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Provenance of the Aptian McMurray Formation:

Insights from Detrital Zircon U-Pb Geochronology

by

Christine Benyon

A THESIS

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Abstract

The McMurray Formation of the Athabasca Oil Sands hosts one of the largest hydrocarbon resources on Earth, yet the provenance of the sediment itself remains poorly constrained. As the first detrital zircon provenance study from the oil sands, new uranium-lead (U-Pb) detrital zircon ages provide important insights into Early Cretaceous paleogeography, continental-scale sediment transport, and assist in the correlation of incised valley deposits. 27 samples dated using laser ablation–multicollector–inductively coupled plasma–mass spectrometry (LA-MC-ICP-MS) reveal two sets of three distinct detrital-zircon signatures. Each set is documented and grouped into three chronofacies, interpreted to reflect derivation from the Canadian Shield, the Appalachians, and the Cordilleran orogen. Several hypotheses are presented to answer the question of when and how sediments from eastern North America were transported to western Canada. These data are combined with subsurface correlations and chemostratigraphic data to demonstrate the complexity of valley fills and examine the relationship between different valley deposits.

Acknowledgements

First and foremost, I extend my sincerest gratitude to my supervisor, Dr. Andrew Leier. His enthusiasm, encouragement, sense of humour, and faith in me throughout the past 2.5 years has been invaluable. By taking a chance and accepting me as one of his students, countless doors were opened for me. I was also fortunate to have had Dr. Stephen Hubbard act as a second supervisor on numerous occasions; his help and ideas greatly enhanced this thesis. In addition, I would like to thank Dr. Dale Leckie for his guidance, input, and constant support.

This project would not have been possible without the help of: Milovan Fustic for his assistance in getting this project started; Owen Anfinson and Brant Skibsted for their assistance dating zircons in Tucson; Mike Blum and Keegan Raines for helpful discussions; and Caterina Heikkinen for helping with processing. Andrew Webb and Cynthia Hagstrom (Nexen Energy ULC) also deserve a great deal of recognition for their collaboration and input throughout this project. I also wish to express my sincere thanks to my committee members, including Dr. Derald Smith, for the careful review of my thesis.

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Table of Contents

Abstract ii
Acknowledgements iii
Table of Contents v
List of Figures and Illustrations vii

CHAPTER ONE: INTRODUCTION 1
1.1 References 3

CHAPTER TWO: PROVENANCE OF THE CRETACEOUS ATHABASCA OIL SANDS, CANADA: IMPLICATIONS FOR CONTINENTAL-SCALE SEDIMENT TRANSPORT 6
2.1 Introduction 6
2.2 McMurray Formation 8
2.3 Methods 9
2.4 Results 10
2.5 Interpretation 10
2.6 Discussion 14
2.6.1 "Appalachian" Sediment Pathways 14
2.6.2 Vertical Stratigraphic Variations 19
2.7 Conclusions 20
2.8 References 21

CHAPTER THREE: DETRITAL ZIRCON GEOCHRONOLOGY OF THE MCMURRAY FORMATION AND APPLICATIONS FOR STRATIGRAPHIC ANALYSIS 29
3.1 Introduction 29
3.2 Background Geology 33
3.3 Methodology 35
3.4 Detrital-Zircon Results 37
3.5 Interpretation of Detrital Zircon Ages 40
3.5.1 Detrital Zircon Chronofacies 40
3.5.2 Detrital Zircon Provenance 41
3.5.2.1 Populations 41
3.5.2.2 Chronofacies 43
3.6 Cross-Sections 45
3.7 Discussion and Analysis 48
3.7.1 Detrital Zircon Provenance 48
3.7.1.1 Drainage Area Estimates 52
3.7.2 Detrital-Zircon Population Characteristics 55
3.7.3 Chronofacies and Incised Valley Systems 58
3.7.4 Detrital Zircons and Chemostratigraphy 59
3.8 Conclusions 62
3.9 References 63

CHAPTER FOUR: CONCLUSIONS 74

4.1 Future Work 76
4.2 References 78

APPENDIX A 79

APPENDIX B 92

List of Figures and Illustrations

Figure 2.1. Sample locations and Lower Cretaceous stratigraphy, western Canada. 7

Figure 2.2. Sample results. 11

Figure 2.3. Comparison between detrital zircon ages in the McMurray Formation and Mississippian-age strata in the Appalachians. 13

Figure 2.4. Generalized Early Cretaceous paleogeography. 15

Figure 2.5. Sediment transport models for ‘‘Appalachian’’ zircons. 16

Figure 3.1. Sample locations and Lower Cretaceous stratigraphy, western Canada. 30

Figure 3.2. Wells, sample locations within the wells, and paleovalley map. 32

Figure 3.3. Sample results. 38

Figure 3.4. Southwest to northeast Cottonwood to Kinosis Cross-Section. 46

Figure 3.5. Southwest to northeast Leismer Cross-Section. 47

Figure 3.6. Proposed Appalachian sediment pathways. 49

Figure 3.7. Paleogeographic and depositional setting for the McMurray Formation. 53

Figure 3.8. Comparison of measured section, chemostratigraphic data, and detrital-zircon data from well 1AB/06-34-084-07W4/00 (Kinosis 1). 60

Figure 4.1. Sample results from all 27 detrital-zircon samples. 75

Chapter One: Introduction

Estimated resources exceeding 1.7 trillion barrels of bitumen in-place occur within the McMurray Formation of the Athabasca Oil Sands, which makes it one of the largest hydrocarbon resources on Earth (ERCB 2011). The McMurray Formation is a complex, heterogeneous unit that was deposited in fluvial, estuarine, and marginal marine environments along the southern margin of the Western Interior Seaway during the Cordilleran Orogeny (Leckie and Smith 1992). Despite the formation's geologic, economic, and geopolitical importance, the provenance of the sediment itself remains poorly constrained. Petrographic evidence has suggested much of the sand was derived from the Canadian Shield (Mellon 1956; Carrigy 1963), while paleogeographic reconstructions have implied the sand was derived from a large south-to-north drainage network with headwaters in the southwestern United States (e.g., McGookey 1972; Miall et al. 2008). The incised valley systems that make up the majority of the formation are often difficult to distinguish between one another with wireline logs and conventional core analysis alone. The hypothesis tested during this thesis is that provenance information from detrital zircon geochronology can provide insights into Early Cretaceous paleogeography, continental-scale sediment transport, and the correlation of intraformational incised valley deposits.

As the first detrital zircon provenance study from the oil sands, the uranium-lead (U-Pb) detrital zircon ages (n = 2608) presented in this thesis have uncovered a complicated and variable provenance history that involves several major tectonic regions from across North America. For this thesis, twenty-seven samples (twenty-five from the McMurray Formation and two from the Wabiskaw Member of the Clearwater Formation)

were collected, processed and dated using procedures outlined in Gehrels (2011) using laser ablation–multicollector–inductively coupled plasma–mass spectrometry (LA-MC-ICP-MS). The ages of detrital zircon grains in quartzose sandstones provides direct evidence for the ages of bedrock from which the sand grains were originally derived (Gehrels and Dickinson 1995), and characterizing the detrital zircon age distribution of a sedimentary unit is commonly referred to as establishing a detrital zircon fingerprint for a source area (Ross and Parrish 1991).

In addition to the Introduction and Conclusion chapters, this thesis is composed of two principal chapters, both of which have an overarching theme of applying U-Pb detrital zircon geochronology to the McMurray Formation. Chapter Two analyzes nine samples collected in the initial part of the study, with a focus on sediment source areas, potential transport pathways, and vertical stratigraphic variations. Eight of these samples were from the McMurray Formation, and one was from the Wabiskaw Member of the Clearwater Formation. Initial hypotheses as to the origin of the sediment are discussed and the new U-Pb detrital zircon ages are presented. Three distinct detrital-zircon signatures in the McMurray Formation are documented and grouped into three distinct chronofacies. These chronofacies are interpreted to reflect derivation from: 1) the Canadian Shield, 2) an "Appalachian" source in eastern North America, and 3) the Cordilleran orogen. The question of when and how sediments from eastern North America were transported to the Athabasca Oil Sands is explored, and several potential hypotheses are presented. Vertical stratigraphic changes in the dominant detrital-zircon signatures are also observed and discussed. This chapter has been published in the Journal of Sedimentary Research (Benyon et al. 2014).

Chapter Three focuses on seventeen samples collected from the McMurray Formation and one sample from the Wabiskaw Member of the Clearwater Formation; these samples cover a broader geographic extent relative to those featured in Chapter Two. Sediment source areas and potential transport pathways are explored, as in Chapter Two. However, this chapter incorporates additional datasets including measured section, chemostratigraphy, and regional cross-sections. Considering the difficulty of correlating incised valley systems in the McMurray Formation, cross-sections were made through the study area in order to compare mapped valley fills (cf. Fustic et al. 2012) and the detrital-zircon signatures. The signatures are also compared to lithology and sedimentary structures in logged core, as well as existing chemostratigraphic zonations and ratios. It appears that detrital-zircon signatures are variable both within and between valleys, likely due to homogenization. Additionally, there may be some correlations between detrital-zircon signatures and chemostratigraphic data; however, there is no obvious relationship as of now. Together, these chapters represent the first focused detrital zircon provenance study of the McMurray Formation, and provide unique insight into the large-scale catchment that sourced the well-constrained fluvial and estuarine units containing vast bitumen resources.

1.1 References

Benyon, C., Leier, A., Leckie, D.A., Webb, A., Hubbard, S.M., and Gehrels, G., 2014, Provenance of the Cretaceous Athabasca Oil Sands, Canada: Implications for Continental-scale Sediment Transport: Journal of Sedimentary Research, v. 84, p. 136–143.

Carrigy, M.A., 1963, Paleocurrent directions from the McMurray Formation: Bulletin of Canadian Petroleum Geology, v. 11, p. 389–395.

Energy Resources Conservation Board (ERCB), 2011, ST98: Alberta's Energy Reserves 2011 and Supply/Demand: Outlook 2012–2021, Calgary.

Fustic, M., Hubbard, S.M., Spencer, R., Smith, D.G., and Leckie, D.A., 2012, Recognition of down-valley translation in tidally influenced meandering fluvial deposits, Athabasca Oil Sands (Cretaceous), Alberta, Canada: Marine and Petroleum Geology, v. 29, p. 219–232.

Gehrels, G.E., and Dickinson, W.R., 1995, Detrital zircon provenance of Cambrian to Triassic miogeoclinal and eugeoclinal strata in Nevada: American Journal of Science, v. 295, p. 18–48.

Gehrels, G.E., 2011, Detrital zircon U–Pb geochronology: Current models and new opportunities, *in* Busby C., and Azor A., eds., Tectonics of Sedimentary Basins: Recent Advances: Chichester, UK, Wiley-Blackwell, p. 47–62.

Leckie, D.A., and Smith, D.G., 1992, Regional setting, evolution, and depositional cycles of the Western Canada Foreland Basin, *in* Macqueen, R.W., and Leckie, D.A., eds., Foreland Basins and Fold Belts: American Association of Petroleum Geologists, Memoir 55, p. 9–46.

McGookey, D.P., 1972, Cretaceous System, *in* Mallory, W., ed., Geological Atlas of the Rocky Mountain Region: Denver, Colorado, Rocky Mountain Association of Geologists, p. 190–228.

Mellon, G.B., 1956, Heavy minerals of the McMurray Formation, *in* Geology of the McMurray Formation: Part 2, Research Council of Alberta, Report 72, p. 1–50.

Miall, A.D., Catuneanu, O., Vakarelov, B.K., and Post, R., 2008, The Western Interior Basin, *in* Miall, A.D., ed., The Sedimentary Basins of the United States and Canada: The Sedimentary Basins of the World: Amsterdam, Elsevier, v. 5, p. 329–362.

Ross, G.M., and Parrish, R.R., 1991, Detrital zircon geochronology of metasedimentary rocks in the southern Omineca Belt, Canadian Cordillera: Canadian Journal of Earth Sciences, v. 28, p. 1254–1270.

Chapter Two: Provenance of the Cretaceous Athabasca Oil Sands, Canada: Implications for Continental-Scale Sediment Transport

2.1 Introduction

The Athabasca Oil Sands of Alberta, Canada, contain an extensive record of Early Cretaceous sedimentation and host one of the largest accumulations of hydrocarbons in the world (Fig. 2.1). Of these deposits, the Lower Cretaceous (Aptian) McMurray Formation is the principal stratigraphic formation. This sedimentary unit was deposited on an unconformity in fluvial–estuarine environments along the southern margin of the Western Interior Seaway during the Cordilleran Orogeny (Leckie and Smith 1992). The sedimentary characteristics of the deposits in the McMurray Formation have led some to posit that the paleoriver system may have been comparable in scale to the modern Mississippi River system, and included a continent-wide drainage network (e.g., McGookey 1972; Mossop and Flach 1983; Miall et al. 2008).

Although significant effort has been made to understand the origin of the hydrocarbons in the McMurray Formation (e.g., Creaney and Allan 1990; Adams et al. 2013), the origin and provenance of the sediment itself remains unclear. Paleogeographic reconstructions using paleocurrent data and facies distributions typically depict the McMurray Formation as the product of a large, continental-scale, south-to-north flowing river system with paleo-headwaters as far away as present-day Texas and Arizona (e.g., McGookey 1972; Mossop and Flach 1983; Lawton 1994; Miall et al. 2008). In contrast, petrographic studies (Mellon 1956; Carrigy 1963) and recent paleogeographic reconstructions (Leckie and Seif El-Dein 2009) suggest the sediments of the McMurray Formation were derived from the Canadian Shield.

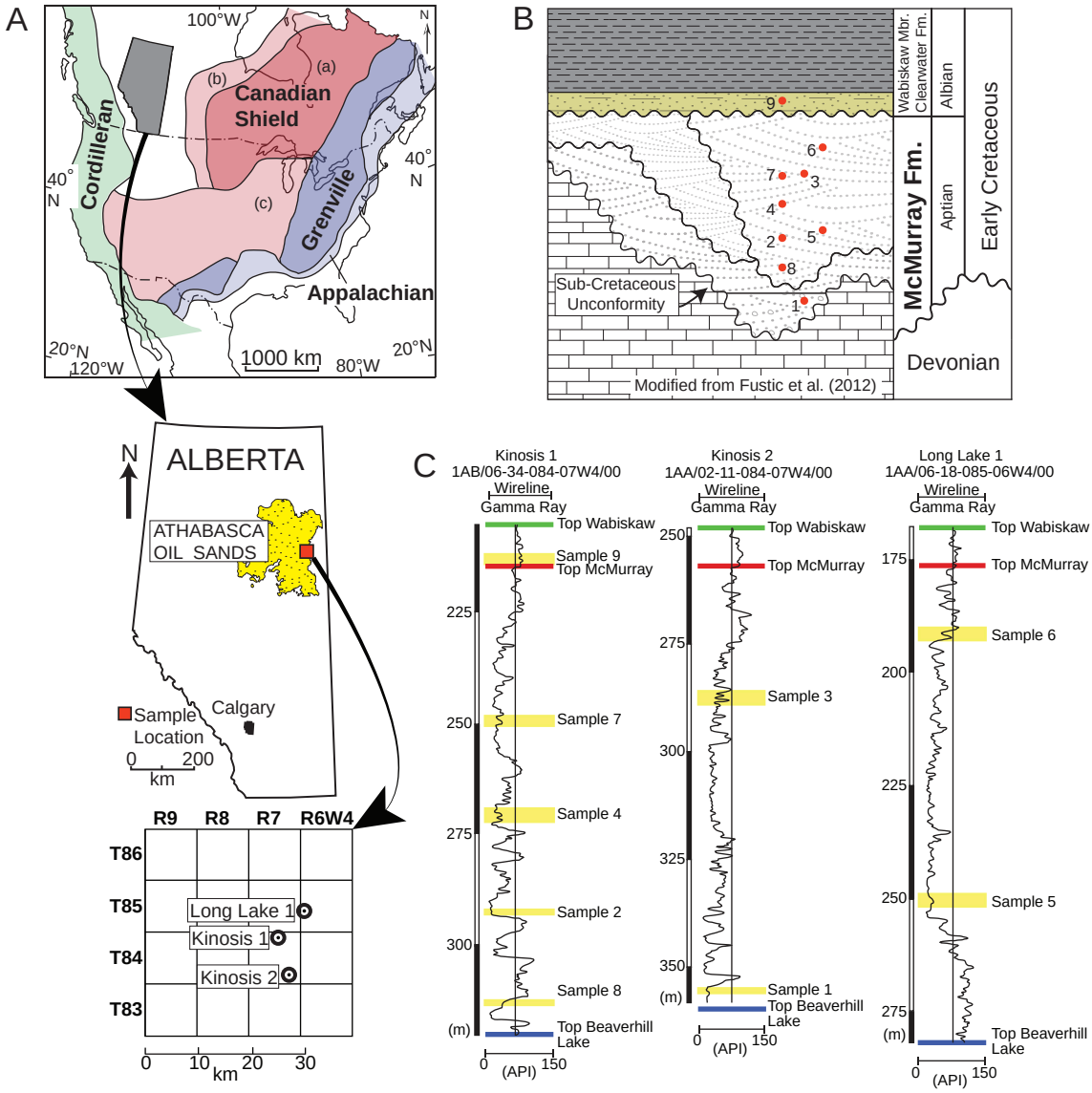


Figure 2.1. Sample locations and Lower Cretaceous stratigraphy, western Canada. A) Distribution of the Athabasca Oil Sands is represented by yellow stippled region. Samples were collected from three wells drilled in the eastern portion of the Athabasca area. The three well locations are displayed on a Western Canadian Dominion Land Survey (DLS) grid. Nearly square townships are marked (T = township), as well as the east and west edges of townships, or range lines (R = range), all west of the 4th meridian here (W4). Precambrian and Phanerozoic age belts from Dickinson and Gehrels (2009): (a) represents the Superior Province of the Canadian Shield (~ 2.5 Ga); (b) represents the Trans-Hudson Province (ca. 1.8 Ga); and (c) represents additional ca. 1.8 Ga provinces. Other principal areas discussed in the text are labeled. B) Stratigraphy of Lower Cretaceous deposits in the Athabasca region. Lower Cretaceous strata of the McMurray Formation unconformably overlie Devonian carbonate strata. The McMurray Formation is typically divided into a lowermost unit (below black line), a middle unit that contains several incised valleys, and an upper unit that contains shallow marine deposits (modified from Fustic et al. 2012). The McMurray Formation is overlain by the Wabiskaw Member of the Clearwater Formation. Yellow represents coarser sediments in the Wabiskaw, and gray represents shale. Sample numbers and their relative stratigraphic locations are shown. C) Three gamma-ray wireline logs for the three sampled wells. The Unique Well Identifiers (UWI's), which follow the aforementioned DLS system, are labeled at the top of each wireline log. The depths at which each of the nine samples were taken are also shown, where meters indicate depth below surface. Note that Beaverhill Lake is Devonian.

We use detrital zircon uranium–lead (U-Pb) geochronology to examine the provenance of the McMurray Formation and by extension provide insights into Early Cretaceous sediment distribution patterns in North America. These data record a complicated and variable provenance history that involves several major tectonic regions from different portions of North America. The McMurray Formation contains three distinct detrital-zircon signatures that reflect sediment derivation from the Canadian Shield, an ‘‘Appalachian’’ source in eastern North America, and the Cordilleran orogen. Vertical stratigraphic variability within the McMurray Formation indicates that the relative contribution from these sediment source areas changed during deposition of the formation.

2.2 McMurray Formation

The McMurray Formation was deposited in the eastern portion of the Cordilleran foreland basin along the southern margin of the Western Interior Seaway during the late Aptian (Hein et al. 2013; Dolby et al. 2012). The succession, 5 to 150 m thick, is typically divided into a lower fluvial unit, a middle fluvial–estuarine unit, and an upper shallow marine unit (Ranger and Pemberton 1997; Hein and Cotterill 2006). Sediments of the McMurray Formation were deposited unconformably on top of Devonian strata in a broad, north-trending valley (Cant 1996; Wightman and Pemberton 1997). Channel patterns and paleocurrent data indicate flow was to the north-northwest, parallel to the trend of this valley (Mossop and Flach 1983; Fustic et al. 2012). In places, paleochannels were as large as 600 m wide and 35 m deep in the middle portion of the formation (e.g., Hubbard et al. 2011; Musial et al. 2012), although paleochannels at the base of the formation (lower fluvial unit) may be smaller (Hein and Cotterill 2006). Deposition took

place in the McMurray sub-basin, which was bordered on the south by paleotopographic highs in central Alberta and Saskatchewan and to the west by a series of linear paleotopographic ridges that separated it from the foredeep of the coeval Cordilleran foreland basin (Leckie and Smith 1992; Ranger and Pemberton 1997; Christopher 2003). McMurray Formation sandstones are composed of mineralogically mature, fine- to medium-grained quartzose sand. Quartz is the most abundant mineral in the sandstones (~ 95%), with lesser amounts of potassium feldspar, chert, and igneous plutonic lithoclasts. Rounded quartz, feldspar, heavy minerals, and abraded authigenic quartz suggest a recycled source. Angular feldspar grains and polycrystalline quartz suggest a Canadian Shield contribution, and chert grains (silicified carbonate) are likely derived from the underlying Devonian carbonate units. Heavy-mineral assemblages from the McMurray Formation suggest a provenance associated with igneous–metamorphic terranes and recycled sedimentary rocks (Mellon 1956; Carrigy 1963). During Albian time, this area was transgressed by the Western Interior Seaway, as recorded by overlying marine mudstone and sandstone of the Wabiskaw Member of the Clearwater Formation (Fig. 2.1B; Keith et al. 1988).

2.3 Methods

Nine sandstone samples were collected from three cored wells in the Athabasca Oil Sands (Fig. 2.1). Samples 1–8 are from the McMurray Formation, and sample 9 is from the overlying Wabiskaw Member of the Clearwater Formation (Fig. 2.1B). Samples of 2–5 kg were collected from fine- to medium-grained sandstone and processed using procedures outlined in Gehrels (2011). Approximately 100 zircons per sample were analyzed using laser ablation–multicollector–inductively coupled plasma–mass

spectrometry (LA-MC-ICP-MS) at the Arizona LaserChron Center (refer to Appendix A for details on samples and analytical procedures.

2.4 Results

The nine samples yielded a total of 848 U-Pb ages and contain several prominent populations (Fig. 2.2; Appendix A). From oldest to youngest, these populations include ages between ca. 2800–2600 Ma, ca. 1900–1800 Ma, ca. 1200–1000 Ma, ca. 600–300 Ma, and <250 Ma. Not all of these age populations are present in each sample (Fig. 2.2). Grain morphology was compared to U-Pb ages, but no relationship was evident (Appendix A).

2.5 Interpretation

We divide the samples into three chronofacies, informally labeled ‘‘*i*,’’ ‘‘*ii*,’’ and ‘‘*iii*’’ (Fig. 2.2) based on the presence of dominant U-Pb age populations and Kolmogorov-Smirnov (K-S) statistics (Press et al. 1986; Appendix A). Chronofacies *i* is limited to sample 1 and is characterized by detrital-zircon populations with U-Pb ages of ca. 1800–1900 Ma and ca. 2600–2800 Ma (Fig. 2.2). Chronofacies *ii* (samples 2, 3, 4, 5, 6; Fig. 2.2) contains U-Pb ages of ca. 300–600 Ma and ca. 1000–1200 Ma. Chronofacies *iii* (samples 7, 8, 9; Fig. 2.2) contains detrital-zircon populations with U-Pb ages <250 Ma and ca. 1800–1900 Ma. Sample 7 contains characteristics of both chronofacies *ii* and *iii*, but is included in chronofacies *iii* based on visual comparisons and K-S results (Appendix A). Sample 9 is from the lowermost portion of the Wabiskaw Member of the Clearwater Formation (Fig. 2.1B), which overlies the McMurray Formation.

Detrital zircons of chronofacies *i* are interpreted to have been derived from the Proterozoic and Archean rocks of the Canadian Shield (Fig. 2.1A). The population of ca.

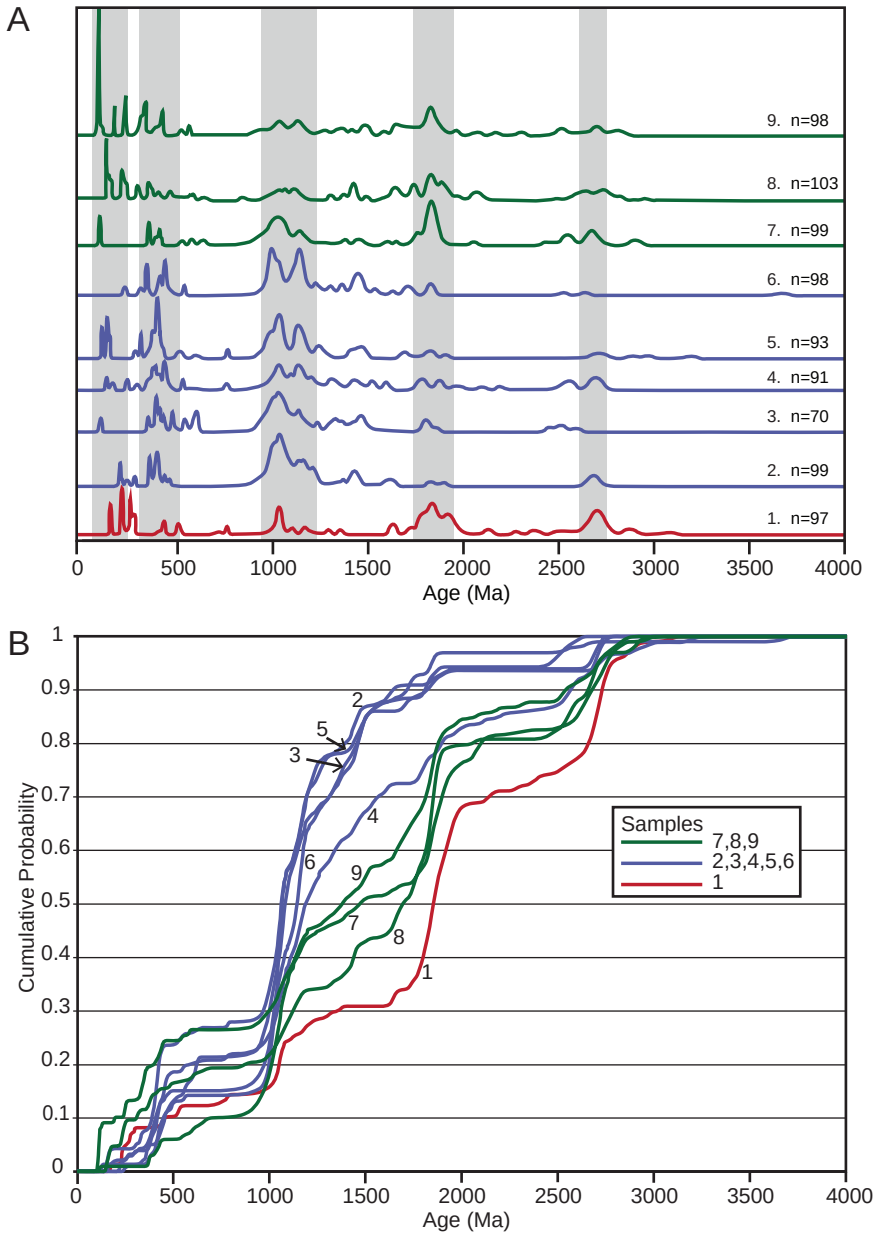


Figure 2.2. Sample results. A) Detrital-zircon normalized probability plots from the nine samples; n is number of analyses. Highlighted areas depict primary age populations. Sample 1 (red) represents chronofacies *i*, and is characterized by 1.8–1.9 Ga and 2.6–2.8 Ga grains. Samples 2–6 (blue) represents chronofacies *ii*, and are characterized by zircons with U-Pb ages of ca. 300–600 Ma, and ca. 1000–1200 Ma. Samples 7–9 (green) represent chronofacies *iii* and are characterized by abundant grains less than 250 Ma. Local recycling of strata likely account for the presence of distinct populations within successive chronofacies. B) Cumulative probability plot. As in Part A, red represents sample 1 (chronofacies *i*), blue represents samples 2–6 (chronofacies *ii*), and green represents samples 7–9 (chronofacies *iii*). Numbers next to the curves are the sample numbers. Samples display distinct groupings. See text for discussion; for complete results, see Appendix A.

2600–2800 Ma zircons are interpreted to have been derived from Archean rocks of the Superior province (Fig. 2.1A; e.g., Dickinson and Gehrels 2009), and the population of ca. 1800–1900 Ma zircons are interpreted to have been derived from the Trans-Hudson province (Fig. 2.1A). These interpretations are supported by previous petrographic studies, which indicate that the heavy minerals in the McMurray Formation were derived from the igneous–metamorphic rocks of the Canadian Shield (e.g., Mellon 1956; James and Oliver 1977; Nelson and Glaister 1978).

Detrital zircons of chronofacies *ii* are interpreted to have been originally derived from Grenville and Appalachian source areas in the eastern regions of North America (Figs. 2.1A, 2.3). The Grenville province is well known to contain zircons with U-Pb ages between ca. 1000 and 1300 Ma (Fig. 2.1A; e.g., Becker et al. 2005; Moecher and Samson 2006), and detrital zircons with ages between ca. 300 and 600 Ma are typically associated with an Appalachian provenance (Fig. 2.3; e.g., Dickinson and Gehrels 2009). Although the 300–600 Ma ages occur in the Ellesmerian and Caledonian regions, the distribution of other age populations from these areas do not match those in the McMurray Formation (e.g., Anfinson et al. 2012; Hadlari et al. 2012). Therefore, we interpret these grains as having been derived from the Appalachian province of eastern North America (Figs. 2.1A, 2.3). An eastern North American provenance is supported by the similarity between detrital zircon ages in sandstones of the McMurray Formation and sandstones in Appalachian foreland basin strata (Fig. 2.3). No significant source of zircons with these ages is present in western Canada (e.g., Ross et al. 2005; Leier and Gehrels 2011; Raines et al. 2013).

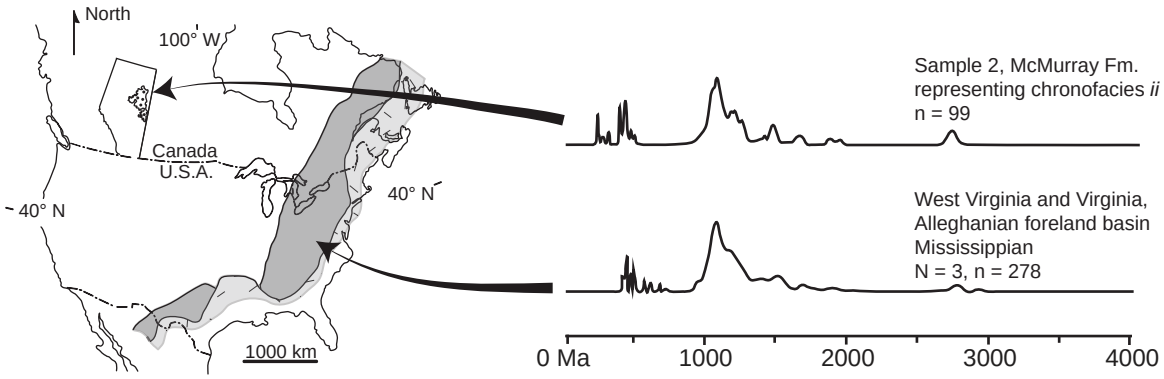


Figure 2.3. Comparison between detrital zircon ages in the McMurray Formation from Alberta, Canada and Mississippian-age strata deposited in the Alleghanian foreland basin of the Appalachians in Virginia and West Virginia, U.S.A. The map of North America shows the Grenville province (gray) and the Appalachian province (light gray, hatches) from Dickinson and Gehrels (2009), as well as the McMurray Formation (stippled area) and approximate location of the samples. Both samples contain very similar detrital-zircon age populations, most notably populations of ca. 300–600 Ma and ca. 1000–1200 Ma. The presence of Grenville and Appalachian detrital zircons in the McMurray Formation of Alberta is interpreted to indicate that some of the sediment in this unit (chronofacies *ii*) was originally derived from eastern North America. How and when the sediment was transported from eastern North America to western Canada is not yet resolved (see Fig. 2.5). McMurray Formation sample is from this study (see Fig. 2.2), Mississippian-age sample is from Park et al. (2010). N = number of samples, n = number of detrital-zircon ages.

Detrital zircons of chronofacies *iii* contain populations of zircons with ages <250 Ma (Fig. 2.2) and are interpreted to have been derived from the Cordilleran province of western North America (Fig. 2.1A; Ross et al. 2005; Dickinson and Gehrels 2009). The presence of lesser populations with U-Pb ages of ca. 1800–1900 Ma is consistent with this interpretation because many of the clastic strata exposed in the Cordilleran fold–thrust belt also contain detrital zircons with these ages (cf. Leier and Gehrels 2011; Raines et al. 2013).

2.6 Discussion

2.6.1 "Appalachian" Sediment Pathways

The presence of detrital zircons of Appalachian affinity (chronofacies *ii*) in the McMurray Formation raises the question of how such grains made their way from eastern North America to western Canada. Based on existing paleogeographic information and potential detrital-zircon source areas (Fig. 2.4), we propose three general models (Fig. 2.5) to explain how these zircons came to be deposited in western North America during the Early Cretaceous: A) detrital zircons were transported from eastern North America via westward-flowing rivers during the Early Cretaceous, contemporaneously with deposition; B) detrital zircons from eastern North America were transported to southwestern North America prior to the Cretaceous, deposited, and then recycled during the Early Cretaceous and transported northward into western Canada; and C) detrital zircons from eastern North America were transported to northwestern North America (i.e., present-day western Canada) prior to the Cretaceous, deposited, and locally recycled during the Early Cretaceous. Evidence to definitively prove or refute any of

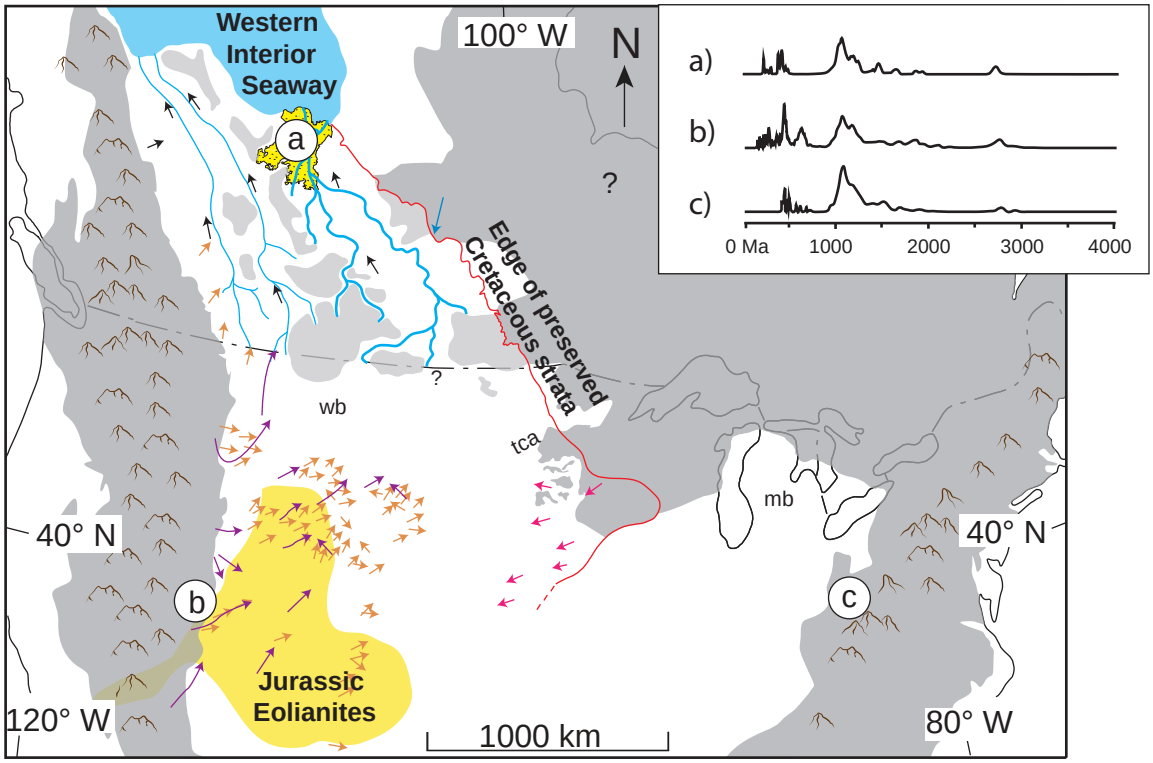


Figure 2.4. Generalized Early Cretaceous paleogeography. Present-day latitude and longitudes are shown. Regions inferred as relative paleotopographic highs are shown in gray (adapted, in part, from Christopher 2003; Blakey 2012). Areas of general deposition are depicted in white. Smaller arrows represent compiled paleocurrent indicators (Heller and Paola 1989 (orange); Leckie and Smith 1992 (black); Witzke and Ludvigson 1994 (pink); Leckie et al. 1998 (blue); and DeCelles 2004 (purple)). Representative detrital-zircon signatures from different parts of North America are shown in the inset: a) Lower Cretaceous McMurray Formation, this study; b) Mesozoic eolianites, Colorado Plateau (Dickinson and Gehrels 2009); c) Mississippian strata, Virginia and West Virginia (Park et al. 2010). Tectonic features (wb, Williston Basin; tca, Transcontinental Arch; mb, Michigan Basin; modified from Sloss 1988) are included, but were not necessarily active during the Early Cretaceous.

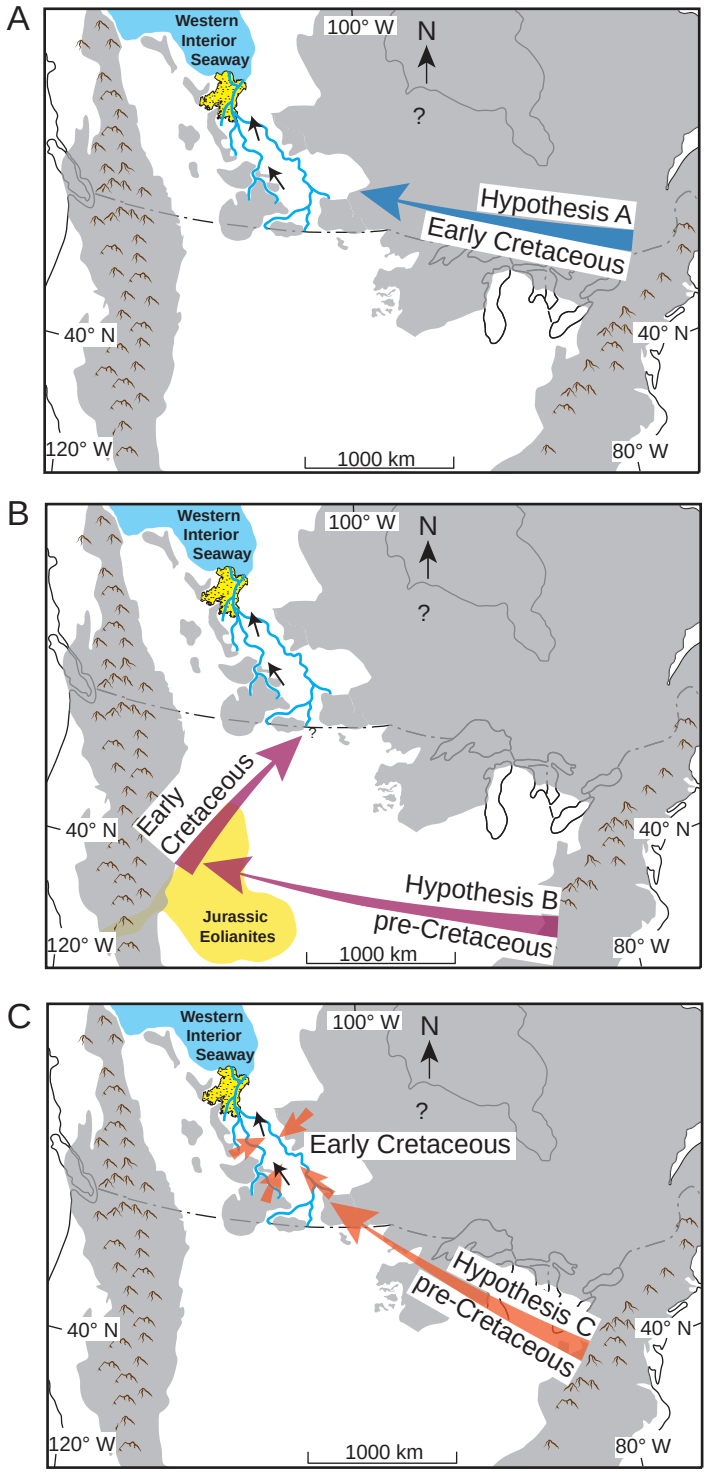


Figure 2.5. Sediment transport models for ‘‘Appalachian’’ zircons. Large arrows represent hypothesized pathways of sediment from eastern North America to the Athabasca region of Canada. Hypothesis A involves direct transport of material from east to west during the Early Cretaceous; Hypothesis B involves pre-Cretaceous transport of sediment from eastern North America to southwestern North America, followed by northward transport during the Early Cretaceous; and Hypothesis C involves pre-Cretaceous transport of sediment from eastern North America to western Canada, followed by local recycling of underlying (pre-Cretaceous strata) during the Early Cretaceous.

these models is currently lacking; however, we outline these hypotheses below and propose some possible means of testing their validity.

Detrital zircons of Appalachian affinity may have been transported to western North America during the Early Cretaceous (Hypothesis A; Fig. 2.5); however, there is little direct evidence supporting this hypothesis. Grenville and Appalachian provinces are located in eastern North America, and sedimentary units in this region contain significant populations of ca. 300–600 and ca. 1000–1300 Ma grains (Fig. 2.3; e.g., Becker et al. 2005; Dickinson and Gehrels 2009; Park et al. 2010). Transcontinental fluvial systems are proposed to have traversed North America during the Jurassic (Dickinson and Gehrels 2009), but no evidence of large-scale, east-to-west flowing systems exist within Cretaceous strata. In areas of central North America (between the proposed sediment source areas and the McMurray Formation), Lower Cretaceous strata are largely absent (Fig. 2.4; e.g., Dyman et al. 1994), and where present, Early Cretaceous paleoflow data are inconclusive with respect to a hypothetical transcontinental river (Fig. 2.4; Witzke and Ludvigson 1994).

Southwestern North America contains a potential source of Appalachian-derived detrital zircons in Jurassic eolianites (Hypothesis B; Figs. 2.4, 2.5; Dickinson and Gehrels 2009). Age populations of 420, 615, 1055, and 1160 Ma in these units reflect original derivation from Grenville and Appalachian sources (Dickinson and Gehrels 2009). Sediment in these eolian units, originally derived from eastern North America (Dickinson and Gehrels 2009), was exposed and recycled into the Cordilleran foreland basin during the Early Cretaceous (Dickinson and Gehrels 2008). These grains would have had to have been transported northward into present-day Canada during the Early Cretaceous, which

is consistent with several Early Cretaceous paleogeographic reconstructions (e.g., McGookey 1972; Lawton 1994; Miall et al. 2008). The primary issue with this hypothesis is the well-established presence of paleohighlands, which existed to the west and south of the Athabasca Oil Sands during the deposition of the McMurray Formation (Figs. 2.4, 2.5; Leckie and Smith 1992; Cant 1996; Ranger and Pemberton 1997; Christopher 2003). If sediment from the south was delivered into the McMurray sub-basin, the likely large fluvial systems would have had to transect these highs (Figs. 2.4, 2.5). Current data (Fig. 2.4) makes this hypothesis seem unlikely; however, at this time, no definitive evidence demonstrates whether this did or did not occur.

The McMurray Formation overlies an unconformity juxtaposing Lower Cretaceous strata on Devonian rocks (Fig. 2.1B). Thus, it is possible that the detrital zircons of Appalachian affinity were recycled from the eroded strata now absent from beneath the McMurray Formation and coeval units of western Canada (Hypothesis C; Fig. 2.5). This hypothesis is consistent with studies that suggest that the paleodrainages of the rivers associated with the McMurray Formation were limited to the surrounding region (e.g., Christopher 2003; Leckie and Seif El-Dein 2009). It is difficult to test this hypothesis, as it relies on strata that have been eroded; however, small exposures of sub-Cretaceous strata are present in limited locations in the subsurface of western Canada. Of these units, most consist of Paleozoic carbonates with lesser Permian–Jurassic sandstones (Hayes et al. 1994). Currently, no detrital-zircon data are available from these sub-Cretaceous clastic units. If the Permian–Jurassic sandstones prove to host detrital zircons of Appalachian affinity, it would strongly support, but not necessarily prove, the hypothesis that sediments from eastern North America were transported to western

Canada during Permian–Jurassic time and subsequently recycled into the McMurray Formation during the Early Cretaceous.

2.6.2 Vertical Stratigraphic Variations

Chronofacies within the McMurray Formation change vertically throughout the succession, suggesting variable contributions from the different source areas over time. The Canadian Shield-derived chronofacies *i* occurs at the base of the formation, suggesting that the Canadian Shield was initially an important sediment source. These deposits are also associated with smaller paleochannels than those in the overlying deposits of the McMurray Formation (Hein and Cotterill 2006). The larger paleochannels of the McMurray Formation (~ 600 m wide, 35 m deep; Mossop and Flach 1983; Hubbard et al. 2011; Fustic et al. 2012) are associated with the transition to chronofacies *ii*, and the detrital zircons of Appalachian affinity (Fig. 2.2). It is apparent that the introduction of this chronofacies was coincident with an expansion of the catchment area, as reflected by the establishment of a large meanderbelt and a more diverse detrital-zircon population (Fig. 2.2). The larger paleochannels associated with chronofacies *ii* suggests that the decrease in Canadian Shield-derived zircons observed in this chronofacies was likely a relative decrease, and one that was the result of a greater influx of Appalachian-derived zircons. Cordillera-derived zircons are rare in chronofacies *ii*, suggesting that sediments shed from the Canadian Cordillera were not transported into this portion of Alberta while most of the McMurray Formation was deposited. During deposition of the McMurray Formation, the McMurray sub-basin appears to have been segregated from the Cordilleran foredeep by the paleotopographic highs on its western margin (Fig. 2.4; Ranger 1994). Chronofacies *iii* is restricted to uppermost samples and

contains Cordillera-derived grains (Fig. 2.2). This chronofacies, from the upper McMurray Formation and the Wabiskaw Member of the Clearwater Formation, is associated with brackish to marine shoreline environments (Figs. 2.4, 2.5; Keith et al. 1988). It is plausible that tidal and long-shore currents facilitated transport of zircons from the Cordilleran orogen to northeastern Alberta as the Western Interior Seaway inundated the study area (Figs. 2.4, 2.5; cf. Li and Komar 1992; Leckie 2003). Based on preliminary observations, there does not appear to be any strong correspondence between sandstone petrology and chronofacies.

2.7 Conclusions

The McMurray Formation (Athabasca Oil Sands, Canada) contains three different detrital-zircon signatures that reflect sediment input from the Canadian Shield, an Appalachian source in eastern North America, and the Cordilleran orogen. Lowermost deposits contain detrital zircons with U-Pb ages of ca. 1800–1900 and ca. 2600–2800 Ma and are interpreted to have been derived from the Canadian Shield. Most of the sediment in the McMurray Formation contains detrital zircons with U-Pb ages of ca. 300–600 and ca. 1000–1200 Ma, which are interpreted to have been originally derived from eastern North America. Uppermost samples in the McMurray Formation contain abundant zircon grains <250 Ma, interpreted to have been derived from the North American Cordillera. How and when the detrital zircons from eastern North America were transported and deposited in western Canada remains unresolved, with options including direct transport via a large-scale Early Cretaceous river system, and others that consider recycling of long-travelled sediment that was once deposited between Appalachia and northeastern Alberta. In either instance, the presence of abundant Appalachian grains in the Athabasca

Oil Sands highlights the importance of transcontinental sediment dispersal across this portion of northern North America.

2.8 References

Adams, J., Bennett, B., Huang, H., Westrick, J., and van Kruisdijk, C., 2013, The dynamic interplay of oil mixing, charge timing, and biodegradation in forming the Alberta oil sands: Insights from geologic modeling and biogeochemistry, *in* Hein, F.J., Leckie, D., Larter, S., and Suter, J.R., eds., Heavy-oil and oil-sand petroleum systems in Alberta and beyond: American Association of Petroleum Geologists, Studies in Geology, v. 64, p. 23–102.

Anfinson, O.A., Leier, A.L., Embry, A.F., and Dewing, K., 2012, Detrital zircon geochronology and provenance of the Neoproterozoic to Late Devonian Franklinian Basin, Canadian Arctic Islands: Geological Society of America, Bulletin, v. 124, p. 415–430.

Becker, T.P., Thomas, W.A., Samson, S.D., and Gehrels, G.E., 2005, Detrital zircon evidence of Laurentian crustal dominance in the lower Pennsylvanian deposits of the Alleghanian clastic wedge in eastern North America: Sedimentary Geology, v. 182, p. 59–86.

Blakey, R.C., 2012, North American Paleogeography: http://cpgeosystems.com/ namK115.jpg (accessed December, 2012).

Cant, D.J., 1996, Sedimentological and sequence stratigraphic organization of a foreland clastic wedge, Mannville Group, Western Canada Basin: Journal of Sedimentary Research, v. 66, p. 1137–1147.

Carrigy, M.A., 1963, Paleocurrent directions from the McMurray Formation: Bulletin of Canadian Petroleum Geology, v. 11, p. 389–395.

Christopher, J.E., 2003, Jura-Cretaceous Success Formation and Lower Cretaceous Mannville Group of Saskatchewan: Saskatchewan Industry and Resources, Saskatchewan Geological Survey, Report 223, 352 p.

Creaney, S., and Allan, J., 1990, Hydrocarbon generation and migration in the Western Canada Sedimentary Basin, *in* Brooks, J., ed., Classic Petroleum Provinces: Geological Society of London, Special Publication 50, p. 189–202.

DeCelles, P.G., 2004, Late Jurassic to Eocene evolution of the Cordilleran thrust belt and foreland basin system, western USA: American Journal of Science, v. 304, p. 105–168.

Dickinson, W.R., and Gehrels, G.E., 2008, Sediment delivery to the Cordilleran Foreland Basin: insights from U-Pb ages of detrital zircons in Upper Jurassic and Cretaceous strata of the Colorado Plateau: American Journal of Science, v. 308, p. 1041–1082.

Dickinson, W.R., and Gehrels, G.E., 2009, U-Pb ages of detrital zircons in Jurassic eolian and associated sandstones of the Colorado Plateau: evidence for transcontinental dispersal and intraregional recycling of sediment: Geological Society of America, Bulletin, v. 121, p. 408–433.

Dolby, G., Demchuk, T.D., and Suter, J.R., 2012, The significance of palynofloral assemblages from the Lower Cretaceous McMurray Formation and associated strata, Surmont and surrounding areas in north-central Alberta, *in* Hein, F.J., Leckie, D., Larter, S., and Suter, J.R., eds., Heavy-oil and oil-sand petroleum

systems in Alberta and beyond: American Association of Petroleum Geologists, Studies in Geology, v. 64., p. 251–272.

Dyman, T.S., Cobban, W.A., Fox, J.E., Hammond, R.H., Nichols, D.J., Perry, W.J., Porter, K.W., Rice, D.D., Setterholm, D.R., Shurr, G.W., Tysdal, R.G., Haley, J.C., and Campen, E.B., 1994, Cretaceous rocks from southwestern Minnesota, northern Rocky Mountains, and Great Plains region, *in* Schurr, G.W., Ludvigson, G.A., and Hammond, R.H., eds., Perspectives on the eastern margin of the Cretaceous Western Interior Basin: Geological Society of America, Special Paper 287, p. 5–26.

Fustic, M., Hubbard, S.M., Spencer, R., Smith, D.G., and Leckie, D.A., 2012, Recognition of down-valley translation in tidally influenced meandering fluvial deposits, Athabasca Oil Sands (Cretaceous), Alberta, Canada: Marine and Petroleum Geology, v. 29, p. 219–232.

Gehrels, G.E., 2011, Detrital zircon U–Pb geochronology: current models and new opportunities, *in* Busby C, and Azor A., eds., Tectonics of Sedimentary Basins: Recent Advances: Chichester, U.K., Wiley-Blackwell, p. 47–62.

Hadlari, T., Davis, W.J., Dewing, K., Heaman, L.M., Lemieux, Y., Ootes, L., Pratt, B.R., and Pyle, L.J., 2012, Two detrital zircon signatures for the Cambrian passive margin of northern Laurentia highlighted by new U-Pb results from northern Canada: Geological Society of America, Bulletin, v. 124, p. 1155–1168.

Hayes, B.J.R., Christopher, J.E., Rosenthal, L., Los, G., McKercher, B., Minken, D., Tremblay, Y.M., and Fennell, J., 1994, Cretaceous Mannville Group of the Western Canada Sedimentary Basin, *in* Mossop, G.D., and Shetsen, I., eds.,

Geological Atlas of the Western Canada Sedimentary Basin: Canadian Society of Petroleum Geologists and Alberta Research Council, p. 317–334.

Hein, F.J., and Cotterill, D.K., 2006, The Athabasca oil sands: a regional geological perspective, Fort McMurray area, Alberta, Canada: Natural Resources Research, v. 15, p. 85–102.

Hein, F.J., Leckie, D.A., Larter, S., and Suter, J.R., 2013, Heavy-oil and oil-sand petroleum systems in Alberta and beyond: American Association of Petroleum Geologists, Studies in Geology, v. 64, p. 1–21.

Heller, P.L., and Paola, C., 1989, The paradox of Lower Cretaceous gravels and the initiation of thrusting in the Sevier Orogenic Belt, United States Western Interior: Geological Society of America, Bulletin, v. 101, p. 864–875.

Hubbard, S.M., Smith, D.G., Nielsen, H., Leckie, D.A., Fustic, M., Spencer, R.J., and Bloom, L., 2011, Seismic geomorphology and sedimentology of a tidally influenced river deposit, Lower Cretaceous Athabasca Oil Sands, Alberta, Canada: American Association of Petroleum Geologists, Bulletin, v. 95, p. 1123–1145.

James, D.P., and Oliver, T.A., 1977, The sedimentology of the McMurray Formation, east Athabasca: The oil sands of Canada: Canadian Institute of Mining and Metallurgy, Special Volume 17, p. 17–26.

Keith, D.A.W., Wightman, D.M., Pemberton, S.G., MacGillivray, J.R., Berezniuk, T., and Berhane, H., 1988, Sedimentology of the McMurray Formation and Wabiskaw Member (Clearwater Formation), Lower Cretaceous, in the central region of the Athabasca oil sands area, northeastern Alberta, *in* James, D.P., and

Leckie, D.A., eds., Sequences, Stratigraphy, Sedimentology: Surface and Subsurface: Canadian Society of Petroleum Geologists, Memoir 15, p. 309–324.

Lawton, T.F., 1994, Tectonic setting of Mesozoic sedimentary basins, Rocky mountain region, *in* Caputo, M.V., Peterson, J.A., and Franczyk, K.J., eds., Mesozoic Systems of the Rocky Mountain Region, USA: SEPM, Rocky Mountain Section, p. 217–230.

Leckie, D.A., 2003, Modern environments of the Canterbury Plains, South Island, New Zealand: an analog for coarse-grained depositional systems in the nonmarine setting and coastal zone: Bulletin of Canadian Petroleum Geology, v. 51, p. 389–425.

Leckie, D.A., and Seif El-Dein, S.A., 2009, Paleogeomorphology and Petrography (Revisited) of the Athabasca Oil Sands, McMurray Sub Basin, Alberta, Canada [abstract]: American Association of Petroleum Geologists, Annual Convention and Exhibition, Abstracts and Program.

Leckie, D.A., and Smith, D.G., 1992, Regional setting, evolution, and depositional cycles of the Western Canada Foreland Basin, *in* Macqueen, R.W., and Leckie, D.A., eds., Foreland Basins and Fold Belts: American Association of Petroleum Geologists, Memoir 55, p. 9–46.

Leckie, D.A., Vanbeselaere, N.A., Seif El-Dein, S.A., McIntyre, D.I., and Swanson, F., 1998, Gold potential and paleogeography of Mannville outcrop sediments (Lower Cretaceous) of north-central Saskatchewan: a new exploration concept: Geoscience Canada, v. 25, p. 115–127.

