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# Lacustrine Records of Holocene Climate and Environmental Change from the Lofoten Islands, Norway

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**LACUSTRINE RECORDS OF HOLOCENE CLIMATE AND  
ENVIRONMENTAL CHANGE FROM THE LOFOTEN ISLANDS, NORWAY**

A Dissertation Presented

by

NICHOLAS L. BALASCIO

Submitted to the Graduate School of the  
University of Massachusetts Amherst in partial fulfillment  
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

February 2011

Geosciences

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NICHOLAS L. BALASCIO

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## ABSTRACT

### LACUSTRINE RECORDS OF HOLOCENE CLIMATE AND ENVIRONMENTAL CHANGE FROM THE LOFOTEN ISLANDS, NORWAY

FEBRUARY 2011

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Lakes sediments from the Lofoten Islands, Norway, can be used to generate well resolved records of past climate and environmental change. This dissertation presents three lacustrine paleoenvironmental reconstructions that show evidence for Holocene climate changes associated with North Atlantic climate dynamics and relative sea-level variations driven by glacio-isostatic adjustment. This study also uses distal tephra deposits (cryptotephra) from Icelandic volcanic eruptions to improve the chronologies of these reconstructions and explores new approaches to crypto-tephrochronology.

Past and present conditions at Vikjordvatnet, Fiskebølvatnet, and Heimerdalsvatnet were studied during four field seasons conducted from 2007-2010. Initially, each lake was characterized by measuring water column chemistry, logging annual temperature fluctuations, and conducting bathymetric and seismic surveys. Sediment cores were then collected and analyzed using multiple techniques, including: sediment density, magnetic susceptibility, loss-on-ignition, total carbon and nitrogen,  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  of organic matter, and elemental compositions acquired by scanning X-



ray fluorescence. Chronologies were established using radiocarbon dating and tephrochronology.

A 13.8 cal ka BP record from Vikjordvatnet provides evidence for glacial activity during the Younger Dryas cold interval and exhibits trends in Ti, Fe, and organic content during the Holocene that correlate with regional millennial-scale climate trends and provide evidence for more rapid events. A 9.7 cal ka BP record from Fiskebølvatnet shows a strong signal of sediment inwashing likely driven by local geomorphic conditions, although there is evidence that increased inwashing at the onset of the Neoglacial could have been associated with increased precipitation.

Heimerdalsvatnet provides a record of relative sea-level change. A 7.8 cal ka BP sedimentary record reflects changes in salinity and water column conditions as the lake was isolated and defines sea-level regression following the Tapes transgression.

Cryptotephra horizons were identified in sediments of Heimerdalsvatnet, Vikjordvatnet, and Sverigedalsvatn. They were also found in a Viking-age boathouse excavated along the shore of Inner Borgpollen. These include the GA4-85, BIP-24a, SILK-N2, Askja, 860 Layer B, Hekla 1158, Hekla 1104, Vedde Ash, and Saksunarvatn tephra. This research project also explored the use of scanning XRF to locate cryptotephra in lacustrine sediments and presents experimental results of XRF scans of tephra-spiked synthetic sediment cores.

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# CHAPTER 1

## INTRODUCTION

### Overview

Geologic archives provide clues about past environments and offer longer-term perspectives to assess natural cycles of change. The Holocene follows the end of the last ice age and spans the last 11,500 years. During that time, the remnants of the major ice sheets melted away, there was a reorganization of ocean and atmospheric circulation, eustatic sea-level stabilized, and human civilizations flourished. Holocene paleoenvironmental reconstructions can be used to provide insights into the mechanisms of these changes, their timing, and regional impacts.

In this dissertation, I explore different aspects of the Holocene environmental history of Lofoten Islands, Norway. Lakes sediments from Lofoten can be used to generate well resolved records of past climate and environmental changes in the northern North Atlantic region. The Lofoten Islands experienced climate changes during the Holocene in response to regional oceanic and atmospheric dynamics, relative sea-level variations due to glacio-isostatic adjustment, and were settled during different prehistoric and historic periods. This research also uses distal tephra deposits (cryptotephra) from Icelandic volcanic eruptions to improve the chronologies of these reconstructions and explores new approaches to crypto-tephrochronology.

## **Background**

### **Setting**

The Lofoten archipelago, located off the northwestern coast of Norway (67-69°N), extends into the Norwegian Sea (Figure 1.1). The Lofoten Islands are separated from the mainland by Vestfjord and consist of seven islands: Austvågøy, Gimsøy, Vestvågøy, Flagstadøy, Moskenesøy, Værøy, and Røst. The lakes studied in this dissertation are located on Austvågøy and Vestvågøy (Figure 1.2). All of the islands are mountainous, reaching elevations up to 1200 m, and dissected by numerous cirques and glacially carved valleys. Present climate conditions are extremely mild temperatures (MAT 4°C) despite this high latitude location because of the warming effects of the Norwegian Atlantic Current, an extension of the North Atlantic Current (Figure 1.1).

### **Glacial & Holocene climate history**

During the last glacial maximum (LGM) the Fennoscandian Ice Sheet reached the shelf edge along almost the entire western coast of Norway (Mangerud, 2004) (Figure 1.3). The Lofoten-Vesterålen archipelago was not overridden by thick ice sourced in the central parts of the Fennoscandian Ice Sheet. Fast flowing ice streams through Andfjord to the north (Vorren and Plassen, 2002) and Vestfjord to the south (Otteson et al., 2005) drained the inland ice and preserved the sharp alpine topography of this region, which was probably glaciated by local ice domes (Otteson et al., 2005). The youngest moraines in the Lofoten-Vesterålen are generally assumed to be Younger Dryas in age



(Andersen, 1975; Rasmussen 1984; Bargel, 2003), but few absolute dates have confirmed these interpretations.

Holocene climate trends in Fennoscandia are primarily driven by northern hemisphere summer insolation, which peaked 12-10 ka and steadily declined during the Holocene (Berger and Loutre, 1991), and are generally characterized by early to mid-Holocene warming with a peak during the mid-Holocene (Holocene Thermal Maximum (HTM)), followed by late-Holocene cooling (Snowball et al., 2004). Superimposed on this long term trend are more rapid climate changes attributed to forcing from freshwater events, volcanic activity, and solar variability (Mayewski et al., 2004).

### **Relative sea-level history**

As a result of the proximity of the LGM ice sheet limit to Lofoten, the area experience relative sea-level variations following deglaciation (Figure 1.4). Postglacial marine limits in Lofoten and Vesterålen generally increase from 10 m a.s.l. in the northwest to 45 m a.s.l. in the southeastern areas (Møller, 1986) following a trend similar to the pattern of present uplift rates occurring in northern Norway (Vestøl, 2006). In Vestvågøy, and areas along a similar isobase, these sea level reconstructions show a relative sea-level regression from ~37 m a.s.l. after deglaciation to ~-3 m a.s.l. in the early Holocene (Vorren et al., 1988). This was followed by the Tapes transgression that reached its maximum at ~6800 cal yr BP (~6000 <sup>14</sup>C years BP) after which relative sea level decreased during the mid- and late Holocene.

## **Links to prehistoric settlements**

Early human settlements and associated land use changes were also considered when interpreting lake sediment records. Archaeological investigations of the Lofoten Islands have identified artifacts dating back to prehistoric times, although much of the early settlement history of the area is associated with the Viking Age. The earliest evidence for farming and domestication of animals is dated around 2,000 cal yr BP, but this area became more heavily inhabited during the Iron Age and through the early Medieval Period (c. AD 1-1300) (Munch et al., 2003). Borg, located in the center of Vestvågøy, was the location of an Iron Age chieftain center and Borgpollen provided a protected natural harbor around which the remains of 20 Iron Age boathouses have been recorded (Munch et al., 2003; Nilsen, 1998). These boathouse structures are linked with the relative sea-level history. The structures around Borgpollen are currently c. 1-3 meters above sea level and fit with the local sea-level history (Møller, 1986; Mills et al., 2009).

## **Tephrochronology**

Another attribute of the region is its location relative to the volcanic systems of Iceland and the presence of tephra in sedimentary environments. Tephra is a collective term for all airborne clastic material erupted from a volcano, which can range in size from *blocks* and *bombs*, several meters in diameter, to *ash*, less than 2 mm in diameter (Alloway et al., 2006). Tephrochronology is the use of these pyroclastic deposits to date sedimentary sequences. Ash layers are typically used in tephrochronology because they are deposited on the landscape outside the immediate vicinity of a volcano and can form

time-synchronous marker beds visible in stratigraphic sections. Geochemical analyses are used to match tephra to known volcanic eruptions or to correlate horizons between depositional environments.

In the North Atlantic region, the volcanic systems of Iceland are the most significant producers of tephra. The volcanic history of Iceland has been well studied and there are a number of historic and prehistoric explosive eruptions that have produced tephra fallout that reached Western Europe (Haflidason et al., 2000). Tephra from Icelandic eruptions have been found as visible layers in Europe (e.g. Birks et al., 1996; Davies et al., 2001), but are more often found in low abundances and as extremely fine-grained particles that are invisible to the naked eye. These are referred to as cryptotephra (Alloway et al., 2006), and the identification of cryptotephra has greatly expanded the use of tephrochronology.

In Lofoten, twenty-three Holocene cryptotephra horizons have been identified in a peat bog (Pilcher et al., 2005). Although techniques to isolate cryptotephra are more easily applied to organic-rich sedimentary environments, this record shows the potential for applying tephrochronology to lacustrine environments in the area

### **Research Themes & Dissertation Organization**

This dissertation presents three lacustrine paleoenvironmental reconstructions that show evidence for Holocene climate changes associated with North Atlantic climate dynamics, and relative sea-level variations driven by local glacio-isostatic adjustment. This study also uses distal tephra deposits (cryptotephra) from Icelandic volcanic

eruptions to improve the chronologies of these reconstructions and explores new approaches to crypto-tephrochronology.

I have structured my dissertation around three themes related to reconstructing Holocene environmental change in Lofoten. These themes address the sea-level history, Holocene climate change, and the use of tephrochronology and are explored within the main chapters of this dissertation:

- Lacustrine records of Holocene climate & environmental change - Chapters 2 & 3
- Isolation basins as records of relative sea-level change - Chapters 3 & 4
- Tephrochronology: applications & method development - Chapters 2, 4, 5 & 6

Each chapter is written in a scientific journal format. The topic of each chapters falls within these research themes and I try to use the data generated to address specific research questions.

### **Lacustrine records of Holocene climate & environmental change**

The record of Holocene environmental change is explored within the sedimentary records of Vikjordvatnet and Fiskebølvatnet. Sediment cores were recovered from both lakes that span the Holocene. Chapters 2 and 3 examine changes in physical and organic geochemical properties of sediment cores to try and interpret past environmental conditions in relation to regional climate. Through these records I try to address the questions:

- How did these lacustrine environments respond to Holocene climate changes?
- How does the timing of changes correspond to regional records?
- Is there evidence for abrupt environmental changes?

- How do these records contribute to our understanding of regional/local Holocene environmental change?

### **Isolation basins as records of relative sea-level change**

Fiskebølvatnet and Heimerdalsvatnet are both isolation basins and sediment cores recovered from these lakes capture the marine-lacustrine transitions. Chapter 3 examines Fiskebølvatnet and describes changes in physical sedimentary characteristics associated with isolation. Chapter 4 presents a multi-proxy approach to assessing the isolation sequence of Heimerdalsvatnet. Through these records I try to address the questions:

- What sedimentary characteristics best define the marine-lacustrine transitions?
- How can we use these records to better define local relative sea-level history?

### **Tephrochronology: applications & method development**

Tephrochronology was used to improve the chronologies of sediment cores from Vikjordvatnet (Chapter 2) and Heimerdalsvatnet (Chapter 4). Extremely low concentrations of tephra were found in sections of both cores and the geochemical compositions were compared to other tephra deposits in the region. Another application of tephrochronology was explored through collaboration with the Lofotr Viking Museum in Borg (Chapter 5). Sediment samples from a Viking Age boathouse were examined for tephra to see if similar techniques could be applied to date local archaeological sites. In Chapter 6, I also examine techniques used in crypto-tephrochronology and I experiment with the use of scanning XRF to locate tephra in sediments using a laboratory-based experiment. Through this research I try to address the questions:

- How can cryptotephra be used to improve age models in different lacustrine settings?

- How accurate are age determinations based on crypto-tephrochronology?
- Can tephrochronology be applied successfully to constrain the age of cultural horizons in sediments excavated from a Viking boathouse?
- What is the potential for tephrochronology for archaeological investigations in Norway?
- What is the scanning XRF signal of tephra?
- Can scanning XRF be used to identify cryptotephra in lacustrine sediments?

### **Research Strategy**

During four field seasons conducted between 2007 and 2009, geomorphic features related to the sea-level and glacial history were investigated and three lakes were targeted for coring: Vikjordvatnet, Fiskebølvatnet, and Heimerdalsvatnet. In the field, lakes were assessed by measuring water column chemistry, logging annual temperature fluctuation, acquiring bathymetric and sub-bottom profiles, and collecting multiple sediment cores. I interpret past environmental conditions using physical and organic geochemical analyses of the lake sediments. I measured physical properties of the sediment (magnetic susceptibility, density), properties of sedimentary organic matter (%LOI, %TC, %OC, %N, C/N,  $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ) to interpret changes in productivity, terrestrial input, and marine influence. I also used an Itrax<sup>TM</sup> core scanner to perform micro-XRF and -radiography to interpret detailed physical and geochemical changes in sediment properties. Together, these data show how different lacustrine environments recorded paleoenvironmental conditions during the Holocene. I applied tephrochronology to date lake sediments in Lofoten using fine sieving and density separations to isolate tephra from minerogenic

components of the sediment. I also used scanning electron microscopy and electron microprobe analysis to describe their morphology and geochemistry.

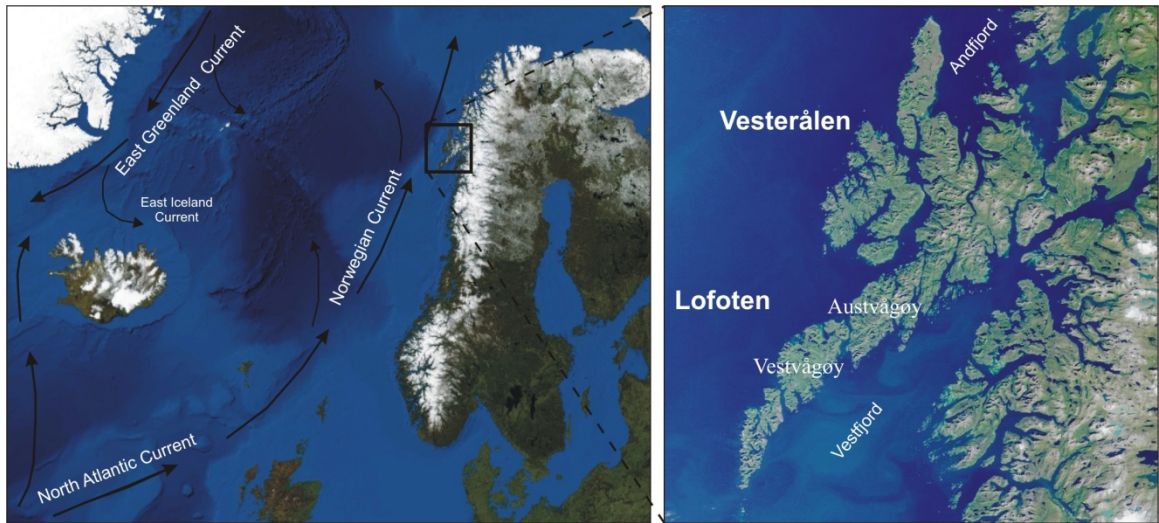
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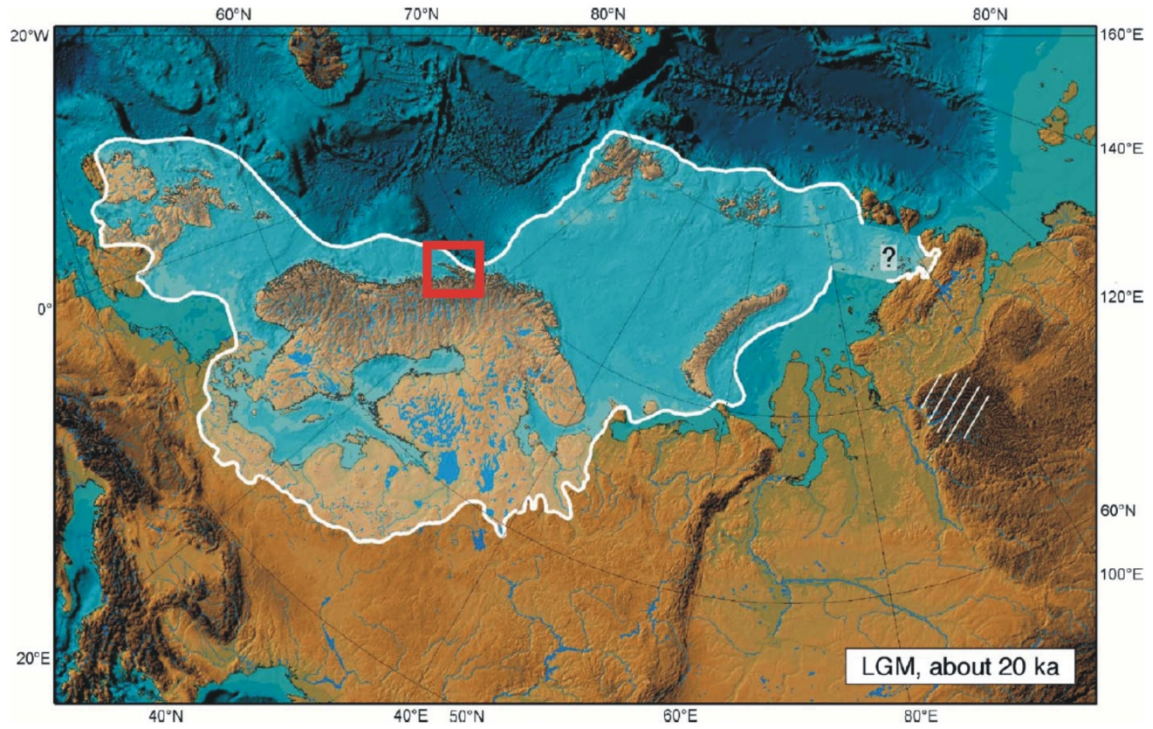
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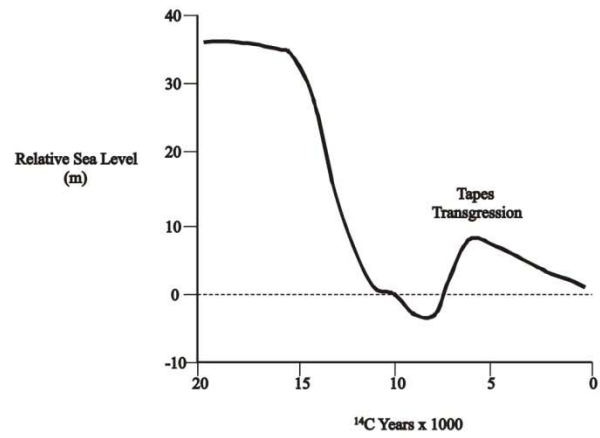
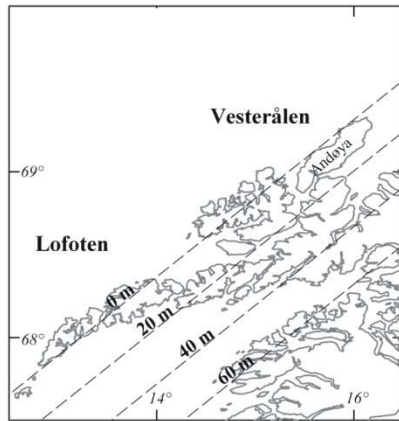
**Figure 1.1.** (Left) Location of the Lofoten-Vesterålen archipelago off the northwestern coast of Norway and the major ocean currents of the northern North Atlantic Ocean. (Right) Lofoten and Vesterålen and the islands Vestvågøy and Austvågøy, where lakes were studied as part of this project.



**Figure 1.2.** Orthophotographs of the islands Austvågøy and Vestvågøy showing the lakes studied as part of this project and other locations referenced in the text.



**Figure 1.3.** A reconstruction of the Eurasian Ice Sheet during the last glacial maximum (LGM) (from Svendsen et al., 2004). Red box indicates the location of the Lofoten-Vesterålen archipelago.



**Figure 1.4.** (Left) Younger Dryas isobases for the Lofoten-Vesterålen archipelago used to show the regional trends in shoreline elevations from northwest to southeast (after Møller, 1985). (Right) Generalized sea-level curve from Andøya (after Vorren et al., 1988).

## CHAPTER 2

### A 14,000-YEAR LACUSTRINE RECORD OF CLIMATE AND ENVIRONMENTAL CHANGE FROM VIKJORDVATNET

#### Abstract

Analysis of a 3-m lacustrine record from the Lofoten Islands shows significant changes in environmental conditions over the last c. 13.8 cal ka BP related to northern North Atlantic climate dynamics. This chapter presents results from a small coastal lake, Vikjordvatnet, on Vestvågøya in the Lofoten Islands. Sediment cores were collected and a 3-m composite record was generated and analyzed for magnetic susceptibility, bulk density, weight loss-on-ignition (LOI), total organic carbon, total nitrogen, and by scanning XRF. A chronology was developed based on nine AMS radiocarbon dates and one tephra horizon. The lake contains two main sedimentary units visible in sub-bottom profiles and sediment cores. The lower unit in the cores is a 0.3 m faintly laminated clay deposited from c. 14.0-11.4 cal ka BP marked by high magnetic susceptibility and Ti values and is evidence for cirque glacier activity in the catchment through the Younger Dryas interval. The upper 2.7 m, deposited during the Holocene, is more organic rich and has a relatively constant accumulation rate of 0.022 cm/yr. An increase in total organic carbon and LOI from c. 11.4-8.0 cal ka BP represents a period of higher aquatic productivity as regional climate warmed from the early to mid-Holocene. This trend is interrupted by a brief periods of decreased organic content from 10.5-10.2 cal ka BP and

9.2-8.0 cal ka BP that likely indicate periods of climate cooling. Organic matter properties are stable during the Holocene Thermal Maximum (c. 8.0-5.0 cal ka BP) as defined by regional atmospheric and sea-surface temperature reconstructions. The late Holocene is marked by two distinct sedimentologic changes at 5.3 and 2.4 cal ka BP. Beginning at 5.3 cal ka BP, there are high amplitude variation in Fe likely related to changes in Fe cycling and driven by cooler conditions and seasonal thermal stratification of the water column. At 2.4 cal ka BP, there is a rise in organic content of the sediment and peaks in LOI at 1.8, 1.6, 1.3, 0.9, and 0.4 cal ka BP indicating periods of greater runoff into the lake that may be attributed to a wetter period or possibly to changes in land cover related to Early Iron Age settlement in the area. These environmental conditions correspond to changes interpreted from nearby marine and terrestrial records and help to better define the regional impact and timing of Holocene climate changes.

## **Introduction**

Holocene paleoenvironmental reconstructions provide information on the natural variability of the climate system and longer-term perspectives on present climate trends (Bradley, 2008). Although climate changes during the Holocene were less pronounced than those of the glacial cycles, there was still significant variability that provides insight into the mechanisms of change and their regional impacts (Mayewski et al., 2004). Reconstructing climate variability in the northern North Atlantic region is particularly important because of the influence of major oceanic and atmospheric circulation patterns

and their potential teleconnections to other Northern Hemisphere climate regimes (e.g. Alley et al., 1997; deMenocal et al., 2000; Kim et al., 2004, Wang et al., 2005).

Climate along the coast of Norway is strongly affected by northward transport of heat through oceanic and atmospheric dynamics. The Norwegian Current, an extension of the North Atlantic Current, carries warm water to the high latitudes of northern Norway (Hopkins, 1991). The North Atlantic Oscillation impacts the region primarily during positive phases when stronger-than-average westerly winds cause greater storminess in the Norwegian Sea increasing winter precipitation and sea-surface temperatures (Uvo, 2003; Hurrell and Dickson, 2004), a phenomena well expressed in records of glacier mass balance (Nesje et al., 2000). The northern coast of Norway, at the northern extend of these systems, is therefore a climatically sensitive region and an important location for paleoenvironmental reconstructions.

Small alpine lakes are sensitive to environmental changes driven by local and regional climate and contain sedimentary archives of past conditions that can be well resolved. Changes in physical and biological characteristics of lake sediments reflect landscape development and past water column properties. This study examines Holocene climate and environmental change along the coast of northern Norway by interpreting the sedimentary record of Vikjordvatnet, a small coastal lake in the Lofoten Islands (Figure 2.1). Results are presented from the analysis of a 3 m sediment core that spans the last c. 14.0 cal ka BP and records changes in glacial input, productivity, and runoff related to past climate conditions. Specifically, I attempt to date the end of local glacial activity and interpret distinct sedimentary changes during the early and late Holocene in the context of regional climate and environmental changes.



## **Study Area**

The Lofoten-Vesterålen archipelago (67-70°N) extends from northeast to southwest into the Norwegian Sea (Figure 2.1). The Lofoten Islands are separated from the mainland by Vestfjord and consist of seven islands; the second largest is Vestvågøya (Figure 2.1). The present climate is mild despite this high latitude location with mean annual temperatures of 4.5°C and mean annual precipitation is 1020 mm, as recorded from 1961-1991 at Bodø (Figure 2.1). This area also contains a regional network of paleoclimate reconstructions (Figure 2.1). It is near the marine coring site MD95-2011 (66°58.19'N, 07°38.36'E) and a number of lacustrine sites that have been studied to generate Holocene temperature records.

Vikjordvatnet (68°13.64'N, 14°3.79'E; 23 m a.s.l.) is located on the southeastern coast of Vestvågøya (Figure 2.2). This small circular lake is ~300 m in diameter and the deepest part of the lake is a broad, flat basin where depths are between 20 and 21 m (Figure 2.2). The lake drains south across a bedrock threshold to the ocean. The main inlet is on the north side of the lake, where a stream has incised through bedrock and has built up an alluvial fan into the lake that consists of cobble-sized clasts. Multiple sediment cores were collected from in front of the deep basin in 18 m water depth (Figure 2.2).

## **Methods**

Geomorphic mapping was conducted in the area around Vikjordvatnet and features related to the glacial and sea-level history were recorded. The bathymetry of Vikjordvatnet was acquired using a fish-finder acoustic sounder with integrated GPS. Sub-bottom profiles were obtained using a SyQwest Stratabox seismic system with a single frequency output of 10 kHz. Travel time was converted to sediment depth using  $1650 \text{ ms}^{-1}$  for the speed of sound in sediment.

Mapped glacial deposits were used to reconstruct the former extent of glaciers in the valley above Vikjordvatnet and to estimate their equilibrium-line altitudes (ELAs). The ELA of a glacier represents the boundary between the accumulation and ablation zones and is mainly controlled by summer temperatures and winter precipitation. Reconstructing the ELA of former glaciers using geomorphic evidence provides a quantitative means of interpreting past climate, assuming steady-state conditions. There are a variety of methods for estimating the ELA of former glaciers (e.g. Porter, 2001; Benn et al., 2005). I applied the accumulation area ratio method (AAR), which assumes a fixed ratio between the accumulation and ablation areas, typically  $\sim 0.60$  for mid- and high-latitude glaciers (Porter, 1975).

Multiple sediment cores were recovered from a floating platform during September of 2008 and 2009. Cores A08 and B08 are two series of drives collected using a Livingstone square-rod piston corer. Casing was used to recover core B08 so each of the 4 drives were collected from the same hole and in a continuous depth sequence. Core A08 was recovered without casing and each drive overlapped those of core B08 by  $\sim 50$  cm. Another core, C09, overlaps the lowest part of the record and was

collected as a single 136 cm drive using a modified piston corer with a 6.5-cm diameter plastic barrel. A 3.01-m composite record was compiled by matching up the physical stratigraphy and magnetic susceptibility profiles measured using a Bartington MS2E sensor.

The core was sub-sampled at 1-cm intervals for wet and dry bulk density, and incinerated at 550°C for 1 hour to measure weight loss-on-ignition (LOI) (Dean, 1974). Samples were also taken every 5 cm, dried in a low temperature oven, acidified with concentrated sulfurous acid, and analyzed for total organic carbon (%TOC), and total nitrogen (%TN) on a Costech ECS 4010 Elemental Analyzer. The  $\delta^{13}\text{C}$  of organic carbon was also measured on acidified samples using a Thermo Delta V Advantage IRMS interfaced with the elemental analyzer, and reported relative to VPDB. Uncertainty in %TOC and %TN, measurements are  $\pm 0.2\%$  and less than  $x.xx\%$  for  $\delta^{13}\text{C}_{\text{org}}$  based on triplicate analysis.

Relative elemental compositions of the sediment was determined by scanning X-ray fluorescence (XRF) using an Itrax<sup>TM</sup> core scanner at the Institut National de la Recherche Scientifique, Quebec City, Canada. Elements were detected and output as peak integrals reflecting their relative concentration in the sediment. The upper 263 cm of the composite record was analyzed. The split core surfaces were scanned at 0.5-cm intervals using an exposure time of 50 s, voltage of 35 kV, and current of 35 mA. The analysis focused on elements: Al, Si, S, Cl, K, Ca, Ti, Mn, Fe, Ni, Zn, Br, Rb, and Sr. Peak integrals for each element were divided by the count rate to account for minor changes in sediment density or water content.

The chronology for the composite core is based on nine AMS radiocarbon measurements on terrestrial macrofossils and one tephra horizon. All radiocarbon ages were calibrated to calendar years using CALIB v. 6.0 (Stuiver and Reimer, 1993) with the IntCal09 calibration dataset (Reimer et al., 2009). The tephra horizon was not a visible layer, but identified as cryptotephra (Alloway et al., 2006) and required isolation from the organic and minerogenic components of the sediment. Samples for tephra were taken between 258 and 267 cm, composite depth. Contiguous 1 or 2 cm samples were acidified to remove organic matter (Pilcher et al., 1996) and then washed in deionized water over a 20  $\mu\text{m}$  sieve. Heavy liquid separation using sodium polytungstate between 2.3-2.5  $\text{gcm}^{-3}$  was then used to concentrate tephra from the remaining mineral grains (Turney, 1998). Samples were mounted in epoxy resin and tephra particles were counted using a polarizing light microscope. Select slides containing tephra were polished and analyzed with an electron microprobe to identify their major element chemistry. Geochemical results were then compared to samples of known age found in other locations around the North Atlantic region.

## **Results**

### **Geomorphic mapping**

The valley above Vikjordvatnet contains a series of three lakes below an east-facing cirque with peak elevations of 540 and 589 m a.s.l. (Figure 2.2). The upper two lakes are surrounded by steep valley walls and talus slopes. The valley widens and has lower slopes around the lake immediately above Vikjordvatnet and there is a low pass,

100 m a.s.l., connecting the valley to the north. South of this lake there are parallel ridges of bouldery till that contain a few isolated depressions. The inlet into Vikjordvatnet flows northeast from this upper lake for 400 m, sharply bends to the southeast, and then runs in a ~5 m channel cut through a bedrock ridge. Below this ridge the streambed contains rounded to sub-rounded cobbles and gravel, which are the primary material that compose the alluvial fan extending into the north side of Vikjordvatnet. Vikjordvatnet is located within a bedrock depression and drains southeast into the ocean.

There is evidence for at least two former phases of glaciation within the valley (Figure 2.3). The older limit, L1, is defined by the extent of till mapped around the lake above Vikjordvatnet. The elevation of the till shows that when ice was at this position it probably spilled into the valley to the north. I also mapped a small cirque moraine, L2, impounding the highest lake. This moraine is not a distinct feature, but is defined by low lateral ridges.

There is also evidence for past sea-levels highstands along this section of coast where the marine limit is mapped at 26 m a.s.l. (Møller, 1985). I observed wave cut terraces and a raised beach deposit from 22-25 m a.s.l. The raised beach (68°14.22'N, 14°6.21'E) consists of rounded boulders 0.3 to 1.0 m in diameter with a gentle slope toward the southeast (Figure 2.4).

### **Equilibrium-line altitudes**

ELAs were estimated for the former glaciers reconstructed from the mapped ice positions, L1 & L2 (Figure 2.3 & 2.5). Glaciers reconstructed from both limits have relatively simple hypsometries (Figure 2.5). L1 has a large percentage of its area

between 150 and 200 m a.s.l. where there is a significant increase in the valley width. Using an AAR of 0.6, the ELA of the glacier at L1 is ~200 m and ~370 m at L2. The modern ELAs of Øksfjordjøkelen ice field and Lenangsbreene in northern Norway have been estimated to be ~1000 m a.s.l. (Rea et al., 1998; Bakke et al., 2005). A similar theoretical modern ELA for Lofoten may also be justified based on the presence of small cirque glaciers around the highest peaks in the Trollfjord region on Austvågøy where mountains reach 1146 m. Therefore, the ELA depressions for glaciers at limits L1 and L2 are estimated to be 800 m and 630 m, respectively.

### **Sediment stratigraphy & chronology**

Sub-bottom images indicate that sediment thickness is greatest in the deep basin and thins away from the northern inlet (Figure 2.6). Average sediment thicknesses are estimated to be 3.0-3.5 m and in the deepest locations there is up to ~6 m of sediment. The upper ~3 m of sediment contains a series of horizontal acoustic reflectors, a couple of which are distinct and continuous. This upper unit overlies more dense sediment that appears massive (Figure 2.6). This lower unit is ~0.5 m thick between 18 and 19 m water depth and is up to ~3 m thick at the deepest part of the basin.

All three of the cores (A08, B08, C09) were collected in 18.0-18.5 m water depth and confirm the presence of the two main sedimentary units observed in sub-bottom images. The composite record compiled from the cores is 3.01 m (Figure 2.7). The lowest 33 cm is dense gray clay that has faint laminations and only a few thin sandy horizons. This unit abruptly transition into a light gray-brown sequence that progressively gets darker in color from 268 to 218 cm. At 218 cm there is a thin, 1.0 cm,

band of gray clay. Above this layer the sediment becomes darker brown and more organic rich and this lithology continues to the top of the core.

The chronology is based on nine AMS radiocarbon dates and one tephra horizon (Figure 2.7; Table 2.1). Tephra samples were taken near the transition from clay to more organic-rich sediment (258-267 cm). Tephra were found in low abundance within this interval with a peak in concentration at 263 cm, where 10 colorless tephra shards were identified. Ten shards were analyzed on the electron microprobe in the samples from 261-262 cm and 262-263 cm, although results are only reported from the eight shards that have totals greater than 90% (Table 2.2). Six of the grains have a similar composition, which matches the tephra from the Icelandic eruption of the Askja caldera in the Dyngjufjöll volcanic center c. 11 cal ka BP (Sigvaldason, 2002) (Figure 2.8). Tephra from this eruption has also been found in southeast Sweden (Davies et al., 2003) and at the base of a peat deposit in Lofoten (Pilcher et al., 2005). Two tephra shards from Vikjordvatnet are slightly outside the geochemical range established by these other studies, although this can probably be explained by lower analytical totals, <94% (Table 2.2). There is some uncertainty associated with using this tephra layer as a chronologic marker because of the small number of shards analyzed. However, an age of c. 11 cal ka BP for this depth interval is supported by trends in the age-depth relationship of radiocarbon dates above this horizon (Figure 2.7).

A polynomial equation was fitted to these ages and extrapolated to the base of the core (Figure 2.7). This age-model suggests that the record spans the last c. 13.8 cal ka BP, although this is a rough estimate since there is no age control below 263 cm and there is a facies change that was probably associated with a different sedimentation rate (Figure

2.7). The transition from the basal clay to the onset of more organic sediment occurs at c. 11.4 cal ka BP. The rest of record is well constrained by radiocarbon ages. The clay horizon at 218 cm occurs at c. 8.6 cal ka BP, and sedimentation rates over the upper 250 cm are generally uniform,  $\sim 0.022 \text{ cm yr}^{-1}$ .

### **Physical & organic geochemical properties**

Physical and organic geochemical properties of the sediment, including: magnetic susceptibility, dry bulk density, LOI, %TOC, and C/N define significant sedimentary changes that correspond with the visible stratigraphy (Figure 2.9). Magnetic susceptibility and dry bulk density are highest below 268 cm in the core. Both parameters decrease at 268 cm marking the transition from the dense minerogenic clay to more organic sediment. Above 268 cm magnetic susceptibility and bulk density values show less variability and LOI shows variations that are supported by changes in %TOC. Average LOI values generally increase from 2% at 268 cm to 29% at 190 cm. This increasing trend is interrupted from 255-246 cm and from 230-218 cm. At 255 cm, LOI values slightly decrease and are stable up to 246 cm. At 230 cm, LOI decreases and then sharply drops at 218 cm. Above 218, LOI increases again until  $\sim 190$  cm where values stabilize and vary from 26-30% up to 40 cm. From 40 cm to the top of the core, LOI values show greater variability and reach 42%. Similar trends are apparent in the coarser %TOC record where values range from 0% to 14% across the core. C/N values show very little variability with an average of 11 and vary from 8 to 12. C/N values in this range are generally assumed to show that organic matter is dominantly from algal sources as opposed to terrestrial plants, which have values of 20 or greater (Meyers, 1997).



## Scanning X-ray fluorescence

Scanning XRF data was examined by compiling the relative response of elements, correlation coefficients between elements, results from principal component analysis (PCA), and elemental profiles (Table 2.3, 2.4; Figure 2.10). Because of the organic-rich nature of the sediment (average TOC=10%) overall count rates are low with an average of ~9000 counts/second. Low count rates resulted in low peak areas especially for the light elements such as: Al, Si, S, and Cl (Table 2.3). Correlation coefficients between elements show the strongest trends among Ti, K, Ca, and Sr ( $r > 0.800$ ), although strong correlations are also present among Zn, Rb, and Si ( $r > 0.700$ ). PCA indicates that first three principal components account for 61.26% of the variability (Table 2.4). PC1, PC2, and PC3, account for 40%, 14%, and 8% of the variability, respectively. PC1 is mainly controlled by Ti, K, Ca, Sr, and Rb, which all have factor loads greater than 0.800. PC2 is mainly controlled by Fe, which has the highest factor load, 0.830.

Ti, a detrital indicator, represents the primary trend in the elemental data, which closely resembles the PC1 profile (Figure 2.10). These profiles show a decreasing trend from 263 cm to 230 cm. There is a slight increase at 250 cm and a prominent peak across the clay layer at 218 cm, and then values stabilize and have less variability up to the present. Elements with slightly lower factor loadings for PC1 (e.g. Zr and Si) display similar trends, but the decline from 263-230 cm and the peak at 218 cm are less pronounced (Figure 2.10). Si exhibits a decreasing trend across the entire record and some counts are zero between 132 cm and the top of the record.

Aside from the trends expressed by PC1 and exhibited by most elements, a few other significant trends are present in the elemental data. Fe has a strong influence on the variability in PC2 (Table 2.4). The Fe profile is similar to Ti (and PC1) between 263 cm and 230 cm where values generally decrease, except for a peak across the clay layer at 218 cm. Although above 132 cm, Fe values increase and have high amplitude variations up to the top of the core; such changes are not present in other element profiles. Mn values respond somewhat similarly over the upper 132 cm, but do not show the low frequency decreasing trend at the base of the core. Mn values are generally higher and more variable above 132 cm and there is a broad increase between 50 cm and 30 cm.

### **Paleoenvironmental interpretation**

Vikjordvatnet contains two main sedimentary units that were identified in sub-bottom profiles and confirmed with sediment coring. The lower clay unit is likely the result of glacial erosion and indicates the presence of a glacier in the catchment from c. 13.8 cal yr BP to 11.4 cal yr BP (Figure 2.7). This fine-grained glacial sediment suggests that the glacier was restricted to the cirque above Vikjordvatnet. Coarse sediment produced by a glacier at that time would have settled out in the upper valley lakes and only the finer grained, suspended material would have reached Vikjordvatnet. The transition to more organic-rich sediment represents the end of glacial activity in the catchment. It seems plausible that L2 marks the position of a cirque glacier advance during the height of this event, although the data cannot be used to precisely say when this occurred. L1 was therefore deposited during an earlier advance.

There was no evidence for marine incursion into Vikjordvatnet over the last 13.8 cal ka BP. The local marine limit was probably reached immediately following deglaciation similar to observations from Andøya, where the marine limit is dated to between 18.5 and 15.5 <sup>14</sup>C ka BP (Vorren et al., 1988). Therefore, it is likely that a longer core from Vikjordvatnet might contain evidence for relative sea-level change.

Early Holocene sedimentation is marked by an increasing percentage of sedimentary organic matter and decreasing clastic input as recorded by declining magnetic susceptibility and Ti values from 11.5 to 9.3 cal ka BP (Figure 2.11). This is likely a response to warmer conditions and reflects increased aquatic productivity as well as decreased clastic input resulting from landscape stabilization and soil development. This warming trend is interrupted from c. 10.5-10.2 cal ka BP and c. 9.2-8.0 cal ka BP when LOI values stabilize or decrease and there are slight increases in detrital indicators. Also, at 8.6 cal ka BP there is a sharp drop in LOI and increase in magnetic susceptibility and Ti that corresponds to a brief period of clay deposition. These intervals probably indicate decreased aquatic productivity related to climate cooling and/or increased clastic input. The clay unit deposited at 8.6 cal ka BP is similar in composition to the clay at the base of the core interpreted to be glaciogenic and might be evidence for the reappearance of a glacier in the catchment at 8.6 cal ka BP. It could also be an older, reworked deposit, but this seems unlikely since it occurs within a longer period of reduced organic production and there is good chronologic control through this interval. A similar stratigraphy was observed in the early Holocene interval of a lake sediment core from Andøya and the reappearance of clay was attributed to landscape adjustment related to permafrost subsidence (Paasche et al., 2007).

After 8.0 cal ka BP, LOI values increase through the mid-Holocene until c. 7.3 cal ka BP where they are more stable and punctuated by slight increases to c. 2.4 cal ka BP. This period represents a final increase and general stabilization of productivity, however Fe values exhibit increased variability during this interval between 5.4 and 2.4 cal ka BP (Figure 2.11). The timing of this change corresponds with slight increases in magnetic susceptibility and Ti, and may indicate increased sediment delivery of Fe-bearing clastic material. Increased sediment input could have been caused by a shift to higher amounts of summer or winter precipitation, which would have increased runoff to the lake by direct rainfall in the catchment or from greater spring melt from a thicker winter snowpack. However, detrital changes may only be a small influence on Fe values since there is no change in sedimentation rate and the distinct trends in Fe are still present even when plotted relative to Ti (Figure 2.11). Alternatively, increased Fe cycling brought on by a shift in redox conditions may explain this trend. Fe is a redox sensitive element and its mobility can be governed by changes in water column oxidation (e.g. Schaller et al., 1997a,b; Ng and King, 2004). A shift to a cooler climate after 5.4 cal ka BP may have resulted in the onset of seasonal lake-ice cover causing reduced mixing, depletion of oxygen in the water column, and reduction of Fe. Mixing of the lake following these periods would oxygenate the water column and cause increased concentration of insoluble forms of Fe to accumulate in the sediment. Increased Fe precipitation was also observed after 5.4 ka BP in lake sediments from Andøya (Vorren and Alm, 1999). From 2.4 cal ka BP to present, Fe, magnetic susceptibility, and LOI increase to their highest values and have greater variability. There is a large increase in Mn detected in the sediment, and distinct peaks in LOI occur at 1.8, 1.6, 1.3, 0.9, and 0.4 cal ka BP. These

trends reflect increased runoff into to lake possibly from intensification of seasonal cycles or changes in land use in the catchment.

### **Comparison to regional late Glacial & Holocene climate records**

Long-term climate change in the Arctic over this period is primarily driven by northern hemisphere summer insolation, which peaked 12-10 ka and steadily declined during the Holocene (Berger and Loutre, 1991) (Figure 2.11). Superimposed on this long term trend are more rapid changes attributed to forcing from freshwater events, volcanic activity, and solar variability (Mayewski et al., 2004). Holocene climate in Fennoscandia can generally be characterized by early to mid-Holocene warming with a peak during the mid-Holocene (Holocene Thermal Maximum (HTM)), followed by late-Holocene cooling. Based on these regional climate trends, the Holocene is typically divided into three time periods: the early Holocene (c. 11.5-8.0 cal ka BP), mid Holocene (c. 8.0-5.0 cal ka BP), and late Holocene (c. 5.0 cal ka BP-Present) (e.g. Snowball et al., 2004; Seppä et al., 2009).

### **Regional temperature reconstructions**

Temperature reconstructions from this area provide an overall understanding of Holocene climate change and provide a framework to interpret the sedimentary changes in Vikjordvatnet as a response to regional climate change. Holocene climate trends are expressed in SSTs from off the Norwegian coast and in atmospheric temperature

reconstructions based on biological proxies from northwestern Scandinavia (Table 2.5; Figure 2.1).

SST changes have been extensively studied at coring site MD952011 because it is located directly beneath the Norwegian Atlantic Current (Figure 2.1). SST reconstructions have been generated using diatoms (Birks and Koç, 2002; Andersen et al., 2004), planktic foraminifera (Risebrobakken et al., 2003), alkenones (Calvo et al., 2002), and radiolarians (Dolven et al., 2002). Although, only alkenone and diatom reconstructions reflect temperatures of the uppermost ocean and have a significant HTM and step-wise cooling during the late Holocene similar to the trend in insolation (Figure 2.11).

Holocene atmospheric summer temperature reconstructions have also been generated in this region from lacustrine records using pollen, diatoms, and chironomids (Table 2.1; Figure 2.12). The trends in these records are compared as temperature anomalies. There is considerable variability among all of the records, but they all generally show warmer conditions during the mid-Holocene followed by a cooler late Holocene. The variability is associated with how each proxy responds to climate change and the reliability of transfer functions used to interpret temperatures from biologic assemblages (Rosén et al., 2003). Uncertainties in diatoms and chironomid reconstructions are greater prior to c. 7 cal ka BP as a result of landscape development and lake ontogeny. The pollen records seem to capture the regional climate trends and compare well with millennial scale changes in SSTs (Figure 2.11). Although pollen records also have uncertainties related to long distance transport and do not capture rapid or small climate changes.

## **Late Glacial – Younger Dryas**

During the last glacial maximum (LGM) the Fennoscandian Ice Sheet reached the shelf edge along almost the entire western coast of Norway (Mangerud, 2004). The Lofoten-Vesterålen archipelago was not overridden by thick ice sourced in the central parts of the Fennoscandian Ice Sheet. Fast flowing ice streams through Andfjord to the north (Vorren and Plassen, 2002) and Vestfjord to the south (Otteson et al., 2005) drained the inland ice and preserved the sharp alpine topography of this region, which was probably glaciated by local ice domes (Otteson et al., 2005). Local deglaciation, established in the Andfjord-Vågsfjord area (Vorren and Plassen, 2002), began at c. 14.6 <sup>14</sup>C ka BP (17.8 cal ka BP) and was followed by at least five halts or readvances of fjord glaciers, the most significant being the Younger Dryas when glaciers readvanced greater than 40 km from c. 10.3-10.7 <sup>14</sup>C ka BP (12.2-12.7 cal ka BP). However, there is evidence in western Norway for a later Younger Dryas ice sheet maximum, 11.6-11.7 cal ka BP (Bondevik and Mangerud, 2002).

Pollen-based temperature reconstructions from Andøya and the north coast of Norway indicate that mean July temperatures were ~5-6°C during the Younger Dryas (Alm, 1993; Seppä et al., 2002), SSTs reconstructed at site MD95-2011 were 7-9°C colder than present (Berner et al., 2010), and ELA lowering in northern and southern Norway are estimated to have been 400-500 m (Nesje, 1992; Dahl and Nesje, 1992; Evans et al., 2002; Bakke et al., 2005). The end of the Younger Dryas is marked by the retreat of glaciers in several fjords in northern Norway that occurred at c. 10.3 ka (11.8 cal ka BP) (Fimreite et al., 2001; Vorren and Plassen, 2002; Hald et al., 2003), a rapid

increase of SSTs of 3-3.5°C at 11.7 cal ka BP (Berner et al., 2010), and a shift to warmer and more stable surface temperature conditions in Andfjord at 11.5 cal ka BP (Ebbesen and Hald, 2004).

The sediment core from Vikjordvatnet provides evidence for glacial activity during the Younger Dryas and the transition to the Holocene is dated to c. 11.4 cal ka BP, corresponding with the timing of regional warming documented by terrestrial and marine records. The youngest moraines in the Lofoten-Vesterålen are generally assumed to be Younger Dryas in age (Andersen, 1975; Rasmussen 1984; Bargel, 2003), but few absolute dates have confirmed these interpretations. The younger moraine (L1) mapped in the valley above Vikjordvatnet was probably deposited during the Younger Dryas and the clay unit in the core captures the final phase of glacial activity from this ice limit. The estimated ELA depression based on the mapped glacier extent at L2 (630 m) is greater than has been observed at other locations in Norway and may reflect uncertainty in the reconstruction of the ice margin, the AAR of 0.6 used, or might be a result of local factors such as snow avalanching, debris cover, snow drifting, and/or topographic shielding, which can allow a glacier to persist below the regional ELA. The ELA reconstructed for a glacier at L1 (200 m) is similar to the ELAs of cirque glaciers reconstructed on Andøya (268 m, 247 m) attributed to late glacial and possible LGM advances (Paasche et al., 2007).

### **Early Holocene (11.5-8.0 cal ka BP)**

The early Holocene is marked by overall warming as the ice sheet retreated farther inland and temperatures rose in response to insolation changes and the greater



northward transport of Atlantic Water into the Nordic Seas (Hald et al., 2007).

Reconstructed SSTs and pollen-derived July temperatures both follow this trend (Figure 2.11). There is also evidence for instability in the climate system during this period exhibited by brief cooling intervals observed around the North Atlantic region (e.g. Björk et al., 1997; Hald and Hagan, 1998; Björk et al., 2001; Alley and Ágústsdóttir, 2005). In Lofoten, precipitation seasonality and summer surface wetness assessed from carbon and hydrogen isotope ratios of leaf waxes and Sphagnum biomarkers in a Lofoten peat deposit indicate a two part early Holocene (Nichols et al., 2009). From 11.0-9.2 cal ka BP summers were cool and wet with dry winters and then from 9.2-8.0 cal ka BP summers were warm and dry with wetter winters. The timing of these changes corresponds well to trends in Vikjordvatnet.

Vikjordvatnet exhibits overall warming during the early Holocene. The warming trend is interpreted briefly from 10.5-10.2 cal ka BP and more significantly from 9.2-8.0 cal ka BP indicating periods of cooler and possibly wetter conditions. Both cooling periods occur at the same time cooler conditions are observed in the alkenone SST record (Figure 2.11). The period from 10.5-10.2 cal ka BP corresponds with a cooling event at 10.3 cal ka BP interpreted for records around the North Atlantic region (Björk et al., 2001) and cooling found in eastern Norwegian Sea SST records from 10.3-9.9 cal ka BP (Berner et al., 2010) possibly related to a reduction in thermohaline circulation. B

The other cooling period, 9.2-8.0 cal ka BP, in Vikjordvatnet, overlaps with the timing of cooling associated with “8.2 ka” event (Figure 2.13). This event is the most dramatic period of cooling observed in Holocene temperature reconstructions from Greenland ice cores (Alley et al., 1997) and had a strong cooling effect on Europe (Alley

and Ágústsdóttir, 2005). It was likely triggered by the input of freshwater into the North Atlantic from the drainage of glacial lakes in front of the retreating Laurentide Ice Sheet (Barber et al., 1999; Teller and Leverington, 2004). Although, there is evidence that the 8.2 ka event occurred within a longer interval of climate deterioration from 8.5-8.0 ka BP (Rohling and Pälike, 2005) and may have been preceded by cooling at 9.2 cal ka BP from a smaller outburst from these glacial lakes (Fleitmann et al., 2008). In central and southern Norway, glacier advances are recorded from c. 8.5-8.0 cal ka BP, locally called the Finse event (Dahl and Nesje, 1994, 1996), and is supported by a decrease in SSTs in the Norwegian Sea (Risebrobakken et al., 2003; Hald et al., 2007). Glacial records show this event was associated with a period of greater winter precipitation from 9.2-8.3 cal ka BP (Nesje et al., 2001). Northern Fennoscandia lacks strong evidence for cooling linked to the 8.2 ka event (Seppä et al., 2007), although there is evidence for glacier advances in northern Norway prior to this period from 9.8-9.4 cal ka BP and 9.3-8.9 cal ka BP (Bakke et al., 2005) and some temperature reconstructions from northern Sweden do show cooling (Korhola et al., 2000; Rosén et al., 2001).

Therefore, it is likely that the changes in sediment characteristics in Vikjordvatnet at this time are a response to cooler conditions and/or greater winter precipitation resulting in lower productivity and/or increased runoff delivering more clastic material to the lake basin. It seems improbable that the deposition of clay within this interval is the result of the formation of a glacier in the catchment based the ELA of glacier advances at this time from a more continental site in northern Norway (Bakke et al., 2005) and the deposit is more likely the result of some type of landscape adjustment associated with this period of environmental change.

### **Mid-Holocene (8.0-5.0 cal ka BP)**

Maximum summer temperatures were reached during the mid-Holocene (Snowball et al., 2004; Seppä et al., 2009). Terrestrial pollen records indicate temperatures were 1.5-2.0°C greater than present (Bjune et al., 2004; 2005). SSTs reconstructions based on diatoms (Andersen et al., 2004) and alkenones (Calvo et al., 2002) from core MD95-2011 also exhibit a pronounced Holocene thermal maximum. Almost all glaciers in Norway completely melted away sometime between 8.0 and 4.0 ka BP (Nesje et al., 2008) and only one glacier is known to have survived this warm interval (Bakke et al., 2010). The peat record from Bøstad indicates this was a dry period (Nichols et al., 2009).

In Vikjordvatnet, organic matters continued to rise from the early Holocene until c. 7ka, and most parameters are relatively stable indicating that no significant changes in productivity or in washing of sediment occurred during this time consistent with warm and dry conditions.

### **Late Holocene (5.5 cal ka BP – present)**

The late Holocene is marked by overall decreasing temperatures (Snowball et al., 2004; Seppä et al., 2009) and is associated with the rejuvenation and gradual expansion of glaciers (Nesje et al., 2008). The alkenone SST record from core MD95-2011 indicates a stepped decrease in temperatures at 5.5 ka and again at 2.7 ka (Calvo et al., 2002) (Figure 2.11). At Bøstad bog, the late Holocene hydrologic record is marked by wetter conditions and higher variability after 4.3 cal ka BP.

These regional environmental conditions correspond with changes at Vikjordvatnet. Fe values increase after 5.3 cal ka BP and can be attributed to changes in water column properties driven by a cooler climate. The increased variability and high organic matter content after 2.4 cal ka BP may be an intensification of these conditions. Particularly interesting are the correspondence between the stepped decrease in alkenone SST and the timing of changes at Vikjordvatnet (Figure 2.11). Wetter conditions over the last 2.0 cal ka BP are supported by changes in the isotopic composition of lakes in northern Sweden (Jonsson et al., 2010) and from glacial records in northern and southern Norway where it was attributed to stronger westerlies (Bakke et al., 2008). However, 2.4 cal ka BP also corresponds with the establishment of farming in the area. At the nearby village of Moland, located ~2 km east along the coast from Vikjordvatnet, a farmstead is dated to c. 2.5 cal ka BP as interpreted from pollen evidence that indicates a decrease in forest cover and increase in grassland, and dates on archaeological findings (Johansen and Vorren, 1986). It is possible that anthropogenic-driven environmental changes in the catchment of Vikjordvatnet might also explain the unique trends in geochemical data over the last 2.4 cal ka BP.

## **Conclusions**

This study of Vikjordvatnet shows that the lake was sensitive to regional climate changes during the Holocene and provides information on climate conditions following the Younger Dryas in the Lofoten Islands. Geomorphic and sedimentary evidence was used to identify cirque glacier activity from 13.8-11.4 cal ka BP that likely corresponds to

a glacier with an estimated ELA of 370 m. There was also evidence for an older glacier advance in the valley with an estimated ELA of 200 m. Holocene sedimentation in Vikjordvatnet was characterized using magnetic susceptibility, %LOI, %TOC, C/N, and scanning XRF data. They indicate that the lake experienced overall warming conditions during the early Holocene from 11.4-8.0 cal ka BP in response to higher insolation and increasing inflow of warm Atlantic water into the Norwegian Sea. Instability during the early Holocene warming was also observed as short-term decreases in organic matter content of the sediment from 10.5-10.2 cal ka BP and 9.2-8.0 cal ka BP, which correspond to regional cooling events, likely attributed to freshwater forcing and slowdown of the northward transport of warm water. The Holocene Thermal Maximum is marked by high organic matter content and stable conditions. This is followed by the transition to the late Holocene and Neoglacial cooling, marked in Vikjordvatnet by changes in Fe cycling possibly related to seasonal ice-cover and thermal stratification of the lake beginning around 5.3 cal ka BP. Large amplitude variations in organic matter are also observed over the last 2.4 cal ka BP and are may be inwashing events related to wetter conditions or the establishment of permanent settlements in the area.

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**Table 2.1.** Radiocarbon results calibrated with CALIB 6.0 using the INTCAL09 dataset (Reimer et al., 2009).

Core Depth (cm)	Description	Laboratory #	$\delta^{13}\text{C}$ (‰)	$^{14}\text{C}$ Age ( $^{14}\text{C}$ yr BP)	Calibrated Age Range (cal yr BP)		Median 1- $\sigma$ Age (cal yr BP)
					(1 $\sigma$ )	(2 $\sigma$ )	
27	Plant/Wood	OS-80456	-26.02	1400 $\pm$ 25	1292-1326	1286-1344	1309 $\pm$ 24
59	Plant/Wood	UCI-58697	--	2435 $\pm$ 20	2363-2654	2356-2694	2509 $\pm$ 206
84	Plant/Wood	OS-80587	-22.92	3210 $\pm$ 30	3394-3450	3369-3477	3422 $\pm$ 40
123	Plant/Wood	OS-80588	-26.68	4250 $\pm$ 30	4826-4852	4661-4864	4839 $\pm$ 18
153	Plant/Wood	UCI-58698	--	5065 $\pm$ 20	5751-5891	5747-5899	5821 $\pm$ 99
189	Plant/Wood	OS-80589	-26.07	6260 $\pm$ 35	7166-7247	7027-7267	7207 $\pm$ 57
208	Plant/Wood	UCI-58704	--	7165 $\pm$ 25	7963-8000	7947-8017	7982 $\pm$ 26
220	Plant/Wood	OS-80590	-25.79	7890 $\pm$ 40	8603-8755	8591-8975	8679 $\pm$ 107
231.5	Plant/Wood	UCI-58699	--	8430 $\pm$ 30	9441-9487	9421-9524	9464 $\pm$ 33

**Table 2.2.** Major oxide concentrations of tephra shards isolated from Vikjordvatnet core B08 261-263 cm. Results are only reported for analyses with totals greater than 90%. Totals less than 95% are in italics.

No.	P <sub>2</sub> O <sub>5</sub>	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	MgO	CaO	MnO	FeO	Na <sub>2</sub> O	K <sub>2</sub> O	Total
<b>Askja c. 11 cal ka BP</b>											
1	<i>0.02</i>	<i>71.94</i>	<i>0.33</i>	<i>12.34</i>	<i>0.23</i>	<i>1.47</i>	<i>0.10</i>	<i>2.46</i>	<i>2.78</i>	<i>2.35</i>	<i>94.10</i>
2	0.10	74.30	0.34	12.18	0.25	1.69	0.11	2.60	3.13	2.53	97.28
3	0.04	74.52	0.25	12.39	0.26	1.65	0.08	2.64	3.47	2.37	97.68
4	<i>0.01</i>	<i>71.45</i>	<i>0.22</i>	<i>12.13</i>	<i>0.23</i>	<i>1.50</i>	<i>0.07</i>	<i>2.36</i>	<i>3.07</i>	<i>2.30</i>	<i>93.34</i>
5	0.04	74.51	0.28	12.64	0.27	1.63	0.11	2.52	2.88	2.47	97.34
6	0.06	74.75	0.29	12.32	0.23	1.60	0.07	2.58	2.48	2.38	96.89
<i>Average</i>	0.05	73.58	0.28	12.33	0.25	1.59	0.09	2.53	2.97	2.40	96.11
<i>Std. Dev.</i>	0.03	1.47	0.04	0.18	0.02	0.08	0.02	0.10	0.34	0.08	1.88
<b>Unknown</b>											
1	0.01	69.24	0.24	13.66	0.16	1.32	0.13	3.82	3.88	3.36	95.83
2	<i>0.05</i>	<i>66.43</i>	<i>0.29</i>	<i>12.81</i>	<i>0.22</i>	<i>1.31</i>	<i>0.13</i>	<i>3.56</i>	<i>2.69</i>	<i>3.26</i>	<i>90.91</i>

**Table 2.3.** Itrax scanning XRF elemental statistics, including the mean and standard deviation of element peak areas and correlation coefficients between elements. Correlation coefficients greater than 0.700 are in bold.

	Mean	Std. Dev.	Al	Si	S	Cl	K	Ca	Ti	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr
Al	4	3	1																
Si	6	5	0.361	1															
S	4	2	0.122	0.224	1														
Cl	1	1	-0.232	0.068	0.195	1													
K	40	32	-0.094	<b>0.733</b>	0.210	0.360	1												
Ca	81	36	-0.067	<b>0.776</b>	0.192	0.277	<b>0.963</b>	1											
Ti	63	30	-0.144	0.690	0.217	0.366	<b>0.969</b>	<b>0.950</b>	1										
Cr	4	3	0.039	0.428	0.096	0.101	0.477	0.485	0.493	1									
Mn	167	176	-0.085	-0.225	-0.039	0.106	-0.178	-0.232	-0.182	0.038	1								
Fe	5467	1490	-0.484	-0.181	0.166	0.509	0.239	0.113	0.301	0.024	0.225	1							
Ni	15	7	-0.160	-0.044	0.181	0.217	0.118	0.065	0.157	-0.048	-0.060	0.325	1						
Cu	14	8	-0.001	0.263	0.141	0.191	0.299	0.317	0.333	0.058	-0.130	0.104	0.269	1					
Zn	28	12	-0.095	0.525	0.247	0.311	<b>0.731</b>	0.696	<b>0.734</b>	0.305	-0.071	0.289	0.252	0.354	1				
Br	53	15	0.186	-0.185	-0.135	-0.252	-0.393	-0.336	-0.424	-0.104	0.082	-0.427	-0.177	-0.142	-0.394	1			
Rb	31	22	-0.095	0.610	0.193	0.267	<b>0.788</b>	<b>0.785</b>	<b>0.775</b>	0.357	-0.173	0.170	0.075	0.248	0.585	-0.343	1		
Sr	67	34	-0.102	0.669	0.135	0.310	<b>0.883</b>	<b>0.883</b>	<b>0.856</b>	0.419	-0.204	0.149	0.097	0.292	0.621	-0.274	<b>0.741</b>	1	
Zr	79	19	-0.035	0.439	0.165	0.202	0.553	0.532	0.565	0.271	-0.148	0.134	0.190	0.209	0.408	-0.262	0.481	0.509	1

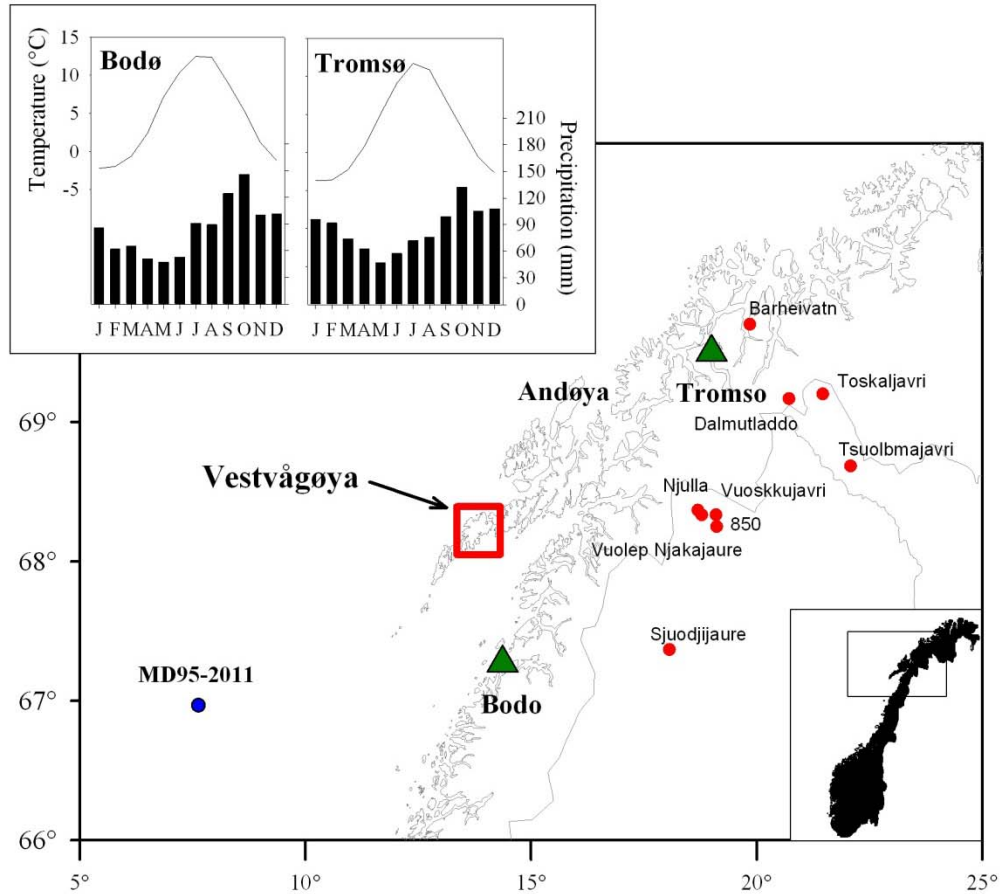


**Table 2.4.** Principal component analysis of scanning XRF results. Eigenvalues and factor loadings are shown for the first 3 principal components (PC). Factor loadings greater than 0.800 are in bold.

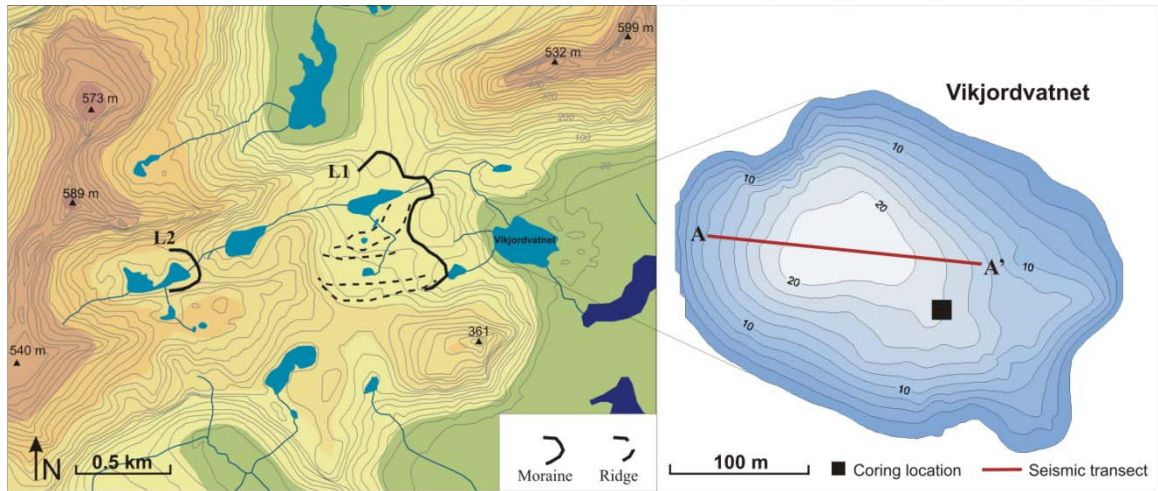
	<b>PC 1</b>	<b>PC 2</b>	<b>PC 3</b>
Eigenvalue	6.83	2.29	1.29
Variability (%)	40.19	13.46	7.61
Cumulative %	40.19	53.65	61.26
<i><b>Factor Loadings</b></i>			
Al	-0.097	-0.668	0.342
Si	0.744	-0.515	0.074
S	0.285	0.089	0.463
Cl	0.406	0.542	-0.018
K	<b>0.965</b>	-0.057	-0.110
Ca	<b>0.948</b>	-0.173	-0.101
Ti	<b>0.966</b>	0.007	-0.095
Cr	0.500	-0.217	-0.360
Mn	-0.203	0.320	-0.415
Fe	0.283	<b>0.830</b>	-0.097
Ni	0.203	0.471	0.554
Cu	0.395	0.086	0.517
Zn	0.786	0.119	0.089
Br	-0.461	-0.378	-0.033
Rb	<b>0.828</b>	-0.073	-0.098
Sr	<b>0.885</b>	-0.111	-0.120
Zr	0.627	-0.023	0.089

**Table 2.5.** Temperature reconstructions based on biological proxies from lakes in northwestern Scandinavia.

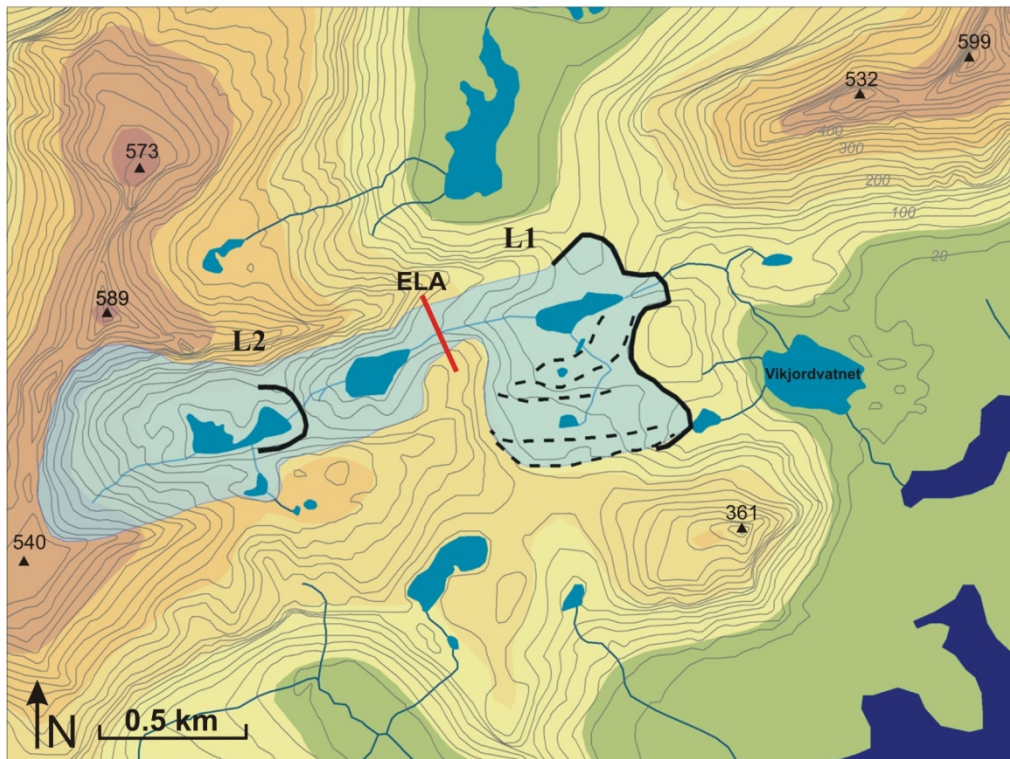
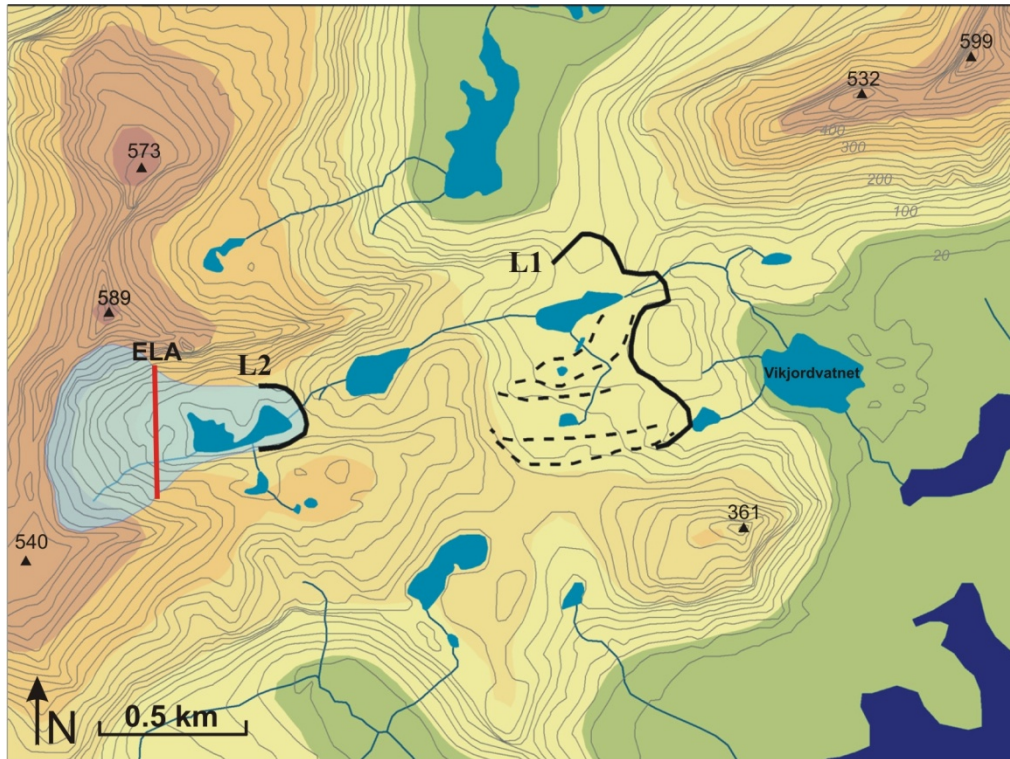
Lake	Latitude (°N)	Longitude (°E)	Elevation (m a.s.l.)	Lake Area (km <sup>2</sup> )	Max. Depth (m)	Proxy	Source
Barheivatn	69° 42'	19° 51'	317	0.12	9	Pollen	Bjune et al., 2004
Toskaljavri	69° 12'	21° 28'	704	1.00	21.5	Chironomids Pollen	Seppä et al., 2002; Seppä and Birks, 2002
Dalmutladdo	69° 10'	20° 43'	355	0.07	4.5	Pollen	Bjune et al., 2004
Tsuolbmajavri	68° 41'	22° 05'	526	0.14	5.35	Diatoms Chironomids Pollen	Korhola et al., 2000; Seppä and Birks, 2001; Korhola et al., 2002
Njulla	68° 22'	18° 42'	999	0.11	4.4	Diatoms Chironomids	Bigler et al., 2003
Vuoskkujavri	68° 20'	19° 06'	348	0.68	18	Diatoms Chironomids Pollen	Bigler et al., 2002
Vuolep Njakajaure	68° 20'	18° 45'	409	0.30	13.7	Diatoms Chironomids	Bigler et al., 2006; Heinrichs et al., 2006
850	68° 18'	19° 07'	850	0.14	8.2	Diatoms Chironomids	Larocque and Bigler, 2004
Sjuodjijaure	67° 22'	18° 04'	826	0.06	4.2	Diatoms Chironomids Pollen	Rosen et al., 2001



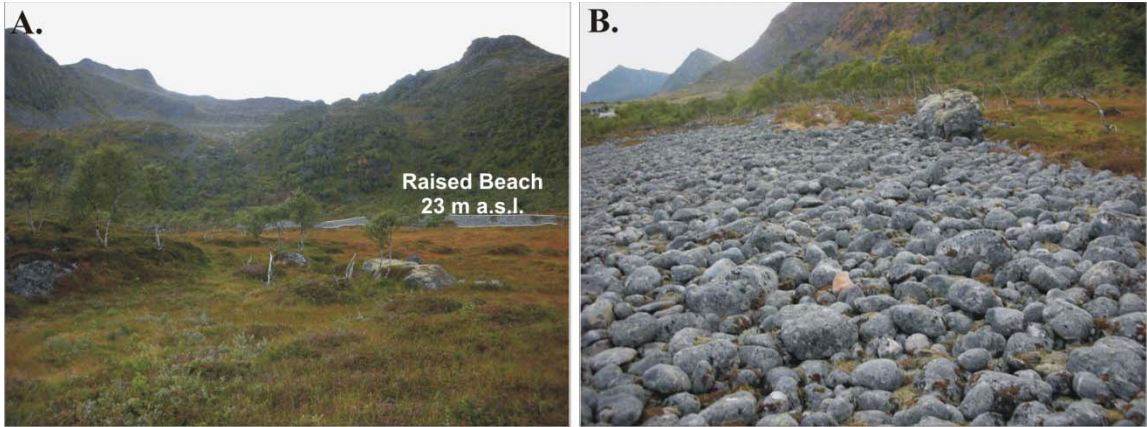
**Figure 2.1.** Location of the Vestvågøya in the Lofoten Islands off the coast of Norway and other sites mentioned in the text. The upper panels are climographs based on weather data collected near the cities of Bodø and Tromsø from 1961 to 1990. Marine core MD95-2011 is shown off the coast of Norway (blue circle) and lakes with paleotemperature reconstructions in the region (red circles) (see also Table 2.5).



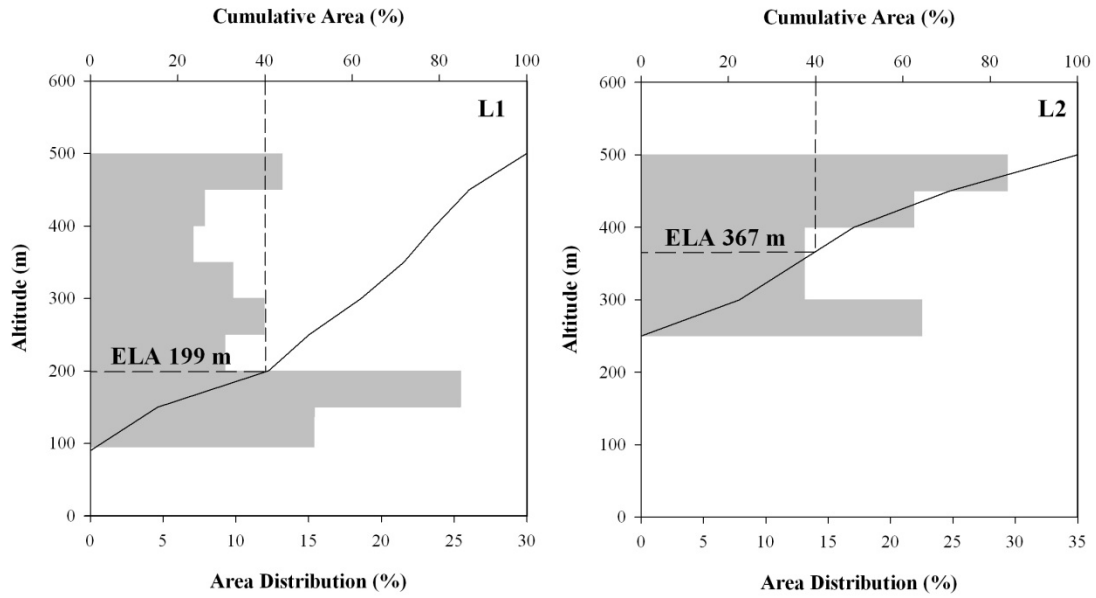
**Figure 2.2.** Vikjordvatnet and its drainage basin showing the mapped positions of former glaciers (L1 & L2) interpreted from geomorphic evidence (Left). A bathymetric map showing the approximate location where cores were recovered and of the sub-bottom profile presented in Figure 2.6 (Right).



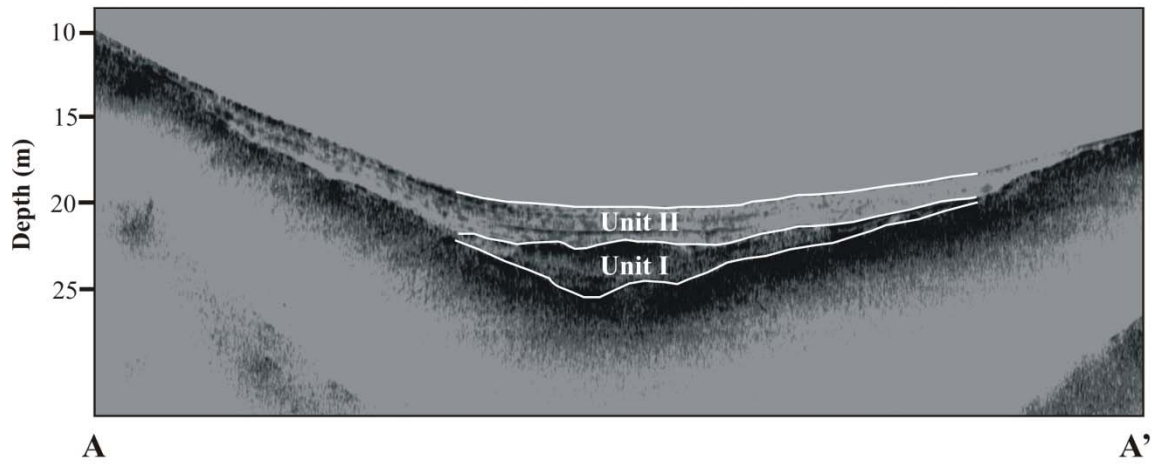
**Figure 2.3.** Reconstructed glacier extents during deposition of the two most prominent moraines (L1 & L2). Approximate location of the reconstructed equilibrium-line altitudes are indicated for each paleoglacier.



**Figure 2.4.** Raised rounded-boulder beach deposit located 3 km northeast along the coast from Vikjordvatnet. (A) Looking northwest toward the deposit from the road. (B) Standing on the deposit looking southwest. Note the range of boulder sizes, generally from 0.5-1.0 m in diameter, and the gentle break in slope that dips to the southeast.

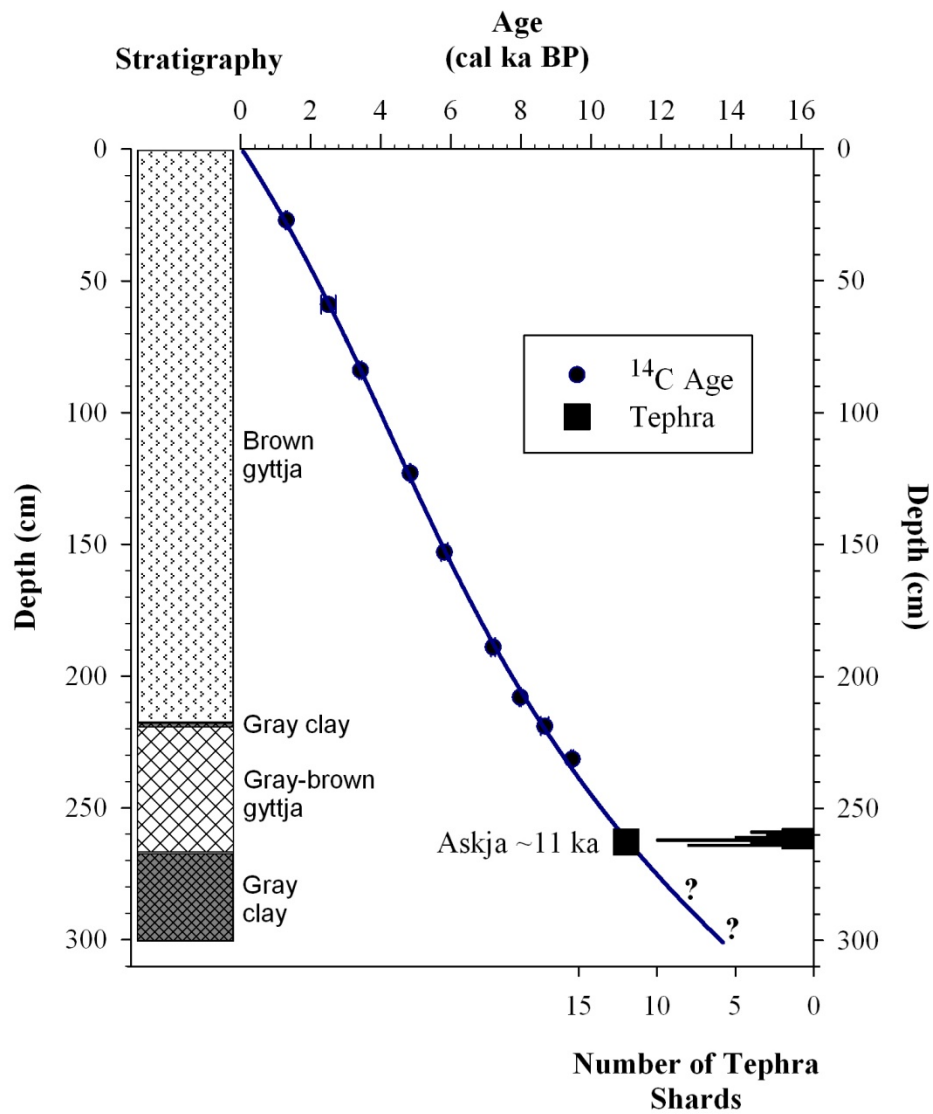


**Figure 2.5.** Area-altitude distribution of reconstructed glaciers in the Vikjordvatnet watershed. Graphs show the area distribution (gray bars) and the cumulative area (black line) for paleoglaciers at limit L1 (left panel) and L2 (right panel). The equilibrium-line altitude for each glacier is estimated using an accumulation area ratio of 0.6.

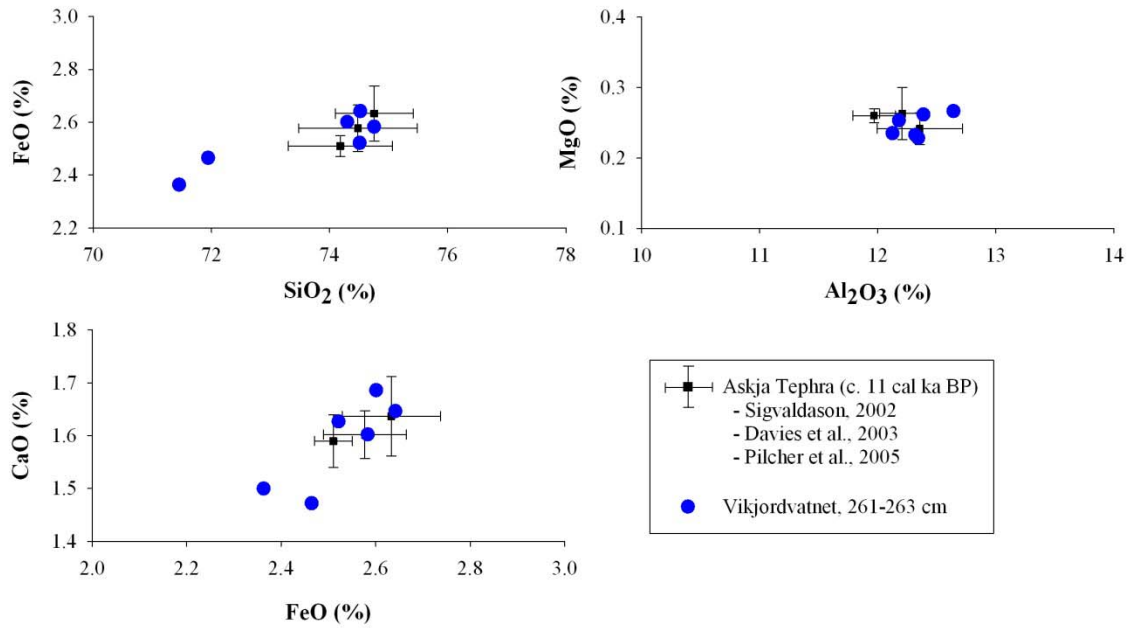


**Figure 2.6.** Sub-bottom profile across Vikjordvatnet from A to A' (Figure 2.2) showing two distinct sedimentary units (Units I & II).

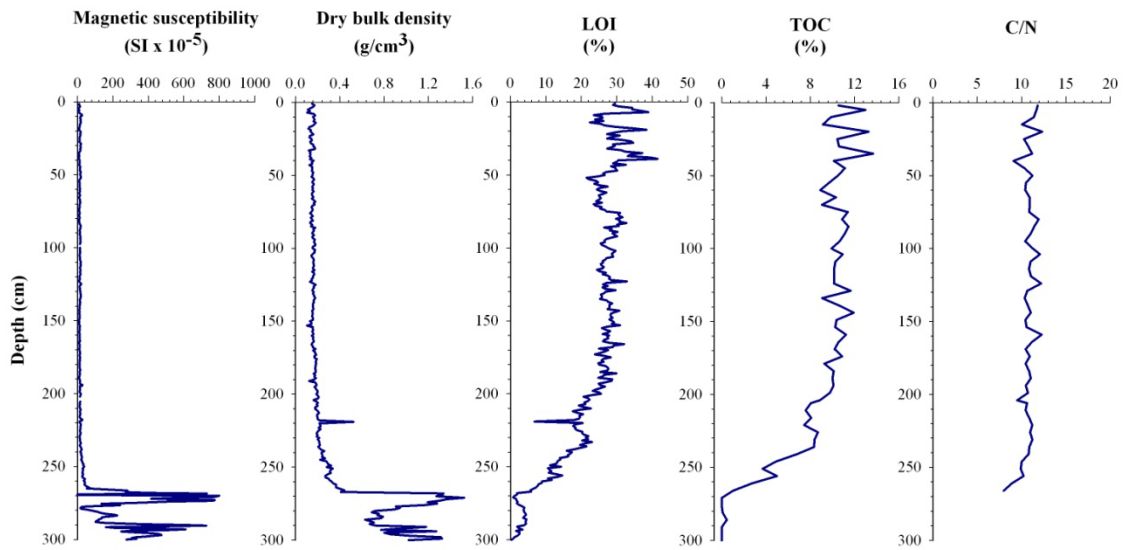




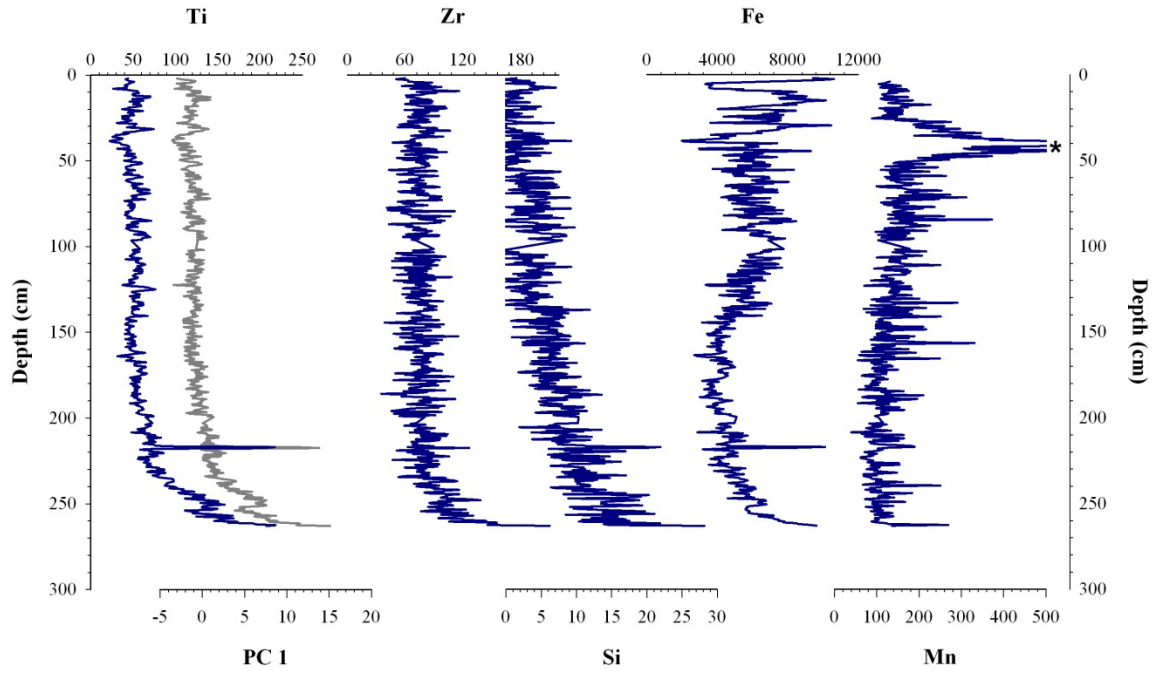
**Figure 2.7.** Sediment stratigraphy and age-depth model based on nine radiocarbon dates (Table 2.1) and one tephra horizon (Table 2.2; Figure 2.8).



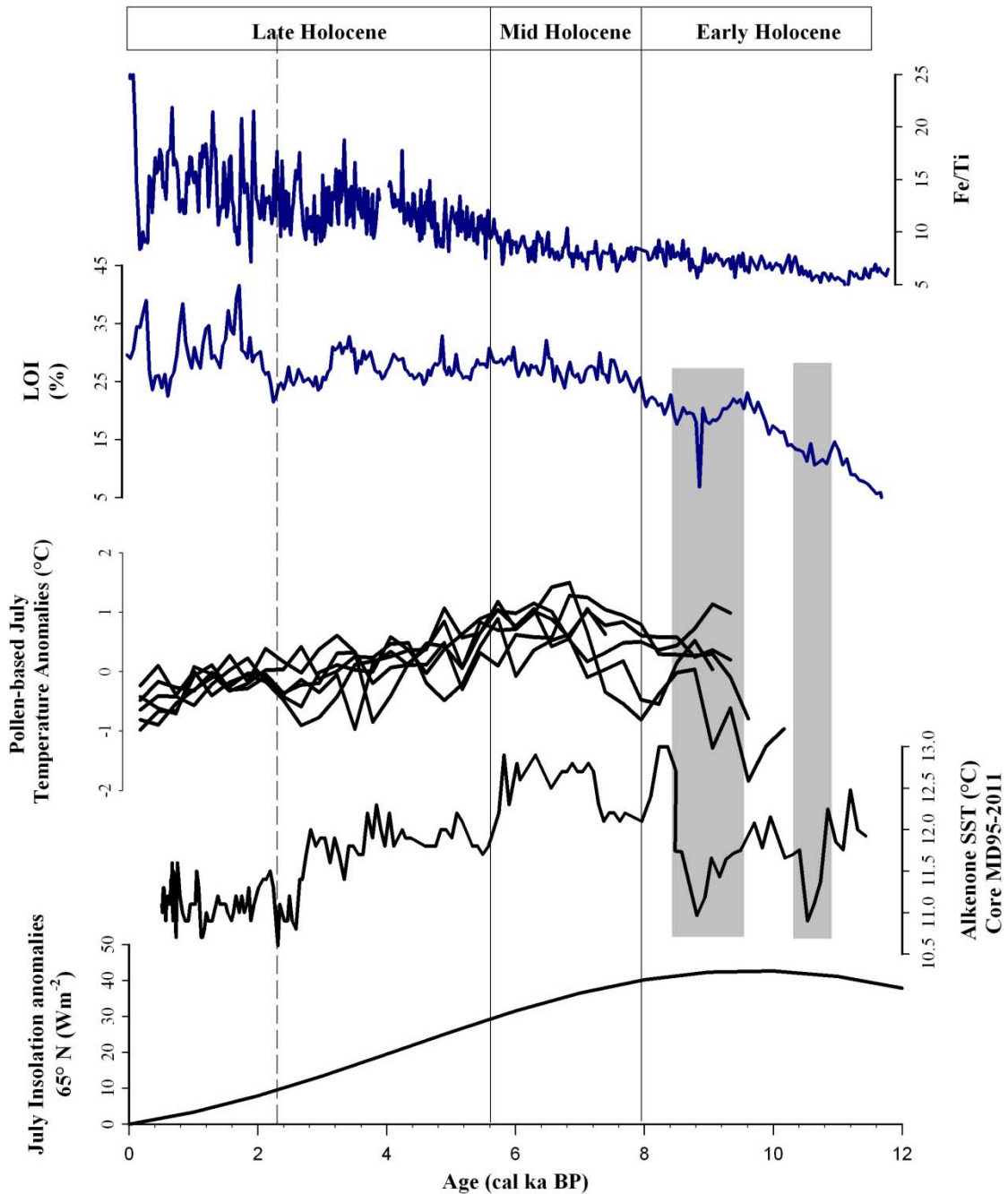
**Figure 2.8.** Geochemical results from electron microprobe analysis of tephra found in Vikjordvatnet compared to tephra attributed to the eruption of the Icelandic Askja caldera c. 11 cal ka BP.



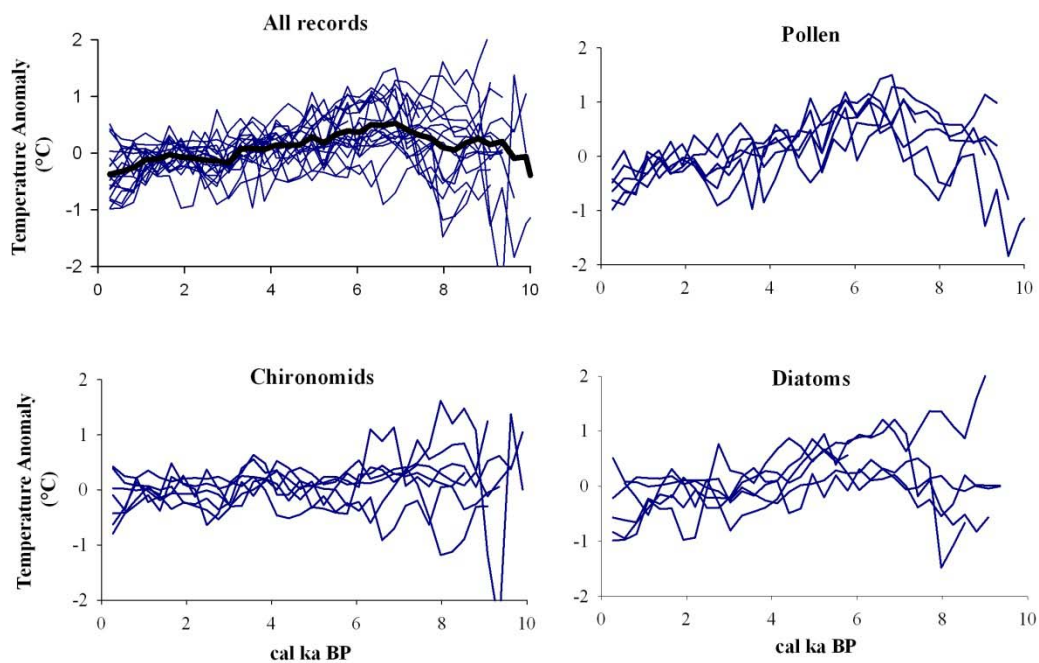
**Figure 2.9.** Physical and organic geochemical properties including, magnetic susceptibility, dry bulk density, and loss-on-ignition (LOI), total organic carbon (TOC), and the ratio of TOC to total nitrogen (C/N).



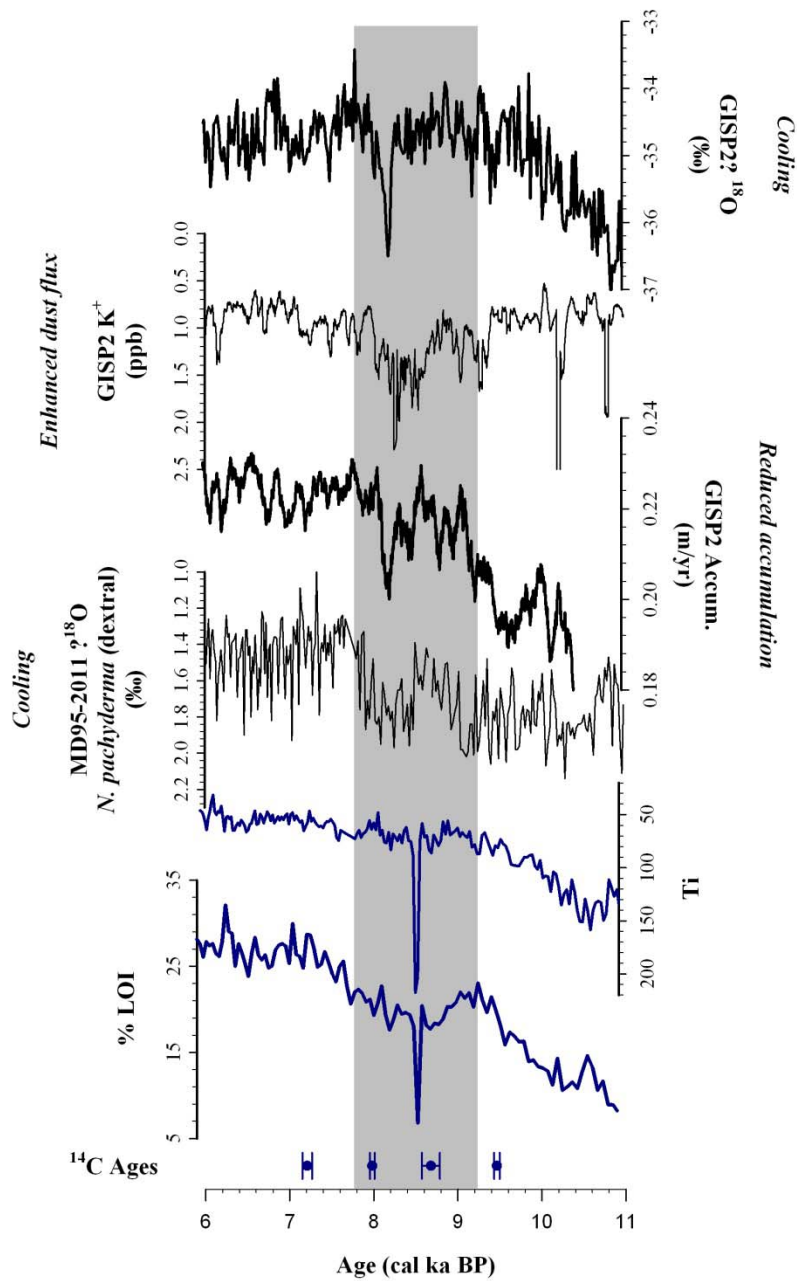
**Figure 2.10.** Scanning XRF element profiles of Ti, PC1, Zr, Si, Fe, and Mn.



**Figure 2.11.** Changes in LOI and Fe/Ti in Vikjordvatnet over the last 12 cal ka BP in comparison with July temperature reconstructions (Table 2.5; Figure 2.12), a record of sea-surface temperature (Calvo et al., 2002) and July insolation anomalies relative to current values (Berger and Loutre, 1991). Gray boxes highlight inferred early Holocene cooling events.



**Figure 2.12.** Pollen-, diatom-, and chironomid-based temperature reconstructions from northwestern Scandinavia. Each time-series was sub-sampled by the time interval of the lowest resolution record (275 years), and then normalized to a common time period (0-5.8 cal ka BP) so relative temperature changes could be compared. See Table 2.5 for references to individual datasets.



**Figure 2.13.** Detailed view of sedimentary changes around the "8.2 ka" event in Vikjordvatnet. Radiocarbon ages with 1-sigma error bars show the timing of changes are well constrained. These records are compared with Greenland ice core GISP2 parameters ( $\delta^{18}\text{O}$ , accumulation,  $\text{K}^+$ ) and  $\delta^{18}\text{O}$  of planktonic foraminifera from marine core MD95-2011 (Risebrobakken et al., 2003). These are a few of the records identified by Rohling and Pälike (2005) that show that the 8.2 ka event may have occurred within a longer-term climate anomaly.

## CHAPTER 3

### A ~10,000-YEAR RECORD OF CLIMATE AND ENVIRONMENTAL CHANGE FROM FISKEBØLVATNET

#### **Introduction**

Lakes sediments record paleoenvironmental conditions within the water column and the surrounding catchment in response to regional climate and environmental changes. Various properties of lake basins and sediments can be examined to interpret the nature and timing past conditions (Last and Smol, 2001). However, the geomorphic and hydrologic setting of lakes, even within one region, influences the paleoenvironmental signal recorded in their sediments and need to be assessed to determine how accurately proxies reflect regional versus local conditions (Rubensdotter and Rosqvist, 2003,2009; Corbett and Munroe, 2010).

This chapter examines the sedimentary record from Fiskebølvatnet, an alpine lake located within a steep-sided catchment within the Lofoten Islands. The lake is below the marine limit and measurement of physical sedimentary properties show that following isolation in the early Holocene, sedimentation was dominated by high energy inwashing events recorded by large amplitude variations in all parameters. These conditions contrast those observed in other studied lakes in the area, discussed in Chapters 2 and 4. Despite the strength of the physical sedimentary signal, there are trends in the data that



are likely related to regional Holocene climate dynamics, but this record highlights the influence that local condition can have on the paleoenvironmental signal within lake sediments.

### **Study Site**

Fiskebølvatnet is located on the northeastern coast of Austvågøy (68°24.78'N, 14°48.09'E) (Figure 3.1). The lake is 23 m a.s.l. and below the marine limit, identified at 37-38 m based on mapped raised shoreline features on the island (as reviewed by Møller, 1985). The lake is within a steep-sided, northeast trending valley surrounded by mountain peaks with summit elevations from 833 m to 906 m a.s.l. (Figure 3.2). There are two main cirques above the lake. Streams draining these areas flow into the lake at the southwestern end. The eastern cirque contains a small lake that drains northward and over a waterfall into Fiskebølvatnet. Fiskebølvatnet is impounded by a moraine and drains to the northeast through a stream that flows through a broad, flat marsh before entering the ocean. There is one main basin in the middle of the lake with a maximum depth of 44 m and one smaller basin, 24 m deep, at the southwestern end (Figure 3.2). The main source of sediment input appears to be from a raised sandy beach deposit at the southwestern end of the lake that has built an alluvial fan out near the edge of the shallow basin.

### **Methods**

In 2008, a 5.73 m sediment core (A08) was collected using a modified Nesje percussion coring device. The core was cut into ~1.4 m sections in the field. Each section was split, described, and the physical properties measured using a GEOTEK core logging system at the University of Rhode Island Graduate School of Oceanography. The Geotek photographed the split cores and measured magnetic susceptibility, gamma ray density, and resistivity of the split cores every 1 cm. Sediment samples and U-channels were then collected for radiocarbon dating, geochemical and scanning XRF analysis.

A chronology was developed based on nine AMS radiocarbon measurements of macrofossils (Table 3.1). Samples were picked from the core surface, rinsed in deionized water, and freeze-dried in glass vials. The samples were analyzed at the University of California Irvine Keck-CCAMS facility and the National Ocean Sciences Accelerator Mass Spectrometry facility. All radiocarbon ages were calibrated to calendar years using CALIB v. 6.0 (Stuiver & Reimer 1993) with the IntCal09 calibration dataset (Reimer et al. 2009).

Wet and dry bulk density, water content, and weight percent organic matter was measured at 1-cm intervals. Samples were taken using a 1 cm<sup>3</sup> tool, weighed in clean vials to determine wet bulk density, dried in a low temperature oven and reweighed to determine dry bulk density. Water content was calculated as a percentage of the dry weight. The weight percent organic matter was determined by loss-on-ignition (LOI) (Dean, 1974), which is based on the mass loss after 1 hour at 550°C.

High resolution spectral reflectance measurements of the sediment surface were collected using a Spectrolino spectrophotometer. Measurements were taken every 2 mm

over a range of 380 nm to 730 nm. Color changes in the sediment were analyzed using the CIELAB scale where color space is defined by three axes L\*, a\*, and b\*. L\* is a measure of lightness on a scale from 0 (black) to 100 (white). The a\* axis is a measure of red/green variations where positive values indicate amounts of red and negative values indicate amounts of green. The b\* axis is a measure of yellow/blue variations where positive values are for yellow and negative values are for blue. Both the a\* and b\* axes have no specific numerical limits.

Relative elemental compositions of the sediment was determined by scanning X-ray fluorescence (XRF) using an Itrax™ core scanner at the Institut National de la Recherche Scientifique, Quebec City, Canada. Elements were detected and output as peak integrals reflecting their relative concentration in the sediment. The upper 4.22 m of the composite record was analyzed. The split core surfaces were scanned at 0.5-cm intervals using an exposure time of 50 s, voltage of 25 kV, and current of 25 mA. The analysis focused on elements: Al, Si, S, Cl, K, Ca, Ti, Mn, Fe, Ni, Cu, Zn, Br, Rb, Sr, and Zr.

## **Results**

### **Sediment stratigraphy**

The isolation of Fiskebølvatnet is marked by a distinct change in sedimentation as the basin transitioned from marine to lacustrine conditions. Sub-bottom profiles across the deep basin show two acoustically distinct units (Figure 3.3). The upper lacustrine unit has horizontal acoustic reflectors and the base of this unit is defined by a strong

continuous reflector. The lower marine unit is massive with a faint acoustic signature. The seismic signal could not penetrate the coarse sediment of the marine unit, so the base of this unit cannot be defined. The sediment core A09 clearly shows the change in sediment character associated with isolation of the lake basin corresponding to the units identified by sub-bottom profiles (Figure 3.4). The base of the core (3.43-5.73 m) is a dense, light brown, silt- and clay-rich sand. Above 3.43 m, the sediment abruptly changes to a lithology that is dark brown and more organic rich, although punctuated by layers of sand and terrestrial macrofossils.

### **Physical and geochemical sediment properties**

Physical sediment properties, sediment color measured by spectral reflectance, and scanning XRF data further define stratigraphic changes and are used to identify six lithostratigraphic units: two marine units (M1, M2) and four lacustrine units (L1-L4) (Figures 3.5-3.8).

Physical properties of the sediment, including: magnetic susceptibility, density, resistivity, and LOI generally show low frequency variations within the marine units that abruptly change to high frequency variations across the lacustrine units (Figure 3.5). Change in magnetic susceptibility and density generally follow grain size changes with the higher values associated with clastic, sandy intervals that have lower %LOI. Sediment resistivity is affected by porosity and water content and is similarly responsive to grain size changes, especially during the marine interval. M1 is marked by decreasing trends in magnetic susceptibility, density, and resistivity. LOI values are extremely low, but exhibit a slight increase across this unit. At the base of M2, LOI values decrease and

magnetic susceptibility, density, and resistivity sharply increase and reach their maximum values before decreasing toward the isolation contact. The onset of lacustrine sedimentation is marked by an abrupt transition to higher variability of the physical sedimentary properties. Magnetic susceptibility, density, and resistivity generally have lower values, but contain sharp changes associated with coarse sandy layers. LOI increases within the lacustrine units and displays large changes in value, from 1-35%. The four lacustrine units mark slight changes in all of these properties. The most significant change that occurs within the lacustrine units is the increase in sediment density, the frequency of magnetic susceptibility peaks, and decrease in average LOI values within L3 and the transition to L4 when LOI and resistivity increase and there are lower peaks in magnetic susceptibility.

Sediment color defined in CIELAB color space show distinct changes in  $L^*$ ,  $a^*$ , and  $b^*$  across the lithostratigraphic units (Figure 3.6).  $L^*$ ,  $a^*$ , and  $b^*$  range from 11-89, -2-4, and -3-17 respectively. Average sediment lightness ( $L^*$ ) is highest in the marine units compared to the lacustrine units, but has the most distinct changes within L1 where there are large variations. These trends reflect the darker properties of the upper organic-rich sediments compared to the lower minerogenic unit, and define alternating light and dark layers within L1. Red/green ( $a^*$ ) and yellow/blue ( $b^*$ ) values have smaller changes within the marine units.  $a^*$  values in this part of the core are around 0, indicating equal red and green contributions, and  $b^*$  values average 8, indicating a slightly greater contribution of yellow to the color scale, which is consistent with observations of the sediment color (Figure 3.6). Both  $a^*$  and  $b^*$  values increase in variability within the lacustrine units. They decrease within L1, but show stepped increases in value from L2-

L4. These trends indicate a change toward sediment color with more red and yellow components. When the three color parameters are displayed together, units M1-M2, L1, and L2-L4 plot in different color space (Figure 3.7). These reflect the significant color difference between marine and lacustrine sediment related to organic content, but also show the unique properties of sediment in L1 right above the isolation contact, which may be related to water column stratification following basin isolation.

Scanning XRF data also define the change from marine to lacustrine sedimentation. Almost all elements exhibit some change from marine to lacustrine sediments, but the elements Si, K, Ca, Br, and Sr show the largest change across this transition (Figure 3.8). Si, K, Ca, and Sr are generally higher in the marine sediment and decrease above the isolation contact. Br displays the opposite trend and has low values in the marine sediment and abruptly increases above the isolation contact and follows similar trends to the organic content of the sediment, a trend observed in other lakes from Br adsorption to organic matter (Ng and King, 2004; Schmidt et al., 2006; Olsen et al., *in press*). The elemental response in the lacustrine sequence is similar to the trends in physical properties of the sediment and displays high frequency variations (Figure 3.9). These trends are exemplified by profiles of Ti, Fe, Ca, and Si, which are common indicators of changes in detrital input (Figure 3.9).

### **Chronology**

A chronology was developed based on nine AMS radiocarbon dates (Table 3.1; Figure 3.5). All samples chosen for dating were terrestrial macrofossils. A linear age model was fit to the ages from the marine samples and a polynomial was fit to the ages in

the lacustrine sequence. The marine-lacustrine transition is marked by a dramatic change in sedimentation rate from 0.91 cm yr<sup>-1</sup> to an average of 0.040 cm yr<sup>-1</sup> in the lacustrine unit. Sedimentation rates are slightly higher, 0.023 cm yr<sup>-1</sup>, immediately above the isolation contact in unit L1 and decrease to an average of 0.046 cm yr<sup>-1</sup> from L2-L4. This age model constrains the timing of the stratigraphic units: M1 (9.7-9.6 cal ka BP), M2 (9.6-9.5 cal ka BP), L1 (9.5-6.7 cal ka BP), L2 (6.7-4.2 cal ka BP), L3 (4.2-1.6 cal ka BP), and L4 (1.6-0 cal ka BP).

## **Discussion**

### **Marine-lacustrine transition: M1-M2 (9.7-9.5 cal ka BP)**

Fiskebølvatnet experienced marine conditions from at least 9.7-9.5 cal ka BP. Sediment properties during M1 probably reflect sea-level lowering and the sharp increase in these properties during M2 may have been a result of wave washing of the threshold immediately before isolation. This transition can be used as a sea-level index point (e.g. Shennan, 1986; Shennan et al., 2000) indicating that sea-level was 23 m a.s.l. at 9.5 cal ka BP. The timing of isolation of Fiskebølvatnet further supports the regional trends in sea-level history (Møller, 1985, 1987, 1989).

### **Water column stratification: L1 (9.5-6.7 cal ka BP)**

The series of thin laminations and the unique color properties of the sediment within L1 may indicate a period of density stratification immediately following isolation from the ocean (Figures 3.4, 3.6, 3.7). Water column stratification occurs in isolation

basins as dense saline marine water in the monimolimnion becomes trapped beneath a lighter less saline epilimnion as a basin transitions to a restricted marine and then freshwater system. The trapped seawater becomes anoxic and laminations in the sediment can be preserved that define a transitional period of basin isolation (e.g. Corner and Haugane, 1993).

### **Late Holocene environmental change: L2-L4 (6.7 cal ka BP - Present)**

The lacustrine units in Fiskebølvatnet contain high frequency variations in physical sedimentary properties. Sharp changes in sediment density, magnetic susceptibility, and organic matter content result from periodic input of coarse clastic material and terrestrial vegetation. The only source of sediment for these coarse layers is the raised beach deposit at the southwest end of the lake. These deposits provide a constant source of sediment throughout the Holocene and the steep-sloped catchment creates a setting that generates high energy inwashing of water and sediment during spring snow melt and/or significant precipitation events. This signal dominates the trends in the lacustrine sedimentary record over the last 6.7 cal ka BP. I speculate that these conditions may be primarily driven by the hydrologic and geomorphic setting of the catchment, but there also may be some features of this record that are a response to regional climate change. Despite the overwhelming signal of inwashing by coarse sediment, there are some significant changes during the late Holocene reflected in organic matter content (LOI), magnetic susceptibility, and the mass accumulation of sediment (Figure 3.10). The transition from Unit L2 to L3 marks the most significant change. During L3, from c. 4.2-1.6 cal ka BP, there are lower average LOI values, an



increase in the number and size of magnetic susceptibility peaks, and an increase in the mass accumulation of sediment. This period of increased accumulation of clastic sediment was likely the result of a climatic shift toward higher precipitation. Higher amounts of summer precipitation or increased winter precipitation could have driven this environmental change and transported more clastic material to the lake basin. After 1.6 cal ka BP, average LOI values increase, and overall magnetic susceptibility and mass accumulation rates decline. These trends could indicate a shift back toward lower relative amounts of precipitation or possibly from stabilization of the sediment source.

### **Regional late Holocene climate dynamics**

Late Holocene climate in Fennoscandia is associated with an overall climate cooling following the Holocene Thermal Maximum (c. 8-5 cal ka BP) (Snowball et al., 2004). In Norway, this period is associated with a gradual rejuvenation and expansion of glaciers (Nesje et al., 2008). At Lyngen in northern Norway, rejuvenation of glacial activity commenced at 3.8 cal ka BP (Bakke et al., 2005). Late Holocene cooling is also recorded in sea-surface temperatures from off the Norwegian margin (Andersen et al., 2004; Calvo et al., 2002) and pollen-based temperature reconstructions from northern European lakes (Seppä et al., 2009). This transition to the late Holocene is also associated with hydrologic changes. A record of precipitation seasonality and summer surface wetness using biomarkers from Bøstad bog on Vestvågøy in the Lofoten Islands indicates a shift toward wetter conditions in the late Holocene after 4.3 cal ka BP. (Nichols et al., 2009). The timing of this transition corresponds to the major change in sedimentation in Fiskebølvatnet at 4.2 cal ka BP and supports the interpretation that the

sediment may record the intensification of precipitation from 4.2-1.6 cal ka BP. However, the transition at 1.6 cal ka BP in Fiskebølvatnet is not consistent with other records, which show higher precipitation *throughout* the late Holocene. Additionally, Bakke et al. (2009) found a shift toward wetter conditions to begin at 2.0 cal ka BP in southern and northern Norway as a response to an increased strength of westerlies, a trend supported by changes in the isotopic composition of lakewater from Sweden that indicate more humid conditions (Jonsson et al., 2010). Therefore, the signal in Fiskebølvatnet may be a response to stabilization of the sediment source in the catchment, which could have decreased the clastic input despite increased local precipitation.

## **Conclusions**

This study presents a sedimentary record from Fiskebølvatnet that spans the last 9.7 cal ka BP. The lake is below the marine and this record captures the isolation of the basin and the subsequent period of late Holocene lacustrine sedimentation. Marine and lacustrine units are visible in the stratigraphy of the core and are clearly defined by physical sedimentary properties. The marine unit (9.7-9.5 cal ka BP) is dominated by clastic sedimentation and there is an abrupt change to more organic-rich sediment at the isolation contact. The marine-lacustrine transition is also defined by scanning XRF profiles of Si, K, Ca, Br, and Sr. Following the isolation of Fiskebølvatnet, there is a transitional period (9.5-6.7 cal ka BP) marked by the deposition of fine laminations and distinct sediment color changes that might be associated with stratification of the water

column. After 6.7 cal ka BP, the lacustrine units are organic rich, but punctuated by periods of clastic sedimentation defined by high frequency changes in physical sedimentary properties. The intensity of inwashing into Fiskebølvatnet throughout the last 6.7 cal ka BP may be the result of local conditions governed by the geomorphic setting of the lake basin. These features probably obscure any regional climate signal. However, there is a distinct change in characteristics of the sediment from 4.2-1.6 cal ka BP that might correspond with a regional climatic shift towards wetter conditions.

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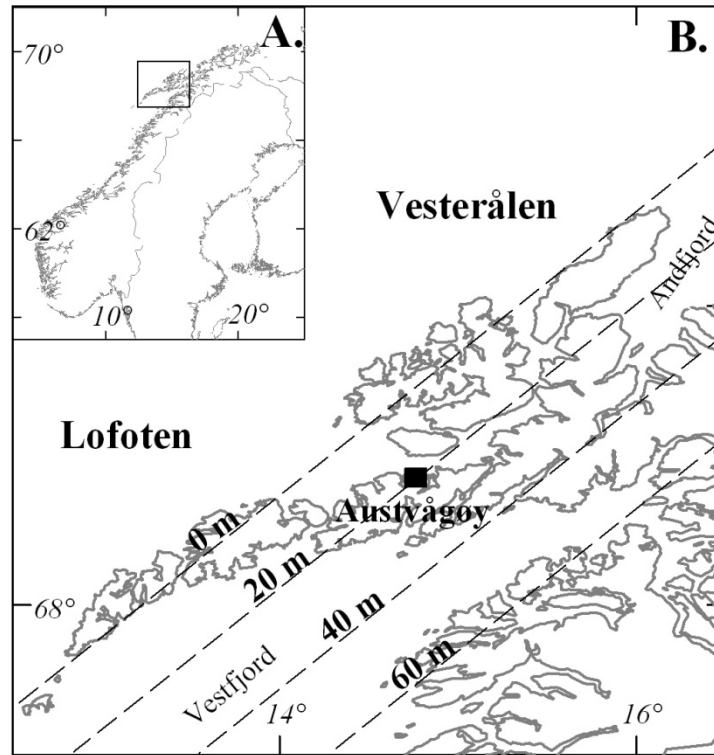
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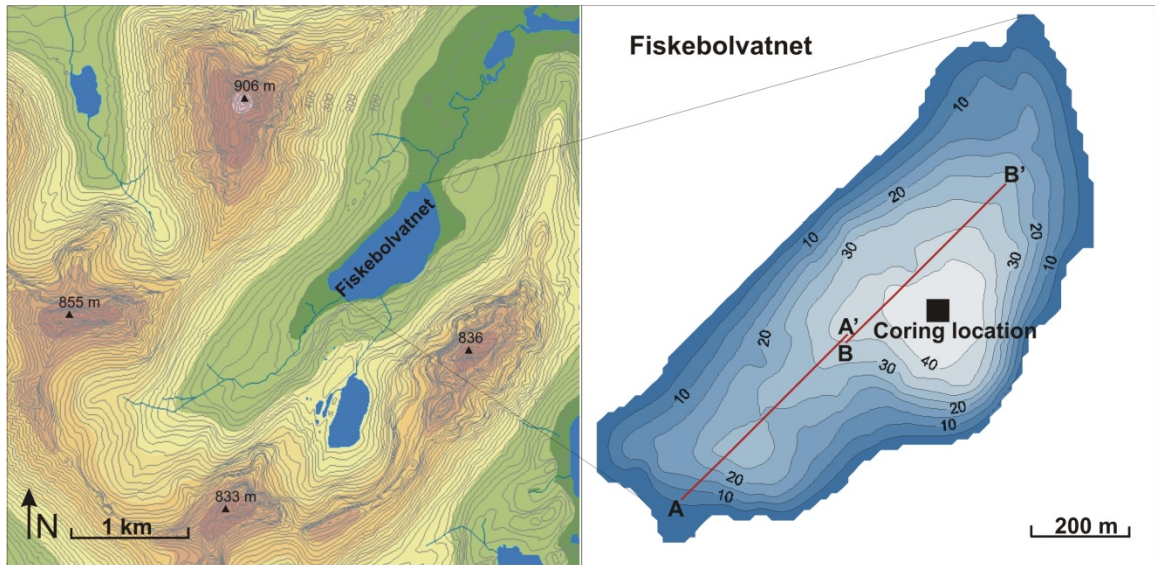
**Table 3.1.** Radiocarbon results for Fiskebolvatnet core A-08 (calibrated with CALIB 6.0 using INTCAL09 dataset).

Core Depth (cm)	Description	Laboratory #	$\delta^{13}\text{C}$ (‰)	$^{14}\text{C}$ Year BP	Calibrated Age Range (yrs BP)		Median 1- $\sigma$
					(1 $\sigma$ )	(2 $\sigma$ )	Age (cal yr BP)
36	Plant/Wood	OS-80453	30.44	1100 $\pm$ 30	966-1053	937-1062	1010 $\pm$ 62
109	Plant/Wood	UCI-58700	--	2255 $\pm$ 20	2184-2335	2159-2341	2260 $\pm$ 107
158	Plant/Wood	OS-80454	28.62	3270 $\pm$ 35	3450-3556	3403-3576	3503 $\pm$ 75
216	Plant/Wood	UCI-58701	--	3960 $\pm$ 20	4413-4498	4303-4517	4456 $\pm$ 60
285	Plant/Wood	OS-80455	27.95	6070 $\pm$ 45	6809-6996	6789-7155	6903 $\pm$ 132
325	Plant/Wood	UCI-58702	--	8000 $\pm$ 30	8780-8995	8729-9006	8888 $\pm$ 152
337.5	Plant/Wood	UCI-58703	--	8440 $\pm$ 30	9445-9493	9432-9523	9469 $\pm$ 34
418	Plant/Wood	OS-80613	-26	8130 $\pm$ 60	8998-9190	8795-9285	9094 $\pm$ 136
563	Plant/Wood	UCI-58737	--	9200 $\pm$ 45	10267-10411	10247-10495	10339 $\pm$ 102

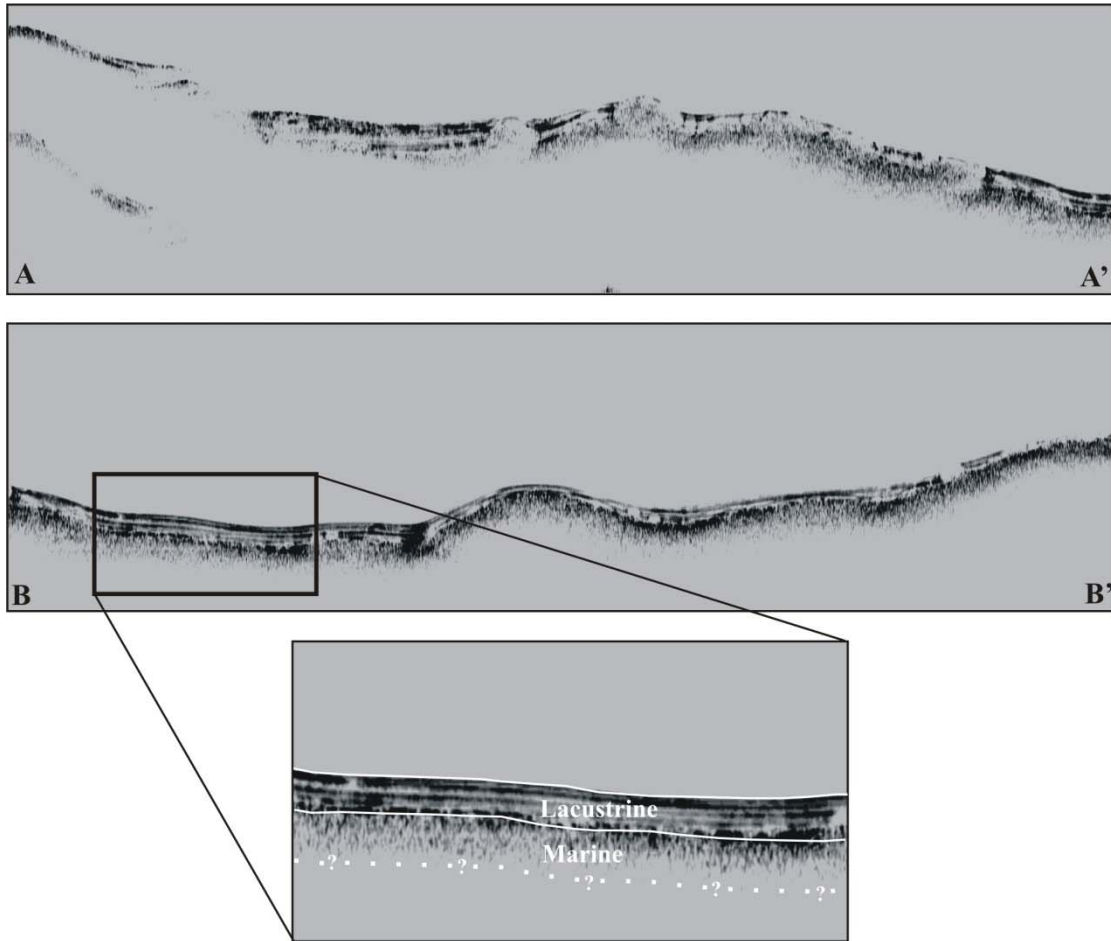


**Figure 3.1.** The location of the Lofoten-Vesterålen archipelago off the northwestern coast of Norway (A) and Austvågøy in the Lofoten Islands (B). Fiskebølvatnet is located on the northern coast of Austvågøy (black box). Dashed lines are the Younger Dryas shoreline isobases (after Møller, 1985).

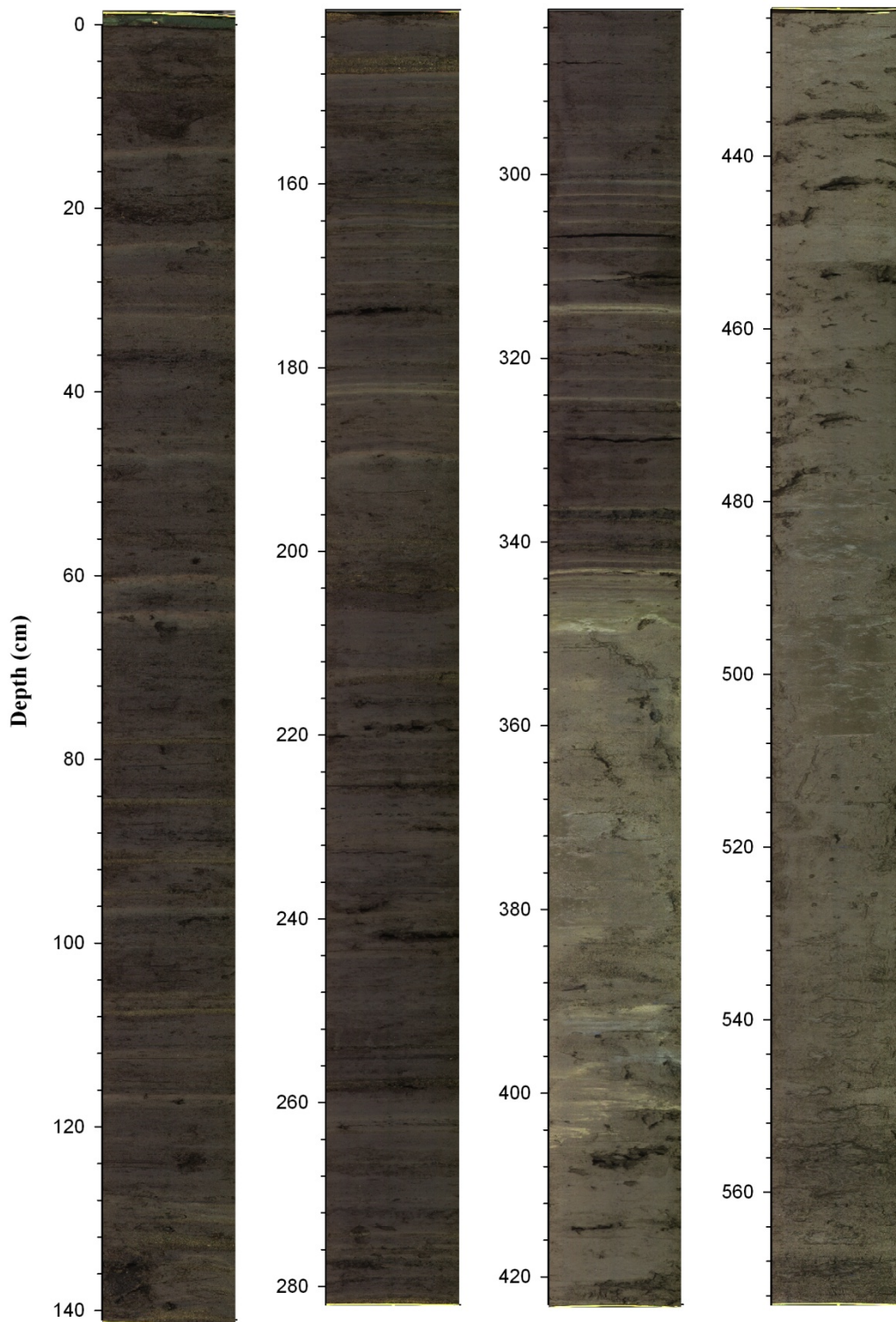




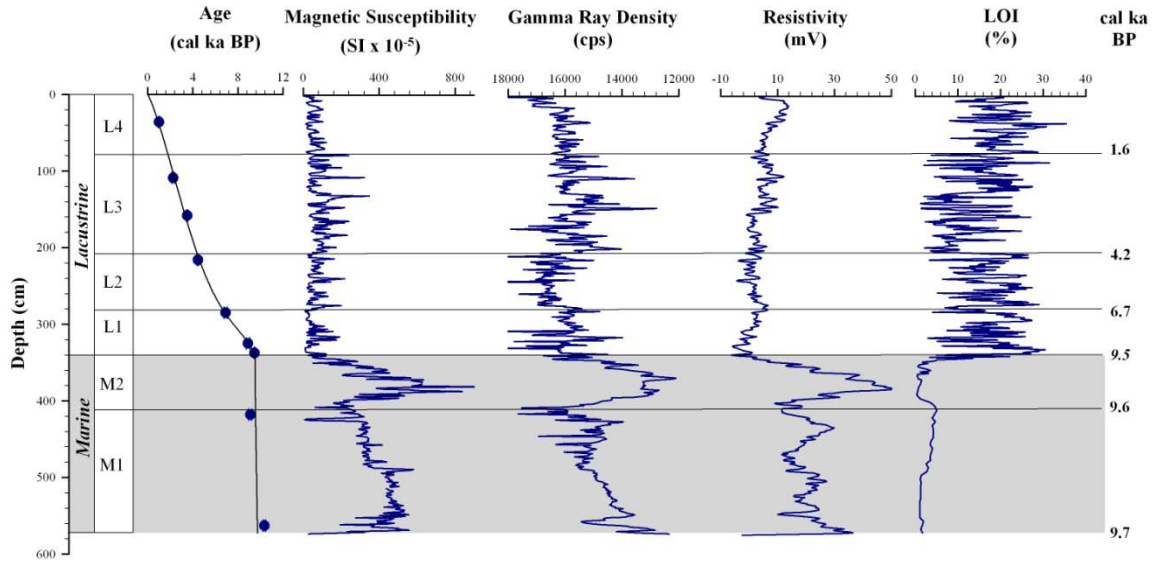
**Figure 3.2.** The watershed of Fiskebølvatnet (left) and a bathymetric map of the lake showing the core location and seismic transects (right).



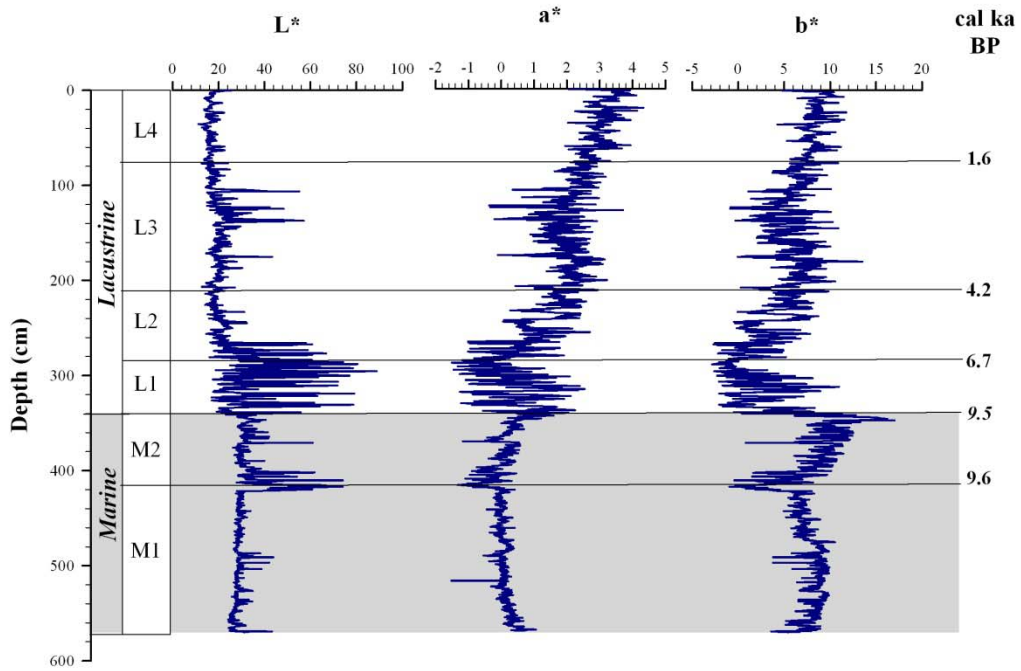
**Figure 1.3.** Seismic profiles A to A' and B to B' across Fiskebølvatnet. The locations of these profiles are shown in Figure 3.2. Enlargement of one section of profile B to B' near the coring location shows acoustic distinctions between marine and overlying lacustrine sediment. The lower boundary of marine sediment cannot be resolved.



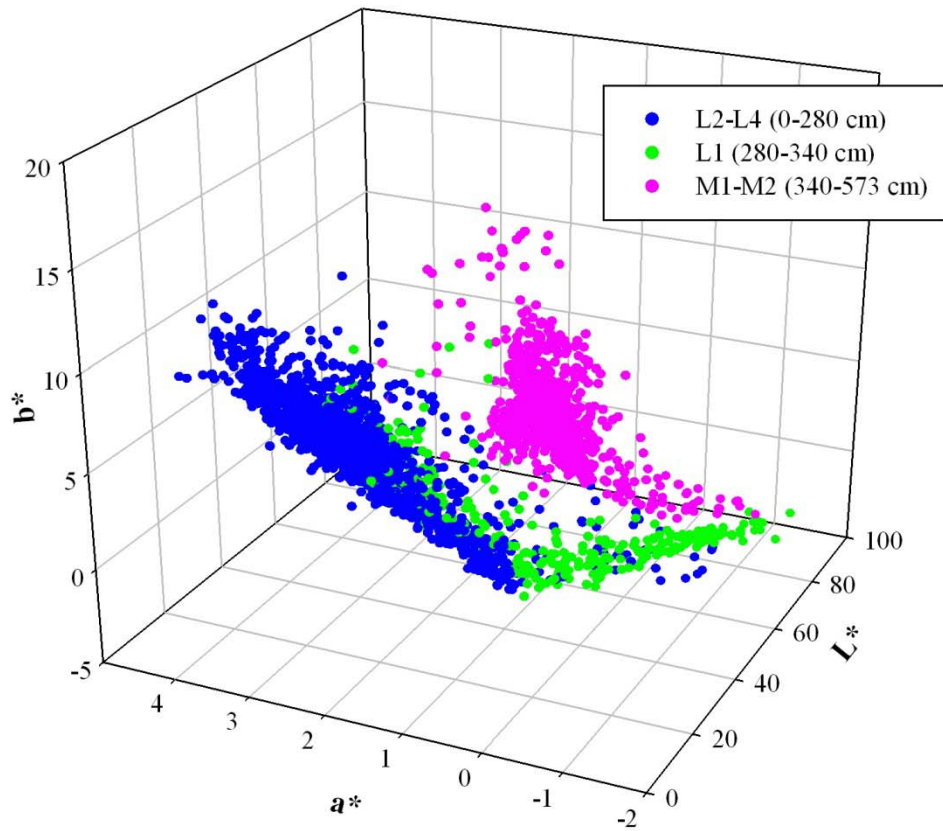
**Figure 2.4.** Sediment core photographs of Fiskebølvatnet core A08. The marine-lacustrine transition is clearly visible at 343 cm depth.



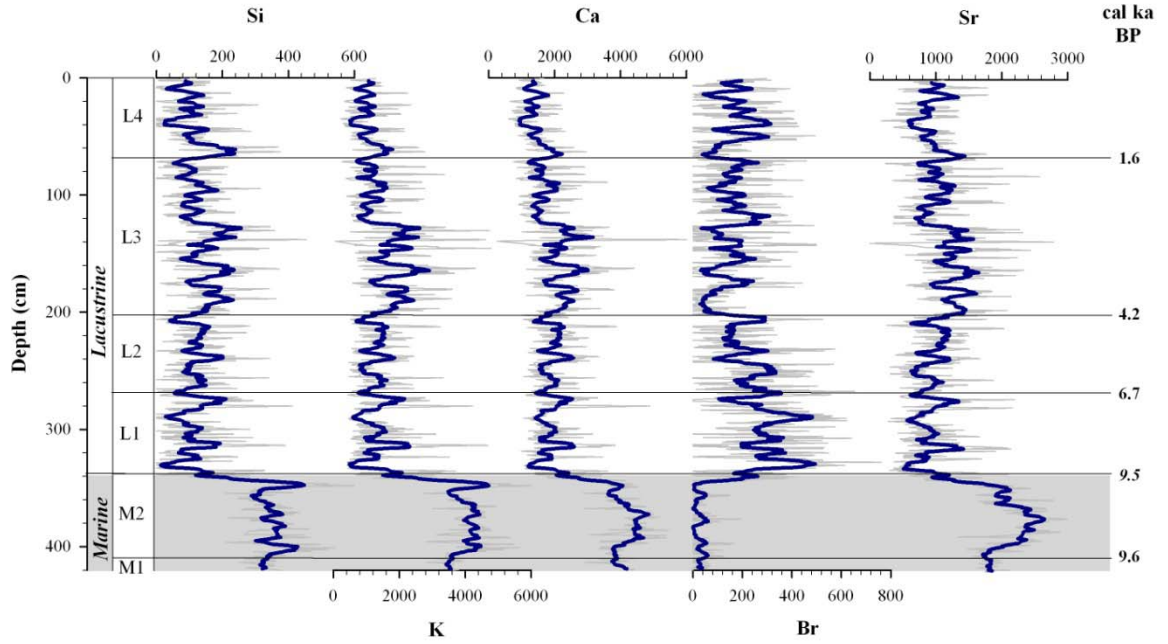
**Figure 3.5.** Age-depth relationship and physical properties of Fiskebølvatnet core A08, including: magnetic susceptibility, gamma ray density, resistivity, and loss-on-ignition (LOI). The marine unit consists of two subunits (M1 & M2) and the lacustrine unit consists of three subunits (L1-L4). The marine-lacustrine transition occurs at 3.43 m depth (c. 9.5 cal ka BP).



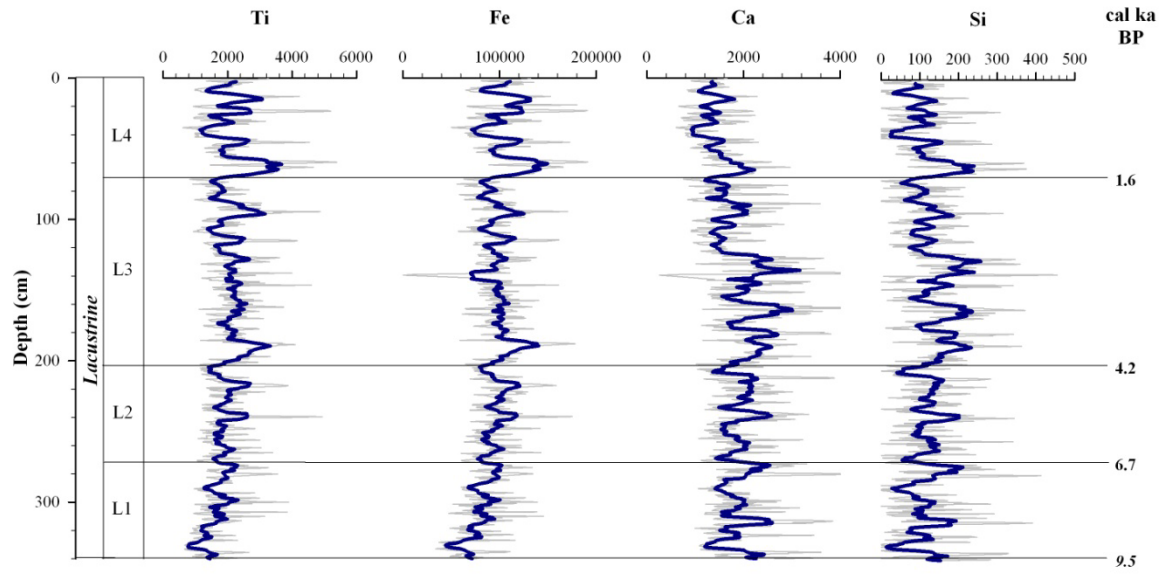
**Figure 4.6.** CIELAB color scale profiles for from spectral reflectance scans of core Fiske-A09. The three profiles indicate changes in sediment color by red/green variations ( $a^*$ ), yellow/blue variations ( $b^*$ ), and lightness ( $L^*$ ) across the defined lithostratigraphic units.



**Figure 5.7.** CIELAB color scale based on spectral reflectance scans of core A09. The three axes indicate changes in sediment color by red/green variations ( $a^*$ ), yellow/blue variations ( $b^*$ ), and lightness ( $L^*$ ). Units M1-M2, L1, and L2-L4 plot in different color space.

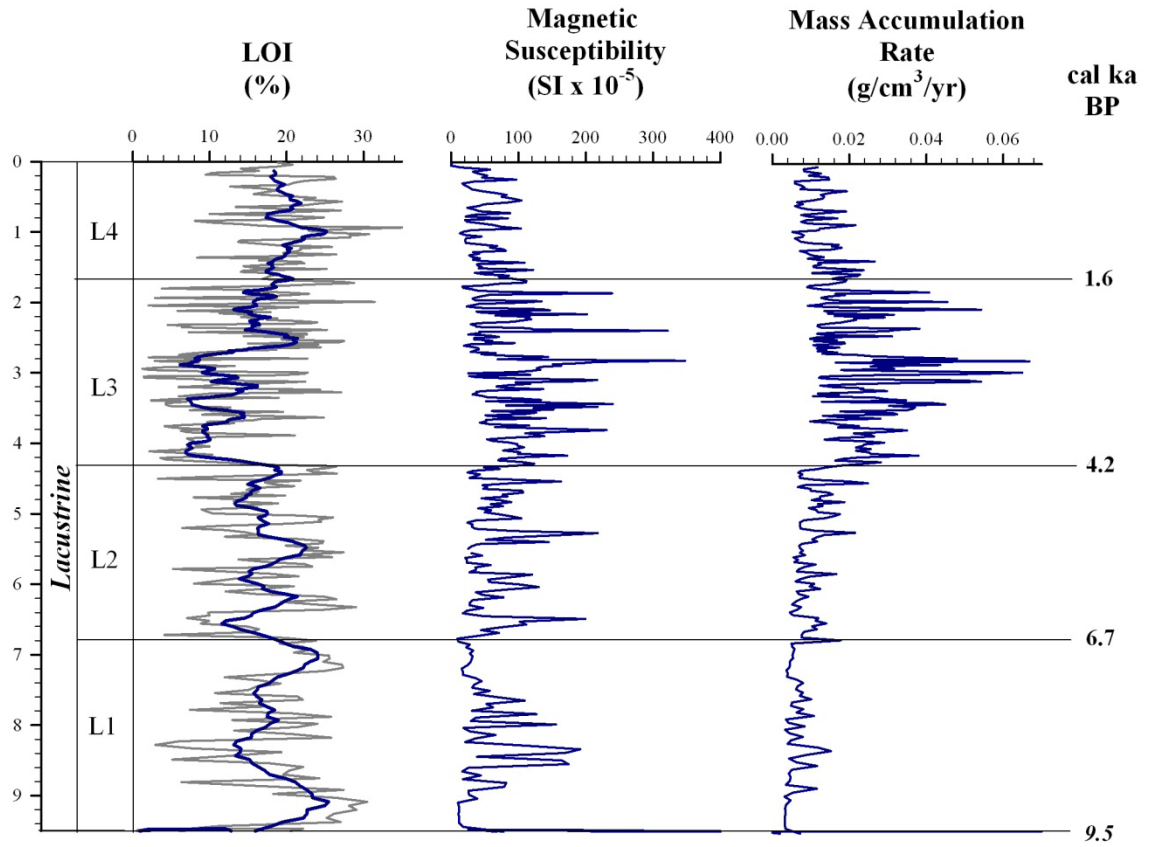


**Figure 3.8.** Scanning XRF profiles of elements that show the most distinct changes across the marine-lacustrine transition.



**Figure 3.9.** Scanning XRF profiles of elements that define trends within the lacustrine units L1-L4.





**Figure 6.10.** Loss-on-ignition, magnetic susceptibility, and mass accumulation rates during the lacustrine phases of sedimentation in Fiskebølvatnet.

## CHAPTER 4

### A MULTI-PROXY APPROACH TO ASSESSING ISOLATION BASIN STRATIGRAPHY FROM THE LOFOTEN ISLANDS, NORWAY

#### Abstract

This study takes a comprehensive approach to characterizing the isolation sequence of Heimerdalsvatnet, a coastal lake in the Lofoten Islands, northern Norway. Established methods and new techniques were explored to assess changes in marine influence. Bathymetric and sub-bottom profiles were acquired to examine basin-wide sedimentation and a 5.8 m sediment core spanning the last 7800 cal yr BP was analyzed. I measured magnetic susceptibility, bulk organic matter properties, molecular biomarkers, diatom assemblages, and elemental profiles acquired by scanning X-ray fluorescence. These characteristics of the sediment reflect detailed changes in salinity and water column conditions as the lake was progressively isolated. Three distinct litho/chemo-stratigraphic units represent a restricted marine phase (7800-6500 cal yr BP), a transitional phase characterized by intermittent marine influence (6500-4900 cal yr BP), and complete isolation and freshwater sedimentation (4900 cal yr BP to present). Although there are uncertainties with the threshold elevation of the lake, the timing of these phases generally corresponds with previous interpretations of the local relative sea-level history. This record captures sea-level regression following the Tapes transgression

and supports the interpretation of a subsequent sea-level stillstand, dated in Heimerdalsvatnet from 6500 to 4900 cal yr BP.

## **Introduction**

Relative sea-level histories can be reconstructed from a variety of coastal sedimentary environments: raised beaches, wave cut terraces, estuaries and isolation basins. Isolation basins are particularly useful because they provide continuous sedimentary archives of marine-lacustrine transitions, the transgression and isolation contacts can usually be well dated, and basin thresholds provide information on former sea-level elevations. In addition, isolation basin records are analogues for processes affecting coastal environments that are being impacted by present rising or falling sea level.

Reconstructing the environmental history of isolation basins requires the identification of changes in marine influence (i.e. marine, brackish, and freshwater facies), which can be difficult since sea-level fluctuations affect water column chemistry, organic matter input, and sediment source. Methods of characterizing isolation basin stratigraphy traditionally rely on microfossil assemblages and their relationship to salinity (e.g. Kjemperud, 1981; Svendsen and Mangerud, 1990; Shennan et al., 1995; Corner et al., 1999, 2001; Long et al., 1999; Zong and Horton, 1999; Lloyd, 2000; Hutchinson et al., 2004). However, counting and identifying microfossils is time consuming and can be affected by microfossil abundance, preservation, non-analogue situations, and when species have wide salinity tolerances.

Recently, different approaches have emerged to overcome limitations of

microfossil records and to better characterize paleoenvironmental conditions. Properties of bulk sedimentary organic matter, mainly  $\delta^{13}\text{C}$  and C/N ratios, have been used to identify salinity changes and in most cases correlate well to microfossil reconstructions (Westman and Hedenström, 2002; Mackie et al., 2005, 2007; Wilson et al., 2005; Lamb et al., 2006 and references therein; Mills et al., 2009). This method is more rapid, but also has limitations such as selective degradation of organic matter and can be affected by large external environmental changes including atmospheric  $p\text{CO}_2$ , vegetation development, and temperature (Lamb et al., 2006; Mackie et al., 2007). Others have also explored the use of molecular biomarkers (Bendle et al., 2009) as indicators of surface water salinity and scanning X-ray fluorescence (XRF) (Sparrenbom et al., 2006) to identify physical sedimentary changes.

This study applies a range of methods for reconstructing environmental conditions in an isolation sequence. Results are presented from Heimerdalsvatnet, a coastal lake located in the Lofoten Islands, northern Norway. This area is near the former margin of the Scandinavian Ice Sheet and has experienced a complex relative sea-level history, which has even been linked to prehistoric and Viking-age settlements (Utne, 1973; Møller, 1987; Mills et al., 2009). Bathymetric and sub-bottom profiles were used to characterize basin-wide sedimentation and analyzed a 5.8 m sediment core using multiple techniques, including: bulk sediment organic geochemistry, diatoms, molecular biomarkers, and high-resolution XRF core scans. This comprehensive approach enables me to characterize environmental conditions and water column properties during isolation, compare the effectiveness of each method for interpreting isolation basin stratigraphy, and contribute to the local sea-level history.

## **Setting**

The Lofoten-Vesterålen archipelago (67-70°N) extends from northeast to southwest into the Norwegian Sea (Figure 4.1A). The Lofoten Islands are separated from the mainland by Vestfjord and consist of seven islands; the second largest is Vestvågøya (Figure 4.1B). Postglacial marine limits in Lofoten and Vesterålen generally increase from 10 m a.s.l. in the northwest to 45 m a.s.l. in the southeastern areas (Møller, 1986) following a trend similar to the pattern of present uplift rates occurring in northern Norway (Vestøl, 2006). The most recent sea-level investigations (Møller, 1984, 1985, 1986, 1987, 1989; Vorren and Moe, 1986; Vorren et al., 1988) built upon and revised earlier work (Marthinussen, 1962; Bergström, 1973; Utne, 1973). In Vestvågøya, and areas along a similar isobase, these sea-level reconstructions show a relative regression from ~37 m a.s.l. after deglaciation to ~-3 m a.s.l. in the early Holocene. This was followed by the Tapes transgression that reached its maximum at ~6800 cal yr BP (~6000 <sup>14</sup>C years BP) after which relative sea level decreased during the mid- and late Holocene. The Tapes shoreline isobases in northern Norway increase from 0 m in the northwest to 20 m in the southeast (Møller, 1987) (Figure 4.1B). The local Holocene shoreline displacement curve is developed from dated lithostratigraphic sequences from Vestvågøy, Andøy, and Flagstadøy and shows the Tapes maximum reached 9-10 m above mean tide level (Møller, 1986).

## **Heimerdalsvatnet**

Heimerdalsvatnet (68°17.78'N, 13°39.38'E; 5 m a.s.l.) is located on the northern coast of Vestvågøy 1.5 km from the town of Eggum (Figure 4.1C) and is impounded by a beach ridge with a crest elevation of 8 m a.s.l. There are numerous raised shoreline features along this section of coast, the most prominent of which is the relict dune field that underlies Eggum. This feature is mapped at 10 m above m.t.l. (Møller, 1985) and a peat deposit found beneath a prominent beach ridge in Eggum has been dated to 6800 cal yr BP (Bergström, 1973), corresponding to the local Tapes transgression maximum (Møller, 1986). Heimerdalsvatnet is 1.5 km long, 0.5 km wide, and the deepest part of the lake is 36.7 m. There is a small inlet to the lake on the southeastern edge that is presently fed by two smaller artificially dammed lakes in the upper valley. Lateral moraines on both sides of the lake near the mouth of the valley have been modified during a period of higher sea level. These glacial deposits are associated with the youngest moraines found in Lofoten and have been most recently mapped as late glacial or Younger Dryas in age (Bargel, 2003).

The present water column conditions of Heimerdalsvatnet were assessed in August 2007 (Figure 4.2). Water column profiles measured at the deepest location show a thermocline at ~14 m water depth. The pH ranges from 5.6 to 6.3 and conductivity from 52 to 57  $\mu\text{s}/\text{cm}$ . Dissolved oxygen ranges from 11.7 to 13.7 mg/L with an average value of 12.1 mg/L in the epilimnion. Data-logging thermistors were deployed throughout the water column and recorded temperatures from September 2007 through 2008. Nine thermistors spaced throughout the water column were suspended from a buoy anchored at the deepest location and recorded temperature every 4 hours. Monthly

average temperature contours show the annual temperature fluctuations, which are typical for a dimictic lake.

## **Methods**

### **Basin analysis & sediment coring**

Bathymetry was recorded using a fish-finder acoustic sounder with integrated GPS. Sub-bottom profiles were obtained using an Edgetech 3100 seismic system with towfish model SB-424 (4-24 kHz). Travel time was converted to sediment depth using  $1650 \text{ ms}^{-1}$  for the speed of sound in sediment. In 2007, a 5.8 m sediment core (NHP-207) was recovered using a modified Nesje percussion coring device. The core was sectioned, split, described, photographed, and the magnetic susceptibility of the split cores was measured every 0.5 cm using a Bartington MS2E sensor.

### **Chronology**

Five radiocarbon samples were analyzed and ages were calibrated to calendar years using CALIB v. 5.0.2 (Stuiver and Reimer, 1993) with the IntCal04 calibration dataset (Reimer et al., 2004). A marine reservoir correction was applied to one date on a marine shell. I searched for tephra to support the radiocarbon chronology and targeted two depth intervals between radiocarbon samples (16-45 cm; 140-153 cm). Previous studies from this area (Pilcher et al., 2005; Mills et al., 2009) have shown that tephra are only present in low concentrations as cryptotephra (Alloway et al., 2006) so that isolation from organic and minerogenic components of the sediment is necessary. Contiguous 1

cm samples were acidified (Pilcher et al., 1996), washed in deionized water over a 20  $\mu\text{m}$  sieve, and subjected to heavy liquid separations using sodium polytungstate between 2.3-2.5  $\text{g}/\text{cm}^3$  to concentrate tephra grains (Turney, 1998). Samples were mounted on slides and tephra were counted using a light microscope. Select slides containing tephra were analyzed with a Cameca SX50 electron microprobe and their major oxide concentrations were compared to samples of known age found around the North Atlantic region.

### **Diatoms**

Six samples were chosen from 70, 140, 230, 240, 310, and 400 cm depth in the core and sent to Bianca Perren at the Laboratoire Chrono-Environnement, Université de Franche-Comté, Besançon, France for diatom analysis. Diatoms were isolated from the sediments using standard oxidative techniques (Renberg, 1990), whereby samples were treated with 30%  $\text{H}_2\text{O}_2$ , heated until the reaction subsided, then treated with HCl to remove carbonates. Samples were repeatedly rinsed with water, aliquots were dried on glass coverslips, and mounted with Naphrax mounting medium. At least 400 diatom valves were identified from each slide using marine and freshwater reference floras.

### **Bulk organic geochemistry**

The core was sub-sampled every 25 cm for bulk organic geochemical analysis. Samples were dried in a low temperature oven, ground, and an aliquot was measured on a Costech ECS 4010 Elemental Analyzer for total carbon (%TC) and total nitrogen (%TN). Another aliquot of samples were acidified with concentrated sulfurous acid to remove carbonate and measured for total organic carbon (%OC). Standard deviations based on



triplicate analysis of %C, %TN, and %OC measurements were  $\pm 0.2\%$ . Total inorganic carbon (%IC) was calculated as the difference between %C and %OC.  $\delta^{13}\text{C}_{\text{org}}$  and  $\delta^{15}\text{N}_{\text{org}}$  were measured on acidified and unacidified samples, respectively, using a Thermo Delta V Advantage IRMS interfaced with the element analyzer, and reported relative to VPDB for  $\delta^{13}\text{C}_{\text{org}}$ , and AIR for  $\delta^{15}\text{N}_{\text{org}}$ . Standard deviations based on triplicate analysis were less than  $0.03\text{‰}$  for  $\delta^{13}\text{C}_{\text{org}}$  and  $0.05\text{‰}$  for  $\delta^{15}\text{N}_{\text{org}}$ .

### **Molecular biomarkers**

Molecular biomarker analyses were performed on 31 samples by Zhaohui Zhang, currently at the Department of Earth Sciences, Nanjing University, Nanjing, China. Lipid extraction and analyses followed the protocol described in Zhang and Sachs (2007). Freeze-dried lake sediments were extracted on a Dionex ASE-200 pressurized fluid extractor with dichloromethane (DCM) and methanol (MeOH) (9:1) at 1200 psi and  $100^{\circ}\text{C}$ . The total lipid extract was fractionated on an aminopropyl cartridge-style SPE column (Burdick and Jackson, size 500 mg/4ml) with DCM/isopropyl alcohol (IPA) (3:1). The DCM/IPA fraction was fractionated by silica gel column chromatography. Hydrocarbons were eluted with hexane. Each fraction was analyzed by an Agilent 6890 gas chromatography-mass spectrometry (GC-MS) for biomarker identification, then by an Agilent GC with flame-ionization detection (GC-FID) to determine concentrations.

### **Scanning X-ray fluorescence**

Relative elemental composition of the sediment was determined by X-ray fluorescence (XRF) using an Itrax<sup>TM</sup> core scanner at the Institut National de la Recherche

Scientifique, Quebec City, Canada. This technique uses an intense micro-X-ray beam to scan a sediment core surface to generate elemental profiles at sub-millimeter resolution (Croudace et al., 2006). At each measurement point, a dispersive energy spectrum is generated and peak area integrals are calculated for each element reflecting their relative concentration in the sediment. These results are considered semi-quantitative because they are also influenced by characteristics of the sediment matrix such as particle size, water content, mineralogy, and density. Although, no significant X-ray count rate changes were observed during scanning of the core that would influence the interpretation of the elemental results. Eight overlapping U-channels that span the length of core NHP-207 were analyzed every 0.5 mm on the Itrax using an exposure time of 20 s, voltage of 35 kV, and current of 45 mA. The analysis focused on elements: Al, Si, S, Cl, K, Ca, Ti, Mn, Fe, Ni, Zn, Br, Rb, and Sr.

## **Results & Discussion**

Analysis of seismic profiles, diatoms, bulk organic geochemistry, molecular biomarkers, and scanning XRF profiles show that core NHP-207 contains three distinct phases of sedimentation: Unit I (576-373 cm), Unit II (373-186 cm), and Unit III (186-0 cm) with Unit II having two sub-units: Unit II<sub>a</sub> (373-310 cm) and Unit II<sub>b</sub> (310-186 cm). Here I describe how each proxy record changes across these units and their relevance for understanding past environmental conditions.

## **Basin analysis**

The southeast end of the lake has three main basins that are 26.1 m, 30.1 m, and 36.7 m deep (Figure 4.3). Northwest of these basins the depth decreases towards the beach ridge that impounds the lake. Core NHP-207 was collected from the northernmost basin. Sub-bottom profiles across the two deepest basins show sediment thicknesses of ~5.8 m and ~8.7 m, respectively, and both profiles have three acoustically distinct units (Figure 4.3). The lower unit appears massive with some faint layering. This unit abruptly transitions into the middle unit that has strong sub-horizontal acoustic reflections. The upper unit is more massive with some weaker discontinuous acoustic reflections. The seismic transect near the coring location indicates that the lower, middle, and upper units are ~2.9 m, 1.5 m, and 1.5 m thick, respectively.

## **Chronology**

AMS dates indicate that the record spans the last ~7800 cal yr BP (Table 4.1). An age-depth model was developed based on linear interpolation between radiocarbon dates (Figure 4.4). Three tephra horizons support the radiocarbon age model (Table 4.2; Figure 4.4). Significant quantities of tephra were found in samples 35-36, 37-38, 39-40, 141-142, and 148-149 cm. Samples from 35-36, 37-38, and 39-40 cm contain pinkish brown vesicular tephra that have distinct TiO<sub>2</sub> and MgO values. These tephra are similar in composition to the GA4-85 tephra found in Ireland with an age range of A.D. 700-800 (Hall and Pilcher, 2002). A second geochemical population occurs at 39-40 cm where the geochemistry is similar to the BIP-24a tephra previously found in peat bog and lake sediments from Lofoten (Pilcher et al., 2005). The age of this tephra is estimated to be

around A.D. 900. Lower in the core, pinkish brown vesicular tephra were found and a peak in concentration occurred at 149 cm. The compositions of grains from 142 and 149 cm match tephra from the Katla volcanic system and probably correspond to the SILK-N2 tephra (Larsen et al., 2001). Tephra from this eruption has been dated in Iceland to ~4200 cal yr BP and has also been found at a site in Ireland (Plunkett et al., 2004). Direct application of these tephra horizons to the chronology of core NHP-207 is difficult because of dating uncertainty and the additional stratigraphic uncertainty due to their vertical distribution within the sediment from landscape reworking and/or downward migration of particles in the sediment (Davies et al., 2007). However, these age estimates confirm the trends in the radiocarbon-based chronology.

## **Diatoms**

Diatoms are reliable indicators of salinity conditions and the select samples from core NHP-207 provide an initial understanding of salinity changes across the record (Figure 4.5). Diatom assemblages analyzed at 400 cm are characterized by a mix of both planktonic and benthic marine taxa (*Chaetoceros* spp. resting spores, *Thalassiosira* spp., marine *Cocconeis* spp.). The sample from 310 cm contains diatoms that represent a true freshwater flora (*Cyclotella pseudostelligera*, *Fragilaria virescens* var. *exigua*, *Achnanthes* spp.). Diatoms from 230 and 240 cm have both brackish (*Diatoma elongatum*) and freshwater (*Fragilaria virescens* var. *exigua* and *Cyclotella pseudostelligera*) affinities. The upper two diatom samples, 70 and 140 cm, contain both benthic and planktonic freshwater species, dominated by *Fragilaria virescens* var.

*exigua*, small *Achnanthes* spp., and *Cyclotella cyclopuncta*. There are also smaller numbers of both *Frustulia* sp. and *Aulacoseira* spp.

The diatom taxa generally show a decreasing marine influence across the three stratigraphic units (Figure 4.5). They transition from marine, to brackish, and then freshwater species in Units I, II<sub>b</sub>, and III, respectively. The one anomaly is the sample analyzed from 310 cm, which shows the appearance of freshwater assemblages between samples that have species indicative of marine (Unit I) and brackish conditions (Unit II<sub>b</sub>).

### **Sedimentary & organic geochemical stratigraphy**

The sediment in core NHP-207 is brown and organic rich throughout, and does not have visibly distinct stratigraphic boundaries. However, there are minor changes in lithology and significant changes in magnetic susceptibility and organic geochemistry across Units I-III (Figure 4.4). Sediment in Unit I is light brown, dense, with isolated shells and shell fragments and has low magnetic susceptibility. %OC values average 6.0% and increase from the base of the core. %IC values are variable and only a small percentage of the total carbon content of the sediment, but are highest in this unit. C/N values average 9.6. Both  $\delta^{13}\text{C}_{\text{org}}$  and  $\delta^{15}\text{N}_{\text{org}}$  are highest in Unit I with average values of -22.86‰ and 6.55‰, respectively. Unit II is a transitional zone. In Unit II<sub>a</sub>, there is a weak cm-scale banding of alternating light and dark brown horizons. This interval is associated with a rise in magnetic susceptibility. In Unit II<sub>b</sub>, the sediment is darker brown and has extremely low magnetic susceptibility. The top of Unit II<sub>b</sub> is marked by a 0.5 cm-thick dark brown organic-rich layer capped by a coarse 1 mm-thick sandy lamination. Bulk organic geochemical properties within Unit II are marked by an abrupt decrease in

$\delta^{13}\text{C}_{\text{org}}$  and  $\delta^{15}\text{N}_{\text{org}}$  by 2.29‰ and 3.26‰, respectively. %OC values are higher than in Unit I and C/N values slightly increase within Unit II<sub>b</sub>. Unit III is characterized by higher, more variable magnetic susceptibility values that correspond to layers with coarser sediment and terrestrial macrofossils. There is also a decrease in average  $\delta^{13}\text{C}_{\text{org}}$  and  $\delta^{15}\text{N}_{\text{org}}$  values.

Organic geochemical data, mainly  $\delta^{13}\text{C}_{\text{org}}$ , support the interpretation of decreasing marine influence between Units I-III.  $\delta^{13}\text{C}_{\text{org}}$  values primarily represent an algae signal since C/N ratios across the record are ~10, which are typical for algae whereas organic matter sourced from terrestrial plants has values greater than 20 (Meyers, 1994). There is a rise in the C/N ratios in Unit II<sub>b</sub> that may indicate a slight increase in the proportion of terrestrial material delivered to the basin, but even during this interval values do not exceed 14. Algae have  $\delta^{13}\text{C}_{\text{org}}$  values that are ~20‰ less than their dissolved inorganic carbon source, which is dissolved CO<sub>2</sub> (-7‰) in freshwater environments and bicarbonate (1‰) in marine environments. Therefore marine algae generally have higher  $\delta^{13}\text{C}_{\text{org}}$  values (-22‰ to -20‰) than freshwater algae (-30‰ to -25‰) (Meyers 1994). Mackie et al. (2005) correlated  $\delta^{13}\text{C}_{\text{org}}$  to salinity, as reconstructed using diatom flora from an isolation basin in Scotland, and further categorized marine (-22‰ to -16‰), brackish (-25‰ to -22‰), and freshwater (-30‰ to -25‰)  $\delta^{13}\text{C}$  zones.

In Heimerdalsvatnet,  $\delta^{13}\text{C}_{\text{org}}$  values in Unit I resemble those typical of algae in marine or brackish conditions. The decrease in values across Units II and III show the change to less saline conditions. These trends are also reflected in  $\delta^{15}\text{N}_{\text{org}}$  values.  $\delta^{15}\text{N}_{\text{org}}$  is a less commonly applied proxy due to complexities in nitrogen cycling (Talbot, 2001; Meyers, 2003), but has been used in isolation basin studies (Westman and Hedenström,

2002). In Heimerdalsvatnet, the  $\delta^{15}\text{N}_{\text{org}}$  trend likely represents a change in the source of dissolved inorganic nitrogen with decreasing surface water salinity.

### **Molecular biomarkers**

Hydrocarbon biomarkers are characterized by two main components, short and long-chain *n*-alkanes, and highly branched isoprenoid hydrocarbons (HBI), which can be related to marine and freshwater environments (Figure 4.6A). GC-MS analyses also showed the presence of elemental sulfur from 570 to 370cm, indicating an anoxic environment during this interval.

Short and medium-chain *n*-alkanes ( $\text{C}_{19}$  to  $\text{C}_{27}$ ) are from freshwater algal sources (Zhang et al., 2004), while long-chain *n*-alkanes are from higher plant leaf waxes. The distribution of *n*-alkanes in core NHP-207 range from  $\text{C}_{23}$  to  $\text{C}_{33}$ , with centers at  $\text{C}_{27}$  and  $\text{C}_{31}$ , indicating an overall mixed source. There are also significant changes in concentration of short/medium-chain *n*-alkanes in the downcore profile (Figure 4.7). They are in low abundance in Unit I with an average of 7.8  $\mu\text{g/g}$ , increase in Unit II<sub>a</sub> to a maximum value of 729  $\mu\text{g/g}$ , and then vary from 23 to 107  $\mu\text{g/g}$  with intermittent low values through Unit II<sub>b</sub>. In Unit III, *n*-alkane concentrations decrease to intermediate concentrations with an average of 39.4  $\mu\text{g/g}$ .

HBIs have been found in various marine and lacustrine hypersaline setting (Robson and Rowland, 1986; Xu et al., 2006). In core NHP-207, there are two types of HBIs,  $\text{C}_{25}$  and  $\text{C}_{20}$  (Figure 4.6A & 4.6B). The  $\text{C}_{25:1}$  HBIs likely originates from marine/brackish diatoms (Robson and Rowland, 1986; Xu et al., 2006). The  $\text{C}_{20}$  HBIs have been found in high abundance in coastal surface sediments (Gearing et al., 1976)

and in Puget Sound (Barrick et al., 1980), but no clear algal producer has been identified. Although, both C<sub>20</sub> and C<sub>25:1</sub> HBIs show similar downcore variations suggesting a common source from marine/brackish diatoms (Figure 4.7). In Unit I, both HBIs are below detection limits. In Unit II<sub>a</sub>, C<sub>20</sub> and C<sub>25:1</sub> are detected in low concentrations (<1.1 µg/g) then rapidly increase within Unit II<sub>b</sub> to maxima of 63.8 and 37.4 µg/g, respectively, and then show an equally dramatic decrease in concentration. In Unit III, C<sub>20</sub> HBIs are in very low abundance, while C<sub>25</sub> HBIs show a slight increase at the base of Unit III and then quickly decrease to below detection limits from 140 cm to the top of the core.

Molecular biomarkers concentrations provide further evidence for decreasing marine influence, and show dramatic changes in surface water conditions during Unit II. The abrupt increase of *n*-alkanes and HBIs across Unit II indicates a period of unusually high productivity, for both freshwater and marine algae, possibly due to changes in surface water salinity and/or nutrient supply. In Unit I, low quantities of *n*-alkanes support the interpretation that this was a dominantly marine interval. The rapid appearance of HBIs in Unit II, which is a brackish interval based on other evidence, could suggest that they produced by species of brackish taxa or that the organisms that produce them require high nutrient conditions. However, the decrease in concentration of HBIs in Unit III suggests a change to freshwater conditions, which is also supported by the presence of *n*-alkanes during this interval.