Leier, A.L., and Gehrels, G.E., 2011, Continental-scale detrital zircon provenance signatures in Lower Cretaceous strata, western North America: Geology, v. 39, p. 399–402.

Li, Z.M., and Komar, P.D., 1992, Longshore grain sorting and beach placer formation adjacent to the Columbia River: Journal of Sedimentary Petrology, v. 62, p. 429–441.

McGookey, D.P., 1972, Cretaceous System, *in* Mallory, W., ed., Geological Atlas of the Rocky Mountain Region: Denver, Colorado, Rocky Mountain Association of Geologists, p. 190–228.

Mellon, G.B., 1956, Heavy minerals of the McMurray Formation, *in* Geology of the McMurray Formation: Part 2, Research Council of Alberta, Report 72, p. 1–50.

Miall, A.D., Catuneanu, O., Vakarelov, B.K., and Post, R., 2008, The Western Interior Basin, *in* Miall, A.D., ed., The Sedimentary Basins of the United States and Canada: The Sedimentary Basins of the World: Amsterdam, Elsevier, v. 5, p. 329–362.

Moecher, D.P., and Samson, S.D., 2006, Differential zircon fertility of source terranes and natural bias in the detrital zircon record: implications for sedimentary provenance analysis: Earth and Planetary Science Letters, v. 247, p. 252–266.

Mossop, G.D., and Flach, P.D., 1983, Deep channel sedimentation in the Lower Cretaceous McMurray Formation, Athabasca Oil Sands, Alberta: Sedimentology, v. 30, p. 493–509.

Musial, G., Reynaud, J.Y., Gingras, M.K., Fenies, H., Labourdette, R., and Parize, O., 2012, Subsurface and outcrop characterization of large tidally influenced point

bars of the Cretaceous McMurray Formation (Alberta, Canada): Sedimentary Geology, v. 279, p. 156–172.

Nelson, H.W., and Glaister, R.P., 1978, Subsurface environmental facies and reservoir relationships of the McMurray oil sands, northeastern Alberta: Bulletin of Canadian Petroleum Geology, v. 26, p. 177–207.

Park, H., Barbeau, D.L., Rickenbaker, A., Bachmann-Krug, D., and Gehrels, G.E., 2010, Application of detrital zircon geochronology to the reconstruction of the Southern and Central Appalachian Orogen: Journal of Geology, v. 118, p. 23–44.

Press, W.H., Flannery, B.P., Tenkolski, S.A., and Vetterling, W.T., 1986, Numerical Recipes: Cambridge, UK, Cambridge University Press, 818 p.

Raines, M.K., Hubbard, S.M., Kukulski, R.B., Leier, A.L., and Gehrels, G.E., 2013, Sediment dispersal in an evolving foreland: detrital zircon geochronology from Upper Jurassic and lowermost Cretaceous strata, Alberta Basin, Canada: Geological Society of America, Bulletin, v. 125, p. 741–755.

Ranger, M.J., 1994, A basin study of the southern Athabasca Oil Sands Deposit, Unpublished Ph.D. Thesis, University of Alberta, 326 p.

Ranger, M.J., and Pemberton, S.G., 1997, Elements of a stratigraphic framework for the McMurray Formation in South Athabasca area, Alberta, *in* Pemberton, S.G., and James, D.P., eds., Petroleum Geology of the Cretaceous Mannville Group, Western Canada: Canadian Society of Petroleum Geologists, Memoir 18, p. 263–291.

Ross, G.M., Patchett, P.J., Hamilton, M., Heaman, L., DeCelles, P.G., Rosenberg, E., and Giovanni, M.K., 2005, Evolution of the Cordilleran orogen (southwestern

Alberta, Canada) inferred from detrital mineral geochronology, geochemistry, and Nd isotopes in the foreland basin: Geological Society of America, Bulletin, v. 117, p. 747–763.

Sloss, L.L., 1988, Tectonic evolution of the craton in Phanerozoic time, *in* Sloss, L.L. ed., Sedimentary Cover: North American Craton: The Geology of North America, Geological Society of America, v. D-2, p. 25–51.

Wightman, D.M., and Pemberton, S.G., 1997, The Lower Cretaceous (Aptian) McMurray Formation: an overview of the Fort McMurray area, northeastern Alberta, *in* Pemberton, S.G., and James, D.P., eds., Petroleum Geology of the Cretaceous Mannville Group, Western Canada: Canadian Society of Petroleum Geologists, Memoir 18, p. 312–344.

Witzke, B.J., and Ludvigson, G.A., 1994, The Dakota Formation in Iowa and the type area, *in* Schurr, G.W., Ludvigson, G.A., and Hammond, R.H., eds., Perspectives on the Eastern Margin of the Cretaceous Western Interior Basin: Geological Society of America, Special Paper 287, p. 43–78.

Chapter Three: Detrital Zircon Geochronology of the McMurray Formation and Applications for Stratigraphic Analysis

3.1 Introduction

The Lower Cretaceous (Aptian) McMurray Formation composes the majority of the Athabasca Oil Sands of Alberta, Canada (e.g., Mossop and Flach 1983; Fig. 3.1). Bitumen within this sedimentary unit is contained within complexly interbedded fluvial, estuarine, and marginal marine deposits that accumulated in the distal portions of the Alberta foreland basin during the Cordilleran Orogeny (Leckie and Smith 1992; Ranger and Pemberton 1997). Despite intensive research over the last several decades, some aspects of the McMurray Formation remain poorly understood. For example, the provenance of the sediments that compose the formation has been variably interpreted. The proximity of the deposits to the Canadian Cordillera makes this orogenic belt an obvious possible source of sediment. However, heavy mineral analyses (Mellon 1956; Carrigy 1963) and recent paleogeographic reconstructions (Leckie and Seif El-Dein 2009) suggested that the sediment was derived from the Canadian Shield, located to the east-northeast of the area (Fig. 3.1A). In contrast, paleogeographic maps commonly imply that the formation is the product of a sizable fluvial system that carried sediment from as far away as the southwestern United States (e.g., McGookey 1972; Mossop and Flach 1983; Lawton 1994; Miall et al. 2008).

Regional stratigraphic correlations within the McMurray Formation are also problematic, owing to the complicated facies relationships and the numerous incised valley systems interpreted in the Athabasca region (e.g., Cant and Abrahamson 1996; Hein et al. 2006; Fustic et al. 2012). Paleovalleys generally trend north-northwest to

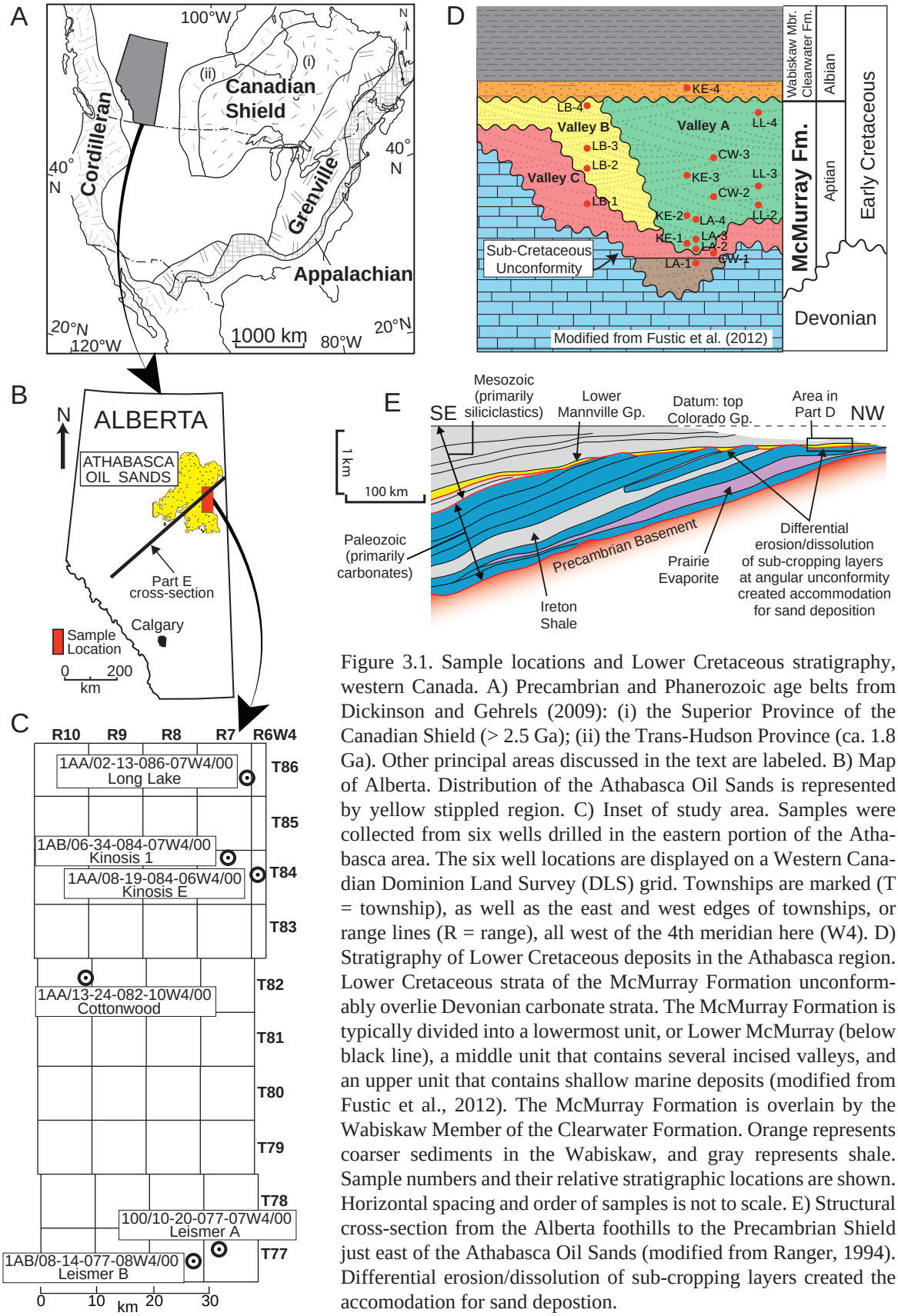


Figure 3.1. Sample locations and Lower Cretaceous stratigraphy, western Canada. A) Precambrian and Phanerozoic age belts from Dickinson and Gehrels (2009): (i) the Superior Province of the Canadian Shield (> 2.5 Ga); (ii) the Trans-Hudson Province (ca. 1.8 Ga). Other principal areas discussed in the text are labeled. B) Map of Alberta. Distribution of the Athabasca Oil Sands is represented by yellow stippled region. C) Inset of study area. Samples were collected from six wells drilled in the eastern portion of the Athabasca area. The six well locations are displayed on a Western Canadian Dominion Land Survey (DLS) grid. Townships are marked (T = township), as well as the east and west edges of townships, or range lines (R = range), all west of the 4th meridian here (W4). D) Stratigraphy of Lower Cretaceous deposits in the Athabasca region. Lower Cretaceous strata of the McMurray Formation unconformably overlie Devonian carbonate strata. The McMurray Formation is typically divided into a lowermost unit, or Lower McMurray (below black line), a middle unit that contains several incised valleys, and an upper unit that contains shallow marine deposits (modified from Fustic et al., 2012). The McMurray Formation is overlain by the Wabiskaw Member of the Clearwater Formation. Orange represents coarser sediments in the Wabiskaw, and gray represents shale. Sample numbers and their relative stratigraphic locations are shown. Horizontal spacing and order of samples is not to scale. E) Structural cross-section from the Alberta foothills to the Precambrian Shield just east of the Athabasca Oil Sands (modified from Ranger, 1994). Differential erosion/dissolution of sub-cropping layers created the accomodation for sand depostion.

south-southeast, although there is considerable variation at a local (e.g., ~5 km) scale (Ranger and Pemberton 1997; Hein et al. 2006). The river systems in the region debouched into an Early Cretaceous epicontinental seaway that transgressed from north to south, creating a complicated interfingering of fluvial, estuarine, and marine deposits (Wightman and Pemberton 1997; Hein et al. 2006; Hubbard et al. 2011; Fustic et al. 2012). The combination of multiple cut-and-fill episodes, complicated paleogeographic arrangements of depositional facies, and valley systems with multiple trends has produced highly complex stratigraphy within the McMurray Formation (e.g., Fustic et al. 2012). Internal stratigraphic units have proven difficult to correlate and distinguish from one another, as lithology can be highly variable and challenging to predict (Hein et al. 2006). The issue of stratigraphic correlation is a principal challenge for hydrocarbon recovery (e.g., Fustic et al. 2012; Su et al. 2014).

Here, we use detrital zircon uranium-lead (U-Pb) geochronology to examine the sediment provenance of the McMurray Formation and to examine these ages within the context of the internal stratigraphy (i.e., various incised valley fills). Eighteen samples were collected from five cored wells in northeastern Alberta (Figs. 3.1, 3.2). Well 1AB/06-34-084-07W4/00 (from Chapter 2) is also included in Figure 3.1 due to the fact that it possesses the detrital zircons, chemostratigraphic data, and measured section that are compared later in this chapter. Uranium-lead ages were calculated for 1760 individual zircon grains using laser ablation–multicollector–inductively coupled plasma–mass spectrometry (LA-MC-ICP-MS), which provide the basis for catchment reconstruction, and ultimately, sediment provenance. In addition, we combine these data with subsurface

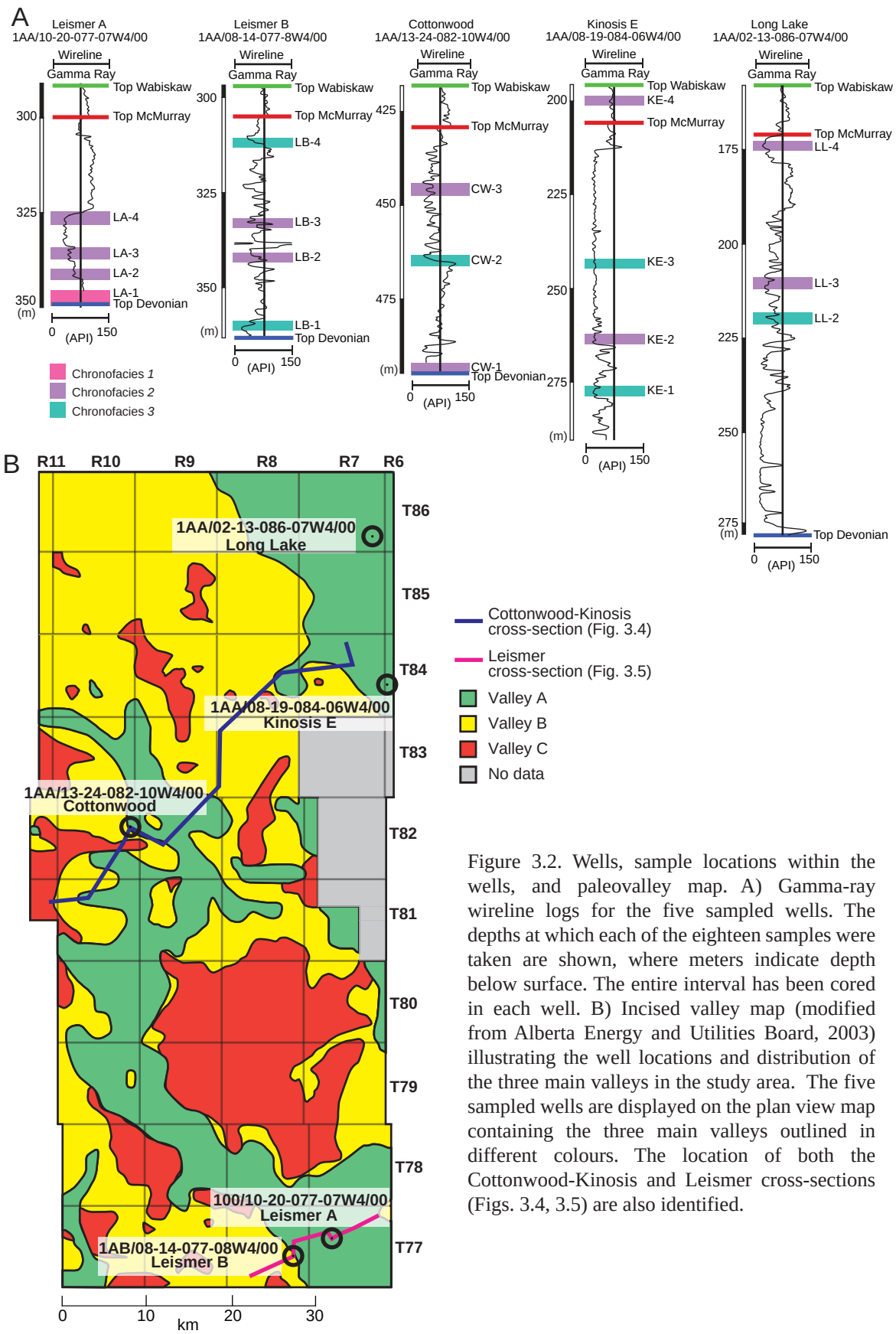


Figure 3.2. Wells, sample locations within the wells, and paleovalley map. A) Gamma-ray wireline logs for the five sampled wells. The depths at which each of the eighteen samples were taken are shown, where meters indicate depth below surface. The entire interval has been cored in each well. B) Incised valley map (modified from Alberta Energy and Utilities Board, 2003) illustrating the well locations and distribution of the three main valleys in the study area. The five sampled wells are displayed on the plan view map containing the three main valleys outlined in different colours. The location of both the Cottonwood-Kinosis and Leismer cross-sections (Figs. 3.4, 3.5) are also identified.

correlations and chemostratigraphic data to examine the relationship between the different valley deposits.

The detrital-zircon data suggests a large proportion of the sediment in the McMurray Formation was originally derived from the Appalachian region in eastern North America. This supports preliminary data suggesting an eastern North American provenance of the unit (Benyon et al. 2014; Blum and Pecha, in press). The relationship between detrital-zircon data and chemostratigraphic data is not particularly robust; however, values of K/Rb within the McMurray Formation appear to correspond to the relative proportion of <250 Ma detrital zircons. In most cases, detrital-zircon signatures within the different valley deposits are similar. This is likely a product of the cannibalization of sediment that took place in the Athabasca region as valleys incised into underlying deposits and redeposited this material in younger valley fills.

3.2 Background Geology

The McMurray Formation was deposited during the Early Cretaceous (Aptian) in the distal (eastern) portions of the Cordilleran foreland basin (Fig. 3.1), and consists of sandstones and mudstones deposited in fluvial, estuarine, and shallow marine environments (e.g., Flach and Mossop 1985; Leckie and Smith 1992; Wightman and Pemberton 1997; Hubbard et al. 2011). The formation lies atop a regional unconformity, referred to as the sub-Cretaceous unconformity, which separates the Lower Cretaceous clastic strata of this unit from underlying Paleozoic carbonates (Fig. 3.1D; Leckie and Smith 1992; Cant and Abrahamson 1996). It is overlain by marine mudstones and sandstones of the Clearwater Formation (Fig. 3.1D), which record the southward

transgression of the Western Interior Seaway during Albian time (Keith et al. 1988; Leckie and Smith 1992).

The deposits of the McMurray Formation are the product of a fluvial system that flowed to the north-northwest and debouched into the Western Interior Seaway in present-day northeastern Alberta. This fluvial system occupied a north-northwest trending basin, referred to as the McMurray sub-basin, which was isolated from the foredeep of the Cordilleran foreland basin by a series of paleotopographic highs associated with differential erosion of underlying, westward dipping Paleozoic strata (Fig. 3.1E; Leckie and Smith 1992; Ranger 1994; Ranger and Pemberton 1997; Christopher 2003). Although the primary trend of the fluvial sandbodies associated with the McMurray Formation is well-established (e.g., Christopher 2003), the extra-regional extent of the paleodrainage basin and the ultimate source of sediment for these deposits is poorly understood.

The McMurray Formation is generally characterized by a complicated stratigraphic arrangement of multiple incised valley systems and stratigraphic units. Multiple schemes have been developed to characterize these deposits (e.g., Cant and Abrahamson 1996; Ranger and Gingras 2003; Hein et al. 2006, Fustic et al. 2012); however, a full description of the history and usage of these models is beyond the scope of this study. Here we use a relatively common technique of referring to three primary stratigraphic units in the upper part of the formation as A, B, and C, with the lowermost deposits referred to as the Lower McMurray (Fig. 3.1D). Units A, B and C are informally designated, and refer to successive valley fills. Valley C (sometimes referred to as system C because it records little evidence of incision) is the oldest of the three valleys, followed

by incision and infill associated with Valley B (Fig. 3.1D; Alberta Energy and Utilities Board 2003; Fustic et al. 2012). Valley A is the youngest of the valley systems and mostly incised into the underlying B and C systems (Fig. 3.1D). These valley systems and associated deposits formed in response to relative sea-level changes associated with the Western Interior Seaway; although not directly correlated to strata in western Canada to this point, recent work has demonstrated significant global sea-level fluctuations during the Aptian (e.g., Hillgärtner et al. 2003; Gréselle and Pittet 2005; Maurer et al. 2013; Bover-Arnal et al. 2014). Of note, not all of the McMurray Formation valley systems or deposits are present in all locations (e.g., Fig. 3.2B). Many of the individual valley system successions contain packages of stacked fluvial or estuarine channel deposits, and shoreline units, that are commonly subdivided into units such as A1 and A2, or B1 and B2 (e.g., Alberta Energy and Utilities Board 2003; Hein et al. 2006; Hein and Cotterill 2006). See Hein and Cotterill (2006) for further explanation.

3.3 Methodology

Eighteen sandstone samples were collected from five cored wells in the Long Lake, Kinosis, Cottonwood, and Leismer areas in the Athabasca Oil Sands (Fig. 3.2) in an effort to explore the provenance and stratigraphic aspects of the McMurray Formation. The study area is located in the northeastern portion of the province of Alberta, Canada (Figs. 3.1B, 3.1C; Township 77 to 86 and Range 6 to 10, using the Dominion Land Survey system of Canada). All samples are from the McMurray Formation except for sample KE4, which is from the Wabiskaw Member of the Clearwater Formation (Fig. 3.2A) which overlies the McMurray Formation.

Samples of 2–5 kg were collected from fine- to medium-grained sandstone and processed using procedures outlined in Gehrels (2011). Approximately 90-100 zircons per sample were analyzed using laser ablation–multicollector–inductively coupled plasma–mass spectrometry (LA-MC-ICP-MS) at the Arizona LaserChron Center. The analyses involve ablation of zircon with an excimer laser using a spot diameter of 30 microns. For each analysis, the errors in determining $^{206}Pb/^{238}U$ and $^{206}Pb/^{204}Pb$ result in a measurement error of ~1-2% (at 2-sigma level) in the $^{206}Pb/^{238}U$ age. The errors in measurement of $^{206}Pb/^{207}Pb$ and $^{206}Pb/^{204}Pb$ also result in ~1-2% (at 2-sigma level) uncertainty in age for grains that are >1.0 Ga, but are larger for younger grains due to low intensity of the ^{207}Pb signal. The resulting interpreted ages are shown on Pb*/U concordia diagrams and relative age probability diagrams using the routines in Isoplot (Ludwig 2008). The age probability diagrams show each age and its uncertainty (for measurement error only) as a normal distribution, and sum all ages from a sample into a single curve. (Details on samples and analytical procedures are in Appendix A).

Detrital-zircon signatures from the Kinosis Well 1 (1AB/06-34-084-07W4/00; see Benyon et al. 2014) were compared to existing chemostratigraphic data and a detailed measured section of core. Chemostratigraphy is predicated on using relative abundances of various elements to identify and correlate lithologic units within sedimentary successions (for details on the methodology, see Hildred et al. 2010). The core from the well was measured at centimeter scale and the deposits were divided into sedimentary facies based on lithologies, grain-size, sedimentary structures, ichnofacies, and other notable characteristics.

3.4 Detrital-Zircon Results

The eighteen sandstone samples yielded a total of 1760 U-Pb ages (Fig. 3.3). Approximately 90–100 U-Pb ages were obtained per sample, which are displayed in both normalized and cumulative relative probability plots (Fig. 3.3; for all individual ages and details on the probability plots, see Appendix B).

Three samples were collected from the McMurray Formation in the Cottonwood area (CW1, CW2, CW3; Figs. 3.2, 3.3). These samples all contain prominent populations of detrital zircons with ages of ca. 300-600 Ma, ca. 1000–1200 Ma, and ca. 1800–1850 Ma (Fig. 3.3). Detrital zircons with ages <250 Ma and those with ages of ca. 1200–1800 Ma are also present, but not numerous. Very minor populations of detrital zircons with ages between ca. 500 and ca. 700 Ma occur in some of the samples. Populations of ca. 1000–1200 Ma are generally widely distributed, although in sample CW2 there is a prominent peak at ~1175 Ma.

Three samples from the McMurray Formation (KE1, KE2, KE3; Figs. 3.2, 3.3) and one sample from the Wabiskaw Member of the Clearwater Formation (KE4; Figs. 3.2, 3.3) were collected in the Kinosis East area. These samples all contain prominent populations of detrital zircons with ages of ca. 300–600 Ma and ca. 1000–1200 Ma. Samples KE1, KE2, and KE3 all contain minor populations of detrital zircons with ages between ca. 1200–1800 Ma and ca. 1800–1850 Ma. Sample KE2 contains a moderate population of ca. 2600 Ma detrital zircons. In all of the samples, the populations with ages of ca. 1000–1200 Ma contain two distinguishable peaks, one at approximately 1050 Ma and one at approximately 1175 Ma. Samples KE1 and KE3 contain prominent populations of detrital zircons with ages <250 Ma (Fig. 3.3), which are largely absent in

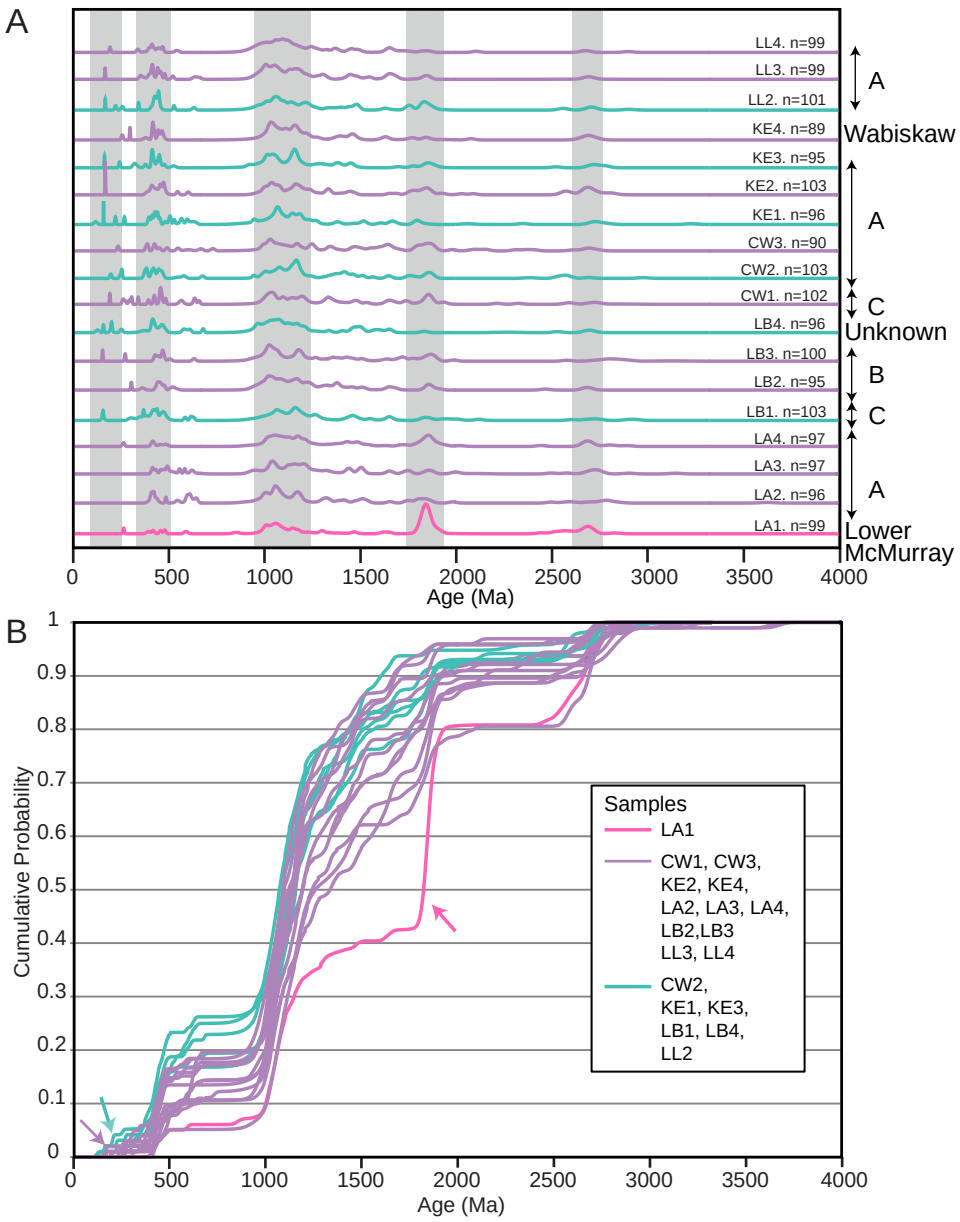


Figure 3.3. Sample results. A) Detrital-zircon normalized probability plots from the eighteen samples; n is number of analyses. Highlighted areas depict primary age populations. Sample LA1 (pink) represents chronofacies *1*, and is characterized by ca. 1800–1900 Ma and ca. 2600–2800 Ma grains. Samples CW1, CW3, KE2, KE4, LA2, LA3, LA4, LB2, LB3, LL3 and LL4 (purple) represent chronofacies *2*, and are characterized by zircons with U-Pb ages of ca. 300–600 Ma, ca. 1000–1200 Ma, and few or no detrital zircons with ages <250 Ma. Samples CW2, KE1, KE3, LB1, LB4, and LL2 (green) represent chronofacies *3* and are characterized by ca. 300–600 Ma and ca. 1000–1200 Ma grains. This chronofacies is similar to chronofacies *2*, but with a relatively larger number (>2 per sample) of ages less than 250 Ma. Local recycling of strata likely account for the presence of distinct populations within successive chronofacies. B) Cumulative probability plot. As in Part A, pink represents sample LA1 (chronofacies *1*), purple represents samples CW1, CW3, KE2, KE4, LA2, LA3, LA4, LB2, LB3, LL3 and LL4 (chronofacies *2*), and green represents samples CW2, KE1, KE3, LB1, LB4, and LL2 (chronofacies *3*). Pink arrow identifies large population of ca. 1800–1900 Ma zircons. Purple arrow identifies small population of zircons <250 Ma relative to chronofacies *3*. Green arrow identifies large population of zircons <250 Ma relative to chronofacies *2*. Samples display distinct groupings. See text for discussion; for complete results, see Appendix B.

KE2 and completely absent in KE4.

Four samples were collected from the McMurray Formation in the Leismer A area (LA1, LA2, LA3, LA4; Figs. 3.2, 3.3). Leismer A samples contain a few different trends than other wells. These samples lack zircons <250 Ma. LA1 has a small population of ca. 300–500 Ma zircons, a moderate population of ca. 1000–2000 Ma zircons, and significant populations of ca. 1800–1900 Ma zircons and ca. 2600–2800 Ma zircons. However, the primary population is ca. 1800–1900 Ma, indicated by the prominent peak. LA2 and LA3 lack zircons <400 Ma, are dominated by ca. 300–650 Ma and ca. 1000–1200 Ma zircons, and contain a lesser amount of grains ca. 1200–1850 Ma. LA4 contains a smaller number of ca. 300–500 Ma zircons and is dominated by ca. 1000–1200 Ma and ca. 1800–1900 Ma zircons.

Four samples were collected from the McMurray Formation in the Leismer B area (LB1, LB2, LB3, LB4; Figs. 3.2, 3.3). Leismer B samples are similar to the Cottonwood and Kinosis East samples, and contain U-Pb ages <250 Ma (minor), ca. 300–600 Ma, ca. 1000–1200 Ma, and a smaller population of zircons greater ca. 1200–1800 Ma. Within the <250 Ma age population, LB1 and LB3 both contain a prominent peak at approximately 155 Ma. LB2 lacks any zircons <250 Ma, and LB4 contains a significant amount of zircons with ages <250 Ma. All four samples contain zircons ca. 300–500 Ma and a minor amount of zircons ca. 500–700 Ma. Samples LB2 and LB3 contain prominent peaks at ca. 1030 Ma, ca. 1180 Ma, and ca. 1880 Ma. LB1 contains zircons with ages of ca. 1000–1200 Ma and a minor amount of zircons ca. 1800–1900 Ma. LB4 contains a significant amount of zircons ca. 1000–1200 Ma and a minor number of zircons with ages of ca. 1800–1900 Ma.

Three samples were collected from the Long Lake area of the Athabasca Oil Sands (LL2, LL3, LL4; Figs. 3.2, 3.3). The sandstone samples from this well contain several prominent populations, similar to Cottonwood, Kinosis East, and Leismer B. The samples contain age populations <250 Ma, ca. 300–600 Ma, ca. 1000–1200 Ma, and a lesser amount of zircons >1200 Ma. Within the <250 Ma age population, all three samples contain a distinct peak at ca. 167 Ma. All three samples also contain ca. 300–600 Ma and ca. 1000–1300 Ma grains, with minor grains ca. 500–600 Ma and ca. 1200–1800 Ma. LL2 contains a significant peak at ca. 1850 Ma.

3.5 Interpretation of Detrital Zircon Ages

3.5.1 Detrital Zircon Chronofacies

To aid in interpretations and the presentation of the data, we grouped samples with similar age populations into three chronofacies (or detrital-zircon signatures), informally labeled "*1*", "*2*", and "*3*" (Fig. 3.3), which are based on the presence of dominant U-Pb age populations and Kolmogorov-Smirnov (K-S) statistics (Press et al. 1986; see Appendix B). The use of Kolmogorov-Smirnov statistics is a way to assess the similarity of the distributions of grain ages. The test gives the probability that random chance alone might produce the observed difference in two distributions drawn from the same parent population (Press et al. 1986; Appendix A, B). A low probability on the test, such as P(KS) <5%, would indicate that the differences between the two distributions are significant. If P(KS)>>5% then the differences are just a factor of random chance (Soloviev et al. 2006). For complete results, see Appendix A and B.

Chronofacies *1* is limited to sample LA1 and is characterized by significant populations of detrital zircons with U-Pb ages of ca. 1800–1900 Ma and ca. 2600–2800

Ma (Fig. 3.3). This chronofacies is unique to sample LA1 and easily distinguishable from the other samples (Fig. 3.3).

Chronofacies *2* and *3* are very similar, the only difference being the relative proportion of grains with ages <250 Ma. Chronofacies *2* is characterized by detrital-zircon populations with U-Pb ages of ca. 300–600 Ma, ca. 1000–1200 Ma, and few or no detrital zircons <250 Ma. Samples CW1, CW3, KE2, KE4, LA2, LA3, LA4, LB2, LB3, LL3 and LL4 are all interpreted as chronofacies *2* (Fig. 3.3). This chronofacies does not contain significant populations of detrital zircons with ages <250 Ma or >1200 Ma.

Chronofacies *3* includes samples CW2, KE1, KE3, LB1, LB4, and LL2 and is characterized by detrital-zircon populations with U-Pb ages of ca. 300–600 and ca. 1000–1200 Ma, similar to chronofacies *2*, but with a relatively larger number (>2 per sample) of ages <250 Ma (Fig. 3.3). This chronofacies does not contain significant populations of detrital zircons with ages >1200 Ma.

3.5.2 Detrital Zircon Provenance

3.5.2.1 Populations

Detrital zircons with ages of ca. 2600–2800 Ma are interpreted to have been derived from the Superior province of the Canadian Shield (Dickinson 2008) or the Proterozoic quartzites of the Athabasca Group in Alberta and Saskatchewan (Rainbird et al. 2002; Rayner et al. 2003). Detrital zircons with these ages may have been recycled several times prior to deposition during the Early Cretaceous.

Detrital zircons with ages of ca. 1800–1900 Ma are interpreted to have been derived from the Trans-Hudson province of the Canadian Shield (Dickinson 2008) or recycled from the Proterozoic quartzites of the Athabasca Group in Alberta and

Saskatchewan (Rayner et al. 2003). In addition, the ca. 1800–1900 Ma zircons also may have been recycled from the Cordillera fold-thrust belt, as a significant amount of sedimentary strata in the fold-thrust belt contains ca. 1800–1900 Ma zircons (e.g., Leier and Gehrels 2011; Raines et al. 2013; Gehrels and Pecha 2014).

Detrital zircons with ages of ca. 1200–1800 Ma are a minor component of the McMurray Formation zircon population, but where present, are interpreted to have been derived from the Mid-Continent granite-rhyolite province (ca. 1300–1500 Ma) and the Yavapai-Mazatzal terranes (ca. 1600–1800 Ma) (Dickinson 2008). As with previous populations, detrital zircons with these ages may have been recycled prior to deposition in the McMurray Formation.

Detrital zircons with ages of ca. 1000–1200 Ma are interpreted to have been derived from the Grenville province of eastern North America (Fig. 3.1A). Zircons of ca. 1000–1200 Ma (hereafter: "Grenville zircons") are abundant across North America and present in many stratigraphic successions (Dickinson 2008). Grenville zircons within sandstones have often been recycled numerous times since their original crystallization (e.g., Dickinson and Gehrels 2008; Dickinson and Gehrels 2009; Rahl et al. 2003). During the Jurassic, a transcontinental paleoriver system with headwaters in the Appalachians was interpreted to disperse sand widely across southwest Laurentia (Dickinson and Gehrels 2009). Following this, the zircon grains were recycled into several depositional systems (e.g., Dickinson and Gehrels 2009; Lawton et al. 2010).

Detrital zircons with ages of ca. 300–600 Ma are interpreted to be derived from the Appalachian region of eastern North America (Fig. 3.1A; e.g., Dickinson and Gehrels 2009). The Appalachian region is dominated by igneous, zircon-bearing rocks with ages

of ca. 300–600 Ma (Fig. 3.1A; Becker et al. 2005; Dickinson and Gehrels 2009). Included with this categorization are the foreland basin strata of the Appalachians, which are dominated by ca. 300–600 Ma zircons (e.g., Park et al. 2010). The correlation between ca. 300–600 Ma zircons and the Appalachian region is consistent with interpretations of Dickinson and Gehrels (2009), who interpreted detrital zircons with these ages in Jurassic sandstones in the southwestern United States as being derived from the Appalachian orogen. Although detrital zircons with 300–600 Ma ages are present in the Canadian Arctic (e.g., Anfinson et al. 2012), we do not consider this to be a likely source because the sedimentary units in the Canadian Arctic contain other populations not present in Alberta. Additionally, paleocurrent data, valley mapping, and point bar migration evident in seismic data from the McMurray Formation indicate that the fluvial system was flowing to the north, not north-to-south (e.g., Leckie and Smith 1992; Ranger and Pemberton 1997; Christopher 2003; Hubbard et al. 2011; Fustic et al. 2012).

Detrital zircons with U-Pb ages <250 Ma are interpreted to be derived from the Cordillera of western North America, as zircons of this age are common in this region (Fig. 3.1A; Ross et al. 2005; Dickinson and Gehrels 2009).

3.5.2.2 Chronofacies

Chronofacies *1* is interpreted to have been derived from the Trans-Hudson and Superior provinces of the Canadian Shield, including the quartzites of the Athabasca Group in northern Alberta and Saskatchewan (Fig. 3.1A). The ca. 1800–1900 Ma zircons of chronofacies *1* are likely originally derived from the Trans-Hudson province of the Canadian Shield. This interpretation is supported by petrographic studies, which suggest that the heavy mineral suite of the McMurray Formation is associated with the igneous-

metamorphic terranes of the Canadian Shield and the Athabasca Group (Mellon 1956; Carrigy 1963; James and Oliver 1977; Nelson and Glaister 1978). However, many zircons with ca. 1800–1900 Ma ages were transported to the western coast of Canada during the Proterozoic and Paleozoic, and are present in strata of those ages (cf. Leier and Gehrels 2011; Raines et al. 2013). These units were eroded during the Cordilleran Orogeny and deposited in the foreland basin, and therefore may have been an additional source of detrital zircons of this (ca. 1800–1900 Ma) age.

Chronofacies *2* is interpreted to originally have been derived from the Grenville and Appalachian provinces in the eastern regions of North America, where zircons of this age are abundant (Fig. 3.1A; Dickinson 2008; Park et al. 2010). This is consistent with interpretations of the same age populations in Jurassic eolianite strata in the Colorado Plateau of the southwestern United States (Dickinson and Gehrels 2009). Localized areas across North America have igneous rocks with ages of ca. 300–600 Ma and ca. 1000–1200 Ma (e.g., Anfinson et al. 2012; Hadlari et al. 2012); however we do not consider these to be viable candidates for sediment source areas. This is based on the predominance of two populations (ca. 300–600 Ma and ca. 1000–1200 Ma) and the absence of other major populations. If detrital zircons were derived from geographically localized areas, the ca. 300–600 Ma and ca. 1000–1200 Ma zircon populations would be only two of many (due to drainage basin sampling effects). The dominance of ca. 300–600 Ma and ca. 1000–1200 Ma zircons indicate these are the two primary populations in the source area. Thus, the Grenville and Appalachian provinces are the best candidates for original derivation. As with all detrital zircons, it is possible these grains were recycled (further discussion below).

Similar to chronofacies *2*, the majority of detrital zircons in chronofacies *3* are interpreted to have been originally derived from the Grenville and Appalachian provinces in eastern North America (Figs. 3.1A); however, chronofacies *3* has greater relative numbers of detrital zircons from the Cordilleran region.

3.6 Cross-Sections

To compare mapped valley fills (cf. Fustic et al. 2012) to detrital-zircon signatures, two cross-sections were constructed in the Cottonwood-Kinosis and Leismer areas using gamma-ray well-logs (Fig. 3.2). It was thought that the detrital-zircon signatures from this study may aid in the difficult correlation of incised valley systems. The Cottonwood-Kinosis cross-section (Fig. 3.4) is in the central portion of the study area and is 55.5 km in length, with well spacing between 1.9 and 10.0 km (Figs 3.2B, 3.4). The Leismer cross-section (Fig. 3.5) is in the southeast corner of the study area and is 18.3 km long, with well spacing between 0.8 km and 5.6 km (Figs. 3.2B, 3.5). Both cross-sections are oriented SW-NE, roughly perpendicular to the overall trend of the fluvial deposits. The orientation of the cross-sections was dependent on the ability to sample multiple valleys. Wells in the area that had been sampled for detrital zircons were intentionally included, in order to compare the signatures between wells and valley system deposits.

Individual valley systems and sequences were interpreted using log characteristics, lithology and existing interpretations (Alberta Energy and Utilities Board 2003; Hein et al. 2006; Fustic et al. 2012). Identification of these valleys is often contingent upon the preservation or removal of certain recognizable sequences or widespread shoreline packages (e.g., A1, A2, etc.). For example, if the lowest recognizable regional sequence, the B2 Sequence, is present in a particular well, the

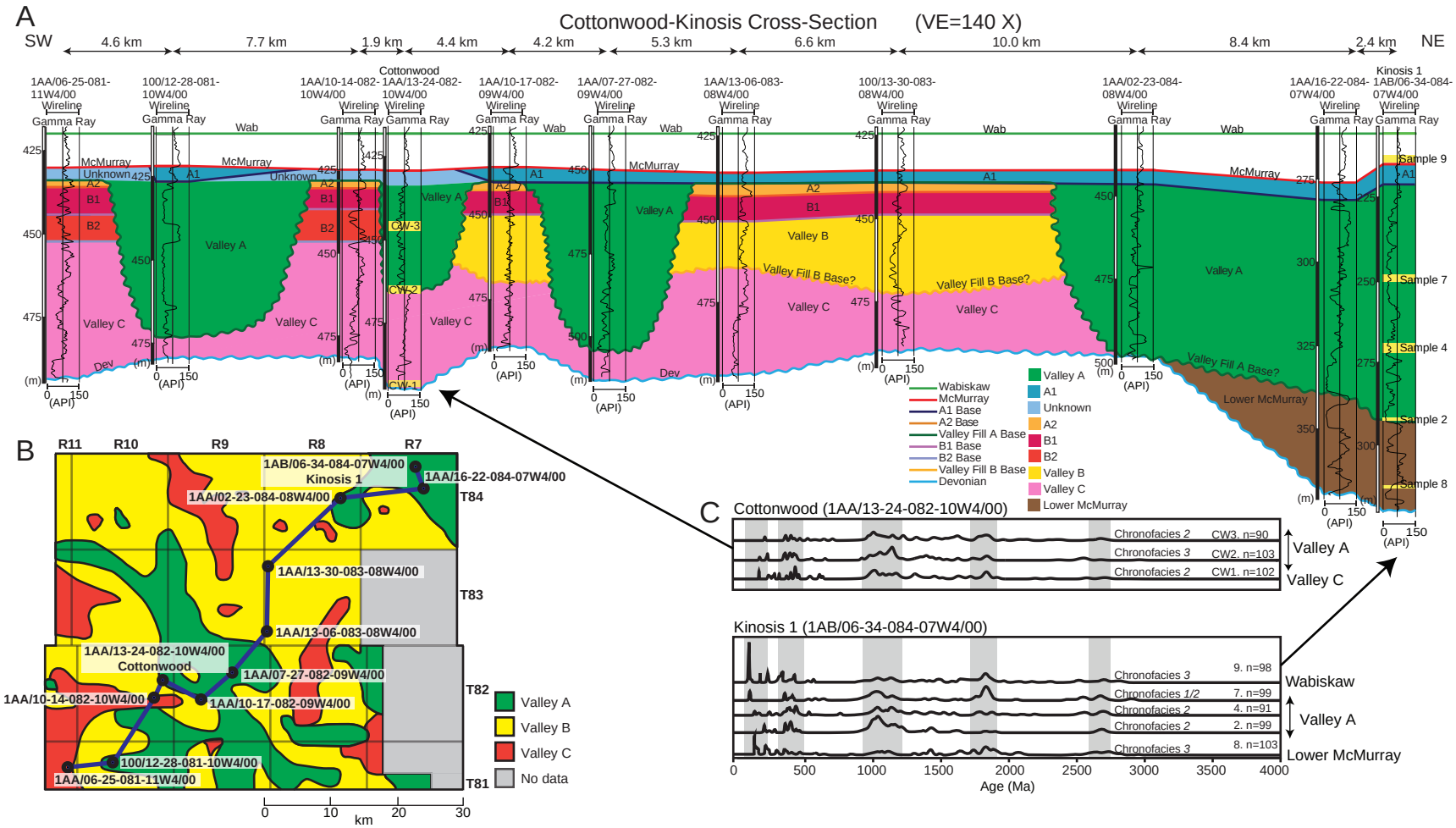


Figure 3.4. Southwest to northeast Cottonwood to Kinosis Cross-Section. A) Schematic displays an incised valley system concept, formed in response to relative sea level changes. Valley C is the oldest and Valley A is the youngest. Multiple stacked channel deposits exist within valleys, but are excluded due to the large scale of the section. Section also displays representative depths of the Cottonwood and Kinosis detrital-zircon samples (CW1, CW2, CW3; 2, 4, 7, 8, 9, respectively). B) Plan view of cross-section depicting the crossing of valley edges (modified from Alberta Energy and Utilities Board, 2003). C) Representative detrital-zircon signatures for Cottonwood and Kinosis wells.

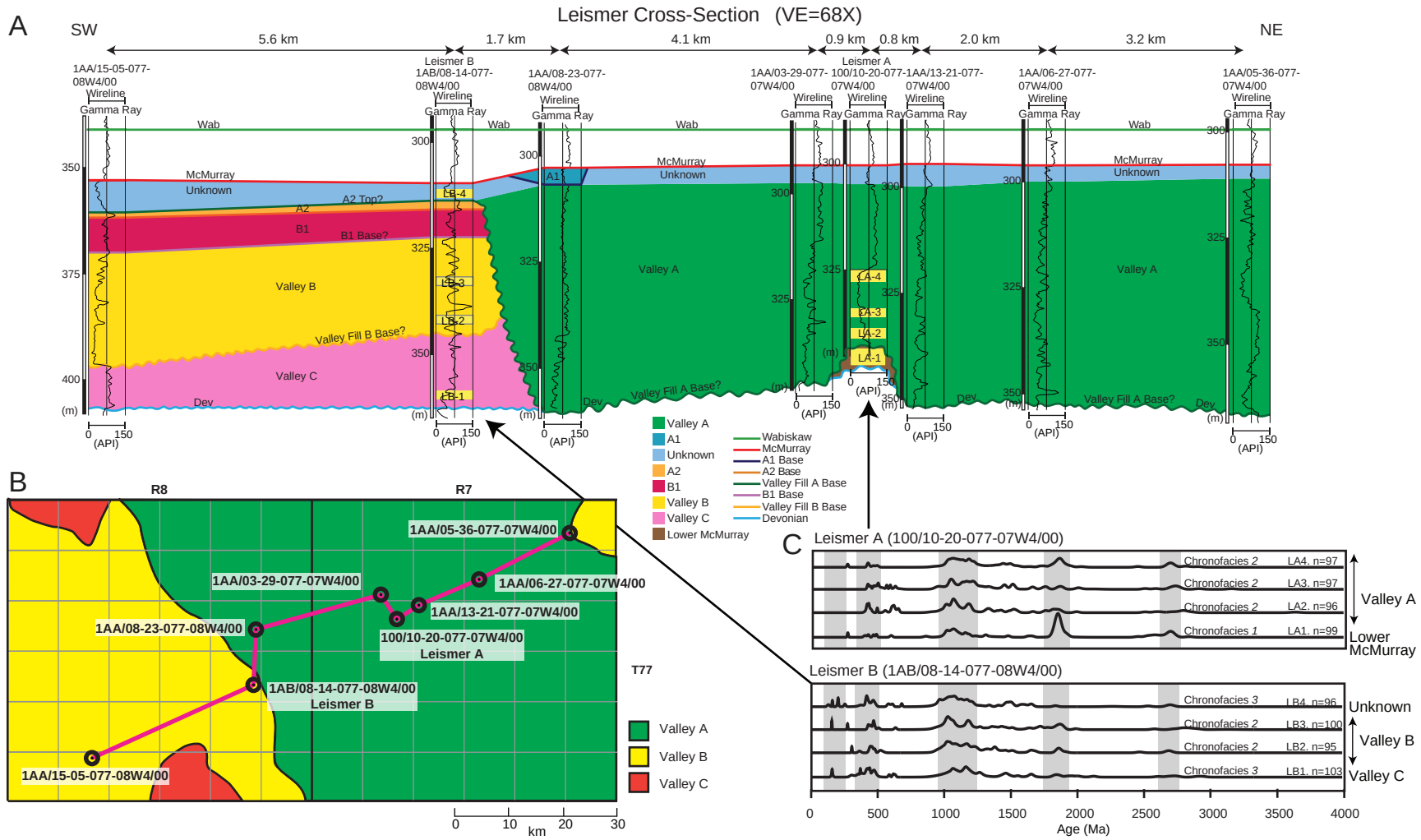


Figure 3.5. Southwest to northeast Leismer Cross-Section. A) Similar to Fig. 3.4A, schematic displays an incised valley system concept, formed in response to relative sea level changes. Section also displays representative depths of the Leismer A and Leismer B detrital-zircon samples (LA1, LA2, LA3, LA4; LB1, LB2, LB3, LB4, respectively). B) Plan view of cross-section depicting the crossing of valley edges (modified from Alberta Energy and Utilities Board, 2003). C) Representative detrital-zircon signatures for Leismer A and Leismer B wells.

underlying channel deposits are referred to as Valley C (Alberta Energy and Utilities Board 2003; Hein and Cotterill 2006). See Hein and Cotterill (2006) for further explanation. The bases of the valleys are often difficult to identify; for example, it is possible there is remnant Valley C deposits beneath Valleys A and B. When the base of the valley was not distinguishable, it was continued downward to the underlying Devonian strata (e.g., Fig. 3.5).

3.7 Discussion and Analysis

3.7.1 Detrital Zircon Provenance

The majority of detrital zircons in the McMurray Formation have ages of ca. 300–600 Ma and ca. 1000–1200 Ma, interpreted to have been derived from the Appalachian region of eastern North America. These results are consistent with other preliminary detrital-zircon data from elsewhere in the McMurray Formation (e.g., Benyon et al. 2014; Blum and Pecha, in press).

It is unclear exactly how and when zircons from the Appalachian region of eastern North America made their way across the continent and into western Canada. This question is made more difficult by the fact that detrital zircons are commonly recycled multiple times (e.g., Lawton et al. 2010). However, Mesozoic paleogeographic reconstructions of western Canada provide some critical constraints that narrow the possible provenance history of the Appalachian and Grenville zircons. The zircons were not derived directly from western (e.g., Cordilleran) sources based partly on the fact that a series of linear paleohighs separated the proximal foreland basin from the McMurray sub-basin during the Early Cretaceous (e.g., Leckie and Smith 1992; Christopher 2003; Fig. 3.6). Moreover, detrital-zircon age populations in Lower Cretaceous strata near the

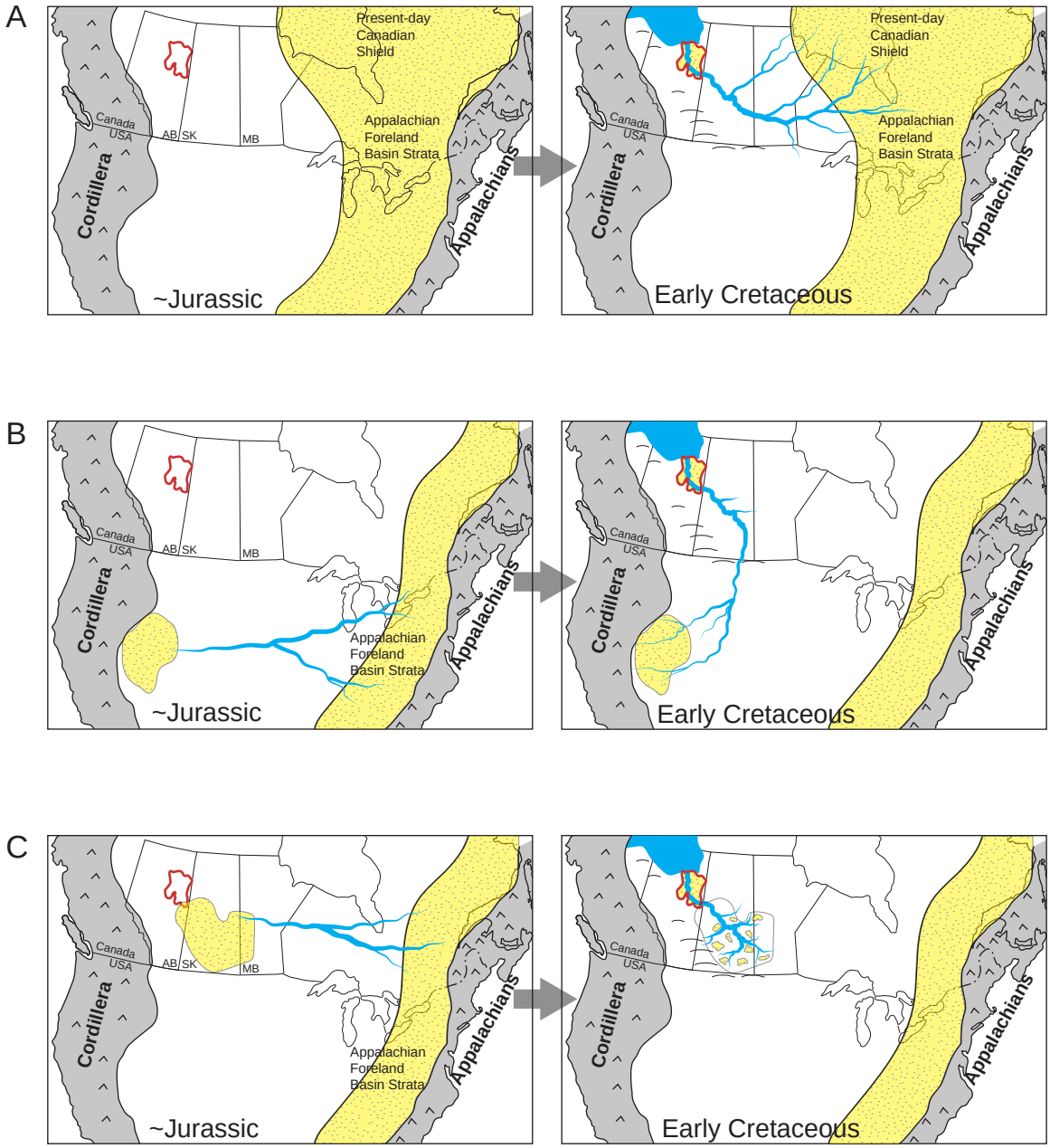


Figure 3.6. Proposed Appalachian sediment pathways. A) Sediment was transported directly to northeastern Alberta during the Early Cretaceous, contemporaneous with deposition. B) Sediment was transported to the southwestern United States prior to the Early Cretaceous, deposited, and subsequently transported northward during the Early Cretaceous. C) Sediment was transported to western Canada prior to the Early Cretaceous and deposited, followed by local recycling of underlying (pre-Cretaceous) strata during the Early Cretaceous.

Cordilleran fold-thrust belt in Canada do not match those in the McMurray Formation (cf. Leier and Gehrels 2011; Raines et al. 2013). The zircons were also not derived from northern sources during the Early Cretaceous. Detrital zircons in the Canadian Arctic have some similar detrital-zircon age populations, but also many that are not found in the McMurray Formation (e.g., Anfinson et al. 2012). In addition, both the direction from which the Western Interior Seaway was transgressing, and the paleocurrent and seismic geomorphological data from Lower Cretaceous strata, indicate the paleoslope of the region was to the north, not north-to-south (e.g., Leckie and Smith 1992; Christopher 2003; Hubbard et al. 2011; Fustic et al. 2012).

Three hypotheses can explain how detrital zircons from the Appalachian region of eastern North America were transported to western Canada and deposited in the McMurray Formation (Fig. 3.6). These general models were formulated with the help of existing paleogeographic information and potential detrital-zircon source areas (Benyon et al. 2014). Hypothesis A involves direct westerly transport, via a major continental-scale river system from the Appalachians, roughly contemporaneous with deposition during the Early Cretaceous (Fig. 3.6A). Hypothesis B involves transport to the southwestern United States prior to the early Cretaceous (e.g., Dickinson and Gehrels 2009). After this deposition, subsequent recycling and northward transport occurred during the Early Cretaceous (Fig. 3.6B). Hypothesis C involves transport from the Appalachians to present-day western Canada prior to the Early Cretaceous, followed by subsequent local recycling during the Early Cretaceous (Fig. 3.6C).

Concrete evidence to prove or refute these hypotheses is currently lacking; however there are some means by which they can begin to be tested. It is possible that

sediment was directly transported from east to west during the Early Cretaceous (Hypothesis A; Fig. 3.6A). During the Jurassic, transcontinental fluvial systems were proposed to have stretched across North America (Dickinson and Gehrels 2009), although no such system has been proven to exist during the Early Cretaceous. Between the source area in the east and the current location of the Athabasca Oil Sands, little Lower Cretaceous strata are preserved (Dyman et al. 1994), and where present, paleoflow data are largely inconclusive with respect to a hypothetical transcontinental river system (Witzke and Ludvigson 1994). Nonetheless, deposits of paleorivers >600 m across and >30–40 m deep have been recognized in the McMurray Formation (Mossop and Flach 1983; Hubbard et al. 2011; Musial et al. 2012), which are of a scale that is presumably consistent with drainage of an immerse catchment (Blum et al. 2013; Blum and Pecha, in press).

The southwestern United States contains a potential source of recycled Appalachian and Grenville zircons (Hypothesis B; Fig. 3.6B); however, the primary issue with this hypothesis is the presence of paleohighlands to the west and south of the Athabasca Oil Sands that existed during the time of deposition (Leckie and Smith 1992; Cant 1996; Ranger and Pemberton 1997; Christopher 2003.) If southerly-derived sediment was delivered into the McMurray sub-basin, the fluvial system would have had to transect these highs. It is plausible that this occurred via a conduit in southern Saskatchewan (Fig. 3.6B), although its presence has not been identified in tens of thousands of wellbores that targeted deep Jurassic and Paleozoic reservoirs of the Williston Basin. Future analysis might consider looking for this hypothetical fluvial system.

The McMurray Formation (and equivalent units) overlie an unconformity that juxtaposes Lower Cretaceous strata on older Jurassic and Paleozoic strata over much of western Canada (Fig. 3.1D), therefore it is possible that the eroded strata now absent beneath the Cretaceous strata once contained detrital zircons of Appalachian affinity that were then recycled into the McMurray Formation (Hypothesis C; Fig. 3.6C). This hypothesis is consistent with studies that suggest the paleodrainage area was limited to western Canada, and perhaps the northern United States (e.g., Christopher 2003; Leckie and Seif El-Dein 2009). Small outcrop exposures of sub-Cretaceous strata are present in limited locations in the subsurface of western Canada (Hayes et al. 1994). Currently, no detrital-zircon data are available from these units; however, these units could be tested for zircons of Appalachian affinity. If these units contain such zircons, this would strongly support, but not necessarily prove, Hypothesis C.

3.7.1.1 Drainage Area Estimates

The drainage area for fluvial sediments of the McMurray Formation can be estimated through numerous methods, providing additional insight into provenance, and the evolution of Lower Cretaceous paleogeography in North America. In consideration of Hypothesis C, it is possible to measure a minimum estimate of the Lower Cretaceous catchment area from the western Canada paleotopographic maps of Christopher (2003) and Leckie and Smith (1992) (Fig. 3.7A). A simple polygon constrained by paleotopographic highs, which were present outlining much of present day southern Saskatchewan, encompasses approximately 400,000 km^2 (Fig. 3.7A). More recent paleogeographic reconstructions based on well data in western Canada suggest an Early

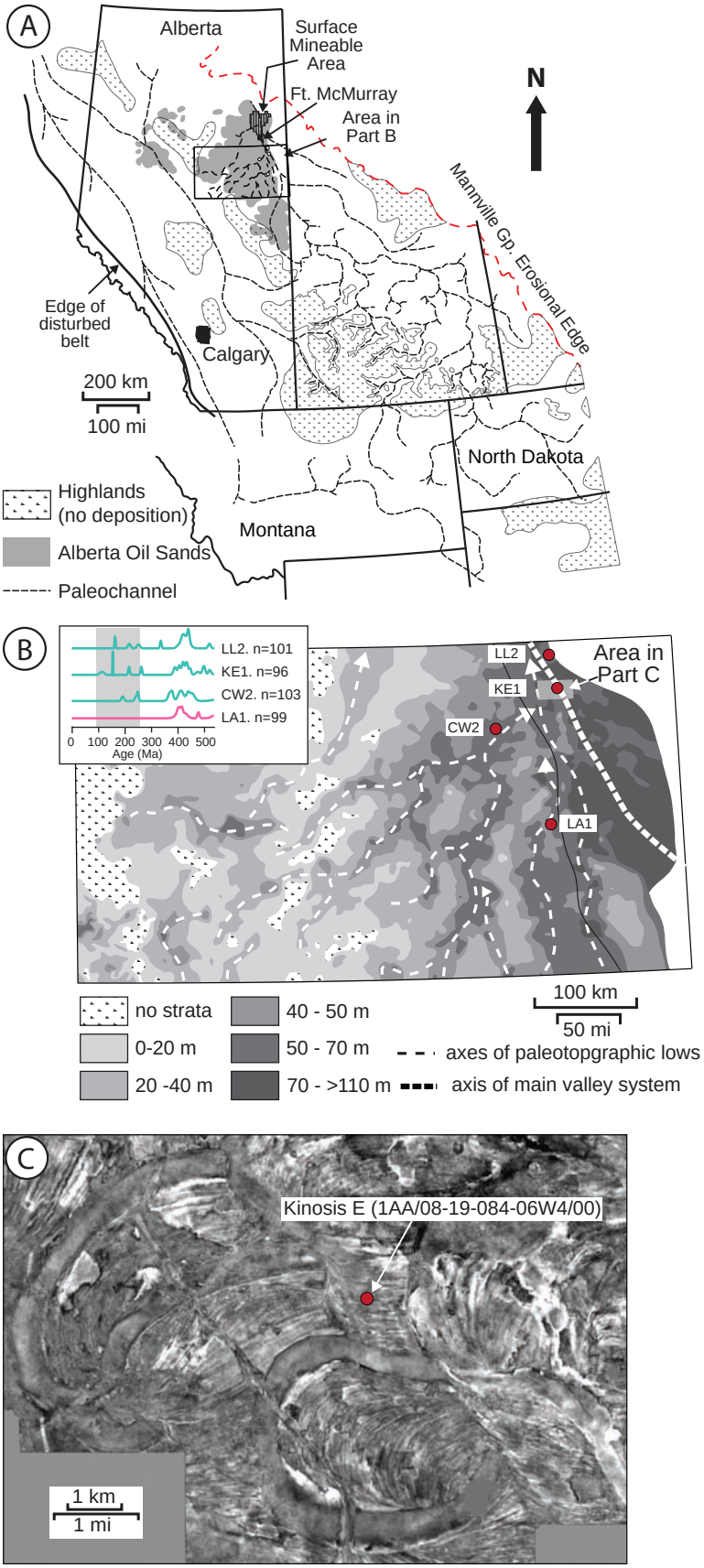


Figure 3.7. Paleogeographic and depostional setting for the McMurray Formation. A) Aptian paleogeographic reconstruction highlighting fluvial drainage networks across the Alberta Basin (modified from Leckie and Smith, 1992; Christopher, 2003). Major river valleys (dashed lines) developed amongst a series of highlands that were created during a long-lived depositional hiatus, which resulted in deposition of Cretaceous strata on top of Devonian units across much of northeastern Alberta. B)Isopach map of Mannville strata, bracketed by the underlying sub-Cretaceous unconformity and an overlying marine flooding surface (modifed from Ranger and Pemberton, 1997). The isopach records a mould of the unconformity surface, thus providing a reconstruction of the paleotopography that both (i) controlled fluvial drainage and (ii) was likely modified by river erosion. Dashed lines indicate axes of interpreted drainage networks. Note the location of this map in Part A; paleotopographic breaks in the highlands on the unconformity surface likely controlled the input of Cordilleran-derived sediment from the west. This is reflected by the absence of Cordilleran (<250 Ma; highlighted grey) grains in the Leismer A well (sample LA1). C) 3-D Seismic reflection time-slice showing the large-scale depositional elements of the meanderbelt present within the middle McMurray Formation at Kinosis (modified from Hubbard et al., 2011). Note the location of well 1AA/08-19-084-06W4, which was sampled in this study. Based on analysis of seismic data, Hubbard et al. (2011) interpreted that the meanderbelt trended 332˚ to the north-northwest. Note the location of this map in Part B.

Cretaceous paleodrainage of ~200,000 km^2 for the smaller channels in the lower part of the McMurray Formation (Leckie 2009).

In a second method, paleodrainage area is estimated using the equation of Davidson and North (2009). This method relates bankfull channel depth (d) to drainage area (DA) [$(d) = a(DA)^b$], where (a) and (b) are region specific variables dependent on climate, lithology, and hydrogeology. These variables correspond to a 'regional curve' derived from catchment surveys in trunk river systems in a variety of climatic settings and latitudes. Applying a chosen 'regional curve' to ancient fluvial deposits allows for an estimate of the drainage area based on paleoclimate and paleolatitude (Davidson and North 2009). Deepest bankfull channel depths of 8–14 m and 30–40 m were used as end-member estimates for the Lower and Middle/Upper McMurray Formation (Fig. 3.1D), respectively (e.g., Hein and Cotterill 2006; Hubbard et al. 2011; Musial et al. 2012). The Cretaceous is thought to have been warm and equable (Hay 2008); and climate reconstructions have placed the Western Interior Seaway into the mid-latitude warm and humid belt that transitioned at its northern end into the temperate zone (Hay and Floegel 2012). Hence, the Pacific Maritime curve (representative of the US Pacific NW; a=0.66, b=0.39), assuming a warm temperate climate with likely seasonal variability, was chosen as the most comparable regional curve available (see Davidson and North (2009) for an in depth review). Considering these parameters, the drainage area is calculated to be 33,000–137,000 km^2 for the Lower McMurray and 970,000–2,000,000 km^2 for the Middle/Upper McMurray. The estimates for drainage area, as deduced from the paleogeographic and paleotopographic reconstructions of the basin (~200,000–~400,000

km^2), are more closely associated with the calculated values for Lower McMurray drainage area.

An additional method for estimating drainage area utilizes a first-order relationship between contributing drainage area and channel size (Fig. 3.7C). Point bar thickness (and bankfull channel depth) can be scaled to drainage area (Blum et al. 2013). Applying the same bankfull channel depths as above, the logarithmic plot of Blum et al. (2013) results in estimates of a drainage area approximately 40,000–200,000 km^2 for the Lower McMurray Formation and 2,000,000–3,000,000 km^2 for the Middle/Upper McMurray Formation. For comparison, the Mississippi River basin is approximately 3,225,000 km^2 (Louque 1976). With application of methods that rely on channel dimensions to estimate drainage area, it is important to acknowledge the tidal influence on deposits of the McMurray Formation (e.g., Smith 1988; Hubbard et al. 2011; Musial et al. 2012); tidal influence affects the scales of the channels (Fig. 3.7C), and therefore complicates the estimates calculated using formulas intended for purely fluvial systems (e.g., Davidson and North 2009; Blum et al. 2013).

3.7.2 Detrital-Zircon Population Characteristics

The majority of the samples collected and analyzed are categorized as belonging to chronofacies *2* or *3*. However, there is notable variation both between wells and within individual wells. The Leismer A well (LA1 through LA4), contains notable exceptions to the general trends present in the other wells (Fig. 3.3). The Leismer A well, located in the southeast of the study area (Fig. 3.1C), contains no zircons <250 Ma. The absence of a particular age population can be attributed to an effect of sampling; however, the absence of detrital zircons with ages <250 Ma in almost 400 grains is more consistent with the

hypothesis that these sandstones do not contain Cordillera-derived grains. The coincidence between the location of the Leismer A area and the absence of <250 Ma grains may provide some explanation (Fig. 3.7B). The Leismer A area is the most southeasterly located site examined. It is possible that much of the Cordillera-derived sediment was transported from northwest to southeast into the McMurray sub-basin by long-shore currents in the Western Interior Seaway (Leckie, personal commun.). Thus, it is possible that Cordilleran input failed to deliver this sediment south to the Leismer A area. However, it is likely that the sediment source area of the fluvial deposits in the Leismer A area simply had no input from the Cordillera due to other factors. For example, a tributary may have only supplied Cordilleran grains north of this sample location at this time (Fig. 3.7B). Currently, it is difficult to determine the reason for this unique detrital-zircon assemblage, although additional sampling and analysis in the region would likely shed more light on this issue.

The Kinosis E well contains a relatively large amount of younger Cordilleran grains (<250 Ma) compared to other wells. Three of the four samples in this well contain zircons <250 Ma. This well is located in the northeast of the study area and is situated the furthest east of any well sampled. It is possible that the major southeast-northeast trending meanderbelt imaged seismically in this area (Fig. 3.7C; Hubbard et al. 2011) was intersected by an eastward-flowing tributary rich in Cordilleran detritus just south of Kinosis (Fig. 3.7B).

Within the Leismer A well, LA1 is one of the most anomalous samples (Fig. 3.3), containing a large number of zircons (n=35) with ages of ca. 1800–1900 Ma. Stratigraphically, this sample is located at the base of the formation, and has been

interpreted to be part of the Lower McMurray. It is plausible that the base of the formation in this locality consists of a remnant, perhaps "terrace" deposit that was not eroded during Valley A incision (Fig. 3.5). This could explain the markedly unique detrital-zircon signature of sample LA1 (Fig. 3.3). It is possible that the Canadian Shield (Trans-Hudson province) was initially an important sediment source for the McMurray Formation before large-scale river systems developed. It is also possible that this is from another source with abundant ca. 1800–1900 Ma detrital zircons that were recycled into this valley system during the Early Cretaceous. The quartzites of the Athabasca Group contain grains of this age, and therefore could be another potential sediment source (Rainbird et al. 2002; Rayner et al. 2003). In addition, Jurassic strata in the foreland basin of Alberta contain a significant number of zircons with these ages (Raines et al. 2013), and it is also plausible that they may have been recycled during the Early Cretaceous. Additional techniques such as hafnium (Hf) isotope geochemistry of the detrital zircons may help resolve their origin (cf. Gehrels and Pecha 2014).

The Kinosis E, Long Lake, and Leismer B wells have multiple zircons with ages between ca. 153–168 Ma (see also Appendix B). Correlating these grains to a specific batholith in the Cordilleran province is not possible using only ages; however the U-Pb ages narrow the possibilities for potential source areas. Of the batholiths in the Canadian Cordillera, the Nelson Batholith in southern British Columbia contains zircons with crystallization ages that overlap the ages of these detrital zircons (Ghosh 1995). Trace element analysis of (ca. 153–168 Ma) zircons of may provide a way to refine the exact provenance of these zircons (cf. Gehrels and Pecha 2014).

3.7.3 Chronofacies and Incised Valley Systems

The McMurray Formation was deposited in the distal-most portion of the Cordilleran foreland basin in a region dominated by relatively low-accommodation (e.g., Cant and Abrahamson 1996). Regarding detrital-zircon age populations, such a low-accommodation setting should contain relatively homogenized sediment because this system would tend to favour sediment cannibalization during the incision and infilling of the multiple valley systems (e.g., Fig. 3.1D). In this scenario, older sediment and detrital zircons would be eroded and redeposited during subsequent incisional and infilling events associated with the formation of the valley systems in the area. Although it had been assumed that present greenhouse conditions dominated the Early Cretaceous, recent work from around the world has demonstrated major Aptian glacio-eustatic sea-level fluctuations (e.g., Hillgärtner et al. 2003; Gréselle and Pittet 2005; Maurer et al. 2013; Bover-Arnal et al. 2014). The widespread presence of incised valley systems in coeval strata from across the Alberta basin is consistent with this interpretation (e.g. Bluesky Formation (Terzuoli and Walker 1997; Hubbard et al. 2002); Dina and Cummings members of the Mannville Group (Bauer et al. 2009); and Basal Quartz (Ardies et al. 2002; Zaitlin et al. 2002)).

Consistent with this hypothesis, the detrital-zircon age populations within and between individual wells generally do not contain specific trends or predictable variations. The same chronofacies is present in deposits of different valley systems and across unconformities (Figs. 3.4, 3.5). For example, in the Leismer B well (Fig. 3.5), chronofacies *3* occurs both in Valley C at the base of the McMurray Formation and at the very top of the McMurray Formation. Additionally, in the Cottonwood well (Fig. 3.4),

both chronofacies *2* and *3* are observed in the same incised valley. In the Leismer A well, the most unique detrital-zircon signature (chronofacies *1*) is present in the most basal portion of the well. It is possible that the incision of Valley A reworked the underlying sediment, changing the detrital zircon abundance at the base of the valley.

3.7.4 Detrital Zircons and Chemostratigraphy

The Kinosis Well 1 (1AB/06-34-084-07W4/00) includes detrital-zircon data, chemostratigraphic data, and logged core. Here, we compare the three datasets (Fig. 3.8). Overall, the chemostratigraphic packages 2, 3 and 4 correlate to the changes in the detrital-zircon signatures (samples 4, 7 and 9 respectively). Each chemostratigraphic package has a corresponding detrital-zircon signature and chronofacies (Fig. 3.8). Chemostratigraphic package 1 differs, however, as it contains two detrital-zircon samples with two different distributions. The detrital-zircon data from sample 8, from the bottom of package 1 (unit 1.1), differs from sample 2, collected in the same chemostratigraphic package (albeit a slightly different unit). Moreover, sample 2 is similar to sample 4, which is associated with package 2. Therefore, at first glance, the divisions based on chemostratigraphic data are different than those that might be predicted using the detrital-zircon data.

The K/Rb elemental ratio appears to correlate with the abundance of <250 Ma detrital zircons (Fig. 3.8). Samples 8 and 9 contain large numbers of <250 Ma grains derived from the Cordillera; the same lithologic unit depths are characterized by a relatively high K/Rb elemental ratio. A high K/Rb elemental ratio usually reflects the relative abundance of potassium feldspar and is an indicator of proximity to the sediment source area (Chemostrat, personal commun.). Thus, it is logical that a relatively high

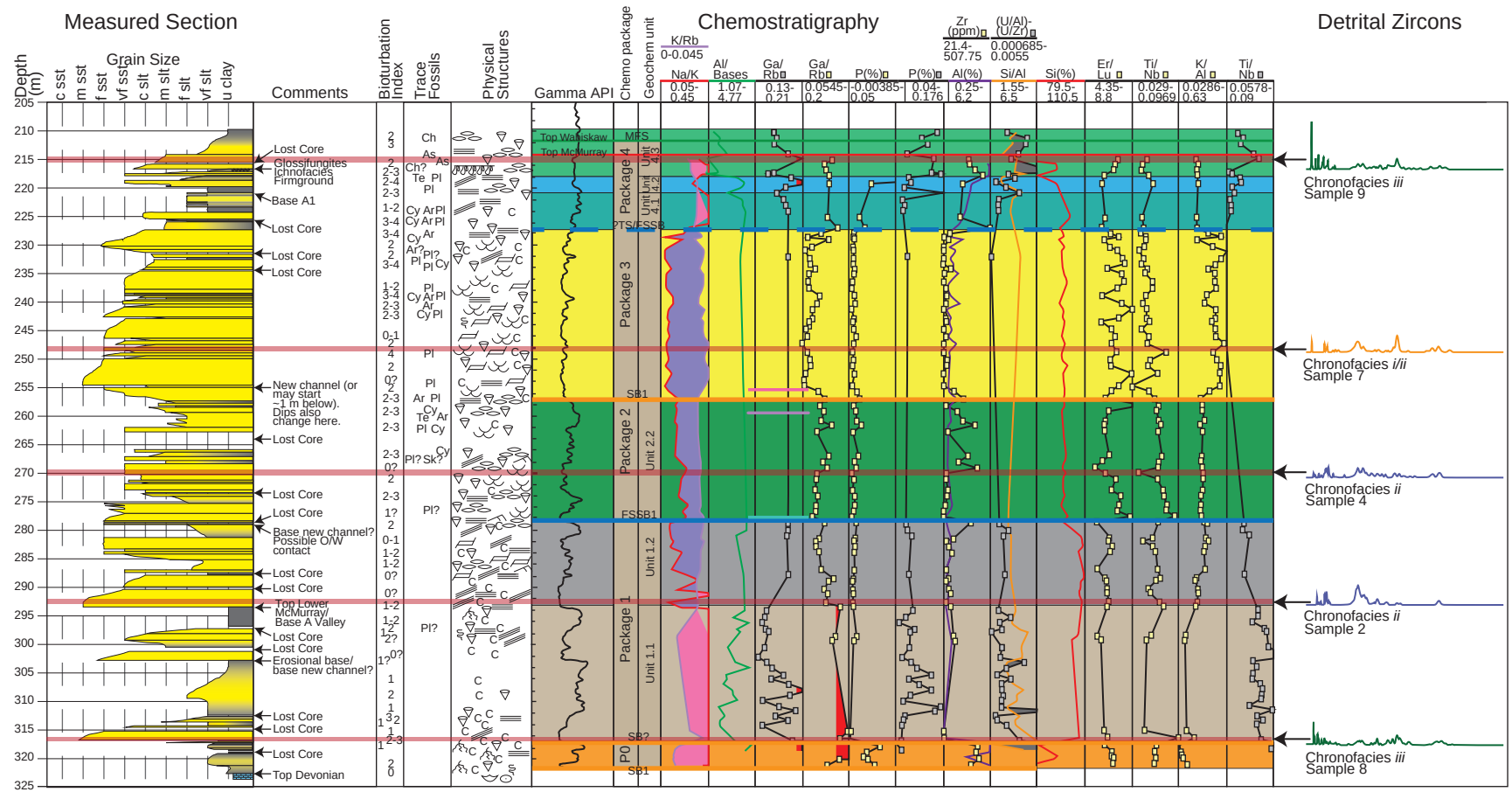


Figure 3.8. Comparison of measured section, chemostratigraphic data, and detrital-zircon data from well 1AB/06-34-084-07W4/00 (Kinosis 1). Chemostratigraphic packages 2, 3 and 4 appear to correlate with the changes in the detrital-zircon signatures of samples 4, 7 and 9 respectively. However, chemostratigraphic package 1 contains two different detrital-zircon signatures (samples 8 and 2), showing that the divisions based on chemostratigraphic data are somewhat different than that predicted by detrital-zircon data. The K/Rb - Na/K profile combination (shaded pink) is notably similar for samples 8 and 9, both of which have a relatively large number of zircons <250 Ma. Furthermore, the K/Rb - Na/K profile combination (shaded purple) corresponds to detrital-zircon signatures characterized by more Appalachian and Grenville age zircons. Note that the measured section is a generalized stratigraphic column adapted from a more detailed one.

K/Rb elemental ratio correlates to a larger number of young detrital zircons derived from the relatively proximal Cordillera. Additionally, a compositionally less mature sandstone derived from more proximal locations would presumably contain more potassium feldspar (e.g., Dickinson and Suczek 1979). The Na/K elemental ratio is also high at these sample depths, likely indicating the relative abundance of plagioclase feldspar relative to potassium feldspar abundance. Shaded in pink, the K/Rb - Na/K profile combination is similar at the depths samples 8 and 9 were taken, showing the separation produced by low K/Rb values and high Na/K values. Note that the exact depths samples 8 and 9 were taken actually show a relatively high K/Rb ratio compared to the rest of the pink shaded area. Furthermore, depths shaded in purple, highlighting the separation produced by high K/Rb values and low Na/K values, correspond to detrital-zircon signatures characterized by more Appalachian and Grenville age zircons.

There is an increase in garnet abundance upwards within the McMurray Formation (Chemostrat, personal commun.), which implies a change in provenance during time of deposition. The GZi (garnet:zircon) index is a useful provenance indicator (Morton and Hallsworth 1994). GZi values are low in Package 1, whereas values in Package 2 and 3 are high, suggesting the provenance change broadly coincides with the Package 1-2 boundary. However, this does not match the change in detrital-zircon signatures observed in well 6-34 (Fig. 3.8). Similar to the chemostratigraphic packages, these divisions based on GZi data are different than those suggested by the detrital-zircon data.

3.8 Conclusions

The McMurray Formation in Alberta, Canada contains the majority of bitumen in the economically and politically significant Athabasca Oil Sands. Despite many studies, several first-order questions about the formation and its depositional history remain. One such example is, "where did the sediment derive from?" This has implications for Lower Cretaceous paleogeographic reconstructions, which help in delineation of principal sedimentary fairways in northeastern Alberta and beyond. Historically, correlation of the stratigraphic units has been difficult due to the complex and dynamic fluvial to marginal marine depositional settings and resultant facies trends.

In this study, detrital zircon geochronology is used in order to gain insight into the sediment provenance, regional paleogeographic setting, and internal stratigraphy of the McMurray Formation. The formation is characterized by detrital zircon populations with U-Pb ages interpreted to have been derived from varied sources: (1) the western North American Cordillera, U-Pb ages <250 Ma; (2) the Appalachians in eastern North America, ca. 300–600 and ca. 1000–1300 Ma; and (3) the Canadian Shield, ca. 1800–1900 Ma and ca. 2600–2800 Ma.

Generally, all of the detrital zircon age populations are widely distributed within a series of previously defined incised valley systems that characterize McMurray Formation strata in northeastern Alberta. This indicates homogenization of the sediment within the fluvial meanderbelt system as a result of extensive incision, reworking and deposition. However, spatial variation in zircons of Cordilleran origin indicate that distinct channel systems existed during the Lower Cretaceous, which sourced different parts of the Western Interior and coalesced in the McMurray sub-basin. Additionally,

from a temporal perspective, the data indicate a significant change in river catchment through evolution of the McMurray Formation. Stratigraphically constrained channel dimensions increase markedly in size from the base to the middle-upper portions of the formation. Along with this shift in channel size, the detrital zircon population is more diverse upwards, supporting an interpretation that river catchment increased through time from something near the scale of modern day western Canada to a more continental-scale system.

3.9 References

Alberta Energy and Utilities Board (AEUB), 2003, Athabasca Wabiskaw-McMurray Regional Geological Study: Report 2003-A, 187 p.

Anfinson, O.A., Leier, A.L., Embry, A.F., and Dewing, K., 2012, Detrital zircon geochronology and provenance of the Neoproterozoic to Late Devonian Franklinian Basin, Canadian Arctic Islands: Geological Society of America, Bulletin, v. 124, p. 415–430.

Ardies, G.W., Dalrymple, R.W., and Zaitlin, B.A., 2002, Controls on the geometry of incised valleys in the Basal Quartz Unit (Lower Cretaceous), Western Canada sedimentary basin: Journal of Sedimentary Research, v. 72, p. 602–618.

Bauer, D.B., Hubbard, S.M., Leckie, D.A., and Dolby, G., 2009, Delineation of a sandstone-filled incised valley in the Lower Cretaceous Dina-Cummings interval: Implications for development of the Winter Pool, west-central Saskatchewan: Bulletin of Canadian Petroleum Geology, v. 57, p. 409–429.

Becker, T.P., Thomas, W.A., Samson, S.D., and Gehrels, G.E., 2005, Detrital zircon evidence of Laurentian crustal dominance in the lower Pennsylvanian deposits of

the Alleghanian clastic wedge in eastern North America: Sedimentary Geology, v. 182, p. 59–86.

Benyon, C., Leier, A., Leckie, D.A., Webb, A., Hubbard, S.M., and Gehrels, G., 2014, Provenance of the Cretaceous Athabasca Oil Sands, Canada: Implications for Continental-scale Sediment Transport: Journal of Sedimentary Research v. 84, p. 136–143.

Blum, M., Martin, J., Milliken, K., and Garvin, M., 2013, Paleovalley Systems: insights from Quaternary analogs and experiments: Earth-Science Reviews, v. 116, p. 128–169.

Bover-Arnal, T., Salas, R., Guimerà, J., and Moreno-Bedmar, J.A., 2014, Deep incision in an Aptian carbonate succession indicates major sea-level fall in the Cretaceous: Sedimentology, p. 1–36.

Cant, D.J., 1996, Sedimentological and sequence stratigraphic organization of a foreland clastic wedge, Mannville Group, Western Canada Basin: Journal of Sedimentary Research, v. 66, p. 1137–1147.

Cant, D.J. and Abrahamson, B., 1996, Regional distribution and internal stratigraphy of the Lower Mannville: Bulletin of Canadian Petroleum Geology, v. 44, p. 508–529.

Carrigy, M.A., 1963, Paleocurrent directions from the McMurray Formation: Bulletin of Canadian Petroleum Geology, v. 11, p. 389–395.

Christopher, J.E., 2003, Jura-Cretaceous Success Formation and Lower Cretaceous Mannville Group of Saskatchewan: Saskatchewan Industry and Resources, Saskatchewan Geological Survey, Report 223, 352 p.

Davidson, S.K., and North, C.P., 2009, Geomorphological regional curves for prediction of drainage area and screening modern analogues for rivers in the rock record :Journal of Sedimentary Research, v. 79, p. 773–792

Dickinson W.R., 2008, Impact of differential zircon fertility of granitoid basement rocks in North America on age populations of detrital zircons and implications for granite petrogenesis: Earth and Planetary Science Letters, v. 275, p. 80–92.

Dickinson, W.R., and Gehrels, G.E., 2008, Sediment delivery to the Cordilleran Foreland Basin: insights from U-Pb ages of detrital zircons in Upper Jurassic and Cretaceous strata of the Colorado Plateau: American Journal of Science, v. 308, p. 1041–1082.

Dickinson, W.R., and Gehrels, G.E., 2009, U-Pb ages of detrital zircons in Jurassic eolian and associated sandstones of the Colorado Plateau: Evidence for transcontinental dispersal and intraregional recycling of sediment: Geological Society of America, Bulletin, v. 121, p. 408–433.

Dickinson, W.R., and Suczek, C.A., 1979, Plate tectonics and sandstone compositions: American Association of Petroleum Geologists Bulletin, v. 63, p. 2164–2182.

Dyman, T.S., Cobban, W.A., Fox, J.E., Hammond, R.H., Nichols, D.J., Perry, W.J., Porter, K.W., Rice, D.D., Setterholm, D.R., Shurr, G.W., Tysdal, R.G., Haley, J.C., and Campen, E.B., 1994, Cretaceous rocks from southwestern Minnesota, northern Rocky Mountains, and Great Plains region, *in* Schurr, G.W., Ludvigson, G.A., and Hammond, R.H., eds., Perspectives on the eastern margin of the Cretaceous Western Interior Basin: Geological Society of America, Special Paper 287, p. 5–26.

Flach, P.D., and Mossop, G.D., 1985, Depositional environments of Lower Cretaceous McMurray Formation, Athabasca Oil Sands, Alberta: The American Association of Petroleum Geologists Bulletin, v. 69, p. 1195–1207.

Fustic, M., Hubbard, S.M., Spencer, R., Smith, D.G., and Leckie, D.A., 2012, Recognition of down-valley translation in tidally influenced meandering fluvial deposits, Athabasca Oil Sands (Cretaceous), Alberta, Canada: Marine and Petroleum Geology, v. 29, p. 219–232.

Gehrels, G.E., 2011, Detrital zircon U–Pb geochronology: current models and new opportunities, *in* Busby C, and Azor A., eds., Tectonics of Sedimentary Basins: Recent Advances: Chichester, U.K., Wiley-Blackwell, p. 47–62.

Gehrels, G.E., and Pecha, M., 2014, Detrital zircon U-Pb geochronology and Hf isotope geochemistry of Paleozoic and Triassic passive margin strata of western North America: Geosphere, v. 10, p. 49–65.

Ghosh, D.K., 1995, U - Pb geochronology of Jurassic to early Tertiary granitic intrusives from the Nelson - Castlegar area, southeastern British Columbia, Canada: Canadian Journal of Earth Sciences, v. 32, p. 1668–1680.

Gréselle, B., and Pittet, B., 2005, Fringing carbonate platforms at the Arabian Plate margin in northern Oman during the Late Aptian-Middle Albian: evidence for high-amplitude sea-level changes: Sedimentary Geology, v. 175, p. 367–390.

Hadlari, T., Davis, W.J., Dewing, K., Heaman, L.M., Lemieux, Y., Ootes, L., Pratt, B.R., and Pyle, L.J., 2012, Two detrital zircon signatures for the Cambrian passive margin of northern Laurentia highlighted by new U-Pb results from northern Canada: Geological Society of America, Bulletin, v. 124, p. 1155–1168.

Hay, W.W., 2008, Evolving ideas about the Cretaceous climate and ocean circulation: Cretaceous Research, v. 29, p. 725–753.

Hay, W.W., and Floegel, S., 2012, New thoughts about the Cretaceous climate and oceans: Earth-Science Reviews, v. 115, p. 262–272.

Hayes, B.J.R., Christopher, J.E., Rosenthal, L., Los, G., McKercher, B., Minken, D., Tremblay, Y.M., and Fennell, J., 1994, Cretaceous Mannville Group of the Western Canada Sedimentary Basin, *in* Mossop, G.D., and Shetsen, I., eds., Geological Atlas of the Western Canada Sedimentary Basin: Canadian Society of Petroleum Geologists and Alberta Research Council, p. 317–334.

Hein, F.J., and Cotterill, D.K., 2006, The Athabasca oil sands: a regional geological perspective, Fort McMurray area, Alberta, Canada: Natural Resources Research, v. 15, p. 85–102.

Hein, F.J., Cotterill, D.K. and Rice, R.J, 2006, Subsurface geology of the Athabasca Wabiskaw- McMurray Succession: Lewis—Fort McMurray area, northeastern Alberta (NTS 74D/74E); Alberta Energy and Utilities Board, EUB/AGS Earth Sciences Report 2006-06, 59 p.

Hildred, G.V., Ratcliffe, K.T., Wright, A.M., Zaitlin, B.A., and Wray, D.S., 2010, Chemostratigraphic applications to low-accommodation fluvial incised-valley settings; an example from the Lower Mannville Formation of Alberta, Canada: Journal of Sedimentary Research, v. 80, p. 1032–1045.

Hillgärtner, H., van Buchem, F.S.P., Gaumet, F., Razin, P., Pittet, B., Grötsch, J., and Droste, H., 2003, The Barremian-Aptian evolution of the eastern Arabian

carbonate platform margin (northern Oman): Journal of Sedimentary Research, v. 73, no. 5, p. 756–773.

Hubbard, S.M., Gingras, M.K., Pemberton, S.G. and Thomas, M.B., 2002, Variability in wave-dominated estuary sandstones: implications on subsurface reservoir development: Bulletin of Canadian Petroleum Geology, v. 50, p. 118–137.

Hubbard, S.M., Smith, D.G., Nielsen, H., Leckie, D.A., Fustic, M., Spencer, R.J., and Bloom, L., 2011, Seismic geomorphology and sedimentology of a tidally influenced river deposit, Lower Cretaceous Athabasca Oil Sands, Alberta, Canada: American Association of Petroleum Geologists, Bulletin, v. 95, p. 1123–1145.

James, D.P., and Oliver, T.A., 1977, The sedimentology of the McMurray Formation, east Athabasca: The Oil Sands of Canada: Canadian Institute of Mining and Metallurgy Special, v. 17, p. 17–26.

Keith, D.A.W., Wightman, D.M., Pemberton, S.G., MacGillivray, J.R., Berezniuk, T., and Berhane, H., 1988, Sedimentology of the McMurray Formation and Wabiskaw Member (Clearwater Formation), Lower Cretaceous, in the central region of the Athabasca oil sands area, northeastern Alberta, *in* James, D.P., and Leckie, D.A., eds., Sequences, Stratigraphy, Sedimentology: Surface and Subsurface: Canadian Society of Petroleum Geologists, Memoir 15, p. 309–324.

Lawton, T.F., 1994, Tectonic setting of Mesozoic sedimentary basins, Rocky mountain region, in Caputo, M. V., Peterson, J. A., and Franczyk, K. J., eds., Mesozoic Systems of the Rocky Mountain Region, USA: Rocky Mountain Section: Society for Sedimentary Geology, p. 217–230.

Lawton, T.F., Hunt, G.J., and Gehrels, G.E., 2010, Detrital zircon record of thrust belt unroofing in Lower Cretaceous synorogenic conglomerates, central Utah: Geology, v. 38, p. 463–466.

Leckie, D.A., and Smith, D.G, 1992, Regional setting, evolution, and depositional cycles of the Western Canada Foreland Basin, *in* Macqueen, R.W., and Leckie, D.A., eds., Foreland Basins and Fold Belts: American Association of Petroleum Geologists, Memoir 55, p. 9–46.

Leckie, D.A., 2009, Geomorphology of the Basinwide Sub-Cretaceous Unconformity, Western Canada Foreland Basin: Canadian Society of Petroleum Geologists Annual Meeting, Calgary, Canada.

Leckie, D.A., and Seif El-Dein, S.A., 2009, Paleogeomorphology and Petrography (Revisited) of the Athabasca Oil Sands, McMurray Sub Basin, Alberta, Canada [abstract]: American Association of Petroleum Geologists, Annual Convention and Exhibition, Abstracts and Program.

Leier, A.L., and Gehrels, G.E., 2011, Continental-scale detrital zircon provenance signatures in Lower Cretaceous strata, western North America: Geology, v. 39, p. 399–402.

Louque, R.E., 1976, New Flowline for the Lower Mississippi River: Journal of the American Water Resources Association, v. 12, p. 1049–1060.

Ludwig, K., 2008, Isoplot 3.60: Berkeley Geochronology Center Special Publication No. 4, 77 p.

Maurer, F., van Buchem, F.S.B., Eberli, G.P., Pierson, B.J., Raven, M.J., Larsen, P.-H., Al-Husseini, M.I., and Vincent, B., 2013, Late Aptian long-lived glacio-eustatic lowstand recorded on the Arabian Plate: Terra Nova, v. 25(2), p. 87–94.

McGookey, D.P., 1972, Cretaceous System, *in* Mallory, W., ed., Geological Atlas of the Rocky Mountain Region: Denver, Colorado, Rocky Mountain Association of Geologists, p. 190–228.

Mellon, G.B., 1956, Heavy minerals of the McMurray Formation, *in* Geology of the McMurray Formation: Part 2, Research Council of Alberta, Report 72, p. 1–50.

Miall, A.D., Catuneanu, O., Vakarelov, B.K., and Post, R., 2008, The Western Interior Basin, *in* Miall, A.D., ed., The Sedimentary Basins of the United States and Canada: The Sedimentary Basins of the World, Amsterdam, NL, Elsevier, v. 5, p. 329–362.

Morton, A.C., and Hallsworth, C.R., 1994, Identifying provenance-specific features of detrital heavy mineral assemblages in sandstones: Sedimentary Geology, v. 90, p. 241–256.

Mossop, G.D., and Flach, P.D., 1983, Deep channel sedimentation in the Lower Cretaceous McMurray Formation, Athabasca Oil Sands, Alberta: Sedimentology, v. 30, p. 493–509.

Musial, G., Reynaud, J.Y., Gingras, M.K., Fenies, H., Labourdette, R., and Parize, O., 2012, Subsurface and outcrop characterization of large tidally influenced point bars of the Cretaceous McMurray Formation (Alberta, Canada): Sedimentary Geology, v. 279, p. 156–172.

Nelson, H.W., and Glaister, R.P., 1978, Subsurface environmental facies and reservoir relationships of the McMurray oil sands, northeastern Alberta: Bulletin of Canadian Petroleum Geology, v. 26, p. 177–207.

Park, H., Barbeau, D.L., Rickenbaker, A., Bachmann-Krug, D., and Gehrels, G.E., 2010, Application of detrital zircon geochronology to the reconstruction of the Southern and Central Appalachian Orogen: Journal of Geology, v. 118, p. 23–44.

Press, W.H., Flannery, B.P., Tenkolski, S.A., and Vetterling, W.T., 1986, Numerical Recipes: Cambridge, UK, Cambridge University Press, 818 p.

Press, W.H., Flannery, B.P., Tenkolski, S.A., and Vetterling, W.T., 1986, Numerical Recipes: Cambridge, UK, Cambridge University Press, 818 p.

Rahl, J.M., Reiners, P.W., Campbell, I.H., Nicolescu, S., and Allen, C.M., 2003, Combined single-grain (U-Th)/He and U/Pb dating of detrital zircons from the Navajo Sandstone, Utah. Geology: v. 31, [no.9], p. 761–764.

Rainbird, R.H., Stern, R.A. and Jefferson, C.W., 2002, Summary of detrital zircon geochronology of the Athabasca Group, Northern Saskatchewan and Alberta: Summary of Investigations, Saskatchewan Geological Survey, Saskatchewan Energy Mines, v. 2, D-17, 3 pp.

Raines, M.K., Hubbard, S.M., Kukulski, R.B., Leier, A.L., and Gehrels, G.E., 2013, Sediment dispersal in an evolving foreland: detrital zircon geochronology from Upper Jurassic and lowermost Cretaceous strata, Alberta Basin, Canada: Geological Society of America, Bulletin, v. 125, p. 741–755.

Ranger, M.J., 1994, A basin study of the southern Athabasca Oil Sands Deposit, Unpublished Ph.D. Thesis, University of Alberta, 326 p.

Ranger, M.J., and Gingras, M.K., 2003, Discussion of Langenberg, C.W., Hein, F.J., Lawton, D., Cunningham, J.: Seismic modeling of fluvial-estuarine deposits in the Athabasca oil sands using ray-tracing techniques, Steepbank River area, northeastern Alberta, Bulletin of Canadian Petroleum Geology, v. 51, p. 347–353.

Ranger, M.J., and Pemberton, S.G., 1997, Elements of a stratigraphic framework for the McMurray Formation in South Athabasca area, Alberta, *in* Pemberton, S.G., and James, D.P., eds., Petroleum Geology of the Cretaceous Mannville Group, Western Canada: Canadian Society of Petroleum Geologists, Memoir 18, p. 263–291.

Rayner, N.M., Stern, R.A., and Rainbird, R. H., 2003, SHRIMP U–Pb detrital zircon geochronology of Athabasca Group sandstones, northern Saskatchewan and Alberta: Current Research, 2003-F2, p. 1–20.

Ross, G.M., Patchett, P.J., Hamilton, M., Heaman, L., DeCelles, P.G., Rosenberg, E., and Giovanni, M.K., 2005, Evolution of the Cordilleran orogeny (southwestern Alberta, Canada) inferred from detrital mineral geochronology, geochemistry, and Nd isotopes in the foreland basin: Geological Society of America, Bulletin, v. 117, p. 747–763.

Smith, D.G., 1988, Tidal bundles and mud couplets in the McMurray Formation, northeastern Alberta: Bulletin of Canadian Petroleum Geology, v. 36, p. 216-219.

Soloviev, A.V., Miller, E.L., Gehrels, G., and Kuzmichev, A.B., 2006, A Statistical Comparison of U-Pb Detrital Zircon Ages From Mesozoic Sandstones of the Russian Arctic Eos Trans: AGU, 87(52), Fall Meeting, Abstract T11D-0470.

Su, Y., Wang, J.J., and Gates, I.D., 2014, Orientation of a pad of SAGD well pairs in an Athabasca point bar deposit affects performance: Marine and Petroleum Geology, v. 54, p. 37–46.

Terzuoli, A., and Walker, R.G., 1997, Estuarine valley fills in the Lower Cretaceous Bluesky Formation, Edson area, Alberta: Bulletin of Canadian Petroleum Geology, v. 45, p. 194–217.

Wightman, D.M., and Pemberton, S.G., 1997, The Lower Cretaceous (Aptian) McMurray Formation: an overview of the Fort McMurray area, northeastern Alberta, *in* Pemberton, S.G., and James, D.P., eds., Petroleum Geology of the Cretaceous Mannville Group, Western Canada: Canadian Society of Petroleum Geologists, Memoir 18, p. 312–344.

Witzke, B.J., and Ludvigson, G.A., 1994, The Dakota Formation in Iowa and the type area, *in* Schurr, G.W., Ludvigson, G.A., and Hammond, R.H., eds., Perspectives on the Eastern Margin of the Cretaceous Western Interior Basin: Geological Society of America, Special Paper 287, p. 43–78.

Zaitlin, B.A., Warren, M.J., Potocki, D., Rosenthal, L., and Boyd, R., 2002, Depositional styles in a low accommodation foreland basin setting: An example from the Basal Quartz (Lower Cretaceous), southern Alberta: Bulletin of Canadian Petroleum Geology, v. 50, p. 31–72.

Chapter Four: Conclusions

The McMurray Formation is the principal bitumen reservoir of the Athabasca Oil Sands, and although numerous studies have focused on its sedimentary and stratigraphic characterization, this study was the first of its kind to explore the detrital zircon sedimentary provenance of these deposits. Two existing provenance models were tested, and while the results leant possible support to both, a new and surprisingly distal source was introduced.

A total of twenty-seven samples from eight wells were analyzed for uranium-lead (U-Pb) detrital zircon geochronology (Fig. 4.1). These samples were processed using procedures outlined in Gehrels (2011), mounted, and analyzed using laser ablation–multicollector–inductively coupled plasma–mass spectrometry (LA-MC-ICP-MS). The resulting data were analyzed and grouped into chronofacies, revealing two sets of three distinct signatures associated with three distinct 'blends' of source areas (Fig. 4.1). Comparing these new detrital-zircon signatures to core analysis, chemostratigraphy, and incised valley systems has revealed some potential links and several new questions.

The most prevalent detrital zircon ages found in all samples were <250 Ma, ca. 300–600 Ma, ca. 1000–1200 Ma, ca. 1800–1900 Ma, and ca. 2600–2800 Ma (Fig. 4.1). These populations are associated with the Cordillera, the Appalachians, the Grenville province, the Trans-Hudson province of the Canadian Shield, and the Superior province of the Canadian Shield respectively. Vertical stratigraphic variability within the McMurray Formation indicates that the relative contribution from these sediment source areas may have changed throughout deposition.

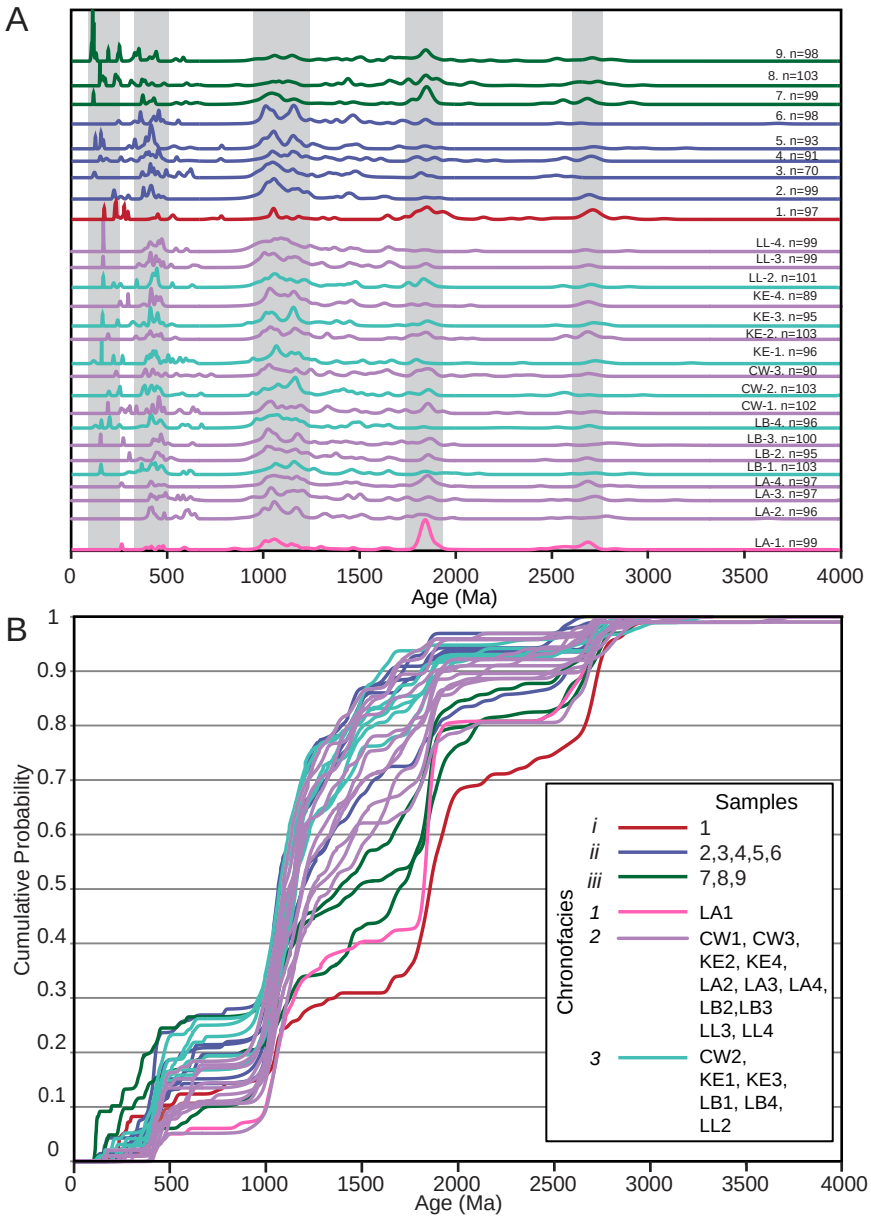


Figure 4.1. Sample results from all 27 detrital-zircon samples. A) Detrital-zircon normalized probability plots from the 27 samples; n is number of analyses. Highlighted areas depict primary age populations. Red represents chronofacies *i*, and is characterized by 1.8–1.9 Ga and 2.6–2.8 Ga grains. Blue represents chronofacies *ii*, and is characterized by zircons with U-Pb ages of ca. 300–600 Ma, and ca. 1000–1200 Ma. Dark green represents chronofacies *iii* and is characterized by abundant grains less than 250 Ma. Pink represents chronofacies *1*, and is characterized by ca. 1800–1900 Ma and ca. 2600–2800 Ma grains. Purple represents chronofacies *2*, and is characterized by zircons with U-Pb ages of ca. 300–600 Ma, ca. 1000–1200 Ma, and few or no detrital zircons with ages <250 Ma. Light green represents chronofacies *3* and is characterized by ca. 300–600 Ma and ca. 1000–1200 Ma grains. This chronofacies is similar to chronofacies *2*, but with a relatively larger number (>2 per sample) of ages less than 250 Ma. B) Cumulative probability plot. As in Part A, red represents chronofacies *i*, blue represents chronofacies *ii*, dark green represents chronofacies *iii*, pink represents chronofacies *1*, purple represents chronofacies *2*, and light green represents chronofacies *3*. See text for discussion; for complete results, see Appendix A and B.

How and when sediment from eastern North America was transported and deposited in western Canada remains speculative, with options including: A) transport from eastern North America via westward-flowing rivers during the Early Cretaceous, contemporaneous with deposition; B) transport from eastern North America to southwestern North America prior to the Cretaceous, deposition, and subsequent recycling and transport northward into western Canada during the Early Cretaceous; and C) transport from eastern North America to northwestern North America (i.e., present-day western Canada) prior to the Cretaceous, deposition, and local recycling during the Early Cretaceous.

4.1 Future Work

The results of this study have raised multiple questions that will require additional investigation. Detrital zircon U-Pb ages alone have some limitations due to sediment recycling, source ambiguity, or even the lack of variance of U-Pb ages in source terranes (e.g., Stockli 2013). Additional constraints can be attained by combining U-Pb and (U-Th)/He dating on the zircons used in this study in order to refine provenance histories. The (U-Th)/He method would capture information about the exhumation history of the source area (e.g. Rahl et al. 2003). Using this, and known timings of rock uplift in regions, we can narrow down the possible sediment source areas. Hence, the ambiguity of candidate source areas can be reduced by applying multiple radioisotopic systems.

Detrital zircon hafnium (Hf) isotopic analysis can also be used on the detrital zircons from this study and could constrain the crustal provenance (e.g., Kinney and Maas 2003). The advantage of using Hf model ages over U-Pb ages for such a study is that while U-Pb dating can identify the igneous crystallization age of a segment of crust,

Hf isotopes can distinguish juvenile mantle-derived crust of a given age from contemporary crust derived by remelting of older crust (Kinney and Maas 2003). In other words, unique Hf isotopes could potentially narrow down where in the Appalachians these zircons were originally derived.

Analyzing detrital zircons from the small exposures of sub-Cretaceous strata that are present in limited locations in the subsurface of western Canada would help to determine if Appalachian zircons were transported to Western Canada prior to the Early Cretaceous. It is possible that Permian–Jurassic sandstones host detrital zircons of Appalachian affinity. If so, it would strongly support, but not necessarily prove, the hypothesis that sediments from eastern North America were transported to western Canada during Permian–Jurassic time and subsequently recycled into the McMurray Formation during the Early Cretaceous.

Ambiguities may be also be further constrained by collecting additional samples at a larger scale for detrital zircon analysis. This would either lend more support to the homogenization and cannibalization of sediment within valleys, or create a more robust provenance framework.

The results presented in this thesis provide important new insights into the sedimentary provenance of the McMurray Formation of Alberta. From the work in this thesis, a series of testable hypotheses to account for eastern North American-derived sediment have been formulated.

4.2 References

Gehrels, G.E., 2011, Detrital zircon U–Pb geochronology: Current models and new opportunities, *in* Busby C., and Azor A., eds., Tectonics of Sedimentary Basins: Recent Advances, Chichester, UK, Wiley-Blackwell, p. 47–62.

Kinney, P.D., and Maas, R., 2003, Lu–Hf and Sm–Nd isotope systems in zircon, *in* Hanchar, J.M., and Hoskin, P.W.O., eds., Zircon: Reviews in Mineralogy and Geochemistry, v. 53, p. 327–341.

Rahl, J.M., Reiners, P.W., Campbell, I.H., Nicolescu, S., and Allen, C.M., 2003, Combined single-grain (U-Th)/He and U/Pb dating of detrital zircons from the Navajo Sandstone, Utah: Geology: v. 31, [no.9], p. 761–764.

Stockli, D.F., 2013, Unlocking provenance secrets from single detrital zircons by U-Pb and trace-element depth-profile laser-ablation-split-stream ICP-MS analysis and (U-Th)/He double dating: Geological Society of America Abstracts with Programs, v. 45 (7), 0 p.