### **Scanning XRF analysis**

XRF data primarily reflect changes in the source and amount of detrital input, but a few marine-sourced elements also reflect changes in marine influence (Figure 4.8).



Plots are shown of the first principal component (PC1) scores, Ti, Ca, S, and Si/Ti profiles. These profiles were chosen based on statistical analysis of the XRF data (Table 4.3 and 4.4) and to highlight elements that have trends similar to changes in organic geochemical data. Principal component analysis (PCA) was performed to statistically define the primary trend in the elemental data (Table 4.4). PCA of the entire dataset shows that the first eigenvector accounts for 77% of the total variance. This variance is mainly controlled by K, Ti, Mn, Fe, Ni, Zn, and Sr, which all have high factor loads (>0.900) and are highly correlated to one another (Table 4.3 and 4.4). Trends in the elemental dataset are therefore strongly controlled by physical sedimentation and the similarity between PC 1 scores and Ti, an common indicator of detrital input, exemplify these changes (Figure 4.8). These trends are also similar to magnetic susceptibility. Values for PC1 and Ti are highest at the base of Unit I. They gradually decrease and then sharply decline at the base of Unit II. Within Unit II values are relative low and less variable. Unit III is marked by high amplitude variations. The decline in Ti values across Unit I is likely affected by the increase in organic content of the sediment across this interval resulting from increased aquatic productivity as surface waters became less saline. Unit II is a period when sedimentation rates are still high, but probably dominated by organic sedimentation since Ti values are low. In Unit III, sedimentation has slowed and is primarily organic-rich, but punctuated by periodic influxes of clastic material marked by peaks in Ti.

Scanning XRF element profiles of Ca and S indicate changes in marine influence (Figure 4.8). Extremely high Ca values in Unit I reflect the presence of calcium carbonate as shell material or coatings on mineral grains. Ca ions must have been

derived from seawater since there is not a significant terrestrial source. Ca values increase in two steps from the base of Unit I and then rapidly decrease at Unit II when the source of Ca to the sediment is abruptly cut-off. In Unit II and III, Ca values are lower and covary with Ti and PC 1 scores and reflect their minor presence in clastic minerals. PCA performed separately on each Unit (I, II, & III) support these observations (Table 4.4). The first eigenvector for the PCA of each unit is controlled by a similar suite of elements as observed during the PCA of the entire dataset, but they generally account for a smaller percentage of the total variance (64%, 58%, and 77%, respectively). Ca shows a strong influence on the variance in Units II and III with factor loads greater than 0.950, but in Unit I Ca varies independently showing it is responding to an environmental condition different from the rest of the elements. Sr, also found only in seawater, exhibits similar trends to Ca ( $r = 0.96$ ) since it has the same valence and gets incorporated into calcite.

S can also indicate changes in marine influence since S is primarily a marine-sourced element and should compare with the identification of sulfur during biomarker analysis (Figure 4.8). Values are highest in Unit I and sharply decline across Unit II<sub>a</sub>. Within Unit II<sub>b</sub>, values rise to an intermediate level and then decrease at the boundary of Unit III and remain low in the rest of this interval.

The ratio of Si to Ti was plotted to interpret changes in the source of Si in the sediment. Si can be biogenic, primarily from diatoms, or in detrital siliclastic material. Therefore, concentration of Si plotted relative to Ti, which only reflects detrital input, should vary as a response to changes in the amount of biogenic silica. The relatively low Si/Ti values in Unit I indicate that biogenic silica concentrations were low, but the

increase in the ratio across Unit II and the peak in Unit II<sub>b</sub> at 270 cm depth indicate that productivity increased and surface water conditions improved for diatoms during this period. The peak in Si/Ti values correlates with changes in the concentration of both HBI biomarkers showing that diatom communities developed rapidly in Unit II. Following this peak in concentration, values gradually decrease across the boundary of Unit III where they stabilize around 140 cm and exhibit only minor fluctuations to the present.

### **Water column stratification**

Water column stratification occurs in isolation basins as dense saline marine water in the monimolimnion becomes trapped beneath a lighter less saline epilimnion as a basin transitions to a restricted marine and then freshwater system. Stratification prevents the complete mixing of the water column and leads to anoxic conditions. Sulfur concentrations and the magnetic susceptibility of the sediment can be used to interpret periods of water column stratification and anoxia. The presence of sulfur in the sediment indicates water column stratification because sulfur reduction only occurs in anoxic environments. In Unit I, elemental sulfur was observed during GC-MS analysis of biomarker samples and high sulfur counts were detected by scanning XRF. This shows that Heimerdalsvatnet was salinity stratified during this interval. Sulfur was not observed in other biomarker samples, but in Unit II, XRF sulfur counts remain elevated compared to the other stratigraphic units. These results could mean that sulfur reduction and stratification also occurred during this period and that lower sulfur values demonstrate a restriction of the source of sulfur.

Magnetic susceptibility can also be used to interpret periods of anoxia. Detrital magnetite, typically the main source of the magnetic signal in sediments, can undergo reductive dissolution in anoxic environments, which is a process that weakens the magnetic susceptibility. Magnetic susceptibility is low in Unit I and lower in Unit II<sub>b</sub>. These values contrast those in Units II<sub>a</sub> and III and provide further support for the interpretation of water column stratification. However, low magnetic susceptibility can also occur from the dilution of minerogenic input by increased organic sedimentation. Nevertheless, combining results from these two indicators shows that anoxia and reduced mixing occurred within Unit I. The lack of evidence for similar conditions in Units II<sub>a</sub> and III shows that the water column was likely not stratified and was fully mixed.

### **Relative sea-level reconstruction**

This multi-proxy dataset shows that Heimerdalsvatnet was influenced by relative sea-level changes during the Holocene. The three stratigraphic units indicate a regressive sequence from restricted marine to freshwater conditions. Here, the timing of the transitions between sedimentary units is used to interpret former sea-level elevations in relation to the threshold of the lake. These are typically referred to as relative sea-level index points, which establish a relationship between a reference tide level and environmental conditions at a site (e.g. Shennan, 1986; Shennan et al., 2000). However, there are uncertainties in the threshold elevation of Heimerdalsvatnet that prohibit strict use of these transitions as sea-level index points. Instead, I present a more general

interpretation of changes in sea-level elevation and compare it to the previously established local sea-level history.

### **Basin threshold**

Heimerdalsvatnet does not have an outlet stream and is a closed basin impounded by a beach ridge (8 m a.s.l.). The lack of an observable bedrock sill complicates the interpretation of former sea-level elevation. The present lake level (5 m a.s.l.) is probably controlled by a bedrock sill beneath the beach ridge and is regulated by infiltration through the beach ridge. I acknowledge the uncertainty in the sea-level interpretation from Heimerdalsvatnet, but using a conservative estimate for the threshold elevation ( $5 \pm 1$  m a.s.l.) show that the general sea-level trends correspond with previous reconstructions.

### **Unit I: Restricted marine phase (7800 – 6500 cal yr BP)**

Diatom assemblages,  $\delta^{13}\text{C}_{\text{org}}$ , and Ca and Sr values show that marine influence was greatest from 7800-6500 cal yr BP. However, anoxic conditions inferred from low magnetic susceptibility and sulfur data indicate that Heimerdalsvatnet was not a completely open marine system. Restricted marine conditions must have caused salinity stratification of the water column. The presence of a less saline epilimnion is supported by  $\delta^{13}\text{C}_{\text{org}}$  values that are on the low end of Mackie et al.'s (2005) category for marine conditions.

Sea level was probably above the threshold of the lake creating a dominantly marine environment, but freshwater input was enough to sustain a density stratified water

column. This scenario enables a strong marine sedimentary signal, but shows that direct contact of the monimolimnion with the ocean and oxygenation of the lower water column did not occur during this period. The environment was likely similar to present conditions at outer and inner Borgpollen in Lofoten, a chain of two coastal basins near present sea level (Mills et al., 2009). Inner Borgpollen (Indrepollen) is more isolated and is connected to outer Borgpollen by a small channel. Outer Borgpollen has higher salinity but is also somewhat restricted and is connected to the ocean by two long narrow channels. Outer Borgpollen directly exchanges with the ocean and buffers the marine influence on Indrepollen. However, both are density stratified and anoxic below ~20 m water depth, where sulfur reduction is presently active. Marine influence to outer Borgpollen and Indrepollen varies throughout the year based on tides and the inflow of freshwater. These represent basins that are currently at different stages of isolation and provide an analogue of former conditions at Heimerdalsvatnet.

## **Unit II: Transitional phase (6500 – 4900 cal yr BP)**

The onset of this phase marks an abrupt decrease in the marine sedimentary signal. Initially, in Unit II<sub>a</sub> (6500-6200 cal yr BP) magnetic susceptibility values are higher and there is a dip in S values. Diatoms in this zone are true freshwater species and *n*-alkanes indicate high concentrations of freshwater algae. Although it is difficult to interpret such a brief interval, these conditions might indicate a short period when sea level dropped below the threshold and the lake began to mix or displace the denser monimolimnion.

After 6200 cal yr BP, Unit II<sub>b</sub> is characterized by slightly higher C/N ratios, and a rapid rise of Si/Ti, and HBIs. This is accompanied by extremely low magnetic susceptibility and diatoms that have a mix of freshwater and brackish affinities. The apparent rise in biogenic silica, as interpreted from Si/Ti values, is confirmed by the simultaneous increase in the two HBIs. The proliferation of diatoms at this time was likely caused by freshening of the surface water and an increase in nutrient supply. An intermittent marine influence from periodic overtopping of the threshold would have delivered saline, nutrient-rich water infrequently to the lake. High productivity in the surface water along with continued meromixis from the re-supply of denser saline water also explains the further reduction of magnetite and/or dilution by high rates of biogenic sedimentation. High productivity and favorable conditions for some diatom species during isolation basin transitions have been recorded elsewhere (e.g. Zong, 1997). In addition, C/N ratios probably reflect instability of the shoreline area around the lake following regression of sea level and prior to soil development, providing another nutrient source.

Unit II<sub>a</sub> therefore represents a period when sea level fell below the threshold of the lake and freshwater conditions increased in the epilimnion. Then (Unit II<sub>b</sub>) a pause in the rate of emergence and infrequent incursions of seawater, possibly by infiltration through the beach ridge, perpetuated this transitional period. Transitional phases of isolation have also been observed in other locations (e.g. Corner and Haugane, 1993). Commonly, the transition period is brief, but in Heimerdalsvatnet it spanned ~1600 years. Sustained transitional periods observed elsewhere have been interpreted to indicate sea-level stillstands (Corner et al. 1999, 2001; Lloyd, 2000). In Heimerdalsvatnet, the

interpretation of a sea-level stillstand is supported by previous investigations (Møller, 1986).

### **Unit III: Lacustrine phase (4900 cal yr BP – present)**

Complete mixing and freshwater conditions began at 4900 cal yr BP.  $\delta^{13}\text{C}_{\text{org}}$  and  $\delta^{15}\text{N}_{\text{org}}$  values reflect freshwater algal sources, diatom floras are entirely freshwater species, and all geochemical properties are more stable during this period. Magnetic susceptibility values show a dramatic increase associated with oxic conditions and periodic detrital input punctuates more organic-rich sedimentation typical of lacustrine environments. Therefore, sea level fell and no longer had any influence on Heimerdalsvatnet. A strong seasonal mixing cycle quickly eroded any remaining water column stratification.

### **Holocene relative sea-level in Lofoten-Vesterålen**

Møller (1986) compiled data from the area to create a shoreline displacement curve that summarizes the Holocene relative sea-level history of the Lofoten-Vesterålen archipelago (Figure 4.9). The isolation of Heimerdalsvatnet is compared to this curve using a threshold elevation of  $5 \pm 1$  m a.s.l. and shows that the general trends are similar. Møller's (1986) shoreline displacement curve has a relative sea-level transgression from -3 m in the early Holocene to 9-10 m a.s.l. at ~6800 cal yr BP (Figure 4.9). The transgression minimum is constrained by radiocarbon dates on a submarine peat from Petvika in southwestern Vestvågøya (Møller, 1984; Vorren and Moe, 1986) and a peat deposit found buried beneath marine sediment from Ramså on Andøya (Møller, 1986).



The transgression maximum is constrained by dates on material found just beneath the highest beach deposits in Ramså (Møller, 1986), from Leknes on Vestvågøya (Møller, 1984), and near Eggum (Bergström, 1973).

Heimerdalsvatnet was a restricted marine environment from 7800 to 6500 cal yr BP. Møller's (1986) shoreline curve shows that relative sea level rose to greater than 5 m around this time and supports the interpretation of marine conditions in Heimerdalsvatnet during Unit I (Figure 4.9). The transgression contact was not recovered, but seismic profiles show that our core penetrated the majority of the sedimentary record and %OC and Ca values rise from the base of the core, possibly indicating that inundation of Heimerdalsvatnet occurred shortly before 7800 cal yr BP and corresponding with Møller's (1986) curve. There is no evidence to constrain the upper limit of sea level during the transgression maximum, but assume that maximum wave exposure was at least 8 m a.s.l. corresponding with the elevation of the beach ridge impounding the lake. Following the Tapes maximum at 6800 cal yr BP, there was a sea level regression of ~4 m (Møller, 1986) (Figure 4.9). This is supported by habitation of the Storbåthallaren cave on Flagstadøya dated between 5500 and 5100 cal yr BP (Utne, 1973). Heimerdalsvatnet indicates a regression of sea level, which is marked by the onset of Unit II at 6500 cal yr BP, when the basin experienced greater freshwater conditions and only periodic marine influence, but it occurred more rapidly than expressed by the Møller (1986) sea-level curve. The dates from Storbåthallaren cave were used to suggest sea level was near or below ~7.6 m during the period it was inhabited, ~400 years. This period defines a sea-level stillstand in Møller's (1986) shoreline curve and closely corresponds with the duration of Unit II in Heimerdalsvatnet, from 6500 to 4900 cal yr

BP. There is also evidence for a short transgressive phase at, ~5100 cal yr BP (Marthinussen, 1962; Møller, 1984), but there is no indication of a change in conditions at Heimerdalsvatnet. Following this stillstand, sea level regressed through the late Holocene (Marthinussen, 1962), which corresponds to the complete isolation of Heimerdalsvatnet at 4900 cal yr BP. Differences between these sea-level curves are a result of uncertainties in the threshold elevation of Heimerdalsvatnet and how representative the Møller (1986) curve is for this exact area.

### **Conclusions**

The isolation sequence of Heimerdalsvatnet was analyzed using a variety of analytical techniques. Physical, organic geochemical, and diatom analyses defined three litho/chemo-stratigraphic units related to sea-level lowering following the Tapes transgression. This multi-proxy approach provides a detailed view of paleoenvironmental conditions and allows me to directly compare methods of assessing isolation basin stratigraphy.

Diatoms are reliable indicators of salinity and select samples provided an overall understanding of salinity changes across the record and supported the interpretations of the other proxies. Bulk organic geochemical data, mainly  $\delta^{13}\text{C}$ , exhibited expected trends from marine to freshwater environments and showed clear changes at stratigraphic boundaries further validating these techniques in isolation basin studies. Molecular biomarkers produced by marine and freshwater algae were also analyzed and are a new approach to characterizing isolation basin stratigraphy. Concentrations of HBIs and *n*-alkanes varied dramatically across the record and indicated changes in surface water

conditions during the transitional phase of isolation. There is great potential for the use of these and other molecular biomarkers in isolation basin studies. Although, the extraction, analysis, and identification of organic molecules is labor intensive, biomarker proxies can add a new understanding of paleoenvironmental conditions or be applied where there are uncertainties in microfossil or bulk organic geochemical data. Scanning XRF is a rapid, high resolution technique for defining changes in sediment composition. A statistical approach was presented using elemental data to classify stratigraphic units and to characterize the response of different elements. The elemental dataset had a strong detrital signal, but profiles of Ca and Sr showed significantly different trends related to changes in marine influence and Si/Ti seemed to indicate changes in biogenic silica.

Results from this analysis demonstrate that Heimerdalsvatnet was a restricted marine basin from 7800-6500 cal yr BP. Evidence for anoxia during this period indicates that conditions resembled the present-day environments in two nearby coastal basins. Following the transgression sea level lowered, but marine water still had periodic influence on Heimerdalsvatnet from 6500-4900 cal yr BP before it was fully isolated at 4900 cal yr BP. Despite uncertainties in the threshold elevation, these intervals correspond with general trends in the local sea-level history.

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**Table 4.1.** Radiocarbon results for core NHP-207 (calibrated with CALIB 5.0.2).

Depth (cm)	Description	Laboratory #	$\delta^{13}\text{C}$ ‰	$^{14}\text{C}$ Years BP	Calibrated Age Range (yr BP)		Median 1- $\sigma$ Age (cal yr BP)
					(1 $\sigma$ )	(2 $\sigma$ )	
73.5	Plant/Wood	OS-67689	-26.52	1760 $\pm$ 30	1619 - 1713	1567 - 1806	1666 $\pm$ 47
130	Plant/Wood	OS-67681	-24.39	3610 $\pm$ 35	3874 - 3972	3834 - 4068	3923 $\pm$ 49
205	Plant/Wood	Beta-241113	NA	4550 $\pm$ 40	5067 - 5314	5049 - 5434	5191 $\pm$ 124
292	Plant/Wood	OS-67690	-24.46	5260 $\pm$ 35	5941 - 6174	5931 - 6178	6058 $\pm$ 117
570	Shell*	Beta-241115	-1.5	7350 $\pm$ 50	7673 - 7818	7616 - 7902	7746 $\pm$ 73

\* Marine reservoir correction applied (Delta-R = 65  $\pm$  44)

**Table 4.2.** Electron microprobe results for tephra analyzed from core NHP-207. The tephra results fall into three compositional populations and the average and standard deviation are presented for each population.

Sample	P <sub>2</sub> O <sub>5</sub>	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	MgO	CaO	MnO	FeO	Na <sub>2</sub> O	K <sub>2</sub> O	Cl	Total
<b>36 cm</b>	0.35	65.27	1.12	14.22	1.21	3.44	0.16	6.01	3.31	2.61	0.08	97.78
<b>38 cm</b>	0.26	65.54	1.12	14.16	1.23	3.51	0.21	5.96	3.54	2.55	0.09	98.18
	0.30	65.58	1.20	14.39	1.20	3.35	0.22	5.62	3.99	2.70	0.07	98.62
	0.27	66.03	1.11	14.42	1.12	3.23	0.23	5.46	3.89	2.72	0.06	98.53
	0.29	64.54	1.10	13.97	1.10	3.20	0.23	5.51	4.21	2.64	0.06	96.84
	0.24	66.32	1.17	14.26	1.19	3.31	0.19	5.58	4.00	2.65	0.07	98.97
	0.25	66.40	1.25	14.56	1.16	3.34	0.23	5.67	3.68	2.64	0.07	99.25
<b>40 cm</b> Group 1	0.32	66.33	1.14	14.27	1.10	3.21	0.19	5.45	2.70	2.70	0.07	97.50
	0.29	66.10	1.20	14.14	1.11	3.21	0.15	5.54	2.87	2.73	0.10	97.44
	0.28	66.88	1.13	14.35	1.04	2.96	0.20	5.19	2.46	2.76	0.09	97.33
	0.39	65.52	1.13	14.16	1.15	3.31	0.16	5.40	2.99	2.72	0.07	97.01
	0.30	66.11	1.21	14.45	1.14	3.30	0.15	5.54	3.47	2.79	0.12	98.57
	0.32	66.12	1.20	14.27	1.16	3.27	0.15	5.66	3.19	2.66	0.10	98.10
<i>Average</i> <i>(1 σ)</i>	<i>0.30</i> <i>0.04</i>	<i>65.90</i> <i>0.60</i>	<i>1.16</i> <i>0.05</i>	<i>14.28</i> <i>0.16</i>	<i>1.15</i> <i>0.05</i>	<i>3.28</i> <i>0.13</i>	<i>0.19</i> <i>0.03</i>	<i>5.58</i> <i>0.22</i>	<i>3.41</i> <i>0.55</i>	<i>2.68</i> <i>0.07</i>	<i>0.08</i> <i>0.02</i>	<i>98.01</i> <i>0.76</i>
<b>40 cm</b> Group 2	0.12	67.40	0.40	16.09	0.26	1.98	0.15	4.28	2.87	3.95	0.22	97.73
	0.10	67.49	0.41	16.06	0.33	2.05	0.17	4.42	2.89	3.92	0.22	98.06
	0.09	64.46	0.43	15.37	0.35	2.04	0.14	4.37	2.72	3.83	0.29	94.09
	0.10	68.40	0.39	15.98	0.25	1.89	0.13	4.13	3.18	4.05	0.25	98.75
	0.09	66.23	0.39	15.58	0.26	1.84	0.16	4.13	2.65	3.77	0.26	95.36
	0.13	66.34	0.42	15.73	0.29	1.97	0.14	4.29	2.56	3.91	0.24	96.00
	0.08	67.13	0.39	16.00	0.25	1.85	0.14	4.23	2.44	4.06	0.22	96.79
	0.11	66.42	0.40	15.90	0.26	1.90	0.15	4.29	3.24	3.86	0.23	96.76
	0.08	66.83	0.38	15.81	0.25	1.87	0.16	4.13	2.53	3.98	0.26	96.29
	0.12	67.15	0.41	15.90	0.25	1.94	0.19	4.20	2.69	4.04	0.22	97.10
	0.11	72.64	0.28	12.99	0.39	2.28	0.09	1.99	2.05	2.00	0.29	95.10
	0.13	66.01	0.47	16.11	0.39	2.29	0.19	4.79	2.94	3.89	0.20	97.40
	0.12	67.25	0.30	14.83	0.26	3.08	0.12	4.86	2.61	2.09	0.06	95.59
	0.07	67.19	0.40	15.80	0.28	1.97	0.18	4.18	3.60	4.02	0.24	97.92
	0.11	67.00	0.39	16.06	0.31	2.05	0.16	4.60	3.32	4.03	0.23	98.24
<i>Average</i> <i>(1 σ)</i>	<i>0.10</i> <i>0.02</i>	<i>67.20</i> <i>1.74</i>	<i>0.39</i> <i>0.05</i>	<i>15.61</i> <i>0.80</i>	<i>0.29</i> <i>0.05</i>	<i>2.07</i> <i>0.31</i>	<i>0.15</i> <i>0.03</i>	<i>4.19</i> <i>0.65</i>	<i>2.82</i> <i>0.39</i>	<i>3.69</i> <i>0.67</i>	<i>0.23</i> <i>0.05</i>	<i>96.75</i> <i>1.33</i>
<b>142 cm</b>	0.26	66.35	1.24	14.39	1.16	3.36	0.11	5.58	4.05	2.61	0.06	99.18
	0.25	65.71	1.19	14.40	1.12	3.15	0.15	5.29	4.21	2.74	0.05	98.27
	0.30	64.87	1.11	14.11	1.09	3.13	0.12	5.33	4.05	2.62	0.04	96.76
	0.31	65.18	1.14	14.21	1.15	3.29	0.12	5.62	4.21	2.77	0.06	98.05
	0.31	66.95	1.19	14.40	1.12	3.24	0.13	5.31	4.04	2.69	0.06	99.43
	0.28	67.27	1.16	14.31	1.14	3.07	0.15	5.46	4.21	2.76	0.07	99.87
	0.30	66.51	1.14	14.50	1.18	3.40	0.08	5.54	4.17	2.72	0.06	99.58
	0.29	65.99	1.17	14.19	1.18	3.24	0.13	5.56	4.14	2.64	0.07	98.60
	0.36	65.73	1.10	14.35	1.19	3.24	0.10	5.70	4.13	2.62	0.05	98.57
	0.25	65.71	1.16	14.45	1.16	3.24	0.14	5.36	4.19	2.65	0.08	98.39

**Table 4.2 (continued).** Electron microprobe results for tephra analyzed from core NHP-207. The tephra results fall into three compositional populations and the average and standard deviation are presented for each population.

	0.28	67.15	1.09	14.27	0.95	2.86	0.12	4.62	4.03	2.79	0.06	98.21
	0.16	66.21	1.13	14.38	1.16	3.27	0.17	5.40	4.45	2.69	0.05	99.08
	0.30	67.00	1.22	14.38	1.16	3.13	0.09	5.59	3.59	2.60	0.07	99.12
	0.29	66.38	1.21	14.53	1.18	3.23	0.13	5.61	4.54	2.55	0.06	99.70
	0.33	65.28	1.19	14.35	1.19	3.34	0.14	5.80	4.39	2.61	0.06	98.69
	0.27	65.02	1.24	14.36	1.10	3.30	0.12	5.42	3.81	2.64	0.06	97.33
	0.33	66.23	1.12	14.07	0.98	2.80	0.11	4.81	4.14	3.05	0.05	97.68
	0.27	66.01	1.15	14.09	1.17	3.35	0.14	5.62	4.05	2.65	0.07	98.54
<b>149 cm</b>	0.32	65.92	1.16	14.45	1.20	3.40	0.12	5.82	3.67	2.59	0.06	98.72
	0.31	65.92	1.04	14.58	1.15	3.21	0.17	5.65	3.46	2.69	0.07	98.24
	0.33	66.31	1.13	14.54	1.18	3.31	0.18	5.62	2.80	2.64	0.07	98.12
	0.28	66.36	1.15	14.55	1.17	3.28	0.18	5.63	3.42	2.67	0.06	98.76
	0.31	66.39	1.05	14.49	1.07	3.10	0.18	5.26	3.23	2.71	0.05	97.84
<i>Average</i>	<i>0.27</i>	<i>61.80</i>	<i>1.07</i>	<i>13.44</i>	<i>1.06</i>	<i>3.00</i>	<i>0.13</i>	<i>5.11</i>	<i>3.60</i>	<i>2.51</i>	<i>0.06</i>	<i>91.96</i>
<i>(1 <math>\sigma</math>)</i>	<i>0.08</i>	<i>16.92</i>	<i>0.29</i>	<i>3.68</i>	<i>0.28</i>	<i>0.80</i>	<i>0.04</i>	<i>1.38</i>	<i>1.00</i>	<i>0.68</i>	<i>0.01</i>	<i>25.24</i>

**Table 4.3.** Correlation coefficients of elements analyzed by scanning XRF. Values with high statistical significant ( $\geq 0.90$ ) are in bold.

	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Zn	Br	Rb	Sr
<b>Al</b>	1.00													
<b>Si</b>	-0.15	1.00												
<b>S</b>	-0.49	0.68	1.00											
<b>Cl</b>	-0.29	0.80	0.76	1.00										
<b>K</b>	-0.51	0.80	0.85	0.79	1.00									
<b>Ca</b>	-0.41	0.43	0.74	0.52	0.80	1.00								
<b>Ti</b>	-0.33	0.81	0.70	0.80	<b>0.93</b>	0.68	1.00							
<b>Mn</b>	-0.36	0.81	0.77	0.81	<b>0.93</b>	0.70	<b>0.97</b>	1.00						
<b>Fe</b>	-0.34	0.83	0.81	0.84	<b>0.92</b>	0.65	<b>0.95</b>	<b>0.97</b>	1.00					
<b>Ni</b>	-0.42	0.74	0.78	0.76	<b>0.93</b>	0.74	<b>0.93</b>	<b>0.94</b>	0.94	1.00				
<b>Zn</b>	-0.39	0.80	0.78	0.82	<b>0.93</b>	0.68	<b>0.95</b>	<b>0.94</b>	<b>0.92</b>	<b>0.92</b>	1.00			
<b>Br</b>	-0.47	0.34	0.81	0.42	0.74	0.89	0.58	0.63	0.61	0.68	0.61	1.00		
<b>Rb</b>	-0.37	0.79	0.63	0.74	<b>0.90</b>	0.58	<b>0.93</b>	<b>0.90</b>	0.87	0.87	0.89	0.47	1.00	
<b>Sr</b>	-0.40	0.54	0.76	0.63	0.87	<b>0.96</b>	0.82	0.83	0.78	0.83	0.79	0.86	0.72	1.00

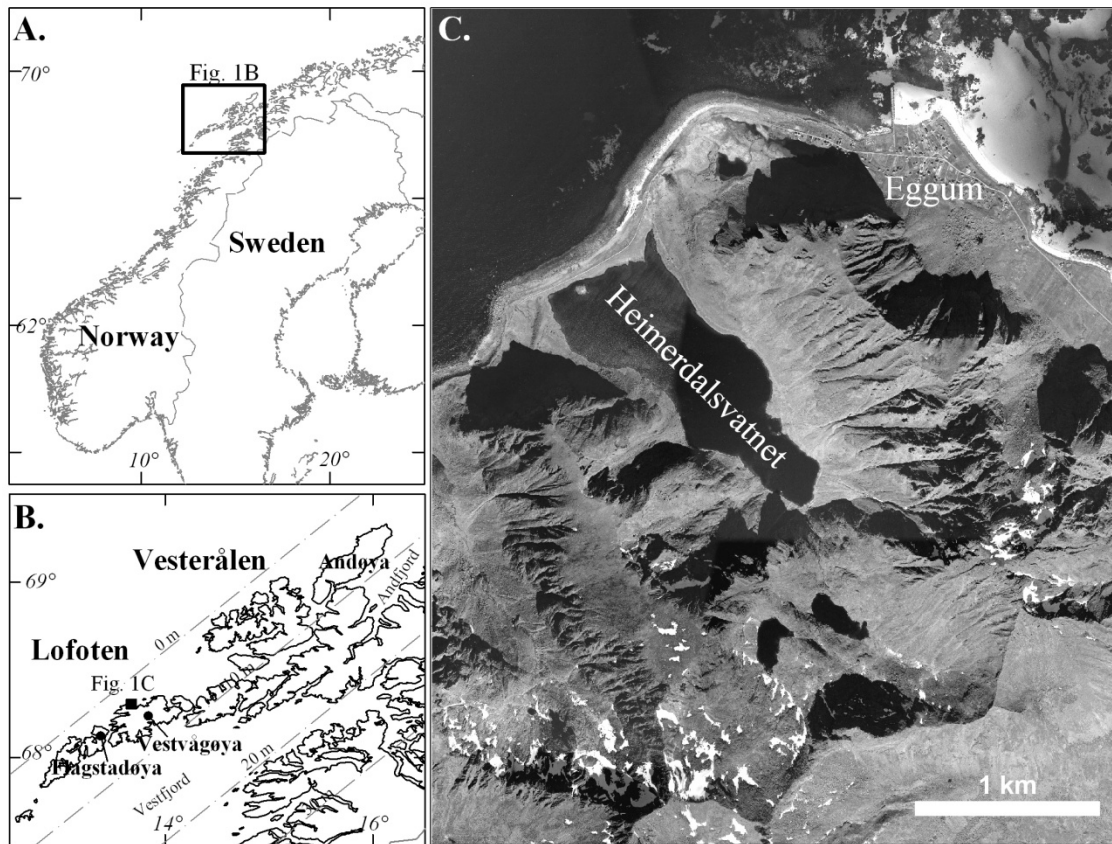
**Table 4.4.** Principal component analysis of scanning XRF data from each lithologic unit. Eigenvalues and factor loadings are shown for the 1st principal component. Factor loadings  $\geq 0.900$  are in bold.

<b>Unit</b>	<b>III</b>	<b>II</b>	<b>I</b>	<b>III - I</b>
Age Range (cal yr BP)	0 - 4900	4900 - 6500	6500 - 7800	0 - 7800
Eigenvalue	9.99	7.51	8.26	9.95
% of Variance	76.84	57.78	63.54	76.55
Cumulative %	76.84	57.78	63.54	76.55
<b><i>Factor Loadings</i></b>				
Al	0.534	0.067	-0.503	-0.467
Si	0.889	0.364	<b>0.917</b>	0.788
S	0.585	0.426	0.692	0.864
K	<b>0.986</b>	<b>0.968</b>	<b>0.921</b>	<b>0.986</b>
Ca	<b>0.983</b>	<b>0.956</b>	-0.414	0.817
Ti	<b>0.982</b>	<b>0.976</b>	<b>0.947</b>	<b>0.950</b>
Mn	<b>0.957</b>	<b>0.937</b>	<b>0.930</b>	<b>0.963</b>
Fe	<b>0.928</b>	0.874	<b>0.954</b>	<b>0.951</b>
Ni	0.861	0.729	<b>0.911</b>	<b>0.959</b>
Zn	<b>0.965</b>	0.876	0.868	<b>0.949</b>
Br	-0.688	0.188	-0.749	0.757
Rb	<b>0.903</b>	0.796	0.895	0.889
Sr	<b>0.965</b>	0.884	-0.226	<b>0.900</b>

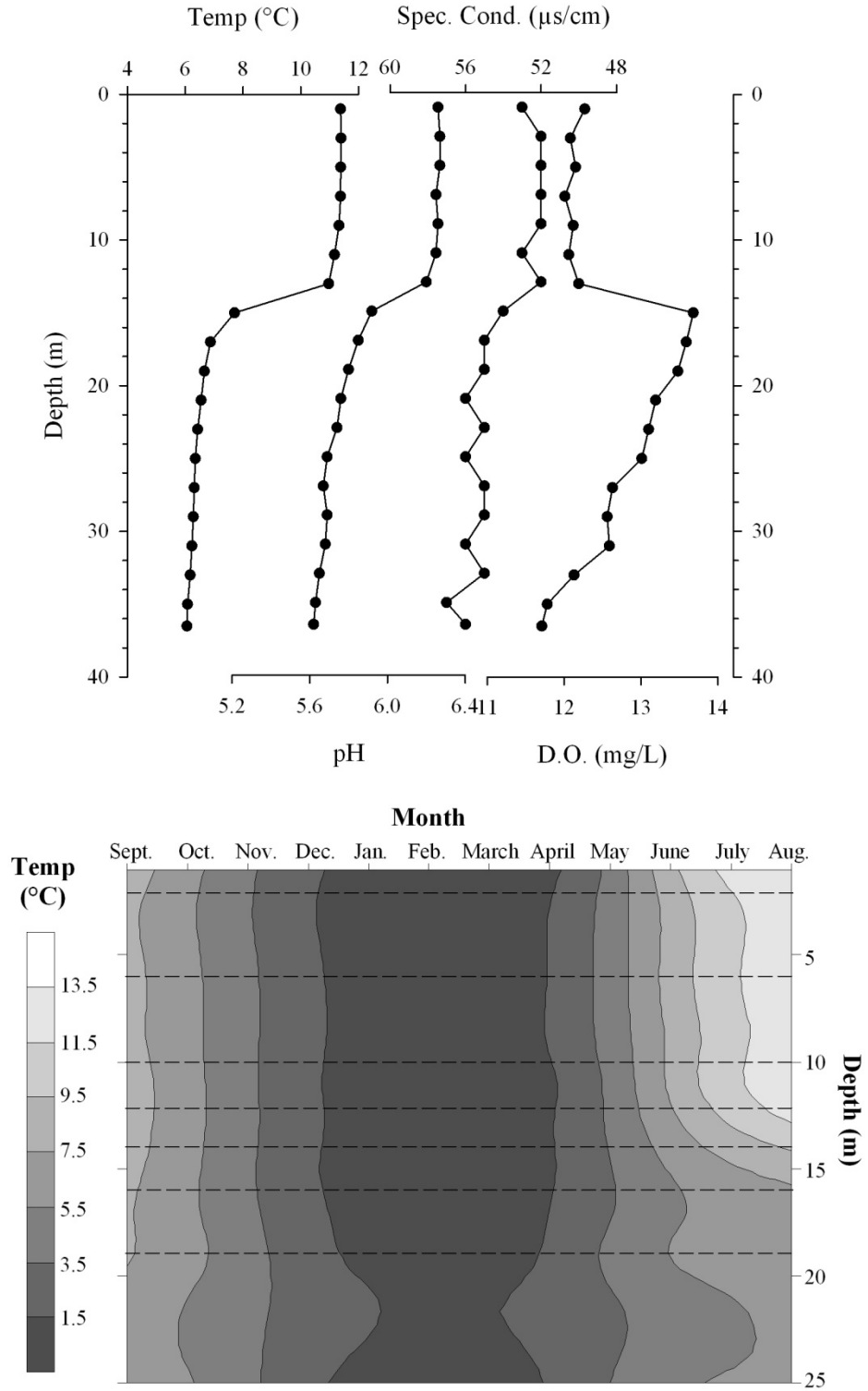
**Table 4.5.** Radiocarbon ages for sites in Lofoten and Vesterålen used to reconstruct Holocene sea level history. Ages were presented as radiocarbon years BP in original publications and were converted to calendar years for this study using CALIB 5.0. Marine reservoir corrections were applied to ages from shell material.

Location	Height Above		Laboratory #	<sup>14</sup> C Year BP	1-σ Age Range		Median 1-σ Age		Source
	m.t.l. (m)	Material			(cal yr BP)	(cal yr BP)			
Ramsa	2.50	Gyttja	T-5280	9890 ± 130	11195 - 11608	11402 ± 207	Møller (1986)		
Ramsa	2.25	Gyttja	T-5279A	9490 ± 160	10575 - 11087	10831 ± 256	Møller (1986)		
Petvika	-1.35	Peat	T-5400	9060 ± 140	9930 - 10475	10203 ± 273	Vorren and Moe (1986)		
Petvika	-2	Peat	T-4732A	8350 ± 60	9300 - 9448	9374 ± 74	Møller (1984)		
Ramsa	2.80	Wood	T-5281	8330 ± 120	9139 - 9473	9306 ± 167	Møller (1986)		
Petvika	-1	Wood	T-4731	8040 ± 180	8630 - 9135	8883 ± 253	Møller (1984)		
Petvika	-0.8	Peat	T-5399	8010 ± 110	8659 - 9015	8837 ± 178	Vorren and Moe (1986)		
Ramsa	7.50	Gyttja	T-5283A	7590 ± 120	8221 - 8540	8381 ± 160	Møller (1986)		
Ramsa	3.00	Peat	T-5282	7400 ± 60	8176 - 8315	8246 ± 70	Møller (1986)		
Ramsa	7.75	Gyttja	T-5284A	6720 ± 160	7432 - 7701	7567 ± 135	Møller (1986)		
Ramsa	8.00	Wood	T-4730	6530 ± 100	7327 - 7559	7443 ± 116	Møller (1986)		
Ramsa	7.80	Gyttja	T-5285A	6290 ± 60	7161 - 7287	7224 ± 63	Møller (1986)		
Ramsa	8.10	Gyttja	T-5286A	6140 ± 50	6954 - 7156	7055 ± 101	Møller (1986)		
Ramsa	8.45	Gyttja	T-5287A	6090 ± 100	6802 - 7156	6979 ± 177	Møller (1986)		
Eggum	10.3	Peat	U-98	5990 ± 110	6676 - 6953	6815 ± 139	Bergström (1973)		
Leknes	8	Shell*	T-4195	5980 ± 100	6216 - 6445	6331 ± 115	Møller (1984)		
Storbåthallaren	7.5	Shell*	T-1014	5250 ± 80	5445 - 5640	5543 ± 98	Utne (1973)		
Storbåthallaren	7.4	Shell*	T-1018	5080 ± 90	5258 - 5506	5382 ± 124	Utne (1973)		
Storbåthallaren	7.6	Shell*	T-1017	4910 ± 80	5020 - 5277	5149 ± 129	Utne (1973)		
Storbåthallaren	7.7	Charcoal	T-1198	4740 ± 140	5307 - 5609	5458 ± 151	Utne (1973)		
Nøss	7.4	Wood	T-266	4500 ± 150	4886 - 5318	5102 ± 216	Marthinussen (1962)		
Ramsa	9.10	Peat	T-5288	3480 ± 80	3640 - 3846	3743 ± 103	Møller (1986)		

\* Delta-R = 65 ± 44

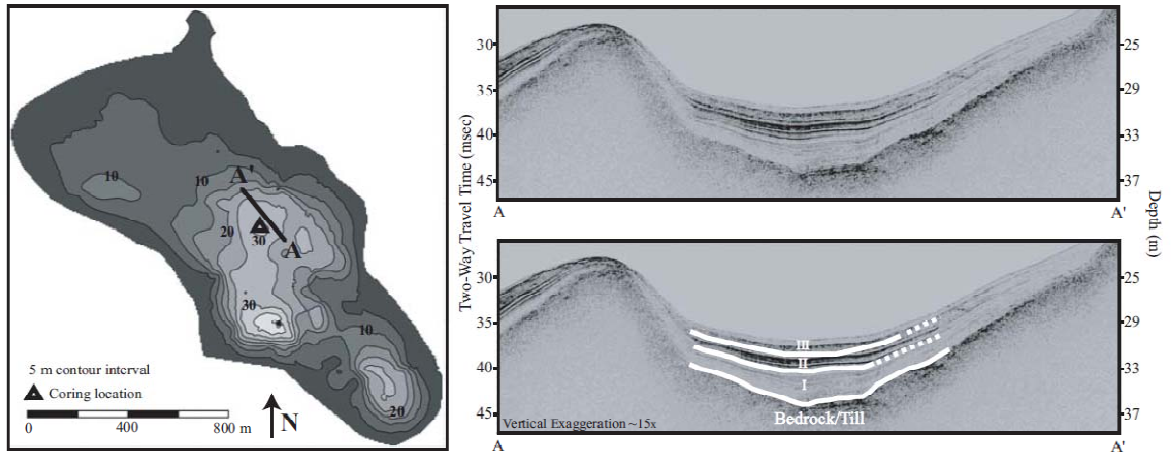


**Figure 4.1.** (A) The Lofoten-Vesterålen archipelago off the northwestern coast of Norway. (B) Vestvågøya in the Lofoten Islands. Dashed lines are isobases of the Tapes transgression maximum reconstructed from sites across northern Norway and represent the general regional trend of this shoreline (from Møller, 1987). (C) Air photograph of Heimerdalsvatnet showing the location of the town of Eggum.

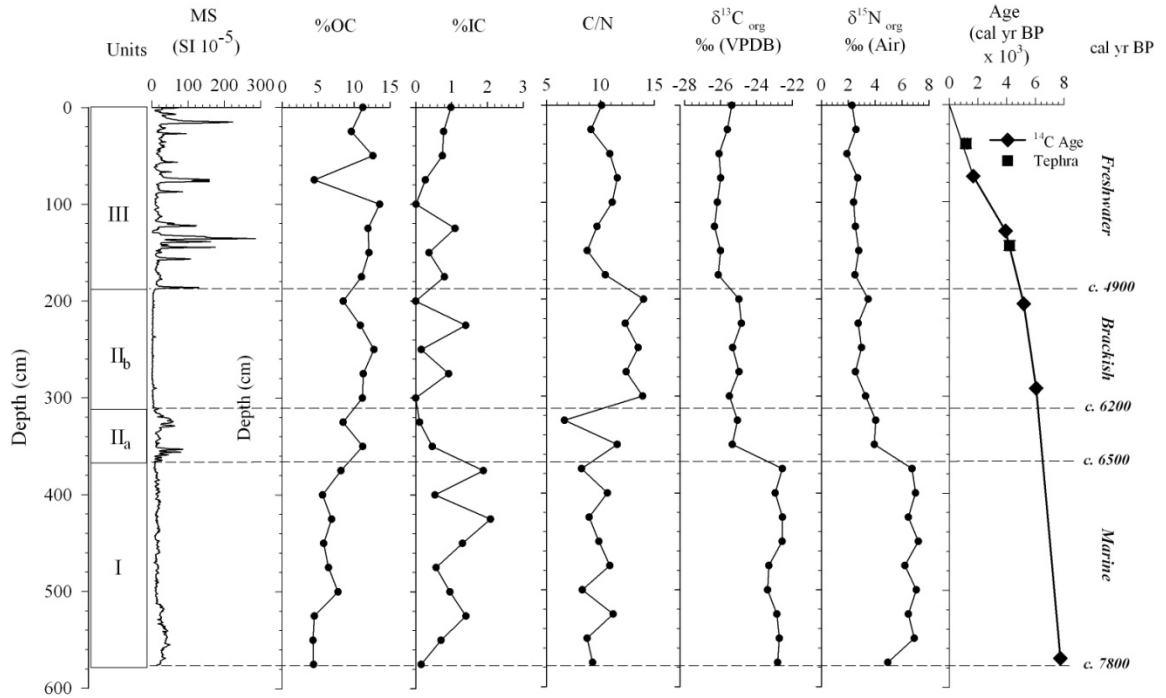


**Figure 4.2.** (Top) Water column profiles from Heimerdalsvatnet taken in August 2007. (Bottom) Monthly average lake water temperature contours from Heimerdalsvatnet recorded from September 2007 through August 2008. Dashed lines show thermistor depths.

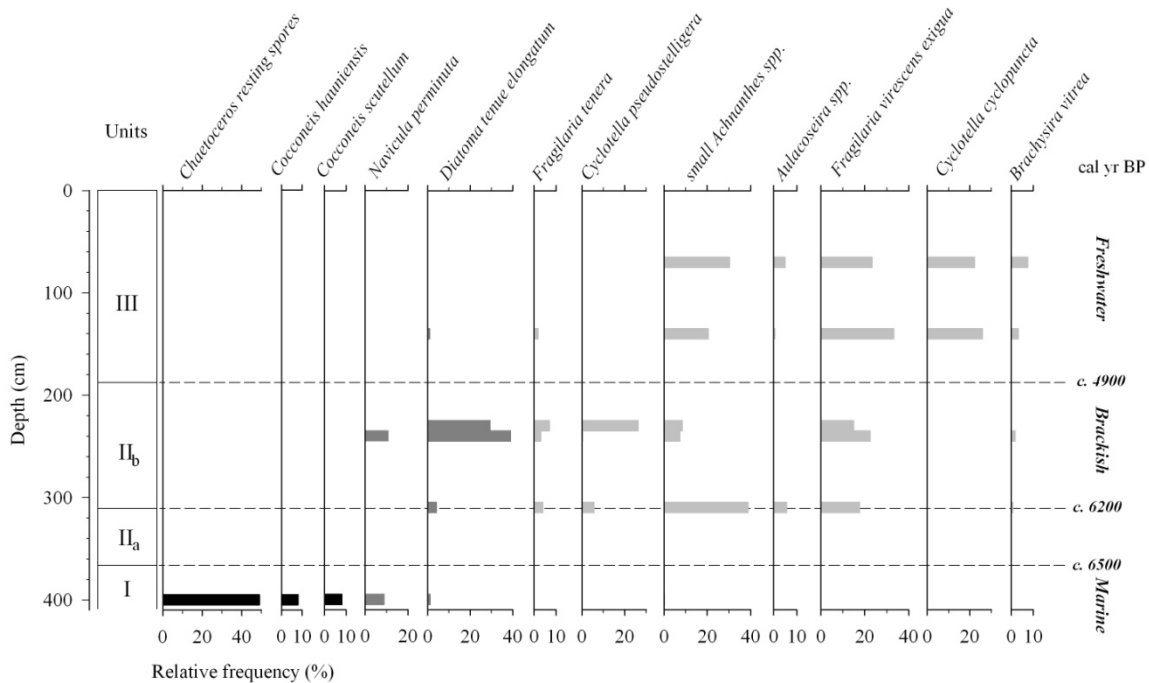




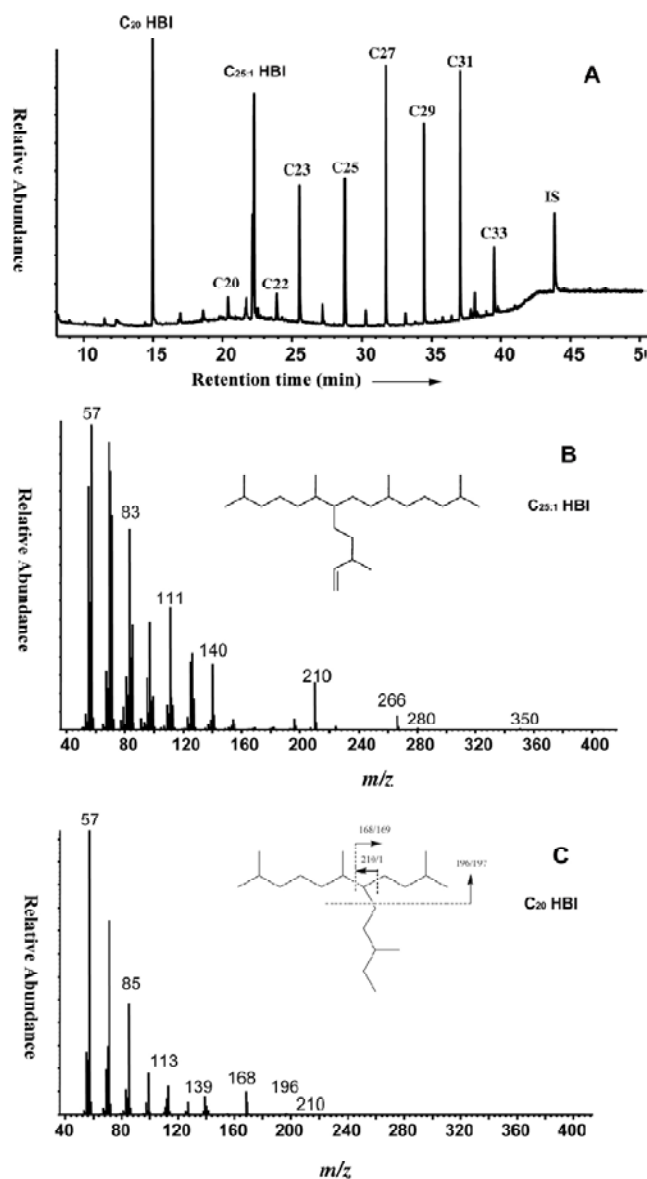
**Figure 4.3.** (Left) Bathymetric map of Heimerdalsvatnet showing the location of sediment core NHP-207 and a sub-bottom profile (A to A'). (Right) Sub-bottom profile near the coring location and our interpretation of three stratigraphic units, I-III.



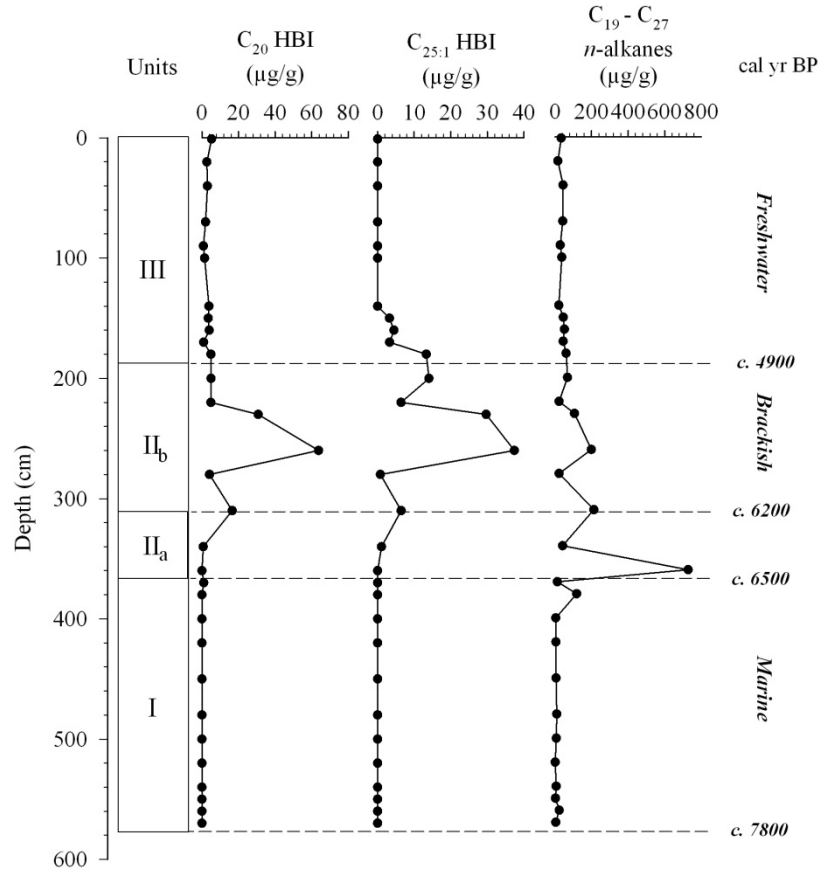
**Figure 4.4.** Magnetic susceptibility, bulk organic geochemical results, and age-depth model plotted with the defined stratigraphic units I-III. The age-depth relationship is based on linear interpolation between radiocarbon dates from core NHP-207. Error bars show 1 $\sigma$  age range. Two tephra horizons identified in core NHP-207 are displayed to support the chronology.



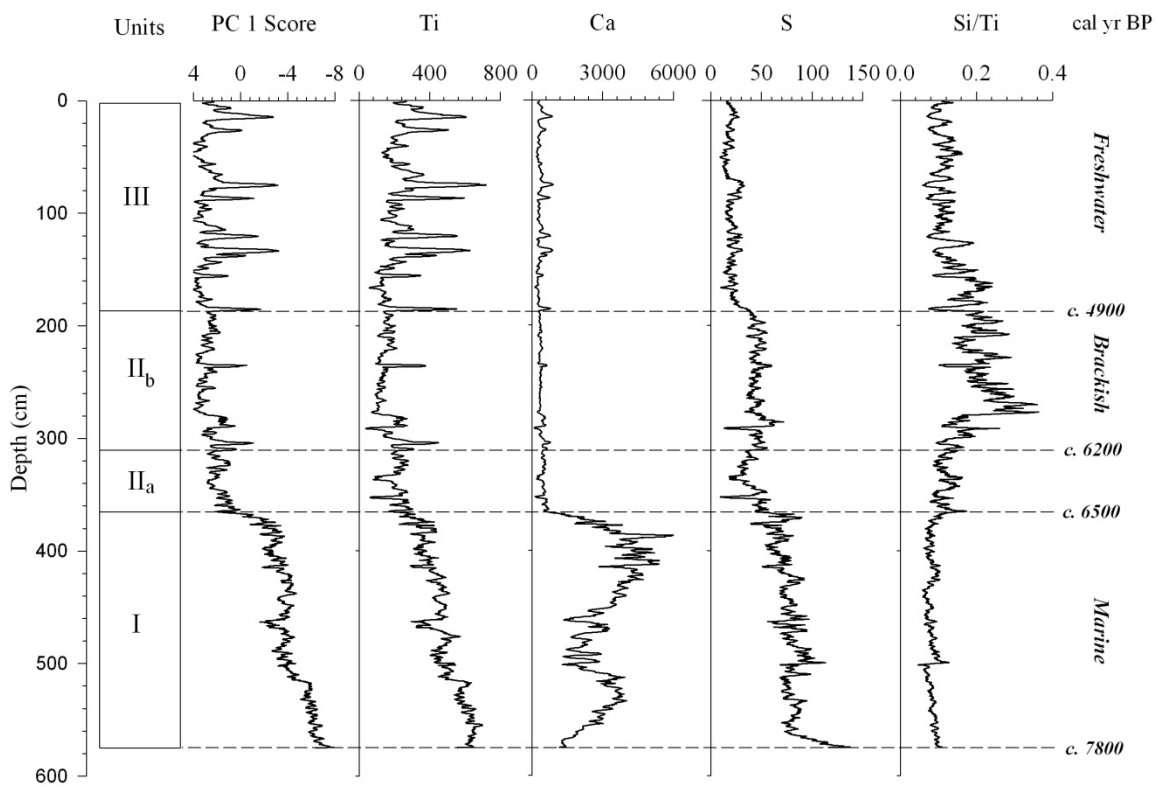
**Figure 4.5.** Percent abundance of diatom taxa that indicate different salinity conditions: marine (black), brackish (dark grey), and freshwater (light grey). Note the different percent abundance scales for each taxa.



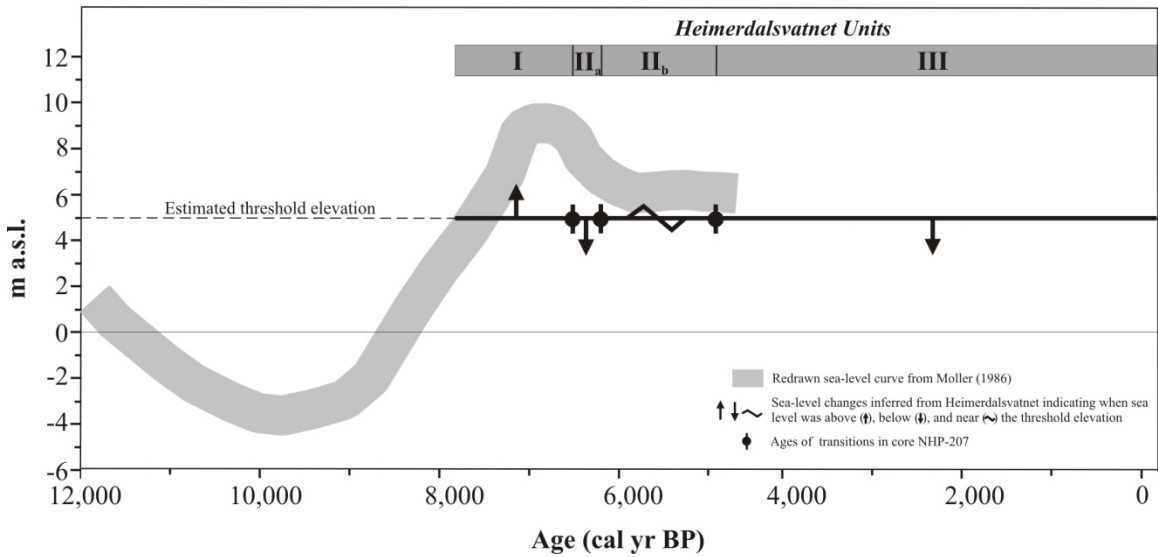
**Figure 4.6.** Total ion chromatogram and mass spectra of hydrocarbons in core NHP-207 sediment. (A) Total ion chromatogram showing the presence of *n*-alkanes and highly branched isoprenoids (HBI). (B) Mass spectra show that C<sub>25</sub> HBIs have a molecular weight 350 (C<sub>25</sub>H<sub>50</sub>) indicating one unsaturation. A comparison of its mass spectrum with published data (Robson and Rowland, 1986; Xu et al., 2006) suggests that this HBI has a skeleton of 2,6,10,14-tetramethyl-7-(3-methylpentyl) pentadecane and the double bond is most likely located in □23-24. (C) The C<sub>20</sub> HBIs have a unique electron impact spectrum that is characterized by the presence of pairs of ions at *m/z* 168/169, *m/z* 196/197 and *m/z* 210/211. While the molecular ion is undetectable at regular 70eV ionization, electron ionization at 20eV and CH<sub>4</sub> chemical ionization revealed a molecular ion of 282, suggesting it is a C<sub>20:0</sub> alkane and its structure is 2,6,10-trimethyl-7-(3-methylbutyl)-dodecane (Barrick et al., 1980; Yon et al., 1982; Rowland et al., 1985; Rowland and Robson, 1990; Wang and Williams, 2001).



**Figure 4.7.** Molecular biomarker concentrations in core NHP-207, including: C<sub>20</sub> highly branched isoprenoids (HBI), C<sub>25:1</sub> HBIs, and short and medium-chain *n*-alkanes (C<sub>19</sub>-C<sub>27</sub>). C<sub>20</sub> and C<sub>25:1</sub> HBIs are typically from marine diatoms and C<sub>19</sub>-C<sub>27</sub> *n*-alkanes and from freshwater algae.



**Figure 4.8.** Scanning XRF data from core NHP-207. Scans were conducted at 0.5 mm intervals, but element peak areas are displayed with a 40-sample running average.



**Figure 4.9.** Generalized shoreline displacement curves. The light grey curve is redrawn from Møller (1986) and converted to calendar years. The dark grey curve is based on our results from Heimerdalsvatnet. The hatched upper limit within Unit I shows that we cannot constrain the transgression maximum based on our data, but do know that it was above the threshold of Heimerdalsvatnet. Circles represent the age of the transitions between units at the estimated threshold elevation ( $5 \pm 1$  m a.s.l.).

## CHAPTER 5

# DISTAL TEPHRA FOUND IN A VIKING BOATHOUSE: THE POTENTIAL FOR TEPHROCHRONOLOGY IN RECONSTRUCTING THE IRON AGE IN NORWAY

### Abstract

Distal tephra deposits from Icelandic volcanic eruptions have been found in Norway and can be used to precisely date a variety of sedimentary environments. Tephrochronology has not yet been applied to archaeological investigations in Norway because tephra are generally not found as visible layers, but are present in very low concentrations as cryptotephra. In this study, results are presented from the analysis of tephra found in an Iron Age boathouse in northern Norway. The boathouse was associated with the chieftain center at Borg on Vestvågøy in the Lofoten Islands. In 2003, a trench was excavated and the stratigraphy of the boathouse was described. Radiocarbon ages from cultural deposits show that it was constructed in the Early Iron Age c. AD 540-660 and the main period of use was at the end of the Iron Age between c. AD 1030 and AD 1270. Tephra were isolated from sediment samples collected above and below this unit. Electron microprobe analysis of the tephra shows that the lower sample resembles the AD 860 Layer B tephra and tephra from the upper sample resembles tephra erupted from the Hekla volcanic system between AD 1104 and AD 1300. Tephra dates agree with radiocarbon ages and possibly further constrain the



boathouse's main period of use to c. AD 1030-1104. These results demonstrate the value of using tephrochronology for archaeological studies in Norway and the potential for finding tephra from other large explosive volcanic eruptions during the Iron Age.

## **Introduction**

Tephrochronology is a dating technique based on the identification of pyroclastic deposits, typically *ash* (<2 mm in diameter), in sedimentary environments (Alloway et al., 2006). Tephra form time synchronous horizons that can be geochemically matched to known volcanic eruptions or used as marker horizons to correlate between deposits. Tephra can provide age control in sediments void of material suitable for other dating techniques or can supplement existing chronologies. In particular, it can improve radiocarbon chronologies where reworking is suspected or where plateaus exist in the calibration curve. Tephrochronology is limited to the area covered by identifiable fallout and is typically applied near large volcanic centers where visible tephra layers are found. However, in some cases it may be possible to isolate and identify finely dispersed tephra grains (cryptotephra) which are not visible as tephra layers.

In the North Atlantic region, the volcanic systems of Iceland have been the most significant producers of tephra. The volcanic history has been well studied and there are a number of historic and prehistoric explosive eruptions that have produced tephra which form discrete layers useful for paleoenvironmental reconstructions (Haflidason et al., 2000; Larsen and Eiríksson, 2008; Larsen et al., 1999; Thordarsen and Höskuldsson, 2008; Thordarsen and Larsen, 2007). Archaeological investigations in Iceland take advantage of the robust tephra stratigraphy and have used tephrochronology to date

settlement periods, landscape change, and soil erosion (e.g. Dugmore et al., 2000, 2005, 2009; Thorarinsson 1981). The initial settlement of Iceland has even been constrained using tephrochronology. The timing of this event coincides with deposition of the precisely dated Landnám Tephra ( $871 \pm 2$  AD; Grönvold et al., 1995) that is spread across most of Iceland marking the beginning of human occupation (Dugmore et al., 2005).

Tephra fallout from Icelandic volcanic eruptions is not limited to local sites. The largest Icelandic eruptions have deposited tephra around the North Atlantic region. Tephra have been found as visible horizons in northern Europe (Birks et al., 1996; Davies et al., 2001; Mangerud et al., 1984), but are more often found in low abundances and as extremely fine-grained particles that are invisible to the naked eye. These are referred to as cryptotephra, a term derived from the Greek *kryptein*, which means to hide (Alloway et al., 2006; Lowe and Hunt, 2001). The first cryptic Icelandic tephra was found in Scotland (Dugmore, 1989) and the more recent development of density separation techniques (Turney, 1998) has led to the identification of tephra from specific eruptions across a wider geographic area and has expanded the use of tephrochronology to more distal regions.

In Norway, a few Icelandic tephra have been found as visible layers (Birks et al., 1996; Mangerud et al., 1984), but more commonly they occur as cryptotephra. An investigation of the Holocene cryptotephra stratigraphy in northern Norway identified twenty-three tephra (Pilcher et al., 2005). These results demonstrate the potential for expanding the use of tephrochronology in Norway. The use of crypto-tephrochronology has been applied to a few paleoenvironmental studies (Balascio et al., *accepted*; Mills et

al., 2009; Vorren et al., 2007), but I wanted to test its application to constrain the age of cultural horizons in Norway. In this study I examined tephra in sediment samples collected during the excavation of a Viking boathouse in northern Norway on the island of Vestvågøy in the Lofoten Islands (Figure 5.1) (Wickler and Nilsen, 2005). Tephra were isolated from two stratigraphic units, geochemically matched their composition to known eruptions, and compared to radiocarbon ages from the boathouse and similar contexts in the area.

### **Site Description**

The boathouse, Naust 48, is located on the western shore of Inner Borgpollen (68°14.94'N; 13°46.69'E) at the settlement of Borg on the island of Vestvågøy in the Lofoten Islands (Figure 5.1). Borg was the location of an Iron Age chieftain center and Borgpollen provided a protected natural harbor around which the remains of 20 Iron Age boathouses have been recorded (Munch et al., 2003; Nilsen, 1998). Previous investigations have examined the local distribution of boathouses in the context of the maritime history of the islands (Nilsen, 1998; Wickler, 2004; Wickler and Nilsen, 2005). The structures around Borgpollen are currently c. 1-3 meters above sea level as a result of continued glacial-isostatic rebound (Mills et al., 2009; Møller, 1986). Based on estimates of former shorelines and radiocarbon ages from excavations, these boathouses span most of the Iron Age and extend into the Medieval Period, c. AD 1-1300 (Nilsen, 1998; Wickler, 2004). A majority of the structures are large and five are over 15 meters in

length, although four of the structures would have housed boats less than six meters in length.

The remains of the boathouse are visible on the surface as linear mounds marking the collapsed walls of a rectangular structure constructed of stone, peat, and soil with an opening facing the water (Wickler and Nilsen, 2005). The Naust 48 boathouse is situated 8 m from the water at an elevation of 1.3 m and has interior dimensions of ~ 21 x 3.2 m. In 2003, a 3 x 0.5 m trench was excavated perpendicular to the long axis of the structure between the walls near the entrance. The trench profile revealed a stratigraphic sequence with a cultural deposit up to 15 cm in thickness (Figure 5.2). There appeared to be two distinct phases of use separated by an extensive zone of dense charcoal with fire-cracked rock interpreted as the remains of multiple hearths. Radiocarbon samples from this zone and slightly above gave dates of  $902 \pm 40$   $^{14}\text{C}$  years BP and  $860 \pm 75$   $^{14}\text{C}$  years BP, respectively. A second concentration of charcoal and fire-cracked rock from a hearth at the base of the cultural deposit produced a date of  $1450 \pm 45$   $^{14}\text{C}$  years BP. The dates correspond with 2-sigma calibrated ages of AD 538-662 for initial construction and AD 1030-1271 for the main period of use (Table 5.1; Wickler and Nilsen, 2005). Two sediment samples were collected for tephra analysis. One was taken from the middle of the Layer Ib cultural deposit (CAT-6) and the other from the stratigraphic unit Layer Ia above the cultural deposit (CAT-5).

### **Tephra Analysis**

Sample Naust 48 CAT-5 and CAT-6 were treated with nitric acid (HNO<sub>3</sub>) and then placed in an 80°C water bath for 3 hours to remove the organic components of the sediment. The remaining material was washed in deionized water over two stacked sieves with mesh sizes of 63 µm and 20 µm to isolate grain sizes typical of distal tephra particles. Heavy liquid density separations were then performed using sodium polytungstate (Na<sub>6</sub>(H<sub>2</sub>W<sub>12</sub>O<sub>40</sub>)H<sub>2</sub>O) between 2.3-2.5 g cm<sup>-3</sup> to concentrate tephra from the remaining mineral grains (Turney, 1998). Samples were mounted in epoxy resin and tephra particles were identified using a polarizing light microscope. Slides were then polished to expose the grains and then analyzed with a Cameca SX50 electron microprobe at the University of Massachusetts Amherst using wavelength dispersal spectrometry with an accelerating voltage of 15 keV, a beam current of 10 nA, and beam size of 5-10 µm. Results are reported as non-normalized major oxide concentrations. Geochemical results were then compared to samples of known age found in other locations around the North Atlantic region and using the *Tephra* database (Newton et al., 2007; <http://www.tephrabase.org>).

## **Results**

Both CAT-5 and CAT-6 contained colorless vesicular tephra grains that were 40-60 µm in diameter (Figure 5.3). Tephra grains in CAT-6 were generally smaller and had much thinner walls than those found in CAT-5, which made microprobe analysis difficult and resulted in low analytical totals for some grains. However within each sample, the major oxide concentrations grouped into distinct geochemical populations.

In CAT-5, nine tephra grains were analyzed (Table 5.2). Results for each grain are the average of between 4 and 7 separate analyses. The number of analyses per grain depended on the size of the exposed surface area of each grain. Totals less than 96% were not included in the average. The data fall within three geochemical populations, which are distinguished mainly by their SiO<sub>2</sub>, FeO, and MgO content, with the largest group showing the highest precision (Figure 5.4).

In CAT-6, seven tephra grains were analyzed (Table 5.2). Additional tephra shards were identified with the microprobe, but because of thin grain walls and the vesicular nature of the shards their analytical totals were too low to report (<90%). All of the results generally fall within one geochemical population with the exception of one grain that has a lower SiO<sub>2</sub> and higher FeO and Al<sub>2</sub>O<sub>3</sub> composition (Figure 5.4). There is some scatter in the data that can probably be attributed to the low analytical totals.

## **Discussion**

Geochemical results from CAT-5 and CAT-6 resemble the composition of tephra from known volcanic eruptions that occurred around the time the boathouse, Naust 48, was in use (c. AD 540-1270; Wickler and Nilsen, 2005) (Table 5.3; Figure 5.4).

### **CAT-5**

The major oxide concentrations of tephra in CAT-5 resemble tephra from the historic eruptions of the Icelandic Hekla volcanic system in AD 1104, AD 1158, and AD 1300 (Table 5.2). Figure 5.4 compares results from CAT-5 to tephra identified from

these eruptions found in Iceland, Ireland, and the UK (Boygles, 1994; Hall and Pilcher, 2002; Larsen et al., 1999; Pilcher et al., 1995, 1996). The geochemistry of tephra from these eruptions can be distinguished by differences in SiO<sub>2</sub>, FeO, MgO, CaO, and TiO (Figure 5.4). The largest geochemical population clusters tightly near the compositional range of the Hekla AD 1158 tephra and supports the interpretation of the presence of this tephra in CAT-5. I speculate that two of the other grains are from the Hekla AD 1104 tephra. This tephra is distinguished from the Hekla 1158 tephra by having a higher SiO<sub>2</sub> and lower FeO content. There is also a single grain attributed to the Hekla AD 1300 eruption. This interpretation is based primarily on comparison of the distinctively high FeO content of tephra from this eruption, which is not found in any of the other tephra from this period (Table 5.3). However, a much larger sample is required to make a more definite statement about the presence of tephra from this event.

The Hekla volcanic system is located in the East Volcanic Zone of Iceland and is one of the country's most historically active volcanoes (Thordarson and Larsen, 2007). The AD 1104 eruption was the first historic eruption of Hekla (Thorarinsson, 1967). The eruption was purely explosive and produced an estimated 2 km<sup>3</sup> of tephra (Thordarson and Larsen, 2007) The AD 1158, and 1300 eruptions also produced significant volumes of tephra, estimated to be 0.33 km<sup>3</sup> and 0.5 km<sup>3</sup>, respectively. Isopach maps created from the fallout on land from these eruptions indicate the main direction of the tephra plumes were generally to the north and northeast, ideal for transport to northern Norway (as reviewed by Haflidasen et al., 2000).

There is strong evidence for the presence of the Hekla AD 1158 tephra based on the number of grains and the precision of the geochemical data within this group. There

is less certainty in the attributions of the other grains to the AD 1104 and AD 1300 eruptions. However, because of the close timing of the AD 1104 and 1158 eruptions, it is not surprising that they would both be present. Pilcher et al. (2005) also found both tephra mixed within multiple horizons and they also found the AD 1158 tephra was in greater abundance than the AD 1104 tephra.

### **CAT-6**

The major oxide concentrations of tephra in CAT-6 resemble the AD 860 tephra Layer B. Figure 5.4 compares results from CAT-6 to tephra identified from this eruption found in northern Ireland (Hall and Pilcher, 2002; Pilcher et al., 1995; Swindles, 2006). This tephra is distinguished from others in this time period by its relatively high SiO<sub>2</sub> and low FeO and MgO composition (Table 5.2 and 5.3).

The AD 860 tephra was originally identified as a distal deposit in northern Ireland and was not attributed to a specific Icelandic eruption (Pilcher et al., 1995). It was found with two distinct populations, Layer A and B, and the age (AD 860 ± 20) was derived from radiocarbon wiggle matching techniques (Pilcher et al., 1995), although it was later correlated to deposits found in Iceland (Wastegård et al., 2003). The AD 860 Layer A has only been found in northern Ireland, but Layer B is more widespread and in addition to Ireland (Hall and Pilcher, 2002) it has been found in northern Germany (van den Bogaard and Schmincke, 2002) and in the Lofoten Islands, within a sediment core from Inner Borgpollen (Pilcher et al., 2005).



## **The Timing of Boathouse Use at Inner Borgpollen**

Samples for tephra analysis were taken from the middle of the cultural deposit (CAT-6) and from above the cultural deposit (CAT-5) in Naust 48. Ages interpreted from these samples indicate that the initial construction of the boathouse took place before AD 860 and that the main period of use was between AD 860 and AD 1104. Radiocarbon ages establish the timing of the initial construction of Naust 48 at c. AD 538-662 and the main period of use was from c. AD 1030-1271 (Wickler and Nilsen, 2005).

Tephra results from CAT-6 support the radiocarbon age range for the construction of the boathouse and suggest that the main period of use may be as early as AD 860. Tephra found in CAT-5 provide a more precise upper limiting age and suggest a shorter period of use that ended before at least AD 1158 and probably before AD 1104. This new age range for the main period of use at Naust 48 also fits well with radiocarbon ages from a second Iron Age boathouse a short distance to the north along the western shore of Inner Borgpollen. This boathouse, Naust 61, has five radiocarbon dates establishing a main period of use during the Viking Age between AD 770 and AD 1050. This structure also had an earlier use phase during the Early Iron Age with a hearth dated to  $1850 \pm 74$   $^{14}\text{C}$  years BP (2-sigma calibrated age of AD 2-350) (S. Wickler, *unpublished data*). Both boathouses are characterized by long-term use with two temporally distinct periods represented.

Overall, these results demonstrate the potential for using tephrochronology in this environment. The processing of larger sediment samples from these horizons and the analysis of more tephra grains would help verify the presence and relative abundances of

these tephra. The analysis of additional sediment samples from Naust 48 and Naust 61 can also be expected to produce new tephra evidence.

### **Tephrochronology during the Iron Age**

Radiocarbon dating is one of the most widely used absolute dating techniques for determining the age of cultural horizons in archaeological investigations. However, to determine ages on an absolute timescale, measured radiocarbon dates must be calibrated due to variations in the atmospheric radiocarbon content (Stuiver and Suess, 1966). During the Holocene, where tree rings are used for the calibration, the errors are usually small. However during certain intervals, “plateaus” in the calibration curve can produce a large range of statistically possible calendar ages for a given radiocarbon age and provide a temporal resolution that is insufficient for some applications (Guilderson et al., 2005).

During the Iron Age and up to the early Medieval Period in Norway (c. AD 300-1200) there are two main intervals where plateaus occur in the radiocarbon calibration curve, c. AD ~700-900 and c. AD 1050-1200 (Reimer et al., 2009) (Figure 5.5).

Radiocarbon ages that fall within these plateaus produce calibrated calendar ages with overlapping uncertainties and hamper detailed interpretations of archaeological findings. Tephrochronology can supplement radiocarbon chronologies to improve temporal resolution.

There are a number of explosive, tephra-producing volcanic eruptions that occurred during the Iron Age (Table 5.3; Figure 5.5) (Haflidason et al., 2000; Larsen et

al., 1999). Tephra from these events have distinct geochemical compositions and many of have been found in Norway (Balascio et al., *accepted*; Pilcher et al., 2005). This demonstrates the potential for tephra as marker horizons or for absolute age control, although, the uncertainty in the ages of each tephra must be considered. The historic eruptions have been dated using written accounts, which can pinpoint the day or month of an eruption (e.g. Thorarinsson, 1967). Some prehistoric tephras have been found in Greenland ice cores and can be precisely dated using layer counting (Grönvold et al., 1995; Zielinski et al., 1995), while the ages of other prehistoric tephra are known from compilations of radiocarbon dates from multiple sites.

## **Conclusion**

I was able to isolate tephra from sediments in a Viking boathouse and match them to known Icelandic volcanic eruptions. I identified the AD 860 Layer B tephra and tephra from historic eruptions of the Hekla volcanic system in 1104, AD 1158, and AD 1300. These results help constrain the timing of the boathouse's use and demonstrate the potential for tephrochronology as a geochronologic tool for archaeologists in Norway.

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**Table 5.1.** Radiocarbon dates from boathouse Naust 48.

<b>Context</b>	<b>Lab. Ref.</b>	<b>Charcoal Taxa</b>	<b>Sample Size (g)</b>	<b>Conventional Age (<sup>14</sup>C years BP)</b>	<b>δ<sup>13</sup>C (‰)</b>	<b>Calibrated Age (1 σ / 2 σ)*</b>
Layer Ib (main cultural deposit)	T-16931	birch, willow, aspen	3.7	860 ± 75	-27.8	AD 1151-1256 / 1030-1271
Layer Ib (main cultural deposit)	Wk-16039	birch	4	902 ± 40	-27.4	AD 1044-1098 / 1034-1213
Layer Ib (base of cultural deposit)	T-16932	birch	4.5	1450 ± 45	-27.3	AD 579-645 / 538-662

\*Reimer et al., 2009



**Table 5.2.** Major oxide concentrations of tephra shards from boathouse Naust 48 samples CAT-5 and CAT-6. Results are only reported for analyses with totals greater than 90%. Totals less than 95% are in italics.

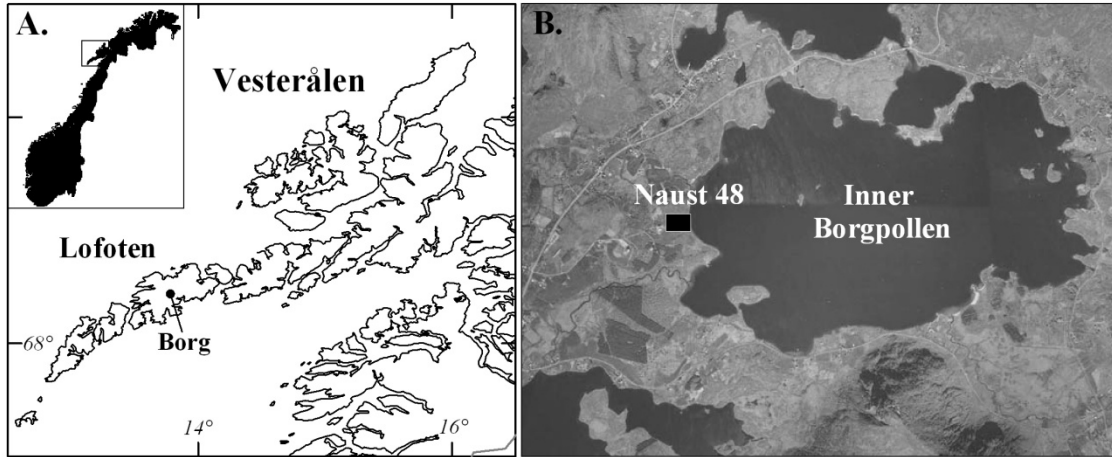
No.	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	FeO	MnO	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	Total
<b>CAT-5</b>										
<b>Hekla AD 1300</b>										
1	61.33	0.89	15.67	8.80	0.23	1.35	4.97	2.79	1.66	98.09
<b>Hekla AD 1158</b>										
1	68.56	0.44	14.43	6.09	0.17	0.49	2.91	2.95	2.28	98.52
2	67.07	0.42	15.31	5.72	0.19	0.41	3.16	2.50	2.18	97.17
3	68.04	0.41	15.09	5.74	0.22	0.44	3.21	2.62	2.14	98.05
4	67.83	0.43	14.99	5.71	0.18	0.44	3.23	2.47	2.18	97.62
5	67.74	0.42	15.72	5.42	0.17	0.42	3.47	3.30	2.05	98.82
6	68.60	0.41	15.48	5.34	0.17	0.43	3.23	2.81	2.16	98.74
<i>Mean</i>	<i>67.97</i>	<i>0.42</i>	<i>15.17</i>	<i>5.67</i>	<i>0.18</i>	<i>0.44</i>	<i>3.20</i>	<i>2.78</i>	<i>2.16</i>	<i>98.15</i>
<i>1-σ</i>	<i>0.57</i>	<i>0.01</i>	<i>0.45</i>	<i>0.27</i>	<i>0.02</i>	<i>0.03</i>	<i>0.18</i>	<i>0.32</i>	<i>0.08</i>	<i>0.66</i>
<b>Hekla AD 1104</b>										
1	72.29	0.20	14.52	3.19	0.11	0.11	2.07	2.80	2.55	97.91
2	70.96	0.34	14.04	4.51	0.14	0.18	1.55	2.93	3.32	98.13
<i>Mean</i>	<i>71.62</i>	<i>0.27</i>	<i>14.28</i>	<i>3.85</i>	<i>0.13</i>	<i>0.14</i>	<i>1.81</i>	<i>2.87</i>	<i>2.94</i>	<i>98.02</i>
<i>1-σ</i>	<i>0.94</i>	<i>0.10</i>	<i>0.34</i>	<i>0.93</i>	<i>0.02</i>	<i>0.05</i>	<i>0.37</i>	<i>0.10</i>	<i>0.54</i>	<i>0.16</i>
<b>CAT-6</b>										
<b>AD 860 Layer B</b>										
<i>1</i>	<i>68.90</i>	<i>0.23</i>	<i>13.72</i>	<i>1.59</i>	<i>0.04</i>	<i>0.34</i>	<i>2.00</i>	<i>2.48</i>	<i>3.02</i>	<i>92.68</i>
<i>2</i>	<i>72.00</i>	<i>0.29</i>	<i>13.02</i>	<i>2.07</i>	<i>0.04</i>	<i>0.11</i>	<i>1.21</i>	<i>1.45</i>	<i>3.31</i>	<i>93.65</i>
<i>3</i>	<i>71.00</i>	<i>0.22</i>	<i>13.80</i>	<i>3.30</i>	<i>0.13</i>	<i>0.11</i>	<i>1.98</i>	<i>2.99</i>	<i>2.62</i>	<i>96.23</i>
<i>4</i>	<i>72.83</i>	<i>0.11</i>	<i>12.88</i>	<i>2.01</i>	<i>0.08</i>	<i>0.04</i>	<i>1.37</i>	<i>2.43</i>	<i>2.69</i>	<i>94.52</i>
<i>5</i>	<i>71.53</i>	<i>0.24</i>	<i>13.96</i>	<i>1.64</i>	<i>0.02</i>	<i>0.41</i>	<i>2.01</i>	<i>2.38</i>	<i>3.03</i>	<i>95.66</i>
<i>6</i>	<i>72.50</i>	<i>0.26</i>	<i>14.50</i>	<i>1.46</i>	<i>0.02</i>	<i>0.44</i>	<i>1.98</i>	<i>2.51</i>	<i>2.87</i>	<i>96.91</i>
<i>Mean</i>	<i>71.46</i>	<i>0.22</i>	<i>13.65</i>	<i>2.01</i>	<i>0.05</i>	<i>0.24</i>	<i>1.76</i>	<i>2.37</i>	<i>2.92</i>	<i>94.94</i>
<i>1-σ</i>	<i>1.42</i>	<i>0.06</i>	<i>0.61</i>	<i>0.68</i>	<i>0.04</i>	<i>0.18</i>	<i>0.36</i>	<i>0.50</i>	<i>0.25</i>	<i>1.61</i>
<b>Unknown</b>										
1	65.23	0.44	16.31	4.29	0.12	0.32	2.07	3.72	3.84	96.64

**Table 5.3.** Geochemical compositions of tephra from explosive volcanic eruptions found around the North Atlantic that occurred during the Iron Age compiled from Tephabase (Newton et al., 2007; <http://www.tephrabase.org>).

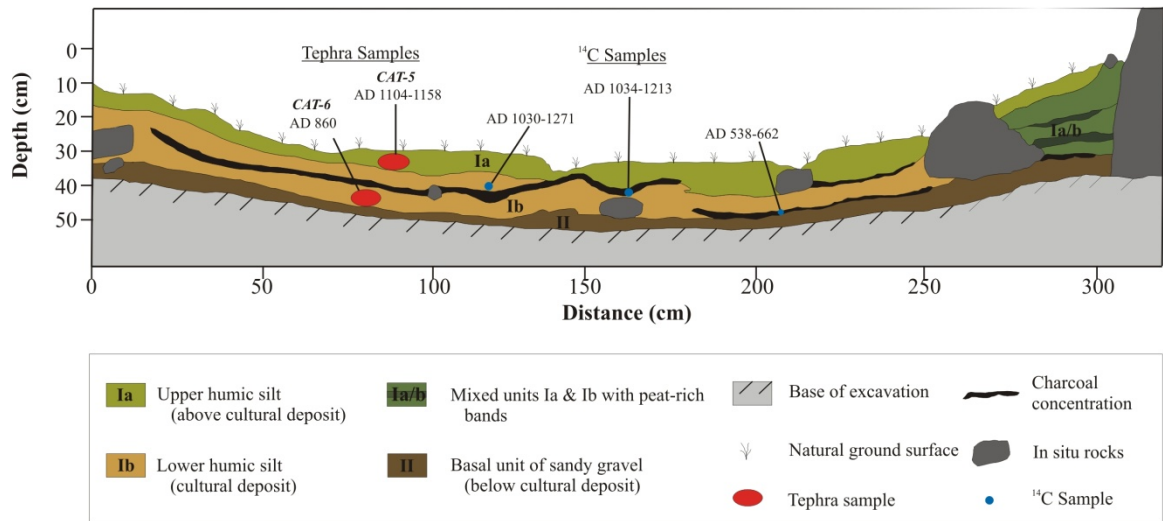
Year (AD)	Tephra		SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	FeO	MnO**	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	Total	n	Source
1362	Öraefajökull	<i>mean</i>	71.66	0.26	13.42	3.18	0.10	0.04	1.03	5.15	3.40	98.16	76	Hall and Pilcher, 2002; Larsen et al., 1999; Pilcher et al., 1995
		<i>1 σ</i>	1.57	0.05	0.44	0.39	0.03	0.07	0.27	0.41	0.24	1.71		
1300	Hekla	<i>mean</i>	58.71	1.31	15.15	9.25	0.24	1.78	5.17	4.24	1.54	97.48	40	Boygles, 1994
		<i>1 σ</i>	1.14	0.16	0.54	0.59	0.03	0.26	0.78	0.25	0.15	1.09		
1158	Hekla	<i>mean</i>	67.36	0.49	14.62	5.70	0.20	0.45	3.10	4.48	2.29	98.64	16	Hall and Pilcher, 2002; Larsen et al., 1999
		<i>1 σ</i>	0.78	0.05	0.47	0.16	0.04	0.04	0.10	0.30	0.12	1.03		
1104	Hekla	<i>mean</i>	71.57	0.25	14.25	2.99	0.12	0.17	1.96	4.63	2.65	98.49	114	Hall and Pilcher, 2002; Larsen et al., 1999; Pilcher et al., 1995, 1996
		<i>1 σ</i>	1.38	0.09	0.49	0.42	0.02	0.14	0.27	0.30	0.24	1.57		
c. 900	BIP-24a	<i>mean</i>	65.93	0.44	15.53	4.22	-	0.34	1.84	5.41	3.78	97.50	9	Pilcher et al., 2005
		<i>1 σ</i>	1.24	0.04	0.30	0.20	-	0.05	0.14	0.45	0.17	1.78		
875	Landnam*	<i>mean</i>	70.97	0.25	14.46	2.32	0.09	0.24	0.89	4.78	4.64	98.63	23	Larsen et al., 1999
		<i>1 σ</i>	0.75	0.04	0.30	0.10	0.04	0.04	0.06	0.24	0.13	0.97		
c. 860	860 Layer B	<i>mean</i>	71.94	0.26	14.46	1.61	0.09	0.09	1.85	4.03	3.13	97.70	76	Hall and Pilcher, 2002; Pilcher et al., 1995; Swindles, 2006
		<i>1 σ</i>	1.20	0.04	0.64	0.42	0.06	0.06	0.15	0.37	0.31	1.37		
c. 800	Tjørnuvík A	<i>mean</i>	69.80	0.27	13.64	3.93	0.14	0.26	2.32	4.01	2.41	96.77	39	Hannon et al., 1998; Wastegård, 2002; Wastegård et al., 2001
		<i>1 σ</i>	4.19	0.21	0.85	2.44	0.07	0.24	1.11	0.33	0.46	1.34		
c. 800	Tjørnuvík B	<i>mean</i>	63.41	1.46	13.80	6.16	0.21	1.49	3.49	4.20	2.59	96.82	3	Wastegård et al., 2001
		<i>1 σ</i>	0.29	0.05	0.13	0.19	0.02	0.04	0.07	0.37	0.06	0.62		
c. 700-800	GA4-85	<i>mean</i>	66.06	1.00	14.20	5.46	-	0.91	2.69	4.33	2.87	97.53	24	Hall and Pilcher, 2002
		<i>1 σ</i>	1.00	0.09	0.20	0.16	-	0.03	0.17	0.45	0.09	1.53		

\* Geochemical results are only from the rhyolitic component of the Landnam tephra

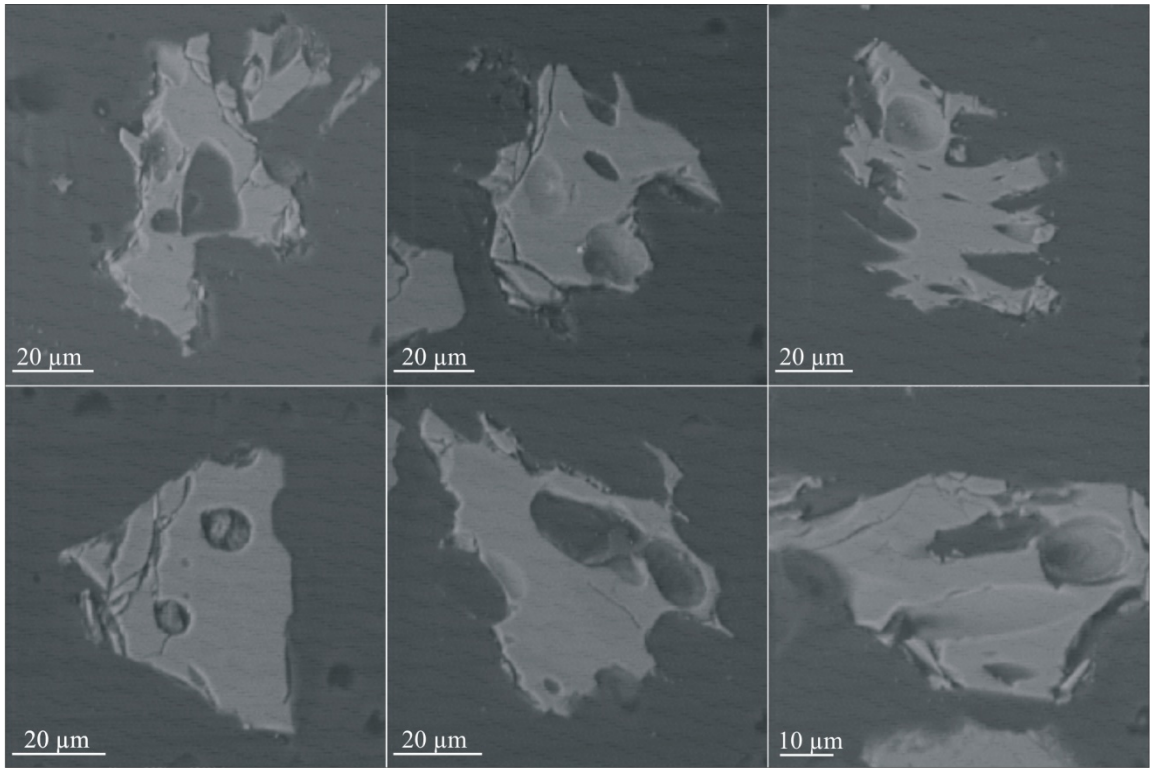
\*\* MnO values not reported for all analyses: Öraefajökull (n= 15), Hekla 1300 (n=40), Hekla 1158 (n=12), Hekla 1104 (n=14), Landnam (n=9), 860B (n=9), Tjørnuvik (n=42)



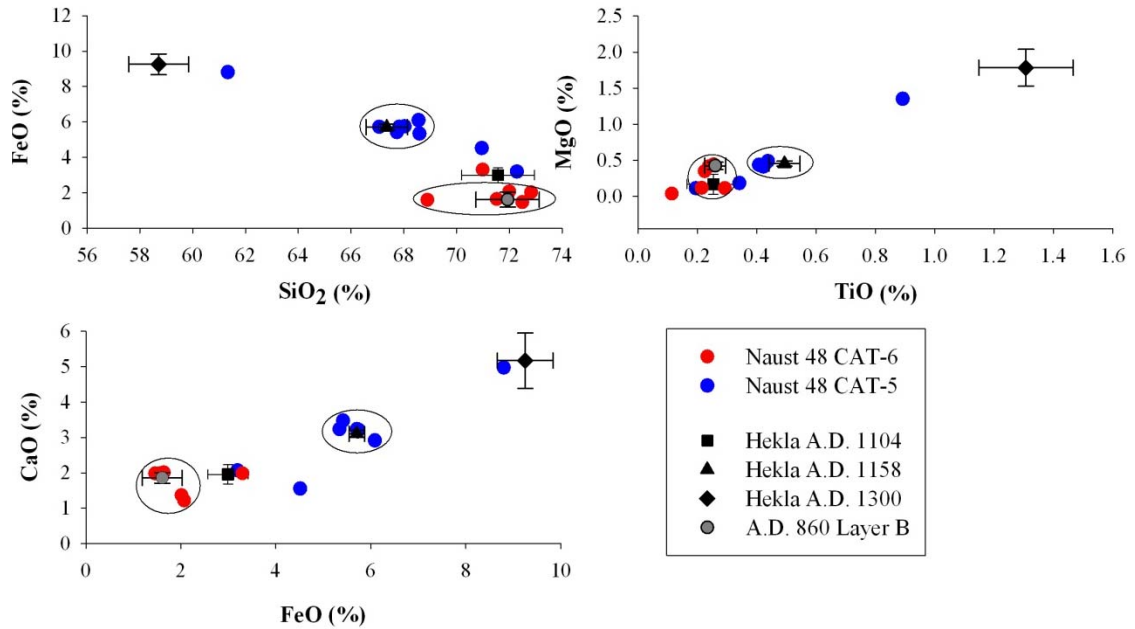
**Figure 5.1.** Location of Viking settlement at Borg on Vestvågøya in the Lofoten Islands, northern Norway (A). Location of the boathouse Naust 48 on the western shore of Inner Borgpollen (B).



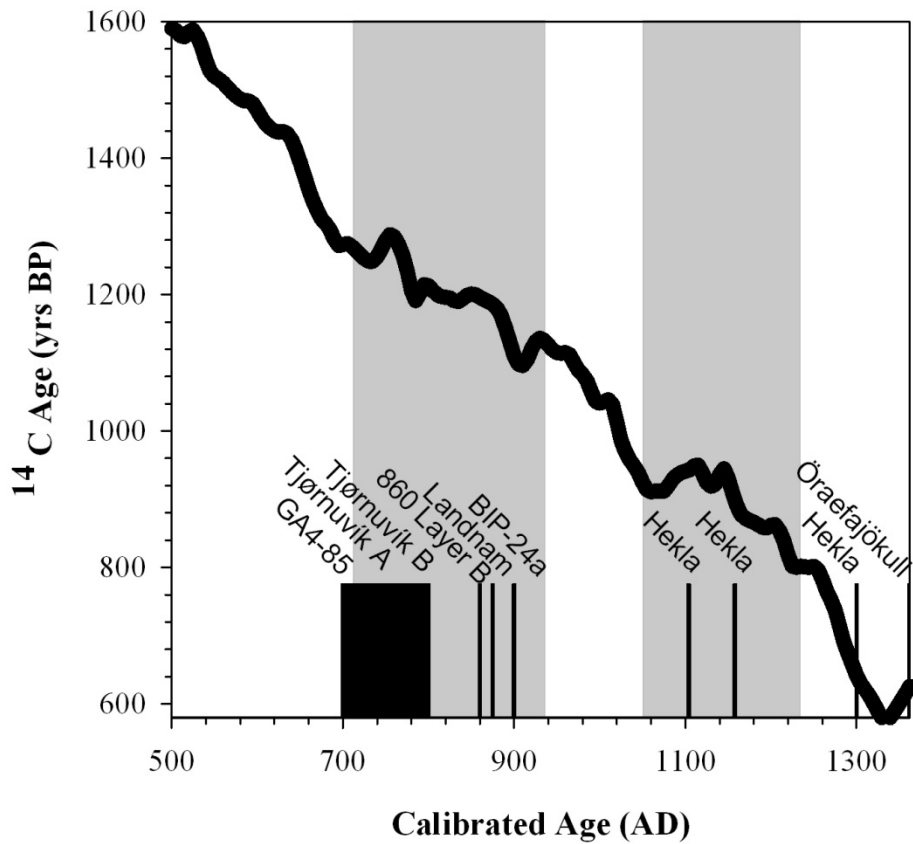
**Figure 5.2.** East face stratigraphic profile of the Naust 48 boathouse excavation trench (Illustration: S. Wickler). Radiocarbon ages from Wickler and Nilsen (2005) and results from tephra analysis.



**Figure 5.3.** Scanning electron microscope images of tephra isolated from Borg boathouse Naust 48 CAT-5.



**Figure 5.4.** Comparison of the geochemical compositions of tephra isolated from Borg boathouse Naust 48 samples CAT-5 and CAT-6 to tephra from Icelandic eruptions, including: Hekla AD 1104 (Hall and Pilcher, 2002; Larsen et al.1999; Pilcher et al., 1995, 1996), Hekla AD 1158 (Hall and Pilcher, 2002; Larsen et al., 1999), Hekla A.D. 1300 (Boygles, 1994), and AD 860 Layer B (Hall and Pilcher, 2002; Pilcher et al., 1995). The majority of tephra shards isolated from CAT-5 resemble tephra from the Hekla AD 1158 eruption and the majority of tephra shards isolated from CAT-6 resemble the AD 860 Layer B tephra (circled).



**Figure 5.5.** Radiocarbon calibration curve around the Iron Age (Reimer et al., 2009). Shaded age ranges (c. AD 700-900 & AD 1050-1200) mark plateaus in the calibration curve. Icelandic volcanic eruptions with potential for tephrochronologic studies in Norway are indicated by the vertical bars (see Table 5.3).

## CHAPTER 6

# INVESTIGATING THE USE OF SCANNING X-RAY FLUORESCENCE TO LOCATE CRYPTOTEPHRA IN MINEROGENIC LACUSTRINE SEDIMENT: EXPERIMENTAL RESULTS

### Introduction

Tephrochronology is a powerful geochronologic tool that can be used to correlate or determine precise ages of a variety of sedimentary archives, including: lake sediments, peat, soils, loess, marine sediments, and glacier ice. Tephra can provide age control in sediments void of material suitable for other dating techniques or can supplement existing chronologies. Tephrochronology has a broad range of applications in paleoenvironmental research (Turney and Lowe, 2001; Alloway et al., 2006). These encompass archaeology (e.g. Hall et al., 1994; Newnham et al., 1998; Dugmore et al., 2000; Lowe et al., 2000), human evolution (e.g. deMenocal and Brown, 1999; WoldeGabriel et al., 2005) the study of landscape change (e.g. Manville and Wilson, 2004; Dugmore et al., 2009), the impact of volcanic eruptions on climate (e.g. Zielinski, 2000), and the recurrence interval and hazard assessment of volcanic activity (e.g. Newnham et al., 1999; Palumbo, 1999; Shane and Hovard, 2002; Wulf et al., 2004; de Fontaine et al., 2007).



Recent advances have expanded the potential for using tephrochronology in environments far from volcanic source regions. These regions receive fallout from volcanic eruptions, but in very low concentrations so tephra layers are not visible to the naked eye in sedimentary profiles. These deposits are called *cryptotephra* layers, a term derived from the Greek *kryptein*, which means to hide (Lowe and Hunt, 2001; Alloway et al., 2006). Improved techniques for extracting and geochemically analyzing tephra have made possible the use of cryptotephra horizons in paleoenvironmental research.

Isolating cryptotephra from the background sediment requires detailed laboratory techniques (Dugmore et al., 1995; Hall and Pilcher, 2002; Turney, 1998; Blockley et al., 2005). Generally, samples undergo ashing or acid digestion to remove organic matter. For organic-rich sediments such as peat, these steps are often enough to concentrate tephra. In more minerogenic sediments, fine sieving and density separations are also performed. Samples are then mounted on slides and scanned using a polarized light microscope to identify tephra grains. These methods are destructive and time consuming, and can be prohibitive when sample size is limited, when looking for tephra over a broad stratigraphic zone where little or no other age control is available, or when sediments are dominantly minerogenic. Therefore, a more rapid, non-destructive approach to detecting tephra would allow tephrochronology to be applied in more investigations and allow for more complete evaluation of tephra content within sedimentary profiles.

A range of alternative approaches have been attempted, all of which try to exploit unique properties of tephra that are distinguishable from the surrounding sediment. Gehrels et al. (2008) reviewed several non-destructive approaches such as spectrophotometry, x-radiography, magnetic susceptibility, and X-ray fluorescence

(XRF). Others have tried to use magnetic properties (Peters et al., 2010), X-ray diffraction (Andrews et al., 2006), and instrumental neutron activation analysis (Lim et al., 2008).

In this study, I investigate the use of scanning XRF to locate cryptotephra. Scanning XRF uses an intense micro-X-ray beam to analyze the surface of sediment profiles at sub-millimeter resolution and identifies a range of relative elemental components (Croudace et al., 2006). A laboratory-based experiment was designed to test if tephra-bearing sedimentary layers produce a detectable geochemical signature with scanning XRF. In particular, the ability of scanning XRF to locate tephra within minerogenic sediments is examined. Minerogenic sediments are typical in lacustrine environments and often lack enough material for radiocarbon dating, making them ideal targets for tephrochronology.

In the laboratory, synthetic sediment cores were created, spiked them with tephra, and analyzed them on an XRF core scanner. I examined how different tephra concentrations, compositions, and grain sizes are expressed in the scanning XRF elemental data. This approach was also applied to a sediment core from a lake in northern Norway, Sverigedalsvatn, where two cryptotephra layers have been identified using conventional approaches, to test the applicability of the experimental results to an actual sediment profile.

## **Methods**

## Experimental Design

Synthetic sediment cores were made in 50 ml centrifuge tubes (Figure 6.1). Surface sediment from a glacially fed lake, Lake Tuborg, was used as the background material. Lake Tuborg is located on Ellesmere Island adjacent to the Agassiz Ice Cap (Smith et al., 2004; Lewis, 2009). Sediment input is from snowmelt and glacially fed streams (Lewis et al., 2005, 2007, 2009). The upper sediments are generally in the silt size range (9-17  $\mu\text{m}$ ) with some lenses of fine sand (Lewis et al., 2009). Sediment from this lake was chosen because it is almost entirely minerogenic. In addition, Ellesmere Island is located far from volcanic centers so it is unlikely that Lake Tuborg contains tephra in high concentrations. Tephra has been reported in lacustrine sediments of the High Canadian Arctic (Zalzal, 2009), however it was found as only a few isolated shards and if present in Lake Tuborg it is unlikely to contain significant amounts that would have affected the results.

Sediment from a surface core was homogenized in deionized water, pipetted into centrifuge tubes, and spun in a horizontal-rotor centrifuge to create distinct, fining upward laminations (Figure 6.1). Four synthetic sediment cores were made (R1, R2, B1, B2) with 20,  $\sim 0.5$  cm-thick laminations (Table 6.1). Tephra was added between some of the laminations and spun in the centrifuge to create discrete layers (Figure 6.1). Eleven tephra layers were created, T1-T4 and CT5-CT11. Tephra was added in successively lower amounts from the bottom of each core to the top. I started by adding 0.2 ml of tephra, which created a  $\sim 0.5$  mm-thick visible tephra layer, and then progressively reduced the amount of tephra with the smallest amount being 3  $\mu\text{l}$ . Tephra layers T1-T4

are visible in the split cores and tephra layers CT5-CT11 are cryptic and not visible. Between some laminations no tephra was added to serve as experimental blanks.

Cores R1 and R2 were spiked with a rhyolitic tephra sample from the Icelandic eruption of Askja in 1875 (Sigvaldason, 2002) and cores B1 and B2 were spiked with a basaltic tephra sample from the Icelandic eruption of Grímsvötn in 2004 (Table 6.1 and 6.2). Both tephra samples were first sieved and cores R1 and B1 only contain tephra <53  $\mu\text{m}$  and cores R2 and B2 only contain tephra between 105 and 177  $\mu\text{m}$  (Table 6.1). All four cores were made simultaneously so the number of laminations, their approximate thickness, and the position where tephra was added are similar.

Cores were split, photographed, and analyzed on an Itrax scanning XRF at the University of Quebec's Institut national de la recherche scientifique, Centre Eau, Terre et Environnement. The Itrax scans the surface of each core with a 22 mm x 100  $\mu\text{m}$  beam. A range of elements from Al to Bi were detected and output as peak integrals reflecting their relative concentration in the sediment. All of the split cores were scanned at a 100  $\mu\text{m}$  interval using an exposure time of 20 s, voltage of 40 kV, and current of 45 mA. The analysis focused on the elements: Al, Si, Cl, K, Ca, Ti, V, Cr, Mn, Fe, Ni, Cu, Zn, Rb, Sr, Zr, and W.

#### **Application: Sverigedalsvatn**

The scanning XRF signal across tephra layers in the synthetic cores was compared to XRF scans of a sediment core taken from Sverigedalsvatn, a lake on Andøya, northern Norway, where two Icelandic cryptotephra layers have been identified (Kvisvik et al., 2010). A ~6 m core was recovered from the lake, but this analysis

focuses on a section of the core between 230 and 300 cm. The sediment composition is characterized by magnetic susceptibility that was measured every 0.2 cm using a Bartington MS2E meter and by loss-on-ignition that was measured every 0.5 cm (Dean, 1974).

Tephra samples were taken at 1-cm intervals from 245-247 cm and 283-287 cm, where tephra from specific Icelandic eruptions were suspected to be located based on a radiocarbon chronology. Samples were processed using conventional approaches to isolate tephra (Hall and Pilcher, 2002; Turney, 1998). Samples were acidified, sieved to isolate grains between 20 and 63  $\mu\text{m}$ , and then subject to heavy-liquid density separations with sodium polytungstate to isolate grains from 2.3-2.5  $\text{g cm}^{-3}$ . Samples were mounted in epoxy resin and tephra particles were counted using a light microscope. Two significant peaks in tephra concentration were found at 246-247 cm and 283-284 cm where greater than 500 shards were observed. Electron microprobe analysis of tephra grains from these samples shows that the lower horizon is a rhyolitic tephra and the upper horizon is a basaltic tephra (Table 6.2) and are likely the Vedde Ash and Saksunarvatn tephra, respectively (Figure 6.2) (e.g. Birks et al., 1996). Itrax core scans of the entire section were performed at the University of Bergen, Department of Geology. The core was scanned at a 1000  $\mu\text{m}$  interval using an exposure time of 10 s, voltage of 30 kV, and current of 50 mA.

## **Experimental Results**

## **Background elemental variations**

There are significant variations in the scanning XRF element profiles of all four synthetic cores that are driven by the physical characteristics of the background sediment and not associated with the presence of tephra (Figure 6.3). These features are related to the repeated fining-upwards of grain size within each lamination. K, Ca, Fe, Rb, and Sr exhibit the strongest variations across each lamination (Figure 6.3). K, Fe, and Rb increase in value from the base to the top of each lamination, while Ca and Sr decrease across each lamination (Figure 6.3). Principal component analyses of the element matrix for each synthetic core demonstrate the strength of this signal (Table 6.3). The first principal components account for 37-40% of the variation and are mainly controlled by K, Ca, Fe, Zn, and Rb, which all have factor loadings greater than 0.8 or less than -0.8.

These data establish the background XRF signal and help guide how the elemental data are analyzed for the presence of tephra. For each core, single element profiles were used to examine elements with the strongest response across the tephra layers as compared to background levels, which are defined as the range of values for a given element across the laminations where no tephra was added. Visible tephra layers T1-T4, produce the strongest response and show which elements should be examined to try and locate cryptotephra layers (CT5-CT-11). Element ratios were also used to try and more clearly define deviations from background elemental variations. The elements identified as most diagnostic of tephra relative to K and Ca are presented, the elements with the strongest response to changes in the background sediment composition (Table 6.3).

### **Synthetic cores spiked with rhyolitic tephra (R1 and R2)**

Eleven rhyolitic tephra layers were added between laminations within cores R1 and R2 with grain size ranges of  $<53 \mu\text{m}$  and  $105\text{-}177 \mu\text{m}$ , respectively (Figure 6.4 & 6.5). In core R1, single element profiles of Ti, Mn, and Si show the strongest responses across the visible tephra layers (Figure 6.4). Mn values have the most well defined peaks and clearly identify tephra layers T1, T2, T3, and T4 (Figure 6.4). The peaks in Mn are larger across T1 and T2 than across T3 and T4. There are small peaks at cryptotephra layers CT5 and CT6, but they are not as distinct and barely above background values. There is no clear signal in the Mn values of tephra layers with lower concentrations, CT7-CT11. Ti and Si also show slight increases at the positions of T1, T2, and T4.

Profiles of Ti, Mn, and Si relative to Ca exhibit more distinct peaks across a few of the tephra layers (Figure 6.4). Ca responds strongly to changes in grain size associated with the artificial laminations, and the ratio of Ca to Ti, Mn, and Si resulted in more distinct peaks across some of the tephra layers compared with the single element profiles. Peaks in these element ratios occur at T1, T2, and T3 for Ti/Ca, Mn/Ca, and Si/Ca values. Mn/Ca and Si/Ca values also show a response above background levels at T4, but none of the ratios indicate the presence of the cryptotephra layers (CT5-CT11).

In core R2, the response of Ti, Mn, and Si at each tephra layer were also examined (Figure 6.5). Overall, the elemental response across the tephra layers was less pronounced. Si values show no clear signature of tephra at any position in the core. Mn only shows a small peak above the background level at T4. Ti has peaks at T2, T3, T4, CT6, and CT7 that are above the background, but show no variation in peak height that correspond with tephra concentration and do not seem to reliably represent the presence

of tephra. Ratios of Ti, Mn, and Si to Ca only show a distinct response at T1 and the response across the other tephra layers are below the background variations.

### **Synthetic cores spiked with basaltic tephra (B1 and B2)**

Eleven basaltic tephra layers were added between laminations within cores B1 and B2 with grain size ranges of <53  $\mu\text{m}$  and 105-177  $\mu\text{m}$ , respectively (Figure 6.6 & 6.7). In core B1, single element profiles of Ti, Mn, Fe and Cu show the strongest responses across the tephra layers (Figure 6.6). A sharp increase in values for Ti, Mn, and Fe is clearly distinguishable from background variations across tephra layers T1-T4 and CT5. Cu values show clear peaks at T1-T4. A few peaks that just exceed background values are present in the profiles of Mn across CT6, and Ti across CT6 and CT8. In general, the peak heights generally decrease with decreasing concentration of tephra.

The ratios of Ti, Mn, Fe, and Cu to K produce a more significant response across the basaltic tephra layers of core B1 (Figure 6.6). The ratio of these elements to K was used, and not Ca as done when trying to better define the elemental response to rhyolitic tephra of R1 and R2, because ratios to K exhibit greater discrimination across tephra layers. This might occur because Ca is a more significant component of the basaltic tephra (9.75%) compared with the rhyolitic tephra (2.43%) (Table 6.2). Profiles of Ti/K, Mn/K, Fe/K, and Cu/K have sharp peaks at the tephra layers and have low background variations. All four profiles show strong responses across the first five tephra layers. Plots of Ti/K and Fe/K also show peaks above background values across CT6. The response across tephra layers T1-T3 is greater than across T4-T6.



In core B2, the responses of Ti, Mn, Fe, and Cu were examined (Figure 6.7). The single element profile of Mn has the most distinct peaks. Significant increases in Mn values occur across tephra layers T1-T3 and there are peaks just above the background values at T4 and T6, but overall the response is not as great as in core B1. The Fe and Cu profiles only show a slight increase at T2, but lack clear evidence for the presence of any of the other tephra layers. Ti has peaks across T1-T3, although a high background spike between T6 and T7 is of similar height as at T1 and T3, making the peak across T2 the only one above background values.

The ratio of Ti, Mn, Fe, and Cu to K in core B2 show distinct peaks and have low background variations (Figure 6.7). Profiles of Ti/K, Mn/K, and Fe/K show distinct peaks at T1-T3 and Fe/K values also increase at T4 and T5. These element ratio profiles more clearly define these tephra horizons compared to the single element plots. The Cu/K ratio only displays a significant peak at T2.

### **Elemental Signal of Tephra**

Scans of tephra-spiked synthetic cores provide a better perspective on the XRF response to tephra composition, concentration, and grain size. I was not able to detect all 11 tephra layers in any of the four synthetic cores, but I was able to characterize conditions where the elemental response to tephra is greatest and identify a significant response to a few of the cryptotephra layers.

First, I consider the relative signature of the four visible tephra layers (T1-T4) to better understand how tephra grain size and composition are detected by scanning XRF.

The different tephra compositions (rhyolitic vs. basaltic) had slightly different diagnostic elements and relative responses. Synthetic sediment cores spiked with rhyolitic tephra show that Ti, Mn, and Si produced the strongest response to tephra, while Ti, Mn, Fe, and Cu are most diagnostic of the presence of the basaltic tephra. Comparison between the relative response across tephra layers in the B cores to the R cores shows that the basaltic tephra layers in B1 and B2 produce the more distinct element peaks and at lower concentrations than the rhyolitic tephra layers in cores R1 and R2. Both of these properties reflect the greater compositional difference between the basaltic tephra and the background sediment as compared to the rhyolitic tephra.

Tephra grain size was found to affect the elemental response across both basaltic and rhyolitic tephra layers. Cores R1 and B1, spiked with tephra <53  $\mu\text{m}$ , had greater elemental responses compared to cores R2 and B2, spiked with tephra 105-177  $\mu\text{m}$ . There are no compositional variations of the tephra with grain size that would cause this trend and this likely results from the difference in grain packing. The XRF response is greater across finer grain layers, which have a greater surface area per volume that interacts with the X-rays.

The elemental response was found to be directly related to tephra concentration. The visible tephra layers, T1 and T2 generally had a greater response than T3 and T4, where less tephra was added. However, most cryptotephra layers (T5-T11) were undistinguishable from the background sediment. Most cryptotephra layers were observed in core B1, where fine grained basaltic tephra even in the lower concentrations was able to affect the bulk geochemical composition and produce an elemental peak above background values.

Both single element and element ratios were analyzed. In this application, element ratios help accentuate elemental peaks across tephra layers and reduce the strength of the background signal related to the physical properties of the laminations. For these tephra and background sediment compositions, elements relative to Ca produced the best results for cores R1 and R2, and elements relative to K provided optimum detection in cores B1 and B2. Although profiles of element ratios did exhibit more distinct peaks across tephra layers, they did not distinguish additional tephra layers as in the single element profiles.

Cryptotephra layers did produce a significant elemental response in a few locations, but overall were difficult to detect considering the idealized conditions of this experiment. The synthetic cores had a consistent background signal throughout, which is not the case in most sediment profiles, where minor changes in sedimentology can result in large changes in the background XRF signal that would further obscure a cryptotephra layer. In addition, tephra were dispersed as discrete layers between laminations, which allowed me to identify precise locations where tephra was located, but this is not representative of how tephra is naturally deposited. This experiment may also have been affected by the XRF counting time (20 seconds) that were chosen in analyzing all of the synthetic cores. By increasing the counting time, I may have been able to show a more distinct response across some of the lower concentrations tephra layers and may have increased detection of the lighter elements, specifically Al.  $\text{Al}_2\text{O}_3$  is typically the second most abundant oxide in both basaltic and rhyolitic tephra and could be a diagnostic element, assuming there is a significant difference between its concentration and the background sediment.

### **Application: Sverigedalsvatn**

Two cryptotephra horizons were identified in Sverigedalsvatn with peaks in concentration greater than 500 shards occurring at 246-247 cm and 283-284 cm (Figure 6.8). The lower tephra horizon is rhyolitic and has a high SiO<sub>2</sub> (70.61%) and low FeO (3.84%) content and the upper tephra horizon is basaltic and has a lower SiO<sub>2</sub> (49.68%) and higher FeO (13.91%) content (Table 6.2).

The section of the core from Sverigedalsvatn (230-300 cm) where the two cryptotephra horizons were found contains significant compositional changes, reflected in LOI and magnetic susceptibility profiles, which affect the overall XRF signal (Figure 6.8). The lower sediments, from 277-300 cm are minerogenic with high magnetic susceptibility and low LOI values and transition to more organic-rich sediment above 277 cm, where magnetic susceptibility decreases and LOI values increase to an average of 24%. There is a large spike in magnetic susceptibility from 244-250 cm at the location where the upper tephra was identified.

Element profiles that were most diagnostic of tephra in the synthetic core experiment (Mn, Ti, Fe, & Si) were examined in Sverigedalsvatn. Ti, Fe, and Si profiles across the entire core section show a response to the major compositional changes (Figure 6.8). These elements have their highest counts from 277-300 cm, sharply decrease at 277 cm, and are low from 277-230 cm. These trends are similar to changes in magnetic susceptibility and are opposite the trend in LOI. Mn was also diagnostic of

tephra in the synthetic core experiment, but varies independently with relatively constant high frequency, low amplitude fluctuations.

At the lower rhyolitic tephra horizon, elemental values around 283-284 cm show no clear departures from the background and the observed changes in values are likely associated with other physical properties of the sediment (Figure 6.9). At the upper tephra horizon, elemental values immediately around 246-247 cm do show a response that is probably related to the presence of tephra (Figure 6.10). Ti values show the most significant increase, but there are also minor peaks in Fe and Ca. At both locations I also examined the response of other elements, but did not find any element that showed a more significant response.

In comparison to the synthetic core experiment, there is again a stronger detection of the basaltic tephra layer. This cryptotephra layer is associated with an increase in magnetic susceptibility and Ti values, but no other significant elemental response. No clear indication of the rhyolitic tephra was observed. However, the basaltic tephra does occur within more organic rich sediment that has more contrast between the tephra and the background sediment, making it easier to detect.

This application demonstrates the complicating factors that large changes in sedimentology can have on detecting tephra with scanning XRF. In Sverigedalsvatn, there are significant changes in sedimentology across this section of the core and the elemental response, even across the basaltic cryptotephra layer, is much less than changes in lithology associated with natural environmental conditions. The core from Sverigedalsvatn was scanned using slightly different analytical conditions, including shorter counting times, which does complicate direct comparison. Nevertheless, similar

results were found by De Vleeschouwer et al. (2008), who analyzed two impregnated peat thin sections on an XRF core scanner and did not observe a significant response across cryptotephra layers.

### **Summary & Conclusions**

In this experiment, I tested the ability of scanning XRF to capture elemental signals of tephra with differences in composition, concentration, and grain size in minerogenic lacustrine sediment. Synthetic sediment cores were created in centrifuge tubes, which provided a simple means to introduce tephra in known positions and to replicate the process of analyzing real sediment cores. A series of 20 laminations was created in 4 synthetic cores that were spiked with rhyolitic and basaltic tephra with different concentrations, using two grain size ranges of  $<53 \mu\text{m}$  and  $105\text{-}177 \mu\text{m}$ . These cores were then scanned using an Itrax scanning XRF, which produced a signal of element composition of the split surface of the cores every  $100 \mu\text{m}$ .

The fining-upward sequences of each lamination imparted a strong signal in the XRF data. It was necessary to define this background variability in order to attribute other elemental changes to the presence of tephra. I was able to identify an elemental response above the background across a few cryptotephra horizons, but in general the signal of tephra attenuated quickly with decreasing concentration of tephra. The basaltic tephra had a greater compositional difference from the background sediment and had a more distinct elemental response. Comparison of the signal between different tephra

grain size fractions showed that grain size appears to be inversely related to the strength of the elemental response produced by the Itrax.

These experimental results were compared to XRF scans of a core from Sverigedalsvatn where basaltic and rhyolitic cryptotephra layers had previously been identified using conventional methods. The rhyolitic tephra did not produce a distinct elemental response, but the basaltic tephra was identified in the XRF data, though it did occur in a more organic-rich zone. This application highlighted the difficulty in identifying tephra, especially rhyolitic tephra, in sediment where there are large background elemental variations.

Overall, I show that the use of scanning XRF to locate cryptotephra in minerogenic sediment is possible in ideal conditions, but generally difficult unless there are large differences in geochemistry of tephra compared to background sediment. XRF core scanners have an extremely small beam size that makes them ideal for high resolution measurements, but only classifies the composition of a small area of the core, which can hinder the detection of cryptotephra unless it is present in significant concentrations to affect the bulk geochemical composition of the sediment. Also, even if an elemental peak is attributed to a tephra layer it would still need to be isolated by traditional methods for further identification purposes.

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**Table 6.1.** Name of synthetic cores created and the sample and grains size range of tephra added to each core.

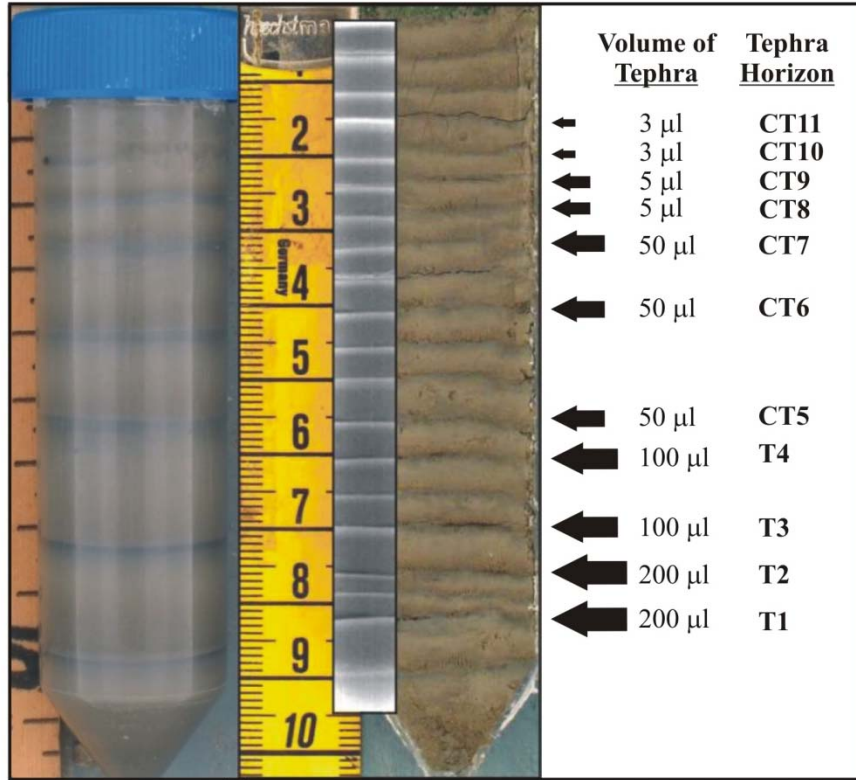
<b>Synthetic Core</b>	<b>Tephra</b>	<b>Grain Size (<math>\mu\text{m}</math>)</b>
R1	Askja 1875	<53
R2	Askja 1875	105-177
B1	Grímsvötn 2004	<53
B2	Grímsvötn 2004	105-177

**Table 6.2.** Major element compositions of tephra used in synthetic cores and tephra isolated from Sverigedalsvatn.

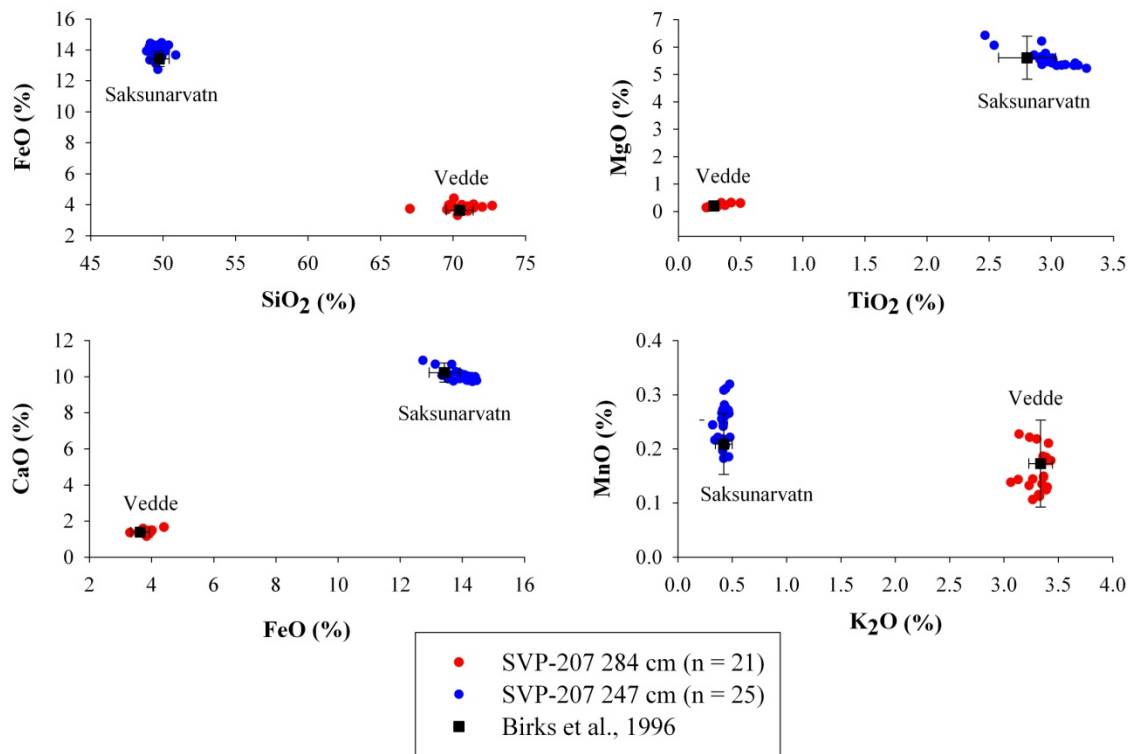
Core	Tephra		SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	FeO	MnO	MgO	CaO	Na <sub>2</sub> O	K <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	Total	n	Source
Synthetic Core B1 & B2	Grimsvotn 2004	<i>mean</i>	50.11	2.81	13.38	13.48	0.23	5.31	9.75	2.65	0.49	0.28	98.47		
		<i>1 σ</i>	0.16	0.04	0.16	0.14	0.00	0.07	0.10	0.03	0.01	0.01	0.29		
Synthetic Core R1 & R2	Askja 1875	<i>mean</i>	72.71	0.69	12.52	3.80	0.14	0.91	2.43	4.23	2.19	0.29	99.91	35	Tephabase
		<i>1 σ</i>	0.42	0.01	0.12	0.12	0.05	0.04	0.03	0.10	0.02	0.06	0.32		
Sverigedalsvatn	246-247 cm	<i>mean</i>	49.68	2.97	13.14	13.91	0.25	5.58	10.06	2.56	0.42	0.37	98.95	25	This study
		<i>1 σ</i>	0.46	0.18	0.29	0.43	0.04	0.29	0.30	0.31	0.04	0.05	0.73		
Sverigedalsvatn	283-284 cm	<i>mean</i>	70.61	0.31	13.70	3.84	0.16	0.21	1.39	4.15	3.31	0.08	97.93	21	This study
		<i>1 σ</i>	1.13	0.06	0.28	0.20	0.04	0.05	0.10	0.71	0.10	0.03	1.34		

**Table 6.3.** Principal component analysis results for scanning XRF elemental data for each synthetic core. Factor loadings greater than 0.8 are in bold.

<b>Synthetic Core</b>	<b>R1</b>	<b>R2</b>	<b>B1</b>	<b>B2</b>
Eigenvalue	6.706	6.323	6.640	6.722
% Variability	39.446	37.194	39.061	39.542
<i><b>Factor Loadings</b></i>				
Al	0.227	0.280	0.374	0.372
Si	-0.467	-0.417	-0.446	-0.484
Cl	0.011	-0.002	-0.079	-0.059
K	<b>0.928</b>	<b>0.934</b>	<b>0.770</b>	<b>0.923</b>
Ca	<b>-0.846</b>	<b>-0.825</b>	<b>-0.889</b>	<b>-0.845</b>
Ti	0.572	0.670	0.606	0.620
V	0.378	0.365	0.536	0.488
Cr	0.426	0.286	0.355	0.418
Mn	0.296	0.460	0.489	0.376
Fe	<b>0.964</b>	<b>0.958</b>	<b>0.911</b>	<b>0.954</b>
Ni	0.691	0.670	0.750	0.695
Cu	0.716	<b>0.756</b>	<b>0.795</b>	0.715
Zn	<b>0.856</b>	<b>0.855</b>	<b>0.873</b>	<b>0.829</b>
Rb	<b>0.862</b>	<b>0.794</b>	0.677	<b>0.834</b>
Sr	<b>-0.753</b>	-0.562	-0.657	<i>-0.697</i>
Zr	-0.073	0.097	-0.268	-0.074
W	-0.392	-0.130	-0.380	-0.248

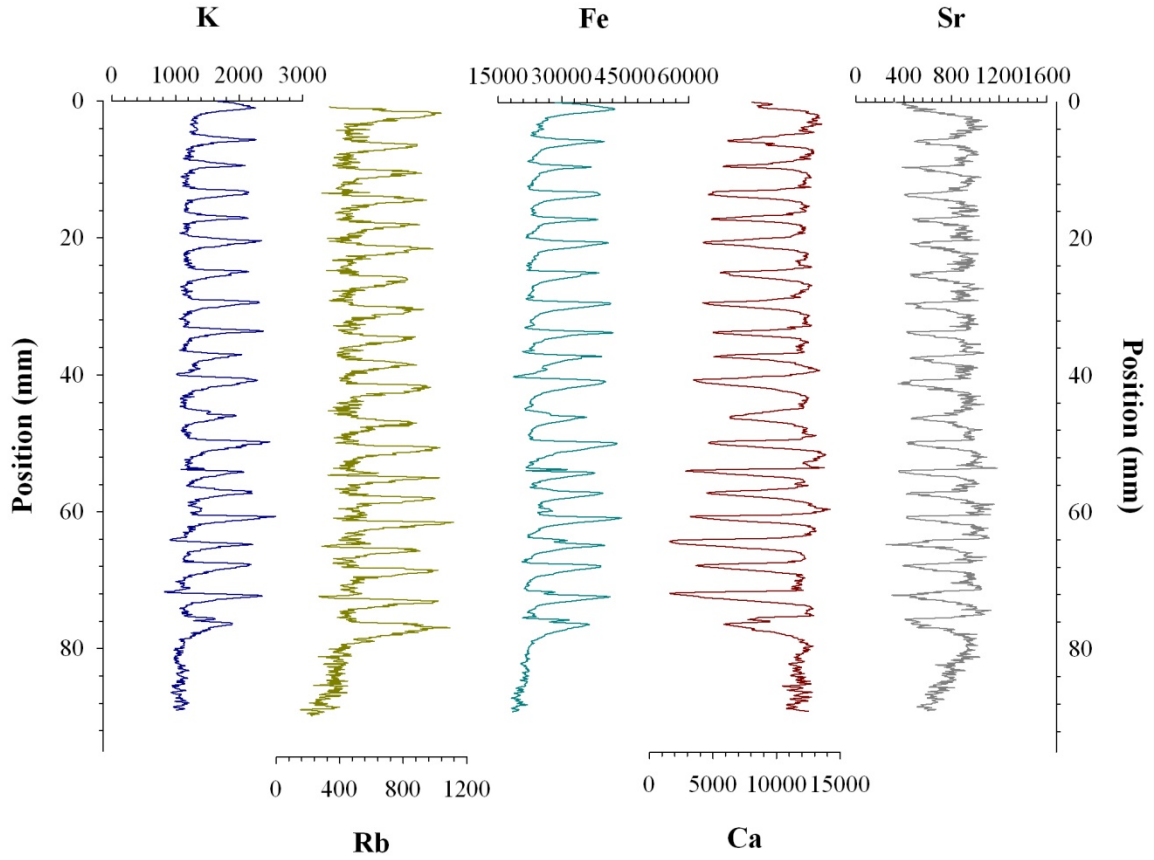


**Figure 6.1.** Synthetic sediment cores created in 50 ml centrifuge tubes (Left). Sediment was added and spun in a horizontal-rotor centrifuge to create multiple fining upward laminations visible in the split cores and in the X-radiographs of the cores (Center). Between some laminations, tephra was added in different concentrations to form 11 tephra layers, four as visible layers (T1-T4) and seven as cryptotephra layers (CT5-CT11) (Right).

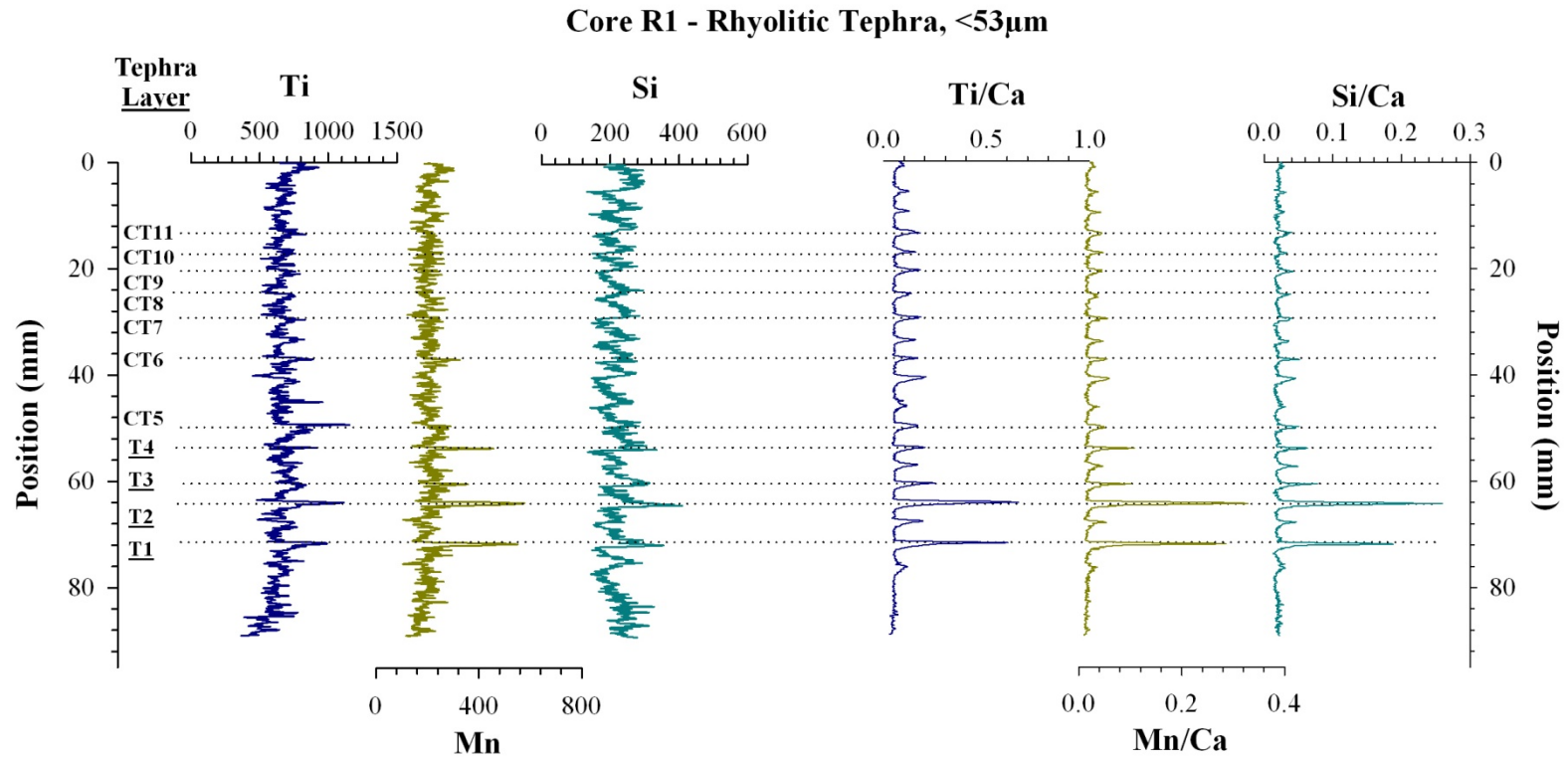


**Figure 6.2.** Geochemistry of tephra from Sverigedalsvatn core SVP-207. Each point represents one tephra grain. The results from each depth (246-247 cm and 283-284 cm) cluster together and resemble the Saksunarvatn tephra and the Vedde Ash. I plotted the range of geochemistry of the Vedde Ash and Saksunarvatn tephra as reported by Birks et al. (1996) for comparison.

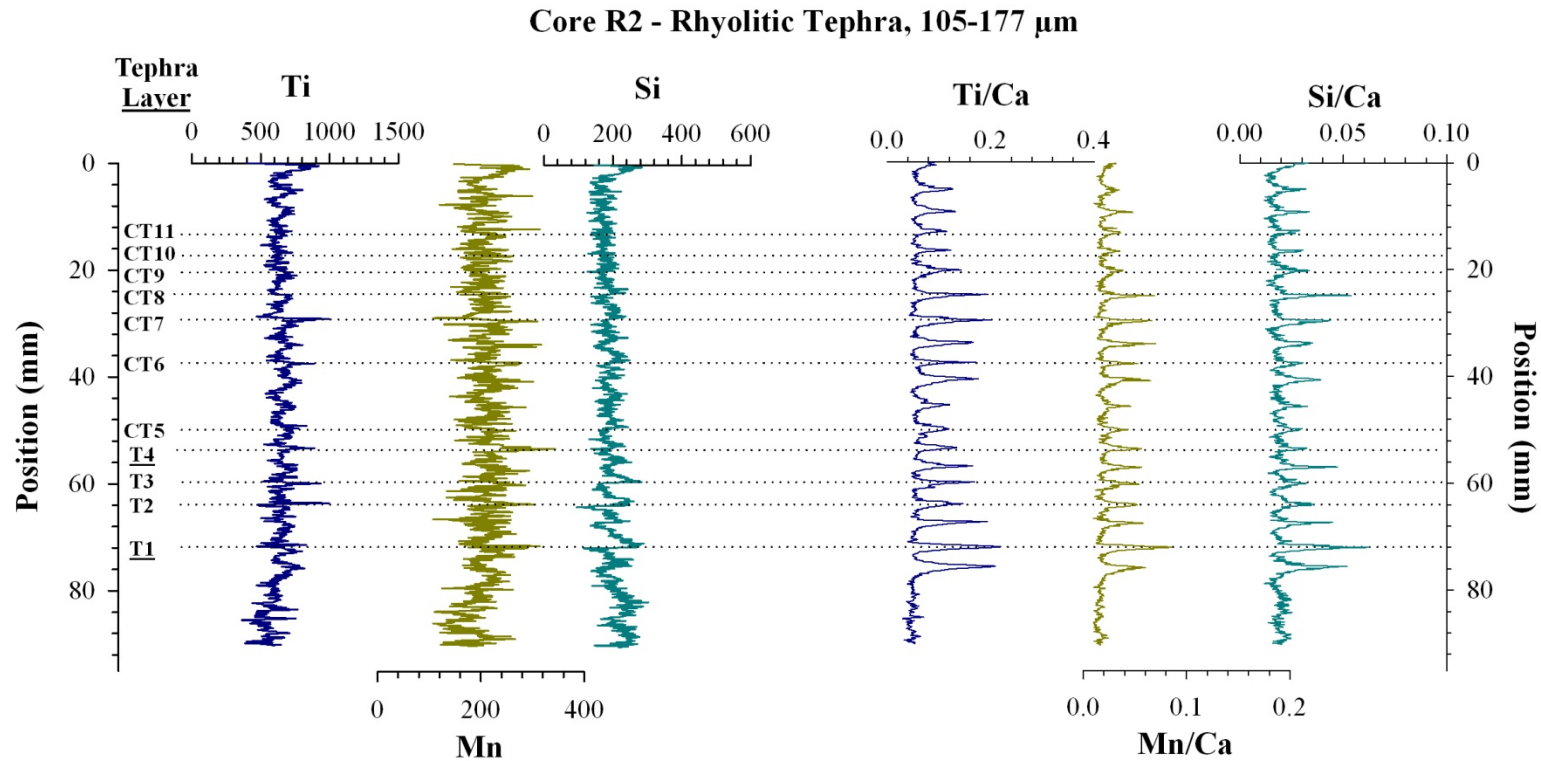




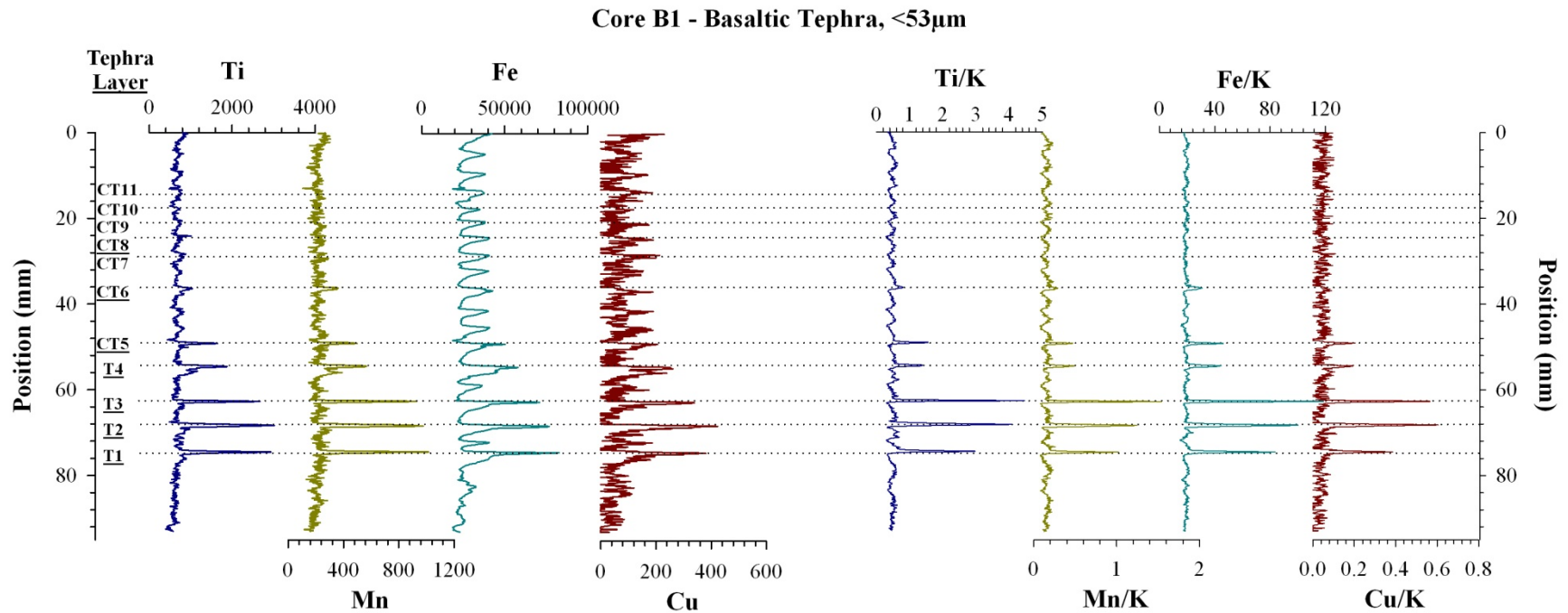
**Figure 6.3.** Example from core R1 of the background elemental response present in all of the synthetic cores from fining-upwards of grain size associated with individual laminations. K, Rb, Fe, Ca, and Sr show the most significant variations across each lamination.



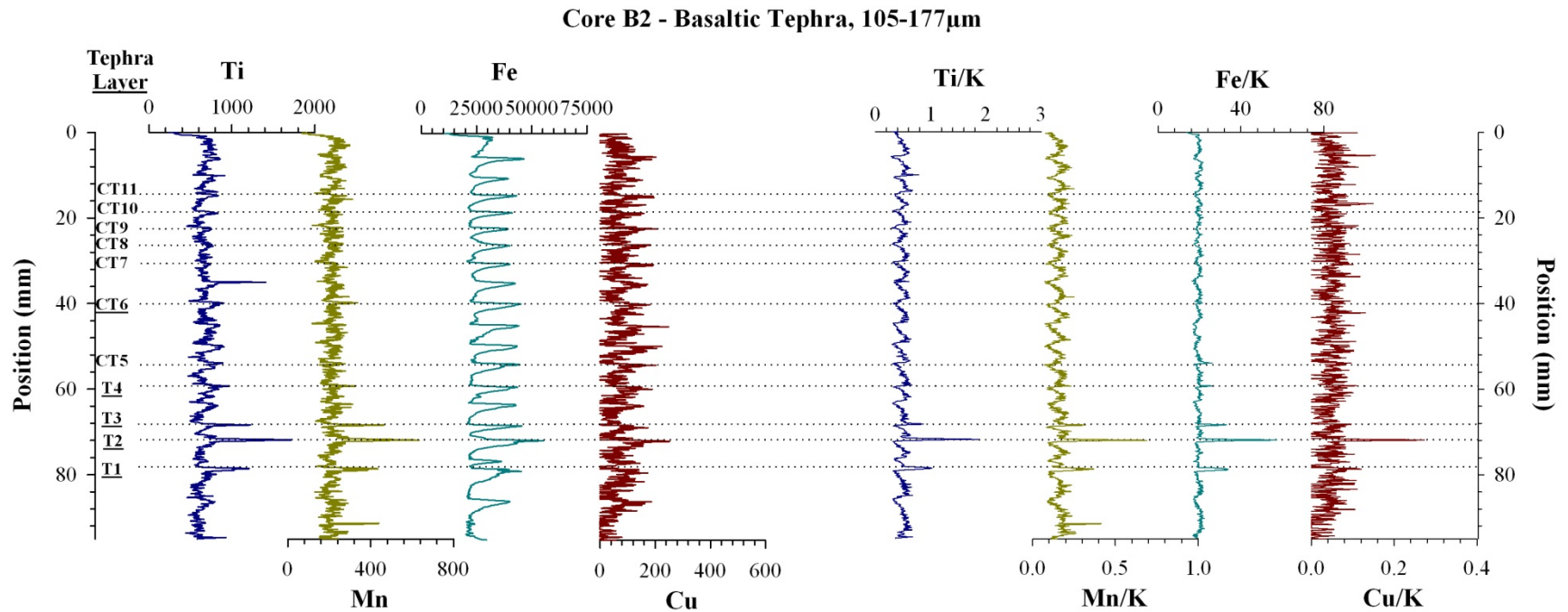
**Figure 6.4.** Scanning XRF data for synthetic core R1, which was spiked with rhyolitic tephra with a grain size of less than 53  $\mu\text{m}$ . Tephra (T) and cryptotephra (CT) layers interpreted to have element peaks above background variations that indicate their presence in the sediment are underlined.



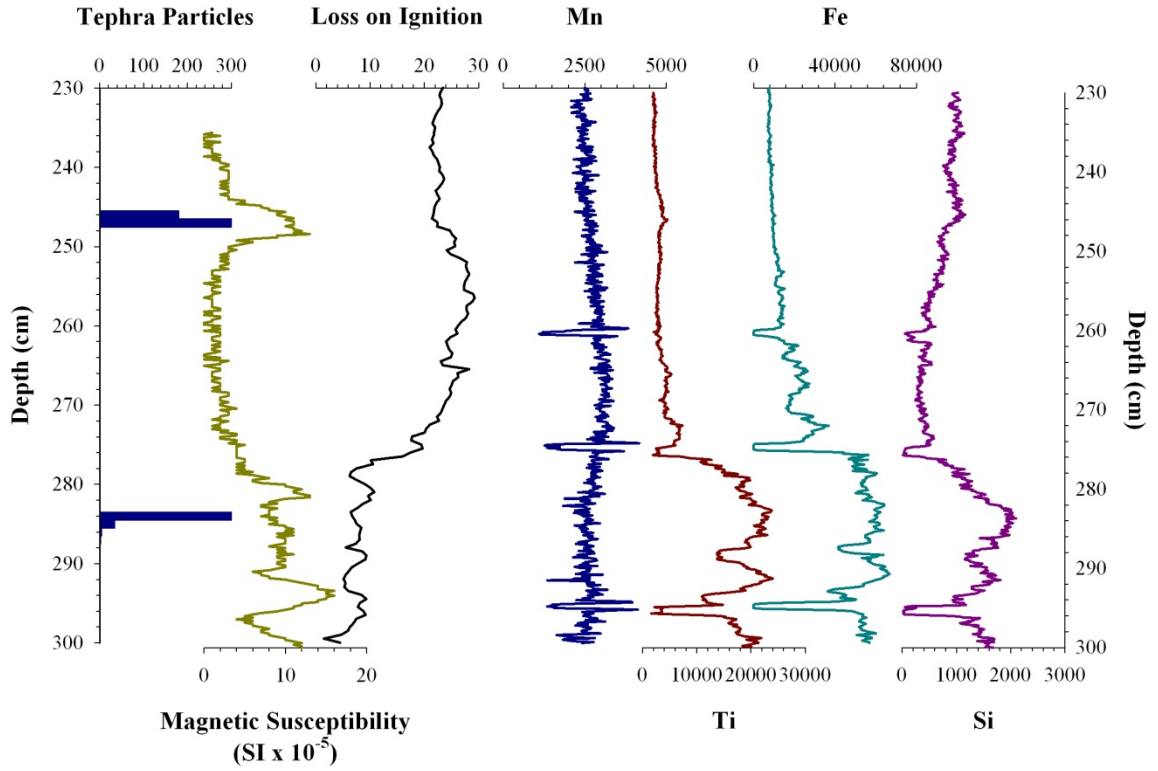
**Figure 6.5.** Scanning XRF data for synthetic core R2, which was spiked with rhyolitic tephra with a grain size of 105-177  $\mu\text{m}$ . Tephra (T) and cryptotephra (CT) layers interpreted to have element peaks above background variations that indicate their presence in the sediment are underlined.



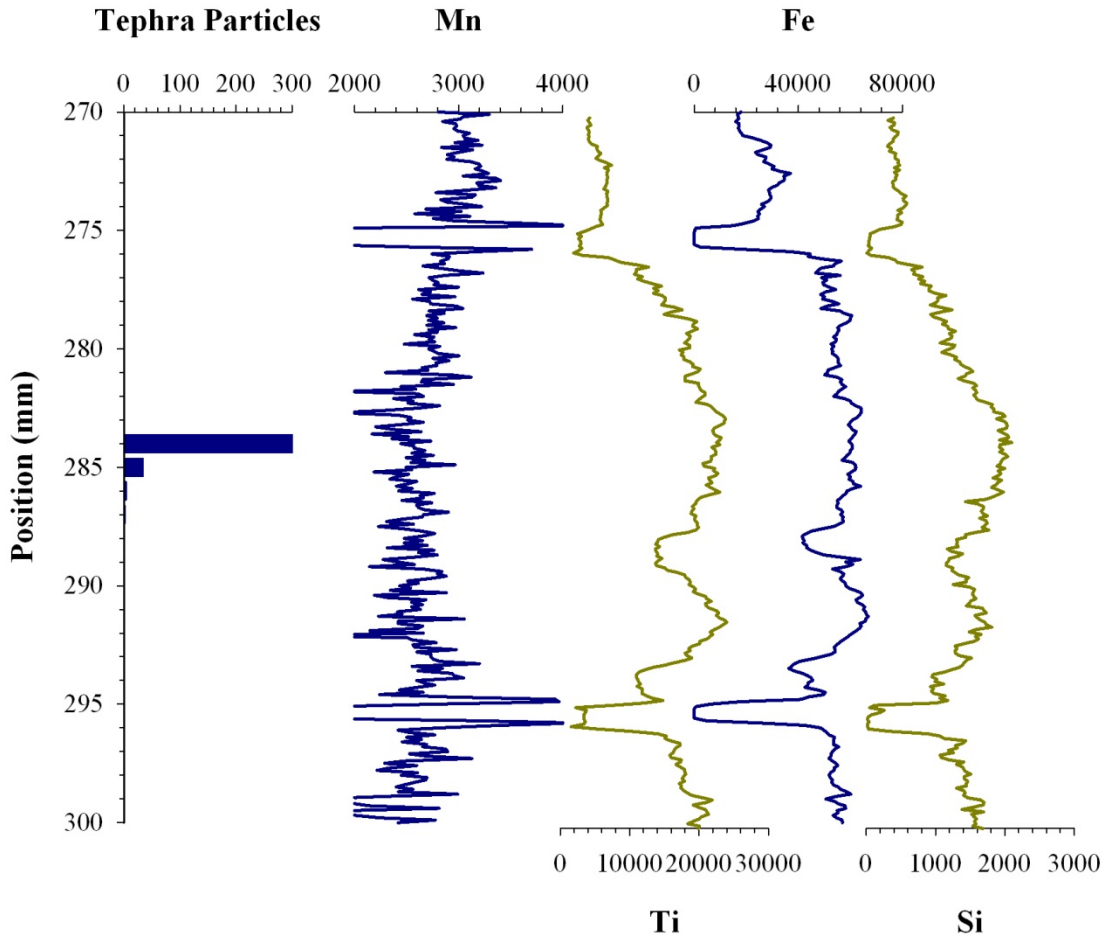
**Figure 6.6.** Scanning XRF data for synthetic core B1, which was spiked with basaltic tephra with a grain size of less than 53  $\mu$ m. Tephra (T) and cryptotephra (CT) layers interpreted to have element peaks above background variations that indicate their presence in the sediment are underlined.



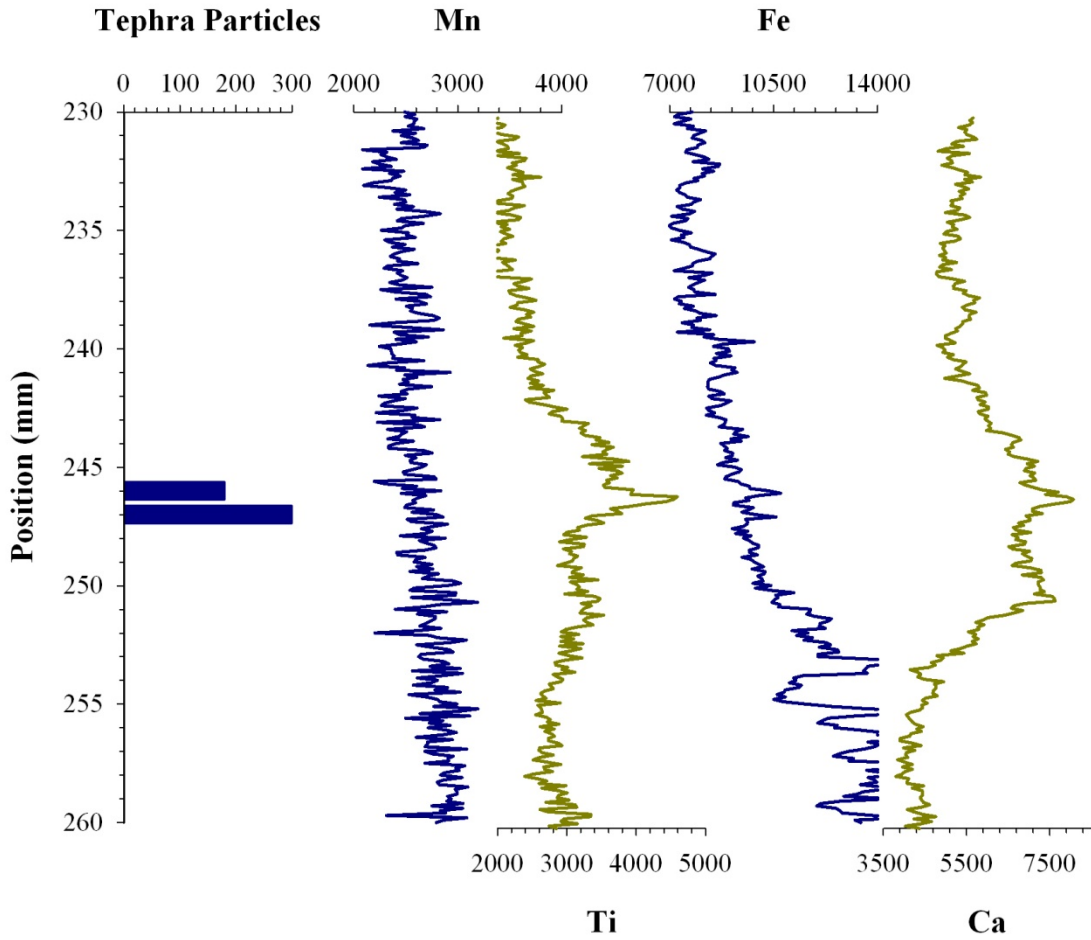
**Figure 6.7.** Scanning XRF data for synthetic core B2, which was spiked with basaltic tephra with a grain size of 105-177  $\mu$ m. Tephra (T) and cryptotephra (CT) layers interpreted to have element peaks above background variations that indicate their presence in the sediment are underlined.



**Figure 6.8.** Section of the Sverigedalsvatn core where two cryptotephra layers were identified. The concentrations of tephra are compared to magnetic susceptibility and loss on ignition profiles, which show significant changes in sediment composition, and scanning XRF profiles of Mn, Ti, Fe, and Si.



**Figure 6.9.** Section of the Sverigedalsvatn core where the rhyolitic cryptotephra layer was identified. The location of the tephra is compared to scanning XRF profiles of Mn, Ti, Fe, and Si.



**Figure 6.10.** Section of the Sverigedalsvatn core where the basaltic cryptotephra layer was identified. The location of the tephra is compared to scanning XRF profiles of Mn, Ti, Fe, and Ca.



## CHAPTER 7

### SUMMARY & CONCLUSIONS

This dissertation has shown that lakes sediments from the Lofoten Islands can be used to generate well resolved records of past environmental changes. Three lacustrine paleoenvironmental reconstructions showed evidence for Holocene climate changes associated with North Atlantic climate dynamics, and relative sea-level variations driven by local glacio-isostatic adjustment. Tephra deposits from Icelandic volcanic eruptions were also used to improve the chronologies of these reconstructions and I explored the application of crypto-tephrochronology to date an archaeological site and the use of scanning XRF to locate tephra in sedimentary profiles. Here is a brief summary of the results and conclusions as they pertain to the main research themes of this dissertation as well as plans for future work.

#### **Research Themes**

##### **Lacustrine records of Holocene climate & environmental change**

Two records of Holocene environmental change were generated. The study of Vikjordvatnet shows that the lake was sensitive to regional climate changes and provides information on climate conditions following the Younger Dryas in the Lofoten Islands. Geomorphic and sedimentary evidence was used to identify cirque glacier activity from 13.8-11.4 cal ka BP that likely corresponds to a glacier with an estimated ELA of 370 m. There was also evidence for an older glacier advance in the valley with an estimated ELA

of 200 m. Holocene sedimentation in Vikjordvatnet was characterized using magnetic susceptibility, %LOI, %TOC, C/N, and scanning XRF data. They indicate that the lake experienced overall warming conditions during the early Holocene from 11.4-8.0 cal ka BP in response to higher insolation and increasing inflow of warm Atlantic water into the Norwegian Sea. Instability during the early Holocene warming was also observed as short-term decreases in organic matter content of the sediment from 10.5-10.2 cal ka BP and 9.2-8.0 cal ka BP, which correspond to regional cooling events, likely attributed to freshwater forcing and slowdown of the northward transport of warm water. The Holocene Thermal Maximum is marked by high organic matter content and stable conditions. This is followed by the transition to the late Holocene and Neoglacial cooling, marked in Vikjordvatnet by changes in Fe cycling possibly related to seasonal ice-cover and thermal stratification of the lake beginning around 5.3 cal ka BP. Large amplitude variations in organic matter are also observed over the last 2.4 cal ka BP and are may be inwashing events related to wetter conditions or the establishment of permanent settlements in the area.

The study of Fiskebølvatnet shows environmental change over the last 9.7 cal ka BP. The lake is below the marine and this record captures the isolation of the basin and the subsequent period of late Holocene lacustrine sedimentation. Following the isolation of Fiskebølvatnet, there is a transitional period (9.5-6.7 cal ka BP) marked by the deposition of fine laminations and distinct sediment color changes that might be associated with stratification of the water column. After 6.7 cal ka BP, the lacustrine units are organic rich, but punctuated by periods of clastic sedimentation defined by high frequency changes in physical sedimentary properties. The intensity of inwashing into

Fiskebølvatnet throughout the last 6.7 cal ka BP may be the result of local conditions governed by the geomorphic setting of the lake basin. These features probably obscure any regional climate signal. However, there is a distinct change in characteristics of the sediment from 4.2-1.6 cal ka BP that might correspond with a regional climatic shift towards wetter conditions.

### **Isolation basins as records of relative sea-level change**

Fiskebølvatnet and Heimerdalsvatnet are both isolation basins and sediment cores recovered from these lakes capture the marine-lacustrine transitions. In Fiskebølvatnet the marine and lacustrine units are visible distinct in the split core and are clearly defined by physical sedimentary properties. Isolation of the lake occurred at 9.5 cal ka BP. The marine unit (9.7-9.5 cal ka BP) is dominated by clastic sedimentation and there is an abrupt change to more organic-rich sediment at the isolation contact. The marine-lacustrine transition is also defined by scanning XRF profiles of Si, K, Ca, Br, and Sr. The isolation of Fiskebølvatnet generally corresponds to the regional sea-level history.

The isolation sequence of Heimerdalsvatnet was analyzed using a variety of analytical techniques. Physical, organic geochemical, and diatom analyses defined three lith/chemo-stratigraphic units related to sea-level lowering following the Tapes transgression. These different approaches contribute to a detailed understanding of paleoenvironmental conditions during isolation. Results from the analysis demonstrate that Heimerdalsvatnet was a restricted marine basin from 7.8-6.5 cal ka BP. Evidence for anoxia during this period indicates that conditions resembled the present-day environments in two nearby coastal basins. Following the transgression sea level

lowered, but marine water still had periodic influence on Heimerdalsvatnet from 6.5-4.9 cal ka BP before it was fully isolated at 4.9 cal ka BP. Despite uncertainties in the threshold elevation, these intervals correspond with general trends in the local sea-level history.

### **Tephrochronology: applications & method development**

Cryptotephra horizons were identified in sediments of Heimerdalsvatnet, Vikjordvatnet, and Sverigedalsvatn. They were also found in a Viking-age boathouse excavated along the shore of Inner Borgpollen. These include the GA4-85, BIP-24a, SILK-N2, Askja, 860 Layer B, Hekla 1158, Hekla 1104, Vedde Ash, and Saksunarvatn tephra. These tephra provided additional age control for the lake sediment records and the tephra found in the boathouse help constrain the timing of the boathouse's use and demonstrate the potential for tephrochronology as a geochronologic tool for archaeologists in Norway.

In addition to using tephra for geochronology, this research project explored the use of scanning XRF to locate cryptotephra in lacustrine sediments and presented experimental results of XRF scans of tephra-spiked synthetic sediment cores. The experiment tested the ability of scanning XRF to capture elemental signals of tephra with differences in composition, concentration, and grain size in minerogenic lacustrine sediment. I was able to identify an elemental response above the background across a few cryptotephra horizons, but in general the signal of tephra attenuated quickly with decreasing concentration of tephra. The basaltic tephra had a greater compositional difference from the background sediment and had a more distinct elemental response.

Comparison of the signal between different tephra grain size fractions showed that grain size appears to be inversely related to the strength of the elemental response produced by the Itrax. These experimental results were compared to XRF scans of a core from Sverigedalsvatn where basaltic and rhyolitic cryptotephra layers had previously been identified using conventional methods. Overall, I show that the use of scanning XRF to locate cryptotephra in minerogenic sediment is possible in ideal conditions, but generally difficult unless there are large differences in geochemistry of tephra compared to background sediment. XRF core scanners have an extremely small beam size that makes them ideal for high resolution measurements, but only classifies the composition of a small area of the core, which can hinder the detection of cryptotephra unless it is present in significant concentrations to affect the bulk geochemical composition of the sediment. Also, even if an elemental peak is attributed to a tephra layer it would still need to be isolated by traditional methods for further identification purposes.

### **Future Work**

This research was part of an initial effort to characterize different lacustrine environments of Lofoten to examine their potential in generating Holocene paleoenvironmental records. Additional work can be done to examine other geochemical proxies from these sediment cores and other environmental records from the area. Below are a few projects that will be pursued.

Vikjordvatnet provided a clear picture of changes in aquatic productivity through the Holocene and more geochemical analysis will be undertaken to further examine how the lake responded to environmental changes. I will analyze bulk carbon and nitrogen

isotopes to see if they confirm productivity changes interpreted from the other organic matter measurements. Also, the signal in Vikjordvatnet from 8.0-9.0 cal ka BP should be examined in more detail to further define environmental conditions near the 8.2 ka event and to try and confirm the timing of these changes with other regional records.

This research also showed that there may be a sedimentary record in some Lofoten lakes of land use changes associated with different prehistoric and historic settlement periods. Research targeting the last few thousand years of sedimentation in select lakes could address specific questions about the timing of settlement in the region and their environmental impacts. There is also the potential for developing robust chronologies using tephra deposits during this period. During the last field season in Lofoten, a surface core was taken from Lilandsvatnet (68°14.00'N, 13°47.60'E) in Borg, adjacent to main settlement area associated with the Viking cheftain center, and will be used to try and address some of these questions.

Tephra identified in Sverigedalsvatn as part of Chapter 6, will be used to improve the chronology of sediment cores from this lake in collaboration with B. Kvisvik (University of Bergen). The abundance of these tephra deposits and their compositions made them perfect for comparison to the scanning XRF data of the tephra-spiked synthetic cores, but I have not examined in detail their use for geochronology. However, both tephra were deposited around the Younger Dryas and I know their presence in this lake and others on Andøya could be useful to constraining environmental changes.

Another aspect of this region is the presence of modern glaciers on Austvågøy. Small cirque glaciers occupy the highest peaks of this islands and proglacial lakes potentially contain sedimentary records of glacier fluctuations, which are directly related

to climate conditions. As part of the last field season in Lofoten, cores were recovered from a small proglacial lake, Kneilvikvatnet (68°18.05'N, 14°50.26'E), and physical sedimentary properties will be examined to see if I can reconstruct glacier fluctuations in the valley over the last 500 years..

## **APPENDIX**

### **RAW DATA FROM SEDIMENT CORE ANALYSES**

This appendix contains the raw data from the analysis of sediment cores from Vikjordvatnet, Heimerdalsvatnet, and Fiskebølvatnet.