APPENDIX A
U-Pb geochronologic analyses of detrital zircon (Nu HR ICPMS)

Zircon crystals are extracted from samples by traditional methods of crushing and grinding, followed by separation with a Wilfley table, heavy liquids, and a Frantz magnetic separator. Samples are processed such that all zircons are retained in the final heavy mineral fraction. A large split of these grains (generally thousands of grains) is incorporated into a 1" epoxy mount together with fragments of our Sri Lanka standard zircon. The mounts are sanded down to a depth of ~20 microns, polished, imaged, and cleaned prior to isotopic analysis.

U-Pb geochronology of zircons is conducted by laser ablation multicollector inductively coupled plasma mass spectrometry (LA-MC-ICPMS) at the Arizona LaserChron Center (Gehrels et al., 2006, 2008). The analyses involve ablation of zircon with a Photon Machines Analyte G2 excimer laser (or, prior to May 2011, a New Wave UP193HE Excimer laser) using a spot diameter of 30 microns. The ablated material is carried in helium into the plasma source of a Nu HR ICPMS, which is equipped with a flight tube of sufficient width that U, Th, and Pb isotopes are measured simultaneously. All measurements are made in static mode, using Faraday detectors with 3x1011 ohm resistors for 238U, 232Th, 208Pb-206Pb, and discrete dynode ion counters for 204Pb and 202Hg. Ion yields are ~0.8 mv per ppm. Each analysis consists of one 15-second integration on peaks with the laser off (for backgrounds), 15 one-second integrations with the laser firing, and a 30 second delay to purge the previous sample and prepare for the next analysis. The ablation pit is ~15 microns in depth.

For each analysis, the errors in determining 206Pb/238U and 206Pb/204Pb result in a measurement error of ~1-2% (at 2-sigma level) in the 206Pb/238U age. The errors in measurement of 206Pb/207Pb and 206Pb/204Pb also result in ~1-2% (at 2-sigma level) uncertainty in age for grains that are >1.0 Ga, but are substantially larger for younger grains due to low intensity of the 207Pb signal. For most analyses, the cross-over in precision of 206Pb/238U and 206Pb/207Pb ages occurs at ~1.0 Ga.

204Hg interference with 204Pb is accounted for measurement of 202Hg during laser ablation and subtraction of 204Hg according to the natural 202Hg/204Hg of 4.35. This Hg is correction is not significant for most analyses because our Hg backgrounds are low (generally ~150 cps at mass 204).

Common Pb correction is accomplished by using the Hg-corrected 204Pb and assuming an initial Pb composition from Stacey and Kramers (1975). Uncertainties of 1.5 for 206Pb/204Pb and 0.3 for 207Pb/204Pb are applied to these compositional values based on the variation in Pb isotopic composition in modern crystal rocks.

Inter-element fractionation of Pb/U is generally ~5%, whereas apparent fractionation of Pb isotopes is generally <0.2%. In-run analysis of fragments of a large zircon crystal (generally every fifth measurement) with known age of 563.5 ± 3.2 Ma (2-sigma error) is used to correct for this fractionation. The uncertainty resulting from the calibration correction is generally 1-2% (2-sigma) for both 206Pb/207Pb and 206Pb/238U ages.

Concentrations of U and Th are calibrated relative to our Sri Lanka zircon, which contains ~518 ppm of U and 68 ppm Th.

The resulting interpreted ages are shown on Pb*/U concordia diagrams and relative age-probability diagrams using the routines in Isoplot (Ludwig, 2008). The age-probability diagrams show each age and its uncertainty (for measurement error only) as a normal distribution, and sum all ages from a sample into a single curve.

References:

Gehrels, G.E., Valencia, V., Ruiz, J., 2008, Enhanced precision, accuracy, efficiency, and spatial resolution of U-Pb ages by laser ablation–multicollector–inductively coupled plasma–mass spectrometry: Geochemistry, Geophysics, Geosystems, v. 9, Q03017, doi:10.1029/2007GC001805.

Gehrels, G.E., Valencia, V., Pullen, A., 2006, Detrital zircon geochronology by Laser-Ablation Multicollector ICPMS at the Arizona LaserChron Center, in Loszewski, T., and Huff, W., eds., Geochronology: Emerging Opportunities, Paleontology Society Short Course: Paleontology Society Papers, v. 11, 10 p.

Ludwig, K.R., 2008, Isoplot 3.60. Berkeley Geochronology Center, Special Publication No. 4, 77 p.

Stacey, J.S., and Kramers, J.D., 1975, Approximation of terrestrial lead isotope evolution by a two stage model: Earth and Planetary Science Letters, v. 26, p. 207 221.

Sample 1 (1AA/02-11-084-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BENYON 356-92	774	32577	1.9	20.0735	3.3	0.1864	3.5	0.0271	1.2	0.34	172.6	2.0	173.6	5.6	186.4	76.5	172.6	2.0	NA
BENYON 356-76	378	20556	3.2	20.4959	5.5	0.2429	5.7	0.0361	1.4	0.25	228.7	3.2	220.8	11.2	137.8	128.8	228.7	3.2	NA
BENYON 356-36	193	15394	2.7	21.0886	10.6	0.2378	10.7	0.0364	1.7	0.16	230.3	3.9	216.6	20.9	70.4	252.5	230.3	3.9	NA
BENYON 356 2	280	23115	1.9	20.1039	7.1	0.2536	7.2	0.0370	0.9	0.12	234.1	2.1	229.5	14.8	182.9	166.5	234.1	2.1	NA
BENYON 356 21	174	20877	1.8	19.8673	8.0	0.2686	8.8	0.0387	3.8	0.43	244.8	9.2	241.6	19.0	210.4	184.7	244.8	9.2	NA
BENYON 356-45	213	134278	2.3	19.6226	11.0	0.3014	11.3	0.0429	2.4	0.21	270.8	6.3	267.5	26.5	239.1	254.4	270.8	6.3	NA
BENYON 356-95	928	61719	2.0	19.4924	1.5	0.3094	1.8	0.0437	1.1	0.60	276.0	2.9	273.8	4.4	254.4	33.7	276.0	2.9	NA
BENYON 356-40	671	94355	3.3	19.2901	1.9	0.3349	2.3	0.0469	1.3	0.57	295.2	3.8	293.3	5.8	278.4	43.1	295.2	3.8	NA
BENYON 356-64	78	11303	1.3	18.4519	10.4	0.5182	11.2	0.0694	4.0	0.36	432.3	16.9	424.0	38.9	379.1	235.5	432.3	16.9	114.0
BENYON 356-102	205	34172	1.6	17.8086	3.9	0.5614	4.2	0.0725	1.3	0.32	451.2	5.8	452.4	15.2	458.4	87.2	451.2	5.8	98.4
BENYON 356 19	90	14452	1.9	17.8886	6.6	0.6542	7.0	0.0849	2.4	0.35	525.2	12.3	511.1	28.1	448.4	145.8	525.2	12.3	117.1
BENYON 356-74	103	15398	3.2	17.9372	5.5	0.6598	5.8	0.0858	1.9	0.33	530.8	9.8	514.5	23.5	442.4	122.1	530.8	9.8	120.0
BENYON 356-56	185	87366	5.3	15.0068	3.1	1.1161	4.6	0.1215	3.3	0.73	739.0	23.3	761.1	24.4	826.4	64.9	739.0	23.3	89.4
BENYON 356-34	401	111235	1.7	15.2784	0.7	1.1632	1.2	0.1289	1.0	0.80	781.5	7.0	783.4	6.5	788.9	14.9	781.5	7.0	99.1
BENYON 356-103	96	55821	2.7	13.8104	3.1	1.7410	3.5	0.1744	1.6	0.45	1036.2	15.3	1023.8	22.7	997.4	63.8	997.4	63.8	103.9
BENYON 356-82	123	52260	1.3	13.7212	3.7	1.3386	8.6	0.1332	7.7	0.90	806.2	58.7	862.6	49.8	1010.6	74.4	1010.6	74.4	79.8
BENYON 356 1	117	55636	2.4	13.5813	1.7	1.7634	2.0	0.1737	0.9	0.48	1032.5	9.0	1032.1	12.8	1031.3	35.2	1031.3	35.2	100.1
BENYON 356 15	115	40800	2.8	13.5120	1.6	1.7734	2.2	0.1738	1.5	0.68	1033.0	14.1	1035.8	14.1	1041.7	32.1	1041.7	32.1	99.2
BENYON 356 3	118	28005	3.2	13.4835	1.6	1.7913	2.1	0.1752	1.3	0.63	1040.6	12.5	1042.3	13.5	1046.0	32.4	1046.0	32.4	99.5
BENYON 356 13	442	140674	3.2	13.4705	0.3	1.8389	1.0	0.1797	0.9	0.94	1065.1	9.0	1059.5	6.4	1047.9	6.6	1047.9	6.6	101.6
BENYON 356-52	413	156812	1.1	13.4590	0.3	1.8303	1.1	0.1787	1.0	0.95	1059.6	9.9	1056.4	7.0	1049.6	7.0	1049.6	7.0	101.0
BENYON 356-53	429	155724	3.0	13.4119	0.5	1.8419	1.6	0.1792	1.5	0.94	1062.4	15.2	1060.5	10.8	1056.7	10.9	1056.7	10.9	100.5
BENYON 356-61	505	136984	4.3	13.3865	0.4	1.8248	2.7	0.1772	2.6	0.99	1051.5	25.4	1054.4	17.4	1060.5	8.8	1060.5	8.8	99.1
BENYON 356-42	165	115750	1.3	13.2787	2.2	1.9500	3.2	0.1878	2.4	0.74	1109.4	24.2	1098.5	21.6	1076.8	43.7	1076.8	43.7	103.0
BENYON 356-66	456	172380	15.9	12.9864	0.6	2.0992	1.4	0.1977	1.2	0.89	1163.0	13.0	1148.5	9.5	1121.3	12.4	1121.3	12.4	103.7
BENYON 356-41	566	283165	2.5	12.5945	0.3	2.2180	1.6	0.2026	1.6	0.98	1189.3	17.4	1186.7	11.5	1182.1	6.9	1182.1	6.9	100.6
BENYON 356-49	183	99338	2.7	12.4270	1.4	2.2913	2.0	0.2065	1.4	0.72	1210.2	15.9	1209.6	14.2	1208.5	27.5	1208.5	27.5	100.1
BENYON 356-59	69	36242	2.1	12.3149	2.4	2.4321	2.9	0.2172	1.7	0.58	1267.2	19.7	1252.1	21.1	1226.3	46.7	1226.3	46.7	103.3
BENYON 356-58	341	158630	2.7	11.7949	0.5	2.6586	1.9	0.2274	1.8	0.96	1321.0	22.0	1317.0	14.1	1310.5	10.1	1310.5	10.1	100.8
BENYON 356-37	302	140646	5.5	11.4367	0.6	2.4761	2.7	0.2054	2.6	0.97	1204.2	29.0	1265.1	19.7	1370.2	12.5	1370.2	12.5	87.9
BENYON 356-90	177	59575	2.8	9.8992	0.8	4.0785	1.1	0.2928	0.8	0.68	1655.6	11.2	1650.0	9.1	1642.9	15.1	1642.9	15.1	100.8
BENYON 356-63	194	145788	1.6	9.8971	0.6	4.2554	5.0	0.3055	5.0	0.99	1718.3	74.8	1684.8	41.1	1643.3	11.1	1643.3	11.1	104.6
BENYON 356-48	421	406388	1.8	9.8434	0.2	4.0682	1.1	0.2904	1.1	0.99	1643.7	15.6	1648.0	8.9	1653.4	3.5	1653.4	3.5	99.4
BENYON 356-29	187	117404	4.4	9.4161	0.6	4.6242	1.2	0.3158	1.1	0.88	1769.2	16.8	1753.6	10.3	1735.2	11.0	1735.2	11.0	102.0
BENYON 356-62	107	56304	2.5	9.3851	0.9	4.7050	3.0	0.3203	2.8	0.95	1791.0	44.0	1768.1	24.9	1741.2	17.2	1741.2	17.2	102.9
BENYON 356-44	69	35572	2.4	9.1800	1.0	4.8167	1.4	0.3207	1.0	0.68	1793.1	14.9	1787.8	11.8	1781.6	18.7	1781.6	18.7	100.6
BENYON 356-33	314	352705	3.3	9.1495	0.3	4.7668	0.8	0.3163	0.8	0.95	1771.7	11.9	1779.1	6.8	1787.7	4.8	1787.7	4.8	99.1
BENYON 356-50	196	89127	1.7	9.1262	0.6	4.9797	2.4	0.3296	2.3	0.97	1836.4	36.5	1815.9	19.9	1792.3	10.1	1792.3	10.1	102.5
BENYON 356-86	445	440931	19.0	9.1211	0.3	4.9640	1.3	0.3284	1.3	0.98	1830.5	21.0	1813.2	11.3	1793.4	4.6	1793.4	4.6	102.1
BENYON 356-32	202	160344	2.4	9.0289	0.7	4.8505	0.9	0.3176	0.6	0.65	1778.2	8.8	1793.7	7.3	1811.8	12.0	1811.8	12.0	98.1
BENYON 356-35	240	60831	2.2	9.0286	0.3	4.9165	0.8	0.3219	0.8	0.94	1799.2	11.8	1805.1	6.8	1811.9	5.0	1811.9	5.0	99.3
BENYON 356 12	280	144631	2.1	8.9610	0.4	4.8281	1.4	0.3138	1.3	0.95	1759.3	20.4	1789.8	11.8	1825.5	8.1	1825.5	8.1	96.4
BENYON 356-43	45	23045	1.1	8.9520	2.0	5.2660	2.3	0.3419	1.1	0.50	1895.8	18.7	1863.4	19.5	1827.4	35.9	1827.4	35.9	103.7
BENYON 356-84	308	94203	3.4	8.9425	0.3	4.5040	4.6	0.2921	4.6	1.00	1652.1	66.9	1731.7	38.2	1829.3	5.6	1829.3	5.6	90.3
BENYON 356-69	123	157535	1.1	8.9349	0.8	5.0065	2.1	0.3244	1.9	0.92	1811.3	30.1	1820.4	17.6	1830.8	15.1	1830.8	15.1	98.9
BENYON 356 14	91	40749	1.0	8.8440	1.1	5.2117	1.3	0.3343	0.7	0.56	1859.2	11.9	1854.5	11.2	1849.3	19.7	1849.3	19.7	100.5
BENYON 356 20	83	46199	1.4	8.8400	1.0	5.2275	1.2	0.3352	0.7	0.57	1863.3	11.1	1857.1	10.3	1850.1	18.0	1850.1	18.0	100.7
BENYON 356-97	117	95421	0.6	8.8344	0.5	5.3926	1.0	0.3455	0.9	0.88	1913.2	14.3	1883.7	8.4	1851.3	8.4	1851.3	8.4	103.3
BENYON 356-30	279	114331	2.8	8.8251	0.2	5.1260	0.9	0.3281	0.9	0.97	1829.1	14.1	1840.4	7.8	1853.2	4.2	1853.2	4.2	98.7
BENYON 356-38	116	23290	1.0	8.8250	1.5	5.1236	2.5	0.3279	2.0	0.79	1828.4	31.4	1840.0	21.3	1853.2	28.0	1853.2	28.0	98.7
BENYON 356 7	291	313355	1.1	8.8210	0.3	5.4420	1.1	0.3482	1.1	0.97	1925.8	17.7	1891.5	9.5	1854.0	5.1	1854.0	5.1	103.9
BENYON 356 16	201	209630	1.4	8.7892	0.4	5.3687	1.6	0.3422	1.6	0.97	1897.4	25.6	1879.9	13.7	1860.6	7.1	1860.6	7.1	102.0
BENYON 356 24	168	153878	0.9	8.7504	0.4	5.4039	1.4	0.3430	1.4	0.96	1900.8	22.4	1885.5	12.2	1868.6	7.2	1868.6	7.2	101.7
BENYON 356 23	199	202015	2.7	8.7035	0.5	5.4525	1.5	0.3442	1.4	0.95	1906.8	23.4	1893.2	12.8	1878.3	8.6	1878.3	8.6	101.5
BENYON 356 22	199	107576	1.5	8.6788	0.5	5.6197	1.3	0.3537	1.2	0.93	1952.4	21.0	1919.1	11.5	1883.4	8.5	1883.4	8.5	103.7
BENYON 356-83	217	127337	1.2	8.5965	0.4	5.7239	3.2	0.3569	3.2	0.99	1967.3	53.5	1935.0	27.5	1900.5	6.8	1900.5	6.8	103.5
BENYON 356-31	69	80619	1.3	8.5339	1.0	5.4962	1.2	0.3402	0.8	0.62	1887.5	12.5	1900.0	10.6	1913.6	17.3	1913.6	17.3	98.6
BENYON 356-68	299	246963	19.2	8.5267	0.3	5.5258	2.6	0.3417	2.6	1.00	1894.9	42.7	1904.6	22.5	1915.1	4.6	1915.1	4.6	98.9
BENYON 356-75	382	272441	3.0	8.4463	0.3	5.6641	1.1	0.3470	1.0	0.97	1920.1	16.9	1925.9	9.1	1932.1	4.6	1932.1	4.6	99.4
BENYON 356-104	169	338609	1.9	8.4372	0.4	5.6973	1.5	0.3486	1.4	0.96	1928.0	23.9	1931.0	13.0	1934.1	7.8	1934.1	7.8	99.7
BENYON 356-57	25	14798	0.4	8.4052	2.2	5.8849	2.8	0.3587	1.7	0.62	1976.2	29.4	1959.0	24.2	1940.9	39.1	1940.9	39.1	101.8
BENYON 356 4	316	263588	0.9	8.3980	0.4	5.8004	1.4	0.3533	1.3	0.96	1950.3	21.9	1946.5	11.7	1942.4	6.9	1942.4	6.9	100.4
BENYON 356-85	36	39520	0.7	8.3650	2.2	5.4941	2.7	0.3333	1.5	0.55	1854.5	23.7	1899.7	23.0	1949.4	39.9	1949.4	39.9	95.1
BENYON 356-79	263	352415	1.4	8.3485	0.3	6.1436	1.8	0.3720	1.7	0.98	2038.8	30.1	1996.5	15.3	1953.0	5.9	1953.0	5.9	104.4
BENYON 356-101	570	208165	2.5	8.2615	0.2	6.0529	1.5	0.3627	1.5	0.99	1994.9	25.8	1983.5	13.2	1971.6	2.7	1971.6	2.7	101.2
BENYON 356-27	49	87317	1.3	8.2117	2.3	6.1372	2.5	0.3655	1.1	0.44	2008.2	18.9	1995.6	21.9	1982.4	40.1	1982.4	40.1	101.3
BENYON 356 25	20	15922	2.3	8.0933	3.5	6.1947	4.1	0.3636	2.2	0.53	1999.3	37.2	2003.7	35.7	2008.2	61.4	2008.2	61.4	99.6
BENYON 356-51	71	60049	2.9	7.5014	1.0	7.3958	1.8	0.4024	1.5	0.84	2179.9	28.4	2160.5	16.3	2142.0	17.3	2142.0	17.3	101.8
BENYON 356-46	137	80915	1.2	7.4633	0.9	7.1052	3.3	0.3846	3.2	0.96	2097.7	57.4	2124.7	29.7	2150.9	15.9	2150.9	15.9	97.5
BENYON 356-88	50	47226	1.1	6.8858	1.2	8.0606	4.3	0.4026	4.2	0.96	2180.8	77.3	2237.8	39.2	2290.4	20.2	2290.4	20.2	95.2
BENYON 356-93	73	43105	2.0	6.5432	1.4	9.3498	2.2	0.4437	1.7	0.78	2367.2	33.1	2372.9	19.7	2377.8	23.1	2377.8	23.1	99.6
BENYON 356-89	62	51293	2.2	6.4766	1.8	9.3567	5.0	0.4395	4.6	0.93	2348.5	90.7	2373.6	45.5	2395.2	31.2	2395.2	31.2	98.0
BENYON 356 5	68	48725	6.3	6.0910	0.6	10.6474	1.3	0.4704	1.1	0.89	2485.2	23.6	2492.8	11.9	2499.1	9.9	2499.1	9.9	99.4
BENYON 356-77	34	27008	0.8	5.9388	0.8	11.5358	1.9	0.4969	1.8	0.91	2600.3	37.7	2567.5	18.0	2541.6	13.2	2541.6	13.2	102.3
BENYON 356-100	146	385550	2.8	5.7826	0.2	12.4294	1.3	0.5213	1.3	0.99	2704.6	28.8	2637.4	12.4	2586.2	3.2	2586.2	3.2	104.6
BENYON 356-96	83	51231	2.3	5.6351	1.9	11.2032	5.3	0.4579	5.0	0.93	2430.1	100.4	2540.2	49.6	2629.3	31.6	2629.3	31.6	92.4
BENYON 356-80	129	156496	1.8	5.5324	0.4	13.3192	1.3	0.5344	1.3	0.95	2760.1	28.6	2702.5	12.6	2659.8	6.7	2659.8	6.7	103.8
BENYON 356-70	300	496444	3.5	5.5084	0.4	11.9673	1.0	0.4781	1.0	0.94	2519.0	20.1	2601.8	9.6	2667.0	5.8	2667.0	5.8	94.5
BENYON 356-98	58	51124	1.2	5.4860	1.0	13.4424	2.7	0.5348	2.5	0.93	2761.8	56.5	2711.2	25.6	2673.7	16.5	2673.7	16.5	103.3
BENYON 356-99	76	133004	0.7	5.4445	0.3	13.5258	1.2	0.5341	1.1	0.97	2758.7	25.4	2717.1	11.0	2686.3	4.8	2686.3	4.8	102.7
BENYON 356-73	81	49279	0.8	5.4001	0.5	13.4005	1.2	0.5248	1.1	0.92	2719.6	25.0	2708.3	11.6	2699.8	7.9	2699.8	7.9	100.7
BENYON 356 18	124	88220	1.0	5.3700	0.3	12.4030	1.5	0.4831	1.5	0.97	2540.6	31.0	2635.4	14.3	2709.1	5.6	2709.1	5.6	93.8
BENYON 356-55	217	156925	3.0	5.3649	0.3	13.5548	1.3	0.5274	1.2	0.98	2730.6	27.6	2719.1	12.0	2710.6	4.2	2710.6	4.2	100.7
BENYON 356-78	132	85952	0.8	5.3619	0.3	13.6096	1.0	0.5293	1.0	0.95	2738.3	21.9	2722.9	9.8	2711.5	5.4	2711.5	5.4	101.0
BENYON 356-67	53	51220	0.7	5.3600	1.0	13.7879	2.0	0.5360	1.8	0.86	2766.7	39.8	2735.2	19.4	2712.1	17.1	2712.1	17.1	102.0
BENYON 356-65	48	76760	1.7	5.3571	0.9	13.5929	3.7	0.5281	3.6	0.97	2733.6	80.7	2721.8	35.3	2713.0	14.6	2713.0	14.6	100.8
BENYON 356-47	679	534444	8.9	5.3248	0.1	12.1773	1.7	0.4703	1.7	1.00	2484.8	35.5	2618.2	16.2	2723.0	2.2	2723.0	2.2	91.3
BENYON 356-80	64	70059	0.8	5.3154	0.5	13.9349	3.3	0.5372	3.3	0.99	2771.7	73.6	2745.3	31.3	2725.9	8.0	2725.9	8.0	101.7
BENYON 356 11	614	448271	3.2	5.3046	0.2	14.1123	1.6	0.5429	1.6	0.99	2795.7	35.5	2757.3	14.9	2729.2	3.1	2729.2	3.1	102.4
BENYON 356-71	135	246006	1.7	5.2856	0.4	14.3562	1.3	0.5503	1.3	0.95	2826.6	29.3	2773.5	12.7	2735.1	6.6	2735.1	6.6	103.3
BENYON 356-94	66	62491	0.7	5.2500	0.8	14.1556	4.7	0.5390	4.7	0.99	2779.3	105.4	2760.2	45.0	2746.3	13.4	2746.3	13.4	101.2
BENYON 356 17	89	117223	1.4	5.1696	1.0	12.9097	2.8	0.4840	2.6	0.93	2544.8	54.0	2673.1	26.0	2771.6	16.3	2771.6	16.3	91.8
BENYON 356 9	43	58033	2.0	5.1687	0.8	15.0896	1.7	0.5657	1.5	0.87	2890.0	34.2	2820.9	16.1	2771.9	13.6	2771.9	13.6	104.3
BENYON 356-60	106	93200	3.8	4.8719	0.4	16.4802	0.9	0.5823	0.8	0.91	2958.2	19.6	2905.1	8.7	2868.5	6.3	2868.5	6.3	103.1
BENYON 356-39	118	201617	1.0	4.8538	0.1	15.8459	0.5	0.5578	0.5	0.97	2857.6	10.8	2867.6	4.6	2874.5	1.9	2874.5	1.9	99.4
BENYON 356-72	45	61110	5.7	4.7426	0.8	17.0977	1.7	0.5881	1.5	0.88	2981.8	36.4	2940.3	16.5	2912.1	13.0	2912.1	13.0	102.4
BENYON 356-87	104	173142	3.6	4.2511	0.4	20.0029	1.8	0.6167	1.7	0.97	3096.9	41.8	3091.5	17.0	3088.0	6.8	3088.0	6.8	100.3

Sample 2 (1AB/06-34-084-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BENYON 293-30	366	25958	1.2	19.7700	3.9	0.2449	4.7	0.0351	2.5	0.53	222.5	5.5	222.4	9.3	221.8	91.4	222.5	5.5	NA
BENYON 293-98	150	17636	1.3	21.0558	7.3	0.2322	7.7	0.0355	2.6	0.34	224.7	5.8	212.0	14.8	74.1	173.5	224.7	5.8	NA
BENYON 293-101	284	23977	1.0	19.7531	3.8	0.2857	5.3	0.0409	3.6	0.68	258.6	9.1	255.2	11.9	223.8	88.6	258.6	9.1	NA
BENYON 293-27	126	14408	2.3	18.3387	11.1	0.3550	11.3	0.0472	2.1	0.18	297.4	6.1	308.5	30.1	393.0	249.7	297.4	6.1	NA
BENYON 293-9	280	28131	1.2	18.9063	3.6	0.4380	3.7	0.0601	0.7	0.20	376.0	2.7	368.9	11.5	324.2	82.6	376.0	2.7	NA
BENYON 293-2	249	28899	1.5	18.7133	3.5	0.4463	4.3	0.0606	2.4	0.57	379.1	9.0	374.7	13.4	347.4	79.6	379.1	9.0	NA
BENYON 293-72	177	17027	1.6	19.7555	4.4	0.4323	5.9	0.0619	3.9	0.66	387.4	14.6	364.8	18.0	223.5	101.8	387.4	14.6	NA
BENYON 293-97	162	18623	3.7	18.0945	4.3	0.4992	4.9	0.0655	2.3	0.46	409.0	8.9	411.1	16.4	423.0	95.9	409.0	8.9	96.7
BENYON 293-90	144	24896	4.1	18.7181	4.7	0.4859	5.4	0.0660	2.7	0.49	411.8	10.7	402.1	18.1	346.9	107.2	411.8	10.7	118.7
BENYON 293-86	27	3761	2.5	27.1216	46.0	0.3377	46.1	0.0664	2.4	0.05	414.6	9.8	295.4	118.6	-565.9	#####	414.6	9.8	NA
BENYON 293-77	352	43712	3.3	18.1289	1.5	0.5100	2.2	0.0671	1.6	0.74	418.4	6.5	418.4	7.4	418.7	32.7	418.4	6.5	99.9
BENYON 293-19	102	14140	1.8	18.6385	7.7	0.4964	8.2	0.0671	2.6	0.32	418.7	10.7	409.3	27.5	356.5	174.8	418.7	10.7	117.5
BENYON 293-33	118	16602	1.1	18.0138	2.9	0.5251	3.9	0.0686	2.5	0.65	427.8	10.5	428.6	13.6	432.9	65.4	427.8	10.5	98.8
BENYON 293-51	244	32467	1.7	17.7308	3.4	0.5684	3.7	0.0731	1.5	0.41	454.7	6.8	457.0	13.8	468.1	75.3	454.7	6.8	97.1
BENYON 293-45	73	9968	1.8	18.9401	11.5	0.5592	11.7	0.0768	2.0	0.17	477.1	9.1	451.0	42.5	320.1	261.8	477.1	9.1	149.0
BENYON 293-83	38	15591	3.5	14.3884	5.4	1.5152	6.0	0.1581	2.4	0.41	946.3	21.5	936.5	36.5	913.6	112.0	913.6	112.0	103.6
BENYON 293-103	150	70242	3.3	14.0743	2.1	1.6068	2.4	0.1640	1.2	0.48	979.0	10.5	972.8	15.1	958.9	43.2	958.9	43.2	102.1
BENYON 293-28	111	49368	1.7	14.0382	1.5	1.5655	1.9	0.1594	1.1	0.57	953.4	9.5	956.6	11.6	964.2	31.4	964.2	31.4	98.9
BENYON 293-94	48	62363	1.9	13.9956	4.0	1.6229	5.5	0.1647	3.8	0.69	983.0	35.0	979.1	34.8	970.3	81.5	970.3	81.5	101.3
BENYON 293-37	83	34529	1.7	13.8951	3.6	1.6484	4.2	0.1661	2.1	0.50	990.7	19.4	988.9	26.6	985.0	74.1	985.0	74.1	100.6
BENYON 293-88	116	16524	2.3	13.8005	1.9	1.7469	2.3	0.1748	1.3	0.56	1038.7	12.1	1026.0	14.6	998.9	38.0	998.9	38.0	104.0
BENYON 293-7	113	46620	3.3	13.7985	1.5	1.6923	2.2	0.1694	1.6	0.72	1008.6	15.1	1005.6	14.2	999.2	31.3	999.2	31.3	100.9
BENYON 293-18	446	115794	8.4	13.7131	0.7	1.7105	3.9	0.1701	3.9	0.98	1012.8	36.4	1012.5	25.3	1011.8	15.1	1011.8	15.1	100.1
BENYON 293-8	270	71460	3.6	13.6730	0.7	1.8007	1.2	0.1786	1.0	0.83	1059.1	10.1	1045.7	8.1	1017.7	13.9	1017.7	13.9	104.1
BENYON 293-4	118	53198	2.0	13.6695	0.9	1.7041	2.6	0.1689	2.4	0.93	1006.3	22.8	1010.1	16.8	1018.3	19.0	1018.3	19.0	98.8
BENYON 293-46	194	71103	2.3	13.6583	1.2	1.7372	1.5	0.1721	0.9	0.60	1023.6	8.6	1022.4	9.8	1019.9	24.8	1019.9	24.8	100.4
BENYON 293-32	43	14616	1.5	13.6521	5.8	1.7813	6.2	0.1764	2.1	0.35	1047.1	20.6	1038.6	40.1	1020.8	117.1	1020.8	117.1	102.6
BENYON 293-35	53	16786	2.6	13.6291	4.3	1.7847	4.8	0.1764	2.2	0.46	1047.4	21.7	1039.9	31.5	1024.2	86.7	1024.2	86.7	102.3
BENYON 293-26	169	67012	2.1	13.6244	2.0	1.7736	2.1	0.1753	0.8	0.39	1041.0	7.9	1035.8	13.8	1024.9	39.6	1024.9	39.6	101.6
BENYON 293-69	216	56263	4.0	13.6216	0.8	1.7473	1.4	0.1726	1.2	0.82	1026.5	11.2	1026.2	9.3	1025.3	16.7	1025.3	16.7	100.1
BENYON 293-85	101	50372	1.9	13.6073	1.8	1.6975	4.2	0.1675	3.8	0.90	998.4	35.4	1007.6	27.1	1027.5	37.1	1027.5	37.1	97.2
BENYON 293-40	164	48750	1.7	13.5603	1.5	1.8589	2.7	0.1828	2.2	0.82	1082.4	22.0	1066.6	17.8	1034.5	31.1	1034.5	31.1	104.6
BENYON 293-84	150	45608	2.2	13.5495	1.3	1.8478	1.9	0.1816	1.4	0.71	1075.6	13.4	1062.7	12.6	1036.1	27.1	1036.1	27.1	103.8
BENYON 293-95	199	61782	3.0	13.5306	1.3	1.7588	1.7	0.1726	1.2	0.68	1026.4	11.1	1030.4	11.1	1038.9	25.6	1038.9	25.6	98.8
BENYON 293-60	132	45339	1.5	13.5238	1.5	1.7510	2.0	0.1717	1.3	0.66	1021.7	12.4	1027.5	12.9	1039.9	30.4	1039.9	30.4	98.3
BENYON 293-56	54	40165	2.0	13.4673	2.7	1.7891	3.1	0.1748	1.6	0.52	1038.2	15.6	1041.5	20.4	1048.4	54.0	1048.4	54.0	99.0
BENYON 293-48	355	125214	1.3	13.4509	0.4	1.7938	0.9	0.1750	0.8	0.90	1039.6	7.6	1043.2	5.7	1050.9	7.8	1050.9	7.8	98.9
BENYON 293-53	205	79215	4.0	13.4483	0.7	1.7830	1.8	0.1739	1.6	0.91	1033.6	15.4	1039.3	11.5	1051.2	14.4	1051.2	14.4	98.3
BENYON 293-43	110	51275	1.3	13.4425	1.7	1.9117	1.9	0.1864	0.9	0.46	1101.7	8.6	1085.2	12.5	1052.1	33.6	1052.1	33.6	104.7
BENYON 293-49	142	125460	4.2	13.4086	2.2	1.9124	3.6	0.1860	2.8	0.79	1099.6	28.5	1085.4	23.8	1057.2	44.0	1057.2	44.0	104.0
BENYON 293-34	138	28888	2.7	13.4051	1.5	1.8044	2.1	0.1754	1.5	0.70	1042.0	14.0	1047.1	13.6	1057.7	30.1	1057.7	30.1	98.5
BENYON 293-76	166	53664	1.9	13.3869	1.2	1.8887	1.7	0.1834	1.2	0.72	1085.4	11.9	1077.1	11.1	1060.5	23.5	1060.5	23.5	102.4
BENYON 293-21	110	33391	2.0	13.3828	1.6	1.8796	2.7	0.1824	2.2	0.80	1080.3	22.0	1073.9	18.2	1061.1	32.8	1061.1	32.8	101.8
BENYON 293-38	264	70331	1.1	13.3774	0.8	1.9210	1.3	0.1864	1.1	0.79	1101.7	10.7	1088.4	8.9	1061.9	16.6	1061.9	16.6	103.8
BENYON 293-47	1207	268964	7.3	13.3627	0.1	1.8609	1.1	0.1803	1.1	0.99	1068.9	11.3	1067.3	7.6	1064.1	2.3	1064.1	2.3	100.4
BENYON 293-36	26	6620	2.5	13.3476	9.1	1.9969	9.6	0.1933	3.1	0.32	1139.3	32.5	1114.5	65.4	1066.4	183.9	1066.4	183.9	106.8
BENYON 293-100	331	39171	1.3	13.3353	0.9	1.8582	1.6	0.1797	1.3	0.81	1065.4	13.0	1066.3	10.7	1068.2	19.0	1068.2	19.0	99.7
BENYON 293-16	141	67302	1.2	13.2889	2.7	1.8900	3.4	0.1822	2.0	0.60	1078.7	20.0	1077.6	22.4	1075.2	54.3	1075.2	54.3	100.3
BENYON 293-6	64	30136	1.6	13.2604	3.6	1.8816	3.7	0.1810	0.7	0.20	1072.2	7.4	1074.6	24.3	1079.5	72.0	1079.5	72.0	99.3
BENYON 293-3	80	23290	2.2	13.2603	2.0	1.8810	2.3	0.1809	1.1	0.49	1071.9	11.1	1074.4	15.3	1079.5	40.3	1079.5	40.3	99.3
BENYON 293-10	130	68191	2.7	13.2238	1.3	1.8674	1.9	0.1791	1.5	0.75	1062.1	14.2	1069.6	12.8	1085.1	25.7	1085.1	25.7	97.9
BENYON 293-87	247	305563	3.4	13.2095	0.4	1.9223	3.0	0.1842	3.0	0.99	1089.7	29.7	1088.9	20.0	1087.2	7.9	1087.2	7.9	100.2
BENYON 293-5	115	60537	1.6	13.1793	1.6	1.9074	2.8	0.1823	2.3	0.82	1079.6	22.8	1083.7	18.6	1091.8	31.9	1091.8	31.9	98.9
BENYON 293-54	178	135362	3.6	13.1237	2.2	1.8399	5.9	0.1751	5.5	0.93	1040.3	52.4	1059.8	38.6	1100.3	43.3	1100.3	43.3	94.6
BENYON 293-31	234	110651	3.0	13.1143	1.5	1.9425	5.6	0.1848	5.4	0.96	1092.9	54.4	1095.8	37.7	1101.7	30.9	1101.7	30.9	99.2
BENYON 293-1	347	163443	9.4	13.0740	0.6	1.9933	1.4	0.1890	1.3	0.90	1116.0	13.1	1113.2	9.7	1107.9	12.6	1107.9	12.6	100.7
BENYON 293-25	55	31895	2.1	13.0027	3.2	1.8819	4.9	0.1775	3.7	0.75	1053.2	35.5	1074.7	32.4	1118.8	64.6	1118.8	64.6	94.1
BENYON 293-22	76	47398	2.6	12.9854	2.6	2.1145	3.5	0.1991	2.4	0.68	1170.7	25.6	1153.5	24.3	1121.4	51.7	1121.4	51.7	104.4
BENYON 293-93	42	14860	2.0	12.9300	4.5	2.0272	4.8	0.1901	1.7	0.35	1122.0	17.4	1124.7	32.4	1129.9	88.9	1129.9	88.9	99.3
BENYON 293-24	266	92598	3.2	12.9261	1.2	2.0364	3.1	0.1909	2.8	0.91	1126.3	28.9	1127.7	20.8	1130.6	24.8	1130.6	24.8	99.6
BENYON 293-55	49	21680	1.5	12.8826	4.1	2.1018	4.4	0.1964	1.7	0.39	1155.9	18.1	1149.4	30.5	1137.3	81.2	1137.3	81.2	101.6
BENYON 293-41	276	391410	3.8	12.8211	0.8	2.1181	1.6	0.1970	1.3	0.84	1158.9	13.9	1154.7	10.7	1146.8	16.6	1146.8	16.6	101.1
BENYON 293-74	84	14503	2.0	12.8016	0.7	2.1473	2.4	0.1994	2.3	0.96	1171.9	24.3	1164.2	16.4	1149.8	13.1	1149.8	13.1	101.9
BENYON 293-59	174	124391	3.5	12.7449	1.5	2.1506	1.9	0.1988	1.2	0.61	1168.8	12.5	1165.3	13.3	1158.6	30.2	1158.6	30.2	100.9
BENYON 293-96	258	155635	2.8	12.7109	0.8	2.1293	1.5	0.1963	1.3	0.86	1155.4	13.9	1158.4	10.5	1163.9	15.2	1163.9	15.2	99.3
BENYON 293-64	410	182496	3.8	12.6280	1.2	2.2067	6.7	0.2021	6.6	0.98	1186.6	71.6	1183.2	46.9	1176.9	23.4	1176.9	23.4	100.8
BENYON 293-68	598	270461	2.2	12.6056	0.3	2.1808	0.7	0.1994	0.6	0.90	1172.0	6.6	1174.9	4.8	1180.4	6.0	1180.4	6.0	99.3
BENYON 293-104	188	456796	4.3	12.6025	1.1	2.2112	1.5	0.2021	1.0	0.69	1186.6	11.3	1184.6	10.5	1180.9	21.4	1180.9	21.4	100.5
BENYON 293-81	105	145752	2.9	12.5581	1.4	2.1455	1.8	0.1954	1.2	0.68	1150.6	13.1	1163.6	12.7	1187.8	26.7	1187.8	26.7	96.9
BENYON 293-99	264	95221	2.9	12.5226	0.7	2.2572	1.4	0.2050	1.2	0.88	1202.2	13.5	1199.0	9.8	1193.4	13.1	1193.4	13.1	100.7
BENYON 293-65	98	53757	3.4	12.4097	1.3	2.3295	3.2	0.2097	2.9	0.91	1227.0	32.3	1221.3	22.6	1211.3	26.0	1211.3	26.0	101.3
BENYON 293-78	112	51269	2.9	12.3600	1.6	2.4049	1.9	0.2156	1.1	0.57	1258.5	12.7	1244.1	13.9	1219.2	31.1	1219.2	31.1	103.2
BENYON 293-73	166	67991	3.5	12.3248	0.7	2.3468	2.5	0.2098	2.4	0.96	1227.6	27.0	1226.6	18.0	1224.7	14.5	1224.7	14.5	100.2
BENYON 293-14	257	109531	1.9	12.3019	0.4	2.3229	3.0	0.2073	3.0	0.99	1214.2	32.9	1219.3	21.3	1228.4	7.2	1228.4	7.2	98.8
BENYON 293-20	36	16338	2.8	12.2597	3.7	2.5247	4.3	0.2245	2.2	0.50	1305.5	25.5	1279.2	31.5	1235.2	73.6	1235.2	73.6	105.7
BENYON 293-70	652	276950	2.4	12.1930	0.2	2.4379	2.2	0.2156	2.2	0.99	1258.5	25.1	1253.9	15.9	1245.9	4.5	1245.9	4.5	101.0
BENYON 293-102	40	19846	1.7	11.8883	2.5	2.5273	3.1	0.2179	1.8	0.58	1270.8	20.7	1279.9	22.5	1295.2	49.1	1295.2	49.1	98.1
BENYON 293-23	91	40483	2.9	11.5314	1.2	2.6925	1.9	0.2252	1.5	0.79	1309.2	17.8	1326.4	14.2	1354.3	22.9	1354.3	22.9	96.7
BENYON 293-12	112	40477	2.3	11.3987	6.0	3.1558	11.1	0.2609	9.3	0.84	1494.4	124.1	1446.4	85.5	1376.6	115.5	1376.6	115.5	108.6
BENYON 293-67	131	61675	2.3	11.3344	0.6	2.8507	1.2	0.2343	1.0	0.87	1357.2	12.6	1369.0	8.9	1387.4	11.3	1387.4	11.3	97.8
BENYON 293-79	131	64709	0.5	11.0958	0.7	3.0055	2.4	0.2419	2.3	0.95	1396.4	29.0	1409.0	18.4	1428.1	13.8	1428.1	13.8	97.8
BENYON 293-52	210	165425	1.9	11.0614	0.6	3.1566	1.0	0.2532	0.8	0.82	1455.2	10.5	1446.6	7.5	1434.1	10.6	1434.1	10.6	101.5
BENYON 293-62	157	86832	2.9	10.9828	0.8	3.1471	1.2	0.2507	0.9	0.78	1442.0	12.2	1444.3	9.4	1447.7	14.7	1447.7	14.7	99.6
BENYON 293-89	101	42033	1.9	10.9500	1.5	3.2249	2.0	0.2561	1.3	0.66	1469.9	17.2	1463.2	15.3	1453.4	28.0	1453.4	28.0	101.1
BENYON 293-63	182	87700	3.9	10.8995	0.9	3.2205	3.1	0.2546	3.0	0.96	1462.1	39.2	1462.1	24.3	1462.1	17.5	1462.1	17.5	100.0
BENYON 293-92	206	212295	1.6	10.8874	0.3	3.2260	3.3	0.2547	3.3	0.99	1462.8	42.9	1463.4	25.6	1464.2	6.6	1464.2	6.6	99.9
BENYON 293-61	50	27500	1.1	10.3524	2.0	3.6872	2.4	0.2768	1.3	0.55	1575.5	18.5	1568.6	19.2	1559.4	37.5	1559.4	37.5	101.0
BENYON 293-58	233	102586	1.8	10.0463	0.5	4.0129	1.8	0.2924	1.7	0.96	1653.5	24.5	1636.8	14.2	1615.5	9.2	1615.5	9.2	102.4
BENYON 293-105	52	26852	1.5	9.9402	1.8	4.0514	2.7	0.2921	2.1	0.76	1651.9	30.0	1644.6	22.0	1635.2	32.5	1635.2	32.5	101.0
BENYON 293-13	100	46056	1.7	9.8841	0.8	4.1412	4.1	0.2969	4.1	0.98	1675.7	60.0	1662.5	33.9	1645.7	14.4	1645.7	14.4	101.8
BENYON 293-91	82	65122	1.6	8.9064	0.9	5.1141	1.4	0.3303	1.2	0.80	1840.1	18.4	1838.5	12.2	1836.6	15.5	1836.6	15.5	100.2
BENYON 293-17	185	88182	18.7	8.7452	1.3	5.3182	1.5	0.3373	0.8	0.51	1873.7	12.6	1871.8	12.9	1869.6	23.4	1869.6	23.4	100.2
BENYON 293-57	94	58103	1.5	8.5153	0.9	5.6513	1.6	0.3490	1.3	0.83	1929.9	22.0	1924.0	13.7	1917.6	15.9	1917.6	15.9	100.6
BENYON 293-75	40	39235	1.9	5.4819	1.1	12.7407	1.3	0.5065	0.7	0.54	2641.9	15.2	2660.7	12.2	2675.0	18.1	2675.0	18.1	98.8
BENYON 293-66	94	67883	2.5	5.4477	0.4	13.5111	1.7	0.5338	1.7	0.97	2757.6	37.5	2716.1	16.3	2685.3	6.9	2685.3	6.9	102.7
BENYON 293-11	48	64949	1.4	5.4232	0.6	13.2766	1.1	0.5222	0.9	0.82	2708.5	20.4	2699.5	10.6	2692.8	10.5	2692.8	10.5	100.6
BENYON 293-82	48	74678	1.0	5.4049	0.5	13.1226	2.9	0.5144	2.9	0.99	2675.4	63.8	2688.5	27.8	2698.4	7.7	2698.4	7.7	99.2
BENYON 293-15	48	54151	0.8	5.3885	0.7	13.5192	1.5	0.5283	1.3	0.87	2734.5	28.4	2716.6	13.9	2703.4	11.9	2703.4	11.9	101.2
BENYON 293-42	167	152078	0.9	5.3128	0.2	13.9439	1.2	0.5373	1.1	0.98	2772.1	25.6	2745.9	10.9	2726.7	3.6	2726.7	3.6	101.7

Sample 3 (1AA/02-11-084-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BENYON 286-30	131	617	1.9	17.2315	29.1	0.1522	29.5	0.0190	5.1	0.17	121.5	6.1	143.9	39.6	531.0	649.1	121.5	6.1	NA
BENYON 286-61	235	20188	1.9	18.4025	3.8	0.4427	4.2	0.0591	1.8	0.43	370.1	6.5	372.2	13.1	385.2	85.2	370.1	6.5	NA
BENYON 286-29	175	2781	1.4	17.9133	3.6	0.4862	5.0	0.0632	3.5	0.69	394.8	13.3	402.3	16.6	445.4	79.9	394.8	13.3	NA
BENYON 286-85	281	32931	7.7	18.1903	2.4	0.5008	2.5	0.0661	0.9	0.34	412.4	3.4	412.2	8.6	411.2	53.4	412.4	3.4	100.3
BENYON 286-82	415	52559	3.5	18.0073	2.8	0.5078	3.4	0.0663	1.9	0.57	413.9	7.7	417.0	11.5	433.7	61.4	413.9	7.7	95.4
BENYON 286-73	501	46521	1.0	18.3161	1.6	0.5174	2.0	0.0687	1.2	0.58	428.5	4.8	423.4	7.0	395.7	37.0	428.5	4.8	108.3
BENYON 286-3	375	21965	2.2	17.5647	4.5	0.5629	6.8	0.0717	5.1	0.75	446.4	22.0	453.4	24.7	488.9	98.4	446.4	22.0	91.3
BENYON 286-69	261	80459	2.5	18.0907	3.4	0.5500	3.8	0.0722	1.7	0.43	449.1	7.2	445.0	13.7	423.4	76.6	449.1	7.2	106.1
BENYON 286-48	421	118976	5.7	17.3697	1.6	0.6333	2.0	0.0798	1.1	0.58	494.8	5.4	498.2	7.8	513.5	35.4	494.8	5.4	96.4
BENYON 286-62	181	2629	1.2	17.8511	4.4	0.6349	5.7	0.0822	3.7	0.64	509.2	17.9	499.2	22.7	453.1	98.6	509.2	17.9	112.4
BENYON 286-47	429	15400	0.8	17.0593	1.9	0.7318	2.5	0.0905	1.6	0.64	558.7	8.4	557.6	10.6	553.0	41.8	558.7	8.4	101.0
BENYON 286-66	75	11999	0.9	16.2543	10.6	0.7882	10.8	0.0929	2.4	0.22	572.8	13.1	590.2	48.5	657.5	226.9	572.8	13.1	87.1
BENYON 286-71	449	27959	1.2	16.6915	1.4	0.8152	2.0	0.0987	1.4	0.72	606.7	8.4	605.4	9.1	600.3	30.0	606.7	8.4	101.1
BENYON 286-33	231	24593	1.2	16.3700	3.3	0.8540	3.8	0.1014	2.0	0.51	622.6	11.7	626.8	17.9	642.3	70.6	622.6	11.7	96.9
BENYON 286-55	230	56054	1.2	16.5367	2.4	0.8467	2.5	0.1016	0.8	0.33	623.5	4.8	622.9	11.7	620.5	51.1	623.5	4.8	100.5
BENYON 286-46	362	266085	3.6	14.0387	1.1	1.6559	2.0	0.1686	1.7	0.84	1004.4	15.4	991.8	12.5	964.1	21.9	964.1	21.9	104.2
BENYON 286-22	29	13218	0.7	14.0292	8.9	1.7555	9.3	0.1786	2.7	0.29	1059.4	26.6	1029.2	60.3	965.5	182.0	965.5	182.0	109.7
BENYON 286-38	157	35270	1.2	13.8666	2.0	1.7134	2.7	0.1723	1.9	0.69	1024.9	17.9	1013.6	17.6	989.2	40.6	989.2	40.6	103.6
BENYON 286-31	150	13321	2.5	13.8190	1.5	1.6824	2.0	0.1686	1.3	0.66	1004.5	12.1	1001.9	12.5	996.2	29.9	996.2	29.9	100.8
BENYON 286-18	120	18024	2.7	13.7901	1.4	1.6916	1.6	0.1692	0.8	0.47	1007.6	7.2	1005.4	10.5	1000.4	29.4	1000.4	29.4	100.7
BENYON 286-40	179	32284	3.6	13.7488	2.0	1.7081	2.2	0.1703	0.9	0.42	1013.9	8.5	1011.6	14.0	1006.5	40.3	1006.5	40.3	100.7
BENYON 286-53	29	49948	1.4	13.7464	8.6	1.8271	9.0	0.1822	2.5	0.28	1078.7	25.3	1055.2	59.0	1006.9	175.0	1006.9	175.0	107.1
BENYON 286-17	184	25903	1.1	13.7233	1.8	1.5995	2.2	0.1592	1.2	0.55	952.4	10.8	970.0	13.8	1010.3	37.4	1010.3	37.4	94.3
BENYON 286-23	83	29201	1.0	13.7084	2.2	1.7330	3.1	0.1723	2.2	0.71	1024.8	21.1	1020.9	20.3	1012.5	45.1	1012.5	45.1	101.2
BENYON 286-56	267	33589	3.0	13.6856	0.6	1.7276	2.2	0.1715	2.1	0.96	1020.2	19.8	1018.8	14.1	1015.9	12.3	1015.9	12.3	100.4
BENYON 286-64	242	88974	3.0	13.6664	1.5	1.7658	3.0	0.1750	2.6	0.86	1039.7	24.9	1033.0	19.5	1018.7	30.7	1018.7	30.7	102.1
BENYON 286-50	199	106235	1.9	13.5614	1.0	1.8151	2.0	0.1785	1.7	0.87	1058.9	16.6	1050.9	12.8	1034.3	19.4	1034.3	19.4	102.4
BENYON 286-36	236	60225	2.1	13.5109	1.3	1.8139	2.1	0.1777	1.6	0.76	1054.7	15.2	1050.5	13.5	1041.8	27.3	1041.8	27.3	101.2
BENYON 286-75	400	54092	4.1	13.4897	0.6	1.8403	1.6	0.1801	1.5	0.93	1067.2	14.8	1060.0	10.7	1045.0	12.1	1045.0	12.1	102.1
BENYON 286-2	171	58395	3.4	13.4638	1.2	1.8311	1.6	0.1788	1.1	0.67	1060.5	10.8	1056.7	10.8	1048.9	24.5	1048.9	24.5	101.1
BENYON 286-27	98	41521	1.9	13.3868	2.8	1.8929	4.4	0.1838	3.5	0.78	1087.6	34.6	1078.6	29.5	1060.5	56.0	1060.5	56.0	102.6
BENYON 286-9	134	51726	2.2	13.3867	1.2	1.9184	2.0	0.1863	1.6	0.80	1101.0	16.3	1087.5	13.5	1060.5	24.6	1060.5	24.6	103.8
BENYON 286-79	301	43833	3.7	13.3723	0.7	1.8355	1.7	0.1780	1.5	0.91	1056.1	15.1	1058.2	11.2	1062.6	14.3	1062.6	14.3	99.4
BENYON 286-11	224	27529	0.9	13.3706	1.7	1.7160	3.8	0.1664	3.4	0.89	992.3	31.0	1014.5	24.3	1062.9	35.1	1062.9	35.1	93.4
BENYON 286-91	398	7224	2.8	13.2708	1.0	1.6139	4.7	0.1553	4.6	0.98	930.8	40.0	975.6	29.5	1077.9	19.1	1077.9	19.1	86.3
BENYON 286-49	294	60069	2.9	13.2211	0.8	1.9975	1.8	0.1915	1.6	0.90	1129.7	16.8	1114.7	12.1	1085.5	15.5	1085.5	15.5	104.1
BENYON 286-63	167	2553	0.9	13.2166	2.0	1.8772	3.6	0.1799	3.0	0.83	1066.6	29.5	1073.1	23.9	1086.1	40.0	1086.1	40.0	98.2
BENYON 286-59	129	24760	2.5	13.1389	1.2	1.9667	2.3	0.1874	1.9	0.86	1107.3	19.6	1104.2	15.2	1098.0	23.3	1098.0	23.3	100.9
BENYON 286-54	17	4252	1.3	13.1182	9.0	1.9144	10.2	0.1821	4.7	0.46	1078.6	47.0	1086.1	68.2	1101.1	181.3	1101.1	181.3	98.0
BENYON 286-84	224	68959	3.7	12.9904	1.2	2.0178	1.8	0.1901	1.3	0.74	1121.9	13.5	1121.5	12.0	1120.7	23.6	1120.7	23.6	100.1
BENYON 286-24	76	39440	2.1	12.8125	3.5	2.1621	4.0	0.2009	1.9	0.49	1180.2	21.0	1168.9	27.7	1148.1	69.1	1148.1	69.1	102.8
BENYON 286-81	98	24185	1.8	12.7842	2.0	2.2272	3.4	0.2065	2.7	0.80	1210.2	29.8	1189.6	23.6	1152.5	39.9	1152.5	39.9	105.0
BENYON 286-14	348	122645	2.6	12.7686	0.6	2.0843	0.9	0.1930	0.7	0.77	1137.7	7.2	1143.6	6.1	1154.9	11.3	1154.9	11.3	98.5
BENYON 286-57	258	23792	2.6	12.7542	1.5	2.2039	2.3	0.2039	1.7	0.76	1196.1	18.7	1182.3	15.8	1157.2	29.3	1157.2	29.3	103.4
BENYON 286-8	149	35734	3.4	12.7422	1.5	2.0980	2.6	0.1939	2.1	0.80	1142.4	21.7	1148.1	17.7	1159.0	30.4	1159.0	30.4	98.6
BENYON 286-5	135	61727	2.3	12.7284	1.7	2.2150	2.2	0.2045	1.4	0.61	1199.4	14.9	1185.8	15.5	1161.2	34.6	1161.2	34.6	103.3
BENYON 286-6	139	64092	1.4	12.4411	1.0	2.2735	1.7	0.2051	1.3	0.78	1202.9	14.0	1204.1	11.6	1206.3	20.5	1206.3	20.5	99.7
BENYON 286-78	304	58547	7.4	12.1522	0.7	2.2447	4.3	0.1978	4.2	0.99	1163.7	44.9	1195.1	30.0	1252.4	12.8	1252.4	12.8	92.9
BENYON 286-76	285	22030	1.8	11.8046	2.1	2.6759	3.7	0.2291	3.0	0.82	1329.8	36.2	1321.8	27.0	1308.9	40.2	1308.9	40.2	101.6
BENYON 286-13	146	64239	1.7	11.7484	1.1	2.6834	2.2	0.2286	1.9	0.87	1327.4	22.9	1323.9	16.1	1318.2	20.5	1318.2	20.5	100.7
BENYON 286-95	263	204090	3.2	11.6104	0.6	2.8141	1.2	0.2370	1.1	0.85	1370.9	13.0	1359.3	9.2	1341.1	12.4	1341.1	12.4	102.2
BENYON 286-35	120	34330	1.5	11.4169	1.2	2.7825	4.9	0.2304	4.7	0.97	1336.6	57.1	1350.9	36.5	1373.5	23.5	1373.5	23.5	97.3
BENYON 286-4	220	124598	1.5	11.3753	1.0	2.8595	1.9	0.2359	1.6	0.84	1365.4	20.1	1371.3	14.6	1380.5	20.1	1380.5	20.1	98.9
BENYON 286-77	67	25161	1.6	11.3707	1.6	2.9381	2.1	0.2423	1.4	0.67	1398.7	17.7	1391.8	16.0	1381.3	30.2	1381.3	30.2	101.3
BENYON 286-93	210	6518	3.7	11.0833	0.7	3.1374	3.3	0.2522	3.2	0.98	1449.8	41.7	1441.9	25.3	1430.3	13.9	1430.3	13.9	101.4
BENYON 286-88	174	65881	1.9	10.9416	1.2	3.1958	2.0	0.2536	1.6	0.79	1457.0	20.3	1456.1	15.2	1454.8	22.7	1454.8	22.7	100.2
BENYON 286-92	282	111805	1.4	10.8556	0.3	2.9961	1.9	0.2359	1.9	0.99	1365.3	22.9	1406.6	14.3	1469.8	5.2	1469.8	5.2	92.9
BENYON 286-72	123	21370	1.2	10.8335	1.2	3.4094	1.8	0.2679	1.3	0.73	1530.1	17.8	1506.6	14.1	1473.7	23.4	1473.7	23.4	103.8
BENYON 286-19	362	188503	2.4	10.7328	0.6	3.3526	1.7	0.2610	1.6	0.94	1494.8	21.4	1493.4	13.4	1491.4	10.9	1491.4	10.9	100.2
BENYON 286-15	84	53321	1.7	10.6502	1.3	3.3730	2.0	0.2605	1.5	0.75	1492.6	20.5	1498.2	16.0	1506.0	25.4	1506.0	25.4	99.1
BENYON 286-58	86	29351	1.0	10.4945	1.9	3.2803	3.2	0.2497	2.6	0.81	1436.8	33.3	1476.4	24.9	1533.7	35.5	1533.7	35.5	93.7
BENYON 286-1	39	15465	0.8	9.9902	3.4	4.1051	4.8	0.2974	3.4	0.70	1678.6	49.7	1655.3	39.3	1625.9	64.1	1625.9	64.1	103.2
BENYON 286-66	153	46992	2.7	9.0332	0.3	4.9352	1.1	0.3233	1.1	0.95	1806.0	16.6	1808.3	9.3	1811.0	6.2	1811.0	6.2	99.7
BENYON 286-67	185	63475	2.4	8.9933	0.5	5.2452	1.6	0.3421	1.5	0.95	1896.9	24.5	1860.0	13.3	1819.0	8.4	1819.0	8.4	104.3
BENYON 286-39	154	30946	29.0	8.9407	0.4	5.1231	1.1	0.3322	1.0	0.91	1849.0	15.9	1839.9	9.2	1829.6	7.9	1829.6	7.9	101.1
BENYON 286-90	70	50186	1.0	8.7321	1.0	5.6596	1.4	0.3584	1.1	0.74	1974.7	18.1	1925.2	12.3	1872.3	17.2	1872.3	17.2	105.5
BENYON 286-74	166	8501	1.1	6.2193	0.4	11.5416	2.9	0.5206	2.8	0.99	2701.7	62.5	2568.0	26.8	2464.0	7.1	2464.0	7.1	109.6
BENYON 286-45	390	37142	1.7	6.0301	0.5	10.0546	3.9	0.4397	3.9	0.99	2349.4	75.9	2439.8	35.9	2516.0	8.6	2516.0	8.6	93.4
BENYON 286-10	242	24485	2.2	5.9653	1.0	11.0816	2.9	0.4794	2.7	0.94	2524.8	56.1	2530.0	26.6	2534.2	16.6	2534.2	16.6	99.6
BENYON 286-37	142	32432	0.6	5.7207	0.6	12.4094	3.1	0.5149	3.0	0.98	2677.4	66.4	2635.9	29.1	2604.2	10.5	2604.2	10.5	102.8

Sample 4 (1AB/06-34-084-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BENYON 269 42	207	2225	1.5	18.7596	8.8	0.1759	9.6	0.0239	3.8	0.39	152.4	5.7	164.5	14.6	341.8	199.9	152.4	5.7	NA
BENYON 269 57	127	10688	1.5	19.6456	16.0	0.2023	16.9	0.0288	5.4	0.32	183.2	9.8	187.1	28.9	236.4	371.0	183.2	9.8	NA
BENYON 269 31	247	11511	1.3	19.5029	3.7	0.2899	4.6	0.0410	2.7	0.59	259.1	6.9	258.5	10.5	253.2	86.0	259.1	6.9	NA
BENYON 269 82	183	28028	0.6	19.2098	5.5	0.3553	6.6	0.0495	3.7	0.56	311.5	11.2	308.7	17.7	287.9	126.4	311.5	11.2	NA
BENYON 269 59	595	4203	3.8	17.6985	4.3	0.4506	4.8	0.0578	2.0	0.43	362.5	7.1	377.7	15.0	472.1	95.2	362.5	7.1	NA
BENYON 269 89	266	22330	1.2	18.2094	3.0	0.4638	4.1	0.0612	2.7	0.67	383.2	10.1	386.9	13.1	408.8	67.9	383.2	10.1	NA
BENYON 269 95	302	29122	2.0	18.3882	2.3	0.4602	3.6	0.0614	2.8	0.77	384.0	10.3	384.4	11.5	386.9	51.9	384.0	10.3	NA
BENYON 269 24	563	83220	1.3	18.4673	1.5	0.4684	2.0	0.0627	1.4	0.69	392.2	5.4	390.1	6.6	377.3	33.2	392.2	5.4	NA
BENYON 269 67	709	76634	13.7	18.1056	1.0	0.4931	1.2	0.0648	0.8	0.62	404.5	3.0	407.0	4.1	421.6	21.6	404.5	3.0	95.9
BENYON 269 32	178	14456	1.9	17.8238	5.0	0.5139	5.6	0.0664	2.4	0.43	414.7	9.5	421.1	19.2	456.5	111.9	414.7	9.5	90.8
BENYON 269 71	396	49598	7.8	18.0769	2.3	0.5188	4.5	0.0680	3.9	0.86	424.2	16.0	424.3	15.8	425.1	52.0	424.2	16.0	99.8
BENYON 269 40	142	16308	2.9	18.0683	4.4	0.5221	5.0	0.0684	2.3	0.46	426.6	9.6	426.5	17.3	426.2	98.4	426.6	9.6	100.1
BENYON 269 80	321	12816	5.5	17.0893	6.6	0.5702	7.4	0.0707	3.3	0.45	440.2	14.1	458.1	27.2	549.2	143.9	440.2	14.1	80.2
BENYON 269 3	320	66146	8.1	18.1906	1.5	0.5484	1.9	0.0723	1.1	0.59	450.3	4.9	443.9	6.8	411.1	33.9	450.3	4.9	109.5
BENYON 269 38	341	56235	2.2	18.2426	2.0	0.5560	2.3	0.0736	1.2	0.49	457.6	5.1	448.9	8.5	404.7	45.7	457.6	5.1	113.1
BENYON 269 86	208	42387	0.5	17.7778	2.8	0.5768	3.3	0.0744	1.7	0.50	462.4	7.4	462.4	12.2	462.2	62.8	462.4	7.4	100.0
BENYON 269 88	135	16724	2.0	17.4527	5.0	0.6070	5.6	0.0768	2.4	0.44	477.2	11.3	481.6	21.3	503.0	109.8	477.2	11.3	94.9
BENYON 269 69	228	37215	1.5	16.9532	2.4	0.7238	2.6	0.0890	1.2	0.44	549.6	6.1	552.9	11.2	566.6	51.6	549.6	6.1	97.0
BENYON 269 53	209	46116	5.5	14.7102	2.7	0.9291	6.5	0.0991	5.9	0.91	609.3	34.2	667.1	31.7	867.9	56.5	609.3	34.2	70.2
BENYON 269 8	222	42895	1.8	15.0929	1.9	1.1727	2.4	0.1284	1.5	0.62	778.6	11.0	787.9	13.2	814.5	39.7	778.6	11.0	95.6
BENYON 269 1	87	75449	0.7	14.0153	2.7	1.6032	5.0	0.1630	4.3	0.85	973.2	38.4	971.4	31.4	967.4	54.2	967.4	54.2	100.6
BENYON 269 98	159	54103	2.2	13.9869	1.7	1.5809	2.4	0.1604	1.8	0.73	958.8	15.6	962.7	15.0	971.6	33.7	971.6	33.7	98.7
BENYON 269 35	23	8602	0.7	13.6552	7.7	1.7934	9.0	0.1776	4.6	0.51	1053.9	44.4	1043.1	58.4	1020.4	156.2	1020.4	156.2	103.3
BENYON 269 17	184	55592	2.6	13.6414	1.2	1.7539	1.7	0.1735	1.3	0.72	1031.5	12.0	1028.6	11.2	1022.4	24.3	1022.4	24.3	100.9
BENYON 269 37	173	78742	2.3	13.5565	1.0	1.7378	1.5	0.1709	1.1	0.73	1016.8	10.5	1022.6	9.9	1035.0	21.1	1035.0	21.1	98.2
BENYON 269 36	141	88796	2.9	13.5305	2.2	1.8049	2.9	0.1771	1.9	0.66	1051.2	18.6	1047.2	19.0	1038.9	44.2	1038.9	44.2	101.2
BENYON 269 4	462	374374	2.5	13.5093	0.4	1.7955	1.1	0.1759	1.0	0.91	1044.6	9.6	1043.8	7.1	1042.1	9.0	1042.1	9.0	100.2
BENYON 269 49	58	3352	1.6	13.5048	7.1	1.7344	8.1	0.1699	3.8	0.47	1011.4	35.3	1021.4	52.0	1042.8	144.0	1042.8	144.0	97.0
BENYON 269 99	194	36897	2.5	13.4923	1.2	1.8889	1.8	0.1848	1.4	0.76	1093.4	14.0	1077.2	12.2	1044.6	24.1	1044.6	24.1	104.7
BENYON 269 102	140	19934	1.7	13.4890	2.6	1.8104	2.8	0.1771	1.1	0.39	1051.2	10.8	1049.2	18.5	1045.2	52.6	1045.2	52.6	100.6
BENYON 269 75	587	253047	4.3	13.4363	0.5	1.9050	1.1	0.1856	1.0	0.87	1097.7	9.8	1082.8	7.4	1053.0	11.1	1053.0	11.1	104.2
BENYON 269 39	337	4518	2.1	13.3812	2.3	1.7554	2.5	0.1704	1.1	0.45	1014.1	10.6	1029.2	16.4	1061.3	45.7	1061.3	45.7	95.6
BENYON 269 106	80	24844	2.8	13.3558	3.2	1.8492	3.7	0.1791	1.8	0.50	1062.2	18.0	1063.2	24.3	1065.1	64.2	1065.1	64.2	99.7
BENYON 269 93	325	176853	2.8	13.3229	0.6	1.8939	1.0	0.1830	0.8	0.79	1083.4	7.8	1079.0	6.5	1070.1	11.9	1070.1	11.9	101.2
BENYON 269 65	182	76144	1.7	13.1899	1.0	1.9434	1.7	0.1859	1.4	0.81	1099.2	14.3	1096.2	11.6	1090.2	20.2	1090.2	20.2	100.8
BENYON 269 104	484	143086	2.3	13.0578	0.4	2.0782	1.9	0.1968	1.8	0.98	1158.2	19.6	1141.6	12.9	1110.3	7.5	1110.3	7.5	104.3
BENYON 269 64	140	58189	1.4	12.9327	2.0	2.0938	2.8	0.1964	2.1	0.72	1155.9	21.8	1146.8	19.5	1129.5	39.0	1129.5	39.0	102.3
BENYON 269 28	897	4587	9.6	12.9294	2.1	1.8278	2.7	0.1714	1.7	0.63	1019.8	16.4	1055.5	18.0	1130.1	42.3	1130.1	42.3	90.2
BENYON 269 29	174	133337	2.1	12.8261	0.9	2.1610	2.0	0.2010	1.8	0.90	1180.8	19.1	1168.6	13.7	1146.0	17.0	1146.0	17.0	103.0
BENYON 269 58	482	160220	2.3	12.8132	0.5	2.1550	0.8	0.2003	0.7	0.81	1176.7	7.4	1166.7	5.9	1148.0	9.8	1148.0	9.8	102.5
BENYON 269 22	256	77798	2.8	12.8053	0.9	2.1313	1.7	0.1979	1.5	0.86	1164.3	16.0	1159.0	12.1	1149.2	17.8	1149.2	17.8	101.3
BENYON 269 72	621	7494	2.4	12.7456	1.1	1.7073	3.2	0.1578	2.9	0.93	944.7	25.8	1011.3	20.2	1158.5	22.7	1158.5	22.7	81.5
BENYON 269 30	134	98431	6.2	12.7042	0.9	2.2176	2.6	0.2043	2.5	0.94	1198.5	26.9	1186.6	18.3	1164.9	17.5	1164.9	17.5	102.9
BENYON 269 92	301	143959	2.3	12.6381	0.7	2.2152	2.2	0.2030	2.1	0.95	1191.7	22.4	1185.9	15.2	1175.3	13.9	1175.3	13.9	101.4
BENYON 269 62	196	23504	3.4	12.6081	0.7	2.2325	1.7	0.2041	1.5	0.91	1197.5	16.8	1191.3	11.9	1180.0	14.2	1180.0	14.2	101.5
BENYON 269 107	216	55560	2.3	12.4032	5.0	2.1292	5.4	0.1915	2.2	0.41	1129.7	23.1	1158.3	37.6	1212.3	97.6	1212.3	97.6	93.2
BENYON 269 87	293	18725	3.2	12.3928	1.6	2.3582	2.8	0.2120	2.3	0.82	1239.3	26.2	1230.1	20.3	1214.0	32.1	1214.0	32.1	102.1
BENYON 269 55	49	36742	2.1	12.3801	5.9	2.3883	6.2	0.2144	2.0	0.31	1252.5	22.3	1239.1	44.7	1216.0	116.7	1216.0	116.7	103.0
BENYON 269 20	248	85994	2.1	12.3688	0.7	2.2472	1.6	0.2016	1.5	0.89	1183.9	15.8	1195.9	11.5	1217.7	14.5	1217.7	14.5	97.2
BENYON 269 61	247	366056	2.5	12.3173	0.9	2.4387	1.6	0.2179	1.4	0.84	1270.5	15.7	1254.1	11.7	1225.9	17.3	1225.9	17.3	103.6
BENYON 269 54	116	79495	2.5	12.1637	1.1	2.4780	3.1	0.2186	2.9	0.94	1274.5	33.6	1265.6	22.4	1250.6	20.7	1250.6	20.7	101.9
BENYON 269 90	138	21598	2.7	11.9247	2.3	2.5418	3.4	0.2198	2.6	0.75	1281.0	29.7	1284.1	24.9	1289.3	43.9	1289.3	43.9	99.4
BENYON 269 96	163	60745	1.8	11.8186	1.2	2.7043	1.4	0.2318	0.7	0.51	1344.0	8.8	1329.6	10.5	1306.6	23.5	1306.6	23.5	102.9
BENYON 269 12	292	74873	2.5	11.7159	0.5	2.6810	2.1	0.2278	2.1	0.97	1323.0	24.7	1323.2	15.7	1323.6	10.2	1323.6	10.2	100.0
BENYON 269 84	92	38523	1.4	11.5502	1.8	2.7482	2.4	0.2302	1.5	0.64	1335.6	18.4	1341.6	17.7	1351.1	35.4	1351.1	35.4	98.9
BENYON 269 85	242	12990	0.9	11.5182	0.9	2.8309	2.8	0.2365	2.7	0.95	1368.4	32.8	1363.8	21.0	1356.5	17.2	1356.5	17.2	100.9
BENYON 269 16	58	36908	2.2	11.4953	2.4	2.8488	2.6	0.2375	1.1	0.41	1373.7	13.3	1368.5	19.6	1360.3	45.7	1360.3	45.7	101.0
BENYON 269 63	232	141802	1.4	11.0790	0.5	3.1123	1.0	0.2501	0.9	0.87	1438.9	11.2	1435.7	7.7	1431.0	9.3	1431.0	9.3	100.6
BENYON 269 41	70	91194	1.8	10.9960	1.5	3.2433	1.7	0.2587	0.9	0.53	1483.0	12.0	1467.6	13.3	1445.4	27.8	1445.4	27.8	102.6
BENYON 269 91	150	53030	1.1	10.9572	0.6	3.2304	1.3	0.2567	1.1	0.88	1473.0	14.7	1464.5	9.9	1452.1	11.4	1452.1	11.4	101.4
BENYON 269 21	198	137822	2.2	10.7983	0.7	3.3306	1.8	0.2608	1.7	0.92	1494.1	22.6	1488.3	14.4	1479.9	13.7	1479.9	13.7	101.0
BENYON 269 9	149	8947	0.9	10.5463	2.0	3.3978	3.0	0.2599	2.2	0.75	1489.3	29.7	1503.9	23.5	1524.5	37.7	1524.5	37.7	97.7
BENYON 269 19	242	179328	2.9	10.5194	0.6	3.5199	1.4	0.2685	1.3	0.92	1533.4	17.8	1531.7	11.2	1529.3	10.4	1529.3	10.4	100.3
BENYON 269 11	289	249024	1.2	10.4260	0.6	3.6170	1.5	0.2735	1.4	0.93	1558.6	19.1	1553.3	11.8	1546.1	10.6	1546.1	10.6	100.8
BENYON 269 105	687	6743	0.8	10.1133	0.5	2.9132	2.8	0.2137	2.7	0.98	1248.4	31.0	1385.3	21.1	1603.1	10.2	1603.1	10.2	77.9
BENYON 269 33	131	72893	3.1	10.0284	0.6	4.1231	1.4	0.2999	1.2	0.90	1690.8	18.5	1658.9	11.3	1618.8	10.9	1618.8	10.9	104.4
BENYON 269 56	215	209592	1.3	9.2129	0.8	4.7072	1.7	0.3145	1.6	0.90	1763.0	24.3	1768.5	14.7	1775.1	13.8	1775.1	13.8	99.3
BENYON 269 101	44	19182	0.8	9.1553	1.2	4.9195	1.7	0.3267	1.3	0.73	1822.2	20.1	1805.6	14.7	1786.5	21.9	1786.5	21.9	102.0
BENYON 269 74	316	391674	1.9	9.0621	0.2	5.0301	1.4	0.3306	1.4	0.99	1841.3	22.9	1824.4	12.3	1805.2	4.4	1805.2	4.4	102.0
BENYON 269 78	188	110299	2.4	9.0304	0.5	5.0948	2.2	0.3337	2.2	0.98	1856.2	34.9	1835.2	18.8	1811.5	8.8	1811.5	8.8	102.5
BENYON 269 43	129	2394	0.3	8.9381	1.9	4.1243	4.0	0.2674	3.5	0.88	1527.4	47.6	1659.1	32.5	1830.2	34.0	1830.2	34.0	83.5
BENYON 269 100	66	45827	3.3	8.7043	1.0	5.4742	1.2	0.3456	0.8	0.63	1913.5	12.9	1896.6	10.7	1878.1	17.5	1878.1	17.5	101.9
BENYON 269 70	177	53100	2.6	8.6120	0.6	5.6614	1.4	0.3536	1.3	0.91	1951.8	21.8	1925.5	12.3	1897.3	10.7	1897.3	10.7	102.9
BENYON 269 25	176	154419	2.7	8.6081	0.4	5.5852	1.4	0.3487	1.4	0.95	1928.4	22.9	1913.8	12.4	1898.1	7.8	1898.1	7.8	101.6
BENYON 269 46	526	4662	1.6	8.3061	0.6	5.9769	1.6	0.3601	1.4	0.93	1982.5	24.5	1972.5	13.5	1962.0	10.5	1962.0	10.5	101.0
BENYON 269 60	185	6070	2.7	8.1219	0.6	5.9778	1.4	0.3521	1.3	0.92	1944.7	22.2	1972.6	12.5	2002.0	9.9	2002.0	9.9	97.1
BENYON 269 23	60	41286	1.0	7.6327	1.1	7.0635	1.6	0.3910	1.1	0.72	2127.6	20.3	2119.5	13.8	2111.6	18.9	2111.6	18.9	100.8
BENYON 269 77	209	143742	1.7	7.2308	0.2	8.0390	2.5	0.4216	2.4	1.00	2267.7	46.8	2235.4	22.2	2206.0	3.9	2206.0	3.9	102.8
BENYON 269 94	250	7404	1.5	6.4754	4.4	10.1814	9.1	0.4782	8.0	0.87	2519.2	165.9	2451.4	84.4	2395.6	75.5	2395.6	75.5	105.2
BENYON 269 5	710	235085	8.1	6.0667	1.2	11.1013	1.6	0.4885	1.0	0.62	2564.0	20.6	2531.7	14.6	2505.8	20.7	2505.8	20.7	102.3
BENYON 269 6	122	175932	2.3	5.8832	0.5	11.5802	2.0	0.4941	1.9	0.97	2588.5	41.1	2571.1	18.6	2557.4	8.5	2557.4	8.5	101.2
BENYON 269 48	161	123247	1.9	5.8620	0.2	11.7089	1.5	0.4978	1.5	0.99	2604.4	32.0	2581.4	14.1	2563.4	2.8	2563.4	2.8	101.6
BENYON 269 50	55	61914	1.2	5.8299	0.7	11.7491	1.5	0.4968	1.3	0.88	2600.0	27.5	2584.6	13.6	2572.6	11.4	2572.6	11.4	101.1
BENYON 269 2	80	59682	0.6	5.7790	1.0	11.5370	1.4	0.4835	1.0	0.71	2542.7	21.3	2567.6	13.4	2587.3	16.9	2587.3	16.9	98.3
BENYON 269 7	56	98158	0.7	5.4873	0.6	13.7317	2.9	0.5465	2.8	0.98	2810.6	64.0	2731.4	27.2	2673.3	10.2	2673.3	10.2	105.1
BENYON 269 97	125	146526	2.5	5.4183	0.2	13.4810	1.8	0.5298	1.8	0.99	2740.5	39.7	2714.0	16.9	2694.3	3.6	2694.3	3.6	101.7
BENYON 269 76	120	48760	1.7	5.4140	0.4	11.5872	16.6	0.4550	16.6	1.00	2417.4	335.2	2571.6	156.6	2695.6	6.0	2695.6	6.0	89.7
BENYON 269 10	43	15127	1.1	5.4120	1.5	13.2912	2.1	0.5217	1.4	0.69	2706.4	32.0	2700.6	19.7	2696.2	24.9	2696.2	24.9	100.4
BENYON 269 13	71	57181	1.2	5.3237	0.5	13.5805	1.4	0.5244	1.3	0.93	2717.6	28.1	2720.9	12.9	2723.3	8.2	2723.3	8.2	99.8
BENYON 269 26	58	55003	1.7	5.3150	0.5	13.9220	1.0	0.5367	0.8	0.84	2769.5	18.5	2744.4	9.2	2726.0	8.6	2726.0	8.6	101.6
BENYON 269 27	213	498705	1.1	5.2812	0.3	13.4577	1.2	0.5155	1.2	0.98	2679.9	25.7	2712.3	11.4	2736.5	4.3	2736.5	4.3	97.9

Sample 5 (1AA/06-18-085-06W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BENYON 250-30	498	21745	1.2	21.6160	5.9	0.1264	6.3	0.0198	2.0	0.32	126.5	2.5	120.8	7.1	11.3	143.0	126.5	2.5	NA
BENYON 250-60	686	30087	1.8	20.2329	2.7	0.1665	3.2	0.0244	1.7	0.54	155.6	2.7	156.4	4.7	168.0	63.6	155.6	2.7	NA
BENYON 250-35	256	2191	1.0	20.3174	12.4	0.1672	13.1	0.0246	4.2	0.32	156.9	6.5	157.0	19.0	158.3	290.8	156.9	6.5	NA
BENYON 250-105	611	32417	4.4	19.9420	5.4	0.1819	5.8	0.0263	2.1	0.37	167.4	3.5	169.7	9.0	201.8	124.5	167.4	3.5	NA
BENYON 250-42	65	11013	0.6	20.7374	11.2	0.3199	11.6	0.0481	3.0	0.26	302.9	8.8	281.8	28.5	110.2	264.4	302.9	8.8	NA
BENYON 250-90	169	21363	0.9	19.2316	4.8	0.3782	5.0	0.0527	1.4	0.28	331.4	4.6	325.7	14.1	285.3	110.7	331.4	4.6	NA
BENYON 250-94	140	26560	0.8	18.3396	5.1	0.3970	5.7	0.0528	2.4	0.42	331.8	7.8	339.5	16.4	392.9	115.4	331.8	7.8	NA
BENYON 250-58	256	33879	5.2	18.2354	4.1	0.4504	6.0	0.0596	4.3	0.73	373.0	15.7	377.6	18.8	405.6	91.7	373.0	15.7	NA
BENYON 250-57	199	37566	1.3	18.6559	3.9	0.4492	5.3	0.0608	3.6	0.68	380.3	13.4	376.7	16.7	354.4	87.4	380.3	13.4	NA
BENYON 250-12	155	27270	0.6	19.2367	7.1	0.4470	7.2	0.0624	1.3	0.18	390.0	4.9	375.2	22.7	284.7	162.6	390.0	4.9	NA
BENYON 250-79	212	18881	3.2	18.6693	3.7	0.4680	4.3	0.0634	2.3	0.52	396.1	8.8	389.8	14.1	352.8	83.7	396.1	8.8	NA
BENYON 250-86	347	42825	4.2	18.5473	1.3	0.4787	3.2	0.0644	2.9	0.91	402.3	11.2	397.2	10.4	367.5	29.8	402.3	11.2	109.5
BENYON 250-54	427	115663	1.1	18.1730	1.7	0.5015	2.5	0.0661	1.8	0.73	412.6	7.2	412.7	8.4	413.3	37.9	412.6	7.2	99.8
BENYON 250-88	249	19990	2.5	18.0587	2.5	0.5050	2.9	0.0661	1.4	0.48	412.8	5.5	415.1	9.8	427.4	56.5	412.8	5.5	96.6
BENYON 250-41	212	36065	4.2	18.2972	2.4	0.5022	3.1	0.0666	2.0	0.65	415.9	8.2	413.2	10.6	398.0	53.2	415.9	8.2	104.5
BENYON 250-21	164	17759	4.3	18.6396	4.3	0.4936	4.5	0.0667	1.4	0.30	416.4	5.5	407.3	15.3	356.3	97.9	416.4	5.5	116.8
BENYON 250-23	239	29361	6.9	18.4370	3.6	0.5046	4.2	0.0675	2.1	0.51	420.9	8.7	414.8	14.2	381.0	80.1	420.9	8.7	110.5
BENYON 250-92	185	32347	1.2	18.4590	2.9	0.5043	3.9	0.0675	2.7	0.69	421.2	11.1	414.6	13.4	378.3	64.4	421.2	11.1	111.3
BENYON 250-22	64	8118	0.9	18.9550	12.4	0.4952	12.5	0.0681	2.1	0.17	424.6	8.7	408.5	42.2	318.3	282.0	424.6	8.7	133.4
BENYON 250-18	325	32688	7.2	18.0932	2.0	0.5208	2.4	0.0683	1.3	0.55	426.1	5.5	425.7	8.4	423.1	45.4	426.1	5.5	100.7
BENYON 250-13	573	48818	1.4	17.7388	1.1	0.5321	3.9	0.0685	3.7	0.96	426.9	15.5	433.2	13.8	467.1	24.8	426.9	15.5	91.4
BENYON 250-52	157	26334	0.6	17.3491	2.7	0.5674	3.3	0.0714	1.8	0.56	444.6	7.9	456.4	12.1	516.1	59.9	444.6	7.9	86.1
BENYON 250-83	119	36025	1.7	17.1957	4.5	0.6935	5.9	0.0865	3.7	0.64	534.7	19.1	534.9	24.4	535.6	99.0	534.7	19.1	99.8
BENYON 250-73	140	19443	2.6	16.6753	3.5	0.7159	4.8	0.0866	3.3	0.69	535.3	17.0	548.2	20.4	602.4	75.5	535.3	17.0	88.9
BENYON 250-70	176	53888	4.4	16.1284	2.7	0.8621	4.0	0.1008	3.0	0.74	619.4	17.8	631.3	19.0	674.2	57.8	619.4	17.8	91.9
BENYON 250-19	217	62584	1.3	15.1020	1.5	1.1794	1.7	0.1292	0.9	0.51	783.2	6.5	791.0	9.5	813.2	31.3	783.2	6.5	96.3
BENYON 250-72	148	63780	2.8	13.9532	0.9	1.6732	2.5	0.1693	2.3	0.93	1008.4	21.8	998.4	16.0	976.5	19.0	976.5	19.0	103.3
BENYON 250-80	602	268894	3.3	13.8383	0.3	1.6955	0.9	0.1702	0.9	0.94	1013.0	8.3	1006.8	6.0	993.4	6.4	993.4	6.4	102.0
BENYON 250-1	132	103147	2.3	13.8277	1.9	1.7099	2.1	0.1715	0.9	0.42	1020.3	8.3	1012.2	13.3	994.9	38.4	994.9	38.4	102.5
BENYON 250-101	354	38632	7.2	13.7685	1.5	1.3548	7.2	0.1353	7.0	0.98	817.9	53.9	869.6	42.0	1003.6	30.9	1003.6	30.9	81.5
BENYON 250-33	73	27730	1.9	13.7422	3.9	1.6608	4.3	0.1655	1.8	0.43	987.4	16.9	993.7	27.4	1007.5	79.2	1007.5	79.2	98.0
BENYON 250-103	82	39673	4.5	13.7277	2.2	1.7004	2.5	0.1693	1.2	0.48	1008.3	11.5	1008.7	16.3	1009.6	45.2	1009.6	45.2	99.9
BENYON 250-14	1111	624094	7.9	13.7257	0.2	1.6418	0.7	0.1634	0.7	0.95	975.9	6.1	986.4	4.5	1009.9	4.5	1009.9	4.5	96.6
BENYON 250-95	337	83844	3.4	13.7222	0.7	1.6940	0.9	0.1686	0.6	0.67	1004.3	5.9	1006.3	6.0	1010.4	14.1	1010.4	14.1	99.4
BENYON 250-65	69	27644	1.4	13.6226	2.9	1.7889	3.1	0.1767	1.2	0.39	1049.2	11.9	1041.4	20.4	1025.2	58.3	1025.2	58.3	102.3
BENYON 250-39	42	23504	2.8	13.5869	7.5	1.7455	7.8	0.1720	2.4	0.30	1023.1	22.5	1025.5	50.7	1030.5	151.2	1030.5	151.2	99.3
BENYON 250-59	531	273447	5.3	13.5653	0.4	1.7551	1.2	0.1727	1.1	0.95	1026.9	10.7	1029.1	7.7	1033.7	7.7	1033.7	7.7	99.3
BENYON 250-99	101	43523	0.5	13.5594	2.2	1.8259	2.8	0.1796	1.8	0.62	1064.6	17.3	1054.8	18.7	1034.6	45.0	1034.6	45.0	102.9
BENYON 250-20	403	150764	21.5	13.5333	0.8	1.7814	2.3	0.1748	2.2	0.93	1038.8	20.8	1038.7	15.1	1038.5	16.9	1038.5	16.9	100.0
BENYON 250-55	262	122394	2.4	13.5254	0.9	1.8122	1.4	0.1778	1.1	0.79	1054.8	10.7	1049.9	9.1	1039.7	17.3	1039.7	17.3	101.5
BENYON 250-66	260	55633	2.4	13.4900	1.3	1.8315	1.7	0.1792	1.1	0.64	1062.5	10.7	1056.8	11.1	1045.0	26.1	1045.0	26.1	101.7
BENYON 250-11	116	37246	0.9	13.4811	2.3	1.8730	3.1	0.1831	2.1	0.66	1084.1	20.6	1071.6	20.6	1046.3	47.0	1046.3	47.0	103.6
BENYON 250-27	800	117673	47.7	13.4786	0.3	1.8380	1.0	0.1797	0.9	0.96	1065.2	9.2	1059.1	6.4	1046.7	5.5	1046.7	5.5	101.8
BENYON 250-15	65	29683	4.0	13.4730	2.1	1.8592	2.7	0.1817	1.7	0.62	1076.1	16.5	1066.7	17.6	1047.5	42.1	1047.5	42.1	102.7
BENYON 250-25	144	21182	1.1	13.4601	3.6	1.7985	3.7	0.1756	1.1	0.29	1042.7	10.6	1044.9	24.5	1049.5	72.2	1049.5	72.2	99.4
BENYON 250-78	327	240254	2.5	13.4384	0.6	1.8677	0.9	0.1820	0.6	0.71	1078.1	6.4	1069.7	6.0	1052.7	12.8	1052.7	12.8	102.4
BENYON 250-76	403	132992	4.8	13.4065	0.4	1.8530	1.0	0.1802	0.9	0.92	1067.9	9.2	1064.5	6.7	1057.5	8.0	1057.5	8.0	101.0
BENYON 250-71	405	152751	5.6	13.3827	0.4	1.8877	2.4	0.1832	2.4	0.98	1084.5	24.0	1076.8	16.2	1061.1	8.8	1061.1	8.8	102.2
BENYON 250-98	231	86289	0.8	13.3355	0.8	1.9103	1.0	0.1848	0.6	0.62	1092.9	6.3	1084.7	6.8	1068.2	16.3	1068.2	16.3	102.3
BENYON 250-84	467	539152	5.9	13.3313	0.7	1.8826	2.0	0.1820	1.8	0.93	1078.0	18.1	1075.0	13.0	1068.8	14.8	1068.8	14.8	100.9
BENYON 250-5	66	21963	1.8	13.3230	2.3	1.9036	2.6	0.1839	1.2	0.45	1088.5	11.6	1082.4	17.3	1070.1	46.6	1070.1	46.6	101.7
BENYON 250-8	336	141982	1.8	13.2296	0.4	1.9739	3.0	0.1894	3.0	0.99	1118.1	30.9	1106.6	20.5	1084.2	8.5	1084.2	8.5	103.1
BENYON 250-7	279	55504	1.4	13.1987	1.4	1.3666	4.9	0.1308	4.6	0.96	792.6	34.6	874.7	28.5	1088.9	28.7	1088.9	28.7	72.8
BENYON 250-82	405	223009	2.6	12.8557	0.6	2.0879	1.2	0.1947	1.1	0.87	1146.7	11.0	1144.8	8.3	1141.4	11.6	1141.4	11.6	100.5
BENYON 250-100	138	93805	2.4	12.8396	0.9	2.1755	3.3	0.2026	3.2	0.96	1189.2	34.2	1173.2	22.9	1143.9	18.6	1143.9	18.6	104.0
BENYON 250-17	288	105847	2.3	12.7851	0.6	2.1450	1.7	0.1989	1.6	0.94	1169.4	16.9	1163.4	11.7	1152.4	11.5	1152.4	11.5	101.5
BENYON 250-49	85	18084	1.9	12.7763	2.0	2.0385	3.9	0.1889	3.3	0.85	1115.4	33.4	1128.5	26.2	1153.7	40.6	1153.7	40.6	96.7
BENYON 250-77	105	31995	2.7	12.7397	1.0	2.1035	3.2	0.1944	3.1	0.95	1144.9	32.3	1149.9	22.3	1159.4	19.6	1159.4	19.6	98.8
BENYON 250-93	130	76679	1.7	12.7187	1.4	2.1366	2.2	0.1971	1.7	0.78	1159.7	17.8	1160.7	14.9	1162.7	26.9	1162.7	26.9	99.7
BENYON 250-47	421	115662	1.8	12.7183	0.3	2.2076	1.4	0.2036	1.4	0.98	1194.8	14.7	1183.5	9.7	1162.7	5.7	1162.7	5.7	102.8
BENYON 250-96	303	87057	3.9	12.7178	0.9	2.2362	1.3	0.2063	0.8	0.67	1208.9	9.2	1192.5	8.8	1162.8	18.6	1162.8	18.6	104.0
BENYON 250-28	54	31698	3.0	12.7123	3.8	2.2582	4.3	0.2082	2.0	0.47	1219.2	22.4	1199.3	30.0	1163.7	74.4	1163.7	74.4	104.8
BENYON 250-63	125	63172	2.9	12.6784	1.3	2.1637	5.1	0.1990	4.9	0.96	1169.7	52.5	1169.5	35.3	1169.0	26.7	1169.0	26.7	100.1
BENYON 250-38	81	28165	1.8	12.6774	1.9	2.1964	3.4	0.2019	2.8	0.83	1185.8	30.7	1179.9	23.9	1169.1	38.2	1169.1	38.2	101.4
BENYON 250-36	156	96378	2.2	12.6561	1.4	2.2282	1.6	0.2045	0.9	0.57	1199.6	10.2	1189.9	11.5	1172.5	26.9	1172.5	26.9	102.3
BENYON 250-62	158	63901	3.2	12.5374	0.5	2.2829	1.8	0.2076	1.8	0.97	1215.9	19.6	1207.0	12.9	1191.1	9.2	1191.1	9.2	102.1
BENYON 250-85	182	70117	2.0	12.4914	1.2	2.2734	2.1	0.2060	1.7	0.82	1207.3	18.7	1204.1	14.7	1198.3	23.5	1198.3	23.5	100.7
BENYON 250-50	135	37719	3.8	12.1518	1.4	2.5341	2.0	0.2233	1.4	0.69	1299.5	16.0	1281.9	14.3	1252.5	27.7	1252.5	27.7	103.8
BENYON 250-9	440	178473	1.3	12.1485	0.4	2.4713	1.0	0.2177	0.9	0.90	1269.9	10.7	1263.7	7.4	1253.0	8.6	1253.0	8.6	101.4
BENYON 250-45	170	84597	2.5	12.0089	1.1	2.5532	1.5	0.2224	1.0	0.65	1294.4	11.2	1287.4	10.7	1275.6	21.7	1275.6	21.7	101.5
BENYON 250-48	75	29712	0.9	12.0033	1.4	2.6025	1.8	0.2266	1.1	0.62	1316.5	13.4	1301.4	13.4	1276.5	27.9	1276.5	27.9	103.1
BENYON 250-4	118	41753	2.5	11.9501	1.4	2.5783	2.3	0.2235	1.8	0.80	1300.1	21.7	1294.5	16.9	1285.1	26.8	1285.1	26.8	101.2
BENYON 250-69	37	20327	2.2	11.7118	5.3	2.8069	5.9	0.2384	2.5	0.42	1378.5	30.9	1357.4	44.1	1324.3	103.3	1324.3	103.3	104.1
BENYON 250-75	122	172704	2.2	11.1165	0.8	3.1714	1.7	0.2557	1.5	0.87	1467.8	19.2	1450.2	13.0	1424.6	15.8	1424.6	15.8	103.0
BENYON 250-46	93	77923	2.3	11.0639	1.2	3.0468	3.2	0.2445	2.9	0.92	1410.0	37.2	1419.4	24.3	1433.6	23.4	1433.6	23.4	98.4
BENYON 250-26	143	81356	2.7	10.9527	0.8	3.2243	1.0	0.2561	0.6	0.62	1470.0	8.0	1463.0	7.6	1452.9	14.7	1452.9	14.7	101.2
BENYON 250-6	210	130796	1.0	10.8273	0.8	3.2260	1.6	0.2533	1.4	0.88	1455.6	18.8	1463.4	12.7	1474.8	14.7	1474.8	14.7	98.7
BENYON 250-64	67	41390	2.2	10.7763	2.2	3.3260	2.5	0.2599	1.2	0.49	1489.6	16.3	1487.2	19.7	1483.7	41.7	1483.7	41.7	100.4
BENYON 250-97	479	44160	3.1	10.7528	0.4	3.4254	1.0	0.2671	0.9	0.90	1526.2	11.7	1510.2	7.5	1487.8	8.0	1487.8	8.0	102.6
BENYON 250-2	157	93826	1.8	10.6673	0.7	3.4562	1.1	0.2674	0.9	0.81	1527.5	12.4	1517.3	8.9	1502.9	12.6	1502.9	12.6	101.6
BENYON 250-91	168	297517	2.3	9.6200	0.5	4.4877	2.8	0.3131	2.7	0.98	1756.0	42.0	1728.7	23.1	1695.8	9.0	1695.8	9.0	103.6
BENYON 250-104	104	35128	2.5	9.5267	0.9	4.1057	3.0	0.2837	2.9	0.95	1609.9	40.7	1655.4	24.5	1713.7	17.0	1713.7	17.0	93.9
BENYON 250-43	68	62692	1.7	9.3028	1.5	4.6915	2.8	0.3165	2.4	0.84	1772.8	36.7	1765.7	23.7	1757.3	28.2	1757.3	28.2	100.9
BENYON 250-51	234	102777	0.8	8.9468	0.5	5.0808	2.2	0.3297	2.2	0.98	1836.9	34.9	1832.9	19.0	1828.4	8.7	1828.4	8.7	100.5
BENYON 250-10	288	2798	5.3	8.8981	1.3	4.6541	2.1	0.3003	1.7	0.78	1693.0	24.7	1759.0	17.9	1838.3	24.4	1838.3	24.4	92.1
BENYON 250-81	155	18109	0.9	8.7903	0.7	5.3489	7.2	0.3410	7.1	1.00	1891.5	117.0	1876.7	61.4	1860.3	12.3	1860.3	12.3	101.7
BENYON 250-44	242	9329	1.9	8.5017	0.8	5.0500	3.5	0.3114	3.4	0.97	1747.5	51.7	1827.7	29.4	1920.4	14.3	1920.4	14.3	91.0
BENYON 250-31	96	73213	0.4	5.3894	0.3	13.4534	0.9	0.5259	0.9	0.95	2724.0	19.4	2712.0	8.6	2703.1	4.5	2703.1	4.5	100.8
BENYON 250-67	64	65721	1.3	5.3473	0.3	13.7940	3.3	0.5350	3.3	1.00	2762.3	73.3	2735.7	31.0	2716.0	4.6	2716.0	4.6	101.7
BENYON 250-37	59	47296	2.8	5.2362	0.4	14.1731	1.4	0.5382	1.4	0.96	2776.1	31.1	2761.4	13.6	2750.6	6.8	2750.6	6.8	100.9
BENYON 250-16	261	442981	3.3	4.7889	0.6	16.5979	1.8	0.5765	1.7	0.94	2934.4	39.5	2911.9	17.1	2896.4	9.9	2896.4	9.9	101.3
BENYON 250-29	106	97673	1.0	4.5624	0.2	17.1812	5.4	0.5685	5.4	1.00	2901.8	126.9	2945.0	52.2	2974.7	3.6	2974.7	3.6	97.5
BENYON 250-102	101	97394	1.6	3.9578	0.3	22.2950	1.8	0.6400	1.8	0.98	3188.9	44.2	3196.7	17.3	3201.6	5.0	3201.6	5.0	99.6

Sample 6 (1AA/06-18-085-06W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BENYON 190 27	437	33255	1.3	19.6308	3.2	0.2747	4.4	0.0391	3.0	0.68	247.3	7.3	246.4	9.7	238.1	74.7	247.3	7.3	NA
BENYON 190 29	55	4277	1.1	19.8653	23.1	0.3642	23.3	0.0525	3.1	0.13	329.7	9.9	315.4	63.2	210.7	540.9	329.7	9.9	NA
BENYON 190 55	55	9330	1.8	21.4192	25.6	0.3657	26.0	0.0568	4.2	0.16	356.2	14.5	316.4	70.7	33.2	622.7	356.2	14.5	NA
BENYON 190 67	434	30172	12.7	18.5812	2.9	0.4273	3.0	0.0576	1.0	0.32	360.9	3.4	361.3	9.2	363.4	64.7	360.9	3.4	NA
BENYON 190 5	103	15916	1.0	19.5255	13.7	0.4117	13.8	0.0583	1.9	0.14	365.3	6.8	350.1	40.8	250.5	315.4	365.3	6.8	NA
BENYON 190 35	194	34815	1.3	17.6757	5.3	0.5241	5.6	0.0672	1.8	0.32	419.2	7.1	427.9	19.4	475.0	116.7	419.2	7.1	88.2
BENYON 190 96	164	37077	1.0	17.9804	2.9	0.5306	3.2	0.0692	1.4	0.45	431.3	6.0	432.2	11.3	437.1	63.9	431.3	6.0	98.7
BENYON 190 99	214	12988	3.8	16.9702	6.9	0.5671	7.4	0.0698	2.6	0.35	434.9	10.9	456.1	27.1	564.4	150.4	434.9	10.9	77.1
BENYON 190 28	172	31347	2.0	17.6838	3.5	0.5639	3.7	0.0723	1.2	0.33	450.2	5.3	454.1	13.5	474.0	76.9	450.2	5.3	95.0
BENYON 190 8	424	84348	1.5	17.7900	0.8	0.5669	1.4	0.0731	1.1	0.80	455.1	4.9	456.0	5.1	460.7	18.6	455.1	4.9	98.8
BENYON 190 58	294	48476	1.0	18.5437	4.0	0.5477	4.1	0.0737	0.7	0.17	458.2	3.1	443.5	14.7	368.0	90.5	458.2	3.1	124.5
BENYON 190 97	178	33384	1.8	17.4897	4.3	0.6029	4.7	0.0765	1.7	0.37	475.1	7.8	479.1	17.8	498.3	95.5	475.1	7.8	95.3
BENYON 190 98	290	29572	4.0	15.1794	4.6	0.7133	6.4	0.0785	4.5	0.70	487.3	21.0	546.7	27.1	802.5	96.2	487.3	21.0	60.7
BENYON 190 102	254	90901	1.8	16.8367	2.6	0.7399	2.8	0.0903	1.2	0.41	557.6	6.2	562.3	12.1	581.5	55.6	557.6	6.2	95.9
BENYON 190 37	51	13611	2.6	14.2845	4.1	1.5676	4.9	0.1624	2.8	0.56	970.1	25.0	957.5	30.6	928.5	83.9	928.5	83.9	104.5
BENYON 190 85	118	42559	2.2	13.8540	1.1	1.6560	1.5	0.1664	1.0	0.65	992.2	8.8	991.8	9.4	991.1	23.0	991.1	23.0	100.1
BENYON 190 77	171	37017	3.2	13.8268	1.4	1.4824	2.2	0.1487	1.7	0.78	893.4	14.5	923.2	13.5	995.1	28.1	995.1	28.1	89.8
BENYON 190 70	72	12405	3.2	13.8001	3.5	1.6192	3.8	0.1621	1.4	0.38	968.2	12.8	977.7	23.8	999.0	71.4	999.0	71.4	96.9
BENYON 190 47	246	77645	3.7	13.7692	1.4	1.6559	1.9	0.1654	1.3	0.67	986.5	11.8	991.8	12.2	1003.5	29.1	1003.5	29.1	98.3
BENYON 190 23	365	177908	4.5	13.7690	0.5	1.6881	1.9	0.1686	1.8	0.96	1004.3	17.1	1004.0	12.1	1003.5	10.2	1003.5	10.2	100.1
BENYON 190 12	561	283813	7.3	13.7414	0.5	1.7361	1.3	0.1730	1.2	0.93	1028.8	11.7	1022.0	8.5	1007.6	9.9	1007.6	9.9	102.1
BENYON 190 87	195	145676	3.1	13.6991	0.9	1.7631	1.6	0.1752	1.4	0.85	1040.6	13.4	1032.0	10.7	1013.9	17.6	1013.9	17.6	102.6
BENYON 190 57	137	60494	4.8	13.6973	1.2	1.7062	2.0	0.1695	1.6	0.80	1009.3	14.8	1010.8	12.8	1014.1	24.4	1014.1	24.4	99.5
BENYON 190 69	200	138826	3.1	13.6795	0.7	1.7241	1.2	0.1710	0.9	0.79	1017.9	8.6	1017.5	7.5	1016.8	14.6	1016.8	14.6	100.1
BENYON 190 50	387	107576	2.6	13.6691	0.7	1.7185	1.4	0.1704	1.2	0.85	1014.1	11.0	1015.5	8.8	1018.3	14.6	1018.3	14.6	99.6
BENYON 190 105	177	16731	3.0	13.6566	2.2	1.6664	2.8	0.1651	1.7	0.62	984.8	15.7	995.8	17.8	1020.2	44.6	1020.2	44.6	96.5
BENYON 190 2	315	278732	168.6	13.6292	0.9	1.7229	2.4	0.1703	2.3	0.93	1013.8	21.2	1017.1	15.6	1024.2	18.0	1024.2	18.0	99.0
BENYON 190 21	343	185742	3.6	13.6199	1.0	1.8070	1.9	0.1785	1.6	0.85	1058.8	16.1	1048.0	12.7	1025.6	20.6	1025.6	20.6	103.2
BENYON 190 3	137	50054	2.5	13.6096	2.6	1.7896	2.8	0.1766	1.1	0.40	1048.6	10.8	1041.7	18.3	1027.1	52.2	1027.1	52.2	102.1
BENYON 190 25	138	56296	2.7	13.5900	2.0	1.7854	2.3	0.1760	1.1	0.49	1045.0	10.7	1040.2	14.7	1030.0	39.7	1030.0	39.7	101.4
BENYON 190 68	199	76146	3.3	13.5720	1.0	1.7728	1.3	0.1745	0.9	0.65	1036.9	8.2	1035.5	8.6	1032.7	20.4	1032.7	20.4	100.4
BENYON 190 92	318	90752	2.9	13.5339	1.0	1.7917	1.4	0.1759	1.0	0.69	1044.4	9.4	1042.4	9.3	1038.4	20.9	1038.4	20.9	100.6
BENYON 190 18	218	78443	2.3	13.5020	1.2	1.8919	2.3	0.1853	2.0	0.86	1095.7	20.4	1078.3	15.6	1043.2	23.8	1043.2	23.8	105.0
BENYON 190 80	102	46987	2.7	13.5012	2.4	1.8216	2.7	0.1784	1.2	0.43	1058.1	11.2	1053.3	17.5	1043.3	48.6	1043.3	48.6	101.4
BENYON 190 30	176	59828	1.7	13.4940	1.2	1.8043	2.8	0.1766	2.5	0.89	1048.3	24.1	1047.0	18.2	1044.4	25.2	1044.4	25.2	100.4
BENYON 190 15	552	58431	3.0	13.4483	0.4	1.7909	1.3	0.1747	1.2	0.95	1037.8	11.5	1042.2	8.2	1051.2	7.7	1051.2	7.7	98.7
BENYON 190 82	84	21240	1.9	13.4396	3.3	1.7143	7.0	0.1671	6.2	0.88	996.1	56.8	1013.9	44.7	1052.5	66.0	1052.5	66.0	94.6
BENYON 190 66	1128	20811	7.0	13.4017	0.6	1.7567	1.1	0.1707	0.9	0.82	1016.2	8.4	1029.6	7.1	1058.2	12.7	1058.2	12.7	96.0
BENYON 190 56	85	35150	1.4	13.3441	2.8	1.8800	3.5	0.1819	2.1	0.59	1077.6	20.7	1074.0	23.4	1066.9	57.3	1066.9	57.3	101.0
BENYON 190 33	165	96054	1.7	13.3210	1.4	1.9280	3.1	0.1863	2.7	0.88	1101.1	27.5	1090.8	20.6	1070.4	29.1	1070.4	29.1	102.9
BENYON 190 103	928	11697	2.3	13.0791	0.9	1.8291	5.0	0.1735	5.0	0.98	1031.4	47.3	1056.0	33.1	1107.1	17.8	1107.1	17.8	93.2
BENYON 190 16	79	5668	1.0	12.9958	2.8	1.9655	3.1	0.1853	1.5	0.47	1095.7	14.8	1103.8	21.2	1119.9	55.6	1119.9	55.6	97.8
BENYON 190 62	609	223709	4.9	12.9863	0.6	1.9619	1.5	0.1848	1.4	0.93	1093.0	13.8	1102.5	9.9	1121.3	11.0	1121.3	11.0	97.5
BENYON 190 75	90	58109	3.6	12.9406	2.6	1.9993	3.3	0.1876	2.0	0.60	1108.6	20.0	1115.3	22.1	1128.3	52.1	1128.3	52.1	98.2
BENYON 190 36	81	20776	3.5	12.8684	1.6	2.0705	2.7	0.1932	2.2	0.80	1138.9	22.6	1139.1	18.4	1139.5	31.9	1139.5	31.9	100.0
BENYON 190 19	157	44409	2.0	12.8540	3.1	2.0829	5.5	0.1942	4.6	0.83	1144.0	48.0	1143.2	37.8	1141.7	61.2	1141.7	61.2	100.2
BENYON 190 86	886	12836	2.6	12.8287	0.4	2.0379	1.2	0.1896	1.1	0.93	1119.3	11.2	1128.3	8.0	1145.6	8.6	1145.6	8.6	97.7
BENYON 190 59	308	110579	2.0	12.8031	0.6	2.0707	2.3	0.1923	2.2	0.96	1133.7	22.9	1139.2	15.7	1149.6	12.2	1149.6	12.2	98.6
BENYON 190 34	75	8431	2.2	12.8025	3.2	2.0976	4.1	0.1948	2.4	0.60	1147.2	25.6	1148.0	27.9	1149.7	64.5	1149.7	64.5	99.8
BENYON 190 101	182	45584	3.5	12.7977	1.6	2.0335	2.0	0.1887	1.3	0.63	1114.6	13.0	1126.8	13.8	1150.4	31.2	1150.4	31.2	96.9
BENYON 190 90	242	97803	2.2	12.7887	0.6	2.0796	1.1	0.1929	0.9	0.81	1137.0	8.9	1142.1	7.3	1151.8	12.5	1151.8	12.5	98.7
BENYON 190 13	122	45262	1.1	12.7818	1.8	2.1387	2.0	0.1983	0.9	0.45	1166.0	9.7	1161.4	14.0	1152.9	35.8	1152.9	35.8	101.1
BENYON 190 11	211	70987	2.5	12.7689	1.2	2.1111	4.7	0.1955	4.6	0.97	1151.1	48.3	1152.4	32.6	1154.9	23.0	1154.9	23.0	99.7
BENYON 190 64	202	75525	2.1	12.7504	1.2	2.0867	3.0	0.1930	2.8	0.92	1137.4	29.2	1144.5	20.8	1157.7	23.2	1157.7	23.2	98.2
BENYON 190 54	558	256637	2.0	12.7466	0.2	2.1521	0.7	0.1990	0.7	0.96	1169.7	7.1	1165.7	4.8	1158.3	3.9	1158.3	3.9	101.0
BENYON 190 17	713	244286	2.4	12.6939	0.3	2.2347	1.1	0.2057	1.0	0.96	1206.1	11.3	1192.0	7.5	1166.5	6.2	1166.5	6.2	103.4
BENYON 190 45	63	41664	2.1	12.6811	3.0	2.1343	4.2	0.1963	2.9	0.70	1155.4	31.0	1160.0	29.0	1168.5	59.4	1168.5	59.4	98.9
BENYON 190 10	310	40302	1.9	12.6765	0.8	1.9763	5.2	0.1817	5.2	0.99	1076.3	51.1	1107.5	35.1	1169.3	15.1	1169.3	15.1	92.0
BENYON 190 72	101	63815	2.0	12.6724	1.2	2.1279	4.5	0.1956	4.3	0.96	1151.5	45.8	1157.9	31.2	1169.9	24.6	1169.9	24.6	98.4
BENYON 190 73	139	60722	1.5	12.6547	1.4	2.1884	2.0	0.2009	1.4	0.72	1179.9	15.6	1177.4	14.1	1172.7	27.9	1172.7	27.9	100.6
BENYON 190 7	332	427514	2.7	12.6463	0.5	2.1465	0.9	0.1969	0.8	0.85	1158.5	8.5	1163.9	6.6	1174.0	10.0	1174.0	10.0	98.7
BENYON 190 51	115	57801	2.5	12.6110	2.1	2.1595	2.3	0.1975	0.9	0.40	1162.0	9.6	1168.1	15.8	1179.6	41.3	1179.6	41.3	98.5
BENYON 190 49	76	26253	1.3	12.5499	2.0	2.2264	2.4	0.2026	1.3	0.54	1189.5	14.1	1189.4	16.8	1189.2	39.9	1189.2	39.9	100.0
BENYON 190 1	50	24088	2.4	12.3267	4.3	2.4636	5.8	0.2203	3.9	0.67	1283.2	45.7	1261.4	42.2	1224.4	84.7	1224.4	84.7	104.8
BENYON 190 38	325	215733	2.1	12.2100	0.6	2.4823	2.1	0.2198	2.0	0.97	1280.9	23.7	1266.9	15.3	1243.2	10.9	1243.2	10.9	103.0
BENYON 190 60	196	103586	1.6	12.0788	1.1	2.3904	2.7	0.2094	2.5	0.91	1225.7	27.6	1239.7	19.5	1264.2	22.3	1264.2	22.3	96.9
BENYON 190 20	40	16033	1.6	12.0753	4.0	2.3997	4.6	0.2102	2.2	0.49	1229.7	24.9	1242.5	32.7	1264.8	77.7	1264.8	77.7	97.2
BENYON 190 79	207	65922	2.4	12.0519	1.9	2.3860	5.1	0.2086	4.7	0.93	1221.1	52.7	1238.4	36.6	1268.6	37.7	1268.6	37.7	96.3
BENYON 190 89	67	23273	2.1	11.8767	7.5	2.4657	9.6	0.2124	5.9	0.62	1241.6	67.1	1262.0	69.2	1297.1	146.0	1297.1	146.0	95.7
BENYON 190 14	260	144335	2.3	11.7311	0.7	2.7475	1.7	0.2338	1.6	0.92	1354.2	19.0	1341.4	12.6	1321.1	12.8	1321.1	12.8	102.5
BENYON 190 40	227	111555	2.0	11.6740	1.2	2.7513	1.6	0.2330	1.0	0.64	1349.9	12.3	1342.5	11.8	1330.5	23.6	1330.5	23.6	101.5
BENYON 190 4	156	132620	2.4	11.3781	0.7	2.9481	1.2	0.2433	1.0	0.82	1403.7	12.3	1394.3	9.0	1380.0	13.1	1380.0	13.1	101.7
BENYON 190 81	221	143074	2.6	11.3701	0.7	2.9306	2.9	0.2417	2.8	0.97	1395.4	35.0	1389.8	21.8	1381.4	13.9	1381.4	13.9	101.0
BENYON 190 100	37	28122	1.4	11.1751	2.7	3.0825	4.4	0.2498	3.5	0.79	1437.6	44.7	1428.3	33.6	1414.5	51.1	1414.5	51.1	101.6
BENYON 190 78	252	60472	2.5	11.0185	0.7	3.1115	2.7	0.2487	2.6	0.97	1431.5	33.7	1435.5	20.9	1441.5	13.6	1441.5	13.6	99.3
BENYON 190 32	167	155288	1.4	10.9958	1.1	3.2034	2.1	0.2555	1.8	0.86	1466.6	23.6	1458.0	16.2	1445.4	20.5	1445.4	20.5	101.5
BENYON 190 71	59	36523	2.0	10.9665	2.6	3.1637	5.5	0.2516	4.9	0.88	1446.9	62.9	1448.3	42.4	1450.5	48.9	1450.5	48.9	99.8
BENYON 190 76	133	82409	0.9	10.9258	0.8	3.1606	1.4	0.2504	1.1	0.79	1440.8	14.3	1447.6	10.7	1457.6	16.1	1457.6	16.1	98.8
BENYON 190 41	179	167915	1.4	10.8953	0.6	3.2760	2.5	0.2589	2.4	0.97	1484.1	31.7	1475.4	19.3	1462.9	12.3	1462.9	12.3	101.4
BENYON 190 91	148	136877	2.0	10.8489	0.5	3.3566	1.5	0.2641	1.4	0.94	1510.8	18.4	1494.3	11.4	1471.0	9.5	1471.0	9.5	102.7
BENYON 190 46	117	19728	2.1	10.8424	2.1	3.1104	3.8	0.2446	3.2	0.83	1410.5	40.0	1435.3	29.2	1472.1	40.1	1472.1	40.1	95.8
BENYON 190 94	69	40885	0.9	10.7888	1.4	3.3096	1.7	0.2590	1.0	0.61	1484.6	13.7	1483.3	13.3	1481.5	25.8	1481.5	25.8	100.2
BENYON 190 95	288	181534	1.9	10.7869	0.6	3.2680	1.3	0.2557	1.2	0.90	1467.7	15.5	1473.5	10.2	1481.9	11.0	1481.9	11.0	99.0
BENYON 190 44	150	93338	0.9	10.7264	1.1	3.1661	2.0	0.2463	1.7	0.84	1419.4	22.0	1448.9	15.8	1492.5	20.8	1492.5	20.8	95.1
BENYON 190 9	360	141812	5.5	10.3836	0.4	3.6987	1.4	0.2785	1.3	0.96	1584.0	18.8	1571.1	11.1	1553.7	7.3	1553.7	7.3	101.9
BENYON 190 48	102	19983	1.6	10.3055	1.7	3.5619	2.2	0.2662	1.4	0.62	1521.6	18.3	1541.1	17.4	1567.9	32.4	1567.9	32.4	97.0
BENYON 190 43	142	80280	2.1	9.8817	0.5	4.2637	2.7	0.3056	2.6	0.98	1718.9	39.7	1686.4	22.0	1646.2	9.5	1646.2	9.5	104.4
BENYON 190 65	298	244648	2.6	9.5384	0.3	4.2700	1.0	0.2954	0.9	0.95	1668.4	13.7	1687.6	8.1	1711.5	5.6	1711.5	5.6	97.5
BENYON 190 53	190	94522	1.6	9.5323	0.5	4.3875	1.4	0.3033	1.4	0.93	1707.8	20.3	1710.0	12.0	1712.7	9.5	1712.7	9.5	99.7
BENYON 190 52	170	96889	1.4	9.4139	0.7	4.1113	1.8	0.2807	1.7	0.91	1594.9	23.5	1656.5	14.9	1735.6	13.7	1735.6	13.7	91.9
BENYON 190 6	110	129331	1.7	9.3417	0.9	4.6484	1.4	0.3149	1.2	0.80	1765.0	17.8	1758.0	12.1	1749.7	15.9	1749.7	15.9	100.9
BENYON 190 93	273	149489	2.6	8.9128	0.5	5.0964	0.9	0.3294	0.7	0.84	1835.7	11.8	1835.5	7.5	1835.3	8.7	1835.3	8.7	100.0
BENYON 190 63	178	107157	1.8	8.8895	0.7	5.0547	1.2	0.3259	1.0	0.84	1818.4	16.2	1828.5	10.4	1840.1	12.1	1840.1	12.1	98.8
BENYON 190 84	112	20048	3.7	8.8611	1.1	5.1320	1.8	0.3298	1.4	0.77	1837.5	21.9	1841.4	15.1	1845.8	20.4	1845.8	20.4	99.5
BENYON 190 74	166	88072	1.1	8.8137	0.4	5.2387	1.2	0.3349	1.2	0.95	1861.9	18.8	1858.9	10.4	1855.5	6.8	1855.5	6.8	100.3
BENYON 190 42	102	110269	2.1	5.9529	0.8	10.8337	2.4	0.4677	2.3	0.95	2473.6	47.1	2509.0	22.5	2537.7	13.0	2537.7	13.0	97.5
BENYON 190 39	201	63262	1.5	5.5627	0.4	12.9121	1.3	0.5209	1.3	0.96	2703.1	27.9	2673.3	12.4	2650.7	6.1	2650.7	6.1	102.0
BENYON 190 26	31	43960	0.4	2.9141	1.1	36.3907	1.9	0.7691	1.6	0.82	3677.6	43.8	3677.1	18.8	3676.9	16.5	3676.9	16.5	100.0