Appendix. Vikjordvatnet Core B08

Drive	Depth (cm)	Composite Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Wet Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Organic Matter (wt. %)	Water Content (%)	Mass Accum (g/cc/yr)
Drive 1	1	1	78	0.078	0.930	0.151	29.550	84	--
	2	2	126	0.126	1.033	0.173	28.955	83	0.004
	3	3	174	0.174	1.021	0.161	30.496	84	0.003
	4	4	222	0.222	0.947	0.137	34.409	85	0.003
	5	5	270	0.270	0.791	0.112	34.326	86	0.002
	6	6	317	0.317	0.918	0.130	36.795	86	0.003
	7	7	364	0.364	0.860	0.107	38.955	88	0.002
	8	8	411	0.411	1.011	0.167	26.600	83	0.004
	9	9	457	0.457	1.013	0.177	23.542	82	0.004
	10	10	503	0.503	0.993	0.159	25.864	84	0.003
	11	11	550	0.550	1.001	0.167	26.000	83	0.004
	12	12	595	0.595	1.012	0.173	23.880	83	0.004
	13	13	641	0.641	0.975	0.163	26.233	83	0.004
	14	14	686	0.686	1.002	0.183	22.449	82	0.004
	15	15	731	0.731	1.011	0.173	25.542	83	0.004
	16	16	776	0.776	0.941	0.156	26.537	83	0.003
	17	17	821	0.821	0.794	0.126	29.59	84	0.003
	18	18	865	0.865	0.761	0.1187	34.71	84	0.003
	19	19	910	0.910	0.779	0.1401	38.39	82	0.003
	20	20	954	0.954	0.740	0.1359	31.79	82	0.003
	21	21	997	0.997	0.938	0.151	29.19	84	0.003
	22	22	1041	1.041	0.968	0.162	27.27	83	0.004
	23	23	1084	1.084	0.818	0.132	30.84	84	0.003
	24	24	1128	1.128	0.776	0.1264	28.47	84	0.003
	25	25	1171	1.171	0.963	0.145	27.27	85	0.003
	26	26	1213	1.213	0.965	0.149	31.53	85	0.003
	27	27	1256	1.256	0.924	0.133	34.07	86	0.003
	28	28	1298	1.298	0.948	0.138	34.615	85	0.003
	29	29	1340	1.340	0.973	0.161	28.967	84	0.004
	30	30	1382	1.382	0.979	0.161	29.484	84	0.004
	31	31	1424	1.424	1.028	0.176	28.419	83	0.004
	32	32	1466	1.466	1.016	0.177	27.344	83	0.004
	33	33	1507	1.507	0.764	0.121	31.164	84	0.003
	34	34	1549	1.549	0.884	0.134	32.279	85	0.003
	35	35	1590	1.590	0.970	0.133	37.204	86	0.003
	36	36	1631	1.631	0.955	0.136	33.817	86	0.003
	37	37	1671	1.671	0.875	0.128	33.129	85	0.003
	38	38	1712	1.712	0.992	0.144	39.411	86	0.004

Drive	Depth (cm)	Composite Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Wet Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Organic Matter (wt. %)	Water Content (%)	Mass Accum (g/cc/yr)
	39	39	1752	1.752	0.922	0.132	41.536	86	0.003
	40	40	1792	1.792	1.018	0.164	30.390	84	0.004
	41	41	1832	1.832	0.952	0.148	29.947	84	0.004
	42	42	1872	1.872	0.989	0.153	29.012	84	0.004
	43	43	1912	1.912	0.890	0.128	32.590	86	0.003
	44	44	1952	1.952	0.937	0.151	28.385	84	0.004
	45	45	1991	1.991	0.953	0.150	29.466	84	0.004
	46	46	2030	2.030	0.968	0.152	29.793	84	0.004
	47	47	2069	2.069	0.947	0.148	30.160	84	0.004
	48	48	2108	2.108	1.004	0.161	27.001	84	0.004
	49	49	2147	2.147	0.934	0.157	26.196	83	0.004
	50	50	2186	2.186	0.995	0.155	26.603	84	0.004
	51	51	2224	2.224	0.884	0.145	24.598	84	0.004
	52	52	2263	2.263	0.949	0.162	21.467	83	0.004
	53	53	2301	2.301	0.994	0.169	22.261	83	0.004
	54	54	2339	2.339	0.984	0.156	24.161	84	0.004
	55	55	2377	2.377	0.985	0.153	24.746	84	0.004
	56	56	2415	2.415	1.003	0.167	23.664	83	0.004
	57	57	2453	2.453	1.014	0.160	25.076	84	0.004
	58	58	2490	2.490	1.003	0.151	27.477	85	0.004
	59	59	2528	2.528	1.014	0.159	25.046	84	0.004
	60	60	2565	2.565	0.989	0.153	24.381	85	0.004
	61	61	2603	2.603	1.040	0.164	25.357	84	0.004
	62	62	2640	2.640	1.010	0.153	27.065	85	0.004
	63	63	2677	2.677	0.965	0.148	26.115	85	0.004
	64	64	2714	2.714	0.963	0.154	24.921	84	0.004
	65	65	2751	2.751	1.002	0.163	25.224	84	0.004
	66	66	2787	2.787	0.964	0.148	25.545	85	0.004
	67	67	2824	2.824	1.014	0.165	24.911	84	0.005
	68	68	2860	2.860	1.031	0.179	24.194	83	0.005
	69	69	2897	2.897	1.029	0.166	25.810	84	0.005
	70	70	2933	2.933	0.999	0.173	23.503	83	0.005
	71	71	2969	2.969	0.892	0.152	23.910	83	0.004
	72	72	3005	3.005	0.921	0.146	25.753	84	0.004
	73	73	3042	3.042	0.959	0.154	25.253	84	0.004
	74	74	3077	3.077	0.986	0.157	26.621	84	0.004
	75	75	3113	3.113	0.982	0.144	27.143	85	0.004
	76	76	3149	3.149	0.881	0.133	30.947	85	0.004
	77	77	3185	3.185	0.938	0.147	30.426	84	0.004

Drive	Depth (cm)	Composite Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Wet Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Organic Matter (wt. %)	Water Content (%)	Mass Accum (g/cc/yr)
	78	78	3221	3.221	1.002	0.157	30.774	84	0.004
	79	79	3256	3.256	0.902	0.139	31.643	85	0.004
	80	80	3292	3.292	0.948	0.148	29.813	84	0.004
	81	81	3327	3.327	1.015	0.158	30.881	84	0.004
	82	82	3362	3.362	0.884	0.135	30.724	85	0.004
	83	83	3398	3.398	0.882	0.135	32.750	85	0.004
	84	84	3433	3.433	0.995	0.153	30.130	85	0.004
	85	85	3468	3.468	0.916	0.141	30.575	85	0.004
	86	86	3503	3.503	1.010	0.179	26.441	82	0.005
	87	87	3538	3.538	0.989	0.161	28.554	84	0.005
	88	88	3573	3.573	1.002	0.168	28.024	83	0.005
	89	89	3608	3.608	0.992	0.155	30.231	84	0.004
	90	90	3643	3.643	0.955	0.153	28.812	84	0.004
	91	91	3678	3.678	1.060	0.168	29.339	84	0.005
	92	92	3713	3.713	1.006	0.154	30.103	85	0.004
	93	93	3748	3.748	0.968	0.157	28.400	84	0.005
	94	94	3782	3.782	1.027	0.170	26.917	83	0.005
	95	95	3817	3.817	0.996	0.170	26.519	83	0.005
	96	96	3852	3.852	0.993	0.169	26.671	83	0.005
	97	97	3886	3.886	0.978	0.178	25.445	82	0.005
	98	98	3921	3.921	0.977	0.178	25.848	82	0.005
	99	99	3956	3.956	0.896	0.157	26.831	83	0.005
	100	100	3990	3.990	0.910	0.156	27.497	83	0.005
	2	101	4025	4.025	1.012	0.177	28.540	82	0.005
	3	102	4059	4.059	1.019	0.173	29.700	83	0.005
	4	103	4094	4.094	1.027	0.172	29.202	83	0.005
	5	104	4128	4.128	0.979	0.155	28.625	84	0.004
	6	105	4163	4.163	0.943	0.145	28.789	85	0.004
	7	106	4197	4.197	0.967	0.148	28.986	85	0.004
	8	107	4232	4.232	0.983	0.162	27.094	84	0.005
	9	108	4266	4.266	1.010	0.166	26.763	84	0.005
	10	109	4301	4.301	1.000	0.163	26.048	84	0.005
	11	110	4335	4.335	0.944	0.163	26.154	83	0.005
	12	111	4370	4.370	0.994	0.164	25.468	83	0.005
	13	112	4404	4.404	1.029	0.168	25.731	84	0.005
	14	113	4439	4.439	1.010	0.162	26.350	84	0.005
	15	114	4473	4.473	1.005	0.158	26.021	84	0.005
	16	115	4508	4.508	1.039	0.172	24.453	83	0.005
	17	116	4542	4.542	0.933	0.151	25.032	84	0.004

**Drive 2**

Drive	Depth (cm)	Composite Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Wet Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Organic Matter (wt. %)	Water Content (%)	Mass Accum (g/cc/yr)
	18	117	4577	4.577	1.022	0.168	26.954	84	0.005
	19	118	4611	4.611	1.022	0.170	26.030	83	0.005
	20	119	4646	4.646	0.999	0.160	27.447	84	0.005
	21	120	4681	4.681	1.027	0.159	28.095	85	0.005
	22	121	4715	4.715	0.949	0.145	27.818	85	0.004
	23	122	4750	4.750	0.988	0.150	28.416	85	0.004
	24	123	4785	4.785	0.898	0.132	32.826	85	0.004
	25	124	4819	4.819	1.017	0.161	27.153	84	0.005
	26	125	4854	4.854	1.026	0.183	26.165	82	0.005
	27	126	4889	4.889	1.026	0.166	27.468	84	0.005
	28	127	4924	4.924	0.981	0.167	26.027	83	0.005
	29	128	4959	4.959	0.949	0.158	26.589	83	0.005
	30	129	4994	4.994	0.988	0.154	29.679	84	0.004
	31	130	5029	5.029	0.986	0.166	26.901	83	0.005
	32	131	5064	5.064	0.960	0.158	26.415	84	0.005
	33	132	5099	5.099	0.990	0.167	25.550	83	0.005
	34	133	5134	5.134	1.002	0.171	25.821	83	0.005
	35	134	5169	5.169	1.042	0.179	25.775	83	0.005
	36	135	5204	5.204	1.000	0.171	25.298	83	0.005
	37	136	5240	5.240	1.004	0.164	27.219	84	0.005
	38	137	5275	5.275	1.023	0.167	27.556	84	0.005
	39	138	5311	5.311	1.019	0.159	28.736	84	0.004
	40	139	5346	5.346	0.996	0.160	27.922	84	0.005
	41	140	5382	5.382	0.990	0.161	28.017	84	0.005
	42	141	5418	5.418	1.009	0.161	27.966	84	0.004
	43	142	5453	5.453	1.014	0.161	27.420	84	0.004
	44	143	5489	5.489	1.012	0.150	30.735	85	0.004
	45	144	5525	5.525	1.032	0.156	29.448	85	0.004
	46	145	5561	5.561	1.013	0.155	28.365	85	0.004
	47	146	5597	5.597	1.007	0.153	28.255	85	0.004
	48	147	5633	5.633	0.975	0.153	28.372	84	0.004
	49	148	5670	5.670	1.027	0.158	28.844	85	0.004
	50	149	5706	5.706	1.015	0.159	27.901	84	0.004
	51	150	5743	5.743	0.887	0.132	28.696	85	0.004
	52	151	5779	5.779	1.009	0.144	29.268	86	0.004
	53	152	5816	5.816	0.992	0.144	28.628	86	0.004
	54	153	5853	5.853	0.713	0.105	30.916	85	0.003
	55	154	5889	5.889	1.004	0.158	27.306	84	0.004
	56	155	5926	5.926	0.976	0.155	25.836	84	0.004

Drive	Depth (cm)	Composite Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Wet Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Organic Matter (wt. %)	Water Content (%)	Mass Accum (g/cc/yr)
	57	156	5964	5.964	1.028	0.161	26.838	84	0.004
	58	157	6001	6.001	0.985	0.152	28.147	85	0.004
	59	158	6038	6.038	1.039	0.159	27.582	85	0.004
	60	159	6076	6.076	1.003	0.162	26.056	84	0.004
	61	160	6113	6.113	0.954	0.148	27.839	84	0.004
	62	161	6151	6.151	1.021	0.162	27.381	84	0.004
	63	162	6189	6.189	1.015	0.158	27.616	84	0.004
	64	163	6227	6.227	1.010	0.163	26.481	84	0.004
	65	164	6265	6.265	1.005	0.165	26.140	84	0.004
	66	165	6303	6.303	0.940	0.152	27.923	84	0.004
	67	166	6341	6.341	0.987	0.146	32.079	85	0.004
	68	167	6380	6.380	0.985	0.157	29.040	84	0.004
	69	168	6418	6.418	0.975	0.158	28.834	84	0.004
	70	169	6457	6.457	1.020	0.182	25.013	82	0.005
	71	170	6496	6.496	0.952	0.160	27.603	83	0.004
	72	171	6535	6.535	1.005	0.175	26.600	83	0.004
	73	172	6574	6.574	1.030	0.179	25.326	83	0.005
	74	173	6614	6.614	1.026	0.188	23.844	82	0.005
	75	174	6653	6.653	1.013	0.172	26.516	83	0.004
	76	175	6693	6.693	0.998	0.174	28.321	83	0.004
	77	176	6733	6.733	1.034	0.193	26.266	81	0.005
	78	177	6773	6.773	0.998	0.186	25.747	81	0.005
	79	178	6813	6.813	1.012	0.183	26.308	82	0.005
	80	179	6853	6.853	1.001	0.188	24.796	81	0.005
	81	180	6894	6.894	0.977	0.182	25.026	81	0.004
	82	181	6934	6.934	1.016	0.183	26.883	82	0.005
	83	182	6975	6.975	1.017	0.178	27.454	82	0.004
	84	183	7016	7.016	1.047	0.182	27.628	83	0.004
	85	184	7057	7.057	1.022	0.181	27.350	82	0.004
	86	185	7099	7.099	1.021	0.184	25.340	82	0.004
	87	186	7140	7.140	0.977	0.164	29.942	83	0.004
	88	187	7182	7.182	1.000	0.178	26.375	82	0.004
	89	188	7224	7.224	0.989	0.172	26.162	83	0.004
	90	189	7266	7.266	1.013	0.184	24.803	82	0.004
	91	190	7309	7.309	0.975	0.168	28.703	83	0.004
	92	191	7351	7.351	0.695	0.124	28.593	82	0.003
	93	192	7394	7.394	1.014	0.179	27.072	82	0.004
	94	193	7437	7.437	1.010	0.188	24.910	81	0.004
	95	194	7480	7.480	1.023	0.190	25.243	81	0.004

Drive	Depth (cm)	Composite Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Wet Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Organic Matter (wt. %)	Water Content (%)	Mass Accum (g/cc/yr)
	96	195	7523	7.523	0.997	0.173	26.685	83	0.004
	97	196	7567	7.567	1.020	0.182	25.455	82	0.004
	98	197	7610	7.610	1.020	0.191	24.147	81	0.004
	99	198	7654	7.654	1.044	0.201	23.208	81	0.005
	100	199	7698	7.698	1.057	0.199	24.963	81	0.005
	101	200	7743	7.743	1.038	0.189	25.578	82	0.004
	102	201	7787	7.787	1.028	0.201	22.627	80	0.005
	103	202	7832	7.832	1.028	0.211	20.646	79	0.005
	104	203	7877	7.877	1.011	0.202	21.994	80	0.004
	105	204	7923	7.923	0.834	0.164	22.309	80	0.004
	24	205	7968	7.968	1.017	0.188	21.880	82	0.004
	25	206	8014	8.014	1.037	0.205	20.853	80	0.004
	26	207	8060	8.060	1.017	0.191	21.166	81	0.004
	27	208	8106	8.106	1.059	0.202	19.319	81	0.004
	28	209	8152	8.152	0.977	0.179	20.656	82	0.004
	29	210	8199	8.199	0.963	0.177	22.695	82	0.004
	30	211	8246	8.246	1.004	0.194	19.394	81	0.004
	31	212	8293	8.293	0.990	0.208	17.622	79	0.004
	32	213	8341	8.341	1.014	0.212	18.857	79	0.004
	33	214	8388	8.388	1.012	0.197	20.489	81	0.004
	34	215	8436	8.436	0.981	0.196	19.471	80	0.004
	35	216	8484	8.484	1.009	0.199	19.625	80	0.004
	36	217	8533	8.533	1.002	0.202	19.369	80	0.004
	37	218	8581	8.581	0.991	0.217	17.972	78	0.004
	38	219	8630	8.630	1.254	0.524	6.798	58	0.011
	39	220	8680	8.680	1.036	0.218	20.404	79	0.004
	40	221	8729	8.729	1.049	0.222	18.146	79	0.004
	41	222	8779	8.779	1.035	0.226	17.713	78	0.005
	42	223	8829	8.829	0.995	0.209	18.369	79	0.004
	43	224	8879	8.879	1.069	0.226	18.261	79	0.004
	44	225	8930	8.930	1.024	0.209	18.873	80	0.004
	45	226	8981	8.981	1.029	0.198	20.298	81	0.004
	46	227	9032	9.032	0.983	0.191	20.277	81	0.004
	47	228	9083	9.083	1.043	0.199	20.790	81	0.004
	48	229	9135	9.135	1.025	0.192	21.985	81	0.004
	49	230	9187	9.187	1.036	0.215	21.295	79	0.004
	50	231	9239	9.239	0.996	0.201	21.896	80	0.004
	51	232	9292	9.292	1.024	0.213	20.276	79	0.004
	52	233	9345	9.345	1.029	0.216	23.032	79	0.004

**Drive 3**

Drive	Depth (cm)	Composite Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Wet Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Organic Matter (wt. %)	Water Content (%)	Mass Accum (g/cc/yr)
	53	234	9398	9.398	1.024	0.218	21.048	79	0.004
	54	235	9451	9.451	1.024	0.221	19.644	78	0.004
	55	236	9505	9.505	1.006	0.206	21.435	80	0.004
	56	237	9559	9.559	1.011	0.216	19.819	79	0.004
	57	238	9614	9.614	1.006	0.232	18.120	77	0.004
	58	239	9668	9.668	1.056	0.261	15.885	75	0.005
	59	240	9723	9.723	1.039	0.237	17.353	77	0.004
	60	241	9779	9.779	1.036	0.240	16.872	77	0.004
	61	242	9834	9.834	1.033	0.244	16.229	76	0.004
	62	243	9890	9.890	1.030	0.242	16.293	77	0.004
	63	244	9946	9.946	1.044	0.268	13.965	74	0.005
	64	245	10003	10.003	0.887	0.224	14.109	75	0.004
	65	246	10060	10.060	1.081	0.280	13.352	74	0.005
	66	247	10117	10.117	1.098	0.288	13.180	74	0.005
	67	248	10175	10.175	1.091	0.295	12.835	73	0.005
	68	249	10233	10.233	1.125	0.323	11.217	71	0.006
	69	250	10291	10.291	1.107	0.282	14.286	75	0.005
	70	251	10350	10.350	1.148	0.338	10.593	71	0.006
	71	252	10409	10.409	1.119	0.318	11.011	72	0.005
	72	253	10468	10.468	1.136	0.311	11.554	73	0.005
	73	254	10528	10.528	1.121	0.319	10.821	72	0.005
	74	255	10588	10.588	1.111	0.289	12.837	74	0.005
	75	256	10648	10.648	1.103	0.270	14.608	76	0.004
	76	257	10709	10.709	1.069	0.270	13.214	75	0.004
	77	258	10770	10.770	1.103	0.300	10.605	73	0.005
	78	259	10831	10.831	1.068	0.310	11.663	71	0.005
	79	260	10893	10.893	1.067	0.328	8.954	69	0.005
	80	261	10955	10.955	1.129	0.340	8.890	70	0.005
	81	262	11018	11.018	1.129	0.366	7.960	68	0.006
	82	263	11080	11.080	1.132	0.367	7.730	68	0.006
	83	264	11144	11.144	1.097	0.368	7.307	66	0.006
	84	265	11207	11.207	1.170	0.410	6.507	65	0.006
	85	266	11271	11.271	1.208	0.443	5.664	63	0.007
	86	267	11336	11.336	1.152	0.410	5.831	64	0.006
	12	268	11400	11.400	1.769	1.336	1.916	24	0.021
	13	269	11466	11.466	1.756	1.326	1.865	24	0.020
	14	270	11531	11.531	1.610	1.273	1.134	21	0.019
	15	271	11597	11.597	1.826	1.524	0.769	17	0.023
	16	272	11663	11.663	1.758	1.363	1.604	22	0.021

Drive 4

Drive	Depth (cm)	Composite Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Wet Bulk Density (g/cc)	Dry Bulk Density (g/cc)	Organic Matter (wt. %)	Water Content (%)	Mass Accum (g/cc/yr)
	17	273	11730	11.730	1.751	1.303	1.735	26	0.020
	18	274	11797	11.797	1.640	1.195	2.045	27	0.018
	19	275	11865	11.865	1.749	1.281	1.812	27	0.019
	20	276	11932	11.932	1.680	1.176	2.331	30	0.017
	21	277	12001	12.001	1.502	0.906	3.267	40	0.013
	22	278	12069	12.069	1.724	0.943	3.959	45	0.014
	23	279	12138	12.138	1.616	0.894	3.752	45	0.013
	24	280	12208	12.208	1.398	0.716	3.761	49	0.010
	25	281	12278	12.278	1.361	0.690	3.911	49	0.010
	26	282	12348	12.348	1.392	0.753	4.219	46	0.011
	27	283	12419	12.419	1.410	0.740	4.388	48	0.010
	28	284	12490	12.490	1.419	0.791	3.938	44	0.011
	29	285	12562	12.562	1.408	0.773	3.609	45	0.011
	30	286	12634	12.634	1.326	0.629	4.533	53	0.009
	31	287	12706	12.706	1.367	0.676	4.325	51	0.009
	32	288	12779	12.779	1.373	0.709	4.297	48	0.010
	33	289	12852	12.852	1.353	0.669	4.423	51	0.009
	34	290	12926	12.926	1.401	0.718	3.916	49	0.010
	35	291	13000	13.000	1.668	1.180	1.937	29	0.016
	36	292	13075	13.075	1.498	0.964	2.308	36	0.013
	37	293	13150	13.150	1.420	0.773	3.401	46	0.010
	38	294	13225	13.225	1.734	1.272	1.629	27	0.017
	39	295	13301	13.301	1.280	0.803	2.534	37	0.011
	40	296	13377	13.377	1.378	0.858	2.575	38	0.011
	41	297	13454	13.454	1.519	1.020	2.147	33	0.013
	42	298	13532	13.532	1.112	1.314	1.324	26	0.017
	43	299	13609	13.609	1.731	1.324	0.926	24	0.017
	44	300	13687	13.687	1.251	1.022	0.348	18	0.013
	45	301	13766	13.766	1.552	1.248	0.601	20	0.016



Appendix. Vikjordvatnet Itrax scanning XRF data.

Depth (cm)	Age (cal yr BP)	kcps	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
2	126	8.65	0	2	5	1	17	16	42	3	44	10	14	1978	9428	10	1	18	73	0	23	8	60	27	19	20	3	8	3199	752
2.5	150	9.05	2	0	3	2	19	16	48	0	41	4	5	1766	10622	6	8	34	66	26	27	34	51	19	24	19	0	2	3091	704
3	174	9.15	2	0	5	4	19	23	47	1	44	1	6	1012	9940	17	10	26	58	3	42	11	63	21	21	8	1	3	3262	720
3.5	198	9.13	6	3	4	4	20	21	51	0	45	0	6	429	8493	18	18	33	54	32	49	16	64	23	28	0	0	0	3496	738
4	222	9.03	3	1	4	1	21	21	52	0	51	0	6	131	6758	20	24	24	57	35	49	6	63	15	28	4	0	12	3670	772
4.5	246	9.01	7	4	3	1	19	19	51	1	47	1	0	124	5070	22	25	12	77	40	61	14	88	19	29	0	15	0	4100	844
5	270	9.10	7	0	3	0	19	15	50	3	46	4	5	118	3502	25	3	10	95	20	40	3	70	36	26	0	14	0	4124	820
5.5	293	9.10	8	4	5	0	17	15	54	1	43	4	1	105	3319	18	26	12	78	26	53	35	76	20	34	13	4	17	4195	840
6	317	9.19	9	4	5	1	14	16	48	0	40	4	0	140	3708	18	15	18	78	25	32	4	86	30	34	2	0	2	4080	817
6.5	340	9.22	7	3	2	0	14	13	58	4	43	8	0	157	3617	18	17	28	91	14	56	13	57	37	40	0	4	0	4157	826
7	364	9.23	8	6	6	1	15	14	52	2	41	0	8	111	3538	14	14	28	88	9	62	40	98	25	27	8	12	11	4155	870
7.5	387	9.30	15	7	9	0	16	10	51	0	42	5	3	108	3531	19	17	19	69	13	32	26	87	35	26	0	0	0	4135	815
8	411	8.97	8	3	3	0	19	14	43	0	27	4	0	144	3649	1	9	6	33	0	43	1	66	25	36	0	10	2	4076	807
8.5	434	9.06	8	5	7	2	20	21	54	0	40	6	4	171	5494	30	26	19	68	4	41	12	88	26	36	2	8	2	3968	795
9	457	8.86	6	2	4	0	16	16	58	0	48	6	4	129	5077	16	1	29	55	41	38	0	92	38	23	10	13	9	3871	795
9.5	480	8.98	4	1	3	2	22	23	60	4	56	9	2	175	7351	15	12	21	21	24	60	32	116	25	33	18	13	5	3651	784
10	503	9.05	0	0	4	2	24	34	65	2	55	5	0	127	8509	20	9	10	47	15	66	37	72	31	29	0	12	17	3567	755
10.5	527	8.94	6	4	3	0	13	21	62	0	57	5	8	149	7942	25	25	24	58	32	47	16	80	19	23	16	4	11	3501	736
11	550	8.91	1	1	4	0	19	22	58	3	50	5	0	127	7117	12	12	33	54	32	47	16	80	19	23	16	1	1	3678	774
11.5	572	9.12	2	0	1	0	16	21	52	2	49	5	2	112	8023	4	11	12	29	22	45	0	80	22	28	6	0	10	3528	749
12	595	9.06	0	2	3	2	19	26	55	2	51	6	0	121	7946	11	12	17	45	6	50	8	61	19	24	4	7	12	3645	767
12.5	618	9.02	0	0	6	0	24	33	70	1	71	4	1	118	9070	29	44	20	40	13	64	7	69	12	34	11	6	8	3423	768
13	641	8.99	1	1	8	4	23	33	69	2	70	2	10	174	9021	27	23	31	45	20	68	21	62	22	24	10	0	8	3446	719
13.5	664	9.03	6	2	6	4	23	24	61	0	63	0	3	117	7509	25	16	23	57	20	56	14	74	20	34	1	1	15	3672	783
14	686	8.72	2	1	6	4	23	28	60	0	49	1	5	109	7552	14	2	20	65	18	51	5	74	26	32	12	23	18	3625	776
14.5	709	8.76	0	0	4	3	21	24	65	1	60	3	6	118	9410	34	12	44	24	21	75	15	87	26	28	12	0	24	3393	756
15	731	9.10	4	0	7	1	22	25	55	5	62	6	0	186	10162	15	2	20	28	18	45	15	65	20	25	0	9	0	3276	736
15.5	754	9.02	3	0	5	4	20	26	61	0	46	7	0	154	9076	16	22	18	32	21	41	0	89	17	16	0	0	0	3483	773
16	776	9.33	1	3	4	3	19	25	55	2	58	2	1	145	8851	13	12	17	43	25	49	14	66	23	26	4	3	8	3472	745
16.5	799	9.43	1	0	5	0	18	22	61	0	52	6	1	127	8332	17	11	21	58	41	73	11	88	27	24	3	0	9	3452	740
17	821	9.29	3	0	4	4	16	21	57	3	50	0	0	167	7745	24	10	24	53	30	58	0	60	29	25	6	0	0	3569	776
17.5	843	9.44	6	0	4	1	20	24	56	0	59	5	4	228	8503	16	14	23	47	15	72	17	70	23	18	0	21	9	3517	764
18	865	9.14	1	0	6	2	18	22	50	3	60	5	7	164	6515	20	21	25	60	19	85	24	73	15	34	8	6	0	3740	776
18.5	888	9.25	7	5	3	1	14	22	51	0	54	4	1	157	6196	7	2	5	65	17	57	17	102	29	27	7	0	11	3831	840
19	910	9.24	2	3	4	0	14	19	50	1	44	7	0	173	5372	12	19	11	48	28	47	0	81	14	22	13	0	11	3839	776
19.5	932	9.45	5	2	3	2	17	18	54	0	46	8	0	106	5064	19	19	16	64	0	63	32	103	23	31	9	0	18	3991	824
20	954	9.18	6	4	6	1	16	16	46	0	37	2	5	120	4020	13	11	11	67	15	38	6	94	33	39	24	0	11	4044	808
20.5	976	9.21	0	0	5	2	20	24	57	4	51	4	2	162	7302	10	12	17	49	6	53	30	60	21	25	6	0	0	3605	778
21	997	9.43	0	0	5	0	17	27	64	5	62	3	2	119	8460	18	7	14	54	46	56	10	94	17	26	0	5	0	3492	718

Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
21.5	1019	9.57	0	1	4	2	18	23	58	5	45	2	0	161	7331	26	7	15	59	15	49	0	70	18	19	0	14	11	3542	707
22	1041	9.63	1	0	5	2	15	24	51	1	44	8	0	125	7253	35	23	25	60	10	54	0	85	20	27	15	12	17	3563	722
22.5	1063	9.64	6	2	3	2	15	21	55	0	50	3	0	131	7436	16	26	23	65	16	54	23	80	16	28	13	6	13	3627	765
23	1084	9.58	0	0	4	1	15	23	56	0	47	0	0	161	6580	23	16	17	56	32	63	18	68	11	36	0	2	0	3727	798
23.5	1106	9.56	2	2	9	4	17	22	52	1	52	0	2	121	7754	15	12	17	58	24	82	6	71	26	21	11	0	6	3504	784
24	1128	9.72	3	0	1	0	13	16	46	1	37	3	2	113	5212	17	10	3	40	35	65	8	95	23	29	6	0	0	3981	845
24.5	1149	9.69	8	4	4	0	11	12	38	0	38	6	6	148	4355	4	15	25	60	22	31	0	63	33	24	0	0	16	4026	789
25	1171	9.66	0	0	4	2	17	20	52	2	45	4	0	105	7609	13	6	22	44	16	65	10	65	21	30	2	7	17	3552	738
25.5	1192	9.22	5	0	5	3	17	21	48	3	37	1	2	89	5560	28	30	18	53	13	71	21	78	20	28	10	25	14	3965	819
26	1213	9.50	1	0	5	1	16	23	52	3	42	2	0	196	7224	23	15	26	56	10	38	0	84	25	16	2	19	5	3582	747
26.5	1235	9.23	0	0	3	2	18	21	54	0	48	0	0	144	7601	12	14	15	48	17	64	9	81	18	29	2	5	17	3643	796
27	1256	9.32	7	1	1	4	12	20	47	1	43	4	0	187	7344	27	22	19	71	51	18	10	63	20	27	0	12	0	3688	748
27.5	1277	9.49	5	1	4	4	16	13	48	1	39	6	0	276	6355	16	10	16	56	26	30	9	86	29	29	11	6	2	3732	783
28	1298	9.42	11	7	3	0	5	8	41	0	31	1	5	224	3602	21	22	12	81	0	28	34	68	22	37	0	15	12	4130	836
28.5	1319	9.06	0	0	5	1	14	21	56	3	54	5	0	206	7074	13	18	23	60	9	33	20	61	26	20	0	7	6	3661	796
29	1340	9.07	0	0	6	3	16	26	57	1	53	4	2	187	8159	25	13	35	41	6	54	0	54	21	24	6	2	7	3446	730
29.5	1361	9.55	0	0	7	6	20	28	69	3	51	2	0	204	10472	15	17	19	70	17	51	10	73	21	27	5	0	9	3199	758
30	1382	9.61	0	0	4	3	17	28	58	1	52	2	3	260	8881	22	15	28	53	38	75	35	76	13	31	14	17	10	3451	753
30.5	1403	9.68	0	0	3	2	14	22	54	2	43	0	0	193	7431	24	9	27	46	8	73	3	52	26	31	13	0	12	3678	785
31	1424	9.43	3	0	6	3	15	30	75	1	61	10	3	205	7872	22	19	19	58	39	70	22	93	20	34	8	10	15	3558	770
31.5	1445	9.36	0	1	6	2	13	35	73	0	74	7	5	297	7405	18	22	25	41	37	72	0	89	15	19	5	0	2	3569	746
32	1466	9.43	2	1	5	1	13	36	67	3	68	4	4	247	7510	31	11	38	47	27	54	0	83	30	34	0	9	0	3588	790
32.5	1487	9.96	2	2	3	1	11	28	59	4	56	3	4	270	7016	27	17	33	52	23	79	10	107	24	24	0	10	2	3581	778
33	1507	9.64	4	0	3	0	13	23	53	3	53	7	4	232	6264	23	16	25	43	33	70	0	75	26	30	12	8	2	3677	791
33.5	1528	9.72	3	0	5	3	13	21	47	2	38	5	1	291	6225	15	15	30	50	9	34	36	78	18	23	11	2	13	3784	801
34	1549	9.77	9	4	7	2	11	19	44	1	45	3	7	346	6517	19	17	19	61	13	52	24	90	31	17	14	7	19	3789	783
34.5	1569	10.08	11	5	4	0	10	18	45	0	41	5	4	287	4771	14	14	33	51	27	42	13	83	24	41	1	16	0	4049	842
35	1590	10.10	9	3	2	0	7	8	31	1	29	6	4	308	3644	17	19	27	65	11	31	26	78	22	29	8	5	11	4121	845
35.5	1610	9.99	2	0	6	0	12	10	38	1	30	5	0	189	5039	22	14	23	60	16	7	7	66	40	22	8	20	0	3931	817
36	1631	10.04	8	4	2	0	9	10	34	1	26	7	0	346	4468	12	0	8	75	20	51	23	100	26	40	0	26	0	4057	821
36.5	1651	9.96	12	5	3	2	7	14	38	2	32	6	3	280	4160	21	0	23	59	3	31	11	78	30	34	19	3	22	3973	827
37	1671	9.82	6	1	6	0	10	14	37	1	38	1	1	319	4619	17	18	21	54	40	28	1	70	27	32	3	12	2	3887	808
37.5	1692	10.18	6	5	4	0	8	12	43	0	37	0	0	398	3740	17	0	14	65	0	32	24	68	33	26	14	28	21	4024	776
38	1712	10.13	9	3	3	0	5	11	41	0	27	4	4	367	2909	4	18	3	78	18	36	0	65	18	27	3	8	0	4156	796
38.5	1732	10.14	16	9	4	0	8	8	40	0	22	7	2	477	1992	6	9	0	43	13	24	0	70	25	32	10	2	15	4283	882
39	1752	9.67	11	1	6	0	5	10	43	0	25	5	6	690	2116	12	17	15	54	19	10	0	61	36	37	21	6	6	4148	841
39.5	1772	8.71	0	0	3	4	14	20	66	4	34	6	1	1603	4079	8	0	21	74	0	60	5	47	31	32	8	0	15	3645	826
40	1792	9.94	3	6	4	0	11	14	50	1	36	4	8	1710	7394	4	10	43	49	26	39	4	76	22	30	3	5	0	3406	721
40.5	1812	10.01	8	4	5	0	8	18	42	0	36	4	5	1194	5932	17	17	41	59	16	38	3	65	20	38	0	4	6	3685	755
41	1832	9.69	0	0	0	0	13	18	43	1	42	3	6	830	5589	7	4	12	65	8	60	9	77	23	30	0	4	10	3751	778
41.5	1852	9.63	0	2	6	0	13	24	52	3	45	11	1	534	6029	13	17	23	63	16	48	0	60	19	30	4	10	0	3725	774
42	1872	9.59	0	0	4	3	13	19	51	6	45	3	0	326	6337	26	19	29	62	7	83	12	67	29	33	0	6	4	3705	800

Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
42.5	1892	9.59	4	1	3	0	13	14	44	3	46	6	0	438	5569	20	8	22	44	32	43	6	63	35	25	8	16	10	3834	805
43	1912	9.94	8	5	1	0	5	7	41	0	31	3	2	306	2966	18	7	22	58	4	48	25	84	36	41	0	1	4	4189	859
43.5	1932	9.56	6	1	4	0	11	13	51	1	44	9	7	321	3012	11	7	5	60	10	32	8	93	25	35	10	16	10	4136	843
44	1952	9.68	0	0	4	3	17	26	55	0	48	0	3	642	7357	13	14	41	64	29	36	16	63	17	23	7	4	2	3549	758
44.5	1971	9.92	1	1	6	4	15	23	55	4	44	5	4	618	9320	14	11	31	36	28	35	9	56	21	36	0	7	4	3325	762
45	1991	9.75	0	0	5	1	11	19	50	0	43	2	0	348	6520	8	26	22	23	8	50	30	103	31	24	5	3	20	3719	786
45.5	2011	9.91	4	6	5	1	10	16	46	0	42	0	0	432	5527	18	26	28	66	23	42	21	79	22	27	2	9	8	3822	781
46	2030	9.74	6	1	4	3	12	23	59	1	52	2	7	301	6571	16	13	16	55	0	36	7	69	22	42	7	1	18	3720	814
46.5	2050	9.75	7	1	4	0	8	22	51	1	42	9	2	259	4957	17	10	20	78	20	54	33	60	30	43	20	2	22	3941	801
47	2069	9.60	11	5	4	0	8	18	43	0	40	8	0	231	4328	16	8	25	64	4	57	29	80	33	35	0	15	18	4024	807
47.5	2089	9.41	0	1	6	4	16	24	60	1	52	0	2	372	6188	12	24	34	41	31	40	6	86	24	26	10	11	0	3723	827
48	2108	9.60	0	0	4	1	13	21	53	0	53	4	0	297	7388	24	16	21	69	26	50	30	94	25	34	7	13	12	3624	813
48.5	2128	9.29	5	2	5	2	14	23	52	4	51	6	8	197	5326	20	0	31	44	17	61	5	51	33	21	18	0	9	3831	822
49	2147	9.43	8	1	3	0	9	21	50	0	48	6	0	254	5858	15	9	15	55	20	52	0	84	24	24	6	7	4	3825	797
49.5	2167	9.56	4	0	4	1	13	21	52	0	48	6	1	271	6072	9	5	10	57	21	39	13	58	20	39	10	0	9	3809	782
50	2186	9.24	9	3	3	0	12	19	46	0	40	6	6	211	4671	10	15	20	61	3	49	0	78	20	31	18	9	5	3840	812
50.5	2205	9.11	4	3	3	3	13	22	48	1	47	4	0	179	5788	19	7	23	64	18	50	24	81	26	19	12	7	14	3750	793
51	2224	9.09	2	0	4	1	12	31	61	0	59	4	3	148	6674	13	24	35	43	11	68	0	71	15	31	6	5	13	3649	799
51.5	2244	9.19	0	2	7	1	19	27	61	2	61	8	4	140	6033	14	15	17	47	39	54	20	84	20	24	15	1	9	3771	796
52	2263	9.14	2	1	5	3	15	29	57	6	58	5	2	214	6530	14	20	29	33	34	71	13	77	12	43	17	18	19	3680	795
52.5	2282	9.32	1	0	1	3	11	28	52	5	47	3	3	151	7015	18	16	27	34	26	75	4	85	12	23	4	0	0	3674	788
53	2301	9.43	3	0	5	2	16	24	49	1	48	6	1	164	5173	15	17	33	54	0	53	21	86	28	31	18	18	25	3843	816
53.5	2320	9.38	0	0	4	0	13	18	41	2	42	3	4	120	6965	24	5	25	54	16	52	24	81	30	24	4	1	14	3660	814
54	2339	9.56	5	0	3	0	8	20	44	3	41	5	8	245	5176	12	15	21	69	26	46	11	81	21	30	13	0	11	3931	806
54.5	2358	9.49	3	0	2	0	13	16	40	0	42	3	0	156	5439	12	18	25	50	37	56	0	69	18	37	7	11	0	3867	801
55	2377	9.21	6	2	3	0	8	17	43	2	42	4	7	176	3735	15	16	21	77	3	51	0	63	26	32	9	18	5	4046	838
55.5	2396	9.49	0	0	2	0	11	20	54	0	52	4	3	110	8341	23	20	27	28	3	32	14	43	17	22	0	0	6	3508	743
56	2415	9.55	11	6	8	0	7	15	43	0	44	4	0	175	5634	19	6	21	56	28	36	11	93	23	29	5	0	2	3890	815
56.5	2434	9.39	7	8	5	0	7	15	47	0	44	8	0	225	4277	15	10	29	45	17	51	16	75	30	33	6	0	15	4060	855
57	2453	9.61	7	6	4	0	10	17	48	0	41	0	5	131	5505	9	20	38	38	4	72	13	63	23	34	18	4	10	3902	809
57.5	2472	9.43	7	2	4	1	14	21	56	1	49	4	0	152	4886	4	16	20	59	13	60	38	66	19	27	13	2	21	3980	828
58	2490	9.25	5	3	3	0	11	21	60	3	39	11	2	132	4899	15	6	30	45	33	61	22	52	36	28	23	0	16	3971	839
58.5	2509	9.40	3	1	4	0	14	23	63	1	57	6	3	139	5649	12	0	44	54	17	52	21	80	22	30	19	13	11	3795	793
59	2528	9.13	6	3	3	0	13	21	62	0	56	6	6	264	4973	19	0	12	53	6	50	18	94	27	29	3	12	5	3799	791
59.5	2547	9.42	0	0	6	3	17	29	65	3	62	8	0	119	6923	25	19	36	30	15	47	17	75	22	33	11	13	13	3655	771
60	2565	9.72	6	6	7	2	15	27	58	2	53	3	0	143	6550	19	8	25	31	16	33	5	76	22	30	12	0	6	3769	788
60.5	2584	9.52	4	7	3	1	13	22	57	0	50	4	0	124	6971	19	24	28	42	44	65	0	74	21	30	5	3	4	3708	790
61	2603	9.54	2	3	1	0	14	19	56	2	43	3	0	187	6456	27	21	29	72	39	36	29	64	24	29	0	2	3800	795	
61.5	2621	9.56	0	0	4	0	14	19	55	1	42	6	3	133	5964	22	17	29	70	24	10	24	79	26	20	6	10	0	3810	797
62	2640	9.36	3	1	4	0	13	21	57	3	43	3	0	149	6234	18	16	46	64	27	29	0	63	25	14	0	13	10	3729	765
62.5	2658	9.56	3	3	5	3	13	19	53	1	48	3	0	146	8050	16	6	26	50	9	43	0	54	23	27	0	0	8	3407	757
63	2677	9.61	6	7	5	1	11	22	56	0	48	5	1	161	6241	25	22	32	69	22	44	7	73	24	28	0	0	0	3797	798

Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
63.5	2695	9.57	2	1	4	1	12	23	61	1	61	6	0	208	7165	21	10	19	49	30	35	9	82	26	33	0	1	7	3602	805
64	2714	9.27	3	1	3	0	13	23	59	0	54	8	1	166	5286	14	14	23	66	17	76	16	75	27	33	2	8	12	3879	824
64.5	2732	9.39	6	3	1	0	11	17	52	0	48	7	8	182	4513	21	16	27	58	7	72	16	70	34	37	7	6	21	4052	822
65	2751	9.29	3	2	4	0	11	20	60	0	52	6	7	99	4456	3	8	22	93	38	60	23	90	27	36	18	19	21	4029	831
65.5	2769	9.67	7	8	4	3	10	20	56	0	55	1	0	110	6584	18	13	26	43	2	35	27	96	25	19	0	0	3	3728	795
66	2787	9.38	8	7	4	0	11	24	58	0	50	7	6	158	4840	7	1	20	55	33	45	0	67	26	27	0	16	3	3940	796
66.5	2806	9.16	0	2	4	1	14	28	72	3	65	7	1	168	6276	19	28	43	68	20	53	38	67	20	28	0	7	14	3695	798
67	2824	9.27	1	0	7	1	16	32	61	5	70	4	6	176	7403	22	13	28	44	35	57	24	69	23	22	9	14	0	3519	761
67.5	2842	9.39	5	3	3	2	14	26	67	0	55	5	4	253	5190	17	15	36	57	29	26	0	80	21	32	9	0	6	3809	774
68	2860	9.08	3	3	5	1	18	24	67	0	56	13	8	180	5335	8	7	24	77	0	59	3	53	21	35	8	16	35	3754	764
68.5	2879	9.30	5	6	7	2	17	26	69	0	59	8	10	167	7435	13	12	38	66	21	49	10	56	26	25	9	9	6	3619	746
69	2897	9.16	0	0	3	1	18	32	71	4	70	10	5	198	5682	5	8	14	57	45	73	2	83	16	33	0	0	8	3751	776
69.5	2915	9.14	5	6	6	1	15	28	66	0	62	8	6	186	5938	18	10	26	28	51	76	35	84	26	33	14	8	16	3819	857
70	2933	9.35	2	5	3	0	13	23	57	0	55	4	6	274	5896	10	24	30	42	17	75	27	72	19	31	3	0	7	3780	776
70.5	2951	9.24	5	5	4	0	10	28	63	0	48	6	1	154	4795	20	20	50	49	29	43	22	88	26	26	10	19	5	3916	793
71	2969	9.20	0	3	4	0	15	24	59	2	54	1	5	155	4547	15	0	34	53	24	50	21	98	25	23	8	5	8	4009	842
71.5	2987	9.25	9	6	3	1	12	23	60	0	50	6	5	312	4223	9	12	28	56	42	44	30	86	25	33	1	17	9	3976	853
72	3005	9.22	0	6	10	2	17	30	68	2	49	8	2	124	7008	21	12	45	49	51	55	0	96	18	44	0	14	0	3694	791
72.5	3023	9.65	0	6	6	1	16	23	66	1	64	2	0	247	5903	14	21	34	29	37	85	26	85	17	27	0	13	14	3812	799
73	3042	9.51	7	4	4	0	13	22	61	0	47	9	3	192	4641	18	8	19	40	14	27	29	98	28	25	8	11	0	4026	836
73.5	3060	9.80	5	3	3	0	12	17	53	4	40	4	1	138	5573	14	14	36	57	30	53	16	62	18	26	10	14	0	3857	783
74	3077	9.74	5	4	7	0	16	20	60	0	48	4	5	166	5139	19	20	32	66	5	25	0	52	25	32	2	7	3	3919	811
74.5	3095	9.84	2	6	2	0	11	26	61	0	49	6	4	110	6937	9	8	33	44	14	55	30	69	25	31	0	11	13	3808	776
75	3113	9.78	3	4	3	0	16	25	53	0	46	0	2	175	4839	9	12	27	49	8	18	26	58	31	28	0	14	29	3943	773
75.5	3131	9.81	6	4	5	0	13	22	58	0	52	2	5	116	5422	22	6	32	53	13	41	29	67	21	20	8	14	16	3837	821
76	3149	9.73	4	5	8	0	18	27	62	0	44	2	1	126	5910	19	1	28	48	14	36	5	83	26	31	4	7	20	3861	780
76.5	3167	9.65	6	6	6	4	14	25	55	2	52	1	4	156	6578	17	7	19	47	2	33	7	68	37	19	4	14	6	3686	784
77	3185	9.89	0	0	2	0	14	23	58	0	52	4	0	237	7040	21	11	23	43	7	59	4	58	24	34	6	0	21	3625	768
77.5	3203	9.79	4	1	5	2	17	24	58	1	46	5	0	141	7277	13	23	28	28	9	47	21	41	14	32	0	4	5	3656	794
78	3221	9.89	9	9	4	0	13	15	54	0	51	5	4	210	5930	11	18	8	46	22	47	18	46	19	22	0	5	0	3841	798
78.5	3238	9.44	5	4	5	0	15	20	62	2	49	2	2	172	4940	27	10	39	79	42	56	0	67	38	44	22	11	8	3875	819
79	3256	9.93	5	1	3	2	15	25	55	1	49	4	0	163	7744	22	16	29	31	21	45	24	42	21	20	5	5	0	3610	749
79.5	3274	9.61	5	5	4	2	12	23	58	0	45	0	1	150	5581	11	8	30	36	39	8	2	112	22	29	0	11	0	3883	832
80	3292	9.73	7	5	2	0	14	17	54	0	41	3	0	138	5544	18	17	22	52	5	9	42	64	27	18	9	0	10	3827	755
80.5	3309	9.48	8	1	3	1	15	21	56	0	45	7	0	188	6387	23	10	17	39	16	28	21	56	20	34	0	21	7	3797	799
81	3327	9.79	7	3	5	2	16	22	57	0	42	2	4	178	7665	11	10	17	39	16	52	29	62	19	32	3	12	8	3620	762
81.5	3345	9.82	3	1	5	1	14	21	64	0	40	3	1	127	5955	16	15	29	54	12	55	29	64	21	31	19	0	13	3840	805
82	3362	9.67	10	7	6	0	14	21	57	0	42	5	3	146	4374	6	12	21	50	18	43	26	69	29	27	1	6	15	4006	787
82.5	3380	9.71	6	4	8	1	14	23	60	0	45	4	0	260	6166	18	15	35	30	18	43	42	107	32	30	1	8	2	3826	780
83	3398	9.54	7	3	1	0	16	20	56	0	48	2	1	144	5210	5	8	33	41	12	50	0	67	30	31	4	4	20	3828	790
83.5	3415	9.44	11	8	6	1	17	22	54	0	43	4	2	167	5749	9	9	27	37	18	17	39	92	27	25	7	0	0	3907	769
84	3433	9.60	1	2	4	3	18	33	74	4	59	8	9	127	8173	18	14	24	46	20	54	0	74	24	28	0	0	13	3552	765

Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
84.5	3450	9.44	2	0	2	1	16	36	71	6	62	13	4	373	6988	20	19	32	57	38	83	38	82	33	29	2	17	11	3647	798
85	3468	9.56	0	0	4	1	18	36	84	1	72	6	10	154	7129	21	17	17	62	43	58	17	101	27	28	20	11	5	3580	776
85.5	3486	9.89	0	0	4	0	18	29	62	0	52	3	3	161	8478	14	8	25	53	18	52	23	90	21	28	14	20	8	3483	753
86	3503	9.84	6	4	3	1	16	27	63	1	48	4	3	185	6413	16	1	20	74	36	24	34	97	35	31	0	8	6	3771	794
86.5	3521	9.94	0	5	8	3	18	32	68	0	56	5	0	133	7658	20	7	30	30	43	34	13	84	24	19	0	0	0	3582	783
87	3538	9.75	8	4	6	0	15	23	63	1	49	6	1	195	5787	18	19	37	20	4	35	0	43	16	30	2	0	13	3743	779
87.5	3556	9.59	8	3	3	3	14	25	60	1	43	2	3	179	5796	15	20	24	40	17	44	11	59	31	39	0	0	0	3909	761
88	3573	9.71	5	6	4	2	14	22	60	1	50	6	4	227	5738	0	18	26	69	39	42	0	67	16	27	9	5	3	3816	774
88.5	3591	9.68	4	0	2	1	17	26	67	1	56	4	2	196	6120	17	13	22	55	13	33	30	61	31	15	0	8	16	3765	785
89	3608	9.64	12	10	6	0	11	18	52	0	43	5	3	159	5221	6	16	32	52	0	26	8	75	27	34	0	0	0	3887	816
89.5	3626	9.49	5	4	3	0	13	23	57	0	42	8	1	119	5625	15	6	18	60	20	36	15	69	26	36	0	12	1	3788	790
90	3643	9.52	6	6	2	0	13	21	58	0	45	2	4	118	5027	1	6	15	56	25	35	6	82	33	27	0	11	0	3850	821
90.5	3661	9.38	9	5	3	1	13	19	54	3	47	5	4	177	4284	14	16	24	54	7	54	15	68	20	32	8	14	1	4067	846
91	3678	9.28	0	2	3	0	17	31	68	3	52	8	3	219	6664	21	10	29	38	33	64	23	88	29	25	10	2	6	3680	788
91.5	3695	9.32	2	3	7	2	13	29	71	0	60	1	3	97	6339	10	16	28	37	42	50	8	83	29	31	8	0	0	3776	788
92	3713	9.37	6	5	7	0	16	34	67	0	64	6	0	125	7006	11	14	29	35	15	43	36	83	10	23	10	0	21	3775	804
92.5	3730	9.30	7	5	5	2	14	31	73	0	65	5	0	178	5907	9	26	30	49	24	49	15	75	26	27	7	14	2	3841	805
93	3748	9.41	10	8	0	0	10	34	67	0	51	6	8	151	6560	12	0	28	45	28	86	0	61	25	21	1	0	6	3739	764
93.5	3765	9.23	3	9	4	1	18	35	77	0	67	8	4	103	5850	19	15	37	57	5	47	27	96	23	37	0	18	20	3916	756
94	3782	9.45	3	9	2	0	19	39	70	0	66	7	4	169	6246	14	17	25	44	27	27	15	95	12	26	0	5	0	3849	808
94.5	3800	9.27	3	7	5	1	19	34	82	0	70	3	2	147	7205	0	6	33	62	12	67	37	58	34	23	9	13	12	3681	754
95	3817	8.91	0	7	5	1	18	34	81	2	61	8	10	111	6910	19	13	39	33	7	61	20	74	25	27	4	19	12	3683	789
95.5	3834	9.24	2	3	6	1	17	41	70	5	60	8	3	188	7853	24	24	38	82	38	60	22	75	25	28	4	3	12	3573	782
96	3852	9.06	4	5	2	0	14	33	72	0	61	7	9	175	7217	23	7	37	49	13	25	0	67	28	28	0	12	9	3672	796
96.5	3869	9.28	10	8	7	0	13	21	54	0	48	3	0	104	6886	28	23	23	43	40	45	3	71	19	30	4	0	0	3801	776
101.5	3994	9.30	0	1	3	0	16	27	66	0	58	2	0	178	7763	18	12	27	50	33	59	35	90	25	27	12	10	0	3611	768
102	4011	9.40	0	0	7	0	17	26	68	1	50	3	2	143	6931	17	8	38	39	65	64	14	85	26	29	24	6	0	3650	755
102.5	4027	9.29	2	0	4	0	16	26	65	0	50	5	0	176	6602	14	0	33	55	19	59	0	68	27	29	14	0	8	3730	780
103	4043	9.48	0	2	4	0	15	32	65	3	58	5	0	217	7039	16	11	21	65	25	60	30	77	31	27	7	3	3	3635	765
103.5	4060	9.55	3	2	4	0	16	23	71	0	55	2	0	137	6456	9	12	25	39	12	67	11	90	26	34	16	1	11	3766	818
104	4076	9.64	0	2	4	0	17	28	68	3	50	5	0	161	6547	10	4	33	26	43	55	23	51	23	16	0	3	0	3711	781
104.5	4093	9.57	1	0	3	0	17	30	67	0	52	7	1	165	6155	8	16	25	71	10	67	35	58	25	27	2	12	14	3779	840
105	4109	9.57	4	6	4	0	17	28	64	0	48	8	0	168	5705	24	25	34	76	44	46	7	58	31	32	0	2	1	3770	807
105.5	4125	9.65	2	2	5	0	16	30	58	3	46	6	2	207	5823	13	8	22	57	19	43	41	91	31	20	0	11	0	3849	802
106	4142	9.79	6	3	5	0	14	24	54	1	48	3	0	147	6134	20	28	29	60	7	46	6	102	20	40	3	16	6	3817	808
106.5	4158	9.45	1	5	5	0	16	26	69	2	52	3	2	100	5822	18	6	22	77	10	44	48	81	29	31	18	15	17	3807	775
107	4175	9.74	0	0	4	0	23	35	75	3	60	0	0	171	7593	9	12	25	44	37	60	1	50	33	27	13	9	2	3604	729
107.5	4191	9.42	1	4	6	0	20	30	61	4	41	1	0	131	6915	15	0	23	28	17	44	9	81	27	26	0	0	15	3650	794
108	4207	9.28	2	2	4	0	13	33	71	3	57	1	0	131	7078	16	29	34	29	44	37	18	96	17	25	12	7	0	3637	792
108.5	4224	9.36	3	2	2	0	15	26	64	0	54	2	4	156	5419	1	21	30	55	11	65	17	46	26	37	13	22	21	3773	782
109	4240	9.22	4	4	8	0	15	28	62	0	53	6	0	129	5963	20	18	24	28	49	48	0	90	32	34	12	6	7	3721	791
109.5	4257	9.11	5	1	6	0	15	28	67	3	56	0	5	156	5630	24	22	29	46	0	64	22	69	28	29	9	6	26	3833	824

Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
110	4273	9.17	5	7	5	0	17	33	75	2	62	2	0	154	7234	15	13	26	32	40	74	18	87	32	33	0	11	0	3621	763
110.5	4289	9.33	0	5	0	5	20	37	82	2	65	8	5	175	7478	7	17	26	47	51	61	18	69	19	24	16	17	3	3573	751
111	4306	9.15	5	5	4	0	16	31	65	1	61	2	0	250	6138	16	17	26	53	36	71	30	94	18	38	14	29	3	3747	777
111.5	4322	9.10	3	3	4	0	16	32	70	1	55	11	0	182	5300	18	18	26	51	23	56	38	84	31	36	25	15	9	3853	809
112	4339	9.06	5	9	4	0	16	30	78	1	57	8	0	122	5840	0	5	26	47	24	58	27	84	26	22	14	0	19	3724	847
112.5	4355	9.47	6	5	7	0	19	32	69	1	59	0	1	126	7677	10	11	38	34	28	16	19	46	22	34	22	3	6	3613	750
113	4372	9.32	0	5	5	0	19	34	76	0	53	2	0	94	6740	23	26	39	58	13	54	23	87	20	30	3	14	3	3749	802
113.5	4388	9.55	0	5	5	0	15	32	70	2	61	4	0	173	6575	19	24	49	46	21	64	0	71	29	34	2	5	4	3700	783
114	4405	9.19	2	3	1	0	19	33	67	0	51	10	0	118	5168	16	17	30	65	20	42	26	60	16	37	0	19	12	3879	790
114.5	4421	9.59	3	3	4	0	13	36	78	1	61	3	3	180	5916	9	4	30	50	40	56	24	83	17	22	0	0	9	3812	784
115	4437	9.55	3	5	5	0	14	39	78	2	57	10	0	158	6679	25	20	39	48	45	40	14	63	20	40	10	8	0	3711	804
115.5	4454	9.22	2	6	3	0	17	34	77	5	61	8	2	177	5134	9	10	29	52	33	83	11	67	17	31	8	13	14	3778	805
116	4470	9.50	3	1	5	0	17	35	65	0	52	3	5	163	6994	9	6	32	53	27	76	21	82	25	24	12	0	6	3663	785
116.5	4487	9.30	5	7	3	0	9	27	67	0	53	6	0	169	4581	12	12	22	56	30	43	30	51	21	21	0	15	4	3969	888
117	4503	9.30	0	2	3	0	14	28	67	1	50	6	0	113	5500	8	13	19	45	18	57	9	90	29	30	20	12	15	3801	808
117.5	4520	9.12	4	4	7	0	17	32	65	2	51	5	4	111	4574	7	8	31	94	0	57	23	65	31	36	20	4	14	3813	785
118	4536	9.15	1	5	3	0	16	31	70	1	56	5	0	124	6550	18	11	29	38	30	37	13	108	24	23	3	0	3	3741	798
118.5	4553	9.13	6	4	5	0	14	30	62	0	55	1	2	124	5804	7	20	39	37	15	33	9	64	31	29	3	17	13	3761	832
119	4570	9.32	0	0	5	0	17	31	65	1	50	6	1	140	6534	19	11	35	44	13	73	21	74	26	22	14	14	22	3747	835
119.5	4586	9.21	4	1	1	0	13	25	59	0	45	5	2	117	4613	7	0	32	77	14	60	40	92	37	31	16	15	8	3999	825
120	4603	9.34	3	2	5	0	12	27	63	4	48	2	2	86	6712	10	17	20	38	15	38	18	48	26	33	0	0	11	3696	821
120.5	4619	9.17	4	0	5	0	15	31	65	1	46	5	2	158	4616	11	0	29	74	16	75	35	80	39	27	18	11	8	3973	843
121	4636	9.17	5	8	7	0	18	21	66	1	52	6	6	132	4909	15	19	18	52	39	45	20	59	27	36	10	7	11	3983	801
121.5	4652	9.24	2	3	3	0	14	29	65	0	50	0	0	163	5930	19	22	34	49	31	45	19	75	19	39	9	18	0	3791	793
122	4669	9.23	4	4	4	0	18	25	66	3	44	8	1	147	5231	18	13	22	40	31	58	15	83	19	31	2	0	3	3997	816
122.5	4686	9.37	6	2	3	0	12	17	54	0	38	3	4	105	3335	10	0	7	70	0	27	21	71	37	33	1	16	21	4138	824
123	4702	9.14	6	6	6	0	11	25	64	0	45	6	7	70	3524	8	12	28	58	16	31	0	87	32	31	5	8	8	4099	850
123.5	4719	9.25	0	1	3	0	13	28	74	0	61	3	4	181	6099	6	9	31	34	29	59	32	76	31	17	0	10	0	3767	822
124	4736	8.91	0	0	5	0	15	36	80	1	69	7	4	134	5681	3	8	39	60	45	68	27	73	19	31	11	10	17	3803	797
124.5	4752	8.92	2	4	5	0	17	34	89	0	71	8	2	151	5742	3	2	26	45	27	60	35	58	27	26	0	0	10	3740	779
125	4769	9.09	2	3	3	0	15	37	85	1	77	3	4	183	5977	16	20	30	51	0	57	8	78	30	20	4	2	5	3724	794
125.5	4786	9.50	3	3	7	0	15	30	74	0	67	0	1	136	6001	11	22	33	37	26	50	0	86	19	22	19	12	6	3725	810
126	4803	9.38	0	1	5	0	13	31	71	3	57	3	7	131	4537	10	7	33	94	11	59	5	91	32	30	23	17	24	3910	785
126.5	4819	9.40	1	2	2	0	15	32	69	0	49	10	0	153	5128	13	2	24	54	36	43	12	66	32	23	1	19	9	3786	791
127	4836	9.44	5	5	9	0	16	31	70	0	51	2	0	129	6386	19	7	39	43	42	56	29	76	28	29	9	8	11	3747	794
127.5	4853	9.36	4	2	5	0	13	29	68	3	54	7	0	142	5379	15	5	32	41	19	35	2	82	37	26	8	14	0	3871	796
128	4870	9.47	5	6	3	0	14	28	65	0	58	3	0	140	5849	19	12	26	45	21	59	5	57	22	38	7	4	14	3789	764
128.5	4887	9.52	2	3	4	0	10	24	73	0	53	4	1	183	4126	13	21	18	63	18	51	16	87	26	26	13	9	10	4050	842
129	4903	9.48	0	4	4	0	17	28	70	2	46	7	2	134	4701	6	7	17	67	4	31	23	78	28	34	10	5	19	3986	813
129.5	4920	9.24	3	7	7	0	16	34	69	0	57	7	1	132	6041	15	13	12	64	47	72	22	64	21	30	7	2	6	3767	802
130	4937	9.40	0	3	5	0	14	33	66	0	52	2	2	110	6052	7	19	14	34	24	27	0	61	28	29	16	14	13	3715	777
130.5	4954	9.44	1	5	4	0	14	25	59	0	49	2	6	201	5360	16	13	20	56	17	43	0	74	33	28	6	0	23	3766	777

Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
131	4971	9.13	4	4	5	0	16	26	62	0	51	0	6	88	5311	17	14	18	33	24	47	15	76	28	26	8	4	0	3861	825
131.5	4988	9.16	0	0	2	0	16	29	76	2	52	8	0	129	5119	15	27	29	32	39	73	12	80	32	32	11	7	7	3869	825
132	5005	9.25	3	4	3	0	14	31	70	5	50	5	3	99	5483	14	16	19	50	17	71	5	100	32	31	11	9	16	3818	814
132.5	5022	9.24	2	4	4	0	13	32	66	0	60	0	7	119	5336	13	2	17	46	31	56	12	62	31	29	0	10	0	3914	818
133	5039	9.32	2	4	1	0	14	32	77	0	62	4	5	291	6842	13	16	22	46	12	74	5	69	30	23	8	11	16	3526	783
133.5	5056	9.43	0	1	4	0	18	36	74	3	56	4	4	143	7075	17	0	19	48	37	51	0	84	24	28	2	0	7	3588	778
134	5073	9.29	0	0	4	0	16	35	81	3	62	4	6	143	5814	17	16	42	43	46	45	12	73	30	39	13	7	4	3752	785
134.5	5090	9.43	0	2	3	0	16	39	78	3	60	5	5	86	6817	21	13	22	40	37	59	20	86	29	30	17	0	2	3665	817
135	5107	9.46	4	4	4	0	15	20	62	0	49	3	2	131	4784	20	21	34	63	13	54	24	93	23	24	0	0	13	3981	820
135.5	5125	9.52	2	8	3	0	16	27	63	0	54	4	7	131	5769	19	24	26	43	16	49	33	84	21	34	4	0	3	3838	851
136	5142	9.51	6	6	6	0	12	31	69	1	49	7	6	217	4302	19	16	24	66	12	55	19	89	24	38	5	18	13	4011	815
136.5	5159	9.45	0	1	5	0	16	31	68	3	57	10	5	69	6721	19	4	24	26	0	62	23	80	24	35	9	16	12	3650	787
137	5176	9.07	8	12	5	0	14	29	78	0	50	6	3	184	4753	11	6	24	48	41	59	8	93	29	36	21	13	12	3891	844
137.5	5193	9.26	8	8	6	0	14	25	62	0	49	5	3	104	4360	18	15	23	66	5	53	17	81	30	31	0	0	10	3932	836
138	5211	9.35	3	4	5	0	16	26	65	1	49	7	4	175	4723	21	3	26	45	19	44	17	73	32	38	19	7	12	3914	813
138.5	5228	9.38	5	7	6	0	15	30	68	2	49	5	0	76	5357	20	0	34	70	24	37	25	76	26	27	0	6	5	3943	814
139	5245	9.34	10	9	9	0	13	31	69	0	49	4	4	154	5397	6	13	34	46	17	38	3	52	23	36	12	6	17	3848	772
139.5	5263	9.43	4	5	2	0	14	32	73	0	51	7	1	183	4396	12	4	21	49	49	56	8	76	29	35	8	4	16	3967	846
140	5280	9.32	6	6	5	0	14	27	71	0	51	3	8	87	4570	11	18	31	72	8	27	22	77	28	32	7	8	7	4005	861
140.5	5298	9.38	6	8	4	0	12	33	70	0	67	5	2	126	6534	15	7	41	48	8	28	25	81	23	25	0	3	7	3741	784
141	5315	9.30	7	8	6	0	13	29	61	0	47	6	4	251	3873	18	20	26	73	27	48	1	87	34	32	4	3	4	4022	843
141.5	5332	9.46	11	8	2	0	9	25	60	0	46	9	1	169	4992	19	0	31	64	31	46	0	67	39	29	7	2	8	3926	821
142	5350	9.35	8	4	4	0	10	18	61	0	42	2	0	117	4021	11	16	22	47	10	55	42	67	18	26	10	13	23	4091	823
142.5	5368	9.44	6	8	4	0	9	21	56	0	42	7	4	104	4601	5	0	9	50	4	44	31	78	27	29	4	6	13	3944	812
143	5385	9.46	5	2	2	0	13	26	73	1	49	5	2	114	4957	5	17	27	43	20	49	10	95	23	37	18	1	22	3871	775
143.5	5403	9.34	0	1	4	0	15	29	74	0	54	2	1	107	4991	10	20	16	67	0	31	8	64	20	27	14	1	7	3844	820
144	5420	9.46	6	7	6	0	12	25	66	0	45	3	2	99	4798	20	18	36	44	35	40	0	71	31	35	3	15	3	3906	822
144.5	5438	9.46	9	8	4	0	7	23	66	0	44	6	4	131	3129	4	19	18	59	22	32	17	39	17	38	0	5	21	4098	851
145	5456	9.49	6	3	3	0	11	24	66	0	41	7	0	98	4676	11	14	48	44	7	36	20	100	24	35	8	21	20	3974	840
145.5	5474	9.46	10	8	1	0	15	19	63	1	41	4	0	98	4676	11	14	48	44	7	36	20	100	24	35	8	21	20	3974	840
146	5491	9.43	4	6	4	0	13	26	64	0	46	7	0	135	4458	17	16	28	53	15	65	26	81	27	40	1	10	19	3963	820
146.5	5509	9.39	7	8	4	0	16	34	74	0	51	2	5	98	4490	5	31	33	48	13	66	6	84	17	36	1	14	20	3956	837
147	5527	9.59	0	1	1	0	14	30	67	0	45	4	0	210	4139	12	0	30	61	4	35	31	97	30	31	3	8	19	4025	778
147.5	5545	9.48	9	6	4	0	11	27	69	0	45	3	5	145	4363	15	20	23	46	7	47	20	55	26	29	23	0	11	3921	786
148	5563	9.56	3	4	4	0	12	28	66	2	47	8	1	98	5007	15	10	37	34	8	60	12	65	28	24	8	0	12	3882	857
148.5	5581	9.66	7	7	7	0	10	23	70	0	41	4	7	217	3916	9	6	34	44	26	48	10	57	28	37	0	8	0	4057	829
149	5599	9.59	8	7	4	0	11	22	63	0	43	4	0	127	4191	14	19	32	52	33	25	28	87	21	30	0	16	0	3999	825
149.5	5617	9.60	6	6	7	0	16	29	60	0	46	6	6	137	4035	16	13	19	55	12	33	20	70	22	27	0	12	0	4068	837
150	5635	9.43	9	7	4	0	11	25	66	0	45	8	5	112	3781	5	12	31	42	14	48	0	68	27	28	3	3	5	4040	833
150.5	5653	9.57	7	4	5	0	10	23	61	0	47	5	0	113	4241	16	19	41	52	43	43	5	68	33	41	18	3	8	3994	798
151	5671	9.73	12	8	4	0	7	20	66	0	40	6	0	100	3414	13	21	32	74	22	52	2	48	20	35	17	8	22	4120	847
151.5	5689	9.85	6	7	6	0	11	27	68	0	51	8	7	130	3446	4	8	17	66	43	42	0	78	32	33	6	4	0	4119	831

Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
152	5707	9.67	11	9	4	0	14	23	61	0	48	6	5	101	3514	14	26	28	43	7	35	0	68	22	39	5	8	2	3996	804
152.5	5726	9.50	9	6	0	0	14	26	71	0	53	2	0	189	4712	13	16	36	50	37	37	19	115	21	30	6	16	6	3888	796
153	5744	9.34	3	1	6	0	17	25	74	5	47	7	0	95	4393	25	13	17	37	14	49	29	55	36	31	4	8	20	4004	822
153.5	5762	9.39	7	7	6	0	10	26	61	0	50	3	3	176	4239	2	17	27	68	0	51	12	67	11	30	10	11	5	3972	809
154	5781	9.43	4	7	4	0	13	21	66	0	41	7	6	99	3910	12	6	24	67	17	56	7	73	31	23	14	19	15	4005	807
154.5	5799	9.51	11	9	5	0	10	25	64	0	47	0	3	86	4120	26	17	28	48	6	41	20	98	20	41	3	18	12	3931	796
155	5818	9.54	3	3	3	0	12	26	67	0	52	6	2	112	3917	9	12	16	61	18	54	30	84	21	25	0	7	8	4019	845
155.5	5836	9.58	5	6	4	0	12	25	68	0	48	2	0	174	4233	8	13	24	51	26	49	17	69	25	40	8	13	8	4051	880
156	5855	9.48	7	2	5	0	13	28	72	0	52	8	5	201	4374	15	8	22	64	0	49	14	61	38	34	1	0	2	4001	848
156.5	5873	9.49	8	11	5	0	11	23	76	0	44	7	12	331	3652	5	13	16	58	25	33	23	95	31	37	14	1	8	4103	869
157	5892	9.54	6	8	6	0	14	31	73	0	49	7	3	143	4224	12	4	20	53	27	52	13	82	29	37	21	11	10	3974	821
157.5	5911	9.25	2	2	3	0	14	28	77	0	53	2	2	88	3972	5	17	23	71	30	67	24	80	22	34	7	9	22	4080	840
158	5929	9.50	8	9	9	0	13	27	79	3	53	3	5	143	4245	8	18	23	67	25	55	3	86	20	26	10	7	12	3985	794
158.5	5948	9.63	9	7	4	0	12	23	66	0	41	2	5	130	3435	4	9	23	69	15	39	0	54	31	40	4	5	10	4050	795
159	5967	9.43	8	8	4	0	9	28	72	0	48	5	6	98	4125	10	8	26	68	32	73	4	74	34	31	23	8	4	3949	834
159.5	5986	9.43	3	5	3	0	11	24	68	0	46	3	6	89	4185	15	19	26	46	37	66	5	49	28	23	19	14	0	3950	830
160	6005	9.51	6	5	1	0	6	28	70	0	46	1	1	175	4196	8	8	24	51	22	52	25	57	29	34	15	26	15	3967	819
160.5	6024	9.42	3	8	3	0	13	29	74	0	47	10	7	91	3939	10	0	13	59	22	53	14	75	39	28	12	19	16	4044	853
161	6043	9.42	4	7	4	0	9	25	72	0	51	4	2	111	4029	9	6	16	70	0	48	37	78	29	41	7	10	9	4096	868
161.5	6062	9.50	4	4	3	0	9	34	81	0	56	5	2	64	4501	4	0	5	45	43	71	14	70	32	17	3	18	4	3963	838
162	6081	9.42	6	7	6	0	15	33	85	0	64	8	0	193	4338	21	25	27	62	30	50	28	69	26	32	0	9	0	3994	845
162.5	6100	9.53	6	8	3	0	14	28	75	1	53	1	2	148	4130	7	14	17	68	8	45	13	98	29	31	1	0	18	3933	827
163	6119	9.34	2	7	4	0	11	26	73	0	47	1	2	135	3726	17	22	33	64	15	70	12	100	22	33	12	14	13	4040	835
163.5	6138	9.70	4	6	2	0	11	16	66	0	37	6	5	59	2687	18	8	15	58	0	59	36	80	30	27	16	0	18	4251	837
164	6158	9.91	12	7	5	0	8	20	59	0	31	1	0	77	2849	9	8	23	55	13	66	0	90	37	21	3	3	26	4074	823
164.5	6177	9.63	6	7	6	0	13	24	67	1	47	10	3	142	3234	22	6	26	77	24	65	17	70	32	38	3	20	10	4093	800
165	6197	9.58	8	5	2	0	14	23	62	0	50	0	7	111	4324	12	11	18	63	15	59	23	84	17	29	13	11	16	3904	825
165.5	6216	9.63	3	9	5	0	12	27	81	0	47	6	2	250	4527	15	17	16	57	19	57	11	84	24	36	11	6	7	3915	798
166	6235	9.48	5	7	3	0	17	27	73	0	48	5	4	104	4435	6	6	16	52	32	50	4	81	27	28	16	9	0	3930	809
166.5	6255	9.51	11	6	2	0	12	26	66	0	42	7	2	55	3614	10	4	17	67	9	90	15	66	32	26	15	15	23	4095	793
167	6275	9.30	2	4	3	0	17	35	77	3	53	5	4	94	4606	20	5	12	73	12	65	17	84	27	23	7	14	14	3842	799
167.5	6294	9.41	2	5	4	0	13	33	76	0	66	2	6	123	4830	12	22	20	60	37	86	8	86	25	31	0	16	14	3884	838
168	6314	9.45	7	10	5	0	12	26	74	0	53	2	4	88	4189	11	2	19	59	37	58	4	79	29	31	12	3	2	3974	825
168.5	6334	9.49	2	3	5	0	14	31	77	4	51	7	0	96	4033	15	17	27	72	13	52	20	66	25	40	1	7	25	3983	835
169	6354	9.43	6	5	5	0	15	31	81	0	54	10	10	94	4681	0	4	25	56	47	82	14	78	24	30	9	17	11	3900	799
169.5	6373	9.41	8	8	9	0	13	32	74	0	52	4	0	133	4877	10	9	19	70	20	81	20	78	22	28	4	19	8	3838	784
170	6393	9.56	6	7	6	0	15	33	84	2	65	4	9	138	4731	20	15	37	63	31	70	15	84	25	36	4	28	11	3883	831
170.5	6413	9.21	6	9	5	0	17	37	86	0	60	7	1	116	5005	15	13	32	42	25	72	9	77	31	29	8	6	16	3860	826
171	6433	9.33	9	5	2	0	14	34	82	1	65	2	5	90	4693	17	21	26	58	29	80	5	84	22	33	18	14	11	3883	800
171.5	6453	9.41	9	7	6	0	11	36	79	0	58	7	6	89	4342	11	6	33	50	54	47	24	91	39	36	20	0	4000	829	
172	6474	9.35	3	4	6	0	16	32	75	0	60	5	2	150	4177	20	13	14	49	8	48	30	74	27	43	3	24	15	3946	821
172.5	6494	9.16	4	5	2	0	13	35	79	3	55	9	3	106	4054	7	25	27	66	25	57	11	98	24	36	10	10	0	4056	867



Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
173	6514	9.24	0	3	2	0	15	38	91	2	57	9	6	95	4282	14	5	20	33	51	60	11	70	31	39	2	15	0	4046	832
173.5	6534	9.18	1	2	4	0	15	33	92	0	60	7	6	124	4055	11	18	28	71	7	59	25	85	25	33	4	6	6	3953	798
174	6555	9.09	5	8	6	0	18	42	89	0	66	6	4	119	4603	3	7	29	60	37	102	21	50	25	39	8	4	26	3922	793
174.5	6575	8.98	6	9	4	0	10	36	88	0	65	2	9	123	4404	12	12	11	58	6	81	0	79	28	36	13	2	16	3940	840
175	6596	8.92	0	6	3	0	14	30	87	0	59	5	3	71	4490	13	12	19	64	51	62	0	60	29	33	1	15	0	3938	829
175.5	6616	9.21	1	4	4	0	13	36	85	5	58	8	1	64	4597	16	18	39	73	17	93	42	96	22	39	22	4	35	3973	852
176	6637	9.22	5	11	4	0	11	33	86	0	52	4	8	85	4471	10	20	18	62	48	66	24	110	20	38	0	8	7	3941	819
176.5	6658	9.10	5	10	5	0	13	32	81	0	46	8	2	116	4385	12	15	22	64	22	69	18	71	23	35	0	17	26	4034	860
177	6678	9.03	0	5	3	0	17	32	86	1	59	7	5	99	4237	6	26	35	60	36	78	0	76	13	24	11	2	13	3938	819
177.5	6699	8.95	4	7	2	0	13	25	77	0	58	8	1	126	3973	9	14	28	48	36	57	14	75	39	28	6	9	5	4015	870
178	6720	8.94	6	7	1	0	11	34	85	0	49	9	4	100	3509	13	16	19	63	16	43	11	48	39	43	12	16	15	4078	852
178.5	6741	9.03	1	5	5	0	14	22	72	0	52	3	6	90	3139	25	14	30	50	10	52	11	106	33	37	11	0	0	4179	887
179	6762	8.89	3	6	4	0	21	35	79	4	58	6	3	91	4087	19	15	19	76	17	94	29	83	33	29	7	31	5	4022	853
179.5	6783	8.89	6	5	6	0	14	24	75	1	53	9	0	108	3574	9	19	28	72	21	41	3	92	26	29	15	22	27	4028	849
180	6804	8.95	1	7	4	0	16	32	75	3	47	6	2	86	3659	10	20	11	70	32	74	12	84	15	26	7	5	0	4122	866
180.5	6825	9.13	12	5	4	0	12	24	74	0	50	0	6	96	3433	1	6	22	49	31	54	2	64	29	34	0	18	0	4089	830
181	6847	8.96	3	4	4	0	17	30	83	2	56	4	10	104	3802	10	6	9	62	18	75	18	94	27	27	4	3	24	4068	835
181.5	6868	8.94	3	4	2	0	16	37	76	1	50	10	4	73	3604	13	10	41	62	50	87	16	78	34	35	10	30	10	4082	851
182	6889	9.11	9	10	3	0	14	32	81	0	58	1	5	76	3812	10	12	25	63	21	84	11	76	23	33	13	17	15	4000	789
182.5	6911	9.03	6	7	4	0	15	35	83	0	55	4	2	80	3690	5	0	13	84	39	73	0	66	39	34	7	12	25	3972	826
183	6932	9.20	2	4	0	0	9	38	77	0	52	6	10	122	3474	12	0	12	69	12	53	33	64	37	27	0	15	18	4051	823
183.5	6954	9.08	9	9	7	0	15	33	87	0	55	5	3	57	3247	13	24	19	86	43	74	10	66	16	23	2	20	3	4071	817
184	6975	8.99	11	12	5	0	10	32	84	0	52	0	6	97	3793	8	11	16	58	12	41	3	102	29	37	18	10	28	3983	829
184.5	6997	8.98	1	8	4	0	13	35	84	0	55	7	9	164	3924	19	5	16	85	54	125	13	58	34	28	10	35	14	4019	851
185	7019	9.00	8	7	7	0	13	38	86	0	51	4	5	111	3731	14	19	33	44	41	98	23	83	22	31	14	2	8	4059	861
185.5	7041	9.02	4	8	4	0	13	34	85	0	49	2	6	132	3524	0	6	18	56	56	51	1	72	24	32	5	12	9	4012	847
186	7063	9.00	6	11	4	0	15	38	89	0	59	5	7	119	4246	12	17	24	36	36	56	0	35	33	35	1	7	0	3912	792
186.5	7085	8.97	9	14	5	0	15	37	87	0	50	9	4	129	4066	19	16	21	54	28	83	0	61	28	40	0	1	3	3997	829
187	7107	9.05	13	9	3	0	12	28	77	0	48	3	7	211	3382	8	10	28	60	7	61	20	61	34	42	22	9	16	4093	858
187.5	7129	9.15	6	8	6	0	13	31	87	0	55	9	4	77	3527	14	7	28	60	37	52	22	56	30	35	12	3	14	4019	852
188	7151	9.16	9	11	5	0	10	27	71	0	51	4	6	66	3010	12	15	12	58	39	37	23	85	34	32	3	8	7	4156	861
188.5	7173	9.08	0	5	3	0	17	36	91	0	54	6	1	85	3877	8	17	14	54	13	65	0	79	29	28	14	12	13	3909	824
189	7196	9.14	6	7	4	0	14	42	90	0	57	11	0	196	4283	16	11	37	28	29	67	30	112	41	30	8	21	20	3942	839
189.5	7218	9.30	4	9	3	0	16	36	96	0	55	10	2	175	4123	9	17	18	54	42	52	24	97	24	30	0	0	0	4018	869
190	7240	9.28	3	6	7	0	18	38	93	0	65	3	9	100	4850	3	8	26	54	39	54	34	75	36	37	10	1	13	3798	828
190.5	7263	9.16	4	5	2	0	17	40	89	0	61	5	5	146	4430	18	7	28	37	26	73	1	82	34	40	3	20	0	3894	797
191	7286	9.24	5	5	2	0	13	43	87	0	58	9	2	100	4290	16	14	27	63	32	75	3	87	33	36	4	12	21	3883	829
191.5	7308	9.44	6	6	7	0	10	31	74	0	46	2	7	55	3877	16	27	33	57	41	77	23	75	20	30	10	7	10	4045	861
192	7331	9.31	6	8	3	0	13	34	84	0	56	7	0	129	3755	6	2	26	78	20	69	31	62	27	41	12	19	23	4017	820
192.5	7354	9.19	2	5	3	0	15	39	86	0	53	8	3	99	4008	13	8	20	61	37	38	23	75	32	26	18	21	18	3954	840
193	7377	9.20	5	6	2	0	13	42	82	1	57	8	8	110	3886	3	6	18	64	64	68	16	101	19	33	17	8	0	4045	864
193.5	7400	9.11	9	11	6	0	16	43	90	1	60	9	0	116	3398	14	0	30	44	42	89	35	86	41	26	28	10	11	4042	837

Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
194	7423	9.11	8	11	3	0	17	47	98	0	61	8	3	154	3698	10	8	19	52	60	99	23	95	32	27	0	6	11	4020	848
194.5	7446	9.01	4	8	5	0	11	38	97	0	61	6	2	99	3909	11	27	24	61	34	72	16	67	16	30	6	14	6	3972	803
195	7469	9.10	5	9	4	0	14	47	96	0	63	4	0	140	4361	11	10	34	57	25	77	0	60	31	21	5	10	17	3843	802
195.5	7492	9.30	3	10	2	0	10	41	98	0	59	8	1	165	4025	7	6	24	51	12	83	28	54	36	26	14	2	34	3961	808
196	7516	9.21	6	12	5	0	13	38	95	0	56	4	3	110	3869	20	4	24	62	0	72	0	46	32	37	2	9	12	3996	851
196.5	7539	9.25	5	6	5	0	16	44	98	0	57	5	0	115	4033	15	17	38	66	42	88	31	98	34	26	18	4	8	3901	807
197	7563	9.28	3	4	3	0	10	34	84	2	54	3	6	110	4238	4	8	17	74	8	39	18	68	26	24	3	0	12	3975	828
197.5	7586	9.17	6	10	4	0	14	35	81	3	57	8	4	128	3871	9	13	18	68	11	45	44	48	31	28	5	8	14	3991	829
198	7610	9.20	3	10	4	0	13	48	98	0	60	7	2	122	4753	10	17	22	51	33	62	22	77	25	34	8	0	15	3726	826
198.5	7634	9.02	2	7	2	0	18	50	102	1	72	4	4	107	4660	13	15	39	59	50	97	35	92	32	33	18	16	0	3942	835
199	7658	8.94	8	9	3	0	13	50	103	1	74	6	3	96	4866	0	8	42	49	54	75	17	54	33	34	5	0	11	3827	836
199.5	7682	9.21	7	10	3	0	16	49	103	1	65	7	7	102	5088	6	18	40	55	40	107	37	81	30	25	0	17	8	3793	786
203	7851	8.42	9	10	4	0	17	56	109	0	73	8	2	115	4974	9	15	26	66	7	85	5	72	26	41	15	7	22	3788	799
203.5	7876	8.36	3	7	1	2	19	46	89	1	68	4	8	82	4175	12	8	25	55	48	60	23	66	32	38	0	0	9	3921	845
204	7901	8.48	8	7	7	1	21	53	95	5	65	10	2	123	4059	4	15	25	67	48	84	31	81	32	32	6	15	0	3982	832
204.5	7925	8.39	3	6	6	0	16	48	93	0	72	7	16	89	4530	10	0	35	41	35	41	0	59	33	35	12	11	3	3766	804
205	7950	8.51	0	8	2	0	17	53	91	0	68	6	5	111	4668	12	11	28	51	46	90	39	75	28	36	0	11	6	3807	790
205.5	7975	8.41	3	2	7	0	17	48	93	2	66	4	8	100	4765	8	0	19	53	33	83	32	73	36	24	13	8	24	3838	815
206	8000	8.34	7	8	4	0	20	49	90	1	63	5	0	75	3943	12	12	20	77	45	85	6	91	29	31	17	9	11	3917	826
206.5	8025	8.55	5	9	7	0	13	44	98	0	55	5	0	83	4380	14	11	29	31	71	87	14	73	38	39	6	16	0	3880	826
207	8050	8.56	11	14	5	1	14	43	89	0	64	8	0	98	4425	18	23	31	46	64	80	9	70	24	39	13	0	3	3949	855
207.5	8076	8.68	4	6	4	0	16	35	85	0	58	2	5	134	4212	13	15	25	69	45	82	37	77	25	32	8	15	14	3950	864
208	8101	8.85	11	11	6	0	17	42	87	0	64	4	4	92	4197	24	1	36	66	22	58	12	85	28	29	9	12	27	3904	807
208.5	8127	8.83	8	4	9	1	21	30	73	4	48	6	4	39	2867	19	13	26	52	30	65	4	65	32	37	9	19	3	4127	832
209	8152	8.67	6	8	3	0	18	53	89	0	69	6	0	90	5444	20	15	38	41	23	76	15	85	22	28	2	13	14	3744	824
209.5	8178	8.47	5	8	2	0	17	44	91	2	65	9	10	65	4705	6	6	18	64	37	95	41	104	31	33	0	6	9	3833	823
210	8203	8.44	5	10	4	1	19	53	96	0	76	4	2	164	4785	0	19	28	35	16	89	30	76	8	39	6	10	25	3746	776
210.5	8229	8.54	0	8	2	0	16	53	95	2	77	5	7	114	5724	23	22	28	27	44	94	31	103	31	44	14	16	12	3661	812
211	8255	8.45	7	12	4	3	19	49	96	0	67	8	3	72	4305	3	12	28	90	47	86	31	77	22	29	18	15	13	3830	814
211.5	8281	8.48	5	7	7	2	21	48	115	2	83	5	7	138	5403	20	9	31	57	53	92	35	88	31	26	19	8	17	3725	757
212	8307	8.53	1	7	3	0	17	44	110	0	68	4	4	165	4701	7	17	24	57	32	81	13	97	23	41	15	8	5	3901	809
212.5	8333	8.55	0	4	5	0	16	48	95	2	71	6	3	142	4763	18	13	30	44	51	69	6	71	26	38	5	2	3849	786	
213	8360	8.62	6	12	5	0	15	50	103	0	74	7	5	92	4695	14	12	30	83	40	77	8	96	32	36	7	8	23	3815	806
213.5	8386	8.81	7	7	4	0	15	45	102	2	69	11	7	152	5579	9	10	30	43	16	76	26	88	24	31	0	8	0	3755	797
214	8412	8.62	4	9	4	1	16	51	103	1	77	2	2	83	4926	6	8	38	61	48	95	12	66	22	31	15	9	7	3698	773
214.5	8439	8.63	3	7	4	2	12	47	99	0	65	4	5	94	4453	8	10	31	73	23	83	13	71	28	34	21	15	11	3819	789
215	8465	8.42	0	8	2	3	16	48	98	0	62	3	5	86	4379	17	18	30	54	67	91	2	73	32	37	4	12	14	3910	852
215.5	8492	8.39	9	7	3	0	19	51	106	3	74	5	0	107	3956	12	14	21	59	36	86	32	68	33	41	12	20	13	3885	796
216	8519	8.34	4	11	4	0	11	60	107	0	75	9	3	152	4680	11	12	44	55	25	106	18	75	24	34	7	0	21	3752	785
216.5	8546	7.74	2	11	6	0	14	71	114	0	88	13	3	186	4539	14	22	35	51	50	108	16	90	23	38	16	0	10	3749	778
217	8573	6.92	5	22	6	0	18	239	247	0	218	19	16	190	10117	12	9	67	42	113	221	47	63	20	23	25	6	32	2745	720
217.5	8600	7.33	0	20	6	7	21	246	277	4	203	13	4	121	8388	23	20	72	39	126	290	43	127	24	38	14	15	13	2925	780

Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
218	8627	8.58	8	6	4	3	14	61	111	0	75	5	0	102	4281	14	18	39	47	71	134	31	71	43	32	14	20	0	3786	815
218.5	8654	8.66	9	10	3	2	11	39	82	1	58	9	8	114	3165	2	16	25	61	20	76	0	78	24	31	5	11	31	3881	767
219	8682	8.41	4	8	5	0	14	44	98	0	71	6	11	108	4269	8	18	18	55	46	84	11	51	24	33	11	5	15	3779	780
219.5	8709	8.36	7	17	7	3	15	55	87	0	70	0	3	95	4927	13	18	30	38	45	90	26	84	28	35	25	9	16	3778	819
220	8737	8.38	6	12	4	0	14	61	106	1	83	10	3	71	4959	11	14	21	46	70	96	21	62	27	32	5	0	1	3726	810
220.5	8765	8.46	6	9	5	2	14	61	121	8	86	8	7	82	5157	13	8	44	26	43	107	18	90	26	36	19	0	19	3673	804
221	8792	8.59	6	8	8	1	13	49	102	0	69	7	8	101	4673	20	23	43	38	42	78	19	68	21	26	5	5	3	3782	801
221.5	8820	8.70	1	6	3	1	14	43	113	0	74	5	5	82	4552	12	7	26	80	19	103	20	85	31	27	25	13	36	3808	785
222	8848	8.44	9	11	4	1	13	60	119	0	79	8	10	92	4912	12	16	38	41	43	72	13	94	32	33	10	0	5	3804	807
222.5	8876	8.68	6	15	4	1	15	55	101	0	75	7	5	84	5169	13	13	18	54	60	112	19	106	25	28	3	6	8	3723	798
223	8905	8.67	5	6	5	1	15	39	88	0	57	3	0	62	3862	11	10	35	60	43	80	14	73	36	35	24	21	14	3898	833
223.5	8933	8.72	9	8	6	0	14	46	91	2	68	5	4	62	4361	14	17	25	47	51	80	0	88	26	30	0	10	10	3848	836
224	8961	8.74	8	14	3	0	10	39	88	0	56	5	1	74	3614	24	14	30	56	20	76	35	86	34	39	8	23	30	3911	809
224.5	8990	8.73	13	8	5	0	12	45	104	0	69	3	11	81	4088	16	26	26	69	11	77	16	47	20	37	16	0	20	3942	824
225	9018	8.58	10	9	5	0	14	43	115	0	67	7	3	92	4101	13	25	23	68	28	77	47	94	26	36	17	12	21	3920	814
225.5	9047	8.76	7	16	3	0	14	45	104	0	65	8	4	87	4222	10	22	27	80	58	79	4	76	29	40	18	4	18	3841	780
226	9076	8.78	7	13	7	0	16	43	93	0	63	4	8	78	4090	20	10	31	64	32	63	23	87	37	38	10	19	6	3894	792
226.5	9105	8.84	6	14	7	0	15	46	95	0	71	5	5	153	4045	8	14	38	55	52	76	14	83	32	37	18	19	8	3867	798
227	9134	9.10	7	9	6	0	14	43	108	1	67	5	11	87	4662	14	19	26	55	58	96	5	96	15	38	3	1	0	3815	809
227.5	9163	8.91	7	9	2	0	13	38	110	0	70	3	3	154	3516	5	15	34	78	60	112	34	70	33	41	9	13	9	3946	829
228	9192	8.69	1	6	2	0	15	54	112	0	72	5	4	85	4377	29	22	24	39	40	104	29	93	27	32	0	22	0	3807	820
228.5	9221	8.90	4	10	4	0	11	45	106	0	66	9	0	107	4552	11	7	29	70	38	120	19	94	23	22	14	3	18	3780	820
229	9251	8.69	2	11	4	0	12	56	115	1	81	6	5	107	4680	17	22	31	62	52	71	22	60	23	37	6	0	20	3790	820
229.5	9280	8.97	6	11	1	0	11	51	98	0	78	3	7	87	5596	10	20	34	51	28	77	20	82	21	27	10	2	4	3724	808
230	9310	8.89	6	11	5	0	15	63	113	3	87	6	4	76	4866	7	15	27	58	83	73	15	73	26	29	1	20	0	3807	832
230.5	9340	9.03	4	10	3	0	15	65	125	0	87	7	6	102	5250	14	27	38	58	48	86	7	80	23	36	10	12	20	3692	791
231	9369	8.92	9	12	5	1	16	47	99	0	70	9	1	94	3812	16	30	24	63	46	93	31	76	29	41	1	16	7	3959	831
231.5	9399	8.65	5	8	7	1	10	56	110	0	67	9	4	115	4395	23	20	40	69	39	92	12	72	28	35	1	11	13	3787	792
232	9496	8.82	8	13	6	0	13	60	116	2	88	10	13	148	4993	16	15	39	87	49	112	36	85	24	33	8	2	13	3696	805
232.5	9527	8.78	7	8	5	1	17	63	114	0	79	6	8	114	4936	3	19	30	51	48	62	40	78	27	38	17	6	23	3720	770
233	9559	8.82	1	10	4	0	11	61	111	2	81	5	7	69	5516	1	23	23	78	45	111	0	83	23	30	9	10	30	3684	795
233.5	9590	8.87	13	17	8	0	11	59	104	0	73	1	0	100	4738	15	22	36	64	43	84	0	85	25	37	0	5	26	3790	795
234	9622	8.75	9	9	5	0	11	56	101	0	78	1	1	69	4450	7	18	35	70	47	62	14	59	24	32	7	13	1	3804	775
234.5	9653	8.68	2	7	3	0	14	58	114	2	80	1	7	79	4583	11	11	22	55	55	96	36	53	26	46	0	17	1	3701	768
235	9685	8.54	9	15	8	0	13	76	121	0	87	9	1	87	5231	18	12	28	63	30	82	15	102	29	38	11	9	9	3737	823
235.5	9716	8.49	7	10	4	0	19	76	126	4	97	10	5	88	5255	18	4	39	29	37	95	24	79	29	38	1	2	12	3646	783
236	9748	8.42	9	13	6	2	16	70	131	1	98	11	8	112	5529	12	25	35	46	25	100	0	100	21	24	0	0	17	3579	806
236.5	9779	8.27	4	12	4	1	15	81	143	2	98	8	4	105	5727	18	15	41	48	78	111	33	111	28	28	4	11	0	3608	796
237	9811	8.32	6	10	6	1	16	83	133	0	98	7	0	98	5568	20	31	46	45	62	119	31	114	19	37	19	9	9	3712	859
237.5	9842	8.56	7	11	5	4	12	79	127	0	94	8	5	162	5516	14	26	38	40	60	106	20	85	27	30	0	16	4	3616	760
238	9874	8.47	6	10	3	2	14	74	125	1	90	6	4	102	4654	4	14	26	60	34	109	13	87	30	40	13	10	8	3699	818
238.5	9906	8.32	1	10	5	3	16	71	123	0	90	5	12	90	4992	13	22	43	23	56	86	24	69	26	24	10	0	0	3722	800

Depth (cm)	Age (cal yr BP)	kops	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Y	Zr	Ta	W	Pb	Bi	Po	inc	coh
239	9937	8.26	2	12	2	4	10	67	115	0	88	7	4	67	5242	11	33	39	42	110	5	85	31	39	2	0	18	3646	824	
239.5	9969	8.35	3	12	5	0	13	72	118	0	88	8	5	250	5711	1	18	26	51	44	96	11	95	30	29	7	14	3	3622	805
240	10000	8.27	4	12	4	1	15	68	139	0	98	4	6	115	5049	33	14	35	37	41	116	31	72	32	34	3	18	13	3764	829
240.5	10032	8.48	5	6	6	1	13	69	126	0	101	7	4	110	6125	23	14	39	39	52	98	37	84	41	36	0	0	17	3533	785
241	10063	8.18	5	7	6	4	13	86	135	1	93	8	7	84	5825	19	31	30	66	19	114	20	94	20	37	2	8	24	3604	813
241.5	10095	8.23	5	12	5	5	14	92	138	0	110	10	7	96	6180	15	16	44	45	65	93	30	90	26	32	11	15	0	3534	812
242	10126	8.20	7	14	3	0	12	86	139	0	108	4	4	73	5259	14	15	31	44	53	97	36	116	26	39	18	0	12	3558	764
242.5	10158	8.19	6	9	6	1	18	88	139	0	108	5	5	110	5975	18	18	40	64	27	111	10	100	24	42	9	15	15	3553	815
243	10189	7.91	5	13	7	2	19	107	164	0	122	13	7	87	5750	9	29	45	27	65	155	10	99	30	24	10	7	18	3573	760
243.5	10221	8.09	1	13	4	1	16	82	141	0	104	12	6	85	5293	16	16	42	55	73	140	40	80	27	33	12	3	19	3612	785
244	10253	8.06	1	17	3	1	19	93	146	0	106	8	5	184	4930	17	28	41	59	56	144	38	83	28	45	13	27	21	3682	841
244.5	10284	7.82	0	8	3	4	13	100	155	0	118	10	5	119	5784	24	20	62	59	69	112	34	116	22	34	0	1	8	3497	796
245	10316	7.99	8	20	5	0	18	108	172	0	135	9	9	127	5813	16	18	51	38	54	136	18	102	35	39	5	7	11	3470	801
245.5	10347	8.00	7	18	5	1	16	99	146	0	125	6	9	106	5678	20	37	53	55	71	126	30	104	30	34	7	19	12	3585	825
246	10379	7.94	10	19	4	0	11	102	161	0	121	12	9	103	5596	14	19	51	52	52	131	36	101	38	35	13	17	38	3566	839
246.5	10410	7.85	9	16	7	2	15	129	179	0	134	9	9	142	6077	10	23	52	26	91	162	31	97	26	37	9	0	17	3413	786
247	10442	7.92	5	9	6	3	20	95	148	5	111	12	7	102	4582	13	30	52	54	71	120	10	106	27	38	17	16	15	3659	817
247.5	10473	8.05	9	16	6	1	18	117	153	5	123	10	9	73	6006	19	25	51	38	59	116	27	128	24	32	11	12	0	3546	824
248	10505	7.93	9	19	4	3	21	130	174	0	140	8	11	92	6737	9	28	47	49	78	166	23	138	32	39	17	23	30	3396	771
248.5	10536	7.79	1	16	4	3	19	138	189	0	151	7	5	93	6754	7	23	42	33	86	152	38	95	28	37	0	6	13	3391	794
249	10568	7.91	0	14	7	4	20	127	174	0	151	10	5	168	6396	28	25	51	11	82	115	13	107	22	32	0	0	5	3445	817
249.5	10600	8.08	0	14	5	1	20	120	168	0	130	7	0	89	6297	23	24	67	43	86	158	31	85	28	35	1	5	0	3423	778
250	10631	8.07	5	14	5	0	21	122	175	0	141	6	6	102	6422	8	12	55	22	100	149	30	87	23	24	0	9	10	3414	777
250.5	10663	7.86	4	15	5	2	17	143	179	1	158	2	10	90	6790	27	14	64	48	88	127	25	106	23	38	0	8	18	3320	770
251	10694	8.02	3	19	5	5	21	126	170	0	140	5	9	112	6400	16	21	52	19	79	137	27	110	35	29	14	0	22	3410	785
251.5	10726	7.92	3	16	8	4	26	111	171	2	133	7	4	139	5854	17	43	58	43	47	143	37	98	16	47	17	21	28	3476	792
252	10757	8.05	0	9	4	4	19	96	156	1	131	6	6	74	5680	7	11	38	45	89	98	43	84	24	31	21	3	7	3528	796
252.5	10789	8.10	6	12	5	2	18	90	150	0	133	10	2	96	5716	16	27	53	40	43	99	35	99	40	24	7	8	25	3569	785
253	10820	8.09	1	10	4	0	16	81	167	1	150	9	5	109	5596	40	30	56	37	48	107	21	93	35	40	7	0	14	3651	842
253.5	10852	8.09	3	13	6	0	15	71	164	0	144	7	3	94	5614	14	31	38	33	52	98	17	123	27	31	0	0	9	3582	838
254	10883	8.13	4	16	4	0	15	87	130	0	111	12	5	115	5675	16	28	39	16	55	87	36	86	29	28	4	0	25	3598	807
254.5	10915	8.00	12	20	8	0	13	99	156	0	119	6	12	86	5840	29	35	66	47	66	105	46	76	27	41	0	5	16	3452	795
255	10946	7.92	0	14	5	0	18	94	157	1	127	10	2	101	5806	16	20	34	50	96	126	26	103	24	40	16	14	14	3533	797
255.5	10978	7.93	3	18	6	1	19	117	165	0	121	13	6	137	5765	8	24	54	33	68	135	50	126	30	28	6	14	12	3576	807
256	11010	7.78	4	21	7	2	18	123	158	0	139	12	7	129	6073	24	10	52	36	77	157	44	104	43	33	6	9	23	3430	795
256.5	11041	7.79	0	8	1	1	16	120	169	0	152	4	9	95	6574	21	35	40	24	81	148	47	97	21	32	0	25	12	3387	814
257	11073	7.70	7	15	7	2	14	147	175	0	168	16	9	114	7202	25	15	71	21	81	157	38	131	28	30	5	3	23	3146	753
257.5	11104	7.74	3	16	5	1	14	129	156	0	125	6	7	139	6335	6	28	51	35	80	124	25	111	19	30	0	3	12	3355	749
258	11136	7.55	4	15	3	2	15	125	180	1	155	15	5	123	6865	19	27	61	30	78	158	39	113	30	35	5	9	25	3372	796
258.5	11167	7.53	1	12	6	3	22	139	165	3	169	11	12	95	7176	26	26	67	30	58	137	31	95	30	32	8	2	14	3302	780
259	11199	7.38	0	17	8	3	19	128	163	4	152	11	11	97	7225	24	16	51	0	77	137	29	121	20	26	9	0	1	3308	794
259.5	11230	7.51	1	11	7	2	19	132	159	4	158	19	7	105	7503	19	16	66	10	95	130	11	121	38	33	13	10	10	3157	778

Depth (cm)	Age (cal yr BP)	kaps	Al	Si	S	Cl	Ar	K	Ca	Sc	Ti	V	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
260	11262	7.35	2	18	7	5	24	130	168	0	146	17	11	96	7450	25	31	62	39	89	145	16	144	29	33	16	20	1	3249	803																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
260.5	11293	7.25	0	10	4	6	25	157	176	4	174	5	4	88	7790	6	2	73	20	81	143	36	106	18	24	2	0	9	3108	790																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
261	11325	7.25	0	17	3	2	18	138	181	1	163	10	18	99	7748	22	27	60	6	85	153	0	155	26	34	0	4	7	3115	810																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
261.5	11357	7.17	0	22	7	4	24	161	217	2	193	7	17	123	8490	15	23	74	38	100	181	31	156	28	37	30	15	29	3078	797																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
262	11388	7.35	0	14	4	3	26	184	228	4	194	17	13	127	8601	26	19	63	4	91	202	37	147	36	37	7	1	1	3123	830																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
262.5	11420	7.27	0	15	7	4	26	178	242	3	218	18	14	269	9245	14	18	47	18	118	173	20	146	27	15	0	0	9	2957	800																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
263	11451	7.17	11	28	11	2	24	201	241	0	208	8	14	136	9629	36	20	73	0	137	239	18	210	29	23	8	10	10	3057	754																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

Appendix. Fiskebølvatnet Core A08

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Sect Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.I. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> /yr)
0	0	15	0.01	1	0	2.84	23260	1.1	5.9	--	--	--	--	--
0.01	1	44	0.04	1	1	4.19	18936	-1.3	5.3	19	1.06	0.35	67.4	0.0117
0.02	2	74	0.07	1	2	3.39	16741	14.8	3.7	21	0.94	0.24	74.8	0.0081
0.03	3	103	0.10	1	3	0.08	16411	58	4.4	19	0.85	0.24	71.7	0.0083
0.04	4	132	0.13	1	4	-4.4	17009	32.3	6.8	14	1.12	0.36	67.5	0.0126
0.05	5	160	0.16	1	5	-4.95	17292	41.4	9.8	16	0.94	0.27	71.0	0.0095
0.06	6	189	0.19	1	6	-5.97	17057	53.6	12.3	10	1.13	0.41	63.4	0.0145
0.07	7	217	0.22	1	7	-6.52	16819	46.3	12.1	9	1.15	0.42	63.5	0.0148
0.08	8	245	0.25	1	8	-6.97	16617	97	12.5	26	0.99	0.16	83.4	0.0059
0.09	9	273	0.27	1	9	-6.97	16321	33.2	12.2	26	0.97	0.16	83.3	0.0058
0.1	10	301	0.30	1	10	-6.92	17127	16.8	13.1	22	0.98	0.21	78.8	0.0075
0.11	11	328	0.33	1	11	-6.85	17081	20.8	13.3	21	1.02	0.23	77.6	0.0083
0.12	12	356	0.36	1	12	-6.78	17056	26.6	13.1	20	0.78	0.20	74.4	0.0073
0.13	13	383	0.38	1	13	-6.69	17147	31.1	13.9	13	1.24	0.53	57.6	0.0194
0.14	14	410	0.41	1	14	-6.6	16855	46.5	13.6	17	1.16	0.40	65.7	0.0147
0.15	15	437	0.44	1	15	-6.14	16116	66.7	13.4	19	1.07	0.34	68.4	0.0126
0.16	16	463	0.46	1	16	-5.75	15667	82.5	13.6	17	1.09	0.36	67.2	0.0134
0.17	17	490	0.49	1	17	-5.53	15974	75.3	12.2	16	1.11	0.35	68.9	0.0131
0.18	18	516	0.52	1	18	-5.35	16005	91.8	11.9	20	1.08	0.27	74.5	0.0105
0.19	19	542	0.54	1	19	-5.19	15869	104.8	10.8	24	0.80	0.17	79.0	0.0064
0.2	20	568	0.57	1	20	-5	15993	85.9	10.8	22	1.00	0.21	79.3	0.0080
0.21	21	594	0.59	1	21	-4.83	16100	49.8	10.6	27	0.97	0.15	84.3	0.0079
0.22	22	619	0.62	1	22	-4.85	16221	40.7	10.8	24	1.01	0.19	81.5	0.0053
0.23	23	645	0.64	1	23	-5.04	16476	24.1	12.4	22	1.03	0.24	76.3	0.0096
0.24	24	670	0.67	1	24	-4.97	16533	35.5	13.1	13	1.19	0.49	59.1	0.0192
0.25	25	695	0.70	1	25	-4.71	16244	42.7	11.7	19	1.09	0.34	69.0	0.0134
0.26	26	720	0.72	1	26	-4.55	15699	87.9	10.5	27	1.02	0.19	81.6	0.0075
0.27	27	745	0.74	1	27	-4.37	16045	33.3	9.1	20	1.02	0.24	76.8	0.0095
0.28	28	769	0.77	1	28	-4.16	16362	21.7	9.5	10	1.11	0.42	62.6	0.0169
0.29	29	794	0.79	1	29	-3.77	15929	84.5	9.9	20	1.01	0.22	78.4	0.0089
0.3	30	818	0.82	1	30	-3.52	16022	20.8	10.8	25	0.92	0.18	80.2	0.0075
0.31	31	842	0.84	1	31	-3.13	16281	23.8	12.6	22	0.99	0.23	76.8	0.0094
0.32	32	866	0.87	1	32	-2.73	16276	45.7	11.9	8	1.16	0.52	55.5	0.0215
0.33	33	890	0.89	1	33	-2.41	15944	63.9	11.5	10	1.13	0.41	64.0	0.0170
0.34	34	914	0.91	1	34	-2.11	15220	75.1	8	14	0.95	0.29	69.1	0.0123
0.35	35	938	0.94	1	35	-1.8	15112	103.8	6.5	17	1.05	0.28	72.9	0.0120
0.36	36	961	0.96	1	36	-1.65	15666	30.7	6	35	0.92	0.12	86.7	0.0052
0.37	37	984	0.98	1	37	-1.36	15918	18.7	7.4	27	0.97	0.16	83.0	0.0071
0.38	38	1007	1.01	1	38	-1.27	16361	13	9.2	23	0.94	0.19	80.0	0.0081
0.39	39	1030	1.03	1	39	-1.35	16413	21.5	9.9	25	0.94	0.18	80.7	0.0079
0.4	40	1053	1.05	1	40	-1.49	15981	45.4	8.5	31	0.91	0.13	85.2	0.0059
0.41	41	1076	1.08	1	41	-1.5	16180	22.6	7.4	28	0.93	0.15	83.6	0.0067
0.42	42	1099	1.10	1	42	-1.5	16284	21.2	6.7	28	0.99	0.17	83.4	0.0073
0.43	43	1121	1.12	1	43	-1.63	16283	21.4	7.9	22	1.01	0.22	78.0	0.0099

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.L. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> /yr)
0.44	44	1144	1.14	1	44	-1.89	16391	21.8	7.5	14	1.10	0.39	64.8	0.0172
0.45	45	1166	1.17	1	45	-2.14	16154	43.9	7.7	14	1.07	0.34	68.1	0.0154
0.46	46	1188	1.19	1	46	-2.31	15903	68.2	6.6	16	1.13	0.40	64.9	0.0180
0.47	47	1210	1.21	1	47	-2.45	15648	57.8	6.7	19	1.06	0.34	67.9	0.0154
0.48	48	1232	1.23	1	48	-2.55	15872	77.3	5	26	0.85	0.16	81.5	0.0072
0.49	49	1254	1.25	1	49	-2.64	15641	81.4	4.4	22	0.83	0.19	77.0	0.0088
0.5	50	1275	1.28	1	50	-2.74	16351	32.3	5.3	22	0.96	0.20	78.7	0.0094
0.51	51	1297	1.30	1	51	-2.94	16391	41.7	5.7	21	0.95	0.22	76.3	0.0104
0.52	52	1318	1.32	1	52	-3.11	16431	27	5.9	20	1.10	0.29	73.9	0.0134
0.53	53	1339	1.34	1	53	-3.17	16413	30.7	6.5	26	0.97	0.20	79.9	0.0092
0.54	54	1361	1.36	1	54	-3.08	16268	42.2	6.3	21	1.06	0.27	74.6	0.0127
0.55	55	1382	1.38	1	55	-2.86	16252	32.5	6.1	8	1.27	0.56	55.7	0.0266
0.56	56	1403	1.40	1	56	-2.52	16322	48.4	5.8	19	1.04	0.25	75.9	0.0119
0.57	57	1424	1.42	1	57	-2.43	15379	109	4.6	16	0.92	0.26	71.5	0.0126
0.58	58	1444	1.44	1	58	-2.32	15912	38.3	3.9	22	0.95	0.22	76.7	0.0107
0.59	59	1465	1.46	1	59	-2.2	16001	39.5	4.9	22	0.94	0.22	76.2	0.0108
0.6	60	1485	1.49	1	60	-2.01	16183	45.7	5.3	18	1.07	0.37	65.5	0.0180
0.61	61	1506	1.51	1	61	-1.86	16131	41.4	5.6	14	1.20	0.49	59.5	0.0237
0.62	62	1526	1.53	1	62	-1.85	15514	122	4.8	16	1.02	0.34	66.8	0.0166
0.63	63	1547	1.55	1	63	-2.16	15524	87.1	4.5	25	0.94	0.21	77.7	0.0104
0.65	65	1587	1.59	1	65	-2.79	16349	46.2	5.5	14	1.15	0.46	60.0	0.0228
0.66	66	1607	1.61	1	66	-3.08	15614	85.9	5.9	19	1.07	0.35	67.5	0.0174
0.67	67	1627	1.63	1	67	-3.26	16195	70.7	5	19	0.97	0.31	68.1	0.0156
0.68	68	1646	1.65	1	68	-3.23	16103	88.1	4.3	18	1.10	0.38	65.3	0.0192
0.69	69	1666	1.67	1	69	-2.89	16127	102.8	4.9	17	1.10	0.37	66.2	0.0189
0.7	70	1686	1.69	1	70	-2.42	15849	112.3	4.9	17	1.05	0.33	68.6	0.0168
0.71	71	1705	1.71	1	71	-1.99	15812	111	3.3	20	1.10	0.29	73.9	0.0147
0.72	72	1725	1.72	1	72	-1.69	15885	68	2.1	27	0.97	0.19	80.2	0.0098
0.73	73	1744	1.74	1	73	-1.57	16132	52.7	3.4	29	0.96	0.18	81.7	0.0090
0.74	74	1764	1.76	1	74	-1.6	16357	17.1	5.1	23	0.95	0.21	78.3	0.0107
0.75	75	1783	1.78	1	75	-1.59	16466	18.3	5.6	20	0.99	0.26	73.3	0.0137
0.76	76	1802	1.80	1	76	-1.49	16295	30.7	7	10	1.20	0.50	58.4	0.0261
0.77	77	1821	1.82	1	77	-1.39	15996	39.6	6.7	4	1.35	0.78	42.4	0.0407
0.78	78	1840	1.84	1	78	-0.91	15958	81.2	3.9	15	1.00	0.31	68.8	0.0164
0.79	79	1859	1.86	1	79	-0.88	14820	239.1	2	15	1.10	0.36	67.3	0.0189
0.8	80	1878	1.88	1	80	-1.09	16019	58.4	0.8	20	1.02	0.28	73.0	0.0145
0.81	81	1897	1.90	1	81	-1.23	15863	47.3	2.1	23	1.03	0.24	76.8	0.0127
0.82	82	1916	1.92	1	82	-1.35	16046	37.7	5	20	1.05	0.26	74.9	0.0141
0.83	83	1935	1.93	1	83	-1.39	16304	32	6.5	16	1.03	0.31	69.9	0.0165
0.84	84	1953	1.95	1	84	-1.12	16295	35.9	6.2	3	1.35	0.85	37.2	0.0455
0.85	85	1972	1.97	1	85	-0.89	15500	134.3	3.8	17	0.98	0.27	72.9	0.0142
0.86	86	1990	1.99	1	86	-1	15276	106.5	3.3	20	0.90	0.23	74.1	0.0126
0.87	87	2009	2.01	1	87	-1.1	16286	40.8	3.2	31	1.01	0.17	83.1	0.0092
0.88	88	2027	2.03	1	88	-1	16385	31.9	6	21	1.05	0.27	74.6	0.0144
0.89	89	2046	2.05	1	89	-0.96	16527	23.3	8.2	8	1.17	0.57	50.8	0.0312

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.I. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> /yr)
0.9	90	2064	2.06	1	90	-0.88	16251	40.8	8.4	2	1.47	1.00	32.1	0.0542
0.91	91	2082	2.08	1	91	-0.67	15097	133.9	5.7	22	0.97	0.25	74.3	0.0135
0.92	92	2101	2.10	1	92	-0.82	14521	147	4.7	17	1.02	0.29	71.8	0.0157
0.93	93	2119	2.12	1	93	-0.97	16080	37.8	5.9	17	0.94	0.26	72.1	0.0145
0.94	94	2137	2.14	1	94	-0.84	16183	47.7	8.1	6	1.11	0.57	48.0	0.0316
0.95	95	2155	2.16	1	95	-0.8	15250	201.8	8	18	0.98	0.29	70.1	0.0162
0.96	96	2173	2.17	1	96	-1.23	15572	66.1	7.8	11	1.16	0.53	54.5	0.0291
0.97	97	2191	2.19	1	97	-1.61	15568	116.7	8	16	1.07	0.38	64.1	0.0212
0.98	98	2209	2.21	1	98	-1.93	15638	110.7	7.3	15	1.10	0.39	64.5	0.0217
0.99	99	2227	2.23	1	99	-2.1	15833	119	7.1	14	1.02	0.36	65.0	0.0199
1	100	2245	2.25	1	100	-2.1	15727	103.3	6.2	19	1.05	0.32	69.4	0.0178
1.01	101	2263	2.26	1	101	-2.31	15975	92.5	6.3	17	0.97	0.26	72.9	0.0147
1.02	102	2281	2.28	1	102	-2.72	16196	42.8	7.8	21	0.93	0.21	77.2	0.0118
1.03	103	2299	2.30	1	103	-2.97	16415	29.2	9.7	24	0.96	0.21	78.1	0.0117
1.04	104	2317	2.32	1	104	-2.69	16593	37.1	11.2	23	0.99	0.22	77.4	0.0126
1.05	105	2335	2.33	1	105	-1.27	16220	37.5	12.3	5	1.18	0.68	42.2	0.0383
1.06	106	2353	2.35	1	106	-0.39	14752	114.8	11.5	7	1.22	0.57	53.5	0.0319
1.07	107	2370	2.37	1	107	0.72	14374	122.4	7.5	6	1.15	0.53	53.9	0.0299
1.08	108	2388	2.39	1	108	1.22	13555	321.8	3.5	16	0.99	0.29	71.2	0.0161
1.09	109	2406	2.41	1	109	1.11	14946	41.9	2.7	25	1.05	0.21	80.3	0.0116
1.1	110	2424	2.42	1	110	0.98	15703	43.4	7.2	20	0.98	0.24	75.1	0.0138
1.11	111	2441	2.44	1	111	0.85	16041	25.7	9.8	7	1.16	0.55	52.4	0.0311
1.12	112	2459	2.46	1	112	0.88	15675	56.6	9.6	23	0.96	0.21	78.4	0.0117
1.13	113	2477	2.48	1	113	0.9	15496	71.3	7.3	23	0.79	0.17	78.1	0.0098
1.14	114	2495	2.49	1	114	0.86	16083	34.6	6	14	0.95	0.30	68.8	0.0167
1.15	115	2512	2.51	1	115	0.78	16042	34.2	6.3	22	0.81	0.19	76.2	0.0109
1.16	116	2530	2.53	1	116	0.58	15704	61.3	6.4	19	1.01	0.33	67.5	0.0186
1.17	117	2548	2.55	1	117	0.5	15943	51.1	4.8	19	1.00	0.33	66.6	0.0188
1.18	118	2565	2.57	1	118	0.66	16318	94.3	3.7	27	0.95	0.19	80.1	0.0106
1.19	119	2583	2.58	1	119	0.78	15916	28.7	3.1	27	0.99	0.21	79.0	0.0117
1.2	120	2601	2.60	1	120	0.83	16147	19.2	3.7	15	0.97	0.31	68.1	0.0174
1.21	121	2619	2.62	1	121	0.83	16008	30.6	4.6	24	0.88	0.21	76.8	0.0116
1.22	122	2636	2.64	1	122	0.67	15829	40.4	3.6	17	0.85	0.25	70.8	0.0141
1.23	123	2654	2.65	1	123	0.36	16039	41.4	3.7	24	0.88	0.21	76.2	0.0118
1.24	124	2672	2.67	1	124	-0.1	16035	35.1	3.8	17	0.97	0.30	69.3	0.0168
1.25	125	2690	2.69	1	125	-0.48	16187	29.1	4.5	19	0.87	0.23	73.4	0.0130
1.26	126	2707	2.71	1	126	-0.74	15971	66.4	5.3	12	1.05	0.39	62.5	0.0221
1.27	127	2725	2.73	1	127	-1.02	16143	45	5.4	10	1.03	0.45	56.1	0.0255
1.28	128	2743	2.74	1	128	-1.1	15782	82.1	6.9	7	1.26	0.65	48.9	0.0362
1.29	129	2761	2.76	1	129	-1.04	15109	144.1	5.8	6	1.62	0.85	47.2	0.0479
1.3	130	2779	2.78	1	130	-1.32	14680	112.9	3.7	10	1.03	0.47	54.7	0.0262
1.31	131	2797	2.80	1	131	-1.28	15291	69	3.4	2	1.71	1.19	30.3	0.0668
1.32	132	2814	2.81	1	132	-0.96	14913	347.5	3.7	23	1.26	0.29	76.7	0.0164
1.33	133	2832	2.83	1	133	-0.6	14655	217.2	7.2	7	1.09	0.54	50.5	0.0301
1.34	134	2850	2.85	1	134	0.39	15102	192.2	9.8	3	1.17	0.78	33.0	0.0437
1.35	135	2868	2.87	1	135	0.99	15605	151.2	9.1	9	1.02	0.46	55.0	0.0255



Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.L. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> /yr)
1.36	136	2886	2.89	1	136	1.98	15078	163.7	8.1	7	1.06	0.55	48.1	0.0304
1.37	137	2904	2.90	1	137	1.96	14838	133	7.8	7	1.10	0.57	48.3	0.0316
1.38	138	2922	2.92	1	138	1.07	15342	127.1	5.8	13	0.96	0.32	66.2	0.0179
1.39	139	2941	2.94	1	139	1.21	15006	132.8	6	3	1.14	0.76	33.6	0.0417
1.4	140	2959	2.96	1	140	3.08	15212	120.9	4.3	1	1.55	1.18	23.9	0.0650
1.41	141	2977	2.98	1	141	6.39	14084	93.1	3.9	2	1.30	0.95	26.7	0.0523
1.42	142	2995	3.00	2	0.71	6.16	16560	25.5	4.9	9	1.03	0.49	52.6	0.0267
1.43	143	3013	3.01	2	1.71	6.3	15288	118.1	6.6	23	0.95	0.23	75.5	0.0127
1.44	144	3032	3.03	2	2.71	3.87	15880	27.1	9.4	22	0.93	0.22	76.1	0.0121
1.45	145	3050	3.05	2	3.71	3.96	15764	37.2	10.2	19	1.00	0.28	71.7	0.0153
1.46	146	3069	3.07	2	4.71	4.24	15016	91.9	6	1	1.27	0.92	27.5	0.0500
1.47	147	3087	3.09	2	5.71	3.96	12774	217.2	1.8	2	1.37	1.00	0.0543	0.0326
1.48	148	3106	3.11	2	6.71	3.74	13503	193	0.9	8	1.15	0.60	47.7	0.0326
1.49	149	3124	3.12	2	7.71	2.83	15189	95.7	4.8	10	0.92	0.39	58.2	0.0208
1.5	150	3143	3.14	2	8.71	2.72	15560	118.1	7.8	22	0.93	0.23	75.1	0.0125
1.51	151	3161	3.16	2	9.71	2.63	15646	86.3	7.6	19	1.00	0.29	70.9	0.0156
1.52	152	3180	3.18	2	10.71	2.44	15739	67.7	5.6	11	1.05	0.44	57.6	0.0236
1.53	153	3199	3.20	2	11.71	2.05	15314	82.5	2.4	10	1.00	0.43	56.7	0.0230
1.54	154	3218	3.22	2	12.71	1.56	14952	136.8	-0.4	6	1.07	0.56	47.6	0.0298
1.55	155	3237	3.24	2	13.71	1.15	16171	59.9	-0.9	14	1.10	0.41	62.6	0.0216
1.56	156	3256	3.26	2	14.71	0.54	15948	38	0.1	24	0.93	0.22	75.8	0.0118
1.57	157	3275	3.27	2	15.71	-0.21	16150	38.3	1.5	19	1.07	0.33	69.2	0.0172
1.58	158	3294	3.29	2	16.71	-0.94	16163	32	1.9	27	0.92	0.20	77.9	0.0106
1.59	159	3313	3.31	2	17.71	-1.56	16580	45.1	1.5	10	1.15	0.51	55.4	0.0267
1.6	160	3333	3.33	2	18.71	-2.25	15910	54	1.5	8	1.21	0.57	53.4	0.0293
1.61	161	3352	3.35	2	19.71	-2.97	15942	104	1	6	1.22	0.67	45.0	0.0348
1.62	162	3371	3.37	2	20.71	-3.61	16017	133.5	2.3	19	0.88	0.25	71.5	0.0129
1.63	163	3391	3.39	2	21.71	-3.95	16368	52.1	2.8	5	1.36	0.82	39.9	0.0418
1.64	164	3410	3.41	2	22.71	-3.9	15755	144.7	1.2	2	1.27	0.88	30.6	0.0449
1.65	165	3430	3.43	2	23.71	-3.79	15083	240.3	0.5	7	1.21	0.60	50.8	0.0304
1.66	166	3450	3.45	2	24.71	-3.84	15576	81.5	1.2	4	1.24	0.73	41.0	0.0371
1.67	167	3470	3.47	2	25.71	-3.4	15488	217.6	2	4	1.22	0.72	40.8	0.0365
1.68	168	3490	3.49	2	26.71	-3.41	15184	122.4	1.7	5	1.17	0.70	40.0	0.0352
1.69	169	3510	3.51	2	27.71	-3.25	15359	151.6	1	13	1.00	0.35	64.6	0.0177
1.7	170	3530	3.53	2	28.71	-3.12	17269	60.5	1.5	10	1.40	0.63	55.2	0.0311
1.71	171	3550	3.55	2	29.71	-2.87	16136	126.4	0.1	7	1.32	0.66	50.5	0.0324
1.72	172	3570	3.57	2	30.71	-2.59	15327	111.8	-0.5	20	0.98	0.27	72.7	0.0132
1.73	173	3591	3.59	2	31.71	-2.34	16089	51.4	-0.5	12	0.99	0.39	61.2	0.0189
1.74	174	3611	3.61	2	32.71	-1.99	17906	69.7	-0.6	9	1.35	0.58	57.5	0.0281
1.75	175	3632	3.63	2	33.71	-1.69	17128	140.6	0.1	17	0.88	0.27	69.1	0.0132
1.76	176	3652	3.65	2	34.71	-1.2	16262	52.1	-0.1	25	0.88	0.20	76.9	0.0099
1.77	177	3673	3.67	2	35.71	-0.81	16797	52.2	1.3	17	1.02	0.32	68.6	0.0155
1.78	178	3694	3.69	2	36.71	-0.73	16337	43	3.1	16	1.06	0.36	65.8	0.0173
1.79	179	3715	3.72	2	37.71	-0.74	16174	57.1	3.4	10	1.05	0.47	55.1	0.0225
1.8	180	3736	3.74	2	38.71	-0.71	15545	116	4	13	0.98	0.36	63.4	0.0171
1.81	181	3757	3.76	2	39.71	-0.65	15909	65.2	4.3	7	1.18	0.60	49.0	0.0283

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.L. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> /yr)
1.82	182	3779	3.78	2	40.71	-0.3	15360	145.2	2.4	4	1.24	0.75	40.1	0.0350
1.83	183	3800	3.80	2	41.71	-0.37	14537	230.8	0.7	5	1.20	0.63	47.6	0.0294
1.84	184	3822	3.82	2	42.71	-0.47	14994	171.7	0.4	9	1.09	0.45	58.4	0.0211
1.85	185	3843	3.84	2	43.71	-0.43	15851	110.4	3.2	6	1.11	0.56	50.0	0.0257
1.86	186	3865	3.87	2	44.71	-0.14	15760	127.9	2.7	7	1.22	0.58	52.7	0.0264
1.87	187	3887	3.89	2	45.71	0.06	15228	138.8	2.5	13	1.04	0.37	64.2	0.0171
1.88	188	3909	3.91	2	46.71	0.41	16639	84.2	2.9	21	1.01	0.30	70.4	0.0136
1.89	189	3931	3.93	2	47.71	0.61	16538	53.5	3.6	10	1.05	0.52	50.5	0.0236
1.9	190	3953	3.95	2	48.71	0.48	16044	61.4	3.5	7	1.20	0.65	45.9	0.0291
1.91	191	3976	3.98	2	49.71	0.21	14866	86	2.6	8	1.08	0.53	50.7	0.0239
1.92	192	3998	4.00	2	50.71	0.02	15068	98.4	1.9	8	1.11	0.53	52.3	0.0235
1.93	193	4021	4.02	2	51.71	0.35	15212	98.7	1.4	8	1.02	0.49	51.6	0.0217
1.94	194	4044	4.04	2	52.71	0.81	16326	108.5	2.1	8	1.23	0.58	52.6	0.0256
1.95	195	4067	4.07	2	53.71	1.1	15041	95.4	3.9	10	1.16	0.50	57.0	0.0217
1.96	196	4090	4.09	2	54.71	1.34	15102	77.2	6.2	7	1.19	0.58	51.6	0.0251
1.97	197	4113	4.11	2	55.71	1.74	15125	102.5	5.3	7	1.21	0.59	50.8	0.0256
1.98	198	4136	4.14	2	56.71	2.06	14787	99.1	4.3	2	1.30	0.89	32.0	0.0380
1.99	199	4160	4.16	2	57.71	2.41	14444	172.5	-0.1	7	1.09	0.53	51.3	0.0227
2	200	4183	4.18	2	58.71	2.19	14024	111	0.1	10	1.10	0.43	60.8	0.0182
2.01	201	4207	4.21	2	59.71	1.59	14920	73.8	2.1	10	1.03	0.39	58.2	0.0164
2.02	202	4231	4.23	2	60.71	0.62	15677	69.9	5.3	4	1.11	0.67	39.4	0.0282
2.03	203	4255	4.25	2	61.71	-0.46	15383	105.9	3.5	4	0.97	0.56	42.5	0.0232
2.04	204	4279	4.28	2	62.71	-1.36	15422	123.4	-0.1	8	0.98	0.43	56.3	0.0177
2.05	205	4303	4.30	2	63.71	-1.25	15536	97.8	-1.3	13	0.89	0.34	61.9	0.0139
2.06	206	4328	4.33	2	64.71	-0.3	16865	48.7	0	18	0.94	0.29	69.4	0.0118
2.07	207	4352	4.35	2	65.71	1.05	16167	72.4	2	26	0.87	0.19	78.7	0.0075
2.08	208	4377	4.38	2	66.71	1.94	16393	33.4	2.3	25	0.72	0.17	76.9	0.0067
2.09	209	4402	4.40	2	67.71	2.38	16587	24.7	3.1	23	0.81	0.20	76.0	0.0078
2.1	210	4427	4.43	2	68.71	2.7	18025	42.9	3.6	23	0.74	0.18	76.2	0.0070
2.11	211	4453	4.45	2	69.71	2.72	15962	36.4	4.3	27	0.85	0.18	78.7	0.0071
2.12	212	4478	4.48	2	70.71	2.62	16327	27.3	4.1	18	0.94	0.28	69.9	0.0111
2.13	213	4504	4.50	2	71.71	2.24	15841	93.2	1.4	9	1.08	0.50	53.2	0.0197
2.14	214	4529	4.53	2	72.71	1.68	15686	163.4	-3.2	3	1.04	0.64	38.4	0.0249
2.15	215	4555	4.56	2	73.71	1.19	14986	87.6	-3.8	22	0.86	0.21	75.1	0.0083
2.16	216	4581	4.58	2	74.71	0.83	16487	46.5	-2.1	17	0.54	0.17	68.0	0.0066
2.17	217	4608	4.61	2	75.71	0.66	17204	53.8	2.3	18	0.87	0.26	70.2	0.0099
2.18	218	4634	4.63	2	76.71	0.45	17040	47.8	2.3	21	1.00	0.26	73.6	0.0099
2.19	219	4661	4.66	2	77.71	0	16081	105.8	0.8	15	1.04	0.39	63.0	0.0145
2.2	220	4687	4.69	2	78.71	0	16999	107.3	-0.8	15	1.05	0.42	60.0	0.0157
2.21	221	4714	4.71	2	79.71	0.15	16231	76.8	-0.2	16	1.02	0.34	67.3	0.0124
2.22	222	4741	4.74	2	80.71	0.37	16345	84.1	0.8	13	0.88	0.34	61.6	0.0125
2.23	223	4769	4.77	2	81.71	0.41	15853	45.2	2	20	1.01	0.28	72.5	0.0102
2.24	224	4796	4.80	2	82.71	0.31	16475	74	1.1	8	1.06	0.52	51.2	0.0187
2.25	225	4824	4.82	2	83.71	0.14	15236	89.6	-0.2	14	0.90	0.33	63.7	0.0119
2.26	226	4852	4.85	2	84.71	-0.21	16012	58.7	-1.8	13	0.93	0.36	60.7	0.0131
2.27	227	4880	4.88	2	85.71	-0.41	17458	77	0	19	0.97	0.27	72.6	0.0095

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.I. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> yr)
2.28	228	4908	4.91	2	86.71	-0.38	16458	40.2	1.9	14	0.94	0.32	65.5	0.0114
2.29	229	4937	4.94	2	87.71	-0.12	16472	59.4	1.8	16	0.99	0.34	66.1	0.0118
2.3	230	4965	4.97	2	88.71	-0.12	16307	49.7	1.2	9	1.14	0.50	55.8	0.0176
2.31	231	4994	4.99	2	89.71	-0.18	17001	71.7	-0.8	10	1.11	0.46	58.4	0.0160
2.32	232	5023	5.02	2	90.71	-0.38	15672	89.6	-1.4	10	1.01	0.40	60.6	0.0137
2.33	233	5052	5.05	2	91.71	-0.35	16717	104.4	-1	22	0.94	0.24	74.4	0.0082
2.34	234	5082	5.08	2	92.71	-0.36	16738	37.2	0.1	26	0.97	0.21	78.2	0.0072
2.35	235	5111	5.11	2	93.71	-0.54	16412	24.3	2.2	24	2.4	0.0071	77.2	0.0071
2.36	236	5141	5.14	2	94.71	-0.89	16788	31.8	3.5	25	0.95	0.21	77.4	0.0072
2.37	237	5171	5.17	2	95.71	-1.49	16749	31	3.6	20	0.84	0.22	73.6	0.0074
2.38	238	5201	5.20	2	96.71	-2.66	16818	36	3.8	11	0.82	0.33	59.5	0.0109
2.39	239	5232	5.23	2	97.71	-3.32	16920	93.4	1.3	6	1.20	0.65	45.7	0.0215
2.4	240	5262	5.26	2	98.71	-3.28	17027	217.9	-3.6	12	1.00	0.41	58.6	0.0135
2.41	241	5293	5.29	2	99.71	-3.06	15679	154.7	-4.3	15	0.91	0.36	61.0	0.0115
2.42	242	5324	5.32	2	100.71	-3.14	16557	82.8	-3	16	0.97	0.32	67.0	0.0104
2.43	243	5355	5.36	2	101.71	-3.06	18711	51.7	0.5	12	0.91	0.36	59.7	0.0117
2.44	244	5387	5.39	2	102.71	-2.47	16472	144.9	0.5	21	0.93	0.24	74.1	0.0077
2.45	245	5419	5.42	2	103.71	-1.78	16715	39.6	1.3	25	0.94	0.22	76.6	0.0070
2.46	246	5451	5.45	2	104.71	-1.44	16786	29.9	2.6	25	0.98	0.23	76.3	0.0072
2.47	247	5483	5.48	2	105.71	-1.18	16715	25.6	2.6	20	0.94	0.26	72.9	0.0079
2.48	248	5515	5.52	2	106.71	-1.21	16368	2	2	24	0.96	0.23	75.7	0.0072
2.49	249	5548	5.55	2	107.71	-1.34	16500	30.5	1.4	22	1.02	0.28	73.0	0.0085
2.5	250	5581	5.58	2	108.71	-1.5	16447	46	1.7	27	0.85	0.18	78.8	0.0055
2.51	251	5614	5.61	2	109.71	-1.67	16488	21.3	2.3	22	0.86	0.22	74.4	0.0067
2.52	252	5647	5.65	2	110.71	-1.85	16671	23.7	2.2	26	0.85	0.19	77.7	0.0057
2.53	253	5680	5.68	2	111.71	-2.11	16577	23.3	1.6	14	0.98	0.37	61.8	0.0112
2.54	254	5714	5.71	2	112.71	-2.5	16534	58.9	1.5	17	0.95	0.29	70.1	0.0084
2.55	255	5748	5.75	2	113.71	-2.64	16601	36.4	1.2	22	0.91	0.23	74.3	0.0069
2.56	256	5782	5.78	2	114.71	-2.71	16696	37.1	2.3	23	0.89	0.22	75.5	0.0064
2.57	257	5817	5.82	2	115.71	-2.93	16601	27.3	2.5	5	0.97	0.57	41.2	0.0166
2.58	258	5851	5.85	2	116.71	-3.56	16318	120.4	0.4	12	0.93	0.34	63.1	0.0098
2.59	259	5886	5.89	2	117.71	-3.82	17614	89.3	-0.3	18	0.90	0.26	71.3	0.0074
2.6	260	5921	5.92	2	118.71	-3.55	16795	54.8	2.7	22	0.82	0.21	73.9	0.0060
2.61	261	5957	5.96	2	119.71	-3.07	16755	56.6	4.3	13	1.01	0.39	61.8	0.0109
2.62	262	5993	5.99	2	120.71	-3.01	16309	103.6	3	11	0.82	0.35	57.9	0.0097
2.63	263	6028	6.03	2	121.71	-2.93	16913	130.2	0.7	8	0.97	0.45	53.9	0.0124
2.64	264	6065	6.06	2	122.71	-2.88	16245	82.1	1.1	21	0.88	0.23	74.0	0.0063
2.65	265	6101	6.10	2	123.71	-2.87	16130	37.2	1.7	17	0.78	0.25	67.7	0.0069
2.66	266	6138	6.14	2	124.71	-2.65	16560	46.2	2.8	12	0.83	0.34	58.7	0.0093
2.67	267	6175	6.17	2	125.71	-2.7	16175	78	2.7	16	0.89	0.27	69.8	0.0073
2.68	268	6212	6.21	2	126.71	-2.89	16734	32.4	1.7	25	0.91	0.22	75.6	0.0060
2.69	269	6249	6.25	2	127.71	-3.01	16691	28.1	3	26	0.88	0.19	77.9	0.0052
2.7	270	6287	6.29	2	128.71	-2.96	16951	27.3	4.1	19	0.94	0.28	70.2	0.0075
2.71	271	6325	6.32	2	129.71	-3.22	16455	47.9	4.5	24	0.99	0.24	75.4	0.0064
2.72	272	6363	6.36	2	130.71	-3.49	16673	23.9	5.3	29	0.87	0.17	80.0	0.0045
2.73	273	6402	6.40	2	131.71	-3.72	16956	17.5	6.6	25	0.90	0.21	76.8	0.0054

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.I. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> yr)
2.74	274	6440	6.44	2	132.71	-3.76	16810	49	6.3	10	1.06	0.46	56.4	0.0120
2.75	275	6479	6.48	2	133.71	-3.26	15961	199.6	5.2	10	1.03	0.44	57.4	0.0112
2.76	276	6519	6.52	2	134.71	-2.7	16040	102	5.5	7	1.03	0.55	46.6	0.0140
2.77	277	6558	6.56	2	135.71	-1.27	15595	111.6	4.8	10	0.89	0.41	53.9	0.0103
2.78	278	6598	6.60	2	136.71	-0.09	15407	73.2	6.3	9	1.01	0.46	54.5	0.0116
2.79	279	6638	6.64	2	137.71	0.44	15678	44.5	6.5	15	1.00	0.33	66.9	0.0083
2.8	280	6678	6.68	2	138.71	0.67	15775	71.4	5.9	16	0.97	0.31	68.0	0.0077
2.81	281	6719	6.72	2	139.71	1.41	15902	41.3	4.3	15	0.89	0.31	65.3	0.0076
2.82	282	6760	6.76	2	140.71	7.33	14785	9.4	2.1	4	1.20	0.73	39.4	0.0178
2.83	283	6801	6.80	3	0.15	7.31	16203	11	1	20	0.73	0.21	71.8	0.0050
2.84	284	6843	6.84	3	1.15	7.53	15968	27.9	1.7	24	0.89	0.21	76.1	0.0051
2.85	285	6885	6.88	3	2.15	6.88	15808	22.7	3.2	19	0.83	0.24	71.3	0.0057
2.86	286	6927	6.93	3	3.15	4.12	15678	32.8	2.6	22	0.88	0.23	74.0	0.0054
2.87	287	6969	6.97	3	4.15	3.86	15687	28.1	2.6	23	0.88	0.22	74.8	0.0052
2.88	288	7012	7.01	3	5.15	3.34	15716	32.1	2.9	21	0.85	0.23	72.9	0.0054
2.89	289	7055	7.05	3	6.15	3.66	16446	30.4	2.6	26	0.89	0.20	77.7	0.0046
2.9	290	7098	7.10	3	7.15	3.4	15876	28.7	2.6	26	0.92	0.20	78.5	0.0046
2.91	291	7141	7.14	3	8.15	3.03	15845	23.5	1.7	25	0.85	0.19	77.5	0.0044
2.92	292	7185	7.19	3	9.15	2.88	16009	15.9	2.1	27	0.82	0.16	80.4	0.0037
2.93	293	7229	7.23	3	10.15	2.67	16118	17.6	2.3	27	0.89	0.18	79.9	0.0040
2.94	294	7274	7.27	3	11.15	2.46	16235	17.5	4.2	25	0.77	0.17	78.3	0.0038
2.95	295	7318	7.32	3	12.15	2.19	16124	36.3	2.5	19	1.01	0.29	71.2	0.0065
2.96	296	7364	7.36	3	13.15	1.98	15832	45.4	1.7	12	1.01	0.36	64.2	0.0080
2.97	297	7409	7.41	3	14.15	1.75	15635	34.9	1.9	17	1.01	0.30	70.7	0.0065
2.98	298	7454	7.45	3	15.15	1.62	16008	31.4	2.3	19	1.01	0.28	72.1	0.0062
2.99	299	7500	7.50	3	16.15	1.6	15883	57.5	3.4	16	1.09	0.37	66.5	0.0079
3	300	7547	7.55	3	17.15	1.71	15905	34.1	3.2	15	0.99	0.33	66.5	0.0071
3.01	301	7593	7.59	3	18.15	1.81	15386	71.4	1.9	11	1.03	0.47	54.3	0.0101
3.02	302	7640	7.64	3	19.15	1.92	15409	109.4	0.6	21	0.92	0.24	73.7	0.0052
3.03	303	7687	7.69	3	20.15	2.16	15808	52.2	0.7	22	0.91	0.23	74.7	0.0049
3.04	304	7735	7.73	3	21.15	2.41	15633	62.4	1.3	11	0.95	0.38	60.0	0.0080
3.05	305	7783	7.78	3	22.15	2.46	15673	31.2	0.8	17	0.98	0.30	69.2	0.0063
3.06	306	7831	7.83	3	23.15	2.31	15181	127.1	-1.3	7	1.06	0.52	51.2	0.0108
3.07	307	7879	7.88	3	24.15	2.15	15820	37.1	-1.9	20	0.61	0.17	72.2	0.0035
3.08	308	7928	7.93	3	25.15	2.21	18584	29.6	-2.8	26	0.88	0.21	76.7	0.0042
3.09	309	7977	7.98	3	26.15	1.98	15671	155.8	-2.4	13	1.06	0.41	60.8	0.0084
3.1	310	8027	8.03	3	27.15	2.02	15817	18.3	-2.1	24	0.74	0.16	77.9	0.0033
3.11	311	8077	8.08	3	28.15	1.84	15976	28.2	-1.5	21	0.91	0.22	75.7	0.0044
3.12	312	8127	8.13	3	29.15	1.87	17083	66.1	-0.5	13	1.05	0.40	61.8	0.0080
3.13	313	8177	8.18	3	30.15	2.1	17146	35.8	0.7	21	0.89	0.24	72.5	0.0048
3.14	314	8228	8.23	3	31.15	2.42	15853	21	2.6	26	0.90	0.20	77.7	0.0040
3.15	315	8279	8.28	3	32.15	2.74	15476	113	1.2	6	1.18	0.61	48.5	0.0119
3.16	316	8330	8.33	3	33.15	2.47	13978	191.9	-1.2	3	1.22	0.79	35.4	0.0153
3.17	317	8382	8.38	3	34.15	2.11	14561	169.2	-3.2	8	1.09	0.47	57.2	0.0090
3.18	318	8434	8.43	3	35.15	1.81	15314	38.6	-2	19	0.91	0.23	75.2	0.0043
3.19	319	8487	8.49	3	36.15	1.74	15720	164	-0.7	13	0.87	0.32	62.8	0.0062

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.L. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> yr)
3.2	320	8540	8.54	3	37.15	1.51	14645	174.7	-1	5	1.15	0.62	46.3	0.0117
3.21	321	8593	8.59	3	38.15	1.61	17778	25.6	-1.7	18	0.94	0.27	71.0	0.0051
3.22	322	8646	8.65	3	39.15	1.76	16151	16.6	-0.4	22	0.96	0.23	76.2	0.0043
3.23	323	8700	8.70	3	40.15	1.99	15841	44.2	0.3	20	0.98	0.26	73.8	0.0048
3.24	324	8754	8.75	3	41.15	2.01	16137	17.7	-0.7	20	0.96	0.25	74.5	0.0045
3.25	325	8809	8.81	3	42.15	1.79	15796	81.9	-3.8	24	0.85	0.19	77.3	0.0035
3.26	326	8864	8.86	3	43.15	1.43	15240	78.9	-5.6	6	1.18	0.64	46.1	0.0116
3.27	327	8919	8.92	3	44.15	1.5	17362	26	-5.8	16	0.92	0.30	67.2	0.0054
3.28	328	8975	8.97	3	45.15	1.47	16041	26.7	-5.2	27	0.84	0.18	79.0	0.0032
3.29	329	9031	9.03	3	46.15	1.35	16128	39.1	-3.9	18	0.90	0.27	70.4	0.0048
3.3	330	9087	9.09	3	47.15	1.55	18341	10.2	-3.7	26	0.96	0.20	78.8	0.0036
3.31	331	9144	9.14	3	48.15	1.76	16265	11.5	-2.8	30	0.98	0.19	80.8	0.0033
3.32	332	9201	9.20	3	49.15	1.96	16149	11.5	-2.3	28	0.97	0.19	80.1	0.0034
3.33	333	9258	9.26	3	50.15	1.96	16237	11.4	-1.1	29	0.96	0.19	80.4	0.0033
3.34	334	9316	9.32	3	51.15	1.86	16224	11.9	0.6	26	0.92	0.19	79.5	0.0032
3.35	335	9374	9.37	3	52.15	1.76	16120	11.8	1.1	25	0.91	0.19	79.2	0.0032
3.36	336	9433	9.43	3	53.15	1.73	16166	18.4	0.6	27	0.91	0.20	78.2	0.0034
3.37	337	9492	9.49	3	54.15	1.45	15470	70.7	-3.7	11	0.95	0.38	59.6	0.0065
3.38	338	9551	9.55	3	55.15	0.79	14499	120.8	-6.2	5	1.09	0.68	38.0	0.0115
3.39	339	9471	9.47	3	56.15	0.35	15892	37.4	-4.1	18	1.03	0.28	72.6	-0.0035
3.4	340	9472	9.47	3	57.15	0.12	16749	25.5	0.12	22	0.95	0.23	76.0	0.2088
3.41	341	9473	9.47	3	58.15	-0.24	15267	118.8	2.7	3	1.35	0.88	34.9	0.8003
3.42	342	9474	9.47	3	59.15	-0.52	15045	48.7	1.2	14	1.08	0.35	67.6	0.3196
3.43	343	9475	9.48	3	60.15	-0.51	15845	51.6	1.8	11	1.07	0.40	62.1	0.3682
3.44	344	9476	9.48	3	61.15	-0.32	16437	85.4	4.5	5	1.20	0.65	46.2	0.5892
3.45	345	9477	9.48	3	62.15	-0.52	16257	196.7	7.4	5	1.25	0.68	45.5	0.6210
3.46	346	9478	9.48	3	63.15	-1.11	14744	185.1	6.3	4	1.10	0.64	42.0	0.5830
3.47	347	9479	9.48	3	64.15	-1.32	14632	263.3	6.6	2	1.45	1.06	27.1	0.9661
3.48	348	9481	9.48	3	65.15	-1.82	14236	285.8	9.9	2	1.27	0.92	28.2	0.8338
3.49	349	9482	9.48	3	66.15	-2.01	14724	170.2	15.1	3	1.37	0.76	45.0	0.6887
3.5	350	9483	9.48	3	67.15	-0.97	14577	51.4	18.5	1	1.37	0.97	28.9	0.8841
3.51	351	9484	9.48	3	68.15	-0.04	13722	252	13.8	1	1.52	1.22	19.6	1.1131
3.52	352	9485	9.48	3	69.15	0.46	13426	138.1	12.9	1	1.63	1.32	19.0	1.2025
3.53	353	9486	9.49	3	70.15	0.19	14259	278.5	14.5	1	1.35	1.10	18.0	1.0055
3.54	354	9487	9.49	3	71.15	-0.72	14421	316.8	22.5	1	1.44	1.13	21.8	1.0294
3.55	355	9488	9.49	3	72.15	-2.23	14552	368.7	24.1	2	1.57	1.12	28.7	1.0229
3.56	356	9489	9.49	3	73.15	-1.62	14596	276.7	24.9	2	1.42	0.92	35.6	0.8359
3.57	357	9490	9.49	3	74.15	-0.9	14161	339	22.6	3	1.34	0.81	39.6	0.7385
3.58	358	9492	9.49	3	75.15	-0.17	13878	425.9	21.5	4	1.32	0.77	41.8	0.6988
3.59	359	9493	9.49	3	76.15	0.37	13702	441.9	22.6	3	1.37	0.79	42.6	0.7156
3.6	360	9494	9.49	3	77.15	1.05	13500	420	21.5	1	1.59	1.20	24.5	1.0927
3.61	361	9495	9.49	3	78.15	1.67	13212	364.9	24.4	3	1.33	0.79	40.5	0.7213
3.62	362	9496	9.50	3	79.15	2.03	13001	431.2	31.6	3	1.09	0.64	41.4	0.5820
3.63	363	9497	9.50	3	80.15	2.02	12924	455	37.2	1	1.55	1.27	17.9	1.1559
3.64	364	9498	9.50	3	81.15	1.79	12913	273	38.8	1	1.63	1.33	18.0	1.2157
3.65	365	9499	9.50	3	82.15	1.68	13230	212.5	37.7	1	1.69	1.37	18.8	1.2487

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.L (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> /yr)
3.66	366	9500	9.50	3	83.15	1.77	13326	206.5	36.7	1	1.75	1.43	18.0	1.3053
3.67	367	9501	9.50	3	84.15	2.37	12788	255.7	35.9	1	1.62	1.34	17.6	1.2182
3.68	368	9502	9.50	3	85.15	2.72	12445	408.7	35.4	1	1.71	1.41	17.9	1.2820
3.69	369	9504	9.50	3	86.15	2.83	12102	565.5	34	1	1.82	1.49	17.9	1.3613
3.7	370	9505	9.50	3	87.15	2.65	12178	466.8	36.1	1	1.61	1.19	26.3	1.0799
3.71	371	9506	9.51	3	88.15	2.11	12513	333.5	38.2	2	1.54	1.11	28.4	1.0071
3.72	372	9507	9.51	3	89.15	0.75	12968	633.9	43	1	1.55	1.12	27.5	1.0227
3.73	373	9508	9.51	3	90.15	-0.89	13150	569.5	44	1	1.58	1.17	26.5	1.0615
3.74	374	9509	9.51	3	91.15	-1.61	13270	598.1	44.3	1	1.51	1.11	26.3	1.0154
3.75	375	9510	9.51	3	92.15	-1.78	13221	627.8	43.7	1	1.62	1.19	26.3	1.0882
3.76	376	9511	9.51	3	93.15	-1.71	13219	622.3	43.3					
3.77	377	9512	9.51	3	94.15	-1.55	13221	43.5	43.5					
3.78	378	9513	9.51	3	95.15	-1.45	13240	624.8	45.7					
3.79	379	9515	9.51	3	96.15	-1.38	13167	601.6	48.2	1	1.73	1.40	19.1	1.2716
3.8	380	9516	9.52	3	97.15	-1.23	13271	572.7	47.6					
3.81	381	9517	9.52	3	98.15	-0.93	13234	934.7	49.9					
3.82	382	9518	9.52	3	99.15	-0.49	13275	494.3	50.5					
3.83	383	9519	9.52	3	100.15	0.31	13343	384.9	49.7					
3.84	384	9520	9.52	3	101.15	1.05	13043	423.7	45.4					
3.85	385	9521	9.52	3	102.15	1.54	12700	557.8	38.4	1	1.66	1.37	17.9	1.2447
3.86	386	9522	9.52	3	103.15	1.9	12768	603.4	33.1					
3.87	387	9523	9.52	3	104.15	1.71	12877	837.9	31.2					
3.88	388	9524	9.52	3	105.15	1.34	13219	663.3	29.3					
3.89	389	9526	9.53	3	106.15	0.88	13019	501.8	25.1					
3.9	390	9527	9.53	3	107.15	0.55	12896	508.7	24.3	0	1.52	1.24	18.9	1.1260
3.91	391	9528	9.53	3	108.15	0.14	13076	296	26.1					
3.92	392	9529	9.53	3	109.15	-0.43	13075	520.2	29.7					
3.93	393	9530	9.53	3	110.15	-0.88	13287	534.1	31.8					
3.94	394	9531	9.53	3	111.15	-1.47	13581	270.5	28.2					
3.95	395	9532	9.53	3	112.15	-3.18	14366	291	22.9	1	1.63	1.21	25.9	1.0979
3.96	396	9533	9.53	3	113.15	-4.85	14353	502.8	18.7					
3.97	397	9534	9.53	3	114.15	-5.21	14345	430.3	15					
3.98	398	9535	9.54	3	115.15	-5.4	14386	260.5	16.2					
3.99	399	9537	9.54	3	116.15	-5.6	14643	214.2	15.7	4	1.39	0.79	43.0	0.7195
4	400	9538	9.54	3	117.15	-5.66	14768	212	13.6					
4.01	401	9539	9.54	3	118.15	-5.48	14801	243	9.1					
4.02	402	9540	9.54	3	119.15	-5.28	14919	160.6	9.7					
4.03	403	9541	9.54	3	120.15	-5.26	14996	165.2	12.4					
4.04	404	9542	9.54	3	121.15	-5.27	15469	213.1	17.9					
4.05	405	9543	9.54	3	122.15	-5.48	15343	199.6	18.7	5	1.28	0.66	48.1	0.6047
4.06	406	9544	9.54	3	123.15	-6.01	15660	265.1	18.1					
4.07	407	9545	9.55	3	124.15	-6.84	15986	216.7	15.8					
4.08	408	9546	9.55	3	125.15	-7.35	17513	62.3	11.7					
4.09	409	9547	9.55	3	126.15	-7.43	17522	229.9	11.6					
4.1	410	9549	9.55	3	127.15	-7.49	15979	244.1	11.6	5	1.26	0.66	47.5	0.6040
4.11	411	9550	9.55	3	128.15	-7.34	15989	256.2	11.5					

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.L. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> /yr)
4.12	412	9551	9.55	3	129.15	-7.2	15900	268.7	11.8					
4.13	413	9552	9.55	3	130.15	-7.2	16589	275.5	11.7					
4.14	414	9553	9.55	3	131.15	-7.27	15910	265.6	12.7					
4.15	415	9554	9.55	3	132.15	-7.03	15953	198.5	13.5	5	1.28	0.72	44.2	0.6523
4.16	416	9555	9.56	3	133.15	-6.39	17642	261.1	15.1					
4.17	417	9556	9.56	3	134.15	-6.18	16003	296.3	16.1					
4.18	418	9557	9.56	3	135.15	-4.83	15298	294.2	17.9					
4.19	419	9558	9.56	3	136.15	-3.8	15266	307.7	19.7	4	1.46	0.84	42.0	0.7696
4.2	420	9560	9.56	3	137.15	-3.49	15871	320.3	20.8					
4.21	421	9561	9.56	3	138.15	-3	15327	278.4	21.3					
4.22	422	9562	9.56	3	139.15	-2.32	15313	184.9	20.2					
4.23	423	9563	9.56	3	140.15	3.67	14746	20.5	21					
4.24	424	9564	9.56	4	0.11	10.36	16327	7.1	21.1					
4.25	425	9565	9.57	4	1.11	10.57	15631	37.8	21.6	5	1.13	0.62	45.0	0.5663
4.26	426	9566	9.57	4	2.11	9.61	13963	287.5	22.9					
4.27	427	9567	9.57	4	3.11	4.65	13991	325.1	21.7					
4.28	428	9568	9.57	4	4.11	3.83	14478	335.8	25					
4.29	429	9569	9.57	4	5.11	2.54	14465	337.7	26.9					
4.3	430	9571	9.57	4	6.11	1.8	14400	309.2	27.7	4	1.42	0.82	42.5	0.7434
4.31	431	9572	9.57	4	7.11	0.9	14692	319.7	28.1					
4.32	432	9573	9.57	4	8.11	-0.3	14754	318.3	28.8					
4.33	433	9574	9.57	4	9.11	-0.81	14930	308.7	29.9					
4.34	434	9575	9.57	4	10.11	-1.16	14871	352.1	29.3					
4.35	435	9576	9.58	4	11.11	-1.43	14750	343.7	28.8	4	1.27	0.73	42.7	0.6618
4.36	436	9577	9.58	4	12.11	-1.74	14940	293.8	27.9					
4.37	437	9578	9.58	4	13.11	-1.55	15446	298	26.8					
4.38	438	9579	9.58	4	14.11	-1.27	14666	334.4	26.9					
4.39	439	9580	9.58	4	15.11	-1.01	15295	331	25					
4.4	440	9582	9.58	4	16.11	-0.88	15225	338	24.8	4	1.39	0.80	42.3	0.7318
4.41	441	9583	9.58	4	17.11	-0.73	14621	316.1	24.6					
4.42	442	9584	9.58	4	18.11	-0.63	14701	331.5	24.8					
4.43	443	9585	9.58	4	19.11	-0.73	14771	305.5	24.3					
4.44	444	9586	9.59	4	20.11	-1.12	15056	307.6	21.6					
4.45	445	9587	9.59	4	21.11	-1.15	16925	280.1	20.3	4	1.41	0.80	43.1	0.7287
4.46	446	9588	9.59	4	22.11	-1.23	14774	324.5	21.9					
4.47	447	9589	9.59	4	23.11	-1.07	14606	336.9	22.4					
4.48	448	9590	9.59	4	24.11	-0.94	14592	340.4	23.2					
4.49	449	9591	9.59	4	25.11	-0.9	14539	345.6	21.4					
4.5	450	9592	9.59	4	26.11	-1.02	14687	343.6	18.1	4	1.48	0.87	41.0	0.7967
4.51	451	9594	9.59	4	27.11	-1.24	14730	338	18.1					
4.52	452	9595	9.59	4	28.11	-1.65	14804	343.8	20					
4.53	453	9596	9.60	4	29.11	-2.24	14914	339.2	19.4					
4.54	454	9597	9.60	4	30.11	-3.04	15058	318.4	19.5					
4.55	455	9598	9.60	4	31.11	-3.7	16114	280.9	19.4	4	1.47	0.88	40.3	0.8001
4.56	456	9599	9.60	4	32.11	-4.23	16318	324.5	18.7					
4.57	457	9600	9.60	4	33.11	-4.6	15089	416	18.3					

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.L (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR g/cm2/yr
4.58	458	9601	9.60	4	34.11	-4.53	15335	316.8	17.9					
4.59	459	9602	9.60	4	35.11	-4.29	15267	321.1	17.4					
4.6	460	9603	9.60	4	36.11	-4	15140	318.9	17.3	4	1.33	0.77	42.1	0.7008
4.61	461	9605	9.60	4	37.11	-3.78	15074	333.1	16.5					
4.62	462	9606	9.61	4	38.11	-3.78	14902	349	17.3					
4.63	463	9607	9.61	4	39.11	-3.97	15049	335.6	16.6					
4.64	464	9608	9.61	4	40.11	-4.23	15164	334.6	14.4					
4.65	465	9609	9.61	4	41.11	-4.52	15157	355	13.7	4	1.40	0.83	40.8	0.7568
4.66	466	9610	9.61	4	42.11	-4.69	16027	313.5	11.9					
4.67	467	9611	9.61	4	43.11	-4.83	15441	309.5	13.5					
4.68	468	9612	9.61	4	44.11	-4.9	15040	327.4	11.5					
4.69	469	9613	9.61	4	45.11	-4.85	15168	341.2	12.2					
4.7	470	9614	9.61	4	46.11	-5.02	15143	343.2	13.1	4	1.32	0.80	39.3	0.7284
4.71	471	9616	9.62	4	47.11	-5.14	15250	314	13.8					
4.72	472	9617	9.62	4	48.11	-5.01	15662	319.1	15.9					
4.73	473	9618	9.62	4	49.11	-5.01	15435	348.5	16					
4.74	474	9619	9.62	4	50.11	-5.15	15014	337.7	12.7					
4.75	475	9620	9.62	4	51.11	-5.22	15262	346.8	12.2	4	1.10	0.65	41.1	0.5915
4.76	476	9621	9.62	4	52.11	-5.28	15337	339.4	12.4					
4.77	477	9622	9.62	4	53.11	-5.31	15380	326.2	15.9					
4.78	478	9623	9.62	4	54.11	-5.33	15375	414.7	14.9					
4.79	479	9624	9.62	4	55.11	-5.35	15141	438.1	16					
4.8	480	9625	9.63	4	56.11	-5.36	15206	356	14.3	3	1.38	0.89	35.8	0.8074
4.81	481	9627	9.63	4	57.11	-5.35	15487	337.4	16					
4.82	482	9628	9.63	4	58.11	-5.36	15569	316.5	16.5					
4.83	483	9629	9.63	4	59.11	-5.35	15619	341	17.5					
4.84	484	9630	9.63	4	60.11	-5.35	15463	358.5	19.8					
4.85	485	9631	9.63	4	61.11	-5.33	15349	343	19.6					
4.86	486	9632	9.63	4	62.11	-5.32	15533	357.1	18.8	3	1.45	0.89	38.4	0.8138
4.87	487	9633	9.63	4	63.11	-5.31	15429	369.1	17.2					
4.88	488	9634	9.63	4	64.11	-5.28	15467	471	13.8					
4.89	489	9635	9.64	4	65.11	-5.25	15238	580.1	13					
4.9	490	9636	9.64	4	66.11	-5.22	15008	562.7	14.3	3	1.24	0.79	36.3	0.7197
4.91	491	9637	9.64	4	67.11	-5.2	14959	497.6	18.7					
4.92	492	9639	9.64	4	68.11	-5.19	14990	438.6	22.9					
4.93	493	9640	9.64	4	69.11	-5.18	15001	477	23.6					
4.94	494	9641	9.64	4	70.11	-5.18	14873	412.2	24.7					
4.95	495	9642	9.64	4	71.11	-5.19	14902	451	23.9					
4.96	496	9643	9.64	4	72.11	-5.19	14872	477.9	24.3	1	1.46	1.07	26.9	0.9720
4.97	497	9644	9.64	4	73.11	-5.19	14968	439.6	22.9					
4.98	498	9645	9.65	4	74.11	-5.2	14967	438.4	22.1					
4.99	499	9646	9.65	4	75.11	-5.2	14911	432.3	20.6					
5	500	9647	9.65	4	76.11	-5.2	14883	451.5	22.5	1	1.49	1.12	25.3	1.0172
5.01	501	9648	9.65	4	77.11	-5.2	14926	447.5	25.3					
5.02	502	9650	9.65	4	78.11	-5.2	14909	450.3	26.8					
5.03	503	9651	9.65	4	79.11	-5.21	14870	464.6	27.2					



Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.L. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR (g/cm <sup>2</sup> /yr)
5.04	504	9652	9.65	4	80.11	-5.22	14833	466.7	25.9	1	1.49	1.09	27.0	0.9893
5.05	505	9653	9.65	4	81.11	-5.21	14664	440.4	21.6	1	1.49	1.09	27.0	0.9893
5.06	506	9654	9.65	4	82.11	-5.18	14657	498.5	20					
5.07	507	9655	9.66	4	83.11	-5.15	14591	473	22.3					
5.08	508	9656	9.66	4	84.11	-5.14	14498	467.8	24.4					
5.09	509	9657	9.66	4	85.11	-5.15	14621	485.8	23.6					
5.1	510	9658	9.66	4	86.11	-5.15	14613	457.1	22.7	1	1.39	1.03	25.9	0.9367
5.11	511	9659	9.66	4	87.11	-5.14	14632	505.1	22.1					
5.12	512	9661	9.66	4	88.11	-5.14	14653	458.3	23.1					
5.13	513	9662	9.66	4	89.11	-5.12	14555	23.6						
5.14	514	9663	9.66	4	90.11	-5.1	14526	438.2	23.9					
5.15	515	9664	9.66	4	91.11	-5.09	14567	449.1	21.9	1	1.59	1.18	25.8	1.0736
5.16	516	9665	9.66	4	92.11	-5.07	14454	449.4	20.7					
5.17	517	9666	9.67	4	93.11	-5.06	14518	473.2	21.1					
5.18	518	9667	9.67	4	94.11	-5.07	14380	472.9	21.8					
5.19	519	9668	9.67	4	95.11	-5.08	14463	458.6	19.6					
5.2	520	9669	9.67	4	96.11	-5.08	14522	439.8	19.6	1	1.52	1.13	25.7	1.0316
5.21	521	9670	9.67	4	97.11	-5.08	14411	448.4	16					
5.22	522	9672	9.67	4	98.11	-5.07	14471	466.3	15.7					
5.23	523	9673	9.67	4	99.11	-5.07	14470	437.5	16.1					
5.24	524	9674	9.67	4	100.11	-5.06	14398	441	19.5	1	1.56	1.15	26.1	1.0522
5.25	525	9675	9.67	4	101.11	-5.07	14378	446.2	18.3					
5.26	526	9676	9.68	4	102.11	-5.08	14320	463.9	18.5					
5.27	527	9677	9.68	4	103.11	-5.1	14366	462.8	18.5					
5.28	528	9678	9.68	4	104.11	-5.12	14238	468.7	17.3					
5.29	529	9679	9.68	4	105.11	-5.08	14177	461.5	16.3					
5.3	530	9680	9.68	4	106.11	-5.16	14184	488.8	18	1	1.59	1.20	24.6	1.0908
5.31	531	9681	9.68	4	107.11	-5.28	14333	491	18.2					
5.32	532	9682	9.68	4	108.11	-5.43	14345	450.5	20.3					
5.33	533	9684	9.68	4	109.11	-5.55	14373	456.8	20.3					
5.34	534	9685	9.68	4	110.11	-5.62	14366	499.5	21.5					
5.35	535	9686	9.69	4	111.11	-5.69	14430	475.2	23.3	1	1.46	1.10	25.0	0.9991
5.36	536	9687	9.69	4	112.11	-5.74	14361	527.1	23.6					
5.37	537	9688	9.69	4	113.11	-5.82	14326	494.8	23.4					
5.38	538	9689	9.69	4	114.11	-5.53	14208	426.2	24.3					
5.39	539	9690	9.69	4	115.11	-4.89	14238	509.1	24.3	1	1.50	1.14	24.3	1.0344
5.4	540	9691	9.69	4	116.11	-4.69	13961	507.3	24.5					
5.41	541	9692	9.69	4	117.11	-4.59	14108	486.7	23.6					
5.42	542	9693	9.69	4	118.11	-4.35	14093	534	22.1					
5.43	543	9695	9.69	4	119.11	-4.2	14061	517.8	19.6					
5.44	544	9696	9.70	4	120.11	-3.76	13963	530.1	12.5					
5.45	545	9697	9.70	4	121.11	-3.34	13859	457.2	11.2	1	1.60	1.21	24.6	1.0993
5.46	546	9698	9.70	4	122.11	-2.61	13826	422.4	10.1					
5.47	547	9699	9.70	4	123.11	-1.81	13650	528.7	12.9					
5.48	548	9700	9.70	4	124.11	-1.33	13551	554.8	17.2					
5.49	549	9701	9.70	4	125.11	-0.72	13642	401.3	20.2					

Core Depth (m)	Depth (cm)	Age (cal yr BP)	Age (cal ka BP)	Section	Seet Depth (cm)	Core Dev (mm)	Gamma Density (cps)	Mag Sus (SI x 10 <sup>-5</sup> )	Resistivity (mV)	L.O.L. (%)	Wet BD (g/cc)	Dry BD (g/cc)	Water Content (%)	MAR g/cm <sup>2</sup> /yr
5.5	550	9702	9.70	4	126.11	-0.63	13804	535.2	22.7	1	1.52	1.15	24.3	1.0482
5.51	551	9703	9.70	4	127.11	-1.26	13886	489.4	24.8					
5.52	552	9704	9.70	4	128.11	-2.44	14527	276.8	24.3					
5.53	553	9706	9.71	4	129.11	-3.55	14641	476.4	23.3					
5.54	554	9707	9.71	4	130.11	-4.24	14614	465.7	21.9					
5.55	555	9708	9.71	4	131.11	-4.99	14592	452.9	23.2	2	1.41	1.00	29.1	0.9094
5.56	556	9709	9.71	4	132.11	-6.34	15208	388.6	23.7					
5.57	557	9710	9.71	4	133.11	-7.19	15423	435.3	24.8					
5.58	558	9711	9.71	4	134.11	-7.25	15363	391.3	26.7					
5.59	559	9712	9.71	4	135.11	-7.27	15226	478	26.9					
5.6	560	9713	9.71	4	136.11	-7.17	14997	443.4	25.9	2	1.42	1.04	26.7	0.9455
5.61	561	9714	9.71	4	137.11	-5.01	14685	195.4	25.8					
5.62	562	9715	9.72	4	138.11	-3.29	14109	373.7	25.2					
5.63	563	9717	9.72	4	139.11	-1.44	13786	360.7	27.1					
5.64	564	9718	9.72	4	140.11	0.01	13714	360.7	30.2					
5.65	565	9719	9.72	4	141.11	1.25	13351	457.4	33.4	1	1.58	1.20	24.4	1.0906
5.66	566	9720	9.72	4	142.11	1.95	13085	503.1	31.3					
5.67	567	9721	9.72	4	143.11	2.75	13028	490.6	29.8					
5.68	568	9722	9.72	4	144.11	3.74	12838	558.2	32.1					
5.69	569	9723	9.72	4	145.11	3.67	13493	444.8	35.5					
5.7	570	9724	9.72	4	146.11	2.32	14193	231.6	36.5	2	1.46	1.08	26.3	0.9828
5.71	571	9725	9.73	4	147.11	2.25	13766	324.3	32.3					
5.72	572	9726	9.73	4	148.11	4.85	13170	173.7	14.5					
5.73	573	9727	9.73	4	149.11	10.77	12338	27.9	-2.4					

Appendix. Fiskebolvatnet core A09 Itrax scanning XRF data.

Depth (cm)	keps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
0.5	8,834,031	70	120	140	71	1281	1658	3280	1393	132148	123	0	769	298	582	1124	392	155	80	8	0	24537	6312
1	9,226,587	18	77	66	65	1136	1423	2787	1100	120044	155	112	692	267	565	1052	683	117	132	84	0	28669	7057
1.5	9,156,288	4	66	72	53	800	1209	2017	1017	99261	52	0	352	131	381	988	678	142	27	0	0	31241	7205
2	9,284,147	0	6	16	0	522	918	1342	768	80945	171	50	292	317	173	665	746	137	108	9	0	35376	7932
2.5	8,699,853	0	9	29	0	752	1017	1696	910	92341	122	14	476	98	247	766	729	102	82	0	0	30627	7179
3	9,839,141	85	162	142	100	1254	1504	2777	1154	135490	177	162	816	235	473	1071	703	117	127	46	14	29943	7628
3.5	8,964,110	30	103	94	53	1088	1344	1906	1081	102599	18	0	507	247	280	751	704	92	95	25	123	29356	6790
4	8,954,970	6	79	62	37	1414	1577	2433	1480	119107	0	0	616	110	739	857	802	144	222	0	0	26279	6544
4.5	9,431,665	99	162	143	71	1439	1600	2381	1366	124548	122	0	518	211	543	1146	899	66	82	0	89	28335	6863
5	8,679,533	50	102	93	68	1059	1312	2016	1100	103507	23	16	473	53	469	932	723	130	86	0	0	27737	6567
5.5	8,313,776	78	111	96	64	1231	1403	2165	1349	106792	15	0	551	55	432	1248	850	183	184	33	55	25078	6713
6	8,369,196	38	110	94	72	1158	1454	2000	1224	103639	0	0	461	135	518	1177	730	150	103	71	0	25559	6548
6.5	8,103,339	67	148	104	53	1360	1698	2142	1439	108504	21	0	447	0	348	1526	821	153	162	0	0	23113	6255
7	7,767,942	0	77	52	32	1473	1268	1325	816	70261	21	6	348	0	396	1782	978	153	116	0	0	27482	7153
7.5	9,690,163	0	0	30	0	710	1087	1140	1021	79247	92	57	393	231	347	713	728	151	175	0	0	36787	8345
8	9,968,440	0	18	26	9	556	993	990	1010	73461	180	30	186	210	62	435	903	111	170	0	0	39964	8482
8.5	9,881,601	0	0	0	7	398	836	989	1010	65117	155	194	85	281	366	696	699	42	160	0	0	39739	8061
9	9,712,582	0	38	26	33	550	1004	1174	933	69189	93	13	291	315	160	866	568	108	163	0	64	39439	8581
9.5	9,574,124	0	15	72	10	520	862	1162	870	69792	106	0	284	393	160	787	903	167	86	0	0	37385	8217
10	9,485,185	5	13	60	41	588	988	1275	800	76564	197	105	321	216	158	507	701	85	218	0	0	36440	7779
10.5	9,486,825	0	26	29	8	784	1364	1708	922	95198	115	32	309	232	356	962	587	110	185	0	0	33418	7876
11	9,445,505	0	40	50	14	718	1114	1741	977	97646	0	6	388	133	400	852	596	109	48	28	25	32447	7335
11.5	9,838,921	55	96	74	50	842	1259	1866	1072	105886	83	0	448	338	578	911	873	168	83	0	0	33784	7782
12	8,758,092	0	54	66	22	739	1141	1862	934	96938	81	11	368	47	430	875	498	160	56	0	0	30147	7166
12.5	9,018,369	78	139	102	26	1121	1419	2407	910	120787	0	0	464	32	489	1065	627	150	25	12	0	27144	6945
13	8,791,592	101	225	126	71	2251	2281	4228	1108	152805	29	53	800	25	658	1790	554	12	108	0	13	21269	6125
13.5	8,777,932	103	146	125	92	1523	1818	3382	1153	136608	174	0	774	97	533	1596	513	184	92	0	0	23540	6509
14	9,082,129	80	116	157	107	1120	1731	2948	1193	130973	110	0	757	0	734	1332	605	176	108	0	62	26372	6910
14.5	8,960,310	51	89	61	37	1023	1666	2982	1027	127322	61	0	547	26	598	1276	685	68	42	21	0	25843	6524
15	9,032,929	49	119	110	70	1001	1620	2836	1100	128245	0	0	743	8	408	1152	625	110	0	0	29	26184	6637
15.5	9,173,208	107	122	107	76	1071	1725	2994	1116	130793	121	0	706	132	493	1084	581	169	185	0	0	26297	7069
16	8,765,892	65	150	113	119	1182	1793	3009	1183	129605	58	6	586	50	411	1283	504	130	58	0	0	24815	6474
16.5	9,163,628	63	134	97	70	1170	1879	3082	1305	133923	31	0	642	0	370	1262	546	90	52	0	0	25747	6416
17	9,137,808	88	169	152	101	1075	1839	2830	1318	127805	43	23	554	112	376	1275	856	67	105	82	32	26925	6888
17.5	8,681,973	88	161	103	74	1079	1786	2517	1288	120215	111	0	490	129	476	1371	573	156	148	0	0	25600	6398
18.5	9,128,448	34	55	86	28	688	1170	1784	3006	110296	45	122	317	229	384	706	657	16	0	4	0	29344	6884
19	10,869,671	31	78	84	39	633	1251	1655	14378	180125	90	34	364	0	211	619	364	186	60	11	0	27345	6633
19.5	9,239,587	16	46	89	51	454	929	1261	3812	101253	92	98	183	153	318	876	625	61	95	20	0	31386	7095
20	9,830,481	0	0	19	0	346	660	934	846	66699	177	56	289	227	57	395	661	90	87	0	0	39898	8458
20.5	9,695,663	0	17	16	0	382	755	1079	791	70460	53	59	252	358	251	479	703	173	163	0	0	38260	7986
21	9,601,484	0	28	48	29	530	925	1301	816	82997	0	20	382	188	165	700	765	125	116	5	27	36300	7670
21.5	9,536,824	46	97	99	61	679	1078	1636	890	93541	48	46	435	309	426	799	840	95	179	0	9	34139	7626
22	9,296,067	0	63	87	23	810	1206	1886	891	106982	65	43	461	328	407	720	593	20	69	0	83	30579	7125

Depth (cm)	keps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
22.5	9,674,203	43	126	122	65	1113	1238	3024	934	142458	0	0	520	208	516	901	595	123	83	40	0	27643	6594
23	9,671,883	156	308	206	135	2348	2030	5122	1179	190927	67	22	863	27	610	1194	563	109	116	0	0	20403	6063
23.5	9,616,184	142	268	149	133	2131	2201	5204	1309	187441	55	0	805	91	566	1213	518	0	82	0	88	21090	6163
24	9,661,583	110	173	148	100	1478	1941	4185	1100	160161	52	0	771	0	499	1182	741	228	0	0	0	24313	6591
24.5	10,077,339	72	75	107	75	708	1163	2204	873	113143	140	9	543	52	493	848	813	154	120	0	17	33927	7612
25	9,751,162	11	18	47	33	474	842	1181	722	752005	125	0	286	150	214	429	684	151	244	0	17	38323	8556
25.5	9,656,823	0	45	58	13	583	971	1088	788	78144	0	0	333	300	195	622	695	262	85	0	0	36312	7838
26	9,247,747	0	45	26	0	859	1098	1295	886	80259	188	0	329	39	364	570	766	124	154	0	0	34845	7510
26.5	8,300,537	80	209	146	77	1952	2237	2052	1244	108322	40	0	615	185	547	1343	712	194	155	0	15	24452	6283
27	8,384,096	58	157	102	64	1059	1527	1876	1267	98333	28	0	407	188	529	1303	1183	156	17	75	16	26441	6785
27.5	9,594,204	23	52	74	19	595	968	1006	857	79821	107	98	258	216	283	954	829	108	94	0	12	35925	8050
28	9,915,480	0	20	54	31	367	711	945	746	66516	85	0	219	234	151	699	584	241	86	0	0	40143	8530
28.5	9,564,544	14	28	51	28	421	738	964	801	67697	74	0	294	409	25	398	771	125	96	0	0	38207	7994
29	9,475,225	16	59	47	18	761	1032	1606	844	96844	0	43	444	274	145	631	675	125	60	0	58	33523	7511
29.5	9,843,901	103	170	99	89	1193	1616	2728	1131	132759	132	59	669	306	387	940	533	157	118	77	0	29401	7116
30	9,386,986	26	44	80	19	526	766	1167	621	82061	36	53	202	363	196	400	707	119	255	0	0	34712	7667
30.5	9,056,569	109	244	153	130	2014	1930	3175	1264	143032	25	0	561	0	415	1083	777	54	129	0	0	24390	6378
31	8,238,877	26	134	89	55	2048	2102	2643	1508	117906	0	0	585	111	639	1323	851	218	132	49	51	23337	6245
31.5	7,470,105	77	154	105	87	1267	1563	1974	1178	92937	28	51	557	0	414	1008	819	147	93	0	0	22513	5998
32	7,773,462	48	118	85	50	1254	1684	2153	1305	100823	48	0	388	150	606	1345	825	107	91	0	0	23986	6509
32.5	7,543,584	59	139	114	77	1629	1846	2659	1450	112846	23	11	605	47	353	1033	696	164	100	0	18	19557	5361
33	9,302,567	42	53	65	6	528	859	1490	815	86258	12	0	307	261	361	688	420	207	181	86	133	32165	7371
33.5	9,399,966	63	156	125	85	753	1057	2055	828	98655	95	7	437	278	358	636	420	131	112	9	0	32427	6704
34	8,899,071	60	153	121	96	992	1220	1844	1018	97567	122	0	457	77	466	732	743	196	90	0	0	29867	7214
34.5	9,914,100	0	0	0	0	394	819	909	730	63173	134	46	276	406	222	351	866	217	162	0	32	40861	8272
35	9,684,003	0	0	0	0	227	603	614	593	50166	124	143	186	171	0	175	617	60	219	0	0	42030	8088
35.5	9,514,204	0	0	0	0	298	677	822	663	59869	41	33	176	408	289	677	792	172	129	0	102	39431	8164
36	9,884,121	0	58	60	19	480	966	1199	849	76206	167	110	263	209	111	490	748	71	149	0	0	38507	8039
36.5	9,351,906	0	0	26	5	446	797	1053	667	69388	111	34	425	191	369	635	592	165	68	0	0	36681	7732
37	9,357,546	0	41	53	7	603	966	1303	924	75726	69	145	271	282	231	643	478	166	93	76	0	35295	7813
37.5	8,938,270	49	124	85	68	1035	1469	1740	1033	94185	47	0	470	150	369	789	738	119	77	0	0	30568	7075
38	9,468,485	15	39	37	29	614	1043	1420	895	79914	103	137	441	312	202	767	342	185	93	0	0	35584	7689
38.5	9,926,720	0	0	6	14	616	1079	1352	827	77857	219	42	494	419	391	693	720	154	137	0	0	39014	8432
39	9,908,681	0	0	52	16	297	792	994	707	64475	97	89	278	421	163	673	791	76	194	0	0	40527	8144
39.5	10,042,959	7	21	33	26	419	876	1124	814	74379	0	7	231	371	239	609	607	50	17	0	0	39014	8022
40	9,875,461	0	0	46	26	451	829	991	744	67822	118	207	279	266	43	468	567	99	154	0	0	38743	8216
40.5	9,641,663	0	0	0	0	344	804	1086	751	67194	94	80	274	297	201	364	822	97	172	32	0	38671	8302
41	9,823,901	0	15	42	6	477	859	1107	764	74746	99	51	371	187	275	456	663	185	148	0	0	38283	8035
41.5	9,431,905	0	0	41	0	363	845	994	632	69057	151	90	328	429	137	533	727	99	308	0	0	37271	8022
42	9,258,947	18	51	76	45	691	1025	1759	781	91450	128	33	427	296	189	794	655	114	53	0	0	33283	7466
42.5	9,363,706	50	108	85	64	888	1255	2059	958	107867	0	20	536	0	340	919	765	176	63	0	82	30778	7278
43	9,252,167	132	203	195	124	1579	2327	927	123374	0	0	495	188	360	799	640	176	13	0	0	0	27591	6554
43.5	8,688,073	115	258	185	133	2145	2212	2915	1479	134324	203	0	721	0	437	1187	784	120	102	0	0	23284	5891
44	8,137,138	79	132	117	90	1595	1817	2448	1408	108051	0	0	517	94	470	1207	1038	140	74	0	78	23647	6502
44.5	9,260,767	99	154	124	104	928	1211	2143	921	108645	0	21	451	56	286	777	546	65	102	0	0	30516	7008

Depth (cm)	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
45	9,568,904	109	173	90	82	1600	1576	3378	1008	147547	25	6	588	47	501	841	624	138	98	0	26610	6748
45.5	9,333,426	139	286	157	141	2140	2310	4541	1195	172679	62	0	755	0	706	1277	661	121	67	0	21820	6160
46	9,183,548	119	155	146	89	1337	1863	3344	1164	144635	82	56	630	0	666	1289	614	57	51	0	25171	6752
46.5	9,318,287	0	52	76	41	681	1122	1688	924	90245	57	0	284	119	319	904	677	141	60	0	32173	7277
47	9,688,803	20	41	66	39	568	1049	1581	830	88746	233	118	492	347	457	685	792	158	155	0	35581	8070
47.5	9,507,244	13	63	64	29	684	1118	1525	870	89026	70	0	447	198	212	747	568	99	20	0	35182	7844
48	9,334,606	0	69	43	26	900	1366	2212	956	108196	121	109	538	330	295	890	665	143	110	0	30479	6741
48.5	9,938,140	96	148	107	54	1212	1627	2652	1060	131944	181	85	723	289	449	1032	617	135	158	22	30294	7057
49	9,451,325	0	45	63	24	638	1008	1500	893	87109	159	0	384	138	207	475	899	198	99	0	34798	7836
49.5	8,943,010	17	74	73	54	560	906	1287	849	73358	60	12	324	494	284	625	688	41	254	107	33479	7127
50	9,504,325	15	70	40	20	675	1203	1769	978	90602	148	36	374	289	419	862	785	99	205	0	34307	7482
50.5	9,628,543	82	142	111	73	867	1348	2217	991	105807	23	0	382	307	440	644	604	141	142	0	32475	7100
51	9,667,163	51	115	103	80	840	1276	2078	1145	97718	78	0	453	202	123	828	502	173	169	0	32538	7368
51.5	8,451,955	53	140	77	64	1198	1731	1833	1266	86508	0	0	428	162	386	1248	683	175	39	0	28412	6771
52	9,600,044	62	130	66	47	649	1279	1650	1269	87012	80	30	281	416	293	781	664	150	94	0	33712	7237
52.5	9,448,045	0	38	70	38	535	1110	1332	1112	76081	0	0	405	345	316	713	657	267	122	17	35830	7765
53	9,341,866	12	65	55	24	881	1508	1885	1199	94173	95	93	507	418	300	818	491	83	108	22	32639	7338
53.5	8,505,455	25	108	66	45	1216	1697	1986	1196	99843	32	65	431	63	536	892	634	68	195	0	26224	6403
54	7,626,863	68	166	95	59	1640	1983	2263	1404	101939	54	0	587	34	301	1228	921	153	179	0	22081	5936
54.5	7,931,340	35	88	59	71	1252	1935	1830	1250	97012	67	6	484	0	227	1312	651	134	140	0	24839	6694
55	9,239,307	47	117	104	67	875	1273	1890	829	102067	61	89	412	235	207	820	632	98	73	0	31208	7102
55.5	8,742,912	42	103	97	68	906	1360	1586	1040	92340	114	105	414	19	466	861	641	106	114	73	30390	6609
56	8,528,874	78	156	119	87	1354	1663	1880	1243	95354	6	0	453	153	451	1059	721	137	135	26	27552	6919
56.5	9,267,387	41	75	68	21	832	1168	1787	1020	98964	75	27	390	103	233	824	696	66	145	0	31811	7406
57	9,167,888	25	95	91	43	1104	1523	2040	1031	104706	165	93	643	195	242	1103	818	103	122	0	30126	6957
57.5	9,302,727	50	105	93	43	1093	1434	1982	1006	106348	86	159	547	196	306	962	625	123	96	0	30618	7258
58	9,171,528	73	144	129	60	992	1359	2205	1057	110915	23	0	448	163	196	971	745	35	145	0	29021	6718
58.5	10,015,719	56	154	95	20	1419	1538	3476	1285	159674	132	64	723	75	393	850	500	155	41	0	27139	6517
59	9,551,244	141	369	146	117	2453	2199	4968	1214	181186	126	0	803	0	546	1045	489	135	56	100	21147	5682
59.5	9,229,827	110	331	172	112	2584	2576	5387	1443	191323	77	7	1014	0	706	1230	666	137	102	28	18788	5662
60	9,430,925	108	253	182	129	1877	2146	4554	1179	175265	83	24	858	0	476	1137	721	184	19	0	21640	6277
60.5	8,971,290	102	175	125	95	1282	1785	3276	1097	142610	48	25	634	75	482	901	489	103	69	0	24109	6334
61	8,855,331	52	162	111	65	1424	1668	2619	1185	115651	131	34	435	174	314	1057	654	88	126	38	26263	6798
61.5	9,482,545	30	69	52	10	590	1142	1462	730	88973	53	57	349	218	188	838	646	135	136	59	34864	7351
62	9,588,624	55	130	110	72	988	1418	2166	1088	115258	55	13	477	4	215	779	731	114	38	0	30919	6998
62.5	10,008,360	103	193	162	92	1756	1517	3764	1231	160991	9	42	635	235	373	862	396	53	67	46	27005	6172
63	8,839,311	145	375	154	129	2786	2966	4662	1235	165902	94	8	918	82	573	1641	366	122	115	50	18888	5639
63.5	8,803,312	185	341	231	151	2260	2356	3890	1230	150426	104	0	830	23	411	1768	551	205	47	0	21174	5963
64	9,023,789	148	237	152	130	1585	2115	3509	1254	141381	60	9	671	11	543	1556	674	117	185	13	23763	6271
64.5	9,262,767	109	201	177	111	1448	2145	3590	1325	139211	66	54	668	0	651	1413	567	156	119	74	25266	6357
65	9,110,009	91	231	158	112	1246	1996	3205	1175	132430	23	0	574	48	384	1253	653	83	38	8	25186	6401
65.5	9,437,805	133	199	139	101	1351	2123	3354	1366	136949	0	0	617	147	605	1291	530	110	47	0	25970	6756
66	9,122,188	56	187	132	97	1298	2032	3145	1302	127748	0	27	518	105	435	1349	632	51	66	0	26463	6760
66.5	8,975,230	121	245	197	124	1339	2150	3163	1237	130372	0	41	625	0	683	1143	528	68	113	48	24454	6247
67	8,810,012	67	164	116	101	1391	2196	3427	1399	134161	76	39	753	0	488	1409	598	84	23	0	24501	6324

Depth (cm)	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh	
67.5	8,974,450	113	148	94	1425	2217	3369	1393	135912	64	0	731	25	422	1583	842	149	80	0	0	24898	6502	
68	9,017,129	84	135	140	73	1230	2076	3070	129385	56	65	561	19	406	1443	627	65	96	43	21	25033	6296	
68.5	8,587,794	86	133	127	89	1151	1889	2742	1388	116479	104	0	709	125	598	1600	588	291	32	19	24490	6683	
69	8,846,871	35	132	88	55	980	1770	2339	1357	106732	28	0	639	72	583	1271	788	148	64	0	28381	6986	
69.5	8,788,732	12	110	56	45	768	1455	1998	1205	96362	142	60	536	52	166	743	711	158	73	0	29022	6996	
70	9,121,788	46	89	71	56	824	1497	2208	1308	108247	133	46	496	21	361	839	576	142	142	0	29687	7191	
70.5	9,371,946	66	99	103	58	804	1407	2128	1727	106228	85	109	497	310	429	992	769	158	59	59	30588	6969	
71	9,653,663	0	55	40	41	547	1090	1486	1265	84876	0	50	330	459	367	780	726	104	107	0	36290	7929	
71.5	9,684,623	0	0	0	0	261	757	821	879	63054	41	63	143	184	180	239	858	78	60	0	39244	8220	
72	9,694,402	0	13	68	22	415	860	1020	766	69125	78	0	403	311	153	453	764	141	178	0	39361	8110	
72.5	9,617,023	30	83	66	45	728	1179	1573	956	85866	54	82	220	323	380	628	741	0	136	0	72	35884	7566
73	9,585,724	0	34	30	33	693	1103	1444	855	83466	159	102	327	243	248	508	470	141	177	0	0	35672	7838
73.5	9,131,788	27	119	82	51	1014	1474	2025	1050	100467	65	30	452	69	434	828	764	47	135	0	0	30299	6913
74	8,844,851	22	56	37	0	1033	1366	1809	1204	96197	20	56	473	370	377	1249	792	107	185	0	0	30212	7179
74.5	8,560,654	5	95	77	32	1194	1562	1828	1008	91470	90	0	345	56	231	876	795	183	187	45	43	28790	6819
75	8,272,977	0	23	39	30	982	1203	914	799	56072	0	0	464	317	180	891	616	132	168	0	0	32389	7432
75.5	8,438,195	0	28	11	0	1972	2119	1835	1218	76926	132	15	505	0	254	998	561	191	161	0	13	30290	6988
76	6,439,035	53	216	79	49	2798	2913	1699	1351	76788	0	0	438	97	426	2014	732	185	136	19	13	18080	5834
76.5	8,380,356	0	6	6	0	530	873	1317	657	64179	56	0	299	258	278	704	421	82	20	0	0	32418	6925
77	9,155,568	48	128	73	61	798	1278	1769	994	92859	0	0	411	299	164	818	563	48	128	0	0	30586	7326
77.5	7,888,081	76	203	115	80	1682	2469	2206	1321	98908	69	34	558	56	361	1247	824	181	148	0	0	22696	6059
78	9,184,268	66	89	88	45	929	1414	1882	846	102372	55	117	480	178	290	854	777	0	145	0	72	30346	7209
78.5	9,243,027	54	127	100	45	853	1308	2013	1040	105084	38	69	464	211	438	950	737	24	72	6	45	30938	7423
79	9,155,008	93	166	127	97	1532	1921	2667	1260	115968	100	51	716	100	350	1264	812	82	66	22	0	27700	6872
79.5	9,501,245	0	68	46	24	655	1227	1467	1235	82364	88	129	471	322	424	779	598	119	110	48	0	35194	7677
80	9,758,442	24	91	79	45	796	1197	1736	961	103456	79	0	441	122	361	759	611	208	16	0	0	34370	7265
80.5	9,290,727	59	109	103	74	820	1365	1559	1000	95258	70	0	420	194	474	698	612	209	169	0	29	32503	7234
81	8,950,950	6	106	85	69	891	1283	1685	1015	82412	29	0	415	233	511	1028	889	93	112	88	15	31354	7552
81.5	9,106,448	0	70	99	48	722	1088	1353	870	83681	103	17	433	119	279	546	752	142	152	0	0	33501	7776
82	7,976,240	31	161	83	66	2452	2667	2559	1508	102437	61	0	554	140	460	1213	475	223	230	0	0	23213	6118
82.5	5,781,202	27	212	24	23	3370	2923	2295	1176	58475	0	0	258	0	621	2571	1067	221	184	0	105	16808	5695
83	8,423,835	0	20	9	16	923	1296	1346	813	65629	122	90	167	22	449	1275	790	46	140	0	44	31495	7327
83.5	9,264,347	0	30	53	23	745	1546	1500	1115	82347	80	0	460	197	263	706	698	196	153	0	0	33493	7359
84	8,756,552	17	109	82	27	819	1358	1525	992	84211	39	68	367	0	301	736	767	86	107	0	40	30111	6769
84.5	8,964,230	55	106	75	60	773	1433	1684	1047	88154	128	0	573	200	239	672	605	223	209	47	6	30911	7189
85	9,207,888	0	44	41	13	962	1416	1743	1153	90446	110	26	401	145	490	977	959	159	90	0	137	31586	7889
85.5	9,706,102	0	0	0	0	541	991	1225	853	73134	93	0	245	227	322	580	672	162	151	0	0	37736	8442
86	9,452,105	0	0	5	0	379	842	977	771	63449	99	8	202	318	247	347	805	63	54	0	64	38990	8006
86.5	9,890,781	43	78	72	49	500	1050	1232	685	87864	13	112	406	57	279	550	683	71	132	64	0	36148	7688
87	9,062,129	31	49	63	30	504	956	1255	696	80309	113	0	329	286	266	750	510	156	145	0	0	33330	7169
87.5	9,147,388	76	162	125	58	991	1462	1880	1042	98882	48	83	524	445	384	1200	740	181	114	41	0	30801	7156
88	8,818,531	47	124	61	65	1434	2040	2300	1305	112633	25	0	653	80	467	941	682	204	85	0	0	26894	6793
88.5	7,803,682	79	148	100	80	2395	2773	3046	1786	117172	0	0	703	0	456	1619	591	81	131	0	0	20735	5908
89	6,340,956	42	197	33	33	2683	3587	2732	1790	87837	20	36	592	0	453	2115	1050	79	147	0	0	16179	5415
89.5	8,616,873	0	120	75	31	1124	1541	2882	1066	106110	6	74	549	110	524	1344	690	0	84	0	0	27051	6611

Depth (cm)	keps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
90	9,124,168	95	176	136	100	1279	1719	3029	1075	115994	179	63	636	215	497	1020	593	160	87	0	0	27912	6634
90.5	9,361,346	56	110	83	81	961	1646	2235	1198	100687	97	119	612	96	460	866	488	101	64	0	0	31444	7307
91	8,598,674	4	97	81	33	938	1554	1869	1286	87490	28	0	406	152	559	946	626	85	59	0	0	29595	6855
91.5	8,353,416	18	95	64	55	1058	1481	1692	1079	83784	65	11	351	318	340	932	602	148	115	0	0	28402	6822
92	8,361,996	39	186	70	20	2262	2808	3019	1635	113510	24	0	504	38	428	1196	704	165	98	0	0	23449	6035
92.5	6,077,659	0	81	0	0	1810	2310	1148	1148	72081	123	46	351	66	599	1781	654	101	151	0	0	18100	5163
93	7,055,009	16	91	67	18	1102	1349	1751	728	71409	92	0	315	137	434	1085	878	160	73	0	0	24442	5971
93.5	9,438,305	7	69	53	37	1069	1457	2209	1101	111333	95	34	494	36	326	739	802	65	162	0	25	30798	6889
94	9,342,766	70	157	108	72	1645	1788	2921	1085	130525	28	0	592	169	274	795	718	159	171	0	0	27284	6478
94.5	9,134,028	126	315	131	101	2771	2663	4873	1302	170529	31	0	881	5	657	1444	537	125	151	28	69	19755	5483
95	8,223,057	87	200	107	96	1768	2143	3417	1278	122976	32	0	607	0	640	1499	732	157	160	0	0	22222	6292
95.5	9,151,828	94	194	146	70	1543	2344	3660	1571	131706	31	44	689	23	482	1154	416	116	134	82	30	24943	6449
96	8,027,619	66	146	98	70	1105	1885	2693	1301	106173	133	74	565	0	425	1343	549	147	224	0	0	23819	6079
96.5	8,363,496	112	182	151	91	1186	2069	2869	1208	111858	109	0	519	118	373	1443	597	242	169	69	47	24174	6303
97	8,575,794	119	207	165	114	1238	2006	2981	1355	120490	82	91	677	188	526	1017	642	113	178	0	0	24343	6336
97.5	8,428,395	89	138	96	54	1549	2129	2719	1313	114730	0	33	507	0	427	1246	811	79	80	0	21	24325	6296
98	9,549,524	90	204	147	91	1214	1723	2572	1145	118844	29	85	701	185	118	955	441	130	127	0	0	30335	6877
98.5	9,207,048	87	117	92	75	1338	2010	2913	1333	126106	203	0	757	87	370	961	644	215	162	0	70	27565	6885
99	9,279,867	0	47	21	18	760	1232	1624	956	89633	115	202	516	361	389	989	660	66	155	0	28	33645	7643
99.5	9,200,928	0	78	77	53	689	1219	1361	933	80204	125	12	395	209	325	660	875	25	129	0	0	34254	7920
100	8,757,532	45	120	74	55	1042	1486	1633	1143	86556	37	16	351	180	467	1228	943	112	103	0	11	30159	7298
100.5	9,711,503	38	49	78	40	632	1045	1283	909	79616	153	188	431	132	72	532	739	122	166	0	19	35922	7762
101	9,598,364	0	19	9	6	413	946	1210	715	74496	79	21	347	319	311	636	526	170	118	0	28	36895	7863
101.5	9,484,945	14	47	16	32	555	1184	1436	944	84402	47	0	453	403	469	700	660	99	124	134	47	33874	7405
102	9,665,123	19	113	69	49	914	1424	2383	1058	111650	99	64	608	71	502	904	732	131	84	31	10	31432	7434
102.5	9,445,585	58	82	56	70	682	1243	1839	820	94604	107	0	422	117	213	863	799	149	88	0	0	33632	7431
103	8,560,174	85	191	139	104	1413	1682	1844	991	101906	70	29	527	238	468	974	604	130	195	30	12	26596	6193
103.5	6,796,692	82	225	92	62	2749	2835	2534	1495	93934	0	0	653	0	624	1860	928	141	181	9	37	17704	5554
104	8,047,899	55	160	113	88	1729	1963	1791	1217	98624	0	0	515	70	540	1012	743	271	36	0	30	24465	6709
104.5	7,976,540	17	128	51	11	2012	2290	2317	1439	110835	0	0	547	84	685	1491	772	170	188	0	0	22477	6189
105	6,493,895	19	187	58	47	2590	2575	1701	1168	82269	16	0	619	176	475	2031	605	282	136	111	24	17773	5269
105.5	7,660,743	25	112	83	40	1357	1533	1192	845	66436	136	29	346	0	346	1458	841	143	181	0	0	27070	6932
106	9,094,069	6	62	57	53	549	1044	1356	727	69925	16	104	354	199	337	673	578	70	205	0	0	35375	7973
106.5	8,509,135	36	111	89	56	1096	1689	1594	984	88393	47	0	408	34	328	874	886	154	102	0	0	28732	6952
107	9,062,429	0	34	56	12	749	1361	1275	1007	70576	133	103	407	230	316	770	746	123	269	0	0	34929	7768
107.5	9,517,564	0	50	48	43	581	925	1068	696	77113	31	0	283	246	295	606	900	109	111	22	0	35519	7647
108	9,695,183	0	39	60	14	578	1045	1107	838	79902	110	0	431	341	0	429	824	135	186	0	121	37566	8219
108.5	6,096,459	0	24	47	5	530	916	942	625	57494	56	0	330	239	84	584	448	170	132	0	53	21536	5054
109	8,860,551	0	66	33	6	810	1185	1251	783	83793	130	152	440	179	207	728	507	89	153	0	0	31604	7019
109.5	8,553,614	60	169	103	71	1623	2148	2262	1443	111520	65	45	701	80	204	994	914	160	164	54	0	26068	6465
110	8,043,339	20	118	58	38	1427	2141	2140	1434	93590	0	8	482	85	375	1338	816	83	206	0	0	25620	6595
110.5	9,600,444	38	128	107	42	823	1289	1746	850	103534	51	106	417	354	218	747	627	0	0	94	90	33018	7090
111	9,784,442	18	55	76	12	642	1050	1483	753	102030	73	44	320	152	305	462	595	95	84	0	0	34055	7391
111.5	9,403,446	40	79	85	41	750	1236	1794	746	103754	131	145	346	220	262	728	508	142	148	0	0	32000	7171
112	9,428,005	25	106	74	26	652	1159	1497	1004	84159	9	0	415	202	329	623	850	93	50	0	0	35116	7769

Depth (cm)	kaps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
112.5	8,836,131	29	71	96	61	815	1302	1458	855	93886	50	0	380	57	128	684	699	69	100	0	0	30293	7070
113	8,491,855	55	183	84	27	1506	1866	2257	1199	110810	0	12	619	139	361	1019	1038	93	137	0	0	25506	6234
113.5	9,389,786	14	89	70	42	851	1395	1807	1272	95549	10	130	427	238	430	876	631	174	159	0	0	32940	7654
114	9,412,466	43	126	116	56	939	1455	2248	1001	102008	38	0	534	29	341	865	519	133	90	0	13	32216	7149
114.5	9,849,101	96	235	135	114	1626	1833	3813	1095	161665	51	0	550	124	492	1012	628	98	0	0	0	25489	6347
115	9,017,850	83	239	123	59	2066	2453	4165	1250	154963	23	34	741	35	501	1394	602	44	107	0	0	22297	5942
115.5	9,322,626	102	163	128	99	1718	2237	4048	1294	148090	59	0	721	18	806	1509	635	78	39	0	0	25158	6551
116	10,044,999	33	144	91	38	828	1374	2179	999	109067	33	18	403	321	274	832	601	98	68	0	0	34430	7588
116.5	7,928,360	0	21	53	16	558	961	1262	747	74581	33	33	121	361	43	369	517	84	73	0	0	28373	5962
117	9,529,004	0	80	46	42	569	1067	1316	880	75850	60	0	355	373	305	519	635	189	93	0	0	36782	7879
117.5	9,450,365	0	40	52	0	560	1056	1421	886	77480	62	0	204	383	236	367	904	223	59	0	0	36348	7656
118	9,135,008	0	30	0	0	569	1181	1425	903	73147	130	43	491	290	284	385	690	270	179	0	0	34587	7734
118.5	9,529,444	64	132	96	64	831	1534	2158	1167	105968	106	18	597	307	208	997	558	94	131	0	0	32311	7273
119	8,836,471	7	69	62	26	1039	1500	1818	1190	86225	21	77	467	288	527	815	613	165	46	0	70	30497	6904
119.5	9,033,189	34	89	91	56	855	1626	1833	1342	85613	0	12	403	215	207	1025	777	198	99	0	0	32109	7240
120	9,374,986	6	91	71	52	728	1426	1561	1184	85337	246	160	487	276	365	743	629	99	253	0	14	33937	7492
120.5	9,001,690	13	79	46	45	872	1575	1473	1242	84053	113	125	567	287	360	779	612	109	324	9	0	32760	7064
121	8,403,936	0	89	67	25	1113	1660	1720	1222	86997	74	7	523	88	354	999	615	151	148	0	0	28626	6767
121.5	9,204,468	27	81	67	15	594	1378	1557	1156	81183	0	56	313	218	379	734	615	113	152	0	0	34258	7632
122	9,165,368	43	130	79	24	780	1429	1952	1041	92783	78	109	581	53	183	533	698	97	103	0	0	31370	7184
122.5	9,559,244	5	70	101	11	633	1117	1657	808	96308	80	0	351	396	156	351	717	182	86	0	0	34062	7608
123	9,442,145	56	132	109	61	849	1296	1708	812	107317	74	0	304	333	305	724	815	140	103	123	17	30956	6881
123.5	8,866,851	75	218	147	85	1772	2134	2296	1243	114393	0	0	610	317	317	1185	910	163	221	0	15	26283	6619
124	9,065,309	0	74	58	0	968	1348	1557	892	96855	81	0	333	342	360	874	892	128	119	36	0	31210	6913
124.5	9,494,445	13	116	70	23	1217	1724	1896	1028	98224	0	27	284	245	277	551	517	151	148	0	0	33102	7246
125	7,136,368	59	100	68	62	1420	1654	1591	948	77810	124	108	534	199	136	1079	625	94	91	50	0	23062	5915
125.5	7,671,683	20	130	63	37	1549	1870	1845	1450	80790	79	50	534	125	470	912	812	190	61	0	46	25693	6213
126	8,347,456	0	91	27	0	1151	1568	1623	1158	78810	0	53	375	489	295	1104	843	85	77	120	26	29127	6533
126.5	7,211,868	84	245	100	76	2789	2865	2456	1395	96657	0	0	582	0	673	1772	816	182	123	28	0	19155	5535
127	8,329,176	169	346	188	154	2532	2633	3613	1452	138254	0	0	699	200	510	1063	784	167	87	5	11	20152	5720
127.5	7,580,384	103	299	109	57	3398	3655	3324	1655	125693	0	0	668	0	578	1509	718	203	138	0	52	17186	5552
128	6,533,414	95	252	92	95	3320	3418	2475	1565	85352	0	0	452	0	641	2270	820	65	58	0	0	16857	5511
128.5	8,820,391	42	166	97	64	1192	1562	1881	1016	105324	15	49	539	102	464	771	877	93	204	0	0	28217	6868
129	8,350,896	103	255	136	101	2055	2126	2876	1351	132452	0	0	673	0	556	842	795	129	32	0	0	21382	5712
129.5	8,140,778	97	215	111	98	1948	2213	2972	1662	125720	68	53	711	0	474	1247	877	79	67	0	0	21119	6074
130	7,478,885	94	330	122	90	3012	2655	3302	1467	110364	0	0	605	0	557	1704	804	97	150	12	0	19502	5735
130.5	5,563,564	52	359	38	62	4741	3144	2271	1190	76991	106	7	594	23	371	2323	673	41	150	0	0	13793	4697
131	6,839,411	36	105	52	18	1257	1683	1500	1014	76738	109	0	412	0	299	1346	682	200	144	0	0	20880	5486
131.5	8,948,170	0	92	62	20	528	1016	1173	794	75467	50	0	228	311	213	768	689	171	181	102	8	33179	7563
132	8,347,316	0	131	71	40	1296	1651	1488	989	82820	29	32	360	393	242	621	590	113	155	0	74	28829	6922
132.5	7,725,502	48	213	106	63	2131	2746	2155	1243	104184	64	0	591	4	562	1246	732	192	186	20	0	21393	5851
133	6,495,055	42	245	80	66	2783	2996	2072	1336	86182	5	0	612	0	524	1386	473	171	104	0	33	17877	5039
133.5	7,341,626	32	129	70	36	1916	2540	2202	1387	94044	23	0	446	35	480	1586	814	77	92	0	0	21008	5849
134	8,245,897	92	224	124	72	1753	2223	2016	1210	106835	0	0	526	198	355	1217	620	149	97	45	0	24363	6215
134.5	8,130,938	58	205	90	62	1937	2204	2389	1383	110299	0	0	673	27	402	1330	800	117	58	0	103	23527	6006



Depth (cm)	kaps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh	
135.5	7,296,907	67	183	89	53	3030	3469	2192	1397	99672	27	0	609	0	460	1754	885	190	90	0	0	19872	5649	
135.5	8,217,318	93	230	143	70	1684	2286	1973	1209	98376	0	0	580	217	430	1491	787	292	125	82	0	25036	6185	
136	7,112,609	56	154	53	32	2317	2770	2132	1275	88140	114	4	486	0	385	1490	775	75	97	0	6	20384	5859	
136.5	8,384,196	57	125	65	45	957	1572	1377	862	77440	48	0	449	318	150	854	767	173	251	0	0	29665	7147	
137	8,000,680	55	243	80	49	2443	2734	2056	1192	100712	0	29	534	237	312	1002	808	185	187	86	0	23258	6106	
137.5	6,316,497	103	225	106	73	2778	3465	2092	1490	89506	23	41	466	0	355	1564	560	73	169	15	62	16547	4900	
138	7,071,809	120	455	121	93	4602	6185	3993	2603	110820	0	0	540	62	581	2239	1189	173	247	129	0	15396	5542	
138.5	5,699,883	42	360	44	54	4304	4744	1748	1136	63530	53	0	383	15	734	2788	886	137	266	0	0	15248	5345	
139	2,888,371	0	6	95	0	505	696	2126	295	10676	102	62	2177	0	191	672	334	71	58	0	0	9500	2964	
139.5	1,998,340	62	86	198	71	64	262	2863	35	388	0	0	3587	16	0	0	31	138	43	47	34	6723	1672	
141.5	9,450,865	0	38	31	0	498	1039	1197	860	74407	224	91	338	381	82	622	921	165	146	0	0	35682	7852	
142	9,473,165	0	50	42	12	599	1154	1428	797	85807	142	244	380	499	208	724	713	125	179	0	27	33843	7429	
142.5	9,060,049	0	63	38	43	920	1406	1495	900	90698	178	15	539	285	294	769	748	137	125	59	22	30236	7273	
143	9,740,882	0	0	7	45	648	1242	1439	754	82802	236	211	419	497	92	845	961	91	196	0	0	35328	8031	
143.5	8,682,273	22	162	67	70	1555	1854	2190	1126	113019	116	0	599	85	482	1059	782	203	99	42	33	25723	6460	
144	6,874,191	27	176	40	53	3157	3378	2988	1822	104584	0	0	646	85	503	1665	1052	185	228	27	0	16263	5406	
144.5	5,836,361	23	190	61	48	3132	3172	1933	1350	82691	0	0	437	0	307	2138	703	153	207	54	48	13681	4941	
145	6,754,992	24	180	46	27	3149	2537	3155	1758	112689	0	0	523	0	627	1605	1029	216	66	0	17	13990	5035	
145.5	5,661,463	24	341	22	17	4786	3219	1996	1189	77780	0	0	425	0	580	2433	700	0	38	0	80	13115	4782	
146	6,033,059	52	192	93	71	1888	1555	1840	610	80376	88	45	456	130	502	1493	579	141	163	0	26	16472	4620	
146.5	8,914,190	151	310	165	114	2225	2572	4603	1192	161107	228	132	871	0	809	1606	835	76	49	28	79	20012	5851	
147	8,502,095	12	128	65	51	1398	1909	2073	1215	97677	218	84	644	273	481	1088	656	123	161	168	35	25863	6297	
147.5	7,653,703	13	122	84	31	1807	2106	2043	1285	102011	11	54	521	0	535	1300	905	116	140	0	0	21112	5865	
148	9,294,207	25	54	69	29	767	1338	1539	1001	83431	169	85	508	114	298	907	970	126	86	0	0	31550	7327	
148.5	9,260,767	0	0	53	0	830	1544	1754	1062	86130	250	150	553	558	421	212	730	744	140	202	22	0	31991	7012
149	8,689,293	8	101	59	28	1392	1881	2180	1173	102751	200	120	640	320	461	1230	859	134	141	0	0	26486	6965	
149.5	9,174,648	0	55	8	8	669	1321	1568	891	80469	116	55	388	181	188	541	888	137	141	0	48	32671	7739	
150	7,918,941	34	149	53	46	1683	2332	2086	1340	96347	45	69	636	119	620	1352	908	154	88	0	57	23769	6353	
150.5	8,290,537	52	136	48	33	1479	2040	2088	1393	98586	138	126	646	88	561	1336	838	121	276	0	19	25796	6885	
151	8,762,352	35	185	46	24	2295	2428	2449	1262	119820	42	17	682	166	659	1216	780	220	143	0	0	24043	6246	
151.5	6,948,930	36	196	50	50	2732	3259	2239	1647	98605	53	40	531	111	475	1751	690	55	243	118	86	17270	5293	
152	6,365,296	9	122	16	8	2956	2882	3009	1363	78027	126	0	411	113	555	2233	1178	64	189	0	0	17244	5556	
152.5	8,629,013	0	80	36	10	1189	1589	2568	1158	93841	105	215	438	242	162	1032	740	110	202	48	133	27245	6721	
153	7,587,384	0	68	34	6	902	1261	1771	747	98522	247	82	457	292	204	976	675	103	33	0	71	22905	5688	
153.5	8,466,115	53	141	88	67	1476	1908	2538	1342	113269	130	58	797	37	503	1335	877	233	212	31	0	24029	6509	
154	9,269,667	0	32	34	18	735	1368	1712	1093	79615	187	0	421	172	281	691	955	183	199	0	0	32941	7861	
154.5	9,732,602	0	101	55	23	826	1334	1923	834	108867	240	144	583	303	297	940	933	180	166	0	0	31739	7402	
155	9,243,907	0	94	60	29	948	1354	1898	908	108844	227	82	655	325	437	878	568	176	79	0	51	28722	6754	
155.5	8,670,333	0	63	38	25	1255	1837	2228	1178	94213	138	0	538	360	472	1318	684	174	104	34	0	27984	6801	
156	9,483,385	0	15	48	20	738	1345	1901	900	90136	162	262	613	217	221	791	823	17	150	0	30	32912	7292	
156.5	9,556,524	0	73	39	13	1657	1987	2802	1432	119867	319	205	617	268	482	904	635	115	120	41	0	30088	6376	
157	8,367,876	9	67	60	51	971	1537	1901	1255	85786	100	0	477	314	272	912	976	251	140	105	44	28609	6663	
157.5	7,977,580	48	195	83	51	2084	2150	3084	1521	140590	173	106	671	0	401	988	647	19	108	0	0	18369	5288	
158	7,652,483	23	155	62	59	1676	1862	2562	1323	99943	224	113	604	10	622	1308	1077	91	74	0	0	22514	6283	
158.5	7,454,805	35	148	50	48	1603	1694	2264	1207	103956	172	42	494	154	590	1392	1352	188	104	0	0	20436	5861	

Depth (cm)	kaps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
159.5	7,638,803	83	198	117	76	1769	2082	2015	1283	93068	0	0	556	85	441	1197	950	174	139	136	0	22278	6071
159.5	8,620,854	74	212	127	79	1512	2022	2433	1084	120608	64	109	623	225	371	1009	676	120	120	0	37	23689	6083
160	7,155,988	61	216	86	79	2868	3044	2780	1724	100471	0	0	601	89	632	1852	1018	160	122	13	0	17710	5683
160.5	9,272,147	0	56	72	39	782	1489	1841	1029	88702	185	105	569	145	307	809	838	145	146	15	18	32138	7278
161	8,612,633	37	112	74	45	1078	1658	1962	966	96349	135	14	466	395	153	880	807	132	137	0	0	27146	6425
161.5	7,562,484	86	264	113	84	3240	3411	3288	1686	122306	107	61	799	0	455	1709	793	67	151	0	30	17727	5433
162	8,076,679	81	267	135	104	2808	3155	3744	1333	133627	115	54	928	15	532	1432	687	113	116	0	88	18279	5368
162.5	6,658,153	84	327	76	62	4321	4412	2186	1970	92704	0	0	539	0	613	2332	1268	116	126	0	0	15667	5858
163	5,357,366	65	372	65	64	4019	4147	1596	1190	64589	0	0	330	0	441	2241	834	183	155	0	0	14118	4896
163.5	5,688,603	43	53	55	31	907	1152	1114	666	65908	141	0	380	0	343	1020	646	150	67	20	0	17839	5082
164	8,091,959	66	218	80	55	2145	2484	2541	1499	113000	125	43	710	104	661	1458	874	159	198	0	48	22395	6477
164.5	8,528,094	44	136	78	63	2022	2204	2630	1264	112040	202	145	784	180	438	811	699	149	213	43	0	24408	6346
165	7,416,085	65	294	100	79	3467	3628	2978	1623	118128	0	0	758	26	581	1808	972	229	124	87	0	17108	5580
165.5	7,174,028	55	207	78	66	2591	2920	2435	1515	103567	0	0	656	0	628	1611	990	230	153	0	0	18089	5661
166	7,364,946	53	207	109	66	2330	2496	2588	1446	106980	71	30	705	0	690	1418	915	114	131	0	0	18952	5682
166.5	6,678,133	48	277	52	61	3662	3387	2359	1420	79995	71	0	740	0	614	1614	771	169	204	122	7	16300	5035
167	5,505,765	4	241	12	8	3664	3290	1338	779	61615	30	53	436	0	535	2209	651	153	148	0	77	14409	4971
168	8,256,237	31	127	95	67	1301	1810	1656	1146	86930	106	0	540	165	482	1242	516	217	76	0	30	26332	6318
168.5	8,177,898	51	188	118	102	1714	2245	2568	1454	114617	65	119	562	68	384	1082	856	102	112	0	0	22488	6145
169	8,560,214	141	264	163	107	2025	2144	2594	1068	125161	175	118	643	91	285	1248	693	106	162	0	170	22617	6011
169.5	7,465,745	63	213	80	83	2256	2783	2292	1456	104037	82	0	618	0	512	1727	731	144	191	56	0	19294	5588
170	8,232,177	61	192	79	35	2071	2442	3111	1293	126748	98	36	664	83	552	1374	902	111	158	0	32	20681	5810
170.5	8,351,756	48	132	106	64	1367	1685	1674	979	94066	189	217	576	135	414	1446	841	115	107	37	0	26634	6882
171	8,323,036	10	63	38	47	847	1375	1417	856	89934	130	198	543	285	164	884	680	153	212	0	25	26489	6203
171.5	7,942,340	12	98	85	31	1117	1595	1506	1041	85023	44	113	440	282	164	1316	686	65	85	43	0	25353	6302
172.5	8,354,896	25	144	39	26	1765	2252	1921	1095	101096	148	168	504	192	329	1005	851	56	186	13	15	25289	6477
173	8,056,099	19	108	101	65	1329	1915	1708	1125	85805	117	53	546	163	440	1388	971	92	206	0	0	26144	6818
173.5	9,563,584	43	143	95	70	1058	1744	2123	1089	113525	252	84	798	173	301	793	294	167	162	22	0	29523	7040
174	8,768,272	34	161	64	54	1435	2016	1963	1081	116085	166	94	551	165	315	1152	919	128	73	12	0	27199	6775
174.5	8,002,300	0	87	83	37	1206	1587	2184	881	105797	163	132	535	101	339	1023	635	118	70	0	68	24071	5804
175	9,370,006	0	47	58	35	594	1132	1256	750	85287	202	117	370	441	69	581	534	282	178	84	0	32210	7065
175.5	9,231,867	0	12	27	27	589	1391	1285	1064	73353	104	130	367	337	278	559	700	119	201	0	39	33104	7735
176	8,628,933	6	71	37	18	1201	1813	1581	979	85967	110	64	502	331	332	1009	778	192	86	35	0	29011	6958
176.5	9,080,729	7	30	64	45	815	1393	1579	771	87982	271	38	520	162	236	669	735	216	175	0	0	30924	7227
177	8,916,530	74	159	100	83	1409	1952	2880	1109	121753	221	95	664	69	318	1018	821	130	116	0	0	25799	6628
177.5	8,362,076	54	204	99	68	2522	2694	2974	1660	135326	90	192	712	137	349	1409	771	45	212	0	13	20409	5967
178	7,596,844	22	111	57	90	1690	1922	2455	1572	106002	76	5	554	57	626	448	1031	152	139	0	20	19943	5524
178.5	9,077,089	54	131	127	99	847	1355	1930	852	100071	161	101	618	408	245	839	974	92	98	0	8	29911	6973
179	8,297,397	71	192	123	79	1702	2076	1963	1123	102339	59	61	579	109	369	1052	622	130	132	0	0	23234	6061
179.5	8,417,915	0	110	75	26	1909	2191	1868	1094	106588	201	14	720	59	457	1225	299	101	127	0	0	24397	6337
180	7,672,103	99	342	107	107	3366	3666	2130	1608	118007	30	0	631	162	575	1796	898	227	136	91	0	18433	5690
180.5	7,055,489	54	289	82	79	3606	3595	2419	1445	109394	20	0	751	0	476	1854	823	133	157	0	35	16140	5368
181	7,075,749	53	289	78	33	3365	3803	2564	1544	100066	58	79	646	0	347	1827	761	186	172	0	0	17676	5536
181.5	7,448,905	0	128	58	29	1423	1831	1624	999	81027	64	11	531	166	348	1467	799	113	85	5	34	23187	6007
182	7,756,262	30	170	100	38	2057	2477	2437	1289	107784	78	102	631	0	418	1698	585	119	203	0	0	19408	5623

Depth (cm)	keps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh	
182.5	7,701,303	23	144	90	50	1918	2641	2156	1312	105378	204	52	630	146	568	1440	1060	117	125	0	0	21350	5929	
183	7,758,222	59	144	97	57	1560	2279	2208	1284	101451	71	0	551	112	532	1635	847	75	100	0	0	22120	6161	
183.5	7,677,403	0	105	60	18	1457	2344	1933	1555	99049	113	7	651	168	406	1248	616	147	115	0	0	21431	5724	
184	7,158,968	51	163	58	28	1912	2280	2539	1134	98501	0	0	412	0	609	1668	832	156	81	0	0	19382	5668	
184.5	7,825,401	63	138	93	45	1509	1997	2240	1207	110821	63	30	599	84	542	1190	716	65	159	0	0	21305	5875	
185	7,349,886	57	236	62	24	3070	2881	1904	1150	101809	0	0	742	49	681	2144	705	102	83	0	62	19306	5903	
185.5	5,402,226	0	31	20	0	831	1157	1160	657	59117	170	113	528	0	287	874	445	100	17	0	0	17046	4539	
186	9,010,829	98	239	112	87	1659	2057	2162	1119	127566	156	16	778	130	263	1220	786	182	106	72	128	24168	6411	
186.5	9,212,168	33	143	93	75	1318	1820	1865	1262	113791	299	211	671	144	306	1179	673	100	204	0	0	28622	7132	
187	8,976,070	13	93	79	31	1296	1851	1857	1560	107280	124	144	788	96	143	731	677	197	253	0	0	27606	6845	
187.5	9,958,540	128	201	188	152	1731	1921	3693	1395	167388	225	0	756	0	311	899	687	114	97	0	0	24482	6406	
188	9,535,184	65	259	70	83	2806	2154	3566	1473	178062	210	119	836	0	496	896	800	142	152	0	0	21112	6129	
188.5	8,613,514	119	363	155	114	3581	3103	4101	1657	163160	78	12	994	20	564	1327	574	125	185	0	32	17975	5685	
189	8,246,537	63	234	102	81	2953	2803	3571	1784	149250	152	35	804	0	719	1301	788	153	125	108	0	17506	5713	
189.5	7,890,861	59	206	90	69	2541	2650	3487	1833	134414	79	0	765	38	594	1271	1060	144	85	0	0	18140	5608	
190	7,878,961	52	238	90	48	2330	2547	3207	1723	128049	121	0	776	0	605	1227	1056	104	123	35	0	19235	6101	
190.5	7,881,341	115	216	132	101	2206	2588	3027	1794	121325	138	37	774	97	415	1215	1045	151	203	20	4	19553	5555	
191	7,979,200	67	205	98	80	2074	2586	3074	1832	125679	122	130	698	131	563	1380	931	99	177	0	128	19972	5910	
191.5	7,478,885	73	205	99	65	1863	2282	2592	1553	119679	87	87	668	11	396	1101	919	113	167	9	0	18824	5500	
192	7,961,800	88	201	130	59	2061	2545	2957	2002	119679	31	0	693	84	437	1306	963	111	218	5	24	19671	5905	
192.5	7,813,261	62	144	48	57	1985	2451	2695	1727	114724	174	0	667	32	478	1359	902	180	211	9	0	19866	5861	
193	7,973,800	63	172	109	89	1774	2252	2796	1599	119517	41	0	646	0	335	1333	883	107	163	0	0	20110	5910	
193.5	8,009,820	42	141	98	54	1661	2212	2588	1663	112671	104	0	672	0	424	1318	890	223	112	0	0	21380	6008	
194	8,275,537	43	146	77	36	1419	2015	2764	1591	114250	165	15	651	26	453	1339	845	156	369	106	0	22355	6416	
194.5	8,076,479	29	146	79	44	1528	2077	2682	1571	122721	76	0	595	0	500	1307	810	144	149	97	25	20936	5880	
195	7,718,942	0	122	52	62	1908	2197	2811	1460	111530	146	204	528	0	317	1279	968	77	158	16	0	20450	6016	
195.5	7,685,403	60	194	82	48	1907	2426	2523	1446	112679	185	40	552	5	311	1330	796	75	77	49	0	20067	5948	
196	7,333,646	28	134	82	63	1696	2281	2333	1607	97609	140	143	636	212	506	1351	718	122	140	0	0	20534	5995	
196.5	7,034,209	10	95	50	13	1643	2262	2415	1661	95775	91	0	576	105	610	1477	810	145	151	38	19	20026	5824	
197	6,672,753	0	210	27	5	3214	3394	3325	1934	102127	25	0	462	0	525	2080	934	164	90	0	37	15391	5364	
197.5	7,841,321	44	127	77	43	1339	1738	2323	1314	109671	45	0	528	142	429	1417	952	181	53	0	0	20228	5871	
198	7,791,982	53	198	96	67	2021	2176	2475	1398	106074	99	0	537	29	420	1236	761	172	121	0	0	21090	5790	
198.5	7,855,021	25	221	90	44	2718	2709	2661	1671	119012	19	0	461	0	615	1741	1156	58	160	76	0	19098	5995	
199	6,824,511	0	37	16	0	976	1453	1426	1084	72658	206	0	306	0	508	1331	835	111	105	0	0	22185	5424	
199.5	7,760,342	21	95	56	23	918	1656	1809	1525	80293	104	168	514	112	337	1096	946	27	146	0	13	25659	6267	
200	8,491,295	51	149	93	60	1174	1540	1961	1264	110084	154	94	567	51	259	976	610	110	220	0	0	24463	6090	
200.5	8,167,118	32	133	92	68	1365	2019	2397	1424	117109	145	40	463	51	248	1356	865	76	103	0	29	22653	6309	
201	7,407,446	18	156	52	46	1703	2323	2933	1670	110745	78	0	353	58	423	1429	999	190	270	0	23	18576	5499	
201.5	7,320,047	84	221	113	88	1997	2207	2287	1606	107941	21	0	513	0	361	1622	986	141	168	19	0	18112	5535	
202	6,958,550	0	163	59	48	1457	2013	2208	1358	95459	121	0	517	38	490	1157	813	149	130	0	23	18772	5304	
202.5	8,432,435	0	15	15	0	587	1023	1157	893	65006	258	87	383	234	286	708	608	743	135	103	0	0	31174	7207
203	9,347,526	0	44	37	46	578	1318	1195	793	77432	174	159	401	286	177	969	638	139	161	4	43	33904	7374	
203.5	8,815,912	11	66	61	29	887	1721	1439	1050	84044	135	130	560	172	410	863	786	123	177	0	15	30492	7016	
204	8,040,459	0	70	65	48	1377	2163	1660	1090	88225	133	50	492	255	372	1084	1062	152	142	0	38	25771	6188	
204.5	7,940,900	0	178	40	34	1961	2404	1833	1254	81968	126	94	547	205	540	1765	794	213	64	0	0	25527	6728	

Depth (cm)	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
205	7,215,308	0	43	42	926	1643	1156	784	72002	127	35	386	235	402	1003	687	72	137	0	0	23735	6025
205.5	9,270,187	0	30	38	751	1633	1552	970	86413	259	230	495	312	297	777	997	70	173	0	43	32116	7344
206	8,236,317	0	0	20	526	1049	1206	746	79102	191	223	366	524	163	519	451	93	132	51	29	29229	6417
206.5	9,088,509	0	47	48	555	1161	1175	823	73670	169	247	332	373	346	737	718	11	181	0	77	33940	7446
207	9,459,245	16	68	80	752	1537	1682	985	84574	182	53	428	335	397	554	505	162	198	0	7	33036	7384
207.5	7,795,782	0	41	30	675	1228	1266	744	74499	135	49	457	108	280	932	751	144	122	117	18	26608	6129
208	9,376,826	0	33	15	774	1408	1559	884	88166	249	117	445	288	126	777	938	109	133	0	50	32877	7459
208.5	8,940,490	0	70	54	870	1710	1828	1165	85522	183	70	581	168	359	680	755	98	184	0	13	30731	6986
209	9,184,908	0	30	7	739	1381	1584	983	88689	105	73	423	276	465	791	692	129	88	0	0	31628	7101
209.5	9,382,666	0	42	31	0	570	1306	1203	815	80503	185	192	466	305	186	254	594	73	158	0	33307	7351
210	8,983,870	0	51	39	0	689	1367	1376	891	77690	212	0	388	213	237	417	783	267	185	0	31863	7163
210.5	9,125,828	30	120	95	57	836	1461	1428	896	100477	246	156	470	224	257	564	906	126	147	0	30144	6854
211	8,158,798	0	154	60	22	1758	2451	1915	1406	103866	142	78	523	134	296	1134	1010	73	140	0	25113	6393
211.5	8,254,757	101	283	129	57	2398	3018	2146	1321	123650	82	0	740	155	386	1288	714	126	198	40	21268	5868
212	6,994,630	61	269	67	61	3033	3861	2651	1881	106061	0	0	489	0	598	2003	1007	237	116	54	16285	5231
212.5	6,017,140	47	248	46	44	3250	3879	1951	1376	80177	0	0	398	0	464	2035	740	155	234	35	15103	5212
213	7,333,086	0	72	23	30	787	1182	1327	768	69620	135	59	303	19	322	1127	673	128	42	0	24964	6099
213.5	9,227,847	46	121	99	50	832	1444	1568	919	91967	188	95	355	325	236	867	979	65	161	19	30640	6956
214	9,129,128	23	104	87	66	824	1492	1582	947	89148	220	205	527	304	168	687	802	70	146	0	30775	7297
214.5	9,042,049	25	139	70	41	1182	1947	1695	987	100246	118	129	565	164	315	984	1001	85	77	0	29496	7232
215	7,592,484	0	101	47	17	1576	2130	1966	1243	86936	119	0	553	29	389	1168	631	160	195	72	23118	5914
215.5	8,898,890	0	62	69	41	823	1493	1720	978	91997	118	89	451	327	240	719	612	173	86	41	29215	6584
216	8,909,891	74	179	111	90	1094	1902	2537	964	112900	312	128	738	148	254	1062	584	61	218	0	26851	6794
216.5	8,794,291	58	184	63	57	1854	2505	3332	1461	135141	175	118	827	238	486	1486	730	91	135	10	23353	6381
217	8,864,271	73	149	93	67	1911	2411	3598	1350	148894	143	56	739	102	503	1383	453	155	139	53	20964	5871
217.5	9,004,429	123	272	156	112	2082	2632	3872	1321	158623	161	151	732	0	377	1326	846	139	79	0	21431	6129
218	8,682,053	56	158	76	66	1836	2566	3771	1468	139606	123	163	836	43	508	1341	1009	102	232	0	22293	6280
218.5	9,392,766	30	133	104	56	1738	2407	2996	1417	129890	152	127	805	189	470	1501	784	126	104	0	26969	6969
219	7,448,125	0	51	7	0	1276	1596	1353	932	81050	187	24	465	111	293	956	884	83	68	43	23235	5943
219.5	9,051,229	0	53	42	25	795	1554	1384	904	89238	144	126	353	340	208	663	726	80	122	0	31085	6983
220	8,612,233	18	152	79	34	1770	2550	2053	1483	118708	188	0	714	130	405	1164	736	237	117	39	24230	6430
220.5	8,266,977	5	115	68	14	1197	1750	1452	1024	96103	95	96	446	267	406	1208	902	153	110	0	26532	6750
221	9,038,729	0	81	81	23	887	1634	1566	1123	90740	224	40	478	208	273	994	749	154	146	0	30587	7082
221.5	8,491,375	36	114	78	34	1230	1937	1847	1190	99936	174	154	609	157	451	850	820	125	189	0	25839	6527
222	8,182,818	63	230	112	58	2408	3015	3160	1813	129106	88	0	754	43	424	1307	930	132	99	0	20296	6055
222.5	7,695,183	91	210	93	69	1891	2619	2387	1451	117088	79	36	734	58	478	1455	798	111	111	6	19060	5804
223	8,592,114	24	143	81	58	1553	2174	2088	1332	117688	59	30	723	65	376	968	859	126	121	0	23855	6335
223.5	8,882,731	55	156	60	55	2194	2710	2598	1618	126938	81	40	617	167	493	1367	773	82	118	0	23681	6317
224	6,839,891	0	56	18	19	1139	1665	1468	945	73732	210	27	517	0	548	1028	655	157	109	0	22578	5723
224.5	7,824,621	39	107	68	31	1386	1816	2268	1249	86884	226	101	435	109	524	1430	993	132	153	0	24631	6753
225	9,111,988	0	19	27	26	654	1357	1434	852	87468	267	164	381	318	296	635	904	108	151	0	32586	7142
225.5	8,962,050	8	122	81	44	1124	1822	1612	1104	91423	170	117	545	257	298	932	638	111	142	0	28509	6902
226	7,096,389	0	78	17	8	1423	2092	1936	1146	94196	86	0	602	81	394	1114	815	163	75	0	20547	5600
226.5	8,655,793	44	109	80	44	1189	1979	2195	1118	112432	184	207	705	294	323	934	913	68	167	0	25647	6249
227	8,349,236	50	131	78	74	1319	2061	2291	1227	104789	118	25	722	303	388	1059	1004	168	181	0	25004	6384

Depth (cm)	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh	
227.5	8,487,215	9	85	34	1102	1761	2097	1123	99227	187	126	758	217	362	784	810	56	91	23	0	26453	6476	
228	8,142,898	70	171	96	70	1613	2111	2064	1144	113137	116	30	664	111	455	990	101	164	0	0	22776	6099	
228.5	8,199,158	6	114	60	5	1458	2145	2016	1311	101759	88	134	453	74	317	1233	740	62	215	0	24070	6085	
229	8,180,598	61	204	118	46	1814	2282	2166	1291	118262	143	0	631	22	383	1025	825	247	198	96	0	22153	6015
229.5	8,102,999	53	207	73	50	2310	2966	2489	1739	116513	90	12	732	157	514	1509	747	111	147	40	0	21121	5751
230	7,481,705	0	99	21	20	1301	2108	1974	1187	94887	88	70	460	5	333	1347	843	129	217	0	22240	6070	
230.5	6,349,976	14	196	60	38	1722	2339	1871	1093	88874	38	0	316	29	271	1354	813	118	103	0	17261	4844	
231	8,527,734	0	79	63	19	561	1264	1210	804	72300	105	125	279	345	435	843	1002	95	144	0	13	30409	6900
231.5	8,537,934	0	59	29	0	747	1638	1511	1127	72010	96	33	462	574	265	724	1039	153	286	0	112	30507	6894
232	8,648,613	68	140	80	76	979	1508	1785	895	94742	231	41	606	226	176	744	733	129	150	0	17	27309	6495
232.5	9,224,007	22	79	59	15	979	1575	1988	911	104972	157	93	601	159	191	858	718	59	216	0	79	28319	6741
233	9,097,409	0	0	16	0	624	1362	1318	923	76003	204	94	430	530	222	536	946	86	70	0	0	33066	7427
233.5	8,993,970	12	88	34	42	727	1466	1215	830	84553	216	136	445	218	164	720	729	167	133	0	0	31182	6756
234	9,023,649	26	95	91	16	1238	1867	2483	1054	110703	95	0	566	80	440	879	634	133	134	0	11	27309	6729
234.5	9,255,027	0	40	8	0	591	1203	1389	779	83238	171	104	429	326	124	399	864	138	238	0	0	32860	7284
235	8,754,332	0	51	46	28	686	1478	1252	883	69419	41	172	408	398	259	403	745	102	246	0	0	31964	7383
235.5	9,095,969	50	143	96	60	886	1527	1579	850	101088	258	154	480	171	179	867	784	142	104	0	0	28330	7008
236	8,575,754	48	144	90	59	1158	2077	1955	1132	92375	164	117	860	183	289	976	616	219	112	0	5	28003	6559
236.5	8,466,235	38	151	27	19	1485	2364	2024	1267	114838	120	78	638	263	241	840	892	133	189	0	0	24175	6221
237	7,869,821	19	176	75	21	1959	2835	1924	1360	109277	43	0	690	128	377	1518	817	193	189	0	0	21096	5697
237.5	8,002,840	54	239	99	63	2448	2986	2293	1388	123578	94	122	732	88	334	1335	706	145	206	0	0	20118	5831
238	6,718,332	13	181	33	23	2321	3348	2336	1517	97803	80	0	601	0	525	1666	780	121	227	84	71	16900	5282
238.5	6,296,397	12	173	54	37	1881	2565	1931	868	86779	50	21	370	91	320	1304	787	130	97	5	0	17493	5087
239	8,129,278	72	218	109	79	1372	2034	2964	1085	118437	97	0	600	114	382	982	641	73	134	0	0	21409	5527
239.5	9,228,207	144	344	180	138	2253	2888	4933	1416	175106	128	19	1029	27	423	1358	670	174	124	77	0	19684	5730
240	8,822,811	67	241	119	77	1836	2451	3993	1122	150245	51	0	778	231	429	1187	650	130	26	0	8	21091	5752
240.5	7,794,462	0	72	51	6	854	1490	1601	945	94011	152	87	473	181	440	568	559	137	91	0	0	24552	5644
241	8,128,418	0	133	72	47	1396	2090	1870	1240	110623	112	51	544	140	283	836	720	146	206	0	6	23464	5920
241.5	7,990,880	74	239	74	58	2289	3060	2343	1365	115353	97	119	588	0	565	1365	886	54	106	0	0	21976	6336
242	6,850,031	0	101	63	22	1566	2227	1827	855	95269	156	70	506	43	364	1094	594	155	138	37	53	19094	5302
242.5	8,236,577	31	153	69	34	1887	2689	2178	1321	116688	119	69	772	0	410	1254	689	150	188	0	0	22575	6074
243	8,804,172	0	60	30	25	473	1439	1326	900	70377	176	187	503	263	171	532	880	139	210	0	5	31956	7410
243.5	8,854,131	55	108	70	72	784	1383	1456	812	90850	169	147	421	235	156	698	558	72	263	0	19	29300	6849
244	9,398,126	47	109	69	57	655	1384	1511	786	101331	211	89	452	181	229	673	646	256	192	0	0	30495	6866
244.5	9,495,684	0	38	50	29	661	1402	1574	839	89886	281	196	484	568	340	681	888	108	167	0	130	33280	7471
245	7,897,261	0	30	17	6	555	1241	1445	832	85115	134	34	379	366	165	307	508	156	68	0	0	25213	5777
245.5	8,848,071	37	163	89	59	1188	1919	2200	1154	109621	149	45	628	218	512	910	867	158	107	0	27	26961	6723
246	8,285,797	0	92	23	6	1078	1906	1606	1185	89967	162	41	576	192	0	1251	726	124	7	0	22	26509	6776
246.5	9,374,146	0	106	76	53	703	1407	1555	811	107350	108	106	474	354	320	448	522	130	250	0	0	30474	6950
247	8,861,011	17	80	31	30	803	1599	2004	1010	89888	182	32	541	325	297	612	789	135	180	18	0	29459	6749
247.5	8,996,790	30	129	73	40	1012	1756	2502	954	113961	177	118	770	299	142	809	647	145	108	0	9	27615	6647
248	9,487,805	111	185	138	106	1241	1840	2847	904	142021	176	37	621	128	389	648	722	115	127	0	0	25590	6284
248.5	9,086,829	21	123	83	76	1052	1827	2386	1068	102014	101	104	569	360	432	855	870	155	91	0	21	29146	6944
249	9,102,949	0	47	28	14	511	1193	1152	823	72130	105	183	466	362	211	471	896	106	233	107	127	32309	7212
249.5	9,205,468	0	25	0	0	550	1244	1374	892	78661	164	8	453	325	287	557	740	115	137	0	0	34280	7538

Depth (cm)	kaps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
250.5	8,949,490	0	69	48	13	677	1479	1447	924	76473	249	97	438	481	282	682	767	125	233	0	0	31847	7099
250.5	8,547,794	0	78	33	23	913	1694	1545	951	86491	135	172	438	150	279	836	1034	70	212	0	0	28522	7071
251	8,898,111	4	73	71	20	599	1295	1236	862	74908	101	102	395	488	41	314	672	66	125	0	12	30783	6867
251.5	8,785,772	0	71	52	30	826	1598	1592	941	80551	61	67	521	357	247	625	703	166	205	0	0	29683	6896
252	8,571,874	67	208	119	86	1509	2076	2638	1539	113204	66	98	773	158	316	721	711	158	142	0	0	24214	6133
252.5	7,720,602	23	108	83	18	1725	2290	2257	1285	101342	229	40	600	214	582	1241	1007	78	102	0	21	22491	6055
253	8,758,812	0	77	66	21	796	1366	1334	909	76200	231	111	392	456	508	528	923	146	108	0	79	31057	7045
253.5	9,168,068	0	47	30	19	789	1729	1343	1065	65900	241	82	397	156	272	486	990	218	140	37	17	34938	7576
254.5	9,251,507	47	138	102	58	838	1347	1372	775	91855	155	46	469	419	256	722	604	229	252	0	0	30650	7103
255	9,060,829	0	21	52	32	475	1072	1086	732	75008	213	60	382	473	116	662	751	153	79	0	0	33098	7300
255.5	8,307,137	0	124	51	25	1087	1840	1826	1275	84660	148	0	573	288	369	829	778	196	116	0	59	26861	6541
256	7,598,144	108	341	97	100	3331	3224	2997	1894	122679	37	0	640	0	485	1645	904	62	51	98	0	17209	5353
256.5	5,928,881	8	188	38	15	2290	2330	2007	1176	79607	0	0	348	0	448	1876	864	173	186	0	0	14953	4870
257	6,525,095	0	149	31	37	1716	1855	1271	854	73582	149	144	452	157	420	1109	736	66	127	0	60	20147	5267
257.5	8,194,038	0	0	0	15	907	1447	1236	842	63769	244	113	451	322	179	797	742	178	164	0	0	29819	6753
258	8,447,675	22	134	93	65	1068	2062	1521	1112	85344	183	152	560	199	53	837	681	103	122	0	0	28562	6827
258.5	8,658,013	0	66	23	23	990	1657	1503	920	77666	190	0	584	281	326	818	831	231	134	0	0	29974	6933
259	8,798,672	43	152	101	67	1233	1905	1502	987	92520	71	35	730	327	645	924	808	183	120	0	14	28530	6898
259.5	8,761,792	0	95	52	24	911	1750	1552	1035	83488	138	66	541	245	326	653	711	141	160	0	65	29997	6746
260	8,208,398	67	162	111	78	1787	2304	1956	1196	122242	112	114	669	139	145	974	816	170	176	49	0	22125	5958
260.5	7,485,945	26	208	89	59	2074	2714	1985	1310	94121	135	132	646	7	536	1485	807	157	212	0	0	20940	5909
261	7,294,387	18	100	71	46	1428	2031	1839	1133	93956	27	0	503	136	456	925	636	181	64	22	116	21109	5733
261.5	7,689,303	58	220	84	54	2399	2642	3040	1640	122672	78	0	647	25	559	1262	1073	172	126	0	0	18632	5565
262	8,207,138	42	135	91	72	1228	1630	1921	985	89757	64	155	471	234	216	1005	870	0	218	17	28	25725	6622
262.5	8,688,173	0	135	63	28	1455	2035	2412	1188	103331	129	0	623	178	497	1082	801	133	168	0	0	27023	6459
263	8,984,590	5	71	27	25	731	1381	1513	884	90195	266	180	566	502	244	458	867	102	199	0	0	30896	6901
263.5	8,444,535	38	124	97	46	1054	1736	1821	1152	86960	157	20	659	415	292	905	603	102	224	0	37	28258	6663
264	8,252,097	15	146	73	15	1218	1789	1978	1165	109011	186	0	494	120	262	740	937	159	156	0	23	24251	6215
264.5	8,172,918	29	124	118	58	1354	1964	2295	1330	109956	121	0	659	240	245	667	952	169	113	0	0	23260	5947
265	8,558,494	78	244	113	81	2438	2756	3403	1694	142902	149	139	849	51	633	1082	905	138	194	139	0	20800	6265
265.5	7,510,585	0	0	0	0	986	1519	1433	834	60378	205	104	402	309	368	1068	874	134	141	0	0	27022	6785
266	8,454,055	0	71	58	34	924	1606	1578	925	73863	172	59	537	12	196	715	843	193	115	0	0	29438	6517
266.5	8,480,855	0	68	61	49	813	1696	1972	1053	81709	194	39	603	471	341	784	745	245	180	0	0	28719	6782
267	9,256,667	0	64	58	36	692	1407	1547	630	96152	218	0	435	171	366	691	726	209	70	5	32370	7295	
267.5	9,004,070	0	4	0	0	562	1300	1236	800	72403	112	0	373	654	79	693	723	108	182	51	0	31819	7098
268	8,660,173	0	59	31	12	670	1407	1583	939	72551	238	186	480	234	161	657	458	131	143	0	0	30473	6838
268.5	8,503,655	38	82	71	58	957	1750	1922	981	91154	199	147	529	305	69	581	744	181	227	0	12	27601	6317
269	8,059,839	39	145	125	69	1467	1906	2411	1133	103523	139	126	718	147	603	988	1054	83	165	0	32	23996	6288
269.5	8,749,472	31	87	92	51	920	1401	1941	743	87967	95	100	603	99	274	539	689	53	120	0	0	29719	6835
270	9,274,067	0	26	32	0	614	1367	1407	765	70297	237	131	517	473	286	457	636	111	156	0	0	34406	7405
270.5	9,353,306	0	17	24	0	439	1126	1059	845	60799	103	69	364	558	211	469	803	88	157	0	0	36278	7562
271	9,237,087	0	11	25	0	574	1169	1072	720	61633	159	127	385	437	204	510	737	165	263	44	47	35061	7120
271.5	8,861,771	0	46	40	0	650	1391	1331	766	69623	52	139	480	380	331	550	826	151	251	40	45	32072	6697
272	8,476,935	6	79	39	21	1152	1775	1562	931	82322	126	135	520	284	334	779	795	245	150	0	12	28930	6789
272.5	8,086,159	83	246	151	123	1925	2580	1870	1217	102083	26	0	604	235	516	1240	705	217	120	0	0	23998	6103

Depth (cm)	kaps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
273.5	6,720,873	65	208	100	45	2785	3309	2029	1174	85349	0	0	471	89	494	2196	825	174	175	63	51	17712	5535
273.5	7,976,820	21	160	63	50	1529	2117	1815	1071	81485	131	67	483	233	304	1261	753	212	220	0	0	25556	6654
274	7,489,785	78	258	81	85	2627	2963	2639	1481	112336	35	0	584	53	473	1295	787	124	71	0	69	18645	5440
274.5	7,461,065	75	251	129	86	2650	3043	2357	1454	112815	126	44	807	0	574	1465	847	161	180	20	0	18294	5457
275	7,245,867	39	202	58	29	2226	2694	2441	1288	104404	0	0	609	0	530	1539	1077	119	83	37	0	19179	5808
275.5	8,008,460	66	294	92	79	2918	2715	3267	1582	133859	141	53	877	0	510	1289	864	178	172	0	0	18325	5518
276	7,367,206	43	245	102	66	2267	2314	2992	1475	109960	98	18	562	0	690	1208	851	114	155	26	0	18965	5719
276.5	7,444,725	36	168	71	54	1555	1921	2117	1324	99849	149	50	520	145	444	1147	662	160	153	55	62	21094	5725
277	8,618,614	0	47	59	8	840	1445	1383	791	77831	177	76	425	435	352	827	703	69	79	0	78	29641	6761
277.5	7,926,140	54	196	99	53	1727	2358	1734	990	90836	73	15	507	177	374	1236	764	176	204	0	0	23959	6216
278	8,560,194	0	59	27	0	798	1669	1356	875	69447	227	121	533	363	431	1031	1011	209	241	0	0	31283	7166
278.5	8,361,116	59	161	104	69	1297	1918	1629	867	82152	248	54	584	382	229	973	674	113	106	0	0	28158	6291
279	8,590,954	0	120	36	35	959	1619	1671	888	87878	165	29	458	243	323	498	739	201	168	0	0	28322	6330
279.5	8,322,677	37	252	101	78	2492	2782	2414	1305	124951	124	84	831	34	526	1304	855	173	151	0	0	22605	6243
280	8,627,353	49	413	80	48	4223	4889	3555	1921	134437	77	6	773	56	748	2155	962	179	255	72	0	19847	5871
280.5	8,758,512	6	52	18	0	826	1505	1835	907	88740	231	192	563	443	278	658	845	242	162	0	0	28365	6736
282.5	9,249,027	0	28	16	0	637	1448	1353	902	74706	127	167	466	299	189	561	1078	34	42	0	0	33356	7418
283	9,548,824	0	72	55	8	798	1500	1581	773	98481	239	140	610	354	244	789	656	195	131	0	0	31866	7017
283.5	8,450,155	0	37	0	0	835	1628	1601	991	79345	215	120	606	34	350	728	840	156	195	60	0	28259	6710
284	9,240,307	19	137	88	53	1067	1624	1944	835	109195	166	112	560	238	287	1038	940	174	212	0	7	28979	6920
284.5	9,283,527	22	127	61	54	894	1467	1949	851	110129	148	88	629	470	517	696	625	138	232	49	0	28372	6441
285	9,083,729	0	95	39	25	949	1713	2127	1030	89026	104	113	564	355	477	815	1082	106	216	0	0	30088	7150
285.5	9,075,269	0	87	37	22	824	1593	1743	832	82406	211	77	497	468	126	704	818	86	291	7	0	30038	6746
286	9,086,309	0	74	23	9	902	1658	1786	1062	94398	254	169	582	188	296	834	1121	159	121	0	0	29675	7175
286.5	8,829,671	7	160	61	47	1171	1778	2148	988	97306	170	42	634	119	664	862	917	196	202	0	0	27646	6628
287	9,386,286	0	0	0	0	669	1611	1590	930	74555	257	130	560	527	354	750	881	88	180	0	0	34573	7550
287.5	9,400,686	0	62	21	0	672	1600	1489	875	79148	201	131	436	478	274	820	812	178	252	0	68	33490	7283
288	9,262,087	0	62	0	9	701	1729	1581	882	70756	210	70	475	343	480	834	812	169	177	0	7	33532	7399
288.5	9,395,646	0	54	31	0	709	1744	1594	1028	73426	177	209	452	563	216	793	800	86	145	0	38	33953	7662
289	9,300,387	0	29	13	0	537	1331	1238	755	69473	218	87	479	295	334	324	640	149	172	0	0	34865	7344
289.5	9,054,789	0	0	0	0	596	1458	1253	862	60298	208	0	504	557	220	569	743	214	226	0	115	34793	7510
290	9,529,344	0	25	0	0	629	1381	1213	877	66985	241	101	306	463	313	559	643	188	203	0	0	35856	7977
290.5	9,422,545	0	0	0	11	464	1065	966	652	62329	228	55	406	620	45	559	650	209	104	67	0	35624	7431
291	9,387,186	0	21	0	0	607	1482	1245	967	61463	126	98	274	535	212	764	748	75	99	110	113	35179	7498
291.5	9,538,464	0	24	33	11	476	1294	1075	722	63346	200	219	382	446	227	280	792	63	228	17	0	35672	7623
292	9,362,826	0	46	23	0	576	1270	1178	763	69925	145	60	386	375	433	468	725	125	206	32	0	34827	7162
292.5	9,365,466	0	102	60	27	649	1527	1347	663	79196	195	14	414	622	412	686	841	217	185	66	55	32750	7182
293	8,953,250	0	76	62	26	870	1553	1735	776	90361	178	135	608	269	283	624	767	71	187	0	0	30384	7114
293.5	9,194,928	53	194	101	75	1564	2121	2841	1000	114200	229	69	760	236	246	908	604	129	131	0	0	26838	6659
294	8,656,493	0	132	72	25	1202	1704	1899	842	84718	192	75	617	273	256	534	838	196	208	0	0	28529	6556
294.5	8,209,338	20	103	14	16	1640	2127	1744	1046	83952	5	0	497	137	302	1255	881	52	32	83	0	25823	6248
295	8,580,814	0	68	36	0	756	1417	1320	832	64664	138	81	496	345	275	706	596	107	20	26	0	30724	6996
295.5	8,574,774	0	41	27	0	994	1672	1424	841	65342	166	6	612	409	358	1025	794	177	123	0	0	30245	7136
296	8,846,491	0	20	23	0	691	1472	1335	881	64987	201	31	496	331	234	723	784	243	124	0	0	32107	7066
296.5	8,946,910	0	33	42	0	774	1556	1549	868	76873	268	73	639	310	214	596	874	182	153	0	0	31649	7194

Depth (cm)	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh	
297	8,835,911	93	138	58	1814	2098	2983	1077	126767	140	56	911	329	412	718	561	128	126	0	0	23223	5879	
297.5	8,675,093	30	171	59	21	1801	2099	2465	10993	110941	97	0	875	231	573	1064	820	172	119	0	42	25139	6731
298	9,090,289	0	35	6	0	777	1615	1400	956	69133	186	103	733	576	270	825	795	214	107	39	0	32680	7274
298.5	8,442,235	0	81	43	37	1015	1583	1395	949	76278	117	5	496	114	301	721	749	163	142	0	67	28934	6815
299	7,581,424	78	208	91	82	2162	2773	2506	1378	101903	55	0	669	93	356	1426	918	175	191	0	8	20116	5544
299.5	8,420,635	34	188	90	70	1756	2082	2787	1046	114845	143	79	638	136	444	957	670	69	173	40	0	23440	6145
300	9,042,509	74	283	114	78	2412	2683	3897	1062	139102	201	93	874	178	438	1279	682	54	220	0	0	22834	6216
300.5	8,743,452	0	85	39	27	840	1569	1515	865	72170	170	169	522	379	303	635	841	142	220	0	0	30893	7153
301	8,867,671	14	167	55	20	1936	2206	2757	1113	117224	77	0	864	179	618	1081	768	151	39	94	0	25665	6394
301.5	9,087,709	0	0	0	0	600	1216	985	51872	176	6	403	469	306	429	605	280	202	26	19	35170	7738	
302	7,981,180	0	161	39	10	2132	2376	1733	1101	83289	18	0	601	260	307	1140	659	128	175	38	17	24350	6085
302.5	8,327,196	0	45	0	7	1427	2053	1462	1008	58196	168	62	562	296	159	1299	917	207	121	0	9	30066	7153
303	8,955,770	0	17	0	10	808	1399	1183	857	70485	102	112	397	347	360	698	581	70	110	0	0	32336	7156
303.5	8,854,451	0	84	29	48	866	1489	1473	786	93887	186	66	474	278	344	740	780	147	153	0	22	28912	6846
304	7,504,805	0	234	40	11	3110	3161	1983	1238	108082	44	0	704	0	467	1435	920	208	100	0	0	18690	5504
304.5	7,285,207	15	162	27	28	1918	2476	1796	1215	74870	33	0	489	164	424	1663	842	210	162	17	32	22577	6206
305	9,269,467	0	56	24	14	864	1437	1163	852	70774	154	0	465	352	316	906	804	141	108	0	35	34379	7650
305.5	6,748,172	8	102	46	33	831	1391	1420	647	73736	47	12	435	258	301	594	663	49	120	0	0	21128	5155
306	8,938,210	0	14	0	0	597	1351	1293	824	61934	127	73	555	525	269	583	880	95	166	75	0	33346	7217
306.5	8,263,817	0	76	21	0	893	1697	1688	817	74774	117	74	704	410	343	461	681	157	47	0	14	27962	6144
307	8,390,296	98	292	92	86	2673	2861	3850	1066	138719	200	180	866	42	425	1314	681	90	151	15	0	20043	5794
307.5	9,019,330	0	15	22	0	601	1212	1061	650	55577	130	84	446	642	396	671	984	157	154	0	12	34594	7607
308	8,956,210	0	33	15	0	535	1233	947	788	47468	103	134	339	311	102	490	826	81	132	0	0	35130	7471
308.5	8,580,774	0	28	35	8	640	1195	1077	705	62476	196	67	503	346	293	543	619	176	117	147	0	32394	7148
309	8,949,510	0	112	12	6	893	1527	1519	843	76186	190	148	667	249	318	749	824	94	136	34	0	31541	7096
309.5	8,627,073	0	84	14	6	880	1545	1531	761	71979	227	141	617	522	195	760	819	173	193	31	107	29710	7119
310	8,772,332	122	272	142	112	2278	2348	3152	1036	145566	54	0	921	135	511	1356	749	136	68	73	0	21211	6068
310.5	8,520,975	45	112	56	58	1473	1874	2106	944	92589	98	24	664	243	401	1158	707	179	175	23	0	26177	6227
311	8,074,859	11	137	37	63	1274	1704	2024	1036	102533	52	37	550	120	495	649	762	94	115	0	0	23694	5870
311.5	9,145,868	0	66	30	18	733	1428	1387	880	72861	166	0	548	545	229	819	835	76	142	38	0	33496	7500
312	9,407,426	0	89	48	8	693	1381	1208	781	79856	159	0	346	432	172	738	588	221	105	0	125	32957	7128
312.5	8,614,953	0	53	15	0	1071	1592	1303	933	76524	74	51	546	341	305	584	707	184	148	0	27	29302	6812
313	7,445,145	83	311	98	61	3480	3440	2424	1416	112988	0	20	846	0	573	1639	636	141	138	0	0	17418	5574
313.5	6,501,075	69	391	59	53	4696	3843	2204	1280	99227	0	0	745	0	515	1830	693	147	162	52	43	14116	4837
314	6,615,814	41	316	36	39	3648	3645	2064	1201	79799	82	0	558	142	474	2083	749	216	203	46	0	17508	5577
314.5	7,120,649	8	189	47	23	2520	3010	2053	1312	87883	26	0	566	0	447	1562	850	112	293	0	0	18772	5617
315	6,830,131	14	156	40	30	3047	3424	1509	1080	69704	43	0	412	123	482	2133	659	138	148	0	0	20075	6008
315.5	8,715,793	0	89	53	0	808	1486	1310	984	77762	168	14	843	530	122	779	731	232	152	37	0	29121	6629
316	9,258,447	22	71	32	59	802	1386	1321	800	94314	213	91	703	156	328	746	782	119	162	0	0	30580	7034
316.5	8,630,113	0	79	49	25	807	1539	1037	830	75143	143	137	502	526	141	591	579	173	265	43	38	29492	6726
317	6,269,497	0	111	33	25	2286	2561	1313	830	58959	34	20	359	136	428	1904	531	72	165	0	0	18668	5108
317.5	7,299,307	12	94	48	31	1004	1554	1074	738	60990	0	0	426	374	171	946	629	171	277	64	0	23870	5687
318	8,285,237	0	84	0	0	1413	2012	1528	946	72079	109	65	405	340	331	1058	1177	66	171	24	20	28133	6702
318.5	4,688,953	0	28	0	0	647	994	907	613	48583	109	47	365	229	202	394	373	134	118	0	0	15510	3838
319.5	9,105,049	0	42	37	0	870	1553	1043	821	69801	223	102	532	486	298	733	605	167	139	0	0	33128	7303



Depth (cm)	keps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh	
320	9,169,708	0	9	17	16	547	1421	950	880	59026	143	57	523	549	202	829	1082	111	182	0	0	35332	7680	
320.5	8,721,033	37	132	85	42	1194	1700	1832	894	101333	133	120	732	292	43	520	621	128	142	0	24	25994	6201	
321	8,189,498	0	126	14	0	1542	1919	1511	919	80370	173	16	617	154	443	1158	885	71	225	0	6	27040	6533	
321.5	8,983,670	0	83	0	5	709	1379	937	1187	57122	182	201	413	349	211	512	858	37	232	10	5	33864	7242	
322	9,069,329	0	28	43	17	604	1183	838	624	63297	135	88	424	492	214	510	752	172	111	0	0	33736	7005	
322.5	8,711,293	0	44	0	0	810	1386	1113	783	68881	104	50	643	476	328	514	586	166	195	36	19	31086	6479	
323	8,294,777	71	233	105	61	1816	2180	1544	955	114041	88	61	706	0	506	736	702	216	197	15	0	22886	5769	
323.5	6,753,472	35	247	39	0	3516	3457	2242	1152	92611	52	0	790	0	632	1695	862	121	146	0	0	16402	5154	
324	7,683,063	33	136	62	28	1743	2439	1597	992	73252	90	67	467	106	388	1386	799	87	122	8	0	24020	5876	
324.5	7,520,685	56	157	82	30	1296	2028	1219	881	76406	106	75	558	220	385	1135	843	153	159	0	78	23102	5873	
325	9,251,087	0	70	0	0	633	1371	1090	766	66619	111	104	412	457	317	663	705	123	141	0	0	34008	7422	
325.5	9,130,568	0	10	16	0	503	1269	954	719	55512	117	48	288	297	310	491	744	183	182	26	164	35341	7353	
326	8,203,438	10	138	76	53	800	1444	1216	694	74671	66	67	586	526	18	363	597	71	197	21	0	27041	6337	
326.5	8,611,554	0	43	26	17	1212	1719	1789	1141	75570	164	68	620	389	479	825	827	205	169	174	95	29710	6784	
327	8,653,653	89	230	130	93	1424	1949	2310	798	116222	181	120	698	217	459	723	1020	99	98	0	35	24306	5869	
327.5	9,281,107	4	75	57	23	531	1307	970	628	63609	133	0	408	464	109	519	731	151	148	9	44	35025	7329	
328	9,415,586	0	30	0	0	421	1301	843	653	46025	47	20	387	762	0	538	834	139	114	0	22	37558	7684	
328.5	9,237,127	0	0	0	0	448	1380	833	706	37387	217	160	270	384	153	588	731	182	137	0	38	37890	7597	
329	9,213,088	0	0	0	0	466	1453	858	755	45172	70	100	328	437	183	497	740	123	162	0	0	37431	7599	
329.5	9,040,749	0	13	7	0	542	1271	929	646	45125	0	60	285	468	283	685	520	0	189	0	4	34575	7189	
330	9,330,006	0	34	48	10	532	1159	686	482	56501	55	92	246	458	166	450	599	123	212	11	50	35298	7465	
330.5	9,209,228	0	0	0	0	413	1100	677	750	41554	139	116	379	614	64	641	810	93	197	0	132	37270	7279	
331	9,062,909	0	17	24	0	440	1086	705	527	51880	113	127	359	554	22	531	1024	158	147	0	30	34913	7343	
331.5	9,113,549	0	30	0	0	516	1174	803	931	43463	66	122	321	462	288	365	782	117	157	0	20	35693	7333	
332	8,859,811	0	16	0	0	529	1178	781	592	43183	188	126	430	345	125	652	873	160	227	0	0	34808	7287	
332.5	8,797,292	0	20	0	0	719	1371	972	637	44380	69	102	489	323	281	629	812	0	102	0	48	33436	7243	
333	8,774,012	0	0	0	0	444	1237	666	611	33994	0	0	189	495	168	306	705	173	142	0	0	35600	7453	
333.5	8,667,773	0	17	4	0	566	1113	675	557	44791	201	207	309	412	152	527	768	33	251	30	53	33923	6891	
334	8,625,533	0	63	11	0	587	1280	827	1008	47260	136	0	479	362	593	427	610	198	96	0	0	32788	6947	
334.5	8,424,915	0	103	22	42	1108	1654	1093	655	70570	134	103	632	300	406	561	911	204	178	0	0	28572	6516	
335	7,650,043	117	328	133	93	2790	2750	1931	1089	110881	88	0	855	154	464	1382	548	182	183	80	64	18630	5331	
335.5	6,837,471	61	321	66	53	3716	3603	2660	1478	105897	49	0	857	0	702	1639	794	167	117	0	35	15373	5171	
336	5,766,122	55	238	43	62	2615	2919	2183	1323	75632	7	0	541	12	505	1394	772	110	112	14	59	14299	4437	
336.5	6,016,200	0	193	21	27	3283	2930	1637	1268	61922	0	0	416	46	536	2100	882	165	87	0	143	16685	4927	
337	8,467,035	0	67	0	0	819	1410	997	766	54875	182	120	320	323	216	728	1009	235	136	0	9	32035	7008	
337.5	8,247,817	0	33	0	0	959	1670	1279	728	60475	213	108	532	184	295	676	895	146	92	0	51	30167	6873	
338	8,699,133	0	39	0	0	875	1586	1137	890	51410	143	65	548	339	370	589	747	199	116	0	21	32943	6888	
338.5	8,159,298	0	0	0	0	684	1417	915	621	48656	151	185	442	378	231	785	810	106	124	0	127	31723	6791	
339	7,156,948	0	214	40	15	2049	2548	1778	933	82590	9	87	551	279	245	1070	534	206	206	25	47	19643	5253	
339.5	5,584,564	72	283	73	45	3074	3438	2294	1367	78483	139	91	378	82	535	1307	1107	95	222	0	38	13114	4450	
340	7,585,884	7	148	28	19	2135	2648	1554	1012	74146	132	64	616	409	358	829	920	180	100	12	90	29092	6703	
340.5	8,266,917	0	99	37	40	1399	1752	1150	837	65577	75	64	703	136	310	881	861	107	226	0	0	25730	6329	
341	8,303,657	9	169	33	24	1800	2229	1341	810	85777	104	131	703	136	371	435	852	762	192	77	0	88	27869	6523
341.5	8,068,699	41	133	46	45	1206	1814	1120	796	68726	70	106	605	371	435	852	762	192	77	0	0	25433	6355	
342	8,083,519	0	176	48	41	1735	2069	1407	797	80577	75	174	710	383	380	857	549	158	167	0	0	0	0	0

Depth (cm)	keps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
342.5	7,476,165	0	271	17	0	3616	3091	1825	970	80268	81	0	770	245	737	1443	595	288	206	167	200	21452	5741
343	7,441,045	90	317	58	54	3115	3155	2027	1069	114145	50	0	844	116	452	1557	613	200	170	42	20	18031	5546
343.5	7,173,848	64	341	96	52	4179	4157	2469	1427	112878	0	0	761	0	535	1788	731	160	44	0	0	16341	5428
344	7,779,942	74	276	85	75	3279	3224	2016	1067	108285	157	56	788	218	507	1648	724	221	171	79	23	20078	6184
344.5	7,535,264	70	287	100	68	3237	3079	2002	1093	108098	68	46	855	80	462	1371	900	144	183	35	59	18311	5783
345	7,583,684	47	285	71	21	3842	3374	2442	1286	123208	0	81	929	0	471	1677	750	132	223	76	49	17144	5239
345.5	7,567,264	97	379	125	101	3584	3325	2149	1355	117878	5	0	866	0	409	1566	636	69	141	134	0	16825	5569
346	7,317,906	133	436	147	91	4410	3883	2761	1466	125504	0	0	905	11	580	1910	549	271	95	0	0	14520	4915
346.5	7,423,406	88	524	97	80	5380	4358	3044	1693	132686	43	63	887	0	878	2167	780	84	175	0	42	14278	5380
347	7,294,427	87	478	89	46	5134	4315	2975	1656	124747	0	0	969	0	877	2061	838	139	136	14	0	14367	5085
347.5	8,120,718	160	529	165	101	5006	3606	2555	1428	152126	84	82	1061	0	731	1662	442	128	159	0	0	14703	5071
348	7,418,286	104	635	110	96	6083	3858	2509	1168	123388	48	0	923	0	719	1977	627	143	198	0	38	15181	5242
348.5	6,546,954	91	493	120	77	5346	4329	2337	1169	92057	0	0	580	24	617	2441	743	132	177	15	0	14778	5230
349	6,051,339	56	366	41	24	4368	4534	2507	1310	79439	0	0	546	0	463	2432	693	110	141	0	27	14079	5191
349.5	6,417,056	42	322	78	66	3621	3734	2505	1198	86574	64	54	681	0	536	1833	678	84	114	34	0	15364	5237
350	6,658,593	23	322	43	51	3905	4208	2648	1348	88860	19	0	632	0	493	2108	710	176	63	0	0	16362	5433
350.5	6,356,296	37	324	61	44	3905	3864	2271	1205	83438	10	0	538	0	596	2160	697	157	172	0	0	15553	5370
351	6,731,432	39	296	47	49	3550	3726	3481	1349	91362	0	19	583	38	453	2011	812	130	153	50	0	15724	5222
351.5	6,641,653	89	339	90	71	3686	3896	2471	1361	88494	72	62	708	0	635	1998	810	135	114	14	0	15583	5368
352	6,525,214	36	310	54	36	3630	3841	2313	1281	84152	30	0	605	0	569	2212	842	164	207	0	0	15956	5599
352.5	6,814,092	49	285	67	42	3588	3685	2566	1377	90922	16	0	618	0	451	2123	633	189	189	30	0	16742	5227
353	6,761,832	38	293	39	30	3540	3680	2317	1230	89117	76	43	732	0	544	1931	941	128	159	57	18	16368	5258
353.5	7,213,908	73	353	116	84	3501	3684	2526	1342	94845	93	0	680	0	596	1844	930	97	190	33	0	18321	5930
354	7,286,927	73	414	79	62	3622	3778	2674	1405	101591	95	59	805	0	495	1613	1610	120	124	0	0	17702	5459
354.5	6,100,599	0	207	46	31	2730	2872	2072	1126	76598	90	0	495	69	433	1613	670	119	106	5	0	16395	5000
355	7,169,968	8	289	50	20	3407	3566	2587	1371	94433	60	0	750	38	491	1998	919	155	168	85	61	18773	5718
355.5	7,198,988	47	318	78	77	3541	3722	2676	1331	96313	33	11	855	0	717	1864	989	161	123	0	0	18464	5727
356	6,979,390	70	359	82	60	3816	3920	2566	1316	93925	0	0	595	151	545	1891	757	97	152	0	8	17122	5421
356.5	6,552,214	63	297	56	42	3712	3685	2296	1245	83030	0	0	604	71	508	2140	965	173	86	26	0	16197	5442
357	6,629,113	30	278	89	27	3663	3745	2551	1336	88561	0	0	643	144	617	2106	605	220	110	105	0	16088	5427
357.5	6,614,814	47	312	71	53	3575	3530	2498	1154	87420	9	0	647	0	647	1951	705	189	203	20	60	16039	5489
358	6,953,150	60	321	67	49	3829	3846	2423	1449	93449	38	0	746	50	667	2230	552	165	156	0	31	16436	5670
358.5	6,133,638	39	249	17	12	3711	3776	2443	1272	75644	30	0	563	0	508	2533	844	204	184	43	23	15073	5428
359	5,808,142	6	249	17	0	4165	4598	2261	1118	65543	0	0	548	0	526	2784	1082	114	135	0	86	14094	5033
359.5	6,800,432	7	294	30	20	4057	4369	2875	1293	86750	42	0	697	0	463	1769	678	150	159	0	0	16916	5286
360	7,177,888	24	337	52	27	3480	3596	2740	1316	93827	39	0	817	0	315	1658	846	229	229	0	160	17845	5371
360.5	6,995,930	54	328	78	48	3507	3593	2515	1241	92764	61	0	675	30	378	1935	747	132	70	0	0	17991	5709
361	6,718,213	67	281	47	35	3678	3788	2264	1260	85491	0	0	583	19	464	1959	557	94	156	120	0	16733	5451
361.5	6,866,011	75	340	80	32	3773	3654	2615	1328	95451	58	6	744	0	513	1723	768	170	143	45	0	16632	5380
362	7,277,327	67	349	79	64	4085	3986	2879	1471	103217	0	8	669	41	384	1780	795	84	163	36	0	17370	5435
362.5	7,370,866	28	339	41	36	4168	4273	2772	1480	101744	60	0	704	0	483	2158	738	130	152	0	83	18229	5773
363	6,861,471	51	352	64	40	4223	4235	2716	1446	91546	0	4	664	0	480	1990	1038	104	198	0	0	16692	5612
363.5	6,814,612	43	317	82	53	4013	4002	2675	1260	92349	0	0	656	21	581	2104	886	110	169	0	118	16668	5440
364	6,847,591	52	377	83	51	3983	4054	2939	1409	94937	28	27	688	0	720	1975	945	50	156	0	0	16403	5496
364.5	6,447,935	22	297	36	16	4067	4280	2623	1477	87742	0	0	690	55	504	2387	730	152	174	25	56	14519	5090

Depth (cm)	kcps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
365	6,069,859	69	323	79	55	4492	4402	2220	1343	75935	34	0	475	0	829	2486	877	211	260	40	0	14547	5297
365.5	5,848,781	45	378	27	20	4878	4712	2288	1211	69566	0	0	397	0	714	2672	642	58	103	0	72	13920	5257
366	6,371,176	58	391	87	57	4943	4775	2593	1372	83407	0	0	518	0	714	2662	764	150	172	85	0	14797	5406
366.5	5,471,905	20	366	45	39	3958	3745	2064	1064	67976	0	0	467	0	571	2228	583	89	171	72	0	13105	4979
367	5,774,442	31	413	33	25	4387	4125	2333	1245	73292	15	0	371	7	629	2437	654	149	134	39	25	14007	5315
367.5	4,329,997	9	266	50	32	3004	2917	1438	865	45805	0	0	194	0	630	2021	431	97	85	0	0	10950	4206
368	5,337,726	38	280	51	21	4366	4460	2411	1328	63733	0	0	369	0	794	2688	664	123	180	20	0	12059	4580
368.5	5,361,746	48	257	57	40	4204	4502	2213	1282	62239	0	0	346	0	648	2605	810	249	123	116	33	12928	4785
369	5,837,401	0	335	9	18	4475	4330	2324	1395	78524	15	0	503	0	660	2189	705	71	201	0	0	12528	4733
369.5	7,408,366	45	329	57	9	4245	4419	2588	1478	87864	0	0	538	0	761	2403	792	164	91	19	49	13603	4828
370	6,838,571	92	417	129	72	4596	4934	2972	1719	99943	34	0	607	0	517	2078	708	109	239	0	17	13561	4992
370.5	6,815,912	62	434	79	70	4542	4749	3122	1852	99688	14	15	657	51	647	2406	931	53	131	0	6	14974	5271
371	6,690,113	79	397	76	87	4419	4688	3037	1934	98681	32	33	706	72	569	2292	818	152	202	40	0	14389	5160
371.5	6,681,593	22	339	52	34	4340	4738	3073	1785	96011	0	0	535	24	645	2515	1088	119	163	25	0	14893	5507
372	6,767,692	82	415	97	61	4571	4993	3114	1753	97776	0	0	722	0	410	2354	879	128	158	0	0	14306	5471
373	6,415,996	81	367	86	44	4283	4865	2878	1621	90252	5	0	574	0	637	2427	826	171	103	0	67	14375	5306
373.5	6,205,438	47	366	41	37	4295	4944	2513	1768	83075	0	0	599	0	590	2503	677	165	162	54	32	13657	4910
374	6,189,838	64	363	59	21	4109	4668	2362	1519	79582	14	0	533	95	540	2698	766	189	151	0	9	14175	5225
374.5	6,302,237	25	349	39	35	4636	4807	2562	1559	79696	0	0	596	37	619	2911	1155	213	208	59	0	14339	5301
375	6,059,179	70	384	61	63	4613	5172	2651	1447	67212	0	0	410	47	627	3006	730	136	170	99	0	14293	5591
375.5	5,880,561	9	215	28	19	3696	4137	2058	1385	65386	0	0	435	0	545	2692	737	255	126	0	0	14976	5248
376	6,267,137	32	290	40	18	3734	4342	2543	1688	82395	0	0	519	0	619	2522	823	181	154	18	0	14776	5440
376.5	6,474,375	48	341	42	65	3708	4253	2488	1604	83669	0	0	582	195	420	2564	925	176	121	24	0	15071	5338
377	6,405,756	27	292	65	42	3794	4267	2763	1739	82485	0	0	526	0	594	2720	749	64	142	0	0	15228	5313
377.5	6,173,278	36	283	58	53	3827	4555	2513	1736	81023	0	0	459	42	627	2423	781	148	161	5	56	13765	5231
378	6,214,838	4	287	29	39	4100	4475	2902	1654	87747	0	0	499	0	385	2356	997	77	161	0	0	13679	4904
378.5	6,224,057	43	391	83	61	4067	4510	2888	1661	89099	0	0	544	109	714	2390	847	185	181	5	43	13062	4798
379	6,252,117	64	363	68	34	4081	4378	2834	1627	88281	0	0	529	59	548	2524	712	116	154	30	72	13310	4805
379.5	6,344,636	48	384	81	29	4207	4503	2905	1649	91416	61	0	556	75	547	2401	646	111	156	0	0	13983	5139
380	6,526,815	80	390	72	62	4334	4794	2952	1542	94283	15	6	657	73	691	2442	1008	132	190	10	0	14141	5248
380.5	6,531,374	69	415	90	66	4177	4575	2945	1643	92831	32	0	548	58	579	2518	962	170	157	11	0	14356	5314
381	6,255,917	74	414	85	66	4436	4496	3109	1699	94258	0	0	682	0	666	2278	727	150	172	127	116	13266	4737
381.5	6,004,380	68	373	81	71	3808	4174	2612	1489	84305	0	0	468	0	600	2227	747	112	134	15	14	13086	4882
382	6,469,835	92	352	120	72	3825	4102	2674	1488	88212	0	0	610	0	481	2217	749	151	140	53	0	14630	5357
382.5	6,295,777	27	355	57	41	4283	4506	2555	1490	89578	19	0	603	0	629	2293	899	164	118	38	58	13850	5184
383	6,333,856	108	374	76	67	4576	4643	2791	1631	90791	0	0	647	0	600	2386	678	123	136	13	19	13598	4892
383.5	6,307,717	67	368	63	48	4500	4769	2852	1667	91247	19	0	695	0	586	2431	853	185	162	10	25	13591	5267
384	6,364,056	73	408	74	53	4563	4614	2745	1590	91766	0	0	595	0	612	2350	812	143	138	0	0	13541	4956
384.5	5,849,478	50	391	59	54	4654	4669	2335	1479	81864	0	0	504	0	608	2722	773	134	172	8	0	13923	5380
385	5,585,824	95	462	76	49	4761	5002	2195	1361	65248	0	0	415	0	581	2676	634	195	109	79	35	12255	4860
385.5	4,845,111	21	305	20	0	3506	3641	2105	1083	50191	0	0	274	0	524	2280	875	123	147	29	0	12228	4514
386	5,887,401	41	339	18	12	4785	5457	2272	1397	68863	0	0	479	0	575	2886	1045	146	287	66	0	14201	5160
386.5	5,130,708	0	283	0	20	4603	4597	1917	1239	52307	8	0	454	0	622	2695	937	131	128	68	42	12395	4808
389.5	4,201,458	9	267	0	0	3233	3361	2569	1190	50663	94	0	329	18	389	1869	511	156	78	78	0	9308	3364

Depth (cm)	keps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
390.5	8,594,514	198	448	196	105	3139	3043	2224	3985	225066	7	0	228	0	288	1338	305	33	22	103	0	9123	3637
390.5	6,603,574	82	405	69	39	4019	5381	2369	2559	119012	0	0	387	25	472	2173	929	61	104	108	116	11330	4390
391	6,071,499	120	342	81	41	4208	4403	2366	1708	80543	0	0	570	7	457	2287	676	219	201	33	0	12750	4654
391.5	6,301,537	61	366	61	42	4515	4676	2288	1667	87797	0	0	478	0	675	2346	621	101	123	15	8	14022	4931
392	6,547,674	80	466	90	68	5346	4754	2543	1567	94077	27	0	681	0	639	2452	712	117	86	0	0	14189	5241
392.5	6,480,435	51	437	28	40	5332	5864	2047	1746	88544	0	0	558	64	590	2497	1054	118	237	72	65	14149	5300
393	5,581,704	73	336	49	42	4421	4602	2620	1788	64009	5	0	443	12	610	2401	967	117	109	32	0	13398	4957
393.5	6,075,399	68	307	75	48	4305	4468	2605	1461	77293	0	9	503	0	596	2608	685	126	160	48	0	13519	5041
394	6,618,034	22	360	42	21	4374	4602	2620	1788	91207	0	0	517	0	678	2464	964	117	187	103	0	15300	5415
394.5	6,338,656	49	301	56	45	4119	4630	2403	1373	75579	0	0	418	0	737	2458	804	218	158	0	34	15691	5300
395	6,344,556	61	296	65	53	3626	3835	2144	1280	77893	0	0	590	50	518	2092	577	142	222	0	87	16213	5295
395.5	6,249,197	48	279	58	28	2983	3385	2111	1397	78953	102	0	557	67	541	1773	782	109	97	14	11	15946	5291
396	6,215,638	36	278	28	21	2817	3392	2045	1642	94099	0	0	581	58	398	1914	685	70	111	39	0	14201	4957
396.5	5,709,603	35	207	0	39	3653	4687	2594	1570	76977	0	0	324	0	523	2256	845	88	170	48	0	12213	4543
397	5,817,102	70	351	84	62	4539	4839	2536	1636	78129	0	0	569	168	561	2337	782	191	156	64	0	12809	4885
397.5	5,688,123	26	292	35	22	4622	4593	2010	1502	64347	0	0	370	0	626	2427	845	224	151	0	0	13837	5170
398	5,973,440	42	497	50	30	5467	3981	2103	1348	71771	0	0	585	152	613	2184	562	154	211	18	0	14511	4989
398.5	6,970,970	42	448	51	58	4633	4253	2508	1694	95305	100	0	593	0	569	1951	677	252	137	24	55	16720	5493
399	6,738,612	76	356	39	28	3985	3971	2606	1641	91301	73	0	656	0	626	2065	810	99	143	0	8	16672	5579
399.5	6,895,891	57	376	80	53	4061	3837	2520	1471	91280	130	0	755	61	646	1767	770	110	115	0	59	17163	5235
400	7,259,667	28	358	60	56	3886	3842	2757	1685	103880	65	0	781	0	513	1647	699	198	230	35	0	17371	5199
400.5	5,909,081	54	364	39	26	3737	3384	2331	1557	82365	0	0	502	0	506	1479	398	103	99	0	0	13496	4480
401	6,461,455	64	543	74	37	5629	3850	2147	1387	77879	34	16	607	0	767	2131	536	107	145	0	122	16370	5378
401.5	6,925,890	76	432	97	57	4189	3652	2386	1464	90584	75	0	568	0	483	1732	620	147	184	0	66	17588	5314
402	6,443,415	65	395	57	71	3976	3355	2112	1297	83934	64	0	575	15	437	1668	631	154	136	0	0	16318	5085
402.5	6,707,173	16	518	54	27	5171	4020	2235	1273	81626	33	0	622	0	472	2318	676	113	179	0	16	17043	5719
403	7,190,208	70	411	70	52	4032	4088	2585	1753	100710	63	15	726	120	524	1615	671	58	197	36	6	17496	5440
403.5	7,288,127	66	388	68	29	4206	3794	2727	1604	100305	12	0	711	22	452	1811	927	221	187	17	0	18618	5924
404	7,457,905	45	471	69	64	4635	3961	2450	2019	101979	185	0	693	0	648	1840	586	109	148	0	0	17987	5691
404.5	7,001,050	21	295	25	21	3817	3655	2549	1610	96374	81	0	748	0	444	1727	760	120	190	51	23	17969	5682
405	7,604,924	26	366	58	57	3731	3909	2834	1686	103501	111	7	784	49	679	1688	836	111	247	0	0	19543	6038
405.5	7,707,902	33	369	52	21	3765	3903	2850	1819	103317	0	0	726	81	524	1761	808	59	143	0	0	19738	5969
406	7,439,825	51	346	52	40	3412	3561	2604	1573	99771	96	91	930	0	486	1754	711	61	149	0	48	18672	5573
406.5	7,446,605	17	321	53	31	3507	3701	2695	1718	100275	72	44	733	34	707	1567	805	87	85	0	0	19216	5856
407	7,401,066	67	347	76	53	3548	3816	2717	1625	99582	5	72	736	53	589	1647	747	99	140	33	29	18997	5800
407.5	7,578,784	87	392	64	50	3808	4012	2899	1838	102370	27	74	741	79	536	1699	841	84	189	47	54	18733	5801
408	7,584,744	48	335	87	80	3634	3859	2795	1923	103064	26	0	794	118	453	1760	753	243	141	0	0	18869	5807
408.5	7,284,707	0	298	27	19	3392	3779	2727	1664	95480	112	37	690	126	454	1901	839	83	215	0	0	19159	6059
409	7,301,547	47	357	72	53	3581	3785	2529	1643	93782	82	65	703	24	644	1709	795	105	149	11	0	18938	5923
409.5	7,634,163	83	341	73	57	3581	3956	2776	1735	105964	5	64	790	0	521	1816	775	89	120	54	52	18889	5673
410	7,920,800	11	361	33	17	3982	4425	2947	1117	112451	28	0	774	94	587	1963	724	157	97	0	17	18974	6008
410.5	6,795,592	22	267	27	43	3132	3361	2310	1628	87914	91	0	520	0	529	1716	686	149	66	0	0	17556	5293
411	7,216,508	28	324	34	49	3597	3727	2649	1647	96552	55	61	698	0	583	1860	876	154	117	0	0	17933	5718
411.5	7,512,285	54	353	75	27	3806	3985	2666	1649	100393	117	0	816	40	564	1809	841	175	175	39	0	18692	5664
412	7,505,625	52	362	96	61	3720	3971	2574	1687	98084	69	0	675	0	844	2002	764	114	177	0	0	19112	6031

Depth (cm)	kaps	Al	Si	S	Cl	K	Ca	Ti	Mn	Fe	Ni	Cu	Zn	Br	Rb	Sr	Zr	Ta	W	Pb	Bi	inc	coh
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Appendix. Fiskebolvatnet core A09 Spectrolino CIE Lab color data.

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
0.4	25.417153	2.0518081	4.8056856	10.8	15.044467	3.5307958	8.499684	21.2	14.133741	3.1681767	8.145432	31.6	18.420191	3.6444438	10.953542
0.6	20.779371	2.8471594	7.273353	11	15.125921	3.2257505	7.084536	21.4	14.058565	3.1303483	8.1719277	31.8	17.488951	3.6638316	10.77196
0.8	21.618517	2.8380728	7.059193	12	15.829827	3.2733387	7.6771378	21.6	14.569419	3.1867075	8.2801777	32	17.637019	3.7616602	10.820305
1	22.155137	2.5908239	5.94059	11.4	16.333743	3.3428217	7.9949708	21.8	15.020424	3.1013395	8.0571661	32.2	18.838628	3.4899351	10.10398
1.2	20.201793	3.1084274	7.5960076	11.6	16.903949	3.3279738	8.2022962	22	16.157999	3.0758378	8.7642509	32.4	18.638601	3.4930332	10.676314
1.4	19.417093	3.0414722	7.9962706	11.8	16.318183	3.2287073	8.3785753	22.2	16.00394	3.2581723	9.1881692	32.6	16.690777	3.6911762	10.201871
1.6	17.962554	3.6127163	9.1213707	12	16.053421	3.224931	8.8703787	22.4	17.420221	3.3003206	8.7863337	32.8	17.078611	3.9496368	10.185689
1.8	18.143858	3.9276219	10.132613	12.2	16.145325	3.016728	8.646721	22.6	17.822033	3.1338312	8.1564618	33	17.566332	3.9417367	11.003783
2	18.204796	3.7570248	10.4026701	12.4	16.219661	3.2872506	9.50488	22.8	18.340924	3.2769738	9.5164749	33.2	19.106199	3.0012765	10.185742
2.2	17.790668	3.469692	10.173372	12.6	17.121038	3.4014452	9.5400027	23	20.354449	3.9531601	11.428243	33.4	16.072518	2.9632501	9.0439019
2.4	16.853924	3.5445228	9.2830571	12.8	19.607779	3.5130159	9.9189648	23.2	21.826317	4.144459	11.785346	33.6	16.153655	3.0911617	8.3715543
2.6	16.13851	3.6655938	9.6017365	13	21.024821	3.5955707	10.805417	23.4	21.885463	3.5688794	11.689426	33.8	16.504725	3.3132169	8.8637992
2.8	16.900888	3.6950479	9.7832536	13.2	21.453281	3.569566	10.926395	23.6	22.558558	2.6829953	10.682533	34	16.201488	3.293182	8.690514
3	16.522694	3.7274098	9.7603823	13.4	21.359897	2.7223386	10.168763	23.8	21.678291	2.2434768	9.8362777	34.2	15.889285	3.2326616	8.5424699
3.2	18.153132	3.530665	10.083582	13.6	20.139988	2.5075144	9.4045049	24	19.719956	2.7773851	9.3826975	34.4	16.65728	3.117941	8.8024055
3.4	18.527472	3.5115384	9.6465924	13.8	18.401407	2.6479104	9.1371628	24.2	18.930848	2.4797578	8.6361177	34.6	15.76669	3.3860263	9.2146536
3.6	16.606079	3.3675553	9.3253541	14	18.229106	2.7122309	9.0574432	24.4	18.021237	2.4092722	7.9674445	34.8	14.171523	3.376456	8.3168916
3.8	16.834712	3.3780543	8.88299	14.2	17.620532	2.7899233	8.9593468	24.6	17.435965	2.4732502	8.1999614	35	13.763152	3.1607726	7.6032301
4	16.049359	3.5494652	9.3592804	14.4	18.094727	2.7620486	8.1133057	24.8	17.60083	2.6119655	7.6475622	35.2	13.360561	3.0877447	7.497943
4.2	17.012774	3.4337146	9.5762041	14.6	18.302394	2.6884105	7.48516	25	14.488818	2.832211	7.596032	35.4	12.56477	2.8816255	6.8676737
4.4	17.145903	3.6949881	9.8002597	14.8	17.029993	2.9837175	8.5554082	25.2	14.926519	2.8339802	7.4898743	35.6	11.115298	3.0265812	6.645418
4.6	17.41472	3.7270083	9.747087	15	16.887308	2.8878379	8.9280065	25.4	15.245943	3.1041632	8.1595267	35.8	12.257962	2.0334606	4.2458379
4.8	17.583998	3.8743934	10.309405	15.2	16.450089	2.8836572	8.4081954	25.6	16.497133	3.1045899	8.6163182	36	13.55665	2.5614201	5.6631874
5	17.849919	3.9087554	9.948171	15.4	16.180231	2.8021542	8.2554587	25.8	14.925647	3.4014168	8.8471134	36.2	13.252962	2.7928387	7.0760623
5.2	16.788841	3.8600971	9.8777163	15.6	16.442893	2.8259218	8.1133624	26	14.523098	3.2638472	8.4190583	36.4	13.558182	2.9856356	7.4566442
5.4	17.681625	3.9330135	10.394109	15.8	16.438266	2.8903922	8.3235198	26.2	15.807314	3.1346758	7.6421704	36.6	14.400161	3.1098469	7.9913201
5.6	16.989994	3.8868599	10.522131	16	16.293674	2.9102358	8.3611944	26.4	16.673478	3.3422805	7.2667021	36.8	14.42593	3.0148248	7.7437924
5.8	17.511729	3.5787243	10.006353	16.2	16.354292	2.8853509	8.2763555	26.6	17.309004	3.0826979	8.3942301	37	14.647413	2.9166037	7.5510781
6	17.034748	3.6375275	10.006233	16.4	16.907619	2.9224789	8.4625964	26.8	19.683535	3.5140715	10.893676	37.2	15.193897	2.9451129	7.7381634
6.2	17.078657	3.4555341	10.196933	16.6	16.641406	2.9173885	7.9880773	27	18.281484	3.4078483	10.347234	37.4	14.542858	3.1045489	8.1043996
6.4	17.258866	3.9174943	10.777632	16.8	16.356529	3.0263753	8.9303337	27.2	17.46337	3.5519703	10.1440086	37.6	14.528452	3.232536	8.3096912
6.6	17.161119	3.8996957	10.77977	17	15.890549	2.9409398	8.4878784	27.4	17.034376	3.6382746	10.323255	37.8	15.9714	3.1880068	8.8115507
6.8	17.401864	4.1253151	11.48587	17.2	15.835394	2.8983088	9.0026609	27.6	16.883582	3.6503361	10.249354	38	16.554118	3.3551965	8.8330236
7	17.10878	3.7462386	10.482294	17.4	15.596067	2.7260217	8.4731404	27.8	15.19828	3.4485901	9.0878208	38.2	14.489309	2.9680875	7.8671071
7.2	14.978642	3.6928332	8.9657961	17.6	15.54805	2.8186571	8.2810809	28	14.289315	3.3347375	8.5463451	38.4	15.067348	2.9170921	7.6257383
7.4	14.890954	3.4463799	8.4259978	17.8	15.736592	2.6888463	8.861049	28.2	14.78255	3.22777	8.4632665	38.6	15.128368	2.8985635	7.5884825
7.6	14.348482	3.5833487	8.5769081	18	15.754427	3.0752295	8.9829436	28.4	15.442921	2.9733587	7.2305308	38.8	15.480186	3.081477	8.4110822
7.8	14.220225	3.5243133	8.5465338	18.2	15.682631	3.192062	9.0842902	28.6	15.639751	2.9288259	7.1242784	39	14.480689	3.0367386	7.3671681
8	14.922309	3.2217488	7.9349716	18.4	17.029262	3.0882317	8.913842	28.8	15.15206	3.06196	7.5055344	39.2	12.682023	2.8332331	6.6485647
8.2	16.700931	2.8099693	6.4142918	18.6	15.68115	3.1403117	8.6080073	29	15.242022	2.9494152	7.8286302	39.4	15.544451	2.603414	6.1564206
8.4	13.827625	3.156142	7.7705756	18.8	16.571754	2.5639436	7.3638295	29.2	15.312912	3.4327322	9.3743986	39.6	14.963518	2.7296586	6.4337176
8.6	13.83095	3.351415	8.0731134	19	17.093861	2.9535547	7.7763269	29.4	16.947066	3.2179647	8.7573449	39.8	13.960469	2.9693825	7.7099338
8.8	14.184248	3.3641226	8.1826893	19.2	15.451751	3.7780586	9.1501995	29.6	18.068701	3.3579518	8.9970702	40	14.121674	3.191346	7.7526849
9	14.361707	3.3714874	8.2344271	19.4	14.898625	3.8727298	8.9723792	29.8	19.471687	3.5032538	9.6598373	40.2	14.629947	2.8045849	7.1895942
9.2	14.537583	3.33450642	8.4762604	19.6	15.252598	3.9339682	9.0967144	30	19.901759	2.6423413	8.1617638	40.4	13.454413	2.698128	6.752911
9.4	14.699084	3.1166383	8.2672167	19.8	13.639455	4.1955683	8.9115126	30.2	15.748744	2.884804	7.3189637	40.6	13.518822	2.7689231	7.2408804
9.6	14.720182	3.2040931	8.4822886	20	14.505147	4.3359154	8.8098502	30.4	16.95921	3.225833	7.2183101	40.8	13.448319	2.7694647	7.3644374
9.8	15.19682	3.3682532	8.4880521	20.2	14.831891	4.0286185	9.0673385	30.6	17.606613	3.2348858	8.7556483	41	13.823535	2.8618127	7.366516
10	15.003049	3.4706931	8.7334744	20.4	14.961339	3.9100693	9.1893172	30.8	20.627944	3.7452232	10.975481	41.2	13.94908	2.8462151	7.2486381
10.2	15.647997	3.4230752	8.9738803	20.6	13.711844	3.5338908	8.3158375	31	20.689705	3.5744429	11.570153	41.4	14.021378	2.9331605	7.6083988
10.4	15.836996	3.5775784	9.249897	20.8	14.16617	3.441606	8.5077861	31.2	19.68734	3.1674869	10.904205	41.6	13.890118	2.9846434	7.5318805
10.6	15.904148	3.4747881	8.5743469	21	13.986951	3.2838328	8.2581665	31.4	19.463628	3.4239635	11.184085	41.8	14.148934	2.8312962	7.025598

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
42	15.333257	2.8290195	7.5632782	63.2	22.356538	2.888209	10.751021	73.8	14.522038	2.7130825	7.1454225
42.2	14.815766	2.7907271	7.6235859	63.4	21.650953	2.3471062	9.8391766	74	15.379048	2.6830955	6.959874
42.4	14.661261	2.7993922	7.5033997	63.6	21.5177848	2.0690238	9.1926727	74.2	15.840017	2.6941096	7.3701187
42.6	16.529239	2.9186994	7.698739	63.8	20.29786	2.0463171	8.329305	74.4	17.336636	2.8199205	8.2156546
42.8	16.051249	2.9468662	8.0539154	64	19.094582	2.293325	8.3682404	74.6	16.98461	2.7347309	7.7148683
43	15.927258	2.993417	8.3906923	64.2	18.410561	2.3940955	8.2549004	74.8	15.679078	2.7705674	7.7752994
43.2	16.144196	2.8435079	8.4095485	64.4	17.491086	2.5021727	8.2733657	75	15.40788	2.7350979	7.4269635
43.4	15.644196	2.9290434	8.2167453	64.6	16.864894	2.8147564	8.405439	75.2	15.530603	2.9625011	7.7578174
43.6	16.535675	3.0961271	9.1307081	64.8	16.703235	2.7282726	7.9992713	75.4	15.631516	2.7597121	7.7167594
43.8	17.578475	3.2437037	9.1001948	65	16.363423	2.6650977	7.5935866	75.6	17.766906	2.8881566	8.5568765
44	18.629576	3.6141207	10.58094	65.2	15.777063	2.7324243	7.882911	75.8	16.510114	2.9358237	7.9279254
44.2	17.269141	3.4217285	10.241041	65.4	15.719407	2.6437403	7.785527	76	16.546024	3.3226269	8.7084473
44.4	15.977736	3.2702724	9.6248112	65.6	15.497697	2.7565788	7.8872824	76.2	18.499565	3.1096126	9.5810682
44.6	16.25182	3.4879326	9.7176856	65.8	15.620025	2.6340786	7.7104521	76.4	19.143073	3.178842	10.896717
44.8	15.150028	3.3563082	9.1564317	66	15.645106	2.6010415	7.807366	76.6	24.139283	2.2118653	9.6943086
45	15.331718	3.2521183	8.5718578	66.2	16.409337	2.4694231	7.3355182	76.8	18.841769	2.8245616	7.453016
45.2	15.387572	3.2343217	8.9166834	66.4	16.514555	2.4660305	7.6147366	77	12.575843	2.5553136	5.6037323
45.4	17.20371	3.1606718	9.47621	66.6	16.393363	2.4260487	7.5952321	77.2	13.245957	2.7242017	6.9963754
45.6	17.001873	3.2740542	9.4320252	66.8	16.563419	2.4924184	7.5611913	77.4	14.121389	2.109681	6.928851
45.8	18.120324	3.2632606	9.2146657	67	16.570691	2.5628408	7.882318	77.6	17.583155	2.3689946	6.4833742
46	19.09697	3.3152671	9.7598068	67.2	16.37017	2.6483687	7.774793	77.8	16.889672	2.4292168	6.9094355
46.2	19.431726	3.0635799	9.9840253	68	16.381812	2.4832608	7.3675507	78	16.713015	2.7646367	7.8172422
46.4	19.532146	3.0795704	8.5162943	68.2	17.56257	2.4848131	6.9632599	78.2	16.645057	2.7819443	8.3374491
46.6	18.069785	2.4720617	8.0938985	68.4	16.084115	2.396591	7.2080157	78.4	15.99262	2.9106308	8.9151383
46.8	16.643833	2.7193525	8.4693142	68.6	17.603877	2.3943	7.2522055	78.6	15.178345	2.7436849	6.8780407
47	17.367532	2.6066889	8.0539396	68.8	16.994195	2.3115001	7.2665447	78.8	16.846631	2.5794561	7.4275432
47.2	15.905482	2.7718887	7.6704501	69	16.22482	2.2681756	7.1219827	79	16.197029	2.6049412	6.9821011
47.4	15.452672	2.7027319	7.2698044	69.2	16.021066	2.4315202	7.399319	79.2	16.007375	2.6530989	6.9310985
47.6	15.317408	2.7403312	7.1596907	69.4	15.99838	2.5807625	7.4826544	79.4	17.859956	2.2674153	6.2564213
47.8	15.234341	2.9374402	7.735405	69.6	16.009361	2.6380381	7.8552872	79.6	17.988362	2.3316503	6.6741614
48	15.057741	2.8303691	7.5249157	69.8	15.226365	2.8461636	7.923842	80.0	15.928067	2.4105876	6.1470493
48.2	15.647884	2.8096411	7.7360498	70	15.133526	2.8745855	7.5286082	80.2	15.962141	2.5106287	6.1951764
48.4	15.740638	2.9589779	8.0299551	70.2	15.478158	2.8063662	7.8056304	80.4	15.710157	2.5153266	6.7253336
48.6	16.354819	2.8084249	7.9574668	70.4	15.285413	2.7206632	7.5647574	80.6	15.069569	2.7276027	6.7667973
48.8	17.351997	2.77319	7.9492005	70.6	15.616989	2.8631118	8.171908	81.2	15.540075	2.4498822	5.8759077
49	18.354735	2.8501509	7.9093982	70.8	15.252875	2.8072965	7.601122	81.4	16.36976	2.402947	5.5489272
49.2	17.507597	2.9327401	8.248936	71	15.447946	2.8385946	7.609652	81.6	15.875909	2.7918947	6.344971
49.4	15.956093	2.999516	8.4791431	71.2	15.431697	2.7827556	7.1128645	81.8	14.516565	2.9194894	7.1659533
49.6	15.840333	3.1142661	7.8877553	71.4	17.133284	2.4462444	6.1444215	82	14.595686	2.744598	6.4249907
49.8	15.681213	2.6718731	7.3059292	71.6	14.577106	2.6628885	6.4978259	82.2	15.450627	2.6227504	6.802109
50	15.575038	2.8576299	7.6660515	71.8	14.3309234	2.6850475	6.7437385	82.4	15.277298	2.6605906	6.373526
50.2	17.661188	2.5714478	7.900614	72	13.973778	2.4140961	6.1154803	82.6	16.020843	2.517489	7.5745314
50.4	14.921508	2.8648956	7.3893701	72.2	14.325803	2.4081679	6.3006728	82.8	23.671381	2.0185545	5.3153418
50.6	15.088386	2.9711006	7.915343	72.4	14.192457	2.4174843	5.6279539	83	21.610393	2.3615013	7.8222057
50.8	16.426046	2.6513096	7.409672	72.6	13.708657	2.4976489	5.8979143	83.2	24.90322	2.42794	9.1450288
51	16.443193	2.8075277	7.9973546	72.8	14.516378	2.5938492	6.7253528	83.4	18.175944	2.6705539	7.9602321
51.2	17.337834	2.6824878	7.3409665	73	14.265372	2.8043852	6.8149278	83.6	16.486023	2.2498861	5.7124908
51.4	18.507993	2.5320619	7.915758	73.2	14.105566	2.996473	7.5329883	83.8	15.355925	2.6167653	6.3935858
51.6	16.356279	2.8382708	7.9564429	73.4	14.256238	3.0213221	7.0475623	84	15.355796	2.7152898	6.242272
51.8	16.722672	2.7984546	7.1000281	73.6	13.747436	2.8336694	7.3803912	84.2	16.217354	2.7172033	6.3287648
52	17.198037	2.664149	6.6592425								
52.2	15.878991	2.8297261	7.1758122								
52.4	14.528032	3.1273276	8.0900609								

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
84.6	16.302468	2.4665398	5.5275453	105.6	37.976749	1.2243638	3.9499666	116.2	18.334583	1.9153251	5.436932
84.6	19.485889	1.8474845	3.8396049	105.8	34.990721	1.6020842	5.7222197	116.4	18.082931	1.8096493	4.809547
84.8	18.35489	2.2825784	4.846823	106	31.848458	1.4234601	3.5068817	116.6	18.020114	1.6383887	4.3659956
85	19.199856	1.9194267	4.6001983	106.2	55.177696	1.343967	1.5011663	116.8	18.907655	1.5525958	3.9519276
85.2	17.438064	2.361711	5.9291053	106.4	40.436103	0.3736477	1.0891164	117	17.185155	1.6893501	4.3992675
85.4	16.276428	2.6494468	6.7029272	106.6	21.386733	1.4163394	2.9296752	117.2	16.023956	1.7242982	5.2827194
85.6	17.779512	2.044885	4.93732075	106.8	18.427955	1.8089155	3.8809807	117.4	17.014756	1.7236628	4.0693555
85.8	16.289575	2.1920072	5.4476556	107	18.714874	2.1937048	4.8201028	117.6	18.385929	1.5253184	3.4437475
86	19.188785	1.8493165	3.9002743	107.2	19.550038	2.2985625	5.2644685	117.8	18.130959	1.5459572	3.9350159
86.2	20.059294	1.7295283	3.766926	107.4	17.199583	2.5685891	6.2719563	118	14.904575	2.0056477	4.6779383
86.4	16.532868	1.8871804	3.9411657	107.6	14.904788	2.7361125	6.5982593	118.2	15.730926	1.7927398	4.6301925
86.6	16.446573	1.8704702	4.145668	107.8	18.000697	2.3357832	5.1959488	118.4	15.693461	2.2515972	5.3421846
86.8	20.247466	1.6245533	3.7124443	108	17.725723	2.2728416	5.2434512	118.6	17.126731	1.9023788	5.1477897
87	16.800108	2.1173926	5.4802734	108.2	17.358166	2.4594129	5.9753825	118.8	18.443876	1.6679724	4.4006762
87.2	16.349896	2.1733894	4.8859553	108.4	16.575826	2.1552769	5.2423964	119	21.447947	1.2918779	3.3671208
87.4	18.237645	1.8847106	4.4687791	108.6	15.494018	2.4050042	5.6531819	119.2	22.923627	1.4441229	3.1954043
87.6	18.583133	2.1005172	4.659157	108.8	16.619878	2.2310636	5.035986	119.4	25.255632	1.2741792	2.6820579
87.8	18.04228	2.1919151	5.0933176	109	16.771404	2.1574408	4.9919442	119.6	20.57132	1.6939947	3.8413051
88	17.696737	2.3727718	5.9511474	109.2	17.39494	2.3091304	5.5763704	119.8	19.146417	1.6880223	3.9536877
88.2	17.150565	2.4151744	6.5284955	109.4	17.986644	2.2576841	5.4879095	120	18.385606	1.8071373	4.355082
88.4	17.934461	2.517428	7.3051156	109.6	16.7736	2.0665693	5.2652619	120.2	18.744234	1.7075935	4.2539035
88.6	19.595222	2.7321165	7.5920673	109.8	18.430228	2.3517685	6.0229498	120.4	17.561572	1.817681	4.03119
88.8	18.359684	2.9417767	8.9075985	110	21.408928	2.6109356	6.9737757	120.6	17.779739	2.0241497	4.6541125
89	19.095533	2.4906238	8.4158119	110.2	19.97811	2.4706817	7.716688	120.8	19.025542	1.7401014	4.0812598
89.2	20.577471	2.8320693	9.3913057	110.4	19.467119	2.728947	8.3081917	121	16.695584	2.3478817	4.9165573
89.4	19.390763	3.0951073	6.9797763	110.6	19.080773	2.463028	7.2572549	121.2	16.1724	2.4109942	5.4096866
89.6	22.713738	2.2510937	7.6662456	110.8	21.193775	2.0840592	6.1527655	121.4	16.334532	2.5059505	5.499063
89.8	19.48548	2.5298816	7.6746284	111	19.082804	2.3198371	6.9154292	121.6	14.896446	2.8802497	6.5390589
90	19.628364	2.3714544	6.4306354	111.2	16.430252	2.6268326	6.2429888	121.8	16.738784	2.1678577	5.3265143
90.2	20.200582	2.1204065	5.4601744	111.4	17.31343	2.2215531	5.3347849	122	17.028084	2.1998712	5.1306018
90.4	20.359046	2.4063975	6.4190533	111.6	16.748604	2.2998355	5.9245722	122.2	17.076197	2.1069226	4.8667255
90.6	17.347895	2.5393002	7.3103848	111.8	16.958722	2.3195412	5.9492565	122.4	16.478982	2.1867197	4.900576
90.8	16.33727	2.6325769	6.5842686	112	17.339463	2.1980524	5.9199828	122.6	21.042497	1.1228993	2.0763702
91	15.976575	2.5906103	6.7197195	112.2	16.515692	2.2621164	5.8188775	122.8	42.370871	-0.376425	-0.861873
91.2	16.189728	2.4076438	6.7759611	112.4	16.685042	2.2436888	5.7399856	123	32.193144	0.3410756	0.3868055
91.4	17.282692	2.3231336	5.9285965	112.6	17.104874	2.1454891	5.6689583	123.2	25.478203	0.8965648	1.0998395
91.6	16.808998	2.3607894	5.9166995	112.8	16.873264	2.2567627	5.6185784	123.4	23.566983	1.2036784	1.9593307
91.8	16.28203	2.6761454	6.8286172	113	16.941813	2.278289	5.9231223	123.6	34.664977	0.4025025	0.4786781
92	15.404481	2.6792639	6.785528	113.2	18.329068	2.1236125	5.1372589	123.8	29.471528	0.8062549	1.1766121
92.2	14.689443	2.7657094	6.232522	113.4	26.587427	1.4891542	2.904909	124	21.374684	1.8569201	4.2404957
92.4	15.189131	2.953906	7.5421222	113.6	20.15457	1.7270596	5.226702	124.2	19.110035	2.0263999	4.3800694
92.6	15.602602	3.1893085	8.6307742	113.8	21.834781	1.0236206	2.7724488	124.4	29.854622	0.5971714	0.9087359
92.8	17.204316	2.6496921	7.8206777	114	28.145864	0.6338182	1.36301	124.6	48.394402	-0.338642	-0.882301
93	19.303994	2.5102756	7.4430738	114.2	24.780513	0.9004694	2.0721737	124.8	19.660164	1.774106	3.7450588
93.2	19.104925	2.4637204	6.4067195	114.4	17.385829	2.3118293	6.7585237	125	29.694809	0.8544279	2.2697446
93.4	17.248304	2.6370446	7.1900858	114.6	20.464439	0.0967772	5.5189251	125.2	36.967142	0.7960829	2.4503418
93.6	16.735733	2.856532	7.5592424	114.8	22.729816	2.9275648	7.1291665	125.4	22.890961	1.8445742	5.9251264
93.8	16.35538	2.8367552	8.0018582	115	22.129342	0.9004694	2.0721737	125.6	18.478457	1.8742175	4.9186474
94	16.919059	2.6012443	7.3018944	115.2	21.803886	2.5623826	7.1966143	125.8	19.244432	1.6901249	5.0038243
94.2	16.418341	2.6587637	7.6455671	115.4	19.984108	2.2782199	6.9095029	126	16.251798	2.4787686	7.3298503
94.4	17.337524	2.6828963	7.4554244	115.6	19.722201	2.3391888	7.2595243	126.2	19.723541	2.2312708	6.4895569
94.6	18.951532	2.6282656	7.7397776	115.8	19.894342	1.9112119	6.9659767	126.4	25.321019	1.7576272	5.3186736
94.8	20.608601	2.2364519	8.5654839	116	19.30379	1.9465056	5.7388623	126.6	23.111103	1.9501021	6.5604613



Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
126.8	21.406579	2.051448	7.050208	137.4	29.453494	1.238275	3.499671	148.4	21.205134	1.564262	3.870797
127	21.435945	2.345689	7.890643	138.6	23.296487	2.143004	7.328506	148.6	20.882739	1.336257	2.894501
127.2	21.380244	2.623544	8.754798	137.8	33.072187	1.579894	6.734568	148.8	20.517166	1.371091	3.050375
127.4	26.240299	2.149809	5.565598	138	48.623083	0.781289	2.742675	149	20.110601	1.337193	3.906655
127.6	19.847095	3.711284	9.575156	138.2	41.343328	2.047928	6.379087	149.2	20.765257	1.692727	4.479249
127.8	19.180992	2.298946	10.10137	138.4	32.078444	2.265311	10.304797	149.4	20.518875	2.098431	5.388424
128	21.390209	2.257607	8.826496	138.6	32.807844	2.555194	8.234072	149.6	20.785185	1.452936	4.043516
128.2	20.388817	2.658062	8.204653	139.2	18.721696	2.916622	8.831931	149.8	18.939176	2.017456	5.007134
128.4	20.168193	2.317167	6.235717	139.4	22.387102	1.859513	5.568182	150	21.419653	2.229965	5.712335
128.6	20.341033	2.397976	6.416574	139.6	22.123323	1.809696	5.621817	150.2	21.212327	2.096795	5.182458
128.8	20.340094	2.021635	6.365077	139.8	19.032203	2.477978	7.369325	150.4	21.866885	2.449907	6.125837
129	18.512573	2.278292	6.828537	140	20.25158	2.424126	7.110971	150.6	20.808185	2.775988	8.696835
129.2	34.249632	1.417571	3.105717	140.2	18.99366	2.327470	6.679538	150.8	19.500583	2.579034	8.462489
129.4	27.460177	1.726945	5.504259	140.4	20.806024	1.724342	4.228277	151	21.533448	2.346840	7.266185
129.6	29.568764	1.186096	6.279192	140.6	19.413599	1.732793	4.265747	151.2	21.238218	2.306411	7.067591
129.8	30.423274	1.030504	5.804396	140.8	19.091206	1.587282	3.40664	151.4	19.131097	2.434686	6.867894
130	28.151198	1.073297	7.016876	141	18.341766	1.673367	3.604725	151.6	19.50696	2.058824	4.871142
130.2	30.466196	1.627124	8.029417	141.2	20.384278	1.604947	3.514654	151.8	21.821246	1.560682	3.574495
130.4	25.09879	2.317717	7.399471	141.4	17.862995	1.888903	4.256310	152	22.316248	1.293399	3.513387
130.6	20.648069	2.365063	6.532781	141.6	19.440801	1.431825	2.933312	152.2	22.096005	1.501362	4.312160
130.8	20.110451	1.953455	4.752846	141.8	17.726137	1.925681	4.086538	152.4	23.307965	1.585974	4.635198
131	23.065535	1.233013	2.906882	142	18.716651	1.884308	4.394621	152.6	22.376674	1.815378	5.289903
131.2	25.369484	1.225238	2.307455	142.2	18.615711	1.236524	2.431751	152.8	21.975057	1.559473	4.658605
131.4	25.150921	1.082892	2.213551	142.4	18.300125	1.412309	2.878740	153	22.095449	1.401387	3.115202
131.6	24.918563	0.884327	1.735006	142.6	19.209798	1.312699	2.624672	153.2	24.838469	0.888151	2.438530
131.8	22.78494	1.225102	2.622594	142.8	21.015213	1.350698	2.887071	153.4	22.506181	1.009165	2.267556
132	24.06958	1.144259	2.204657	143	22.138323	2.368036	7.112158	153.6	22.816651	1.030879	2.119667
132.2	28.391325	0.832407	1.26891	143.2	29.589685	1.669595	4.501897	153.8	21.292313	1.054358	2.269593
132.4	23.687006	1.216485	2.813130	143.4	24.224066	2.042352	6.494194	154	20.902387	1.503493	3.508610
132.6	22.548226	1.390412	3.911091	143.6	27.935356	1.091721	8.465071	154.2	20.902387	1.503493	3.508610
132.8	24.563694	1.207852	2.295157	143.8	28.740982	1.700659	8.282091	154.4	23.031781	1.332077	3.194865
133	22.61021	1.343658	3.107219	144	27.31015	1.487308	8.058954	154.6	21.122212	1.677962	3.849903
133.2	23.117575	1.533155	3.879528	144.2	25.571701	1.455675	7.967071	154.8	20.808037	1.665324	3.677318
133.4	24.632906	1.394816	3.145878	144.4	26.286595	1.847535	8.966768	155	22.008323	1.095412	2.534317
133.6	25.822078	1.163807	2.267921	144.6	22.65262	1.739232	7.224736	155.2	21.507724	0.969365	1.996027
133.8	25.873115	1.252876	2.574539	144.8	24.414681	1.889933	9.104019	155.4	20.515754	1.372303	3.075998
134	21.96444	2.109163	5.590317	145	26.81392	2.706748	10.905101	155.6	18.886168	1.628077	3.861869
134.2	21.619075	2.488017	7.467219	145.2	24.775776	2.095902	6.706770	155.8	18.238532	1.943209	4.330871
134.4	23.476692	2.305506	8.024724	145.4	25.974282	1.887709	5.479656	156	20.313591	1.351375	3.307264
134.6	21.549977	2.534743	7.348231	145.6	27.726789	1.850760	5.431432	156.2	19.047384	1.774568	4.495347
134.8	22.113136	1.994315	6.091401	145.8	24.99855	1.304848	5.289928	156.4	23.622281	1.335056	4.654527
135	22.251638	1.212406	5.105896	146	22.490537	1.302048	4.549631	156.6	21.154408	1.984922	6.245911
135.2	27.291758	1.115936	2.300925	146.2	19.319652	1.624878	4.096030	156.8	20.373577	2.045131	6.342721
135.4	35.77927	0.679669	1.581186	146.4	18.915696	2.208037	5.52237	157	18.07368	2.309716	7.062136
135.6	52.929598	0.199890	1.095683	146.6	18.881815	2.222168	6.076253	157.2	18.912977	2.295831	6.078084
135.8	21.749712	2.357629	7.235333	146.8	18.809826	2.555954	7.304485	157.4	20.94401	2.212661	6.824208
136	30.911542	0.794604	1.94359	147	19.043117	1.649196	3.982529	157.6	19.62997	2.637043	7.266508
136.2	48.403712	0.239502	0.420028	147.2	20.570246	1.396390	3.160052	157.8	18.709192	2.699643	7.078471
136.4	55.927958	0.199890	1.095683	147.4	22.234306	1.139075	2.663717	158	17.811007	1.614732	4.195286
136.6	35.949291	0.945262	2.315273	147.6	20.890445	1.312917	2.806107	158.2	19.639203	1.4936749	3.312103
136.8	45.773651	0.171676	0.895514	147.8	20.855882	1.203710	2.886584	158.4	20.03903	1.808452	5.276169
137	44.087745	-0.164653	-0.312926	148	20.893691	2.084904	6.455569	158.6	20.07021	1.582715	4.37317
137.2	57.162767	-0.209121	0.270091	148.2	20.834566	2.154352	5.652471	158.8	21.062166	1.4587998	3.84779

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
169.6	19.321944	1.6486349	4.4122093	180.2	27.940594	2.1620541	11.430325	190.8	19.773696	2.136022	7.1375149
169.8	17.256525	1.7718001	4.1500293	180.4	23.204791	2.6371661	9.7402837	191	21.396186	1.7718722	6.425641
170	19.000403	1.6614055	4.4837342	180.6	20.301916	2.4384834	7.4143559	191.2	20.090318	1.7451463	6.2049834
170.2	17.662902	2.0654658	5.5520302	180.8	19.926491	2.3954348	7.0392627	191.4	21.091946	1.7405645	6.0820902
170.4	16.582513	2.21016	6.3862238	181	19.889454	2.7443968	8.1411372	191.6	21.465166	1.5818415	5.6003975
170.6	16.166725	2.2700929	7.0060115	181.2	23.386258	2.6500254	9.5556236	191.8	20.496511	1.834803	6.0190651
170.8	15.791681	2.4202893	7.9923203	181.4	22.161409	2.6210054	8.6596373	192	22.007848	1.3806848	5.8754719
171	16.084417	2.2988114	7.7412414	181.6	21.58673	2.3342865	7.4348004	192.2	20.512382	1.8966662	6.2271144
171.2	16.910279	2.0930984	6.3520637	181.8	20.764149	2.3806959	7.1692195	192.4	19.981683	1.9823045	6.809425
171.4	14.426874	2.6594144	7.8552143	182	21.290957	2.1292966	6.3386507	192.6	20.126927	2.1091361	6.9445884
171.6	15.275015	2.3115479	6.490895	182.2	20.491584	2.2485677	6.3356903	192.8	18.653355	2.3066454	7.4368477
171.8	15.785085	2.4637712	7.4209127	182.4	20.099656	2.4429242	6.7979888	193	19.272655	2.1812567	7.1720055
172	16.397624	2.6583851	7.8843638	182.6	19.661196	2.6088001	7.6362138	193.2	18.983006	2.261944	6.884053
172.2	16.969876	2.5619241	7.8552143	182.8	18.874306	3.0187598	8.5467854	193.4	19.567609	2.0318704	6.6362526
172.4	17.25866	2.4682391	7.2226787	183	19.090871	2.9198065	8.6214365	193.6	19.048771	1.9278276	5.6013483
172.6	18.418203	1.883361	5.4728982	183.2	19.909418	2.9433027	8.9129554	193.8	19.28948	2.0513618	6.0443055
172.8	17.516424	2.0759937	5.8493626	183.4	20.923925	2.550978	7.9160924	194	19.255069	2.2888747	7.102182
173	18.847814	1.5115091	4.3910002	183.6	20.559869	2.2948488	6.672667	194.2	19.013822	2.3443994	7.2975222
173.2	17.807892	1.5730186	4.5839431	183.8	20.79878	3.0939372	8.9797082	194.4	19.181151	2.4573767	7.4613879
173.4	19.557532	1.3522815	4.0124224	184	20.086703	2.516181	7.5189676	194.6	20.255584	2.1202144	7.3245263
173.6	19.692683	1.6924064	4.4197961	184.2	22.083562	2.5488518	7.1141707	194.8	20.728688	2.1829599	7.0162597
173.8	17.196138	2.1506287	5.565474	184.4	20.79878	3.0939372	8.9797082	195	20.135656	2.291936	7.5152481
174	21.00796	1.5001462	3.5346735	184.6	18.84545	3.0180495	8.9948031	195.2	20.658537	1.9663386	6.0231238
174.2	26.867044	0.725206	0.7882959	184.8	18.226478	2.9718551	8.7419912	195.4	19.528375	2.2599155	7.1511819
174.4	24.851335	0.9778919	1.35339	185	18.147599	2.8312648	8.5504975	195.6	20.054174	2.2661475	7.2918056
174.6	22.087351	0.7989203	1.7404162	185.2	20.630307	2.3485888	6.4843101	195.8	19.054161	2.0598363	8.3759849
174.8	25.276503	0.8017929	1.0541922	185.4	23.539415	1.9561004	5.2239582	196	19.484417	2.6935769	7.9537689
175	43.432887	-0.107836	-0.074212	185.6	20.506645	2.4947975	6.6585255	196.2	22.435	2.3496748	8.7481886
175.2	23.192828	1.0199157	1.9284832	185.8	16.925143	2.5887172	6.7342316	196.4	24.06371	2.6516404	9.5622864
175.4	18.030559	2.092198	5.276154	186	18.876904	1.9467245	5.259644	196.6	21.834958	2.4563226	8.2808439
175.6	18.108479	2.243723	5.9991094	186.2	24.325613	1.7070288	3.5967357	196.8	20.937615	2.1570733	6.5211728
175.8	20.466908	1.414068	2.9746152	186.4	22.728859	2.0522487	4.6637117	197	21.653452	1.8837429	5.4236763
176	22.751262	0.8503106	1.6113087	186.6	24.386418	1.9467245	5.259644	197.2	20.262536	2.2406499	6.734938
176.2	23.692095	0.9990895	2.3187725	186.8	26.729009	2.4885361	6.5054877	197.4	21.654845	2.3664102	9.2617798
176.4	22.48676	1.316142	3.3884389	187	30.381695	2.1923215	5.5550317	197.6	17.758465	2.8957101	8.1411428
176.6	21.182555	1.8029194	5.201417	187.2	27.598453	2.2763727	7.4632267	197.8	19.931687	2.1202676	5.7805588
176.8	20.775779	2.4063077	7.1141433	187.4	26.370423	2.048832	8.19778	198	19.930987	2.4665795	6.8219905
177	19.525217	2.7764869	9.1531559	187.6	23.704422	2.2768911	9.5834484	198.2	21.789248	1.7892315	4.6573332
177.2	18.638049	2.3547106	8.4562873	187.8	22.248023	1.8423368	6.8583344	198.4	21.421277	1.760616	4.4253508
177.4	18.780158	2.0430195	5.6374217	188	22.342677	1.4914509	7.7199803	198.6	20.224951	2.012757	5.113767
177.6	18.618029	1.8591795	5.0769743	188.2	19.554218	2.3257991	7.8652975	198.8	21.81289	1.8097241	4.6741821
177.8	19.264458	1.805812	5.0201903	188.4	20.212979	2.1017645	7.9613234	199	21.95728	1.8640149	4.7163936
178	18.288926	1.941565	4.4616995	188.6	21.147184	2.0451756	7.6133037	199.2	20.165274	2.2104605	5.8739164
178.2	19.692157	1.7022346	4.1531665	188.8	21.229639	2.2840955	7.9068297	199.4	19.942163	2.1893976	5.815918
178.4	18.473755	2.7299859	7.3340097	189	19.554218	2.3257991	7.8652975	199.6	18.794552	2.0591443	6.4254529
178.6	20.462498	3.0088391	8.8794012	189.2	19.985749	2.055637	7.1532924	199.8	18.680412	2.1861818	7.3685775
178.8	18.277638	3.09826	8.1335709	189.4	20.507708	2.3320213	7.7672864	200	19.549705	2.1307309	8.0154004
179	19.866896	2.5288878	5.9211268	189.6	20.448184	2.0421314	7.0199047	200.2	21.235998	2.1317153	9.1269089
179.2	22.492747	2.7024585	8.8688081	189.8	19.882099	2.2538743	7.5285961	200.4	19.579429	2.8384113	9.549659
179.4	23.062289	2.754778	10.800389	190	19.884653	2.1109623	6.6827625	200.6	20.880205	2.1763754	9.3251578
179.6	20.692403	3.1574001	10.981055	190.2	19.974426	2.0220003	6.9044587	200.8	19.271832	2.2116077	8.5514859
179.8	23.312108	2.9308468	11.134318	190.4	20.36853	1.7679998	6.5690377	201	17.601253	3.2228009	10.563054
180	27.89849	2.6694017	13.515229	190.6	20.396648	1.9222366	6.7589406	201.2	17.035885	2.7391006	9.5401428

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
212	17.069463	2.8298005	7.834808	222.6	18.878897	2.268282	6.7227633	233.2	18.885323	1.2926694	3.007168
212.2	15.788474	2.3617668	6.2185684	222.8	18.84966	2.3853466	7.0510433	233.4	18.211697	0.6889016	1.5705933
212.4	16.359941	2.0179692	5.2041556	223	18.565111	2.4437736	7.1182443	233.6	18.755899	1.0068323	2.8313369
212.6	17.226684	1.7713281	4.2870506	223.2	16.586326	2.4323124	7.6927202	233.8	21.61597	0.6646883	1.6938712
212.8	17.841325	1.6515258	3.8569934	223.4	16.052237	2.3570715	7.3790288	234	20.548672	0.7092039	0.9981218
213	16.482005	1.9246072	4.0450785	223.6	16.427698	2.5264289	8.1797787	234.2	20.871408	0.6258632	1.1126355
213.2	16.789774	1.5945118	5.0874196	223.8	16.089928	2.5954558	7.8164042	234.4	20.697667	1.1813186	2.5331918
213.4	17.001486	2.0072593	5.3945801	224	16.619811	2.2913389	6.8777129	234.6	20.902112	1.2767738	2.9470645
213.6	16.637972	2.1786716	6.481858	224.2	16.528444	2.4840027	6.636526	234.8	19.056721	1.5100697	3.2452865
213.8	16.097638	2.343671	7.2215587	224.4	15.380327	2.2928449	5.799424	235	17.96618	1.4630522	3.9413534
214	14.185883	1.9670159	6.314404	224.6	14.685565	2.1276219	5.2298217	235.2	18.000199	1.4222285	6.345774
214.2	15.591477	1.8833356	5.9900453	224.8	16.236687	1.7242652	4.4846873	235.4	17.360873	1.6435242	4.2040033
214.4	15.480976	2.0789785	6.2251895	225	19.323025	1.4674552	3.2725795	235.6	15.19543	1.6751338	4.7195522
214.6	16.555948	1.7355648	5.0410204	225.2	17.987944	1.6672166	4.1929107	235.8	16.18651	2.0328896	6.0348129
214.8	16.776831	1.5724269	4.0917332	225.4	15.851225	2.2714494	5.9292302	236	16.287848	2.1120932	6.3068813
215	16.466174	1.6304839	4.5267507	225.6	14.07108	1.9673288	6.0516232	236.2	18.249199	1.9968918	5.9256143
215.2	16.764609	1.7256514	4.805021	225.8	15.904744	1.8853358	6.3111518	236.4	17.434286	2.4191189	7.3943311
215.4	17.155753	1.4347511	4.9725972	226	21.741708	1.4308417	4.0530872	236.6	18.370024	2.3871892	7.0815369
215.6	17.915195	1.5578608	5.4485792	226.2	19.106466	1.6687255	5.6273673	236.8	18.603769	2.2632219	7.0414185
215.8	17.724196	1.6550886	6.0470676	226.4	18.167463	1.9617673	5.2748687	237	21.004327	2.1685367	6.7725936
216	18.485921	1.5152489	5.4885512	226.6	16.472509	1.0675984	2.6469652	237.2	22.707135	1.9281836	6.4702996
216.2	18.376194	1.6437006	6.0543008	226.8	18.58146	1.4283128	4.2457579	237.4	20.508879	2.3799637	8.704178
216.4	18.904291	1.6979439	6.7220676	227	18.850056	1.8418045	5.3447831	237.6	21.056047	2.2802566	8.0595657
216.6	19.374645	1.5803349	6.280003	227.2	17.420639	1.653481	4.6851638	237.8	19.60812	2.2652637	8.2351553
216.8	19.578387	1.512602	6.0116319	227.4	19.240778	1.2580814	3.9077144	238	19.46196	2.3015499	8.126643
217	18.536297	1.6496858	6.2935530	227.6	16.402673	1.9286953	6.3592744	238.2	18.192962	2.0228226	7.944885
217.2	19.106584	1.7751665	6.1862262	227.8	17.475926	2.4153424	7.8976519	238.4	18.533965	2.0759413	6.7394742
217.4	18.480366	1.8150447	6.6172036	228	17.432238	2.3840474	7.3508882	238.6	20.253618	1.9014588	6.309705
217.6	19.1168711	1.7032935	5.988806	228.2	16.844656	2.0161477	4.4410522	238.8	20.241295	1.8384513	6.1836439
217.8	18.796644	1.835075	6.2997696	228.4	17.280253	1.8548555	5.5891809	239	20.477356	1.8098419	5.9352631
218	19.245736	1.8254822	5.8416423	228.6	17.229484	2.0305452	6.4713315	239.2	19.311625	2.0401771	7.8730155
218.2	17.21104	1.9537927	6.3862542	228.8	18.910997	1.2912863	6.3846016	239.4	20.318954	1.8950007	6.8350558
218.4	18.880237	1.6767428	5.0982751	229	19.644151	2.0850167	7.3318114	239.6	21.577984	1.7293758	6.2700925
218.6	17.234881	1.5317671	4.3096531	229.2	19.12013	1.9303607	6.5514219	239.8	20.88332	1.9127551	6.2333993
218.8	18.417864	1.2492348	3.3390531	229.4	18.981613	2.006048	6.9240057	240	15.771783	2.1863201	7.1967974
219	18.267864	1.2930728	3.3306915	229.6	18.312062	2.4413777	8.0346899	240.2	16.855079	2.1771243	7.0895318
219.2	18.698216	1.5084954	4.2434849	229.8	18.438082	2.288552	7.5692707	240.4	18.61112	1.6565029	5.3941817
219.4	18.447539	1.8216714	5.8903995	230	17.40271	2.3842878	7.5222604	240.6	17.691485	2.1052266	6.2843649
219.6	19.684077	1.6888699	5.6770442	230.2	17.56451	1.9263529	5.380242	240.8	18.123738	2.1072273	6.6033936
219.8	16.848833	1.9256091	5.6091489	230.4	16.582851	1.7508981	4.6750865	241	17.612873	2.3805507	7.7579481
220	16.545454	1.842899	4.7849836	230.6	16.551614	1.6886672	4.2037652	241.2	18.193225	2.1518591	6.9754228
220.2	16.924056	1.7221249	4.542259	230.8	18.1502	1.4406716	3.7167611	241.4	18.956321	2.1736477	6.5573704
220.4	17.365054	1.5955866	4.0526815	231	19.240624	1.3734343	3.4981692	241.6	22.611017	1.631135	4.7950168
220.6	18.071022	1.8281562	4.94884317	231.2	19.686476	1.3997912	3.5366979	241.8	20.991922	1.9274948	5.7998063
220.8	18.050233	1.7544669	5.3314625	231.4	17.913071	1.5892997	3.7825878	242	22.991922	1.531005	4.5608081
221	18.810127	1.7971261	5.2942794	231.6	18.576686	1.2877451	3.1154448	242.2	23.940892	1.1707352	3.2186945
221.2	18.299007	1.7861081	5.5480754	231.8	22.748705	0.9278604	2.201231	242.4	23.779031	0.6260261	0.7922752
221.4	17.821943	1.991002	4.94884317	232	23.193884	1.0436823	2.0111336	242.6	23.724749	0.6546181	1.0225416
221.6	18.050233	1.7544669	5.3314625	232.2	21.695197	0.9732529	2.0209628	242.8	20.088604	1.124352	2.5654446
221.8	17.148864	2.4412724	7.4906284	232.4	22.062181	0.9579176	1.5217626	243	24.517689	0.1623587	1.0464204
222	17.768439	2.0420437	5.8071842	232.6	22.025459	0.8133899	1.4448462	243.2	22.25748	0.7540063	1.488068
222.2	17.32384	2.1092278	5.5635328	232.8	22.547484	0.7835046	1.3368533	243.4	31.937364	0.10718572	-0.4847701
222.4	18.74314	1.7607225	4.9663309	233	31.262849	0.2737703	-0.084161	243.6	31.552889	0.1382898	-0.422095

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
254.4	20.573717	0.6481736	1.2623531	265	16.293921	1.4640257	4.3601885	275.6	22.835972	0.460282	2.5019145
254.6	20.883364	0.698778	1.5074984	265.2	23.35196	0.7226032	1.2043315	275.8	24.173107	0.7373884	2.1691286
254.8	18.732451	1.3857131	3.2375551	265.4	22.94342	0.8063741	1.4331875	276	41.89448	-0.111612	-0.108876
255	17.591052	1.6880509	4.6173874	265.6	57.992473	-1.015821	-2.550748	276.2	50.998501	-0.654849	-1.637318
255.2	18.799876	1.5453789	4.2295007	265.8	25.755891	0.5139294	0.8915603	276.4	64.814724	-1.015808	-2.086014
255.4	17.573617	2.1050693	6.4738664	266	24.124708	0.5969152	1.3385078	276.6	66.9009	-0.975235	-2.215364
255.6	16.333095	2.2161907	6.2164557	266.2	17.167726	1.7690098	4.9960558	276.8	26.633152	0.523924	0.6581185
255.8	15.433483	2.3357392	7.1905165	266.4	19.307184	1.2314788	3.2174008	277	43.493162	-0.204115	-0.656192
256	14.629272	2.7084253	7.7142101	266.6	19.843032	1.1899353	2.4291873	277.2	61.26836	-0.4211739	-1.092264
256.2	15.416585	2.6639257	7.8225245	266.8	27.619726	0.3238903	-0.2358328	277.4	40.917498	-0.154714	-0.675017
256.4	16.333095	2.2161907	6.2164557	267	60.844575	-1.003815	-2.711898	277.6	53.006493	-0.463781	-1.044847
256.6	16.112538	1.9961808	5.4107919	267.2	21.694538	0.7664801	1.0970417	277.8	34.530878	0.407642	0.5772268
256.8	17.162581	1.7587666	4.4726528	267.4	33.364045	0.0431761	-0.42735	278	60.778844	-0.152355	-0.612627
257	21.441077	1.0423217	2.0836368	267.6	53.993629	-0.485722	-1.155288	278.2	46.463417	-0.276073	-0.689147
257.2	20.80526	0.994897	2.242877	267.8	54.153935	-0.962949	-2.32405	278.4	49.058976	0.0745104	0.2377016
257.4	17.586334	1.5564266	4.4160336	268	50.805643	-0.729818	-2.23308	278.6	58.755838	-0.135131	-0.690634
257.6	21.76	1.1136763	3.4221687	268.2	22.001836	0.6732213	1.8377858	278.8	40.460281	0.5020814	1.8419983
257.8	20.432419	1.2606301	3.4266677	268.4	22.838054	0.7182355	2.106815	280	18.227259	1.6983326	3.4859991
258	22.793782	0.7043508	1.2895372	268.6	19.927081	0.9034301	3.642569	280.2	19.593785	1.3508274	2.8850343
258.2	24.927323	0.5632864	1.1664855	268.8	22.487392	0.8303624	2.4919667	280.4	20.020898	1.3470847	2.8866437
258.4	21.630848	1.0273029	2.5180533	269	24.618006	0.4484872	0.7005123	280.6	15.926424	1.9143676	5.1804352
258.6	23.738768	0.7356086	1.5732883	269.2	23.296976	0.735794	1.3447696	280.8	19.574323	1.3060279	3.6557768
258.8	23.160426	0.7196854	1.5250468	269.4	24.135443	0.4957714	1.0669105	281	30.224962	0.2220145	0.510243
259	22.271778	0.8068114	2.0582749	269.6	23.554855	0.4549339	0.4741438	281.2	37.470753	-0.040313	-0.067402
259.2	23.689799	0.8719045	2.0302296	269.8	23.081154	0.5497165	0.1257144	281.4	21.655155	0.9975017	2.6087833
259.4	22.912618	1.1421342	3.6302612	270	22.474762	0.5276598	0.0621294	281.6	28.481261	0.1909851	-0.4843288
259.6	21.429277	1.3800608	5.27394	270.2	24.352026	0.4397825	-0.242361	281.8	29.891388	0.0698079	-0.189555
259.8	19.541752	1.8040318	6.2220604	270.4	24.757475	0.4131779	-0.278101	282	27.071043	-0.3938961	0.2988987
260	17.821404	1.9463729	5.9378019	270.6	27.099754	0.45629	-0.362072	282.2	46.39444	-0.567095	-1.045655
260.2	17.628748	1.9532796	6.1290785	270.8	22.257265	0.7239595	0.7832208	282.4	38.480594	-0.063288	0.3808674
260.4	17.939322	1.8822463	5.9356965	271	23.730137	0.5334369	0.1382431	282.6	41.921579	-0.465775	-0.692087
260.6	18.65436	1.5272179	5.2205163	271.2	25.459912	0.5557668	0.161039	282.8	37.587149	-0.229909	-0.580852
260.8	19.769433	1.5985694	5.8218236	271.4	28.092759	0.453174	0.144107	283	40.086873	-0.128403	0.1389242
261	19.324725	1.8899996	6.7838332	271.6	28.91606	0.4378928	0.1963556	283.2	28.834412	0.2685421	0.1934823
261.2	22.106934	1.5031587	5.2571487	271.8	34.738271	0.2390193	0.1586532	283.4	60.70783	-0.828647	-1.137391
261.4	21.128323	1.4702393	4.6987069	272	26.854126	0.7252989	1.3597109	283.6	44.176446	-0.493655	-0.877983
261.6	20.193806	1.1330577	3.0950477	272.2	23.687955	1.0806848	3.8639558	283.8	56.601893	-0.753732	-1.175181
261.8	22.924654	0.8001297	2.0848591	272.4	26.785474	1.292629	4.2821972	284	40.334329	-0.258338	-0.433009
262	23.02877	0.8608834	2.0888722	272.6	22.145092	1.7923531	4.9000111	284.2	56.455159	-0.711013	-1.31424
262.2	20.913612	1.0216111	2.1290406	272.8	25.205926	0.8427227	1.6894907	284.4	28.844028	0.1115112	-0.236922
262.4	20.391456	1.1110847	2.0796747	273	45.600651	-0.482143	-0.717626	284.6	48.48286	-0.546771	-0.990498
262.6	23.355373	0.7619886	1.4094651	273.2	58.845466	-0.94818	-1.77474	284.8	38.962439	-0.15001	-0.320452
262.8	24.340466	0.6992579	1.3042071	273.4	47.844361	-0.360588	-0.74811	285	40.64387	-0.334255	-0.654797
263	22.45936	0.9551986	2.4827375	273.6	31.384245	0.6065803	1.1072144	285.2	29.436804	0.0218246	0.0195653
263.2	21.836963	1.0917368	2.7806201	273.8	21.65626	1.6277794	4.9254159	285.4	33.532165	-0.264967	-0.567709
263.4	20.430799	1.2359942	3.3817884	274	17.936488	1.5120134	4.0155805	285.6	72.433712	-1.196871	-1.986485
263.6	23.019845	0.8366725	2.1550094	274.2	23.497327	0.9574762	2.7666369	285.8	74.268366	-1.147953	-2.072263
263.8	23.7015	0.7493796	1.8224262	274.4	27.029213	0.8087205	2.9000315	286	64.880358	-0.965304	-1.31189
264	21.322505	0.9183716	2.7876332	274.6	29.718063	0.8181576	2.3525101	286.2	62.906358	-1.088575	-1.393923
264.2	18.876145	1.4532279	4.0899668	274.8	31.094923	0.6368068	1.924001	286.4	69.467645	-0.94901	-1.762197
264.4	18.065845	1.4447752	5.820575	275	23.950491	1.1846853	4.6083999	286.6	63.26572	-0.872466	-1.723389
264.6	18.233455	1.1785252	4.4308329	275.2	21.735621	0.9335333	4.7924415	286.8	55.703125	-0.667722	-1.322252
264.8	18.233455	1.1785252	4.4308329	275.4	19.865138	0.991431	4.78368	287	61.377707	-0.784403	-1.40445

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
297.8	23.313369	0.823462	2.3482825	319	70.642493	-1.017162	-1.890398	329.6	47.231119	-0.172694	-0.259039
298	26.863297	0.7235497	4.3883582	319.2	33.503696	0.0414171	0.2597548	329.8	47.540269	-0.318869	-0.195782
298.2	32.024765	-0.316911	2.1902897	319.4	62.144997	-0.924326	-1.363973	330	34.384957	0.3238526	0.5970373
298.4	30.232576	-0.367888	0.9273766	319.6	57.469782	-0.44529	-0.21446	330.2	23.887706	1.0409755	1.8400708
298.6	31.733171	-0.041882	0.025798	319.8	61.247989	-0.719467	-1.024478	330.4	50.888386	-0.534471	-1.082336
298.8	62.763986	-0.878366	-1.482187	320	57.403027	-0.743637	-1.198124	330.6	67.115375	-0.817435	-1.62176
299	58.984796	-0.696266	-0.878179	320.2	55.115388	-0.7021169	-1.284287	330.8	78.811524	-1.230841	-2.100289
299.2	57.192771	-0.666346	-0.53631	320.4	30.199751	0.2150645	-0.43838	331	66.633886	-0.957817	-1.153518
299.4	66.082171	-0.953517	-1.098239	320.6	57.700321	-0.7021172	-1.409182	331.2	53.741911	-0.542903	-0.495873
299.6	73.759817	-1.2028	-1.610179	320.8	48.589738	-0.480359	-0.49413	331.4	44.440845	-0.161071	-0.099929
299.8	67.925036	-1.028744	-1.684424	321	60.953607	-0.786188	-1.161866	331.6	32.915728	0.4195742	0.5262313
300	77.092837	-1.270215	-2.324499	321.2	52.330882	-0.64173	-0.75468	331.8	30.290826	0.3982381	0.2782614
300.2	70.016792	-1.139765	-1.778614	321.4	63.020244	-0.87571	-0.930676	332	31.337605	0.4677794	0.7357842
300.4	23.569223	1.3696902	4.6792638	321.6	42.866412	-0.028176	1.348291	332.2	35.557596	0.2066687	0.3768653
300.6	22.411005	1.4150502	6.1988234	321.8	27.768772	1.010134	5.4339792	332.4	53.98245	-0.537687	-0.451435
300.8	22.341383	1.2187043	3.8625137	322	22.342092	1.5512132	7.1191005	332.6	63.999899	-0.896313	-1.697288
301	26.597668	0.4603697	0.2946311	322.2	21.274242	1.5642226	5.5627785	332.8	40.472896	-0.002921	0.3621361
301.2	52.387706	-0.522137	-0.80759	322.4	24.857396	0.8974415	2.9661655	333	28.89336	0.6762579	1.6277207
301.4	33.935204	0.1211531	0.077267	322.6	23.402273	0.9900759	2.833674	333.2	35.729885	0.181009	0.9243019
301.6	42.721175	-0.256629	-0.331359	322.8	18.15273	1.7734986	5.044984	333.4	29.138698	0.609077	2.5397471
301.8	42.124487	-0.241957	-0.252773	323	16.924479	2.1166501	6.2342623	333.6	32.650521	0.5293886	3.5198208
302	63.382849	-0.757482	-1.268066	323.2	18.922011	1.6282791	4.4251753	333.8	27.158407	0.9870808	6.4863455
302.2	27.564423	1.0814003	3.4186984	323.4	21.030612	1.4063489	3.7649863	334	23.549864	1.4926867	8.3375067
302.4	24.231018	1.8503998	7.238934	323.6	18.886069	1.7473663	6.416157	334.2	20.176209	1.6466446	7.511319
302.6	21.95897	1.0872239	8.1138735	323.8	20.752237	1.4218129	3.6876764	334.4	21.281732	1.4408783	6.4465764
302.8	20.979991	0.7570449	5.8116456	324	22.61404	1.0557007	2.6145427	334.6	20.7182	1.6929629	6.7141644
303	22.867717	1.3217268	3.804531	324.2	33.217555	0.0802672	-0.174434	334.8	20.353445	1.6958586	7.3165405
303.2	27.548811	0.6507179	0.9049491	324.4	44.816436	-0.365601	-0.589022	335	21.2252	1.6468275	5.6579388
303.4	34.989146	0.0100918	-0.257172	324.6	24.360212	0.7047314	1.3639197	335.2	23.407927	1.3441859	3.9002536
303.6	26.660456	0.4572963	1.4736532	324.8	23.517371	0.72849	2.8921868	335.4	23.848639	1.3011591	3.6113369
303.8	20.776994	1.3129264	3.3860052	325	30.996829	0.2146939	0.5499103	335.6	23.300705	1.3821287	4.2476212
304	17.419127	1.6720144	4.5665666	325.2	25.575783	0.6124838	0.8821052	335.8	23.493998	1.3172245	3.6461639
304.2	17.625639	1.6325471	4.6660536	325.4	26.33679	0.735635	1.8458954	336.6	23.35101	1.1406743	3.02672
304.4	20.546778	1.1173495	3.3802734	325.6	28.655202	0.6347165	2.9452781	336.8	23.775655	1.035304	2.7668447
304.6	22.211413	1.1618015	3.0112597	325.8	23.942238	0.9870267	3.5613571	337	25.436105	0.8195182	2.7276289
304.8	23.616266	0.9977253	2.7908168	326	17.289712	1.745299	4.4336823	337.2	22.318026	1.4272284	4.8194263
305	25.916486	0.6613166	2.0323049	326.2	16.95601	1.9175886	4.9504713	337.4	20.096209	1.9588052	7.6198413
305.2	25.978866	0.9414421	3.0187921	326.4	21.305843	1.4422584	3.901162	337.6	21.03466	1.8653814	7.2769826
305.4	28.179666	0.8724786	4.6511892	326.6	19.505924	1.5969982	4.206277	337.8	19.748384	2.1062705	8.1005457
305.6	30.518563	0.0410761	2.3220228	326.8	20.209635	1.474434	3.4708026	338	19.104705	2.2592131	8.2144983
305.8	27.060892	0.4074938	1.0530277	327	30.56312	0.3190218	-0.144127	338.2	20.871451	1.7563397	5.618752
306	50.05109	-0.388493	-0.509012	327.2	46.578014	-0.298627	-0.530469	338.4	28.489068	0.7361064	1.7053685
306.2	71.952655	-1.094109	-2.120198	327.4	28.658337	0.4149956	0.0523792	338.6	55.780308	-0.561168	-0.498081
306.4	46.47297	-0.523788	-1.002878	327.6	25.683733	0.7166348	0.9821237	338.8	44.507513	-0.172308	0.322201
306.6	66.427783	-1.028758	-1.472301	327.8	40.716732	-0.095054	-0.307357	339	37.156006	0.2428415	0.9138316
306.8	33.981587	0.1852534	0.0857727	328	41.761972	-0.114421	-0.138542	339.2	54.847723	-0.272054	0.2858017
307	36.663809	-0.064654	-0.206189	328.2	61.668269	-0.831236	-1.131193	339.4	45.001198	-0.084454	1.2324054
307.2	36.224169	0.0173361	0.2940309	328.4	46.578014	-0.298627	-0.349766	339.6	34.329522	0.6323106	2.553476
307.4	41.708623	-0.310822	-0.2929704	328.6	50.879559	-0.382993	-0.383753	339.8	43.650355	-0.127176	0.3720972
307.6	53.262749	-0.672079	-0.575016	328.8	53.923112	-0.457836	-0.644712	340	33.191936	0.4286741	2.0104833
307.8	40.139481	-0.154252	-0.059599	329	34.191833	0.2260185	0.2531149				
308	34.033418	0.0255943	0.3524016	329.2	30.166778	0.440205	0.0182479				
308.2	23.423295	0.9008661	3.7206123	329.4	16.16728	1.624591	-2.08265				