Sample 7 (1AB/06-34-084-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BENYON 247-21	844	44309	1.7	20.5332	3.9	0.1221	4.3	0.0182	1.8	0.42	116.2	2.1	117.0	4.7	133.5	90.6	116.2	2.1	NA
BENYON 247-90	614	58470	1.8	18.5386	1.7	0.4423	2.1	0.0595	1.2	0.56	372.4	4.2	371.9	6.5	368.6	39.2	372.4	4.2	NA
BENYON 247-10	387	22656	2.2	18.5368	2.3	0.4448	2.9	0.0598	1.9	0.64	374.4	6.8	373.6	9.2	368.8	51.1	374.4	6.8	NA
BENYON 247-55	203	41219	2.2	18.1946	3.7	0.4941	4.6	0.0652	2.7	0.59	407.2	10.6	407.7	15.3	410.6	82.2	407.2	10.6	99.2
BENYON 247-65	156	20583	1.5	19.0654	5.9	0.4906	6.4	0.0678	2.4	0.38	423.1	10.0	405.3	21.4	305.1	135.1	423.1	10.0	138.7
BENYON 247-1	319	44801	1.3	18.0688	2.0	0.5283	2.4	0.0692	1.4	0.58	431.5	5.9	430.7	8.6	426.1	44.5	431.5	5.9	101.3
BENYON 247-2	298	34032	1.2	16.9040	3.1	0.7237	4.0	0.0887	2.5	0.63	548.0	13.2	552.8	17.0	572.9	67.3	548.0	13.2	95.7
BENYON 247-48	169	30072	1.8	16.5579	3.9	0.8068	4.3	0.0969	1.9	0.43	596.1	10.6	600.7	19.7	617.7	84.8	596.1	10.6	96.5
BENYON 247-37	215	10746	0.7	16.0531	3.7	0.8923	6.5	0.1039	5.3	0.81	637.1	31.9	647.6	30.9	684.2	80.0	637.1	31.9	93.1
BENYON 247-58	185	32167	1.5	16.1928	1.7	0.9179	3.4	0.1078	3.0	0.87	659.9	18.8	661.2	16.7	665.7	35.7	659.9	18.8	99.1
BENYON 247-19	39	33553	1.7	14.3010	7.6	1.5672	7.9	0.1626	2.2	0.27	970.9	19.6	957.3	49.2	926.1	156.9	926.1	156.9	104.8
BENYON 247-7	220	78691	0.9	14.0683	1.7	1.4005	7.9	0.1429	7.7	0.98	861.0	62.3	889.2	46.9	959.8	34.8	959.8	34.8	89.7
BENYON 247-76	68	21247	1.9	13.9644	3.4	1.5492	3.7	0.1569	1.4	0.37	939.6	11.9	950.2	22.6	974.9	69.4	974.9	69.4	96.4
BENYON 247-63	143	44955	4.9	13.8601	2.0	1.7179	2.9	0.1727	2.1	0.72	1026.9	19.8	1015.2	18.5	990.2	40.5	990.2	40.5	103.7
BENYON 247-14	26	6360	1.3	13.8601	8.7	1.6730	9.5	0.1682	3.8	0.40	1002.1	35.4	998.3	60.7	990.2	178.2	990.2	178.2	101.2
BENYON 247-91	55	7765	2.3	13.7852	3.8	1.7609	4.8	0.1760	2.9	0.62	1045.4	28.4	1031.2	30.9	1001.2	76.2	1001.2	76.2	104.4
BENYON 247-20	83	27262	1.5	13.7605	3.1	1.7334	3.4	0.1730	1.5	0.43	1028.6	13.9	1021.0	22.0	1004.8	62.5	1004.8	62.5	102.4
BENYON 247-93	54	26748	2.4	13.7574	4.2	1.7056	4.7	0.1702	2.0	0.43	1013.1	18.8	1010.6	30.0	1005.3	86.0	1005.3	86.0	100.8
BENYON 247-24	188	123752	2.7	13.7466	0.9	1.7089	1.4	0.1704	1.1	0.78	1014.2	10.2	1011.9	9.0	1006.9	17.8	1006.9	17.8	100.7
BENYON 247-94	225	58276	2.8	13.7010	1.3	1.7232	1.6	0.1712	0.9	0.57	1018.9	8.6	1017.2	10.3	1013.6	26.7	1013.6	26.7	100.5
BENYON 247-62	40	11951	1.3	13.6911	2.8	1.7099	4.1	0.1698	3.0	0.73	1010.9	27.7	1012.2	26.0	1015.0	56.3	1015.0	56.3	99.6
BENYON 247-56	65	17222	1.6	13.6095	4.0	1.8674	4.2	0.1843	1.3	0.30	1090.5	12.6	1069.6	28.0	1027.1	81.7	1027.1	81.7	106.2
BENYON 247-59	133	17703	4.1	13.5893	1.1	1.7341	1.4	0.1709	0.9	0.60	1017.1	8.2	1021.3	9.3	1030.2	23.2	1030.2	23.2	98.7
BENYON 247-8	47	15204	2.3	13.5575	3.4	1.8797	3.7	0.1848	1.6	0.43	1093.3	16.2	1074.0	24.7	1034.9	68.0	1034.9	68.0	105.6
BENYON 247-5	173	55672	1.3	13.5362	1.6	1.8326	1.9	0.1799	1.1	0.57	1066.5	10.9	1057.2	12.7	1038.1	32.1	1038.1	32.1	102.7
BENYON 247-39	160	59639	3.0	13.5307	1.0	1.7875	3.2	0.1754	3.0	0.95	1041.9	29.0	1040.9	20.7	1038.9	20.1	1038.9	20.1	100.3
BENYON 247-28	264	92427	1.7	13.5093	1.1	1.7691	1.5	0.1733	1.1	0.71	1030.5	10.4	1034.2	9.9	1042.1	21.8	1042.1	21.8	98.9
BENYON 247-38	132	30084	2.8	13.4857	1.1	1.7698	4.1	0.1731	4.0	0.97	1029.2	37.7	1034.5	26.6	1045.7	21.5	1045.7	21.5	98.4
BENYON 247-50	86	43759	2.1	13.4789	3.0	1.8238	4.9	0.1783	3.9	0.79	1057.7	37.7	1054.1	32.0	1046.7	59.9	1046.7	59.9	101.1
BENYON 247-22	32	20840	1.4	13.4125	5.0	1.9731	8.9	0.1919	7.4	0.83	1131.9	76.9	1106.4	60.4	1056.6	101.2	1056.6	101.2	107.1
BENYON 247-101	98	16605	2.1	13.3805	1.5	1.8719	1.9	0.1817	1.3	0.65	1076.0	12.5	1071.2	12.8	1061.4	29.4	1061.4	29.4	101.4
BENYON 247-46	192	70453	1.3	13.3614	1.0	1.8424	1.6	0.1785	1.2	0.77	1059.0	12.2	1060.7	10.6	1064.3	20.6	1064.3	20.6	99.5
BENYON 247-100	48	12965	1.1	13.3391	6.7	1.9093	6.9	0.1847	1.7	0.24	1092.7	17.0	1084.3	46.1	1067.6	134.7	1067.6	134.7	102.3
BENYON 247-17	107	44325	4.5	13.3082	1.6	1.8672	1.9	0.1802	1.1	0.55	1068.2	10.5	1069.5	12.8	1072.3	32.3	1072.3	32.3	99.6
BENYON 247-47	267	112651	1.6	13.2823	0.9	1.9794	1.6	0.1907	1.3	0.82	1125.1	13.8	1108.5	11.0	1076.2	18.7	1076.2	18.7	104.5
BENYON 247-32	50	6964	3.2	13.2388	4.6	1.8983	5.1	0.1823	2.1	0.41	1079.4	20.7	1080.5	33.8	1082.8	93.1	1082.8	93.1	99.7
BENYON 247-6	239	59792	1.0	13.2186	0.7	1.8992	1.2	0.1821	1.0	0.81	1078.3	9.5	1080.8	7.8	1085.8	13.7	1085.8	13.7	99.3
BENYON 247-84	98	3755	2.4	13.1177	2.9	1.9481	3.2	0.1853	1.3	0.39	1096.1	12.6	1097.8	21.3	1101.2	58.4	1101.2	58.4	99.5
BENYON 247-64	105	38918	2.5	12.8324	1.5	2.0643	2.9	0.1921	2.5	0.86	1132.9	25.7	1137.0	19.7	1145.1	29.3	1145.1	29.3	98.9
BENYON 247-42	166	67648	3.2	12.7799	1.1	2.0641	3.7	0.1913	3.5	0.95	1128.5	36.8	1137.0	25.5	1153.1	22.6	1153.1	22.6	97.9
BENYON 247-96	177	67890	3.2	12.7167	1.0	2.0979	4.1	0.1935	4.0	0.97	1140.2	41.7	1148.1	28.2	1163.0	19.3	1163.0	19.3	98.0
BENYON 247-35	31	14871	2.0	12.6676	8.0	2.1178	8.2	0.1946	1.4	0.17	1146.1	14.9	1154.6	56.3	1170.7	159.2	1170.7	159.2	97.9
BENYON 247-82	125	40173	2.8	12.6203	1.2	2.3452	2.3	0.2147	1.9	0.86	1253.6	22.2	1226.1	16.1	1178.1	23.0	1178.1	23.0	106.4
BENYON 247-71	89	35784	3.0	12.5920	2.9	2.1403	4.0	0.1955	2.7	0.68	1150.9	28.8	1161.9	27.8	1182.5	58.2	1182.5	58.2	97.3
BENYON 247-34	36	12210	1.6	12.1583	3.9	2.2499	4.5	0.1984	2.1	0.47	1166.7	22.6	1196.8	31.3	1251.5	76.7	1251.5	76.7	93.2
BENYON 247-81	131	24879	1.7	11.8962	1.6	2.5635	2.4	0.2212	1.8	0.74	1288.1	20.9	1290.3	17.6	1293.9	31.4	1293.9	31.4	99.5
BENYON 247-49	90	40313	2.3	11.4230	1.8	2.9615	3.0	0.2454	2.4	0.80	1414.5	30.1	1397.8	22.5	1372.5	34.4	1372.5	34.4	103.1
BENYON 247-4	172	71587	1.8	11.2722	0.7	3.0535	2.8	0.2496	2.7	0.97	1436.6	34.8	1421.1	21.3	1398.0	13.3	1398.0	13.3	102.8
BENYON 247-26	106	34358	2.5	10.8998	1.1	3.3304	2.4	0.2633	2.2	0.90	1506.6	29.6	1488.2	19.1	1462.1	20.3	1462.1	20.3	103.0
BENYON 247-51	33	30340	0.5	10.8152	2.5	3.2821	3.2	0.2574	2.1	0.65	1476.7	27.7	1476.8	25.2	1476.9	46.7	1476.9	46.7	100.0
BENYON 247-40	69	32583	4.2	10.8092	1.4	3.2008	1.6	0.2509	0.9	0.54	1443.3	11.4	1457.3	12.6	1477.9	26.1	1477.9	26.1	97.7
BENYON 247-103	388	111116	2.5	10.0286	0.4	3.9917	1.4	0.2903	1.3	0.95	1643.2	19.2	1632.5	11.3	1618.8	7.8	1618.8	7.8	101.5
BENYON 247-53	293	81347	1.6	9.7860	0.4	4.1636	2.6	0.2955	2.6	0.99	1669.0	38.4	1666.9	21.6	1664.2	7.7	1664.2	7.7	100.3
BENYON 247-70	161	1748	3.7	9.2624	3.2	4.4516	4.0	0.2990	2.4	0.61	1686.6	36.3	1722.0	33.1	1765.3	57.7	1765.3	57.7	95.5
BENYON 247-31	225	76566	1.4	9.2601	0.2	4.6045	2.0	0.3092	2.0	0.99	1737.0	30.3	1750.1	16.7	1765.8	4.2	1765.8	4.2	98.4
BENYON 247-61	124	180861	2.1	9.2239	0.6	4.7817	1.2	0.3199	1.1	0.88	1789.2	16.8	1781.7	10.3	1772.9	10.7	1772.9	10.7	100.9
BENYON 247-44	84	39326	2.5	9.1676	1.3	4.7889	2.7	0.3184	2.4	0.87	1782.0	36.9	1783.0	22.9	1784.1	24.5	1784.1	24.5	99.9
BENYON 247-74	157	90373	2.7	9.1636	0.5	4.8056	2.0	0.3194	1.9	0.97	1786.7	29.7	1785.9	16.4	1784.9	8.3	1784.9	8.3	100.1
BENYON 247-68	110	55546	1.5	8.9520	0.7	5.0562	2.0	0.3283	1.8	0.93	1830.0	29.0	1828.8	16.6	1827.4	13.0	1827.4	13.0	100.1
BENYON 247-3	56	30688	1.8	8.9292	0.9	5.1693	1.5	0.3348	1.2	0.79	1861.5	19.6	1847.6	13.0	1832.0	16.8	1832.0	16.8	101.6
BENYON 247-12	63	64580	3.1	8.9162	1.4	5.2077	1.7	0.3368	1.0	0.59	1871.1	16.4	1853.9	14.5	1834.6	24.9	1834.6	24.9	102.0
BENYON 247-45	87	83120	1.3	8.9114	1.2	5.0974	1.7	0.3295	1.1	0.67	1835.7	17.9	1835.7	14.2	1835.6	22.3	1835.6	22.3	100.0
BENYON 247-30	138	139864	3.1	8.9060	0.5	5.0891	1.6	0.3287	1.6	0.96	1832.2	24.8	1834.3	13.8	1836.7	8.5	1836.7	8.5	99.8
BENYON 247-11	51	63344	0.5	8.8963	1.3	5.1256	1.7	0.3307	1.1	0.65	1841.8	17.5	1840.4	14.2	1838.7	22.9	1838.7	22.9	100.2
BENYON 247-83	59	31636	1.0	8.8816	1.5	5.2635	2.6	0.3391	2.1	0.81	1882.1	34.8	1863.0	22.4	1841.7	27.7	1841.7	27.7	102.2
BENYON 247-60	112	46085	1.7	8.8730	0.8	5.1869	1.6	0.3338	1.4	0.87	1856.8	22.9	1850.5	13.8	1843.4	14.3	1843.4	14.3	100.7
BENYON 247-9	54	52228	0.8	8.8563	1.2	5.1716	3.0	0.3322	2.7	0.91	1848.9	43.2	1847.9	25.1	1846.8	22.1	1846.8	22.1	100.1
BENYON 247-105	207	38349	1.9	8.8395	0.4	5.0583	1.9	0.3243	1.9	0.97	1810.6	29.6	1829.1	16.3	1850.2	7.8	1850.2	7.8	97.9
BENYON 247-25	94	37263	1.9	8.8350	0.5	5.3593	2.8	0.3434	2.8	0.99	1903.0	46.1	1878.4	24.2	1851.2	8.4	1851.2	8.4	102.8
BENYON 247-104	194	34372	0.9	8.8217	0.5	4.9553	3.4	0.3170	3.4	0.99	1775.3	52.8	1811.7	29.1	1853.9	9.9	1853.9	9.9	95.8
BENYON 247-78	86	17524	1.1	8.8154	1.1	5.2931	2.1	0.3384	1.8	0.84	1879.0	29.4	1867.7	18.3	1855.2	20.8	1855.2	20.8	101.3
BENYON 247-41	68	40324	1.8	8.8012	0.7	5.2399	1.2	0.3345	1.0	0.80	1860.0	15.5	1859.1	10.2	1858.1	13.0	1858.1	13.0	100.1
BENYON 247-69	44	21556	0.7	8.7918	1.4	5.2663	1.7	0.3358	1.0	0.58	1866.4	16.3	1863.4	14.9	1860.0	25.7	1860.0	25.7	100.3
BENYON 247-23	92	21414	2.5	8.7811	0.7	5.3047	1.4	0.3378	1.2	0.86	1876.3	20.0	1869.6	12.2	1862.2	13.1	1862.2	13.1	100.8
BENYON 247-67	88	50368	2.6	8.7731	0.9	5.2938	1.5	0.3368	1.2	0.81	1871.4	20.2	1867.9	13.0	1863.9	15.9	1863.9	15.9	100.4
BENYON 247-87	109	104261	1.7	8.7055	0.9	5.4232	1.5	0.3424	1.2	0.80	1898.2	20.1	1888.5	13.1	1877.8	16.4	1877.8	16.4	101.1
BENYON 247-33	63	22591	4.5	8.6597	0.9	5.3544	1.6	0.3363	1.3	0.83	1868.8	21.8	1877.6	13.8	1887.3	16.1	1887.3	16.1	99.0
BENYON 247-85	37	5091	1.0	8.6443	3.0	5.5999	3.6	0.3511	1.9	0.54	1939.8	32.4	1916.1	30.9	1890.5	54.4	1890.5	54.4	102.6
BENYON 247-13	107	9046	2.2	8.5926	4.1	5.2704	6.7	0.3284	5.3	0.79	1830.9	84.1	1864.1	57.2	1901.3	74.2	1901.3	74.2	96.3
BENYON 247-72	130	59294	1.8	7.8082	0.6	6.7855	1.9	0.3843	1.8	0.95	2096.2	31.5	2083.8	16.4	2071.6	10.1	2071.6	10.1	101.2
BENYON 247-97	196	39353	1.9	6.2847	0.5	8.5846	1.2	0.3913	1.1	0.90	2128.8	19.4	2294.9	10.8	2446.3	8.9	2446.3	8.9	87.0
BENYON 247-77	147	14126	2.5	6.1305	0.6	9.9038	2.2	0.4404	2.2	0.96	2352.2	42.6	2425.9	20.7	2488.2	10.4	2488.2	10.4	94.5
BENYON 247-99	161	13795	2.2	5.9089	1.4	11.1430	3.1	0.4775	2.7	0.88	2516.5	56.8	2535.2	28.7	2550.1	24.1	2550.1	24.1	98.7
BENYON 247-27	72	45022	1.8	5.9035	0.6	11.3242	1.2	0.4849	1.1	0.88	2548.4	22.5	2550.2	11.3	2551.6	9.6	2551.6	9.6	99.9
BENYON 247-89	74	47818	2.2	5.8628	0.3	11.5799	1.0	0.4924	0.9	0.97	2581.0	20.1	2571.1	9.1	2563.2	4.2	2563.2	4.2	100.7
BENYON 247-88	161	123040	1.3	5.8568	0.2	11.7445	1.4	0.4989	1.4	0.99	2609.0	29.2	2584.3	12.9	2564.9	2.9	2564.9	2.9	101.7
BENYON 247-43	86	121979	2.2	5.8500	0.3	11.4888	0.8	0.4874	0.8	0.93	2559.6	16.0	2563.7	7.6	2566.9	4.8	2566.9	4.8	99.7
BENYON 247-54	18	16767	1.5	5.5904	1.8	12.5014	2.3	0.5069	1.4	0.61	2643.3	31.2	2642.8	22.0	2642.5	30.7	2642.5	30.7	100.0
BENYON 247-16	12	4405	2.3	5.5004	3.1	12.9030	6.0	0.5147	5.2	0.85	2676.8	113.2	2672.6	57.0	2669.4	52.1	2669.4	52.1	100.3
BENYON 247-73	91	31396	1.1	5.4677	0.4	12.6942	1.4	0.5034	1.3	0.96	2628.3	28.4	2657.2	12.9	2679.3	6.5	2679.3	6.5	98.1
BENYON 247-52	113	104300	2.4	5.4556	0.4	13.0868	1.5	0.5178	1.5	0.97	2689.9	32.3	2685.9	14.3	2682.9	6.3	2682.9	6.3	100.3
BENYON 247-98	69	55663	1.1	5.4517	0.5	13.0762	1.4	0.5170	1.3	0.94	2686.6	28.0	2685.2	12.8	2684.1	7.6	2684.1	7.6	100.1
BENYON 247-86	90	64866	0.9	5.4508	0.5	13.1815	1.1	0.5211	1.0	0.90	2703.9	21.4	2692.7	10.2	2684.4	7.8	2684.4	7.8	100.7
BENYON 247-29	93	112194	0.8	5.4336	0.6	13.0890	1.5	0.5158	1.4	0.90	2681.4	29.9	2686.1	14.2	2689.6	10.7	2689.6	10.7	99.7
BENYON 247-18	45	82363	1.0	5.4143	0.5	12.9754	2.4	0.5095	2.4	0.98	2654.6	51.3	2677.9	22.7	2695.5	8.3	2695.5	8.3	98.5
BENYON 247-36	205	250172	4.4	5.2761	0.2	14.2623	4.6	0.5458	4.6	1.00	2807.5	105.6	2767.3	44.1	2738.1	2.7	2738.1	2.7	102.5
BENYON 247-102	77	12886	3.9	4.7855	0.5	15.9061	1.5	0.5521	1.4	0.95	2833.7	32.6	2871.2	14.3	2897.5	7.9	2897.5	7.9	97.8
BENYON 247-66	25	22224	2.1	4.7379	1.0	16.8026	1.9	0.5774	1.6	0.86	2938.0	38.5	2923.6	18.2	2913.7	15.7	2913.7	15.7	100.8
BENYON 247-75	72	63838	2.4	4.7057	0.5	17.1442	2.2	0.5851	2.2	0.98	2969.6	51.7	2942.9	21.3	2924.8	7.3	2924.8	7.3	101.5

Sample 8 (1AB/06-34-084-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BENYON 316-6	873	31222	1.7	21.0684	4.3	0.1531	4.4	0.0234	0.9	0.21	149.1	1.4	144.7	6.0	72.7	102.8	149.1	1.4	NA
BENYON 316-74	764	40576	1.7	20.4705	2.9	0.1634	3.8	0.0243	2.5	0.65	154.5	3.8	153.7	5.4	140.7	67.8	154.5	3.8	NA
BENYON 316-83	104	4422	0.3	24.4034	21.6	0.1453	21.9	0.0257	3.5	0.16	163.7	5.7	137.7	28.2	-288.9	555.9	163.7	5.7	NA
BENYON 316-79	437	21931	5.4	20.7171	6.2	0.1729	6.9	0.0260	3.0	0.44	165.3	5.0	161.9	10.3	112.5	146.6	165.3	5.0	NA
BENYON 316-22	177	10534	2.7	20.4762	7.6	0.1868	7.9	0.0277	2.1	0.26	176.4	3.6	173.9	12.6	140.0	179.0	176.4	3.6	NA
BENYON 316-52	284	32476	1.5	20.1402	5.8	0.2467	6.2	0.0360	2.1	0.34	228.2	4.7	223.9	12.5	178.7	136.0	228.2	4.7	NA
BENYON 316-38	206	52234	1.6	19.4733	6.3	0.2595	6.5	0.0367	1.8	0.28	232.1	4.2	234.3	13.7	256.7	144.1	232.1	4.2	NA
BENYON 316-21	232	26963	1.1	19.5842	2.9	0.2655	4.0	0.0377	2.8	0.70	238.6	6.6	239.1	8.6	243.6	66.6	238.6	6.6	NA
BENYON 316-57	273	26512	1.5	19.9842	6.5	0.2646	6.7	0.0384	1.9	0.28	242.6	4.5	238.4	14.3	196.8	150.3	242.6	4.5	NA
BENYON 316-62	401	28012	1.9	19.6561	3.7	0.2805	4.2	0.0400	2.0	0.48	252.7	5.0	251.0	9.3	235.2	84.9	252.7	5.0	NA
BENYON 316-95	368	37466	0.7	18.9015	2.6	0.3607	3.1	0.0494	1.7	0.56	311.1	5.2	312.7	8.3	324.7	58.0	311.1	5.2	NA
BENYON 316-51	154	18057	1.1	18.1359	6.4	0.3911	7.0	0.0514	2.7	0.39	323.4	8.6	335.2	20.0	417.9	144.2	323.4	8.6	NA
BENYON 316-94	610	134058	48.5	18.5118	0.9	0.4385	1.5	0.0589	1.2	0.78	368.8	4.2	369.2	4.6	371.8	21.2	368.8	4.2	NA
BENYON 316-98	561	54970	3.4	18.3691	1.2	0.4587	2.1	0.0611	1.8	0.82	382.4	6.5	383.4	6.9	389.2	27.7	382.4	6.5	NA
BENYON 316-27	51	12620	25.2	19.6363	11.7	0.4316	12.1	0.0615	3.1	0.26	384.5	11.7	364.3	37.1	237.5	270.8	384.5	11.7	NA
BENYON 316-65	267	39564	0.8	17.9306	3.1	0.5179	3.7	0.0674	2.0	0.55	420.2	8.3	423.8	12.9	443.2	69.2	420.2	8.3	94.8
BENYON 316-8	212	34189	1.7	17.4411	2.8	0.6162	3.4	0.0779	1.9	0.56	483.8	9.1	487.4	13.3	504.5	62.6	483.8	9.1	95.9
BENYON 316-35	476	88830	6.9	16.6988	1.0	0.7394	8.6	0.0895	8.5	0.99	552.8	45.2	562.0	37.1	599.4	22.5	552.8	45.2	92.2
BENYON 316-9	155	46548	2.2	16.6071	2.3	0.8122	2.8	0.0978	1.6	0.58	601.7	9.2	603.7	12.6	611.3	48.7	601.7	9.2	98.4
BENYON 316-85	185	30244	1.8	16.5205	1.6	0.8989	3.6	0.1077	3.2	0.89	659.4	19.8	651.1	17.1	622.6	35.2	659.4	19.8	105.9
BENYON 316-64	81	18963	3.1	14.3669	4.5	1.3782	5.2	0.1436	2.6	0.49	865.0	20.7	879.7	30.4	916.7	92.2	865.0	20.7	94.4
BENYON 316-46	247	62116	3.1	13.9181	1.1	1.6149	1.6	0.1630	1.2	0.73	973.5	10.9	976.0	10.3	981.7	22.7	981.7	22.7	99.2
BENYON 316-90	135	44982	2.6	13.7022	0.9	1.7037	2.5	0.1693	2.3	0.93	1008.3	21.6	1009.9	15.9	1013.4	18.2	1013.4	18.2	99.5
BENYON 316-60	46	12901	1.8	13.6332	3.5	1.7512	4.2	0.1732	2.3	0.55	1029.5	21.9	1027.6	27.1	1023.6	70.9	1023.6	70.9	100.6
BENYON 316-40	183	115648	3.0	13.5160	1.2	1.7360	1.8	0.1702	1.3	0.74	1013.1	12.6	1022.0	11.8	1041.1	25.1	1041.1	25.1	97.3
BENYON 316-11	239	129337	5.4	13.4481	0.7	1.8166	1.2	0.1772	1.0	0.80	1051.6	9.6	1051.5	8.1	1051.3	15.1	1051.3	15.1	100.0
BENYON 316-13	311	104460	1.9	13.4480	1.1	1.8178	1.6	0.1773	1.2	0.75	1052.2	11.7	1051.9	10.5	1051.3	21.5	1051.3	21.5	100.1
BENYON 316-39	251	82932	1.2	13.2429	0.5	1.8977	1.3	0.1823	1.2	0.93	1079.4	12.3	1080.3	8.8	1082.2	9.4	1082.2	9.4	99.7
BENYON 316-71	97	28867	1.4	13.1200	1.9	1.9428	2.0	0.1849	0.7	0.36	1093.5	7.1	1096.0	13.3	1100.8	37.2	1100.8	37.2	99.3
BENYON 316-19	114	35976	1.3	13.0575	1.8	2.0078	2.4	0.1901	1.7	0.68	1122.1	17.0	1118.1	16.4	1110.4	35.3	1110.4	35.3	101.1
BENYON 316-2	279	92739	5.7	12.9898	0.8	1.9432	2.6	0.1831	2.5	0.95	1083.7	24.7	1096.1	17.5	1120.8	16.4	1120.8	16.4	96.7
BENYON 316-26	161	62340	2.2	12.9772	2.0	2.0067	2.9	0.1889	2.2	0.74	1115.2	22.3	1117.8	19.8	1122.7	38.9	1122.7	38.9	99.3
BENYON 316-69	216	92086	3.7	12.8745	0.9	1.9895	1.4	0.1858	1.1	0.78	1098.4	11.3	1111.9	9.7	1138.5	17.8	1138.5	17.8	96.5
BENYON 316-7	147	71339	3.1	12.8269	1.3	2.0702	1.9	0.1926	1.4	0.71	1135.4	14.1	1139.0	13.1	1145.9	26.8	1145.9	26.8	99.1
BENYON 316-15	126	50988	2.1	12.6761	0.8	2.1496	2.5	0.1976	2.3	0.95	1162.6	24.9	1164.9	17.1	1169.3	15.7	1169.3	15.7	99.4
BENYON 316-102	130	3053	2.4	11.8685	2.8	2.4305	3.5	0.2092	2.1	0.60	1224.6	23.5	1251.7	25.5	1298.5	55.3	1298.5	55.3	94.3
BENYON 316-100	288	108652	1.0	11.7121	0.3	2.6022	1.0	0.2210	1.0	0.96	1287.4	11.6	1301.3	7.6	1324.2	5.8	1324.2	5.8	97.2
BENYON 316-14	155	59290	2.9	11.3236	0.7	2.8730	1.6	0.2360	1.5	0.91	1365.6	17.9	1374.9	12.1	1389.2	12.7	1389.2	12.7	98.3
BENYON 316-25	39	15119	1.1	11.2951	1.8	2.8827	2.0	0.2361	0.7	0.37	1366.6	9.0	1377.4	14.8	1394.1	35.0	1394.1	35.0	98.0
BENYON 316-47	350	135167	3.6	11.0576	0.4	3.0319	0.9	0.2431	0.8	0.88	1403.0	10.0	1415.7	6.9	1434.7	8.0	1434.7	8.0	97.8
BENYON 316-86	447	403777	2.0	11.0219	0.4	3.1230	1.9	0.2496	1.8	0.98	1436.7	23.6	1438.4	14.4	1440.9	6.7	1440.9	6.7	99.7
BENYON 316-72	346	188743	3.1	11.0129	0.3	3.0674	1.2	0.2450	1.1	0.96	1412.6	14.3	1424.6	8.9	1442.4	5.9	1442.4	5.9	97.9
BENYON 316-81	327	245019	1.7	11.0079	0.4	3.1226	2.3	0.2493	2.3	0.98	1434.8	29.3	1438.3	17.8	1443.3	8.3	1443.3	8.3	99.4
BENYON 316-66	132	89904	1.4	10.9871	1.4	3.1450	2.1	0.2506	1.5	0.74	1441.6	19.5	1443.8	15.8	1446.9	26.5	1446.9	26.5	99.6
BENYON 316-77	134	141715	2.0	10.6375	0.6	3.3686	2.0	0.2599	1.9	0.96	1489.3	25.5	1497.1	15.6	1508.2	10.6	1508.2	10.6	98.7
BENYON 316-89	142	103645	4.5	10.1178	1.2	3.5714	2.7	0.2621	2.5	0.90	1500.4	32.9	1543.2	21.7	1602.2	22.4	1602.2	22.4	93.6
BENYON 316-70	46	37130	1.9	9.9210	1.4	3.9341	2.2	0.2831	1.7	0.76	1606.8	23.6	1620.7	17.7	1638.8	26.4	1638.8	26.4	98.0
BENYON 316-88	261	197572	1.2	9.8397	0.4	3.9698	1.0	0.2833	0.9	0.91	1608.0	12.5	1628.0	7.9	1654.1	7.5	1654.1	7.5	97.2
BENYON 316-92	154	56415	1.1	9.8379	0.5	4.0190	1.9	0.2868	1.8	0.96	1625.3	25.6	1638.1	15.1	1654.4	9.9	1654.4	9.9	98.2
BENYON 316-49	357	352824	2.5	9.8359	0.3	3.9939	1.6	0.2849	1.6	0.99	1616.0	22.9	1633.0	13.2	1654.8	4.6	1654.8	4.6	97.7
BENYON 316-56	243	120007	4.5	9.7022	0.4	4.2646	2.2	0.3001	2.2	0.99	1691.7	32.3	1686.6	18.1	1680.1	6.6	1680.1	6.6	100.7
BENYON 316-59	194	103605	0.6	9.6414	0.8	4.1403	1.6	0.2895	1.4	0.88	1639.1	20.9	1662.3	13.4	1691.7	14.4	1691.7	14.4	96.9
BENYON 316-93	79	37179	2.7	9.4943	1.5	4.0355	1.9	0.2779	1.2	0.63	1580.7	16.9	1641.4	15.5	1720.0	27.2	1720.0	27.2	91.9
BENYON 316-53	154	113462	2.3	9.3756	1.0	4.3987	1.7	0.2991	1.4	0.83	1686.9	21.3	1712.1	14.4	1743.1	17.9	1743.1	17.9	96.8
BENYON 316-55	160	120290	2.4	9.3128	0.5	4.5517	1.2	0.3074	1.1	0.92	1728.1	16.6	1740.5	9.9	1755.4	8.3	1755.4	8.3	98.4
BENYON 316-75	136	19152	3.3	9.3097	0.9	4.5698	2.0	0.3086	1.7	0.88	1733.6	26.4	1743.8	16.4	1756.0	17.0	1756.0	17.0	98.7
BENYON 316-12	498	337437	5.9	9.2945	0.2	4.6870	0.8	0.3159	0.8	0.96	1769.9	12.5	1764.9	7.0	1759.0	4.2	1759.0	4.2	100.6
BENYON 316-16	67	43237	2.6	9.2852	0.9	4.6961	2.1	0.3162	1.9	0.90	1771.4	29.5	1766.5	17.7	1760.8	16.8	1760.8	16.8	100.6
BENYON 316-44	272	147964	1.3	8.9712	0.4	5.0642	1.0	0.3295	0.9	0.90	1836.0	13.9	1830.1	8.2	1823.5	7.7	1823.5	7.7	100.7
BENYON 316-32	89	88659	1.5	8.9525	1.3	5.0574	1.8	0.3284	1.3	0.71	1830.5	19.9	1829.0	15.0	1827.3	22.7	1827.3	22.7	100.2
BENYON 316-73	30	22204	0.9	8.9307	2.8	5.0094	3.1	0.3245	1.5	0.47	1811.5	23.4	1820.9	26.5	1831.7	50.1	1831.7	50.1	98.9
BENYON 316-43	250	185306	0.9	8.9203	0.3	4.9356	1.1	0.3193	1.1	0.97	1786.4	17.4	1808.4	9.7	1833.8	5.0	1833.8	5.0	97.4
BENYON 316-42	35	15248	1.3	8.8879	2.0	5.0823	2.3	0.3276	1.1	0.49	1826.8	18.2	1833.2	19.9	1840.4	37.1	1840.4	37.1	99.3
BENYON 316-105	249	167142	1.5	8.8812	0.4	4.9633	1.2	0.3197	1.1	0.93	1788.2	16.7	1813.1	9.7	1841.7	7.7	1841.7	7.7	97.1
BENYON 316-91	59	46426	1.7	8.8553	1.0	5.1122	1.4	0.3283	1.0	0.69	1830.3	15.7	1838.1	12.2	1847.0	18.9	1847.0	18.9	99.1
BENYON 316-23	236	115658	2.0	8.8430	0.3	4.6984	1.1	0.3013	1.1	0.96	1697.9	16.1	1767.0	9.4	1849.5	5.6	1849.5	5.6	91.8
BENYON 316-34	60	56886	0.5	8.8400	0.8	5.0566	1.2	0.3242	0.8	0.71	1810.2	13.2	1828.9	10.0	1850.2	15.0	1850.2	15.0	97.8
BENYON 316-50	87	46240	2.5	8.8326	1.0	5.1314	1.4	0.3287	1.0	0.68	1832.2	15.6	1841.3	12.1	1851.7	18.9	1851.7	18.9	98.9
BENYON 316-68	205	245425	1.8	8.8281	0.6	5.0402	1.0	0.3227	0.8	0.82	1803.0	12.5	1826.1	8.2	1852.6	10.0	1852.6	10.0	97.3
BENYON 316-37	106	66578	1.6	8.6704	0.8	5.2867	1.2	0.3324	0.9	0.78	1850.2	15.2	1866.7	10.4	1885.1	13.9	1885.1	13.9	98.1
BENYON 316-28	118	90210	2.6	8.6343	0.5	5.4273	1.2	0.3399	1.1	0.91	1886.0	17.9	1889.2	10.3	1892.6	9.1	1892.6	9.1	99.7
BENYON 316-78	271	136414	2.1	8.5975	0.2	5.4555	0.8	0.3402	0.8	0.96	1887.5	12.5	1893.6	6.8	1900.3	3.8	1900.3	3.8	99.3
BENYON 316-104	331	368586	1.4	8.5894	0.4	4.9114	1.1	0.3060	1.0	0.94	1720.8	15.7	1804.2	9.4	1902.0	6.8	1902.0	6.8	90.5
BENYON 316-61	118	73494	2.0	8.5593	0.5	5.4902	1.1	0.3408	1.0	0.91	1890.6	17.0	1899.1	9.7	1908.3	8.2	1908.3	8.2	99.1
BENYON 316-33	51	12365	0.8	8.5350	2.5	5.3629	3.0	0.3320	1.6	0.54	1847.9	25.8	1878.9	25.3	1913.4	44.5	1913.4	44.5	96.6
BENYON 316-84	68	40415	1.2	8.4961	0.9	5.5678	1.3	0.3431	1.0	0.73	1901.5	16.1	1911.1	11.6	1921.6	16.5	1921.6	16.5	99.0
BENYON 316-20	105	68553	1.7	8.4578	0.8	5.6230	1.4	0.3449	1.1	0.80	1910.3	18.0	1919.6	11.7	1929.7	14.6	1929.7	14.6	99.0
BENYON 316-30	119	76122	0.8	8.3047	1.1	5.6559	2.3	0.3407	2.0	0.87	1889.8	32.2	1924.7	19.5	1962.3	19.7	1962.3	19.7	96.3
BENYON 316-45	118	120184	1.5	8.1606	0.6	5.9162	1.2	0.3502	1.1	0.88	1935.4	18.3	1963.6	10.8	1993.5	10.6	1993.5	10.6	97.1
BENYON 316-17	259	12961	1.4	7.8569	0.8	6.2588	1.6	0.3566	1.3	0.85	1966.3	22.5	2012.7	13.6	2060.7	14.4	2060.7	14.4	95.4
BENYON 316-10	85	112701	1.9	7.7829	0.7	6.7650	1.3	0.3819	1.1	0.85	2085.0	19.9	2081.2	11.6	2077.4	12.2	2077.4	12.2	100.4
BENYON 316-31	48	49765	0.7	7.7600	1.4	6.5693	2.8	0.3697	2.4	0.87	2028.1	42.2	2055.2	24.6	2082.6	24.2	2082.6	24.2	97.4
BENYON 316-18	82	101439	1.7	7.6628	0.7	6.7271	1.4	0.3739	1.2	0.86	2047.5	21.4	2076.2	12.5	2104.7	12.7	2104.7	12.7	97.3
BENYON 316-29	18	16350	2.1	7.6010	2.2	6.5340	6.2	0.3602	5.8	0.93	1983.1	98.4	2050.5	54.5	2118.9	39.2	2118.9	39.2	93.6
BENYON 316-48	18	23503	2.8	6.8653	3.0	7.7268	3.7	0.3847	2.1	0.58	2098.4	37.9	2199.7	32.9	2295.6	51.3	2295.6	51.3	91.4
BENYON 316-87	27	28472	0.4	6.0665	1.7	10.2121	3.2	0.4493	2.7	0.85	2392.2	54.9	2454.2	29.8	2505.9	28.5	2505.9	28.5	95.5
BENYON 316-36	97	188025	2.5	5.8057	0.6	11.4670	1.3	0.4828	1.2	0.89	2539.6	24.8	2561.9	12.3	2579.6	9.9	2579.6	9.9	98.5
BENYON 316-4	138	103461	1.4	5.6998	0.3	11.9551	1.4	0.4942	1.4	0.98	2588.9	29.8	2600.9	13.4	2610.3	4.8	2610.3	4.8	99.2
BENYON 316-103	91	138964	1.7	5.6583	0.5	12.0308	2.9	0.4937	2.8	0.99	2586.7	60.4	2606.8	26.9	2622.4	7.7	2622.4	7.7	98.6
BENYON 316-101	406	560240	2.8	5.6563	0.1	10.9179	0.8	0.4479	0.8	0.99	2385.9	15.8	2516.2	7.5	2623.0	2.1	2623.0	2.1	91.0
BENYON 316-54	233	170255	0.5	5.5415	0.3	12.3901	2.0	0.4980	2.0	0.99	2605.1	42.1	2634.4	18.6	2657.1	4.5	2657.1	4.5	98.0
BENYON 316-96	137	245153	1.1	5.5356	0.4	12.3941	1.6	0.4976	1.5	0.97	2603.5	33.2	2634.7	14.9	2658.8	6.0	2658.8	6.0	97.9
BENYON 316-82	253	15107	1.0	5.5023	0.3	11.6596	1.9	0.4653	1.9	0.99	2462.9	38.9	2577.5	18.0	2668.8	5.5	2668.8	5.5	92.3
BENYON 316-76	113	151867	1.4	5.4516	0.3	12.8342	3.0	0.5074	3.0	0.99	2645.7	65.7	2667.6	28.7	2684.2	5.6	2684.2	5.6	98.6
BENYON 316-67	98	108653	1.6	5.3024	0.3	13.8698	2.5	0.5334	2.5	0.99	2755.7	56.3	2740.9	24.0	2729.9	5.1	2729.9	5.1	100.9
BENYON 316-3	55	44355	2.0	5.2868	0.7	13.4956	2.0	0.5175	1.9	0.94	2688.4	42.1	2715.0	19.3	2734.8	11.5	2734.8	11.5	98.3
BENYON 316-97	79	147858	1.2	5.2819	0.4	13.5888	0.9	0.5206	0.8	0.91	2701.5	17.7	2721.5	8.4	2736.3	6.2	2736.3	6.2	98.7
BENYON 316-41	37	32387	1.0	5.2586	0.8	13.4408	1.7	0.5126	1.5	0.87	2667.8	33.0	2711.1	16.3	2743.6	13.8	2743.6	13.8	97.2
BENYON 316-63	111	136194	1.0	5.2505	0.3	13.8282	1.1	0.5266	1.0	0.97	2727.0	23.2	2738.0	10.2	2746.1	4.3	2746.1	4.3	99.3
BENYON 316-99	50	41459	1.6	5.1601	0.6	13.9048	0.8	0.5204	0.6	0.70	2700.8	12.8	2743.2	7.9	2774.6	9.7	2774.6	9.7	97.3
BENYON 316-58	95	90741	2.2	5.0372	0.6	14.8607	1.6	0.5429	1.5	0.93	2795.6	34.5	2806.4	15.6	2814.1	10.1	2814.1	10.1	99.3
BENYON 316-1	27	106464	1.3	5.0010	0.7	14.7153	2.7	0.5337	2.6	0.97	2757.2	58.7	2797.0	25.7	2825.9	10.9	2825.9	10.9	97.6
BENYON 316-5	50	73227	1.0	4.5633	0.5	17.5353	2.6	0.5804	2.6	0.98	2950.2	61.1	2964.6	25.2	2974.4	7.4	2974.4	7.4	99.2