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
340.2	25.515163	1.3004908	5.8104085	350.8	30.587537	0.1479365	8.621547	361.4	32.066599	0.1590963	11.372852	372	28.661125	0.4940657	11.292718
340.4	26.927316	1.4432075	9.7249681	351	31.096772	0.2182882	8.5084788	361.6	30.885709	0.2557944	11.448586	372.2	28.343335	0.5081957	11.066251
340.6	30.146478	1.1354121	11.310594	351.2	30.744218	0.1552	8.5563008	361.8	31.100526	0.3259453	11.917119	372.4	29.369258	0.4281288	10.868978
340.8	24.431805	2.048438	10.019533	351.4	31.322549	0.0697	7.4996175	362	32.352362	0.2421769	10.331743	372.6	28.881056	0.4546346	11.145289
341	23.073856	1.893586	8.5105159	351.6	30.512145	0.1933922	8.0392323	362.2	35.538879	0.0551365	8.9722255	372.8	29.024052	0.5419887	11.341114
341.2	28.652992	1.5018715	10.768526	351.8	31.681317	0.0003771	7.5076778	362.4	31.83495	0.3357856	11.587004	373	29.248904	0.462325	11.018259
341.4	36.280041	0.4695802	8.0130439	352	29.718212	0.0251252	9.5826622	362.6	31.006581	0.2211392	11.540654	373.2	28.583691	0.5068719	10.493947
341.6	29.015409	1.4873954	12.814455	352.2	29.977426	0.2590497	9.6927996	362.8	30.162737	0.2657559	11.540775	373.4	28.347833	0.5381967	11.225976
341.8	32.312736	0.6935954	8.167551	352.4	28.541292	0.4609667	10.455181	363	30.148253	0.1731415	11.329047	373.6	28.190136	0.4995244	10.509527
342	30.978655	0.7164625	7.916897	352.6	34.532504	0.353296	7.5545499	363.2	31.098153	0.1783883	12.423955	373.8	30.11835	0.5715742	10.01304
342.2	34.316505	0.5412567	6.1204368	352.8	31.095501	0.4591759	9.664233	363.4	30.388201	0.2582023	11.911337	374	28.701421	0.5117252	11.188541
342.4	30.512169	0.7949477	6.1342477	353	29.551218	0.6239279	10.34228	363.6	29.329261	0.2291214	11.948783	374.2	29.910061	0.2320952	11.366687
342.6	32.727231	0.6650834	6.6396103	353.2	30.788756	0.4591571	9.6126521	363.8	30.920276	0.1441406	11.73099	374.4	30.57721	0.1389893	10.284994
342.8	31.128683	0.8378533	9.3034373	353.4	29.689599	0.340128	9.9288175	364	30.438572	0.0467571	11.225555	374.6	32.740986	0.18884	8.3404226
343	28.714115	0.753335	11.494518	353.6	28.541193	0.3271122	10.608428	364.2	42.056139	0.2515586	6.9202483	374.8	32.006664	0.2299854	8.3404845
343.2	28.113484	1.0568792	12.118183	353.8	29.842922	0.2975739	9.1728509	364.4	39.101292	0.1326078	7.0609261	375	28.360295	0.4002065	10.267797
343.4	29.134914	1.206374	13.045345	354	28.241901	0.5164331	10.009901	364.6	30.876407	0.1059888	11.66617	375.2	31.083282	0.3542277	8.7901828
343.6	29.661113	1.5860422	14.172074	354.2	28.597775	0.4256426	10.507474	364.8	30.577229	0.0254328	11.743069	375.4	28.033535	0.563137	10.33999
343.8	28.400299	1.5982002	14.459632	354.4	28.999415	0.4855457	10.743497	365	30.876371	-0.040648	11.636034	375.6	26.242942	0.5810981	9.9667072
344	30.782937	1.2747612	14.725372	354.6	29.378883	0.4453438	10.632104	365.2	29.894586	0.0838726	11.646027	375.8	27.507003	0.4340144	10.342961
344.2	32.032754	1.0413829	15.068472	354.8	29.287194	0.6545777	12.09379	365.4	30.680646	-0.021779	11.907091	376	27.37255	0.3666161	9.9232806
344.4	32.391983	0.7884399	15.40005	355	29.3003	0.5102179	11.842092	365.6	30.318663	-0.064015	11.458216	376.2	27.257939	0.4258272	9.5362828
344.6	30.844334	0.9195075	15.237334	355.2	29.134492	0.270408	11.225595	365.8	30.455408	-0.045478	11.309002	376.4	27.575875	0.2917713	9.7865741
344.8	31.828995	0.5056276	14.963108	355.4	29.605248	0.312841	11.091034	366	41.721986	0.0069309	6.338984	376.6	27.774599	0.3066188	10.058314
345	31.837428	0.8059667	14.806883	355.6	29.761614	0.5297961	11.463977	366.2	31.301174	-0.156232	10.60015	376.8	28.094401	0.2871958	10.008069
345.2	31.941328	0.7801873	15.597767	355.8	35.65808	0.1938403	8.5926647	366.4	32.600682	-0.259989	10.715024	377	28.187292	0.3000097	9.8152233
345.4	33.252054	0.9535673	16.240013	356	36.609852	0.2026582	8.214931	366.6	30.970712	-0.266629	11.115333	377.2	29.407223	0.102921	9.2963495
345.6	33.038712	0.8264676	15.516555	356.2	35.313139	0.209026	8.5494012	366.8	30.987771	-0.269182	10.093314	377.4	27.984282	0.3562232	10.393287
345.8	35.2289134	0.6656016	16.030385	356.4	30.526056	0.3075326	11.065464	367	32.304491	-0.469188	10.898328	377.6	29.877544	0.2048337	8.7662844
346	35.318254	0.6129663	16.248449	356.6	30.730906	0.2428157	10.11188	367.2	32.511142	-0.227021	12.165094	377.8	33.165223	0.2099281	7.7039454
346.2	35.669323	0.2017368	14.912305	356.8	30.190186	0.4029512	10.442155	367.4	31.458862	-0.17622	11.183167	378	27.883007	0.1471815	10.297461
346.4	34.89896	0.3411954	15.52648	357	35.786159	0.4860711	8.349499	367.6	31.542588	-0.129025	11.595198	378.2	27.905836	0.1395093	10.067019
346.6	35.292134	0.7118673	15.800901	357.2	31.590298	0.1081163	9.6915548	367.8	32.015454	-0.221941	11.584906	378.4	27.57952	0.3665001	10.444234
346.8	40.567947	1.2138506	13.209031	357.4	29.9838	0.5089111	11.294692	368	31.802366	-0.14476	11.852169	378.6	28.324314	0.2311545	9.2380812
347	35.718009	1.1130796	17.034217	357.6	30.117099	0.4975629	12.01397	368.2	31.531611	0.0552791	12.015143	378.8	28.768934	0.2465918	10.006377
347.2	38.538254	0.4240308	15.870294	357.8	30.46612	0.6851284	11.511333	368.4	31.334644	-0.146856	10.120632	379	29.568254	0.1731339	9.5107164
347.4	34.854819	0.5295132	10.144896	358	32.817542	0.6962288	10.007739	368.6	31.539448	-0.202917	9.4208843	379.2	29.541598	0.1733153	9.5466232
347.6	34.45666	0.657584	10.225733	358.2	33.316643	0.4277749	9.4856984	368.8	30.804005	-0.099437	9.6615813	379.4	28.440261	0.2170304	10.013223
347.8	36.10778	0.5207256	9.2460017	358.4	31.247341	0.4132462	12.109583	369	31.471218	-0.105262	8.7999817	379.6	33.855892	-0.069478	7.9740424
348	33.219709	0.5368664	12.161672	358.6	31.661936	0.2962599	12.44304	369.2	32.522632	-0.368715	6.6548722	379.8	33.026965	0.2443633	9.311202
348.2	33.086427	0.5688328	12.55997	358.8	32.226105	0.309553	12.297095	369.4	32.019676	-0.306394	7.2934774	380	32.424406	0.5429501	8.5720457
348.4	37.986863	0.6088332	10.431869	359	31.654844	0.2986012	11.357021	369.6	33.079832	-0.388485	6.990747	380.2	33.316716	0.0735745	8.6733096
348.6	32.297993	0.4889162	12.824126	359.2	32.18374	0.3396219	11.646445	369.8	34.019336	-0.491617	6.1962632	380.4	32.457984	0.2971781	9.9169447
348.8	32.152043	0.5645009	13.304528	359.4	41.472642	0.3253636	7.7185338	370	33.2600834	-0.437554	6.137871	380.6	29.791576	0.2208819	9.9992775
349	32.990979	0.3977628	13.089994	359.6	35.563513	0.1655412	9.1774519	370.2	33.327816	-0.300993	6.7436691	380.8	30.749419	0.2250611	9.9347906
349.2	32.934487	0.4331218	12.466686	359.8	31.375889	0.3072939	11.863972	370.4	33.265917	-0.312541	7.128495	381	30.72317	0.207199	10.54533
349.4	31.694672	0.4479242	11.808126	360	31.297579	0.2726779	12.523268	370.6	33.536651	-0.331819	6.872248	381.2	30.007542	0.0670783	10.860988
349.6	32.814746	0.20629	11.133378	360.2	31.860763	0.172385	11.911288	370.8	61.022639	-1.175927	0.800198	381.4	28.779044	0.383363	11.191362
349.8	30.339235	0.2986722	10.443359	360.4	32.243103	0.1821365	12.030364	371	32.617473	-0.0490664	9.1296593	381.6	30.522231	0.3196144	10.225277
350	30.339238	0.3726658	12.276736	360.6	32.685659	0.1920774	12.48405	371.2	32.417286	-0.309289	8.400493	381.8	30.245315	0.3193801	10.840923
350.2	29.946566	0.4423676	10.497746	360.8	32.578801	0.2144606	12.168908	371.4	30.143228	-0.039585	10.350788	382	29.930774	0.3960218	11.46956
350.4	31.716176	0.1040533	8.4233822	361	32.08443	0.1337145	11.641299	371.6	29.167055	0.3347987	10.42148	382.2	29.231298	0.443167	9.667262
350.6	30.447526	0.159209	8.6732751	361.2	31.872759	0.1014324	11.186423	371.8	28.43581	0.533361	11.03765	382.4	30.506663	0.3278804	9.7343299

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
382.6	30.570874	0.0352756	9.066355	393.2	29.839052	0.1899276	9.6439508	403.8	32.593075	-0.17034	6.8195281
382.8	29.488198	0.2066652	10.270815	393.4	30.886571	-0.01972	9.7739106	404	31.584839	0.0327967	8.0516565
383	28.967563	0.2996095	10.715187	393.6	29.234256	0.275013	9.7604703	404.2	29.849050	0.2888561	9.2452231
383.2	27.891868	0.5173854	9.6925755	393.8	29.326163	0.1019713	8.9921949	404.4	28.929203	0.3813558	9.6842901
383.4	27.347345	0.1421414	9.0213615	394	30.083034	0.0256867	8.2461462	404.6	28.672711	0.4571428	9.6665104
383.6	26.792249	-0.084755	8.6242576	394.2	29.854677	0.1500942	10.323115	404.8	28.42636	0.3932936	9.2287589
383.8	27.876123	-0.109469	8.690726	394.4	31.740785	0.1827945	8.5851927	405	28.858059	0.2970254	8.8383582
384	29.255743	0.0450923	9.3671744	394.6	29.498853	0.1338345	9.5390433	405.2	28.860531	0.2567274	8.8696629
384.2	28.769821	0.1254232	8.2163818	394.8	30.096654	0.0201138	9.0666327	405.4	28.775350	0.2531052	8.5050136
384.4	28.394822	-0.07296	6.9943076	395	29.851441	0.2178924	9.8930327	405.6	28.583756	0.2249054	8.0480413
384.6	29.4613	-0.085899	6.5529633	395.2	29.829264	0.1545519	9.4945079	405.8	29.292461	0.1710287	7.9696801
384.8	30.8853	-0.11362	6.3461094	395.4	29.451207	0.3135344	10.257406	406	48.937215	-0.960897	1.561351
385	29.023452	0.10105	8.9929375	395.6	29.523366	0.2738363	10.224871	406.2	54.146136	-0.632921	1.4962731
385.2	28.615962	0.3384174	8.5799092	395.8	30.913839	0.1563214	9.5115691	406.4	30.528152	0.0074295	7.5262826
385.4	29.017581	0.15772	8.6542545	396	32.039772	0.0493757	7.9197238	406.6	31.190302	-0.043205	6.8096436
385.6	29.382683	-0.178843	7.523103	396.2	32.321551	-0.082195	7.1811757	406.8	32.558592	-0.226666	5.5270746
385.8	28.206297	-0.068794	7.5102025	396.4	35.393962	-0.27591	6.5263726	407	31.335285	-0.061843	7.0481561
386	28.107937	0.0141627	7.7362801	396.6	34.379738	-0.176442	7.6561406	407.2	31.156611	-0.045793	6.838958
386.2	29.592561	-0.114689	8.2741575	396.8	34.209315	-0.228027	7.6167798	407.4	33.113575	-0.12783	5.8768321
386.4	29.677441	-0.024301	9.5218487	397	34.087438	-0.265	7.1296204	407.6	35.155274	-0.452409	4.0985626
386.6	28.472257	-0.079576	7.7407277	397.2	34.610955	-0.287302	8.4812462	407.8	33.847395	-0.16179	5.2733212
386.8	29.128518	0.0846144	9.7764469	397.4	34.506043	-0.241708	7.9216664	408	33.565091	-0.218266	5.0092597
387	29.077832	0.0237241	9.7933317	397.6	35.854059	-0.354231	7.6728632	408.2	33.200526	-0.184477	5.0545952
387.2	29.539158	0.0072248	9.855179	397.8	36.129974	-0.471836	7.7733037	408.4	33.192634	-0.210688	4.88218
387.4	30.69016	0.1725965	10.376555	398	38.541708	-0.575249	6.8088616	408.6	35.599075	-0.247102	4.6292661
387.6	28.549859	0.0776634	10.090485	398.2	36.119831	-0.033717	7.9696452	408.8	35.140284	-0.231133	4.8554711
387.8	28.489285	-0.137606	9.5966308	398.4	34.186331	-0.405346	8.4583739	409	31.723935	-0.094032	6.6378732
388	30.398375	-0.189884	10.712485	398.6	35.388737	-0.242625	7.4788217	409.2	32.084682	-0.124911	6.1323997
388.2	29.477192	-0.179957	10.031396	398.8	33.424804	-0.324605	7.9454252	409.4	32.716601	-0.22674	5.931292
388.4	30.022014	-0.247423	8.8492707	399	32.236035	-0.118994	8.4959014	409.6	33.087844	-0.092117	6.9955471
388.6	28.419189	-0.293369	9.1214433	399.2	32.696113	-0.124223	6.9099278	409.8	44.849761	-0.387635	3.1622973
388.8	30.365487	-0.281156	10.265578	399.4	31.879894	-0.042478	7.392451	410	43.43217	-0.420023	2.6600076
389	31.609367	-0.387888	10.709115	399.6	33.704553	-0.108763	7.53997	410.2	74.179667	-1.098716	-0.451088
389.2	31.220558	-0.302595	10.004992	399.8	32.230475	0.0396974	8.3975232	410.4	53.52429	-0.527145	1.966103
389.4	30.043689	-0.265202	10.636205	400	33.1973	-0.110228	8.8959529	410.6	46.941796	-0.285583	2.9041553
389.6	29.928473	-0.143882	10.574536	400.2	36.037006	-0.616988	10.088461	410.8	44.999494	-0.473144	2.9212823
389.8	39.976413	0.069933	6.4040354	400.4	34.691662	-0.352288	10.115374	411	48.087557	-0.635474	1.8793746
390	28.795545	0.2713617	9.8991869	400.6	32.74628	-0.188361	7.2469938	411.2	37.74708	-0.502131	3.725276
390.2	28.739926	-0.060327	9.9963671	400.8	32.568619	-0.155109	7.076213	411.4	45.114094	-0.86636	2.1360078
390.4	30.19289	-0.053066	10.65125	401	41.76132	-0.703891	5.6249873	411.6	37.72643	-0.369169	4.3462362
390.6	30.004993	0.0974748	9.9576178	401.2	40.441157	-0.56982	5.0491917	411.8	31.590734	0.0247635	6.9092829
390.8	28.733221	0.3998994	9.9011031	401.4	43.24054	-0.455166	3.5883008	412	30.65308	0.0552966	7.3754348
391	29.319652	0.3072894	8.8772436	401.6	53.28434	-0.453374	3.2656771	412.2	28.507038	0.2175203	7.9801699
391.2	29.121348	0.1835058	8.9429022	401.8	61.83678	-0.454574	1.895985	412.4	27.814544	0.3242716	8.1349515
391.4	28.959702	0.2808754	8.7289035	402	40.246914	-0.468382	3.9979351	412.6	29.714746	0.1930654	7.3129217
391.6	27.27052	0.3618985	8.2914968	402.2	61.252883	-0.89529	1.608716	412.8	32.863408	-0.104893	5.8861042
391.8	29.222424	0.1639146	7.916335	402.4	44.455575	-0.399912	3.6866348	413	30.346238	0.0238587	6.8781364
392	27.977865	0.3173204	8.3685275	402.6	34.389325	-0.280936	6.1836754	413.2	34.749121	-0.147207	5.0605887
392.2	27.486745	0.4330117	9.0612246	402.8	36.898584	-0.424542	5.0700383	413.4	43.079604	-0.599229	2.851457
392.4	33.50186	0.3730497	6.8289878	403	35.491538	-0.271947	5.3963759	413.6	31.570071	-0.02936	6.2887137
392.6	30.600701	0.278638	8.457684	403.2	48.27139	-0.748524	3.191997	413.8	42.868823	-0.514614	3.1675013
392.8	31.38692	0.2948072	6.3776691	403.4	43.278221	-0.706287	4.0685431	414	35.027318	-0.258537	5.286995
393	30.950259	0.3840406	8.5633443	403.6	33.953349	-0.24898	6.3274463	414.2	43.50003	-0.442567	3.3598938
414.4	47.55566	-0.685442	2.3184905	414.6	41.56273	-0.388556	3.0947419	414.8	51.260506	-0.579266	1.9313189
414.6	41.56273	-0.388556	3.0947419	415	60.852142	-0.831902	0.683573	415.2	66.659085	-1.050354	-0.002739
415	60.852142	-0.831902	0.683573	415.4	57.544343	-0.841401	0.8310158	415.6	58.70434	-0.897596	0.7227296
415.2	66.659085	-1.050354	-0.002739	415.8	57.495466	-0.95002	0.8707777	416	50.270437	-0.624067	1.8341032
415.4	57.544343	-0.841401	0.8310158	416	50.270437	-0.624067	1.8341032	416.2	71.674101	-1.187848	-0.379741
415.6	58.70434	-0.897596	0.7227296	416.4	64.690899	-1.070927	-0.042145	416.6	71.3503	-1.144279	-0.105879
415.8	57.495466	-0.95002	0.8707777	416.8	74.048213	-1.338535	-0.982528	417	63.305456	-0.857937	0.6701172
416	50.270437	-0.624067	1.8341032	417	60.113138	-0.774638	1.3626667	417.2	67.449023	-1.035367	0.4287217
416.2	71.674101	-1.187848	-0.379741	417.4	67.449023	-1.035367	0.4287217	417.6	63.852239	-0.690194	0.9203853
416.4	64.690899	-1.070927	-0.042145	417.8	52.617166	-0.667554	2.0004446	418	42.472021	-0.400994	3.2007212
416.6	71.3503	-1.144279	-0.105879	418.2	50.036528	-0.59872	1.8433331	418.4	47.248717	-0.542977	2.1431771
416.8	74.048213	-1.338535	-0.982528	418.6	57.981029	-0.836452	0.9542017	418.8	52.203409	-0.798384	1.5882459
417	63.305456	-0.857937	0.6701172	419	60.704115	-0.85994	0.8151659	419.2	45.643165	-0.399869	3.1008932
417.2	60.113138	-0.774638	1.3626667	419.4	41.351774	-0.042602	3.7389184	419.6	46.495432	-0.375055	2.9295208
417.4	67.449023	-1.035367	0.4287217	419.8	60.721667	-0.385706	1.8252223	420	43.196433	0.0879346	4.5413039
417.6	63.852239	-0.690194	0.9203853	420.2	53.750585	-0.041805	3.3473478	420.4	35.218853	-0.168531	4.4212726
417.8	52.617166	-0.667554	2.0004446	420.6	27.941689	0.4125312	7.997357	420.8	31.616884	-0.033782	5.5199702
418	42.472021	-0.400994	3.2007212	421.4	30.427492	0.0376298	6.4078787	421.6	29.371937	0.1677683	6.9979367
418.2	50.036528	-0.59872	1.8433331	421.8	30.4291471	0.1601806	6.7858081	422	29.386491	0.157344	7.1705615
418.4	47.248717	-0.542977	2.1431771	422.2	30.427492	0.0376298	6.4078787	422.4	30.291471	0.1601806	6.7858081
418.6	57.981029	-0.836452	0.9542017	422.6	29.371937	0.1677683	6.9979367	422.8	30.428141	0.0081846	5.8642326
418.8	52.203409	-0.798384	1.5882459	423	30.364205	-0.013828	5.8638965	423.2	30.964914	-0.039782	6.0060333
419	60.704115	-0.85994	0.8151659	423.4	30.370972	0.022577	6.3965619	423.6	28.984981	0.1801755	7.0962829
419.2	45.643165	-0.399869	3.1008932	423.8	28.216425	0.2031404	7.5330799	424	27.588686	0.2513736	8.2695163
419.4	41.351774	-0.042602	3.7389184	424.2	28.159233	0.1814305	7.8443627	424.4	28.544355	0.2579768	7.97157
419.6	46.495432	-0.375055	2.9295208								

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
426	30.600126	-0.13346	6.0821581	436.6	30.753621	-0.181601	5.6904104	446.2	30.295515	-0.08027	6.3386305
426.2	29.81805	0.0003688	6.3624104	436.8	30.088794	-0.124549	5.5179042	447.4	29.385756	-0.051588	6.8027424
426.4	28.825006	0.0011531	6.3541893	437	29.574699	0.0199296	6.3480621	447.6	28.824838	0.0075494	6.7831599
426.6	29.431867	-0.030563	6.0934236	437.2	29.721579	-0.082348	6.2237706	447.8	29.929102	-0.082348	6.2083805
426.8	29.533512	-0.080424	6.2797329	437.4	29.709217	-0.18923	6.0612168	448	31.462096	-0.179196	5.7898698
427	29.410754	-0.111829	6.3110346	437.6	29.451268	-0.0805	6.5258767	448.2	30.28372	0.0078146	6.4525211
427.2	30.44556	-0.132559	6.3245066	437.8	29.57254	-0.097339	6.6256921	448.4	30.290051	-0.042347	6.3105596
427.4	30.872532	-0.140131	6.0424941	438	30.044857	-0.126439	6.1280441	448.6	30.767609	-0.052818	6.467805
427.6	30.406756	-0.137267	6.0262846	438.2	29.821093	-0.010837	6.0698754	448.8	31.279923	-0.068503	6.1447217
427.8	29.206991	-0.070641	6.4797171	438.4	29.134454	-0.000256	6.4412162	449	32.442943	0.204206	5.1737811
428	30.43586	-0.147347	6.2278905	438.6	27.971094	0.1104617	6.9415814	449.2	31.974651	-0.051042	5.9329271
428.2	29.898789	-0.142367	6.0253139	438.8	28.312576	0.0636588	7.1227232	449.4	30.545396	-0.0184503	6.854207
428.4	30.245279	-0.076637	6.3415688	439	29.51806	-0.0029725	6.7419654	449.6	31.026226	-0.001284	6.8388056
428.6	29.883212	-0.121117	5.4323647	439.2	29.197616	-0.001064	6.9161643	449.8	30.865078	-0.060043	6.5283333
428.8	28.426285	0.0181003	6.8477309	439.4	29.2277	-0.029188	6.8971355	450	30.347623	-0.04011	6.6996983
429	28.874554	-0.114508	6.5269779	439.6	29.175666	-0.031609	6.732107	450.2	29.655196	0.1284746	7.2151996
429.2	28.318447	-0.066532	6.6727287	439.8	28.148303	0.023536	7.0604866	450.4	30.091272	0.026323	7.2553894
429.4	29.654883	-0.146253	6.4811784	440	28.603242	0.0642496	7.221158	450.6	28.778828	0.1074454	7.6470979
429.6	30.702447	-0.212424	5.698155	440.2	28.669891	0.1214696	7.1538189	450.8	27.948769	0.2451277	8.6397944
429.8	30.087441	-0.172485	6.0286004	440.4	28.646356	0.1352181	7.5560993	451	27.578424	0.3528821	8.7027263
430	30.828431	-0.23602	5.6861032	440.6	28.159101	0.168119	7.3162751	451.2	27.245588	0.2997534	8.7075088
430.2	28.317575	-0.017438	7.1706438	440.8	27.726772	0.1630721	7.0891619	451.4	27.824029	0.2335238	8.9263747
430.4	28.478299	0.0405829	7.7623222	441	28.909895	0.0620519	7.0036104	451.6	27.912141	0.1427527	8.3654488
430.6	28.92144	-0.100478	7.4186715	441.2	28.411794	0.0709632	7.1662558	451.8	27.98705	-0.1990168	8.1083126
430.8	28.541303	-0.04602	7.3880075	441.4	27.935562	0.1687973	7.7960009	452	27.844494	0.1875112	7.7660421
431	28.968634	-0.025382	7.2564719	441.6	29.020398	0.1313448	7.1646179	452.2	28.208599	0.1009914	7.4691781
431.2	29.628052	-0.174653	6.8121896	441.8	28.887176	0.1331527	7.8378791	452.4	28.651463	0.0071883	6.9490283
431.4	29.390827	-0.002409	6.8865906	442	28.693752	0.1007651	7.759245	452.6	29.161035	-0.050966	6.6941323
431.6	28.614785	-0.042359	7.166145	442.2	30.081479	-0.0528164	6.9759338	452.8	29.357465	-0.100118	6.5135184
431.8	28.273514	-0.170108	6.9849708	442.4	34.019254	-0.44791	4.9477206	453	29.537465	-0.05956	6.7425889
432	28.761808	-0.082598	7.2246974	442.6	29.467422	-0.024777	7.2863013	453.2	29.232803	-0.031002	6.5841639
432.2	28.759608	-0.070586	7.0046493	442.8	27.761969	0.0859151	7.3116013	453.4	29.338915	-0.082162	6.6370627
432.4	28.557785	-0.015178	7.1607129	443	28.346344	0.0096887	7.264823	453.6	28.522857	0.0645554	7.3008355
432.6	28.162396	0.0197036	7.2186083	443.2	28.535783	0.0060694	6.7095649	453.8	28.828958	-0.027509	7.2953503
432.8	28.49191	0.0143298	7.2977036	443.4	28.897059	0.0356326	6.8294191	454	29.284209	-0.023897	7.0452338
433	28.509499	0.0291355	7.0796466	443.6	28.843801	-0.02609	6.7349584	454.2	28.960362	0.0154374	6.7066071
433.2	28.424445	0.1025975	7.2421599	443.8	29.589043	-0.15331	6.2092973	454.4	28.522857	0.0645554	7.3008355
433.4	28.416801	0.0722158	7.143657	444	28.907903	-0.060694	6.7095649	454.6	27.680466	0.1447377	7.8111667
433.6	29.360091	-0.065894	6.8279468	444.2	30.009311	-0.097672	6.1871011	454.8	27.725453	0.1017644	7.7941043
433.8	30.71363	-0.13773	6.135346	444.4	31.641782	-0.152213	5.9567476	455	27.068776	0.2200887	7.7897514
434	29.232012	-0.008455	6.669092	444.6	30.537218	-0.163399	6.4750623	455.2	28.440165	0.0973451	7.0476896
434.2	29.3637	0.0001569	6.6289017	444.8	28.46307	0.0551552	7.8616625	455.4	27.8829	0.0816971	7.3571928
434.4	29.089247	0.1231754	6.9183604	445	30.410894	-0.10158	5.9956041	455.6	28.583642	0.0786327	7.2621928
434.6	27.899516	0.1253869	7.3470706	445.2	29.790361	-0.033617	6.5103165	455.8	28.317615	0.0721051	7.5589321
434.8	28.276536	0.0794687	7.0636045	445.4	29.609797	-0.085835	6.4543928	456	28.235874	0.0647014	7.713165
435	28.31926	0.0499285	7.0425496	445.6	30.009515	-0.114203	6.2358019	456.2	27.659245	0.1193854	7.5660753
435.2	28.800685	0.008906	6.6166723	445.8	29.836631	-0.09944	6.1551037	456.4	28.290234	0.0207532	7.0787717
435.4	28.415638	0.1633144	7.3376696	446	29.905996	-0.09424	6.2275468	456.6	29.307153	-0.050453	6.8993635
435.6	28.204151	0.1698589	7.3979647	446.2	28.470138	-0.004177	6.9168676	456.8	28.999824	-0.108459	6.8593028
435.8	28.645114	0.1470974	7.4467185	446.4	28.265388	-0.006251	6.7698845	457	28.463331	-0.084392	7.3034697
436	29.895309	0.0645094	6.8973433	446.6	30.473729	-0.163903	5.7172348	457.2	29.346808	-0.095544	7.1818645
436.2	28.498288	0.1558427	7.4238798	446.8	29.072054	-0.183949	6.7820825	457.4	28.656247	-0.019832	7.237206
436.4	31.291589	-0.129629	5.431001	447	28.982788	-0.026162	6.7048942	457.6	28.733053	-0.037701	7.0605707



Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
468.4	28.790588	-0.071766	7.3502183	479	28.136754	0.1642852	8.8606708	489.6	32.850033	0.0391083	7.6907923
468.6	28.530453	-0.129656	7.2527797	479.2	27.95079	0.1812488	8.7086519	489.8	29.864586	-0.074429	9.0573712
468.8	29.386946	-0.180788	6.9946074	479.4	28.156558	0.210926	8.8724999	490	35.020508	-0.19234	8.6242327
469	30.337306	-0.218853	6.3025518	479.6	27.874436	0.2372457	8.9432487	490.2	30.332798	-0.08182	8.6296656
469.2	29.063099	-0.157367	6.9575443	479.8	27.883332	0.2144511	8.6011493	490.4	30.947683	-0.193241	8.6138456
469.4	30.335609	-0.161497	6.1834879	480	27.553773	0.2639347	8.6080629	490.6	31.32824	-0.168983	8.3837128
469.6	30.072419	-0.194779	6.04991	480.2	27.837316	0.209499	9.2485869	490.8	40.857191	-0.501688	4.8625511
469.8	28.197099	0.0310417	7.3309414	480.4	28.065207	0.2698916	8.9865027	491	43.934757	-0.542592	3.7573762
470	29.16787	-0.143809	6.7566182	480.6	27.99627	0.3086419	9.0941353	491.2	34.577471	-0.423533	6.2537962
470.2	29.238298	-0.168291	6.7388972	480.8	28.236572	0.1629011	8.4492252	491.4	41.101219	-0.4268828	4.7568828
470.4	28.666858	-0.092922	7.2606783	481	27.747101	0.1796158	8.792023	491.6	28.617497	0.015456	8.7075995
470.6	28.481894	-0.109699	7.2850876	481.2	27.391184	0.2637252	8.6792846	491.8	28.101239	0.1122706	9.0864986
470.8	28.395039	-0.050827	7.142215	481.4	27.593848	0.2936793	8.6505876	492	29.07872	0.0373484	8.6002598
471	28.470995	0.0134014	7.2452378	481.6	27.211853	0.3624058	9.3315402	492.2	28.373768	0.060575	8.8883
471.2	28.897965	-0.050363	7.5334511	481.8	27.704767	0.2314804	9.4698328	492.4	28.775849	0.0335768	9.0928086
471.4	27.668454	0.0016663	7.6659866	482	26.941022	0.2552288	8.7880594	492.6	29.177071	0.036322	9.5581947
471.6	28.265012	0.0348904	7.4347914	482.2	27.154932	0.2906983	9.3293808	492.8	29.16517	0.0539309	9.1748198
471.8	28.897965	-0.050363	7.5334511	482.4	27.704767	0.2314804	9.4698328	493	29.097436	-0.019955	8.7735167
472	28.930017	0.0272395	7.1285058	482.6	27.432645	0.2843063	9.4926068	493.2	28.556029	0.0412807	8.7631631
472.2	28.466788	-0.003443	7.0762205	482.8	27.01371	0.3207991	9.1463875	493.4	28.374996	0.1265404	9.5467683
472.4	28.138982	-0.056122	7.5735602	483	27.638111	0.3094015	9.386871	493.6	29.506429	-0.053515	9.2015815
472.6	28.036568	0.0007476	7.6707797	483.2	27.966069	0.2019757	9.5372079	493.8	29.160988	-0.044983	9.2333004
472.8	28.543836	0.002293	7.4884243	483.4	26.692299	0.3851348	9.2344398	494	28.371867	0.115023	9.1299832
473	28.657094	0.0511759	7.188872	483.6	27.669592	0.1595701	9.8949031	494.2	27.811814	0.1693584	9.1325514
473.2	28.571021	0.02550078	7.2945217	483.8	28.051588	0.1523475	9.6324525	494.4	29.022781	0.1231175	8.4009063
473.4	27.692073	0.0685506	7.9601188	484	28.09507	0.2974098	9.6832951	494.6	28.430544	0.1820959	9.0500943
473.6	27.80138	0.0558999	8.4047	484.2	27.854847	0.3002469	9.7698366	494.8	28.79491	0.0693754	9.4577996
473.8	28.644598	0.0543741	7.8313334	484.4	27.918605	0.2548905	9.5739468	495	27.969404	0.0589527	8.7449616
474	29.091275	0.1748850	8.6854512	484.6	27.711664	0.3540507	9.5426681	495.2	28.521544	0.0622228	8.9002861
474.2	28.250467	0.128483	9.2974737	484.8	27.471438	0.2853664	9.838878	495.4	28.606011	0.0262341	9.6403652
474.4	28.361823	0.245212	8.8425509	485	27.884929	0.2607151	9.8691512	495.6	28.311636	-0.035736	9.2077606
474.6	28.638911	0.375415	9.9617727	485.2	27.180714	0.3015944	9.5277451	495.8	28.167089	0.1317198	8.5997446
474.8	29.513023	0.1793952	10.214851	485.4	27.756583	0.2671016	9.2097269	496	28.7081	-0.101179	8.5580541
475	30.16816	-0.071145	10.532017	485.6	28.357537	0.1142936	9.2173137	496.2	28.42709	0.0321108	8.8816805
475.2	29.195563	0.2316854	8.9756638	485.8	28.515086	0.127802	8.6647151	496.4	28.187563	0.0490067	8.7055571
475.4	27.763945	0.2398389	9.5169872	486	28.795192	0.0933536	8.2516611	496.6	28.998799	-0.06265	7.8784541
475.6	26.637677	0.2893598	8.6990527	486.2	29.174582	-0.0070099	7.639808	496.8	42.06441	-0.381742	3.7655283
475.8	27.535548	0.2012946	8.9188025	486.4	30.003603	-0.169466	7.9310503	497	32.004547	0.0466324	7.2063636
476	28.37682	0.0347642	8.158846	486.6	28.712763	0.0148789	8.6331958	497.2	31.541878	-0.061903	7.7590636
476.2	28.042107	0.1742982	7.9968399	486.8	28.229343	0.1209777	9.2127683	497.4	30.311762	-0.015349	8.5371468
476.4	28.594107	-0.049278	7.9442625	487	38.240774	0.2194179	5.7909494	497.6	30.009143	-0.032885	8.9380859
476.6	28.252971	0.0473944	8.4155588	487.2	28.179114	0.1479844	8.3442453	497.8	29.905635	-0.014746	9.4790537
476.8	27.830038	0.0229786	7.9745869	487.4	28.760417	0.0002683	8.7622774	498	30.268757	0.0184662	8.7538896
477	28.062241	0.0970993	8.2227039	487.6	28.79241	0.127215	8.4447358	498.2	30.121588	0.0385798	8.396045
477.2	28.631736	0.1037363	8.7037363	487.8	29.603638	0.0280855	8.0253158	498.4	28.598138	0.0364626	9.3166399
477.4	28.382162	0.1985624	8.7007585	488	29.69299	0.1026036	8.5500752	498.6	28.80977	0.1246466	9.4001705
477.6	28.570902	0.1209066	8.627375	488.2	28.760466	0.1031879	8.8329381	498.8	30.211447	0.0268472	8.9805948
477.8	28.251889	0.0683922	8.6652994	488.4	29.61381	-0.0057	7.9949495	499	29.117311	0.0048671	8.8939564
478	28.490446	0.0843635	8.7521982	488.6	29.603596	0.0047145	7.8712711	499.2	28.502293	0.128394	9.6573399
478.2	28.009343	0.1530847	8.633351	488.8	29.785472	-0.089732	8.0260468	499.4	28.799658	-0.042943	9.3207809
478.4	27.822995	0.2019291	8.8248781	489	30.216059	-0.125548	7.2348248	499.6	28.116413	0.1145709	9.4077688
478.6	28.886527	0.1241104	9.2214585	489.2	31.674294	-0.249527	6.9174297	499.8	28.236784	0.0415728	8.6882321
478.8	28.279426	0.2587006	9.2243075	489.4	28.65532	-0.136043	8.3711738	500	30.877929	-0.119876	7.8389504

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
510.8	27.423423	0.0954058	8.7939097	532	27.741067	-0.0616	9.1816564	542.6	28.18162	0.2614342	8.0015143
511	28.306613	0.0063094	8.4465238	532.2	28.342136	0.0797812	9.6652999	542.8	27.107174	0.4355484	8.8844789
511.2	28.150139	0.051182	8.5934721	532.4	25.766789	0.3668792	9.0618723	543	27.401291	0.2339466	8.8381529
511.4	27.845136	-0.015092	8.5589733	532.6	27.563553	0.0472502	8.8434763	543.2	26.876447	0.3504917	8.7878164
511.6	28.405363	0.059728	8.3822454	532.8	26.960473	0.2194679	8.8057505	543.4	26.654007	0.2488147	8.9034593
511.8	27.712651	0.1192079	8.8973677	533	27.925685	0.097099	9.4227345	543.6	26.932154	0.11142666	8.4127984
512	27.320469	0.228175	9.0330869	533.2	27.592475	0.1524463	9.0869351	543.8	27.406282	0.132061	8.9531317
512.2	27.622658	0.166867	8.9459353	533.4	26.895125	0.2282455	9.1471634	544	27.013681	0.1145014	9.1177957
512.4	27.802959	0.1943026	8.8033139	533.6	28.096814	0.1619775	9.6110822	544.2	27.092764	0.2112072	8.8716199
512.6	28.458766	0.0917501	8.5386474	533.8	28.200362	0.1475501	9.4269829	544.4	27.493959	0.2805147	8.8039009
512.8	31.061919	0.0797806	6.9282176	534	28.088106	0.0289967	9.4287271	544.6	27.296443	0.1907718	8.8392596
513	27.355275	0.3044931	9.3410367	534.2	28.138396	0.1100272	9.514291	544.8	27.663771	0.1664616	8.8981837
513.2	27.452832	0.1542058	9.3867563	534.4	27.788228	0.051755	9.3735193	545	27.82238	0.0494464	8.9120705
513.4	27.698553	0.028708	9.1332189	534.6	28.289414	-0.04311	9.2962607	545.2	27.535108	0.2265433	9.0085983
513.6	28.458766	0.0917501	8.5386474	534.8	28.289414	-0.04311	9.2962607	545.4	27.324957	0.2501172	8.8527106
513.8	28.032147	0.1083374	8.9459722	535	28.035025	0.1444374	9.2597605	545.6	26.680119	0.1649893	8.9398875
514	27.404543	0.1272691	8.8144085	535.2	27.522846	0.1573666	9.0771997	545.8	27.132973	0.250252	9.0710857
514.2	27.276719	0.1364829	9.1021461	535.4	27.458395	0.1752541	8.9078167	546	27.651312	0.248653	8.7073974
514.4	27.887209	0.1048016	8.9046581	535.6	28.170168	0.0990257	8.9153081	546.2	26.246953	0.2306211	8.3859282
514.6	27.77246	0.1809336	8.65648	535.8	33.234017	-0.124455	6.5433634	546.4	26.707874	0.3275771	8.4840775
514.8	27.592446	-0.025321	8.7537445	536	28.202197	0.0990965	6.5327342	546.6	26.830068	0.2205841	8.5558543
515	28.470442	-0.011063	8.8617611	536.2	27.685306	0.1000369	9.2025878	546.8	27.546606	0.1691475	8.9849207
515.2	28.234956	0.0326929	8.9930579	536.4	27.608971	0.2140158	9.1186947	547	26.93213	0.1723489	8.114756
515.4	27.59672	0.0900721	8.9354293	536.6	29.293756	-0.150565	8.9193991	547.2	29.883346	0.1156079	7.1702042
515.6	27.807314	0.0857477	9.4300645	536.8	27.516081	0.0122622	9.4767578	547.4	30.229334	0.2828227	6.9451807
515.8	27.742375	0.1811408	9.403612	537	28.864634	-0.009572	9.1842065	547.6	29.364409	0.1691475	8.9849207
516	27.693833	0.0960005	8.8206943	537.2	28.05438	0.248455	8.7334908	547.8	29.536694	0.0150054	6.224873
516.2	28.503909	0.0069153	8.8816318	537.4	32.435104	-0.096119	6.6795507	548	26.233977	0.2574884	7.571582
516.4	28.369025	0.0286048	8.8535015	537.6	34.75427	0.199118	6.5303621	548.2	25.914267	0.440706	8.8580863
516.6	28.932937	-0.041751	9.3162601	537.8	28.293507	0.2232149	8.7888575	548.4	26.693191	0.2808644	8.8658671
516.8	28.39581	-0.022356	9.1639226	538	28.81414	0.1162945	8.706537	548.6	27.626213	0.0722603	8.1894975
517	28.205672	-0.035564	8.2308195	538.2	31.430382	0.1163031	7.364313	548.8	27.791097	0.1156475	8.6953551
517.2	28.35555	-0.686142	7.1973978	538.4	30.314418	0.2247124	7.5135823	549	25.73439	0.1432791	7.7441402
517.4	27.360792	-1.528663	6.3781426	538.6	31.34891	0.225286	7.3264635	549.2	26.256305	0.1458231	8.0489252
517.6	26.500858	0.1291732	8.7303959	538.8	28.198039	-0.020482	8.9438872	549.4	26.851685	0.1149591	8.0358868
517.8	27.106014	0.1405412	8.9371476	539	27.888636	-0.019941	8.9724639	549.6	27.067091	0.2066246	8.3752681
518	27.16543	0.1730861	8.867562	539.2	27.607956	0.0430571	9.0672161	549.8	26.807925	0.2397657	8.2705136
518.2	27.24832	0.2177523	8.6120514	539.4	27.199425	0.0949285	8.9605378	550	26.187447	0.3875711	8.225404
518.4	27.695652	0.1099062	8.9720969	539.6	26.978498	0.2543564	9.1742426	550.2	25.13094	0.3470999	8.3458066
518.6	27.349078	0.1222167	8.8841349	539.8	27.864519	0.2482949	8.1392423	550.4	26.636228	0.3934097	9.0013988
518.8	27.942691	0.0787969	9.1340518	540	29.977204	0.0039967	8.4902097	550.6	26.388479	0.2877335	8.6529021
519	27.679795	0.1159977	8.6599614	540.2	32.434072	0.0931038	7.1802313	550.8	25.840636	0.3271559	8.2837023
519.2	27.498727	0.0406085	8.9637708	540.4	29.771793	0.020797	8.6251588	551	25.202917	0.2545311	7.6143987
519.4	27.524886	-0.041399	8.9759835	540.6	27.575575	0.1757323	9.3020359	551.2	25.910413	0.3709223	8.2949654
519.6	27.679795	0.0976519	8.6599614	540.8	27.344715	0.0811045	9.1505552	551.4	26.228029	0.3195823	8.6871958
519.8	27.659122	0.0279566	8.9149464	541	27.221225	0.1687301	8.8290226	551.6	24.72245	0.3912844	7.8774562
520	27.498432	0.1436375	9.1094449	541.2	29.110257	0.2398094	8.5936421	551.8	25.797458	0.4022683	8.2303501
520.2	27.530482	0.043881	8.6271435	541.4	27.798304	0.2646635	9.1524741	552	25.657766	0.3330991	8.1948185
520.4	27.679795	0.0522405	8.8021941	541.6	27.522895	0.1671837	8.6822904	552.2	25.650797	0.288106	8.0424411
520.6	29.248107	-0.076581	8.983651	541.8	27.390527	0.3779915	8.6672479	552.4	24.975443	0.344355	7.1467297
520.8	29.350581	0.0266282	8.6637433	542	28.493249	0.39887	8.8054724	552.6	25.84829	0.3819807	7.9813393
521	29.410875	-0.032667	8.9634491	542.2	28.511519	0.20925	8.2318118	552.8	25.750472	0.4290982	8.6815885
521.2	28.27929	-0.014405	7.6973905	542.4	27.310617	0.3319947	8.3860786				

Depth	L*	a*	b*	Depth	L*	a*	b*	Depth	L*	a*	b*
553.2	26.8486	0.3689823	8.9031789	563.8	27.841054	0.1675132	8.4949331	563.8	27.841054	0.1675132	8.4949331
553.4	25.458187	0.2994203	8.3449321	564	27.344165	0.1817168	8.2128058	564	27.344165	0.1817168	8.2128058
553.6	25.332899	0.3686905	8.4710168	564.2	27.062201	0.2536556	8.3525997	564.2	27.062201	0.2536556	8.3525997
553.8	25.589138	0.4845877	8.3393189	564.4	26.823772	0.2620839	8.0801413	564.4	26.823772	0.2620839	8.0801413
554	25.354155	0.4055981	8.224672	564.6	25.826189	0.2060428	7.7099877	564.6	25.826189	0.2060428	7.7099877
554.2	24.891045	0.428355	8.0260145	564.8	25.184356	0.3368447	7.5754346	564.8	25.184356	0.3368447	7.5754346
554.4	26.169204	0.1685625	8.2669856	565	25.754173	0.3358747	7.8129246	565	25.754173	0.3358747	7.8129246
554.6	25.426841	0.3136341	8.5180369	565.2	24.536129	0.4517432	7.3133644	565.2	24.536129	0.4517432	7.3133644
554.8	26.488284	0.3139494	8.773061	565.4	24.397077	0.6932114	7.5235953	565.4	24.397077	0.6932114	7.5235953
555	26.387893	0.2272599	8.9571476	565.6	24.626509	0.6390073	7.853569	565.6	24.626509	0.6390073	7.853569
555.2	26.328324	0.2208694	8.3881914	565.8	25.38413	0.5509553	8.116167	565.8	25.38413	0.5509553	8.116167
555.4	26.285496	0.2918267	8.6319588	566	26.953418	0.3786917	6.6271975	566	26.953418	0.3786917	6.6271975
555.6	27.071078	0.2383544	8.9813659	566.2	25.535816	0.611799	8.1810804	566.2	25.535816	0.611799	8.1810804
555.8	25.906321	0.1026513	8.135317	566.4	26.152156	0.6169385	8.9534506	566.4	26.152156	0.6169385	8.9534506
556	26.270918	0.0975028	8.1250154	566.6	25.883598	0.448339	8.0114379	566.6	25.883598	0.448339	8.0114379
556.2	26.059441	0.5359482	7.9374709	566.8	25.426227	0.4935888	7.8546115	566.8	25.426227	0.4935888	7.8546115
556.4	24.148646	0.6525335	8.1425887	567	25.727584	0.5213771	8.0988645	567	25.727584	0.5213771	8.0988645
556.6	25.76481	0.473966	8.5075885	567.2	25.785515	0.6657727	8.5681382	567.2	25.785515	0.6657727	8.5681382
556.8	26.579006	0.3645205	7.918217	567.4	25.079504	0.6592546	8.5197412	567.4	25.079504	0.6592546	8.5197412
557	26.219986	0.2843104	8.3861742	567.6	25.509187	0.5467284	7.4058624	567.6	25.509187	0.5467284	7.4058624
557.2	25.763069	0.3023788	8.3501769	567.8	27.930377	0.6103778	6.3804647	567.8	27.930377	0.6103778	6.3804647
557.4	28.922297	0.4016381	6.5107282	568	27.990018	0.5645477	6.7260221	568	27.990018	0.5645477	6.7260221
557.6	27.902345	0.4238126	7.2560431	568.2	24.85193	0.4742806	6.5249654	568.2	24.85193	0.4742806	6.5249654
557.8	27.119125	0.3938571	6.5554811	568.4	24.771001	0.8043767	7.2124246	568.4	24.771001	0.8043767	7.2124246
558	25.074268	0.1746688	5.1982855	568.6	26.10206	1.0553188	7.9328904	568.6	26.10206	1.0553188	7.9328904
558.2	26.488252	0.4217667	7.1749199	568.8	31.409374	0.8817843	5.7117916	568.8	31.409374	0.8817843	5.7117916
558.4	25.595966	0.4606385	7.0355554	569	43.362315	0.6248174	3.5767832	569	43.362315	0.6248174	3.5767832
558.6	24.922478	0.379858	7.5548763	569.2	27.454718	0.7723578	5.979069	569.2	27.454718	0.7723578	5.979069
558.8	24.330872	0.5618458	7.7397827	569.4	33.854607	0.2989642	3.7005604	569.4	33.854607	0.2989642	3.7005604
559	24.949764	0.437746	7.925197	569.6	30.467206	0.3522275	6.6962842	569.6	30.467206	0.3522275	6.6962842
559.2	24.950899	0.5354564	7.9890277	569.8	30.739768	0.5421653	5.5842912	569.8	30.739768	0.5421653	5.5842912
559.4	25.971182	0.472707	7.8900908	570	31.194662	0.7162127	5.367736	570	31.194662	0.7162127	5.367736
559.6	24.657018	0.6791642	8.2434129								
559.8	25.722275	0.4026166	7.5721401								
560	25.531396	0.5630972	8.3543889								
560.2	25.677798	0.4534298	7.4940675								
560.4	28.243316	0.2140265	5.5382055								
560.6	27.160682	0.2328372	6.5090696								
560.8	30.265892	0.302207	6.5177402								
561	26.035883	0.3916117	6.9877687								
561.2	27.683631	0.3818405	6.3463529								
561.4	28.129255	0.2550848	6.5364971								
561.6	27.385045	0.2012725	6.0771224								
561.8	29.541878	0.1026471	5.623337								
562	29.466999	0.1289452	5.1356278								
562.2	28.831102	0.1459138	6.5460094								
562.4	31.460755	0.0898099	5.8625807								
562.6	27.663887	0.1691447	7.7136951								
562.8	31.937951	0.0705048	6.4829161								
563	28.072584	0.3490924	7.7369127								
563.2	31.65723	0.232643	6.5407108								
563.4	29.864135	0.1485039	7.6519441								
563.6	27.771569	0.2656579	8.9602147								

Appendix. Heimerdalsvatnet core NHP-207 bulk organic geochemical data.

Sample Depth	Depth (cm)	Age (cal yr BP)	Total Carbon (%)	Total Nitrogen (%)	Organic Carbon (%)	Inorganic Carbon (%)	C/N	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)
NHP207_0cm	0	0	12.22	1.11	11.24	0.98	10.14	-25.38	2.28
5cm	5	113	10.64	1.00	9.49	1.15	9.52		
10cm	10	227	9.80	0.96	8.90	0.90	9.26		
15cm	15	340	7.44	0.61	6.93	0.51	11.41		
NHP207_20cm	20	453	10.05	1.06	10.13	-0.07	9.60		
25cm	25	567	10.42	1.05	9.64	0.78	9.14	-25.62	2.57
30cm	30	680	9.58	0.93	8.87	0.71	9.51		
35cm	35	793	11.23	1.13	9.96	1.27	8.83		
NHP207_40cm	40	907	11.83	1.19	11.08	0.76	9.28		
45cm	45	1020	11.76	1.25	11.03	0.74	8.81		
50cm	50	1133	13.40	1.16	12.65	0.75	10.89	-26.09	1.91
55cm	55	1247	11.11	0.88	10.45	0.66	11.89		
NHP207_60_cm	60	1360	11.46	1.18	11.6	-0.11	9.77		
65cm	65	1473	10.50	0.87	9.6	0.88	11.03		
70cm	70	1587	10.22	0.84	9.3	0.89	11.06		
75cm	75	1726	4.74	0.39	4.47	0.27	11.58	-25.99	2.70
NHP207_80_cm	80	1926	12.47	1.07	11.3	1.13	10.60		
85cm	85	2125	9.47	0.75	8.7	0.76	11.65		
90cm	90	2325	12.64	1.11	11.4	1.23	10.32		
95cm	95	2525	12.1	1.10	11.1	0.99	10.07		
NHP207_100_cm	100	2725	13.60	1.22	13.59	0.01	11.12	-26.18	2.40
105cm	105	2924	13.59	1.62	12.4	1.15	7.67		
110cm	110	3124	11.98	1.26	11.1	0.90	8.82		
115cm	115	3324	11.91	1.77	10.9	0.98	6.17		
NHP207_120_cm	120	3524	8.86	0.61	8.2	0.68	13.34		
125cm	125	3723	13.06	1.23	11.97	1.10	9.70	-26.34	2.53
130cm	130	3923	12.61	1.15	11.4	1.16	9.92		
135cm	135	4008	3.72	0.38	3.1	0.61	8.25		
NHP207_140_cm	140	4092	11.49	1.01	10.9	0.63	10.72		
145cm	145	4177	12.24	1.13	11.3	0.91	10.00		
150cm	150	4261	12.48	1.38	12.10	0.37	8.80	-26.00	2.78
155cm	155	4346	11.62	1.16	10.6	0.99	9.19		
NHP207_160_cm	160	4430	13.78	1.08	13.0	0.82	12.04		
165cm	165	4515	13.47	1.25	12.9	0.54	10.32		
170cm	170	4599	10.73	0.93	10.1	0.65	10.87		
175cm	175	4684	11.86	1.06	11.06	0.80	10.48	-26.13	2.50

Sample Depth	Depth (cm)	Age (cal yr BP)	Total Carbon (%)	Total Nitrogen (%)	Organic Carbon (%)	Inorganic Carbon (%)	C/N	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)
NHP207_180_cm	180	4768	11.48	1.01	11.1	0.34	11.02		
185cm	185	4853	7.92	0.48	7.4	0.52	15.31		
190cm	190	4937	10.66	0.74	9.5	1.15	12.76		
195cm	195	5022	10.78	1.39					
NHP207_200_cm	200	5106	6.91	0.61	8.50	-1.60	14.03	-24.98	3.48
205cm	205	5191	10.02	0.74					
210cm	210	5241	11.34	0.75					
215cm	215	5291	10.12	0.79					
NHP207_220_cm	220	5340	9.78	0.80					
225cm	225	5390	12.29	0.88	10.90	1.39	12.33	-24.84	2.73
230cm	230	5440	12.43	0.93					
235cm	235	5490	11.87	1.05					
NHP207_240_cm	240	5540	10.80	0.87					
245cm	245	5590	11.90	0.93					
250cm	250	5639	12.95	0.95	12.79	0.16	13.52	-25.33	2.99
255cm	255	5689	6.69	0.59					
NHP207_260_cm	260	5739	10.89	0.88					
265cm	265	5789	11.10	0.92					
270cm	270	5839	11.85	0.94					
275cm	275	5889	12.22	0.91	11.30	0.92	12.41	-24.97	2.53
NHP207_280_cm	280	5938	8.60	0.73					
285cm	285	5988	10.82	0.92					
290cm	290	6038	4.75	0.59					
295cm	295	6076	11.40	0.92					
NHP207_300_cm	300	6107	9.98	0.80	11.18	-1.20	13.94	-25.51	3.29
305cm	305	6137	4.92	0.44					
310cm	310	6167	10.07	1.30					
315cm	315	6198	11.26	0.84					
NHP207_320_cm	320	6228	8.19	0.65					
325cm	325	6258	8.60	1.27	8.49	0.11	6.68	-25.06	4.04
330cm	330	6289	10.93	0.92					
335cm	335	6319	14.06	0.98					
NHP207_340_cm	340	6349	12.11	0.83					
345cm	345	6380	11.14	1.04					
350cm	350	6410	11.69	0.97	11.22	0.46	11.58	-25.35	3.94
355cm	355	6441	7.52	0.77					
NHP207_360_cm	360	6471	9.62	0.86					
365cm	365	6501	10.60	1.03					

Sample Depth	Depth (cm)	Age (cal yr BP)	Total Carbon (%)	Total Nitrogen (%)	Organic Carbon (%)	Inorganic Carbon (%)	C/N	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)
370cm	370	6532	10.30	1.08					
375cm	375	6562	10.09	0.99	8.20	1.89	8.26	-22.56	6.73
NHP207_380_cm	380	6592	8.09	0.68					
385cm	385	6623	11.12	1.07					
390cm	390	6653	11.04	1.07					
395cm	395	6683	8.46	0.96					
NHP207_400_cm	400	6714	6.17	0.53	5.63	0.54	10.67	-22.96	7.00
405cm	405	6744	9.12	0.95					
410cm_NHP207	410	6774	8.77	0.65					
415cm	415	6805	7.92	0.63					
NHP207_420_cm	420	6835	6.80	0.56					
425cm	425	6866	8.98	0.77	6.89	2.09	8.98	-22.56	6.46
430cm	430	6896	9.09	1.19					
435cm	435	6926	8.21	1.59					
440cm	440	6957	8.05	0.72					
445cm	445	6987	9.34	1.32					
450cm	450	7017	7.09	0.59	5.78	1.30	9.88	-22.57	7.21
455cm	455	7048	8.50	0.75					
460cm	460	7078	6.94	0.78					
465cm	465	7108	8.14	0.74					
470cm	470	7139	8.60	0.61	6.46	0.57	10.89	-23.31	6.21
475cm	475	7169	7.03	0.59					
480cm	480	7200	8.16	0.87					
485cm	485	7230	7.49	0.73					
490cm	490	7260	8.11	0.66					
500cm	500	7321	8.74	0.93	7.79	0.95	8.34	-23.38	7.05
505cm	505	7351	8.39	0.87					
510cm	510	7382	7.57	0.57					
515cm	515	7412	6.37	0.44					
520cm	520	7442	5.75	0.53					
525cm	525	7473	5.89	0.40	4.49	1.40	11.20	-22.86	6.46
530cm	530	7503	5.98	0.48					
535cm	535	7533	5.98	0.54					
540cm	540	7564	5.23	0.54					
545cm	545	7594	5.21	0.48					
550cm	550	7625	5.02	0.49	4.31	0.71	8.79	-22.73	6.91
555cm	555	7655	4.42	0.46					
560cm	560	7685	4.99	0.58					

Sample Depth	Depth (cm)	Age (cal yr BP)	Total Carbon (%)	Total Nitrogen (%)	Organic Carbon (%)	Inorganic Carbon (%)	C/N	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)
565cm	565	7716	4.74	0.49					
570cm	570	7746	4.85	0.53					
575cm	575	7776	4.53	0.47	4.38	0.16	9.29	-22.82	4.94

Appendix. Scanning XRF data for synthetic core R1

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
0	1068123	24	192	53	66	91	1658	8069	663	49	133	211	288	50	88	228	61	101	143	104	336	315	0	285	90	228	494	0	23	4455	1571	
0.1	1085873	17	223	32	55	91	1735	8554	647	45	125	188	30853	226	153	301	98	117	151	128	363	335	0	273	118	197	535	32	0	38	5153	1737
0.2	2209695	0	244	26	47	66	1835	9310	833	61	110	259	33484	143	70	285	78	142	104	110	442	405	0	299	41	195	535	9	0	37	6247	2131
0.3	2583935	0	228	47	40	86	1942	9645	804	17	74	244	35485	159	107	281	113	120	192	154	621	417	0	433	67	241	523	8	0	34	7253	2441
0.4	2719232	0	225	41	53	69	1952	9415	778	72	135	258	36653	189	101	332	100	116	0	64	608	387	0	463	78	239	550	0	9	58	7999	2831
0.5	2288993	17	182	18	27	64	2069	8495	822	52	139	222	37700	233	95	305	113	74	241	119	683	438	91	531	94	252	545	9	0	55	8729	3229
0.6	2796730	9	203	17	46	63	2043	8777	785	80	137	258	39124	233	109	293	55	84	89	75	665	483	0	477	114	223	563	0	57	35	9367	3294
0.7	2972925	0	253	20	29	56	2166	8562	792	39	128	235	40100	156	125	270	48	87	82	80	956	517	105	511	115	214	522	0	0	44	10268	3531
0.8	4291792	41	246	18	40	53	2129	8920	803	38	136	254	41775	212	131	300	54	168	134	127	976	436	0	633	64	223	547	8	14	81	10706	3659
0.9	4409489	18	198	33	34	57	2185	9238	933	97	122	301	42341	180	121	322	118	91	127	122	1039	428	55	710	7	231	601	16	0	22	11775	4368
1	5291967	33	263	48	54	67	2257	10178	744	96	152	298	42590	160	38	285	88	150	166	179	980	552	53	678	77	277	549	0	17	61	11820	4126
1.1	6064648	7	296	14	26	54	2129	10960	902	55	140	230	41163	271	182	359	63	124	148	195	1000	668	94	715	58	254	530	0	48	83	12214	4508
1.2	5895302	0	266	18	44	66	2045	11659	886	59	148	254	40216	232	107	264	120	60	132	66	993	537	126	722	59	222	566	0	0	75	12112	4775
1.3	6435138	14	242	32	44	71	1907	12270	845	65	129	295	38641	257	138	360	128	97	185	195	931	483	102	731	41	251	607	0	0	61	11885	4585
1.4	7454713	10	253	53	44	71	1790	12521	774	34	97	303	36715	185	152	239	100	129	112	131	935	608	77	648	46	203	556	0	0	68	11603	4425
1.5	7849953	19	260	23	69	80	1651	12319	803	39	140	234	35111	122	47	263	93	60	50	163	900	638	161	695	45	192	539	0	15	36	11402	4588
1.6	8217044	0	224	0	18	46	1623	12415	736	57	83	231	32861	169	63	191	46	37	173	99	855	745	91	616	27	232	565	0	0	36	11123	4548
1.7	8652583	6	237	0	41	66	1472	12752	777	33	138	275	31473	180	21	142	32	103	0	33	696	693	76	673	47	211	509	0	10	16	11106	4526
1.8	8153446	0	237	0	4	52	1504	13220	766	38	107	241	30423	169	81	212	139	98	56	164	745	827	76	657	9	175	585	0	14	8	10958	4313
1.9	8802729	21	268	30	37	80	1391	13217	787	20	123	241	29298	220	109	219	30	115	5	110	674	767	143	663	28	185	565	0	24	28	10973	4437
2	9182870	17	292	52	31	95	1402	13359	694	47	107	241	28705	188	88	237	117	147	84	200	764	849	156	599	31	203	572	20	0	45	10955	4510
2.1	8776880	18	285	45	30	89	1349	13157	658	25	137	185	27658	194	64	220	87	130	172	180	624	865	110	587	33	244	562	7	0	55	10815	4577
2.2	9407114	12	256	35	7	89	1354	13094	687	47	114	201	26754	57	0	150	0	103	59	113	633	977	56	631	0	236	524	0	0	65	10617	4482
2.3	8547335	17	283	37	28	125	1291	13422	721	50	95	247	26134	131	6	154	125	139	96	73	584	973	67	681	13	170	509	0	0	33	10640	4335
2.4	8832028	26	259	28	34	111	1308	12816	733	58	113	179	26732	161	74	178	66	45	113	160	556	961	51	698	9	230	584	5	0	44	10751	4552
2.5	8179195	15	254	5	17	70	1343	12810	715	87	154	233	26743	184	55	184	29	133	74	85	429	908	177	489	23	180	553	0	0	15	10550	4552
2.6	8071048	0	278	23	15	73	1271	12886	651	36	116	173	26744	158	41	169	50	49	168	209	613	986	41	654	46	164	567	9	0	44	10557	4462
2.7	8630833	6	278	10	18	73	1277	13202	672	46	99	210	25829	140	72	146	105	29	59	146	493	1053	129	703	22	156	589	8	7	9	10538	4434
2.8	7937551	0	264	0	0	42	1252	12816	701	21	77	203	25495	153	62	188	0	170	113	100	513	931	22	727	0	203	555	0	0	0	10198	4505
2.9	8190894	27	229	35	0	53	1324	12408	634	36	90	185	25445	223	94	147	66	103	55	109	430	1028	119	591	60	187	553	0	0	8	10407	4551
3	7660208	9	298	35	43	87	1299	12572	723	50	96	244	25998	163	45	134	64	96	155	160	451	948	0	663	34	179	584	6	0	62	10306	4396
3.1	7480512	0	276	30	30	89	1307	13089	661	49	103	223	24800	140	38	140	8	42	160	79	448	922	131	909	55	224	583	0	0	31	10240	4514
3.2	7628159	17	280	52	44	105	1346	13552	656	45	90	198	24129	131	42	79	49	78	56	83	467	982	146	885	38	209	549	4	12	25	10550	4493
3.3	7725756	28	299	36	17	72	1249	13014	657	44	74	197	24574	129	22	144	106	184	36	98	589	989	77	789	20	176	537	32	0	68	10383	4410
3.4	7416514	9	263	24	23	63	1235	12665	730	42	97	281	25458	197	38	171	39	91	148	109	380	932	37	688	42	241	564	0	0	37	10191	4501
3.5	7329666	0	237	63	34	87	1267	12909	728	36	110	205	24774	152	48	166	146	69	60	125	484	934	108	713	42	172	644	19	8	25	10409	4253
3.6	7685607	0	259	18	38	68	1291	12324	681	36	77	228	24564	70	33	162	66	63	35	122	435	1102	83	673	0	202	550	40	10	82	10242	4544
3.7	7300767	12	296	29	26	61	1279	11951	648	51	128	212	25014	106	34	116	89	49	64	121	468	987	59	727	13	225	547	22	14	54	10379	4357
3.8	7242268	0	249	20	15	54	1297	12035	641	34	141	183	24564	159	49	151	116	61	175	69	435	942	92	837	68	206	599	0	0	61	10361	4537
3.9	7574660	17	282	4	22	85	1328	12239	699	36	136	188	25822	186	22	158	51	82	197	149	545	963	31	875	52	212	603	27	0	73	10395	4394
4	7255217	14	268	19	5	52	1342	12443	551	50	108	195	24499	150	97	189	61	137	81	81	447	1056	85	721	45	169	574	0	0	58	10193	4287
4.1	7141163	0	277	37	35	78	1344	11786	622	36	81	206	24419	139	53	177	99	87	106	441	996	27	976	15	159	585	0	0	67	10373	4433	
4.2	7193320	28	286	17	39	71	1345	11824	627	75	86	214	24628	158	35	239	109	58	78	143	453	845	157	1106	37	195	574	11	6	39	10155	4312
4.3	7945750	0	281	18	39	62	1320	12685	759	6	74	168	23586	125	74	203	92	87	132	123	479	945	114	827	0	167	619	0	0	55	10354	4665
4.4	7598959	10	274	29	31	87	1287	12956	612	31	102	157	23031	190	56	190	109	62	148	585	964	136	954	41	164	544	29	5	56	10150	4493	
4.5	7833504	20	230	14	0	60	1224	12519	583	27	120	179	23066	165	82	186	42															



Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
4.9	7173270	12	220	0	0	53	1374	10204	689	21	123	166	23518	113	16	164	66	47	113	146	572	922	96	922	42	203	528	9	0	44	10397	4435
5	7607309	0	205	25	20	61	1493	9968	736	39	94	171	24406	148	67	199	44	79	68	114	475	873	27	992	29	163	572	0	0	81	10666	4377
5.1	7465412	7	186	0	0	36	1510	8659	627	40	139	185	25518	182	57	161	97	25	81	91	528	784	125	904	19	161	655	0	11	16	10583	4410
5.2	7927051	0	132	22	0	14	1614	8657	620	21	211	214	27428	202	103	239	136	164	204	60	865	149	1026	64	189	655	0	10	55	10859	4642	
5.3	7093072	8	185	0	12	63	1782	8501	661	54	100	159	28015	169	72	267	54	150	134	210	690	843	87	1245	7	223	563	0	0	63	10862	4407
5.4	6973275	0	178	7	24	44	1898	7806	679	53	139	210	31887	217	119	161	123	152	85	98	791	784	0	1122	52	174	554	32	0	84	11138	4601
5.5	7439363	7	152	32	24	34	1970	6777	719	39	92	232	36452	160	21	217	51	120	19	171	888	686	119	1000	62	271	526	0	29	65	10897	4401
5.6	7092072	23	197	26	30	41	2264	6161	749	44	151	233	38705	182	113	277	87	85	56	62	886	527	109	808	40	222	546	0	43	15	11120	4204
5.7	7126821	9	180	25	28	57	2238	6255	766	56	142	187	40042	195	156	273	130	106	164	229	886	512	64	741	61	189	513	19	0	81	11298	4121
5.8	7034974	0	203	33	10	62	2092	7096	759	55	142	211	38706	210	141	298	126	55	187	153	817	489	20	592	44	171	567	0	0	64	10394	4256
5.9	7788704	14	213	7	0	18	1862	8637	698	80	112	240	33848	164	43	301	103	149	106	175	856	590	72	686	42	234	505	0	10	80	10735	4342
6	7031123	22	178	20	49	58	1669	9649	672	33	96	210	34425	160	84	195	87	106	84	93	774	619	104	620	19	234	509	44	16	39	10477	4202
6.1	7764855	41	206	45	43	74	1551	9857	672	38	99	186	33021	164	109	239	115	76	91	94	741	608	55	634	38	222	499	0	0	29	10305	3985
6.2	7439213	0	197	17	21	78	1597	9171	727	33	100	235	32004	185	138	269	146	185	130	135	680	584	20	548	27	200	466	0	0	84	10124	4196
6.3	8179895	11	202	34	22	85	1507	9365	658	62	86	249	30749	221	85	193	84	88	133	78	686	761	47	629	49	169	519	0	14	49	10147	4336
6.4	8067397	17	215	27	5	42	1343	10213	685	43	94	183	29383	160	98	175	98	24	73	154	590	852	99	615	24	175	553	0	26	90	10327	4235
6.5	8753880	9	179	0	9	42	1434	10985	687	41	92	215	28208	172	106	178	145	113	276	156	518	916	44	663	0	200	545	0	0	64	10150	4339
6.6	8472138	10	202	20	6	59	1271	11786	676	79	83	214	26883	141	42	174	61	143	153	96	579	850	52	677	0	192	490	0	0	46	10352	4324
6.7	7897952	16	231	27	19	70	1244	12307	616	46	115	225	26239	140	95	146	103	124	22	114	467	956	85	599	62	196	539	0	46	53	10169	4369
6.8	7780305	4	239	23	30	75	1281	12508	695	37	101	226	25852	127	85	205	115	71	78	113	440	956	147	518	10	188	494	18	0	32	10157	4272
6.9	8393839	6	236	20	5	62	1256	12551	654	45	98	223	25241	121	0	182	28	71	91	57	382	878	48	592	25	231	532	0	0	49	10022	4324
7	7634309	31	217	50	31	63	1179	12882	633	21	122	208	25060	144	7	147	33	106	80	123	486	866	58	760	37	225	553	10	0	12	10455	4477
7.1	7402764	0	240	7	22	63	1171	12745	673	35	113	213	25043	126	18	189	93	51	76	106	466	976	173	669	43	199	582	13	0	31	10302	4364
7.2	7295917	6	197	23	28	72	1338	12946	678	55	108	229	24902	141	67	132	36	94	67	112	424	922	157	626	45	183	572	0	0	66	10381	4237
7.3	7198969	0	276	38	53	96	1298	12716	697	0	95	157	24445	177	32	200	149	162	150	484	1019	76	661	63	209	520	0	0	80	10152	4133	
7.4	7444513	31	228	24	41	71	1243	12940	658	11	121	202	24494	176	33	157	0	133	126	100	365	979	80	623	34	218	505	13	0	46	10286	4483
7.5	7214419	16	259	16	39	84	1184	12918	627	27	135	219	24295	103	44	166	79	133	125	157	429	963	106	636	46	248	536	0	0	49	10259	4124
7.6	7771255	8	240	4	15	29	1233	12280	753	29	80	184	23925	128	6	188	26	126	117	121	504	1005	143	800	22	194	544	5	0	72	10115	4242
7.7	7791504	9	222	46	22	71	1203	12655	753	21	87	198	24119	83	53	130	95	87	103	138	394	1026	49	675	30	145	560	0	0	53	10108	4190
7.8	7586260	18	292	29	23	86	1285	11844	651	6	75	247	23054	87	24	105	68	80	22	71	528	922	139	766	22	199	531	38	0	21	10117	4200
7.9	7545561	14	245	14	8	63	1228	12379	622	16	97	180	23396	153	61	165	35	112	32	122	450	928	69	720	57	183	535	8	0	25	9977	4296
8	7808204	0	231	8	0	46	1156	11902	670	14	131	228	23099	60	0	135	69	111	84	118	471	927	58	657	0	204	513	0	0	37	9899	4210
8.1	7338066	18	292	29	23	86	1285	11844	651	6	75	247	23054	87	24	105	68	80	22	71	528	922	139	766	22	199	531	38	0	53	9857	4240
8.2	7324166	10	240	49	15	86	1225	12546	623	16	91	239	23352	98	18	156	46	205	96	95	385	827	0	923	16	209	509	0	0	0	9949	4277
8.3	7942501	0	226	35	30	69	1161	12688	626	53	72	153	23373	139	41	175	117	78	146	57	448	919	54	857	7	159	567	0	0	16	9968	4148
8.4	7838453	8	288	5	31	55	1125	11628	536	60	101	194	22981	138	62	185	65	49	75	96	470	873	81	947	43	186	528	20	0	16	10022	4392
8.5	7357265	0	260	26	35	61	1228	11388	600	10	70	192	22197	153	34	146	122	50	82	108	357	832	52	770	42	160	571	9	0	40	9953	4059
8.6	7196670	0	236	6	12	69	1210	11350	584	20	72	139	22036	124	0	153	0	95	89	91	383	922	40	1017	20	219	542	4	0	14	9709	4279
8.7	7248018	0	225	0	0	21	1382	10799	591	36	103	175	22721	118	74	167	101	64	110	122	514	860	0	888	44	205	533	8	0	33	9696	4242
8.8	8035898	15	177	14	19	66	1471	10204	540	19	79	193	24023	156	0	221	83	66	110	122	514	860	0	1023	53	188	568	13	0	43	10369	4269
8.9	7025374	0	188	0	30	50	1479	9552	604	6	90	149	24563	173	95	129	29	59	122	128	390	880	0	1023	53	188	568	13	0	0	10094	4389
9	6934126	23	224	40	36	43	1610	9689	626	47	87	165	24973	218	86	116	64	189	118	497	889	112	998	57	168	694	0	0	77	10184	4465	
9.1	6907177	0	183	22	12	50	1758	8777	686	38	107	196	27973	275	177	199	128	107	100	97	504	912	68	1210	45	202	552	0	0	25	10610	4541
9.2	7364910	22	207	19	0	41	1822	7019	717	55	104	194	31599	264	42	223	102	125	166	162	635	823	99	1386	9	262	541	0	0	91	10691	4551
9.3	7710357	33	172	29	41	54	1997	5898	659	50	109	193	34354	198	66	251	76	78	118	116	834	906	54	1105	72	198	537	0	8	21	10921	4611
9.4	7778705	15	139	15	0	2093	5813	722	55	104	194	31599	264	42	223	102	125	166	162	635	823	99	1386	9	262	541	0	0	91			

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
10	7023474	30	219	19	30	77	1288	11539	591	36	82	218	26673	94	32	181	107	105	49	165	813	662	120	570	38	184	511	0	28	10570	4194	
10.1	7905502	8	215	20	59	72	1223	11931	636	30	71	218	26544	177	77	218	51	77	70	134	760	575	82	598	37	218	549	31	0	61	10271	4160
10.2	8102547	15	261	20	14	67	1263	11856	645	44	98	240	25434	123	36	157	81	83	161	157	643	716	39	702	9	197	477	8	0	25	10178	4061
10.3	7771705	0	175	0	43	78	1210	12311	622	19	64	209	24921	122	36	176	126	44	104	133	634	788	87	603	33	191	495	30	0	75	10057	4189
10.4	7670308	10	252	35	27	92	1241	12437	615	21	87	205	24631	105	21	156	67	145	56	155	586	763	110	633	52	206	517	23	0	58	10055	4292
10.5	7602709	21	350	36	95	1302	12410	625	56	95	233	24836	122	23	133	54	75	103	137	502	830	169	582	59	176	500	7	0	75	10266	4342	
10.6	8397689	0	194	36	31	61	1141	12451	606	61	128	246	24833	67	0	112	45	33	75	105	517	841	73	596	51	176	500	0	0	40	10152	4205
10.7	7683457	18	223	12	22	53	1182	12603	594	49	164	194	24701	121	36	107	100	85	149	60	498	886	64	633	58	201	525	0	0	45	10005	4360
10.8	7142871	8	209	23	0	52	1166	12522	651	44	96	224	24360	163	72	205	27	130	60	161	489	865	170	451	29	191	510	13	24	39	10140	4307
10.9	7120471	22	224	26	27	78	1214	12674	656	44	88	261	24168	120	101	168	91	92	89	103	501	980	50	572	27	153	511	35	5	58	10395	4344
11	7578060	19	232	31	26	84	1086	12736	676	49	81	149	24063	159	74	202	77	64	116	89	420	1048	114	623	23	174	517	25	0	50	10011	4277
11.1	7924951	0	244	0	18	59	1111	12240	689	36	86	133	23685	147	67	213	50	83	135	109	460	960	105	605	9	197	530	0	0	9	10101	4177
11.2	7862953	0	274	37	19	73	1150	12271	614	34	90	176	23993	218	80	160	48	80	87	73	541	934	51	619	63	225	507	0	0	40	10051	4373
11.3	7825554	13	243	35	38	72	1210	12343	682	27	106	194	23702	160	66	148	60	152	105	108	410	962	141	764	41	208	566	0	0	7	9896	4327
11.4	7553460	12	227	16	31	78	1191	12357	710	27	91	189	23143	134	68	174	61	118	106	102	427	972	111	644	6	170	549	0	0	28	9972	4257
11.5	7273368	23	259	27	39	84	1164	12151	645	18	87	184	23049	107	0	161	9	74	26	162	429	918	148	712	51	179	501	25	0	84	10037	4348
11.6	7270467	0	227	9	0	29	1153	12088	685	61	102	189	23100	133	27	175	66	66	68	154	413	995	146	638	0	180	543	33	31	57	10273	4335
11.7	7269568	0	258	27	49	110	1167	12249	621	32	109	219	23042	166	42	161	61	42	91	73	408	890	102	678	49	208	481	0	0	0	10026	4276
11.8	7262818	9	279	7	19	72	1194	12316	612	59	120	184	23316	161	66	226	146	45	65	164	386	878	56	679	51	171	539	0	33	24	10140	4347
11.9	7324716	0	267	16	25	65	1113	12084	619	30	132	225	22800	200	63	167	51	151	136	68	378	968	0	728	44	187	553	0	0	49	10124	4347
12	7357115	24	260	7	6	37	1134	12261	692	25	85	156	23284	113	0	159	75	92	143	148	453	932	78	756	22	232	583	9	0	8	9903	4355
12.1	7369215	0	268	8	0	57	1174	11959	628	41	117	184	23133	139	36	103	5	10	96	148	453	932	78	756	22	232	583	9	0	21	10251	4626
12.2	7348316	37	261	38	44	77	1213	11694	626	38	97	152	22049	119	16	166	0	54	28	127	482	944	136	658	26	219	526	8	16	45	9922	4275
12.3	7323466	13	224	16	34	76	1138	11795	681	46	115	136	22003	111	11	134	103	11	87	83	418	940	36	839	49	201	547	21	16	53	9654	4309
12.4	7267717	22	220	15	27	49	1116	12700	577	26	113	179	22556	162	47	171	104	77	88	128	411	903	137	841	43	159	564	5	0	10	9926	4396
12.5	7239118	0	220	36	42	81	1204	12017	572	45	84	161	22341	154	40	145	30	171	25	89	590	893	88	907	53	211	582	0	26	0	9932	4370
12.6	7275117	9	221	0	22	61	1298	10906	775	23	112	179	22241	140	50	141	53	32	41	87	287	1022	11	100	537	0	0	66	9861	4298	4298	
12.7	7290467	0	209	18	18	52	1228	10372	670	19	118	201	22602	142	17	139	90	93	148	146	457	869	26	994	51	176	520	8	0	30	10042	4254
12.8	7293917	0	205	24	18	62	1361	10185	633	40	99	159	23649	155	84	125	57	6	52	117	432	779	44	1027	25	144	525	0	0	30	9766	4277
12.9	7249168	34	209	6	18	58	1529	8204	670	46	98	220	26071	177	61	184	96	107	130	143	416	936	109	1143	37	179	551	0	0	24	10286	4298
13	7556260	26	183	23	11	29	1890	6134	765	38	117	182	32297	194	74	226	133	59	70	64	492	840	95	1192	20	195	545	0	11	66	10823	4490
13.1	7205069	25	163	20	11	41	2060	4991	687	47	114	188	37536	226	160	295	81	173	103	111	759	782	63	1099	74	207	555	0	0	0	10458	4527
13.2	7338116	15	204	0	20	48	2099	5038	767	45	131	194	38425	180	64	246	96	76	44	181	801	723	73	1131	34	242	459	0	0	22	10900	4603
13.3	7621059	17	170	55	54	62	2154	5021	753	76	92	228	38568	179	136	245	99	108	117	100	743	645	110	868	53	190	469	0	0	21	11059	4505
13.4	6860928	27	175	9	19	49	2119	4807	737	96	144	211	39132	237	111	277	65	152	154	61	865	484	21	812	48	196	474	0	0	64	10774	4220
13.5	7008924	4	150	19	24	29	2078	4646	836	49	115	199	39116	262	174	294	96	116	54	69	873	414	71	666	6	227	476	0	23	21	10828	4187
13.6	6707432	10	150	25	42	42	2132	5306	681	83	109	226	37847	235	33	325	81	156	94	123	948	408	114	659	38	260	470	0	25	31	10745	4110
13.7	7141771	5	194	46	19	53	1939	5801	726	67	99	235	36832	219	119	350	78	141	58	100	899	429	0	640	20	236	473	0	13	54	10577	3972
13.8	6826679	7	186	9	21	46	1807	6588	661	39	120	177	35437	172	81	245	133	35	56	79	852	509	125	733	33	204	511	0	0	32	10447	4125
13.9	6912877	18	220	38	40	75	1755	7458	659	42	114	221	33513	187	87	245	133	35	56	79	852	509	125	733	33	204	511	0	0	47	10238	3992
14	7391465	21	212	15	25	63	1654	8397	702	59	132	197	32220	194	85	237	74	83	166	210	698	596	35	621	33	201	480	0	0	40	10025	4189
14.1	7684207	26	200	16	16	45	1539	9487	727	8	96	228	30167	161	95	210	86	69	52	112	626	628	75	682	33	187	514	13	0	32	10206	4091
14.2	7763805	0	170	25	8	51	1426	10101	590	18	52	208	28332	162	100	203	161	107	112	96	635	638	86	591	29	169	552	0	0	32	10206	4091
14.3	7758955	0	223	30	34	51	1345	10752	665	85	96	217	27338	168	9	233	86	0	98	150	600	772	173	497	11	209	556	0	0	74	10073	4004
14.4	7711656	5	179	24	24	67	1326	11220	639	12	121	249	26168	124	78	154	142	155	122	136	475	742	122	589	24	184	558	0	0	0	9880	4042
14.5	8556735	0	180	0	12	60	1182	11396	617	62	102	196	25578	64	19	133	15	77	131	149	583											

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
15.1	7622509	9	172	17	18	66	1157	12235	624	59	83	222	23493	115	0	164	60	62	17	133	474	938	98	674	16	218	523	0	26	8	10070	4118
15.2	7877952	20	209	31	7	58	1149	12580	604	22	105	178	23324	120	72	124	87	6	51	148	465	1013	137	724	30	184	547	19	22	51	9614	4344
15.3	7365815	0	190	10	23	51	1174	12130	629	59	80	195	23331	148	98	148	152	47	38	60	415	897	11	663	32	120	650	0	0	37	9703	4280
15.4	7082722	12	237	32	55	98	1169	12373	649	26	91	223	23123	144	0	137	41	49	148	109	383	910	127	655	54	241	587	0	0	31	10098	4203
15.5	7198469	18	274	45	41	88	1155	11872	661	44	92	211	22765	99	32	71	25	32	62	147	373	772	43	700	0	121	527	4	0	57	9947	4126
15.6	6929826	0	254	34	44	67	1179	11956	627	41	104	258	23034	116	6	182	79	92	73	175	483	947	7	636	54	216	546	9	10	39	10076	4167
15.7	6878777	17	255	51	35	85	1204	12102	652	9	125	187	23557	132	0	106	80	85	105	86	447	997	100	776	58	166	507	18	0	20	9957	4396
15.8	6903527	38	245	30	26	82	1140	12243	615	32	119	174	22970	104	59	178	16	20	36	79	440	1025	33	735	42	171	541	26	5	35	9979	4348
15.9	7246468	5	238	14	42	79	1196	12339	630	37	100	165	23050	131	108	148	71	168	117	161	449	868	0	826	14	133	605	6	0	30	10117	4382
16	7730906	0	264	53	44	114	1145	12259	530	27	83	213	23171	85	20	116	60	154	75	139	489	1013	60	788	47	193	531	0	0	50	9951	4253
16.1	8011299	29	216	24	6	75	1139	11728	585	64	138	219	23965	173	85	167	70	115	128	151	446	870	97	1076	50	169	577	0	0	33	9892	4297
16.2	7590909	0	266	29	14	72	1182	11032	652	61	57	126	23590	189	47	166	93	87	89	115	421	806	166	972	0	234	553	0	0	30	9751	4331
16.3	7797754	12	217	15	9	67	1226	10780	641	55	159	171	23254	146	87	188	97	67	116	112	476	808	12	933	4	172	542	0	0	35	9951	4358
16.4	7835003	13	239	28	39	70	1319	11287	752	13	131	160	22864	94	47	140	114	98	34	166	384	871	146	928	20	143	495	9	0	82	9541	4397
16.5	7760655	0	232	44	40	107	1411	10613	702	22	113	185	23739	124	7	117	45	139	61	102	406	899	159	1017	93	206	479	0	9	26	10134	4404
16.6	7780455	9	190	5	0	43	1339	8804	741	46	88	217	24081	138	45	117	95	66	51	83	472	887	62	1001	19	164	530	0	0	6	10007	4337
16.7	7659908	0	192	6	9	45	1563	7734	672	40	122	181	25299	145	0	145	52	137	130	165	595	1036	99	1024	84	208	528	0	0	60	10413	4490
16.8	7578960	20	148	8	0	45	1727	7040	628	57	122	258	28628	230	111	394	140	46	136	462	858	103	968	63	214	550	0	16	16	10343	4413	
16.9	7609459	16	168	18	0	41	2014	6429	683	75	153	256	33728	253	171	307	128	95	116	114	593	796	12	1075	64	215	574	23	10	69	10471	4399
17	7983950	28	164	10	25	26	2099	5022	702	50	134	241	37763	211	101	356	70	172	177	152	753	612	155	951	52	263	448	0	0	53	10868	4365
17.1	6932776	0	161	10	12	32	2141	4898	761	75	148	194	38506	218	142	284	5	162	116	140	862	477	54	741	17	231	483	0	4	0	10626	4433
17.2	6825779	0	163	13	13	29	1985	5747	739	40	89	208	36869	224	145	336	112	50	197	212	904	523	127	797	0	199	490	39	0	75	10570	4149
17.3	6740881	11	167	12	21	60	1674	7246	673	49	138	158	33724	158	149	216	47	70	61	145	785	488	104	639	29	195	490	27	21	62	10365	4016
17.4	7226019	0	192	53	44	58	1603	8565	655	43	94	218	31277	155	70	258	58	71	119	87	781	610	94	635	46	173	451	0	0	47	10080	4053
17.5	7205919	5	192	41	22	74	1488	9629	712	24	100	216	29333	140	60	223	32	90	21	106	811	519	22	592	17	195	494	24	47	12	10101	4109
17.6	7662757	13	152	20	20	36	1324	10379	693	43	101	220	27681	138	15	232	49	127	139	98	677	722	129	612	27	222	468	0	0	34	10423	4308
17.7	6900772	8	220	11	46	81	1255	10955	669	43	67	214	26038	14	35	186	120	170	104	127	617	706	124	601	32	167	497	0	0	29	9770	4180
17.8	7093972	12	230	11	46	61	1311	11249	644	14	64	147	25411	83	43	143	84	78	146	207	675	746	601	679	7	150	493	12	0	79	10032	4169
17.9	7451363	7	181	21	17	53	1125	11765	574	58	79	232	25403	128	0	189	35	76	0	107	558	857	103	528	24	190	458	0	7	17	10147	4335
18	7636608	9	210	34	47	66	1155	12012	678	34	87	264	24756	108	30	151	42	46	17	37	539	736	41	649	26	194	484	0	16	0	9909	4306
18.1	7597359	15	174	29	39	78	1215	11869	509	61	62	212	24371	98	0	188	120	124	101	129	570	946	40	511	63	156	500	0	5	58	9906	4137
18.2	8268693	0	199	12	51	64	1171	11976	696	34	93	205	24661	105	52	125	24	40	49	120	538	926	57	567	10	171	563	35	23	84	9879	4257
18.3	7939351	10	205	17	11	89	1142	12275	662	47	102	187	24683	155	35	148	55	176	84	54	510	915	37	514	43	183	525	0	0	37	9575	4332
18.4	7158620	7	207	15	0	64	1180	11996	602	74	96	193	24288	95	18	160	64	90	122	99	554	866	148	647	14	170	528	0	0	30	10005	4294
18.5	7056573	11	264	20	27	86	1234	12286	649	49	100	234	24017	117	32	152	10	63	117	143	465	928	89	529	26	172	541	0	0	43	9926	4196
18.6	7003524	8	239	10	24	51	1133	11989	644	58	110	186	24008	145	62	145	59	9	89	83	458	887	0	656	49	208	593	0	0	42	9981	4332
18.7	7747156	0	251	52	47	110	1200	12223	607	44	112	195	23996	175	69	188	131	54	100	143	446	831	95	664	56	181	564	26	0	42	9981	4027
18.8	7683907	0	252	31	39	65	1205	12098	634	67	104	193	23564	115	24	178	99	85	66	125	539	959	65	714	14	210	575	0	7	73	9684	4281
18.9	7343566	13	200	35	39	57	1173	12094	589	56	81	265	23027	133	26	104	53	86	22	125	529	981	89	624	45	173	505	0	9	44	9943	4272
19	7297517	9	224	0	0	48	1167	11677	598	52	73	175	23107	133	0	142	34	111	70	128	406	959	53	662	0	213	529	0	0	45	9786	4186
19.1	7238568	0	213	35	35	67	1190	12234	747	31	119	131	23380	169	49	203	82	56	118	108	517	877	140	645	0	207	551	0	0	60	9844	4222
19.2	7537611	0	279	26	24	53	1111	11968	672	37	128	210	22396	147	63	119	56	110	138	323	841	122	760	49	187	541	0	0	18	9884	4101	
19.3	6927076	4	242	0	10	74	1071	11546	757	47	94	182	22008	132	34	102	38	56	96	147	459	926	65	743	30	189	530	39	0	65	9944	4287
19.4	6860278	13	230	20	6	76	1145	11414	750	26	135	224	21788	151	0	119	57	34	137	64	409	844	23	781	39	194	517	0	0	7	9804	4259
19.5	7474413	13	232	22	10	46	1197	11290	626	51	128	197	22253	180	63	202	75	116	161	100	474	878	115	742	61	166	561	0	0	53	9829	4274
19.6	7436513	10	232	22	24	63	1192	11123	560	6	103	186	21707	134	0	149	80	63	94	175	421	973	103									

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
20.2	7511961	7	193	28	0	34	1857	6576	703	60	109	205	28984	100	29	214	30	112	8	141	568	1035	75	949	0	193	506	15	39	33	10657	45888
20.3	7524461	0	182	17	36	64	2031	5414	645	84	127	246	35245	222	154	272	74	224	127	196	667	847	153	1079	58	218	523	16	30	43	10805	4497
20.4	7510011	4	157	34	0	37	2357	4404	720	76	133	183	40436	181	135	283	126	115	42	74	849	649	45	825	30	219	517	20	16	45	11014	4483
20.5	6761930	0	181	0	11	44	2211	4244	761	90	209	163	40999	242	77	341	95	122	62	129	837	550	106	854	0	288	446	14	11	62	11106	4417
20.6	6616684	27	177	21	27	43	2256	4421	703	59	126	201	39977	157	165	335	150	119	114	156	897	621	106	708	41	179	486	43	18	19	11080	4316
20.7	6649033	0	178	22	19	55	2095	5022	86	138	182	38679	207	94	279	121	121	98	111	988	484	38	874	59	210	473	0	4	44	10691	4197	
20.8	7413614	0	162	25	22	59	2110	6008	678	95	135	213	37410	162	21	223	26	124	127	117	868	453	132	688	32	247	440	0	0	0	10462	4187
20.9	7990549	9	182	10	0	41	1815	6866	673	42	85	183	36409	186	144	308	117	120	150	122	843	502	58	743	38	174	498	0	0	46	10386	4103
21	6916477	10	198	12	29	45	1863	7749	795	77	118	255	35330	212	149	326	115	70	63	58	805	522	177	690	10	210	491	0	0	38	10779	4326
21.1	6974225	8	184	35	21	65	1717	8259	702	77	93	180	34474	180	23	237	102	95	156	155	817	531	75	571	10	201	474	0	12	70	10501	4209
21.2	7189719	20	205	37	36	71	1700	8493	645	75	146	227	32868	238	148	249	106	86	90	84	833	657	131	686	60	205	485	0	15	19	10391	4139
21.3	7591609	5	169	18	17	50	1597	9126	740	35	84	180	31027	129	86	231	37	106	56	54	737	750	86	599	11	132	478	0	0	44	10405	4213
21.4	7868453	14	170	0	7	37	1361	9922	677	48	112	177	29396	172	61	202	53	145	111	134	690	628	123	606	24	197	507	0	0	47	10262	4209
21.5	8074847	5	191	26	35	61	1406	10799	674	22	101	183	27841	73	37	110	77	103	0	160	743	825	110	700	23	189	461	11	39	81	10330	4173
21.6	7734706	0	187	5	9	68	1350	11083	669	20	95	148	26735	148	19	184	55	111	95	139	662	819	34	709	8	206	489	0	0	68	10305	4408
21.7	7621609	0	184	32	23	68	1272	11705	667	39	99	197	25968	126	26	165	63	101	49	113	598	736	85	666	36	175	448	0	0	0	10292	4185
21.8	8771030	14	179	0	32	60	1295	11610	621	33	104	232	25262	159	79	205	7	92	96	181	441	797	119	639	64	207	491	0	0	59	10246	4231
21.9	8040098	7	182	32	24	53	1183	11832	637	27	58	169	24620	41	17	134	68	67	119	132	565	873	0	561	0	134	524	0	0	51	10125	4215
22	7512912	5	209	0	16	38	1191	12345	626	56	107	168	24349	137	96	99	87	26	75	114	527	804	34	654	23	130	560	0	0	21	9777	4224
22.1	7408014	8	216	14	22	68	1149	12428	628	29	68	198	24350	104	62	199	51	53	114	172	501	924	107	606	47	191	551	0	0	58	10227	4186
22.2	7644058	32	198	11	28	52	1227	12523	690	33	56	188	24504	113	24	195	62	80	35	93	594	1023	23	584	13	207	540	28	0	13	10005	4216
22.3	7912901	5	204	19	4	62	1133	12266	640	34	77	159	24489	131	37	161	26	95	217	133	392	908	105	600	0	230	498	0	0	28	9964	4129
22.4	7137171	12	214	18	29	75	1181	12376	628	6	83	202	23816	93	13	161	100	122	27	128	356	913	39	628	46	192	532	0	0	92	9815	4154
22.5	7264518	11	199	15	0	43	1136	12114	656	32	56	210	23477	141	44	177	44	38	60	55	482	881	42	542	17	219	528	21	0	55	9857	4176
22.6	7003774	11	241	30	29	93	1146	12411	636	47	80	236	23356	158	63	159	91	70	25	82	448	864	0	683	43	216	537	0	26	41	10111	4313
22.7	6997224	9	230	9	20	80	1156	12425	628	38	71	232	23670	101	63	136	76	63	63	112	482	930	50	779	35	180	551	7	5	43	10304	4334
22.8	7374615	0	207	0	17	73	1171	12258	686	29	93	204	23712	167	35	156	62	74	113	97	455	978	139	721	43	200	521	5	0	32	10156	4224
22.9	7790554	0	228	16	14	61	1202	12161	658	65	107	212	23956	167	35	156	62	74	113	97	455	978	139	721	43	200	521	5	0	54	9684	4224
23	8079347	15	194	19	12	38	1153	12324	610	34	68	198	23082	133	50	176	69	30	69	218	457	966	88	684	41	195	578	39	8	55	9969	4117
23.1	8092147	13	253	11	31	77	1136	11884	523	72	109	199	22971	156	97	167	157	86	134	99	476	883	49	696	66	149	551	0	0	40	10187	4436
23.2	7339966	6	239	41	21	60	1240	11510	579	56	85	163	23151	126	72	162	99	147	83	96	439	998	132	670	53	172	553	0	0	83	10195	4236
23.3	7203669	0	230	14	18	79	1160	11707	674	49	101	189	23075	173	103	159	158	71	72	160	417	996	41	692	13	143	560	0	0	0	9985	4339
23.4	7198869	0	213	14	19	71	1132	11898	698	36	122	156	22987	153	15	132	0	134	46	111	409	815	127	667	27	233	515	0	0	0	9711	4373
23.5	7314467	19	255	25	42	83	1201	11717	693	19	81	173	21985	56	24	112	64	98	115	166	405	983	55	724	0	167	550	12	10	28	10344	4201
23.6	7344815	0	239	28	10	52	1193	11849	576	21	123	186	22561	130	56	129	96	60	119	129	453	964	109	763	31	129	573	0	0	60	10070	4311
23.7	7418114	10	296	40	48	82	1256	11853	562	34	104	192	22885	140	12	151	17	124	137	95	441	767	5	847	12	224	527	0	0	12	9934	4010
23.8	7418663	25	252	10	10	82	1197	11756	586	47	70	193	21696	75	0	166	54	82	63	91	475	936	32	743	28	238	514	0	0	89	10153	4407
23.9	7073573	5	228	0	15	56	1148	12352	589	50	88	220	22138	87	0	118	49	97	102	131	316	993	135	798	0	205	534	0	0	82	9995	4438
24	7346916	11	225	29	57	90	1226	12673	561	32	72	181	22294	43	0	155	34	76	134	100	494	926	111	742	40	212	510	0	0	45	10114	4473
24.1	7321066	9	245	39	17	84	1248	12775	547	30	90	193	22970	114	103	155	77	121	123	199	518	870	188	1035	42	181	563	34	0	67	10143	4240
24.2	7887752	0	220	9	16	72	1308	12367	572	51	37	154	22377	159	66	388	46	130	69	135	404	952	169	1049	13	230	516	11	11	37	10046	4451
24.3	7965000	21	227	27	14	49	1196	11451	519	7	85	221	22378	101	99	604	39	106	100	151	404	931	132	1060	37	165	501	0	0	43	9970	4302
24.4	7967200	18	249	24	16	59	1265	11272	546	34	105	166	22630	112	15	258	135	73	54	95	517	803	165	1054	101	179	519	28	0	31	9952	4417
24.5	7920501	7	205	20	22	72	1288	10610	631	50	94	178	21783	98	19	111	27	62	75	113	496	855	81	1048	18	185	490	18	0	0	10322	4396
24.6	7972900	0	210	35	0	53	1341	9737	546	52	83	180	24930	133	71	170	96	111	187	104	460	907	80	952	44	158	481	0	6	80	10464	4474
24.7	7947101	7	188	0	18	48	1729	7485	721	36	116	200	32905	142	126	257	66	89	84	114												

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
25.3	7258118	0	166	25	5	44	1839	6308	720	84	109	198	34438	237	131	282	101	84	101	136	824	537	87	620	21	190	490	21	0	56	10475	4183
25.4	7446563	26	189	0	27	65	1874	7113	667	63	93	267	34054	182	110	263	70	130	66	39	786	461	100	703	31	217	482	0	0	16	10250	4210
25.5	6796279	0	156	18	0	42	1783	7808	673	74	129	248	33066	179	45	229	100	194	159	67	695	488	67	745	60	208	471	0	0	29	10537	4230
25.6	7004774	10	168	9	16	52	1640	8379	718	89	80	232	31575	181	119	231	110	156	129	123	812	492	139	728	0	179	493	0	0	46	10551	4224
25.7	8315591	12	174	9	10	52	1568	9093	728	63	111	233	30550	184	97	242	91	131	106	41	730	591	200	633	47	197	479	11	10	54	10427	4189
25.8	8227293	0	184	30	16	46	1475	9734	628	25	193	219	29147	151	73	196	82	147	101	95	740	681	79	505	35	162	553	6	17	40	10270	4155
25.9	8377990	0	218	26	16	71	1485	10408	648	70	123	216	28456	135	47	174	97	76	55	94	694	680	62	600	52	165	509	0	28	25	9987	4155
26	7756205	28	208	13	0	47	1404	10652	674	46	83	192	27334	133	93	219	45	128	113	133	706	769	114	685	23	160	496	0	0	40	9872	4271
26.1	7381615	22	198	19	8	32	1341	11032	623	47	112	231	26678	142	101	182	98	54	124	88	618	692	113	759	31	216	552	0	7	40	9891	4109
26.2	7268868	16	205	34	24	83	1318	11758	670	33	107	238	25844	169	64	160	29	137	123	8	683	774	36	661	41	207	492	0	0	26	10071	4220
26.3	7784654	10	219	32	0	62	1230	11954	682	51	106	219	25222	159	100	147	130	38	46	92	597	867	139	550	21	164	513	8	0	37	10086	4171
26.4	7336616	19	200	20	29	80	1183	12101	646	26	81	261	24644	147	76	161	70	77	130	132	555	856	68	625	15	154	542	0	0	62	9993	4074
26.5	7259318	21	236	6	21	81	1183	12004	596	37	64	241	24575	169	108	270	140	97	50	141	476	822	99	645	62	197	502	17	9	103	9950	4195
26.6	7184220	11	196	8	13	80	1265	12511	664	50	97	225	24180	151	64	162	11	40	87	123	463	996	55	543	11	227	576	0	0	59	9921	4194
26.7	7087672	0	206	30	34	55	1168	12633	617	15	65	163	23766	93	61	168	31	79	122	144	511	968	85	653	29	183	528	16	0	0	9923	4256
26.8	7059223	0	218	10	26	57	1161	12762	551	29	90	191	23318	111	66	123	72	127	15	94	559	956	92	666	40	152	487	0	19	24	10274	4323
26.9	7830804	19	243	29	31	77	1179	12449	522	35	117	175	23034	63	0	87	51	43	87	84	358	952	135	549	50	200	494	0	0	24	10011	4307
27	7770955	5	252	20	28	62	1132	12582	576	46	106	198	23367	128	67	162	53	72	39	114	500	891	108	644	17	204	495	33	0	40	10095	4261
27.1	7363415	29	224	16	24	70	1082	12541	681	0	99	190	22987	103	8	152	0	56	0	77	450	932	159	556	25	200	520	58	26	72	9915	4131
27.2	7726156	44	246	30	40	76	1122	12534	701	50	79	222	23234	156	65	149	90	81	98	116	464	964	67	571	19	188	510	24	0	8	10158	4274
27.3	6952375	12	227	13	5	53	1151	12520	665	39	107	211	23109	109	0	131	41	33	96	142	418	1067	107	653	0	236	552	12	0	44	9737	4261
27.4	7047773	21	257	20	19	55	1148	12307	679	47	111	228	23444	130	17	139	28	140	89	94	498	978	117	636	28	217	517	0	0	0	10077	4313
27.5	6914626	8	263	17	0	59	1190	11925	657	32	110	223	23337	140	53	186	117	95	28	127	470	988	0	681	40	188	523	31	0	71	9924	4282
27.6	6888977	7	271	5	30	66	1133	11928	566	37	139	278	22955	139	27	138	25	8	29	106	397	842	63	722	44	209	571	0	0	31	9988	4279
27.7	6917777	42	226	39	39	90	1098	12273	595	57	87	206	22882	124	0	176	0	91	74	81	443	795	62	709	15	222	497	61	5	28	9993	4344
27.8	6863728	0	244	45	44	79	1264	11812	727	43	79	169	22785	109	0	151	43	100	113	148	475	918	75	680	0	196	559	0	0	44	10151	4437
27.9	6795880	5	258	28	19	83	1192	11963	657	33	112	180	22690	7	81	68	130	137	127	433	835	79	647	48	169	592	47	0	72	10125	4223	
28	7238918	11	232	14	23	68	1160	11722	598	22	94	191	22446	123	31	161	39	119	73	64	425	900	125	749	44	169	592	6	8	57	10019	4320
28.1	7542561	19	241	9	0	68	1186	11417	576	12	103	144	22478	175	40	180	77	100	81	218	358	944	87	657	35	218	590	9	0	33	9692	4264
28.2	7581160	22	239	0	20	59	1114	11518	679	54	116	196	22080	154	91	114	87	120	145	55	480	848	0	775	0	223	555	0	0	0	9960	4279
28.3	7583809	22	251	14	16	93	1138	11114	680	7	91	197	23160	123	109	131	134	30	86	151	336	961	24	830	33	162	589	0	0	77	9911	4255
28.4	7179070	0	233	31	17	67	1199	11469	660	31	104	166	23507	105	69	208	35	0	32	163	430	948	129	918	46	163	559	42	36	43	10026	4503
28.5	6894677	0	285	39	37	113	1241	11895	598	69	87	122	22852	206	58	175	45	42	44	75	461	840	68	847	55	220	642	0	13	42	9838	4312
28.6	6826529	0	255	48	35	110	1222	11360	512	48	117	202	21966	149	58	142	84	80	70	179	481	878	76	951	67	155	543	0	17	0	10108	4277
28.7	6847078	14	247	11	17	43	1193	10391	546	70	88	193	21574	151	91	112	64	36	142	130	468	903	148	1055	36	168	534	11	0	78	10076	4443
28.8	6864578	6	241	17	8	66	1257	9901	601	59	111	143	22143	156	83	206	107	161	71	138	486	806	88	998	38	178	482	27	0	65	9809	4258
28.9	6841478	14	213	16	0	47	1245	9410	659	64	138	159	23529	100	75	156	56	84	106	193	458	858	50	1068	11	187	531	0	0	62	10309	4313
29	6809129	0	174	12	0	33	1378	8808	692	37	124	244	26575	156	120	153	77	50	88	151	511	1025	114	1059	6	138	654	60	0	46	10494	4425
29.1	7014824	9	176	25	40	66	1870	7557	690	45	113	225	32144	137	40	266	73	102	64	227	561	924	24	1003	57	224	552	0	0	50	10578	4449
29.2	7297317	10	159	0	0	30	2053	5455	649	46	109	230	39379	189	130	287	53	178	103	138	757	778	59	1106	29	216	492	0	0	29	10710	4483
29.3	7091172	24	171	0	0	20	2306	4205	759	48	123	208	41487	281	198	311	61	118	0	132	860	567	13	840	50	235	499	0	42	71	10917	4492
29.4	7241418	0	164	23	10	39	2296	4410	732	59	167	248	41523	284	111	296	92	134	146	93	755	580	101	658	43	254	480	0	0	31	10933	4247
29.5	7669857	0	166	10	20	68	2316	4563	684	62	98	232	41296	191	125	317	105	68	86	112	841	414	159	811	70	234	480	0	0	6	10585	4111
29.6	6748481	6	183	10	27	58	2175	4908	834	58	163	157	39376	190	103	305	151	67	136	165	929	497	62	648	26	156	458	0	0	73	10476	4085
29.7	7284417	26	199	23	36	61	1978	5537	710	70	116	220	38155	194	104	281	57	171	123	143	806	514	128	582	68	251	429	0	0	27	10622	4143
29.8	7998799	0	209	18	15	69	1911	6423	741	84	141	260	36858	205	126	291	130	88	65	137												

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
30.4	8101896	0	170	49	36	82	1389	10787	644	20	77	173	28000	105	9	256	118	99	82	105	603	790	98	714	41	212	483	0	29	10121	4154	
30.5	7783505	13	163	7	10	50	1335	11152	662	77	100	213	27402	177	67	215	81	112	60	31	623	758	85	611	9	198	543	0	0	64	9982	4040
30.6	8168395	12	168	10	0	59	1332	11516	687	65	80	207	26761	108	79	187	103	99	137	147	618	784	80	655	19	178	518	5	0	21	10020	4111
30.7	7563360	16	159	0	0	40	1224	11832	675	15	57	166	26027	63	42	153	93	59	61	142	655	821	68	584	19	155	512	0	0	34	9872	4224
30.8	7464662	28	223	38	34	76	1184	11938	614	28	63	226	25236	112	10	115	62	70	107	164	478	851	119	497	19	172	495	0	0	19	10038	4387
30.9	7419414	6	207	0	0	52	1258	11855	643	32	81	227	24797	123	61	198	66	138	106	168	623	847	192	560	45	147	505	0	0	86	10107	4540
31	7293267	11	228	22	19	61	1251	12205	627	68	114	262	24672	102	151	67	152	59	157	474	873	127	639	31	216	520	19	0	63	10043	4336	
31.1	7213819	0	216	0	0	21	1126	12418	621	76	56	215	24453	69	14	157	26	77	109	115	550	937	27	575	0	213	532	22	0	37	9875	4275
31.2	7207869	29	234	29	26	58	1208	12598	650	38	108	221	24151	133	13	95	54	114	120	175	523	988	89	653	28	181	494	18	0	49	9931	4242
31.3	7849153	14	234	16	10	37	1142	12430	630	0	104	170	23676	135	32	160	12	90	61	65	438	927	84	685	39	212	466	0	0	23	9862	4224
31.4	7819254	5	228	22	46	64	1158	12489	701	46	120	221	23740	163	61	135	38	120	122	149	474	966	43	640	22	202	502	0	0	50	9864	4450
31.5	8376890	0	185	22	12	65	1141	12189	633	79	101	239	23569	121	28	109	7	138	97	51	424	849	73	621	17	158	500	0	0	63	10017	4317
31.6	7617458	12	234	15	28	73	1114	12352	613	47	87	218	23394	146	93	141	16	148	174	116	504	939	66	714	46	195	500	0	0	63	10017	4365
31.7	7737756	17	201	0	18	46	1118	12123	623	28	93	181	23119	155	20	148	45	100	42	168	457	1003	146	581	49	226	548	20	29	41	10259	4441
31.8	7307317	18	228	25	25	69	1056	12329	589	53	89	211	22632	195	146	178	164	54	115	114	561	941	0	624	40	136	568	35	14	40	10093	4353
31.9	6975725	0	242	18	25	84	1162	12235	635	14	98	206	22837	100	68	97	18	91	118	41	434	949	131	738	40	186	553	0	0	58	9989	4268
32	7116872	16	199	8	46	67	1153	12181	651	53	80	174	22790	152	77	136	115	44	50	76	361	986	27	710	28	160	575	0	11	40	10271	4437
32.1	6963375	0	271	11	12	87	1138	12398	708	51	110	224	22602	110	0	129	0	47	22	87	468	932	34	822	25	224	521	0	24	37	10225	4412
32.2	6942975	0	221	47	21	77	1195	12439	603	46	129	186	22985	176	72	152	96	151	118	136	467	954	117	843	55	197	579	0	0	50	10110	4401
32.3	7382615	0	212	35	38	70	1218	12035	552	60	102	180	23289	116	0	144	21	40	74	109	529	875	53	747	73	209	551	12	0	46	10273	4359
32.4	7624659	0	218	21	0	69	1193	12224	686	19	113	175	23422	79	39	149	130	120	109	180	494	989	0	825	17	140	521	10	0	42	10215	4397
32.5	7670107	0	253	14	12	45	1144	12544	608	90	92	220	23605	170	25	154	134	102	126	78	507	1024	88	949	23	187	546	0	6	28	10133	4496
32.6	7664707	0	229	8	0	65	1201	12749	613	25	81	200	22820	139	49	149	71	54	137	129	393	895	114	901	0	150	562	0	0	89	10064	4371
32.7	7799954	18	250	51	56	64	1165	12662	582	30	101	154	22297	144	14	137	0	135	78	128	435	947	97	880	47	208	520	0	0	78	10204	4436
32.8	7676057	13	285	58	13	89	1158	11800	583	31	77	138	21636	111	64	125	37	124	149	98	414	787	79	1019	57	191	528	0	0	19	10025	4384
32.9	7430713	0	269	33	27	76	1124	10852	652	53	75	201	21292	130	24	95	89	74	92	113	468	948	130	992	14	193	609	0	0	0	10160	4598
33	7431063	25	244	28	23	67	1135	11335	773	53	115	147	22016	147	13	171	131	28	111	147	964	116	945	21	121	553	5	0	32	10285	4416	
33.1	6927376	29	267	52	50	99	1347	11517	721	21	96	180	23240	87	0	159	0	49	106	180	428	928	100	960	29	220	529	0	0	0	10430	4313
33.2	6889127	12	214	16	6	80	1532	10270	730	55	96	228	25449	149	17	207	88	97	25	69	545	958	0	988	35	160	614	0	7	21	10392	4349
33.3	6894477	13	200	12	0	44	1745	9474	827	34	125	238	28729	186	86	247	29	121	57	135	528	932	97	921	47	186	563	0	0	55	10334	4459
33.4	6978775	14	220	29	28	44	2045	7771	732	44	107	222	34457	204	131	223	153	102	110	159	550	916	43	893	58	159	521	46	0	14	10500	4568
33.5	6967475	0	166	20	11	47	2284	5797	719	79	140	234	39795	298	130	323	149	179	141	121	694	656	31	786	39	244	511	0	0	47	10834	4366
33.6	6941926	30	179	38	20	62	2383	5005	773	76	113	204	42160	249	108	359	181	119	158	149	877	427	0	863	18	213	494	0	0	9	10389	4157
33.7	7100622	23	177	17	17	68	2335	5018	773	68	140	239	41875	307	215	355	128	158	143	74	848	452	100	737	55	194	501	0	0	35	10206	4208
33.8	6782930	28	189	26	7	54	2037	5585	733	51	132	204	37786	214	154	303	120	49	127	119	801	434	95	638	39	224	513	0	0	31	10010	3876
33.9	7057323	19	196	0	12	76	1766	6593	702	37	129	193	34771	167	95	254	102	109	151	99	855	497	164	645	52	186	426	0	0	57	10492	4211
34	7320766	8	154	14	7	39	1680	7307	666	0	106	182	32552	241	144	253	79	182	0	83	792	489	99	664	60	193	460	19	96	23	10533	3984
34.1	7436064	0	187	48	28	56	1602	8336	674	45	106	246	31360	183	64	215	59	96	127	137	817	599	84	684	46	198	506	0	0	37	10295	4170
34.2	8305592	20	228	23	16	43	1460	9311	647	54	68	187	30378	84	41	115	85	71	136	43	773	662	68	667	20	185	498	0	0	44	10111	4052
34.3	7927251	0	151	0	13	38	1513	10142	659	57	100	247	29823	165	67	242	0	76	60	129	753	655	140	681	28	216	494	0	0	25	10297	4242
34.4	7648258	5	175	5	13	44	1367	11113	655	26	110	230	28047	94	55	167	34	101	135	141	678	668	163	660	25	176	495	0	0	0	9901	4271
34.5	7792804	5	209	34	24	50	1370	11544	609	34	83	208	26117	138	74	205	70	155	73	76	660	834	136	626	40	159	515	0	0	20	9840	4251
34.6	8058298	14	198	19	25	76	1262	11921	603	54	73	208	26117	138	74	205	70	155	73	76	660	834	136	626	40	159	515	0	0	35	9968	4156
34.7	7689457	5	171	19	0	47	1217	11903	649	46	91	186	25846	95	30	194	36	46	177	150	623	864	82	538	0	197	550	12	0	35	9968	4156
34.8	7928601	0	206	0	11	53	1248	11869	624	25	88	244	25698	79	80	149	34	75	0	116	526	908	90	674	56	165	517	0	31	24	10068	4344
34.9	7944601	0	229	40	36	62	1205	12155	644	28	60	209	25438	169	66	245	121	76	157	139	541	907										

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
35.5	7940851	8	199	0	0	55	1150	11754	649	29	105	207	23546	159	54	189	31	139	185	36	497	926	76	633	43	186	491	0	0	68	9844	4257
35.6	7542261	21	263	29	32	97	1128	12148	605	39	119	194	23459	102	0	128	27	171	132	151	549	891	90	655	91	221	526	0	0	35	10127	4425
35.7	7894252	16	263	6	33	51	1188	11515	660	30	65	201	23025	61	0	117	0	122	125	145	422	880	0	760	0	228	512	0	0	13	10058	4316
35.8	7033523	0	264	42	11	59	1132	11953	609	57	82	206	23114	174	61	155	100	183	138	178	408	951	145	768	24	190	546	0	0	86	9869	4428
35.9	7025074	0	230	13	19	42	1141	11778	646	37	116	160	22515	112	76	154	66	75	113	150	383	980	97	664	10	157	490	0	0	52	10003	4237
36	6976675	0	240	8	13	67	1160	12073	676	37	119	22406	121	108	56	134	100	134	100	56	464	930	145	578	5	160	523	0	0	0	9882	4340
36.1	6902727	16	245	0	8	48	1112	11970	654	33	112	173	22887	129	52	141	54	155	154	142	444	911	58	801	51	180	563	0	0	79	10245	4388
36.2	6849078	0	244	6	5	53	1168	11588	607	45	81	161	23526	154	42	152	95	51	100	107	385	896	171	871	61	163	562	0	0	10	10275	4492
36.3	6829728	25	232	7	18	36	1155	11924	629	39	84	198	22226	108	33	128	64	48	96	418	895	71	915	36	206	598	0	0	73	10040	4441	
36.4	6828028	0	208	10	7	61	1060	11944	525	20	87	175	20720	104	0	153	30	118	112	136	388	927	118	811	12	207	522	0	0	83	10013	4406
36.5	6812579	0	254	14	37	85	1152	12202	568	37	113	183	21493	129	12	198	47	57	45	92	500	867	117	993	56	195	546	0	17	37	10142	4528
36.6	6859978	0	230	28	16	52	1227	11978	641	41	87	187	22311	152	108	156	115	122	104	78	411	1035	148	904	26	147	565	0	0	64	10345	4466
36.7	6821079	15	264	26	22	69	1400	11354	752	39	85	236	23938	173	64	151	122	102	126	98	435	1071	26	948	29	208	566	26	0	33	10355	4490
36.8	6842629	33	221	14	7	76	1504	8729	781	31	90	185	26651	161	72	87	0	145	106	40	540	987	73	1035	33	234	563	0	0	15	10841	4527
36.9	6780630	0	229	7	0	45	1714	6648	841	16	125	292	31340	214	119	247	22	145	83	98	440	988	159	1003	46	190	596	0	0	31	10934	4675
37.1	7034474	19	278	26	18	60	2018	5565	891	98	127	278	39477	279	229	327	139	75	105	163	673	767	91	1300	46	190	596	0	0	36	10645	4337
37.2	6916877	35	182	21	22	39	1860	5069	760	72	130	257	34613	208	175	296	151	132	123	171	698	608	34	1084	52	166	482	0	0	41	9717	4059
37.3	6834429	20	158	18	29	40	1825	6106	709	29	130	279	34688	215	148	301	139	138	97	143	737	550	33	761	49	148	474	0	0	0	10866	4742
37.4	7462413	13	169	0	24	45	1838	7302	772	47	95	228	34638	218	92	308	85	117	120	61	791	458	81	741	33	178	496	0	0	36	9945	3993
37.5	7709406	14	177	21	26	61	1699	7905	687	43	116	203	33209	167	86	224	49	102	74	103	823	454	98	625	41	179	517	0	0	28	10385	4128
37.6	7663108	11	196	22	27	58	1587	8842	661	31	108	174	31548	169	66	208	135	99	71	140	842	525	9	625	41	179	517	0	0	28	10385	4128
37.7	7605909	0	192	28	36	71	1594	9739	722	36	96	206	30787	135	85	181	80	72	132	148	883	649	91	671	30	136	501	0	0	58	10544	4235
37.8	7985399	0	218	13	12	47	1542	9843	652	31	123	243	30030	155	136	301	157	67	74	152	752	570	103	701	47	205	507	0	0	41	10498	4173
37.9	8215594	16	227	22	24	85	1424	10348	584	54	103	253	29503	203	176	197	68	49	34	45	725	617	116	737	68	160	569	0	0	49	10214	4131
38	7986799	4	209	31	25	57	1352	11088	650	60	92	266	28577	121	55	188	40	144	65	82	775	642	38	690	48	153	472	0	0	36	10286	4203
38.1	7843453	0	214	37	54	82	1347	11501	705	82	90	277	28232	173	77	252	66	59	158	105	707	639	82	592	37	206	513	0	0	12	10055	4027
38.2	7098622	0	211	13	14	76	1358	11441	711	55	87	185	27426	125	50	142	82	181	154	45	677	757	53	588	9	214	453	0	0	0	10263	4086
38.3	7109421	0	185	10	0	44	1286	11498	704	49	93	189	27091	158	50	170	27	77	81	107	583	799	119	668	6	187	502	13	0	20	10119	4317
38.4	7261368	0	236	21	28	51	1325	11922	653	21	133	231	26582	185	68	248	54	91	146	122	643	822	78	652	46	184	549	0	0	48	9909	4320
38.5	7290367	29	182	22	37	78	1264	12004	594	55	44	211	25633	133	110	194	70	14	51	157	573	902	116	616	37	151	573	0	0	67	10226	4139
38.6	7219669	0	237	0	20	49	1339	12188	646	17	74	231	25584	157	80	192	129	206	171	152	475	984	85	595	37	162	548	0	0	43	10285	4399
38.7	7224319	0	204	41	12	65	1271	12487	619	46	94	214	25501	89	46	164	20	0	100	37	569	835	122	605	40	161	514	0	0	39	10209	4290
38.8	8056698	5	210	10	21	69	1301	12819	694	47	107	219	25379	104	64	166	78	63	195	175	466	1016	99	611	0	143	505	14	0	46	10278	4442
38.9	8090997	4	226	9	25	78	1304	12501	767	32	78	214	26170	126	87	213	119	65	154	170	573	1021	128	629	0	189	514	5	0	29	10264	4387
39	8470738	0	233	43	28	104	1323	13131	699	40	100	214	26551	157	12	242	30	120	161	108	439	839	127	639	74	213	548	0	0	25	10126	4496
39.1	8425488	0	260	14	0	71	1384	13123	622	34	81	228	26195	138	29	165	54	54	31	140	462	982	75	603	48	197	564	0	5	23	10231	4308
39.2	8392439	0	275	47	48	76	1330	13409	688	23	92	230	25701	142	20	171	46	95	112	202	497	839	43	796	0	177	633	52	0	55	9930	4347
39.3	7982149	4	244	18	4	76	1203	13075	643	26	115	192	24343	126	90	154	80	153	90	121	429	928	103	655	30	186	593	0	28	52	10208	4380
39.4	7951100	14	274	44	36	84	1290	12934	676	46	124	202	24107	170	94	179	116	73	130	188	440	953	69	783	54	180	614	0	0	51	10164	4322
39.5	7906701	10	246	21	30	86	1243	12393	661	53	114	156	23872	136	78	150	103	155	93	106	453	834	138	730	23	130	551	7	0	22	9915	4414
39.6	8415038	20	257	19	21	62	1444	12387	727	4	87	184	23180	137	72	140	42	55	16	14	399	912	106	802	12	196	573	0	19	6	9941	4166
39.7	8399039	0	243	25	39	52	1444	11667	578	12	105	173	21941	65	0	143	89	14	87	205	467	922	41	840	87	179	526	39	0	45	9903	4312
39.8	8443938	0	234	21	25	57	1043	11082	596	30	113	197	21003	76	0	108	0	67	0	148	414	964	90	842	13	184	549	0	29	12	10077	4345
39.9	8088397	34	193	6	20	49	1034	10643	519	66	79	191	18631	63	0	92	63	37	0	35	476	879	95	841	53	123	484	28	47	52	9964	4233
40	8183994	0	213	6	20	49	1034	10643	519	66	79	191	18631	63	0	92	63	37	0	35	476	879	95	841	53	123	484	28	47	52	9964	4233
40.1	8178345	6	199	18	14	67	1088	8286	451	62	77	190	18631	63	0	92	63	37	0	35	476	879										

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
40.6	7392064	20	160	21	0	28	2119	3485	717	47	77	203	38377	148	86	220	83	99	127	129	849	683	177	862	0	200	470	12	0	42	10887	4537
40.7	7204119	20	166	14	14	46	2233	3684	712	78	180	219	40043	176	102	280	54	102	85	162	935	457	116	884	63	204	460	11	15	70	10786	4297
40.8	7053623	0	162	23	7	49	2288	3760	704	108	118	211	40367	262	174	356	85	118	83	114	949	463	171	768	38	197	498	0	0	40	10814	4329
40.9	7285917	20	155	0	7	56	2259	4019	762	93	114	216	39668	243	154	239	81	88	72	92	919	454	46	734	23	196	479	0	0	67	10551	4031
41	7191219	0	164	16	8	16	2121	4334	728	41	142	222	39789	203	117	339	112	60	12	156	974	382	0	686	53	180	445	31	36	57	10718	4130
41.1	6190845	0	155	0	32	2107	4914	685	45	98	119	210	39071	196	129	305	179	152	134	66	853	450	179	568	53	227	491	0	0	36	10605	4224
41.2	6440638	13	183	24	0	32	1966	5566	790	85	119	219	38082	189	76	269	76	122	150	199	931	354	35	669	0	218	420	0	0	61	10511	3974
41.3	6772630	7	173	14	0	31	2015	6089	743	57	117	188	36809	181	102	324	130	122	188	153	889	451	9	664	27	197	461	0	0	15	10291	4162
41.4	7573160	0	164	0	8	30	1933	6726	762	24	109	161	35591	144	20	230	61	98	89	55	911	472	117	687	14	188	470	0	0	26	10395	4130
41.5	8210794	23	199	54	37	87	1934	7376	763	72	118	239	34417	165	86	249	118	43	67	219	888	523	20	773	16	190	491	0	4	49	10358	3959
41.6	8045148	9	209	36	9	53	1737	8093	682	42	120	234	33328	172	83	234	52	62	120	115	805	597	0	592	76	199	477	0	10	18	10268	4169
41.7	8100547	29	176	7	11	27	1645	8682	681	60	113	225	31536	136	73	203	42	122	116	143	837	121	732	36	212	489	13	18	0	10463	4185	
41.8	8108946	0	160	26	10	67	1512	9273	674	77	119	194	30943	160	0	220	58	26	108	124	808	658	104	627	21	211	505	0	0	49	10183	4250
41.9	8313142	7	149	25	10	40	1509	9745	636	75	73	161	30157	145	52	223	0	116	45	183	570	806	82	624	29	221	467	25	13	14	10273	4267
42	8382890	25	181	32	0	61	1517	9989	629	40	98	187	29115	152	93	236	78	94	137	187	665	601	51	668	17	168	497	0	0	9	10264	4325
42.1	7567610	14	200	15	21	70	1411	10213	661	4	99	251	27951	174	62	208	47	89	82	159	687	814	54	558	35	201	496	0	0	0	10102	4136
42.2	7501412	26	200	33	10	50	1434	10432	707	0	122	214	27286	182	69	226	74	127	37	170	534	748	51	579	33	207	515	0	0	54	10012	4248
42.3	8295192	0	173	12	23	52	1257	10933	638	39	103	217	26722	119	21	132	26	18	48	116	528	830	84	631	23	179	496	0	0	34	10295	4279
42.4	8330591	11	173	16	26	47	1297	11196	594	43	96	217	25904	150	76	179	42	81	47	61	477	872	93	627	45	160	509	0	13	30	9926	4304
42.5	7391614	0	174	20	15	75	1265	11493	628	37	105	212	25285	133	17	218	31	101	88	239	469	946	70	487	33	236	507	14	0	90	9883	4206
42.6	7287117	0	167	11	26	71	1243	11675	634	55	77	207	25275	60	62	118	87	42	149	147	496	952	21	570	0	179	509	18	9	58	9858	4415
42.7	8039698	8	199	4	0	23	1200	11908	593	39	119	192	24908	165	47	150	5	116	71	110	506	964	82	603	22	234	542	0	0	52	10283	4333
42.8	7916451	5	203	12	22	68	1269	11845	577	39	113	212	24334	162	94	172	65	112	26	128	508	861	51	617	40	191	509	39	34	27	9847	4261
42.9	7754855	10	181	29	10	70	1210	12233	660	28	117	248	23889	104	33	131	77	137	114	134	470	856	48	636	22	118	510	18	0	113	9903	4180
43	7099922	0	212	20	0	48	1117	12346	591	38	76	205	23497	62	20	105	72	170	153	550	1043	125	628	0	144	489	34	0	33	9675	4350	
43.1	7199669	8	177	0	15	45	1124	12298	638	25	95	208	23651	99	69	152	125	53	15	133	490	917	105	580	25	162	535	29	0	29	9903	4415
43.2	6983524	12	243	18	45	85	1292	12541	707	12	79	214	23420	184	40	170	92	100	94	99	410	990	98	555	16	169	542	38	0	81	10083	4405
43.3	6969125	7	184	23	19	50	1154	12435	571	44	90	177	23177	109	0	170	0	36	55	117	385	941	100	665	32	227	531	0	0	21	10094	4336
43.4	6916677	21	232	14	0	50	1083	12355	574	73	47	195	22828	156	44	195	98	79	34	115	440	876	0	641	12	176	542	0	0	14	9980	4303
43.5	6909927	4	193	0	0	60	1074	12465	643	0	108	224	22682	87	0	112	75	130	54	111	539	1009	111	639	23	176	511	0	0	39	9858	4415
43.6	6857978	0	204	13	31	66	1140	12013	631	44	120	134	22792	111	62	112	74	91	135	76	512	969	52	620	53	189	508	15	0	24	10018	4305
43.7	7151820	13	219	21	34	74	1180	12342	651	55	116	184	22568	161	34	161	26	42	104	142	423	919	114	640	19	194	541	21	0	64	10263	4424
43.8	7619109	10	191	14	22	71	1120	12374	648	64	70	145	22743	169	25	124	74	59	71	30	459	977	57	746	17	172	552	13	11	16	9999	4209
43.9	7311367	16	217	31	48	62	1128	12174	714	57	80	174	22494	129	48	110	87	7	100	129	359	890	122	597	40	182	562	7	0	31	9767	4277
44	7265918	5	230	37	30	51	1084	12222	625	38	61	238	22646	127	39	136	70	100	180	163	527	956	0	779	28	211	534	0	0	32	9912	4223
44.1	6874477	0	246	22	5	71	1167	11742	647	44	85	197	23035	128	55	150	17	110	41	132	374	905	112	635	32	187	558	0	0	47	9938	4153
44.2	6861178	0	205	8	25	55	1119	12065	645	34	85	182	23264	162	62	192	16	86	113	83	464	1076	96	787	9	209	510	0	0	60	10216	4370
44.3	6839628	28	238	18	32	70	1155	12096	708	44	71	143	22928	145	23	166	139	92	124	135	448	1001	93	834	0	177	526	36	28	51	10056	4403
44.4	7268968	5	230	23	12	75	1137	11798	590	0	68	188	22912	114	14	102	51	125	152	45	328	906	128	671	66	178	522	0	0	0	10009	4238
44.5	7665908	0	265	36	31	72	1163	12169	584	43	79	214	22140	162	48	123	51	160	68	79	497	891	32	733	51	177	573	26	0	13	10285	4216
44.6	7645708	0	221	17	26	54	1071	12096	590	0	89	204	21971	123	0	100	18	73	114	153	508	877	0	920	44	230	565	12	6	71	9961	4303
44.7	7858853	0	267	28	30	84	1165	12120	823	50	67	203	21350	100	40	144	50	73	146	107	461	966	153	853	9	178	569	12	0	75	9975	4271
44.8	7706706	0	227	31	31	88	1134	11671	700	21	106	228	21533	134	92	177	70	103	108	93	367	916	109	872	57	131	567	8	0	17	10053	4287
44.9	7658208	18	218	15	7	41	1174	10753	643	61	97	161	21426	68	0	168	40	44	82	177	475	979	0	821	40	236	547	39	0	18	9815	4218
45	7514812	12	263	15	41	54	1228	10340	777	52	92	171	22497	145	51	194	27	160	128	91	388	901	81	772	47	217	510	0	0	10	9717	4260
45.1	7095472	0	199	25	48	74	1308	9932	958	7	140	158	23480	171	84	120	109	164	104	107	514	821	50	928								



Position (nm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
45.7	6728931	0	175	21	18	72	1493	7621	593	36	117	194	27347	151	26	232	79	68	98	174	624	853	229	963	7	183	526	14	0	37	10069	4375
45.8	6677232	4	141	9	0	20	1706	6830	608	26	94	177	30082	127	41	160	124	71	131	153	649	778	87	938	34	189	501	19	0	75	10588	4352
45.9	6940375	0	146	27	29	61	1942	6468	702	53	90	184	34995	175	79	279	32	76	74	114	782	608	703	11	234	507	0	5	22	10417	4210	
46	7233119	0	201	0	0	39	1953	6330	723	89	113	256	35950	235	139	353	182	166	90	124	845	596	199	712	20	197	541	0	17	103	10590	4310
46.1	7046973	12	164	33	54	77	1884	6503	618	80	146	208	33964	204	149	315	154	79	134	174	827	525	99	676	62	164	551	26	6	66	10434	4247
46.2	7270368	0	165	0	5	33	1664	6375	707	43	81	172	33054	193	104	243	113	87	123	151	884	477	91	487	11	175	489	0	6	51	10476	4125
46.3	6805729	16	172	21	16	56	1755	7037	633	86	89	205	32393	239	97	278	114	125	84	76	778	462	16	605	42	195	487	6	0	22	10273	4228
46.4	6868377	17	171	19	14	47	1659	7990	638	50	115	229	31846	161	97	192	120	87	115	119	858	597	32	656	54	186	506	37	0	62	10231	4000
46.5	7347416	12	170	18	25	51	1612	8548	694	43	117	190	30690	177	65	307	53	89	124	111	649	570	133	646	35	234	458	0	0	18	10187	4143
46.6	7193419	9	180	24	12	41	1605	9200	594	44	108	245	29624	189	98	226	55	105	18	157	837	676	29	674	58	211	487	0	38	7	10337	4020
46.7	6909276	0	170	10	0	47	1480	9491	707	33	105	242	28911	131	81	244	71	80	107	185	620	688	59	660	0	203	473	24	12	53	10103	3871
46.8	7300467	0	203	35	31	64	1504	10319	583	27	108	201	27729	146	58	201	64	143	138	109	531	845	151	570	37	150	503	0	0	0	9975	4169
46.9	7413764	8	188	9	26	64	1359	10673	740	51	83	201	26658	138	109	218	116	93	41	123	606	772	67	637	0	160	519	0	31	61	10150	4145
47	7392565	38	212	47	42	99	1299	11230	715	35	100	178	26042	133	84	218	26	0	42	42	574	816	145	700	25	198	535	30	8	27	10167	4144
47.1	7208219	14	186	0	0	65	1273	11385	693	29	92	195	25417	162	42	134	33	96	131	110	622	819	90	571	18	222	553	0	0	34	9995	4191
47.2	7700507	0	185	30	27	52	1253	11509	556	0	66	238	24788	97	58	151	100	119	133	113	594	853	170	691	49	206	475	0	12	50	10017	4085
47.3	7912251	0	190	0	10	46	1149	11384	636	26	56	207	24129	152	8	168	47	118	36	105	535	811	143	702	8	237	507	0	10	40	9860	4357
47.4	7787654	0	210	18	22	73	1205	12076	600	37	90	197	24004	105	4	128	29	52	157	126	585	889	79	670	27	206	514	0	0	60	9941	4256
47.5	7155521	12	206	9	0	65	1152	12065	634	35	93	219	23552	93	66	133	99	43	15	154	463	847	191	553	22	146	550	0	44	38	10009	4280
47.6	7241918	18	218	45	55	89	1183	12328	630	24	102	246	23509	131	20	151	52	28	40	99	475	939	57	587	54	171	513	0	5	45	10060	4340
47.7	7028974	13	179	17	0	49	1120	12424	627	8	94	211	23159	159	49	200	67	80	62	151	515	935	125	658	21	217	543	24	0	68	9975	4395
47.8	7486812	8	202	36	0	99	1108	12339	615	24	66	206	22909	125	72	165	95	112	56	170	413	940	92	686	35	152	510	0	0	35	10088	4428
47.9	7683107	0	211	10	0	62	1113	12072	591	40	91	219	22868	147	65	169	108	124	104	150	495	1060	125	603	25	159	561	0	0	89	10307	4371
48	6951375	0	199	20	34	89	1175	12158	669	36	110	209	23148	177	8	111	17	87	98	145	446	949	76	718	44	212	498	10	0	62	10401	4358
48.1	6932526	15	205	26	14	91	1089	12411	621	29	124	192	22833	117	8	111	17	87	98	145	446	949	76	718	44	212	498	10	0	16	10329	4541
48.2	6876528	0	191	0	0	39	1154	12077	608	59	89	197	22831	120	28	152	37	108	76	89	470	959	118	746	22	238	524	0	0	0	9893	4572
48.3	7727506	5	257	32	0	90	1108	12017	602	33	82	225	22791	76	0	156	10	50	161	60	410	966	121	850	49	170	562	0	0	25	10009	4340
48.4	7493462	0	215	31	32	93	1188	12220	651	32	99	220	22799	144	12	160	12	60	161	60	410	966	121	850	49	170	562	0	0	0	9893	4572
48.5	7783755	8	287	21	22	82	1246	12341	657	48	94	176	22249	117	0	138	79	124	66	73	463	957	111	800	40	196	467	0	0	59	10263	4466
48.6	6925676	0	222	25	11	74	1148	12586	614	49	100	195	22219	129	69	154	54	176	124	149	423	912	93	713	15	171	529	0	0	28	10227	4281
48.7	6916727	19	267	39	40	74	1140	13135	663	50	105	199	22390	109	0	150	59	125	113	143	478	904	86	902	54	206	527	0	0	93	10256	4431
48.8	6892127	17	262	26	45	63	1221	12916	711	43	99	142	22421	136	69	170	127	118	134	189	519	914	58	967	14	138	586	0	0	62	10304	4436
48.9	6845378	9	242	24	38	75	1170	12241	651	45	125	197	23161	122	46	156	78	86	135	104	483	990	90	980	38	191	643	13	0	20	10184	4358
49	6913127	22	246	48	36	84	1218	12024	684	6	120	185	23177	152	8	162	98	166	106	140	402	910	50	947	36	211	580	0	0	36	10254	4309
49.1	6909876	0	241	18	14	47	1191	12064	601	18	106	178	22482	149	75	137	74	99	42	80	377	965	12	981	61	236	521	0	0	87	10495	4667
49.2	6919926	0	284	37	32	91	1185	12026	669	33	162	202	22762	129	84	181	152	0	77	109	520	950	70	1092	40	206	661	45	21	53	10428	4494
49.3	6888727	0	222	0	9	57	1326	11722	1156	32	105	202	23474	152	39	188	89	91	178	191	488	994	106	1115	45	161	620	0	0	30	10634	4605
49.4	6893927	6	251	13	0	34	1318	9951	1137	46	113	266	25509	145	34	191	38	38	98	71	547	980	114	1157	53	176	513	0	0	0	11052	4586
49.5	7600559	32	204	20	13	56	1495	6958	816	32	93	291	30225	168	99	240	100	72	85	136	618	848	128	1121	28	205	519	24	68	63	10887	4628
49.6	7817154	51	185	37	45	68	1984	5188	783	29	109	211	37996	228	155	283	55	62	157	121	911	538	130	917	74	206	475	0	11	35	11277	4362
49.7	7894152	20	240	47	22	44	2216	4711	789	19	151	200	42131	203	148	283	75	103	66	40	989	451	130	874	76	200	501	15	5	73	11169	4492
49.8	7658708	7	204	19	30	44	2487	4642	770	89	167	229	43028	211	88	335	128	142	66	127	1031	428	38	762	53	221	493	0	19	5	11297	4296
49.9	7600609	6	204	30	25	71	2374	5004	825	35	132	209	43204	242	97	359	119	147	142	44	978	491	120	731	81	221	457	0	0	0	11350	4384
50	7607459	13	252	9	18	31	2337	5488	814	35	125	281	42234	281	159	385	67	43	149	94	982	434	80	691	53	244	501	0	0	49	11131	4595
50.1	7624159	0	197	26	18	47	2355	5975	815	45	119	235	41431	197	119	272	50	118	58	128	937	506	36	772	38	183	503	0	0	13	11147	4363
50.2	7044923	0	193	0	11	43	2089	6808	844	69	133	252	40244	164	137	322	143	80	145													

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
50.8	8136145	5	260	26	26	86	1832	12024	865	71	109	267	33786	116	91	242	92	97	116	116	753	852	36	662	0	185	568	0	41	11085	4405	
50.9	8091797	17	219	7	14	51	1718	12497	823	35	115	266	32659	107	0	230	8	135	30	5	564	885	67	762	30	231	515	0	28	10642	4603	
51	8454088	0	230	50	36	65	1602	13200	786	41	157	227	31388	151	91	238	84	142	115	633	977	62	699	41	197	568	0	0	68	10743	4683	
51.1	8876127	0	209	15	30	73	1516	13470	752	65	101	219	29461	153	96	221	91	153	90	61	587	962	147	639	14	184	593	0	0	39	10709	4721
51.2	8500136	0	242	15	15	39	1480	13234	693	32	129	244	28586	205	47	163	106	95	112	106	512	1014	38	600	59	241	580	0	0	69	10700	4425
51.3	8945376	0	231	0	10	54	1428	13556	717	24	102	244	28396	173	60	218	88	62	149	546	979	699	607	31	196	597	0	0	44	10784	4568	
51.5	8911076	13	224	18	26	77	1461	13883	723	66	108	281	27945	165	11	167	114	63	79	56	482	1043	21	635	47	211	624	0	0	42	10832	4511
51.6	8883427	8	241	14	16	67	1380	13777	736	19	117	253	26879	144	111	185	38	167	123	167	510	1036	54	638	37	247	576	15	0	65	10675	4601
51.7	8826628	38	229	21	13	57	1415	13661	753	55	52	185	26307	173	65	168	48	75	141	93	473	967	89	692	0	232	572	0	0	32	10714	4582
51.8	8590934	7	229	15	25	77	1333	13241	685	90	102	210	26033	175	63	207	147	42	177	217	426	991	110	752	26	226	618	15	0	74	10430	4595
51.9	7892802	0	262	23	0	75	1323	13271	651	45	124	268	25995	158	57	165	22	181	212	117	529	1097	99	733	34	232	567	0	0	0	10563	4470
52	7794455	0	240	14	23	81	1234	13400	632	30	107	214	24770	133	58	143	90	114	75	196	439	1019	60	779	57	172	571	0	0	75	10564	4646
52.1	7700757	12	261	14	42	91	1276	12890	733	66	97	242	24135	121	93	112	39	117	74	129	513	1026	137	663	0	165	525	29	0	73	10438	4501
52.2	7954450	0	232	8	0	65	1257	13005	619	22	115	189	24563	152	57	171	152	97	83	62	437	1018	41	697	48	220	569	0	0	66	10635	4453
52.3	8229393	44	298	38	54	108	1249	13236	672	64	124	214	24458	145	18	184	89	109	114	157	493	1002	7	736	45	167	600	13	12	75	10563	4548
52.4	7646858	5	249	27	32	78	1148	12956	710	12	101	218	23983	130	16	164	136	51	97	101	402	991	133	966	21	140	545	0	0	36	10760	4601
52.5	7616909	10	267	48	38	104	1214	12495	649	32	99	181	22880	143	55	163	92	120	153	87	493	1004	62	799	37	175	519	0	8	41	10438	4506
52.6	7496612	10	257	22	20	74	1236	12139	651	73	111	231	22407	112	61	182	116	149	123	135	454	960	65	848	27	206	564	0	0	35	10492	4579
52.7	7790305	11	248	34	31	70	1206	12127	612	48	91	182	23049	154	17	162	81	149	110	217	466	1053	82	928	63	223	579	0	20	35	10638	4534
52.8	7725556	31	244	11	0	50	1157	12067	624	66	91	223	23417	81	21	200	68	86	160	114	360	977	125	808	42	202	553	0	0	80	10395	4497
52.9	8067498	13	305	47	18	90	1263	12453	642	89	61	208	23124	157	53	198	107	34	73	97	452	927	142	1078	11	221	579	11	0	45	10457	4608
53	7273617	11	264	0	0	32	1201	12373	538	46	121	183	22552	87	41	117	51	78	121	169	496	990	83	975	13	172	546	0	0	12	10651	4777
53.1	7217569	6	230	22	10	52	1187	12591	536	28	107	162	22121	112	0	142	67	142	161	119	441	844	67	119	35	193	516	0	0	61	10791	4829
53.2	8044998	13	244	25	6	80	1150	12579	598	57	126	141	22053	138	98	118	49	134	85	61	489	990	108	1145	39	150	495	0	0	10	11010	4797
53.3	7313366	0	225	0	0	79	1219	12763	565	8	90	166	21625	104	0	131	14	58	123	178	527	1059	199	1090	55	174	521	6	0	46	11011	4788
53.4	7198869	0	245	7	0	48	1222	13773	605	25	64	203	22335	145	59	139	76	48	55	53	573	1047	92	137	15	161	583	36	7	22	11485	4775
53.5	7904851	0	240	20	11	78	1181	12593	678	41	94	287	25744	168	76	189	54	69	124	107	645	1184	152	1170	40	226	613	8	0	86	11849	4905
53.6	7925201	0	274	25	17	41	1332	8806	861	48	88	362	31335	101	151	172	122	155	15	128	540	945	200	1110	37	140	632	21	5	51	11366	4766
53.7	7145621	26	335	4	12	45	1448	5500	920	0	121	456	30888	106	141	191	78	166	40	28	463	833	252	1199	77	204	557	0	0	50	10753	4390
53.8	7156521	9	199	15	7	43	1085	3143	583	38	93	341	21530	128	104	156	110	109	23	72	326	555	177	990	50	94	371	30	0	0	8374	3526
53.9	7128621	14	153	14	16	43	1238	2842	573	40	116	263	26442	81	46	191	38	75	111	152	497	362	65	642	56	169	344	37	0	23	7012	2819
54	7627259	0	179	19	22	49	1724	3813	711	61	142	209	36533	157	144	231	48	131	150	96	773	358	0	616	48	228	441	0	24	0	8382	3217
54.1	7795554	26	135	24	24	54	2039	4860	672	58	167	204	37828	209	145	268	83	109	82	186	911	369	37	644	46	204	470	0	15	59	10477	4026
54.2	7624609	23	171	20	34	73	2073	5414	736	61	127	227	37550	224	133	279	91	76	33	110	1028	424	17	591	51	199	488	0	0	70	10765	4064
54.3	7807554	19	208	0	11	42	1938	6114	695	72	84	230	36461	147	48	233	45	66	133	109	895	462	64	646	12	197	442	0	17	36	10707	4446
54.4	7503362	18	173	17	14	28	1813	6933	747	71	123	208	35028	140	56	158	88	23	72	129	757	623	85	629	0	206	478	0	0	71	10782	4036
54.5	7751156	8	149	6	0	45	1777	7874	750	32	92	196	33762	83	17	187	0	34	72	129	757	623	85	629	0	206	478	0	0	29	10737	4128
54.6	8507637	11	173	22	11	65	1734	8343	658	53	88	250	32720	142	67	191	176	36	50	96	740	739	7	695	29	160	521	0	0	48	10550	4308
54.7	7645908	14	197	18	44	97	1652	9412	736	49	118	255	31204	142	70	172	130	102	106	96	710	739	7	695	29	160	521	0	0	0	10249	4175
54.8	5445314	0	190	14	23	60	1643	10469	661	87	124	245	30216	151	24	199	78	91	61	165	749	864	72	655	47	178	562	0	0	32	10209	4203
54.9	5204469	14	214	18	23	69	1490	11020	715	25	132	237	29178	192	117	237	115	89	128	89	508	863	82	716	36	179	556	0	0	28	10252	4358
55	6866228	0	190	7	17	80	1403	11565	709	12	94	172	27546	131	48	161	45	23	122	169	608	883	109	601	20	164	544	0	0	101	10526	4410
55.1	7807004	16	229	20	15	60	1391	11998	597	40	114	207	26747	131	29	173	68	40	7	72	580	927	78	588	63	203	565	24	25	55	10356	4442
55.2	7532061	0	215	17	45	73	1410	12119	650	48	128	222	26133	114	33	141	64	127	117	128	453	909	54	540	27	158	552	14	0	35	10463	4315
55.3	7526161	7	198	32	21	62	1315	12108	643	53	90	269	25245	140	61	161	57	43	75	134	513	990	48	581	27	182	557	0	0	15	10346	4440
55.4	7450263	0	183	0	0	56	1250	12258	575	8	123	200	24926	133	28	241	115	33	93	1												

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
55.9	8019749	31	230	26	24	71	1220	11814	554	46	123	221	23735	155	69	186	102	145	157	134	441	902	0	746	47	220	547	41	0	83	10327	4276
56	7245568	16	234	30	7	67	1238	12502	590	39	59	169	24109	185	40	193	59	146	113	134	509	860	28	771	34	175	525	0	16	16	10478	4336
56.1	7218669	0	242	15	18	62	1184	12045	666	15	82	203	23742	72	50	124	33	154	104	94	449	842	64	910	12	193	528	0	0	49	10422	4462
56.2	7179320	14	217	16	35	59	1171	11624	612	21	82	159	22528	151	21	169	61	96	96	155	418	997	82	767	19	187	502	36	0	66	10254	4461
56.3	7121171	0	244	20	18	77	1227	11633	598	38	98	132	22940	168	88	155	72	100	77	124	459	890	40	862	18	199	557	27	42	51	10024	4446
56.4	7040073	0	248	9	18	60	1343	11390	690	29	65	199	25415	111	27	146	56	92	62	126	402	905	49	827	7	192	549	0	0	13	9833	4327
56.5	7075222	5	229	0	0	42	1452	10488	808	65	95	205	26799	185	27	167	128	109	85	115	483	930	67	920	22	218	557	0	0	27	10245	4227
56.6	7375410	18	227	19	14	67	1614	9425	684	91	98	215	27701	172	82	231	124	160	96	145	579	805	67	940	26	198	547	5	7	70	10025	4344
56.7	7763055	4	193	18	13	47	1609	8783	634	45	91	212	28147	201	109	231	133	126	158	137	458	807	61	791	42	207	533	0	0	54	10051	4219
56.8	8006849	4	177	18	38	69	1717	6890	663	43	89	191	30834	117	117	167	83	111	79	138	575	937	140	921	24	156	497	0	4	55	10480	4260
56.9	7842203	21	180	0	12	40	2032	5600	644	50	116	189	36624	252	218	303	215	63	80	57	718	908	98	1085	31	179	572	0	27	51	10589	4573
57	8356790	49	182	14	13	59	2200	4861	694	8	134	199	39400	254	155	319	97	97	212	192	879	664	72	1001	62	217	520	0	0	70	11009	4631
57.1	8292542	28	180	22	14	59	2177	4498	750	43	121	151	39735	171	78	323	90	125	58	132	984	460	67	846	0	186	475	0	0	30	10914	4275
57.2	8121546	41	231	28	0	53	2123	4694	752	21	109	220	38790	242	137	334	42	80	131	233	1000	457	148	650	20	234	486	23	19	0	10710	4244
57.3	8191895	4	179	32	26	52	2204	5411	774	67	137	213	38271	198	75	340	95	126	178	127	973	422	8	669	15	215	463	0	0	68	10555	4137
57.4	7750105	15	203	21	11	59	2028	6216	730	59	140	187	36918	183	136	295	145	138	12	66	921	613	84	586	65	172	522	0	27	67	10861	4172
57.5	7147871	20	200	5	10	59	1843	6996	712	59	113	198	35547	167	106	292	120	54	132	86	924	523	76	564	30	164	504	16	0	29	10610	4224
57.6	7100872	28	207	20	14	60	1759	7840	706	17	84	239	33902	151	102	228	26	64	110	141	818	622	52	649	8	173	507	0	0	34	10770	4411
57.7	7702057	7	207	0	10	42	1687	8706	737	14	129	222	32779	167	72	266	71	71	113	102	796	713	35	589	16	188	514	0	17	31	10550	4444
57.8	8453438	12	209	16	15	52	1598	9352	736	40	108	296	31461	239	106	300	110	49	111	222	791	773	84	630	31	212	552	38	0	102	10319	4287
57.9	7691457	0	196	0	0	38	1529	9991	671	19	111	183	30030	141	27	138	56	64	115	177	667	792	82	645	44	193	529	0	0	14	10501	4428
58	8003549	19	203	16	12	64	1520	10492	660	38	102	237	28570	161	84	208	58	129	98	88	510	786	100	596	47	187	548	5	0	30	10272	4352
58.1	8257893	0	193	28	46	78	1424	11098	627	56	117	218	27589	167	73	224	73	205	72	116	559	863	117	706	56	202	486	0	0	74	10649	4624
58.2	7667257	10	188	8	23	63	1310	11216	722	51	103	222	26933	177	89	192	170	54	91	97	601	937	170	628	16	147	552	0	0	61	10449	4296
58.3	7964950	23	225	12	28	67	1321	11664	590	64	104	254	25950	135	45	212	82	33	70	116	555	926	4	662	48	200	579	0	19	14	10423	4459
58.4	8325091	0	231	8	16	70	1381	12048	637	38	79	205	25401	153	25	162	98	85	127	117	506	960	103	604	0	226	523	0	0	40	10492	4453
58.5	7500812	7	216	23	10	68	1309	12361	685	61	43	129	202	25032	145	26	145	93	42	59	512	989	29	568	47	103	533	0	0	0	10570	4525
58.6	7426113	7	251	23	10	68	1200	12566	671	43	129	205	25381	139	94	123	59	37	109	151	520	878	34	639	32	171	516	10	0	57	10564	4502
58.7	7372015	0	220	20	35	62	1245	12773	694	61	97	257	24934	114	70	155	67	101	112	103	394	998	72	693	13	167	524	0	0	19	10567	4580
58.8	7995749	0	214	28	23	62	1327	12588	713	32	89	200	24534	118	75	193	100	63	98	37	480	1160	188	682	0	209	527	0	0	69	10556	4658
58.9	7487612	0	233	30	29	76	1295	12509	675	70	109	263	24956	140	27	166	139	120	30	75	471	1125	204	652	36	203	640	29	0	72	10965	4606
59	7437913	7	225	27	0	52	1245	12841	703	46	100	236	25525	136	118	209	74	44	52	68	524	996	94	817	48	147	542	11	0	50	10774	4783
59.1	7242068	0	256	33	12	60	1202	13066	669	38	49	228	24575	57	0	92	41	159	61	139	479	968	14	824	25	178	539	0	0	7	11011	4624
59.2	7288917	16	262	37	21	65	1274	13012	721	19	95	218	24681	83	0	147	0	124	65	84	538	1066	69	863	50	186	517	0	20	37	11047	4736
59.3	7155320	22	261	32	0	50	1328	13146	746	32	55	225	25952	161	0	181	65	167	19	142	559	1061	128	894	24	260	563	53	40	60	11563	4850
59.4	7480862	5	284	16	6	83	1367	13889	729	19	113	258	27173	166	87	168	93	119	113	169	517	991	172	844	60	203	624	15	0	48	11340	4854
59.5	8030148	0	285	16	0	66	1413	14215	778	36	71	209	27290	165	41	138	63	170	164	164	511	1131	152	842	6	200	593	0	0	41	11276	4994
59.6	7717606	0	294	20	8	75	1397	13624	714	49	135	221	27327	219	44	219	110	66	115	120	572	1040	48	947	78	205	599	0	0	9	11491	4802
59.7	8026848	12	298	45	38	75	1393	13773	727	56	128	246	27949	169	62	172	179	89	44	123	554	1027	109	968	49	197	621	22	18	59	11318	4683
59.8	7681107	7	267	0	0	57	1401	13509	753	33	103	166	25698	220	96	162	66	102	187	58	432	1020	148	1126	0	210	613	8	0	51	11234	4708
59.9	8131396	26	314	18	36	66	1402	12865	644	0	92	185	24339	198	67	216	103	74	133	67	362	988	106	907	74	201	577	0	0	30	11176	4748
60.1	7482012	0	268	24	9	46	1239	12401	635	20	133	171	25017	108	67	216	103	74	133	67	362	988	106	907	74	201	577	0	0	30	11176	4748
60.2	7482012	0	268	24	9	46	1239	12401	635	20	133	171	25017	108	67	216	103	74	133	67	362	988	106	907	74	201	577	0	0	30	11176	4748
60.3	7815454	16	308	32	29	66	1345	10414	786	44	87	317	32173	151	113	165	88	137	153	157	520	1129	165	1226	63	198	551	0	0	42	11258	4902
60.4	7848303	38	281	17	21	44	1264	6283	796	43	63	357	27839	156	110	263	48	75	0	75	416	919	179	1184	51	195	519	0	0	0	10893	4562
60.5	7848953	0	250	17	8	35	1403	3217	732	51	109	328	31715	69	136</																	

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
61	8142245	17	183	40	17	24	2328	5608	768	50	103	228	40881	233	62	288	50	83	93	151	1031	527	0	752	40	248	486	0	21	11352	4477	
61.1	7554611	4	210	0	10	31	2171	6516	817	47	78	274	38767	217	129	293	150	120	75	27	871	558	81	784	38	227	493	0	0	11185	4364	
61.2	7551861	0	185	10	36	60	2079	7365	768	40	130	216	37331	215	90	265	92	70	80	177	880	660	45	669	76	221	523	22	0	25	10796	4496
61.3	8266242	0	183	0	0	48	1890	8212	781	41	92	234	34800	195	73	203	22	127	65	107	781	720	0	760	0	188	484	0	0	6	10871	4496
61.4	7201119	13	248	5	19	63	1791	9313	724	63	114	232	33332	193	107	242	85	74	134	116	871	767	82	637	49	201	563	0	0	39	10774	4536
61.5	7386715	15	205	31	37	89	1774	10207	775	88	122	283	32164	256	160	213	140	123	103	109	672	814	45	658	32	179	561	0	0	0	10897	4505
61.6	7816054	17	182	9	17	65	1565	11002	737	61	100	205	30760	188	104	267	115	110	159	149	678	862	0	613	18	218	533	41	11	81	10745	4550
61.7	8145596	11	187	29	46	55	1545	11666	710	37	88	285	29335	179	78	218	53	147	84	109	634	821	94	659	30	216	529	38	0	22	10691	4519
61.8	8493887	5	206	16	13	38	1359	12038	652	40	88	254	27973	165	67	208	87	18	104	53	552	985	87	632	18	184	565	0	0	60	10548	4509
61.9	8399939	14	212	29	33	70	1398	12644	652	24	84	207	27046	164	24	187	41	63	67	14	568	999	152	674	37	156	533	39	14	79	10739	4529
62	8421939	0	194	37	15	72	1359	12457	654	50	74	173	26021	123	26	135	77	95	101	97	520	963	172	689	37	193	511	0	0	66	10711	4652
62.1	7900452	0	254	12	33	104	1295	12778	706	52	95	208	25531	175	74	192	130	57	108	155	518	1049	0	617	29	172	496	4	0	26	10654	4595
62.2	7821254	0	166	0	15	17	1189	12846	621	48	57	228	25312	193	81	189	46	130	206	206	497	967	98	686	28	186	583	0	0	65	10525	4525
62.3	7725556	0	251	35	32	71	1307	13061	617	30	118	210	24558	146	79	155	109	63	0	94	436	1106	115	741	50	151	582	0	12	7	10758	4529
62.4	7646908	0	251	0	9	67	1234	12841	674	26	86	244	24914	133	38	121	103	55	97	89	523	982	67	777	17	187	597	0	8	54	10668	4510
62.5	7619909	15	242	0	7	70	1203	12968	651	16	109	212	24803	185	177	178	125	51	139	190	559	1068	57	654	43	159	621	15	0	62	10713	4577
62.6	7530861	40	245	12	31	64	1313	13033	655	30	85	207	24313	135	29	147	61	92	64	148	510	1073	76	661	31	228	597	0	16	48	10609	4523
62.7	7489162	15	211	0	0	69	1221	13127	616	82	77	237	24028	100	49	134	101	91	67	99	468	1015	155	691	34	148	542	0	0	80	10848	4573
62.8	7403764	0	268	24	16	76	1213	12605	676	47	80	210	23876	134	20	101	74	96	37	42	446	1002	65	727	7	168	609	0	10	76	10628	4533
62.9	7363865	0	250	27	49	119	1265	12673	635	54	78	179	23334	132	30	158	43	130	97	198	419	962	185	711	10	147	502	0	0	64	10619	4543
63	7581760	27	265	20	18	63	1125	12671	653	37	83	229	23096	127	49	194	51	99	61	113	412	1014	101	868	29	234	597	0	0	64	10850	4403
63.1	7732856	0	233	0	0	56	1170	12220	685	50	87	184	22592	118	15	206	47	81	142	204	532	1004	36	999	8	198	516	47	0	58	10825	4547
63.2	7922851	7	261	16	17	63	1202	12772	621	40	116	255	22048	135	67	174	103	130	190	105	506	892	31	920	47	202	568	0	0	39	10624	4606
63.3	7249168	0	257	39	38	83	1144	12406	630	47	130	204	22139	152	57	162	44	136	29	120	395	958	198	753	25	179	542	7	0	62	10702	4646
63.4	7300317	0	295	20	33	100	1146	12054	551	50	91	171	22522	104	16	121	44	43	33	193	519	1100	106	972	23	220	570	41	0	43	10826	4717
63.5	7350115	5	237	0	0	48	1144	11209	480	14	95	154	22051	144	0	147	0	95	0	80	508	1056	109	1127	50	248	584	12	0	6	11066	4687
63.6	7208669	0	268	0	0	62	1175	10740	585	31	146	173	23292	164	20	112	92	97	122	124	557	1094	87	996	47	173	526	7	0	29	11558	4955
63.7	8028498	0	297	13	0	56	1175	10034	701	55	148	242	26105	178	102	226	48	100	165	55	443	1117	106	983	48	173	547	0	0	24	11616	4990
63.8	7986650	16	327	19	13	50	1074	7105	844	22	79	465	28832	181	148	195	79	80	158	113	595	1067	28	1153	35	243	634	27	0	58	11713	4926
63.9	7215569	31	327	32	24	51	998	4028	937	44	90	515	30235	71	95	184	63	68	95	129	513	1007	299	1378	54	218	578	0	0	55	11486	4818
64	7336516	25	386	33	9	50	944	2272	1114	42	81	577	31364	107	212	274	106	144	99	103	372	693	130	1181	8	181	555	0	0	48	10329	4101
64.1	7533861	16	354	13	0	48	913	1768	1053	42	66	550	29857	134	183	267	83	64	157	99	331	593	213	1210	69	195	559	0	0	28	9490	4013
64.2	7338466	0	410	12	15	32	931	1580	1037	12	85	520	28239	93	171	223	130	162	0	21	287	562	151	1199	35	183	481	0	10	9	8842	3689
64.3	7131421	9	296	5	14	42	1136	1731	931	34	98	460	29763	127	193	220	77	123	84	178	360	611	194	1095	70	177	489	5	8	49	8394	3591
64.4	7682407	6	309	13	15	33	1387	1990	768	33	131	370	31594	155	175	307	38	155	79	108	515	511	197	1070	97	219	439	0	0	75	8710	3615
64.5	7485862	13	226	7	9	38	1564	2327	805	11	85	227	35169	178	168	326	101	120	183	127	782	451	192	846	9	190	470	0	0	69	9688	3813
64.6	7377215	10	206	29	17	51	1919	3081	785	69	103	177	39297	106	127	327	39	65	95	116	879	417	125	676	11	232	435	34	0	8	9746	3781
64.7	8759430	0	173	34	12	50	2175	3940	777	47	168	288	40131	262	171	342	92	147	119	139	808	252	48	637	53	216	504	0	0	10	10200	3989
64.8	7759805	0	181	30	18	35	2219	4627	791	42	95	251	38567	238	128	295	146	134	206	142	881	434	87	653	0	211	502	0	0	43	10517	4120
64.9	7753305	24	229	0	6	50	2045	5658	765	58	153	203	37145	185	95	272	88	160	85	135	907	559	105	707	10	216	444	0	5	37	10685	4178
65	7592960	25	188	17	5	53	1893	6389	730	55	143	200	34131	188	90	227	87	63	154	129	837	512	0	707	19	220	498	0	0	15	10418	4296
65.1	7524561	0	180	18	27	32	1664	7063	640	29	88	175	31532	142	241	0	88	25	133	769	809	146	573	31	253	487	0	7	0	10512	4356	
65.2	6078448	6	164	32	6	29	1705	7748	700	50	106	188	30409	98	84	192	74	177	131	130	710	668	114	551	31	156	483	0	0	47	10311	4078
65.3	6070649	11	197	32	26	75	1595	9073	694	65	97	203	29580	149	19	210	59	176	75	98	589	743	67	647	40	216	495	0	0	30	10379	4168
65.4	6838128	19	210	15	16	76	1511	9624	703	53	94	244	28601	167	0	239	92	30	86	83	588	786	33	505	22	210	475	31	15	43	10449	4288
65.5	6824128	8	197	9	19	50	1395	10401	589	27	76	226	27665	205	91	200	81	99	168	149	553											

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
66.1	7754005	0	187	0	16	60	1175	11964	519	53	94	244	23501	173	25	160	63	50	119	53	412	934	62	643	56	214	535	0	0	39	10363	4334
66.2	8078197	0	246	40	18	72	1233	12146	590	53	91	199	23364	107	51	124	40	58	126	145	435	902	44	703	50	156	559	0	0	27	10103	4219
66.3	7212069	0	241	17	21	60	1219	12166	608	28	106	223	23015	146	48	173	37	47	128	182	485	920	91	638	32	196	510	0	0	86	10368	4268
66.4	7081272	0	208	49	35	91	1196	12202	661	38	98	188	22918	90	0	174	84	115	110	121	464	908	41	629	53	205	506	6	0	31	10131	4346
66.5	7114371	0	198	24	17	76	1144	12165	670	28	107	179	23017	113	74	178	30	104	104	111	501	1091	0	772	20	157	536	0	0	0	10080	4269
66.6	7792654	0	227	34	16	70	1153	12232	649	31	107	255	23081	164	93	160	36	100	124	47	363	935	52	695	55	141	560	9	0	83	9930	4066
66.7	8470038	0	229	26	24	70	1133	12279	692	71	92	182	22156	122	11	165	19	60	104	127	375	925	87	712	38	198	566	0	0	78	10331	4544
66.8	7548860	0	231	34	34	85	1132	12069	686	0	121	153	21210	123	15	141	119	54	79	139	454	897	0	745	4	143	515	33	5	68	9849	4339
66.9	7491212	8	224	43	24	71	1119	12040	692	34	95	136	21928	123	28	90	76	106	84	145	448	830	72	816	14	171	563	0	0	0	9773	4394
67	7459812	0	213	9	25	51	1146	11906	561	40	105	172	21411	180	0	150	65	78	90	149	517	1061	104	890	35	190	510	0	0	46	10269	4396
67.1	7865853	17	194	26	13	60	1127	10958	511	33	103	106	20640	132	26	105	124	40	100	127	477	936	39	897	22	163	582	12	0	49	9966	4398
67.2	7752955	16	223	22	31	71	1283	11456	485	46	105	129	21994	151	27	154	76	60	119	129	413	981	153	1035	50	157	577	9	0	99	10082	4399
67.3	7771405	0	241	0	8	64	1120	10038	580	27	70	173	22672	129	57	177	114	94	33	83	445	962	0	1064	5	147	566	0	0	35	10311	4390
67.4	7756405	5	169	24	13	51	1359	7693	593	48	77	146	27976	98	80	205	99	12	75	85	806	786	96	1066	0	144	527	24	15	46	10624	4554
67.5	7435614	9	158	10	18	67	1820	5698	599	63	147	177	35093	188	121	261	165	102	140	120	813	671	74	704	45	167	559	0	4	48	10490	4301
67.6	7751956	14	168	0	17	20	2113	4309	744	72	144	203	37568	200	97	319	80	131	99	134	871	540	70	684	0	177	444	0	0	62	10649	4193
67.7	7414914	0	173	10	0	38	2188	3659	702	38	147	182	39265	184	94	286	38	21	101	125	1019	410	111	691	74	255	480	0	27	28	10707	4188
67.8	7543411	7	151	28	19	52	2132	3992	757	90	145	215	39269	217	112	349	75	141	151	153	951	392	110	738	37	222	439	0	21	72	10734	4023
67.9	6986175	0	166	16	30	57	2145	4512	742	41	100	163	38873	213	94	252	29	38	115	56	988	455	83	566	5	234	488	0	0	39	10927	4193
68	7503612	33	154	31	18	67	2017	5348	722	59	126	144	37657	176	72	246	74	128	186	120	962	504	108	707	46	209	418	0	0	51	10574	4191
68.1	6718681	26	156	27	17	44	1949	5900	725	56	108	178	36205	196	53	262	75	109	121	134	879	573	70	642	16	237	462	32	0	44	10528	4200
68.2	6804829	23	173	24	28	63	1943	6543	716	46	53	186	34542	252	107	234	121	154	161	171	809	532	60	569	13	207	539	0	0	33	10279	4142
68.3	7537811	0	181	13	0	43	1825	7244	718	66	72	210	33179	153	60	206	53	122	57	70	791	616	93	719	7	202	456	0	0	32	10659	4357
68.4	7896532	25	186	27	11	39	1727	7945	657	47	141	221	32424	179	84	254	51	74	154	68	750	677	131	600	54	194	509	12	0	22	10285	4336
68.5	8660932	11	181	17	11	43	1645	8713	740	44	107	162	31272	195	65	242	67	0	167	92	745	642	75	613	0	231	524	17	0	16	10237	4241
68.6	7572910	0	203	14	35	66	1591	9561	773	43	131	233	29919	179	76	250	102	69	87	108	696	814	0	522	20	176	553	10	36	25	10358	4252
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68.8	7826453	0	197	9	29	63	1446	10538	597	32	97	249	28223	132	39	176	52	166	93	161	641	968	60	587	43	195	518	21	33	66	10044	4438
68.9	8136246	18	197	13	15	42	1512	11159	710	51	73	229	28126	153	54	261	64	122	81	48	506	910	76	646	10	224	536	0	0	75	10138	4403
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69.2	8127846	5	222	22	13	45	1317	11563	597	19	114	201	24795	154	45	238	22	142	88	77	470	991	57	622	53	200	499	0	0	69	10200	4227
69.3	8224393	23	224	25	12	64	1226	11700	644	0	143	168	24026	179	51	185	26	132	90	146	522	902	30	753	14	210	523	0	0	42	10128	4427
69.4	7326816	0	210	11	4	77	1193	11885	612	39	113	187	25625	164	18	182	89	87	129	177	485	950	124	535	42	189	493	31	0	75	10154	4474
69.5	7233068	15	203	23	0	56	1261	12255	585	20	105	213	23538	85	32	167	59	101	23	179	552	992	88	638	55	153	494	20	25	67	9954	4347
69.6	7227168	17	191	21	36	78	1126	12061	581	30	96	197	23205	181	78	173	99	116	74	144	479	937	90	731	31	185	509	7	0	6	10333	4359
69.7	8472637	0	205	34	15	58	1160	12044	541	33	74	223	23021	102	14	159	76	50	153	95	493	1004	127	613	42	234	511	17	0	78	9995	4233
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69.9	8142696	22	200	6	0	46	1130	11426	590	30	105	178	22642	122	37	165	7	119	147	134	406	920	134	673	60	193	498	0	0	10	10308	4532
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70.1	7061473	0	234	24	19	59	1099	11782	630	65	109	202	22144	143	12	133	29	103	72	79	427	872	70	694	22	153	502	20	17	11	10174	4369
70.2	6935076	19	216	11	6	59	1006	11707	560	63	102	200	21913	166	34	231	108	147	90	140	475	975	148	778	33	211	540	33	29	102	10491	4474
70.3	6884077	0	206	16	0	47	1062	11559	658	17	80	170	22099	98	12	127	34	104	82	171	511	798	0	778	0	203	550	0	0	7	10164	4365
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70.5	6918176	12	225	0	0	53	1073	11995	584	51	78	200	22402	121	74	140	115	76	139	88	408	981	131	870	46	188	548	4	0	19	10613	4524
70.6	6883027	15	244	26	9	49	1137	11770	619	29	106	160	22253	136	61	149	62	77	102	127</												

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
71.2	6886577	8	259	0	24	38	1219	11537	634	13	82	183	21762	92	60	112	97	103	86	141	517	1052	230	1164	8	125	575	0	0	96	11293	4788
71.3	6914527	0	224	35	4	62	1132	12118	563	45	99	213	21745	151	75	143	24	101	133	124	470	1038	128	1405	61	179	601	0	0	52	11200	4901
71.4	6946526	0	300	67	42	94	1085	11267	678	14	72	243	25262	50	71	56	90	66	63	72	449	885	183	1592	33	155	589	0	0	21	10377	4434
71.5	7238168	9	300	25	20	49	1005	6879	934	40	27	492	28468	88	161	247	144	102	155	167	269	726	167	1225	20	162	568	0	0	81	9151	3951
71.6	7018174	0	329	24	29	56	982	3833	984	8	103	511	27780	113	157	243	91	121	130	115	284	654	63	1046	35	214	546	0	0	12	8253	3504
71.7	7606959	24	355	17	10	52	827	2149	971	66	67	550	26291	47	98	182	79	162	107	59	320	714	201	942	0	136	472	0	0	35	8655	3655
71.8	8227343	12	303	38	23	63	876	1607	971	25	81	460	25822	81	187	195	138	147	57	98	360	515	248	1106	42	104	462	0	0	18	9257	3899
71.9	7136621	0	285	23	21	43	1190	1946	811	15	65	422	27878	113	150	227	47	13	30	104	648	606	189	979	61	134	449	32	30	61	9451	3840
72	8030548	10	201	17	27	62	1688	2638	799	25	118	317	33809	141	158	270	64	126	113	99	789	495	168	850	18	171	430	0	26	92	10131	3974
72.1	7235369	38	159	18	8	60	1992	3211	741	47	109	254	38991	162	110	280	83	72	115	100	870	301	90	865	46	229	476	0	6	49	10475	3963
72.2	8029848	14	156	32	38	42	2297	3820	839	31	175	243	41423	189	141	345	73	74	162	187	1020	488	69	763	18	234	477	22	0	88	10408	4165
72.3	7272418	29	161	26	23	61	2365	3992	737	44	156	216	40656	212	143	314	83	121	182	143	999	506	32	636	49	201	485	0	0	60	10825	4178
72.4	7171020	23	171	17	21	41	2245	4356	788	36	146	180	38762	204	105	312	87	59	171	93	983	453	82	687	41	220	487	14	0	47	10842	4232
72.5	7466163	18	173	41	32	68	2098	5230	746	61	122	258	37398	165	134	288	166	127	88	124	986	575	129	610	40	161	479	0	0	40	10559	4251
72.6	6093797	8	147	23	7	32	1945	6105	756	77	136	220	35975	119	61	253	105	74	48	111	774	591	0	726	26	199	505	0	28	26	10541	4391
72.7	7066973	9	185	18	13	50	1860	6511	702	48	126	160	34552	137	69	223	69	7	60	125	705	524	125	672	13	177	525	0	0	40	10590	4322
72.8	5977350	10	173	9	40	57	1647	7466	724	75	139	294	33212	108	55	200	0	32	28	55	761	679	92	613	10	215	457	0	15	54	10571	4387
72.9	6222844	6	169	6	27	35	1622	8226	708	35	135	187	31658	101	49	230	58	103	73	108	673	749	105	694	47	169	516	0	0	11	10459	4303
73	7654308	0	178	0	0	18	1584	8827	701	58	82	198	29831	152	33	220	50	148	108	137	710	727	82	611	0	223	490	23	0	68	10401	4304
73.1	7845553	6	187	0	26	44	1468	9755	580	0	112	211	28572	160	128	133	104	80	145	125	579	825	92	537	61	129	498	54	0	24	10331	4379
73.2	7662758	9	185	0	21	63	1464	10359	639	53	59	244	27104	195	93	190	51	165	49	163	599	870	101	683	71	193	466	30	0	0	10489	4376
73.3	7656608	0	193	26	26	80	1246	11284	647	43	92	239	25962	156	46	202	16	96	152	130	524	886	118	592	38	172	532	0	0	23	10428	4363
73.4	8227294	14	178	16	13	47	1273	11352	629	54	116	219	25013	144	89	144	51	99	185	81	454	844	87	519	26	168	527	0	0	33	10213	4405
73.5	8629983	0	195	0	31	61	1257	12193	703	29	116	251	24500	146	10	186	100	33	190	115	458	979	187	606	21	208	519	0	0	18	10278	4493
73.6	7502462	13	162	26	13	61	1211	12391	623	6	76	192	24009	86	10	134	0	105	0	82	491	971	54	682	31	261	519	18	35	53	10186	4471
73.7	7366615	19	199	25	30	75	1163	12678	633	32	132	201	23940	161	66	161	104	47	136	102	401	927	138	641	65	183	610	0	0	38	10478	4312
73.8	7517561	11	206	32	37	67	1187	12670	670	30	77	297	23761	96	33	139	24	164	113	111	420	1010	99	170	166	511	0	0	22	10626	4372	
73.9	7287767	14	234	22	37	77	1165	12792	666	50	90	218	23894	132	109	172	113	138	28	92	500	998	63	631	39	151	499	0	0	42	10554	4449
74	7183520	7	226	11	52	79	1137	12886	602	53	66	196	23428	96	42	161	57	9	54	82	407	1013	84	692	0	181	558	18	0	35	10604	4435
74.1	7305967	14	238	15	0	70	1063	12541	604	34	75	203	23108	124	28	165	57	69	122	87	457	965	222	687	24	174	559	61	0	51	10768	4497
74.2	7078272	19	205	24	19	78	1145	12600	629	23	132	192	22573	143	67	155	32	57	155	85	438	887	77	720	37	195	529	0	0	6	10451	4553
74.3	7057123	0	219	19	20	58	1121	12356	719	27	70	219	22190	118	71	157	63	76	28	135	433	1131	127	749	0	204	550	0	17	30	10695	4442
74.4	7929601	0	263	5	32	73	1127	12430	686	36	81	224	22305	115	18	150	0	118	115	157	471	1077	55	706	25	241	500	36	0	31	10344	4572
74.5	7564260	7	267	7	40	100	1175	12419	673	14	56	158	21918	170	115	136	89	66	105	150	430	1061	110	661	59	167	549	16	0	12	10862	4558
74.6	7832954	0	246	11	26	76	1206	12351	663	58	99	225	22851	91	21	135	9	85	64	169	386	1001	117	806	8	180	514	0	0	19	10856	4401
74.7	7273967	4	262	41	27	100	1100	12252	674	26	114	195	23545	146	95	152	78	26	83	186	472	1027	9	883	16	146	567	47	15	63	10565	4526
74.8	7445863	5	267	24	28	77	1189	12712	680	37	123	218	23524	150	19	183	93	29	0	108	504	1055	101	847	47	205	568	16	26	40	10851	4436
74.9	7096822	0	244	4	9	75	1109	12593	753	13	114	180	23149	152	25	125	14	12	100	154	441	1077	144	943	37	224	539	8	0	44	10724	4634
75	7039573	14	293	45	37	105	1261	12948	821	41	147	187	23691	170	26	176	57	102	42	115	467	1002	26	1018	36	204	483	0	0	61	10467	4499
75.2	6981475	7	218	0	22	54	1135	10432	625	14	107	128	21642	105	0	112	51	136	140	63	461	916	86	1042	40	182	481	19	0	70	9599	4123
75.3	6988475	0	215	10	0	49	1195	8579	553	48	97	136	20767	141	53	144	97	78	151	153	513	805	56	955	27	162	514	0	0	9	9712	4214
75.4	7001174	0	217	38	41	77	1339	8444	576	0	77	105	22721	124	31	152	70	70	94	117	650	805	68	824	29	169	460	0	0	39	9890	4121
75.5	7026174	14	198	30	33	67	1562	8294	534	52	65	200	28861	155	89	197	112	98	118	172	890	517	55	878	20	148	503	0	9	55	10529	4229
75.6	7074623	5	235	0	7	40	1612	7732	656	37	122	178	31752	166	51	235	101	70	76	107	800	409	103	724	16	204	483	0	0	16	10353	4236
75.7	7156671	32	217	20	58	51	1622	8566	621	41	105	184	30354	145	77	203	84	7	129	150	924	421	107	730	36	160	529	24	5	39	10901	4243
75.8	7181120	0	199	14	13	61	1473	9452	584	44	132	178	28201	152	60	197	124	118														

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
76.3	7065173	5	181	0	8	36	1894	5879	691	58	97	185	36521	169	80	250	69	96	94	121	908	470	21	732	0	244	460	0	0	0	10741	4294
76.4	6810929	0	190	30	35	47	1888	6244	680	41	128	154	33379	158	84	242	45	49	131	98	955	545	148	669	57	194	494	0	6	8	10874	4255
76.5	7799054	8	178	28	0	29	1883	6617	643	28	105	185	35174	160	14	232	19	69	48	183	918	628	153	684	67	219	495	34	35	28	10631	4277
76.6	7934901	0	155	7	0	24	1758	7036	691	45	168	195	34440	157	56	153	142	133	151	168	813	527	66	545	74	198	438	0	0	0	10570	4164
76.7	7860403	34	192	25	17	41	1701	7427	744	36	122	223	32810	144	35	239	43	92	123	133	848	552	60	648	0	171	448	0	0	27	10492	4177
76.8	7619359	15	158	0	0	7	1619	7717	710	46	95	251	31318	103	7	207	41	104	111	148	735	618	0	689	16	211	508	0	0	32	10447	4174
76.9	7545011	14	167	10	19	60	1557	8242	710	46	95	251	31318	103	7	207	41	104	111	148	735	618	0	689	16	211	508	0	0	68	10547	4281
77	7708457	16	195	21	9	62	1515	8263	673	37	107	170	31156	155	63	171	81	68	224	123	729	766	0	698	14	155	498	11	0	61	10453	4501
77.1	7835853	0	144	0	0	46	1527	8066	676	25	137	200	30546	151	21	211	68	70	80	161	795	826	9	622	79	199	430	9	0	10	10502	4367
77.2	7800204	33	170	0	0	14	1545	8387	710	72	122	200	29785	175	73	194	129	90	23	82	706	734	23	623	31	192	526	0	5	18	10360	4234
77.3	7814604	0	156	21	8	36	1427	9084	690	49	123	196	28871	86	28	183	88	11	138	100	637	800	78	621	21	179	515	33	0	46	10326	4300
77.4	8298842	14	168	0	0	35	1493	9792	638	50	151	196	28096	153	48	169	0	30	64	106	659	800	6	648	33	217	494	0	28	36	10438	4334
77.5	7892352	0	179	4	30	58	1393	9887	661	18	103	182	27667	147	42	170	36	11	47	83	585	792	0	522	7	216	528	0	0	33	10478	4331
77.6	7732655	0	181	5	18	76	1404	10186	711	57	105	175	26955	206	72	207	63	35	158	124	597	824	205	599	5	165	559	34	0	52	10532	4433
77.7	8083197	15	190	27	0	42	1246	10406	671	15	86	196	26141	182	92	182	117	52	132	116	504	836	97	655	45	172	502	21	0	62	10681	4466
77.8	7315367	6	180	19	26	61	1392	10648	655	33	99	210	25971	117	18	174	54	54	77	136	489	1016	131	633	0	180	489	0	0	55	10393	4349
77.9	7301167	14	162	0	0	32	1298	10715	563	18	97	215	26102	130	101	207	90	120	38	34	514	819	52	567	54	159	543	0	5	10	10238	4218
78	7246768	18	189	9	14	32	1274	11292	589	34	76	179	25637	123	101	172	84	129	61	85	597	913	55	554	24	194	506	16	41	35	10641	4367
78.1	7834553	4	161	0	0	51	1314	11268	630	44	80	239	25341	187	69	206	55	127	121	61	618	897	44	544	22	196	474	0	0	34	10539	4302
78.2	7640958	0	167	0	0	42	1235	11304	585	46	110	231	25120	133	55	194	75	87	70	125	538	948	0	581	55	205	553	18	0	57	10307	4330
78.3	7865952	0	166	28	24	59	1231	11654	628	48	85	162	24333	113	69	115	25	70	27	72	523	910	43	590	14	147	522	0	0	40	10597	4412
78.4	7912202	37	197	35	18	75	1251	11695	607	32	87	217	24373	79	15	172	53	46	48	221	486	1007	154	601	24	151	495	48	0	15	10562	4301
78.5	7867653	0	182	29	23	85	1209	11713	608	31	92	232	23882	163	97	161	67	198	18	121	420	970	44	632	32	147	542	0	33	9	10517	4324
78.6	7124271	11	178	42	24	73	1080	12184	635	11	88	184	23589	128	72	175	64	129	104	160	409	904	172	588	34	134	462	0	0	38	10601	4177
78.7	7012724	11	207	0	7	56	1060	12096	642	22	103	263	22887	92	76	175	45	35	76	171	446	980	25	589	40	158	480	0	0	23	10505	4478
78.8	7037023	7	196	40	18	79	1131	11948	590	40	104	203	22978	154	26	164	83	65	37	118	418	930	74	723	25	192	503	42	6	43	10550	4466
78.9	7068522	5	219	8	12	43	1086	11816	609	40	86	171	22888	124	29	127	127	114	38	91	468	941	56	536	16	184	474	0	0	15	10576	4343
79	7047223	13	225	30	14	61	1142	12215	577	26	134	151	23534	196	90	179	129	102	93	155	400	955	96	751	40	152	532	0	0	25	10508	4197
79.1	8212394	0	226	22	32	51	1147	12471	562	58	112	174	22921	138	83	185	73	96	202	47	461	951	18	634	27	161	479	0	0	62	10545	4445
79.2	7411514	6	202	12	11	77	1130	12294	565	35	113	232	22758	145	49	191	46	51	120	83	334	983	92	525	39	166	524	23	0	26	10553	4271
79.3	7425513	0	206	35	16	45	1125	12431	627	38	94	225	22691	96	31	195	0	64	0	141	436	926	0	578	40	220	530	0	0	20	10622	4245
79.4	7781855	10	183	10	13	44	1137	12592	651	33	93	217	22580	168	6	204	57	144	32	121	385	1018	64	653	36	230	521	0	4	51	10570	4434
79.5	7275618	9	210	33	38	53	1133	12881	605	0	85	202	22230	172	75	146	103	104	190	186	414	920	155	636	15	185	583	0	0	107	10655	4281
79.6	7240968	12	202	25	24	78	1138	12644	712	40	69	201	22276	171	36	161	0	83	105	151	363	929	131	715	0	225	509	8	0	50	10678	4329
79.7	6985125	19	208	35	15	54	1092	12154	613	35	62	226	22115	84	0	116	57	127	82	83	359	933	119	574	8	190	454	0	0	0	10718	4306
79.8	6938676	0	173	20	0	28	1074	12142	593	23	78	208	22254	158	62	137	87	43	95	151	412	941	95	612	26	159	548	0	0	52	10796	4484
79.9	6964525	0	207	25	48	76	1137	12480	594	16	93	201	22159	94	6	118	0	81	42	116	447	949	84	650	61	193	495	0	0	65	11259	4438
80	7028724	0	220	5	6	73	995	12644	637	51	73	211	22136	106	22	178	71	78	93	101	470	933	69	615	0	200	525	23	0	43	11096	4344
80.1	6997974	0	186	0	7	53	1031	12101	528	59	79	243	21833	133	33	160	108	59	114	157	420	997	79	694	43	181	571	0	0	69	10974	4380
80.2	6987075	0	192	0	4	60	973	12484	606	56	122	196	22262	152	73	144	56	94	122	145	475	936	188	684	32	167	532	0	0	40	11191	4483
80.3	6990375	23	196	19	26	67	1119	12294	592	60	80	217	21896	150	14	210	0	125	75	133	265	912	123	755	22	201	515	38	0	46	11287	4284
80.4	7020124	4	167	18	0	56	1031	12098	633	38	109	245	21851	110	40	90	40	125	75	133	265	912	123	755	22	201	515	38	0	46	11287	4284
80.5	7024524	0	223	0	0	55	1044	12021	611	55	107	214	22343	111	40	90	40	125	75	133	265	912	123	755	22	201	515	38	0	46	11287	4284
80.6	6997424	5	207	25	16	65	1116	12116	574	34	106	158	21960	109	0	171	39	83	58	86	397	871	216	689	0	193	538	0	0	26	11572	4411
80.7	6969075	0	187	19	12	82	1012	11537	541	32	105	240	21373	51	8	116	46	27	70	69	391	961	96	750	50	168	498	6	0	54	11634	4436
80.8	7029923	0	189	12	17	64	1039	11827	561	61	119	186	21778	137	7	88	10	103	119	139	423	907	166	745	34	239	5					

Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh	
81.4	7122121	0	207	0	0	57	1041	11687	622	23	108	167	21695	110	0	75	7	34	78	174	298	981	146	774	61	211	543	0	0	40	12672	4589	
81.5	7155620	0	217	5	14	57	978	11500	710	54	123	174	21711	69	0	130	26	111	48	200	437	830	0	852	40	182	507	0	0	0	12287	4404	
81.6	7127621	7	261	0	13	34	1019	11828	711	28	102	187	21957	154	9	181	0	112	87	209	411	800	99	805	59	264	479	15	0	71	12679	4436	
81.7	7083222	18	220	7	8	82	990	12190	583	32	95	170	21420	135	0	62	28	78	47	163	421	899	45	734	46	247	547	32	0	64	13084	4487	
81.8	7202219	13	230	0	0	47	1042	12112	547	81	105	230	21332	114	0	127	12	100	118	180	323	870	50	796	62	183	544	0	0	43	12656	4479	
81.9	7248968	7	199	0	0	32	1050	11658	581	11	117	155	20562	111	0	84	23	40	141	415	909	117	696	58	210	521	0	0	65	13095	4616		
82	7267968	0	188	0	0	32	994	11121	543	58	117	154	20368	103	17	112	32	113	36	214	380	764	132	891	21	207	519	5	8	46	12755	4404	
82.1	7274618	0	239	0	10	69	1005	10972	598	15	122	145	20622	84	0	108	24	162	181	162	366	790	97	818	41	192	495	0	0	54	12846	4390	
82.2	7364165	15	243	0	0	51	1044	11109	582	64	114	177	20860	99	0	112	36	70	80	250	429	829	57	871	41	277	540	4	46	72	12842	4614	
82.3	7428513	21	215	9	0	32	1066	11523	614	22	135	182	21594	199	59	105	54	225	100	109	382	668	69	878	71	206	537	0	0	53	12763	4317	
82.4	7429664	0	237	20	0	58	1084	11586	582	61	85	142	21225	127	0	114	61	154	180	276	332	831	140	915	29	221	562	0	0	119	12541	4418	
82.5	7407065	0	230	15	11	81	1149	11817	580	59	92	229	21784	162	0	111	55	116	59	203	389	794	109	858	81	251	601	0	0	101	12904	4294	
82.6	7504611	0	236	0	0	32	1042	11960	554	31	151	279	21751	98	0	147	43	132	106	150	332	740	158	870	73	242	558	0	0	59	12908	4428	
82.7	7465963	10	256	13	0	39	1078	11288	587	56	127	215	21511	100	0	211	57	83	62	130	394	783	94	879	61	266	527	0	31	93	13010	4409	
82.8	7467112	7	244	13	0	54	1107	11504	564	23	110	201	22214	121	0	147	40	85	113	226	433	821	148	905	51	240	591	0	0	62	12974	4341	
82.9	7390715	6	229	0	16	57	1038	11879	565	38	127	182	21817	109	0	167	47	72	74	117	386	792	146	780	44	239	569	0	0	50	12770	4464	
83	7373414	0	233	0	22	40	1109	11652	651	50	98	204	22105	156	38	182	148	119	161	89	315	875	178	828	47	242	636	0	0	94	12736	4388	
83.1	7367165	7	255	11	0	58	1157	11302	645	80	106	183	22405	140	0	186	16	108	100	299	405	915	11	852	45	262	510	0	0	129	13032	4361	
83.2	7421714	11	328	34	34	67	1208	11590	727	30	145	188	21746	89	0	79	0	98	145	80	349	752	37	828	58	274	527	0	0	64	12546	4163	
83.3	7480812	12	228	16	24	71	1120	11974	639	51	112	195	20703	123	0	135	50	166	151	178	352	805	101	878	71	230	536	0	0	49	12727	4348	
83.4	7466863	0	200	0	9	9	1080	11786	574	35	110	172	21477	92	0	121	113	119	97	193	385	842	0	933	23	236	590	27	36	72	12707	4333	
83.5	8223794	20	239	11	0	77	1119	12181	562	25	107	197	21240	102	46	180	0	210	57	205	349	726	76	916	66	245	552	6	0	102	12564	4226	
83.6	8039148	4	263	0	0	51	1014	11421	665	82	136	204	21348	138	164	232	70	62	97	212	392	823	107	708	26	190	584	5	0	92	12790	4211	
83.7	7716405	9	234	16	35	60	1032	11191	643	69	117	154	21760	170	23	175	94	62	87	185	395	839	76	737	61	43	270	572	0	0	37	12520	4107
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84	8125396	4	257	25	33	74	1077	12301	569	76	97	156	20905	105	0	149	33	179	114	217	338	748	103	910	83	252	568	0	0	82	12006	4010	
84.1	8116396	0	224	0	0	32	1118	11656	573	47	76	161	20975	121	0	224	62	130	146	197	403	825	0	943	15	278	516	14	0	51	11842	4102	
84.2	8053098	16	228	10	13	51	1133	12175	589	52	112	185	22000	138	0	128	86	197	97	205	325	784	106	1065	43	191	514	0	5	71	12090	4171	
84.3	7804254	18	313	0	7	63	1195	12014	599	49	111	181	21647	135	0	159	83	114	120	176	410	785	43	1064	57	272	610	0	0	75	11715	4078	
84.4	8589384	6	239	0	0	39	1083	11515	548	16	120	171	20257	74	0	90	81	96	88	227	353	835	161	925	52	217	532	25	0	90	12376	4028	
84.5	7562110	8	269	6	18	70	1075	11715	650	57	114	210	21108	145	0	174	46	159	88	167	235	838	169	797	52	287	526	0	0	95	12689	4135	
84.6	7377115	0	220	0	0	60	1114	12669	542	45	117	198	21970	93	0	148	28	49	142	210	450	773	41	889	86	221	656	7	15	88	12539	4202	
84.7	7411614	0	254	0	0	21	1025	12139	778	47	97	199	21831	84	0	155	111	141	135	209	380	714	26	820	26	221	549	0	0	86	12440	4072	
84.8	7387665	11	249	0	0	53	1145	11602	768	57	115	149	21790	71	0	141	0	151	133	191	378	810	20	919	18	281	566	0	0	59	12424	3988	
84.9	7359465	17	248	4	18	39	1023	12139	591	77	164	166	21501	181	0	105	118	62	146	269	367	683	73	920	69	244	616	11	0	64	13052	4052	
85	7293417	7	252	9	22	70	1112	12691	569	31	147	190	21244	139	0	178	11	42	87	240	417	769	72	898	90	277	621	4	0	124	13053	3890	
85.1	7273017	0	232	38	29	56	1146	12242	640	63	117	126	21460	99	0	135	91	90	84	121	410	742	76	917	30	259	584	0	18	75	13052	3931	
85.2	7318616	0	243	28	19	70	1125	11651	613	54	118	171	21517	97	0	122	35	132	110	121	333	652	88	985	93	261	552	0	0	45	12995	3775	
85.3	7287717	0	271	0	0	36	1002	10460	747	38	101	150	21150	89	0	95	26	12	19	85	400	647	16	998	49	222	514	0	0	37	12734	3919	
85.4	7327966	0	266	35	30	55	944	10814	748	55	98	226	20063	160	9	63	0	144	44	146	324	673	74	1060	48	214	521	0	0	43	13016	3845	
85.5	7353266	15	276	21	26	67	1053	11847	491	37	111	185	19918	156	0	140	44	0	51	163	386	614	8	1282	64	209	628	0	26	116	12939	3934	
85.6	7492112	6	223	5	0	43	953	12085	388	44	123	199	19214	115	0	106	54	120	174	446	826	50	905	86	244	544	0	0	86	12882	3883		
85.7	7413164	5	251	0	0	47	994	11777	524	33	122	149	20677	143	14	52	38	114	82	147	310	692	75	799	22	242	547	0	0	86	12841	3901	
85.8	7395214	10	192	16	0	50	992	11630	547	33	107	150	20974	135	0	113	15	126	84	234	303	755	90	742	50	268	515	0	19	134	12840	3736	
85.9	7544260	0	204	0	0	46	1055	10815	565	21	123	181	19593	102	0	98	0	47	0	250	272	699	33	833	52	276	523	0	0	70</			



Position (mm)	keps	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	C	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
86.5	8398139	0	260	9	12	62	954	11823	633	63	114	158	19714	141	0	124	15	43	40	190	340	687	55	864	41	272	488	19	46	104	12703	3627
86.6	8150096	0	272	0	21	75	977	11624	522	40	159	157	20238	148	0	130	89	103	71	240	251	581	63	876	60	190	474	0	0	51	12092	3529
86.7	7389709	14	303	6	13	65	1091	11367	511	54	114	168	19882	64	0	102	52	88	69	239	286	642	115	919	46	191	409	0	0	66	12066	3665
86.8	7215619	16	313	0	0	56	1086	11815	468	21	75	170	19411	100	0	164	83	133	134	212	251	628	102	860	24	198	490	0	0	66	11654	3420
86.9	7036623	9	242	0	6	33	1049	12734	522	64	93	147	19189	106	0	132	84	124	0	219	249	674	0	744	41	199	443	0	40	64	12064	3357
87	7228969	10	287	19	31	73	1064	12458	505	33	97	147	18121	93	0	71	0	106	170	207	292	625	17	780	50	261	449	0	0	98	11862	3315
87.1	7232669	0	202	19	20	51	1075	11473	444	7	110	139	18950	120	0	203	0	75	47	200	211	597	81	672	58	237	513	0	0	86	11793	3421
87.2	7428763	21	199	0	0	32	1005	11059	418	27	112	152	20244	172	0	201	24	93	181	167	323	701	90	712	62	238	455	0	0	70	11941	3516
87.3	7059773	0	264	7	24	75	1109	11265	579	22	139	143	19678	131	14	86	72	72	110	189	274	738	71	762	45	197	507	0	0	89	11833	3349
87.4	6993075	0	230	0	16	42	1081	12271	490	78	87	169	19089	85	0	110	16	0	51	148	245	638	87	756	46	154	689	0	0	59	11724	3397
87.5	7101272	7	200	0	0	46	1105	12490	511	34	104	140	19822	101	49	49	62	0	70	133	327	645	72	774	37	164	684	4	0	34	11997	3328
87.6	6932126	15	244	35	29	54	1160	11724	505	27	89	208	20792	104	0	77	49	132	45	113	318	663	0	837	71	209	470	13	0	73	11588	3360
87.7	6930726	7	250	0	7	25	990	11484	485	67	93	143	20488	94	0	92	37	83	97	168	399	685	14	723	12	233	484	0	15	15	11484	3266
87.8	7609309	17	234	16	46	74	1099	11852	520	45	75	146	19458	82	0	138	32	128	86	173	350	664	55	561	32	187	502	39	16	19	11115	3344
87.9	7780455	7	227	23	41	83	1207	11445	643	40	99	194	20840	144	45	64	73	155	84	138	365	633	19	699	33	162	534	24	0	79	11077	3253
88	8112397	5	236	18	20	68	1133	10793	628	56	70	230	21945	129	0	73	0	50	54	123	189	634	84	874	9	247	452	0	0	23	11191	3190
88.1	7373565	17	231	8	29	55	1180	10845	549	79	98	200	20370	67	0	80	0	53	91	131	153	544	37	632	39	205	519	0	0	12	11017	3119
88.2	7556960	34	201	0	0	36	1104	11192	509	36	100	163	19286	109	0	95	108	10	0	121	256	564	92	544	24	153	511	0	9	0	10934	3146
88.3	7051973	20	244	23	34	84	1136	11405	484	23	64	170	19501	107	63	107	86	5	44	148	262	563	13	597	36	133	570	0	0	86	10465	2937
88.4	7463463	10	221	5	14	56	1019	11664	455	32	57	164	19008	85	0	130	0	28	90	191	303	512	77	635	27	164	559	6	0	54	10859	3056
88.5	7510862	0	250	14	19	48	968	10925	440	24	71	150	18159	44	0	107	42	50	58	77	268	636	48	677	36	193	521	0	0	21	10690	3009
88.6	6809379	12	232	14	28	62	985	10783	476	38	79	148	18735	163	0	120	60	159	0	156	195	581	50	680	9	260	424	0	20	81	10645	3017
88.7	6647033	8	234	0	0	53	1112	11512	464	83	110	171	19935	65	0	152	49	82	38	128	270	574	21	710	24	171	493	0	0	47	10617	2999
88.8	7328516	9	245	25	45	67	1146	11588	427	57	127	172	19259	101	9	109	90	75	54	90	216	671	69	706	61	182	434	0	10	52	10650	2982
88.9	7389964	6	253	21	49	64	1053	11982	494	49	122	118	19228	144	0	111	18	75	71	179	226	597	7	569	93	211	450	0	0	49	10511	2984
89	7377715	0	279	10	20	70	1011	12510	366	25	102	133	18405	156	0	55	45	35	102	150	224	611	124	665	49	224	482	0	0	81	10404	2912

Appendix. Scanning XRF data for synthetic core R2.

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
0	10	77	195	0	70	417	3544	161	19	56	78	6563	52	41	83	42	66	40	52	8	246	20	65	1195	136	245	8	0	16	2694	693
0.1	15	94	227	29	107	449	3663	278	0	86	51	6689	28	58	84	40	56	71	91	43	231	15	107	1173	125	235	4	0	32	2649	738
0.2	14	135	213	35	98	608	4349	299	32	61	98	8361	55	43	67	37	0	41	33	0	259	0	65	1171	159	282	0	0	39	2516	697
0.3	0	144	232	30	101	583	4703	583	0	109	115	7691	62	47	74	16	21	83	76	37	245	0	34	1179	149	296	0	0	8	2471	620
0.4	5	70	270	24	73	310	2374	314	0	95	25	3448	23	0	31	9	56	40	73	45	213	0	41	1251	137	200	0	0	6	2386	609
0.5	0	35	235	8	61	171	1245	12	0	71	51	2376	0	10	42	56	42	67	60	28	181	0	86	1323	83	179	6	0	14	2401	591
0.6	0	36	277	12	63	141	719	127	24	91	16	1523	37	29	43	70	33	28	31	221	0	77	1255	103	167	0	8	17	2204	584	
0.7	10	13	237	15	55	84	415	61	0	79	20	737	0	0	0	0	39	37	54	42	207	0	88	1274	132	122	0	0	0	2345	526
0.8	0	18	235	0	43	76	459	188	32	64	11	832	0	0	0	41	43	47	51	23	174	31	91	1132	98	143	0	0	43	2587	620
0.9	0	38	240	8	57	127	494	171	0	61	6	1479	18	0	0	28	27	35	52	18	209	6	76	1130	116	167	0	0	18	2460	677
1	0	6	202	9	49	121	409	105	6	46	34	1042	0	0	19	0	38	56	76	49	262	0	60	990	90	130	0	0	22	2622	674
1.1	5	24	164	8	52	74	313	134	44	57	10	790	0	0	0	13	47	19	31	66	291	0	112	886	88	136	0	0	21	2509	610
1.2	0	5	156	9	52	61	211	11	0	70	0	557	0	0	0	0	24	75	61	56	227	0	108	876	77	123	0	0	8	2504	691
1.3	0	0	131	4	32	39	249	17	24	50	32	613	0	0	0	29	27	50	72	50	269	12	128	755	99	113	0	0	8	2729	699
1.4	0	16	137	11	47	137	812	85	22	36	20	2226	12	7	0	27	10	68	86	100	260	0	81	686	100	137	10	0	27	2787	785
1.5	0	45	131	20	54	343	1779	147	0	66	42	5197	14	0	35	25	33	19	95	60	248	18	101	747	122	165	9	0	0	3081	889
1.6	12	52	137	14	54	432	2006	181	21	66	92	7153	27	0	59	72	47	42	34	135	247	37	206	698	146	228	0	4	36	3515	1002
1.7	0	34	137	28	43	529	1885	250	9	78	50	7487	34	0	22	0	17	62	73	148	235	0	139	693	159	228	10	0	43	3718	963
1.8	0	47	103	11	32	476	2458	278	35	102	101	8165	40	0	56	0	69	121	97	104	219	0	205	680	145	245	0	0	26	3975	1134
1.9	6	88	152	40	46	527	3387	258	22	98	52	8963	50	9	0	46	100	13	78	148	253	0	107	714	158	274	0	0	41	3971	1149
2	0	69	140	59	73	594	3216	284	27	74	58	8956	26	0	69	31	27	32	117	217	350	0	154	599	190	272	21	20	59	4421	1328
2.1	0	60	117	36	57	541	2188	141	13	71	59	8216	42	52	56	41	39	41	74	203	334	12	174	621	160	269	0	0	63	4382	1336
2.2	0	63	104	32	38	493	2046	229	28	60	44	8364	20	4	34	0	40	69	92	264	277	0	249	534	152	277	0	0	17	4821	1303
2.3	5	51	95	32	63	555	2108	296	58	74	47	8629	76	29	70	23	67	110	92	219	295	17	213	485	157	246	0	0	24	4871	1504
2.4	0	75	106	29	39	679	2229	248	0	119	60	9801	97	58	110	20	114	50	76	197	288	19	274	513	139	281	0	0	53	5224	1531
2.5	5	71	57	39	51	823	2600	359	12	76	82	11046	65	30	64	18	12	103	94	226	334	8	290	472	142	259	29	0	44	5333	1604
2.6	0	111	82	28	49	916	2981	370	47	80	101	13239	106	66	92	88	36	94	94	256	355	10	269	436	182	314	13	21	27	5722	1891
2.7	16	142	87	54	47	1202	3807	377	46	91	91	15611	95	27	73	0	68	76	155	368	408	0	277	368	193	333	9	0	47	5783	1857
2.8	24	146	39	56	51	1440	4844	399	33	98	148	19903	152	75	111	46	188	91	43	367	393	12	292	321	204	365	0	10	68	6160	2037
2.9	17	206	65	51	66	1737	6249	569	76	130	198	27023	225	128	251	90	115	124	105	358	380	0	192	265	250	475	9	0	41	6364	2161
3	12	217	60	65	82	1983	8172	686	64	104	201	31493	205	87	252	106	39	109	170	391	399	0	331	215	258	519	12	0	25	6587	2196
3.1	41	255	66	68	94	2254	9774	771	64	154	274	35284	222	156	281	176	108	216	192	383	393	42	275	207	280	626	18	0	60	6706	2388
3.2	27	285	29	55	106	2220	10833	890	30	153	259	36861	305	188	333	136	160	99	123	438	434	54	339	154	307	601	13	4	28	7281	2683
3.3	39	276	60	75	118	2175	10582	922	31	137	241	36900	174	143	268	121	189	160	130	481	492	0	348	77	251	574	0	0	44	7585	2512
3.4	24	253	16	32	66	1919	9715	916	78	150	279	36514	261	147	254	140	104	122	117	404	462	0	379	66	251	618	5	0	22	7848	2724
3.5	22	218	0	43	58	1841	10016	781	54	100	199	36821	214	98	347	94	158	167	139	445	454	0	439	66	279	503	0	0	61	7846	2733
3.6	22	258	43	55	102	1856	10511	778	87	125	252	37228	254	201	289	108	164	176	107	538	443	46	398	72	249	603	0	0	48	8252	2887
3.7	6	257	33	50	81	1869	11134	825	42	157	294	37824	219	145	249	103	178	137	110	511	366	0	413	31	238	574	0	0	36	8381	2941
3.8	0	222	10	0	44	1742	11634	862	67	124	271	37118	227	144	264	150	58	185	131	519	452	0	433	35	218	606	0	0	92	8527	3100
3.9	10	250	30	72	62	1876	12321	847	92	104	240	37398	204	161	241	109	170	175	166	563	512	0	414	12	224	547	0	0	9	8704	3101
4	19	226	31	54	90	1846	12703	795	80	128	253	36440	177	104	213	59	17	162	173	551	519	0	478	34	270	649	8	0	48	8680	2987
4.1	9	233	32	57	81	1810	12318	796	57	145	265	34637	122	117	236	127	77	59	243	632	602	32	521	24	197	573	26	66	61	8989	3070
4.2	20	231	39	74	56	1580	11907	714	46	104	230	32533	138	0	248	64	119	109	134	599	569	18	500	54	223	549	23	42	53	9102	3316
4.3	31	223	45	54	63	1517	11889	690	65	95	247	31485	190	68	194	71	115	86	149	556	542	70	510	46	223	525	5	0	70	9073	3136
4.4	13	218	23	9	72	1441	12080	679	30	117	251	30741	133	55	170	35	186	119	168	645	512	82	553	61	224	502	0	0	19	9415	3422

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
4.5	10	216	30	34	80	1389	12300	722	50	105	238	29476	83	82	149	85	116	75	221	711	636	0	521	40	194	518	0	13	114	9688	3443
4.6	0	186	15	0	45	1354	12442	596	63	114	249	28771	148	66	197	78	76	57	119	636	640	34	543	52	181	526	18	0	10	9884	3652
4.7	11	201	16	54	76	1302	12248	655	70	131	233	28280	106	50	189	28	97	54	180	692	666	58	597	42	158	516	0	11	31	10136	3702
4.8	24	161	13	37	57	1265	11959	669	58	118	21	28068	171	27	109	27	112	140	19	672	647	92	564	22	216	540	13	0	59	10245	4025
4.9	0	166	0	0	65	1278	12023	625	58	72	231	27487	107	0	140	38	103	112	172	756	603	74	585	47	188	479	0	0	57	10655	4030
5	8	183	17	26	63	1205	12087	728	25	146	235	26789	181	134	145	16	42	42	108	603	672	124	551	58	172	560	0	9	65	11161	4030
5.1	22	181	25	31	78	1121	12045	574	44	109	219	25672	137	21	161	12	48	66	188	640	616	53	689	40	234	511	8	0	61	11150	4100
5.2	0	143	5	23	80	1128	11986	658	47	126	243	25129	158	53	143	0	111	113	76	685	735	61	622	40	244	559	0	6	19	10997	4289
5.3	0	208	38	7	62	1156	12259	664	53	69	161	24700	176	67	211	55	96	86	89	604	774	106	689	0	184	583	17	0	44	10983	4191
5.4	0	207	24	14	68	1126	11981	700	34	35	224	24196	122	77	134	102	10	76	156	750	846	56	590	0	178	546	10	30	68	10955	4304
5.5	0	178	0	14	55	1142	11589	685	61	76	186	24329	60	0	190	13	88	106	139	589	702	39	587	36	243	525	0	0	28	10525	4244
5.6	0	161	0	14	65	1090	11514	585	59	96	190	23387	95	7	163	0	70	149	139	591	828	160	637	23	217	509	0	0	38	10576	4205
5.7	41	199	31	52	63	1138	11770	614	29	102	188	22687	137	8	80	0	116	48	65	516	799	78	633	26	216	475	0	0	0	10410	4284
5.8	24	187	15	14	53	1040	11097	579	53	97	201	22302	140	73	180	62	100	98	130	502	869	97	709	0	153	503	0	0	18	10558	4425
5.9	0	162	36	38	90	1089	10724	620	20	135	183	21245	93	0	125	49	8	58	117	519	892	33	661	42	209	528	0	0	54	10318	4314
6	0	135	0	30	49	885	10535	576	19	96	158	21206	103	34	86	12	64	28	103	423	816	76	651	12	174	486	0	0	24	10430	4381
6.1	0	135	27	15	35	996	10584	578	24	68	175	20483	84	17	71	46	131	110	132	485	865	99	674	24	175	424	0	0	56	10390	4255
6.2	0	139	0	0	55	960	10258	559	45	92	196	20860	117	8	100	57	77	70	82	479	838	17	570	17	168	473	0	0	31	10212	4322
6.3	0	153	23	24	67	1029	10205	593	21	70	184	20395	111	5	112	24	82	63	107	392	861	162	687	6	215	516	0	0	56	10397	4309
6.4	12	143	32	40	70	1092	10509	576	71	87	183	21224	147	34	208	94	102	192	145	425	905	153	730	44	168	642	0	0	69	10123	4439
6.5	0	159	43	43	67	1017	10303	625	12	55	175	21650	106	20	44	102	89	0	67	506	887	79	825	42	175	540	0	0	25	10475	4375
6.6	0	151	9	0	47	1069	10266	594	48	99	174	21439	206	72	142	123	136	84	118	344	935	160	685	55	195	542	0	0	74	10405	4290
6.7	10	176	29	11	36	1166	10229	617	23	129	178	21819	157	0	153	88	137	93	139	500	909	83	863	44	208	549	0	0	18	10557	4409
6.8	0	184	37	32	46	1253	10030	725	39	96	186	22629	144	52	153	103	24	78	13	522	946	48	797	38	159	612	0	26	6	10520	4495
6.9	26	149	7	22	56	1325	9530	696	11	111	184	23349	180	77	172	13	90	120	141	563	961	135	777	54	208	550	15	0	40	10728	4529
7	9	178	11	13	40	1424	9593	598	65	130	210	23956	141	31	160	59	129	116	79	442	978	0	831	33	190	515	0	0	79	10679	4482
7.1	0	149	0	0	56	1450	9350	567	26	147	205	24819	165	27	171	100	92	35	70	414	786	52	859	57	209	533	0	0	21	10479	4513
7.2	14	168	11	22	35	1631	8814	642	44	83	188	26535	188	86	147	53	9	15	132	487	764	83	883	20	216	641	0	18	21	10564	4239
7.3	0	189	0	0	16	1715	8051	654	58	98	195	27218	208	66	134	122	127	186	139	554	899	31	761	15	216	548	0	0	26	10783	4436
7.4	21	170	0	0	55	1770	7841	716	59	104	203	27834	200	39	158	93	69	99	101	506	843	66	701	10	193	514	0	0	36	10809	4406
7.5	34	160	38	17	67	1832	7634	635	44	126	231	27942	206	89	182	113	7	47	98	558	697	90	971	55	191	548	18	0	31	11037	4394
7.6	11	153	15	9	57	1868	7482	600	73	118	184	29077	244	42	183	82	81	171	137	499	822	137	1065	54	236	562	0	0	54	11104	4621
7.7	22	224	56	43	72	2002	7030	711	73	115	156	31426	175	101	214	29	10	66	26	556	769	7	809	40	214	600	0	0	0	10652	4586
7.8	5	132	0	40	46	2033	6334	803	48	157	198	32860	226	149	239	138	69	123	131	644	808	136	804	70	224	566	0	0	60	10946	4481
7.9	7	164	14	15	38	2063	5695	713	88	118	199	33327	249	124	168	29	59	159	99	597	666	117	934	17	253	614	0	0	64	10946	4657
8	27	172	15	20	45	2038	5927	698	66	173	156	33189	243	132	299	115	111	130	55	697	688	28	881	33	201	577	0	0	23	10955	4477
8.1	18	161	22	0	54	1886	6462	721	56	114	189	32064	149	132	225	23	161	59	139	654	838	0	882	9	246	538	0	0	84	10969	4348
8.2	34	144	22	34	65	1865	6793	740	40	96	208	31553	238	60	225	61	144	42	75	640	799	62	854	17	248	537	0	45	31	10946	4663
8.3	0	135	9	0	31	1737	7792	710	19	78	223	31718	175	133	246	46	39	140	81	552	852	114	901	28	164	514	0	0	43	10951	4510
8.4	25	191	15	26	65	1622	9408	758	22	121	206	31090	139	44	176	15	46	150	112	687	914	166	739	18	237	530	5	0	29	10926	4652
8.5	0	203	13	21	38	1437	10045	667	28	97	227	30251	177	33	246	81	140	97	77	639	783	50	800	10	214	506	0	0	54	11229	4581
8.6	27	193	10	37	78	1519	10375	645	66	96	214	30292	140	61	204	52	120	56	143	667	830	135	707	0	217	513	0	16	31	11172	4495
8.7	0	186	0	0	51	1369	10937	692	33	79	242	30047	164	83	227	25	109	103	137	732	634	28	688	0	217	492	7	0	0	10823	4357
8.8	7	191	33	25	69	1362	11527	690	50	99	300	28889	154	67	232	55	158	123	153	764	712	36	933	13	209	490	0	0	65	11072	4349
8.9	11	188	4	6	81	1203	11730	644	15	124	181	27147	176	39	208	96	72	117	114	680	716	131	679	8	190	559	0	0	53	10766	4334
9	11	211	46	45	96	1257	11509	666	66	71	213	25107	134	0	155	46	97	105	144	632	673	83	549	34	225	510	7	0	60	10657	4209
9.1	5	168	37	41	36	1108	11534	675	38	81	208	24674	126	64	84	116	124	94	211	615	787	85	620	9	147	541	0	0	52	10593	4209

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh	
9.2	0	135	18	15	60	1088	11064	587	59	79	159	24381	184	80	170	74	59	60	81	590	734	131	578	45	196	505	0	4	10281	4155		
9.3	15	172	36	33	74	1146	11404	615	28	89	188	24155	120	38	144	9	79	115	135	582	716	0	523	19	219	569	0	103	10475	4111		
9.4	0	180	22	42	68	1167	11564	551	24	121	239	23534	138	22	106	32	66	111	54	545	776	97	514	47	140	482	0	0	49	10422	4218	
9.5	0	177	13	14	39	1207	11571	529	22	104	214	23668	158	105	168	68	118	111	156	552	918	109	654	52	137	500	0	0	56	10297	4257	
9.6	8	154	42	24	48	1083	11529	580	57	89	212	23047	70	0	65	26	133	97	188	539	963	174	727	8	192	509	0	0	44	10354	4242	
9.7	10	195	7	6	57	1079	11587	616	25	104	187	22727	114	41	127	68	144	138	137	523	848	72	701	13	203	520	9	0	52	10001	4030	
9.8	0	136	0	9	56	1039	11593	610	54	97	181	22369	132	83	186	78	18	94	69	449	778	126	626	0	157	564	0	0	53	10309	4323	
9.9	8	145	12	15	72	1018	11647	562	47	93	208	22539	163	26	127	0	111	132	63	432	809	103	588	23	204	516	0	0	92	9807	4082	
10.0	23	187	52	52	81	1102	11619	586	59	88	213	22289	101	11	127	79	50	42	107	472	945	160	581	28	159	538	0	0	40	9863	4120	
10.1	9	180	41	44	75	1137	11375	550	49	60	209	21934	130	31	184	105	103	119	172	448	867	0	701	35	225	546	23	0	10	10059	4190	
10.2	8	162	0	31	46	1104	11171	588	69	110	211	21752	108	10	174	93	69	100	88	485	875	40	596	35	204	503	13	0	56	10008	4276	
10.3	0	152	20	23	69	1067	11260	644	11	117	195	21957	173	0	165	40	106	89	71	471	856	85	628	33	232	530	22	0	20	10085	4307	
10.4	24	181	27	17	67	1069	11463	626	45	91	120	21887	106	0	152	57	66	57	46	491	1075	95	617	24	212	557	0	0	35	9972	4194	
10.5	32	172	14	35	55	1032	11141	586	57	86	162	22193	173	0	165	40	106	89	71	471	856	85	628	33	232	530	22	0	20	10085	4307	
10.6	21	165	7	0	64	1089	10847	584	44	116	229	21538	113	5	111	75	102	35	116	357	963	122	685	11	173	534	7	0	0	9957	4206	
10.7	0	201	24	38	67	1070	11061	583	7	119	170	21315	124	0	151	75	88	35	127	433	840	10	773	38	202	483	0	0	17	10089	4084	
10.8	0	189	17	21	77	1060	11469	640	8	139	181	22172	128	88	161	96	103	159	109	424	870	87	761	81	198	535	0	0	29	10358	4250	
10.9	15	205	35	0	50	1095	10641	612	39	74	149	21265	114	31	116	51	69	131	101	427	895	27	991	0	220	491	9	0	49	10284	4387	
11	11	145	10	19	52	1107	10083	673	13	89	159	22218	173	78	195	69	113	95	112	458	851	11	914	48	186	512	0	0	75	10291	4348	
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11.4	0	166	9	12	28	1426	8784	678	45	69	179	25460	202	83	156	32	44	54	82	516	867	60	956	0	213	554	5	0	64	10407	4414	
11.5	0	148	0	0	29	1535	8335	664	40	122	209	26288	197	98	178	120	86	85	174	478	876	79	951	0	221	614	0	0	35	10434	4451	
11.6	30	154	32	19	66	1646	8317	701	34	127	192	27517	128	82	155	67	36	59	189	519	919	42	1109	8	205	595	0	0	65	10562	4553	
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11.9	14	166	5	22	55	1913	5844	717	80	86	253	33662	172	126	241	64	103	132	164	627	805	61	925	0	230	526	0	0	67	10855	4457	
12	29	175	0	17	35	2050	5219	654	78	96	250	36030	212	104	236	86	121	73	143	755	722	7	937	34	223	548	0	9	49	10891	4324	
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12.5	37	191	37	19	59	1650	8920	634	56	113	228	30654	131	33	162	60	109	190	126	723	609	97	785	24	203	474	0	0	23	11062	4236	
12.6	15	163	31	39	74	1423	9501	680	61	135	259	29273	130	9	180	113	50	61	85	697	606	92	573	0	215	493	0	15	40	10802	4158	
12.7	6	148	22	37	78	1372	9849	672	24	78	225	27349	129	51	179	78	56	16	33	690	720	44	665	35	155	530	0	29	53	10529	4361	
12.8	15	176	18	45	64	1377	10185	639	63	112	226	26356	140	20	70	29	87	170	124	583	685	117	681	54	203	458	0	0	68	10340	4173	
12.9	16	146	0	7	40	1309	10423	639	41	63	192	25678	101	48	146	111	69	94	126	661	687	61	686	0	163	525	12	0	60	10142	4221	
13	14	171	34	30	59	1227	10910	658	62	110	176	25017	163	63	207	34	61	0	63	560	724	119	561	16	220	508	0	31	27	10276	4207	
13.1	0	147	11	9	68	1253	10956	582	65	68	209	24658	91	0	100	0	125	127	122	620	731	110	729	0	233	486	0	0	44	10341	4230	
13.2	6	132	13	0	61	1146	11354	602	31	101	221	24219	100	0	128	43	71	83	113	554	836	107	618	57	220	514	28	6	23	10300	4219	
13.3	8	173	19	19	55	1151	11288	637	36	132	236	24057	100	0	158	74	173	118	155	463	859	108	611	24	212	511	0	0	50	10112	4097	
13.4	10	198	17	31	74	1087	11542	631	37	103	250	23771	76	0	103	0	103	0	47	120	559	831	197	668	14	225	545	36	10	78	10312	4320
13.5	21	166	27	21	49	1076	11632	549	42	97	235	23024	181	0	170	0	110	129	122	416	807	37	442	37	240	491	0	0	7	9863	4162	
13.6	10	164	10	25	71	1089	11561	618	51	90	246	22799	151	69	96	100	85	98	102	525	936	74	525	30	159	504	0	0	41	10239	4273	
13.7	0	210	8	12	41	1073	11452	579	36	73	194	22592	106	63	122	58	113	28	67	435	891	123	568	45	136	490	0	0	23	10405	4313	
13.8	34	195	42	54	100	1173	11690	579	8	99	185	22003	73	54	110	11	56	121	61	447	900	121	569	86	171	509	0	0	0	10060	4192	

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
13.9	15	169	21	24	39	1055	11629	629	53	83	195	21817	157	43	218	27	91	47	97	479	859	46	653	0	194	531	0	0	40	10116	4300
14	27	182	15	13	55	1048	11208	609	20	108	190	22496	128	12	122	60	69	49	115	484	926	119	626	27	163	517	0	0	30	10035	4245
14.1	9	184	34	54	89	1047	11524	622	24	74	207	21870	113	73	175	79	78	86	114	469	804	75	677	50	149	473	52	42	38	9943	4168
14.2	7	188	20	12	68	1082	11200	611	60	101	185	22390	123	52	95	83	103	130	107	423	807	70	770	0	160	561	0	0	0	9934	4235
14.3	17	181	8	33	65	1009	10947	565	22	94	180	22408	141	54	126	51	76	66	115	489	878	151	819	42	160	557	0	0	20	10170	4395
14.4	14	171	15	30	59	1078	10737	675	20	66	180	21700	100	0	102	70	130	0	193	430	777	129	859	4	221	627	16	50	67	10034	4262
14.5	10	178	0	19	53	1075	10378	694	26	105	155	21841	114	0	146	20	83	71	109	421	951	93	836	14	202	512	0	0	36	10416	4323
14.6	31	197	0	16	61	1110	10314	589	34	89	191	21431	146	118	195	106	76	104	97	468	923	39	720	68	133	581	0	0	49	9989	4263
14.7	0	191	0	21	51	1088	10265	642	37	84	164	20936	98	26	124	36	128	49	104	434	961	62	805	33	200	569	0	0	38	10114	4223
14.8	0	142	29	11	37	1115	10421	631	7	99	168	21016	149	16	95	117	23	141	112	443	883	89	817	60	193	610	19	0	49	9942	4215
14.9	0	164	24	18	42	1111	10076	652	22	92	201	21654	100	25	122	47	90	36	68	398	861	112	918	34	206	475	0	0	59	10012	4188
15	19	175	25	24	81	1201	9709	635	40	91	314	21896	102	35	74	19	140	54	109	402	874	57	789	38	192	517	0	0	29	10235	4337
15.1	11	199	38	47	85	1291	9952	658	45	100	233	22621	126	34	161	110	5	24	98	520	909	146	756	34	188	553	50	0	15	10309	4505
15.2	17	183	9	0	35	1326	9468	606	62	44	182	23820	184	142	205	66	90	124	160	489	920	62	898	6	176	563	0	0	6	10306	4421
15.3	0	158	28	0	59	1479	8807	572	30	111	162	24753	202	100	174	63	96	126	99	448	886	73	1121	57	173	528	0	0	44	10597	4461
15.5	16	205	21	0	53	1728	7090	727	28	81	169	29865	85	39	234	102	96	78	151	635	895	185	922	0	201	564	0	0	43	10592	4395
15.6	18	161	13	15	38	1825	6676	696	59	118	193	32874	233	118	241	133	141	93	114	644	853	10	991	27	221	565	0	0	38	10832	4571
15.7	21	157	8	15	35	1898	6397	604	78	95	228	34330	191	132	288	83	217	166	130	621	774	89	795	53	193	538	0	0	26	10797	4448
15.8	0	135	0	0	18	1927	5841	671	37	128	204	35229	127	0	226	66	90	73	51	736	794	92	763	31	195	460	0	0	0	11147	4413
15.9	0	171	13	31	50	1907	6404	623	50	133	232	34224	198	125	289	114	121	116	193	802	609	74	804	59	221	515	0	0	47	10751	4446
16	11	191	38	20	49	1822	7125	637	65	137	199	32544	210	29	223	79	58	40	115	748	646	91	845	43	263	486	0	12	43	11254	4413
16.1	0	151	18	20	27	1613	8319	649	23	92	247	30887	165	141	200	149	52	56	136	810	524	10	642	51	152	517	0	0	8	10741	4388
16.2	17	160	0	24	55	1571	9629	679	22	70	231	28907	127	82	184	32	34	32	152	749	640	83	735	34	217	522	0	19	25	10737	4201
16.3	21	207	30	34	62	1378	10075	692	72	112	216	28103	160	58	214	104	116	143	152	748	562	37	600	19	181	515	0	0	30	10487	4092
16.4	4	189	0	14	50	1329	10523	690	41	61	212	26702	117	43	244	75	78	71	126	704	729	57	653	0	149	500	0	0	90	10696	4226
16.5	24	153	24	0	41	1262	10405	552	31	119	248	25842	152	70	133	61	93	87	99	661	635	96	715	68	229	547	0	33	81	10501	4269
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16.7	4	184	0	27	34	1234	10248	591	43	95	209	24066	117	68	131	102	54	83	168	504	670	0	645	4	166	478	0	0	31	10364	4319
16.8	0	191	22	12	45	1128	10870	655	32	90	228	23995	124	25	127	42	67	77	88	584	750	73	606	16	172	489	0	0	0	10197	4285
16.9	5	183	13	16	53	1213	10768	590	32	90	200	23612	90	0	167	36	76	67	104	547	716	43	621	13	164	490	10	0	17	10309	4117
17	0	171	11	21	69	1201	11121	604	58	111	185	23618	136	30	139	95	65	56	112	550	803	63	626	11	200	507	0	0	0	10197	4285
17.1	12	165	5	27	41	1161	11368	616	27	94	176	23145	102	14	160	102	88	97	135	412	858	100	694	18	163	524	0	0	34	10098	4172
17.2	0	184	26	32	66	1193	11344	573	51	89	185	23022	127	40	114	26	27	59	64	537	908	110	675	35	189	507	12	0	29	10201	4090
17.3	0	194	6	21	47	1116	11539	581	41	76	211	22783	91	0	155	24	87	75	194	531	870	117	646	41	174	500	11	0	31	9992	4187
17.4	0	169	27	29	64	1092	11668	581	31	107	215	22300	154	50	96	49	52	96	91	514	977	41	652	33	189	534	0	0	26	10281	4172
17.5	19	166	0	15	54	1100	11338	594	39	78	188	22096	84	0	77	43	53	9	149	551	923	77	632	28	191	522	0	29	0	10039	4184
17.6	0	154	8	12	39	1136	11487	633	36	94	174	21719	133	39	157	45	45	49	92	455	800	52	625	44	194	491	0	0	19	9872	4124
17.7	15	207	42	25	103	1056	11672	614	76	63	161	22062	88	0	79	0	4	86	86	508	816	21	549	0	172	520	0	0	45	9825	4290
17.8	0	188	0	19	42	1089	11560	588	28	113	221	22624	131	64	122	40	41	49	106	442	857	178	664	68	174	507	14	25	59	9978	4254
17.9	18	182	29	41	77	1102	11437	607	37	113	217	22226	177	21	187	70	68	93	120	451	995	75	829	33	225	567	0	0	68	10214	4097
18	5	153	45	14	72	1007	11062	534	46	88	180	22077	52	26	117	57	116	100	192	436	1004	102	804	25	179	560	0	7	13	10233	4208
18.1	22	165	19	0	43	1115	10795	540	19	83	193	22319	101	0	208	0	98	16	94	367	791	193	761	42	206	505	12	0	23	10171	4199
18.2	0	163	36	29	71	1133	10805	540	53	74	177	22398	171	9	140	16	56	96	95	451	820	16	833	27	187	505	0	0	0	10085	4376
18.3	14	172	14	18	73	1139	10771	630	42	90	184	22149	161	0	171	38	94	79	122	391	887	9	647	64	205	479	0	0	62	9738	4215
18.4	12	181	21	35	78	1170	10705	688	46	139	207	21633	127	13	127	43	99	61	71	374	860	69	842	6	182	532	0	0	47	10096	4326
18.5	11	183	0	16	75	1143	10510	610	17	77	159	21380	86	18	118	128	108	94	100	496	936	22	789	36	153	497	13	0	57	10120	4254

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
18.6	16	167	31	24	76	1142	10647	590	46	121	168	22028	93	50	151	116	42	137	66	465	1001	75	637	39	176	558	14	0	56	10165	4231
18.7	0	177	8	27	69	1215	10586	618	22	107	145	23117	120	55	123	25	71	107	169	474	904	105	938	36	185	533	6	0	50	10056	4351
18.8	0	164	13	21	69	1322	10024	574	66	131	253	24581	98	0	92	0	40	43	76	549	977	80	1021	54	229	505	0	0	29	10556	4501
18.9	10	157	19	34	53	1435	9283	633	22	135	249	25620	174	59	221	112	184	99	102	482	868	121	985	32	196	556	0	0	26	10483	4481
19	12	157	19	40	52	1485	8836	644	18	115	205	27330	156	50	167	56	124	98	205	559	969	31	1006	32	199	552	0	12	23	10477	4572
19.1	15	141	0	0	36	1666	7910	611	31	106	211	31201	178	25	168	38	82	102	141	444	835	116	955	17	196	557	0	0	63	10601	4571
19.2	26	206	26	34	57	1919	6766	689	32	107	218	33709	139	35	204	79	158	155	52	536	868	61	957	31	216	535	0	0	22	10725	4516
19.3	0	128	0	14	46	1611	4821	593	72	84	171	30109	148	98	189	64	103	77	100	675	830	171	934	23	183	457	40	13	94	10843	4632
19.4	9	168	31	42	75	1692	5749	640	45	90	168	31559	129	65	206	82	113	159	204	722	862	104	1061	24	179	475	0	0	64	11029	4335
19.5	0	203	24	28	47	1728	7962	732	58	102	238	32803	216	106	190	129	97	66	139	683	743	73	821	0	178	532	9	0	66	10830	4550
19.6	18	178	16	8	60	1689	8645	668	44	119	203	28829	165	67	163	67	87	94	80	763	752	8	821	42	212	531	0	9	24	11061	4441
19.7	13	165	8	0	43	1608	9013	634	29	111	220	28829	165	67	163	67	87	94	80	763	752	8	821	42	212	531	0	9	24	11061	4441
19.8	22	180	20	34	60	1482	9691	604	48	101	176	27431	159	33	157	42	143	46	76	666	722	51	706	52	201	531	0	0	20	10887	4153
19.9	0	165	0	13	48	1447	10407	613	46	93	222	26913	130	52	162	49	143	0	111	766	702	88	685	27	203	530	0	55	40	10665	4309
20	0	181	16	11	55	1324	10631	651	40	88	248	26167	113	25	206	31	83	70	157	684	660	0	694	22	228	542	0	18	55	10704	4118
20.1	15	202	23	8	47	1305	10631	585	51	88	261	25083	162	68	159	92	84	128	181	709	640	66	621	28	189	516	5	0	53	10801	4225
20.2	15	176	0	31	45	1320	11001	610	45	63	210	24141	82	27	190	0	75	100	123	582	683	89	647	10	210	483	15	0	0	10476	4212
20.3	23	163	44	23	57	1227	11097	600	9	110	161	24029	153	86	166	31	55	116	88	644	780	85	611	25	176	501	5	35	43	10293	4266
20.4	18	158	0	13	47	1279	10834	577	40	75	179	24594	112	14	157	50	58	114	157	557	760	200	636	37	196	477	0	0	32	10549	4545
20.5	9	199	17	20	28	1285	10985	666	37	104	195	25024	145	160	187	41	119	92	198	576	828	181	597	7	163	497	0	0	95	10437	4283
20.6	6	177	24	24	70	1248	11047	609	27	118	173	24403	93	58	150	18	27	86	154	553	785	91	613	46	164	509	5	0	51	10498	4278
20.7	0	166	12	22	56	1240	11272	629	31	102	227	24558	122	19	165	0	58	165	73	535	804	81	629	24	199	532	0	0	33	10434	4355
20.8	24	195	14	16	59	1167	11523	650	16	90	241	24116	114	35	138	84	31	45	118	589	913	118	615	43	212	564	0	15	35	10248	4299
20.9	0	191	18	22	45	1236	11613	612	32	62	245	23448	167	42	127	93	120	70	127	477	880	153	601	43	179	570	0	4	60	10260	4242
21	33	199	36	34	71	1160	11632	590	0	118	260	23606	146	57	106	106	46	116	206	527	867	85	638	84	184	557	0	0	106	10289	4371
21.1	15	210	12	13	43	1169	11874	542	40	84	195	23622	153	63	198	0	77	51	115	494	874	145	609	54	186	537	0	0	46	10242	4309
21.2	0	183	6	0	52	1213	11768	614	18	107	181	23161	147	21	121	55	60	81	146	545	916	118	633	28	205	558	0	0	63	10301	4237
21.3	12	155	16	36	76	1205	11810	701	57	106	231	23322	147	58	191	115	127	139	154	454	951	109	692	15	160	569	0	0	57	10352	4342
21.4	0	217	17	25	67	1136	11103	683	41	103	199	24078	121	43	82	136	96	101	182	495	876	97	667	49	171	507	0	0	50	9930	4248
21.5	16	201	15	0	57	1220	10652	701	21	82	195	23436	144	0	188	104	78	0	97	463	924	101	612	21	196	543	19	34	58	9871	4144
21.6	9	196	18	22	55	1305	11001	611	26	93	194	23751	152	41	192	94	154	96	151	546	912	121	685	29	219	494	0	0	21	10247	4325
21.7	6	169	23	28	52	1242	11222	591	53	139	174	24015	164	29	156	45	47	88	221	481	932	196	777	51	196	532	20	0	62	10554	4455
21.8	0	165	24	0	54	1139	11012	524	58	95	215	23981	198	103	172	151	51	96	51	539	949	190	786	55	168	547	0	0	54	10399	4430
21.9	13	207	31	23	74	1250	10612	610	64	104	177	23911	182	130	175	74	68	146	181	496	886	101	784	13	206	514	40	0	36	10186	4266
22	41	169	37	45	87	1271	10051	547	30	107	166	23479	103	64	101	45	88	43	136	495	903	65	784	50	182	575	0	39	42	10111	4242
22.1	20	216	7	19	67	1465	9265	535	35	90	172	24535	187	37	139	146	51	125	94	525	936	89	813	55	195	653	27	0	26	10155	4427
22.2	31	160	5	0	20	1576	8181	684	36	146	163	27283	178	126	213	103	129	44	89	501	781	34	777	13	135	609	0	0	41	10123	4237
22.3	0	157	7	0	25	1604	7802	659	64	94	207	28532	184	102	203	60	80	73	182	538	869	65	831	26	204	530	16	14	64	10228	4465
22.4	0	154	0	7	47	1625	7856	592	53	124	238	27769	125	21	168	33	106	202	155	411	888	0	810	53	212	495	0	0	35	10074	4357
22.5	29	197	9	35	50	1694	7726	643	43	77	174	27501	139	48	171	83	181	124	119	528	937	65	906	17	195	505	35	0	77	10390	4419
22.6	0	204	24	17	45	1776	7497	691	68	115	167	27436	178	114	210	139	99	121	157	585	900	161	946	20	165	554	0	0	28	10675	4659
22.7	26	127	0	0	40	1735	7273	565	78	102	216	28278	157	104	182	35	202	82	34	536	916	52	967	39	190	581	0	0	21	10708	4720
22.8	7	137	32	0	30	1834	6300	670	16	439	204	31033	148	90	229	71	44	96	149	595	945	143	991	28	203	537	18	0	74	10594	4756
22.9	10	174	15	0	51	2000	5391	638	53	596	208	35280	249	77	298	110	68	166	123	610	1018	8	1127	62	234	524	0	0	39	10650	4639
23	36	160	25	29	52	2114	4774	683	63	154	181	38013	231	149	247	183	79	198	157	632	777	199	919	63	171	515	0	0	69	11031	4522
23.1	24	175	21	6	40	1960	5526	666	62	79	187	37236	168	112	247	90	163	150	107	799	659	114	944	0	193	470	0	0	47	10831	4677
23.2	16	162	42	29	41	1868	6732	734	38	52	193	35096	123	44	231	78	127	81	114	772	679	71	719	0	216	433	0	22	57	11049	4474

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh	
23.3	20	181	0	0	30	1759	7013	694	77	114	180	35424	183	96	274	56	77	161	116	833	562	183	749	0	198	483	6	0	20	11025	4288	
23.4	43	176	33	32	67	1843	7228	712	53	105	207	34822	245	109	312	113	158	75	53	835	467	38	553	53	182	502	0	0	28	10880	4314	
23.5	23	169	23	7	78	1804	7357	692	56	149	210	33616	200	80	274	137	152	93	132	805	611	40	880	59	176	522	0	0	25	11007	4360	
23.6	6	165	27	32	70	1780	7657	666	37	115	210	32714	146	58	237	66	117	94	175	856	605	65	824	51	220	512	0	13	65	11159	4375	
23.7	5	161	32	39	66	1655	7849	613	31	109	178	31772	153	82	265	132	135	65	97	872	661	33	689	79	195	498	20	53	38	11231	4170	
23.8	12	180	15	17	47	1568	8909	763	68	105	248	30258	202	76	229	68	147	146	166	736	547	117	752	13	188	525	0	0	35	10782	4211	
23.9	0	150	39	11	44	1524	9172	660	46	121	242	28993	151	99	195	51	107	125	138	709	599	31	748	14	223	518	0	15	33	10808	4250	
24	37	197	31	29	40	1618	9457	644	61	81	203	28115	150	63	180	112	101	115	145	785	721	47	625	8	195	518	0	16	60	10327	4325	
24.1	0	158	13	0	38	1579	9618	619	61	127	236	27862	161	80	235	48	0	75	130	661	597	88	607	48	173	499	0	0	38	10704	4327	
24.2	11	202	11	12	32	1516	9563	708	17	110	199	27287	101	44	202	44	69	35	73	684	713	37	764	16	187	502	17	9	23	10699	4370	
24.3	0	168	25	18	77	1437	9938	742	64	120	220	26904	177	91	147	58	45	89	150	573	749	44	584	0	132	567	38	0	60	10438	4367	
24.4	7	169	34	30	70	1433	10182	614	48	106	186	26733	115	92	137	50	87	44	107	569	830	155	733	67	134	527	0	5	54	10553	4378	
24.5	19	189	0	13	65	1430	10553	636	20	79	187	26407	177	42	172	17	87	63	54	605	823	67	688	25	230	509	0	0	42	10532	4413	
24.6	0	191	13	21	53	1404	11081	659	25	96	237	26263	126	52	172	35	86	160	114	508	798	14	599	41	196	505	0	0	20	10441	4319	
24.7	12	199	24	37	75	1309	11630	621	55	94	245	25101	129	37	270	97	65	122	150	590	830	20	562	34	199	514	0	0	74	10520	4422	
24.8	10	171	17	0	81	1229	12060	680	53	113	202	25033	103	49	124	67	91	136	129	439	852	79	591	8	179	560	41	0	58	10324	4379	
24.9	9	154	0	29	50	1191	12205	586	44	98	234	24413	146	78	154	95	85	107	100	510	865	118	640	48	130	522	0	0	11	10165	4374	
25	0	169	16	0	56	1176	12147	592	25	143	163	24409	135	0	133	0	65	42	53	522	871	94	593	39	167	524	0	8	0	10241	4415	
25.1	0	180	29	51	94	1197	12025	643	19	128	212	24001	147	58	144	0	95	42	108	137	496	985	140	541	48	257	486	0	0	35	10195	4196
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25.3	5	197	36	27	77	1131	12078	638	47	69	180	23527	128	57	133	95	0	68	84	534	961	50	657	0	184	483	0	0	49	10456	4224	
25.4	10	202	26	29	77	1100	11876	606	27	93	210	23292	108	10	118	0	76	23	173	391	1011	33	627	39	208	525	7	18	43	10569	4272	
25.5	12	176	35	20	61	1108	12059	606	57	140	193	23472	142	88	167	18	110	104	135	395	963	90	520	51	219	539	0	0	41	10374	4411	
25.6	5	180	14	26	46	1140	11486	627	60	125	228	23539	128	62	152	44	161	76	167	396	935	233	623	22	200	532	0	0	77	10487	4481	
25.7	0	147	0	0	57	1104	11258	636	49	76	207	23039	125	94	178	111	47	71	128	502	971	37	635	6	166	544	34	0	50	10389	4425	
25.8	37	185	49	30	73	1040	11741	638	32	81	142	22769	138	75	175	109	0	99	200	439	854	69	655	48	167	555	16	0	35	10264	4176	
25.9	11	203	33	13	72	1074	11683	626	52	103	189	22570	105	37	124	132	97	154	78	391	930	99	660	0	182	595	0	0	40	10092	4341	
26	14	243	26	10	48	1108	11547	608	56	139	243	22518	177	88	160	33	104	89	74	496	846	117	767	57	210	612	0	0	9	10165	4248	
26.1	12	227	32	22	64	1071	11723	608	46	97	182	22123	120	0	94	0	36	64	101	398	985	50	738	34	211	546	37	0	12	10214	4240	
26.2	26	188	41	32	64	1102	11119	609	44	114	197	22468	161	88	184	90	46	110	101	494	861	24	740	0	157	581	42	0	85	9996	4242	
26.3	15	202	6	12	58	1149	11227	656	40	113	170	22028	166	15	168	52	107	71	113	451	886	17	765	43	189	530	21	0	5	10356	4191	
26.4	23	213	22	12	47	1206	11455	603	8	117	165	22153	129	5	131	101	97	69	178	472	1002	63	752	36	192	566	0	0	55	10134	4106	
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26.6	9	210	38	24	75	1200	10687	582	26	163	181	21907	151	40	189	84	120	129	73	405	933	104	738	49	226	600	11	0	22	10005	4236	
26.7	9	236	49	57	92	1207	10579	603	57	86	154	21992	112	23	213	57	182	59	35	437	973	274	1038	10	166	520	0	0	39	10299	4426	
26.8	12	203	26	42	63	1212	10219	568	57	111	198	22831	143	0	193	82	104	77	96	462	921	147	884	78	183	510	28	0	66	10215	4153	
26.9	0	200	10	5	52	1331	9190	576	14	100	238	23571	129	59	170	0	111	65	100	397	828	11	937	48	188	510	0	0	43	10549	4286	
27	17	185	18	27	89	1429	8688	576	59	155	227	24506	184	32	185	105	107	65	124	507	873	128	985	67	200	558	29	0	68	10327	4521	
27.1	10	164	17	0	49	1546	8386	579	52	108	252	26058	196	57	181	71	81	57	59	385	941	94	856	45	215	587	0	0	0	10418	4485	
27.2	18	163	4	31	59	1708	8399	627	45	122	160	26836	121	70	189	78	117	50	133	410	1002	62	810	39	220	534	13	0	32	10294	4346	
27.3	25	181	9	7	64	1823	7924	578	47	86	210	28298	166	63	211	51	72	99	184	630	1106	43	1087	44	206	528	0	0	7	10288	4487	
27.4	8	137	0	10	59	1932	6399	710	35	97	204	31772	222	68	254	118	174	0	83	561	980	91	960	31	224	564	0	32	45	10743	4665	
27.5	26	174	30	24	61	2215	4867	720	32	99	197	36924	200	139	243	88	124	109	700	858	47	1083	48	211	522	13	0	76	11102	4698		
27.6	29	199	32	21	41	2224	3711	725	94	119	257	39913	194	115	297	68	126	54	102	661	786	31	1111	54	265	491	0	15	40	11328	4827	
27.7	38	149	13	24	46	2247	3942	684	49	120	201	39974	298	170	331	146	124	127	82	791	731	27	830	51	204	552	0	0	18	11436	4528	
27.8	14	163	25	23	30	2146	4856	706	51	145	249	38300	190	128	287	64	189	75	144	877	637	9	947	89	189	492	0	0	16	11390	4496	
27.9	49	167	20	28	37	2023	5682	674	49	102	238	36500	232	88	292	52	122	192	168	911	569	15	903	27	259	495	0	0	58	11186	4349	

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
28	8	172	24	0	42	1874	6113	700	61	135	223	35592	169	54	260	47	132	146	211	936	550	85	854	27	245	445	0	0	72	11326	4517
28.1	0	186	0	13	70	1905	6661	731	77	96	177	34120	216	109	218	90	50	96	112	854	503	71	694	9	11	483	0	11	11190	4310	
28.2	25	153	33	27	57	1642	7317	694	57	110	184	33794	167	82	244	64	139	30	166	835	476	48	639	14	215	488	0	27	47	11100	4224
28.3	10	189	31	26	79	1670	8251	710	45	98	215	32171	169	201	244	132	53	81	97	843	539	93	625	30	110	472	0	0	59	10749	4022
28.4	0	166	19	0	28	1525	8542	684	32	108	216	31043	196	175	306	89	100	124	810	558	11	620	35	141	492	0	0	43	10497	4218	
28.5	12	153	23	36	70	1610	9153	666	55	90	187	30085	121	0	201	24	153	74	182	814	617	91	565	24	203	423	0	0	54	11030	4269
28.6	0	138	0	5	39	1534	9579	687	17	97	221	28666	84	19	192	22	80	85	194	705	745	115	620	23	198	509	0	0	57	10746	4246
28.7	0	164	28	28	34	1510	10156	595	54	67	239	28171	162	77	172	71	124	101	223	719	618	51	664	24	168	465	0	0	26	10587	4347
28.8	0	188	0	0	42	1387	10553	696	46	121	239	27645	191	126	211	73	83	138	165	647	715	133	624	15	154	608	25	0	48	10539	4339
28.9	27	211	14	10	73	1384	11232	684	19	96	214	26815	148	48	158	64	106	108	158	586	701	131	631	0	156	495	0	0	54	10687	4351
29	12	210	30	27	50	1372	11127	658	32	96	180	26311	172	17	188	46	188	168	170	587	857	46	541	12	205	492	0	0	35	10666	4315
29.1	24	210	24	32	90	1229	11513	617	19	111	191	26003	96	42	151	81	7	135	86	543	967	80	685	0	191	553	0	12	17	10450	4315
29.2	22	200	39	39	96	1285	11905	546	50	78	204	25628	126	93	145	51	70	75	135	548	915	61	685	54	165	534	52	0	69	10395	4173
29.3	7	173	0	7	42	1300	11710	653	0	89	221	25228	171	54	220	72	129	158	113	573	868	7	622	29	206	488	17	0	24	10395	4081
29.4	0	174	31	32	58	1244	11982	580	34	100	235	24512	156	73	163	92	156	178	179	580	929	77	528	54	203	501	0	0	22	10128	4178
29.5	0	219	0	19	68	1130	12194	662	28	135	256	24157	159	0	140	96	22	29	146	518	930	27	560	5	239	537	46	6	89	10355	4234
29.6	0	197	40	18	44	1182	11960	629	80	133	220	23963	123	33	109	48	118	128	198	521	993	118	600	20	165	522	0	0	31	10124	4281
29.7	0	215	15	16	55	1196	11878	633	11	77	194	23590	151	39	171	51	97	61	87	484	917	55	680	30	174	501	0	0	9	10179	4380
29.8	12	185	27	34	60	1193	12000	597	51	110	183	23639	145	36	154	58	82	161	105	500	815	61	648	30	132	482	0	0	0	10379	4344
29.9	9	221	31	34	79	1128	12378	576	36	131	223	23468	121	76	172	41	107	120	89	454	910	78	665	58	198	516	0	0	38	10218	4340
30.1	21	215	24	33	74	1081	12121	659	12	74	204	22879	132	95	121	62	76	62	94	455	1006	78	576	31	173	533	22	13	44	10138	4267
30.2	0	198	21	34	68	1080	11951	647	34	108	191	22713	141	45	129	60	104	45	118	483	890	61	631	33	196	583	0	0	40	10407	4265
30.3	0	219	30	6	61	1095	11906	624	59	118	236	22777	92	19	134	33	77	32	115	461	990	94	622	9	153	539	0	38	53	10367	4296
30.4	11	213	30	21	53	1054	11645	652	17	119	259	23115	133	25	146	63	61	99	114	500	915	144	633	37	227	507	0	0	26	9967	4227
30.5	0	178	8	0	49	1109	11574	662	26	90	224	22909	156	46	153	47	209	98	84	442	999	53	620	50	225	520	0	0	29	10135	4204
30.6	0	212	14	18	49	1156	11688	628	30	90	207	22782	159	40	136	93	127	38	215	479	987	85	689	26	210	581	35	8	61	10363	4201
30.7	0	205	30	43	78	1029	11490	615	31	98	180	22656	126	53	103	70	69	54	106	391	951	49	689	35	173	519	0	0	29	10405	4315
30.8	7	181	9	14	58	1059	11495	590	62	99	190	22519	156	54	157	68	129	107	98	474	918	206	787	21	230	517	0	0	74	10368	4270
30.9	5	211	27	35	83	1060	11787	590	16	84	187	22273	147	64	136	104	36	36	61	506	973	106	755	32	141	547	46	10	81	10294	4293
31	27	222	31	36	76	1164	11985	573	36	109	173	22152	97	6	112	16	111	80	126	419	934	73	718	13	227	493	0	0	40	10341	4246
31.1	15	237	34	44	98	1140	11550	522	27	130	185	22560	119	35	155	81	57	98	126	481	929	103	858	71	206	566	0	0	33	10227	4433
31.2	16	191	27	13	62	1175	11664	561	45	115	166	22884	129	10	172	103	117	117	78	544	945	150	778	43	200	557	0	0	28	10435	4629
31.3	8	231	27	41	72	1244	11697	548	24	125	176	22119	153	38	200	81	87	80	91	428	859	52	890	30	214	582	0	0	25	10424	4402
31.4	12	214	16	12	56	1150	11309	577	23	105	168	22064	124	53	171	40	62	134	103	429	846	36	926	16	196	559	0	0	68	10247	4221
31.5	9	200	17	30	80	1152	11030	470	23	115	175	21867	130	8	78	52	93	66	141	402	960	62	1019	48	194	541	0	0	0	10253	4428
31.6	20	190	34	22	66	1282	10473	622	42	72	107	22159	113	0	112	71	82	60	186	377	824	82	871	0	199	520	0	24	0	10397	4421
31.7	7	184	0	29	65	1268	9889	577	64	131	193	24430	163	44	185	103	31	195	104	433	996	114	830	55	220	549	11	0	76	10275	4510
31.8	0	176	22	30	77	1446	8817	796	43	147	184	26375	178	74	141	49	62	101	71	440	793	23	938	54	217	619	0	0	5	10093	4523
31.9	8	167	14	9	68	1522	8433	998	60	131	219	26260	177	68	168	80	29	100	59	397	905	0	980	8	200	603	0	0	30	10371	4244
32	8	172	8	17	56	1641	8652	879	24	141	219	27644	251	103	245	115	123	90	164	434	968	134	998	63	182	582	0	0	22	10527	4490
32.1	14	187	14	18	73	1873	7654	893	72	136	257	29501	174	128	218	109	210	109	66	606	1007	71	1094	57	162	545	0	0	20	10614	4562
32.2	17	181	13	21	36	1887	5763	780	89	102	310	33392	171	46	232	43	123	96	145	564	997	62	1211	0	243	535	0	0	33	10827	4638
32.3	19	188	28	16	65	1994	4317	657	30	106	287	37571	212	108	241	134	70	190	181	680	1024	73	1005	65	237	577	0	0	62	11038	4569
32.4	33	172	0	13	25	2142	4049	809	37	108	235	39906	177	122	278	33	125	170	120	719	722	199	1056	0	241	490	0	0	69	11431	4663
32.5	9	175	26	10	27	2086	4303	722	74	132	247	39836	266	237	335	128	143	154	182	858	676	107	947	24	211	528	0	0	55	11481	4610
32.6	0	137	7	0	34	2033	4751	727	67	113	214	38890	283	240	300	123	101	40	76	1015	505	69	827	36	217	553	0	62	11	11219	4493



Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
32.7	31	195	36	27	60	2170	5320	689	65	93	214	37994	166	72	256	65	125	54	172	1039	531	120	710	29	211	483	0	70	16	11340	43374
32.8	28	157	12	21	41	1887	5566	711	68	105	129	36778	179	98	257	137	101	122	116	863	464	148	851	25	163	485	0	0	87	11383	43354
32.9	8	193	16	23	39	1896	6331	721	60	151	236	36424	268	141	315	68	112	129	132	1011	588	69	642	80	237	528	0	0	26	11101	42925
33	0	210	14	27	84	1839	7089	752	71	119	221	34652	185	62	212	85	110	88	82	894	451	17	711	37	225	496	0	24	17	10766	42544
33.1	6	180	31	32	64	1750	7841	651	55	114	278	33079	178	85	187	29	133	50	101	727	529	124	722	20	182	475	0	35	60	10996	42233
33.2	0	194	37	26	82	1725	8406	771	66	63	228	32113	164	83	199	82	77	148	167	865	511	63	712	0	173	501	0	0	21	10974	41388
33.3	16	176	27	10	55	1644	8787	700	7	94	250	31322	176	135	252	219	166	147	176	739	611	143	711	32	173	507	11	0	36	10925	42426
33.4	13	186	0	33	59	1634	9091	734	26	82	221	30871	209	45	277	23	118	31	156	737	632	19	678	0	234	499	0	22	35	10493	41222
33.5	20	176	14	13	94	1516	9585	669	53	84	214	29217	103	55	194	59	160	13	189	660	641	131	656	21	190	477	0	0	32	10686	43448
33.6	17	184	0	15	46	1428	10010	665	47	94	221	28423	170	25	195	55	66	21	80	596	721	178	654	21	186	515	0	0	55	10646	4156
33.7	19	160	35	15	50	1510	10640	592	57	96	223	27470	229	149	242	148	112	112	81	593	739	22	519	72	142	600	0	14	42	10489	43099
33.8	8	207	15	38	44	1412	11051	680	47	111	260	26721	160	36	181	28	161	119	133	586	839	125	594	21	192	466	0	0	42	10501	44229
33.9	20	139	0	22	54	1299	11283	655	43	47	197	25743	163	88	108	83	69	106	128	546	878	53	588	0	187	529	0	0	58	10372	42660
34	0	175	9	0	34	1314	11791	657	53	104	180	25722	160	115	180	136	48	47	122	565	893	18	646	29	155	556	0	0	49	10326	4235
34.1	0	218	34	18	59	1220	11757	679	58	85	207	25027	92	76	159	93	91	112	98	405	968	117	572	0	163	498	11	0	99	10527	4337
34.2	0	153	0	5	63	1192	11645	647	29	68	246	24620	132	14	92	35	122	145	160	503	855	131	576	0	210	517	8	0	58	10142	4256
34.3	21	182	35	25	69	1199	11893	648	78	83	220	24095	121	0	140	45	56	0	45	496	903	17	582	0	220	508	33	0	27	10395	4444
34.4	7	176	49	39	68	1116	12113	669	49	121	219	23986	124	53	139	82	0	16	57	469	959	82	671	0	203	513	23	0	54	10371	44220
34.5	12	189	13	24	71	1217	12200	629	34	112	237	24292	132	69	148	93	17	23	130	503	1008	58	677	44	227	511	27	0	55	10299	4475
34.6	6	205	30	29	81	1179	12212	683	62	101	254	23885	134	35	110	113	34	13	133	430	897	82	665	11	199	556	20	6	40	10159	4351
34.7	0	171	13	36	74	1124	12129	606	34	144	203	23415	135	12	127	31	66	69	40	421	904	53	738	41	193	540	0	0	10	10316	4279
34.8	0	212	29	20	76	1175	11918	650	8	116	208	23192	118	14	113	57	138	49	146	378	962	146	716	11	183	537	18	7	97	10351	4305
34.9	7	187	25	37	73	1170	11919	664	31	88	179	22977	118	14	113	57	138	49	146	378	962	146	716	11	183	537	18	7	97	10351	4305
35	30	219	10	48	63	1197	11616	671	36	55	178	22838	116	25	116	94	55	46	35	392	900	93	662	0	166	557	0	6	43	10441	4314
35.1	17	244	22	16	69	1149	11303	569	39	115	201	22868	204	74	172	106	129	111	107	405	891	62	573	57	186	537	0	0	43	10466	42660
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35.3	13	195	40	38	69	1200	11901	729	15	99	193	22632	106	64	110	59	23	100	83	452	904	187	783	5	119	556	0	0	18	10378	4369
35.4	0	178	16	0	43	1111	11580	579	23	82	218	23221	134	77	159	88	0	46	149	388	886	15	636	41	201	551	25	12	7	10129	4368
35.5	25	212	38	43	81	1137	11935	531	0	115	163	22672	143	108	190	103	112	184	149	440	874	79	804	79	179	589	0	0	38	10252	4426
35.6	31	195	27	14	50	1135	11039	568	23	131	158	22126	124	28	120	41	73	79	79	323	885	96	763	31	185	501	0	0	21	10083	4286
35.7	5	206	0	0	35	1254	9862	610	42	158	138	22551	123	19	149	67	55	48	75	436	888	104	873	12	200	604	5	7	7	10412	4454
35.8	13	159	0	9	50	1325	9503	693	34	115	146	23840	113	26	159	62	72	56	117	474	966	65	891	10	232	609	18	17	21	10083	4286
35.9	0	161	6	0	48	1327	9308	700	15	115	206	25410	160	58	152	87	192	150	167	420	913	56	945	50	219	563	0	0	29	10479	4361
36	0	170	0	0	41	1405	8920	683	48	69	243	27126	166	72	227	53	124	84	110	444	979	84	1041	0	180	524	0	0	54	10575	4338
36.1	19	190	16	25	52	1508	8377	670	40	68	194	27033	132	62	188	38	76	84	145	461	1043	93	953	7	164	522	0	10	71	10504	4484
36.2	0	170	0	19	53	1720	8136	638	56	131	224	27677	143	38	160	59	74	155	105	591	991	111	988	55	183	546	0	0	34	10874	4576
36.3	36	181	7	9	59	1838	6640	630	88	105	226	31357	231	137	235	93	85	98	47	510	818	111	960	54	202	585	0	0	36	10863	4598
36.4	17	156	24	17	33	2182	4905	663	71	133	192	36336	220	177	309	143	105	152	138	730	738	91	815	56	215	552	0	0	26	10990	4611
36.5	0	155	17	0	35	2217	4418	718	22	136	218	38673	141	78	231	88	145	144	144	822	717	0	899	63	207	519	30	29	68	11054	4617
36.6	9	145	5	13	33	2131	4535	755	82	121	317	39604	154	98	263	62	41	50	136	862	616	157	851	47	252	502	18	0	55	11433	4383
36.7	0	145	16	4	40	2204	4751	718	67	118	235	39074	218	141	317	92	129	121	153	860	613	83	772	46	202	474	20	0	0	11015	4397
36.8	14	174	12	12	40	2114	5153	805	89	128	244	38483	214	138	329	142	77	124	144	851	661	13	678	0	219	451	0	32	29	10981	4491
36.9	30	172	32	7	42	1962	5790	687	39	129	222	36889	188	142	259	58	26	106	146	828	552	70	690	52	182	484	0	0	0	10797	4221
37	19	151	6	5	6	2002	6160	673	47	162	307	36399	186	142	281	162	95	103	96	827	591	108	650	52	167	552	0	0	33	10837	4199
37.1	13	200	21	33	43	1904	6799	726	72	113	166	34815	96	36	238	103	78	75	185	840	677	36	766	31	187	496	0	0	54	11005	4299
37.2	43	170	0	9	35	1855	7433	717	40	136	232	33996	108	50	277	12	96	89	119	726	672	70	606	28	166	483	0	0	20	10936	4364
37.3	16	185	16	23	56	1704	8466	721	32	93	182	32007	212	171	243	108	101	143	162	810	677	0	671	39	182	570	0	0	30	10697	4288

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
37.4	14	167	8	6	60	1643	9185	723	32	97	213	30028	189	76	214	9	247	42	130	639	629	193	720	38	174	425	0	9	28	10868	4311
37.5	27	199	30	8	46	1553	10216	681	21	100	201	28557	133	35	204	57	121	60	196	647	713	38	653	0	209	505	40	10	43	10496	4337
37.6	0	188	0	18	38	1393	10946	643	27	104	237	27441	153	106	172	99	108	36	158	690	777	45	466	24	169	543	0	18	10	10431	4418
37.7	0	217	20	38	51	1420	11391	669	70	65	218	26768	166	77	201	83	99	122	158	607	932	143	686	9	194	547	13	0	55	10331	4328
37.8	11	192	21	20	56	1412	11748	652	37	80	234	26107	127	39	176	58	87	138	630	924	27	675	20	203	532	9	49	56	10664	4372	
37.9	0	195	8	15	57	1239	11951	629	47	107	215	25902	146	0	103	53	101	0	25	564	956	149	661	31	210	549	0	0	42	10648	4309
38	0	192	16	5	50	1294	11878	623	45	96	229	25579	139	41	184	77	130	70	131	598	995	16	603	0	186	532	0	0	52	10369	4326
38.1	18	232	45	26	74	1248	12373	610	28	120	217	25321	194	31	190	85	87	37	147	547	908	62	655	63	176	537	0	0	82	10494	4334
38.2	8	212	26	29	97	1192	12497	617	24	116	188	25364	128	6	171	96	51	19	78	547	1013	116	563	43	194	526	0	21	83	10300	4538
38.3	12	199	47	36	112	1278	12620	636	55	106	206	24781	173	28	217	53	127	184	131	504	1018	61	602	18	203	495	0	0	21	10269	4448
38.4	21	209	26	32	66	1369	12496	657	0	62	176	24287	125	41	168	77	0	13	125	487	848	165	670	55	201	586	5	46	52	10431	4306
38.5	12	225	29	16	87	1174	12170	630	51	93	237	24491	176	62	248	96	137	153	186	517	969	73	634	11	177	563	21	0	72	10248	4259
38.6	21	242	33	25	62	1159	12231	608	24	79	195	24213	124	55	157	76	89	0	38	477	857	32	721	35	204	550	0	16	24	10537	4310
38.7	0	210	14	18	28	1077	11931	593	21	46	190	23580	116	0	115	49	36	129	110	491	927	9	689	0	196	540	0	0	21	10360	4414
38.8	0	229	33	25	56	1130	12320	665	39	88	211	23383	96	17	151	80	93	73	113	413	844	119	711	8	184	586	0	0	0	10457	4209
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39.1	0	203	27	0	87	1172	11939	629	33	123	190	23492	194	69	179	75	121	134	140	364	953	145	753	19	196	530	0	0	32	10328	4475
39.2	12	231	8	10	65	1125	11657	608	44	122	229	23365	142	34	99	66	46	131	102	418	1014	78	849	19	205	557	0	0	6	10273	4503
39.3	0	249	5	0	66	1173	11787	712	36	94	211	22617	142	7	156	36	149	71	114	430	839	126	900	0	209	550	0	0	32	10354	4369
39.4	0	226	19	30	65	1144	12019	632	71	90	152	22378	183	62	146	48	142	28	25	503	907	58	903	14	189	566	0	0	0	10377	4437
39.5	29	192	43	26	108	1252	11720	623	35	121	142	23391	122	68	160	76	136	139	113	449	866	84	953	26	231	568	0	0	20	10569	4456
39.6	12	234	10	26	67	1192	11281	598	5	95	207	23406	164	44	149	62	85	130	177	461	891	84	907	46	191	511	0	0	41	10399	4412
39.7	5	225	20	29	72	1236	10820	542	9	102	177	23186	80	37	141	101	143	113	155	442	885	111	996	58	200	521	0	0	39	10589	4388
39.8	5	181	39	17	52	1343	10352	625	50	79	219	23724	98	88	121	101	51	116	87	559	841	44	902	20	143	560	0	0	32	10524	4366
39.9	13	176	14	31	60	1527	9193	665	68	107	218	26233	130	100	152	128	25	154	50	563	908	49	878	36	189	584	0	0	56	10494	4498
40	10	190	5	9	35	1673	8407	701	47	118	279	28545	191	136	182	76	194	155	87	592	918	45	909	78	221	530	0	0	46	10831	4518
40.1	38	176	30	24	73	1658	7592	732	51	89	258	31240	172	37	148	56	159	47	114	678	1014	31	985	0	250	515	0	9	15	10854	4569
40.2	8	191	0	11	35	1879	6267	772	37	146	249	34303	228	177	238	101	123	116	136	581	889	86	1052	39	193	623	0	0	53	10781	4556
40.3	17	154	18	0	50	1951	5175	886	72	135	273	37527	163	76	279	83	109	77	122	698	705	28	1191	42	229	496	0	0	21	11050	4388
40.4	0	160	8	26	51	2067	5464	752	63	79	264	38806	156	58	238	25	10	52	40	746	743	107	927	35	223	520	0	24	72	10920	4507
40.5	29	164	16	29	50	1968	6481	691	71	154	237	37196	165	105	288	54	41	168	162	854	551	37	809	63	243	476	0	0	71	11224	4537
40.6	13	173	13	25	39	1790	7307	710	31	77	225	35285	138	33	217	0	75	88	124	826	446	61	863	0	239	500	0	0	0	10800	4284
40.7	0	220	9	14	72	1735	8271	716	9	108	193	33980	218	148	259	105	79	25	109	748	524	48	691	30	149	524	0	8	44	10585	4196
40.8	16	220	0	16	74	1657	9200	699	68	120	226	32120	188	84	222	0	163	54	56	873	569	23	752	51	221	454	0	0	28	10680	4300
40.9	21	195	12	10	53	1497	9986	727	77	89	190	30363	188	53	177	34	52	27	61	659	695	132	644	0	183	537	0	27	42	10743	4230
41	0	232	16	11	76	1457	10334	658	17	123	176	29045	176	36	215	79	82	58	181	660	727	116	720	19	146	513	0	14	71	10728	4119
41.1	0	199	9	29	71	1375	10936	664	20	92	187	27459	109	56	127	43	67	105	141	670	765	0	589	30	189	530	8	0	50	10590	4291
41.2	19	192	8	29	64	1322	11279	686	22	90	237	26730	187	100	252	70	89	81	180	656	804	5	623	47	182	555	0	9	57	10403	4245
41.3	0	184	27	5	57	1321	11107	600	19	101	221	26204	135	41	151	0	92	50	123	577	911	60	607	47	204	520	0	17	20	10446	4323
41.4	32	179	16	14	34	1345	10983	696	59	119	206	25732	107	57	137	37	24	70	108	526	942	67	687	0	167	532	12	0	0	10187	4439
41.5	0	184	0	5	55	1299	11139	626	41	57	239	25334	85	67	140	79	105	106	166	514	855	17	718	30	160	526	0	0	56	10171	4414
41.6	23	163	18	38	52	1300	11090	707	22	116	216	25929	103	13	141	56	126	81	116	495	867	78	690	55	196	527	5	0	26	10208	4210
41.7	24	206	6	0	49	1415	10876	704	18	120	216	25897	172	60	182	133	91	89	227	502	961	64	644	0	184	536	31	11	96	10351	4014
41.8	26	205	23	31	66	1403	11015	708	43	90	206	25674	146	110	175	78	137	45	117	451	963	103	708	26	225	561	0	31	32	10064	4304
41.9	13	204	29	34	62	1474	10819	645	25	95	212	25245	150	8	157	20	82	0	115	411	913	29	678	22	209	575	0	29	33	10464	4375
42	18	186	16	0	51	1431	10987	694	29	94	187	24759	118	69	135	52	75	100	55	428	884	40	773	0	203	525	15	0	55	10208	4240

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
42.1	20	233	29	23	55	1421	10893	712	64	124	222	24852	97	22	166	116	96	95	122	409	919	129	691	8	156	539	0	0	65	10280	4528
42.2	0	193	15	13	58	1413	10896	668	10	143	171	24935	75	0	145	39	69	20	142	479	869	72	707	26	222	516	12	0	25	10281	4518
42.3	33	214	14	27	66	1374	10539	655	37	95	197	24582	158	82	160	99	160	78	100	501	915	126	819	48	179	556	0	0	0	10137	4285
42.4	19	192	11	8	51	1419	9774	699	51	105	171	24958	156	42	173	59	82	77	100	421	961	72	887	30	206	524	0	0	88	10284	4425
42.5	8	161	0	24	40	1495	9534	629	34	99	229	25568	176	99	205	119	132	87	155	467	902	101	812	63	204	568	11	0	69	10472	4506
42.6	21	223	17	6	60	1615	9032	637	81	117	203	27501	242	119	196	127	49	83	99	559	1004	134	922	0	165	535	10	0	70	10863	4509
42.7	19	201	25	32	55	1752	8632	662	70	134	165	28553	150	114	142	12	34	120	98	460	975	145	914	45	199	593	0	0	16	10384	4563
42.8	4	172	0	0	59	1787	7958	686	40	164	155	29519	196	110	256	70	83	87	169	540	998	99	1063	35	208	565	14	0	86	10639	4812
42.9	22	179	19	14	28	1903	7120	657	71	131	180	30004	207	75	209	109	64	82	98	533	915	52	922	34	198	559	0	0	4	11238	4779
43	0	168	0	0	45	1986	6208	727	44	134	252	32654	247	145	241	204	147	14	179	650	996	5	1029	60	161	554	0	14	32	11514	4758
43.1	14	150	15	19	66	2146	5599	710	34	139	234	35954	234	116	276	71	178	112	168	623	977	44	985	78	238	586	0	0	0	11664	4699
43.2	17	175	5	17	48	2167	4986	760	73	147	275	40579	244	109	304	150	61	99	258	738	821	114	1026	59	223	528	0	26	109	11664	4699
43.3	18	170	27	24	43	2250	4801	725	67	165	184	42142	251	170	266	130	87	114	61	882	668	43	779	73	176	524	0	0	67	11559	4660
43.4	11	175	0	26	29	2301	4487	793	51	117	253	41481	207	132	312	110	117	91	160	965	449	67	777	23	246	521	0	17	31	11353	4373
43.5	24	165	37	0	66	2357	4626	742	70	110	301	40821	252	154	322	107	165	109	194	914	410	96	926	14	206	494	0	0	40	11510	4580
43.6	11	186	35	43	71	2219	5325	721	57	108	194	39567	216	145	277	81	95	129	146	951	465	78	783	35	204	482	0	15	67	11400	4309
43.7	16	172	29	26	65	1912	6128	707	39	148	220	38224	234	144	264	35	104	144	136	999	395	64	778	47	201	534	0	9	52	11395	4279
43.8	0	173	18	18	63	1897	6658	742	44	90	235	37076	196	36	314	38	60	139	111	932	434	106	648	56	198	421	8	0	43	11082	4318
43.9	18	195	36	29	58	1859	6955	796	64	95	230	35941	201	91	216	83	128	78	140	876	508	35	612	12	208	522	0	20	45	10910	4218
44	8	174	0	13	30	1782	7336	736	11	97	240	35385	195	80	342	73	137	148	117	775	448	45	656	35	231	499	0	0	6	10737	4220
44.1	19	170	0	0	27	1814	7489	749	29	101	226	35082	185	103	240	71	32	103	142	841	558	96	614	0	270	480	0	0	23	10676	4259
44.2	0	183	31	10	49	1745	7803	667	83	103	187	34120	220	56	221	62	75	137	120	808	547	81	784	18	196	519	0	0	42	10871	4193
44.3	0	188	29	9	52	1704	8304	721	42	103	264	33440	156	55	229	62	153	103	183	678	575	99	669	47	200	507	0	0	69	10692	4386
44.4	0	176	16	27	35	1581	8630	747	61	121	235	32659	182	101	273	66	178	102	126	734	719	0	566	15	175	464	0	0	0	10741	4160
44.5	0	142	0	0	67	1500	8931	674	7	81	213	31440	232	155	268	72	100	118	131	637	704	26	647	44	198	528	0	0	33	10560	4245
44.6	11	202	25	18	50	1514	9801	721	44	146	214	30571	168	78	253	80	91	155	137	621	698	115	607	36	198	530	0	0	31	10631	4304
44.7	0	201	0	9	38	1460	10088	724	60	119	271	29371	165	61	298	52	51	193	209	561	765	61	681	6	225	528	13	0	8	10200	4326
44.8	0	172	27	25	59	1370	10702	677	31	125	250	28117	118	75	162	137	131	76	123	610	804	98	645	26	174	457	0	0	33	10214	4286
44.9	0	211	20	13	73	1341	10910	644	27	135	227	27681	223	84	235	93	101	112	154	565	839	28	648	72	237	589	6	0	42	10407	4328
45	14	192	32	32	73	1307	11328	628	32	63	218	26238	74	53	157	18	111	37	26	583	905	71	581	41	154	533	0	0	69	10372	4321
45.1	0	187	11	30	64	1254	11367	688	25	106	187	25837	191	54	133	96	103	40	31	563	816	38	581	23	151	480	14	5	48	10098	4447
45.2	0	187	35	0	62	1254	11502	654	30	102	239	25496	117	81	180	38	99	75	106	518	791	63	614	5	206	512	0	5	31	10136	4259
45.3	0	215	19	46	61	1250	11521	582	36	92	229	24956	145	29	154	25	98	81	86	425	888	49	613	23	202	530	0	0	0	10231	4164
45.4	4	215	24	21	89	1152	11750	565	33	105	226	24160	109	96	127	25	98	118	154	475	953	135	610	62	164	471	0	0	52	10284	4360
45.5	12	216	32	37	92	1266	11882	568	28	81	194	24302	179	77	115	54	59	0	64	539	974	149	711	66	165	533	0	36	25	10552	4334
45.6	24	241	37	36	96	1166	11895	574	44	110	173	24105	124	31	174	36	71	30	112	492	862	130	745	77	154	540	0	16	46	10346	4361
45.7	13	174	0	0	63	1065	12132	662	32	103	181	23648	114	25	90	101	48	50	87	539	919	0	671	21	176	504	13	6	65	10024	4355
45.8	12	208	31	20	58	1203	11649	576	15	128	205	23160	197	64	185	79	103	94	166	475	947	47	702	93	134	528	0	0	44	10398	4438
45.9	8	196	16	36	71	1101	11830	535	37	91	197	23013	121	18	102	68	41	75	76	470	937	28	640	42	190	542	67	0	24	10251	4337
46	0	224	6	15	79	1177	12016	614	25	87	199	22629	132	41	160	39	129	113	112	451	989	47	708	5	190	507	0	0	26	10484	4401
46.1	7	215	36	29	90	1159	11704	602	73	103	196	22927	147	37	97	56	97	59	163	424	1001	104	606	23	208	512	0	0	35	10376	4199
46.2	0	191	51	34	85	1222	11629	613	44	69	156	22824	107	0	107	14	54	92	112	407	906	109	772	51	239	519	0	0	38	10255	4303
46.3	0	212	51	35	88	1213	11506	623	44	81	140	22443	82	0	139	55	108	33	49	396	922	58	753	13	198	543	0	37	42	10496	4438
46.4	32	220	37	20	63	1216	11155	604	28	76	170	22664	98	0	109	13	165	157	143	373	858	115	805	23	225	527	0	0	60	9989	4226
46.5	21	185	0	28	68	1222	10848	640	62	95	206	23035	108	55	136	85	73	6	133	432	849	173	800	24	153	541	20	0	62	10140	4215
46.6	9	207	28	0	40	1247	10880	542	29	110	204	23456	145	13	150	43	117	183	67	520	888	59	740	35	215	541	0	0	28	10206	4392
46.7	0	160	14	7	58	1343	10680	626	54	101	221	23040	139	0	121	90	95	76	77	481	970	26	746	33	178	516	0	0	5	10193	4284

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
46.8	0	232	20	34	79	1331	10603	583	39	100	184	22986	122	7	158	24	87	134	99	470	835	59	710	25	254	571	0	0	38	9906	4135
46.9	0	154	0	16	70	1420	10122	637	40	127	181	23617	131	24	175	68	123	130	123	465	875	102	659	31	192	563	0	0	39	10126	4276
47	0	149	0	14	81	1503	9952	591	35	85	195	24066	138	55	139	85	102	147	131	502	913	68	836	50	163	546	0	0	46	10097	4272
47.1	5	198	19	22	61	1558	9328	614	23	121	171	25190	138	64	230	83	165	33	90	464	875	11	840	42	176	467	0	0	6	10380	4180
47.2	28	175	28	23	52	1665	8907	636	37	99	121	25880	154	76	216	128	57	81	175	385	961	75	747	67	195	531	34	8	64	10021	4163
47.3	23	159	34	20	44	1618	9058	697	6	124	169	26061	115	82	222	95	107	70	151	375	803	113	928	43	198	475	0	10	105	10308	4370
47.4	7	185	0	0	37	1578	9404	695	51	100	209	25661	160	111	102	154	152	154	605	751	0	979	30	175	593	0	0	22	10160	4254	
47.5	39	176	35	33	69	1580	9437	671	42	104	248	25455	207	92	197	72	28	114	157	503	907	28	770	54	194	569	30	0	76	10324	4526
47.6	0	221	42	37	89	1486	9280	726	67	137	217	26101	186	72	128	148	131	169	115	492	860	59	768	39	198	519	0	0	25	10281	4430
47.7	4	207	39	21	53	1533	9114	666	41	104	220	27566	213	110	152	93	18	48	112	575	897	38	1000	41	157	584	0	0	52	10484	4444
47.8	14	182	21	9	84	1518	9285	659	8	105	208	27965	180	79	128	70	157	46	70	504	904	49	1045	27	189	570	0	0	38	10233	4507
47.9	19	176	22	22	82	1546	9332	609	59	83	192	28318	121	63	243	67	128	111	89	544	930	121	934	20	182	562	0	0	47	10653	4590
48	0	195	0	0	59	1679	8335	715	37	140	240	29997	174	83	243	67	128	111	89	544	930	121	934	20	182	562	0	0	61	10511	4540
48.1	12	181	7	0	28	1875	7133	693	70	133	200	33891	191	136	254	87	119	135	182	658	781	74	972	11	206	540	0	0	62	10704	4587
48.2	19	181	9	13	47	1927	6231	750	83	123	236	37182	184	104	274	117	103	89	119	737	780	70	856	26	201	509	0	26	46	10923	4551
48.3	7	162	0	13	49	1956	6207	751	137	93	287	37462	238	147	327	183	84	142	112	837	654	96	912	0	215	554	13	32	96	10817	4396
48.4	9	212	32	5	62	1918	6478	648	36	103	203	37019	156	120	334	60	128	77	99	948	527	17	829	64	215	458	0	14	19	10902	4405
48.5	12	186	26	18	68	1804	7214	752	65	100	254	35939	189	124	233	66	67	121	142	877	439	118	769	29	184	520	0	0	73	10877	4337
48.6	11	157	25	20	31	1705	7611	729	48	129	189	34131	194	41	234	36	79	28	102	828	526	34	679	21	223	469	0	0	45	10692	4321
48.7	23	187	0	18	33	1737	8402	707	22	109	198	32932	183	66	180	69	23	156	159	883	514	56	730	45	191	509	0	0	102	10860	4369
48.8	37	185	40	30	96	1724	9022	740	44	124	201	31634	156	117	185	118	45	46	48	774	573	82	700	33	170	545	0	54	9	10582	4325
48.9	0	204	41	17	68	1671	9082	724	14	120	206	30379	150	100	204	85	59	132	139	828	617	114	691	45	176	526	0	0	26	10748	4294
49	9	200	11	6	62	1569	9430	644	37	105	223	29363	119	69	185	38	48	104	134	726	617	95	534	43	182	522	0	0	38	10490	4163
49.1	22	177	5	19	70	1448	9840	651	49	111	238	28105	126	75	218	84	144	42	77	666	718	92	644	31	212	497	0	18	51	10356	4174
49.2	5	194	7	6	48	1413	10156	667	41	81	255	26924	151	47	221	38	64	74	110	629	827	177	634	0	174	539	17	26	51	10324	4313
49.3	13	162	5	5	26	1428	10088	601	33	112	215	26354	153	32	172	80	61	66	71	604	718	0	608	32	181	538	16	27	75	10324	4253
49.4	0	170	14	10	40	1364	10408	581	48	109	230	25980	129	119	200	72	34	16	88	609	721	51	599	40	182	546	0	9	55	10066	4139
49.5	0	173	21	22	79	1413	10798	587	35	102	214	25586	138	49	228	92	57	33	155	564	871	127	604	24	201	532	34	0	49	10183	4234
49.6	19	198	38	15	64	1359	10826	680	34	96	219	25622	118	11	173	0	23	62	114	558	868	39	606	22	195	513	4	0	20	10528	4373
49.7	0	155	0	0	25	1342	10728	601	27	129	242	25130	168	50	189	62	31	60	30	599	894	54	713	31	170	556	0	0	57	10205	4315
49.8	6	189	21	14	75	1428	10997	624	16	86	209	24821	205	40	179	68	107	94	111	516	979	66	687	60	224	604	0	0	18	10218	4320
49.9	0	194	16	33	71	1419	11128	618	55	105	208	24760	119	119	180	72	102	93	168	479	874	0	675	6	147	557	0	0	57	10529	4374
50	33	193	37	24	94	1327	11432	611	68	79	245	24300	107	5	151	70	26	116	125	539	906	38	676	34	167	511	13	0	40	10223	4125
50.1	0	193	21	0	71	1145	11725	638	46	78	217	24247	178	72	147	48	101	160	215	437	914	76	571	15	197	555	32	0	48	9899	4361
50.2	0	207	20	43	82	1316	11816	578	32	89	174	24480	160	33	184	56	63	140	119	388	1003	17	607	65	185	518	0	0	46	10022	4289
50.3	0	193	10	19	62	1278	11163	652	44	83	183	24607	209	79	162	46	77	181	121	452	917	0	578	20	187	551	0	0	37	9724	4310
50.4	0	213	18	11	90	1381	11109	657	4	96	172	24304	108	35	170	95	181	111	97	549	966	66	614	27	151	479	0	0	0	9954	4214
50.5	14	230	21	24	74	1264	10898	638	12	103	257	24302	158	92	233	78	48	89	0	466	938	201	649	45	176	533	8	0	44	10193	4405
50.6	9	218	34	14	76	1334	11107	640	33	100	149	24173	115	0	168	61	58	57	98	423	907	104	678	0	183	547	0	0	23	10176	4324
50.7	0	204	30	29	79	1236	11193	617	52	127	230	24141	143	31	111	50	44	13	87	448	861	0	692	47	212	483	18	0	46	10286	4375
50.8	0	185	8	0	65	1177	11450	579	14	112	191	23646	99	0	92	79	80	95	190	460	931	97	715	47	239	539	18	0	45	10146	4217
50.9	24	202	18	15	74	1198	11329	622	22	94	157	23256	149	60	107	59	77	105	194	409	871	32	784	19	217	533	21	0	46	10167	4174
51	13	182	29	25	64	1213	11277	629	10	114	169	23134	113	21	112	31	14	40	93	346	848	66	667	35	223	526	0	0	54	9956	4212
51.1	18	209	21	22	57	1239	11148	640	61	54	211	23559	147	70	137	34	205	125	106	423	881	56	850	0	169	480	0	0	26	9933	4381
51.2	0	181	27	0	40	1261	11033	575	43	97	169	23945	106	31	160	57	120	101	133	496	971	41	707	27	208	530	0	0	58	10286	4279
51.3	0	207	20	14	69	1237	11267	601	28	136	220	24367	197	112	166	170	90	88	143	498	987	27	967	32	213	625	0	0	43	10294	4473
51.4	19	211	36	21	104	1288	11140	576	65	92	260	23897	131	114	162	180	93	171	184	405	971	131	865	25	137	599	0	0	46	10094	4375

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
51.5	18	206	29	0	64	1252	10914	659	46	106	211	24253	99	34	144	88	56	172	177	487	802	228	942	0	164	541	0	0	40	10006	4424
51.6	33	229	35	31	68	1289	10721	649	22	75	181	24618	59	0	137	13	146	109	145	509	911	21	763	35	230	522	0	0	47	10312	4364
51.7	25	231	38	54	71	1300	11032	606	37	66	153	25551	151	133	170	93	114	176	89	537	927	60	1084	6	149	550	10	0	80	10019	4493
51.8	8	245	31	43	92	1354	10876	619	33	132	181	25994	115	0	134	20	90	41	59	576	889	48	1025	26	229	512	0	0	47	10325	4491
51.9	30	205	27	35	78	1331	9786	834	5	140	178	27115	171	68	212	57	117	74	168	562	932	116	901	24	244	546	29	17	57	10346	4505
52	0	172	18	24	57	1455	9555	708	57	90	181	26840	96	64	153	94	72	110	115	578	845	0	854	34	195	547	0	0	0	10498	4271
52.1	0	182	20	16	52	1429	9547	648	33	141	200	27156	154	98	219	28	78	21	138	714	784	0	800	30	209	448	41	0	16	10707	4467
52.2	6	196	21	36	75	1549	8603	710	51	91	169	29326	128	62	216	11	100	147	109	686	833	148	964	0	191	545	0	0	42	10535	4357
52.3	7	171	0	27	44	1692	7887	705	83	114	226	31406	161	113	250	129	100	68	152	663	679	103	947	49	182	539	0	15	60	10742	4385
52.4	9	169	24	34	62	1739	7193	777	55	86	217	32654	176	75	184	140	53	120	127	702	681	73	905	47	124	533	0	0	65	10679	4387
52.5	4	159	0	0	35	1907	6437	701	28	114	223	34023	166	92	242	111	80	54	151	822	554	50	813	51	182	490	15	30	15	10717	4347
52.6	23	188	24	0	46	1878	6243	679	72	149	213	34586	188	93	281	60	52	42	112	751	542	74	772	44	218	528	0	20	23	10820	4281
52.7	20	176	24	21	53	1972	6138	703	58	118	268	34234	191	129	248	23	45	22	73	810	566	8	745	48	210	525	0	0	25	10783	4458
52.8	23	163	7	0	43	1895	6087	729	51	118	240	34097	254	163	289	153	83	16	107	710	600	133	764	16	190	521	50	52	65	10692	4317
52.9	5	182	13	14	32	1983	6490	689	77	155	202	33468	196	81	254	83	48	93	102	776	615	24	655	47	223	493	14	0	56	10498	4159
53	0	167	9	27	41	1925	6664	734	58	169	232	33497	189	62	216	81	152	89	103	739	703	90	612	68	227	508	0	0	98	10568	4327
53.1	15	163	0	0	52	1870	7107	730	49	103	211	32990	162	123	245	94	126	124	71	738	618	201	702	41	170	519	0	0	72	10635	4298
53.2	23	176	26	9	49	1818	7710	737	47	98	208	30291	150	71	261	61	79	91	85	717	756	108	624	13	192	532	16	17	55	10438	4316
53.3	21	166	0	0	14	1798	8030	701	50	97	208	30291	150	71	261	61	79	91	85	717	756	108	624	13	192	532	16	17	55	10438	4316
53.4	0	165	0	11	40	1605	8683	672	71	91	212	29517	178	83	224	65	184	101	118	741	694	66	601	29	195	498	0	12	49	10535	4115
53.5	28	196	34	47	84	1627	9366	670	53	132	216	28423	222	146	218	164	45	110	136	654	799	152	652	44	160	562	0	20	100	10507	4253
53.6	0	185	19	14	61	1520	10020	712	34	83	233	27422	188	107	215	82	61	19	108	574	796	80	670	11	207	521	0	0	27	9994	4355
53.7	15	172	13	29	62	1505	10363	625	49	90	253	26135	112	54	174	0	56	124	127	491	815	93	600	55	179	508	0	0	0	10084	4245
53.8	31	186	43	32	80	1385	10273	667	60	128	173	26207	147	40	135	76	60	39	122	622	799	78	616	55	183	535	0	11	60	10406	4320
53.9	16	167	4	9	57	1523	9783	728	48	119	175	25633	132	63	201	81	119	111	187	535	910	108	572	0	203	524	0	0	51	10367	4336
54	0	189	0	6	14	1515	9477	677	17	73	198	25429	104	40	160	63	77	77	95	475	853	130	680	18	205	550	0	0	38	10104	4565
54.1	0	131	0	0	35	1400	9278	720	8	129	218	25603	175	118	173	40	76	69	122	544	946	5	643	27	213	528	0	12	48	10328	4244
54.2	10	176	0	5	68	1530	9247	720	47	100	255	25547	110	70	118	69	59	97	38	536	844	38	625	45	206	536	29	0	73	10557	4326
54.3	0	163	29	37	60	1536	9404	708	48	110	224	25600	118	43	137	119	49	75	83	486	968	154	750	19	176	546	0	0	34	10271	4415
54.4	0	176	0	8	51	1390	9578	669	6	109	209	25238	176	86	179	17	139	85	167	488	906	179	576	38	233	521	20	18	30	10292	4461
54.5	7	189	19	0	39	1440	9847	595	75	92	150	25205	135	47	157	47	137	108	171	454	951	72	645	24	173	531	0	0	18	10184	4333
54.6	10	203	22	7	48	1344	9802	602	46	90	219	24190	176	99	171	97	65	66	103	471	822	53	697	9	192	562	0	0	38	10400	4356
54.7	15	171	0	10	75	1274	10285	630	27	82	205	23854	139	31	161	56	111	122	112	448	883	146	792	0	214	517	43	0	11	10244	4514
54.8	9	190	27	42	103	1308	10408	603	47	96	193	24281	150	54	160	0	118	28	113	431	774	56	802	41	215	530	0	0	29	10339	4494
54.9	0	223	32	29	64	1319	10490	607	47	112	216	24628	186	34	149	66	60	101	154	448	1000	114	828	33	203	496	12	8	34	10708	4215
55	0	229	10	16	60	1241	11202	635	38	101	209	24899	159	0	160	31	67	78	65	452	737	0	868	19	192	542	0	0	19	10239	4473
55.1	13	192	33	41	68	1289	11349	655	39	118	177	24375	117	39	142	0	120	148	128	504	987	73	819	29	205	496	0	0	21	10239	4371
55.2	20	188	13	19	72	1294	10842	682	78	106	200	24093	152	60	151	62	65	82	30	408	905	140	971	17	175	559	0	0	40	10394	4580
55.3	6	186	20	20	78	1259	10608	618	20	98	234	24093	134	27	165	45	69	39	138	396	915	102	950	33	181	550	38	21	65	10285	4572
55.4	0	236	30	35	99	1215	10187	525	14	98	243	23639	139	60	153	47	85	205	92	443	873	27	892	52	209	498	0	0	37	10262	4331
55.5	24	195	8	22	71	1172	9720	557	44	91	241	24659	97	45	141	41	113	108	134	548	974	89	843	67	161	518	0	0	42	10322	4482
55.6	0	205	0	0	26	1282	9160	641	29	92	244	26194	114	61	139	79	42	109	46	512	1050	90	875	41	187	558	0	12	46	10520	4506
55.7	0	200	6	0	41	1301	8643	633	49	84	243	29341	163	50	212	53	52	43	67	553	870	112	909	47	183	593	0	0	48	10413	4490
55.8	16	177	12	34	58	1382	8092	763	61	103	296	31553	144	90	152	32	119	56	67	519	782	181	1091	26	148	490	0	0	58	10580	4581
55.9	14	136	0	0	31	1238	7249	714	12	112	265	29236	176	120	209	84	134	57	407	869	41	1010	63	136	445	0	0	0	9924	4305	
56	19	170	29	5	63	1365	7138	736	67	116	238	31140	134	64	181	18	40	55	134	483	762	177	1267	17	152	438	0	0	58	9751	4253
56.1	5	179	24	0	58	1427	7264	890	55	108	344	38543	186	123	203	96	27	64	107	503	718	23	890	11	144	461	24	0	31	9234	4049

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
56.2	9	196	32	19	69	1473	6076	771	57	103	316	37270	141	140	233	35	71	69	69	529	583	89	760	34	195	472	0	19	22	8605	3740
56.3	22	170	33	13	66	1542	5313	713	86	105	301	35541	94	66	216	0	57	84	80	578	655	81	737	57	230	505	0	0	0	8255	3651
56.4	20	167	23	31	60	1785	5451	692	51	90	254	35492	178	93	235	37	31	116	125	415	483	36	725	35	226	679	0	0	60	8441	3764
56.5	0	164	12	9	44	1843	5992	625	83	140	272	36601	189	140	267	67	104	96	175	620	555	144	793	65	220	539	0	9	32	9370	4005
56.6	22	184	0	11	43	1754	6926	700	53	100	240	35506	164	64	273	97	71	39	137	745	608	17	767	21	175	470	0	0	39	9970	4056
56.7	14	147	18	9	51	1705	7847	687	35	102	185	33743	197	158	322	130	144	199	51	791	487	59	764	49	145	554	0	0	59	10388	3912
56.8	0	190	9	14	66	1621	8641	706	10	101	219	32348	89	68	199	0	72	117	100	762	600	253	790	24	196	485	0	0	12	10746	4373
56.9	8	161	32	24	48	1559	9474	653	50	122	221	30377	133	98	231	65	116	37	120	825	624	0	760	62	185	455	0	0	66	10699	4112
57	0	194	0	15	49	1525	9920	647	17	120	226	28515	129	92	207	79	65	80	140	850	681	88	652	57	169	459	0	0	66	10381	4117
57.1	7	196	32	27	74	1548	10509	624	17	120	226	28515	129	92	207	79	65	80	140	850	681	88	652	57	169	459	0	0	66	10381	4117
57.2	9	200	26	5	68	1398	10798	649	19	93	228	28182	142	55	172	61	85	117	105	685	787	149	662	54	193	511	0	11	29	10359	4259
57.3	17	205	19	21	61	1432	10647	661	33	76	188	27570	127	59	158	80	54	145	104	655	898	0	660	31	191	486	0	0	31	10167	4345
57.4	0	225	44	28	92	1464	10677	638	29	107	232	27086	160	48	184	42	49	74	230	734	805	96	555	55	218	515	13	0	49	10466	4224
57.5	0	187	0	11	53	1447	10924	639	65	107	215	26889	146	88	140	99	178	33	99	605	743	62	625	27	151	470	0	0	47	10316	4314
57.6	0	232	24	25	77	1306	11340	640	34	116	240	26538	133	87	160	23	7	125	48	527	780	149	634	30	197	535	40	0	28	10530	4444
57.7	35	202	0	11	51	1334	11463	668	39	76	227	25690	136	60	161	11	127	115	194	664	906	75	663	15	200	552	21	32	71	10332	4470
57.8	27	169	29	14	94	1282	11877	658	37	123	228	25134	133	37	151	43	124	69	179	445	936	97	624	28	193	520	0	0	0	10348	4264
57.9	15	179	0	15	83	1276	11925	651	36	102	249	24412	131	56	131	62	105	67	140	510	907	150	653	10	248	516	0	14	59	10231	4366
58	18	239	38	51	115	1250	11572	659	72	114	191	24301	135	115	195	129	34	34	113	546	918	75	651	20	160	609	0	14	76	10064	4219
58.1	15	196	13	26	66	1136	11500	655	22	118	210	24374	101	4	172	12	114	61	137	463	942	125	837	19	199	511	0	26	0	10550	4370
58.2	0	203	18	0	74	1189	11364	653	35	76	228	24382	166	39	195	27	103	69	170	481	950	0	764	42	234	559	51	0	70	10299	4419
58.3	18	235	31	32	78	1279	11223	585	46	164	188	24290	115	63	122	51	69	123	94	453	948	75	710	67	210	525	0	0	36	10108	4352
58.4	20	254	15	11	71	1249	10863	551	61	78	181	23746	182	46	186	72	18	65	152	465	990	62	700	7	204	558	0	14	0	10224	4438
58.5	19	215	24	11	63	1344	10569	587	61	99	241	23627	123	77	171	28	101	73	75	457	873	78	748	47	157	598	0	0	0	9844	4348
58.6	7	195	32	27	74	1283	9665	657	29	124	192	23163	154	77	124	83	74	77	131	512	873	110	761	15	141	475	0	0	59	10314	4249
58.7	7	209	22	14	60	1414	9679	627	10	129	184	23685	91	0	90	41	116	7	112	517	923	64	762	32	196	498	13	21	20	10175	4328
58.8	11	210	21	23	55	1484	9398	633	24	103	165	24012	129	62	182	73	81	56	137	422	946	106	761	28	147	551	17	0	30	10108	4455
58.9	9	175	0	12	46	1450	8894	659	50	106	170	24010	146	22	185	25	81	98	146	362	1079	151	768	14	187	570	21	0	90	10306	4426
59	0	173	18	0	26	1511	8937	601	33	215	165	24534	186	118	177	116	77	122	196	448	882	72	829	57	178	605	0	0	50	10529	4364
59.1	19	176	11	13	73	1688	8642	695	51	142	233	26101	202	85	222	116	129	141	145	503	842	163	828	31	208	545	10	0	32	10537	4561
59.2	10	193	17	17	40	1633	8053	767	24	90	194	27465	137	55	205	23	125	72	194	504	975	19	944	26	256	515	0	0	19	10548	4434
59.3	0	192	0	5	36	1790	7362	755	26	104	214	28535	160	133	274	91	62	100	155	505	966	171	892	14	180	569	0	0	75	10667	4492
59.4	0	166	0	28	49	1980	6813	671	71	126	250	30149	263	131	193	160	36	105	122	513	906	126	929	36	128	597	33	0	0	10827	4581
59.5	26	163	33	16	63	2098	6459	620	34	121	233	32964	240	192	231	133	0	164	83	590	942	116	1077	86	64	963	0	0	18	11003	4546
59.6	33	168	20	49	56	2170	4779	706	100	154	200	37998	191	154	263	167	0	44	109	649	957	156	1206	46	114	915	0	24	52	10807	4782
59.7	28	194	26	17	52	2274	4115	682	77	116	232	40868	246	141	310	109	133	130	209	813	736	59	1077	40	266	562	19	23	50	10839	4642
59.8	41	195	8	6	52	2253	4754	679	74	155	257	40206	209	120	283	62	91	177	65	846	625	28	820	43	193	446	0	0	0	10938	4527
59.9	16	203	32	0	54	2166	5592	764	43	121	257	38633	180	112	296	64	149	62	110	776	542	102	776	62	218	479	0	14	45	11178	4376
60	16	198	23	21	64	1899	6717	751	52	153	228	37020	182	117	381	135	109	191	188	964	436	19	703	62	210	485	0	0	61	10879	4189
60.1	29	173	41	29	96	1889	7834	676	62	152	212	35476	211	112	320	74	87	148	77	883	537	54	681	67	190	542	0	0	75	10908	4328
60.2	5	197	44	17	75	1781	8601	763	11	100	294	33711	188	105	192	30	70	103	202	916	637	51	702	48	219	513	0	0	52	11076	4272
60.3	28	186	34	26	65	1598	9504	745	55	92	258	32028	206	100	244	76	52	138	42	799	563	75	629	36	166	529	0	0	0	10803	4194
60.4	13	178	7	24	73	1425	10320	718	69	73	238	30520	157	64	270	97	118	68	95	778	603	58	582	18	221	515	0	0	83	10429	4166
60.5	7	203	12	6	61	1296	10967	731	32	134	240	28981	196	79	203	158	109	5	99	669	743	165	623	20	181	529	0	8	24	10851	4233
60.6	0	185	13	0	53	1385	11474	709	16	94	225	28043	194	60	119	58	23	143	112	686	794	0	641	47	225	561	0	0	30	10585	4532
60.7	22	209	16	17	75	1287	11936	661	36	70	205	27673	133	82	212	61	108	118	175	641	824	94	608	0	240	529	34	0	43	10302	4314
60.8	11	223	30	10	70	1316	12286	668	30	94	271	27071	114	76	193	64	97	43	174	662	841	45	668	33	159	556	0	0	21	10556	4496

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
60.9	0	171	21	28	88	1229	12604	678	55	134	201	25981	160	0	105	46	114	90	103	545	788	93	687	33	203	492	0	12	50	10370	4282
61	17	231	11	0	41	1284	12426	583	20	109	200	25174	153	35	126	50	48	101	80	514	988	137	726	66	195	524	0	0	53	10408	4401
61.1	0	234	16	0	40	1266	12731	622	23	89	226	24471	169	60	184	34	0	156	129	445	887	72	697	49	201	640	29	0	41	10442	4419
61.2	0	214	0	28	40	1250	12466	681	69	122	208	24710	179	112	178	153	163	177	111	530	922	20	661	24	172	534	0	0	32	10580	4502
61.3	21	242	36	13	51	1183	12468	636	14	77	166	23748	138	69	146	130	149	74	108	490	1009	101	711	59	196	521	0	19	12	10175	4282
61.4	22	246	30	27	83	1160	11982	762	0	104	209	23138	161	89	124	71	103	131	102	429	860	207	753	57	206	577	32	0	60	10462	4566
61.5	12	236	5	8	71	1246	12082	722	10	95	212	23198	121	15	156	32	122	55	82	554	988	0	710	45	223	521	33	0	35	10629	4350
61.6	17	256	21	17	83	1156	12146	764	18	92	250	23570	163	35	177	29	63	74	88	465	916	13	792	0	249	557	0	8	53	10581	4511
61.7	7	251	26	40	79	1313	11748	562	53	93	198	23695	166	22	145	18	130	90	147	453	1010	35	831	71	197	546	0	0	66	10703	4514
61.8	23	237	34	15	80	1302	12089	628	35	112	230	25596	163	38	183	56	83	89	168	532	942	152	919	48	227	575	0	0	41	10710	4670
61.9	26	278	14	24	95	1277	12573	648	63	90	224	25443	183	83	162	40	105	125	169	471	982	117	862	54	225	582	0	0	23	10849	4596
62	0	223	20	10	43	1244	11781	662	40	116	215	24564	174	45	240	95	97	74	34	587	949	0	697	48	225	576	0	0	53	10431	4450
62.1	22	284	12	5	66	1206	10376	581	25	93	158	22826	134	53	210	91	100	38	135	530	913	85	893	62	192	539	22	0	17	10864	4585
62.2	32	200	25	25	94	959	8408	563	31	94	184	20850	128	64	212	108	118	112	149	448	925	21	925	10	170	468	0	0	56	10353	4371
62.3	13	169	0	16	54	1077	8136	517	43	96	255	22708	106	93	162	75	56	12	0	464	886	60	1053	36	128	507	0	17	30	10420	4438
62.4	21	172	29	46	86	1266	8273	661	42	110	240	25122	188	77	147	36	54	0	82	458	927	101	1008	18	153	506	0	14	5	10378	4346
62.5	6	156	25	0	62	1408	7131	672	12	94	224	27413	164	49	215	87	136	137	116	482	893	210	1113	8	149	472	0	0	57	10603	4553
62.6	20	156	35	24	58	1505	6002	732	44	79	249	31076	138	79	191	80	104	101	59	472	833	150	932	27	172	451	0	0	34	10674	4474
62.7	0	159	23	14	47	1566	5560	937	41	123	260	33242	162	130	254	65	84	91	149	503	849	62	934	6	204	478	18	0	40	10299	4363
62.8	0	174	7	0	39	1627	5426	822	63	128	274	32808	145	127	223	54	132	73	140	544	753	85	892	19	192	450	0	0	21	10164	4213
62.9	18	154	7	6	52	1596	5290	694	26	109	286	32722	141	66	213	88	65	43	103	613	713	72	892	76	188	497	56	54	92	9611	4193
63	19	161	38	27	79	1769	6126	680	54	96	232	33417	141	66	213	88	65	43	103	613	713	72	892	76	188	497	56	54	92	9611	4193
63.1	5	189	5	16	44	1654	6830	728	57	105	188	32608	129	88	212	41	84	163	174	443	688	90	957	0	153	460	0	0	62	9076	3945
63.2	23	154	22	6	56	1399	6881	615	24	81	241	29567	103	32	137	33	135	89	108	589	656	118	808	29	180	422	0	0	45	8929	3657
63.3	18	152	41	7	54	1345	6861	550	27	98	176	28774	75	64	163	0	22	89	63	584	474	67	790	58	164	425	0	0	62	8869	3860
63.4	23	180	23	12	61	1436	7287	607	54	62	248	30643	101	106	198	72	68	88	62	683	487	79	803	23	126	463	0	0	36	9887	4053
63.5	0	142	12	6	41	1411	7667	640	32	96	248	31626	126	74	214	93	84	153	121	791	479	177	738	28	198	414	28	0	45	10324	3968
63.6	34	182	23	46	75	1378	7968	631	70	111	248	31033	144	95	235	93	113	67	129	798	493	61	684	35	165	491	0	0	76	10410	4017
63.7	12	169	0	16	37	1395	8041	742	51	103	162	31075	141	50	213	46	90	31	157	808	545	118	634	0	171	407	31	29	37	10354	4005
63.8	8	182	21	8	63	1323	8763	662	45	82	249	30875	140	15	189	0	100	105	81	807	559	111	691	0	194	443	0	11	55	10370	4097
63.9	45	173	38	43	71	1330	10040	688	66	73	208	28482	129	53	206	84	24	12	137	753	717	70	717	27	153	557	30	0	59	10336	4270
64	15	177	39	29	63	1270	11211	640	57	112	134	26949	27	0	187	26	24	84	208	704	678	0	570	0	175	474	0	0	56	10218	4246
64.1	0	196	13	26	63	1188	11301	561	32	109	215	25906	204	119	262	191	110	142	148	680	775	126	502	55	190	560	9	0	90	10325	4126
64.2	5	188	11	14	31	1234	10979	598	0	100	209	25311	152	67	159	59	6	83	122	585	733	131	633	44	174	547	0	0	47	10198	4224
64.3	7	191	15	18	52	1150	11470	656	72	104	213	25101	118	38	154	68	52	69	57	514	784	76	746	43	169	522	0	0	0	10195	4370
64.4	5	172	9	15	62	1133	11916	569	63	89	206	24595	164	63	194	74	67	132	149	486	835	94	686	31	194	530	4	0	46	10229	4222
64.5	21	181	24	21	53	1138	11878	626	33	122	214	24270	125	0	182	53	103	8	95	600	929	0	498	38	241	502	17	0	43	9933	4213
64.6	0	190	12	31	52	1139	11994	607	42	51	229	23454	131	82	111	88	118	0	182	509	835	42	697	24	151	502	0	0	36	10319	4412
64.7	13	203	30	24	59	1135	11839	640	40	88	204	23383	92	37	151	44	37	74	123	500	957	195	669	26	170	539	0	0	30	10272	4450
64.8	0	206	0	30	48	1123	11762	623	42	100	248	23180	97	26	170	0	103	101	122	410	896	9	596	26	223	537	0	0	22	10364	4249
64.9	0	175	0	0	53	1141	11749	676	21	110	199	22961	112	35	165	16	95	88	33	436	846	105	612	17	193	549	0	0	10	10145	4122
65	0	190	15	11	47	1120	11853	634	55	62	197	22725	171	34	131	36	160	81	115	460	1044	74	571	14	219	512	0	0	27	10276	4582
65.1	0	222	44	9	72	1038	11529	634	10	106	160	22747	93	32	154	37	52	49	24	515	975	80	714	0	179	528	0	0	12	10412	4669
65.2	0	247	41	32	82	1098	11846	605	44	99	133	22061	83	0	136	97	101	126	162	459	967	196	710	18	221	551	9	0	65	10592	4406
65.3	30	234	23	9	61	1137	11746	680	37	102	158	22116	136	39	156	41	58	48	102	525	919	131	737	0	168	535	14	0	26	10257	4441
65.4	0	237	8	0	71	1106	11579	581	53	109	219	22303	239	67	173	0	82	126	30	385	903	146	812	58	219	605	0	0	34	10837	4491
65.5	12	248	14	37	76	1082	11760	600	67	78	208	22189	154	25	190	39	110	67	153	434	936	184	883	13	203	556	0	0	37	10821	4650

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
65.6	8	235	13	0	46	1116	11749	569	64	83	186	21816	127	6	120	57	149	36	52	449	973	44	910	0	182	575	0	0	37	10828	4511
65.7	22	261	17	24	62	1162	11583	665	59	121	148	21448	166	14	159	58	128	62	0	441	1103	106	865	0	192	573	0	0	24	11004	4610
65.8	0	228	8	33	66	1168	11226	673	52	143	218	22504	157	117	207	56	134	100	103	563	958	122	969	58	161	509	0	0	33	10922	4574
65.9	0	217	10	10	62	1288	10479	718	17	85	215	23059	121	56	153	46	41	60	95	522	983	100	1134	10	174	515	21	0	34	11316	4732
66	0	233	0	22	62	1277	10299	664	36	142	207	24657	224	52	180	101	146	138	122	557	1037	91	1037	57	201	544	7	0	11	11293	4653
66.1	0	247	44	26	72	1343	10703	590	40	92	252	24653	196	65	158	87	122	146	144	466	1025	78	937	67	208	528	0	0	0	10876	4646
66.2	14	208	0	5	35	1330	9284	565	25	150	226	25492	130	0	135	0	109	54	96	538	927	104	829	66	243	487	0	0	0	10826	4572
66.3	0	193	4	15	78	1471	8798	865	27	113	246	32454	157	88	166	90	106	79	113	562	931	139	893	25	213	502	15	17	0	10726	4470
66.4	27	249	22	40	71	1705	8592	995	71	128	288	35419	212	41	213	91	119	143	66	621	891	86	997	57	256	543	0	0	38	10743	4647
66.5	10	229	20	24	45	1483	6700	792	30	97	305	29224	200	78	259	47	95	44	59	533	880	131	1101	21	196	526	0	0	33	10512	4554
66.6	10	144	13	13	75	1279	5391	614	54	92	266	23979	161	55	194	86	43	0	46	532	759	74	968	31	114	395	18	14	66	10138	4355
66.7	12	142	0	18	49	953	3958	475	20	92	204	19847	71	0	67	4	24	66	94	551	735	106	979	37	135	355	0	9	35	9953	4143
66.8	21	95	11	4	74	1004	3365	493	39	73	175	20058	146	70	138	37	156	76	131	434	553	165	810	9	159	322	0	0	51	8868	3806
66.9	18	146	12	13	33	1400	4227	491	32	135	205	26313	107	0	165	0	77	62	95	522	468	66	792	63	186	382	0	0	49	8217	3434
67	0	144	20	21	44	1677	5258	583	60	118	231	31606	130	70	243	79	152	87	193	516	501	50	612	49	162	435	8	0	68	7684	3372
67.1	18	148	0	5	31	1629	6054	698	75	90	247	34471	142	82	224	100	75	23	118	711	499	28	686	25	205	464	18	0	34	7969	3219
67.2	8	139	25	13	69	1780	6948	707	77	85	228	34415	224	107	263	154	67	168	106	540	433	69	557	48	183	510	0	0	28	8371	3460
67.3	34	179	17	25	55	1634	7530	705	36	84	186	31454	207	90	241	132	94	56	129	740	512	75	554	0	200	456	0	30	44	9062	3552
67.4	13	199	27	22	67	1584	8215	664	36	109	175	30679	157	86	192	75	91	91	128	642	512	100	661	51	199	434	0	0	36	9257	3880
67.5	0	176	0	0	47	1620	8631	638	34	80	204	29451	178	18	222	32	105	109	91	677	657	53	634	29	250	471	17	0	16	9838	3956
67.6	22	186	0	4	31	1447	9079	709	11	73	185	28503	121	60	252	54	131	101	108	683	645	0	616	0	170	459	0	0	58	9589	3848
67.7	20	194	5	5	57	1456	9630	634	36	66	212	27652	159	26	185	43	99	113	124	723	668	86	753	8	251	511	0	0	41	9933	4254
67.8	8	176	42	14	54	1350	9848	667	19	78	238	27464	119	31	89	58	40	152	82	556	676	111	561	52	210	522	12	0	0	9338	4147
67.9	22	210	54	37	78	1344	10503	593	14	48	261	26423	124	59	172	95	51	106	92	630	781	145	625	53	178	502	0	22	26	10169	4272
68	22	171	23	31	61	1312	10898	664	40	109	217	26310	120	11	154	60	120	61	110	587	756	52	786	9	143	466	0	9	47	10081	4207
68.1	8	215	38	36	91	1233	11229	599	33	69	223	25596	142	61	189	84	45	100	118	548	771	99	569	38	199	503	0	0	70	10051	4213
68.2	0	202	11	0	71	1186	11458	681	29	71	194	24676	184	60	218	86	131	209	125	483	807	106	588	0	226	534	5	0	31	10200	4341
68.3	19	174	28	12	61	1184	11796	650	91	122	181	24435	101	0	138	9	49	26	74	523	892	44	653	0	169	540	0	9	24	10230	4241
68.4	0	203	38	14	69	1110	11899	661	50	97	216	24092	181	30	145	48	23	37	197	543	879	97	732	20	199	492	0	0	53	10402	4295
68.5	0	188	0	0	53	1174	11899	663	53	125	203	23686	174	46	172	35	124	146	87	464	893	55	711	36	223	494	0	0	0	10039	4462
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68.7	0	213	0	0	29	1202	11902	660	54	106	257	22818	75	42	112	124	65	67	169	479	898	175	850	21	161	565	44	35	49	10306	4315
68.8	13	203	31	43	66	1140	11934	651	22	122	197	22670	127	45	116	70	121	135	230	475	967	186	742	65	197	538	17	0	61	10171	4345
68.9	35	178	18	20	73	1160	12061	753	32	117	208	22611	154	72	188	50	98	76	47	460	871	126	739	18	215	515	0	0	10	10241	4307
69	10	208	42	15	70	1182	11724	623	35	149	160	22727	83	9	102	67	71	32	88	462	914	79	773	36	167	581	0	8	57	10066	4365
69.1	0	209	35	16	44	1187	11218	607	28	88	212	22506	151	67	89	9	139	101	118	558	884	68	805	11	173	536	0	0	27	10427	4366
69.2	14	223	13	11	37	1168	10954	503	18	123	206	23085	190	51	194	66	56	110	106	483	1027	58	818	88	185	530	0	0	0	10218	4463
69.3	0	204	8	23	36	1228	11035	605	43	118	108	23424	154	44	121	58	136	88	120	393	859	78	918	27	161	536	0	0	14	10440	4298
69.4	36	249	0	12	66	1341	10728	661	52	100	258	23690	130	42	158	38	65	48	155	515	995	77	914	36	221	506	0	18	76	10296	4353
69.5	0	219	5	24	58	1319	10620	635	55	88	145	23996	180	11	179	75	133	115	124	552	895	0	962	36	262	511	34	0	0	10396	4431
69.6	22	227	10	42	55	1319	10219	622	11	85	167	25217	71	0	134	40	56	0	172	503	1001	0	1060	26	200	498	0	0	89	10543	4530
69.7	11	148	16	29	31	1418	9904	603	38	100	251	26536	144	57	199	138	72	108	47	551	955	157	945	17	158	490	9	0	54	10553	4465
69.8	0	176	0	0	36	1508	8974	526	41	104	203	32446	153	138	190	76	94	175	161	634	819	87	974	39	242	540	0	0	15	10712	4429
69.9	4	158	0	0	48	1719	7422	681	41	124	184	30466	184	71	262	80	116	112	112	731	796	58	921	39	183	448	19	0	19	10606	4518
70	30	148	27	8	56	2124	5399	669	42	158	256	36289	217	162	232	118	109	24	101	786	589	38	949	49	185	519	0	0	32	10891	4475
70.1	18	156	37	7	51	2059	3478	674	46	127	168	36417	228	81	243	19	130	106	135	725	608	116	708	18	272	439	0	6	4	10585	4308
70.2	22	135	25	11	58	1950	3899	668	53	118	227	37603	213	123	322	115	96	124	103	916	457	26	823	14	206	453	0	0	43	10715	4284



Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
70.3	18	143	0	15	30	2002	4568	711	69	125	224	37571	175	103	285	127	56	93	148	861	590	80	699	0	174	460	0	0	51	10760	4251
70.4	35	179	27	26	58	2046	5235	719	42	113	171	37017	247	177	303	103	136	184	173	871	459	89	639	44	196	453	0	0	59	10793	4272
70.5	13	159	40	20	61	2060	5681	660	73	148	199	36376	122	43	259	40	59	75	153	814	588	143	822	51	194	429	0	4	57	10905	4211
70.6	27	147	10	0	39	1845	6402	744	59	101	191	33578	137	61	228	60	59	121	117	940	546	157	626	21	216	436	0	0	58	10673	4456
70.7	0	171	11	27	54	1758	6968	717	60	114	247	33953	151	72	217	48	97	0	126	917	563	57	626	55	208	485	0	21	31	10651	4392
70.8	0	176	0	21	52	1668	7758	745	57	118	197	32908	187	110	254	100	71	79	126	788	487	93	577	8	135	486	0	0	38	10634	4215
70.9	31	196	30	23	58	1611	8319	722	39	85	208	31745	189	75	235	95	50	65	181	700	639	161	620	31	172	507	5	0	56	10871	4330
71	8	200	16	10	39	1594	8917	664	62	99	186	30734	189	123	230	128	115	86	120	707	708	81	677	31	151	492	12	0	85	10435	4116
71.1	4	208	20	8	71	1477	9443	650	62	128	235	29929	126	18	178	55	128	126	114	674	718	0	639	44	175	495	0	14	37	10459	4318
71.2	5	187	31	0	50	1383	10168	629	13	86	180	29227	182	80	246	62	53	73	126	583	642	141	731	61	186	489	0	0	26	10650	4337
71.3	18	201	29	21	55	1404	10607	708	25	98	192	27795	76	31	184	62	119	42	166	698	782	92	719	40	167	508	0	0	17	10374	4481
71.4	18	192	0	0	48	1360	10910	624	42	102	206	27317	136	87	162	92	41	100	108	594	760	72	537	40	143	536	26	0	29	10116	4224
71.5	0	198	0	6	74	1331	11449	673	7	81	221	26957	149	42	145	52	58	80	92	560	907	38	597	35	205	519	0	0	41	10129	4384
71.6	0	195	0	7	60	1299	11723	660	17	105	227	26049	158	39	160	5	53	51	123	551	900	96	660	19	202	515	0	0	11	9967	4263
71.7	0	197	13	6	58	1291	12129	724	17	120	258	25810	207	59	161	99	72	163	108	509	886	79	627	13	181	539	13	0	73	10498	4364
71.8	15	192	18	20	47	1269	12366	696	74	80	256	24877	150	53	150	24	119	73	53	441	804	179	668	26	209	565	0	0	28	10337	4417
71.9	7	208	23	32	85	1174	12588	682	71	89	214	24921	138	7	82	12	76	40	102	476	926	57	620	0	206	580	0	11	56	10213	4386
72	11	227	12	35	73	1260	12720	596	66	79	268	24877	150	53	150	24	119	73	53	441	804	179	668	26	209	565	0	0	35	10394	4255
72.1	0	192	5	0	59	1294	12623	680	39	67	242	24723	104	24	210	93	78	52	145	462	1006	211	650	0	195	537	0	0	68	10171	4399
72.2	9	188	17	19	81	1155	12793	667	43	106	208	24624	153	107	207	156	58	25	170	534	943	52	647	9	174	616	0	0	11	9967	4263
72.3	6	222	26	12	68	1193	12538	687	44	75	231	24377	136	69	221	83	39	112	168	408	993	119	805	25	159	588	9	0	111	10620	4402
72.4	0	218	18	0	33	1211	12538	638	49	112	236	24325	132	30	119	25	142	108	156	452	975	19	691	32	239	543	0	0	17	10314	4412
72.5	0	204	6	8	56	1217	12315	674	48	97	241	23773	180	10	163	18	145	85	82	526	1007	41	639	32	235	539	0	31	27	10559	4344
72.6	14	229	18	12	66	1101	12495	645	29	51	238	23326	89	52	138	98	50	77	98	482	930	76	812	0	197	525	0	0	45	10534	4275
72.7	7	224	39	20	90	1194	12685	659	19	92	176	23062	128	22	137	0	84	23	88	382	989	67	728	14	196	517	0	0	17	10373	4530
72.8	11	255	32	56	76	1179	12599	651	31	82	214	23318	128	7	141	42	88	58	44	499	926	97	697	16	185	531	25	26	14	10575	4484
72.9	23	238	31	17	74	1220	12554	582	30	85	226	23063	119	51	148	99	56	33	134	462	1004	64	803	67	167	566	7	13	15	10747	4652
73	16	221	5	12	70	1186	12784	650	23	101	224	23274	157	41	137	84	149	30	53	382	888	28	765	21	195	516	0	0	0	10635	4558
73.1	8	255	28	57	92	1148	12681	596	43	109	183	23053	145	40	145	91	74	65	116	495	912	102	812	42	211	579	45	0	61	10450	4413
73.2	26	250	18	10	61	1155	12513	575	41	84	187	22649	122	19	127	34	112	91	116	528	1016	37	812	18	216	560	39	0	48	10801	4650
73.3	0	223	29	22	78	1132	12547	614	24	88	214	22866	163	47	162	86	118	118	177	422	1015	100	820	36	192	544	0	0	0	10585	4479
73.4	12	239	22	34	70	1172	12192	673	55	77	157	23458	141	89	137	132	99	165	75	539	996	36	920	0	141	566	0	0	78	10857	4675
73.5	14	230	5	22	52	1151	11816	699	20	104	214	23700	104	34	133	99	95	49	156	445	964	51	865	34	157	628	0	0	27	10997	4599
73.6	20	290	38	49	79	1162	11682	636	57	108	206	23268	177	34	148	82	121	19	136	443	946	101	1181	53	222	602	0	17	5	11111	4718
73.7	12	257	21	0	67	1103	12386	590	50	144	183	22592	143	21	131	77	73	168	132	423	1011	161	1081	59	233	563	0	0	10	11082	4621
73.8	15	281	23	53	82	1143	13080	570	49	107	220	22046	105	30	140	11	30	43	152	468	1153	159	1193	31	159	556	0	13	44	11598	4758
73.9	21	248	18	27	63	1093	12767	503	53	87	159	22386	122	25	129	0	98	27	134	523	1066	108	1248	21	166	537	0	0	0	11469	4874
74	19	248	5	18	73	1271	12979	593	36	100	167	24212	156	33	165	70	90	0	159	550	1093	147	1142	31	195	534	0	5	0	11665	4866
74.1	7	245	27	18	80	1379	13382	738	50	91	192	27814	80	0	171	126	158	69	126	690	1193	135	1275	41	150	547	0	0	26	12008	5033
74.2	20	275	25	23	52	1401	11581	832	70	109	282	30360	160	79	187	65	153	71	59	648	910	224	1096	6	200	605	0	0	44	11387	4861
74.3	12	269	14	19	77	1350	8198	730	33	121	314	26832	160	44	119	76	81	155	106	450	773	176	1072	42	205	492	0	0	48	8911	3782
74.4	15	209	9	5	75	1107	4842	521	37	109	232	19418	129	18	134	56	112	77	100	358	513	89	691	68	100	354	0	19	64	6452	2659
74.5	15	116	8	21	58	945	3265	469	35	57	176	17754	78	15	117	14	109	85	116	336	447	35	511	12	137	307	0	0	19	5864	2387
74.6	16	146	41	26	60	1118	3133	545	36	70	250	24659	76	20	127	12	14	57	24	411	403	62	561	20	140	390	12	0	20	6395	2570
74.7	23	173	42	34	55	1536	3374	670	32	83	290	32181	147	85	228	46	117	159	110	534	422	79	720	42	210	412	8	0	44	8119	3088
74.8	14	186	29	24	25	1719	2984	655	83	70	241	32028	151	102	245	88	130	121	124	716	446	12	681	0	168	423	0	0	60	9119	3559
74.9	0	134	36	5	56	1790	3097	675	66	47	202	34261	140	87	222	101	57	97	76	887	358	59	748	0	179	441	13	0	33	9838	3725

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
75	12	166	15	17	44	2138	3462	677	56	136	237	38471	200	182	256	98	100	115	79	852	436	117	737	0	198	522	0	0	60	10789	4043
75.1	19	161	19	39	73	2262	4312	750	58	147	219	39233	278	132	309	83	111	100	134	883	429	38	732	48	204	523	0	34	10991	4244	
75.2	0	180	13	0	42	2132	4993	743	58	138	245	38390	188	117	231	64	160	164	163	864	497	121	506	37	195	475	0	0	9	10808	4331
75.3	9	180	5	0	36	1972	5993	698	44	143	198	37138	186	88	241	51	34	102	199	911	505	149	703	53	238	489	6	0	57	10902	4419
75.4	29	203	7	20	41	1900	7025	802	61	107	230	35376	238	147	329	47	151	137	65	913	598	16	635	19	216	488	0	0	12	10649	4300
75.5	0	189	23	0	37	1832	7826	717	42	110	238	34385	131	91	228	84	79	88	113	779	663	24	587	27	187	498	0	0	50	10525	4092
75.6	0	201	4	12	48	1699	8637	719	69	101	232	32447	164	40	276	51	107	78	69	717	761	88	721	28	248	555	0	36	66	10657	4404
75.7	6	177	29	17	53	1570	9419	758	39	104	242	30724	134	52	221	113	102	103	51	666	757	123	565	8	216	508	9	0	76	10696	4371
75.8	30	174	28	9	45	1528	10235	626	43	104	235	29254	130	58	205	91	84	69	90	652	778	125	599	16	209	532	0	0	13	10410	4350
75.9	5	182	30	7	52	1450	10923	666	44	77	263	28076	167	45	201	70	35	99	109	603	829	195	639	12	190	541	23	0	90	10627	4470
76	25	180	37	40	84	1359	11540	670	41	128	245	27099	119	54	160	61	59	85	158	619	999	103	621	65	140	544	6	9	94	10705	4344
76.1	28	204	0	17	56	1205	11848	677	50	86	199	25712	116	79	173	119	138	171	157	539	878	105	595	0	155	538	0	0	0	10153	4341
76.2	13	180	34	31	57	1250	11785	636	21	87	191	24583	94	0	163	55	45	106	74	540	973	0	689	18	177	511	0	0	19	10336	4455
76.3	19	195	13	15	74	1212	12071	604	47	96	265	24292	175	82	193	72	65	0	86	540	963	69	653	52	221	509	0	11	18	10540	4483
76.4	0	173	39	27	80	1158	12156	602	43	103	212	23585	140	83	178	111	124	113	145	581	1051	112	748	39	175	603	0	7	31	10216	4518
76.5	0	253	40	49	80	1129	12173	603	36	105	226	23163	141	62	115	28	45	130	129	440	893	160	679	66	175	691	0	0	21	10245	4247
76.6	9	259	48	11	76	1137	12038	597	23	66	198	22625	125	66	123	33	61	47	101	524	925	91	690	36	150	593	7	19	36	10122	4228
76.7	5	225	9	25	53	1132	11265	611	46	86	199	23000	134	52	90	42	116	40	168	515	933	81	643	44	271	526	0	6	0	10345	4361
76.8	0	210	0	25	53	1132	11265	611	46	86	199	23000	134	52	90	42	116	40	168	515	933	81	643	44	271	526	0	6	0	10345	4361
76.9	8	194	27	13	41	1126	11085	638	79	74	222	22863	133	6	179	85	80	55	166	507	973	55	717	0	188	558	0	20	26	10246	4301
77	16	211	27	15	62	1133	10867	591	48	100	179	22490	144	72	137	101	119	80	126	391	937	77	745	18	183	531	0	0	26	10302	4313
77.1	0	242	26	34	95	1233	11007	579	29	95	183	23108	111	0	130	58	95	138	148	427	932	39	689	24	224	518	0	0	27	9998	4203
77.2	0	192	26	24	60	1207	10996	621	44	91	184	22968	155	79	133	116	93	51	60	434	912	54	725	45	154	526	0	0	52	10164	4318
77.3	21	171	13	0	35	1232	10568	601	25	107	196	23545	187	71	152	67	101	96	109	395	832	19	678	31	177	521	0	5	4	10047	4264
77.4	34	225	11	45	83	1393	10271	691	49	98	181	24322	104	0	136	89	99	12	124	419	830	85	715	15	168	508	0	0	53	10360	4379
77.5	35	245	38	57	128	1513	9808	681	49	111	183	25284	176	136	208	128	76	73	113	469	864	85	850	48	130	574	52	0	0	10593	4443
77.6	0	189	0	8	38	1626	8713	589	16	108	199	26605	172	59	160	94	0	128	88	446	921	120	815	46	208	553	54	0	68	10382	4455
77.7	7	188	0	0	47	1602	8337	726	72	89	181	28052	169	22	185	66	75	71	126	509	868	0	779	0	203	501	0	0	8	10375	4548
77.8	0	254	31	15	61	1705	8179	705	59	112	210	30488	278	159	233	72	82	178	152	441	912	8	915	38	213	537	0	0	54	10354	4324
77.9	24	215	18	32	78	1697	7867	741	0	109	165	30753	177	105	175	125	66	117	179	489	864	111	893	76	190	578	0	0	20	10325	4415
78	0	166	15	9	59	1910	7497	747	76	88	195	30813	177	110	210	85	141	109	125	537	882	6	962	13	187	531	0	0	11	10574	4543
78.1	23	197	39	17	80	1995	6639	780	14	132	199	31600	201	123	233	78	102	184	126	494	994	134	869	43	193	573	7	0	34	10686	4579
78.2	7	152	15	9	54	2136	5101	782	14	138	208	35409	222	102	234	113	17	146	198	619	868	126	1191	22	220	603	0	0	38	10892	4768
78.3	0	205	22	34	20	2295	3953	653	50	127	198	39519	216	138	309	126	173	94	92	744	901	21	1257	64	222	537	0	12	34	10900	4799
78.4	13	170	36	21	44	2379	3564	718	82	154	168	41021	288	151	334	49	71	130	171	794	651	179	993	26	253	459	0	0	45	11365	4657
78.5	26	156	6	15	25	2254	3633	760	38	148	219	41466	202	135	249	109	124	137	145	935	439	126	731	39	180	468	0	6	65	11339	4432
78.6	10	179	23	29	52	2315	4171	819	63	139	230	40505	236	125	344	53	67	145	942	444	71	816	11	238	470	0	28	0	1559	4492	
78.7	36	137	0	0	19	2072	4262	766	39	104	180	40134	240	161	332	118	234	116	130	1095	491	56	824	14	195	483	0	27	54	11450	4634
78.8	9	180	8	0	60	2119	4617	716	53	134	231	39228	208	148	297	117	56	121	175	972	394	142	817	53	177	467	5	33	70	11130	4323
78.9	18	179	34	33	66	2188	5175	722	83	132	224	37841	195	92	266	23	52	106	79	1001	436	0	743	39	210	483	0	6	9	10916	4271
79	31	155	25	17	51	1929	5650	706	92	93	192	36755	201	127	244	128	109	201	121	1079	384	85	855	27	199	495	29	0	46	11133	4393
79.1	29	162	31	9	46	1878	6088	679	80	110	243	35453	165	103	243	121	31	123	148	908	441	74	681	52	185	491	0	0	39	11097	4246
79.2	0	170	0	0	31	1798	6401	713	39	112	247	34757	146	84	233	112	66	71	171	1014	497	50	691	15	173	512	0	19	52	10958	4176
79.3	18	167	34	19	43	1813	6948	716	52	117	236	34225	155	108	267	102	108	151	195	841	588	250	675	36	231	500	24	8	65	11091	4177
79.4	20	164	12	8	25	1760	7476	659	42	88	233	33126	180	82	227	56	123	155	150	949	471	67	634	25	240	478	0	0	40	10828	4196
79.5	23	195	16	19	52	1614	8007	677	34	96	236	32205	168	122	250	83	48	107	144	920	487	69	669	56	182	500	9	0	27	10671	4311
79.6	14	176	18	12	44	1571	8626	675	48	87	226	31647	144	80	225	84	92	58	142	934	605	88	711	54	217	440	8	0	28	10835	4300

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
79.7	9	153	0	0	48	1579	8687	678	20	89	257	30850	142	40	236	89	56	137	110	797	576	0	706	36	184	531	0	0	37	10581	4173
79.8	42	190	10	0	33	1603	9141	728	63	106	203	30750	168	77	212	97	102	0	119	702	595	90	703	0	172	551	0	17	22	10628	4160
79.9	0	206	0	0	60	1462	9760	605	46	96	221	29379	125	66	236	76	48	31	215	781	633	161	690	42	175	525	0	44	72	10596	4339
80	22	202	4	18	46	1447	10219	633	47	87	213	28869	108	46	176	53	107	122	119	763	745	118	681	10	221	491	13	0	33	10752	4351
80.1	14	210	10	37	84	1405	10579	704	55	117	215	28385	171	93	196	59	166	138	195	744	782	0	658	29	209	527	0	0	50	10549	4346
80.2	6	222	14	25	50	1299	10662	671	42	70	224	27429	110	4	191	106	68	109	127	712	758	84	671	0	213	475	18	0	35	10544	4312
80.3	23	218	14	8	71	1340	11120	598	41	91	238	26886	158	79	164	86	20	156	129	584	769	64	694	43	197	556	0	0	21	10618	4159
80.4	0	212	0	0	54	1290	11291	686	39	74	238	26756	191	192	242	102	64	156	129	584	769	64	694	43	197	556	0	0	65	10467	4210
80.5	0	228	41	20	69	1304	11476	654	43	101	211	26622	177	90	179	69	80	195	120	495	840	103	629	31	215	581	0	0	65	10679	4317
80.6	0	167	37	34	107	1244	11769	582	22	77	230	25648	98	25	156	0	125	71	149	608	865	0	630	73	188	493	5	6	65	10683	4319
80.7	0	175	0	12	71	1217	11717	607	77	93	234	25335	107	20	134	6	93	81	145	669	867	97	605	19	198	521	0	0	25	10679	4317
80.8	12	214	35	18	73	1305	11901	645	50	74	215	25134	115	81	145	46	30	31	121	599	797	0	550	9	218	544	31	0	38	10574	4337
80.9	7	178	0	0	37	1227	11920	566	43	131	255	25113	154	54	210	42	91	100	107	501	982	65	699	55	187	543	0	0	31	10549	4352
81	17	200	13	34	55	1279	12095	627	15	96	223	25111	178	77	169	116	106	154	146	493	912	18	501	46	177	530	0	0	61	10558	4406
81.1	8	210	21	43	83	1175	12250	626	53	85	222	24253	152	68	154	54	80	101	87	495	956	0	624	47	215	553	0	0	51	10423	4276
81.2	37	212	30	17	74	1163	12165	617	0	79	199	24187	136	5	129	49	4	49	144	513	924	199	664	47	195	557	6	0	45	10587	4175
81.3	8	189	8	5	77	1083	11977	500	49	92	225	23809	199	54	170	10	44	166	52	451	879	48	566	60	186	512	0	0	0	10424	4548
81.4	21	202	25	13	51	1112	11934	612	0	107	188	23143	85	19	129	43	113	0	95	450	885	92	525	36	192	526	0	0	54	10606	4521
81.5	0	140	10	0	26	1042	12004	629	11	89	234	23341	117	29	153	39	161	85	91	416	932	79	662	35	211	493	0	0	24	10522	4444
81.6	27	209	8	9	74	1162	12261	570	67	83	208	22834	189	40	178	60	156	120	164	407	981	163	664	24	194	554	0	0	28	10639	4387
81.7	0	182	22	22	75	1084	12230	559	29	78	224	22601	169	57	187	59	90	78	94	420	927	161	559	43	169	535	0	0	54	10843	4336
81.8	8	178	16	13	81	1074	12172	471	44	103	172	26009	118	61	202	29	94	109	123	506	1049	206	595	18	192	517	57	0	57	10633	4384
81.9	14	188	0	0	42	1098	12174	608	0	93	198	23029	129	67	202	78	31	6	80	377	978	139	693	33	193	513	29	0	23	10436	4377
82	0	240	35	20	61	1055	12219	554	57	93	197	22009	144	36	112	42	101	17	55	480	1021	111	528	19	154	502	0	0	0	10638	4482
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82.2	0	197	14	12	74	992	12417	603	35	116	125	22491	125	19	195	48	55	124	119	521	1040	155	570	21	191	538	6	0	57	10910	4406
82.3	29	221	0	0	72	988	12182	606	45	115	192	21894	102	30	174	0	35	52	146	526	1009	75	700	21	191	538	6	0	61	10597	4477
82.4	21	222	20	21	84	990	12297	628	43	114	262	22132	176	45	219	52	150	95	98	366	897	166	683	20	205	547	0	0	77	10746	4418
82.5	11	209	17	56	94	1118	12524	577	42	109	218	22301	148	42	177	111	47	60	106	421	1081	127	580	29	211	522	27	0	10	10978	4545
82.6	19	194	35	28	80	997	12341	585	25	118	198	22044	179	20	191	57	143	43	177	481	949	146	587	45	241	479	0	0	17	10950	4546
82.7	0	232	22	20	76	1018	12420	618	55	95	197	22126	147	0	124	35	132	146	45	456	1016	100	601	14	186	541	0	0	23	10532	4354
82.8	14	220	14	10	55	1021	12337	637	60	68	179	21953	94	0	100	93	121	74	110	406	899	93	660	12	186	534	0	0	48	10612	4470
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83	0	215	15	0	60	1061	11865	617	44	91	177	21356	135	52	92	79	45	113	74	387	929	108	683	24	180	519	14	0	6	10668	4484
83.1	17	199	17	21	69	986	11675	572	32	89	169	21819	108	63	131	97	178	44	153	427	991	79	679	39	199	563	0	27	6	10668	4484
83.2	31	239	30	29	75	988	12167	599	83	62	203	22011	85	28	129	97	138	61	121	485	948	43	681	21	155	547	0	0	37	10684	4420
83.3	12	223	7	24	46	1080	12183	576	64	74	204	21934	125	43	156	100	50	127	133	395	952	51	590	39	209	611	0	0	13	10988	4454
83.4	7	261	26	39	81	1080	11757	628	49	93	184	21472	94	6	97	28	47	62	220	445	875	13	726	17	166	542	0	0	60	11082	4324
83.5	13	207	8	9	48	1058	11523	547	46	68	208	21018	144	0	115	20	137	20	124	326	853	91	769	32	226	515	0	0	10	11327	4368
83.6	0	233	16	8	41	995	11363	524	47	76	222	21198	126	0	119	10	157	53	110	493	920	118	783	12	217	470	6	0	61	11484	4535
83.7	0	199	5	9	57	1039	10597	657	9	99	187	21498	130	34	96	22	144	89	144	409	871	156	672	0	188	506	15	0	25	11651	4400
83.8	0	256	8	21	79	1101	11061	640	38	101	222	21634	148	26	127	55	72	50	90	422	1057	134	714	20	242	524	0	0	41	11304	4370
83.9	7	240	13	12	55	1058	11468	631	46	112	195	21472	99	54	123	63	39	32	155	433	913	21	700	37	204	497	17	15	18	11764	4506
84	0	222	33	20	43	1114	11641	630	52	81	185	21590	76	0	125	62	45	48	161	477	937	61	778	53	204	497	0	0	57	12108	4570
84.1	0	218	0	0	55	1123	12038	601	35	110	193	21818	141	57	166	49	167	130	131	525	941	70	802	25	224	495	0	0	56	12214	4503
84.2	5	246	0	0	31	1107	11940	559	42	129	219	22032	142	45	122	43	96	106	136	426	870	68	743	67	240	550	0	0	42	11885	4411
84.3	16	283	26	6	84	1065	11649	590	31	113	218	21205	148	0	100	0	106	57	193	403	903	81	754	59	254	496	0	0	75	12361	4564

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
84.4	0	222	0	7	50	1136	11628	640	53	103	182	21592	162	0	125	36	149	103	144	364	912	106	888	26	180	529	0	0	75	12237	4512
84.5	0	246	20	21	58	1155	12111	645	38	130	206	23350	190	7	110	64	14	100	168	303	908	8	731	54	270	618	0	0	37	12181	4563
84.6	0	303	0	27	55	1126	12190	618	56	104	167	23327	148	0	124	53	21	118	194	483	814	92	865	36	239	606	0	0	72	12637	4462
84.7	0	284	0	0	44	1115	12042	617	30	140	229	22511	98	30	106	116	90	0	60	330	937	51	805	79	241	513	0	16	61	12632	4470
84.8	7	260	22	32	56	1126	11706	601	61	90	168	21677	120	11	129	51	115	46	129	431	823	93	885	9	246	493	10	27	51	12719	4536
84.9	0	239	0	0	45	1138	12081	603	16	65	178	22708	169	22	134	48	130	145	148	401	879	171	812	38	231	515	0	0	44	12962	4346
85	0	248	0	0	49	1081	11826	567	67	103	188	21259	95	0	99	0	0	133	111	447	924	137	784	10	268	581	9	0	83	12869	4498
85.1	0	212	0	0	49	1066	11723	438	57	113	144	19763	76	0	215	86	128	66	160	370	902	136	890	41	191	553	20	0	84	12859	4599
85.2	10	257	0	0	46	1044	12111	477	74	108	151	19983	83	5	288	0	43	32	234	416	875	78	966	14	229	561	0	0	90	13135	4507
85.3	0	222	0	8	44	1152	11924	512	34	114	168	20207	86	0	119	34	0	0	174	401	849	84	922	25	191	570	31	45	52	13225	4664
85.4	6	288	42	21	119	1129	12369	514	95	104	172	20706	96	0	85	85	30	105	196	447	929	86	722	71	225	589	12	0	74	13018	4453
85.5	8	244	6	0	69	1124	12020	596	51	96	149	21171	120	0	140	69	178	171	247	386	818	139	1015	27	233	547	0	0	101	13217	4504
85.6	0	192	0	0	12	1235	11460	616	36	98	140	21796	121	0	66	37	153	153	206	438	906	64	921	39	236	579	0	0	80	13187	4441
85.7	18	270	19	11	60	1144	11403	523	21	129	211	21889	88	0	122	14	117	67	190	439	857	150	898	86	255	555	0	0	120	13204	4478
85.8	11	226	0	7	58	1061	12505	557	53	178	218	22645	174	0	199	27	101	64	138	483	746	116	995	81	233	541	0	0	83	13243	4303
85.9	0	242	0	0	23	1048	11212	683	35	115	231	21872	139	0	145	0	132	54	220	549	835	79	759	14	269	545	0	0	83	13243	4303
86	0	240	0	0	77	1063	11948	576	75	111	200	21634	187	35	222	109	104	106	104	372	906	26	814	39	212	590	51	33	70	12915	4323
86.1	0	229	0	0	26	1095	11859	567	58	128	202	22505	144	0	148	74	65	125	225	382	823	0	807	32	209	576	0	0	50	13386	4391
86.2	18	259	20	30	83	1211	12633	644	39	89	182	22651	123	0	153	42	111	77	203	468	799	103	892	47	265	572	0	5	79	13238	4324
86.3	0	239	0	0	49	1125	12991	770	37	158	207	21671	104	0	129	117	60	47	120	383	725	54	825	29	261	649	0	0	82	13155	4400
86.4	16	264	0	0	43	1134	12106	672	56	167	177	20689	127	0	140	72	172	126	179	363	781	116	824	54	291	604	8	0	97	13086	4119
86.5	6	252	0	0	28	874	10623	578	53	116	148	18974	90	0	65	83	84	59	190	388	828	71	810	17	235	554	22	30	106	13108	4155
86.6	0	220	24	8	83	991	10490	476	62	108	110	19187	104	0	96	0	150	124	157	393	807	28	734	69	242	521	0	0	70	13096	4137
86.7	6	238	12	0	31	926	10471	487	43	100	124	17786	100	0	53	108	0	73	176	388	766	130	798	60	168	593	0	0	103	12864	4176
86.8	0	219	5	0	58	899	11206	470	38	106	149	17798	114	0	50	0	61	48	152	437	797	125	784	88	210	517	0	0	62	13050	4154
86.9	0	242	11	0	40	1061	11333	558	70	116	170	20122	147	0	67	7	99	30	265	447	837	53	788	45	237	512	39	37	82	13085	4292
87	5	266	0	6	48	1030	10550	520	49	107	146	20501	146	0	134	48	9	155	135	409	714	62	869	82	178	524	22	0	59	12916	4054
87.1	10	235	0	0	58	999	10026	519	51	114	148	19629	97	0	140	64	60	47	176	292	687	0	874	36	178	524	22	0	71	13189	4086
87.2	9	227	13	8	65	1056	10785	467	21	111	195	20186	103	0	85	32	12	70	173	292	800	114	879	55	215	532	12	0	104	13152	4204
87.3	0	228	0	4	42	1105	12468	543	69	117	164	20697	162	16	88	24	79	56	130	325	743	107	891	23	206	579	0	7	110	13147	4371
87.4	0	197	0	0	43	877	11085	486	60	133	162	18313	126	0	170	19	91	35	154	320	790	16	730	47	184	531	21	0	38	12346	4045
87.5	0	187	12	5	52	882	10282	457	61	132	189	16911	137	0	112	0	70	72	170	362	690	131	921	56	185	414	0	0	51	12783	4064
87.6	0	199	4	0	76	931	10057	459	24	126	190	17018	122	0	123	0	150	152	178	407	836	10	945	38	232	451	0	0	78	13006	3975
87.7	8	165	0	0	45	934	10699	459	32	101	208	18176	109	0	133	44	68	48	153	417	825	152	852	32	218	538	34	18	107	13052	4036
87.8	0	203	0	0	31	1013	10907	577	44	115	159	20018	155	0	186	16	127	81	182	340	698	88	896	62	256	546	0	0	41	12609	4040
87.9	7	198	0	0	28	1040	10633	647	10	113	177	20451	160	0	179	0	96	45	204	263	648	157	924	64	260	482	0	0	71	12676	3918
88	0	207	5	12	61	948	10722	754	70	98	184	19542	117	0	141	85	35	126	190	298	654	165	774	66	226	495	0	0	56	12544	3965
88.1	0	237	29	0	39	890	11174	620	50	120	133	18454	104	0	100	0	91	54	104	254	688	43	741	38	262	460	0	0	39	12661	4040
88.2	16	194	19	35	83	930	12352	459	56	113	140	18065	105	0	113	0	47	123	199	305	792	143	722	52	253	503	0	0	66	12201	3877
88.3	6	205	0	0	45	929	12146	362	38	98	190	18118	137	6	106	0	18	101	239	292	687	0	751	46	242	528	0	0	98	12308	3891
88.4	0	206	28	12	40	987	11906	432	69	100	138	18833	122	0	183	56	162	98	241	298	659	27	823	40	239	462	0	0	49	12322	3886
88.5	0	187	0	0	48	1010	11249	492	35	120	149	18969	141	0	113	44	100	94	182	306	633	80	685	60	223	488	0	0	46	12268	3852
88.6	11	183	7	0	45	912	10601	474	33	110	133	18424	84	0	121	7	115	81	120	275	571	133	784	57	224	542	0	21	22	12454	3829
88.7	0	222	14	0	42	1058	10937	571	43	79	144	18319	109	0	125	28	54	95	154	266	686	8	799	48	208	505	0	0	56	12422	3681
88.8	0	236	4	6	29	987	11029	496	54	102	108	19334	116	0	120	99	69	112	210	279	705	105	784	36	243	476	0	0	74	12243	3777
88.9	18	156	0	9	41	888	11470	425	29	115	118	17737	72	0	127	37	61	35	215	282	627	86	950	57	208	531	0	0	43	12161	3900
89	16	192	28	0	50	845	11623	477	27	98	130	16794	117	0	112	123	94	31	156	299	702	61	749	84	224	494	5	37	90	12570	3809

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
89.1	0	203	0	0	60	966	11768	571	44	78	121	19363	108	0	80	0	116	130	168	334	623	25	788	31	249	506	0	0	28	12269	3828
89.2	6	269	7	9	66	1040	12489	496	11	116	161	20292	145	0	128	113	50	94	151	348	702	51	868	86	220	641	0	13	101	12476	3804
89.3	5	218	24	0	28	903	12299	488	22	115	157	19603	117	0	100	11	65	88	200	363	731	57	909	25	247	552	0	0	11	12369	3882
89.4	0	202	0	0	33	988	12473	484	49	112	138	19950	126	0	144	46	115	83	199	387	679	37	901	57	231	514	0	0	77	12104	3674
89.5	20	256	22	51	68	1090	13265	571	8	139	167	20397	90	0	127	42	91	87	145	283	625	57	831	31	174	526	14	0	43	12171	3671
89.6	7	266	30	6	70	1013	13002	529	46	96	153	20314	98	0	91	27	37	37	143	422	726	89	833	32	205	495	12	0	69	12257	3938
89.7	0	265	7	11	67	1047	12732	551	53	92	197	19839	116	0	190	61	54	50	175	300	652	45	834	39	226	543	0	0	123	11967	3637
89.8	14	225	12	21	76	1095	12477	591	35	105	128	19635	190	26	153	99	72	171	114	270	604	46	810	32	259	548	0	0	80	11892	3635
89.9	0	197	31	14	50	1061	11478	524	27	170	158	20846	148	103	162	54	101	48	100	306	774	50	757	60	304	556	24	49	87	11994	3578
90	0	222	9	0	65	1124	12707	542	68	142	157	22562	165	57	156	75	182	55	116	313	754	0	658	13	209	550	0	0	84	11834	3580
90.1	10	248	13	0	62	1069	12910	480	59	117	170	21528	151	24	190	73	95	51	202	400	672	78	743	50	144	521	0	0	20	11875	3635
90.2	9	228	17	17	68	1139	12230	511	67	163	144	21564	132	0	114	6	127	84	153	311	649	88	763	58	236	520	0	0	100	11713	3508
90.3	0	238	21	28	72	1126	13105	536	52	107	207	21886	225	0	163	53	82	44	196	311	708	58	886	0	222	515	0	0	56	11423	3553
90.4	0	259	0	4	42	1160	13420	615	31	87	176	22211	190	0	131	45	0	24	252	342	748	0	812	25	193	612	43	7	97	11776	3471
90.5	17	248	11	29	54	1115	12015	617	34	96	121	21564	115	0	87	0	120	73	223	297	783	129	882	29	278	551	0	17	101	11675	3411
90.6	0	265	32	0	59	1032	12302	622	20	109	167	20983	103	0	106	60	23	32	142	316	766	63	844	48	194	553	18	0	69	11289	3323
90.7	14	218	5	26	64	1067	12752	710	39	81	201	21417	99	24	136	84	119	154	139	334	584	90	606	64	218	545	0	0	74	11236	3349
90.8	11	253	5	0	84	1152	11685	626	43	93	198	21235	90	5	159	55	12	91	169	350	622	71	643	55	215	545	18	0	17	10936	3356
90.9	0	226	0	0	43	1134	11575	540	50	64	205	21183	111	0	142	89	43	28	79	336	533	17	856	33	187	562	5	8	49	10908	3402
91	0	275	11	12	42	1069	11315	563	75	78	213	22285	100	0	191	64	77	68	146	340	609	13	719	0	224	500	0	0	85	10740	3319
91.1	13	277	37	24	76	1145	11276	541	7	99	194	22175	128	38	147	92	22	108	119	262	610	45	780	50	164	574	0	0	24	10428	3169
91.2	20	264	28	36	103	1060	11130	563	19	71	258	19831	90	0	117	72	53	0	159	346	700	45	860	9	191	475	39	0	79	10501	3083
91.3	10	239	23	13	88	1056	11088	508	53	76	197	20312	93	0	113	26	129	20	114	239	753	69	855	35	237	538	0	0	51	10511	3200
91.4	0	253	20	20	83	1143	12008	552	40	78	224	21376	129	0	132	0	107	53	100	308	678	90	607	42	254	648	0	13	62	10128	3218
91.5	10	241	20	28	76	1159	11579	670	32	136	209	19901	182	23	141	29	41	97	135	358	642	114	631	63	215	558	0	0	76	10342	3204
91.6	10	242	0	0	55	1079	10480	674	31	86	206	19975	168	50	101	108	86	77	137	373	652	62	690	49	164	504	0	0	39	10324	3240
91.7	29	247	40	20	79	1176	11012	637	30	118	266	21147	145	36	133	101	46	76	211	315	636	160	759	67	150	548	0	0	73	10074	3138
91.8	13	264	0	21	78	1136	10758	515	35	119	197	21078	166	89	130	88	28	92	128	309	677	125	584	37	158	565	21	0	51	9813	3007
91.9	14	251	40	27	76	1098	11157	527	38	100	205	20997	139	58	112	60	66	134	151	269	622	90	518	103	181	522	0	7	24	10016	2912
92	8	241	27	11	66	1142	10850	590	57	87	151	21509	124	0	87	33	65	76	142	196	589	71	577	51	210	465	0	0	70	9917	3014
92.1	7	211	23	35	86	1121	10810	567	34	81	195	20846	202	98	117	61	82	119	164	275	576	0	631	48	197	493	0	0	0	9849	2950
92.2	5	253	19	28	83	1046	11304	456	29	56	167	18309	120	16	106	0	32	119	84	245	601	97	543	53	177	506	0	0	74	9851	3114
92.3	0	193	26	17	65	993	12011	397	39	97	128	17066	104	26	98	55	110	88	37	363	684	58	639	68	141	491	35	0	55	9639	3045
92.4	8	271	11	37	76	1099	13349	567	46	68	202	20051	145	67	133	75	122	0	175	266	778	103	685	28	132	495	0	0	34	9917	2980
92.5	0	259	14	0	47	1054	12237	586	59	84	229	19129	136	19	163	84	109	24	91	233	469	7	710	24	211	450	0	0	54	9342	2599
92.6	9	191	0	14	64	863	9598	385	27	71	152	14849	138	42	90	49	141	17	111	169	601	28	1136	41	134	380	0	0	5	9209	2607
92.7	0	146	0	5	33	760	9207	499	40	45	122	15692	67	0	69	0	137	54	144	227	636	37	1616	0	224	385	9	5	64	9330	2711
92.8	10	205	0	24	58	992	10115	500	45	130	162	19604	148	5	110	96	16	65	192	246	646	0	560	33	206	537	37	6	47	10215	2743
92.9	0	245	8	0	32	1083	12250	648	24	107	205	20363	198	26	156	104	100	129	157	229	461	15	605	5	240	482	0	0	85	10146	2744
93	0	217	28	50	65	1006	11017	583	33	123	176	16679	211	39	106	111	138	119	154	153	404	0	545	54	207	412	0	0	32	9840	2678
93.1	18	144	35	33	78	759	8312	404	23	122	124	13056	147	0	55	69	152	100	191	233	447	12	653	87	223	398	0	0	39	10183	2784
93.2	0	105	5	19	55	687	8026	384	42	66	125	13161	104	0	70	53	60	64	121	193	472	0	490	41	237	403	0	0	78	9922	2701
93.3	0	81	6	14	31	616	7944	265	18	86	123	10658	30	0	53	26	37	112	155	220	578	68	583	45	218	469	0	0	78	10323	2718
93.4	0	105	15	8	14	628	8267	313	70	79	135	11985	46	0	128	0	24	0	171	287	504	87	531	28	264	483	0	33	93	11072	2836
93.5	0	140	18	0	37	664	8511	427	19	66	100	14687	37	0	89	17	97	181	212	298	709	0	731	41	304	444	0	0	65	12221	3105
93.6	0	93	65	0	11	519	7607	522	45	62	130	16734	0	0	83	31	170	67	258	391	929	125	864	0	363	573	0	0	118	12815	3153
93.7	0	32	98	18	10	537	9338	456	51	41	212	27378	0	0	220	173	320	298	355	376	978	20	625	0	648	862	0	0	55	14286	3388

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh	
93.8	0	36	185	52	47	379	6499	314	0	73	228	18803	0	16	388	473	615	906	595	0	74	0	575	0	1895	1617	0	0	238	19795	3199	
93.9	21	95	164	91	109	165	1162	117	0	52	0	2685	0	35	322	667	919	1221	799	0	0	0	368	0	2707	2126	0	0	356	22386	2912	
94	53	101	146	127	131	134	470	69	0	71	0	1126	0	0	337	510	728	1217	794	0	0	0	354	0	2908	2192	0	0	350	22253	3058	
94.1	64	83	155	161	141	129	386	63	0	88	0	862	0	0	259	472	961	1047	850	0	0	0	252	0	2871	2144	0	0	247	21377	2883	
94.2	74	113	159	158	159	140	427	38	0	88	0	792	0	0	229	400	568	960	1149	905	0	0	0	234	0	2795	2204	0	0	307	20922	2626
94.3	64	118	168	164	166	148	503	97	0	42	0	918	0	98	309	563	853	1085	787	0	0	0	335	0	2749	2316	0	0	352	20506	2592	
94.4	48	127	177	177	161	152	174	512	67	0	24	0	1067	0	96	423	511	972	1022	727	0	0	270	0	2809	2320	0	0	319	19986	2658	
94.5	75	122	182	172	161	144	483	93	0	56	0	871	0	28	380	543	898	1004	585	0	0	0	271	0	2904	2242	0	0	253	19697	2615	
94.6	67	87	150	155	143	126	326	37	0	60	0	815	0	32	318	579	724	1041	728	0	0	0	461	0	2564	2054	0	0	320	18971	2398	
94.7	18	41	83	80	96	112	421	52	0	14	0	814	0	5	306	417	718	809	480	0	0	0	273	0	2006	1655	0	0	248	17292	2480	
94.8	0	22	43	31	54	89	439	104	6	61	18	807	0	0	267	136	469	615	443	0	0	0	235	16	1382	1003	0	0	174	15180	2017	
94.9	0	25	15	5	49	87	319	308	16	62	33	667	0	0	460	34	202	270	271	0	0	27	262	40	618	493	0	0	53	10103	1455	
95	0	10	39	18	59	27	68	755	0	35	25	170	0	20	876	45	103	88	81	0	0	0	51	10	193	174	16	0	4	3881	743	
95.1	6	5	54	19	84	28	61	1013	0	38	4	138	0	0	1064	18	38	77	72	18	0	0	101	0	230	184	0	0	34	2914	719	
95.2	9	0	59	23	82	20	60	1003	0	61	22	174	0	12	1263	24	84	48	44	0	0	0	120	28	216	183	0	0	30	2989	661	
95.3	0	11	56	34	55	22	59	1177	0	69	10	120	0	0	1276	35	94	5	53	0	8	0	125	0	259	217	0	0	0	3209	715	
95.4	0	4	65	26	61	17	72	1098	0	48	23	134	0	0	1403	29	57	61	88	0	0	0	138	0	234	161	9	0	14	3229	768	
95.5	0	7	65	24	61	23	52	1159	0	70	18	130	0	43	1417	8	85	16	51	0	0	0	105	0	196	192	0	0	32	3117	801	
95.6	0	9	55	16	52	33	78	1058	0	83	16	145	0	38	1306	7	25	94	62	0	0	0	116	16	201	226	0	0	37	3192	831	
95.7	0	5	66	30	57	23	70	957	0	60	20	145	8	26	1519	71	67	20	57	0	20	0	144	12	194	187	6	0	25	3110	777	
95.8	6	7	51	22	56	19	87	909	0	49	44	111	0	22	1455	53	52	78	124	0	0	45	151	0	190	202	11	0	28	3203	792	
95.9	0	16	64	25	51	20	82	904	0	53	30	137	9	0	1420	0	39	128	150	0	0	95	0	273	191	0	0	0	3044	825		
96	0	0	54	10	39	18	76	776	5	71	50	196	0	39	1348	54	72	81	135	0	0	0	121	27	196	224	0	0	34	3206	840	

Appendix. Scanning XRF data for synthetic core B1.