Sample 9 (1AB/06-34-084-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
BENYON 216-40	189	6012	2.6	21.2850	17.3	0.1078	17.5	0.0166	2.9	0.17	106.4	3.1	103.9	17.3	48.3	416.0	106.4	3.1	NA
BENYON 216-12	172	7689	3.3	22.6751	19.4	0.1036	19.8	0.0170	3.7	0.19	108.9	4.0	100.1	18.8	-105.0	481.1	108.9	4.0	NA
BENYON 216-94	1106	31960	1.8	20.2494	3.4	0.1192	3.7	0.0175	1.4	0.39	111.8	1.6	114.3	3.9	166.1	78.4	111.8	1.6	NA
BENYON 216-95	112	2629	2.7	28.6439	23.4	0.0846	24.1	0.0176	6.0	0.25	112.3	6.7	82.5	19.1	-715.7	657.8	112.3	6.7	NA
BENYON 216-98	922	36930	3.1	21.0353	2.6	0.1153	3.1	0.0176	1.7	0.53	112.5	1.8	110.8	3.3	76.4	62.2	112.5	1.8	NA
BENYON 216-15	482	18207	1.2	21.4835	12.2	0.1162	13.8	0.0181	6.4	0.46	115.6	7.3	111.6	14.6	26.1	294.0	115.6	7.3	NA
BENYON 216-101	723	24195	2.1	19.7995	5.1	0.1268	5.4	0.0182	1.9	0.35	116.3	2.2	121.2	6.2	218.4	117.2	116.3	2.2	NA
BENYON 216-25	568	41611	2.6	20.6088	6.4	0.1226	6.6	0.0183	1.5	0.23	117.1	1.8	117.5	7.3	124.8	150.3	117.1	1.8	NA
BENYON 216-63	401	13078	1.6	21.1467	6.5	0.1325	7.1	0.0203	2.9	0.40	129.7	3.7	126.3	8.5	63.8	155.8	129.7	3.7	NA
BENYON 216-53	554	31643	2.4	19.9798	4.1	0.2100	4.3	0.0304	1.2	0.28	193.3	2.3	193.6	7.6	197.3	95.8	193.3	2.3	NA
BENYON 216-24	305	27598	1.7	19.7514	5.6	0.2701	5.8	0.0387	1.5	0.26	244.7	3.6	242.8	12.4	224.0	128.5	244.7	3.6	NA
BENYON 216-100	340	24248	1.6	19.5795	4.7	0.2801	4.8	0.0398	1.1	0.24	251.4	2.8	250.7	10.6	244.2	107.3	251.4	2.8	NA
BENYON 216-42	151	8877	2.2	20.4107	10.5	0.2732	10.7	0.0404	1.7	0.16	255.6	4.4	245.3	23.2	147.5	247.0	255.6	4.4	NA
BENYON 216-99	215	27734	1.7	19.1700	6.6	0.3705	7.2	0.0515	2.9	0.40	323.8	9.1	320.0	19.9	292.6	151.9	323.8	9.1	NA
BENYON 216-10	93	8564	1.0	19.5745	13.7	0.3714	13.8	0.0527	1.3	0.09	331.3	4.0	320.7	37.9	244.7	317.0	331.3	4.0	NA
BENYON 216-46	406	27382	7.8	18.6158	2.4	0.4072	3.0	0.0550	1.8	0.59	345.0	6.0	346.8	8.9	359.2	55.0	345.0	6.0	NA
BENYON 216-75	68	5976	1.4	18.6074	12.3	0.4084	15.4	0.0551	9.3	0.60	345.9	31.2	347.8	45.3	360.2	277.6	345.9	31.2	NA
BENYON 216-29	454	42243	1.5	18.7011	1.8	0.4101	2.6	0.0556	2.0	0.74	348.9	6.6	348.9	7.8	348.9	40.4	348.9	6.6	NA
BENYON 216-7	233	25224	1.9	18.4970	3.8	0.4197	3.9	0.0563	0.9	0.23	353.1	3.1	355.8	11.6	373.6	84.9	353.1	3.1	NA
BENYON 216-92	657	58348	2.4	17.8782	1.8	0.4853	6.6	0.0629	6.3	0.96	393.4	24.2	401.7	21.9	449.7	41.0	393.4	24.2	NA
BENYON 216-58	174	1456	2.0	17.8047	8.4	0.5092	8.6	0.0658	1.8	0.21	410.5	7.2	417.9	29.3	458.9	185.7	410.5	7.2	89.5
BENYON 216-105	208	20197	2.0	17.4903	4.4	0.5473	4.9	0.0694	2.1	0.43	432.7	8.8	443.2	17.5	498.3	97.1	432.7	8.8	86.8
BENYON 216-4	438	88314	3.4	18.0046	1.6	0.5405	2.6	0.0706	2.0	0.77	439.7	8.4	438.8	9.1	434.1	36.5	439.7	8.4	101.3
BENYON 216-9	495	76244	2.2	17.9664	1.5	0.5461	1.6	0.0712	0.7	0.44	443.2	3.1	442.5	5.8	438.8	32.3	443.2	3.1	101.0
BENYON 216-3	238	36323	1.8	17.2967	2.2	0.7028	3.0	0.0882	2.0	0.68	544.7	10.4	540.5	12.4	522.7	47.7	544.7	10.4	104.2
BENYON 216-16	276	44988	0.8	16.4164	1.5	0.7956	1.9	0.0947	1.2	0.64	583.4	6.9	594.3	8.7	636.2	32.0	583.4	6.9	91.7
BENYON 216-88	81	33279	2.6	14.3266	3.6	1.5077	4.0	0.1567	1.6	0.39	938.2	13.7	933.5	24.2	922.5	74.9	922.5	74.9	101.7
BENYON 216-93	138	29989	2.9	14.1041	1.6	1.4983	2.5	0.1533	1.9	0.76	919.2	16.2	929.7	15.1	954.6	32.7	954.6	32.7	96.3
BENYON 216-19	226	145617	2.7	14.0381	1.3	1.5368	1.4	0.1565	0.5	0.37	937.1	4.4	945.2	8.3	964.2	25.6	964.2	25.6	97.2
BENYON 216-33	157	37409	3.0	13.5819	1.5	1.7127	2.4	0.1687	1.9	0.77	1005.0	17.4	1013.3	15.5	1031.3	31.2	1031.3	31.2	97.5
BENYON 216-23	136	46598	2.7	13.5759	2.0	1.7753	2.1	0.1748	0.7	0.32	1038.5	6.4	1036.5	13.6	1032.1	40.2	1032.1	40.2	100.6
BENYON 216-31	98	31013	3.4	13.4382	2.7	1.8006	3.2	0.1755	1.6	0.50	1042.3	15.1	1045.7	20.7	1052.8	55.4	1052.8	55.4	99.0
BENYON 216-89	334	95112	3.1	13.3913	0.8	1.7789	2.8	0.1728	2.6	0.95	1027.4	25.0	1037.8	18.0	1059.8	16.9	1059.8	16.9	96.9
BENYON 216-5	186	60101	2.0	13.3912	2.4	1.8366	3.8	0.1784	3.0	0.78	1058.1	29.3	1058.6	25.3	1059.8	48.5	1059.8	48.5	99.8
BENYON 216-57	225	60046	4.2	13.3816	1.1	1.7726	1.3	0.1720	0.7	0.55	1023.3	7.0	1035.5	8.8	1061.3	22.7	1061.3	22.7	96.4
BENYON 216-103	103	55080	2.4	13.3476	1.7	1.8624	2.5	0.1803	1.8	0.74	1068.5	18.2	1067.8	16.4	1066.4	33.3	1066.4	33.3	100.2
BENYON 216-18	44	12272	2.9	13.0555	4.3	1.9925	4.9	0.1887	2.3	0.47	1114.1	23.4	1113.0	33.1	1110.7	86.4	1110.7	86.4	100.3
BENYON 216-43	64	70427	0.9	12.9875	3.3	1.8923	3.9	0.1782	2.1	0.54	1057.4	20.6	1078.4	25.8	1121.1	65.1	1121.1	65.1	94.3
BENYON 216-56	83	24800	2.1	12.8513	3.1	2.0261	3.6	0.1888	1.8	0.49	1115.1	18.1	1124.3	24.3	1142.1	61.7	1142.1	61.7	97.6
BENYON 216-96	122	52490	2.1	12.8457	1.7	1.9934	1.9	0.1857	0.9	0.45	1098.2	8.9	1113.3	13.2	1143.0	34.6	1143.0	34.6	96.1
BENYON 216-8	118	56672	1.8	12.8169	0.9	2.0667	3.2	0.1921	3.1	0.96	1132.8	32.2	1137.8	22.1	1147.4	17.6	1147.4	17.6	98.7
BENYON 216-68	81	25837	1.7	12.8103	1.9	2.0361	2.9	0.1892	2.1	0.74	1116.9	21.6	1127.6	19.4	1148.4	38.3	1148.4	38.3	97.3
BENYON 216-74	93	30583	1.8	12.7755	1.2	2.1146	2.5	0.1959	2.3	0.89	1153.4	23.9	1153.6	17.6	1153.8	23.3	1153.8	23.3	100.0
BENYON 216-66	155	49190	2.5	12.7365	1.4	2.0958	1.9	0.1936	1.2	0.66	1140.8	12.7	1147.4	12.7	1159.9	27.6	1159.9	27.6	98.4
BENYON 216-55	88	51357	2.7	12.4679	2.3	2.1853	2.7	0.1976	1.4	0.53	1162.5	14.9	1176.4	18.6	1202.0	44.7	1202.0	44.7	96.7
BENYON 216-85	141	63272	3.7	11.9938	1.1	2.5469	2.8	0.2215	2.6	0.92	1290.0	30.8	1285.5	20.8	1278.0	21.1	1278.0	21.1	100.9
BENYON 216-48	150	52587	2.2	11.8576	1.1	2.4272	1.3	0.2087	0.6	0.47	1222.1	6.8	1250.7	9.3	1300.3	22.0	1300.3	22.0	94.0
BENYON 216-69	155	114334	2.9	11.5279	1.3	2.6625	2.1	0.2226	1.6	0.77	1295.6	18.9	1318.1	15.5	1354.8	25.9	1354.8	25.9	95.6
BENYON 216-45	144	84636	2.8	11.5053	0.9	2.6315	2.2	0.2196	2.0	0.91	1279.7	23.0	1309.5	16.1	1358.6	17.9	1358.6	17.9	94.2
BENYON 216-65	200	137798	1.9	11.3330	0.6	2.7656	0.9	0.2273	0.7	0.78	1320.4	8.7	1346.3	7.0	1387.6	11.4	1387.6	11.4	95.2
BENYON 216-78	106	82035	1.1	11.0717	2.1	3.0316	2.3	0.2434	0.9	0.38	1404.5	11.2	1415.6	17.7	1432.3	40.9	1432.3	40.9	98.1
BENYON 216-38	175	59436	1.3	11.0698	0.5	3.0252	1.7	0.2429	1.6	0.95	1401.7	20.0	1414.0	12.8	1432.6	9.8	1432.6	9.8	97.8
BENYON 216-17	439	316749	2.6	10.7779	0.3	3.1505	0.8	0.2463	0.8	0.93	1419.2	9.8	1445.1	6.3	1483.4	5.6	1483.4	5.6	95.7
BENYON 216-44	110	57490	2.2	10.6986	1.1	3.3057	1.2	0.2565	0.5	0.42	1471.9	6.7	1482.4	9.4	1497.4	20.7	1497.4	20.7	98.3
BENYON 216-82	304	207753	2.1	10.6305	0.3	3.1506	3.6	0.2429	3.6	1.00	1401.8	45.2	1445.1	27.8	1509.5	6.5	1509.5	6.5	92.9
BENYON 216-73	163	92928	2.5	10.5880	0.7	3.4235	1.0	0.2629	0.7	0.73	1504.6	9.6	1509.8	7.7	1517.0	12.7	1517.0	12.7	99.2
BENYON 216-22	304	74173	1.8	10.1448	0.4	3.7558	1.2	0.2763	1.1	0.95	1572.9	15.3	1583.3	9.3	1597.3	7.1	1597.3	7.1	98.5
BENYON 216-86	111	48564	1.1	9.8436	0.7	4.0239	1.9	0.2873	1.8	0.93	1627.9	26.1	1639.0	15.8	1653.3	12.8	1653.3	12.8	98.5
BENYON 216-67	161	117225	1.5	9.8385	0.6	4.0411	1.1	0.2884	0.9	0.86	1633.3	13.5	1642.5	8.9	1654.3	10.4	1654.3	10.4	98.7
BENYON 216-49	222	125453	0.9	9.7597	0.5	4.0330	1.4	0.2855	1.3	0.94	1618.9	18.6	1640.9	11.3	1669.2	9.1	1669.2	9.1	97.0
BENYON 216-30	291	139848	1.4	9.5995	0.4	4.2369	2.3	0.2950	2.2	0.99	1666.4	32.9	1681.2	18.7	1699.7	6.8	1699.7	6.8	98.0
BENYON 216-6	95	32458	313.1	9.5320	1.4	3.9919	2.3	0.2760	1.8	0.80	1571.0	25.6	1632.6	18.8	1712.7	25.7	1712.7	25.7	91.7
BENYON 216-59	52	36610	0.8	9.4822	2.0	4.2387	2.3	0.2915	1.2	0.51	1649.0	17.0	1681.6	18.7	1722.3	35.9	1722.3	35.9	95.7
BENYON 216-70	68	56737	2.5	9.4462	1.9	4.0647	4.0	0.2785	3.5	0.88	1583.7	49.2	1647.2	32.4	1729.3	34.4	1729.3	34.4	91.6
BENYON 216-60	54	39187	1.5	9.3628	1.1	4.3946	2.3	0.2984	2.0	0.87	1683.5	29.2	1711.3	18.8	1745.6	20.8	1745.6	20.8	96.4
BENYON 216-32	90	28576	1.2	9.2454	1.4	4.7058	3.5	0.3155	3.2	0.92	1767.9	49.0	1768.3	28.9	1768.7	25.0	1768.7	25.0	100.0
BENYON 216-61	256	192003	2.4	9.1478	0.3	4.9408	1.4	0.3278	1.3	0.97	1827.7	21.4	1809.3	11.7	1788.0	6.3	1788.0	6.3	102.2
BENYON 216-91	201	203782	3.2	9.0427	0.5	4.7995	0.9	0.3148	0.8	0.84	1764.1	12.2	1784.8	7.9	1809.1	9.3	1809.1	9.3	97.5
BENYON 216-14	67	74851	1.6	8.9344	0.8	5.0626	1.8	0.3280	1.6	0.90	1828.9	25.4	1829.9	15.0	1830.9	14.1	1830.9	14.1	99.9
BENYON 216-83	112	52146	1.1	8.9247	0.8	4.8957	4.1	0.3169	4.1	0.98	1774.5	63.1	1801.5	35.0	1832.9	14.6	1832.9	14.6	96.8
BENYON 216-21	64	32624	2.1	8.9081	1.8	4.9987	2.1	0.3230	1.1	0.52	1804.1	16.9	1819.1	17.4	1836.3	31.9	1836.3	31.9	98.3
BENYON 216-34	54	29840	1.2	8.8747	1.1	5.0521	1.7	0.3252	1.3	0.77	1815.0	20.5	1828.1	14.3	1843.1	19.4	1843.1	19.4	98.5
BENYON 216-37	137	77636	2.4	8.8583	0.5	5.0111	1.0	0.3219	0.9	0.89	1799.2	14.4	1821.2	8.8	1846.4	8.6	1846.4	8.6	97.4
BENYON 216-13	232	215626	1.9	8.8573	0.4	5.0790	1.3	0.3263	1.2	0.94	1820.3	19.2	1832.6	10.9	1846.6	7.9	1846.6	7.9	98.6
BENYON 216-64	93	56922	1.1	8.8528	1.2	4.9074	2.4	0.3151	2.0	0.85	1765.7	31.0	1803.5	19.9	1847.5	22.4	1847.5	22.4	95.6
BENYON 216-76	290	184876	1.6	8.8479	0.3	5.1502	0.7	0.3305	0.6	0.91	1840.8	9.7	1844.4	5.7	1848.5	5.1	1848.5	5.1	99.6
BENYON 216-72	145	39210	1.8	8.8254	0.6	5.0906	0.9	0.3258	0.6	0.73	1818.2	9.8	1834.5	7.2	1853.1	10.6	1853.1	10.6	98.1
BENYON 216-50	63	99485	0.7	8.8178	1.5	5.0060	1.8	0.3201	1.1	0.60	1790.4	17.3	1820.3	15.6	1854.7	26.7	1854.7	26.7	96.5
BENYON 216-26	185	155469	0.6	8.7108	0.3	5.2330	0.9	0.3306	0.8	0.94	1841.3	13.2	1858.0	7.5	1876.7	5.4	1876.7	5.4	98.1
BENYON 216-27	233	204970	2.4	8.6034	0.3	5.3297	1.6	0.3326	1.6	0.99	1850.8	26.1	1873.6	14.1	1899.1	4.8	1899.1	4.8	97.5
BENYON 216-87	50	31398	0.8	8.5075	2.0	5.5304	2.2	0.3412	0.8	0.39	1892.6	13.9	1905.3	18.7	1919.2	35.9	1919.2	35.9	98.6
BENYON 216-81	85	76575	11.9	8.4602	3.6	5.1769	4.4	0.3176	2.6	0.58	1778.2	39.7	1848.8	37.7	1929.2	64.8	1929.2	64.8	92.2
BENYON 216-28	88	34909	1.3	8.2283	0.5	5.9935	1.0	0.3577	0.8	0.88	1971.2	14.4	1974.9	8.4	1978.8	8.1	1978.8	8.1	99.6
BENYON 216-1	137	74834	1.9	7.7623	0.6	6.1352	1.4	0.3454	1.3	0.89	1912.6	21.1	1995.3	12.5	2082.0	11.3	2082.0	11.3	91.9
BENYON 216-2	149	116212	1.1	7.3315	0.6	6.3179	1.6	0.3359	1.4	0.91	1867.1	22.9	2020.9	13.6	2181.9	11.1	2181.9	11.1	85.6
BENYON 216-47	62	96232	1.4	6.7874	0.6	8.4125	1.0	0.4141	0.8	0.79	2233.7	14.6	2276.5	8.9	2315.2	10.3	2315.2	10.3	96.5
BENYON 216-62	177	178289	2.3	6.0022	0.4	10.6010	1.5	0.4615	1.5	0.96	2446.1	30.0	2488.8	14.2	2523.8	7.0	2523.8	7.0	96.9
BENYON 216-77	103	127623	2.6	6.0022	0.5	9.9782	1.5	0.4344	1.4	0.95	2325.4	27.2	2432.8	13.6	2523.8	8.0	2523.8	8.0	92.1
BENYON 216-90	60	50035	2.1	5.9636	0.6	10.8676	1.7	0.4700	1.6	0.93	2483.8	32.2	2511.9	15.7	2534.6	10.7	2534.6	10.7	98.0
BENYON 216-35	41	35032	0.6	5.7308	0.8	11.6877	1.2	0.4858	0.9	0.76	2552.4	18.8	2579.7	11.0	2601.2	12.8	2601.2	12.8	98.1
BENYON 216-20	78	65998	0.8	5.5756	0.6	11.6991	3.9	0.4731	3.8	0.99	2497.1	78.8	2580.6	36.1	2646.9	10.3	2646.9	10.3	94.3
BENYON 216-54	86	92795	2.0	5.3852	0.6	12.9737	1.4	0.5067	1.3	0.91	2642.6	28.5	2677.7	13.6	2704.4	9.7	2704.4	9.7	97.7
BENYON 216-71	44	70705	0.9	5.3632	0.6	13.5806	1.0	0.5282	0.8	0.81	2734.1	18.6	2720.9	9.8	2711.1	10.1	2711.1	10.1	100.8
BENYON 216-80	131	211256	1.0	5.3618	0.4	12.8731	2.9	0.5006	2.8	0.99	2616.4	60.9	2670.4	27.0	2711.6	7.3	2711.6	7.3	96.5
BENYON 216-102	165	152503	0.5	5.3408	0.1	13.3161	2.2	0.5158	2.2	1.00	2681.4	48.5	2702.3	20.9	2718.0	2.4	2718.0	2.4	98.7
BENYON 216-39	81	111136	1.2	5.1119	0.3	14.3247	1.6	0.5311	1.6	0.98	2746.0	35.7	2771.5	15.5	2790.0	5.4	2790.0	5.4	98.4
BENYON 216-97	178	324104	4.0	5.0543	0.2	14.5707	1.1	0.5341	1.1	0.98	2758.8	23.9	2787.6	10.4	2808.5	3.8	2808.5	3.8	98.2
BENYON 216-52	93	113634	2.0	4.9319	0.4	14.9452	1.3	0.5346	1.2	0.94	2760.7	27.6	2811.8	12.4	2848.6	7.2	2848.6	7.2	96.9

Kolmogorov-Smirnov (K-S) statistics

Analysis run on: Tuesday, Jan 15, 2013 @ 04:59:51 PM. Version: 1.0.

K-S P-values using error in the CDF

	9	7	8	2	5	3	6	4	1
9		**0.060**	**0.297**	0.000	0.000	0.001	0.000	**0.303**	0.000
7	**0.060**		**0.550**	0.000	0.000	0.000	0.000	0.046	0.025
8	**0.297**	**0.550**		0.000	0.000	0.000	0.000	0.001	0.046
2	0.000	0.000	0.000		**0.435**	**0.925**	**0.521**	0.027	0.000
5	0.000	0.000	0.000	**0.435**		**0.479**	**0.249**	0.045	0.000
3	0.001	0.000	0.000	**0.925**	**0.479**		**0.694**	**0.151**	0.000
6	0.000	0.000	0.000	**0.521**	**0.249**	**0.694**		**0.052**	0.000
4	**0.303**	0.046	0.001	0.027	0.045	**0.151**	**0.052**		0.000
1	0.000	0.025	0.046	0.000	0.000	0.000	0.000	0.000	

D-values using error in the CDF

9	7	8	2	5	3	6	4	1
	0.189	0.138	0.330	0.299	0.302	0.302	0.141	0.301
0.189		0.112	0.377	0.345	0.361	0.382	0.200	0.212
0.138	0.112		0.445	0.429	0.435	0.435	0.274	0.194
0.330	0.377	0.445		0.126	0.086	0.116	0.213	0.580
0.299	0.345	0.429	0.126		0.133	0.148	0.203	0.551
0.302	0.361	0.435	0.086	0.133		0.111	0.181	0.568
0.302	0.382	0.435	0.116	0.148	0.111		0.197	0.567
0.141	0.200	0.274	0.213	0.203	0.181	0.197		0.411
0.301	0.212	0.194	0.580	0.551	0.568	0.567	0.411	

K-S P-values for no error

	9	7	8	2	5	3	6	4	1
9		**0.048**	0.196	0.000	0.000	0.001	0.000	0.239	0.000
7	**0.048**		0.411	0.000	0.000	0.000	0.000	0.045	0.016
8	0.196	0.411		0.000	0.000	0.000	0.000	0.001	0.034
2	0.000	0.000	0.000		0.278	0.545	0.127	0.018	0.000
5	0.000	0.000	0.000	0.278		0.297	0.151	0.018	0.000
3	0.001	0.000	0.000	0.545	0.297		0.325	0.097	0.000
6	0.000	0.000	0.000	0.127	0.151	0.325		**0.040**	0.000
4	0.239	0.045	0.001	0.018	0.018	0.097	**0.040**		0.000
1	0.000	0.016	0.034	0.000	0.000	0.000	0.000	0.000	

D-values for no error

9	7	8	2	5	3	6	4	1
	0.195	0.152	0.338	0.309	0.306	0.316	0.150	0.313
0.195		0.125	0.384	0.357	0.360	0.393	0.200	0.221
0.152	0.125		0.453	0.434	0.439	0.441	0.279	0.202
0.338	0.384	0.453		0.143	0.125	0.167	0.223	0.590
0.309	0.357	0.434	0.143		0.154	0.165	0.226	0.551
0.306	0.360	0.439	0.125	0.154		0.149	0.196	0.576
0.316	0.393	0.441	0.167	0.165	0.149		0.203	0.568
0.150	0.200	0.279	0.223	0.226	0.196	0.203		0.416
0.313	0.221	0.202	0.590	0.551	0.576	0.568	0.416	

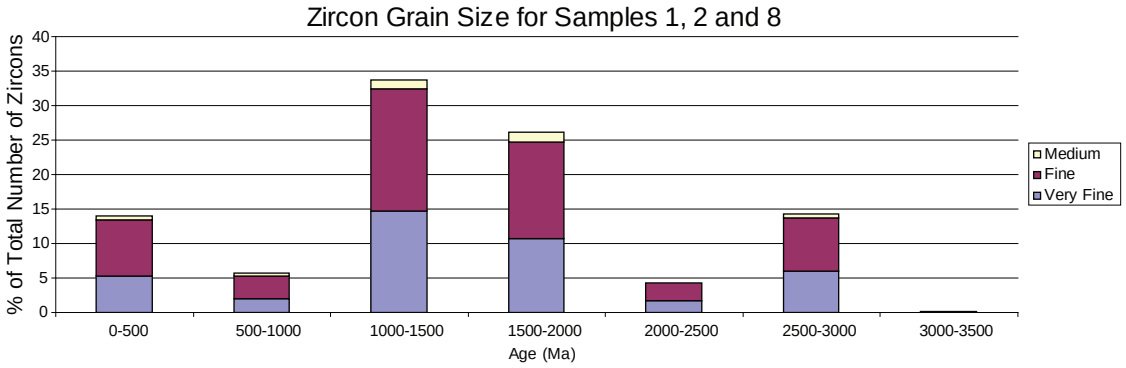
Average K-S P-values using Monte-Carlo

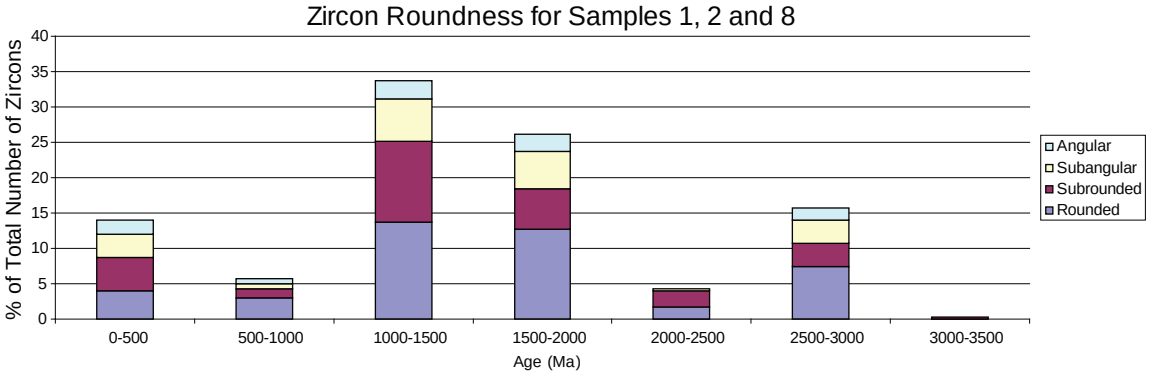
	9	7	8	2	5	3	6	4	1
9		**0.049**	0.178	0.000	0.000	0.001	0.000	0.244	0.000
7	**0.049**		0.425	0.000	0.000	0.000	0.000	**0.037**	0.011
8	0.178	0.425		0.000	0.000	0.000	0.000	0.001	**0.037**
2	0.000	0.000	0.000		0.328	0.703	**0.324**	0.016	0.000
5	0.000	0.000	0.000	0.328		0.374	**0.133**	0.022	0.000
3	0.001	0.000	0.000	0.703	0.374		0.417	**0.096**	0.000
6	0.000	0.000	0.000	**0.324**	**0.133**	0.417		**0.044**	0.000
4	0.244	**0.037**	0.001	0.016	0.022	**0.096**	**0.044**		0.000
1	0.000	0.011	**0.037**	0.000	0.000	0.000	0.000	0.000	

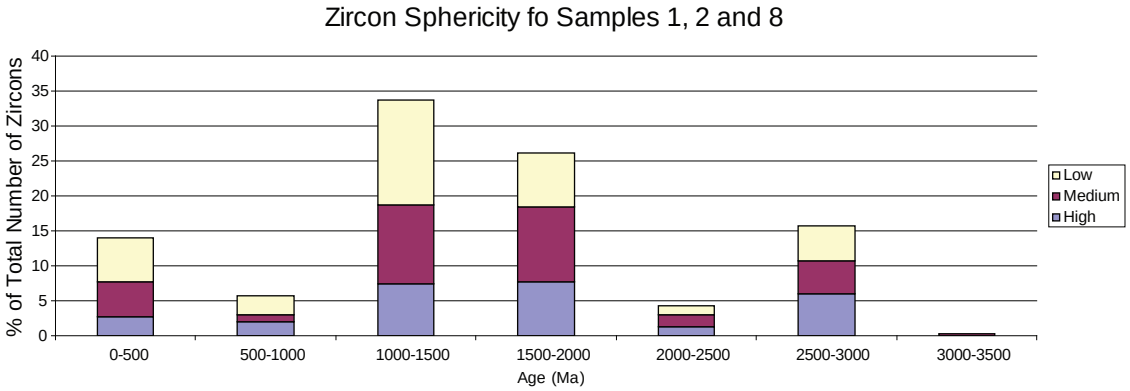
Two std devs. of P-values using Monte-Carlo

9	7	8	2	5	3	6	4	1
	0.012	0.085	0.000	0.000	0.001	0.000	0.059	0.000
0.012		0.120	0.000	0.000	0.000	0.000	**0.015**	0.012
0.085	0.120		0.000	0.000	0.000	0.000	0.001	**0.022**
0.000	0.000	0.000		0.214	0.319	**0.333**	0.016	0.000
0.000	0.000	0.000	0.214		0.148	**0.098**	0.023	0.000
0.001	0.000	0.000	0.319	0.148		0.345	**0.068**	0.000
0.000	0.000	0.000	**0.333**	**0.098**	0.345		**0.014**	0.000
0.059	**0.015**	0.001	0.016	0.023	**0.068**	**0.014**		0.000
0.000	0.012	**0.022**	0.000	0.000	0.000	0.000	0.000	

Grain Morphology Analysis







Zircon roundness was measured using a comparison to standard frameworks, and sphericity was measured using a round and elongate grain as endmembers.

APPENDIX B

CW1 (1AA/13-24-082-10W4/00)

Analysis	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± (%)	207Pb* 235U*	± (%)	206Pb* 238U	± (%)	error corr.	206Pb* 238U*	± (Ma)	207Pb* 235U	± (Ma)	206Pb* 207Pb*	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
CW-1-10	210	32782	2.4	21.2570	7.5	0.1951	7.6	0.0301	1.5	0.19	191.1	2.8	181.0	12.7	51.4	179.1	191.1	2.8	NA
CW-1-66	194	16850	1.2	18.3647	8.8	0.3089	9.1	0.0411	2.3	0.26	259.9	6.0	273.3	21.9	389.8	198.7	259.9	6.0	NA
CW-1-38	152	35034	1.4	18.8902	6.0	0.3130	6.5	0.0429	2.4	0.37	270.7	6.3	276.5	15.6	326.1	136.5	270.7	6.3	NA
CW-1-25	140	34643	3.7	19.5411	3.3	0.3282	3.9	0.0465	2.1	0.53	293.1	5.9	288.2	9.7	248.7	75.6	293.1	5.9	NA
CW-1-24	121	23688	0.8	19.0901	3.2	0.3505	3.3	0.0485	0.9	0.28	305.5	2.8	305.1	8.7	302.2	72.5	305.5	2.8	NA
CW-1-74	183	23241	0.8	18.6930	2.2	0.3985	2.5	0.0540	1.2	0.48	339.2	4.0	340.6	7.3	349.9	49.7	339.2	4.0	NA
CW-1-53	119	40696	1.0	18.8231	2.5	0.4611	2.9	0.0629	1.6	0.53	393.5	5.9	385.0	9.4	334.2	56.3	393.5	5.9	NA
CW-1-34	120	105404	1.8	17.9131	3.5	0.5209	3.8	0.0677	1.6	0.41	422.1	6.3	425.7	13.2	445.4	77.2	422.1	6.3	94.8
CW-1-47	114	36367	1.1	18.2868	4.4	0.5130	4.6	0.0680	1.1	0.24	424.3	4.6	420.4	15.8	399.3	99.7	424.3	4.6	106.3
CW-1-99	100	31975	0.8	18.0580	3.1	0.5570	3.4	0.0730	1.4	0.42	453.9	6.3	449.6	12.5	427.5	69.6	453.9	6.3	106.2
CW-1-20	136	51030	0.9	18.1801	2.9	0.5538	3.0	0.0730	0.9	0.29	454.3	3.8	447.5	10.8	412.4	64.1	454.3	3.8	110.2
CW-1-15	174	104283	0.8	17.5311	3.0	0.5773	3.1	0.0734	0.9	0.30	456.7	4.1	462.8	11.7	493.1	66.2	456.7	4.1	92.6
CW-1-58	268	86994	2.9	17.7906	1.6	0.5762	1.7	0.0743	0.7	0.41	462.3	3.1	462.0	6.4	460.6	34.8	462.3	3.1	100.4
CW-1-91	117	42326	0.8	17.4735	4.3	0.5899	5.1	0.0748	2.8	0.55	464.7	12.6	470.8	19.3	500.4	94.4	464.7	12.6	92.9
CW-1-60	123	37798	0.9	17.3421	1.5	0.6184	1.8	0.0778	1.0	0.54	482.8	4.6	488.8	7.1	517.0	33.9	482.8	4.6	93.4
CW-1-87	27	21070	1.5	18.4761	8.5	0.6795	8.8	0.0911	2.3	0.26	561.8	12.5	526.5	36.1	376.2	190.9	561.8	12.5	149.3
CW-1-52	35	25014	1.3	17.3185	9.6	0.7318	9.8	0.0919	1.9	0.19	566.9	10.3	557.6	42.1	520.0	211.5	566.9	10.3	109.0
CW-1-98	62	34587	1.4	16.4690	4.6	0.8632	4.8	0.1031	1.4	0.28	632.6	8.2	631.9	22.5	629.3	98.7	632.6	8.2	100.5
CW-1-82	80	18492	0.9	16.2534	4.7	0.8794	4.8	0.1037	1.1	0.23	635.8	6.8	640.7	23.0	657.7	101.2	635.8	6.8	96.7
CW-1-55	202	110999	1.4	16.3752	1.8	0.9043	2.0	0.1074	0.9	0.46	657.6	5.8	654.0	9.7	641.7	38.5	657.6	5.8	102.5
CW-1-54	37	40885	2.5	14.0384	3.5	1.6422	3.7	0.1672	1.1	0.30	996.7	10.2	986.6	23.2	964.1	71.5	964.1	71.5	103.4
CW-1-41	87	80370	2.9	13.8220	0.9	1.7239	1.4	0.1728	1.0	0.73	1027.6	9.4	1017.5	8.8	995.8	19.0	995.8	19.0	103.2
CW-1-7	190	201797	2.4	13.7473	0.8	1.7093	1.1	0.1704	0.8	0.68	1014.5	7.1	1012.0	7.2	1006.7	16.7	1006.7	16.7	100.8
CW-1-78	32	19334	1.2	13.7258	3.6	1.7548	3.8	0.1747	1.3	0.34	1037.9	12.4	1028.9	24.5	1009.9	72.2	1009.9	72.2	102.8
CW-1-79	182	167833	4.1	13.6601	1.0	1.6822	1.9	0.1667	1.6	0.84	993.7	14.3	1001.8	11.8	1019.6	20.4	1019.6	20.4	97.5
CW-1-17	83	72418	2.8	13.6523	1.7	1.7571	2.2	0.1740	1.4	0.63	1034.0	13.0	1029.8	14.0	1020.8	34.3	1020.8	34.3	101.3
CW-1-72	111	107716	1.8	13.6428	1.8	1.7317	1.9	0.1714	0.8	0.42	1019.5	7.8	1020.4	12.5	1022.2	35.7	1022.2	35.7	99.7
CW-1-40	103	144172	2.4	13.6287	0.8	1.8118	1.1	0.1791	0.8	0.69	1062.0	7.5	1049.7	7.3	1024.3	16.3	1024.3	16.3	103.7
CW-1-32	124	81965	2.3	13.6246	1.0	1.7893	1.5	0.1768	1.2	0.78	1049.5	11.7	1041.6	10.0	1024.9	19.4	1024.9	19.4	102.4
CW-1-44	74	63717	1.5	13.6091	1.5	1.7921	2.0	0.1769	1.3	0.66	1049.9	12.9	1042.6	13.2	1027.2	30.9	1027.2	30.9	102.2
CW-1-12	46	84191	2.2	13.5749	2.6	1.7935	2.9	0.1766	1.2	0.41	1048.2	11.2	1043.1	18.6	1032.3	52.7	1032.3	52.7	101.5
CW-1-11	199	314276	2.4	13.5577	0.8	1.7804	1.0	0.1751	0.6	0.64	1040.0	6.2	1038.3	6.6	1034.9	15.9	1034.9	15.9	100.5
CW-1-68	125	156217	4.8	13.5260	0.9	1.7756	1.2	0.1742	0.9	0.71	1035.2	8.4	1036.6	7.9	1039.6	17.3	1039.6	17.3	99.6
CW-1-100	214	183253	1.9	13.5138	0.8	1.7096	4.2	0.1676	4.1	0.98	998.6	37.9	1012.1	26.8	1041.4	17.2	1041.4	17.2	95.9
CW-1-5	267	405447	2.7	13.4615	0.5	1.8238	1.0	0.1781	0.9	0.90	1056.4	9.0	1054.1	6.8	1049.3	9.2	1049.3	9.2	100.7
CW-1-94	34	27513	1.2	13.4144	5.1	1.8597	5.4	0.1809	1.7	0.31	1072.0	16.6	1066.9	35.8	1056.3	103.7	1056.3	103.7	101.5
CW-1-57	120	438129	1.2	13.3128	1.2	1.9089	1.7	0.1843	1.2	0.72	1090.5	12.0	1084.2	11.1	1071.6	23.3	1071.6	23.3	101.8
CW-1-59	99	6393	2.7	13.2799	4.6	1.6753	5.8	0.1614	3.5	0.60	964.3	31.0	999.2	36.7	1076.6	92.6	1076.6	92.6	89.6
CW-1-96	64	43812	0.9	13.1598	0.9	1.9848	1.9	0.1894	1.7	0.89	1118.3	17.5	1110.3	13.0	1094.8	17.9	1094.8	17.9	102.1
CW-1-77	68	60273	1.0	13.1523	1.5	1.9014	1.9	0.1814	1.2	0.65	1074.5	12.2	1081.6	12.7	1095.9	29.2	1095.9	29.2	98.0
CW-1-93	134	142888	4.0	13.1395	0.5	1.9636	2.0	0.1871	1.9	0.97	1105.8	19.8	1103.1	13.6	1097.9	10.5	1097.9	10.5	100.7
CW-1-21	53	34313	1.2	13.1267	2.4	1.9084	3.0	0.1817	1.8	0.59	1076.2	17.4	1084.0	19.8	1099.8	47.9	1099.8	47.9	97.9
CW-1-19	56	57594	0.7	12.9331	2.7	2.0491	2.8	0.1922	0.8	0.28	1133.3	8.2	1132.0	19.3	1129.5	54.2	1129.5	54.2	100.3
CW-1-101	120	117596	2.2	12.8939	1.1	2.0922	1.2	0.1957	0.6	0.51	1151.9	6.6	1146.2	8.4	1135.5	20.9	1135.5	20.9	101.4
CW-1-36	25	28754	1.3	12.8608	6.6	2.1169	6.8	0.1975	1.8	0.26	1161.6	18.8	1154.3	46.9	1140.6	130.6	1140.6	130.6	101.8
CW-1-73	113	78287	2.2	12.8515	0.8	2.0806	1.1	0.1939	0.7	0.68	1142.6	7.6	1142.4	7.3	1142.1	15.7	1142.1	15.7	100.1
CW-1-42	29	20916	1.3	12.7964	3.4	2.1727	5.8	0.2016	4.8	0.82	1184.1	51.8	1172.3	40.7	1150.6	66.6	1150.6	66.6	102.9
CW-1-3	144	265499	2.1	12.7865	0.8	2.1637	1.4	0.2007	1.1	0.83	1178.8	12.4	1169.5	9.6	1152.1	15.1	1152.1	15.1	102.3
CW-1-49	30	40332	1.5	12.7168	3.1	2.2140	3.2	0.2042	0.9	0.29	1197.8	10.1	1185.5	22.5	1163.0	61.0	1163.0	61.0	103.0
CW-1-33	72	32395	2.1	12.6480	1.8	2.2639	2.5	0.2077	1.8	0.72	1216.4	20.2	1201.1	17.9	1173.8	35.2	1173.8	35.2	103.6
CW-1-26	337	116484	4.5	12.6064	0.6	2.2004	0.9	0.2012	0.7	0.76	1181.7	7.5	1181.2	6.4	1180.3	11.8	1180.3	11.8	100.1
CW-1-61	88	106533	2.2	12.5374	1.1	2.1537	2.7	0.1958	2.4	0.91	1152.9	25.6	1166.3	18.5	1191.1	21.6	1191.1	21.6	96.8
CW-1-31	242	390303	0.8	12.5138	0.5	2.3142	1.1	0.2100	1.0	0.90	1229.0	11.0	1216.6	7.7	1194.8	9.1	1194.8	9.1	102.9
CW-1-84	102	105816	2.1	12.4995	4.1	2.1524	4.3	0.1951	1.4	0.32	1149.1	14.6	1165.8	29.8	1197.1	80.2	1197.1	80.2	96.0
CW-1-83	194	468248	3.9	12.4396	0.6	2.3012	1.3	0.2076	1.1	0.89	1216.1	12.6	1212.7	9.0	1206.6	11.3	1206.6	11.3	100.8
CW-1-103	134	100140	1.1	12.3562	1.0	2.3238	1.5	0.2083	1.2	0.77	1219.5	13.2	1219.6	10.9	1219.8	19.1	1219.8	19.1	100.0
CW-1-75	58	59501	1.7	12.3157	1.8	2.3215	3.1	0.2074	2.5	0.81	1214.7	27.8	1218.9	22.0	1226.2	35.7	1226.2	35.7	99.1
CW-1-63	136	163396	1.4	11.8085	1.1	2.5927	2.0	0.2220	1.6	0.82	1292.7	19.3	1298.6	14.7	1308.3	22.1	1308.3	22.1	98.8
CW-1-28	57	120080	1.0	11.7274	1.5	2.7213	1.8	0.2315	1.0	0.55	1342.1	12.4	1334.3	13.7	1321.7	29.8	1321.7	29.8	101.5
CW-1-70	165	284974	0.6	11.7043	0.5	2.6885	1.5	0.2282	1.4	0.94	1325.2	16.3	1325.3	10.8	1325.5	9.9	1325.5	9.9	100.0
CW-1-62	9	10371	1.6	11.6370	7.8	2.5942	9.0	0.2190	4.5	0.50	1276.3	51.7	1299.0	65.7	1336.7	150.3	1336.7	150.3	95.5
CW-1-103	180	291177	3.8	11.6294	0.4	2.7904	1.0	0.2354	0.9	0.92	1362.5	11.1	1353.0	7.4	1337.9	7.6	1337.9	7.6	101.8
CW-1-46	58	100759	2.4	11.6070	1.0	2.7308	1.7	0.2299	1.4	0.81	1333.9	17.0	1336.9	12.9	1341.6	19.7	1341.6	19.7	99.4
CW-1-43	40	42781	2.2	11.5984	1.3	2.7782	1.7	0.2337	1.1	0.66	1353.9	14.0	1349.7	13.0	1343.1	25.2	1343.1	25.2	100.8
CW-1-2	47	35661	1.4	11.5322	2.5	2.6808	5.5	0.2242	4.9	0.89	1304.2	57.9	1323.2	40.8	1354.1	48.5	1354.1	48.5	96.3
CW-1-23	134	384934	2.2	11.4715	1.0	2.7919	1.5	0.2323	1.2	0.77	1346.4	14.4	1353.4	11.4	1364.3	18.7	1364.3	18.7	98.7
CW-1-89	177	95323	3.0	11.3040	1.2	2.8159	5.1	0.2309	5.0	0.97	1339.0	60.2	1359.8	38.4	1392.6	23.6	1392.6	23.6	96.2
CW-1-56	176	136732	2.0	11.0878	1.1	2.9822	1.7	0.2398	1.4	0.79	1385.7	16.9	1403.1	13.1	1429.5	20.3	1429.5	20.3	96.9
CW-1-6	128	151327	2.3	10.8862	0.4	3.2686	1.2	0.2581	1.2	0.95	1479.9	15.4	1473.6	9.6	1464.5	7.4	1464.5	7.4	101.1
CW-1-16	69	49982	1.1	10.8143	0.9	3.2001	1.8	0.2510	1.5	0.86	1443.6	19.8	1457.2	13.8	1477.0	17.3	1477.0	17.3	97.7
CW-1-106	214	252526	2.3	10.7544	0.4	3.3405	1.1	0.2606	1.0	0.93	1492.7	13.2	1490.6	8.3	1487.6	7.4	1487.6	7.4	100.3
CW-1-102	241	1367	1.3	10.5881	4.8	3.3114	6.7	0.2543	4.7	0.70	1460.5	61.0	1483.7	52.3	1517.0	90.7	1517.0	90.7	96.3
CW-1-9	252	393407	1.6	10.4958	0.2	3.5681	1.3	0.2716	1.3	0.99	1549.0	18.1	1542.5	10.5	1533.5	3.5	1533.5	3.5	101.0
CW-1-30	60	75522	0.5	9.9017	1.0	4.0766	1.4	0.2928	1.0	0.71	1655.3	14.2	1649.6	11.1	1642.4	17.7	1642.4	17.7	100.8
CW-1-22	55	75422	1.3	9.8652	1.4	4.1066	1.5	0.2938	0.6	0.41	1660.6	9.2	1655.6	12.4	1649.3	25.7	1649.3	25.7	100.7
CW-1-71	71	173249	0.8	9.8144	1.2	3.9840	1.8	0.2836	1.3	0.74	1609.4	18.9	1630.9	14.6	1658.8	22.4	1658.8	22.4	97.0
CW-1-39	383	721082	2.4	9.7755	1.6	4.0337	4.1	0.2860	3.8	0.92	1621.4	54.5	1641.0	33.6	1666.2	30.0	1666.2	30.0	97.3
CW-1-64	61	110904	2.2	9.6919	1.6	4.2540	2.2	0.2990	1.6	0.69	1686.5	23.0	1684.5	18.4	1682.1	29.9	1682.1	29.9	100.3
CW-1-81	202	270023	1.7	9.4141	0.3	4.5686	0.8	0.3119	0.8	0.94	1750.2	12.2	1743.6	7.0	1735.6	5.3	1735.6	5.3	100.8
CW-1-4	85	139714	1.9	9.3827	0.8	4.6947	1.3	0.3195	1.0	0.76	1787.2	15.3	1766.3	10.8	1741.7	15.5	1741.7	15.5	102.6
CW-1-50	92	39256	1.5	9.3522	1.3	4.4134	2.1	0.2994	1.6	0.78	1688.1	23.9	1714.9	17.2	1747.7	23.9	1747.7	23.9	96.6
CW-1-29	123	204221	1.9	9.0794	0.4	4.9563	1.5	0.3264	1.5	0.97	1820.8	23.5	1811.9	12.9	1801.7	6.6	1801.7	6.6	101.1
CW-1-65	88	138498	1.0	8.9063	0.5	5.1770	0.9	0.3344	0.7	0.79	1859.7	11.1	1848.8	7.4	1836.6	9.5	1836.6	9.5	101.3
CW-1-45	114	169574	0.8	8.8893	0.5	5.1791	1.1	0.3339	1.0	0.91	1857.3	16.1	1849.2	9.4	1840.1	8.4	1840.1	8.4	100.9
CW-1-88	52	98312	0.4	8.8677	0.6	5.1509	0.9	0.3313	0.8	0.79	1844.6	12.1	1844.5	8.1	1844.5	10.5	1844.5	10.5	100.0
CW-1-18	81	113887	0.5	8.8245	0.7	5.2375	1.1	0.3352	0.9	0.81	1863.6	15.0	1858.7	9.8	1853.3	12.2	1853.3	12.2	100.6
CW-1-14	110	292423	1.5	8.8207	0.3	5.2152	1.2	0.3336	1.2	0.97	1856.0	19.3	1855.1	10.5	1854.1	5.7	1854.1	5.7	100.1
CW-1-1	44	88961	3.2	8.7919	0.6	5.4175	1.1	0.3454	0.9	0.81	1912.8	14.1	1887.6	9.0	1860.0	11.2	1860.0	11.2	102.8
CW-1-80	96	215145	2.1	8.7742	0.7	5.3166	1.1	0.3383	0.8	0.72	1878.6	12.6	1871.5	9.1	1863.7	13.3	1863.7	13.3	100.8
CW-1-37	100	145847	4.5	8.7693	0.3	5.3068	0.7	0.3375	0.6	0.88	1874.7	9.5	1870.0	5.7	1864.6	5.7	1864.6	5.7	100.5
CW-1-51	58	76957	0.9	8.7377	1.3	5.5003	1.5	0.3486	0.8	0.54	1927.7	13.8	1900.6	13.1	1871.2	23.1	1871.2	23.1	103.0
CW-1-92	83	148020	0.6	8.7316	0.5	5.2994	1.4	0.3356	1.3	0.93	1865.5	21.2	1868.8	12.1	1872.4	9.5	1872.4	9.5	99.6
CW-1-69	80	215855	0.8	8.4676	0.7	5.7306	1.0	0.3519	0.7	0.66	1943.8	10.9	1936.0	8.6	1927.6	13.4	1927.6	13.4	100.8
CW-1-8	165	221552	1.3	8.4180	0.2	5.7585	0.9	0.3516	0.9	0.98	1942.1	15.5	1940.2	8.2	1938.1	3.8	1938.1	3.8	100.2
CW-1-48	77	123614	1.5	7.1982	0.4	7.8024	1.3	0.4073	1.2	0.96	2202.7	23.3	2208.5	11.7	2213.8	6.5	2213.8	6.5	99.5
CW-1-76	63	186832	0.9	6.7517	0.5	8.9311	1.3	0.4373	1.2	0.91	2338.7	23.8	2331.0	12.1	2324.2	9.3	2324.2	9.3	100.6
CW-1-105	60	144293	1.5	5.8059	0.4	11.8033	1.3	0.4970	1.2	0.94	2601.0	25.4	2588.9	11.8	2579.5	7.2	2579.5	7.2	100.8
CW-1-95	119	268531	0.7	5.7309	0.2	12.1173	1.0	0.5037	1.0	0.97	2629.5	21.6	2613.5	9.6	2601.2	3.8	2601.2	3.8	101.1
CW-1-85	51	154595	1.0	5.4206	0.4	13.1668	0.9	0.5176	0.8	0.89	2689.1	17.2	2691.7	8.3	2693.6	6.6	2693.6	6.6	99.8
CW-1-35	75	175730	1.4	5.3218	0.2	13.9482	0.9	0.5384	0.9	0.98	2776.6	19.4	2746.2	8.3	2723.9	2.7	2723.9	2.7	101.9
CW-1-97	87	188688	2.5	5.2601	0.3	13.8948	1.4	0.5301	1.3	0.97	2741.8	29.8	2742.6	13.0	2743.1	5.1	2743.1	5.1	100.0
CW-1-27	92	285774	2.2	4.8775	4.8	14.9100	5.8	0.5274	3.3	0.57	2730.6	73.7	2809.5	55.4	2866.6	77.7	2866.6	77.7	95.3