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
0	12	220	0	0	35	2338	6425	878	72	136	266	42335	259	149	375	116	147	129	199	895	708	56	683	43	258	572	18	0	49	3324	766
0.1	8	217	15	20	38	2387	6946	805	102	81	267	41684	261	230	333	187	140	161	236	769	713	67	714	34	247	584	0	0	84	3415	829
0.2	33	235	11	28	55	2334	7710	845	90	139	218	41194	247	153	264	122	104	161	204	949	812	63	698	31	216	562	34	0	69	3279	880
0.3	22	195	0	8	28	2190	8187	925	45	110	274	40225	218	26	329	38	129	136	191	828	821	149	762	8	261	558	0	14	92	3266	724
0.4	22	208	0	0	9	2112	8638	817	103	107	270	38651	208	159	307	135	196	119	148	776	721	68	695	17	267	546	0	0	76	3288	845
0.5	19	218	24	11	52	2105	8989	825	66	126	257	36941	203	109	286	29	154	137	112	693	868	95	809	29	268	542	23	0	35	3202	760
0.6	0	241	0	23	61	1991	9524	862	66	113	260	36789	226	145	249	134	121	136	126	766	783	149	801	50	207	580	0	0	0	3031	711
0.7	0	206	0	0	40	2032	10003	833	87	124	250	36049	258	73	279	137	135	96	140	653	936	107	699	32	244	591	0	0	33	3062	710
0.8	18	246	8	11	66	1975	10442	822	24	121	300	35731	259	177	283	141	148	190	168	659	953	181	750	89	257	645	0	0	70	3022	802
0.9	23	247	0	0	30	1959	10954	800	45	123	274	35400	236	124	242	83	17	114	185	712	864	111	708	93	268	675	22	20	66	3015	728
1	7	252	18	23	59	1888	11536	885	57	128	284	34450	191	98	257	146	154	248	172	534	981	56	725	0	200	574	0	0	53	2966	719
1.1	0	219	0	0	52	1801	11560	791	44	115	246	33430	237	172	292	165	59	66	58	637	939	66	720	36	179	643	0	0	73	2769	720
1.2	21	228	31	13	72	1789	12124	792	84	120	275	32896	198	83	218	97	67	134	174	683	1009	85	695	42	219	639	0	0	25	2959	746
1.3	0	210	0	8	41	1735	12206	760	21	118	268	33144	179	96	238	58	138	88	133	582	937	35	741	66	223	577	26	0	44	2891	797
1.4	9	235	25	18	58	1671	12161	834	39	101	258	33032	184	75	219	0	53	30	150	522	946	120	725	33	270	597	48	0	49	3029	770
1.5	9	195	6	0	34	1696	11367	750	52	135	306	32503	171	98	223	93	151	88	173	524	998	118	730	70	249	592	0	0	34	2829	801
1.6	28	244	35	19	80	1647	10998	807	98	117	225	31369	202	153	218	87	98	140	139	576	959	0	753	9	182	572	0	7	39	2887	755
1.7	0	203	0	0	51	1571	11277	707	46	116	246	31433	230	115	333	133	98	158	141	511	999	35	664	74	209	588	0	0	32	2897	829
1.8	15	216	0	27	73	1594	12022	708	43	113	286	30606	170	0	199	35	70	86	113	530	1030	67	733	27	265	483	16	0	48	2742	746
1.9	14	213	5	30	69	1511	12472	768	64	136	236	30215	182	108	207	76	64	165	128	419	955	123	812	37	216	579	7	0	34	2839	805
2	7	222	0	11	63	1504	12783	703	57	115	254	29375	162	82	177	53	67	79	149	487	1020	140	733	24	249	594	6	0	75	2897	882
2.1	12	232	23	25	74	1419	13180	695	42	95	264	27915	85	68	194	34	50	83	182	471	938	93	910	21	199	541	47	0	41	2928	733
2.2	7	210	24	25	65	1381	13540	632	38	97	241	27064	155	18	139	84	182	206	195	469	976	82	688	34	242	599	0	0	64	2964	862
2.3	0	207	8	4	37	1305	13526	666	70	104	303	26472	96	54	150	49	122	113	63	412	980	97	862	26	230	561	0	0	13	3036	859
2.4	0	215	14	30	47	1281	13565	633	22	94	258	26279	114	25	210	7	0	45	164	414	1028	154	828	53	237	550	0	0	0	3096	893
2.5	0	217	19	0	45	1204	13909	732	39	91	274	26477	104	45	178	95	133	123	140	486	1042	77	771	41	217	616	36	0	55	3332	980
2.6	19	199	24	12	42	1266	13558	722	56	83	251	26286	155	82	183	100	46	143	162	526	1040	88	817	0	230	614	7	0	69	3542	1028
2.7	6	230	41	25	71	1280	13591	726	46	114	209	25748	157	72	219	95	142	90	131	561	1018	69	875	33	198	568	0	0	64	3971	1168
2.8	0	238	0	22	61	1277	13249	667	22	120	237	25330	185	54	191	58	137	203	109	436	970	95	826	22	200	553	0	0	42	4088	1324
2.9	17	238	22	13	106	1150	13458	636	60	83	263	24961	181	108	242	93	92	126	141	440	866	12	833	35	193	569	0	0	7	4603	1550
3	23	219	16	0	49	1284	13565	661	26	119	155	24737	180	17	185	59	111	58	104	512	1004	156	891	44	239	593	0	0	53	5231	1756
3.1	0	201	24	10	64	1192	13061	629	38	84	223	24460	111	22	65	43	106	121	124	517	919	67	1038	53	220	608	0	0	94	6036	2028
3.2	19	240	17	5	80	1268	12810	641	46	123	235	24266	135	22	136	25	61	173	88	417	949	84	951	46	196	544	0	0	5	7458	2550
3.3	17	281	41	47	79	1249	13663	657	62	123	248	25043	131	38	172	154	114	106	41	449	875	116	978	59	199	580	0	0	0	8334	2991
3.4	8	242	11	5	38	1123	13772	658	32	106	207	24008	181	0	154	66	66	124	140	553	867	122	976	43	245	563	31	25	72	9405	3288
3.5	0	214	0	0	75	1165	12715	692	26	116	218	22747	158	5	192	99	72	81	69	513	918	150	1034	42	200	565	10	0	40	9651	3477
3.6	23	232	8	7	74	1151	12165	596	45	151	189	22802	166	82	135	92	100	0	138	514	772	46	953	29	211	498	0	0	40	10320	3514
3.7	0	225	0	6	57	1188	12219	650	5	119	187	23482	50	17	155	0	99	73	132	530	801	119	766	9	244	510	0	16	17	10737	3875
3.8	0	252	0	0	47	1236	12271	679	62	121	238	25159	161	62	141	84	50	101	38	672	899	160	853	40	275	599	0	0	54	11493	4175
3.9	16	255	12	29	91	1277	11732	749	65	112	256	25385	145	59	163	163	113	153	115	647	743	218	869	0	138	585	0	0	21	11333	4224

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
4	0	201	0	8	54	1392	9864	604	56	83	218	25546	83	50	195	73	152	220	143	715	669	164	948	28	163	495	0	0	91	12058	4348
4.1	0	144	18	20	46	1526	8563	565	34	96	221	27110	143	107	230	125	48	72	121	812	708	90	899	10	163	595	25	0	74	12176	4467
4.2	17	194	15	0	55	1686	8336	642	69	135	167	29174	149	105	174	107	84	52	130	841	150	801	7	194	605	0	0	71	12047	4498	
4.3	27	178	18	7	39	1771	8278	705	69	116	201	30383	187	54	266	62	129	145	120	766	747	18	818	20	262	483	0	0	46	12148	4709
4.4	28	193	39	4	66	1780	7770	671	67	131	210	31671	175	84	220	69	61	121	155	882	597	30	768	19	173	511	0	0	38	12209	4779
4.5	9	192	0	0	32	1809	7135	694	61	127	185	33012	200	148	244	48	40	82	77	856	646	55	524	14	215	582	0	46	0	12277	4797
4.6	17	183	16	0	47	1745	7303	651	50	97	177	33620	126	60	204	46	87	76	179	869	623	128	680	15	208	463	0	27	77	11867	4804
4.7	20	169	11	0	31	1884	6852	731	61	144	221	35607	179	129	252	101	119	82	79	821	536	82	627	5	260	520	9	6	73	12036	4818
4.8	17	167	4	0	36	2014	6120	738	17	135	241	38185	168	97	336	92	104	95	159	856	498	0	698	47	249	503	0	9	8	11852	4568
4.9	36	169	5	4	48	2082	5863	831	42	133	236	38150	204	117	257	164	171	142	143	825	560	30	649	0	185	461	0	0	66	11931	4812
5	12	207	9	26	42	2070	5549	702	68	118	223	37781	195	105	252	120	122	69	88	809	637	54	663	65	195	508	15	0	31	11816	4630
5.1	36	179	0	0	34	2105	6071	770	54	141	198	37266	172	110	261	131	141	11	114	795	655	34	583	29	214	496	0	46	17	12072	4621
5.2	31	195	0	7	34	1985	6493	730	65	149	231	35910	176	131	278	31	62	153	111	790	692	66	647	57	230	520	0	0	38	11544	4731
5.3	21	149	0	14	32	1839	6742	711	106	100	227	34486	224	95	281	159	139	132	46	676	704	87	611	0	166	477	0	0	34	11346	4594
5.4	8	186	14	6	43	1829	7448	711	43	83	204	33054	239	105	267	74	126	113	23	691	736	87	665	0	199	509	0	0	93	11469	4770
5.5	21	174	0	0	34	1685	8190	743	21	77	219	31775	176	89	166	99	81	103	118	640	789	221	627	7	150	526	0	5	27	11411	4798
5.6	0	167	0	9	36	1528	9325	678	57	95	235	30343	170	55	206	43	47	102	182	644	859	58	698	52	199	530	0	0	64	11611	4786
5.7	0	208	38	28	64	1502	9984	708	53	106	180	29196	188	65	217	54	121	56	85	628	832	89	699	28	216	534	18	45	42	11508	4828
5.8	0	168	7	15	58	1438	10807	723	26	78	205	28477	211	147	245	145	152	156	145	558	919	95	650	7	144	522	0	0	29	11571	4678
5.9	32	173	30	26	46	1412	11062	659	46	97	171	27544	155	54	205	48	83	20	144	548	928	145	695	20	203	510	0	20	48	11289	4694
6	0	176	5	22	39	1370	11578	654	29	101	191	26784	114	68	153	60	111	109	57	499	943	30	660	8	228	498	0	0	23	11186	4716
6.1	7	191	0	0	50	1270	11833	659	49	102	181	26726	104	24	168	88	94	116	63	534	771	117	669	0	180	485	15	0	36	11195	4695
6.2	9	200	26	5	63	1240	12055	628	40	106	222	25800	77	6	152	21	120	58	116	431	893	19	711	26	190	501	0	0	29	11143	4532
6.3	18	168	48	16	52	1274	12513	604	37	104	226	25443	195	108	184	120	122	77	168	434	980	141	619	73	168	503	0	21	67	11341	4613
6.4	0	174	37	40	68	1254	12629	609	34	93	245	24738	166	128	196	75	116	50	125	533	926	76	734	48	164	525	0	13	26	11147	4657
6.5	19	209	15	13	39	1227	12658	640	34	101	221	24692	105	74	164	122	101	4	97	447	1038	105	780	0	163	523	12	8	47	11221	4510
6.6	10	198	0	7	79	1175	12671	670	71	109	190	24289	126	39	141	46	106	155	162	397	948	110	564	0	222	547	0	0	49	11178	4802
6.7	5	187	26	48	86	1203	13076	663	34	139	219	24134	127	37	172	25	107	160	83	477	1014	0	683	31	226	511	0	0	29	10984	4666
6.8	32	180	38	33	78	1237	13027	684	0	95	213	24044	98	0	152	76	95	86	190	432	910	97	626	10	201	489	14	0	42	11145	4465
6.9	0	195	42	16	63	1228	13052	701	8	71	209	23853	83	0	167	19	53	80	129	320	914	128	617	6	191	499	0	0	8	11048	4504
7	9	192	35	36	69	1202	13145	650	30	79	204	23316	131	98	122	72	30	70	147	398	935	135	635	16	192	565	8	0	68	10881	4671
7.1	13	228	38	32	70	1080	12584	648	47	95	196	22589	73	0	102	19	51	120	117	408	952	147	668	22	208	501	15	0	0	11071	4604
7.2	0	182	5	0	36	1077	12039	671	36	68	157	22311	73	0	119	0	120	77	109	419	937	78	752	31	199	508	0	0	23	10833	4602
7.3	0	180	0	0	41	1092	12110	702	29	101	201	22594	190	76	81	65	46	76	61	338	989	97	715	0	214	524	0	0	14	10815	4698
7.4	0	179	12	13	58	1072	12434	582	21	120	223	23212	156	35	148	122	98	108	150	438	958	90	666	47	193	534	25	0	57	11321	4738
7.5	19	212	0	0	37	1140	12441	591	59	94	222	23166	137	0	152	57	101	0	141	405	984	17	782	28	194	498	20	48	47	11057	4683
7.6	38	185	23	19	72	1107	12445	644	59	110	208	23234	113	0	150	84	119	154	154	395	1002	58	689	0	230	531	0	0	29	11154	4446
7.7	0	233	26	10	86	1118	12276	595	63	93	226	23676	208	110	191	141	79	111	70	447	878	81	815	31	191	564	26	0	40	10894	4781
7.8	0	221	8	6	68	1132	11980	665	68	95	220	22991	108	0	91	14	85	61	146	469	937	85	827	0	218	545	0	0	30	10835	4691
7.9	15	199	8	10	51	1073	12116	682	34	119	180	22295	118	57	94	105	170	129	129	419	961	122	922	31	150	487	14	0	56	10697	4747
8	16	211	14	33	72	1099	11795	677	40	72	140	21618	146	32	181	85	42	90	166	480	931	46	933	0	209	586	47	0	77	10864	4670
8.1	12	224	25	20	63	1023	11679	577	24	98	229	22191	154	69	128	156	43	67	64	445	932	117	857	41	152	624	33	0	38	10699	4747



Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
8.2	10	215	23	15	74	1112	11820	626	21	91	133	22183	129	9	116	88	119	146	73	493	939	0	915	15	191	497	0	0	33	11034	4737
8.3	10	224	10	0	50	1145	11847	677	22	86	148	22363	117	0	122	59	78	69	129	407	889	83	975	0	203	538	5	0	62	10864	4646
8.4	0	218	0	15	52	1130	11642	522	30	103	164	21435	140	77	112	138	96	86	162	492	882	83	978	34	174	548	0	12	32	10949	4641
8.5	16	241	18	14	47	1066	11278	585	30	97	190	22133	132	0	110	63	71	129	118	401	918	116	935	30	229	593	0	0	44	11175	4638
8.6	26	219	0	0	63	1170	10621	669	9	84	182	23607	95	26	133	97	75	77	89	424	957	41	882	0	157	613	18	0	71	11026	4462
8.7	16	215	14	18	49	1229	10824	535	10	77	168	23491	163	82	128	65	65	103	151	400	941	33	1126	55	204	566	0	0	65	11108	4587
8.8	0	215	6	7	43	1212	10650	610	10	113	192	23385	145	33	200	71	101	87	97	570	955	0	840	31	216	570	0	43	37	11007	4536
8.9	18	210	20	0	60	1205	10406	604	25	117	215	23425	95	58	136	87	79	98	198	767	693	93	926	52	189	523	29	0	70	10824	4324
9	12	184	0	0	28	1308	9980	650	49	95	205	25468	120	0	177	69	92	118	40	661	565	82	859	22	207	475	0	4	0	11067	4519
9.1	20	182	0	0	24	1655	8520	818	28	108	195	28587	190	97	236	35	131	159	148	749	676	110	687	38	185	517	0	0	86	11102	4359
9.2	14	184	0	13	44	1865	6661	697	54	122	203	33007	140	76	303	94	122	134	88	987	549	34	665	64	237	499	0	0	58	11339	4528
9.3	16	150	0	0	44	1909	5104	757	59	104	211	36255	194	92	258	64	98	69	73	972	452	76	713	17	228	501	0	0	32	11308	4511
9.4	15	170	36	27	45	2098	4450	789	82	136	203	38208	240	167	285	43	125	95	79	883	409	13	616	22	261	514	0	8	49	11290	4318
9.5	12	142	21	13	24	2110	4231	720	11	114	163	37696	230	124	325	52	161	89	174	881	447	115	607	51	202	459	0	0	26	11114	4210
9.6	33	158	0	0	34	2067	4490	777	75	96	228	38005	256	170	302	148	163	166	90	885	486	33	699	6	208	491	0	0	49	10999	4283
9.7	26	206	30	16	41	1957	5240	723	33	91	195	36871	195	137	239	82	45	65	129	800	421	54	684	44	201	511	0	10	30	11318	4393
9.8	19	168	0	7	45	1926	5657	788	70	43	229	35580	198	125	192	43	93	20	111	800	558	48	682	42	175	505	0	0	50	10733	4107
9.9	0	186	28	10	38	1946	6346	741	42	148	209	35567	229	146	259	147	60	95	140	739	625	38	782	42	175	505	0	0	36	10545	4065
10	9	159	14	0	48	1869	6968	792	56	106	235	34034	174	129	277	143	77	106	104	732	692	13	521	37	194	513	0	0	19	10573	4298
10.1	15	189	17	26	40	1766	7994	727	18	97	227	32101	184	60	258	85	107	19	53	675	681	37	603	48	199	502	7	0	30	10577	4361
10.2	25	184	27	38	59	1642	8766	754	49	136	216	31166	182	112	212	89	124	83	104	712	775	42	588	47	175	499	0	0	19	10389	4295
10.3	14	196	0	11	59	1516	9309	680	38	122	217	30206	151	109	206	83	48	79	96	562	758	140	597	42	210	541	13	0	15	10702	4274
10.4	13	188	8	0	39	1572	9750	695	35	92	212	28828	117	0	174	0	70	111	86	592	718	22	634	28	198	467	6	0	31	10441	4307
10.5	0	152	8	0	43	1380	10227	716	27	104	212	28548	118	26	175	85	136	173	130	602	829	71	631	0	208	521	0	0	45	10563	4346
10.6	0	202	9	27	55	1399	10662	657	68	116	215	27822	148	59	153	132	94	129	162	564	860	128	624	8	180	511	5	0	61	10636	4611
10.7	9	192	0	0	35	1341	11034	677	0	96	243	27102	155	76	184	60	81	109	93	534	917	168	578	32	176	490	35	0	21	10305	4186
10.8	25	234	22	23	68	1439	11709	631	36	118	228	26478	119	48	182	36	130	54	183	539	912	132	671	22	203	533	0	0	57	10589	4361
10.9	21	202	25	11	51	1306	12036	658	10	94	209	25941	106	36	120	4	38	74	76	453	914	36	535	53	189	540	0	0	40	10395	4382
11	0	208	6	23	70	1206	12196	681	49	75	224	25295	126	56	160	65	41	13	110	484	955	39	679	19	190	548	21	39	51	10348	4383
11.1	24	173	0	0	50	1323	12504	556	33	115	241	25378	140	7	147	49	57	100	164	441	1066	25	635	27	222	513	0	0	23	10441	4286
11.2	0	191	19	34	57	1247	12927	641	40	77	253	24799	119	0	132	58	139	79	137	465	993	59	681	21	228	518	0	0	36	10407	4284
11.3	12	167	18	0	22	1185	12982	552	54	83	199	24651	84	25	150	80	62	92	87	399	1024	122	659	41	196	526	0	0	0	10581	4460
11.4	35	212	46	35	107	1170	12908	611	40	126	243	24392	151	25	183	120	119	87	154	454	988	155	660	85	201	553	0	0	43	10366	4602
11.5	0	230	0	0	48	1109	12852	579	35	104	206	24017	148	76	176	75	76	42	79	311	869	131	708	53	194	600	0	15	50	10686	4581
11.6	5	193	22	18	42	1176	12880	601	18	85	188	22864	26	0	88	30	159	55	103	420	962	75	632	45	189	508	0	7	77	10499	4460
11.7	7	194	0	8	61	1146	12677	589	0	58	179	23031	100	48	103	73	201	78	105	572	1033	11	651	44	222	555	0	32	70	9958	4223
11.8	26	196	25	17	40	1093	12848	598	26	105	222	23271	102	12	95	50	52	67	137	457	916	120	805	12	222	567	0	0	11	10364	4308
11.9	9	236	41	28	91	1113	12600	565	21	122	204	22741	134	32	101	59	12	32	79	490	971	47	811	38	182	591	14	0	26	10479	4490
12	8	226	0	11	69	1115	12379	594	6	117	247	23060	151	10	184	71	112	109	117	436	987	66	831	46	225	610	15	0	13	10425	4439
12.1	0	191	8	0	67	1134	12381	604	16	80	177	22493	98	0	189	20	106	134	143	319	872	82	875	46	226	577	0	0	67	10360	4487
12.2	6	217	23	23	75	1172	12417	620	47	111	179	22494	187	47	218	79	112	117	99	412	1023	85	904	33	219	539	0	0	56	10459	4287
12.3	17	208	10	11	58	1149	12456	609	37	96	206	22932	110	0	205	18	85	150	120	465	899	51	939	44	247	511	0	0	29	10466	4446

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
12.4	0	203	17	0	58	1209	11876	684	22	113	180	22959	95	22	160	86	52	70	44	387	1048	97	831	27	220	572	0	5	54	10301	4332
12.5	0	214	0	0	50	1150	12575	744	58	94	215	23752	154	72	189	67	80	107	151	439	985	67	964	47	196	563	0	0	64	10559	4465
12.6	15	292	33	30	75	1222	13086	691	38	97	214	23692	144	86	200	171	78	84	159	579	951	31	917	47	214	638	16	22	94	10407	4478
12.7	0	289	7	24	62	1289	12698	740	57	107	195	25855	144	13	85	77	46	64	103	414	774	172	1020	40	218	586	0	0	16	10140	4426
12.8	28	273	35	6	71	1261	11934	714	15	104	186	22851	166	102	168	78	72	83	92	448	810	80	980	14	207	533	0	0	33	10758	4619
12.9	4	195	8	7	50	1056	10056	508	42	94	168	18586	83	44	151	69	87	13	111	486	770	147	829	26	188	492	35	0	53	10295	4284
13	0	189	4	21	46	1112	9172	515	22	90	105	20115	71	0	172	48	60	23	178	570	810	124	1135	0	180	451	11	0	72	10152	4181
13.1	6	163	12	9	46	1315	8555	486	38	107	180	22835	108	63	112	52	151	28	68	691	794	29	1102	53	161	484	0	0	28	10085	4314
13.2	12	192	0	0	20	1585	7843	588	49	76	182	27543	195	91	178	82	85	14	138	728	670	88	816	40	197	545	7	23	37	10122	4551
13.3	33	186	8	9	65	2017	6637	745	72	111	229	32628	179	128	258	124	76	109	111	846	589	119	656	28	188	494	0	0	7	10304	4471
13.4	19	172	27	5	48	1916	5705	794	61	85	180	36033	197	147	271	73	129	120	78	840	468	0	773	0	171	485	0	0	47	10510	4651
13.5	17	181	12	20	57	2133	5228	714	54	102	227	36512	214	109	290	77	171	44	207	978	380	41	789	58	227	461	0	0	34	10299	4529
13.6	20	192	9	19	39	1930	5136	740	52	141	249	36807	256	117	283	52	156	177	196	840	386	99	831	62	232	472	0	0	27	10410	4480
13.7	12	161	20	0	48	1960	5001	722	88	145	194	36875	177	187	367	110	170	159	860	478	135	692	76	201	472	11	0	83	10516	4534	
13.8	23	132	0	10	49	2065	4798	721	55	134	242	37577	248	113	262	76	78	124	68	871	399	107	679	43	265	563	0	0	0	10820	4467
13.9	18	152	18	14	53	2016	4676	760	34	89	214	37232	141	137	243	80	68	116	71	899	490	76	732	17	143	473	0	12	7	10892	4458
14	0	193	16	16	53	1966	5154	753	40	118	197	37578	239	107	282	74	38	181	161	856	527	16	609	62	196	509	0	0	79	11019	4489
14.1	14	201	31	0	27	2031	5538	767	53	128	219	36919	221	108	301	94	50	105	179	762	515	17	632	44	201	490	0	0	14	11210	4161
14.2	23	194	11	12	30	2033	5944	791	39	137	195	36268	125	74	243	44	75	48	133	727	458	171	648	59	223	431	19	0	13	10868	4236
14.3	34	160	0	0	31	1937	6316	787	82	109	249	34865	249	106	301	126	50	32	127	797	594	185	618	19	198	548	5	0	26	11210	4247
14.4	0	179	0	18	19	1819	7021	736	55	128	246	34369	223	94	240	81	43	104	153	647	637	60	671	54	223	516	0	0	46	10654	4270
14.5	15	138	0	0	37	1859	7645	760	34	122	220	33183	191	90	320	129	92	89	119	632	760	209	626	25	220	489	4	11	20	10401	4067
14.6	14	200	17	20	50	1741	8299	739	38	74	206	31948	153	92	240	103	88	73	145	636	749	72	569	4	194	469	0	0	18	10573	4127
14.7	18	193	13	11	74	1720	8777	757	52	119	203	31140	155	31	222	88	54	129	147	738	800	110	569	0	199	502	8	0	14	10537	4112
14.8	15	175	26	7	57	1653	9245	653	28	105	204	29876	160	56	186	39	22	66	126	610	862	65	676	17	225	489	17	0	52	10607	4119
14.9	37	178	25	30	75	1540	9689	678	55	103	243	29084	183	129	232	44	108	111	73	572	738	24	630	74	169	513	0	0	9	10236	4243
15	7	202	0	10	60	1485	10076	708	43	113	217	29200	127	84	196	143	91	211	131	580	947	161	769	25	190	502	0	0	74	10235	4298
15.1	0	204	22	14	24	1576	10387	630	69	85	246	28958	177	87	256	59	102	81	115	530	917	0	589	57	248	545	8	0	35	10240	4026
15.2	26	164	0	0	37	1495	10256	708	45	76	207	28666	149	67	235	71	129	204	148	488	975	47	664	41	215	521	21	0	34	10317	4281
15.3	24	202	0	9	57	1599	10437	738	15	126	266	28868	210	86	237	93	115	60	133	517	945	40	618	34	220	520	0	0	28	10156	4202
15.4	32	226	23	18	69	1587	10907	672	5	59	270	28074	175	50	203	53	80	36	154	413	807	57	618	48	233	549	39	9	24	10576	4249
15.5	35	193	0	41	62	1507	11691	648	27	137	251	29216	200	29	202	46	136	149	138	485	889	11	628	71	256	563	0	0	84	10324	4179
15.6	0	225	0	0	40	1539	12803	714	26	122	219	29075	202	151	197	82	147	57	89	423	984	18	635	33	174	558	0	57	30	10102	4242
15.7	0	287	21	40	69	1436	13821	758	49	100	227	27446	164	63	170	23	73	103	237	430	1050	115	630	19	238	538	7	0	16	10582	4367
15.8	35	231	27	10	75	1333	13142	645	43	115	160	24608	172	86	141	68	27	76	65	359	966	160	617	65	212	539	8	0	54	10262	4459
15.9	0	197	21	0	61	1116	11953	617	37	75	188	22441	117	17	136	16	78	33	97	405	924	57	619	0	199	526	0	0	62	10349	4274
16	14	204	33	27	72	1113	11405	555	69	100	199	21581	77	51	159	15	68	50	133	396	855	13	632	24	195	518	0	0	32	10604	4436
16.1	0	187	11	27	53	1023	10838	603	60	96	209	21619	146	51	161	70	143	79	142	422	903	67	781	0	141	509	0	9	18	10522	4416
16.2	0	198	19	15	69	949	10202	520	64	70	181	20438	61	35	112	79	52	86	91	423	861	42	753	28	106	483	0	0	9	10403	4409
16.3	0	147	0	0	48	993	9994	517	42	63	190	20647	147	52	151	48	103	0	68	412	757	65	693	46	169	497	0	0	5	10559	4559
16.4	11	181	7	21	54	1065	11254	577	41	86	186	21860	129	21	125	95	69	134	237	444	891	64	744	0	149	524	0	0	45	10649	4431
16.5	0	190	21	20	74	1068	11880	561	68	101	239	22392	93	48	198	100	113	84	118	380	872	78	831	22	165	563	0	0	45	10466	4601

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
16.6	0	194	38	33	53	1124	11718	592	32	96	212	22340	148	79	173	72	112	89	165	423	885	0	764	30	183	581	0	0	71	10734	4446
16.7	0	198	14	8	56	1113	11583	621	53	97	238	22618	148	40	190	114	138	68	161	394	906	104	872	0	204	549	0	22	30	10696	4361
16.8	24	219	23	29	49	1190	11512	604	39	90	223	22715	147	94	159	127	107	137	166	499	908	50	839	47	186	540	22	0	28	10704	4482
16.9	0	173	4	17	36	1138	11317	564	48	89	171	23300	107	0	120	45	35	109	77	436	895	74	979	30	224	539	10	0	20	10524	4543
17	29	196	31	17	84	1208	11073	565	50	116	231	23934	193	53	173	56	50	169	23	473	826	102	867	61	205	585	0	0	44	10744	4589
17.1	20	237	13	16	84	1172	10964	499	34	92	175	23757	58	50	155	0	100	104	82	656	745	0	937	49	141	537	0	0	0	10922	4513
17.2	0	188	15	0	47	1170	10734	567	35	87	236	23671	177	67	152	36	65	89	144	518	805	41	834	24	179	587	0	16	54	10999	4603
17.3	0	180	12	9	70	1429	9791	571	5	88	182	24389	169	65	129	0	124	58	133	597	681	162	760	37	204	558	0	9	16	10725	4458
17.4	35	167	25	23	54	1529	8682	628	26	117	222	26338	157	69	191	30	39	59	89	683	606	109	733	26	221	538	12	0	77	10771	4449
17.5	16	143	32	13	73	1618	7822	688	42	98	213	28848	123	56	117	99	124	168	102	723	630	38	745	9	151	499	0	0	27	10845	4560
17.6	0	166	0	0	29	1798	6707	696	100	127	223	33182	162	82	276	109	186	65	130	770	589	37	579	0	159	461	0	0	0	10414	4431
17.7	16	154	18	20	44	1957	5447	717	29	161	191	35048	171	119	254	29	85	75	128	822	490	44	632	67	188	489	0	23	0	9967	4239
17.8	0	125	32	23	49	1865	5403	727	36	111	198	34693	110	86	159	68	0	119	71	840	488	0	643	38	157	514	17	6	48	9556	4198
17.9	26	161	0	8	42	1766	5974	693	59	107	215	33582	149	105	243	74	105	158	114	713	630	102	614	36	184	450	0	0	28	9806	3944
18	0	170	12	11	32	1845	6689	744	83	92	247	32555	206	96	309	47	127	156	176	703	612	24	572	22	269	494	0	0	52	10436	4223
18.1	0	175	12	0	31	1653	7387	662	23	87	229	31472	141	15	236	107	133	127	86	662	703	19	622	44	165	449	0	0	64	10649	4361
18.2	0	177	19	9	48	1540	8057	658	52	114	231	30146	123	0	230	31	70	58	105	685	824	78	555	52	206	476	0	0	39	11030	4352
18.3	0	173	14	21	48	1568	9023	651	33	113	235	28049	128	73	208	76	79	24	96	599	778	0	668	43	160	509	0	32	54	10974	4317
18.4	0	159	0	18	60	1480	9561	621	36	81	251	27371	164	88	181	102	104	63	92	562	773	133	689	36	188	479	12	9	30	10959	4298
18.5	0	176	24	16	64	1381	10668	596	0	108	168	26709	133	67	189	76	62	0	129	459	904	25	569	67	178	501	12	7	28	10943	4168
18.6	8	179	0	0	53	1277	11219	611	25	62	196	25913	145	10	107	41	173	104	91	536	924	78	540	20	238	481	0	0	58	10747	3971
18.7	0	190	16	13	37	1276	11602	560	55	117	180	24752	95	44	124	31	36	51	96	474	916	49	556	9	169	487	0	5	37	10688	4134
18.8	0	177	31	5	75	1169	12123	708	24	98	181	24130	140	11	141	38	42	55	23	506	985	116	777	0	186	512	0	0	47	10648	4213
18.9	31	202	37	10	59	1135	12515	612	29	80	257	23923	151	54	198	52	69	117	168	557	903	21	685	70	192	537	16	7	99	10477	4159
19	21	214	16	24	110	1210	12646	563	27	90	204	23752	103	17	144	25	105	70	113	448	1008	71	691	61	196	553	0	0	53	10569	4204
19.1	0	159	7	0	54	1135	12727	602	44	72	182	23791	130	59	122	83	100	0	126	473	954	96	770	15	169	513	0	0	31	10717	4068
19.2	11	237	38	24	52	1178	12853	616	59	97	212	23012	110	19	162	41	110	71	114	432	996	45	623	33	178	535	0	0	56	10450	4324
19.3	0	208	7	0	84	1136	12547	608	46	109	164	23546	160	61	175	168	97	91	98	494	989	61	703	36	154	551	0	0	83	10583	4123
19.4	0	191	20	7	45	1062	12116	632	44	111	191	23038	135	38	141	54	140	97	49	458	973	34	872	24	195	555	11	0	42	10350	4227
19.5	0	205	0	0	60	1063	11842	643	40	110	169	22574	162	102	126	109	73	23	61	449	973	0	812	0	151	550	0	0	31	10345	4374
19.6	39	256	38	31	83	1168	12110	593	56	77	186	22755	146	0	189	25	80	58	86	418	852	21	907	41	241	546	0	12	57	10350	4305
19.7	10	200	20	30	89	1167	11891	623	32	103	215	22591	153	11	165	69	94	95	171	387	988	106	846	51	216	546	0	0	61	10245	4407
19.8	9	272	10	8	56	1160	11986	593	40	85	262	22862	138	57	156	9	94	69	81	377	897	0	924	20	214	550	0	0	43	10309	4384
19.9	0	237	13	5	55	1191	11985	621	57	94	177	22828	109	59	165	87	117	102	101	474	924	130	879	30	207	535	16	0	26	10274	4290
20	8	277	0	17	72	1063	12395	682	20	77	142	22991	162	86	176	117	96	123	108	600	901	103	955	0	160	563	0	0	9	10551	4360
20.1	17	223	20	19	42	1136	11908	628	14	100	174	21315	69	0	151	56	102	134	113	589	797	57	830	58	202	537	0	0	0	10781	4391
20.2	12	227	10	27	67	1066	11025	579	56	120	220	22817	93	41	184	52	24	32	77	646	719	92	662	34	177	478	0	0	23	10540	4490
20.3	6	212	10	0	33	1380	10317	605	59	135	226	25774	83	0	180	17	68	126	130	826	652	67	818	10	200	450	0	0	37	10370	4553
20.4	19	197	42	12	69	1581	8905	722	32	110	209	30635	151	70	171	30	102	100	86	789	687	89	837	0	174	488	0	0	26	10569	4469
20.5	17	171	20	25	43	1744	7231	765	30	75	184	35438	158	55	198	78	134	120	129	921	500	28	802	27	192	494	0	0	0	10355	4409
20.6	10	161	26	37	59	1822	5984	796	40	98	202	38105	192	45	213	47	161	88	93	942	414	42	744	25	187	495	0	0	0	10634	4492
20.7	10	166	0	5	32	1886	5065	732	22	107	205	37797	132	38	258	88	86	67	115	759	476	84	607	34	217	475	0	0	44	10395	4351

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
20.8	14	158	12	21	38	1997	4430	699	39	86	159	37302	149	92	261	120	82	98	173	784	437	126	658	11	186	470	12	0	53	10207	4294
20.9	6	143	13	18	28	2079	4276	725	75	140	191	38148	168	55	282	26	70	89	162	849	458	75	645	25	259	416	0	6	20	10186	4333
21	17	152	8	0	44	2102	4483	736	74	94	187	37668	268	170	352	94	117	84	150	848	606	91	662	47	238	468	27	11	35	10155	4287
21.1	30	175	17	25	59	2000	4966	756	58	126	231	36634	184	28	256	86	67	110	147	680	500	141	699	51	225	451	0	0	14	10072	4254
21.2	30	170	8	0	47	2031	5921	770	0	100	215	35264	161	57	246	128	91	106	198	871	681	39	712	42	178	503	0	29	40	9895	4368
21.3	19	167	0	0	19	1831	6604	732	49	119	189	34537	243	175	271	191	103	200	129	737	630	0	620	28	192	546	22	0	77	10126	4230
21.4	0	177	32	30	64	1771	7502	766	65	130	240	33033	192	82	228	131	144	212	82	725	774	0	654	21	222	546	0	0	0	10173	4296
21.5	17	204	22	14	73	1727	8297	734	35	112	214	31982	123	36	203	71	102	136	127	615	864	152	611	26	179	487	0	23	85	9942	4203
21.6	0	213	19	0	28	1787	8810	703	56	132	221	30910	122	73	184	75	41	100	105	552	853	92	597	41	169	533	6	0	54	9932	4347
21.7	19	187	18	0	36	1550	9395	700	71	120	276	30116	172	72	171	70	61	95	125	492	848	89	631	42	206	476	7	0	31	10162	4278
21.8	0	164	13	13	51	1650	10159	741	74	99	233	28627	172	112	140	87	77	67	137	613	1008	66	589	0	120	507	0	10	0	10381	4412
21.9	5	186	16	9	41	1553	10539	670	14	74	224	27922	165	35	199	72	74	73	132	469	885	141	567	9	211	541	14	0	15	10316	4423
22	0	185	21	12	30	1475	11098	673	38	101	274	27042	152	96	147	89	112	176	101	499	975	0	548	41	182	506	0	0	37	10370	4433
22.1	10	190	0	28	68	1449	11411	655	21	120	253	26495	159	90	256	123	75	44	147	475	1023	139	702	65	178	556	0	26	36	10602	4271
22.2	0	167	0	0	36	1347	11406	656	38	97	263	26101	160	73	216	103	164	90	152	521	1051	78	634	4	178	530	0	0	48	10712	4299
22.3	14	198	36	28	62	1350	12160	687	33	67	229	25347	109	25	158	70	112	107	145	409	1020	71	740	32	226	480	0	16	67	10736	4394
22.4	0	200	7	0	67	1202	12106	696	39	103	206	24956	170	84	180	163	118	137	98	433	980	83	594	31	134	515	0	0	50	10596	4232
22.5	0	191	20	20	82	1163	12988	671	31	87	245	24337	96	36	105	83	110	193	125	524	990	34	748	22	194	557	12	0	64	10718	4169
22.6	0	158	16	4	60	1171	12550	680	47	64	222	24064	140	29	176	49	126	65	158	454	945	110	733	9	201	520	0	0	59	10332	4300
22.7	15	210	58	36	78	1280	12721	630	55	116	222	23895	184	90	180	121	76	102	147	519	1016	31	776	43	136	591	0	0	50	10429	4227
22.8	0	186	0	0	48	1144	12742	557	53	128	196	24177	114	21	148	60	97	95	190	469	1068	149	810	41	217	613	0	0	75	10460	4143
22.9	14	244	27	0	64	1165	12858	658	74	93	241	24007	124	42	135	57	99	76	192	511	997	132	659	0	158	544	31	0	51	10305	4124
23	0	215	30	33	83	1211	13038	648	26	130	192	24020	140	0	136	30	63	102	58	502	902	48	785	29	211	548	0	0	0	10235	4144
23.1	34	231	10	29	76	1198	12589	631	52	98	219	23768	143	66	89	105	88	112	130	536	987	174	786	38	190	594	0	0	52	10211	4118
23.2	30	216	32	54	86	1153	12430	637	23	120	208	23844	139	15	131	129	46	28	136	447	812	85	912	58	182	503	41	16	40	10157	4350
23.3	0	225	30	22	60	1176	12350	627	70	82	182	23803	99	62	134	51	60	139	109	406	951	113	868	31	196	595	0	0	59	10005	4115
23.4	9	237	41	37	77	1246	12382	646	41	127	189	23428	144	41	196	55	65	96	197	591	771	11	793	62	189	548	16	0	26	10277	4278
23.5	0	260	30	14	66	1264	12171	532	32	106	235	23477	134	0	145	20	51	150	102	451	996	136	805	78	255	564	8	0	67	10022	4262
23.6	16	250	47	37	63	1252	11317	666	65	86	200	23465	139	49	151	39	133	42	67	465	931	80	931	37	205	524	0	0	0	10049	4324
23.7	0	164	0	0	29	1217	10408	582	16	45	189	22856	131	10	125	106	89	27	170	744	766	14	884	35	231	538	0	0	13	10139	4374
23.8	9	203	0	14	63	1285	9766	628	39	60	160	23466	159	48	182	46	0	108	107	669	698	92	918	0	192	583	0	0	52	10422	4428
23.9	0	210	17	11	49	1519	9365	612	45	104	199	26743	126	52	150	50	0	59	90	887	746	135	931	35	204	655	35	40	71	10224	4331
24	45	193	29	6	58	1678	8209	747	73	87	225	30690	127	78	202	24	94	170	157	862	734	109	622	31	157	484	0	0	38	10082	4283
24.1	7	162	5	0	45	1864	7489	1011	7	140	271	34041	114	53	193	4	160	167	131	912	551	84	931	72	185	492	0	0	33	10433	4462
24.2	16	171	36	26	43	2173	5692	875	86	110	196	37431	161	59	345	71	97	127	209	955	559	158	982	0	232	445	36	0	41	10305	4242
24.3	0	201	23	28	50	2260	4472	742	72	121	195	40359	205	157	299	166	97	131	93	886	452	167	762	63	217	507	0	9	32	10650	4490
24.4	19	147	17	31	49	2381	4186	684	61	126	243	40832	233	101	403	147	102	123	184	949	513	0	692	77	209	522	0	0	12	10687	4360
24.5	15	180	50	18	69	2312	4134	791	69	154	221	40752	185	123	283	87	27	95	118	871	494	100	706	59	216	483	21	0	0	10614	4580
24.6	20	178	23	17	52	2253	4352	789	83	103	238	39986	213	140	250	77	33	54	83	856	532	91	693	17	260	519	0	11	48	10414	4459
24.7	37	165	13	7	53	2282	4724	771	56	146	215	39869	200	190	261	138	59	139	58	806	600	190	588	94	152	528	0	0	10	10380	4520
24.8	17	195	5	8	60	2239	5151	787	49	118	244	38998	247	170	290	112	111	172	223	812	593	64	743	51	212	550	0	0	0	10568	4392
24.9	7	147	6	6	38	2118	5582	682	70	174	250	37718	238	151	316	52	145	124	166	680	646	97	603	112	259	471	0	0	43	10407	4510

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
25	19	193	15	28	41	2001	6358	749	71	142	227	36245	187	32	269	58	126	143	109	659	692	88	644	61	213	480	0	0	16	10701	4602
25.1	17	205	29	27	82	1873	7371	808	58	112	227	34594	149	95	170	80	154	56	85	643	709	92	565	30	199	444	0	15	40	10574	4399
25.2	41	200	29	8	59	1844	8269	669	45	82	271	33146	224	102	219	69	119	98	132	619	840	240	588	45	150	527	0	0	39	10435	4100
25.3	32	193	8	24	42	1675	8892	736	57	70	207	31835	135	103	200	67	87	61	149	575	787	118	618	12	175	496	23	5	57	10528	4297
25.4	27	220	40	37	77	1784	9737	739	69	95	252	30548	208	124	232	74	113	83	97	519	929	162	681	51	177	564	0	18	56	10704	4287
25.5	17	157	5	0	40	1520	9797	735	34	66	261	29400	121	31	169	37	67	125	137	654	1003	13	645	34	243	552	0	0	73	10719	4038
25.6	34	187	7	10	50	1559	10417	742	61	122	197	28764	101	55	175	49	31	92	99	609	1019	20	623	28	211	528	0	0	52	10572	4123
25.7	35	230	27	32	61	1503	11002	719	42	103	182	28103	197	121	112	148	191	61	528	956	98	587	27	185	572	0	0	25	10818	4026	
25.8	28	225	5	29	60	1487	11113	668	36	83	216	27328	132	78	225	88	144	0	74	457	889	139	695	29	191	532	0	59	51	10573	4260
25.9	0	163	0	4	47	1389	11278	627	38	146	228	26882	208	133	229	83	189	34	110	469	1027	11	613	40	198	580	0	22	37	10611	4441
26	0	181	0	11	38	1374	11466	657	66	106	259	26202	172	119	198	116	95	58	147	433	901	0	643	15	162	497	0	0	10	10531	4119
26.1	16	167	0	10	48	1410	11751	634	34	87	230	25370	139	65	248	0	27	114	99	416	948	71	754	8	207	554	0	0	71	10322	4173
26.2	18	214	5	4	39	1384	11826	621	81	114	253	25422	165	80	162	130	80	62	118	447	934	116	643	52	187	581	36	0	87	10168	4156
26.3	0	214	0	37	55	1298	11890	708	28	56	226	24759	95	77	181	106	81	42	112	476	1018	21	765	0	157	527	0	0	0	10142	4084
26.4	12	223	13	11	62	1265	12276	642	35	102	246	24735	129	32	134	0	85	108	135	455	983	64	676	24	198	576	0	0	48	10304	4322
26.5	16	245	12	19	64	1215	12610	722	36	94	213	24156	127	88	179	0	125	116	23	436	859	44	756	16	178	541	0	0	0	10161	4230
26.6	17	210	29	27	72	1224	12610	636	47	86	224	23044	117	21	111	83	25	43	135	459	983	158	725	23	205	547	24	0	78	10400	4256
26.7	0	210	22	0	78	1158	12298	599	53	78	206	23067	124	0	164	81	136	108	113	439	977	178	824	32	171	488	25	0	85	9944	4440
26.8	14	204	0	18	71	1109	12391	595	45	90	146	23174	126	40	120	52	85	46	108	413	950	170	884	60	222	554	32	12	14	10351	4551
26.9	12	189	19	16	62	1210	12038	644	36	107	209	23206	130	40	132	56	113	36	56	496	978	49	816	58	216	563	0	36	16	10218	4385
27	4	216	16	6	52	1128	11966	632	37	124	205	23201	102	0	126	95	105	35	196	486	798	57	829	45	208	536	0	0	66	10269	4381
27.1	0	211	0	10	57	1205	11734	577	21	63	198	22322	170	41	188	26	106	134	72	429	911	77	886	26	210	545	21	0	35	10317	4446
27.2	18	239	0	25	57	1177	11796	616	53	99	210	22858	150	86	229	75	65	114	159	373	886	183	938	0	194	574	0	42	71	10587	4459
27.3	0	252	17	30	79	1271	11912	575	45	169	210	22767	110	41	166	43	152	85	149	473	1070	89	896	33	196	544	0	0	47	10455	4458
27.4	16	203	0	0	39	1142	11738	553	63	98	182	22594	154	68	176	96	116	89	144	576	924	61	908	24	195	575	0	0	82	10610	4393
27.5	9	197	15	13	73	1188	11259	554	36	122	207	22700	158	59	155	67	74	104	29	361	842	0	858	54	200	545	0	0	0	10420	4520
27.6	0	186	0	0	28	1166	10565	534	15	61	195	22324	94	30	136	31	22	53	135	438	1024	144	970	41	167	672	0	0	42	10757	4388
27.7	6	216	21	35	70	1223	10818	603	42	78	179	22953	91	0	143	66	20	60	98	455	950	92	994	57	207	529	13	0	0	10293	4443
27.8	7	196	0	0	38	1257	9844	688	12	157	152	24383	178	0	183	55	115	112	65	567	821	121	877	9	219	534	11	0	48	10831	4536
27.9	22	198	0	9	48	1346	9123	623	47	74	178	25535	131	53	168	63	61	98	103	682	804	34	767	28	155	600	0	0	61	10576	4521
28	19	183	0	26	35	1521	7950	723	37	83	209	27566	110	39	99	36	57	15	109	558	701	63	808	0	164	549	0	51	55	10664	4444
28.1	10	182	0	7	49	1761	7976	713	79	125	243	30659	149	48	217	71	95	171	137	826	650	120	583	58	157	534	0	0	85	10537	4547
28.2	0	208	43	14	38	1904	7236	809	53	167	278	34361	196	92	212	154	0	74	179	875	696	62	878	71	191	563	45	0	77	10538	4547
28.3	33	162	9	0	9	1941	5749	887	40	91	246	38190	178	213	283	157	73	90	135	786	595	13	718	8	143	538	0	26	28	10244	4397
28.4	25	194	41	6	37	2169	4839	876	77	123	223	40652	151	83	297	81	123	99	132	1002	442	0	639	0	223	458	0	0	39	10410	4402
28.5	19	180	31	25	45	2275	4207	744	61	104	262	40687	246	109	316	80	167	164	142	911	466	72	750	53	236	440	0	0	33	10638	4382
28.6	22	191	26	10	36	2186	4128	796	51	121	209	40127	244	148	317	115	149	140	69	983	505	125	847	61	238	472	0	0	35	10629	4460
28.7	41	177	22	16	38	2166	4282	743	34	108	219	39570	196	167	264	126	115	99	164	927	523	110	799	33	178	496	14	0	50	10792	4568
28.8	16	190	51	18	42	2166	4522	724	97	110	224	38764	188	112	254	89	57	169	69	862	571	69	730	34	192	491	0	0	43	10892	4419
28.9	24	189	14	6	36	2141	4907	838	72	105	219	38533	272	200	295	101	130	84	133	940	544	54	730	17	208	477	0	12	51	10921	4422
29	5	179	0	0	27	2127	5285	771	61	104	223	37412	247	158	327	144	174	90	135	741	592	126	595	15	189	487	0	0	40	10993	4346
29.1	21	178	8	9	22	2052	5910	788	73	164	185	36795	154	77	246	134	228	48	93	803	724	38	617	51	218	418	0	9	7	11095	4383

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
29.2	14	167	32	27	63	2067	6259	835	38	133	228	35837	200	119	281	133	159	148	146	642	749	107	644	21	129	494	29	0	39	11014	4408
29.3	23	158	0	13	41	1947	6853	799	46	128	290	34765	211	113	271	138	82	139	54	546	813	81	570	0	181	502	10	0	25	10779	4320
29.4	0	203	21	10	38	2005	7428	744	60	133	222	34235	199	61	241	69	106	46	64	641	748	112	594	39	189	501	0	31	15	10605	4141
29.5	5	219	15	19	32	1974	8207	761	62	108	271	34309	202	56	216	32	97	72	80	636	855	67	572	24	249	528	0	7	28	11045	4504
29.6	0	206	0	39	58	1822	8312	696	50	118	287	32235	199	70	227	52	170	90	144	527	895	97	707	76	265	537	0	14	30	10559	4160
29.7	0	178	23	18	45	1610	8618	730	43	62	191	30072	139	72	251	101	123	113	151	574	818	89	678	0	199	581	0	0	28	10534	4100
29.8	15	213	16	5	31	1618	9723	719	24	140	236	29450	188	115	242	85	77	95	108	470	835	179	678	39	192	559	0	0	60	10553	4338
29.9	5	202	11	0	34	1475	10723	786	38	86	167	27870	117	101	142	32	77	21	129	544	947	118	601	0	180	541	12	0	52	10494	4272
30	22	256	14	4	32	1408	11411	709	39	87	266	26214	136	35	115	78	0	54	187	482	950	127	624	0	212	537	24	0	59	10432	4297
30.1	0	209	17	4	82	1190	11603	622	20	97	162	24001	119	8	129	74	12	45	151	504	978	127	677	69	185	524	23	0	14	10446	4277
30.2	21	255	19	32	82	1288	11719	576	59	83	236	23189	71	11	154	78	107	117	153	581	995	110	688	26	208	509	30	11	96	10254	4243
30.3	0	205	18	11	45	1182	11620	612	52	103	204	22796	196	72	174	83	132	117	115	496	885	60	776	28	246	557	0	0	33	10389	4238
30.4	0	172	0	0	32	1121	11003	611	16	70	187	22487	135	74	201	85	89	158	153	423	952	49	839	16	156	547	26	0	75	10503	4505
30.5	21	214	31	37	63	1091	10824	584	37	100	194	22057	133	85	150	54	89	105	150	413	898	93	737	19	205	511	23	0	12	10484	4425
30.6	25	206	14	8	73	1234	10153	519	28	94	171	22293	94	10	126	29	93	69	154	439	978	66	774	46	212	545	0	0	47	10632	4427
30.7	7	197	18	11	61	1212	10780	688	16	114	195	23454	165	72	197	26	80	46	143	437	996	44	778	39	177	543	0	0	49	10611	4556
30.8	10	212	13	5	50	1197	11191	699	14	116	194	23791	200	102	148	117	113	49	107	426	861	28	748	7	172	572	0	0	49	10340	4372
30.9	0	208	33	36	99	1309	11509	630	30	111	206	23976	150	71	146	50	57	81	134	389	847	66	854	52	195	543	0	0	11	10324	4441
31	11	214	20	35	71	1202	11433	588	31	105	220	24156	154	115	184	122	134	97	178	480	873	52	953	65	189	528	15	0	21	10398	4419
31.1	18	263	40	24	63	1226	11542	583	69	84	203	23916	103	20	205	140	108	82	71	506	984	129	911	24	206	540	4	0	71	10773	4431
31.2	5	231	17	30	66	1212	11627	655	50	93	196	22968	162	27	130	77	72	30	115	500	838	25	913	5	161	587	23	21	35	10377	4532
31.3	10	202	10	15	53	1213	11457	568	72	78	187	22860	86	25	95	25	95	130	102	528	883	0	979	0	200	607	0	0	66	10470	4458
31.4	13	207	0	0	53	1233	10450	658	25	130	207	23984	35	17	157	104	69	55	196	548	936	181	1195	0	128	486	20	0	47	10472	4510
31.5	38	233	21	25	59	1364	10000	684	57	116	219	25768	170	34	189	58	86	84	61	621	857	24	1015	28	239	547	0	0	35	10586	4224
31.6	38	217	33	0	47	1568	9562	679	50	131	216	27449	112	104	142	106	98	60	159	672	783	51	954	22	175	515	0	20	70	10406	4251
31.7	23	135	7	0	47	1644	7984	619	49	141	181	30735	128	13	162	0	78	101	108	1010	571	8	843	49	206	472	23	0	46	10518	4353
31.8	23	166	20	16	50	1965	6196	688	37	136	196	34425	169	55	245	66	45	128	153	953	543	42	756	25	244	444	0	0	59	10457	4420
31.9	7	175	16	19	26	2115	4791	662	61	102	199	37315	214	154	355	68	93	76	100	918	470	54	741	34	183	505	0	0	17	10454	4397
32	19	158	16	0	49	2137	4209	689	36	112	196	38308	209	79	286	109	130	15	79	892	350	104	700	62	216	459	0	44	59	10473	4514
32.1	21	162	12	0	23	2153	4129	671	91	130	191	40453	213	85	303	139	109	163	177	999	363	14	711	89	249	409	0	0	0	10316	4527
32.2	0	138	11	0	33	2202	4046	744	19	147	213	39911	229	152	271	137	143	165	117	943	483	66	733	57	198	480	0	0	60	10378	4472
32.3	0	219	18	8	43	2132	4636	784	85	120	207	38887	162	97	301	65	144	215	59	825	387	77	639	44	199	477	0	0	58	10365	4505
32.4	37	184	27	17	52	2139	5178	737	43	97	200	38014	196	41	279	18	84	57	147	987	645	140	635	61	209	432	7	0	72	10358	4449
32.5	23	193	8	9	49	1946	5815	731	40	129	253	37273	194	51	246	74	115	160	197	906	645	140	635	61	209	432	0	0	75	10384	4501
32.6	22	188	0	34	43	1960	6539	723	71	85	208	36452	220	77	230	86	78	71	170	850	751	117	731	59	161	466	0	0	29	10358	4494
32.7	8	199	37	27	52	1848	7229	787	52	111	188	34984	167	0	195	56	93	114	151	758	583	99	641	26	228	472	0	16	84	10223	4489
32.8	12	189	40	0	53	1785	7780	717	26	114	228	33943	204	145	284	182	103	167	202	720	747	77	699	62	158	488	0	0	62	10288	4394
32.9	42	222	34	28	71	1812	8796	780	55	103	272	32518	173	54	217	45	112	60	130	864	702	146	723	22	215	469	0	5	53	10526	4358
33	0	162	0	0	31	1643	9071	719	47	83	213	31493	177	146	267	77	133	85	94	628	801	80	628	0	165	497	29	0	48	10891	4353
33.1	16	214	11	13	56	1613	9999	730	61	123	213	30189	165	118	219	44	119	50	128	605	794	150	701	18	183	515	35	58	58	10853	4407
33.2	28	196	39	13	79	1574	10215	695	21	108	215	29551	183	95	200	67	96	139	143	635	890	40	516	46	197	540	0	0	72	10895	4430
33.3	0	213	18	14	41	1545	10658	637	57	96	255	29030	138	90	223	87	116	25	147	550	895	78	541	56	134	483	0	47	65	10879	4208

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
33.4	0	186	0	10	20	1343	11014	646	24	81	262	28056	184	100	177	36	96	72	130	547	953	76	543	34	155	520	0	0	28	10743	4257
33.5	17	194	0	18	45	1442	11766	665	33	59	216	27197	145	57	210	67	8	23	89	439	891	35	551	22	230	490	26	0	51	10491	4201
33.6	0	189	0	0	39	1396	11531	663	67	113	169	26929	126	21	149	68	81	99	50	466	912	130	633	14	198	517	0	0	30	10704	4275
33.7	0	204	39	20	61	1423	11904	669	36	113	255	26666	188	78	220	97	80	153	132	430	910	157	588	43	190	508	0	0	44	10370	4210
33.8	11	202	30	28	55	1378	12040	668	58	130	212	26617	95	11	103	47	73	76	192	464	1014	22	536	33	204	509	0	0	66	10778	4296
33.9	10	203	19	25	57	1257	12243	676	71	100	219	25556	132	65	121	141	79	63	90	457	972	47	672	5	161	531	0	0	48	10524	4143
34	5	194	21	18	69	1304	12588	642	49	73	210	25111	158	68	145	82	65	22	79	483	922	74	614	34	190	554	17	18	6	10590	4343
34.1	24	203	0	9	45	1276	12612	637	22	99	216	24695	139	14	158	62	82	115	146	355	998	137	695	26	181	519	0	0	50	10531	4381
34.2	0	199	21	29	81	1283	12907	618	56	131	216	24398	143	22	129	10	149	109	193	534	912	116	690	57	207	498	0	0	42	10723	4298
34.3	5	182	7	13	28	1162	12806	633	26	108	179	24488	170	34	223	0	169	120	130	406	888	65	681	35	241	517	0	0	36	10212	4214
34.4	35	217	43	51	84	1140	13148	648	29	98	227	24055	134	0	194	0	158	47	135	494	1108	141	598	54	213	516	0	0	70	10425	4220
34.5	10	217	19	21	68	1189	12896	692	47	73	257	23647	122	86	176	79	39	44	144	323	943	108	741	25	165	539	18	0	49	10680	4211
34.6	0	200	5	0	55	1084	12590	618	51	88	196	23048	86	0	113	88	81	84	129	400	912	106	766	36	185	551	16	0	0	10468	4455
34.7	0	182	16	16	69	1161	12585	621	60	113	279	22867	138	38	76	70	50	31	93	380	931	103	744	45	230	536	53	0	18	10208	4498
34.8	12	189	0	20	59	1110	12224	622	61	101	210	22611	62	0	89	15	27	0	89	510	912	90	659	29	178	542	5	0	83	10663	4357
34.9	0	213	6	17	49	1128	12138	613	59	77	263	22994	135	0	188	5	110	35	21	355	902	41	835	11	220	499	0	0	25	10576	4414
35	11	205	12	9	44	1065	11960	632	27	123	174	22276	67	32	121	30	47	99	149	329	877	134	776	23	217	568	0	0	46	10552	4408
35.1	0	176	0	0	36	1218	11768	631	39	76	202	21999	166	50	158	72	109	118	39	456	845	46	739	6	204	569	16	0	33	10333	4404
35.2	0	236	26	38	71	1160	11889	673	27	120	217	21858	92	17	120	51	74	0	117	394	900	82	874	22	191	522	0	61	71	10072	4381
35.3	36	210	45	46	83	1183	11927	651	40	80	217	21948	122	42	128	21	77	45	110	429	997	0	744	24	206	580	0	4	39	10303	4371
35.4	17	218	0	0	50	1178	11644	660	55	91	246	22090	97	69	118	71	85	126	22	421	983	83	821	27	159	547	0	0	22	10281	4442
35.5	13	265	24	34	67	1151	11822	611	41	91	185	22098	106	0	168	69	126	81	190	447	923	28	895	13	138	542	0	0	37	10161	4288
35.6	0	245	48	0	63	1033	11684	589	58	77	221	23459	122	38	193	55	133	123	74	471	867	0	821	0	241	570	0	0	70	10382	4333
35.7	27	229	35	7	53	1122	11393	655	53	83	179	23628	101	0	150	78	38	153	62	437	917	59	1012	12	194	536	0	0	22	10487	4405
35.8	23	246	20	20	55	1211	11847	701	18	75	184	23784	115	48	106	133	136	9	124	479	939	133	919	0	193	536	0	52	30	10595	4337
35.9	10	255	8	19	41	1192	11925	759	65	63	258	25932	141	48	161	108	74	72	171	429	890	20	914	41	183	509	0	0	18	10423	4602
36	34	253	23	6	63	1098	11838	757	13	88	220	29443	76	54	121	68	81	30	118	459	755	83	836	48	173	487	0	0	12	10100	4469
36.1	18	261	0	0	37	1183	10721	865	72	58	325	33888	103	67	199	50	79	64	20	494	881	94	808	18	159	454	0	0	0	10531	4380
36.2	34	294	42	42	95	1227	11275	976	36	62	349	35745	104	79	156	64	87	118	110	515	780	53	1149	0	132	467	0	0	50	10605	4477
36.3	17	214	25	5	53	1239	9936	999	32	89	362	38364	89	83	167	27	74	49	98	538	656	210	919	26	148	444	0	41	55	10286	4370
36.4	14	207	40	18	72	1334	8678	1039	43	114	321	38744	92	59	121	0	20	27	69	587	585	81	804	0	139	410	0	0	21	10684	4525
36.5	6	185	0	22	43	1370	8393	909	41	93	355	37877	139	115	229	54	133	106	184	817	634	131	949	0	204	444	7	7	74	10676	4515
36.6	28	147	28	16	50	1479	6889	891	42	65	349	39681	175	98	264	96	51	0	96	867	521	68	696	7	168	455	0	43	33	11064	4563
36.7	19	180	23	0	47	1757	4972	962	44	97	289	42787	170	137	267	96	86	39	109	895	485	125	724	27	186	485	0	37	18	11235	4439
36.8	27	169	33	7	25	2125	4129	814	54	125	278	42333	186	106	270	29	117	148	135	923	363	73	674	73	259	403	0	13	53	10908	4227
36.9	41	122	0	0	10	2084	3740	802	90	153	235	41301	235	189	383	106	125	153	135	860	458	95	628	36	224	493	0	0	34	10906	4177
37	12	163	18	9	32	2183	3791	792	33	148	239	38738	215	130	340	157	124	96	77	953	358	49	741	26	197	431	0	28	63	10833	4089
37.1	24	156	11	20	27	2107	4279	740	66	107	216	38063	211	97	299	130	94	149	116	782	464	74	649	35	175	447	0	0	14	10659	4113
37.2	21	168	29	14	45	2150	4536	741	81	109	236	37664	188	117	229	54	85	143	151	766	523	115	586	25	195	480	0	0	7	10523	4199
37.3	44	165	39	22	44	2123	5093	762	69	131	226	36636	191	30	273	97	28	58	112	709	538	64	670	56	196	477	45	0	84	10425	4133
37.4	9	159	10	5	25	2067	5543	777	39	135	167	36056	179	128	232	90	94	59	166	776	714	0	736	33	186	478	0	0	35	10652	4179
37.5	47	198	17	22	36	1998	6024	790	65	105	215	35529	186	86	260	151	90	199	165	668	726	84	604	16	171	520	0	0	48	10464	4165

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
37.6	16	187	4	0	22	1930	6499	838	52	74	184	35277	218	79	230	57	113	133	142	703	718	54	673	0	223	542	30	0	65	10669	4327
37.7	22	183	0	9	31	1927	7259	778	41	82	213	34099	191	64	271	97	94	66	97	608	652	30	687	16	206	513	0	31	9	10237	4212
37.8	10	181	35	21	41	1929	7353	832	12	106	215	33126	193	66	275	84	104	118	18	572	749	115	580	64	240	495	0	0	40	10275	4192
37.9	16	203	13	0	29	1701	7404	738	33	108	232	31258	192	74	149	47	90	116	52	593	836	20	546	63	235	511	0	0	0	10328	4333
38	0	174	0	0	29	1658	7852	668	19	100	163	29575	211	42	174	97	81	119	149	511	861	48	582	59	170	518	0	0	46	10594	4373
38.1	0	154	0	0	6	1565	8584	631	33	115	197	28558	186	47	172	36	33	130	68	427	841	82	612	25	161	502	0	0	0	10136	4485
38.2	10	166	0	0	22	1519	9618	680	70	72	201	27315	107	50	109	32	83	109	102	559	838	22	631	0	173	511	0	0	15	10657	4394
38.3	9	153	29	24	60	1402	10172	625	15	95	210	27051	133	84	223	48	83	26	98	578	875	91	644	61	208	550	0	0	29	10576	4342
38.4	9	187	25	24	68	1381	10519	671	25	110	216	26264	179	62	191	64	66	118	144	511	939	124	606	51	194	529	0	0	49	10457	4773
38.5	0	203	19	30	47	1351	11001	688	18	112	227	25918	118	22	211	0	115	162	126	443	977	190	667	47	228	520	0	0	49	10459	4333
38.6	9	196	22	40	85	1319	11289	637	40	93	206	25460	148	58	169	75	28	68	128	486	984	82	483	45	181	537	33	13	67	10863	4545
38.7	0	170	17	11	61	1320	11705	600	49	97	230	25238	137	48	143	34	124	54	172	492	1068	197	682	43	196	521	0	0	57	10792	4520
38.8	9	200	0	8	56	1336	11432	614	27	115	243	25373	149	48	182	0	55	174	183	468	1039	170	637	36	200	546	17	0	10	10709	4361
38.9	0	205	36	0	56	1286	11778	666	33	105	248	24881	140	95	240	140	192	123	143	492	992	113	700	0	151	562	0	0	70	10644	4483
39	18	234	17	0	66	1242	11863	612	57	85	235	24418	139	72	142	66	54	97	131	525	1088	64	662	44	181	527	21	20	49	10638	4526
39.1	17	210	6	12	36	1305	12019	558	80	77	194	24525	188	77	181	47	123	61	67	445	994	45	628	54	192	512	8	0	30	10509	4406
39.2	25	202	24	0	66	1219	12177	600	37	65	266	24230	178	89	166	49	107	69	123	405	986	31	730	33	183	535	0	0	42	10959	4476
39.3	7	202	16	16	43	1296	12201	583	58	80	214	24131	146	41	221	57	38	92	95	521	966	0	823	24	207	579	0	0	20	10892	4520
39.4	6	214	42	29	77	1259	12218	604	9	83	188	23888	127	40	143	77	91	123	190	429	949	106	642	57	160	553	0	0	45	10452	4345
39.5	0	235	10	0	48	1247	12294	664	52	91	214	24473	174	90	178	0	152	120	140	480	933	0	744	9	186	536	0	0	37	10640	4483
39.6	23	210	34	36	78	1241	12287	603	59	110	263	23707	147	0	100	15	40	74	43	433	953	66	678	56	240	544	0	0	56	10776	4633
39.7	22	232	52	37	76	1202	11871	628	45	92	225	23523	131	19	136	61	124	62	141	444	889	90	880	38	185	532	0	0	18	10461	4485
39.8	0	216	16	14	68	1267	12293	626	34	108	202	23594	135	95	124	71	93	61	46	458	940	50	803	45	179	536	0	25	32	10411	4575
39.9	8	192	27	28	73	1189	12614	663	54	137	222	23514	161	58	164	85	109	178	120	440	925	51	742	32	195	578	0	0	69	10776	4399
40	13	223	28	16	91	1087	12576	632	63	104	201	23525	147	64	183	142	143	122	121	470	1043	65	729	0	173	555	0	0	75	10407	4283
40.1	34	227	9	5	61	1137	12534	654	0	94	210	23399	136	63	157	84	66	79	167	451	869	48	903	21	175	555	0	10	0	10361	4408
40.2	24	229	16	24	47	1163	12139	614	37	114	217	23588	144	27	198	57	84	75	97	439	924	0	854	43	206	554	0	0	0	10496	4287
40.3	0	222	0	0	68	1162	12421	565	26	103	174	23833	88	5	136	38	129	121	142	512	919	28	925	33	212	532	13	0	55	10382	4380
40.4	0	260	12	28	55	1183	12242	577	11	84	225	23248	163	17	141	84	134	164	123	449	921	112	939	19	187	580	0	0	50	10381	4531
40.5	16	240	0	13	59	1123	11532	613	59	83	165	22331	66	0	104	24	140	56	142	506	936	22	937	11	202	521	7	0	5	10209	4375
40.6	0	243	18	0	49	1087	11446	565	26	56	167	22089	112	49	103	81	0	48	99	515	948	97	1001	14	146	585	31	0	57	10177	4392
40.7	0	215	15	20	88	1127	11920	530	43	75	175	22518	118	89	135	71	103	104	103	637	732	20	1030	36	151	624	0	0	30	10525	4150
40.8	9	229	27	35	63	1135	11902	506	5	85	193	22149	101	0	146	76	142	125	169	746	741	151	1281	31	217	491	30	6	35	10361	4354
40.9	0	215	13	6	56	1225	10335	580	49	96	207	23646	97	56	204	81	138	98	68	755	685	105	1053	23	167	457	0	5	33	9890	4493
41	10	213	26	24	70	1466	9393	660	29	77	150	27906	187	47	228	135	86	173	148	875	557	223	880	15	190	474	26	0	27	9319	4197
41.1	38	172	68	38	62	1788	8160	807	65	61	178	32350	144	81	245	69	151	126	133	1046	514	41	693	0	192	493	0	18	41	9351	4251
41.2	23	171	0	0	28	2024	6117	708	97	95	216	36667	171	105	277	22	139	130	72	1012	433	22	649	0	228	440	0	0	28	9646	4173
41.3	7	159	12	9	24	2217	4477	681	63	73	193	39006	201	104	277	148	96	118	168	957	417	129	679	47	184	455	4	0	36	9758	4046
41.4	29	203	9	7	45	2234	3900	759	62	114	207	40150	230	190	363	150	59	149	176	993	492	57	674	20	195	529	0	0	75	10012	4189
41.5	26	155	14	33	49	2384	4060	658	53	148	187	40048	204	113	338	110	52	144	127	914	489	32	615	95	260	479	29	0	37	10315	4165
41.6	19	168	14	0	23	2153	4400	747	54	111	210	38836	169	96	315	77	93	111	89	899	407	11	614	71	204	441	0	0	59	10632	4173
41.7	0	171	0	0	30	2100	4785	743	10	112	207	38445	207	171	305	181	118	198	138	885	547	44	711	50	197	485	24	0	76	10684	4170



Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
41.8	29	179	0	0	26	2087	5491	842	85	121	200	37100	218	129	273	149	64	135	41	881	583	75	680	0	188	498	0	0	29	10643	4154
41.9	30	215	49	17	54	2033	6187	749	66	81	239	35950	233	159	273	84	68	67	111	726	698	19	702	23	197	544	0	44	58	10589	4209
42	12	175	8	9	30	1907	6904	740	64	148	221	35013	238	99	321	71	92	182	136	673	703	85	595	41	243	504	0	0	72	10252	4202
42.1	9	179	0	16	38	1909	7674	732	81	91	241	34325	159	94	241	65	59	103	133	703	837	24	559	34	259	525	0	0	5	10507	4262
42.2	0	206	28	0	27	1961	8149	776	15	78	231	33811	189	97	277	68	63	148	144	670	844	31	509	40	193	553	0	0	34	10399	4300
42.3	15	200	24	14	72	1869	8410	822	61	106	250	32831	168	55	228	35	24	149	171	546	756	75	596	36	208	571	0	0	50	10323	4225
42.4	0	142	16	16	40	1669	8488	785	75	102	235	31449	202	101	246	109	51	109	204	539	843	0	530	0	237	570	0	0	67	10204	4297
42.5	18	223	12	14	44	1672	8799	727	73	92	171	29877	166	63	204	62	96	36	116	508	908	125	756	24	188	542	0	0	27	10538	4218
42.6	6	199	19	17	47	1569	9201	684	22	118	271	28400	168	97	215	51	131	16	114	492	980	20	631	21	207	557	0	0	43	10479	4159
42.7	26	188	13	14	58	1523	9947	694	30	97	219	26963	127	36	195	48	110	119	71	470	919	80	631	59	204	519	0	0	13	10193	4395
42.8	17	171	30	16	70	1435	11326	709	60	67	176	26068	97	0	95	21	20	118	25	433	961	55	829	6	194	496	0	0	67	10286	4379
42.9	0	191	15	23	75	1311	11863	651	59	88	215	25480	142	61	211	52	147	131	157	499	856	17	700	6	198	523	8	0	41	10354	4320
43	29	220	25	33	76	1299	12400	686	63	65	209	24752	113	34	108	38	84	66	70	429	989	58	657	5	173	504	0	0	45	10362	4384
43.1	12	192	15	0	31	1181	12565	615	56	142	214	24846	196	99	242	80	154	137	156	472	1009	62	670	42	178	518	0	0	38	10411	4453
43.2	0	183	9	14	64	1174	12914	601	39	82	217	24214	126	41	146	56	169	209	183	384	981	52	688	21	209	532	0	0	19	10477	4297
43.3	7	197	0	0	20	1160	13096	597	14	110	206	23874	134	74	194	27	125	25	139	372	937	99	717	21	169	537	0	0	46	10577	4473
43.4	0	243	8	0	40	1144	13212	569	21	90	263	24072	189	81	273	129	36	80	85	414	1009	242	839	60	191	633	49	0	87	10136	4276
43.5	0	240	13	9	59	1193	13204	650	35	50	249	24195	149	95	152	29	27	53	145	486	946	12	723	30	182	570	0	0	66	10597	4525
43.6	10	219	29	34	72	1143	13443	641	60	88	219	23603	110	59	161	97	121	0	135	437	979	17	680	43	151	566	0	0	41	10423	4607
43.7	6	234	22	17	46	1164	13346	666	79	76	192	23915	152	51	208	82	97	102	36	455	1013	176	705	13	181	566	8	0	95	10633	4552
43.8	10	256	6	22	48	1158	13017	668	52	84	207	23805	139	31	143	60	50	46	85	384	852	0	777	10	209	560	0	0	26	10569	4386
43.9	0	227	19	16	48	1183	13194	582	25	95	208	23649	134	24	103	93	107	31	123	372	921	63	718	28	178	570	0	36	27	10885	4406
44	0	199	19	16	59	1169	12849	669	50	100	186	23990	122	30	148	9	127	86	111	470	1049	82	798	27	260	558	0	0	77	10533	4378
44.1	10	225	0	13	58	1186	12557	647	60	89	237	23947	132	38	120	40	164	137	128	442	888	0	735	15	181	579	0	0	19	10323	4377
44.2	17	292	43	18	65	1228	12705	702	22	82	174	23672	121	21	139	91	125	148	146	456	961	47	980	27	205	551	0	0	10	10541	4354
44.3	0	257	7	26	61	1189	12531	594	15	137	202	23652	167	93	172	35	44	83	103	452	851	0	862	87	200	574	0	0	4	10676	4563
44.4	5	228	4	0	46	1243	12089	638	71	167	198	23630	177	38	188	81	137	118	124	506	991	93	997	16	208	511	0	0	60	10468	4368
44.5	33	238	42	47	86	1318	11520	664	74	126	175	24205	113	80	175	133	149	72	77	379	898	139	1104	41	163	517	0	0	27	10450	4453
44.6	22	204	34	29	90	1439	10637	673	35	120	185	24357	146	67	182	62	175	120	55	472	953	109	1106	54	200	472	0	0	0	10634	4536
44.7	14	222	9	12	22	1550	9769	644	61	70	172	24614	132	43	149	75	163	67	120	511	985	96	951	15	197	497	16	0	82	10591	4234
44.8	8	219	12	0	41	1519	9254	698	68	151	191	26795	210	85	189	62	80	80	100	468	885	40	1135	16	210	478	0	0	16	10572	4408
44.9	0	212	13	0	39	1706	8132	699	29	115	191	27884	154	45	195	92	47	34	122	608	776	112	1064	25	209	517	0	18	33	10439	4361
45	17	187	18	0	59	1975	6948	635	51	94	161	30956	195	71	257	85	75	160	93	961	774	92	848	37	239	549	17	0	31	10245	4460
45.1	22	193	23	26	17	2222	6085	710	51	94	161	34877	170	123	238	55	44	85	222	992	583	46	657	41	177	570	0	0	72	10157	4493
45.2	0	166	0	0	29	2292	5057	744	78	138	232	39094	237	163	383	77	78	157	112	996	542	104	736	75	221	531	0	0	47	10213	4581
45.3	24	145	12	0	45	2338	4593	790	87	131	212	41047	241	145	333	117	173	136	126	992	319	30	760	36	221	498	0	0	48	10004	4272
45.4	25	194	34	14	63	2403	4584	747	56	149	213	40770	221	108	313	100	98	102	187	1031	501	99	741	45	228	469	16	36	53	10233	4300
45.5	45	223	17	14	36	2237	4637	834	67	102	211	40236	193	182	376	59	186	144	110	1004	533	157	697	6	183	482	0	8	87	10175	4361
45.6	13	166	17	11	33	2114	4735	846	41	137	182	39293	165	107	287	88	49	141	140	906	415	99	669	19	178	507	9	0	52	10320	4528
45.7	51	184	14	16	43	2060	5131	781	36	123	208	39491	178	91	278	151	136	156	144	862	548	155	589	42	178	506	10	0	63	10903	4516
45.8	19	175	21	8	53	2117	5293	836	64	106	175	39047	243	189	335	104	110	92	131	950	444	51	732	68	165	516	0	8	11	10724	4412
45.9	9	173	0	8	36	2141	5623	811	62	112	185	38587	228	143	312	115	61	152	119	885	568	54	663	16	217	560	0	31	99	10606	4332

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
46	15	202	20	16	63	2103	6376	793	45	120	236	36971	225	111	264	101	150	70	163	719	610	112	676	52	217	492	6	0	33	10862	4300
46.1	30	221	10	0	39	1866	6925	780	40	148	225	35883	153	36	248	6	59	60	156	863	748	63	609	47	258	471	18	23	24	10923	4248
46.2	14	174	0	0	57	1854	7791	760	29	124	226	33802	202	168	227	171	59	116	125	830	749	114	552	18	146	531	5	0	11	10816	4261
46.3	16	204	38	11	48	1825	8609	769	53	137	265	32454	159	66	216	120	103	172	123	702	797	97	737	12	131	506	0	0	53	10928	4147
46.4	26	210	11	15	47	1654	9195	758	23	99	218	31594	184	139	209	113	164	89	107	625	823	164	556	25	180	554	0	0	21	10788	4308
46.5	21	204	14	0	76	1678	9985	716	62	113	262	30493	112	38	159	94	97	111	100	628	812	117	727	51	157	447	0	0	43	10481	4229
46.6	4	215	28	17	46	1540	10457	691	55	77	267	29492	149	73	234	22	104	76	81	577	891	122	564	0	191	499	6	0	31	10320	4021
46.7	0	210	20	0	54	1534	10981	666	43	99	255	28610	146	39	180	27	79	115	156	603	903	29	639	20	183	523	0	0	33	10624	4272
46.8	6	213	0	6	60	1436	11498	692	44	117	258	28082	200	124	233	61	41	112	193	580	1027	129	657	24	205	558	33	12	53	10612	4177
46.9	17	214	14	18	59	1340	12177	646	30	112	224	27678	175	50	146	49	170	121	134	567	1008	181	604	67	216	556	0	0	41	10193	4289
47	0	200	19	17	76	1321	12454	635	81	112	222	27176	143	103	199	34	78	175	117	469	1005	156	698	46	180	573	0	0	40	10508	4479
47.1	0	225	9	7	54	1415	12669	707	55	119	291	26397	147	57	130	61	68	103	39	402	948	159	640	20	181	572	0	0	26	10215	4333
47.2	5	204	33	9	85	1336	12838	632	16	96	224	25804	124	130	156	83	91	124	166	523	1018	108	564	50	116	563	0	0	39	10532	4314
47.3	10	197	27	0	47	1334	12942	657	60	124	252	25135	140	42	151	20	55	102	44	439	911	60	715	33	204	576	0	0	25	10374	4370
47.4	0	255	0	0	27	1145	13335	642	20	134	215	25809	202	58	189	20	125	102	104	429	994	47	597	36	200	547	0	17	45	10347	4297
47.5	17	259	0	17	45	1332	14474	702	39	85	283	26748	198	80	173	65	111	149	125	506	1093	117	633	46	208	627	0	0	40	10144	4390
47.6	0	239	27	12	49	1312	14088	713	27	84	223	25850	138	76	162	131	76	89	180	518	1042	137	665	0	198	564	0	5	57	10401	4324
47.7	14	236	24	20	70	1272	13629	641	54	101	268	24710	192	74	128	35	58	143	166	434	913	4	792	48	202	556	5	0	9	10357	4381
47.8	0	219	38	14	69	1215	13700	668	34	82	230	24556	89	29	116	51	116	193	73	365	997	139	811	30	206	531	8	0	50	10531	4656
47.9	0	243	19	17	57	1253	13372	651	24	112	269	24366	138	79	185	61	82	86	128	383	912	28	779	31	227	579	0	0	75	10295	4272
48	16	236	0	0	22	1218	13042	627	40	136	237	24032	110	23	109	47	84	35	165	385	901	192	725	42	214	550	0	0	38	10634	4804
48.1	8	269	19	32	89	1171	13003	604	27	111	241	22986	203	72	171	63	80	148	151	483	903	114	788	50	178	544	21	0	15	10237	4460
48.2	0	180	21	23	52	1023	10878	524	46	108	153	19731	74	0	35	0	30	69	36	438	901	43	798	28	168	456	0	0	62	10522	4461
48.3	13	206	8	10	44	878	9689	541	48	86	204	18682	84	0	116	19	50	10	97	490	927	113	766	49	168	460	43	23	20	10721	4482
48.4	20	202	31	31	69	1019	10444	525	13	155	155	21031	133	7	147	91	110	34	71	476	906	122	695	94	196	545	0	7	49	10790	4493
48.5	0	232	46	11	75	1157	10372	622	29	98	174	21481	139	0	130	26	54	101	123	463	848	8	720	29	187	523	11	0	0	10726	4575
48.6	10	235	44	35	81	1246	10931	671	45	96	211	22258	122	59	114	8	127	43	147	438	907	148	882	37	177	518	0	0	42	10614	4411
48.7	6	238	27	0	46	1258	10547	621	54	97	177	23692	173	61	155	40	84	37	133	386	896	77	902	39	193	518	8	18	55	11173	4513
48.8	28	190	15	0	71	1169	10409	827	39	74	191	25838	115	65	161	35	75	43	102	492	900	65	778	5	194	511	0	0	39	10773	4343
48.9	18	231	9	6	26	1296	10007	914	56	129	246	29207	213	106	207	106	55	111	161	403	881	40	844	9	183	555	0	0	32	10974	4473
49	32	240	48	32	59	1183	10167	1178	79	59	451	34823	185	169	252	56	49	9	168	435	774	162	881	7	204	568	26	7	43	10823	4528
49.1	28	236	24	42	56	1007	9603	1567	40	90	477	46305	267	206	325	162	106	93	71	447	766	99	954	53	152	538	7	0	44	10527	4422
49.2	6	223	18	23	34	1092	8722	1647	25	77	499	50368	219	189	299	117	71	61	151	501	853	71	865	0	165	484	0	0	35	10470	4454
49.3	25	219	52	8	58	1191	7567	1305	50	91	372	45825	198	175	286	104	62	58	133	545	775	30	855	37	162	483	0	34	34	10359	4394
49.4	28	194	28	0	57	1477	6746	1105	45	91	352	41430	169	145	291	71	25	115	65	614	670	82	773	58	161	458	0	0	59	10376	4401
49.5	41	155	8	0	51	1592	5192	861	89	108	248	36604	140	162	257	61	125	79	128	791	589	53	742	7	161	420	0	0	38	10415	4399
49.6	8	131	15	0	5	1787	4533	718	68	84	227	35749	154	112	232	68	34	98	95	766	582	137	755	29	188	455	0	5	53	10420	4621
49.7	0	150	0	18	36	1812	4322	830	48	76	292	38077	185	138	292	78	67	102	61	883	484	64	730	31	143	487	5	0	47	10498	4510
49.8	7	156	17	0	52	1953	4556	722	59	155	217	34489	195	150	297	88	89	46	83	948	551	5	658	84	199	440	29	26	46	10584	4569
49.9	17	178	16	18	41	2086	4620	710	79	102	232	37088	190	135	286	61	92	134	132	919	366	56	655	33	214	498	24	0	53	11049	4665
50	7	159	22	26	31	2102	4954	746	70	135	224	36570	158	108	225	92	147	172	80	867	460	92	670	23	153	475	0	0	55	11334	4323
50.1	31	182	23	19	59	2080	5327	943	18	84	194	35584	213	122	261	87	93	130	100	880	570	0	677	0	184	487	20	0	47	11507	4474

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
50.2	9	193	18	0	37	1910	5771	743	44	111	282	35132	199	132	292	110	136	141	132	835	625	184	582	0	175	447	0	0	56	11345	4338
50.3	16	184	16	9	57	1858	6292	766	15	117	193	34059	177	65	252	128	91	83	104	816	572	38	560	63	158	444	0	24	33	11178	4391
50.4	11	192	0	16	34	1880	6954	752	65	111	179	33467	118	18	222	19	73	124	140	807	720	157	676	51	176	477	18	0	49	11294	4278
50.5	9	204	0	20	40	1791	7220	756	28	79	178	32120	174	30	296	15	99	62	140	695	604	22	528	25	251	473	7	0	18	11057	4195
50.6	22	229	19	11	53	1738	8163	739	68	112	203	31462	162	26	176	84	128	107	135	634	808	143	514	22	215	526	0	0	33	10565	4185
50.7	0	233	11	0	46	1684	8769	736	44	114	288	30387	151	58	232	40	101	204	114	690	722	44	698	26	222	482	0	0	28	10638	4222
50.8	17	213	21	0	62	1648	9279	702	59	131	286	29478	154	87	184	64	74	125	190	597	811	136	663	26	179	472	0	0	73	10699	4174
50.9	14	205	5	19	59	1591	9750	665	50	78	216	28998	174	21	141	97	123	62	143	611	812	0	584	43	208	493	0	0	37	10514	4353
51	10	190	0	7	49	1604	10160	689	55	83	207	28326	151	93	190	73	41	113	105	675	963	101	624	42	198	481	9	0	73	10972	4320
51.1	27	204	14	30	63	1551	10817	666	48	121	239	28302	161	85	208	63	85	117	86	606	809	180	653	64	190	528	0	0	37	10580	4412
51.2	0	199	9	0	52	1464	10888	673	33	59	234	27070	106	69	217	31	137	159	158	624	863	79	672	34	194	509	0	0	47	10352	4388
51.3	28	200	28	44	100	1550	11471	717	55	108	224	26986	168	50	194	21	14	126	109	489	948	129	636	31	193	503	0	0	11	10794	4404
51.4	9	183	6	0	30	1442	11838	669	42	103	226	27005	188	21	167	47	83	130	183	526	969	165	743	52	228	521	0	0	33	10655	4405
51.5	0	187	23	14	61	1491	12053	711	46	98	240	26997	125	53	139	57	131	28	114	563	987	37	722	27	174	509	0	32	43	10647	4386
51.6	0	211	22	0	41	1362	12526	671	68	104	248	27003	148	17	147	87	64	102	114	466	990	161	682	15	150	569	0	0	18	10239	4464
51.7	0	239	19	18	81	1371	13031	656	15	135	265	26570	157	52	170	0	88	77	116	444	975	68	730	48	241	580	4	24	17	10907	4527
51.8	0	208	12	0	41	1317	13071	642	45	113	219	25820	196	55	162	179	10	47	109	512	979	33	730	37	197	555	38	0	6	11034	4534
51.9	10	197	16	6	37	1260	13439	715	39	81	262	25554	183	71	118	52	146	150	88	444	1040	89	648	9	185	545	0	0	50	10801	4648
52	0	227	8	0	42	1242	13583	641	68	100	234	25255	74	0	186	46	48	129	179	503	1063	108	664	39	202	534	19	0	58	10960	4515
52.1	12	243	46	7	86	1271	13778	735	31	83	273	25020	95	51	112	63	70	154	153	496	1090	22	661	0	188	535	10	0	58	10917	4588
52.2	0	234	0	0	26	1229	13461	647	45	107	205	24890	105	50	155	45	127	110	88	457	1032	70	766	24	202	575	0	13	54	10903	4358
52.3	6	249	24	16	63	1195	13583	634	6	68	189	24716	151	42	128	76	70	0	143	469	953	106	762	38	218	611	7	12	36	10914	4523
52.4	6	247	7	19	38	1279	13409	650	70	73	231	24654	148	117	181	110	64	84	182	384	1018	73	894	16	177	652	35	13	66	10675	4413
52.5	12	237	18	4	80	1296	13760	726	48	103	213	23920	155	0	183	124	147	136	169	453	1129	142	725	24	194	564	0	0	23	10907	4437
52.6	21	268	31	21	70	1167	13416	667	41	97	219	23726	163	11	186	4	91	59	93	360	1035	156	787	8	211	563	0	0	33	10810	4703
52.7	17	270	9	8	45	1161	12837	677	39	107	264	24003	119	52	108	23	101	124	107	459	960	10	747	55	222	552	0	0	32	10731	4468
52.8	0	251	26	4	67	1200	12483	638	46	107	227	23958	174	89	197	93	150	162	88	420	866	136	814	0	177	585	0	0	6	10705	4415
52.9	17	303	0	0	38	1200	12642	656	27	105	171	23368	83	47	188	41	78	107	228	461	952	91	971	0	183	557	37	0	81	10868	4525
53	27	267	22	24	82	1173	12539	595	43	128	213	22993	91	5	149	82	115	182	98	513	1072	163	691	74	259	616	0	0	21	10786	4582
53.1	5	272	4	15	84	1207	12582	608	46	105	198	22562	76	0	182	87	138	52	97	420	910	43	905	28	195	562	26	0	25	10572	4518
53.2	11	287	30	38	73	1206	12538	593	31	108	188	22752	208	62	344	67	125	100	157	460	984	80	808	71	211	532	0	0	13	10464	4251
53.3	18	311	47	21	87	1231	12067	579	18	118	223	23706	106	30	233	80	67	75	79	458	913	81	890	75	190	586	14	0	52	10155	4217
53.4	0	297	14	19	46	1312	11762	780	44	101	201	24128	135	7	168	55	40	100	52	418	957	76	851	0	222	568	0	0	66	10238	4534
53.5	39	250	0	13	48	1207	12084	631	26	97	204	24472	180	48	213	144	94	111	94	508	881	119	970	45	211	584	27	0	125	10177	4309
53.6	20	205	10	0	62	1273	12338	658	44	69	151	23834	113	21	145	91	88	157	162	538	866	102	1035	29	205	558	0	0	71	10059	4262
53.7	21	264	0	0	34	1252	12205	762	74	40	190	23891	73	69	146	86	40	85	66	469	888	123	1064	0	230	607	0	0	44	9970	4284
53.8	13	266	41	34	70	1275	12566	688	30	57	237	26346	110	44	141	56	117	98	112	523	897	70	1063	9	168	566	25	0	40	9992	4339
53.9	19	266	22	32	64	1250	12173	687	18	98	183	26626	147	24	110	82	61	107	70	411	1078	104	955	0	184	571	20	0	13	9701	4259
54	36	295	51	52	105	1246	12042	663	29	69	227	27381	72	0	164	97	45	114	80	374	899	86	943	22	189	564	0	0	20	10184	4353
54.1	31	294	14	36	93	1206	11508	743	61	64	242	32079	54	10	147	40	10	159	445	817	34	901	15	183	559	13	41	8	9917	4307	
54.2	28	262	23	28	68	1231	10056	932	77	100	363	37837	92	147	198	37	32	40	135	451	808	34	966	18	199	471	4	41	13	9787	4228
54.3	5	226	44	22	66	1213	9053	1359	60	54	443	44127	113	102	231	78	85	49	138	639	676	122	928	0	160	475	0	34	16	9846	4221

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh	
54.4	17	192	28	16	58	1117	8332	1565	67	117	546	50125	193	219	266	20	42	189	59	732	569	76	722	20	191	466	0	0	18	9891	4319	
54.5	40	187	42	38	76	1322	7088	1812	89	83	566	55486	284	252	283	102	39	104	92	782	549	67	671	18	172	502	0	0	6	10491	4242	
54.6	28	221	0	10	17	1410	5860	1877	144	145	559	58051	288	245	384	139	110	155	56	849	489	152	701	10	128	463	0	0	0	10543	4257	
54.7	0	173	12	11	27	1754	5024	1731	82	140	499	55858	362	246	350	148	51	128	92	882	417	18	803	0	245	521	41	0	93	10780	4281	
54.8	32	196	26	23	30	2039	4589	1342	56	91	397	50150	283	261	378	142	110	104	212	989	435	103	788	30	183	550	24	0	98	10884	4186	
54.9	0	192	26	0	48	2178	4286	1154	111	127	322	46639	245	220	341	115	89	171	134	967	536	69	695	4	208	521	0	0	74	10438	4260	
55	13	195	13	13	25	2124	4354	1137	116	100	262	46752	197	108	305	151	44	159	184	1027	599	80	621	0	187	499	0	0	28	10805	4122	
55.1	26	245	12	5	43	2184	4800	1154	58	84	355	46465	277	203	388	155	139	190	218	894	531	40	625	0	209	475	0	0	43	10708	4048	
55.2	14	185	12	0	29	2303	5397	966	53	110	271	45208	224	103	365	74	49	151	111	877	668	54	597	7	242	518	0	0	33	10546	4195	
55.3	37	218	17	8	41	2352	5397	994	69	116	304	44218	265	147	360	184	45	124	110	796	697	19	777	14	185	560	0	0	86	10389	4196	
55.4	22	243	28	0	50	2506	5175	894	87	133	295	44317	264	168	415	159	51	179	70	736	708	68	664	37	233	552	0	0	56	10353	4127	
55.5	15	191	11	15	39	2378	5357	947	66	154	285	44193	213	186	330	113	40	67	149	779	807	86	680	47	218	539	32	31	54	10108	4297	
55.6	31	183	23	0	51	2392	5492	1041	72	117	293	45694	214	176	287	97	202	111	138	704	805	119	698	20	187	483	0	0	31	55	10299	4575
55.7	29	219	11	0	36	2384	5777	1166	75	124	295	45638	206	169	278	171	95	138	69	733	857	95	714	0	220	569	0	0	51	10146	4119	
55.8	30	223	10	16	53	2260	6207	1041	105	161	330	44918	266	239	316	59	101	141	189	664	939	60	578	78	204	609	0	0	39	10514	4531	
55.9	20	213	12	10	36	2248	6581	1084	76	133	347	43949	264	204	349	139	76	168	141	680	843	0	658	22	211	580	8	0	109	10454	4446	
56	46	223	0	0	45	2120	7069	968	79	160	391	42434	280	177	310	134	139	102	162	574	955	36	695	64	251	558	0	0	51	10456	4417	
56.1	27	194	0	26	67	1921	8358	1053	59	94	329	40603	248	158	321	88	86	129	95	573	58	706	12	225	546	0	0	0	10500	4342		
56.2	31	217	33	38	73	1773	9125	1000	44	100	320	37251	189	138	227	36	23	51	107	508	985	124	635	26	211	614	64	0	100	10744	4585	
56.3	19	215	6	24	46	1701	9410	941	43	95	311	35546	211	105	263	54	103	132	67	525	884	111	544	45	184	598	0	0	64	10454	4538	
56.4	0	229	31	19	47	1562	9837	856	33	101	282	33883	190	137	219	76	77	100	101	534	883	159	651	42	187	492	10	0	109	10805	4561	
56.5	25	246	42	32	74	1583	9870	919	23	130	278	32343	194	111	211	53	95	138	174	517	1030	94	719	30	182	545	0	0	73	10807	4634	
56.6	17	227	7	14	59	1458	10380	758	61	135	266	29700	202	60	216	155	60	183	121	539	1050	42	763	26	224	552	28	5	101	10902	4582	
56.7	8	162	8	10	76	1373	10553	693	38	100	243	27900	207	136	250	70	116	129	222	501	1044	155	635	48	226	534	0	0	107	10631	4550	
56.8	13	175	16	13	54	1492	9630	725	71	78	229	28360	163	70	234	70	54	74	141	543	962	57	730	0	220	502	0	0	5	10689	4567	
56.9	0	175	47	17	61	1460	9418	701	52	93	248	29096	159	104	181	68	78	126	154	538	890	86	667	26	196	597	0	0	76	10882	4549	
57	21	189	15	7	53	1446	9449	700	41	119	214	28958	158	50	170	83	64	146	87	476	846	96	663	18	157	541	0	0	73	10758	4515	
57.1	10	212	30	25	57	1419	9861	656	60	114	202	28226	95	38	188	48	83	83	58	471	851	74	631	30	196	490	0	0	25	10812	4604	
57.2	19	209	22	48	69	1371	10668	745	15	82	198	27102	202	83	204	116	200	41	123	493	879	61	788	6	223	495	0	11	17	10725	4571	
57.3	0	216	37	25	60	1296	11032	581	27	111	224	25643	145	40	259	41	79	187	105	447	803	32	655	47	232	488	11	0	32	10929	4518	
57.4	4	208	21	23	72	1158	11391	642	58	79	219	24266	144	92	204	52	66	87	116	525	764	8	714	26	204	519	28	0	26	10876	4581	
57.5	14	270	37	32	79	1214	11488	682	37	87	184	23346	119	31	155	79	67	88	99	445	873	18	615	0	215	561	34	0	57	11096	4746	
57.6	0	235	15	0	41	1083	11558	604	21	108	200	23764	100	68	183	133	85	68	184	554	879	84	786	22	168	514	35	8	49	11280	4470	
57.7	34	252	22	6	61	1082	11911	734	52	82	228	23336	94	7	165	42	160	152	203	455	933	132	799	0	188	530	0	0	47	10657	4425	
57.8	17	217	38	41	86	1080	11528	721	11	105	196	22068	102	23	144	0	73	148	119	450	844	179	713	45	217	450	44	0	38	10791	4509	
57.9	34	237	22	28	87	1016	11429	654	42	93	197	21462	111	49	176	96	136	89	185	478	887	80	877	36	173	461	37	20	52	10677	4496	
58	0	225	28	23	53	1082	10957	663	23	156	188	22340	122	28	169	110	60	91	116	497	904	93	901	45	178	511	6	0	28	10336	4359	
58.1	24	248	62	32	55	1170	10362	593	46	162	205	22158	175	69	227	17	130	135	91	487	775	13	828	30	202	570	0	0	52	10332	4408	
58.2	15	222	28	31	94	1218	10272	632	19	71	169	22258	133	17	125	54	29	106	97	465	856	59	905	11	210	546	10	0	8	10474	4257	
58.3	13	226	22	34	73	1237	10462	610	24	78	148	23540	146	43	190	84	161	57	94	496	868	48	871	20	162	489	0	0	36	10039	4401	
58.4	14	152	10	17	29	1317	9532	629	38	80	170	24080	128	39	262	14	76	165	155	536	888	60	1007	0	193	463	0	0	0	10235	4457	
58.5	26	161	9	7	63	1338	8393	707	50	69	151	26494	90	0	194	0	33	7	137	680	850	95	887	0	218	496	4	29	61	10308	4496	

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
58.6	14	144	0	6	50	1701	6710	648	65	100	220	31540	191	90	238	107	205	176	76	814	669	139	677	70	160	478	0	0	28	10354	4296
58.7	35	185	30	30	76	1872	5298	716	62	121	221	35041	189	106	302	108	100	126	117	798	532	133	706	54	198	461	0	0	53	10031	4290
58.8	29	192	38	19	42	1960	4480	654	49	108	174	36467	198	80	292	94	115	107	108	889	444	0	755	43	187	473	0	0	34	10092	4500
58.9	39	138	0	0	40	2060	4385	645	38	87	177	35972	181	82	269	63	102	91	110	881	499	91	635	11	190	397	0	0	34	9859	4592
59	45	159	23	8	33	1950	4684	706	29	149	174	36115	178	128	310	184	116	112	125	954	412	69	652	58	156	463	11	14	17	9565	4361
59.1	24	164	13	0	11	2008	4860	690	70	103	208	35358	181	130	266	102	159	136	109	834	473	21	650	7	143	413	0	0	47	8423	3931
59.2	26	185	8	5	34	1923	5248	706	57	87	180	35076	151	119	217	87	63	157	52	855	561	154	643	17	152	509	16	0	71	8889	4110
59.3	20	181	45	28	26	1949	5957	685	46	101	169	33945	54	42	164	20	82	60	112	841	548	124	746	8	184	470	10	17	31	9240	4180
59.4	6	146	11	0	44	1876	6468	714	45	80	181	32876	148	76	213	88	78	132	96	815	544	111	782	0	140	511	0	0	53	10001	4255
59.5	19	169	5	0	9	1663	6879	737	42	101	219	32052	167	122	248	69	149	75	74	662	656	78	573	0	179	439	0	0	53	10444	4237
59.6	0	215	10	5	51	1709	7678	642	72	120	254	31322	151	34	235	19	104	67	59	721	762	94	664	50	188	463	0	0	22	11126	4404
59.7	0	206	13	0	37	1634	8004	732	11	92	177	30093	163	90	170	57	59	113	114	673	752	21	580	15	192	486	0	0	31	11055	4484
59.8	13	197	25	17	53	1648	8515	591	60	134	212	29440	214	175	233	76	147	69	104	625	808	111	673	48	133	491	0	0	31	10986	4291
59.9	0	204	6	15	59	1546	9012	667	0	101	217	28585	161	51	190	70	68	113	131	539	860	211	630	76	208	490	39	0	33	11053	4456
60	24	223	33	40	55	1517	9715	753	55	102	201	26890	152	33	186	97	44	169	81	492	869	99	623	48	167	513	0	0	52	11180	4377
60.1	6	178	10	16	50	1393	9832	717	25	65	253	26558	118	30	172	66	54	50	90	633	874	0	679	5	144	505	31	21	44	10768	4463
60.2	5	182	21	24	61	1509	10117	613	51	94	211	26034	150	18	206	28	105	70	158	518	915	73	526	70	215	514	26	20	21	10712	4289
60.3	27	214	7	11	51	1480	10421	667	80	105	287	26381	145	89	127	83	46	80	117	452	899	41	577	6	202	516	5	13	52	11131	4464
60.4	17	172	15	8	31	1369	10792	680	40	76	224	25818	142	17	128	41	114	119	143	483	949	63	574	0	220	493	0	0	46	10750	4659
60.5	25	203	29	19	64	1410	11503	696	37	130	231	25578	113	22	218	77	98	69	85	441	951	117	725	0	226	493	0	0	17	11067	4541
60.6	6	219	32	27	55	1366	11442	642	55	88	229	25126	147	101	135	93	76	47	86	452	819	91	648	26	149	555	0	21	29	11194	4510
60.7	0	193	25	30	70	1388	11398	626	51	119	218	24697	141	46	187	49	80	99	58	438	913	118	542	44	183	516	0	0	26	11159	4575
60.8	0	200	33	43	72	1311	11855	631	23	112	202	23894	120	42	150	14	148	109	114	471	858	55	643	59	185	549	0	0	12	10774	4567
60.9	40	219	43	0	62	1192	11910	714	46	98	184	22943	86	35	165	62	53	98	140	446	881	0	674	21	183	567	0	0	24	10763	4515
61	0	173	4	16	69	1165	11936	608	0	72	190	22320	112	19	151	66	80	107	112	461	899	148	698	29	179	530	34	0	21	10712	4524
61.1	0	203	24	9	44	1143	11959	584	48	97	210	22562	157	76	162	80	83	169	151	422	988	96	698	0	210	583	0	0	49	10651	4497
61.2	0	237	12	0	63	1149	11705	544	78	60	198	22560	36	0	85	63	49	83	149	463	898	47	687	31	195	526	20	0	49	10641	4467
61.3	0	232	0	0	29	1115	11699	584	41	85	192	21985	107	14	142	105	143	98	54	351	1022	83	703	20	161	517	0	0	57	10652	4573
61.4	0	219	0	0	33	1076	11995	603	16	107	180	21927	141	8	157	89	142	98	44	341	817	73	687	13	203	511	0	0	6	10751	4457
61.5	10	251	27	33	63	1122	11812	586	25	106	229	21387	156	85	169	46	89	47	28	418	811	91	741	44	181	534	0	0	28	10321	4270
61.6	11	271	18	24	52	1047	11735	694	44	92	225	22045	111	0	132	17	82	74	56	599	954	83	704	0	213	501	0	0	55	10488	4492
61.7	9	257	21	0	56	1103	11788	685	57	105	187	21910	112	41	165	99	93	118	52	314	981	168	923	20	172	532	0	0	28	10762	4290
61.8	20	244	40	17	85	1194	11739	559	52	98	174	22096	128	19	142	94	194	77	113	432	879	161	896	53	188	574	0	0	89	10266	4356
61.9	15	219	16	0	31	1112	11049	576	48	67	210	22762	119	28	164	111	52	109	183	420	881	0	750	36	182	588	11	0	71	10664	4356
62	14	259	36	31	77	1112	11280	578	53	82	192	22684	148	88	192	123	108	133	165	377	908	73	765	27	212	586	0	0	58	10557	4494
62.1	17	276	24	11	56	1213	11835	594	50	105	165	21934	154	82	161	131	108	61	115	453	933	77	900	24	183	633	12	0	36	10338	4286
62.2	12	218	20	19	69	1154	11599	566	47	66	171	21176	153	50	137	84	191	14	135	384	833	164	971	0	234	561	0	10	21	10415	4151
62.3	16	212	31	11	66	1036	11277	582	14	84	157	20928	84	14	158	87	96	139	174	498	875	0	950	39	212	493	21	0	43	10128	4264
62.4	0	257	25	6	35	1143	10541	836	12	134	275	27877	156	90	139	87	82	71	201	346	845	0	849	38	156	528	28	0	22	10001	4092
62.5	0	242	18	37	73	1051	9905	1384	75	241	450	44695	172	198	179	90	163	106	149	328	908	54	888	14	179	469	10	6	14	10071	4220
62.6	14	250	44	22	80	757	8098	2156	124	169	802	63253	255	333	305	139	93	101	71	223	715	84	743	0	177	501	7	0	61	10157	4236
62.7	11	211	24	29	48	599	6443	2673	65	55	926	71114	278	339	318	177	85	51	102	142	908	112	723	0	121	497	0	44	45	9851	4097

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
62.8	21	240	28	16	44	755	5329	2408	73	94	827	68817	281	329	324	212	38	71	99	261	877	78	612	0	123	477	0	0	0	9724	4477
62.9	9	215	26	35	66	1264	4759	1841	110	20	607	59997	213	271	355	43	75	85	68	501	726	135	748	0	150	419	0	0	0	9867	4086
63	11	135	17	14	19	1850	4203	1121	58	111	369	49678	247	291	357	26	136	134	116	785	554	102	639	34	193	445	0	0	26	9979	4371
63.1	20	214	0	15	15	2216	3772	797	74	119	250	42874	246	175	373	89	97	202	215	961	396	115	701	50	198	481	0	0	49	9636	4161
63.2	29	149	35	22	41	2283	3524	698	51	130	185	40583	178	122	360	104	107	144	116	1043	514	33	605	70	237	459	5	0	83	9713	4254
63.3	0	175	19	4	30	2324	3913	711	55	106	217	40405	194	124	313	111	65	65	138	1031	556	12	655	73	173	502	0	17	78	9641	4198
63.4	15	148	20	0	18	2275	4203	770	45	140	216	40404	185	66	302	125	146	152	57	964	389	39	785	21	252	494	0	0	7	9964	4304
63.5	9	183	16	13	39	2207	4655	829	63	105	220	40465	252	157	298	119	109	99	128	1039	478	55	661	0	204	485	0	0	31	10235	4467
63.6	38	158	26	17	27	2223	5128	836	70	123	233	38994	189	111	279	117	113	72	91	915	585	74	728	0	154	439	0	0	29	10397	4179
63.7	42	163	11	9	26	2112	5558	814	37	148	226	38866	242	132	323	52	115	222	149	885	406	51	635	75	224	490	0	0	45	10349	4073
63.8	0	159	12	14	38	2081	6157	848	43	125	191	37651	220	166	307	135	113	122	132	1020	532	52	622	37	183	495	0	7	50	10441	4013
63.9	7	200	44	27	52	2026	6810	745	84	115	222	36937	216	78	234	80	33	70	133	948	584	0	571	39	214	514	0	29	78	10387	4138
64	35	229	20	37	56	1882	7572	802	70	115	258	30800	162	76	226	63	60	40	68	604	857	49	630	7	193	564	22	0	65	10186	4266
64.6	0	189	0	16	45	1484	10767	674	24	117	218	29132	129	40	201	78	98	83	110	565	853	118	622	18	151	545	0	7	8	10071	4296
64.7	17	210	0	20	65	1455	11357	675	39	111	281	28196	139	78	166	38	51	122	86	631	873	96	582	25	234	508	8	0	23	10306	4338
64.8	33	187	15	0	48	1436	11382	644	61	95	206	27697	159	71	234	58	61	86	135	523	801	70	739	20	207	530	0	0	11	10428	4227
64.9	0	204	0	15	59	1380	11750	628	69	108	200	27257	143	47	206	93	82	86	174	519	913	74	624	43	207	494	26	0	75	10169	4347
65	19	224	19	37	88	1352	12167	638	37	95	271	26554	149	67	150	85	66	44	143	455	906	107	551	30	180	559	23	4	44	10124	4265
65.1	16	208	31	32	65	1357	12333	614	53	104	207	26222	116	64	185	108	49	185	464	997	82	586	47	163	576	0	0	70	10314	4160	
65.2	6	229	14	8	72	1298	12739	706	71	135	247	25988	115	0	128	54	45	84	50	507	962	8	682	14	194	508	0	0	10	10201	4314
65.3	19	197	7	0	47	1268	12661	665	39	98	211	25587	89	34	140	24	87	105	92	544	964	36	640	20	179	505	0	0	38	10206	4222
65.4	0	182	37	0	40	1277	12663	597	29	89	199	25659	59	0	113	5	41	6	92	467	974	115	623	18	205	480	0	0	61	10120	4481
65.5	0	197	5	0	90	1261	12619	626	58	106	167	25192	117	43	145	52	81	28	83	470	967	51	615	16	217	511	43	24	35	10426	4372
65.6	14	247	13	25	65	1166	12875	714	49	110	222	24854	134	13	114	66	134	0	137	542	945	15	595	42	225	529	0	6	64	10441	4270
65.7	0	240	16	10	52	1226	12851	675	36	88	220	24480	105	0	132	51	126	29	88	422	967	100	650	18	213	483	0	0	44	10507	4345
65.8	13	263	28	21	56	1160	12820	645	33	83	225	24587	129	51	157	110	65	115	100	420	960	23	634	18	213	548	0	0	0	10337	4411
65.9	12	263	48	26	53	1170	13570	700	72	70	215	24601	150	67	185	44	99	153	151	465	960	74	691	20	183	591	0	0	45	10119	4362
66	4	260	33	13	64	1194	13356	687	50	86	278	23682	164	61	145	134	146	85	126	364	963	116	662	26	181	570	0	0	0	10608	4367
66.1	28	247	21	22	68	1247	13502	654	59	114	240	23861	174	17	158	67	104	41	110	399	946	103	625	43	223	506	0	20	12	10501	4444
66.2	18	260	47	20	89	1191	13016	682	39	85	194	23033	127	24	174	65	107	46	147	481	877	67	670	28	196	566	51	0	18	10056	4286
66.3	13	279	21	20	61	1157	12591	685	12	111	202	22802	101	66	143	103	159	57	130	458	962	123	601	22	164	509	0	0	42	10239	4481
66.4	6	275	0	9	85	1104	12584	617	51	72	212	22637	105	0	114	43	132	184	130	426	941	43	685	25	240	506	0	0	63	10397	4434
66.5	5	247	28	17	57	1189	11587	688	37	62	172	22841	117	17	103	100	50	69	135	464	941	67	627	23	187	524	0	0	48	10372	4362
66.6	24	267	24	17	70	1066	11919	692	25	102	160	22654	133	0	163	73	174	46	72	404	968	134	764	4	192	545	0	0	54	10181	4363
66.7	13	273	31	13	60	1163	11789	643	40	114	250	22894	76	13	81	19	101	122	158	449	1038	126	695	60	177	528	10	0	30	10044	4323
66.8	0	246	17	0	66	1262	11793	590	15	72	170	23370	94	16	190	32	93	117	116	470	891	130	764	50	233	562	41	7	51	10114	4315
66.9	12	245	0	0	41	1195	11775	624	38	102	184	23443	109	16	165	75	88	106	147	421	923	89	792	18	217	529	0	0	40	9792	4348

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
67	0	259	11	0	51	1159	11979	651	41	73	187	22096	130	0	121	62	98	0	128	432	934	137	783	28	201	533	0	42	24	9612	4216
67.1	5	211	27	20	65	1172	12202	664	45	99	209	21850	117	31	167	61	104	120	125	491	1010	0	828	65	209	563	5	0	38	9522	4201
67.2	15	257	11	18	52	1175	12116	717	20	98	169	22172	130	23	205	60	188	112	105	418	876	156	807	39	191	538	0	0	54	9494	4119
67.3	0	269	55	23	69	1110	12176	644	56	113	215	21968	86	25	206	124	120	189	63	388	828	71	821	26	155	547	0	0	38	9506	4208
67.4	12	252	27	35	91	1297	12166	560	32	79	202	23135	122	41	162	40	69	163	195	462	899	108	944	31	227	619	0	0	62	8887	4220
67.5	27	264	32	11	67	1285	11636	485	30	106	201	23784	135	28	100	74	77	75	145	375	982	99	955	67	185	595	0	0	78	8416	3995
67.6	16	292	11	0	69	1226	11315	567	26	90	178	23267	184	0	147	58	75	124	90	517	960	105	922	10	209	537	0	0	25	7600	3828
67.7	23	239	22	17	60	1091	11621	730	10	142	221	24221	138	0	88	71	55	85	106	479	904	83	954	0	212	558	30	7	70	7643	3919
67.8	0	261	17	8	53	989	10913	973	55	125	218	27085	233	145	226	185	60	187	163	362	936	21	983	11	181	656	14	0	84	8299	4146
67.9	37	255	0	0	30	914	10552	1230	87	112	340	32399	263	149	221	160	80	120	121	359	921	120	995	37	199	581	0	0	29	9422	4133
68	26	272	5	27	78	840	9869	1634	68	84	420	39916	311	241	257	81	109	36	91	427	934	24	930	22	224	544	0	0	13	10317	4251
68.1	0	233	16	14	33	790	8259	2356	86	122	636	53495	322	386	320	182	155	81	108	450	861	0	865	20	158	560	0	0	0	10838	4284
68.2	0	207	29	0	42	700	6609	2852	121	141	873	70012	396	423	436	138	198	79	95	343	859	7	932	0	185	555	0	0	48	10652	4269
68.3	19	205	43	5	40	767	5905	3018	125	73	925	76849	307	362	289	105	129	125	169	280	832	9	840	0	145	472	0	0	0	10961	4300
68.4	35	189	34	51	55	945	5291	2747	118	54	935	76787	320	352	311	113	84	39	109	142	923	66	789	0	154	503	0	35	24	10699	4082
68.5	43	213	25	10	46	1265	4860	2278	200	97	977	73622	315	319	403	105	103	108	108	117	1016	124	594	0	170	427	0	0	0	10784	4274
68.6	33	179	22	21	41	1709	4560	1807	71	105	664	66035	264	330	352	130	85	69	80	103	985	143	771	47	145	478	7	0	0	10800	4195
68.7	42	153	22	25	52	2121	4179	1186	39	115	403	54662	69	178	250	78	0	90	108	411	831	95	868	0	191	471	20	26	23	10663	4107
68.8	25	180	31	21	36	2394	4373	832	66	161	232	45099	212	258	382	132	115	98	174	707	657	60	694	70	196	496	0	0	57	10697	4207
68.9	11	186	20	0	16	2342	4543	777	82	146	270	42337	233	191	386	76	128	221	137	837	490	0	661	58	236	509	0	0	6	10594	4309
69	6	196	9	32	42	2309	5217	752	108	142	255	41559	213	196	364	199	135	137	170	886	463	49	673	68	173	522	0	33	49	10643	4372
69.1	37	184	16	11	32	2141	5734	829	67	145	259	40648	193	101	324	105	131	180	116	875	476	51	657	36	185	491	0	0	48	10830	4309
69.2	21	186	12	6	57	2039	6122	980	53	146	261	39053	149	107	270	104	150	208	103	799	432	45	629	0	184	464	0	0	78	10549	4351
69.3	30	218	25	18	64	1884	6705	932	36	135	236	38442	191	136	335	157	159	104	179	812	571	81	559	20	182	450	0	0	55	10419	4335
69.4	31	186	17	30	43	1765	7718	887	69	90	315	37416	125	139	232	179	92	139	128	845	639	114	761	33	177	531	34	0	64	10538	4297
69.5	29	203	21	27	69	1658	8439	853	13	101	270	35516	110	70	247	58	29	76	104	767	690	185	704	15	182	472	0	0	38	10530	4539
69.6	35	197	19	6	52	1626	9466	848	61	124	291	33942	161	97	213	84	106	114	173	807	733	148	654	48	181	530	6	13	35	10524	4340
69.7	22	210	17	9	59	1490	10260	845	76	113	277	32247	195	80	224	32	93	78	123	640	772	130	610	5	232	523	16	0	69	10566	4337
69.8	17	197	7	0	42	1424	10571	851	56	70	215	31508	138	65	187	83	114	56	185	672	920	60	535	0	175	541	8	10	28	10710	4406
69.9	23	189	25	0	72	1364	11022	839	71	92	292	30889	141	32	206	60	79	153	109	649	854	102	646	32	228	444	19	8	40	10338	4368
70	13	216	10	21	47	1245	11173	861	57	78	294	30512	142	60	220	129	32	14	56	665	885	34	763	44	239	526	49	49	49	10315	4336
70.1	6	221	11	25	43	1374	11362	809	62	86	235	29825	227	150	220	140	138	161	178	600	920	14	651	35	188	557	0	0	53	10422	4347
70.2	8	252	15	9	61	1415	11931	858	52	94	281	27860	139	45	203	59	44	60	65	623	944	124	720	16	190	571	0	13	28	10528	4603
70.3	22	237	12	24	56	1326	12080	744	56	96	252	26627	220	153	182	110	99	91	37	518	997	145	584	30	176	613	35	0	51	10798	4402
70.4	7	210	9	0	66	1333	11642	701	52	102	258	25811	223	77	223	9	97	65	63	481	983	76	653	45	206	522	0	0	32	10862	4661
70.5	12	241	14	6	50	1236	11876	686	31	92	221	24651	153	33	204	106	75	32	113	482	927	177	781	16	175	551	18	0	48	10577	4622
70.6	0	225	0	4	37	1209	12133	651	49	100	185	24831	129	36	170	63	132	86	117	569	951	122	668	12	168	511	0	0	41	10474	4440
70.7	0	228	15	17	74	1259	12111	654	45	80	197	24138	148	17	189	78	56	147	191	531	914	122	741	63	191	579	28	23	51	10772	4381
70.8	59	268	49	66	77	1241	12635	634	63	109	244	23219	151	35	133	62	106	63	129	525	1036	64	677	59	192	560	34	20	39	10438	4509
70.9	0	214	15	12	61	1180	11574	734	42	98	202	23171	52	20	221	36	55	78	105	473	893	0	727	0	188	518	0	0	50	10610	4573
71	0	233	19	14	57	1184	11652	760	0	113	180	23777	175	65	171	126	140	177	145	449	939	66	745	61	183	555	15	0	89	10869	4277
71.1	23	244	30	17	74	1362	11651	790	50	102	194	22999	109	42	141	115	59	76	83	518	954	27	705	7	134	541	25	0	0	10853	4342

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
71.2	13	249	12	21	54	1184	11493	823	74	159	235	22269	119	86	168	60	90	138	141	461	924	43	760	32	167	546	17	0	38	10597	4277
71.3	0	202	0	0	58	1241	10944	837	45	137	245	22245	155	89	142	194	94	121	125	482	1063	60	794	69	169	564	4	0	36	10435	4441
71.4	33	224	19	31	50	1290	10682	674	56	126	168	22592	128	51	127	14	126	109	104	363	941	129	791	29	196	545	0	0	56	10582	4577
71.5	21	191	23	26	57	1366	9600	607	107	103	182	23899	142	70	138	50	159	73	111	498	1022	35	875	25	183	539	0	0	37	10733	4436
71.6	0	155	0	0	49	1527	9838	586	24	107	234	24283	180	6	185	104	98	49	119	436	896	22	994	51	243	538	0	0	41	10643	4443
71.7	13	178	5	17	36	1702	9038	645	29	113	191	25650	178	108	212	90	121	168	122	515	1069	137	942	62	211	520	0	0	18	10502	4548
71.8	0	185	16	7	43	1908	7701	704	41	99	214	28325	175	45	208	49	71	140	174	456	942	72	975	47	188	568	0	0	0	10571	4397
71.9	19	155	0	0	55	2094	6199	615	65	120	247	33443	189	109	270	107	145	111	136	624	781	130	965	120	173	565	0	0	44	10369	4311
72	25	178	14	0	55	2341	4782	723	40	131	233	38129	181	146	246	171	133	144	139	636	747	81	720	14	171	529	0	0	0	10380	4401
72.1	31	162	27	24	56	2367	4760	759	61	177	224	40696	186	187	306	115	103	122	126	852	659	136	913	75	201	453	0	0	19	10311	4318
72.2	10	197	17	20	49	2238	5356	823	73	111	221	40305	275	103	285	128	191	97	115	937	581	0	722	46	197	514	0	0	27	10338	4548
72.3	15	218	44	20	70	2181	6226	729	108	142	300	38990	189	93	229	40	146	81	110	872	647	112	626	88	232	534	0	0	46	10452	4394
72.4	20	204	29	14	51	1971	7294	753	17	135	178	36830	194	162	297	194	110	171	141	810	646	122	787	75	197	528	0	0	43	10305	4341
72.5	29	170	4	4	13	1767	8688	761	47	97	250	33967	207	57	286	77	152	131	156	940	681	28	685	16	224	513	0	0	76	10002	4386
72.6	18	167	0	17	43	1654	9663	733	72	103	216	32616	174	76	211	73	97	122	41	735	689	73	638	19	226	518	0	0	19	10041	4366
72.7	0	200	35	13	56	1530	10855	823	41	101	202	30220	133	52	175	64	12	42	82	574	762	83	669	0	213	538	11	0	0	9827	4286
72.8	21	231	4	37	67	1412	11870	660	57	69	267	28513	141	15	205	117	95	111	152	647	852	135	634	16	236	515	0	0	70	9691	4187
72.9	8	213	0	0	48	1375	12033	710	53	61	223	26614	191	80	235	124	134	55	168	603	925	147	566	4	192	541	12	22	75	9633	4227
73	18	230	10	12	31	1351	12398	654	50	67	210	25626	142	49	181	99	84	117	164	464	886	61	667	29	169	535	0	0	28	9688	4302
73.1	19	251	0	0	69	1248	12569	607	25	91	209	24995	162	98	152	119	39	109	106	450	856	72	707	49	157	481	0	0	28	9743	4270
73.2	15	206	17	0	14	1224	12505	637	55	88	287	24270	126	11	158	50	107	0	164	498	913	98	592	4	224	504	0	16	11	9332	4388
73.3	12	209	25	9	75	1120	12401	660	55	63	290	24378	117	0	95	38	90	72	120	475	1011	109	697	15	200	534	0	0	32	8294	4097
73.4	0	246	0	5	55	1122	12148	658	22	78	204	24484	97	0	179	24	42	62	156	481	910	0	715	6	185	459	12	0	68	7970	4262
73.5	0	248	25	35	53	1151	12396	718	35	107	214	23734	149	56	172	15	77	105	97	495	1004	134	817	9	235	573	20	0	45	7817	4248
73.6	7	210	0	10	50	1084	12236	782	59	96	223	23840	117	48	150	80	85	79	125	476	875	105	730	0	195	507	8	0	0	7191	4132
73.7	0	226	43	10	76	1217	11907	739	58	84	236	24724	123	0	136	40	87	56	172	457	944	71	930	26	179	556	17	0	49	8347	4238
73.8	8	216	0	0	38	1131	11920	722	41	126	209	24816	127	31	150	43	114	31	82	515	934	16	784	55	229	494	0	0	54	9892	4432
73.9	34	254	22	30	72	1170	11916	777	47	109	241	24912	117	50	166	100	95	33	127	381	958	127	879	43	199	523	40	31	58	10062	4062
74	10	239	5	8	59	1145	11489	731	27	107	225	25680	190	132	160	152	36	141	128	486	948	161	879	70	143	655	0	0	11	10345	4165
74.1	0	232	31	23	64	1141	11379	933	37	107	245	26704	131	91	172	90	162	71	43	510	897	0	1020	41	200	524	0	17	12	10515	4116
74.2	6	227	0	0	46	1100	10817	974	36	152	308	31180	231	141	213	112	117	114	129	493	827	86	1028	79	196	504	0	0	30	10199	4130
74.3	44	207	23	14	53	1072	9377	1488	41	91	429	44537	158	202	277	29	66	138	139	446	983	65	762	11	167	502	0	0	7	10338	4049
74.4	27	275	36	32	57	1085	8731	2258	126	36	754	66279	273	344	349	141	123	99	57	275	921	82	809	0	176	618	0	0	9	10416	4217
74.5	34	273	51	38	82	990	8070	2938	131	93	###	82865	339	381	396	145	153	113	45	194	1065	197	799	54	153	526	0	0	55	10506	4275
74.6	12	175	18	8	24	995	6160	2745	191	138	781	76790	230	307	310	98	119	105	103	149	907	174	759	0	137	443	0	0	0	10727	4292
74.7	29	220	57	33	59	1445	5299	1990	75	93	667	67291	216	281	309	95	85	23	36	203	827	169	733	0	133	445	0	20	13	10599	4324
74.8	44	226	58	35	58	1990	4557	1437	117	54	584	56657	285	301	392	136	94	82	85	514	764	80	721	14	178	463	0	5	23	10741	4543
74.9	31	165	14	20	44	2053	4079	1118	57	107	283	48833	144	161	256	118	132	116	109	830	562	73	719	0	217	435	0	0	33	10595	4385
75	28	146	29	0	45	2089	4070	972	77	115	313	46351	269	199	377	126	207	204	39	925	576	58	754	19	206	506	0	0	45	10849	4593
75.1	60	208	16	24	61	2396	4115	801	61	99	256	43958	210	134	392	126	117	136	167	870	480	47	726	33	231	461	0	20	54	10543	4350
75.2	24	188	14	17	32	2321	4125	824	74	127	187	42597	197	119	306	65	74	54	57	1055	402	70	691	38	246	496	0	0	5	10668	4618
75.3	7	209	24	6	49	2327	4362	740	54	113	181	42361	221	195	360	129	120	114	130	1189	364	0	698	26	245	521	0	16	46	10550	4235



Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
75.4	0	153	11	21	46	2397	4569	790	91	138	235	41655	261	155	366	126	114	121	120	906	444	42	730	53	221	480	0	0	25	10534	4447
75.5	39	231	28	21	43	2417	4684	804	62	163	203	41316	240	145	313	104	132	125	109	982	454	79	788	51	211	521	0	0	32	10608	4466
75.6	0	183	13	0	40	2294	4890	803	79	119	257	41036	219	95	259	112	102	146	101	969	413	155	606	35	200	492	0	0	51	10444	4328
75.7	16	193	22	10	47	2273	5215	835	63	117	240	40609	199	116	246	78	70	140	101	1073	437	78	767	0	203	528	0	0	37	10477	4486
75.8	16	212	17	12	34	2352	5617	833	57	115	281	40659	175	108	270	122	79	20	116	957	482	93	704	41	189	504	0	56	56	10355	4460
75.9	22	174	45	7	37	2285	5899	873	97	140	232	40386	234	177	271	144	179	202	144	943	695	59	632	26	184	546	0	0	41	10616	4280
76	15	202	8	18	34	2268	6246	895	61	130	221	40151	256	112	269	112	68	139	140	972	494	0	776	26	263	525	0	0	59	10350	4369
76.1	33	209	34	17	60	2223	6701	828	56	135	265	39678	230	180	324	139	103	190	129	865	545	0	728	54	188	533	0	0	66	10440	4364
76.2	0	191	23	16	43	2201	7184	892	58	133	231	38393	176	86	254	132	59	182	199	901	664	14	719	16	202	542	25	0	97	10257	4412
76.3	16	164	10	11	31	2080	7175	802	63	130	232	37878	190	96	242	98	97	143	143	765	651	215	798	44	208	549	0	0	47	10477	4583
76.4	22	197	17	0	33	2084	7451	814	34	120	218	36467	182	130	292	94	72	110	107	724	780	102	680	58	189	533	0	16	39	10252	4442
76.5	8	198	15	0	42	2099	7647	776	78	130	253	35325	189	84	227	86	160	74	108	689	866	211	635	0	233	502	0	13	78	10257	4330
76.6	0	211	7	7	67	1904	8302	752	78	105	304	35082	175	82	212	73	191	122	153	691	702	88	643	48	242	494	0	0	58	10609	4415
76.7	16	182	7	0	30	1821	8733	743	45	92	196	33482	157	106	284	126	88	142	119	645	841	20	613	37	170	532	6	0	94	10537	4656
76.8	17	222	27	27	46	1831	9273	810	80	139	227	33146	149	75	191	99	95	60	70	659	841	130	702	4	202	566	11	13	21	11068	4329
76.9	36	209	23	19	49	1720	10041	725	21	102	251	32806	168	80	251	129	106	162	116	584	915	96	641	68	180	588	31	0	91	10571	4651
77	27	233	24	38	79	1725	10548	747	59	107	188	31453	138	9	136	22	43	114	110	476	874	137	512	49	233	553	23	0	33	10664	4499
77.1	27	201	0	38	55	1581	10630	743	53	90	245	29686	129	39	190	69	56	136	100	587	950	66	741	18	215	474	0	0	49	11040	4493
77.2	16	174	30	22	73	1446	10279	635	60	91	233	28574	135	85	202	132	89	62	170	476	899	166	794	25	198	525	0	41	69	10827	4375
77.3	0	208	18	15	57	1510	10706	664	52	93	229	27963	168	27	187	18	38	134	101	501	874	25	687	28	236	450	0	0	16	10848	4289
77.4	11	155	32	27	75	1358	11194	692	29	94	218	27283	169	34	229	76	40	101	156	523	853	83	669	27	189	544	0	0	26	10716	4290
77.5	6	210	38	24	77	1276	11477	675	30	64	227	26247	113	70	184	97	114	110	150	501	986	53	678	0	208	514	0	9	58	10416	4373
77.6	26	196	36	21	69	1321	11641	637	16	52	275	25986	121	47	161	108	113	80	229	432	941	49	571	0	184	498	20	0	24	10581	4465
77.7	5	234	49	34	65	1284	12196	746	54	94	217	25465	155	50	194	59	109	133	181	456	954	137	604	0	198	523	17	0	77	10336	4242
77.8	25	198	29	4	59	1250	11858	656	37	73	178	24798	100	0	85	128	106	50	83	425	882	158	644	0	193	527	0	0	64	10862	4417
77.9	0	191	0	0	33	1224	12088	666	57	91	212	24645	76	48	100	104	116	119	131	530	990	41	684	8	167	523	0	0	0	10502	4307
78	0	204	0	0	52	1209	12084	638	60	119	188	24231	126	53	166	64	48	78	123	484	998	0	560	33	205	528	5	0	22	10096	4488
78.1	6	210	35	35	91	1104	12482	645	50	86	241	23640	131	67	195	56	140	135	112	458	1013	80	730	33	184	535	7	0	44	10371	4284
78.2	0	216	0	0	67	1108	12179	638	34	83	223	23456	101	43	195	25	49	0	99	451	1071	129	791	19	177	497	32	35	32	10347	4282
78.3	11	234	21	21	58	1121	12347	638	19	112	195	22883	91	15	172	21	0	28	117	474	991	107	681	24	168	504	0	0	22	10467	4383
78.4	0	223	24	22	60	1068	12311	591	32	90	227	22751	160	41	119	67	116	30	121	380	1058	63	640	35	195	542	0	0	27	10275	4458
78.5	6	247	23	0	59	1127	12500	661	24	96	243	23268	133	45	182	63	143	48	131	451	1137	151	734	0	168	518	14	0	90	10597	4430
78.6	0	218	21	15	56	1198	13196	707	48	81	195	23359	101	50	137	41	69	30	151	488	1052	143	753	0	173	536	48	63	50	10218	4305
78.7	11	266	16	10	49	1172	13183	684	51	82	279	23962	171	50	101	45	140	27	152	501	1022	117	687	27	182	522	0	0	0	10606	4309
78.8	8	255	21	22	81	1186	13254	697	35	92	246	24711	147	29	204	40	115	111	117	502	1056	79	667	26	218	608	0	5	40	10496	4492
78.9	13	309	40	30	74	1144	13420	648	38	72	210	24921	165	0	146	0	103	65	111	505	946	62	721	53	229	487	0	0	30	10720	4468
79	5	272	24	13	59	1147	13211	687	47	100	231	24665	144	36	155	34	50	86	137	443	955	163	788	25	205	578	0	0	37	10309	4322
79.1	15	271	12	33	78	1188	13556	573	70	83	259	25115	85	17	98	40	61	24	71	486	990	135	762	82	202	574	0	0	34	10215	4369
79.2	0	234	25	27	73	1240	13539	649	48	93	253	24906	137	24	150	50	36	52	86	390	1002	0	580	63	223	525	10	0	13	10273	4565
79.3	0	278	35	14	60	1224	13583	654	41	103	252	24637	154	48	138	53	64	12	9	439	941	94	801	59	183	551	0	0	14	9846	4380
79.4	4	282	31	31	80	1222	13470	738	33	95	254	24502	193	44	161	91	10	87	136	446	915	81	790	52	192	547	35	0	59	9051	4238
79.5	0	230	6	0	42	1132	13046	642	76	91	209	24566	120	56	201	143	125	33	140	462	882	82	781	23	184	571	6	0	46	7948	4214

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
79.6	16	294	24	12	55	1136	13046	561	55	68	231	24460	140	86	201	54	161	72	159	500	1099	125	815	47	246	561	23	0	57	7451	4102
79.7	31	261	34	9	58	1140	12883	595	29	70	189	23807	174	67	150	76	131	99	107	394	956	20	816	35	217	600	0	0	25	7374	3908
79.8	14	234	28	26	63	1172	12837	684	35	97	205	24470	162	100	172	44	167	120	134	428	999	50	872	45	184	544	0	0	27	8752	3991
79.9	20	291	16	46	100	1242	12951	750	48	124	210	23713	132	58	161	58	114	74	193	460	954	105	891	23	202	524	6	0	77	9778	4134
80	0	268	31	13	67	1172	12686	589	37	53	167	23465	129	62	134	111	193	110	107	450	961	0	704	55	173	499	19	0	15	10283	4236
80.1	20	286	23	27	74	1194	12681	642	20	101	184	23425	141	0	144	54	97	176	124	400	878	41	851	56	226	585	34	0	32	11008	4137
80.2	11	258	8	23	82	1251	12399	655	12	50	147	23806	111	27	126	86	153	115	116	473	988	50	803	41	197	549	0	0	45	11163	4163
80.3	0	247	0	0	37	1262	12216	683	48	91	210	24847	143	33	193	114	77	86	133	442	930	22	856	0	169	528	5	0	60	11208	4316
80.4	17	246	39	33	75	1385	11990	617	79	103	225	25210	193	43	129	93	122	67	70	510	857	39	956	50	177	590	0	0	46	11245	4430
80.5	10	249	27	22	61	1288	11696	710	17	81	216	24472	163	46	136	13	43	71	94	398	833	19	1012	61	243	609	0	0	72	11215	4279
80.6	0	255	0	17	43	1310	11956	729	38	73	259	24186	159	40	129	157	126	93	143	501	911	0	801	8	181	537	0	16	33	10834	4310
80.7	9	278	28	26	65	1370	11756	736	54	121	203	23966	154	67	114	166	148	60	70	432	778	40	847	22	162	552	0	12	28	11322	4382
80.8	0	243	41	43	67	1295	10086	628	48	132	208	21875	190	66	182	112	150	118	151	387	796	0	855	87	174	506	0	0	14	11007	4431
80.9	0	211	9	0	31	1354	9376	542	18	115	130	22754	143	27	192	76	94	29	95	459	842	121	1011	42	163	460	0	0	38	11101	4338
81	42	247	35	34	73	1545	8984	620	61	95	171	24574	188	41	143	92	139	118	131	471	826	69	1080	42	177	514	11	0	66	11022	4310
81.1	15	249	24	15	57	1481	8035	650	77	119	159	26268	165	109	198	91	129	70	83	549	831	55	1039	0	188	443	24	10	33	11027	4413
81.2	21	217	29	18	68	1644	7846	633	59	128	195	27103	187	58	181	114	153	143	115	571	824	64	723	6	230	495	18	0	25	11144	4640
81.3	34	207	44	31	76	1518	7925	618	63	108	234	27024	154	90	214	72	167	100	161	778	699	14	642	18	171	472	0	0	65	10844	4381
81.4	25	187	27	27	36	1465	7610	584	48	104	157	28207	89	49	168	111	59	0	209	809	682	102	798	23	188	501	36	68	59	10834	4478
81.5	29	225	33	33	61	1498	7316	603	37	106	182	28505	101	28	207	41	0	102	139	905	538	50	752	28	180	496	34	0	53	10725	4463
81.6	25	199	0	18	43	1533	7110	586	34	97	215	28104	116	54	189	117	80	60	82	923	512	85	792	30	169	478	0	0	76	10794	4230
81.7	15	195	0	0	33	1458	7346	512	16	97	178	28123	110	36	210	94	66	148	141	882	455	77	622	81	200	509	17	18	78	10313	4321
81.8	0	150	6	0	37	1460	7539	598	39	89	242	27281	79	0	189	28	13	151	105	879	445	18	690	36	199	515	17	0	20	10673	4446
81.9	27	178	5	6	74	1398	7801	633	25	93	201	27023	79	31	254	12	100	109	124	811	424	57	676	34	183	397	0	0	50	10825	4422
82	0	208	0	17	40	1473	7747	697	18	88	208	27425	99	18	202	48	113	78	148	908	457	7	519	13	206	426	36	22	53	10599	4546
82.1	19	174	33	19	46	1442	7101	676	75	117	224	29594	105	93	243	52	97	70	207	743	525	55	633	37	170	470	0	0	28	10493	4374
82.2	19	150	0	0	30	1574	6697	714	80	101	249	31461	113	54	215	19	85	95	126	873	506	22	646	19	197	406	0	0	74	10682	4461
82.3	0	158	17	5	63	1490	6433	634	57	113	218	32467	119	72	189	0	85	127	143	748	508	56	577	59	166	421	0	0	12	10336	4471
82.4	15	155	10	18	37	1533	6455	591	26	99	238	32326	132	84	254	48	96	94	105	696	477	120	642	69	194	480	45	0	62	9936	4283
82.5	44	167	14	39	72	1632	6073	639	28	86	233	32773	183	78	208	64	103	150	203	698	561	20	668	68	186	436	0	0	64	10459	4391
82.6	4	159	0	6	31	1689	5506	684	36	107	233	32271	200	120	204	117	110	106	72	683	507	5	724	43	181	471	0	0	57	10754	4451
82.7	0	170	18	0	64	1646	5534	635	47	94	220	31194	159	76	190	15	111	67	78	689	629	66	678	56	198	434	0	34	56	10463	4365
82.8	28	160	12	19	55	1609	5954	703	57	106	230	30314	172	80	268	117	116	178	140	554	667	78	680	74	199	382	0	0	34	10660	4525
82.9	31	181	14	32	43	1598	6573	626	59	101	198	29712	120	13	180	20	44	91	100	570	667	64	544	49	200	460	0	0	19	10408	4330
83	0	157	8	0	51	1482	7413	631	57	93	174	28635	123	42	159	61	110	83	107	656	750	64	591	0	176	455	0	19	14	10690	4431
83.1	7	147	19	18	53	1418	7574	604	52	102	206	28144	157	55	225	0	131	142	77	616	726	22	677	48	210	456	0	0	10	10568	4520
83.2	33	141	19	0	43	1469	7036	637	61	135	195	28476	128	42	336	65	76	64	217	650	761	50	546	16	188	475	12	46	57	10773	4379
83.3	30	176	31	27	59	1637	6527	609	36	81	188	29064	159	94	366	79	115	142	50	609	707	17	557	37	133	422	0	0	56	10894	4422
83.4	21	152	15	0	32	1725	5817	602	63	65	167	30040	119	0	221	25	61	143	79	668	647	23	657	0	210	466	0	0	37	10898	4604
83.5	17	118	30	8	39	1693	5736	567	37	120	141	30492	167	71	189	57	97	52	53	642	605	57	474	66	183	440	0	0	0	10949	4555
83.6	4	183	14	0	52	1758	5716	597	30	99	165	29946	147	69	243	37	161	86	100	643	640	78	657	38	213	435	0	33	49	11173	4493
83.7	0	126	0	0	27	1620	5847	601	66	139	208	29951	178	105	220	85	70	130	120	553	637	17	570	44	160	463	0	0	28	10941	4675

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
83.8	21	138	7	8	16	1626	5994	594	34	78	180	29231	164	95	192	49	55	91	155	564	646	112	681	36	177	436	0	0	46	10952	4636
83.9	29	164	14	33	46	1561	6477	583	41	86	169	28355	141	72	202	22	60	87	90	515	770	62	708	70	209	440	5	0	34	11214	4667
84	33	125	0	5	34	1581	6569	651	32	70	206	27810	128	112	184	95	68	160	152	525	723	77	667	23	197	462	0	0	0	11266	4604
84.1	12	132	14	23	33	1453	7061	573	50	95	198	27408	165	84	218	35	109	76	142	546	736	72	622	33	189	457	5	0	16	10690	4530
84.2	9	177	18	0	55	1429	7246	644	36	126	186	26390	197	73	151	21	89	86	63	513	775	198	577	38	193	491	0	0	34	11104	4473
84.3	5	149	6	0	20	1455	7623	608	30	113	222	26217	149	106	168	171	69	113	137	483	754	35	654	21	109	558	0	0	57	10872	4645
84.4	16	143	0	0	49	1380	7950	580	39	85	229	25925	163	67	122	32	94	65	56	474	766	93	514	48	158	460	0	0	0	10626	4400
84.5	10	183	21	0	37	1340	8509	652	63	82	234	25661	92	75	133	0	36	15	72	476	749	74	669	12	175	463	0	26	34	10477	4356
84.6	18	165	0	0	55	1303	8750	573	48	99	217	25962	152	91	150	56	83	123	72	476	781	77	562	48	132	447	0	0	47	10322	4470
84.7	21	169	22	0	49	1296	9453	670	45	96	206	25048	143	43	199	85	89	110	144	489	866	75	599	7	161	439	36	0	43	10075	4393
84.8	0	163	25	5	41	1205	10168	574	42	64	200	24785	129	46	85	94	110	117	191	451	927	67	579	18	153	511	0	0	55	10338	4269
84.9	36	208	24	20	57	1229	10695	610	62	77	205	24132	138	19	150	78	49	52	95	406	895	55	578	25	192	552	0	29	43	10139	4264
85	12	167	16	19	40	1218	11129	625	43	115	209	24310	74	0	146	63	154	83	137	435	933	14	487	10	180	480	0	0	36	9989	4188
85.1	0	193	47	14	43	1160	11428	656	30	100	228	24198	133	44	139	88	106	91	110	621	790	54	714	27	178	504	22	0	39	9592	4130
85.2	8	212	14	0	69	1142	11447	637	47	63	232	23027	119	13	126	15	139	57	59	425	821	90	556	17	188	442	0	0	19	9843	4103
85.3	18	163	0	0	39	1050	11680	534	31	96	171	22879	132	34	163	82	110	104	81	438	797	75	599	31	213	516	0	0	64	9905	4045
85.4	16	197	16	9	74	1167	11660	549	58	71	217	22733	113	21	152	34	140	147	225	540	883	58	643	37	193	454	0	0	54	10022	4232
85.5	4	200	12	0	53	1106	11653	604	5	82	221	22639	125	21	95	46	54	75	114	495	952	57	699	21	177	539	18	0	54	9827	4341
85.6	5	210	38	12	75	1209	11828	582	47	96	231	22822	120	12	86	31	33	80	183	520	869	103	643	26	183	523	17	0	23	9431	4019
85.7	0	189	0	0	34	1123	11840	631	39	90	190	23107	136	59	178	22	81	154	127	437	945	79	707	6	211	562	0	0	53	9303	4000
85.8	0	177	0	0	29	1214	12255	560	95	117	285	23943	134	13	156	92	31	41	144	437	899	159	604	35	208	577	0	0	52	9108	4102
85.9	14	251	30	24	60	1286	12609	701	39	122	239	24903	166	55	143	63	70	99	176	465	881	75	645	26	184	559	0	0	56	9353	4115
86	0	196	20	0	41	1203	13140	680	26	103	241	24465	148	45	143	28	182	143	137	506	852	65	650	29	232	547	0	0	63	9769	4116
86.1	13	259	9	10	66	1153	13500	675	30	92	216	24538	105	33	131	51	63	26	189	530	935	89	758	31	192	578	5	0	128	9920	4291
86.2	0	277	25	25	65	1273	13470	622	38	104	216	23909	183	28	110	117	97	95	235	406	907	64	733	62	193	562	0	0	39	9878	4187
86.3	9	227	26	41	52	1293	12784	691	23	113	245	24118	133	58	144	54	101	89	148	490	930	72	634	41	206	585	20	0	78	10248	4082
86.4	14	209	24	26	85	1238	12551	711	28	109	241	24885	117	0	92	113	72	64	107	397	907	41	691	51	235	550	0	0	49	10328	4066
86.5	4	217	8	8	59	1284	11944	713	32	135	256	25128	152	62	131	70	86	97	82	305	865	9	653	69	193	545	0	0	49	10353	4052
86.6	11	185	24	17	38	1402	11310	599	52	113	240	25288	166	0	119	93	80	88	146	424	827	75	720	53	217	551	0	0	75	10244	4020
86.7	0	197	0	0	25	1378	11229	663	20	110	241	25764	130	0	159	43	108	34	209	520	852	223	709	12	245	488	18	0	30	10313	3951
86.8	17	218	16	5	62	1512	11415	633	63	116	245	26289	169	57	135	141	103	159	221	534	858	55	726	54	183	559	0	0	83	10281	4095
86.9	21	264	27	19	53	1283	11824	664	55	110	233	25013	188	44	148	114	89	75	156	494	840	41	633	35	181	544	5	20	90	10396	3974
87	0	213	8	27	62	1191	11926	636	38	116	188	23422	174	49	44	100	132	91	116	358	724	79	616	43	240	547	0	0	15	9811	3886
87.1	0	241	0	8	60	1081	11359	678	56	51	209	22516	95	0	78	0	5	67	127	385	843	53	705	44	242	515	0	0	52	10013	3968
87.2	12	212	0	0	37	1130	11008	502	69	110	179	22523	117	6	134	37	150	32	73	388	742	89	653	27	238	522	0	0	39	9818	3943
87.3	8	172	9	14	57	1143	10672	569	44	107	197	22665	112	0	140	46	54	86	173	353	847	8	659	53	236	495	0	0	32	9842	4015
87.4	0	227	6	0	66	1168	10705	589	46	103	227	23056	94	12	169	39	76	0	195	445	795	52	761	40	262	519	31	47	32	9687	4091
87.5	0	233	27	28	61	1178	10993	635	46	108	160	22751	124	14	110	12	89	0	113	310	753	120	635	16	211	514	40	41	50	9696	3902
87.6	15	245	38	18	58	1142	11319	643	62	148	192	22393	128	0	111	0	47	139	108	321	810	100	714	50	241	559	0	0	85	9779	3983
87.7	6	236	0	0	40	1124	11788	683	53	99	149	22005	134	0	136	77	84	87	174	290	632	45	672	8	220	528	0	0	60	9931	4017
87.8	0	232	11	11	64	1089	11647	593	47	111	193	21629	96	0	116	37	105	101	131	374	767	146	700	12	205	538	17	0	59	9604	4072
87.9	7	234	16	11	82	1060	11581	605	21	108	223	22096	163	0	171	57	156	170	210	305	763	128	729	26	254	522	0	0	24	9801	4120

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
88	0	208	17	8	31	1144	11175	580	36	93	194	22055	77	0	61	0	112	161	84	391	676	0	725	38	233	522	0	0	60	9899	4003
88.1	21	230	19	23	68	1104	11651	599	33	76	212	21864	121	64	85	151	100	59	191	415	807	24	756	28	173	561	37	19	20	10331	4179
88.2	0	207	8	17	84	1092	11635	602	22	92	222	21004	160	74	148	59	104	119	144	384	654	25	826	27	212	536	11	0	65	10122	4033
88.3	31	195	35	53	60	1096	11629	596	31	112	206	20875	138	46	84	81	115	169	206	263	727	112	753	39	194	500	5	0	71	9979	4076
88.4	31	233	36	29	65	1120	11813	597	23	75	175	20911	104	34	142	96	99	129	133	283	746	0	686	24	212	522	21	0	76	9955	3968
88.5	11	254	15	18	77	1055	11948	564	39	78	231	21837	154	19	141	56	106	72	207	319	779	112	793	24	234	497	0	0	63	9854	3905
88.6	15	242	39	45	90	1140	11493	538	37	79	202	21845	98	14	172	44	119	125	211	339	743	125	681	33	198	548	25	0	33	9709	4120
88.7	7	190	22	15	61	1079	11401	660	37	106	175	21304	148	4	157	50	33	94	133	349	673	107	810	0	209	575	15	0	39	9792	4005
88.8	5	183	23	0	50	1094	11209	547	61	62	163	21515	96	0	117	63	88	130	272	339	772	184	689	34	235	473	19	0	69	9994	3954
88.9	0	226	0	0	59	1157	10956	549	37	113	195	22740	137	11	69	96	144	107	105	470	753	50	801	45	160	490	0	0	27	10055	4129
89	18	219	0	10	70	1265	10567	520	63	105	212	23788	120	57	150	114	112	114	145	361	780	171	779	80	205	470	11	0	36	9995	4050
89.1	8	203	23	9	41	1254	10265	625	22	124	201	23993	173	67	181	96	108	134	147	342	688	36	669	55	197	503	0	0	16	10022	4276
89.2	27	235	34	34	78	1254	10371	570	57	96	158	23813	168	41	183	103	107	140	134	461	610	33	729	25	236	501	0	0	24	10053	4147
89.3	19	187	10	20	56	1267	9911	620	35	95	174	24182	143	71	125	48	120	80	122	302	689	0	808	31	219	552	0	0	42	9950	4069
89.4	0	216	21	5	57	1302	9978	552	38	107	165	24190	139	19	191	59	82	68	262	449	689	0	775	47	245	534	28	0	32	10085	4175
89.5	8	195	34	14	77	1258	10296	568	18	107	216	23920	160	35	193	127	111	57	112	501	666	0	730	48	185	506	10	38	11	10071	4111
89.6	21	227	29	5	78	1168	10298	539	60	101	202	23999	162	38	121	109	65	9	151	450	636	0	719	19	210	545	0	9	66	10309	4223
89.7	0	220	0	0	40	1299	10209	567	45	88	203	24512	120	15	186	50	146	123	140	556	598	64	776	44	198	446	0	7	25	10017	4187
89.8	16	224	10	44	59	1176	9996	623	10	82	156	24359	136	62	116	133	61	145	149	416	522	22	690	6	187	457	0	0	53	10234	4145
89.9	12	190	21	0	44	1239	9880	551	54	122	198	24673	171	85	187	70	121	23	130	437	583	30	767	66	211	444	0	0	63	10353	4391
90	12	232	26	41	75	1268	9835	603	52	94	199	25283	122	4	84	70	96	122	100	484	665	120	682	5	198	497	0	0	38	10433	4272
90.1	11	225	23	21	39	1207	9431	653	48	129	158	25645	119	12	157	43	83	136	125	398	657	36	701	15	196	481	0	0	26	10454	4118
90.2	16	214	15	17	54	1315	8709	566	33	118	178	25997	156	41	153	48	33	52	161	403	632	81	790	53	226	504	0	0	44	10588	4137
90.3	0	174	22	11	52	1363	8584	606	48	104	180	25284	169	35	199	70	145	118	177	398	606	0	852	69	244	436	0	0	36	10551	4372
90.4	16	196	34	30	53	1416	8500	597	61	99	200	25771	143	36	148	133	36	10	138	415	590	29	785	36	246	529	22	33	74	10865	4068
90.5	15	186	10	20	51	1400	8649	618	41	79	179	25968	159	80	183	80	50	127	99	408	627	88	804	41	194	546	12	0	69	11117	4343
90.6	13	218	30	40	53	1395	8516	662	49	122	156	24819	117	16	107	71	0	46	79	372	609	88	985	11	175	513	0	0	54	11283	4384
90.7	4	179	8	22	61	1307	7815	575	45	85	187	24457	135	16	128	31	20	77	134	391	500	115	883	48	176	494	11	0	92	11721	4309
90.8	13	189	6	14	55	1380	7992	625	65	97	157	25109	206	43	157	79	105	100	130	448	613	47	755	27	244	466	20	0	68	11774	4445
90.9	23	166	20	5	51	1433	8120	692	27	118	164	25298	130	54	107	81	97	24	170	385	544	0	657	40	194	484	0	0	48	11765	4385
91	7	163	0	10	55	1365	8380	732	35	99	232	25129	157	44	134	48	71	14	171	361	618	29	840	40	196	522	4	6	49	11782	4322
91.1	25	198	5	8	46	1406	8850	665	66	105	184	24948	167	36	161	122	119	88	176	312	556	152	864	17	222	452	0	0	37	12098	4626
91.2	8	215	0	14	32	1327	8883	597	43	133	218	23958	138	73	142	19	44	44	141	402	619	0	696	81	190	468	0	12	29	11808	4256
91.3	17	217	18	22	39	1207	9650	617	72	91	157	23048	76	35	129	0	100	72	118	352	563	112	621	47	235	408	0	0	58	11990	4167
91.4	23	220	28	7	71	1140	10049	624	27	96	182	21803	143	28	144	24	122	135	339	592	0	766	30	205	419	14	0	36	11935	4356	
91.5	0	174	4	0	38	1159	9448	578	39	94	176	20747	108	24	52	23	40	42	146	328	560	0	697	25	136	451	0	0	65	11853	4408
91.6	0	228	25	19	43	1110	9577	494	60	81	216	20191	142	7	127	33	129	60	109	278	526	109	702	19	170	470	0	0	53	12052	4536
91.7	0	208	0	35	65	1053	10002	471	35	108	189	19624	138	0	110	0	67	50	37	231	546	118	486	37	186	441	0	0	37	12231	4410
91.8	0	163	0	0	31	1052	10110	455	45	102	150	19187	144	0	78	0	90	107	105	231	672	118	580	37	205	452	0	0	10	11915	4244
91.9	0	205	0	0	24	1060	10153	434	32	114	180	18617	115	0	47	52	20	90	112	228	657	79	678	52	159	512	0	0	68	11450	4033
92	0	187	0	0	43	1043	10104	484	42	108	159	19105	138	0	97	0	14	50	150	222	541	5	672	76	232	507	23	0	38	11833	4003
92.1	0	182	0	7	38	1036	9309	434	30	71	187	19230	88	0	60	0	142	25	199	280	551	39	712	39	180	359	0	0	46	11844	4165

Position  
(mm) Al Si S Cl Ar K Ca Ti V Cr Mn Fe Ni Cu Zn Ga Ge As Se Rb Sr Y Zr Ba Ta W Hg Pb Bi inc coh

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Appendix. Scanning XRF data for synthetic core B2.

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
0	11	72	104	29	52	771	2523	239	24	62	91	10600	65	8	83	0	30	42	98	222	312	0	195	377	128	192	0	16	44	3308	1153
0.1	21	122	87	38	70	866	4049	356	9	95	88	12923	122	96	66	30	34	95	26	161	214	0	201	299	109	232	0	0	15	3373	1116
0.2	7	97	49	14	39	870	3725	304	12	85	68	12856	113	0	89	60	49	60	51	216	252	0	231	267	116	290	0	0	29	3562	1202
0.3	0	67	50	0	60	870	3723	309	30	96	108	14038	106	29	115	57	31	76	35	323	303	0	128	247	122	268	32	0	27	3824	1281
0.4	0	87	33	17	65	909	3947	360	33	78	106	15228	85	18	117	0	33	78	58	204	312	33	172	120	147	260	32	0	27	3917	1319
0.5	10	101	14	10	50	888	3794	360	29	81	100	17558	13	0	109	62	73	148	66	325	355	0	188	103	143	283	12	0	34	4498	1480
0.6	12	105	19	15	60	1079	5516	395	24	100	142	21144	44	23	176	34	29	55	180	334	374	0	226	101	167	382	22	0	40	4893	1593
0.7	0	170	11	20	43	1300	7582	542	62	99	177	25777	111	30	195	69	87	75	139	378	397	0	299	65	169	433	0	25	13	5389	1883
0.8	20	179	33	48	69	1553	7334	615	72	140	158	30124	119	99	235	147	49	118	58	466	353	0	304	71	171	478	0	0	87	5811	1958
0.9	27	194	29	12	50	1773	6577	696	72	65	219	31931	160	91	206	106	73	140	67	440	398	0	328	56	189	499	0	0	57	6323	2058
1	21	200	46	23	90	1757	7491	692	60	128	202	32374	132	71	249	84	135	79	121	476	305	0	437	86	229	423	0	28	51	6214	2242
1.1	6	173	31	32	81	1585	7988	635	44	100	188	29129	135	114	203	97	71	138	107	555	409	0	370	77	155	456	0	0	41	6531	2265
1.2	13	156	30	16	47	1434	8202	576	43	87	205	27961	127	29	145	14	72	57	149	502	445	15	309	59	209	435	14	0	26	7041	2287
1.3	31	178	24	14	85	1495	8754	634	69	118	203	29132	127	40	174	41	156	106	118	676	564	0	428	73	201	444	11	0	38	7346	2590
1.4	10	178	0	0	42	1617	9035	655	59	110	252	31265	209	53	256	90	118	45	230	642	367	75	468	78	236	491	32	14	67	8014	2868
1.5	13	193	0	30	78	1664	10373	726	66	117	206	32115	153	55	176	73	113	172	155	788	523	0	490	53	196	525	0	5	39	8707	3122
1.6	22	200	29	34	114	1615	11502	760	64	109	196	32170	148	0	185	16	0	115	213	760	532	0	544	46	225	565	0	16	79	9390	3344
1.7	26	239	9	5	77	1599	12174	737	68	80	269	31641	225	41	195	82	63	124	138	719	575	105	681	28	238	617	0	17	67	9908	3489
1.8	0	225	11	18	45	1455	12708	698	55	122	267	30309	147	43	193	64	80	49	113	814	597	65	635	27	206	534	55	0	90	10359	3792
1.9	27	241	18	18	57	1508	12267	715	37	94	250	30037	183	76	185	81	72	85	119	726	613	31	642	19	183	521	0	14	31	11041	4033
2	0	187	0	0	28	1509	12251	767	31	106	265	29905	144	70	256	87	120	90	156	855	579	0	732	10	184	550	0	0	40	11378	4457
2.1	22	211	20	8	57	1457	12078	666	28	95	221	29724	116	0	215	45	124	156	157	930	716	130	736	46	231	577	12	0	85	11525	4500
2.2	0	223	14	16	57	1500	12008	721	57	108	276	29574	116	50	165	117	74	167	148	820	758	75	584	30	208	587	21	0	17	11370	4600
2.3	0	210	10	0	34	1585	12272	656	43	102	272	30047	171	88	249	104	54	94	162	755	798	129	809	45	215	582	0	0	24	11551	4508
2.4	12	200	8	12	77	1577	12434	698	66	114	244	30097	186	73	201	71	114	79	117	669	856	68	711	49	231	577	0	0	44	11340	4634
2.5	0	202	11	19	52	1592	12459	755	31	110	223	30018	233	105	251	106	157	98	133	747	823	72	635	16	247	560	0	0	62	11511	4739
2.6	28	188	12	18	75	1479	12572	728	8	75	227	29391	149	22	189	51	131	28	116	672	902	190	700	38	203	583	0	24	72	11521	4617
2.7	6	220	9	0	54	1480	12994	674	59	107	243	29477	127	74	211	109	61	77	125	645	806	181	749	0	194	608	5	0	58	11469	4517
2.8	7	231	19	0	53	1541	13308	626	37	105	235	29238	119	34	176	35	79	80	143	570	792	87	833	49	219	543	15	0	40	11410	4596
2.9	0	172	0	0	58	1489	13817	801	27	117	299	28635	201	57	147	104	139	44	141	701	970	15	683	10	182	547	0	10	0	11578	4604
3	32	267	43	38	73	1425	14141	737	17	122	202	28389	184	120	210	40	51	97	110	676	970	0	692	40	183	615	34	0	38	11784	4699
3.1	0	226	0	9	79	1406	14114	764	56	93	299	28435	154	22	231	55	136	61	163	521	975	92	707	20	259	571	0	32	45	11603	4645
3.2	6	234	17	24	89	1426	14272	735	52	102	200	28336	183	105	199	42	87	152	163	495	934	146	632	4	156	556	0	0	43	11240	4718
3.3	14	251	9	20	74	1425	14627	708	25	86	285	28212	197	97	203	92	111	74	114	564	1004	0	520	19	206	591	0	0	19	11454	4741
3.4	7	217	12	13	99	1363	14835	712	41	133	283	28030	170	87	187	154	172	59	149	564	1142	163	695	56	170	615	0	0	30	11501	4748
3.5	13	256	21	19	74	1415	14791	757	38	97	224	27840	126	44	185	9	155	132	142	516	1066	67	751	0	184	582	0	0	76	11387	4646
3.6	20	272	40	47	83	1452	15055	771	44	117	276	27772	182	113	203	151	59	35	171	565	1143	182	652	56	143	650	0	6	47	11481	4747
3.7	0	250	0	5	63	1408	15107	711	31	110	275	27599	175	127	218	120	103	61	145	538	1024	79	732	55	195	646	10	0	56	11817	4756
3.8	0	263	0	6	63	1337	15227	780	52	149	214	27882	108	38	157	0	65	138	120	523	1046	158	687	29	221	629	0	0	49	11578	4901
3.9	34	256	12	29	62	1418	15202	772	76	135	220	28061	183	56	166	55	51	142	111	529	1201	140	781	17	231	630	34	0	56	11862	4791

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
4	0	257	0	0	51	1322	15312	816	29	132	207	27908	154	100	225	23	29	124	223	566	1071	112	683	0	250	648	58	0	46	11370	4612
4.1	34	234	9	13	90	1284	14910	710	13	93	231	26363	105	30	120	50	134	108	149	449	1082	32	772	32	210	622	0	0	9	11424	4815
4.2	24	322	0	40	84	1337	14193	703	33	66	230	25921	195	125	170	82	134	86	81	314	1024	63	711	30	188	580	0	0	48	11446	4887
4.3	13	280	28	25	98	1316	14183	664	42	116	240	25677	114	48	108	78	19	44	105	405	885	133	721	41	173	618	0	0	44	11505	4690
4.4	0	261	7	12	59	1245	13879	692	0	78	228	25938	109	41	176	37	94	0	123	519	954	93	819	19	237	573	0	0	52	11634	5082
4.5	13	282	22	24	81	1299	14239	654	20	85	200	26148	110	9	178	75	75	68	185	495	984	123	920	56	221	577	0	0	36	11579	4804
4.6	22	254	12	0	60	1349	13940	733	59	116	204	26013	172	40	189	98	60	80	98	472	1009	87	948	38	185	574	0	0	48	11736	4797
4.7	12	286	32	34	59	1342	13687	774	24	103	195	26257	179	72	159	100	49	48	112	424	1035	30	940	62	219	636	0	0	35	11317	4864
4.8	10	288	33	0	86	1279	13585	772	29	124	205	25723	133	100	184	110	115	41	121	410	1135	139	958	20	169	696	0	33	82	11335	4793
4.9	11	259	17	0	68	1307	13371	749	11	70	215	25620	159	84	200	177	0	50	125	439	1011	103	914	30	183	732	12	0	37	11194	4680
5	11	262	0	0	59	1280	13481	783	26	84	203	24817	122	47	161	77	61	0	72	489	975	152	1036	13	211	663	0	20	77	11362	4938
5.1	17	303	38	31	78	1387	13662	811	43	100	155	25039	128	80	181	42	127	158	201	421	1025	0	1139	45	230	622	0	0	59	11451	4851
5.2	15	252	45	34	85	1375	14320	813	66	91	146	25024	142	25	127	34	174	99	137	552	1001	105	904	0	244	554	0	0	31	11194	4889
5.3	4	209	0	10	56	1255	14228	651	33	87	241	23772	194	143	189	130	151	172	196	466	1022	73	1107	25	213	651	0	0	65	10944	4807
5.4	10	255	30	11	66	1313	14348	702	24	69	176	22913	103	203	177	113	67	66	74	508	1138	25	1012	30	179	624	5	0	52	11162	4762
5.5	13	246	19	21	57	1309	12334	691	4	93	156	22881	112	42	162	70	7	107	130	485	1034	125	1141	70	146	563	7	0	27	11544	4872
5.6	0	167	0	0	57	1443	9986	697	40	162	217	27294	206	74	212	76	83	105	116	676	1028	99	1304	0	215	545	7	0	44	11754	4930
5.7	34	241	0	0	53	2024	8055	690	77	186	175	36776	202	86	257	143	132	214	87	872	625	169	1196	0	267	564	0	0	44	11792	4779
5.8	31	210	0	9	62	2405	5915	681	67	183	259	43400	251	102	341	103	141	148	145	1002	488	82	983	50	276	557	0	0	85	11865	4560
5.9	36	176	21	8	52	2517	5159	815	93	145	257	46239	285	173	399	116	110	222	203	908	426	127	779	45	253	548	0	0	37	11773	4476
6	11	215	25	19	61	2592	5278	851	79	136	241	46557	237	188	344	187	118	187	133	1155	359	34	630	60	221	513	0	0	43	11669	4338
6.1	37	205	9	8	67	2625	5410	797	42	130	212	44804	247	119	376	89	79	177	128	875	373	141	665	69	260	521	0	0	51	11669	4305
6.2	34	219	25	15	36	2425	6082	860	40	113	248	41958	193	147	359	136	89	152	110	968	481	56	627	10	206	574	13	0	45	11183	4118
6.3	20	200	19	18	67	2074	6902	847	68	156	247	38111	280	148	262	84	110	165	90	787	517	109	727	0	241	508	0	0	11	11067	4277
6.4	30	201	32	35	61	1862	7571	818	25	90	225	35245	191	105	263	99	66	137	125	921	492	147	623	14	189	521	6	0	91	11217	4270
6.5	18	172	21	0	65	1719	8119	709	71	96	238	33545	146	35	237	69	82	137	140	884	522	55	627	19	238	465	37	0	79	11322	4400
6.6	24	212	41	18	69	1699	8966	760	31	109	250	32843	153	61	241	158	66	119	79	684	702	128	621	35	210	537	8	0	24	11218	4405
6.7	19	180	6	0	66	1552	9547	681	56	117	210	31478	132	113	161	64	146	132	125	619	773	123	798	0	148	498	0	0	38	11156	4476
6.8	27	229	15	19	61	1510	10194	681	25	111	190	30614	141	132	233	103	179	206	161	706	732	218	725	51	153	490	0	0	46	10906	4461
6.9	8	160	0	0	80	1450	10928	638	21	136	198	30038	150	60	235	72	95	173	226	704	933	86	648	39	245	524	4	0	66	11004	4466
7	28	181	27	16	78	1355	11344	688	23	108	251	29478	185	127	194	177	60	134	151	545	842	69	554	42	176	574	0	0	18	10882	4282
7.1	41	192	31	26	73	1353	11772	675	18	85	209	28780	178	63	244	58	72	103	136	557	897	6	621	22	186	542	0	17	36	10892	4595
7.2	28	206	12	27	67	1331	11850	677	42	112	181	28205	184	115	176	92	129	184	110	533	882	6	611	29	168	573	0	0	66	10763	4520
7.3	0	224	17	0	54	1367	12115	686	45	115	243	28164	163	93	205	78	123	142	182	432	968	148	629	40	213	537	0	0	69	11112	4525
7.4	0	213	10	0	44	1299	12583	662	11	91	231	27288	40	21	143	91	102	130	141	676	934	85	699	19	210	526	22	6	43	10866	4324
7.5	0	186	12	14	49	1298	12853	663	40	137	275	26538	200	38	171	0	92	52	17	483	897	141	737	41	238	575	0	0	0	10614	4534
7.6	29	203	25	34	59	1243	13096	643	58	104	235	26215	172	55	220	70	171	129	100	598	929	41	537	67	250	527	0	0	29	10801	4616
7.7	8	191	14	14	85	1264	13230	591	42	109	229	26208	162	66	192	98	72	101	128	480	1042	133	649	49	218	536	49	0	48	10943	4311
7.8	16	244	23	36	95	1302	13461	688	53	97	219	25617	130	97	188	125	55	124	152	466	1002	73	729	0	164	593	12	0	54	10750	4426
7.9	17	209	43	26	86	1241	13529	669	59	102	277	25695	147	105	203	63	79	130	155	558	1077	44	586	47	234	575	14	0	106	10924	4536
8	7	220	25	35	67	1216	13576	704	31	121	186	25411	123	123	196	90	115	69	177	508	1002	36	653	20	161	572	8	22	94	10751	4480
8.1	0	196	0	0	71	1262	13457	653	34	151	220	25131	154	143	145	93	86	63	91	385	982	158	764	72	192	626	0	7	46	10800	4539

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
8.2	0	194	23	17	49	1191	13402	703	43	108	283	25327	115	61	128	75	101	136	121	468	998	175	627	9	216	588	0	0	42	10673	4679
8.3	28	195	30	0	99	1257	13614	696	38	93	247	24768	111	13	168	0	131	93	74	445	920	125	726	15	202	573	0	0	50	10930	4407
8.4	0	212	9	0	56	1184	13470	640	38	86	240	25215	145	23	154	68	36	105	146	472	947	108	633	49	242	553	5	0	46	10916	4451
8.5	0	207	0	0	93	1167	13509	747	55	112	235	25071	124	75	155	83	35	131	110	385	920	92	741	20	217	609	0	0	53	10930	4487
8.6	16	259	19	17	73	1183	13717	646	32	90	190	25102	153	82	96	101	124	55	132	513	916	57	808	35	191	598	0	0	29	10754	4597
8.7	32	216	19	36	72	1170	13446	694	55	136	258	24786	140	79	161	41	126	81	207	478	1088	41	714	65	224	557	0	0	40	11079	4513
8.8	0	195	0	15	67	1167	13291	678	69	120	205	24380	144	85	185	78	109	101	130	418	912	101	801	0	220	554	13	0	43	10947	4544
8.9	29	253	13	19	63	1161	12802	627	14	101	225	24596	115	35	124	115	87	76	68	378	924	124	814	54	212	606	0	0	70	10875	4485
9	0	233	0	0	64	1188	13070	632	33	100	175	23791	173	35	136	68	76	84	187	458	933	102	785	38	208	574	27	0	102	10799	4498
9.1	8	220	6	0	57	1219	12927	597	49	78	183	23368	139	55	96	42	0	44	180	390	917	62	731	0	193	557	20	0	104	10586	4339
9.2	27	267	0	20	79	1154	12685	620	52	114	198	22981	168	33	177	61	56	120	80	492	938	155	884	29	217	560	0	0	46	10273	4439
9.3	6	266	30	11	106	1173	12758	585	20	85	235	22857	200	92	157	83	97	79	106	358	929	135	811	53	189	540	0	0	22	10434	4313
9.4	15	210	28	10	72	1180	12347	579	40	122	193	22297	162	88	119	31	119	95	95	478	900	112	885	13	205	587	29	0	28	10595	4329
9.5	0	194	5	20	80	1234	11993	604	30	91	212	22380	151	95	198	93	123	66	120	409	930	47	928	64	191	572	0	0	62	10512	4267
9.6	0	254	33	26	75	1229	12262	688	59	114	201	21878	92	83	117	89	77	145	171	417	883	62	938	13	170	600	0	0	63	10111	4417
9.7	29	229	0	14	66	1129	12018	597	43	111	164	22066	125	43	150	127	145	55	176	467	935	40	871	29	176	567	18	0	0	9987	4348
9.8	0	258	36	0	70	1125	11526	599	46	76	169	22255	129	94	115	80	121	114	135	497	834	118	1100	59	181	580	4	0	66	10250	4534
9.9	0	225	0	18	68	1119	11133	533	56	97	157	22888	153	30	150	96	140	54	27	405	834	72	969	29	191	507	12	0	25	10166	4357
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10.1	27	249	14	11	60	1168	11318	915	0	127	163	23415	123	80	155	76	90	60	88	510	1022	84	884	43	182	539	8	15	37	10773	4579
10.2	25	214	38	33	75	1272	11603	759	35	102	164	24016	184	46	185	59	64	185	99	616	957	167	1000	42	239	531	12	0	17	11393	4499
10.3	27	200	18	6	81	1373	9727	758	0	81	158	27179	101	20	206	17	79	85	46	765	775	110	1136	8	211	537	0	11	23	11310	4576
10.4	0	162	5	5	68	1786	6814	750	43	127	212	34179	186	125	307	153	83	98	168	838	585	96	852	0	234	511	0	60	61	11688	4450
10.5	22	199	12	0	48	2147	4470	769	71	143	188	38454	186	50	272	50	120	72	172	980	388	0	787	20	251	484	14	0	61	11479	4298
10.6	62	156	19	7	48	2188	4199	767	86	126	192	39417	246	97	280	74	109	176	167	900	415	59	733	18	267	466	0	0	59	11723	4431
10.7	15	130	0	17	49	2135	4697	718	76	132	197	38745	206	113	343	148	149	137	116	828	343	243	736	49	211	520	0	8	52	11133	4347
10.8	25	192	19	32	66	1997	5425	718	73	138	210	37178	208	154	302	93	123	153	101	937	405	0	636	76	194	499	0	0	60	11159	4182
10.9	39	181	28	6	53	1843	6230	699	67	71	256	35378	148	137	189	54	44	113	168	703	528	0	680	31	218	505	0	0	35	11249	4123
11	17	160	18	7	48	1893	7011	773	29	131	248	34429	149	97	193	88	110	187	158	655	701	89	610	23	215	500	0	0	56	10753	4289
11.1	7	178	0	0	74	1675	8308	755	37	111	243	32612	174	134	175	30	111	87	73	771	691	54	598	0	192	532	0	0	43	10822	4336
11.2	0	175	18	0	46	1600	8953	799	55	117	241	31280	188	45	236	68	52	63	76	674	719	49	622	0	219	501	30	16	73	10579	4342
11.3	21	184	17	12	48	1579	9632	782	35	90	280	29928	176	74	212	62	125	82	90	691	789	0	698	27	193	531	0	0	57	10811	4369
11.4	21	173	5	10	55	1464	10212	759	34	136	219	29389	177	49	250	71	88	136	106	562	868	87	575	17	261	526	0	0	29	10472	4368
11.5	11	185	0	0	65	1450	10504	650	40	76	254	28514	155	37	243	57	80	49	85	542	798	17	625	51	241	504	0	29	26	10558	4302
11.6	7	184	15	0	51	1354	10862	695	40	88	218	27927	112	38	183	68	101	42	134	580	853	180	572	0	151	551	26	20	80	10513	4361
11.7	12	222	18	13	70	1322	11386	715	31	102	251	27239	150	0	177	42	86	0	37	527	854	95	651	23	221	519	0	12	5	10838	4471
11.8	14	171	13	0	48	1226	11684	653	50	76	224	26812	138	40	138	79	90	56	167	534	968	132	645	35	194	557	36	0	50	11115	4627
11.9	35	194	40	23	73	1328	12181	670	38	105	229	26162	128	52	163	118	68	107	553	900	121	666	12	202	577	8	0	29	10660	4467	
12	14	185	0	0	77	1313	12385	653	15	111	234	25833	143	93	154	111	33	67	111	547	914	116	535	53	224	578	0	0	26	10576	4409
12.1	5	210	9	5	60	1202	12659	635	37	126	237	25260	117	43	203	41	121	19	117	481	904	0	717	21	181	531	0	0	37	10874	4448
12.2	12	164	30	35	63	1189	12908	649	30	127	229	24771	163	127	152	97	117	119	151	453	996	193	615	20	165	550	0	0	91	10783	4299
12.3	9	198	25	18	89	1266	12927	669	39	76	230	24404	164	47	186	66	52	133	126	501	1068	130	555	23	233	540	7	0	58	10760	4504



Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
12.4	0	199	20	8	69	1235	12882	624	46	104	196	24240	115	7	144	59	83	101	175	462	934	0	730	36	174	541	0	0	48	10781	4573
12.5	0	193	32	15	66	1131	12845	617	25	93	257	24172	134	54	186	32	113	99	180	370	1015	208	719	29	227	575	0	0	52	10805	4486
12.6	12	199	7	0	65	1166	13213	646	16	106	214	23964	96	0	193	0	150	127	213	547	1004	54	678	22	213	523	30	0	115	10670	4585
12.7	0	208	5	6	46	1167	12817	682	19	68	211	23830	134	77	145	67	37	105	190	429	985	94	715	0	189	544	41	0	7	10984	4510
12.8	0	195	22	25	95	1168	12672	656	61	128	223	24011	152	63	179	103	92	46	108	462	1090	105	746	34	201	563	0	0	47	11090	4610
12.9	16	177	24	13	81	1169	12993	587	55	128	210	23901	218	77	129	32	108	160	74	432	891	138	616	64	248	582	0	0	38	10620	4431
13	26	221	35	32	73	1178	12766	648	64	100	232	23706	137	54	168	47	89	60	169	427	963	95	786	53	189	560	0	0	76	10767	4495
13.1	14	249	23	18	71	1087	12815	550	47	110	274	23544	156	29	205	68	119	186	180	454	973	94	864	64	249	496	0	0	37	10779	4415
13.2	0	212	0	5	68	1152	12529	597	20	70	161	23208	69	13	127	75	73	70	122	463	910	56	824	28	231	552	0	0	60	10621	4482
13.3	13	205	0	0	61	1136	12595	645	46	100	230	23392	96	22	136	48	131	115	125	453	927	10	736	0	201	582	0	0	37	10737	4285
13.4	9	256	0	7	86	1127	12402	661	29	109	203	22756	130	48	229	52	103	78	66	370	916	32	709	27	188	553	0	0	18	10347	4529
13.5	30	226	28	19	79	1153	12296	644	48	91	156	22524	147	47	193	58	113	93	168	549	930	119	861	0	206	577	0	0	52	10879	4467
13.6	19	296	10	9	43	1156	12333	691	25	81	195	22760	147	31	172	37	62	84	132	373	922	132	900	29	204	538	11	16	41	10549	4432
13.7	0	249	23	0	65	1159	12019	779	50	71	189	22834	130	58	102	76	95	139	120	386	809	33	863	20	189	611	0	0	52	10275	4457
13.8	12	269	33	8	77	1173	12013	773	25	97	203	22416	128	45	102	125	65	61	94	438	915	67	860	59	198	585	35	0	41	10403	4479
13.9	29	276	28	29	89	1272	12292	829	50	108	206	22741	194	8	186	90	75	124	100	387	908	49	919	0	207	568	0	0	30	10535	4325
14	13	235	21	35	62	1301	11529	634	23	115	199	23026	163	65	144	136	100	62	88	504	1017	140	906	65	184	576	11	0	36	10421	4431
14.1	17	229	30	24	81	1317	10727	580	0	115	172	24211	160	38	129	42	98	60	94	431	937	93	857	85	214	539	0	0	0	10293	4248
14.2	0	207	0	0	80	1295	10391	566	27	100	129	23401	126	17	156	0	90	73	163	432	896	294	999	19	233	543	0	0	36	10508	4560
14.3	0	177	0	0	57	1330	8798	593	60	89	161	23590	98	71	142	70	144	146	54	627	945	83	964	19	160	506	0	0	29	10168	4419
14.4	24	178	29	28	72	1533	6992	695	49	101	188	28110	92	71	195	70	65	31	75	582	789	47	930	76	154	506	0	6	16	10419	4268
14.5	14	166	15	0	68	1933	5073	766	39	128	213	38240	200	144	255	148	114	103	142	752	600	110	891	67	184	538	0	0	67	10273	4262
14.6	21	163	28	15	55	2281	3970	794	32	144	235	43117	224	193	331	116	136	123	59	836	457	0	720	58	225	501	0	0	49	10452	4071
14.7	23	132	14	0	39	2279	3792	814	76	168	212	42063	323	172	349	157	135	176	118	863	508	44	752	62	237	547	0	0	64	10445	4055
14.8	0	198	20	20	57	2272	4334	838	90	130	283	40408	240	90	353	82	94	139	121	907	393	113	811	34	259	529	0	0	51	11142	4137
14.9	27	153	19	20	56	2210	4988	789	97	128	274	38990	257	196	346	136	147	139	95	941	587	120	646	32	171	535	9	70	76	10885	4088
15	34	197	23	10	59	2040	5626	742	41	105	216	36827	217	125	265	115	89	134	163	877	371	129	708	37	220	490	0	0	60	10936	4131
15.1	5	167	8	7	46	1908	6384	703	79	134	221	35402	190	81	256	74	144	137	112	864	548	92	734	12	206	471	0	8	39	10698	4170
15.2	5	142	7	0	38	1807	7219	709	5	102	217	33302	207	86	209	105	14	110	150	695	618	176	637	56	220	511	0	12	13	10518	4185
15.3	0	178	4	5	46	1629	8113	693	38	124	208	31584	146	134	188	135	80	95	83	807	524	87	732	21	182	495	0	0	43	10562	4253
15.4	5	198	0	4	64	1537	8903	699	48	82	205	29989	146	53	189	101	131	131	127	781	674	72	655	16	197	487	0	0	52	10138	4069
15.5	0	172	40	0	55	1493	9588	666	69	109	237	29533	124	79	183	149	114	91	109	804	724	71	565	37	176	521	0	0	47	10645	4167
15.6	19	197	5	12	49	1473	9860	577	65	113	312	28757	164	20	175	0	152	116	83	658	738	82	673	58	204	469	0	0	15	10382	4327
15.7	18	211	10	25	113	1390	10281	604	33	60	171	27749	160	49	162	107	138	163	95	698	678	82	733	36	198	521	0	28	46	10504	4245
15.8	16	154	0	0	36	1348	10688	627	45	102	203	27176	144	86	167	64	150	121	117	600	728	77	624	19	192	542	0	0	66	10249	4080
15.9	12	193	35	46	87	1314	11079	666	63	73	265	26650	139	7	153	40	104	95	88	550	848	137	795	21	221	515	0	0	79	10682	4368
16	0	150	10	0	38	1337	11175	645	14	82	201	26113	109	115	218	133	34	134	211	528	769	157	639	13	176	528	42	9	81	10654	4438
16.1	8	200	26	31	72	1354	11622	621	7	117	195	25474	80	13	145	73	76	75	180	537	865	166	697	45	190	536	0	15	73	10622	4215
16.2	21	168	15	30	82	1288	11950	572	49	100	258	25096	158	79	159	98	113	152	166	454	915	114	654	27	162	590	0	0	22	10092	4243
16.3	0	161	0	0	58	1193	11779	611	14	95	202	24504	138	39	153	66	105	97	121	502	937	164	594	61	181	530	0	0	43	10597	4271
16.4	0	195	0	16	58	1219	11970	567	24	91	224	24053	133	0	119	85	102	58	67	430	867	61	637	39	206	564	16	12	30	10359	4151
16.5	12	212	24	12	54	1158	11865	566	28	104	200	23294	130	69	180	88	95	18	90	453	943	41	673	65	208	549	0	62	15	10372	4434

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
16.6	8	161	26	0	52	1102	12321	638	70	147	245	23613	190	165	178	83	0	118	166	463	859	42	589	27	199	605	6	0	57	10696	4366
16.7	21	171	34	11	59	1130	12041	585	24	61	197	22838	129	139	207	123	52	0	86	492	980	0	646	6	144	580	9	53	34	10134	4237
16.8	16	194	41	7	92	1103	12009	621	35	116	194	22641	164	141	148	67	18	143	139	434	880	94	554	24	175	601	0	0	81	10347	4280
16.9	0	160	0	0	61	1039	11778	595	51	83	188	21811	125	60	154	67	98	77	108	423	891	67	656	20	206	518	0	18	13	10579	4249
17	0	204	4	13	73	1036	11965	622	41	81	191	22068	132	84	187	164	116	148	92	447	901	83	711	10	185	622	0	0	63	10323	4210
17.1	0	149	17	12	89	1058	11833	624	31	91	186	21937	151	100	118	123	117	51	164	474	925	123	525	7	146	533	4	0	41	10204	4117
17.2	0	188	9	7	53	1029	11489	565	34	88	165	21695	166	5	138	68	140	97	74	323	882	104	652	0	228	506	0	8	13	10275	4279
17.3	0	179	8	0	64	1129	11362	603	49	88	172	21300	130	0	98	69	46	43	98	355	891	75	635	17	255	540	0	0	42	10341	4341
17.4	0	196	0	0	86	1082	11425	549	34	85	214	21259	79	9	121	58	33	0	111	322	831	149	749	46	194	515	7	39	41	10320	4164
17.5	0	190	11	6	74	1161	11434	567	48	94	228	21566	99	40	125	70	60	102	106	294	830	14	702	28	179	556	0	0	69	9950	4369
17.6	0	206	7	13	59	1198	11298	567	30	114	161	21805	157	40	179	65	145	70	60	441	874	22	699	55	193	570	0	0	15	10282	4259
17.7	0	192	21	0	75	1118	10868	521	38	91	195	21998	122	57	123	65	58	0	91	381	839	100	846	31	205	540	15	19	34	10488	4304
17.8	5	260	15	0	65	1087	11047	559	50	84	227	22326	158	0	163	21	66	93	100	425	837	91	741	14	210	543	0	0	7	10481	4439
17.9	0	240	6	0	76	1170	11599	573	29	104	182	21988	98	18	91	58	94	132	5	349	835	75	842	53	176	584	0	0	14	10267	4240
18	16	257	0	10	67	1167	11491	564	33	94	191	22015	116	75	161	146	47	102	136	444	881	59	842	41	171	590	0	0	62	10273	4477
18.1	22	226	0	22	74	1216	11321	539	47	124	149	22420	161	9	152	59	133	113	85	488	862	74	1012	40	219	501	0	0	49	10343	4321
18.2	7	202	22	10	91	1244	11181	565	37	138	199	23645	128	14	159	0	99	129	149	569	870	128	957	27	194	523	0	0	86	10601	4510
18.3	0	183	10	0	58	1453	8410	557	39	132	209	29895	201	18	225	40	100	55	484	901	67	846	37	269	514	0	0	104	10690	4457	
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18.5	25	190	35	21	53	2241	4041	695	60	136	240	40230	298	105	307	102	158	118	149	817	529	55	946	45	260	498	0	0	17	11053	4393
18.6	36	192	44	31	60	2278	4156	781	70	123	251	41252	219	160	348	139	54	138	238	851	538	13	712	54	181	500	27	23	81	11121	4180
18.7	30	173	31	17	75	2120	4562	754	49	106	251	39384	187	73	325	81	21	78	83	796	353	61	772	41	194	475	0	25	36	10773	4319
18.8	24	170	0	18	42	2039	5491	799	78	124	216	37948	206	127	297	78	113	139	76	873	372	92	686	14	254	473	0	0	11	11022	4401
18.9	29	182	20	5	66	1971	6187	832	26	97	202	35931	202	61	258	36	148	80	111	845	509	62	793	6	249	478	0	0	26	10710	4196
19	9	197	13	0	54	1740	7040	700	75	105	208	34373	169	148	220	108	117	138	176	788	599	111	644	23	204	496	5	6	64	10574	4191
19.1	44	193	25	55	82	1700	7837	793	43	106	175	32440	119	41	222	49	85	38	101	809	552	27	628	0	201	472	0	23	61	10732	4293
19.2	20	202	9	8	54	1647	8630	708	76	151	263	31152	160	68	178	34	210	94	141	717	603	70	615	50	241	416	0	0	14	10580	4172
19.3	0	179	0	11	64	1405	9399	664	37	126	230	29579	208	53	191	76	128	108	144	667	743	63	528	32	201	478	0	0	105	10362	4071
19.4	22	196	25	29	95	1450	9958	614	39	118	215	27877	140	37	196	71	84	132	143	666	690	226	664	50	217	465	0	0	54	10551	4298
19.5	0	191	45	4	80	1415	10322	620	67	130	188	26939	187	112	197	100	107	82	89	573	859	55	546	13	168	534	0	0	29	10304	4314
19.6	10	186	0	7	38	1309	10579	639	30	100	239	26239	141	95	198	95	138	116	177	517	643	198	862	59	190	524	0	0	34	10498	4223
19.7	32	183	21	27	37	1271	11231	658	48	66	224	25284	109	5	197	31	100	92	124	640	842	43	688	0	231	494	14	5	55	10451	4204
19.8	19	216	32	28	73	1252	11659	627	37	99	214	24942	184	54	206	72	54	140	155	575	940	155	613	53	235	544	42	0	70	10278	4056
19.9	12	186	8	17	87	1118	11838	539	49	92	235	24329	148	76	141	56	167	107	137	517	844	0	594	57	211	500	0	0	47	10329	4207
20	13	174	13	12	87	1112	11982	573	47	85	207	24001	180	75	199	77	36	111	158	519	883	67	560	25	188	564	20	0	52	10382	4248
20.1	0	191	27	20	101	1173	12125	570	41	97	208	23396	101	49	172	49	0	15	152	391	845	27	623	47	201	525	21	0	0	10339	4179
20.2	15	183	30	39	83	1157	12237	601	0	96	223	23027	54	33	132	104	140	52	180	511	766	62	594	48	181	507	0	0	0	10071	4192
20.3	15	204	7	17	72	1135	12031	568	31	80	217	23107	110	0	109	44	158	87	109	479	751	30	723	33	184	510	0	0	14	10301	4172
20.4	22	173	10	16	98	1141	11938	589	44	74	219	22780	101	56	176	113	60	37	110	458	1002	44	600	34	218	565	0	9	26	10324	4243
20.5	13	184	23	23	82	1111	11871	540	29	119	224	22062	106	5	70	108	107	101	161	386	923	0	671	21	195	537	0	0	24	10231	4306
20.6	30	221	26	25	69	1142	12105	592	50	85	199	22624	131	16	126	0	186	73	140	446	820	37	762	36	232	508	0	0	53	10403	4372
20.7	0	207	26	8	68	1141	12035	563	52	146	241	22658	115	38	219	41	42	53	207	469	888	131	712	44	222	498	0	0	40	9944	4323

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
20.8	0	217	10	19	81	1157	12053	591	63	119	205	22821	136	74	181	153	28	119	188	434	978	154	825	26	176	554	52	6	52	10360	4377
20.9	0	188	11	0	99	1129	11927	651	52	100	185	22152	119	20	117	53	54	101	126	448	909	88	693	31	176	515	57	0	30	10220	4157
21	26	207	22	0	59	1147	12059	540	39	80	207	21600	48	0	140	90	120	83	112	438	929	57	817	43	200	529	0	0	83	10167	4162
21.1	17	206	9	8	76	1043	12085	669	48	106	194	21764	134	21	93	56	105	168	124	304	888	108	699	40	214	526	0	0	16	10041	4292
21.2	0	184	28	16	76	1133	11965	620	42	121	243	22453	171	89	160	75	98	84	137	421	926	122	704	81	189	545	17	0	19	10086	4251
21.3	5	230	10	39	77	1115	11881	577	30	77	225	22321	133	53	131	81	86	106	132	481	906	97	722	57	185	552	0	0	43	10228	4415
21.4	25	204	19	20	79	1151	11192	606	21	82	166	22234	115	42	134	78	133	87	87	430	888	0	670	0	212	535	0	0	33	10044	4321
21.5	29	196	7	10	59	1134	11124	618	62	76	150	21709	92	41	118	63	112	67	132	480	887	106	870	0	185	558	0	0	34	10148	4307
21.6	5	227	5	0	70	1053	11087	614	30	95	171	21757	120	50	98	52	93	32	89	359	929	26	824	30	163	479	37	10	23	10084	4096
21.7	0	282	12	34	59	1135	10684	579	27	66	118	22013	162	36	114	0	135	42	96	472	855	79	841	0	214	574	0	0	8	9925	4321
21.8	9	241	31	29	77	1151	10704	461	50	72	171	22315	131	131	117	141	43	116	179	502	1003	94	744	34	153	602	0	0	51	10324	4354
21.9	0	208	14	15	48	1194	9552	462	70	77	161	22398	141	33	175	43	123	81	119	418	894	114	864	17	192	490	0	0	28	9972	4366
22	0	187	0	0	50	1322	8223	507	50	123	188	25164	100	17	156	44	50	51	120	503	926	0	1248	56	208	524	0	0	21	10144	4349
22.1	30	186	24	18	47	1653	7133	596	51	91	181	30686	94	0	185	4	75	91	39	574	851	30	1135	19	208	565	0	0	27	10450	4583
22.2	26	163	17	23	69	1951	6080	711	79	128	245	37208	249	210	305	166	57	167	154	672	687	87	972	49	203	534	0	0	5	10651	4420
22.3	41	174	10	12	57	2096	5172	746	86	114	266	39271	212	105	294	41	71	212	124	747	580	59	746	19	215	531	0	0	41	10404	4281
22.4	12	144	15	8	55	2101	3939	722	75	112	189	39334	197	161	329	144	128	135	136	809	647	66	792	40	196	491	0	32	53	10594	4186
22.5	16	118	9	11	51	2140	4294	648	88	121	243	38842	231	151	323	101	175	166	67	972	585	33	733	80	247	468	0	0	22	10731	4208
22.6	0	141	26	6	48	2011	5050	753	86	84	233	36791	198	122	291	112	129	125	125	825	482	37	797	0	204	486	27	21	95	10631	4341
22.7	31	137	11	0	60	1963	5889	736	47	125	219	35269	135	136	244	195	112	86	141	800	410	101	746	41	166	463	6	23	67	10376	4159
22.8	28	124	0	0	40	1746	6666	732	80	130	239	33503	181	114	248	135	110	131	132	713	559	104	615	6	221	483	0	0	59	10689	4189
22.9	35	133	14	0	37	1672	7747	737	41	88	230	31386	126	63	199	93	117	55	177	777	557	112	620	0	201	472	0	32	58	10527	4264
23	0	161	0	0	48	1604	8340	720	23	100	173	30069	224	135	253	117	123	40	104	718	647	90	701	43	155	529	0	6	40	10539	4271
23.1	0	164	13	0	61	1480	9453	649	61	85	236	28315	105	19	163	65	30	134	759	630	36	661	11	189	512	0	62	53	10439	4298	
23.2	0	187	6	10	36	1447	9890	648	0	79	266	27888	150	103	211	69	131	117	98	615	747	109	631	56	180	471	0	0	12	10314	4216
23.3	0	164	0	0	54	1389	10015	675	39	102	206	26965	130	84	149	100	120	128	150	568	651	71	555	7	182	528	0	0	60	10344	4203
23.4	0	163	8	0	59	1341	10250	585	24	85	197	26299	126	114	177	140	133	61	102	634	708	103	656	43	159	521	0	0	41	10266	4215
23.5	15	166	0	0	22	1375	10695	614	36	87	230	25531	95	36	149	99	30	101	172	541	762	109	514	30	214	497	16	0	50	10134	4139
23.6	17	186	0	13	51	1267	11103	625	0	102	222	24649	126	102	140	107	76	68	111	583	764	126	647	13	176	529	0	0	29	9981	4249
23.7	23	164	6	0	69	1265	11368	605	29	83	156	24456	129	102	200	62	35	65	137	532	801	76	611	25	167	562	28	13	72	10268	4140
23.8	0	177	0	0	64	1130	11444	661	30	111	181	24167	150	68	192	77	133	92	88	546	847	79	644	0	195	531	0	0	72	10089	4104
23.9	25	180	19	28	88	1202	11819	598	44	102	209	23748	77	0	157	0	61	86	113	526	778	35	565	22	190	504	11	0	45	9987	3998
24	0	171	11	12	59	1121	11941	602	14	97	269	23211	128	8	149	41	12	37	81	507	881	139	628	34	208	504	0	0	24	10361	4304
24.1	18	194	19	28	115	1160	12128	634	30	136	180	22959	169	69	158	105	81	0	103	401	992	241	655	67	218	546	0	0	44	10108	4453
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24.3	32	211	24	20	85	1158	12135	527	30	83	208	22412	107	17	104	30	58	66	113	396	790	270	566	37	173	513	0	0	45	10045	4192
24.4	8	185	10	0	46	1161	11983	626	41	78	265	22351	143	91	165	23	120	112	94	428	922	64	666	13	176	491	23	0	0	10180	4124
24.5	31	222	30	20	64	1175	11590	687	0	68	220	22780	136	63	111	85	64	85	154	484	952	37	755	28	180	525	0	15	67	10344	4159
24.6	21	182	9	18	75	1211	11107	578	35	104	185	23874	163	89	156	103	15	0	12	483	884	24	672	38	180	561	6	19	31	10159	4273
24.7	12	200	13	28	69	1287	10883	625	30	75	247	24134	185	71	147	27	138	154	101	460	810	0	569	46	186	495	0	0	56	10008	4304
24.8	17	171	20	16	73	1336	10515	532	58	79	180	24602	148	0	140	50	86	83	73	473	946	84	692	80	235	544	44	0	68	10229	4114
24.9	20	217	17	13	70	1335	10579	580	45	110	180	24625	107	24	129	152	42	56	29	372	788	109	678	33	194	616	0	8	64	10045	4385

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
25	24	199	22	14	76	1352	10603	667	48	115	181	25332	129	27	187	55	128	79	132	440	924	128	661	5	203	547	15	0	18	10042	4296
25.1	0	209	19	20	81	1401	10009	693	45	101	209	25835	181	73	169	129	117	66	152	441	848	6	733	50	200	540	0	0	35	9827	4119
25.2	0	187	30	0	67	1367	10713	650	42	111	176	25379	165	110	122	123	61	120	167	328	853	31	762	14	170	593	0	0	46	10130	4370
25.3	0	189	0	0	70	1460	10655	605	74	63	172	25704	186	78	287	90	135	133	165	451	867	176	633	0	199	549	0	12	30	9930	4240
25.4	16	213	11	0	50	1418	9463	618	34	86	176	27371	185	92	375	65	74	135	136	438	850	88	870	32	162	584	0	0	55	10084	4336
25.5	35	199	7	0	40	1373	7857	555	28	126	177	26736	146	98	157	117	137	135	93	534	757	80	767	19	151	493	0	0	52	9748	4239
25.6	8	162	7	13	60	1439	8088	666	0	103	193	27527	87	43	193	13	62	74	132	493	810	23	760	35	183	532	0	0	52	9976	4080
25.7	27	203	23	0	44	1518	8188	717	40	91	235	29835	159	79	209	86	142	110	102	470	831	91	782	36	205	484	0	0	19	9984	4275
25.8	18	185	19	12	87	1622	7806	674	49	133	203	30251	143	13	204	0	52	0	151	509	784	68	808	57	216	486	0	0	36	10206	4151
25.9	21	190	6	0	53	1774	7126	737	67	108	265	31439	134	47	219	53	94	177	165	615	820	78	1006	0	252	522	31	0	60	10411	4430
26	28	174	7	6	42	1978	5809	631	29	116	200	34511	220	183	291	125	187	16	90	591	846	95	966	62	190	579	0	0	17	10425	4588
26.1	22	159	10	7	39	2191	4444	755	75	113	266	38267	227	150	324	166	98	104	134	659	749	46	880	0	201	558	0	16	60	10450	4336
26.2	39	164	41	13	60	2207	4107	736	72	127	263	39485	143	115	267	56	113	221	59	738	578	0	981	21	169	499	0	0	16	10357	4291
26.3	18	164	29	0	38	2243	4122	679	28	123	202	40092	203	167	360	84	189	235	106	746	495	95	844	72	215	494	0	0	84	10759	4320
26.4	36	180	31	5	40	2117	4541	763	60	90	256	38060	187	163	311	123	104	122	154	922	484	0	705	36	173	468	0	0	39	10525	4137
26.5	21	164	11	16	63	2049	4870	695	71	121	228	37456	202	81	282	53	82	71	56	803	440	0	689	47	242	500	0	16	23	10658	4013
26.6	26	154	18	19	51	1956	5554	774	75	101	210	36534	181	103	227	148	77	104	155	918	508	79	638	21	186	483	0	0	28	10580	4315
26.7	29	222	37	0	56	1849	6280	755	35	139	233	35308	226	141	277	92	137	199	153	946	460	38	682	51	205	520	16	0	16	10542	3977
26.8	20	188	13	14	48	1737	6800	698	60	126	192	33706	159	139	220	123	112	112	56	835	493	99	584	44	179	469	5	10	66	10693	4064
26.9	0	159	9	12	57	1651	7473	725	88	121	200	32649	182	76	241	69	75	90	43	856	501	61	599	0	222	438	4	0	39	10530	4164
27	17	186	27	19	76	1531	8361	705	61	133	251	31352	127	62	224	37	162	144	142	822	574	143	587	56	183	490	0	0	26	10612	4158
27.1	23	166	0	0	34	1502	8704	683	21	92	229	30183	143	98	249	64	63	94	160	785	608	137	607	18	193	481	12	0	77	10026	4280
27.2	18	200	22	9	58	1405	9282	671	54	116	197	29323	127	7	193	59	62	28	79	802	714	47	589	30	188	523	0	31	55	10149	3992
27.3	0	174	0	0	49	1342	9881	671	44	55	242	27898	195	109	207	109	86	31	119	697	656	154	680	7	171	494	9	19	30	10150	4230
27.4	9	195	41	20	103	1335	10509	701	43	63	213	27256	101	27	204	83	85	81	45	638	796	64	576	31	168	490	0	0	40	10100	4433
27.5	10	179	40	12	65	1360	10715	615	62	66	220	26532	166	83	188	94	76	34	186	636	761	104	583	50	179	521	39	47	69	10201	4241
27.6	5	160	10	13	75	1354	11163	627	25	89	228	26036	139	37	137	57	74	79	73	597	837	124	614	61	187	541	0	0	19	10147	4414
27.7	0	157	0	0	34	1270	11568	660	62	71	264	25689	120	79	185	47	151	113	185	566	823	0	616	0	191	518	0	0	9	10245	4287
27.8	0	152	0	0	64	1190	11869	636	20	128	254	25363	159	55	226	135	59	91	127	538	838	142	732	38	213	516	79	20	26	10228	4406
27.9	0	174	14	28	58	1240	12221	619	37	132	213	24828	144	72	164	25	20	117	0	389	968	0	608	54	146	529	0	0	15	10113	4278
28	21	199	25	18	82	1279	12609	617	51	106	209	24175	104	28	192	49	63	46	166	436	945	67	584	48	216	525	25	12	52	10178	4291
28.1	16	199	17	0	62	1180	12367	607	22	114	184	23965	167	105	201	106	93	18	124	457	983	115	554	27	185	576	6	39	70	10214	4378
28.2	19	206	21	17	87	1180	12677	614	24	88	184	23997	142	42	167	85	103	137	158	396	938	124	684	49	197	572	0	0	23	10286	4346
28.3	0	244	0	0	51	1152	12484	622	12	105	220	33968	128	86	139	94	23	29	77	438	1037	78	582	45	158	567	0	0	26	10462	4204
28.4	8	177	14	0	55	1172	12727	622	5	46	186	23315	154	83	89	88	52	79	74	427	963	101	642	0	172	539	9	0	59	10702	4473
28.5	38	222	11	37	87	1178	12621	730	30	74	207	23353	122	138	237	126	127	95	115	359	1029	75	580	10	140	528	28	0	76	10689	4428
28.6	13	227	28	5	68	1167	12457	629	16	102	227	23511	177	7	161	82	45	122	172	394	1006	128	643	62	222	593	0	7	73	10504	4308
28.7	0	250	15	5	71	1047	12453	597	26	94	166	23031	82	10	69	49	122	9	194	533	997	68	703	8	208	524	11	51	38	10831	4380
28.8	0	215	10	5	68	1141	12435	606	35	90	177	23385	103	12	150	36	104	94	129	426	837	50	642	18	219	522	8	0	40	10575	4374
28.9	4	230	4	5	65	1169	12086	623	14	87	188	23654	211	95	179	186	106	104	62	462	928	86	673	16	180	562	0	0	62	10463	4536
29	0	199	0	4	65	1150	12174	704	8	112	220	24329	138	31	170	67	124	122	107	361	941	121	736	0	183	551	0	0	62	10412	4507
29.1	10	261	13	0	60	1270	12385	675	23	149	223	24272	145	102	164	79	112	96	101	400	923	154	755	64	177	585	25	0	37	10396	4354

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
29.2	29	255	28	31	82	1286	12563	763	0	146	197	24487	181	74	147	43	171	148	109	422	815	78	766	38	208	585	0	0	24	10453	4353
29.3	6	261	0	6	77	1260	12723	621	54	92	159	23486	141	38	159	38	82	112	177	394	1018	89	739	27	225	575	11	0	44	10235	4281
29.4	10	238	28	14	71	1264	12790	670	34	66	170	22884	149	7	181	33	106	79	84	365	992	56	745	0	225	524	9	0	28	10142	4472
29.5	10	257	0	27	90	1214	12403	697	30	110	194	23176	153	99	169	124	57	61	125	549	914	26	907	0	188	602	32	11	77	10516	4332
29.6	16	258	44	39	112	1212	12015	676	23	146	196	22728	172	69	129	85	76	72	58	403	881	0	741	89	202	511	0	0	0	9671	4219
29.7	30	325	16	8	99	1149	10985	608	55	105	178	21881	201	99	190	115	107	154	240	386	801	95	865	27	198	628	0	0	85	9982	4227
29.8	22	250	26	6	95	1131	10691	576	36	121	195	20759	119	40	191	101	122	120	112	413	827	44	878	42	196	555	25	0	25	9911	4148
29.9	9	229	20	14	78	1140	10206	604	58	106	173	20918	108	78	118	91	97	135	69	338	834	88	852	10	159	518	0	0	15	9682	4229
30	15	204	0	0	56	1152	9510	560	43	72	133	20958	147	57	149	127	69	98	176	385	872	116	655	26	151	509	20	0	31	9479	4214
30.1	0	172	0	0	40	1175	8344	690	12	84	171	22187	143	0	143	69	46	49	103	437	825	137	863	20	188	497	0	0	0	9553	4275
30.2	31	165	17	14	46	1377	7477	687	40	73	131	24519	128	92	141	134	99	100	101	440	845	30	1039	15	167	461	0	0	0	10054	4427
30.3	4	118	0	0	31	1578	6053	622	76	153	162	28494	231	139	208	21	33	107	142	574	741	0	831	31	197	529	0	0	17	10412	4554
30.4	20	159	0	7	65	1858	4879	628	90	84	216	35822	153	106	203	55	56	70	101	780	777	58	870	57	184	525	0	43	40	10583	4464
30.5	11	168	17	0	53	2100	4391	668	21	124	229	39704	260	175	264	105	83	69	84	931	403	61	775	93	179	523	0	20	18	11014	4386
30.6	8	148	15	0	54	2117	4576	726	69	171	193	40169	225	194	348	205	13	42	127	943	412	22	778	66	167	542	34	75	47	10885	4175
30.7	42	163	25	0	48	2135	4808	708	22	170	174	39435	205	147	306	163	60	73	105	862	391	100	845	57	168	467	0	22	17	11019	4253
30.8	20	222	44	46	57	2124	5417	738	20	109	231	38258	182	97	265	70	181	115	142	875	480	72	665	43	213	486	0	0	35	10398	4138
30.9	35	188	26	0	41	1873	5850	740	62	87	244	37492	208	190	335	130	141	221	161	874	481	60	734	31	195	486	0	0	65	10356	3951
31	16	189	32	16	68	1842	6442	721	58	113	237	35759	164	93	282	153	177	104	138	850	624	156	621	50	211	485	0	6	41	10555	4311
31.1	17	182	5	16	57	1819	7346	654	51	105	220	34471	139	104	291	130	100	102	89	846	531	35	535	53	181	481	0	0	30	10326	4101
31.2	19	206	11	23	56	1627	7942	704	28	129	222	32865	186	86	248	116	167	124	117	768	605	93	602	49	187	510	10	20	45	10464	4264
31.3	16	137	0	0	33	1577	8630	705	0	114	204	31514	138	51	227	134	78	96	78	815	564	123	621	22	186	534	0	0	52	10528	4231
31.4	0	182	13	8	76	1452	9294	671	59	126	221	30205	149	46	181	82	132	37	154	736	566	40	770	34	141	461	0	0	64	10194	4066
31.5	17	183	13	17	60	1428	9908	692	62	73	287	29202	146	39	203	54	44	17	72	704	630	147	626	35	170	518	0	21	41	10176	4105
31.6	0	145	22	0	62	1411	9864	690	64	114	205	28309	149	92	185	41	89	109	219	633	577	105	722	6	197	499	15	0	28	10253	4276
31.7	5	186	15	10	62	1403	9794	559	32	76	181	27775	146	37	204	35	91	76	123	571	698	51	677	37	228	469	36	0	78	10495	4189
31.8	10	152	29	0	77	1309	10341	582	71	119	235	27362	187	78	196	73	138	90	95	552	721	95	608	30	158	501	0	0	80	10126	4065
31.9	21	179	21	0	46	1344	10376	637	38	88	233	26633	168	50	246	60	89	78	134	656	803	76	530	18	212	478	0	26	47	10195	4284
32	28	179	11	8	55	1241	11168	651	46	92	250	26258	136	52	165	62	119	159	116	463	774	98	620	33	182	496	0	0	46	10518	4237
32.1	12	234	34	12	73	1287	11491	610	51	95	201	25414	136	0	137	94	66	61	167	504	798	254	646	9	191	527	12	0	0	10194	4246
32.2	14	214	0	0	71	1211	11644	655	48	77	242	25060	118	14	163	113	53	77	71	514	851	142	693	34	130	602	0	5	10	9948	4078
32.3	0	189	17	26	66	1250	11938	599	28	96	191	25013	175	87	159	41	123	38	36	479	806	0	550	47	184	495	0	0	0	10017	4158
32.4	5	170	0	0	55	1241	12261	642	34	103	219	24312	122	54	171	99	103	75	124	449	801	44	607	0	184	543	0	0	39	10026	4214
32.5	0	194	40	11	76	1161	12278	620	17	102	213	24270	150	68	152	99	128	70	180	538	884	49	562	22	205	588	35	28	56	10072	4103
32.6	19	182	17	0	78	1150	12264	662	34	88	215	24061	101	53	106	36	64	11	72	514	889	124	613	0	196	521	18	19	58	10123	4131
32.7	20	177	0	0	74	1162	12630	709	10	63	218	23459	135	28	155	77	154	51	79	400	878	40	582	0	164	476	0	0	22	10347	4310
32.8	0	201	14	5	47	1145	12715	633	44	79	225	23495	133	60	157	105	10	144	133	422	926	96	633	0	157	557	0	0	62	10139	4311
32.9	12	214	19	0	67	1161	12590	709	39	63	234	22968	118	108	131	45	149	108	156	427	1018	36	710	5	193	547	0	0	40	10273	4253
33	25	220	23	0	64	1181	12460	648	22	125	214	23327	125	112	133	76	15	125	116	433	932	57	526	47	126	543	0	0	24	10165	4228
33.1	22	159	19	17	63	1207	12593	632	35	96	229	23066	155	51	158	73	80	100	207	400	970	137	659	10	202	537	0	0	8	10390	4469
33.2	13	168	0	0	50	1153	12638	633	51	84	202	23271	119	101	137	70	89	87	178	474	897	121	731	19	193	553	25	0	0	10414	4403
33.3	14	231	10	9	36	1168	12744	638	34	66	187	23166	73	0	83	98	63	43	123	510	952	97	666	0	171	518	0	0	16	10429	4498

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
33.4	7	204	23	12	79	1178	12671	597	13	162	180	23712	137	88	193	47	49	116	134	399	1042	69	719	80	168	534	0	0	74	10531	4454
33.5	0	200	0	0	43	1180	12498	621	35	93	253	23394	157	97	167	67	69	101	130	460	952	49	750	52	206	566	26	0	39	10399	4473
33.6	16	224	0	0	37	1074	12367	634	78	96	223	23122	193	27	193	83	151	60	102	424	909	21	844	43	203	541	16	0	53	10494	4266
33.7	11	263	0	14	66	1282	12510	727	45	123	226	24372	173	151	173	172	51	103	119	477	950	74	636	41	148	618	36	0	29	10292	4295
33.8	12	289	27	15	105	1240	12801	641	64	104	209	23954	114	39	105	121	107	102	149	430	1052	159	818	45	203	594	0	0	36	10455	4548
33.9	34	270	20	28	87	1258	13520	696	63	148	194	24302	116	19	142	102	158	92	131	448	940	114	763	26	213	616	0	0	75	10692	4475
34	0	303	0	0	47	1240	12874	658	30	119	170	24209	133	12	142	100	125	37	211	418	981	126	958	18	186	606	8	0	85	10535	4421
34.1	10	242	0	0	85	1305	12653	641	69	86	194	24178	175	53	157	120	86	133	117	433	873	64	840	0	202	620	0	0	6	10217	4393
34.2	17	267	29	23	74	1398	12117	705	46	87	186	24618	167	37	195	110	153	66	92	426	895	9	797	14	204	616	0	11	20	10194	4496
34.3	18	260	35	25	95	1358	11417	698	58	74	222	24534	117	46	118	0	33	131	121	510	976	80	723	18	218	609	0	0	28	10616	4456
34.4	0	188	0	0	66	1369	10680	685	24	87	207	24682	107	38	196	80	90	135	152	513	906	64	936	23	231	620	0	0	25	10185	4565
34.5	21	204	18	0	72	1528	10336	640	51	62	202	25974	169	85	133	44	90	65	116	499	909	108	756	25	227	558	0	0	46	10552	4471
34.6	7	177	4	12	62	1546	10172	732	48	105	176	28209	158	106	195	105	15	134	160	651	918	24	826	9	152	607	39	0	58	10804	4613
34.7	9	189	30	15	53	1840	7854	696	76	105	192	30180	191	119	202	113	124	105	181	482	873	151	1027	15	209	498	10	0	26	10602	4487
34.8	20	178	0	0	28	1891	5500	653	73	124	142	34272	207	76	198	135	109	73	37	647	783	87	911	8	224	533	0	0	16	10849	4575
34.9	5	164	0	13	45	2148	4706	915	41	127	234	38640	193	98	236	153	145	75	63	855	712	0	789	13	171	530	0	0	0	10960	4536
35	28	135	5	20	45	2304	3968	1410	27	169	228	42117	264	136	313	91	118	183	149	872	451	55	858	75	231	518	0	0	57	11047	4368
35.1	27	192	28	6	55	2349	3955	1023	83	120	207	42442	209	139	337	178	140	227	156	1002	382	0	723	0	169	560	0	0	63	11030	4344
35.2	23	169	31	18	52	2443	4244	826	41	88	189	41692	323	172	379	146	147	62	139	940	513	25	671	28	170	540	15	13	24	11427	4387
35.3	0	156	12	0	36	2320	4651	839	43	114	236	41307	183	85	339	105	127	149	139	874	419	156	841	16	201	469	27	0	33	11249	4381
35.4	42	198	7	17	29	2319	5388	796	59	110	225	40050	191	122	320	123	100	163	156	969	379	73	760	41	211	501	5	18	61	10984	4315
35.5	0	151	0	0	29	2048	6102	818	70	103	252	39027	206	167	309	97	128	62	123	919	575	83	641	30	201	528	14	65	74	11283	4255
35.6	31	210	20	0	70	1960	6750	798	46	69	269	37405	256	112	310	123	141	133	142	784	461	97	713	5	243	493	0	5	0	10900	4148
35.7	33	233	19	19	54	1932	7467	792	58	101	213	36326	214	124	236	71	129	175	178	889	457	30	663	26	222	477	0	0	32	10765	4240
35.8	24	189	5	0	57	1883	8042	708	57	124	270	35051	171	118	203	127	166	111	139	844	533	0	646	33	164	496	0	0	42	10453	4433
35.9	17	221	26	16	65	1766	8716	721	48	106	214	34347	212	146	328	138	84	30	119	792	564	105	708	46	178	531	13	33	42	10397	4191
36	0	205	0	0	33	1780	9360	780	10	100	231	32270	115	41	163	65	106	56	173	779	671	146	669	8	218	525	0	8	68	10535	4238
36.1	25	235	27	35	80	1680	10095	765	40	89	206	31136	204	114	197	174	72	68	128	738	752	73	602	43	188	550	14	18	53	10543	4228
36.2	15	176	13	0	46	1586	10477	692	61	102	261	30647	181	84	243	85	0	107	133	631	726	36	722	0	166	551	18	0	49	10450	4281
36.3	13	207	26	0	64	1528	11135	706	45	115	209	29275	170	98	237	77	113	148	115	522	731	93	709	0	145	537	0	0	28	10532	4554
36.4	7	207	0	0	53	1475	11217	714	33	91	196	28598	105	59	229	67	100	56	129	594	754	94	570	31	185	500	0	0	62	10454	4190
36.5	0	177	34	5	54	1526	11766	632	40	123	271	28257	164	90	162	101	139	58	88	573	807	112	631	61	228	541	0	0	59	10411	4337
36.6	7	206	25	25	61	1447	12314	633	58	76	231	27126	158	87	207	58	67	35	146	536	945	130	754	15	211	558	0	0	31	10789	4526
36.8	29	203	27	13	66	1296	12695	600	63	91	201	26480	128	0	147	0	62	126	116	626	877	9	647	76	210	524	0	0	0	10791	4646
36.9	18	225	26	19	75	1284	12735	654	57	83	236	25770	165	98	193	120	128	137	74	445	880	8	566	37	157	540	0	0	64	10601	4420
37	11	235	29	25	82	1287	12904	597	49	96	225	25392	139	45	158	19	78	0	39	473	936	88	667	40	186	584	23	54	7	10499	4335
37.1	0	193	15	5	58	1238	12989	695	51	63	186	25533	140	75	204	79	78	79	149	466	939	109	628	31	208	569	0	0	42	10792	4534
37.2	11	211	24	10	33	1284	13074	707	52	107	225	25288	156	84	263	153	192	147	164	416	1017	149	496	0	174	571	0	0	0	10733	4482
37.3	13	261	35	34	108	1205	13254	670	63	69	226	24939	140	5	204	37	134	65	127	484	969	78	577	0	229	468	19	26	52	10617	4442
37.4	0	195	0	22	63	1183	13202	654	41	73	217	24904	166	42	198	50	110	86	60	552	1055	57	662	7	225	530	0	0	11	10721	4466
37.5	0	210	16	0	49	1206	13230	710	45	70	227	24447	149	40	100	81	126	84	23	422	849	118	705	23	165	563	0	0	29	10636	4541

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
37.6	7	226	28	6	59	1235	13224	666	24	102	204	24559	128	9	83	90	125	115	114	492	1020	60	674	0	209	532	0	0	45	10682	4443
37.7	11	196	15	9	88	1207	13356	706	27	127	223	24671	149	68	167	123	67	223	203	594	1004	55	640	47	192	634	39	0	30	10801	4523
37.8	22	236	26	9	54	1261	12924	649	67	65	208	24315	109	47	181	60	83	78	140	546	1097	139	683	0	220	560	0	0	56	10894	4496
37.9	12	230	0	15	74	1239	13111	678	83	122	235	25009	140	25	143	50	60	84	80	391	972	71	721	33	211	549	15	0	40	10973	4497
38	0	202	0	0	41	1161	13055	668	21	107	194	24805	93	30	120	0	122	8	154	480	923	50	766	43	184	507	0	0	5	10707	4464
38.1	0	258	5	10	56	1223	12828	707	43	108	242	24455	191	64	132	73	88	73	157	421	978	145	706	25	228	555	14	0	45	10748	4629
38.2	0	275	0	0	74	1159	12879	693	0	89	207	23757	107	0	181	88	248	72	167	503	954	79	808	45	204	525	0	5	22	10657	4529
38.3	0	267	28	22	70	1173	12458	658	0	93	190	23485	129	52	173	83	121	163	166	519	871	34	832	43	198	541	0	0	86	10657	4315
38.4	16	241	0	5	56	1177	12180	611	50	111	296	23821	175	79	177	40	93	149	131	466	988	28	652	62	170	553	22	0	42	10181	4220
38.5	5	212	24	21	79	1168	12388	670	32	44	187	23812	178	41	116	143	128	67	158	399	1092	199	824	0	221	574	46	0	58	10635	4383
38.6	7	269	23	9	57	1195	12812	649	48	93	201	23426	113	23	158	92	100	135	96	454	956	43	746	12	194	564	0	0	24	10282	4233
38.7	31	234	0	16	37	1165	12663	702	47	110	219	23622	160	41	123	71	80	76	96	391	898	40	825	17	196	559	0	0	49	10517	4316
38.8	18	257	19	10	81	1130	12811	706	19	98	177	23773	160	86	203	84	135	122	141	492	888	74	794	32	209	557	14	0	36	10315	4234
38.9	36	281	19	46	92	1119	12868	626	77	120	200	22717	105	0	152	64	157	132	150	419	962	109	905	40	204	587	7	0	33	10214	4335
39	20	239	20	5	73	1155	12724	683	32	93	190	22213	56	25	113	54	112	121	101	452	910	45	775	12	168	514	0	0	50	10270	4276
39.1	16	271	32	0	54	1206	12493	602	76	101	181	22729	126	44	120	52	56	104	51	416	875	98	868	6	161	535	30	0	19	10127	4481
39.2	4	291	6	11	84	1230	11991	607	31	73	165	22611	154	43	176	100	67	119	115	401	869	99	897	18	217	571	0	7	108	10048	4154
39.3	26	253	48	29	79	1158	11773	491	47	86	179	22304	145	37	190	81	126	81	106	416	874	82	808	25	180	534	0	0	28	9773	4283
39.4	14	238	39	10	64	1117	10776	486	45	109	181	23203	131	105	172	85	114	56	107	510	794	45	892	44	138	502	39	5	0	9824	4395
39.5	22	220	25	19	59	1415	9814	567	50	86	211	24944	155	101	153	122	34	119	97	487	867	84	1013	30	110	543	0	0	51	9583	4457
39.6	14	186	10	0	30	1549	8845	724	67	124	220	29638	196	93	264	101	126	88	130	397	878	21	939	41	201	570	0	9	44	10048	4296
39.7	23	184	29	29	74	1861	7028	835	75	122	290	36175	178	89	248	23	156	161	153	492	906	87	725	28	218	505	0	0	46	10314	4386
39.8	45	183	22	16	45	2042	5661	860	89	147	337	43106	214	157	281	122	0	194	126	586	816	77	973	40	198	584	0	0	48	10427	4534
39.9	5	205	8	0	54	2105	4854	904	104	80	307	45096	193	151	316	119	140	136	119	737	814	56	1070	0	222	504	0	0	52	10779	4792
40	44	218	16	17	53	2234	4068	858	101	108	291	44304	215	181	367	179	73	88	148	846	624	132	959	35	170	521	0	25	60	10970	4432
40.1	30	155	41	22	70	2369	4046	767	60	130	217	42597	209	139	333	194	125	140	165	1061	525	128	853	37	218	532	0	13	100	11350	4448
40.2	0	164	0	0	38	2337	4210	772	76	133	212	42374	220	55	295	45	75	96	112	1047	433	34	715	42	311	485	0	26	25	11354	4455
40.3	33	184	23	27	45	2319	4639	806	94	140	196	42203	198	119	251	30	91	161	166	1048	433	33	727	27	248	530	0	0	33	10995	4395
40.4	31	172	25	16	54	2225	5061	850	86	96	234	40869	192	107	260	8	95	67	102	977	518	108	665	23	226	483	0	29	33	11290	4254
40.5	26	215	26	19	46	2119	5464	790	70	137	222	39257	229	108	269	57	136	88	139	1127	489	9	579	58	233	468	0	8	15	10861	4467
40.6	24	173	12	0	46	1980	5881	747	60	158	188	38141	158	128	319	65	167	239	113	949	509	175	870	40	197	493	0	0	67	11214	4346
40.7	30	184	28	18	48	2001	6464	739	81	110	189	37128	213	152	312	98	190	224	251	815	598	177	716	23	218	524	0	0	83	10909	4371
40.8	7	215	11	27	56	1916	7293	749	34	107	200	36019	252	73	296	104	138	75	133	983	554	74	659	38	221	453	0	11	15	10683	4196
40.9	40	211	20	19	60	1831	7887	787	32	114	249	34829	217	121	299	107	152	74	117	881	496	113	676	75	191	497	0	0	13	10691	4329
41	35	170	15	0	48	1733	8546	758	40	102	239	33563	194	85	251	67	98	139	181	795	591	83	765	55	223	494	0	0	0	10871	4300
41.1	15	180	30	19	54	1726	9419	738	67	118	249	32135	194	100	254	108	95	140	139	790	699	12	631	51	240	557	0	0	38	10625	4419
41.2	18	238	16	4	68	1561	9848	696	51	79	187	30448	133	56	225	15	166	95	206	780	718	27	635	10	230	478	0	8	49	10522	4308
41.3	5	162	6	0	38	1513	10100	598	30	89	232	29350	129	57	197	68	87	127	83	669	648	29	572	50	186	541	0	0	32	10363	3900
41.4	9	204	25	21	60	1471	10629	683	48	99	201	28628	185	97	236	58	94	61	182	639	768	92	540	29	161	520	0	0	23	10531	4225
41.5	18	203	13	0	50	1352	10860	678	27	55	212	27770	163	87	185	81	74	49	116	681	840	23	546	0	203	532	18	12	59	10357	4392
41.6	27	197	18	23	65	1365	11232	615	21	102	209	27388	172	40	160	51	108	116	122	636	856	50	549	39	230	569	0	0	41	10087	4237
41.7	10	179	0	9	88	1396	11405	601	40	94	233	26375	176	105	156	68	89	42	127	530	818	84	612	37	190	513	0	0	26	10276	4410

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
41.8	19	202	14	0	56	1318	11591	677	47	57	177	25598	151	128	188	65	127	76	128	519	846	121	554	0	178	518	20	16	54	10347	4373
41.9	0	194	23	14	34	1301	11611	612	49	83	181	25497	129	57	122	55	108	156	84	411	943	63	574	61	174	508	0	0	48	10347	4224
42	7	181	31	8	84	1237	11728	591	51	78	209	24874	154	112	178	116	76	31	20	395	818	75	644	10	129	558	0	0	0	10256	4443
42.1	0	194	13	0	54	1264	11649	618	32	68	225	24655	94	42	159	71	66	16	108	486	977	89	605	15	158	497	0	32	40	10472	4395
42.2	0	212	18	0	77	1207	12124	694	41	90	255	24154	188	158	219	160	16	44	79	435	900	76	565	0	183	558	77	23	60	10465	4425
42.3	0	194	8	0	61	1159	12429	661	48	118	202	24130	130	79	184	39	28	36	77	477	995	116	741	9	186	570	13	19	72	10641	4424
42.4	0	208	36	21	86	1180	12529	605	36	73	216	24018	97	73	134	71	121	122	188	347	983	105	681	25	153	546	0	0	14	10161	4441
42.5	0	159	0	0	48	1116	12677	630	41	95	248	24028	121	71	190	78	118	40	113	516	1057	71	704	62	192	523	0	0	63	10699	4606
42.6	19	234	23	48	73	1244	13145	676	37	105	257	24037	125	47	155	38	69	83	106	296	1008	173	624	27	199	509	15	0	70	10577	4618
42.7	20	175	14	12	51	1200	12979	645	20	92	196	24281	132	47	150	24	41	115	143	366	1071	111	637	7	220	560	0	0	34	10320	4513
42.8	10	181	11	9	60	1178	13237	679	0	124	211	24395	133	43	174	106	99	44	95	416	1017	90	788	40	190	521	0	0	0	11177	4745
42.9	8	223	22	35	42	1200	13351	698	22	118	229	24427	180	89	190	103	117	109	51	314	1015	88	685	16	192	570	0	0	39	11143	4669
43	0	221	4	15	58	1251	13549	625	32	103	236	24754	84	28	142	61	70	183	90	462	1033	239	734	60	189	578	27	0	41	11497	4725
43.1	16	225	6	8	75	1203	14097	647	48	114	244	25043	194	56	253	98	119	123	112	437	1115	115	754	41	218	605	0	9	52	11017	4670
43.2	14	264	15	0	72	1184	13605	658	51	116	266	25330	94	0	146	41	71	74	113	405	1018	71	849	31	218	575	0	0	87	11363	4602
43.3	0	245	28	22	76	1204	14109	708	59	138	228	25660	210	83	200	56	136	98	117	472	1092	76	853	41	261	622	0	0	30	10819	4721
43.4	0	292	0	0	53	1276	13764	769	35	99	198	25243	141	85	169	77	22	137	171	519	974	28	837	0	179	620	0	0	34	10908	4546
43.5	23	261	0	21	50	1309	13756	622	52	88	219	25132	136	40	224	85	61	117	20	526	1013	25	898	52	225	596	0	0	36	11119	4663
43.6	34	224	23	0	69	1258	13308	599	45	82	192	24636	153	73	175	97	78	141	179	454	952	181	833	4	173	641	0	0	50	10986	4532
43.7	29	276	22	8	84	1207	13155	592	30	79	201	24331	140	48	166	110	92	58	108	465	917	102	815	15	184	608	0	0	25	10791	4609
43.8	23	260	36	30	105	1311	13175	789	27	105	186	25018	166	51	177	92	51	83	177	461	1062	154	745	0	230	593	23	0	33	10832	4331
43.9	0	259	31	0	88	1385	13020	815	50	142	230	25644	164	49	196	94	63	89	131	468	909	100	939	48	216	587	40	0	78	10695	4429
44	5	309	22	5	73	1329	12828	778	28	137	173	24564	193	58	161	69	55	125	149	538	916	0	842	0	245	577	29	0	102	10517	4310
44.1	17	284	14	15	88	1217	12681	602	8	129	199	24006	148	98	149	99	58	134	107	386	961	140	955	43	156	601	0	0	54	10646	4616
44.2	35	297	0	13	69	1255	13039	569	43	95	216	22762	109	20	149	170	103	23	114	420	964	67	806	69	156	553	0	0	66	10287	4386
44.3	8	256	23	21	67	1179	13217	541	37	108	180	22290	167	82	149	138	102	61	122	483	986	104	894	39	149	580	0	13	55	10445	4574
44.4	26	266	40	20	120	1245	13292	634	54	84	208	23559	140	67	134	83	25	110	104	473	953	0	1062	5	156	668	33	0	23	10265	4318
44.5	25	255	18	5	87	1221	11080	706	0	67	157	22031	153	30	105	125	146	136	131	436	898	18	946	90	151	577	0	0	23	10107	4473
44.6	0	216	0	0	60	1280	9291	566	17	112	118	22094	159	45	169	37	118	43	119	316	964	99	999	71	190	537	0	0	10	10663	4511
44.7	0	149	0	0	49	1557	7444	629	39	108	118	27125	159	65	179	36	98	92	137	534	896	73	831	4	218	517	0	0	40	11006	4572
44.8	26	172	0	12	39	2179	5433	693	41	150	204	36718	236	130	271	118	85	171	106	880	818	71	867	35	266	526	0	6	75	11219	4759
44.9	50	216	27	7	57	2497	4425	828	51	126	266	43102	264	141	283	190	177	61	226	1089	610	117	880	29	220	536	9	31	74	11522	4608
45	35	177	12	0	36	2570	4201	852	41	144	280	44277	337	164	397	125	205	83	54	939	387	24	817	71	285	549	0	22	16	11275	4374
45.1	31	193	15	23	55	2402	4370	855	69	135	276	43230	289	249	445	148	175	212	74	1081	375	93	686	0	213	533	0	0	66	11530	4421
45.2	0	167	27	0	34	2352	4710	786	103	112	196	42485	164	108	298	126	133	204	129	1077	524	73	661	33	211	513	0	0	25	11116	4149
45.3	33	224	36	8	63	2288	5270	845	55	130	239	41849	204	125	326	134	136	146	123	983	407	158	763	16	221	495	0	0	62	11179	4164
45.4	34	184	8	4	59	2266	5888	817	95	118	224	41353	189	101	271	69	127	130	113	1052	471	64	647	36	238	509	0	0	27	11208	4456
45.5	17	186	0	0	38	2142	6308	801	97	144	236	38924	243	129	322	114	99	166	218	948	532	199	719	34	221	515	0	0	77	11083	4401
45.6	16	194	14	7	73	1968	6935	789	17	106	222	36655	240	95	234	57	84	86	90	781	544	0	619	25	211	531	0	0	67	10828	4305
45.7	36	183	12	25	51	1917	7495	768	55	119	213	35366	198	117	245	59	112	80	117	873	670	43	577	29	225	491	0	5	28	10560	4444
45.8	16	227	15	15	51	1816	7984	730	43	107	186	33308	171	140	274	160	92	77	150	732	525	49	656	45	195	545	0	6	28	10465	4248
45.9	38	195	0	10	47	1767	8271	696	69	132	265	32618	201	148	269	56	71	196	118	776	718	50	626	35	169	567	0	0	27	10635	4376



Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
46	43	189	22	21	49	1904	8705	742	34	107	221	32187	173	141	266	147	139	133	136	719	734	80	669	30	197	523	0	0	70	10517	4361
46.1	24	176	0	11	60	1779	8858	684	50	115	241	31592	204	67	214	69	113	55	120	695	685	114	669	45	232	577	0	24	91	10518	4223
46.2	28	171	6	19	55	1732	8723	690	30	92	186	31158	129	19	184	49	117	80	139	733	845	110	582	0	201	530	0	0	47	10492	4348
46.3	29	180	19	5	44	1734	9054	756	23	109	248	31035	172	76	268	139	93	110	172	595	854	105	572	22	207	551	36	0	91	10852	4538
46.4	27	217	23	15	56	1738	9190	679	73	133	235	31024	185	135	204	123	38	40	102	569	785	61	675	38	171	573	0	0	72	10537	4556
46.5	0	190	0	0	21	1726	9305	793	32	96	207	30467	173	75	247	67	98	114	137	549	1032	99	651	5	198	548	11	0	61	10800	4432
46.6	12	216	0	0	44	1743	9529	721	34	107	248	29700	171	33	177	95	89	86	103	577	1000	70	723	0	178	567	0	0	58	10789	4483
46.7	7	212	0	10	54	1643	9917	696	52	86	190	29290	185	89	233	49	58	117	95	514	902	28	637	37	253	552	0	5	8	10641	4605
46.8	0	210	25	19	67	1725	10428	811	60	110	287	29370	209	159	249	78	79	70	118	512	905	62	624	11	204	582	23	0	52	10742	4580
46.9	21	218	21	8	81	1642	10634	786	60	94	240	28662	163	68	147	103	122	71	126	495	981	51	639	0	183	556	0	0	29	10720	4544
47	5	212	0	0	39	1610	10997	667	59	56	258	28468	201	91	138	103	80	97	186	533	1019	99	644	45	224	574	0	18	59	10744	4419
47.1	0	230	20	0	78	1545	11737	691	48	89	258	27899	195	124	187	88	158	48	37	466	1084	100	683	22	193	540	0	0	54	10856	4597
47.2	0	229	8	12	70	1575	12284	738	44	111	247	27981	159	83	182	92	125	100	115	461	1084	104	638	50	197	580	0	26	49	11097	4600
47.3	26	237	32	23	86	1609	12691	745	22	81	233	28055	163	89	201	86	90	39	128	410	917	110	707	14	204	560	0	0	46	11227	4804
47.4	17	255	0	19	70	1503	13177	751	39	78	254	28157	140	29	193	4	96	110	124	506	1146	36	765	32	234	566	0	0	23	11425	4642
47.5	27	303	19	16	71	1435	13768	767	40	116	271	27457	176	73	220	99	57	5	94	488	993	23	686	31	197	608	0	0	0	10904	4713
47.6	19	231	42	17	77	1348	13678	761	58	118	224	25919	200	99	183	122	38	63	111	425	1036	42	802	8	196	641	9	0	74	11114	4675
47.7	30	246	12	0	70	1224	13668	675	64	85	244	25269	139	39	183	122	38	63	111	425	1036	42	802	19	204	601	22	22	57	11323	4726
47.8	13	265	39	17	93	1219	13722	680	12	102	211	24917	155	57	148	62	37	81	103	426	1083	198	840	38	166	651	0	27	17	11393	4865
47.9	16	252	0	0	45	1213	13551	654	26	91	187	25068	123	28	158	74	89	101	136	489	1003	156	801	17	224	595	0	0	54	11499	4459
48	20	260	33	27	99	1376	14121	703	42	100	264	25523	123	39	153	64	106	0	107	475	990	27	726	43	219	615	15	49	0	11495	4733
48.1	0	288	16	7	77	1278	14479	730	53	125	244	25778	162	95	172	108	51	116	164	490	919	15	677	11	177	671	0	0	52	11439	4691
48.2	16	316	40	24	69	1318	14446	780	12	77	232	25219	153	6	159	73	168	97	111	469	954	61	677	11	223	556	0	0	53	11117	4635
48.3	0	298	37	0	49	1168	13608	617	34	99	255	23227	128	0	118	68	157	73	156	636	1032	163	1016	43	228	534	0	0	53	11075	4797
48.4	10	273	19	0	70	1096	12592	608	41	100	252	22356	117	22	217	75	135	112	149	531	892	65	916	29	177	537	0	0	55	10535	4733
48.5	7	270	25	20	62	1159	12656	751	51	102	186	23506	97	0	222	72	66	127	188	458	895	152	883	30	233	551	0	0	0	10800	4553
48.6	16	303	38	26	92	1212	13489	641	41	88	238	24458	207	56	240	59	59	19	120	442	964	125	881	7	242	621	0	0	34	10766	4596
48.7	19	277	8	13	62	1245	13842	681	8	86	158	23725	118	17	156	50	137	101	169	396	980	47	1002	25	221	572	0	13	80	10670	4653
48.8	7	270	33	26	83	1193	13253	654	67	104	176	22167	158	39	160	99	176	160	52	300	923	93	1107	39	202	573	0	0	45	10325	4516
48.9	14	295	23	15	49	1223	12715	543	51	94	187	22252	146	131	146	111	102	131	124	454	864	64	1055	20	127	587	0	0	24	10290	4517
49	18	315	11	18	70	1197	12234	586	16	114	197	22063	127	76	196	144	15	112	64	502	975	17	1059	49	158	611	11	0	37	9918	4607
49.1	13	265	28	27	91	1136	12266	697	42	87	135	22270	139	0	178	6	54	71	74	554	884	68	1212	0	241	537	16	0	35	10386	4604
49.2	14	275	32	6	76	1253	12018	575	35	107	166	22044	203	39	137	63	60	40	120	582	1012	172	1329	47	246	515	0	0	32	11243	4788
49.3	21	237	26	14	54	1316	9564	530	63	102	175	23988	94	0	83	88	75	13	153	735	738	45	924	20	163	522	0	0	59	11361	4732
49.4	4	168	0	0	55	1669	6845	610	75	328	206	31022	157	52	180	17	39	179	212	984	522	67	702	57	213	429	0	0	38	11393	4480
49.5	30	165	10	0	59	1937	5135	645	24	303	196	36741	144	21	229	17	0	193	148	1042	372	167	714	61	224	503	0	0	56	11832	4361
49.6	32	195	48	9	53	2276	4314	769	57	100	207	41271	191	75	315	90	72	71	159	1208	442	16	638	39	238	485	7	19	48	11354	4402
49.7	17	190	15	5	39	2477	4219	750	46	130	216	43349	312	225	461	128	118	160	44	1109	417	42	815	60	229	550	0	11	55	11792	4549
49.8	20	180	0	0	42	2385	4552	880	73	140	253	43401	235	132	332	126	139	116	140	1007	431	74	678	11	208	524	0	0	25	11252	4624
49.9	5	177	0	0	43	2420	4838	890	74	156	194	43254	220	113	279	117	114	104	127	1062	422	18	742	0	236	498	0	20	12	11576	4587
50	21	193	23	21	36	2401	5223	892	68	127	180	42652	224	110	324	117	117	164	156	1016	522	94	794	23	292	511	0	0	89	11485	4472
50.1	24	169	0	0	65	2230	5376	906	8	130	255	42238	255	206	322	93	165	146	76	1039	416	0	884	34	190	524	0	0	0	11408	4600

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
50.2	18	201	26	21	56	2317	5572	799	39	175	264	41138	247	122	365	173	96	139	147	969	498	110	779	53	163	531	0	0	26	11160	4529
50.3	22	184	17	0	33	2299	5809	833	86	133	222	40304	212	161	338	193	133	176	170	1020	596	107	699	24	214	548	26	0	58	11230	4505
50.4	18	179	13	20	61	2137	5961	864	78	112	242	38976	179	119	245	135	151	162	98	874	635	101	719	31	239	527	4	0	76	11027	4597
50.5	32	208	43	40	69	2224	6503	843	32	130	212	38326	242	126	355	106	191	122	120	701	739	26	661	40	242	490	0	0	27	10958	4303
50.6	11	213	16	26	72	2093	7718	850	87	120	246	36191	270	168	324	135	108	65	119	705	784	37	633	0	234	576	0	18	24	11104	4376
50.7	0	228	0	0	33	1884	9713	854	49	137	242	33928	274	144	283	139	125	85	91	620	789	93	812	32	203	559	0	0	34	10815	4359
50.8	34	241	11	0	55	1745	10573	784	25	99	199	31612	141	51	218	142	64	123	169	522	793	82	608	22	193	534	9	19	82	10612	4281
50.9	19	230	24	14	53	1665	10488	765	56	93	250	30473	198	170	251	111	165	72	199	578	941	109	585	18	197	578	0	0	63	10486	4311
51	10	189	0	0	65	1561	10038	755	36	96	202	29936	151	102	225	121	62	108	44	536	846	30	678	28	197	542	0	0	11	10285	4376
51.1	5	179	0	0	52	1539	10345	709	39	118	216	28720	165	157	202	140	45	135	159	526	912	65	552	49	162	581	0	0	86	10337	4284
51.2	14	187	19	11	69	1524	10529	753	47	143	260	28237	199	87	236	128	104	136	111	573	897	55	767	25	217	491	0	0	57	10648	4403
51.3	20	195	20	0	80	1430	10202	663	46	76	174	27012	142	32	167	102	82	100	161	500	965	116	540	5	208	497	29	0	61	10396	4356
51.4	0	197	0	0	33	1371	10240	646	98	102	238	26342	188	128	184	97	103	65	101	419	949	37	598	18	186	497	0	0	16	10248	4462
51.5	0	171	24	11	77	1374	10928	561	38	110	202	25790	121	54	140	68	27	88	131	460	906	37	644	52	214	519	40	0	46	10352	4364
51.6	0	192	0	0	47	1337	11151	658	7	111	188	25397	84	32	137	93	43	72	173	396	931	9	642	30	186	552	0	0	22	10058	4370
51.7	0	211	22	22	58	1324	11813	626	30	67	236	25095	177	61	170	61	18	108	150	459	1041	46	560	0	180	510	0	0	55	10315	4348
51.8	0	238	6	0	39	1293	11833	605	39	97	223	24794	99	0	200	0	106	71	100	469	893	83	603	27	231	512	0	0	34	10491	4386
51.9	26	249	17	25	65	1229	12484	643	37	83	243	24376	124	20	131	69	152	69	177	497	1002	85	665	16	192	541	0	0	27	10622	4247
52	36	236	28	14	57	1302	12594	668	68	62	227	24146	103	60	99	120	72	82	142	508	980	61	762	0	182	553	0	0	74	10785	4469
52.1	14	204	11	20	69	1186	12244	670	30	83	206	23964	172	79	177	27	86	64	127	324	927	120	626	17	206	605	0	0	23	10539	4429
52.2	13	229	18	14	56	1251	11549	635	59	132	196	24269	101	0	130	0	111	70	114	378	956	34	699	49	214	505	0	0	35	10534	4429
52.3	14	237	24	24	62	1352	10333	649	22	106	219	24472	116	69	133	138	122	81	130	502	984	90	706	32	175	511	31	0	30	10404	4370
52.4	5	214	35	7	70	1220	10364	578	40	116	209	24612	144	82	132	63	16	63	138	443	952	50	655	77	206	535	7	0	58	10579	4381
52.5	12	267	14	13	75	1239	10870	479	18	99	224	24682	139	61	150	144	122	118	52	444	960	63	710	82	174	545	0	0	31	10181	4269
52.6	12	224	9	23	55	1210	10898	622	36	95	205	24576	217	77	184	99	192	192	126	454	924	90	843	30	194	608	0	0	16	10421	4340
52.7	18	266	27	18	88	1268	10507	616	40	94	254	24276	140	106	180	159	115	107	88	419	839	15	758	19	177	540	6	0	25	10142	4336
52.8	12	247	13	0	65	1238	10346	675	47	97	232	24216	164	72	173	84	85	120	203	350	835	137	798	17	190	555	0	0	85	10115	4315
52.9	0	225	24	11	70	1073	10523	636	26	91	148	22865	113	10	84	29	54	64	72	449	903	52	837	48	123	530	0	0	5	10462	4560
53	10	226	18	10	71	1179	10892	631	41	76	175	22556	156	24	195	101	112	160	229	503	933	57	717	43	181	562	39	0	86	10200	4303
53.1	16	264	39	26	50	1202	11005	621	38	96	171	22900	109	36	117	110	110	25	69	410	845	47	831	45	161	546	14	26	76	10176	4456
53.2	24	257	14	13	81	1182	10844	589	30	102	178	24053	65	0	176	66	80	59	163	451	890	28	890	9	196	486	41	0	63	9977	4310
53.3	13	258	28	0	73	1186	11579	593	19	105	167	24769	132	49	179	52	46	14	184	435	924	32	756	65	208	528	15	0	54	10146	4338
53.4	29	269	25	23	86	1237	12806	708	52	113	156	24227	126	21	182	94	156	203	84	610	996	0	814	21	204	540	0	0	0	10263	4455
53.5	0	221	0	0	57	1119	11372	705	26	94	191	23034	110	0	124	52	21	128	104	507	875	138	1065	13	222	503	26	0	42	10249	4360
53.6	16	199	18	0	35	1106	9659	663	30	93	181	24012	133	67	171	124	104	140	53	506	963	105	1168	0	148	511	0	0	87	10221	4502
53.7	43	230	14	21	56	1248	8588	720	35	125	156	27684	186	21	164	49	129	47	126	487	913	70	1235	45	208	465	0	0	57	10410	4505
53.8	19	242	33	33	92	1456	7130	812	36	108	254	34472	134	102	236	63	114	42	59	627	856	140	951	40	154	460	0	9	16	10257	4656
53.9	45	151	25	0	39	1592	4855	890	50	64	259	41496	200	153	241	85	22	79	101	774	641	68	875	0	141	523	0	0	0	10892	4569
54	33	214	33	17	60	2047	4213	829	79	129	249	44156	173	121	336	130	110	122	76	930	554	56	697	33	214	483	14	0	18	11167	4384
54.1	44	205	0	0	43	2404	4020	848	68	101	277	44705	178	203	381	136	145	106	152	931	451	125	817	44	151	489	0	0	101	11041	4356
54.2	35	172	15	4	41	2414	3894	749	65	105	230	41956	205	145	344	111	157	138	179	923	408	80	703	45	196	507	0	12	29	10656	4161
54.3	11	160	0	0	50	2069	3853	688	21	120	153	37682	151	68	242	71	101	49	95	1006	449	60	760	41	213	429	0	0	6	10727	4292

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
54.4	0	120	36	6	50	1909	4215	735	76	97	247	36256	187	150	259	62	88	92	135	953	481	0	766	7	177	474	0	0	12	10981	4238
54.5	25	162	12	9	69	2063	4993	730	88	97	221	37559	180	119	316	106	141	137	146	944	451	0	593	6	227	449	0	0	38	10588	4229
54.6	45	198	15	25	73	1992	5785	740	31	145	205	36977	166	95	293	62	174	174	66	792	556	105	681	54	233	488	0	0	81	10540	4224
54.7	13	146	15	30	46	1879	5960	795	59	130	170	35654	176	65	257	85	44	92	44	787	506	146	687	9	206	467	0	27	86	10652	4178
54.8	27	173	0	0	27	1917	6097	786	54	114	204	35975	201	88	276	98	145	156	154	836	493	0	620	18	202	509	0	0	34	10348	4375
54.9	23	175	22	18	57	1884	6851	776	71	91	200	35342	160	96	217	105	87	160	92	812	610	98	679	42	165	505	0	0	0	10753	4203
55	16	178	7	0	50	1704	7408	793	85	109	208	33852	164	101	255	138	126	115	158	747	782	71	632	19	163	475	0	7	30	10665	4368
55.1	18	172	26	19	70	1764	7963	792	67	142	213	32894	207	115	217	118	72	175	68	722	664	53	593	6	191	529	0	0	69	10535	4195
55.2	11	191	5	11	61	1726	7846	768	25	69	217	31894	123	91	221	66	70	145	162	687	707	0	715	0	198	480	0	0	71	10647	4395
55.3	15	177	21	0	55	1638	8416	726	38	113	225	31337	220	116	268	122	143	146	159	629	788	0	562	38	195	557	0	0	63	10223	4363
55.4	30	169	0	10	44	1571	8616	620	38	79	170	29590	173	50	241	70	104	0	112	556	783	100	641	14	206	520	0	21	61	10677	4372
55.5	0	180	19	15	47	1494	9306	632	45	87	190	28479	94	86	182	39	80	60	122	624	822	47	615	21	216	456	0	0	32	10393	4303
55.6	17	219	25	10	43	1400	9899	599	40	100	257	28048	243	128	279	85	77	117	143	619	890	13	633	61	165	547	8	0	45	10545	4441
55.7	34	195	24	27	84	1413	10417	633	27	97	226	27174	141	44	199	39	123	160	41	528	790	21	663	41	195	511	0	0	36	10514	4393
55.8	5	163	0	0	39	1356	10791	638	63	112	278	27338	179	78	197	57	58	134	97	473	908	0	669	47	174	547	0	0	26	10647	4294
55.9	0	192	4	19	46	1328	11147	605	49	97	202	26279	87	32	168	91	121	98	186	587	854	87	628	26	192	514	5	0	60	10794	4342
56	18	209	38	14	58	1258	11596	656	24	69	170	25270	90	34	175	16	10	63	66	584	937	58	596	27	177	517	0	0	57	10829	4419
56.1	13	176	9	0	45	1139	11582	611	19	87	181	24716	114	28	100	10	170	79	127	458	956	144	666	10	204	501	0	0	47	10363	4461
56.2	0	193	0	0	74	1169	11731	608	48	82	224	24150	96	31	182	17	18	51	115	416	958	123	671	10	243	532	19	0	67	10694	4523
56.3	5	159	0	0	65	1133	11579	528	47	120	229	23909	102	43	152	51	78	71	126	601	992	124	662	37	216	516	0	0	48	10673	4543
56.4	8	197	20	0	74	1188	11627	548	42	111	189	23345	146	59	141	80	81	65	149	456	1076	61	580	29	162	540	35	0	53	10817	4322
56.5	19	182	49	33	84	1141	11975	559	44	111	238	23000	141	54	178	112	107	110	101	410	954	71	653	33	198	540	13	0	14	10681	4415
56.6	0	168	22	14	73	1175	12001	527	26	88	234	22573	134	94	150	115	150	138	68	414	920	38	638	37	217	514	0	0	83	10438	4461
56.7	18	187	34	18	61	1095	12451	591	37	72	177	22660	90	0	131	8	108	36	154	414	967	112	680	0	203	503	25	0	72	10459	4426
56.8	0	181	16	0	56	1078	12321	605	39	90	188	22717	147	31	143	101	86	94	109	489	959	60	593	0	201	572	0	0	41	10757	4319
56.9	0	191	0	11	55	1081	12137	469	41	106	215	23037	94	78	144	27	79	85	78	363	924	63	680	58	176	517	0	0	19	10534	4411
57	0	202	0	0	57	1116	12064	536	11	81	212	22507	144	29	180	36	94	40	128	494	1025	173	696	48	211	587	13	22	16	10725	4652
57.1	0	190	24	4	75	1195	12304	585	64	121	248	22602	86	69	194	96	121	18	132	414	906	100	717	40	185	527	11	22	65	10702	4540
57.2	14	202	20	21	44	1131	12220	632	83	66	183	22771	157	99	148	82	83	85	182	416	973	120	715	8	165	536	0	0	15	10522	4528
57.3	27	200	10	19	81	1142	12471	586	59	114	207	23008	160	58	188	120	148	78	67	476	946	0	669	44	219	532	0	0	66	10671	4386
57.4	9	206	12	11	56	1165	12544	686	34	114	217	22800	176	97	160	29	67	114	125	356	1006	169	763	37	181	576	0	0	34	11016	4447
57.5	20	211	14	20	74	1124	12127	628	32	101	227	22806	130	0	101	16	112	140	123	503	1035	108	665	10	228	575	42	0	93	10616	4473
57.6	10	233	0	0	47	1137	11508	625	35	81	203	23090	91	0	100	40	33	86	79	492	942	77	715	0	216	560	0	0	39	10736	4466
57.7	0	203	23	4	30	1244	11807	678	51	96	199	23383	141	72	164	132	17	36	151	491	935	139	771	51	159	546	66	0	40	10892	4507
57.8	25	240	15	14	81	1213	11824	697	0	85	189	22857	121	42	134	46	78	107	65	531	1019	112	791	9	203	559	0	0	31	10951	4489
57.9	14	249	18	24	63	1079	12317	657	45	82	165	22294	171	62	153	96	62	101	148	425	906	132	832	10	215	592	0	0	49	10818	4496
58	19	246	22	21	74	1039	12259	588	27	115	178	22387	136	21	163	82	91	0	168	388	935	22	775	42	232	573	0	10	60	10449	4331
58.1	39	285	46	30	110	1153	12030	683	23	117	212	22860	139	46	187	104	123	140	134	521	928	95	842	62	208	598	0	0	60	10319	4435
58.2	19	242	14	0	70	1201	11609	649	27	77	182	22881	175	104	155	77	106	129	512	984	40	737	15	156	610	42	0	54	10252	4428	
58.3	16	222	18	4	62	1152	12079	670	50	110	162	22424	136	32	139	53	103	97	106	426	855	97	887	44	226	542	0	0	44	10295	4343
58.4	17	266	35	4	77	1151	11750	642	67	92	194	22241	142	94	119	61	119	97	109	442	907	76	893	29	158	526	0	0	14	10187	4376
58.5	18	278	37	22	72	1123	11355	673	67	91	176	22769	153	53	141	106	63	182	113	396	920	45	897	11	158	599	23	0	78	10140	4375

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
58.6	35	270	30	14	62	1198	11839	526	64	105	158	22596	114	41	115	114	69	161	105	473	1006	13	1101	37	150	610	0	0	29	10253	4375
58.7	26	225	5	0	73	1100	11550	526	42	83	191	21868	135	57	176	39	130	72	124	482	843	35	871	35	190	589	17	20	58	9869	4150
58.8	11	251	10	10	59	1133	11138	718	42	98	167	22801	134	40	141	106	153	100	49	558	812	0	948	35	179	557	0	0	22	9826	4300
58.9	23	234	17	15	62	1239	11305	754	54	88	240	24225	121	20	193	124	109	7	192	575	777	124	883	10	207	524	0	43	30	10067	4129
59	25	250	23	27	83	1321	10723	679	44	98	181	26105	165	56	154	77	28	73	117	460	745	166	1024	36	192	485	25	0	29	9796	4246
59.1	40	224	38	17	67	1409	8708	771	57	116	219	28826	175	108	228	65	61	164	100	493	753	56	981	6	127	487	16	0	69	9488	4336
59.2	13	180	14	0	37	1394	6388	930	60	120	326	35280	190	152	246	27	103	48	175	455	784	38	919	0	165	428	0	0	0	9558	4385
59.3	25	170	22	31	65	1682	4783	968	56	89	329	43477	245	140	313	126	105	196	32	674	813	29	884	18	195	399	0	0	34	9890	4434
59.4	36	160	0	8	63	1956	4072	909	73	139	264	43531	196	124	275	88	97	145	142	787	518	62	821	51	214	462	7	0	49	10381	4164
59.5	10	160	0	12	61	1999	3851	763	94	101	258	40009	181	61	290	76	120	116	150	937	482	146	639	13	250	479	0	0	56	10651	4122
59.6	50	172	19	23	43	2223	4023	781	40	91	198	40192	242	138	295	70	126	124	179	1041	432	46	649	12	215	490	0	77	106	10726	4141
59.7	28	173	26	14	50	2183	4485	716	77	125	243	39965	265	189	311	95	170	149	110	956	352	7	701	45	225	471	0	0	53	10938	4224
59.8	6	189	47	14	52	2165	5201	827	78	120	220	39367	196	144	309	142	124	206	142	974	568	135	663	16	187	510	0	0	21	11058	4275
59.9	17	144	0	13	31	2042	5742	779	13	141	251	39024	252	130	371	145	160	162	125	989	503	99	633	34	183	496	0	0	60	11115	4131
60	9	211	15	0	33	1922	6348	844	44	151	169	37248	146	65	262	121	82	105	204	871	533	54	710	25	169	464	0	0	82	10912	4248
60.1	10	166	0	0	52	1876	7387	805	68	117	231	35941	213	113	226	105	90	151	181	785	543	61	670	11	225	532	0	0	17	10676	4174
60.2	32	195	26	25	73	1728	8338	760	78	113	225	34177	192	131	235	118	51	98	59	690	722	161	626	23	201	526	17	0	17	10771	4443
60.3	0	193	4	7	57	1634	8935	765	30	71	229	32473	164	70	203	100	6	94	113	844	780	38	736	0	205	523	0	0	71	10465	4391
60.4	16	203	10	27	77	1521	9322	742	4	111	204	31398	181	78	221	49	148	128	162	697	825	135	656	10	226	539	14	9	39	10835	4457
60.5	54	207	42	23	94	1523	10310	761	75	126	238	30047	147	74	215	61	92	119	105	659	680	71	734	8	252	528	0	0	58	10879	4525
60.6	9	195	36	0	55	1454	10749	687	32	68	221	29203	121	87	210	158	92	63	178	651	747	0	586	14	205	582	15	0	53	10949	4447
60.7	19	206	54	33	85	1369	11421	715	44	79	211	28016	198	83	218	151	56	94	89	608	854	87	655	0	211	565	16	0	37	10873	4582
60.8	36	217	16	7	74	1354	11961	674	18	99	189	26698	204	137	208	55	130	91	112	574	926	73	709	26	197	561	42	0	51	11007	4550
60.9	12	187	23	0	43	1310	11961	662	46	131	220	26103	126	85	184	132	44	111	217	606	1006	153	528	10	173	590	16	0	38	10643	4405
61	4	184	0	0	50	1210	12267	597	35	86	236	25493	176	106	191	91	4	54	76	507	1019	0	645	48	207	568	26	17	17	11276	4523
61.1	25	178	0	11	49	1267	12593	644	32	96	203	24876	154	76	118	73	79	120	89	478	951	161	730	0	149	569	0	0	42	11551	4779
61.2	9	235	20	13	87	1272	13414	681	18	154	208	25267	119	7	147	18	89	39	107	486	1086	70	678	61	205	518	0	0	17	11265	4899
61.3	17	197	0	0	49	1185	13570	686	53	87	221	25791	190	90	202	94	142	138	101	458	1008	135	587	0	179	557	0	0	35	11585	4564
61.4	0	255	0	23	88	1345	14428	662	59	108	238	26504	150	58	235	196	110	110	122	547	1041	65	701	30	184	602	0	0	68	11345	4808
61.5	0	229	8	0	60	1307	14717	778	57	101	222	26921	136	61	196	53	88	133	115	476	1068	103	691	0	237	549	24	0	17	11505	4728
61.6	23	282	8	20	70	1346	15038	682	54	83	219	27020	182	127	188	55	181	119	184	447	1010	131	658	39	249	614	0	0	0	10940	4760
61.7	0	280	18	18	103	1334	14386	790	65	88	270	26156	134	60	108	80	121	137	136	411	1059	83	816	31	212	582	0	0	61	11302	4500
61.8	0	232	8	0	75	1296	13736	773	45	82	190	24591	122	30	148	59	17	19	126	411	986	114	824	0	209	615	28	0	65	11427	4672
61.9	5	263	34	39	78	1195	13144	753	34	121	233	24114	126	13	166	71	101	73	109	510	968	92	680	0	192	584	0	0	62	10873	4549
62	9	298	56	38	76	1151	12859	743	36	77	216	23418	121	55	208	56	67	106	160	433	1037	177	772	0	220	573	0	0	84	10904	4362
62.1	0	290	13	33	94	1226	12648	628	48	89	245	23739	110	36	180	59	60	141	186	422	842	82	754	56	168	644	0	0	59	11087	4475
62.2	9	234	24	7	75	1171	12272	636	15	115	163	23384	132	93	141	125	94	129	223	422	1005	187	874	12	181	608	0	0	62	10815	4518
62.3	22	244	7	11	66	1180	12969	651	39	80	191	23366	117	7	133	44	118	95	144	366	956	183	806	15	193	580	0	0	42	10594	4568
62.4	19	251	0	0	65	1103	12643	603	52	98	185	23270	148	0	109	63	137	179	144	356	995	130	807	8	190	541	0	0	0	10580	4600
62.5	11	302	31	0	64	1097	12550	580	0	215	215	22923	140	63	125	59	116	37	108	500	960	52	822	49	179	569	24	35	26	10777	4303
62.6	10	283	0	8	68	1112	12815	636	42	207	209	22762	109	11	163	87	119	78	106	491	981	128	787	13	193	575	0	0	48	10588	4486
62.7	0	279	33	23	82	1191	12322	654	52	136	189	22871	147	71	114	107	131	132	116	440	914	0	942	4	189	568	0	0	40	10304	4362

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
62.8	37	277	41	18	91	1216	11790	580	40	73	186	22161	141	100	164	91	217	49	178	487	1050	53	881	19	186	580	0	5	20	10191	4256
62.9	12	275	43	17	75	1230	11437	578	30	97	160	21643	96	0	137	44	170	111	49	491	852	54	873	0	206	531	0	7	88	10242	4437
63	0	185	18	13	59	1250	10133	490	58	81	185	21430	112	0	158	30	169	104	112	466	910	135	1026	9	221	543	0	0	59	10247	4478
63.1	30	216	24	29	60	1527	8696	565	53	87	208	25834	180	72	253	20	51	80	89	543	988	61	932	9	230	480	0	0	51	10391	4295
63.2	0	182	0	0	28	1799	6594	647	68	144	183	32605	214	78	319	129	154	55	47	602	954	88	1060	52	233	526	0	15	0	10747	4518
63.3	18	162	0	0	37	2132	4660	769	87	112	258	39060	216	99	315	100	168	125	67	703	739	30	1074	22	200	536	0	36	46	10817	4437
63.4	41	172	17	0	35	2376	3724	750	54	113	220	42430	240	117	335	67	74	121	115	828	658	0	928	49	243	451	0	27	68	10938	4607
63.5	17	153	15	10	21	2299	3742	715	64	138	312	42682	177	143	271	159	68	36	147	951	536	59	914	38	220	496	0	27	56	11263	4530
63.6	27	166	0	0	44	2299	4223	769	70	142	227	42875	216	157	313	122	112	92	121	1024	415	102	754	61	222	529	16	44	0	11416	4491
63.7	12	170	0	0	23	2325	4592	789	97	152	252	42294	156	158	282	91	124	176	83	1000	414	57	762	52	206	478	0	0	60	11230	4353
63.8	18	189	45	10	42	2213	5181	825	55	153	234	40821	234	143	346	179	10	142	146	946	508	45	667	49	196	549	0	19	36	10874	4314
63.9	27	208	23	10	71	2198	5696	831	42	155	247	38558	228	86	309	89	187	127	135	1006	461	143	735	36	217	437	0	58	46	10754	4234
64	26	201	11	4	55	1953	6001	808	93	115	242	35902	130	56	220	51	68	92	133	933	469	33	748	12	202	462	35	0	25	10660	4203
64.1	42	181	4	0	43	1823	6393	707	48	163	201	34981	131	0	239	40	75	89	155	912	608	128	782	78	220	464	0	0	61	11019	4322
64.2	26	180	23	13	63	1807	7191	800	47	119	204	34270	165	123	248	79	75	101	127	773	646	69	669	0	185	493	0	0	75	10858	4365
64.3	5	161	27	34	69	1803	7863	689	42	150	304	34180	185	97	268	114	125	107	150	822	603	92	715	87	219	499	0	0	73	10570	4443
64.4	34	202	13	8	42	1776	8242	775	44	107	183	32893	165	98	233	115	33	129	137	720	659	179	614	39	166	535	0	0	51	10610	4298
64.5	33	196	33	25	56	1737	8808	770	15	94	236	31502	114	68	222	111	148	74	173	776	693	16	579	28	215	506	0	42	51	10311	4220
64.6	12	180	13	11	57	1622	9450	685	49	93	249	30133	122	0	199	83	99	80	106	690	693	32	637	60	222	525	0	25	34	10179	4475
64.7	44	211	10	13	49	1440	9996	713	26	79	255	28934	136	82	175	21	39	65	91	698	775	97	555	0	206	505	0	0	26	10666	4549
64.8	0	255	20	22	62	1427	10478	742	64	97	226	28058	110	80	138	90	124	130	112	672	849	105	517	0	178	512	0	8	65	10543	4204
64.9	15	214	14	25	51	1405	10739	646	20	93	163	27410	114	11	196	54	92	0	91	621	748	81	610	43	202	536	9	72	20	10570	4368
65	14	217	36	37	77	1419	11248	703	51	65	217	26496	164	15	209	79	119	118	110	488	766	0	495	0	218	535	8	0	81	10337	4123
65.1	27	185	0	23	80	1319	11448	645	28	77	231	26351	138	66	255	34	159	176	138	585	928	84	602	17	196	521	0	0	71	10535	4172
65.2	0	211	0	0	90	1274	11542	670	54	120	195	25630	166	63	232	105	55	80	24	520	938	181	606	21	181	556	0	0	86	10190	4366
65.3	15	212	26	10	60	1264	11976	657	40	78	264	25123	108	73	196	154	73	92	47	531	931	112	649	20	178	563	14	34	57	10305	4312
65.4	22	176	19	17	42	1272	12053	584	28	94	173	24784	123	0	112	39	81	88	156	544	946	0	615	15	234	497	17	0	45	10404	4355
65.5	0	200	23	23	58	1193	12315	593	50	86	260	24731	131	61	158	68	93	169	93	510	899	137	621	30	189	564	0	0	41	10190	4247
65.6	0	204	10	0	96	1172	12369	597	32	87	206	24636	114	30	213	80	104	55	144	529	971	78	608	27	195	541	5	16	0	10549	4316
65.7	0	197	13	12	71	1192	12150	576	38	129	257	24508	151	50	174	69	87	119	113	447	860	50	678	59	221	531	0	0	56	10570	4577
65.8	0	164	0	0	72	1162	12036	551	38	83	210	23891	93	8	162	8	210	189	186	424	1067	88	651	45	202	481	0	0	43	10533	4294
65.9	17	247	0	5	56	1151	12324	623	30	86	230	23630	123	61	151	60	104	135	97	445	936	70	664	29	206	511	0	0	21	10530	4418
66	41	197	0	0	79	1148	12437	648	33	98	215	23527	161	59	185	122	84	101	86	574	937	33	648	22	219	529	6	0	14	10112	4509
66.1	5	207	10	13	86	1100	12450	651	27	86	220	22887	130	22	118	0	71	106	107	358	960	81	630	12	218	526	0	0	37	10667	4387
66.2	16	228	8	17	50	1161	12080	640	36	84	228	22745	105	65	206	97	123	126	173	499	1004	56	714	16	201	515	12	4	65	10499	4281
66.3	17	231	13	5	63	1118	12149	496	47	89	215	22623	104	48	166	65	37	102	180	460	989	78	715	50	208	539	32	0	74	10041	4260
66.4	19	221	36	12	81	1103	12414	605	40	89	208	22113	88	58	122	66	0	78	48	427	898	69	569	21	189	561	46	13	60	10659	4316
66.5	41	230	22	19	62	1144	12108	657	27	90	191	21772	105	18	103	26	83	111	149	354	851	212	732	35	204	514	7	0	79	10179	4142
66.6	21	249	32	19	73	1130	11560	617	42	73	241	21617	133	12	161	49	104	72	36	416	859	15	757	27	199	507	22	0	0	10073	4343
66.7	0	225	19	0	42	1140	11276	550	18	75	218	21596	62	22	137	71	107	101	160	465	898	55	708	38	174	544	4	0	0	10139	4279
66.8	15	224	12	20	54	1069	11561	556	0	99	208	22047	87	6	181	20	111	64	137	494	1006	0	661	68	228	488	0	0	35	10007	4115
66.9	16	229	25	0	66	1114	11711	588	25	93	157	21965	81	34	96	50	58	63	101	384	1031	126	757	12	163	577	0	0	35	10121	4286

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
67	0	241	21	5	80	1107	11756	533	35	88	210	21595	122	29	158	0	95	15	461	822	70	718	34	186	582	0	0	29	10220	4195	
67.1	0	262	35	28	90	1066	11592	644	6	106	181	21818	167	41	126	105	41	120	174	409	888	87	786	60	211	597	12	10	71	10085	4260
67.2	16	221	28	36	74	1109	11570	592	31	85	177	21807	108	70	200	144	76	93	177	487	1048	155	784	0	153	589	24	0	42	10022	4043
67.3	31	247	34	25	80	1120	11357	508	57	104	142	21457	149	67	114	35	39	75	91	357	798	51	963	53	178	553	13	0	66	10030	4264
67.4	0	250	26	14	63	1056	10745	495	30	77	163	21778	118	38	107	92	63	45	162	453	933	88	742	23	166	530	0	8	29	9607	4154
67.5	34	262	22	16	62	1036	11060	515	34	92	134	21220	144	27	130	58	37	140	157	422	827	29	753	31	201	523	48	0	52	10034	4078
67.6	31	268	31	28	72	1102	11491	508	38	100	185	20968	122	75	142	100	127	129	218	455	882	70	850	51	181	510	0	0	24	9858	4223
67.7	23	246	20	22	70	1035	11202	557	51	113	161	21304	155	33	149	75	68	134	121	438	858	39	821	44	141	593	0	0	69	9829	4112
67.8	29	247	30	28	72	1103	11132	606	0	90	204	21804	108	43	184	147	73	31	126	385	826	37	951	42	192	521	39	6	69	9490	4085
67.9	8	238	18	0	70	1202	11108	612	0	100	182	21530	85	0	159	77	97	98	178	423	936	119	926	0	230	503	38	7	83	9369	4180
68	20	206	0	0	64	1149	11372	631	37	48	175	21823	98	0	145	88	83	68	159	411	852	0	896	0	190	544	40	0	41	9091	3906
68.1	19	215	28	20	72	1221	11336	673	0	41	214	24305	81	10	201	71	0	138	134	530	889	206	1031	32	201	530	5	0	65	9440	4278
68.2	16	201	40	15	65	1254	10220	926	37	58	266	30929	160	121	202	65	190	99	75	431	756	31	956	0	163	469	0	0	61	9363	4350
68.3	8	193	18	10	46	1250	7666	1081	54	55	394	41375	148	115	218	124	69	125	92	434	764	181	909	41	128	429	0	0	12	8753	4191
68.4	19	146	18	0	49	1455	4672	1226	80	90	465	45610	122	101	238	50	76	0	99	432	789	99	698	0	161	356	8	0	35	9008	3907
68.5	0	141	13	0	19	1596	3300	965	63	129	394	44712	137	72	210	86	31	154	32	681	605	172	664	0	187	382	8	0	42	9877	4197
68.6	25	144	8	16	41	1939	3180	798	58	116	249	40692	109	135	290	87	59	49	77	897	415	50	806	6	129	429	0	28	53	10163	4091
68.7	17	146	0	11	28	2102	3911	714	90	103	198	39259	215	174	273	106	88	0	82	931	398	62	751	14	179	470	0	53	28	10503	4063
68.8	32	158	25	15	31	2093	4597	687	46	114	200	38001	195	73	319	98	86	156	104	886	319	81	690	45	230	476	0	0	48	10863	4283
68.9	0	161	17	8	61	1934	5622	751	60	135	163	36442	202	133	257	140	63	62	75	875	507	143	642	36	157	457	0	0	48	10685	4181
69	9	191	18	4	38	1715	6953	727	65	121	218	34227	132	66	306	102	112	151	87	841	513	120	648	49	208	511	0	0	51	10584	4147
69.1	15	182	23	0	35	1718	7594	720	77	95	214	32822	150	121	276	72	94	83	176	758	569	64	626	35	176	479	0	22	42	10565	4194
69.2	19	218	8	19	34	1595	8448	707	43	85	220	30777	134	95	227	27	93	111	68	686	574	49	615	16	238	496	0	20	46	10415	4160
69.3	0	185	0	0	54	1572	9032	670	63	106	193	29219	181	51	198	62	94	81	118	666	545	25	500	0	226	464	0	0	20	10230	4206
69.4	0	170	22	0	80	1393	9502	686	37	109	209	27793	159	75	230	85	69	89	142	668	694	0	521	28	161	538	0	0	52	10017	4377
69.5	6	161	0	0	42	1334	10223	665	61	141	222	27113	130	36	195	129	97	146	211	627	926	51	621	27	215	562	44	0	84	10383	4316
69.6	12	168	0	0	27	1242	10267	647	41	77	215	26155	156	85	222	53	153	86	96	516	891	51	568	6	213	521	0	0	35	9952	4271
69.7	9	188	0	0	59	1202	11140	631	0	119	233	24802	92	60	164	71	121	77	191	482	928	38	651	7	185	486	0	0	29	10348	4359
69.8	0	186	0	34	50	1156	11603	609	41	97	271	24084	109	55	99	85	161	104	115	455	825	262	626	5	177	518	0	0	46	10286	4386
69.9	4	181	0	8	59	1177	11947	611	16	87	205	23314	135	90	186	79	46	64	156	501	838	90	561	34	199	563	40	0	33	10450	4396
70	22	196	28	22	66	1154	11987	630	16	108	214	22659	159	5	154	66	79	101	137	474	983	124	682	14	216	524	19	0	105	10437	4455
70.1	0	176	5	5	55	1082	12028	602	41	108	169	22375	132	46	162	67	40	163	134	429	996	27	726	0	200	532	11	0	68	10875	4516
70.2	5	231	25	26	88	1025	12414	569	14	98	220	22355	152	57	170	133	10	37	101	444	984	104	555	41	194	505	34	0	0	10376	4516
70.3	10	249	45	5	83	1055	12070	603	36	65	196	22140	120	0	170	53	99	66	93	520	968	120	618	48	212	508	0	0	41	10552	4500
70.4	7	225	9	0	54	1050	11636	554	81	69	220	22334	129	6	103	98	36	60	71	476	1026	115	740	24	201	526	0	0	48	10788	4651
70.5	0	229	4	10	48	1162	12043	564	33	64	225	22294	70	0	92	43	64	20	141	443	1081	105	790	18	166	534	0	18	71	11134	4854
70.6	0	268	11	0	74	1174	11962	604	63	115	255	22164	117	55	86	56	100	99	211	545	1044	129	827	15	172	583	0	0	30	11529	4802
70.7	0	225	0	0	32	1101	11867	686	28	98	225	22949	148	13	97	36	0	45	75	485	1043	125	1007	5	165	638	0	0	8	11374	4742
70.8	11	263	0	0	54	1232	12753	706	18	99	182	24562	114	46	97	31	67	86	102	522	995	154	909	10	181	619	20	0	19	11902	4842
70.9	10	275	22	39	42	1270	14293	764	47	113	189	25367	166	38	123	70	126	181	137	537	1152	50	839	40	192	611	0	0	36	11840	5063
71	0	273	0	0	38	1276	14897	810	46	106	251	26612	140	0	138	0	79	11	58	503	1017	0	835	42	285	622	0	10	0	11585	4916
71.1	0	291	30	0	62	1439	15131	748	59	77	287	27907	207	118	251	68	75	72	137	568	1111	111	915	25	213	679	23	6	40	11722	4882

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh	
71.2	10	301	25	0	74	1466	14542	669	77	106	242	28412	169	36	154	52	87	102	195	483	1049	91	998	7	248	681	0	6	50	11113	4773	
71.3	19	360	28	20	91	1571	15525	741	67	102	293	28970	126	65	171	128	98	124	127	578	1081	122	984	28	220	645	10	14	63	10817	4753	
71.4	0	321	6	0	54	1507	14626	723	32	133	239	28574	194	103	198	201	196	121	162	471	930	39	886	15	177	674	0	0	71	10356	4429	
71.5	14	274	13	13	86	1464	13866	751	59	120	237	28599	143	0	128	34	77	91	6	508	824	93	892	37	229	614	23	0	6	10279	4207	
71.6	0	206	7	0	75	1483	11359	948	43	133	334	34965	183	110	229	124	23	75	159	560	978	120	967	57	202	568	17	11	38	9811	4380	
71.7	23	249	22	0	62	1391	10029	1298	47	131	436	47091	239	165	237	133	64	93	113	406	779	111	908	89	181	515	12	0	5	9238	4105	
71.8	12	197	10	9	58	1120	7945	1712	117	93	577	55413	228	253	278	130	111	119	143	362	798	48	838	36	129	482	0	0	33	8693	4014	
71.9	0	181	31	7	64	918	5912	1719	124	57	634	52511	225	251	237	102	128	96	75	312	758	69	777	0	133	369	0	0	11	8203	3983	
72	17	143	31	0	47	1098	4482	1405	125	85	495	47342	234	201	269	95	68	89	29	282	682	77	749	35	141	397	0	0	42	7720	3572	
72.1	6	135	12	7	41	1365	3808	1226	76	77	433	43822	122	163	142	68	86	22	90	323	703	99	650	0	99	382	0	16	8	7829	3647	
72.2	42	133	19	11	45	1667	3413	850	41	77	280	41947	125	85	200	52	72	88	88	506	697	199	841	0	185	377	0	0	31	8586	4090	
72.3	21	147	0	0	52	2062	3211	845	69	101	259	43728	93	113	259	46	102	90	73	701	637	167	786	0	212	468	0	0	0	9621	4195	
72.4	18	152	11	9	30	2330	3607	731	73	131	277	42940	158	93	328	43	110	129	136	849	587	124	773	24	186	481	0	11	22	10591	4549	
72.5	16	150	0	0	37	2358	4062	800	67	138	219	43196	207	158	354	148	41	99	81	1029	351	54	657	27	221	539	0	0	76	11183	4349	
72.6	30	189	39	0	42	2321	4562	784	82	98	253	42146	292	142	361	144	116	129	126	1007	390	40	723	43	217	561	0	7	48	11003	4215	
72.7	18	157	0	0	29	2270	5166	789	74	123	229	40631	229	141	344	101	220	96	108	1082	412	30	633	31	240	467	0	0	10	10982	4300	
72.8	43	227	17	17	51	2202	5859	750	76	102	277	40234	198	114	298	118	115	85	140	1064	536	178	653	42	247	509	0	7	55	10944	4154	
72.9	17	182	0	0	46	2072	6339	775	50	173	207	39145	276	139	334	203	130	214	105	879	474	52	614	41	247	562	0	0	34	10585	4328	
73	13	211	25	12	52	1924	6591	693	53	125	203	36791	236	156	250	146	142	154	79	858	534	154	646	45	198	542	0	0	36	10339	4052	
73.1	12	156	8	7	53	1874	7049	738	34	108	191	34041	174	115	304	119	107	63	84	789	521	33	631	39	162	506	0	0	41	10606	4239	
73.2	26	193	0	14	36	1728	7622	657	47	79	263	32578	194	75	219	90	49	129	133	676	642	40	679	37	219	480	27	10	13	10747	4248	
73.3	29	168	11	0	42	1610	8375	666	32	80	250	31583	124	29	195	30	110	32	131	732	685	50	666	30	200	500	7	0	19	10452	4168	
73.4	19	168	0	21	59	1647	9021	753	45	96	213	30600	123	69	147	18	95	120	55	619	729	162	714	0	208	513	0	0	26	10282	4094	
73.5	16	229	12	7	53	1532	9763	619	74	126	201	29419	131	128	288	75	71	72	79	548	810	43	549	31	154	536	0	27	39	10572	4292	
73.6	37	173	7	22	60	1517	9957	576	43	109	219	28095	174	84	224	73	134	126	67	629	737	99	686	48	214	513	0	0	18	10290	4347	
73.7	0	207	25	0	52	1392	10464	615	63	86	240	26910	210	47	161	91	85	96	133	579	883	123	617	66	181	516	0	5	27	10351	4348	
73.8	8	179	16	20	59	1377	11017	614	34	88	199	25981	106	80	156	42	164	52	89	468	746	5	688	34	223	521	0	0	8	10070	4190	
73.9	0	185	0	17	64	1259	11179	618	38	100	219	25366	112	104	158	101	76	105	150	474	878	157	592	29	156	530	27	0	107	10265	4106	
74	0	220	14	0	54	1242	11596	652	25	66	215	24848	115	0	170	32	96	82	171	475	981	17	576	19	209	542	18	0	57	10188	4331	
74.1	22	226	29	9	64	1217	12055	605	55	90	226	24694	153	16	205	68	151	172	91	419	838	94	530	32	198	548	0	0	46	10247	4245	
74.2	0	199	13	11	54	1256	11927	598	34	103	205	24434	133	50	171	110	47	178	54	433	914	0	519	48	193	521	32	0	57	10038	4294	
74.3	0	226	14	0	68	1195	12123	599	23	86	232	23696	160	69	167	30	55	124	116	458	895	108	704	19	206	539	36	0	25	10123	4293	
74.4	27	172	29	6	67	1201	12350	624	43	89	249	23975	124	76	156	69	157	121	19	538	894	54	639	13	174	506	0	0	52	10211	4316	
74.5	16	216	17	0	68	1290	12229	632	46	88	204	23214	107	80	169	28	93	28	127	212	461	832	96	696	43	180	542	16	0	39	10359	4202
74.6	16	161	10	9	60	1224	12120	672	36	94	258	23362	149	49	114	55	97	175	64	394	802	71	604	18	181	500	0	0	0	10253	4167	
74.7	6	214	0	0	61	1156	12046	565	17	102	238	22748	171	86	214	93	28	127	212	461	832	96	696	43	180	542	16	0	39	10359	4202	
74.8	21	214	33	19	76	1037	11927	654	19	37	178	22146	55	0	166	111	36	123	116	460	989	92	747	0	158	532	0	0	52	10085	4397	
74.9	4	196	21	14	72	1049	11812	566	0	65	240	22277	129	81	208	99	91	87	136	467	1020	114	705	10	159	548	23	0	48	10281	4276	
75	13	240	0	7	65	1118	11851	635	0	59	207	22628	125	35	128	82	70	36	89	463	902	101	739	0	169	563	10	15	28	9995	4366	
75.1	8	174	27	20	58	1067	11512	668	36	73	207	21711	110	15	103	0	60	85	174	411	924	203	741	29	173	501	32	0	17	9928	4252	
75.2	27	225	13	14	62	1143	11401	666	45	100	206	22080	126	119	160	108	160	149	102	423	911	49	641	37	146	532	0	0	36	9812	4211	
75.3	29	232	31	31	62	1106	11448	567	56	95	222	21575	91	10	148	80	98	68	149	385	797	125	789	16	153	523	0	0	70	9858	4188	

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
75.4	0	210	14	11	63	1129	11067	562	15	99	153	21752	98	17	144	45	88	73	124	474	881	0	903	37	149	453	0	0	31	9838	3897
75.5	28	192	21	11	49	1164	11405	560	27	67	146	22341	147	74	149	104	66	155	123	494	861	135	860	52	177	534	34	0	36	9732	4292
75.6	32	231	0	7	54	1205	11318	571	8	74	153	22150	119	0	188	100	116	78	141	424	862	10	819	21	203	503	8	0	27	9973	4206
75.7	0	194	16	16	59	1131	10971	561	31	109	195	21639	141	92	116	110	91	137	130	415	802	30	851	47	170	561	0	0	44	9700	4280
75.8	0	251	31	27	65	1130	10972	635	42	72	166	22355	126	85	153	97	57	118	91	504	908	50	829	44	176	548	38	10	0	9695	4157
75.9	7	225	24	16	66	1196	11608	660	37	135	201	22943	93	19	151	64	100	123	156	415	820	133	967	20	187	558	0	0	59	9314	4233
76	17	178	18	21	75	1168	11423	654	24	97	155	22193	121	39	133	11	28	80	136	472	870	111	1035	0	190	566	0	0	66	9540	4115
76.1	13	179	0	9	83	1134	10399	592	16	80	192	21753	61	45	166	25	64	57	113	526	818	44	919	27	149	498	12	0	33	9419	4212
76.2	13	157	23	0	57	1179	9659	539	40	77	190	23391	150	48	180	46	77	163	95	535	817	116	882	16	229	509	27	0	54	9780	4194
76.3	12	184	26	19	59	1432	8899	536	16	72	183	26806	121	68	121	64	137	98	100	625	764	0	830	27	154	507	0	0	19	9808	4295
76.4	16	185	35	0	60	1616	7072	556	51	71	183	30658	131	70	129	86	123	160	84	669	610	38	778	30	187	536	0	0	49	9780	4119
76.5	35	140	32	9	41	1688	5928	677	52	107	171	32617	122	27	160	59	83	131	190	771	725	127	721	31	227	502	0	0	41	10026	4160
76.6	4	163	28	19	56	1887	5499	690	53	115	213	34924	166	127	260	94	111	103	132	880	578	128	801	5	207	514	0	26	70	10285	4077
76.7	14	166	31	10	69	1979	5181	678	31	102	183	36377	169	95	285	63	56	122	37	702	499	104	597	23	197	455	12	8	38	10299	4072
76.8	26	172	6	35	42	1931	5642	704	15	144	187	35130	188	33	255	111	143	133	201	788	539	127	798	57	206	458	0	0	37	10149	4118
76.9	23	187	14	22	58	1941	6718	711	12	170	231	32874	173	123	232	121	143	116	129	747	635	94	555	81	219	479	0	0	68	9910	4040
77	0	150	0	0	23	1568	7712	608	73	87	200	30263	162	145	265	55	43	156	93	755	685	65	742	35	158	517	16	6	65	10215	4228
77.1	13	186	0	0	33	1459	8961	661	47	102	211	28571	122	94	114	44	97	97	67	639	736	71	669	41	179	504	17	0	56	10035	4061
77.2	5	185	23	0	67	1400	9881	604	48	75	217	27058	153	94	233	118	94	137	76	536	687	89	611	38	137	529	0	0	48	9976	4127
77.3	14	225	11	17	61	1281	10722	604	36	128	231	25224	126	59	169	117	37	78	153	658	779	70	641	53	179	556	27	36	42	10087	4169
77.4	0	184	0	0	38	1252	10906	590	36	92	225	24102	135	60	151	73	67	23	137	651	941	58	516	17	190	522	25	34	24	10124	4215
77.5	7	208	19	13	72	1207	11403	585	19	98	192	23320	133	58	169	87	139	125	74	414	839	82	720	54	169	526	0	0	52	9835	4227
77.6	16	226	22	0	45	1209	11211	593	21	84	231	22963	134	55	148	97	106	57	109	407	863	191	813	43	180	518	0	0	24	10174	4368
77.7	0	200	9	8	77	1133	11211	551	42	102	191	22400	132	0	148	27	124	106	86	437	1004	147	796	46	212	476	26	0	33	10071	4243
77.8	12	220	18	0	42	1143	11434	588	0	55	182	21928	76	7	113	64	26	9	45	471	874	88	731	10	172	504	0	15	18	9941	4362
77.9	28	210	39	10	68	1154	11553	594	19	89	185	22560	119	0	163	95	144	122	99	517	995	160	710	27	224	539	0	0	110	9891	4231
78	20	248	20	15	70	1178	11304	594	43	80	137	22668	90	12	153	98	134	96	99	452	922	134	834	0	163	503	0	7	20	9977	4414
78.1	11	253	9	0	69	1238	11432	589	71	74	192	23043	145	48	159	119	47	69	110	442	890	75	830	15	181	602	0	0	23	9924	4348
78.2	24	266	31	30	54	1233	11791	640	40	84	165	23109	91	66	192	87	19	72	96	397	852	160	834	17	170	579	17	14	30	9761	4046
78.3	7	240	17	0	55	1174	11580	642	14	119	202	22807	101	0	160	0	34	97	98	455	935	60	807	49	219	572	0	0	35	9303	4242
78.4	30	287	43	29	100	1123	11705	922	25	105	282	29786	114	66	172	130	28	67	150	480	1038	31	907	0	182	554	43	29	23	9068	4029
78.5	18	241	21	13	83	1307	12022	1210	36	111	421	39862	195	140	263	116	153	121	150	377	834	120	708	56	177	525	0	0	11	8225	3902
78.6	18	222	41	11	52	1177	9817	1205	66	88	435	38437	152	135	218	140	104	95	133	289	760	23	641	28	150	436	73	0	61	7550	3606
78.7	26	194	5	5	73	1020	7260	1011	78	71	268	34605	166	123	196	62	53	156	96	299	719	96	599	27	190	423	0	0	49	7549	3632
78.8	15	198	19	18	73	1148	6505	1042	81	91	390	36660	96	42	120	48	71	11	112	399	697	142	791	13	178	366	0	0	30	8019	3923
78.9	17	163	28	0	47	1271	5597	1002	71	98	342	42476	107	80	237	55	150	83	117	570	656	120	727	5	119	374	0	6	30	9496	4305
79	21	176	0	6	56	1656	4763	1022	94	115	384	45347	142	141	296	134	104	143	57	832	477	167	822	18	143	448	0	0	6	9761	4232
79.1	0	139	0	0	67	1720	3678	759	72	102	294	38910	154	133	176	62	87	111	161	895	374	70	689	14	155	384	0	23	50	10416	4021
79.2	8	125	16	0	48	1808	3294	775	76	84	187	36424	135	92	256	38	58	78	125	916	413	63	738	0	201	413	0	0	38	10501	4070
79.3	31	172	22	17	56	2126	4212	682	66	148	210	37684	312	173	239	161	76	105	238	934	373	85	723	44	204	502	0	22	57	10715	4240
79.4	17	163	11	18	49	2081	5047	699	45	142	205	36317	152	110	223	23	38	125	144	913	422	113	604	23	216	450	0	0	39	10731	4121
79.5	30	159	14	7	39	1973	5529	744	64	105	256	35101	179	123	239	74	78	90	126	957	470	45	728	16	173	543	0	41	94	10471	4121



Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
79.6	18	199	22	20	56	1859	5816	690	41	111	190	34295	145	61	226	125	110	94	95	1030	426	56	669	23	174	461	0	10	27	10617	4286
79.7	7	157	12	0	46	1810	6441	637	50	126	242	34324	159	89	258	64	70	124	130	875	449	66	733	62	149	478	0	0	32	10600	4140
79.8	0	163	7	12	39	1804	6871	638	62	116	224	34684	192	89	331	72	136	148	143	814	484	56	612	73	213	506	0	10	69	10311	4036
79.9	8	163	13	23	66	1894	6733	809	49	121	180	35205	218	97	258	160	75	83	134	947	505	48	687	42	206	507	0	0	13	10452	4195
80	0	201	16	0	29	1946	6795	755	79	81	211	34734	209	104	269	79	64	69	57	831	585	101	690	21	221	546	0	25	23	10642	4174
80.1	9	187	6	14	77	1817	7037	732	63	104	196	33997	170	78	275	75	40	157	69	783	568	47	572	29	224	466	0	0	30	10431	4186
80.2	11	160	4	0	61	1720	6969	677	28	126	184	33434	192	33	249	34	120	174	122	768	557	62	640	58	215	491	0	0	25	10156	4253
80.3	0	184	0	0	56	1812	7468	679	53	109	214	33665	230	105	255	84	171	168	218	694	569	34	640	47	210	519	0	14	54	10370	4284
80.4	17	227	8	23	54	1685	8057	758	35	66	207	32268	163	71	248	151	92	103	135	739	509	71	577	30	171	517	0	0	37	10682	4266
80.5	25	175	13	11	44	1673	8229	728	33	85	172	31735	169	80	255	129	88	106	96	717	638	100	667	50	170	495	12	0	16	10368	4295
80.6	12	201	23	32	67	1696	8269	699	77	119	233	31880	212	128	253	95	79	40	66	681	687	133	588	22	207	521	44	0	46	10647	4337
80.7	0	194	0	0	39	1623	8319	637	25	67	227	31370	107	28	209	63	124	106	206	738	754	44	634	41	228	459	17	0	77	10260	4110
80.8	6	154	13	0	57	1638	8628	700	56	89	227	30789	163	86	168	91	111	115	197	579	766	107	670	16	185	511	0	0	0	10499	4279
80.9	14	153	0	0	42	1612	9042	739	71	83	254	31095	150	86	183	105	135	166	101	624	882	16	593	28	190	501	0	0	13	10484	4402
81	20	194	25	36	54	1553	9645	739	43	83	230	30138	177	125	230	75	112	56	97	625	750	7	644	21	174	550	0	0	44	10249	4330
81.1	0	196	0	7	52	1591	9899	732	64	96	243	29569	212	97	260	151	136	155	145	635	757	31	609	20	258	523	31	0	40	10019	4395
81.2	7	185	10	0	36	1483	10210	668	17	106	252	28459	144	54	161	41	55	205	54	570	860	81	606	31	223	548	0	0	0	10450	4279
81.3	0	175	0	0	36	1469	10498	697	36	127	231	28534	135	160	251	150	118	126	169	568	939	29	571	0	159	556	10	0	74	10250	4420
81.4	12	195	5	0	60	1394	10904	640	44	89	222	27534	117	65	143	18	0	27	121	532	899	141	543	30	217	491	32	0	85	10555	4525
81.5	18	190	0	0	43	1225	10600	677	59	50	226	26063	126	21	191	127	90	71	93	529	878	0	522	0	221	474	0	5	0	10353	4221
81.6	5	130	0	0	13	1193	10738	634	17	81	199	25638	125	89	179	53	98	149	103	454	1081	97	541	20	181	510	42	0	36	10463	4178
81.7	0	231	24	20	75	1342	11170	622	82	81	210	24500	142	18	143	83	66	98	75	483	775	117	583	0	169	508	0	0	33	10132	4268
81.8	31	187	15	0	24	1284	11265	606	43	118	234	24412	108	46	180	103	126	155	123	545	821	72	553	50	190	474	0	0	65	10142	4333
81.9	8	199	16	19	74	1217	11726	612	35	93	199	24111	118	53	152	56	63	77	108	490	1029	94	590	23	202	513	0	0	57	10227	4243
82	29	196	21	9	60	1232	11775	646	58	74	191	23597	115	129	211	95	118	80	84	429	928	73	557	12	130	505	0	17	39	10362	4424
82.1	0	167	0	0	72	1161	11902	571	35	95	201	23666	149	118	199	97	157	168	134	404	992	123	613	34	157	500	0	0	53	10039	4318
82.2	20	163	12	6	75	1143	11950	632	15	99	192	22876	105	0	127	21	176	77	126	493	998	48	520	10	202	523	0	0	36	10147	4273
82.3	20	206	12	7	85	1155	12064	508	8	84	176	22771	150	120	115	71	125	160	106	367	879	153	640	70	177	521	0	0	27	10105	4326
82.4	0	170	20	0	64	1055	12361	678	42	91	249	22288	139	41	94	84	118	136	95	440	1005	47	730	19	192	573	17	9	62	10524	4307
82.5	0	183	0	0	60	1046	12470	623	36	97	231	22476	133	57	190	23	89	187	123	394	951	11	649	34	187	511	0	0	37	10203	4383
82.6	13	207	13	13	80	1130	12449	572	29	97	181	22227	106	0	142	80	78	81	123	395	960	72	675	39	249	527	0	0	16	10153	4364
82.7	0	188	24	23	49	1062	12528	511	37	109	206	22728	95	25	116	45	94	115	160	429	1036	102	628	36	210	582	40	0	72	10320	4475
82.8	0	183	0	4	49	1094	12181	591	26	72	228	22515	115	38	165	73	99	69	146	400	996	55	632	38	179	575	20	0	73	10289	4216
82.9	20	215	24	29	55	1021	12173	586	18	95	191	22194	177	26	182	46	130	98	130	335	906	26	663	84	200	541	0	16	0	10104	4227
83	13	200	0	0	43	1084	12034	504	5	63	158	22183	97	22	121	21	147	119	399	961	142	656	26	243	537	10	0	39	10648	4203	
83.1	0	231	54	20	48	1013	12341	665	37	73	179	21833	89	0	111	18	76	114	219	405	896	44	660	23	213	508	23	0	56	10438	4318
83.2	21	222	18	35	97	1105	12260	570	14	100	190	21755	69	63	69	68	59	71	115	387	1023	182	691	54	150	532	15	9	62	10208	4435
83.3	5	208	16	0	56	1146	12225	556	39	101	169	21734	120	72	144	113	86	152	433	884	75	659	30	203	538	16	0	26	10606	4294	
83.4	0	194	15	0	57	1071	12049	546	65	101	169	21734	150	119	145	80	127	82	161	368	939	126	705	13	198	552	6	0	49	10351	4428
83.5	18	229	14	0	41	1015	11861	577	31	80	193	21599	135	67	232	0	79	67	96	528	946	32	760	35	195	533	71	7	51	10595	4461
83.6	16	231	11	11	49	1057	11928	526	30	104	194	21506	133	0	108	16	110	52	116	373	948	66	692	54	198	516	0	0	34	10593	4435
83.7	0	198	35	15	64	1015	11829	595	34	121	168	21872	193	61	155	50	85	125	157	460	955	9	707	30	177	574	0	0	0	10212	4226

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
83.8	0	224	0	0	69	1048	11631	582	49	97	224	21562	131	18	92	86	74	56	358	913	20	702	34	159	450	0	0	34	10289	4442	
83.9	26	254	22	21	58	1114	11678	622	67	123	260	21444	68	53	107	51	127	88	149	404	1012	65	648	0	182	568	0	0	87	10371	4264
84	0	235	12	18	74	984	11921	614	53	85	130	21555	112	0	185	5	41	77	117	416	801	123	751	46	191	508	14	0	0	10276	4399
84.1	39	231	21	7	70	1128	11796	644	0	90	206	21235	127	33	167	66	71	110	214	479	911	153	843	11	187	526	13	13	60	10296	4296
84.2	10	231	4	0	51	1097	11608	590	25	81	204	21329	112	66	167	130	48	99	129	357	844	77	746	38	159	504	0	0	19	10390	4340
84.3	17	225	0	23	84	1125	11569	596	0	103	178	21643	141	66	164	32	125	95	73	454	953	65	605	57	172	562	0	0	49	10089	4318
84.4	0	233	16	19	72	1040	11867	507	57	114	201	22079	134	39	137	145	87	146	169	350	874	108	740	77	201	575	0	0	66	9917	4147
84.5	31	261	15	11	57	1031	11345	615	24	100	199	21728	104	24	114	97	122	15	196	365	856	115	745	12	174	570	0	0	65	9938	4288
84.6	33	235	36	28	79	1075	11370	556	25	111	169	20943	118	0	157	73	86	156	125	498	861	50	741	51	229	545	0	0	72	9586	4189
84.7	0	259	23	21	65	1042	11380	626	44	73	151	21181	102	62	138	30	45	168	97	352	842	92	804	50	186	501	0	0	42	9529	4133
84.8	16	246	0	0	49	1138	11360	610	66	102	163	21400	108	47	153	131	121	87	161	362	990	97	924	62	133	513	0	0	66	9367	4157
84.9	0	209	40	11	48	1075	11364	637	24	96	177	20707	80	0	165	67	150	80	73	391	937	167	954	18	201	493	0	0	49	9615	4107
85	6	269	5	17	60	1144	11165	771	19	84	164	21252	139	0	165	67	150	80	73	391	937	167	954	18	201	493	0	0	49	9615	4107
85.1	4	233	28	16	63	1261	11536	577	0	170	219	21851	136	45	129	113	63	97	102	371	818	83	855	62	177	528	37	0	43	9369	4193
85.2	20	211	24	19	49	1136	11033	547	57	110	180	21791	111	79	155	178	77	111	109	399	812	36	966	26	136	510	13	0	67	9235	4043
85.3	0	214	0	0	54	1190	9545	461	34	96	189	21126	109	33	160	149	210	0	171	469	870	51	942	56	188	491	11	17	37	9499	4181
85.4	22	216	27	36	71	1223	9076	573	38	87	134	21940	100	0	139	29	121	130	155	473	848	138	946	16	206	449	16	0	108	9430	4182
85.5	24	206	0	8	65	1437	8791	639	24	74	151	24922	120	67	119	102	73	48	25	593	745	0	989	0	173	496	0	0	39	10115	4209
85.6	25	209	6	4	78	1579	8290	631	32	122	198	27495	198	101	206	156	94	112	72	557	776	28	953	35	221	538	0	0	65	10308	4272
85.7	34	175	9	23	42	1782	6989	684	66	115	183	30838	163	66	213	5	95	103	137	767	843	102	834	4	252	442	15	0	6	10718	4505
85.8	41	181	18	0	32	1974	6046	620	50	96	214	33831	177	46	265	67	159	43	146	850	695	28	841	55	207	430	10	14	39	10899	4549
85.9	23	172	12	6	34	2072	5004	715	49	115	281	37413	172	70	292	58	111	65	46	932	479	37	795	36	231	459	0	10	52	11166	4332
86	46	202	5	0	35	2197	3983	732	34	142	221	39834	179	187	353	91	152	146	120	1000	403	108	689	29	227	502	0	0	101	10881	4126
86.1	24	157	17	9	39	2232	3850	726	72	141	204	40208	260	152	323	115	189	97	179	1007	300	37	706	35	239	485	0	0	51	10904	4130
86.2	20	157	0	0	13	2201	4009	721	42	155	199	39373	168	81	290	126	138	168	61	1030	471	59	671	46	198	468	0	24	0	11082	4357
86.3	24	152	0	8	49	2255	4320	797	89	148	230	39070	217	144	324	128	141	172	69	1040	311	143	755	31	129	479	0	0	26	10939	4127
86.4	10	165	7	0	41	2113	4801	734	32	134	248	38504	166	98	249	105	79	53	118	963	428	20	641	50	175	533	0	0	26	11055	4330
86.5	10	163	0	0	30	1986	5263	743	53	112	182	37165	202	162	299	110	60	74	173	908	468	172	704	42	159	496	0	6	36	10961	4072
86.6	14	170	13	9	36	1994	5663	781	53	116	228	35658	180	76	217	54	65	97	139	944	527	8	645	9	218	502	18	0	56	10768	4439
86.7	8	127	20	0	45	1952	6277	745	30	114	291	34913	205	95	298	122	118	119	112	851	465	29	617	21	236	493	0	0	37	10538	4199
86.8	22	189	29	9	45	1789	6594	633	60	159	246	34370	171	152	218	127	69	127	235	815	565	146	656	116	140	512	0	0	66	10893	4241
86.9	28	188	40	15	56	1838	7071	694	64	115	194	32840	120	58	184	70	97	87	68	797	644	122	690	45	185	501	0	0	23	10686	4160
87	12	155	0	0	22	1718	7337	666	33	103	211	31411	106	42	233	71	163	119	140	786	712	69	626	49	201	438	0	0	16	10466	4137
87.1	4	160	10	0	50	1615	7782	707	39	129	276	31346	152	87	204	123	153	132	146	807	731	73	548	52	161	523	0	39	81	10698	4166
87.2	0	174	11	12	38	1558	8383	716	48	79	237	30490	166	69	235	72	62	156	191	746	750	59	735	15	234	523	8	0	72	10687	4384
87.3	0	164	13	6	47	1580	8791	678	43	110	224	29202	113	85	179	66	150	99	87	678	810	0	678	48	210	549	0	0	91	10495	4351
87.4	10	180	5	0	39	1576	9286	714	34	96	217	28171	122	80	176	68	62	155	54	597	834	55	671	22	184	484	32	0	61	10699	4368
87.5	0	161	0	0	58	1407	9593	592	30	100	228	27965	148	6	191	68	119	86	145	545	795	105	609	62	235	506	0	25	39	10776	4545
87.6	4	207	18	12	56	1394	9737	641	32	120	205	27570	170	71	191	20	77	91	137	593	842	51	626	31	212	502	0	0	52	10942	4395
87.7	22	193	27	6	37	1413	10092	648	24	104	230	27655	129	31	150	45	127	105	178	621	801	45	686	51	233	487	13	0	85	11246	4442
87.8	0	202	12	8	70	1448	10443	659	68	124	253	27185	151	92	158	105	0	20	121	658	819	81	655	35	180	558	59	13	69	10972	4492
87.9	9	201	12	8	55	1363	10354	672	69	111	185	26119	159	77	198	160	0	68	78	615	1039	122	703	0	144	548	45	20	40	11304	4424

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
88	0	181	0	0	40	1300	10768	651	35	153	200	26404	157	38	173	68	51	77	75	492	798	130	557	44	278	516	0	0	47	11028	4425
88.1	0	148	11	0	65	1266	11169	651	41	126	269	26407	190	134	173	61	94	155	189	525	834	110	635	45	204	525	0	0	42	10884	4584
88.2	35	218	23	44	71	1226	11077	638	30	116	233	25502	143	10	159	69	95	89	118	515	985	6	653	54	205	547	0	0	49	10943	4457
88.3	14	163	15	0	70	1223	10827	571	29	76	205	24846	165	28	174	52	37	0	123	452	915	147	613	39	211	499	30	26	0	10663	4416
88.4	7	193	22	26	60	1214	11328	586	55	111	216	24258	190	54	201	108	111	94	16	509	954	134	662	50	203	543	0	0	34	10783	4245
88.5	0	181	18	15	34	1203	11293	591	50	74	184	24058	79	0	167	0	89	119	74	544	876	6	631	35	223	516	0	16	46	10715	4360
88.6	0	160	7	0	28	1112	11821	588	22	63	214	24041	143	57	152	77	168	65	131	480	868	0	575	50	190	483	0	0	0	10512	4203
88.7	0	180	0	0	43	1129	12030	608	5	95	217	23309	149	39	144	28	89	53	55	423	767	114	700	51	200	570	0	0	47	10602	4672
88.8	8	206	27	21	63	1116	12055	564	49	106	224	23347	91	49	113	15	61	27	148	389	935	102	593	32	161	505	0	35	33	10776	4323
88.9	0	217	20	32	72	1120	12760	527	26	122	252	22883	134	79	183	135	33	32	264	444	1003	90	663	63	109	545	30	0	69	10733	4329
89	9	210	27	4	57	1062	12410	541	7	96	219	22761	102	76	116	54	121	45	99	392	890	70	727	42	173	580	0	10	51	10702	4275
89.1	0	178	0	0	34	1138	12096	580	66	116	214	22780	128	71	131	125	67	113	181	468	989	55	597	25	155	575	0	0	42	10908	4376
89.2	14	199	25	33	69	1166	12497	574	36	91	217	22207	107	36	137	7	74	78	130	410	983	167	693	36	189	517	0	0	24	10764	4503
89.3	12	222	33	43	103	1071	12064	528	37	92	224	21690	87	0	132	14	130	142	163	304	986	103	675	45	208	508	0	0	85	10985	4564
89.4	0	216	0	0	65	1054	11999	474	44	70	161	21732	132	11	116	60	86	69	168	389	994	107	592	35	204	540	0	0	71	10754	4463
89.5	20	220	23	29	67	1053	12030	607	53	56	192	22076	149	61	226	86	36	112	137	408	975	169	578	0	191	542	0	0	34	10810	4354
89.6	0	143	0	0	28	1036	11801	556	36	96	247	22518	144	58	153	94	110	50	175	460	857	152	624	45	189	522	0	14	25	11011	4405
89.7	14	199	22	33	61	1106	12005	546	60	94	260	22548	124	59	73	76	68	73	149	439	903	152	635	38	170	521	12	0	8	11395	4678
89.8	11	244	0	6	78	1100	12209	599	64	122	186	21984	121	0	140	46	155	111	201	430	928	123	673	34	196	519	0	0	26	11104	4398
89.9	8	215	11	9	49	1010	11957	557	36	58	148	21538	98	9	117	10	116	82	73	396	979	91	535	33	211	543	27	6	63	11483	4356
90	15	216	4	0	39	1047	11903	540	61	119	192	22151	129	19	95	28	45	27	12	531	983	30	757	56	193	537	0	0	100	11549	4669
90.1	13	234	14	18	50	1082	12316	562	43	89	193	22482	87	0	144	5	118	101	121	426	802	180	820	52	220	559	0	10	110	11654	4610
90.2	0	205	5	0	43	1014	12414	606	51	105	201	22691	166	41	122	83	33	205	165	427	934	136	611	34	189	548	0	0	82	11641	4508
90.3	28	251	38	27	78	1136	12586	548	43	98	196	22685	161	62	94	76	116	102	170	444	929	55	791	31	180	562	0	0	53	11989	4556
90.4	15	222	0	15	68	1120	12673	664	53	101	188	23403	106	0	78	89	43	120	104	296	973	95	629	23	275	547	6	0	70	12159	4547
90.5	0	235	0	8	29	1093	12785	589	73	114	215	23138	131	0	79	19	63	139	129	401	830	128	606	25	227	532	0	0	27	11929	4454
90.6	0	199	9	0	30	1096	12254	578	43	96	197	22209	118	65	120	76	31	136	134	380	983	148	693	27	223	576	15	0	101	12369	4342
90.7	6	217	0	0	54	1115	11927	568	12	88	217	21232	103	0	59	0	163	159	189	471	882	88	769	25	251	518	0	0	73	12304	4475
90.8	15	234	0	0	42	982	11483	500	48	80	190	20555	128	0	134	63	139	122	208	439	809	162	758	32	207	475	0	0	85	12206	4482
90.9	11	219	0	0	61	1014	11029	561	37	73	186	20592	89	0	108	0	140	88	175	438	858	78	784	12	238	468	0	0	71	12111	4458
91	0	216	0	0	50	1005	10996	580	25	121	186	21484	126	0	85	61	200	150	214	360	925	76	766	70	243	534	0	0	69	12510	4280
91.1	0	238	0	0	46	1095	11137	667	53	95	201	22653	109	32	151	62	15	69	147	326	904	82	863	0	217	594	36	0	56	12648	4382
91.2	0	218	14	0	44	1136	11476	675	38	90	202	24033	58	0	93	40	83	105	226	472	847	0	621	7	240	561	0	0	67	12299	4283
91.3	16	226	6	13	33	1219	11060	681	24	101	196	24253	109	0	145	21	102	126	153	523	837	0	764	0	264	544	0	0	47	12680	4373
91.4	11	232	0	0	43	1058	10963	643	74	91	440	22398	140	6	100	76	143	59	218	381	889	43	776	37	229	520	0	5	50	12743	4652
91.5	0	221	0	0	27	1027	11144	577	72	99	418	20627	115	0	93	43	100	23	149	489	867	47	784	82	228	561	0	15	85	12774	4502
91.6	0	206	0	0	47	1020	11273	581	71	101	263	21133	190	50	160	129	140	110	173	405	901	125	868	25	243	619	0	0	91	13256	4495
91.7	15	251	13	0	48	1015	11983	519	58	76	155	21608	82	0	72	35	140	148	193	425	820	119	838	57	237	592	0	0	97	12081	4463
91.8	0	258	0	0	29	1068	12235	549	36	131	209	22570	138	0	93	0	67	127	217	421	803	51	700	52	245	543	0	0	92	13047	4454
91.9	25	273	19	0	53	1114	12489	642	58	63	153	22118	93	0	106	62	60	59	262	489	819	148	923	17	224	557	23	0	110	13061	4393
92	0	212	17	0	63	986	12460	538	46	130	218	21324	90	0	67	5	97	67	90	385	780	94	838	51	231	535	10	0	97	12739	4262
92.1	0	202	0	0	39	994	11698	633	31	89	162	20748	101	0	52	52	59	90	109	504	891	98	814	25	231	536	0	0	83	13002	4271

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
92.2	0	229	13	0	43	1045	11961	558	30	132	196	21385	102	0	89	78	74	165	231	425	839	58	864	58	246	550	0	0	69	13030	4371
92.3	11	233	6	0	59	1110	11985	633	65	115	209	22071	124	0	53	30	123	86	219	470	819	173	865	47	253	606	0	0	35	12932	4443
92.4	0	257	0	0	61	1105	12145	602	49	84	190	22258	139	0	144	100	170	86	268	354	795	59	869	53	251	554	0	12	39	13140	4239
92.5	0	317	0	0	39	1005	11477	658	44	102	189	21774	109	0	26	46	102	64	113	442	693	132	924	57	256	579	0	0	36	13081	4296
92.6	0	264	9	0	78	1011	11173	586	56	133	177	22538	212	40	161	90	146	122	188	417	862	112	942	55	273	550	0	0	73	13368	4372
92.7	10	234	0	0	50	1091	12327	574	34	119	170	22014	190	29	158	117	153	181	259	372	756	60	907	49	255	569	0	0	53	12837	4234
92.8	0	265	0	0	51	1041	12710	617	83	119	240	21759	129	57	99	115	96	80	211	325	770	0	856	66	211	578	6	6	106	12735	4146
92.9	0	254	0	0	28	1088	12426	552	46	106	201	21125	145	40	99	98	113	42	172	438	881	109	823	57	214	589	9	8	94	12764	4254
93	19	276	0	18	52	1000	12935	659	49	84	191	20629	84	0	102	74	80	127	115	361	821	58	761	17	226	638	0	0	66	12726	4326
93.1	0	279	0	0	79	1018	13102	670	48	101	207	21148	88	0	130	91	70	16	154	307	819	229	732	35	227	577	8	25	102	12698	4204
93.2	0	230	0	0	69	1132	12824	591	25	97	196	21264	104	0	109	74	153	30	194	334	680	10	788	62	266	515	0	0	94	12874	4108
93.3	10	222	15	20	86	1124	12647	586	73	118	290	21922	162	0	125	152	211	117	227	347	746	27	1029	60	232	569	0	0	110	12959	4093
93.4	0	221	0	5	50	1121	12714	554	47	149	174	23307	122	7	106	70	123	94	213	359	711	0	853	91	247	500	9	0	56	12503	4215
93.5	0	245	0	0	37	1180	12536	548	35	88	205	23407	133	59	78	81	67	49	205	339	637	76	776	61	240	571	55	8	76	12305	3927
93.6	0	230	0	0	50	1110	11473	444	53	123	256	21445	192	13	117	51	130	113	203	338	632	0	973	54	280	506	0	0	84	12266	3966
93.7	0	211	0	0	36	1084	11301	490	82	102	286	20197	125	0	111	96	49	85	148	396	706	0	797	47	224	534	0	0	71	12175	3945
93.8	0	221	0	12	60	1080	11105	517	65	95	239	20537	124	0	97	42	103	82	228	330	769	29	883	72	209	494	0	0	70	12032	3993
93.9	0	205	0	0	62	1117	11532	581	56	135	225	20590	75	0	78	112	118	48	182	415	769	55	810	53	242	515	0	10	103	12606	3923
94	14	211	0	0	50	1224	11440	645	80	92	242	20751	115	28	116	112	59	67	145	300	747	20	860	11	247	558	42	0	81	12336	3972
94.1	7	179	0	0	34	1218	10736	627	59	84	208	22126	112	0	131	92	90	0	244	342	605	83	754	22	223	516	13	0	92	12175	3883
94.2	6	216	25	0	42	1269	10532	619	68	105	237	24138	138	0	146	57	143	46	122	392	770	95	869	47	285	493	13	22	67	12520	3966
94.3	17	228	17	0	56	1433	10591	577	41	140	155	24209	138	30	125	122	232	51	204	393	707	0	991	66	246	561	17	0	80	12285	3909
94.4	0	186	0	0	35	1275	10159	543	55	105	193	25054	152	18	167	74	128	35	183	352	559	27	979	49	238	531	0	0	50	12543	3995
94.6	0	190	0	0	44	1409	10162	587	64	109	209	25274	200	11	123	57	66	84	239	293	658	73	733	71	227	553	0	0	9	12737	3940
94.7	12	189	0	8	54	1380	9872	930	63	141	181	25836	117	0	149	54	76	83	147	342	756	74	991	61	246	609	0	13	52	12592	3951
94.8	0	234	0	0	40	1372	10546	738	51	98	151	26281	125	0	172	93	80	0	249	415	842	110	774	31	219	600	20	68	119	12472	3871
94.9	0	196	0	0	19	1442	10128	635	52	75	170	27105	135	0	69	9	92	128	135	420	612	63	823	37	296	537	0	0	73	12651	3667
95	0	199	0	0	0	1618	10008	582	49	138	242	29554	185	57	157	98	171	62	213	410	610	0	881	75	252	498	0	12	79	12521	3805
95.1	0	217	17	0	41	1504	9409	652	36	126	230	28912	161	19	178	58	84	142	161	462	479	142	623	58	209	523	0	0	48	12721	3816
95.2	0	215	0	0	63	1422	9467	672	49	129	143	27873	119	0	145	79	155	50	118	513	663	46	616	0	224	489	0	0	71	12294	3860
95.3	8	222	0	0	29	1560	9779	765	47	104	198	30064	162	104	199	99	85	147	227	430	525	99	818	27	226	537	34	0	94	12565	3831
95.4	8	194	7	25	52	1537	9419	648	73	115	237	28921	185	0	207	53	11	96	265	440	648	0	750	33	223	497	30	0	58	11985	3762
95.5	15	193	0	11	24	1565	8643	561	30	138	161	27920	163	0	156	68	95	68	143	497	605	52	917	64	256	478	55	0	81	12204	3665
95.6	20	204	8	19	49	1526	8775	588	38	111	241	27704	121	11	118	57	143	103	242	459	652	98	755	48	237	477	0	0	74	11978	3557
95.7	17	203	11	11	52	1542	8803	631	64	96	165	28012	152	0	159	15	80	115	184	491	534	59	769	30	244	444	0	0	65	11873	3654
95.8	27	198	15	0	68	1565	9278	667	24	108	195	28909	157	31	197	59	192	0	187	500	628	0	638	29	218	480	0	6	107	11840	3525
95.9	18	192	0	0	38	1681	9500	697	62	117	156	30306	202	25	154	78	191	135	192	433	698	0	736	130	210	510	0	0	35	11655	3538
96	17	230	25	48	88	1602	10211	729	73	111	143	27407	104	25	92	0	119	50	204	466	541	0	766	70	275	450	0	0	53	11928	3529
96.1	6	186	6	0	57	1354	10209	534	55	76	175	23812	79	0	98	0	113	63	125	368	437	76	691	14	241	403	11	0	44	11220	3259
96.2	0	199	0	8	61	1225	10826	572	50	116	201	23730	98	0	110	9	71	61	181	368	561	107	613	57	261	497	7	13	58	11033	3356
96.3	5	214	10	10	72	1165	9890	601	73	97	190	22222	198	14	149	0	80	81	176	360	618	121	875	36	192	500	0	0	70	11345	3239

Position (mm)	Al	Si	S	Cl	Ar	K	Ca	Ti	V	Cr	Mn	Fe	Ni	Cu	Zn	Ga	Ge	As	Se	Rb	Sr	Y	Zr	Ba	Ta	W	Hg	Pb	Bi	inc	coh
96.4	0	184	0	0	31	1190	9221	562	29	69	171	21435	124	40	129	4	0	52	174	283	570	75	676	59	220	507	0	0	66	10922	3164
96.5	0	199	5	0	46	1120	8868	606	55	109	142	22048	164	0	106	69	124	155	341	481	52	652	12	170	464	0	0	52	11291	3217	
96.6	5	204	18	15	67	1251	8724	590	66	81	184	23086	148	48	126	116	87	100	258	385	432	0	685	22	198	488	0	13	58	10935	3186
96.7	0	201	0	0	59	1296	8644	556	60	104	207	24274	160	56	144	78	28	33	175	436	517	68	523	32	156	484	5	0	50	11103	3288
96.8	0	178	13	0	44	1371	9104	589	17	119	167	26228	68	33	135	69	172	107	123	483	526	48	669	58	189	392	0	0	64	11212	3105
96.9	6	196	11	0	46	1403	8693	682	44	102	218	26917	162	45	99	99	65	14	184	468	445	103	647	24	174	459	0	57	18	10814	3173
97	14	184	13	19	64	1410	8847	588	61	87	192	25829	171	11	165	31	88	42	149	333	517	0	535	46	230	434	24	0	23	10488	3086
97.1	0	169	0	0	30	1248	8537	577	26	82	170	25265	197	0	144	64	6	120	104	327	410	95	482	46	229	412	0	0	96	10387	3179
97.2	0	169	25	0	52	1259	8484	596	72	84	210	24242	115	45	108	59	50	29	181	362	469	61	484	0	168	389	0	71	41	10472	2979
97.3	8	153	0	10	46	1314	7147	722	36	126	205	24494	100	0	94	31	41	21	89	426	393	66	510	55	215	386	0	0	53	10275	3049
97.4	8	160	25	23	74	1301	6713	684	50	65	171	25721	108	63	120	43	42	143	160	464	367	65	527	0	184	386	0	0	63	10369	2869
97.5	34	198	6	28	61	1437	7324	622	31	109	195	27790	149	35	191	101	35	55	72	412	480	11	582	23	182	445	23	37	81	10537	2985
97.6	13	218	0	20	40	1439	7218	615	0	71	193	27515	130	85	203	19	33	86	59	469	445	52	342	47	176	409	0	39	14	10363	2949
97.7	27	190	33	32	80	1451	7595	570	43	95	192	26689	127	41	164	95	80	148	140	473	499	27	518	49	163	450	0	0	67	10167	2968
97.8	29	136	0	13	48	1460	7141	492	48	114	198	26370	129	68	168	65	50	28	109	571	449	50	460	55	189	411	7	17	34	10232	2872
97.9	0	182	8	0	30	1414	7313	558	51	88	154	26316	184	10	168	57	101	106	159	452	443	0	488	39	191	405	0	0	48	10606	3021
98	0	175	0	0	36	1366	7452	646	0	104	168	27311	170	34	216	0	29	32	159	395	384	89	464	52	205	492	17	7	31	10555	2840
98.1	21	183	19	19	42	1453	8252	603	6	90	181	26962	184	27	222	79	48	16	82	512	387	120	490	51	192	468	0	0	55	10398	2924
98.2	19	201	20	0	31	1452	9033	537	46	118	185	25807	158	67	183	67	116	26	186	340	417	82	493	93	214	440	0	0	72	10240	2844
98.3	0	178	0	0	33	1247	8287	553	55	89	129	23992	167	70	214	0	108	0	117	368	363	0	427	30	173	440	0	0	34	9569	2724
98.4	17	152	19	17	66	1218	7520	519	40	85	177	22424	128	25	148	60	100	57	137	326	399	42	515	0	135	408	6	0	92	9679	2735
98.5	0	154	0	21	23	1241	7104	581	48	97	166	23055	124	20	162	113	27	66	131	340	463	0	547	30	165	395	0	0	51	9817	2891
98.6	5	165	30	32	47	1347	7060	573	33	74	170	24324	102	68	153	98	0	60	151	395	436	129	743	5	197	426	40	46	63	10224	3011
98.7	27	184	27	12	42	1238	6727	576	20	78	141	23746	200	78	228	40	143	146	52	374	386	24	621	19	195	380	0	0	26	10420	3022
98.8	22	152	4	9	55	1109	7060	497	44	74	156	22731	96	0	144	0	56	126	179	345	529	0	445	21	222	386	0	0	23	10343	2934
98.9	0	184	0	12	43	1134	7316	628	22	71	149	23676	82	0	186	33	86	94	103	442	591	90	625	4	211	400	9	0	81	10849	2987
99	20	188	19	22	45	1212	7880	569	27	50	170	23407	138	52	123	75	110	58	129	400	510	49	607	5	197	476	0	6	5	10671	3177
99.1	5	155	19	14	48	1298	9154	502	42	106	209	24909	116	73	267	132	164	101	173	484	548	129	738	49	219	470	17	0	100	11344	3228
99.2	0	155	17	9	28	1258	8959	531	36	58	163	26197	139	0	160	39	147	130	82	544	589	81	591	27	273	470	0	0	27	12100	3490
99.3	0	181	16	11	29	1361	8428	555	37	97	202	27390	122	0	200	46	188	98	143	588	688	119	702	27	232	460	0	0	32	12670	3596
99.4	25	217	40	24	64	1411	9368	655	41	80	207	31216	73	0	197	47	37	128	105	709	901	0	696	62	317	552	0	0	66	13464	3745
99.5	0	174	70	23	70	1399	10504	735	41	132	255	37000	89	77	301	202	265	203	313	675	649	81	902	17	522	780	0	0	42	16093	3503
99.6	0	163	59	65	20	1380	9452	588	41	144	200	28041	0	0	245	186	318	291	373	262	113	0	661	59	1090	902	0	0	145	19830	3146
99.7	29	228	76	45	47	1411	10428	611	49	190	118	26043	0	31	344	334	385	517	549	131	51	0	433	0	1132	1207	0	0	311	20469	3209
99.8	13	207	68	57	49	1572	11487	675	54	151	200	28972	0	0	439	204	466	603	434	155	67	0	491	9	1216	1200	0	0	224	20802	3193
99.9	25	225	131	53	40	1886	10224	667	44	138	205	31121	0	43	635	402	434	577	551	35	48	0	409	14	1316	1299	0	0	273	20914	3182
100	19	209	171	49	56	1885	9096	643	29	80	201	31588	0	39	514	498	459	635	522	0	0	0	454	44	1420	1375	0	0	221	21108	3139

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