CW2 (1AA/13-24-082-10W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
CW2-55	122	19325	1.9	19.4042	7.5	0.2204	8.1	0.0310	3.0	0.37	196.9	5.9	202.2	14.9	264.8	173.5	196.9	5.9	NA
CW2-15	221	22932	0.9	19.2536	2.3	0.2808	3.2	0.0392	2.3	0.71	247.9	5.6	251.3	7.2	282.7	52.3	247.9	5.6	NA
CW2-96	92	18876	1.0	18.3158	6.5	0.3030	6.7	0.0403	1.5	0.22	254.4	3.7	268.8	15.7	395.8	145.7	254.4	3.7	NA
CW2-45	248	76247	1.4	18.3007	1.9	0.4506	2.4	0.0598	1.4	0.58	374.5	5.0	377.7	7.5	397.6	43.3	374.5	5.0	NA
CW2-68	46	10278	1.1	19.1577	17.6	0.4330	17.8	0.0602	2.8	0.16	376.6	10.4	365.3	54.8	294.1	404.5	376.6	10.4	NA
CW2-63	91	46807	1.1	18.8076	6.8	0.4493	7.3	0.0613	2.7	0.37	383.4	10.0	376.8	22.9	336.0	153.2	383.4	10.0	NA
CW2-98	164	37597	0.7	18.3597	3.9	0.4614	4.1	0.0614	1.2	0.29	384.3	4.5	385.2	13.1	390.4	87.6	384.3	4.5	NA
CW2-46	258	75676	0.8	18.0486	1.8	0.5016	2.5	0.0657	1.7	0.68	410.0	6.8	412.8	8.5	428.6	41.1	410.0	6.8	95.7
CW2-73	89	28622	1.3	17.7971	5.7	0.5179	6.1	0.0668	2.1	0.34	417.1	8.3	423.7	21.1	459.8	126.8	417.1	8.3	90.7
CW2-12	97	26296	0.6	17.7888	4.9	0.5231	5.1	0.0675	1.5	0.30	421.0	6.3	427.2	17.9	460.8	108.9	421.0	6.3	91.4
CW2-106	325	72927	1.4	18.3594	1.1	0.5088	2.8	0.0678	2.6	0.92	422.6	10.4	417.6	9.5	390.4	24.1	422.6	10.4	108.2
CW2-80	186	33829	1.9	18.3897	1.6	0.5204	3.7	0.0694	3.3	0.90	432.6	14.0	425.4	12.9	386.7	36.8	432.6	14.0	111.9
CW2-8	413	193558	1.1	17.8599	0.8	0.5529	1.5	0.0716	1.2	0.82	445.9	5.2	446.9	5.3	452.0	18.7	445.9	5.2	98.6
CW2-4	203	39645	0.6	17.9138	2.9	0.5513	3.7	0.0716	2.3	0.61	446.0	9.8	445.9	13.4	445.3	65.2	446.0	9.8	100.2
CW2-21	351	187980	2.1	17.8054	0.7	0.5731	2.3	0.0740	2.2	0.95	460.3	9.6	460.0	8.4	458.8	16.3	460.3	9.6	100.3
CW2-90	126	30667	1.2	17.9500	3.2	0.5689	3.7	0.0741	1.8	0.49	460.5	8.1	457.3	13.6	440.8	71.8	460.5	8.1	104.5
CW2-32	39	14503	1.1	18.3000	7.9	0.5640	8.3	0.0749	2.5	0.31	465.4	11.3	454.2	30.2	397.7	176.5	465.4	11.3	117.0
CW2-54	63	28163	1.0	17.2806	3.4	0.7113	4.9	0.0891	3.5	0.71	550.5	18.2	545.5	20.5	524.8	75.2	550.5	18.2	104.9
CW2-9	270	117086	1.6	15.6761	1.1	0.8274	2.1	0.0941	1.8	0.87	579.6	10.1	612.2	9.7	734.7	22.5	579.6	10.1	78.9
CW2-55	249	158008	1.1	16.0629	0.7	0.9484	1.6	0.1105	1.5	0.90	675.6	9.4	677.2	8.0	682.9	14.8	675.6	9.4	98.9
CW2-92	444	450184	0.7	14.1832	0.5	1.4934	1.0	0.1536	0.9	0.90	921.2	8.0	927.7	6.3	943.1	9.4	943.1	9.4	97.7
CW2-101	204	193188	8.8	13.8353	0.8	1.7340	2.1	0.1740	2.0	0.93	1034.1	18.9	1021.2	13.7	993.8	16.1	993.8	16.1	104.1
CW2-18	233	145942	3.2	13.7745	0.6	1.6797	0.8	0.1678	0.5	0.66	1000.0	5.1	1000.9	5.3	1002.7	12.7	1002.7	12.7	99.7
CW2-77	85	66204	2.0	13.7057	1.5	1.7266	1.9	0.1716	1.2	0.62	1021.1	11.3	1018.5	12.5	1012.9	31.0	1012.9	31.0	100.8
CW2-41	124	107370	1.8	13.7030	1.6	1.7123	2.6	0.1702	2.0	0.79	1013.1	19.2	1013.1	16.7	1013.3	32.5	1013.3	32.5	100.0
CW2-35	126	125270	1.3	13.6046	1.6	1.7149	2.8	0.1692	2.2	0.81	1007.8	20.9	1014.1	17.8	1027.9	33.2	1027.9	33.2	98.0
CW2-31	83	64434	2.2	13.5935	1.3	1.7337	1.7	0.1709	1.1	0.64	1017.2	10.3	1021.1	10.9	1029.5	26.3	1029.5	26.3	98.8
CW2-38	60	90422	0.9	13.5930	2.7	1.7280	3.2	0.1704	1.8	0.56	1014.1	16.7	1019.0	20.5	1029.6	53.7	1029.6	53.7	98.5
CW2-42	27	9566	1.6	13.5842	4.3	1.7807	4.6	0.1754	1.4	0.31	1042.0	13.5	1038.4	29.7	1030.9	87.9	1030.9	87.9	101.1
CW2-72	54	42888	1.2	13.4496	2.8	1.8189	3.6	0.1774	2.2	0.62	1052.9	21.5	1052.3	23.3	1051.1	56.2	1051.1	56.2	100.2
CW2-25	114	47733	1.6	13.4232	2.2	1.8077	3.5	0.1760	2.6	0.76	1045.0	25.4	1048.2	22.6	1055.0	45.2	1055.0	45.2	99.1
CW2-61	61	39059	2.0	13.4046	1.7	1.8738	1.9	0.1822	0.9	0.48	1078.8	9.0	1071.9	12.6	1057.8	33.8	1057.8	33.8	102.0
CW2-43	130	104342	0.9	13.3979	0.8	1.8150	1.3	0.1764	1.0	0.77	1047.1	9.7	1050.9	8.5	1058.8	16.8	1058.8	16.8	98.9
CW2-22	24	10580	1.0	13.3933	6.3	1.7577	6.6	0.1707	2.0	0.31	1016.2	19.1	1030.0	42.7	1059.5	126.4	1059.5	126.4	95.9
CW2-99	91	45507	3.0	13.3142	1.6	1.8659	2.7	0.1802	2.1	0.80	1067.9	21.1	1069.1	17.6	1071.4	31.9	1071.4	31.9	99.7
CW2-105	134	155336	1.4	13.2824	1.1	1.9160	2.4	0.1846	2.2	0.89	1091.9	21.7	1086.7	16.2	1076.2	22.1	1076.2	22.1	101.5
CW2-50	182	146187	1.6	13.2773	0.6	1.8993	1.8	0.1829	1.8	0.95	1082.8	17.5	1080.8	12.2	1077.0	11.1	1077.0	11.1	100.5
CW2-79	199	132877	1.9	13.2409	0.6	1.8939	1.1	0.1819	0.9	0.83	1077.2	8.9	1078.9	7.2	1082.5	12.1	1082.5	12.1	99.5
CW2-29	54	39606	1.5	13.2049	1.7	1.9299	2.0	0.1848	0.9	0.48	1093.3	9.4	1091.5	13.2	1088.0	34.6	1088.0	34.6	100.5
CW2-86	50	65655	1.1	13.1742	2.0	1.9022	3.0	0.1818	2.2	0.74	1076.6	22.3	1081.9	20.1	1092.6	40.5	1092.6	40.5	98.5
CW2-44	52	35080	1.8	13.1557	2.8	1.9182	3.1	0.1830	1.4	0.45	1083.5	13.7	1087.4	20.5	1095.4	55.2	1095.4	55.2	98.9
CW2-64	290	187065	1.9	13.0861	0.8	2.0501	2.6	0.1946	2.5	0.95	1146.1	26.2	1132.3	17.9	1106.0	15.9	1106.0	15.9	103.6
CW2-62	41	25094	1.7	13.0774	2.9	1.9335	3.0	0.1834	0.9	0.30	1085.4	9.0	1092.7	20.3	1107.4	57.8	1107.4	57.8	98.0
CW2-48	45	58280	2.4	13.0317	2.1	2.0565	4.7	0.1944	4.2	0.90	1145.0	44.1	1134.5	32.1	1114.3	41.3	1114.3	41.3	102.8
CW2-49	100	73616	4.3	12.9174	1.4	2.0517	2.3	0.1922	1.9	0.80	1133.4	19.6	1132.9	16.0	1131.9	27.8	1131.9	27.8	100.1
CW2-52	55	30642	0.9	12.8873	1.5	2.1137	1.9	0.1976	1.2	0.61	1162.2	12.3	1153.3	13.1	1136.6	30.1	1136.6	30.1	102.3
CW2-103	205	149942	1.7	12.8544	0.5	2.0559	1.8	0.1917	1.7	0.96	1130.4	17.6	1134.3	12.1	1141.7	10.4	1141.7	10.4	99.0
CW2-11	89	85683	2.5	12.8504	1.2	2.0615	1.9	0.1921	1.4	0.76	1132.9	14.7	1136.1	12.7	1142.3	23.8	1142.3	23.8	99.2
CW2-34	131	151258	1.6	12.8494	1.4	2.0905	2.4	0.1948	2.0	0.82	1147.4	20.6	1145.7	16.5	1142.4	27.5	1142.4	27.5	100.4
CW2-75	57	29642	1.8	12.7896	1.3	2.0837	3.0	0.1933	2.7	0.90	1139.1	27.9	1143.5	20.5	1151.6	26.4	1151.6	26.4	98.9
CW2-93	111	77766	1.4	12.7804	1.1	2.1453	2.5	0.1989	2.2	0.89	1169.1	23.5	1163.5	17.1	1153.1	22.7	1153.1	22.7	101.4
CW2-84	200	180749	1.3	12.7487	0.8	2.1815	1.4	0.2017	1.2	0.83	1184.5	13.0	1175.2	10.1	1158.0	15.8	1158.0	15.8	102.3
CW2-67	116	77494	1.7	12.7153	1.2	2.1697	1.7	0.2001	1.2	0.70	1175.8	12.4	1171.4	11.5	1163.2	23.4	1163.2	23.4	101.1
CW2-97	228	536740	2.2	12.6987	0.6	2.2172	1.8	0.2042	1.7	0.95	1197.9	18.9	1186.5	12.7	1165.8	11.1	1165.8	11.1	102.8
CW2-39	217	177607	2.1	12.6897	0.6	2.1373	1.4	0.1967	1.2	0.90	1157.6	12.9	1160.9	9.4	1167.2	11.9	1167.2	11.9	99.2
CW2-6	191	59111	2.0	12.6771	1.6	2.0996	1.8	0.1930	0.8	0.44	1137.9	8.5	1148.7	12.6	1169.2	32.6	1169.2	32.6	97.3
CW2-70	153	230882	2.4	12.6713	0.5	2.1726	1.0	0.1997	0.9	0.87	1173.5	9.2	1172.3	6.8	1170.1	9.5	1170.1	9.5	100.3
CW2-10	77	63346	2.5	12.6459	1.6	2.1684	2.4	0.1989	1.7	0.73	1169.3	18.7	1171.0	16.6	1174.1	32.0	1174.1	32.0	99.6
CW2-3	58	64659	2.4	12.6450	1.3	2.1808	1.6	0.2000	1.0	0.61	1175.3	10.7	1174.9	11.4	1174.2	25.7	1174.2	25.7	100.1
CW2-28	74	74286	3.4	12.6281	1.5	2.1215	4.0	0.1943	3.7	0.92	1144.6	38.7	1155.8	27.6	1176.9	30.6	1176.9	30.6	97.3
CW2-36	169	173602	1.9	12.6164	0.9	2.1880	1.3	0.2002	0.9	0.73	1176.4	10.1	1177.2	9.0	1178.7	17.6	1178.7	17.6	99.8
CW2-47	120	88724	2.8	12.6135	0.9	2.1726	1.7	0.1988	1.4	0.83	1168.6	15.0	1172.3	11.8	1179.1	18.6	1179.1	18.6	99.1
CW2-40	99	25523	2.5	12.5783	4.2	2.0188	4.6	0.1842	1.9	0.41	1089.7	18.7	1121.8	31.0	1184.7	82.5	1184.7	82.5	92.0
CW2-66	41	32687	3.2	12.5353	2.1	2.1462	2.3	0.1951	0.9	0.38	1149.0	9.2	1163.8	15.9	1191.4	41.9	1191.4	41.9	96.4
CW2-95	35	26234	2.4	12.3522	3.0	2.0221	4.9	0.1812	3.9	0.80	1073.3	39.0	1123.0	33.5	1220.4	58.3	1220.4	58.3	87.9
CW2-87	82	69325	2.7	12.2166	0.9	2.4121	3.0	0.2137	2.8	0.96	1248.6	32.2	1246.2	21.3	1242.1	16.9	1242.1	16.9	100.5
CW2-33	125	98260	1.3	11.7754	1.0	2.5710	1.6	0.2196	1.2	0.74	1279.6	13.5	1292.4	11.4	1313.8	20.3	1313.8	20.3	97.4
CW2-5	80	159305	2.5	11.5944	0.8	2.8205	1.5	0.2372	1.3	0.85	1372.0	15.8	1361.0	11.2	1343.7	15.1	1343.7	15.1	102.1
CW2-71	75	50476	1.6	11.4764	1.2	2.8356	1.8	0.2360	1.3	0.74	1366.0	16.3	1365.0	13.5	1363.5	23.4	1363.5	23.4	100.2
CW2-30	39	30658	0.9	11.4431	1.8	2.7336	2.0	0.2269	0.9	0.45	1318.1	10.7	1337.6	14.9	1369.1	34.4	1369.1	34.4	96.3
CW2-37	284	370451	2.2	11.4370	0.5	2.8457	2.2	0.2361	2.1	0.98	1366.1	26.2	1367.7	16.4	1370.1	9.1	1370.1	9.1	99.7
CW2-82	43	80544	1.7	11.3458	0.8	2.9766	2.3	0.2449	2.2	0.94	1412.3	27.8	1401.7	17.7	1385.5	15.1	1385.5	15.1	101.9
CW2-20	86	84209	2.9	11.2134	0.8	2.8300	4.3	0.2302	4.3	0.98	1335.3	51.5	1363.5	32.6	1408.0	15.6	1408.0	15.6	94.8
CW2-19	88	145518	2.1	11.1680	0.9	3.0119	2.1	0.2440	1.8	0.89	1407.2	23.0	1410.6	15.6	1415.7	18.0	1415.7	18.0	99.4
CW2-89	58	60209	0.9	11.1610	0.7	3.1253	2.0	0.2530	1.9	0.93	1453.8	24.5	1438.9	15.5	1416.9	14.0	1416.9	14.0	102.6
CW2-27	139	205257	1.9	11.1194	0.6	3.0284	1.6	0.2442	1.4	0.91	1408.6	18.2	1414.8	12.0	1424.1	12.3	1424.1	12.3	98.9
CW2-14	67	60536	2.1	11.1185	1.8	3.0511	2.5	0.2460	1.6	0.67	1418.0	20.9	1420.5	18.8	1424.2	35.0	1424.2	35.0	99.6
CW2-91	189	28056	1.1	10.9364	1.1	3.1738	2.1	0.2517	1.8	0.86	1447.5	23.8	1450.8	16.6	1455.7	21.2	1455.7	21.2	99.4
CW2-94	80	67022	1.1	10.9075	0.9	3.2330	1.2	0.2558	0.8	0.67	1468.1	10.8	1465.1	9.6	1460.8	17.6	1460.8	17.6	100.5
CW2-58	82	72699	1.6	10.8987	0.6	3.2241	1.5	0.2548	1.3	0.91	1463.4	17.6	1463.0	11.4	1462.3	11.4	1462.3	11.4	100.1
CW2-65	136	146987	1.8	10.6433	0.7	3.4003	1.6	0.2625	1.5	0.91	1502.5	19.6	1504.5	12.6	1507.2	12.4	1507.2	12.4	99.7
CW2-88	224	188921	2.0	10.6066	0.3	3.4352	0.9	0.2643	0.9	0.95	1511.6	11.6	1512.5	7.2	1513.7	5.4	1513.7	5.4	99.9
CW2-100	201	380851	3.1	10.3187	0.2	3.7997	1.2	0.2844	1.2	0.98	1613.3	16.5	1592.7	9.5	1565.5	4.4	1565.5	4.4	103.1
CW2-76	105	59824	1.1	9.8792	0.6	4.0527	1.1	0.2904	1.0	0.87	1643.4	14.0	1644.8	9.1	1646.6	10.3	1646.6	10.3	99.8
CW2-56	88	75831	0.5	9.8685	0.9	4.1421	2.8	0.2965	2.6	0.94	1673.7	38.6	1662.6	22.7	1648.6	16.9	1648.6	16.9	101.5
CW2-1	95	112675	2.8	9.3441	0.7	4.6311	1.2	0.3138	1.0	0.81	1759.6	14.9	1754.9	10.0	1749.3	12.7	1749.3	12.7	100.6
CW2-2	59	132472	1.0	9.3092	0.8	4.6927	1.1	0.3168	0.8	0.71	1774.3	11.9	1765.9	9.1	1756.1	14.0	1756.1	14.0	101.0
CW2-83	122	153967	5.7	9.1554	0.5	4.7652	3.3	0.3164	3.3	0.99	1772.2	50.7	1778.8	27.8	1786.5	9.2	1786.5	9.2	99.2
CW2-69	27	35584	0.7	8.9698	2.4	5.1198	3.2	0.3331	2.2	0.67	1853.2	34.7	1839.4	27.1	1823.7	42.8	1823.7	42.8	101.6
CW2-24	153	203937	1.1	8.8836	0.6	5.0667	1.7	0.3264	1.6	0.94	1821.1	24.9	1830.5	14.2	1841.3	10.1	1841.3	10.1	98.9
CW2-102	79	172695	2.0	8.8381	0.6	5.2561	1.8	0.3369	1.7	0.95	1871.8	27.8	1861.8	15.4	1850.6	10.4	1850.6	10.4	101.1
CW2-26	73	36571	1.4	8.8336	1.2	5.2158	1.9	0.3342	1.4	0.77	1858.5	23.3	1855.2	15.9	1851.5	21.3	1851.5	21.3	100.4
CW2-13	59	99355	2.8	8.7555	0.7	5.3152	2.0	0.3375	1.8	0.93	1874.7	30.1	1871.3	17.0	1867.5	13.1	1867.5	13.1	100.4
CW2-81	68	106821	0.8	8.7363	0.5	5.3545	2.6	0.3393	2.5	0.98	1883.1	41.2	1877.6	22.1	1871.5	9.8	1871.5	9.8	100.6
CW2-17	40	55526	2.5	8.7198	1.2	5.3743	1.9	0.3399	1.5	0.79	1886.1	24.8	1880.8	16.4	1874.9	21.1	1874.9	21.1	100.6
CW2-78	40	103704	1.2	6.5133	1.8	9.0632	5.3	0.4281	4.9	0.94	2297.3	95.2	2344.4	48.1	2385.6	31.3	2385.6	31.3	96.3
CW2-74	36	148346	1.3	5.9845	0.6	11.3116	3.0	0.4910	2.9	0.98	2574.8	62.1	2549.2	27.8	2528.8	9.3	2528.8	9.3	101.8
CW2-60	162	327086	2.0	5.9264	0.3	11.0138	1.5	0.4734	1.5	0.98	2498.5	31.4	2524.3	14.4	2545.1	5.2	2545.1	5.2	98.2
CW2-7	25	44036	1.2	5.8307	1.1	11.7605	2.3	0.4973	2.0	0.88	2602.3	42.6	2585.5	21.2	2572.4	18.2	2572.4	18.2	101.2
CW2-23	76	140547	2.0	5.8204	0.9	11.3890	2.5	0.4808	2.3	0.94	2530.6	48.9	2555.5	23.2	2575.3	14.2	2575.3	14.2	98.3
CW2-59	78	171576	1.2	5.7808	0.3	11.6600	1.9	0.4889	1.9	0.99	2565.7	39.7	2577.5	17.7	2586.7	4.4	2586.7	4.4	99.2
CW2-53	36	100805	1.3	5.4196	0.4	13.2752	2.0	0.5218	2.0	0.98	2706.8	44.0	2699.4	19.2	2693.9	7.1	2693.9	7.1	100.5
CW2-51	57	136911	2.2	4.5568	0.3	17.9846	1.9	0.5944	1.9	0.99	3007.1	44.8	2988.9	18.2	2976.7	4.9	2976.7	4.9	101.0

CW3 (1AA/13-24-082-10W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
CW3-97	288	26578	1.3	20.0533	6.7	0.2543	7.2	0.0370	2.6	0.36	234.2	5.9	230.1	14.9	188.8	157.0	234.2	5.9	NA
CW3-43	348	46662	1.6	18.1797	2.4	0.4628	2.9	0.0610	1.6	0.57	381.8	6.1	386.2	9.3	412.5	53.5	381.8	6.1	NA
CW3-46	100	43315	3.1	18.3654	5.7	0.4672	5.9	0.0622	1.5	0.26	389.2	5.8	389.2	19.1	389.7	128.0	389.2	5.8	NA
CW3-86	116	39942	1.8	17.9159	8.1	0.5237	8.3	0.0680	1.8	0.22	424.4	7.4	427.6	28.9	445.0	179.8	424.4	7.4	95.4
CW3-25	266	46909	1.8	18.2949	1.7	0.5138	2.5	0.0682	1.9	0.74	425.2	7.8	421.0	8.7	398.3	38.0	425.2	7.8	106.7
CW3-62	120	27334	1.4	18.5301	6.7	0.5373	7.0	0.0722	1.9	0.28	449.5	8.4	436.7	24.8	369.6	151.3	449.5	8.4	121.6
CW3-56	141	59000	0.8	17.3331	1.4	0.6285	2.4	0.0790	1.9	0.80	490.2	8.9	495.2	9.2	518.1	30.8	490.2	8.9	94.6
CW3-8	65	20787	1.4	17.0689	3.1	0.7158	3.6	0.0886	1.9	0.52	547.4	9.8	548.2	15.2	551.8	67.0	547.4	9.8	99.2
CW3-22	111	40184	0.6	16.7225	1.4	0.8046	3.9	0.0976	3.7	0.94	600.2	21.2	599.4	17.9	596.3	29.8	600.2	21.2	100.7
CW3-101	299	80735	3.2	16.1215	1.4	0.9315	2.4	0.1089	1.9	0.81	666.4	12.1	668.4	11.6	675.1	29.8	666.4	12.1	98.7
CW3-29	309	66073	2.3	15.6758	0.8	1.0540	1.9	0.1198	1.7	0.90	729.6	11.9	730.9	10.0	734.8	17.5	729.6	11.9	99.3
CW3-61	37	20813	3.0	14.3373	3.9	1.5491	4.3	0.1611	1.8	0.43	962.8	16.4	950.1	26.4	921.0	79.4	921.0	79.4	104.5
CW3-20	1042	5862	7.0	13.8595	0.4	1.4671	1.0	0.1475	0.9	0.92	886.8	7.9	917.0	6.2	990.3	8.2	990.3	8.2	89.6
CW3-31	79	55543	1.9	13.7582	1.4	1.6652	2.1	0.1662	1.6	0.77	990.9	14.8	995.3	13.4	1005.1	27.4	1005.1	27.4	98.6
CW3-21	256	171170	3.9	13.7161	0.4	1.7252	2.1	0.1716	2.1	0.98	1021.1	19.4	1018.0	13.5	1011.3	8.6	1011.3	8.6	101.0
CW3-44	350	317633	1.5	13.5974	0.3	1.7857	1.4	0.1761	1.4	0.98	1045.6	13.7	1040.3	9.4	1028.9	6.0	1028.9	6.0	101.6
CW3-7	254	465438	3.7	13.5817	0.6	1.8078	2.5	0.1781	2.4	0.97	1056.5	23.1	1048.3	16.0	1031.3	12.4	1031.3	12.4	102.4
CW3-45	61	49758	2.6	13.5807	2.2	1.8513	5.3	0.1823	4.8	0.91	1079.8	47.7	1063.9	34.9	1031.4	45.3	1031.4	45.3	104.7
CW3-96	49	46209	1.9	13.5578	4.1	1.8533	5.0	0.1822	2.8	0.57	1079.2	28.3	1064.6	33.2	1034.8	83.7	1034.8	83.7	104.3
CW3-95	339	96252	4.2	13.5405	0.8	1.7734	1.7	0.1742	1.5	0.88	1035.0	14.6	1035.8	11.3	1037.4	16.7	1037.4	16.7	99.8
CW3-92	63	24428	0.9	13.5193	3.7	1.7264	4.3	0.1693	2.2	0.51	1008.1	20.5	1018.4	27.9	1040.6	75.7	1040.6	75.7	96.9
CW3-38	57	74171	2.0	13.5128	2.1	1.7942	2.6	0.1758	1.6	0.62	1044.2	15.8	1043.4	17.2	1041.6	41.8	1041.6	41.8	100.3
CW3-90	124	47379	2.0	13.5063	1.9	1.8049	2.2	0.1768	1.2	0.51	1049.5	11.2	1047.2	14.6	1042.5	38.8	1042.5	38.8	100.7
CW3-78	71	29970	3.9	13.4713	3.7	1.7564	3.9	0.1716	1.1	0.28	1021.0	10.1	1029.5	25.1	1047.8	75.2	1047.8	75.2	97.4
CW3-67	57	22997	2.8	13.4212	2.7	1.7648	4.6	0.1718	3.7	0.81	1021.9	34.9	1032.6	29.7	1055.3	54.7	1055.3	54.7	96.8
CW3-102	104	28035	2.5	13.4193	2.6	1.8572	5.1	0.1808	4.4	0.86	1071.1	43.1	1066.0	33.7	1055.6	52.8	1055.6	52.8	101.5
CW3-34	35	29018	0.6	13.3994	2.3	1.8200	2.5	0.1769	0.9	0.36	1049.9	8.9	1052.7	16.5	1058.6	47.3	1058.6	47.3	99.2
CW3-40	98	61749	3.1	13.3757	0.9	1.8536	1.9	0.1798	1.6	0.87	1066.0	15.8	1064.7	12.2	1062.1	18.6	1062.1	18.6	100.4
CW3-30	44	39116	0.9	13.2732	1.2	1.8845	1.6	0.1814	1.0	0.65	1074.7	10.3	1075.7	10.5	1077.6	24.1	1077.6	24.1	99.7
CW3-99	232	147704	2.9	13.1529	1.2	1.9600	1.6	0.1870	1.0	0.63	1104.9	10.2	1101.9	10.7	1095.8	24.9	1095.8	24.9	100.8
CW3-12	92	92030	2.2	13.0377	1.1	2.0308	1.7	0.1920	1.3	0.76	1132.4	13.4	1125.9	11.6	1113.4	21.9	1113.4	21.9	101.7
CW3-2	136	17162	2.7	13.0367	9.0	1.8513	9.2	0.1750	2.2	0.23	1039.8	20.8	1063.9	60.8	1113.5	179.0	1113.5	179.0	93.4
CW3-66	170	53625	2.3	12.8410	1.1	2.0787	2.1	0.1936	1.8	0.85	1140.8	19.0	1141.8	14.7	1143.7	22.8	1143.7	22.8	99.7
CW3-72	102	109044	1.9	12.7711	1.5	2.0039	4.7	0.1856	4.4	0.95	1097.5	44.6	1116.8	31.6	1154.5	30.2	1154.5	30.2	95.1
CW3-84	63	41003	2.9	12.7267	2.9	2.1060	3.3	0.1944	1.6	0.49	1145.1	16.7	1150.8	22.6	1161.4	56.8	1161.4	56.8	98.6
CW3-88	540	355919	10.1	12.6790	0.7	2.1624	2.2	0.1988	2.1	0.95	1169.1	22.0	1169.0	15.1	1168.9	13.8	1168.9	13.8	100.0
CW3-23	305	57432	1.9	12.6748	0.4	2.2089	3.3	0.2031	3.3	0.99	1191.7	35.7	1183.9	23.1	1169.5	8.4	1169.5	8.4	101.9
CW3-104	181	123832	2.2	12.5320	0.8	2.2200	1.4	0.2018	1.1	0.82	1184.9	12.4	1187.4	9.7	1192.0	15.5	1192.0	15.5	99.4
CW3-91	66	36256	2.0	12.4529	4.5	2.1808	5.8	0.1970	3.7	0.63	1159.0	38.7	1174.9	40.6	1204.4	89.4	1204.4	89.4	96.2
CW3-63	165	116015	2.5	12.2616	1.3	2.3679	1.6	0.2106	1.0	0.64	1231.9	11.8	1233.0	11.7	1234.9	24.6	1234.9	24.6	99.8
CW3-11	223	224140	2.5	12.2310	0.5	2.3929	1.6	0.2123	1.5	0.95	1240.9	17.3	1240.5	11.5	1239.8	9.7	1239.8	9.7	100.1
CW3-7	436	417950	6.5	12.1859	0.2	2.4610	1.3	0.2175	1.3	0.98	1268.7	14.8	1260.7	9.4	1247.0	4.5	1247.0	4.5	101.7
CW3-53	199	301876	5.3	12.1115	0.5	2.3976	1.9	0.2106	1.9	0.97	1232.0	21.2	1241.9	14.0	1259.0	8.9	1259.0	8.9	97.9
CW3-64	109	84822	1.8	12.0190	2.9	2.4278	3.3	0.2116	1.7	0.50	1237.5	18.6	1250.9	23.9	1274.0	56.1	1274.0	56.1	97.1
CW3-103	85	40435	0.7	11.6739	2.2	2.6476	2.8	0.2242	1.8	0.63	1303.8	20.8	1314.0	20.8	1330.5	42.6	1330.5	42.6	98.0
CW3-65	202	142819	1.5	11.6510	0.6	2.7055	2.1	0.2286	2.0	0.96	1327.3	23.8	1330.0	15.3	1334.3	11.0	1334.3	11.0	99.5
CW3-35	84	61924	1.8	11.5580	0.4	2.7776	1.7	0.2328	1.6	0.97	1349.3	20.0	1349.5	12.7	1349.8	8.6	1349.8	8.6	100.0
CW3-37	77	117432	2.0	11.4084	1.2	2.8900	4.8	0.2391	4.7	0.97	1382.1	58.4	1379.3	36.5	1374.9	22.1	1374.9	22.1	100.5
CW3-28	62	197401	2.3	10.9621	2.2	3.2956	6.7	0.2620	6.3	0.95	1500.2	85.0	1480.0	52.4	1451.2	41.8	1451.2	41.8	103.4
CW3-47	72	106645	1.6	10.9484	0.7	3.2732	1.8	0.2599	1.7	0.92	1489.4	22.1	1474.7	14.0	1453.6	13.1	1453.6	13.1	102.5
CW3-19	123	140230	1.2	10.8508	0.4	3.2931	1.4	0.2592	1.3	0.97	1485.5	17.8	1479.4	10.8	1470.6	6.9	1470.6	6.9	101.0
CW3-58	117	311277	4.6	10.7680	0.5	3.3694	1.1	0.2631	0.9	0.88	1505.9	12.4	1497.3	8.3	1485.2	9.7	1485.2	9.7	101.4
CW3-81	141	69253	3.0	10.6318	0.7	3.3224	1.1	0.2562	0.9	0.78	1470.3	11.8	1486.3	9.0	1509.3	13.5	1509.3	13.5	97.4
CW3-68	85	32405	1.9	10.4360	1.8	3.4621	2.1	0.2620	1.1	0.53	1500.3	15.3	1518.6	16.9	1544.3	34.1	1544.3	34.1	97.2
CW3-18	417	464330	2.7	10.3857	0.3	3.5070	1.4	0.2642	1.3	0.97	1511.1	17.9	1528.8	10.8	1553.4	6.3	1553.4	6.3	97.3
CW3-41	64	126808	1.5	10.2058	1.1	3.8319	1.6	0.2836	1.1	0.70	1609.6	15.8	1599.5	12.7	1586.1	20.9	1586.1	20.9	101.5
CW3-5	42	75611	1.3	10.0981	1.0	3.8490	3.0	0.2819	2.8	0.94	1600.9	40.0	1603.1	24.1	1605.9	18.5	1605.9	18.5	99.7
CW3-6	35	20942	1.9	10.0921	2.2	3.9278	4.7	0.2875	4.1	0.88	1629.0	58.7	1619.4	37.7	1607.0	41.9	1607.0	41.9	101.4
CW3-55	56	122198	0.8	9.9897	1.4	4.1041	1.8	0.2974	1.0	0.58	1678.2	15.0	1655.1	14.4	1626.0	26.7	1626.0	26.7	103.2
CW3-50	100	78610	1.0	9.9118	0.6	4.0764	1.5	0.2930	1.3	0.92	1656.7	19.4	1649.6	11.8	1640.5	10.8	1640.5	10.8	101.0
CW3-39	89	146684	2.0	9.9106	1.0	4.0671	1.5	0.2923	1.2	0.76	1653.2	17.0	1647.7	12.5	1640.8	18.7	1640.8	18.7	100.8
CW3-73	77	74753	1.1	9.8857	1.6	4.2472	3.0	0.3045	2.6	0.85	1713.6	38.5	1683.2	24.6	1645.4	29.0	1645.4	29.0	104.1
CW3-50	75	354463	1.6	9.8398	0.5	4.0868	3.1	0.2917	3.0	0.99	1649.8	44.2	1651.7	25.1	1654.1	9.3	1654.1	9.3	99.7
CW3-27	53	132293	1.2	9.6949	1.1	4.3351	1.7	0.3048	1.4	0.78	1715.2	20.5	1700.1	14.4	1681.5	20.2	1681.5	20.2	102.0
CW3-16	137	50691	1.1	9.5656	1.5	4.3529	2.2	0.3020	1.6	0.73	1701.2	23.7	1703.4	17.8	1706.2	26.9	1706.2	26.9	99.7
CW3-15	71	108139	2.2	9.1548	0.9	4.9268	1.4	0.3271	1.0	0.76	1824.4	16.6	1806.9	11.5	1786.6	16.1	1786.6	16.1	102.1
CW3-42	114	257443	1.3	9.1088	0.6	4.8828	1.8	0.3226	1.7	0.95	1802.3	26.2	1799.3	14.8	1795.8	10.2	1795.8	10.2	100.4
CW3-17	114	149071	2.3	9.0587	0.3	4.8465	2.3	0.3184	2.2	0.99	1782.0	34.8	1793.0	19.0	1805.8	6.0	1805.8	6.0	98.7
CW3-54	76	270057	2.1	9.0244	0.5	5.0827	1.0	0.3327	0.9	0.88	1851.3	14.8	1833.2	8.8	1812.7	8.8	1812.7	8.8	102.1
CW3-26	18	73287	2.2	8.9034	2.2	5.0661	3.3	0.3271	2.4	0.74	1824.5	38.5	1830.4	27.9	1837.2	40.2	1837.2	40.2	99.3
CW3-60	107	302623	3.0	8.9017	0.4	5.1907	3.6	0.3351	3.6	0.99	1863.1	58.5	1851.1	30.9	1837.6	6.9	1837.6	6.9	101.4
CW3-33	49	98988	1.7	8.8927	1.0	5.2175	3.5	0.3365	3.4	0.96	1869.8	54.8	1855.5	30.1	1839.4	18.8	1839.4	18.8	101.7
CW3-13	42	87994	1.8	8.8819	0.6	5.2124	1.2	0.3358	1.0	0.86	1866.3	16.6	1854.6	10.2	1841.6	11.1	1841.6	11.1	101.3
CW3-14	133	280181	2.9	8.8030	0.3	5.3100	1.7	0.3390	1.7	0.99	1882.0	27.4	1870.5	14.5	1857.7	5.3	1857.7	5.3	101.3
CW3-57	39	50268	4.1	8.7463	0.7	5.3681	1.7	0.3405	1.5	0.90	1889.2	25.3	1879.8	14.6	1869.4	13.1	1869.4	13.1	101.1
CW3-79	55	71891	4.3	8.7391	1.2	5.3973	3.6	0.3421	3.4	0.94	1896.7	55.3	1884.4	30.6	1870.9	21.3	1870.9	21.3	101.4
CW3-59	50	65370	2.8	8.6974	0.5	5.3280	1.2	0.3361	1.0	0.89	1867.8	16.7	1873.4	9.9	1879.5	9.4	1879.5	9.4	99.4
CW3-71	65	67037	1.0	8.6613	1.0	5.3850	1.9	0.3383	1.6	0.85	1878.3	26.2	1882.5	16.2	1887.0	18.0	1887.0	18.0	99.5
CW3-85	136	87089	2.0	8.2293	0.6	6.0034	1.6	0.3583	1.5	0.92	1974.2	25.5	1976.3	14.1	1978.6	11.1	1978.6	11.1	99.8
CW3-10	34	104458	1.5	7.7352	1.5	6.9988	1.7	0.3926	0.9	0.51	2135.0	15.7	2111.3	15.2	2088.2	26.0	2088.2	26.0	102.2
CW3-93	29	13063	1.0	7.6053	1.7	5.6944	2.3	0.3141	1.5	0.66	1760.8	23.9	1930.5	20.1	2117.9	30.5	2117.9	30.5	83.1
CW3-74	119	142557	2.2	7.4312	0.6	7.4759	3.0	0.4029	3.0	0.98	2182.5	55.2	2170.1	27.3	2158.4	11.2	2158.4	11.2	101.1
CW3-48	62	27896	2.0	6.8050	0.3	9.0609	0.8	0.4472	0.7	0.91	2382.8	13.7	2344.2	6.9	2310.7	5.5	2310.7	5.5	103.1
CW3-36	72	193994	1.5	6.5948	0.9	9.1417	1.6	0.4372	1.4	0.85	2338.3	27.5	2352.3	15.0	2364.4	14.6	2364.4	14.6	98.9
CW3-87	175	452957	1.9	6.4293	0.3	9.9735	1.7	0.4651	1.7	0.99	2461.9	33.9	2432.3	15.5	2407.7	4.7	2407.7	4.7	102.2
CW3-75	110	147102	1.8	5.6949	0.4	12.2444	1.2	0.5057	1.1	0.95	2638.4	23.8	2623.3	10.8	2611.7	6.0	2611.7	6.0	101.0
CW3-24	528	12127	4.0	5.4645	0.4	10.4370	1.8	0.4136	1.8	0.97	2231.6	33.6	2474.3	17.0	2680.2	7.0	2680.2	7.0	83.3
CW3-100	81	159042	1.0	5.4554	0.3	13.0775	1.0	0.5174	1.0	0.95	2688.2	21.9	2685.3	9.9	2683.0	5.3	2683.0	5.3	100.2
CW3-32	46	461963	1.0	5.3896	0.5	13.5199	1.2	0.5285	1.1	0.91	2735.0	24.1	2716.7	11.2	2703.0	8.2	2703.0	8.2	101.2
CW3-80	47	51498	1.8	5.2767	0.9	13.7282	1.6	0.5254	1.3	0.82	2721.9	29.9	2731.1	15.6	2737.9	15.6	2737.9	15.6	99.4

KE1 (1AA/08-19-084-06W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
KC-1-39	47	2498	3.1	27.2403	224.4	0.0932	224.5	0.0184	7.5	0.03	117.6	8.8	90.5	196.8	-577.7	0.0	117.6	8.8	NA
KC-1-86	340	44103	0.8	19.7543	4.8	0.1741	4.9	0.0249	0.7	0.15	158.8	1.2	163.0	7.4	223.6	112.0	158.8	1.2	NA
KC-1-35	67	8280	1.6	19.4796	13.9	0.2463	14.1	0.0348	1.8	0.13	220.5	3.9	223.6	28.2	255.9	321.9	220.5	3.9	NA
KC-1-25	168	24991	1.9	20.4695	4.3	0.2855	4.6	0.0424	1.5	0.32	267.6	3.8	255.0	10.3	140.8	101.4	267.6	3.8	NA
KC-1-10	196	37025	1.5	18.2275	3.3	0.4769	3.6	0.0631	1.4	0.39	394.2	5.3	396.0	11.7	406.6	73.3	394.2	5.3	NA
KC-1-32	245	70526	1.7	18.1418	2.1	0.4851	3.0	0.0638	2.1	0.70	398.9	8.3	401.6	10.1	417.1	48.0	398.9	8.3	NA
KC-1-16	189	66995	3.6	18.3547	3.3	0.4957	3.5	0.0660	0.9	0.25	411.9	3.5	408.8	11.6	391.0	75.0	411.9	3.5	105.4
KC-1-28	195	51563	1.7	18.0485	2.6	0.5086	3.3	0.0666	2.1	0.64	415.5	8.5	417.5	11.4	428.6	57.5	415.5	8.5	96.9
KC-1-13	99	10038	1.4	17.6507	3.4	0.5324	3.7	0.0682	1.3	0.36	425.0	5.5	433.4	13.0	478.1	75.8	425.0	5.5	88.9
KC-1-14	377	213922	4.1	17.8636	1.6	0.5280	1.7	0.0684	0.5	0.31	426.6	2.2	430.5	6.1	451.5	36.4	426.6	2.2	94.5
KC-1-85	218	72608	0.8	18.1139	2.1	0.5341	2.4	0.0702	1.2	0.48	437.2	4.9	434.5	8.5	420.6	47.4	437.2	4.9	104.0
KC-1-104	53	21441	1.5	18.6373	5.7	0.5207	6.1	0.0704	2.1	0.34	438.4	8.9	425.6	21.2	356.6	129.6	438.4	8.9	122.9
KC-1-62	104	20094	0.9	18.5499	6.6	0.5286	6.7	0.0711	0.9	0.13	442.9	3.9	430.9	23.6	367.2	149.9	442.9	3.9	120.6
KC-1-88	238	124863	0.4	17.8117	2.6	0.5644	2.7	0.0729	0.7	0.26	453.7	3.1	454.4	9.9	458.0	58.2	453.7	3.1	99.0
KC-1-76	134	54017	1.1	17.5642	4.3	0.6104	4.7	0.0778	1.8	0.39	482.8	8.5	483.8	18.0	489.0	94.9	482.8	8.5	98.7
KC-1-44	240	5288	0.5	16.8864	2.8	0.6627	3.0	0.0812	1.1	0.37	503.1	5.3	516.3	12.0	575.2	60.0	503.1	5.3	87.5
KC-1-69	208	52962	0.9	17.1775	2.4	0.6569	2.6	0.0818	1.0	0.40	507.1	5.0	512.7	10.4	537.9	52.1	507.1	5.0	94.3
KC-1-38	103	60439	2.3	17.2996	2.7	0.6796	2.8	0.0853	0.8	0.27	527.5	3.8	526.5	11.7	522.4	60.0	527.5	3.8	101.0
KC-1-2	49	19340	1.1	17.4131	6.8	0.7208	7.2	0.0910	2.5	0.35	561.6	13.6	551.1	30.8	508.0	149.3	561.6	13.6	110.5
KC-1-71	128	44454	0.9	16.9569	2.2	0.7473	2.5	0.0919	1.2	0.48	566.8	6.5	566.7	11.0	566.1	48.4	566.8	6.5	100.1
KC-1-105	13	4783	0.9	15.3968	22.1	0.8634	22.8	0.0964	5.6	0.25	593.4	32.0	632.0	107.9	772.6	471.1	593.4	32.0	76.8
KC-1-84	129	71224	2.1	16.8944	2.9	0.7895	3.2	0.0967	1.2	0.38	595.3	6.8	590.9	14.2	574.1	63.8	595.3	6.8	103.7
KC-1-94	184	90319	1.5	16.6450	1.5	0.8254	2.6	0.0996	2.1	0.81	612.3	12.1	611.1	11.7	606.4	32.3	612.3	12.1	101.0
KC-1-63	141	185431	0.8	16.1910	2.0	0.8833	2.7	0.1037	1.9	0.69	636.2	11.5	642.8	13.0	665.9	42.3	636.2	11.5	95.5
KC-1-31	47	34876	1.6	14.6012	3.1	1.4498	3.8	0.1535	2.1	0.57	920.7	18.3	909.8	22.6	883.4	64.2	883.4	64.2	104.2
KC-1-26	30	19710	0.7	14.5878	4.1	1.4291	6.3	0.1512	4.8	0.76	907.7	40.4	901.2	37.5	885.2	84.4	907.7	40.4	102.5
KC-1-29	303	201885	2.9	14.1641	0.2	1.5791	0.8	0.1622	0.7	0.97	969.1	6.7	962.0	4.8	945.9	3.9	945.9	3.9	102.5
KC-1-97	129	172540	2.7	14.0778	1.1	1.6256	1.8	0.1660	1.5	0.81	989.9	13.7	980.2	11.6	958.4	22.1	958.4	22.1	103.3
KC-1-64	25	19080	2.6	14.0117	5.9	1.6144	6.3	0.1641	2.0	0.32	979.3	17.9	975.8	39.3	968.0	121.5	968.0	121.5	101.2
KC-1-102	71	45332	1.6	13.9031	1.4	1.7055	2.1	0.1720	1.5	0.74	1023.0	14.5	1010.6	13.3	983.8	28.5	983.8	28.5	104.0
KC-1-96	127	98214	5.6	13.6645	1.3	1.7520	1.8	0.1736	1.3	0.71	1032.1	12.4	1027.9	11.9	1019.0	26.1	1019.0	26.1	101.3
KC-1-30	33	16959	2.5	13.6468	4.0	1.7290	4.1	0.1711	1.1	0.28	1018.3	10.8	1019.4	26.6	1021.6	80.4	1021.6	80.4	99.7
KC-1-80	24	28292	1.7	13.6348	4.7	1.7914	5.1	0.1771	1.8	0.36	1051.4	17.6	1042.3	33.1	1023.4	96.0	1023.4	96.0	102.7
KC-1-89	49	51902	1.8	13.6296	3.5	1.7494	4.1	0.1729	2.2	0.54	1028.2	21.3	1026.9	26.8	1024.2	70.6	1024.2	70.6	100.4
KC-1-70	83	69189	1.0	13.5342	1.8	1.7887	2.0	0.1756	0.8	0.41	1042.8	8.0	1041.3	13.2	1038.4	37.3	1038.4	37.3	100.4
KC-1-72	98	83551	1.4	13.5024	1.8	1.8038	2.1	0.1766	1.1	0.53	1048.6	10.7	1046.8	13.6	1043.1	35.7	1043.1	35.7	100.5
KC-1-65	117	73346	1.7	13.4339	1.5	1.8917	2.4	0.1843	1.9	0.79	1090.5	19.3	1078.2	16.1	1053.4	29.6	1053.4	29.6	103.5
KC-1-59	77	116266	1.9	13.4199	1.4	1.8433	1.8	0.1794	1.2	0.66	1063.7	11.9	1061.0	12.0	1055.5	27.5	1055.5	27.5	100.8
KC-1-81	91	54423	1.5	13.4030	1.7	1.8618	2.2	0.1810	1.4	0.63	1072.3	13.9	1067.6	14.8	1058.0	34.9	1058.0	34.9	101.3
KC-1-17	157	120246	2.5	13.3786	0.8	1.8832	1.4	0.1827	1.2	0.84	1081.9	11.6	1075.2	9.2	1061.7	15.1	1061.7	15.1	101.9
KC-1-73	94	72748	6.1	13.3509	1.4	1.9071	1.6	0.1847	0.9	0.55	1092.4	8.9	1083.6	10.8	1065.9	27.4	1065.9	27.4	102.5
KC-1-6	167	176342	2.0	13.3468	0.4	1.8810	1.4	0.1821	1.4	0.95	1078.4	13.4	1074.4	9.4	1066.5	8.8	1066.5	8.8	101.1
KC-1-3	155	91148	0.6	13.3414	1.4	1.8822	1.6	0.1821	0.9	0.54	1078.5	8.6	1074.8	10.7	1067.3	27.3	1067.3	27.3	101.1
KC-1-91	562	609755	5.6	13.3246	0.5	1.8726	1.2	0.1810	1.1	0.92	1072.3	10.6	1071.5	7.7	1069.8	9.1	1069.8	9.1	100.2
KC-1-42	171	164750	3.0	13.2870	0.9	1.9006	1.4	0.1832	1.1	0.78	1084.2	10.8	1081.3	9.2	1075.5	17.2	1075.5	17.2	100.8
KC-1-22	77	58376	2.9	13.2858	1.7	1.8830	1.8	0.1814	0.7	0.40	1074.8	7.2	1075.1	12.1	1075.7	33.8	1075.7	33.8	99.9
KC-1-7	132	9689	1.6	13.2572	2.6	1.8367	2.9	0.1766	1.2	0.43	1048.4	11.9	1058.7	19.0	1080.0	52.5	1080.0	52.5	97.1
KC-1-52	104	99020	1.4	13.2410	1.4	1.9091	2.3	0.1833	1.8	0.79	1085.2	18.3	1084.3	15.5	1082.5	28.6	1082.5	28.6	100.3
KC-1-56	83	70197	1.8	13.2246	1.7	1.8884	2.6	0.1811	1.9	0.74	1073.1	18.8	1077.0	17.1	1085.0	34.8	1085.0	34.8	98.9
KC-1-103	59	40171	1.6	13.2023	1.6	1.8922	2.2	0.1812	1.4	0.66	1073.5	14.1	1078.4	14.4	1088.3	32.7	1088.3	32.7	98.6
KC-1-1	20	16575	1.1	13.1750	4.3	1.8136	4.5	0.1733	1.4	0.32	1030.3	13.5	1050.4	29.5	1092.4	85.8	1092.4	85.8	94.3
KC-1-12	126	2548	1.0	13.1341	4.6	1.6720	5.2	0.1593	2.4	0.47	952.7	21.4	997.9	32.8	1098.7	91.2	1098.7	91.2	86.7
KC-1-15	125	174032	2.7	13.0898	0.9	1.9361	2.0	0.1838	1.7	0.88	1087.7	17.3	1093.6	13.1	1105.5	18.4	1105.5	18.4	98.4
KC-1-99	27	21328	0.7	13.0472	3.6	1.9468	4.6	0.1842	2.9	0.64	1090.0	29.4	1097.3	31.0	1111.9	71.1	1111.9	71.1	98.0
KC-1-9	159	115503	2.1	12.8818	0.6	2.0716	1.1	0.1935	0.9	0.83	1140.5	9.1	1139.4	7.2	1137.4	11.9	1137.4	11.9	100.3
KC-1-27	197	150294	3.8	12.8343	0.5	2.0888	3.0	0.1944	3.0	0.99	1145.3	31.4	1145.1	20.8	1144.7	9.2	1144.7	9.2	100.1
KC-1-77	62	36898	1.9	12.8275	1.8	2.0550	3.7	0.1912	3.2	0.88	1127.8	33.4	1134.0	25.2	1145.8	35.4	1145.8	35.4	98.4
KC-1-48	40	31697	1.0	12.8016	3.8	2.0057	4.1	0.1862	1.4	0.34	1100.8	14.0	1117.4	27.7	1149.8	76.3	1149.8	76.3	95.7
KC-1-49	41	28336	2.0	12.7972	3.8	2.1312	4.3	0.1978	2.1	0.48	1163.5	21.9	1159.0	29.9	1150.5	75.6	1150.5	75.6	101.1
KC-1-75	339	181388	1.9	12.7656	0.7	2.1416	2.5	0.1983	2.4	0.96	1166.0	25.7	1162.3	17.3	1155.4	13.1	1155.4	13.1	100.9
KC-1-66	140	62557	1.4	12.7424	1.3	2.1423	1.8	0.1980	1.3	0.71	1164.5	13.8	1162.6	12.5	1159.0	25.2	1159.0	25.2	100.5
KC-1-101	54	37841	1.0	12.6924	1.8	2.1863	2.0	0.2013	0.8	0.42	1182.1	9.0	1176.7	13.9	1166.8	35.8	1166.8	35.8	101.3
KC-1-36	14	12602	1.1	12.6790	9.0	2.2283	9.8	0.2049	3.9	0.40	1201.6	43.2	1190.0	68.8	1168.9	177.9	1168.9	177.9	102.8
KC-1-5	209	198811	2.9	12.6618	0.9	2.2189	5.3	0.2038	5.3	0.98	1195.5	57.5	1187.0	37.5	1171.6	18.4	1171.6	18.4	102.0
KC-1-68	55	54513	1.1	12.6601	1.9	2.2233	2.7	0.2041	1.9	0.70	1197.5	20.5	1188.4	18.8	1171.9	38.0	1171.9	38.0	102.2
KC-1-40	117	73553	1.0	12.6449	1.0	2.1843	2.0	0.2003	1.7	0.88	1177.0	18.7	1176.0	13.8	1174.2	18.8	1174.2	18.8	100.2
KC-1-74	219	225705	1.7	12.5779	0.6	2.2614	0.9	0.2063	0.7	0.78	1209.1	8.1	1200.4	6.6	1184.7	11.4	1184.7	11.4	102.1
KC-1-20	249	226654	1.5	12.5507	0.6	2.2426	1.2	0.2041	1.1	0.86	1197.5	11.7	1194.5	8.7	1189.0	12.3	1189.0	12.3	100.7
KC-1-53	172	25682	1.4	12.4597	1.0	2.2205	1.9	0.2007	1.6	0.85	1178.9	17.1	1187.5	13.1	1203.3	19.7	1203.3	19.7	98.0
KC-1-54	39	31491	1.4	12.4305	3.9	2.2148	4.4	0.1997	2.0	0.46	1173.6	21.6	1185.7	30.9	1208.0	77.3	1208.0	77.3	97.2
KC-1-45	224	156228	2.0	12.2811	0.8	2.4174	2.9	0.2153	2.8	0.97	1257.1	32.1	1247.8	20.9	1231.8	14.9	1231.8	14.9	102.1
KC-1-34	143	68521	2.3	12.2606	1.0	2.3736	1.4	0.2111	1.0	0.72	1234.5	11.5	1234.7	10.1	1235.0	19.1	1235.0	19.1	100.0
KC-1-93	95	99711	2.1	12.0512	0.4	2.6186	1.4	0.2289	1.4	0.95	1328.6	16.5	1305.9	10.6	1268.7	8.5	1268.7	8.5	104.7
KC-1-95	57	66101	1.5	12.0372	1.1	2.5342	1.8	0.2212	1.4	0.78	1288.4	16.5	1281.9	13.2	1271.0	21.9	1271.0	21.9	101.4
KC-1-100	103	229962	1.1	11.3751	1.3	3.0042	2.4	0.2478	2.1	0.85	1427.4	26.7	1408.7	18.6	1380.5	24.4	1380.5	24.4	103.4
KC-1-33	84	122011	1.1	11.3674	0.8	2.9840	2.4	0.2460	2.3	0.95	1417.9	29.5	1403.5	18.6	1381.8	15.1	1381.8	15.1	102.6
KC-1-92	67	99030	1.8	10.8445	1.4	3.3030	1.6	0.2598	0.9	0.55	1488.8	12.0	1481.8	12.7	1471.8	25.8	1471.8	25.8	101.2
KC-1-98	22	66523	0.9	10.6567	5.2	3.4296	5.6	0.2651	1.9	0.34	1515.7	25.2	1511.2	43.7	1504.8	98.9	1504.8	98.9	100.7
KC-1-60	119	136070	1.1	10.5934	0.6	3.4523	1.7	0.2652	1.6	0.94	1516.6	22.0	1516.4	13.6	1516.1	10.7	1516.1	10.7	100.0
KC-1-79	149	90775	1.5	10.5728	0.7	3.5352	1.2	0.2711	1.0	0.82	1546.3	13.1	1535.1	9.2	1519.8	12.5	1519.8	12.5	101.7
KC-1-83	98	84736	0.7	10.0936	0.7	3.8855	1.7	0.2844	1.6	0.92	1613.7	22.6	1610.7	13.9	1606.7	12.7	1606.7	12.7	100.4
KC-1-11	111	222621	1.0	9.8194	0.5	4.1287	1.2	0.2940	1.0	0.89	1661.6	15.3	1660.0	9.6	1657.9	10.0	1657.9	10.0	100.2
KC-1-58	177	224493	1.5	9.7353	0.3	4.2733	3.7	0.3017	3.7	1.00	1699.9	55.2	1688.2	30.5	1673.8	5.7	1673.8	5.7	101.6
KC-1-37	109	81160	1.0	9.6991	1.4	4.2473	2.1	0.2988	1.5	0.74	1685.2	22.8	1683.2	17.0	1680.7	25.8	1680.7	25.8	100.3
KC-1-8	95	206542	1.0	9.1499	0.4	4.9390	1.0	0.3278	0.9	0.90	1827.5	13.8	1808.9	8.1	1787.6	7.7	1787.6	7.7	102.2
KC-1-78	442	735818	2.6	9.1152	0.2	4.8820	1.0	0.3227	1.0	0.98	1803.1	15.4	1799.2	8.4	1794.5	3.5	1794.5	3.5	100.5
KC-1-4	248	399362	1.0	9.0767	0.2	4.9707	0.6	0.3272	0.6	0.96	1824.9	9.5	1814.4	5.2	1802.2	3.1	1802.2	3.1	101.3
KC-1-51	72	15340	1.3	8.9150	1.6	5.0641	2.2	0.3274	1.5	0.69	1825.9	24.3	1830.1	18.8	1834.9	29.2	1834.9	29.2	99.5
KC-1-55	83	331300	0.9	7.8673	1.9	6.8068	3.7	0.3884	3.1	0.85	2115.4	56.1	2086.6	32.4	2058.3	34.0	2058.3	34.0	102.8
KC-1-47	92	135149	1.3	6.6595	0.7	9.2292	1.7	0.4458	1.5	0.92	2376.4	30.4	2361.0	15.2	2347.7	11.1	2347.7	11.1	101.2
KC-1-57	30	89206	1.7	5.3822	0.8	13.5110	2.4	0.5274	2.3	0.94	2730.5	50.4	2716.1	22.8	2705.3	13.8	2705.3	13.8	100.9
KC-1-87	75	203266	0.9	5.3590	0.3	13.5582	0.7	0.5270	0.6	0.92	2728.7	14.4	2719.4	6.6	2712.4	4.4	2712.4	4.4	100.6
KC-1-41	48	185634	1.5	5.2628	0.4	13.8856	1.1	0.5300	1.0	0.93	2741.5	21.9	2741.9	9.9	2742.3	6.2	2742.3	6.2	100.0
KC-1-61	42	129229	1.0	5.2582	0.5	14.0652	1.1	0.5364	1.0	0.89	2768.3	22.2	2754.1	10.5	2743.7	8.3	2743.7	8.3	100.9
KC-1-90	47	106331	1.0	5.0970	0.4	15.0156	1.0	0.5551	0.9	0.89	2846.3	19.7	2816.2	9.2	2794.8	7.3	2794.8	7.3	101.8
KC-1-23	22	52466	1.5	3.8927	0.5	23.0718	0.8	0.6514	0.6	0.79	3233.6	15.3	3230.0	7.4	3227.7	7.3	3227.7	7.3	100.2

KE2 (1AA/08-19-084-06W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
KE2-35	279	46810	1.6	20.1161	1.9	0.2080	2.9	0.0303	2.2	0.75	192.7	4.1	191.8	5.1	181.5	45.3	192.7	4.1	NA
KE2-37	645	150795	1.9	18.7001	0.9	0.3960	2.6	0.0537	2.4	0.93	337.3	7.8	338.8	7.4	349.1	20.9	337.3	7.8	NA
KE2-63	103	48730	4.5	17.6316	4.0	0.4914	8.4	0.0628	7.4	0.88	392.8	28.2	405.8	28.1	480.5	87.3	392.8	28.2	NA
KE2-16	398	252391	0.6	18.5391	1.3	0.4718	2.2	0.0634	1.8	0.81	396.5	6.8	392.5	7.1	368.5	28.5	396.5	6.8	NA
KE2-74	155	45269	2.1	18.0058	4.1	0.5032	4.3	0.0657	1.5	0.34	410.2	5.8	413.8	14.7	433.9	90.3	410.2	5.8	94.5
KE2-65	126	29894	2.6	18.6973	3.5	0.4924	3.9	0.0668	1.8	0.45	416.6	7.1	406.5	13.1	349.4	79.0	416.6	7.1	119.3
KE2-45	81	32403	2.6	17.6741	3.0	0.5351	4.5	0.0686	3.4	0.75	427.7	14.1	435.2	16.0	475.2	65.7	427.7	14.1	90.0
KE2-58	80	24490	1.1	18.1931	3.3	0.5416	3.8	0.0715	2.0	0.52	445.0	8.6	439.5	13.6	410.8	72.9	445.0	8.6	108.3
KE2-23	84	50775	1.1	17.8834	3.6	0.5676	4.5	0.0736	2.7	0.60	457.9	12.0	456.5	16.6	449.1	80.6	457.9	12.0	102.0
KE2-75	164	121814	0.8	17.5953	2.1	0.5889	2.4	0.0751	1.2	0.49	467.1	5.3	470.2	9.1	485.1	46.3	467.1	5.3	96.3
KE2-15	139	78242	0.8	17.3043	1.5	0.6985	2.6	0.0877	2.2	0.83	541.7	11.4	537.9	11.0	521.8	31.9	541.7	11.4	103.8
KE2-1	109	65140	2.3	14.0374	1.4	1.5779	3.0	0.1606	2.6	0.88	960.4	23.2	961.6	18.4	964.3	29.0	964.3	29.0	99.6
KE2-26	49	33700	1.5	13.9276	1.6	1.5887	3.8	0.1605	3.5	0.91	959.5	30.9	965.8	23.9	980.3	33.1	980.3	33.1	97.9
KE2-76	86	70069	2.4	13.8667	1.4	1.6967	2.4	0.1706	1.9	0.80	1015.6	17.8	1007.3	15.1	989.2	28.7	989.2	28.7	102.7
KE2-87	515	840713	4.7	13.8196	0.3	1.7017	1.0	0.1706	0.9	0.96	1015.2	8.8	1009.2	6.3	996.1	5.8	996.1	5.8	101.9
KE2-59	76	76231	2.1	13.7240	1.3	1.7646	2.8	0.1756	2.5	0.88	1043.1	23.9	1032.5	18.2	1010.2	26.5	1010.2	26.5	103.3
KE2-13	200	195366	4.9	13.6979	0.7	1.7035	3.4	0.1692	3.3	0.98	1007.9	30.8	1009.9	21.5	1014.0	13.3	1014.0	13.3	99.4
KE2-53	89	70029	0.8	13.6435	1.5	1.7095	4.3	0.1692	4.1	0.94	1007.5	37.9	1012.1	27.8	1022.1	30.5	1022.1	30.5	98.6
KE2-15	159	258882	21.2	13.6361	0.8	1.6635	3.6	0.1645	3.5	0.97	981.8	32.0	994.7	22.9	1023.2	16.8	1023.2	16.8	96.0
KE2-25	52	51551	1.6	13.5645	1.8	1.8423	5.7	0.1812	5.4	0.95	1073.7	53.4	1060.7	37.5	1033.8	36.5	1033.8	36.5	103.9
KE2-89	194	249183	2.2	13.5641	0.7	1.7509	1.5	0.1723	1.3	0.87	1024.5	12.4	1027.5	9.7	1033.9	15.1	1033.9	15.1	99.1
KE2-17	173	128736	1.9	13.5538	0.8	1.7669	2.7	0.1737	2.6	0.96	1032.4	25.2	1033.4	17.8	1035.4	15.3	1035.4	15.3	99.7
KE2-3	58	29911	1.7	13.5390	1.9	1.7173	3.2	0.1686	2.5	0.79	1004.5	23.3	1015.0	20.4	1037.6	39.4	1037.6	39.4	96.8
KE2-8	226	182343	2.2	13.5257	0.6	1.7682	2.7	0.1735	2.6	0.97	1031.1	25.1	1033.9	17.6	1039.6	12.4	1039.6	12.4	99.2
KE2-67	337	275615	3.1	13.5101	0.5	1.8287	1.9	0.1792	1.8	0.96	1062.5	17.4	1055.8	12.2	1042.0	11.1	1042.0	11.1	102.0
KE2-48	38	17219	2.6	13.4583	3.8	1.7921	4.5	0.1749	2.5	0.55	1039.2	24.0	1042.6	29.5	1049.7	76.0	1049.7	76.0	99.0
KE2-30	72	53245	0.8	13.4570	2.4	1.7640	3.9	0.1722	3.1	0.80	1024.0	29.5	1032.3	25.3	1049.9	47.4	1049.9	47.4	97.5
KE2-41	345	310336	1.2	13.3715	0.4	1.8384	2.9	0.1783	2.8	0.99	1057.6	27.6	1059.3	18.8	1062.8	8.1	1062.8	8.1	99.5
KE2-91	133	106452	2.4	13.3708	1.2	1.8515	2.3	0.1795	2.0	0.86	1064.5	19.6	1064.0	15.3	1062.9	23.9	1062.9	23.9	100.2
KE2-55	127	286126	1.8	13.2906	0.8	1.9142	1.6	0.1845	1.3	0.85	1091.6	13.6	1086.0	10.6	1075.0	16.7	1075.0	16.7	101.5
KE2-83	115	311417	1.6	13.2853	0.8	1.8980	3.0	0.1829	2.9	0.96	1082.7	29.3	1080.4	20.3	1075.8	16.2	1075.8	16.2	100.6
KE2-52	144	274594	1.7	13.2691	0.3	1.9298	1.1	0.1857	1.1	0.95	1098.1	10.7	1091.5	7.4	1078.2	6.9	1078.2	6.9	101.8
KE2-47	84	55379	0.9	13.2438	1.8	1.8819	3.4	0.1808	2.9	0.85	1071.1	28.4	1074.7	22.4	1082.0	35.2	1082.0	35.2	99.0
KE2-27	125	137615	2.2	12.9663	0.7	2.0131	3.9	0.1893	3.8	0.98	1117.7	38.8	1119.9	26.2	1124.4	14.6	1124.4	14.6	99.4
KE2-95	40	26309	1.0	12.9186	2.4	1.9675	2.9	0.1843	1.6	0.55	1090.7	16.1	1104.5	19.6	1131.7	48.3	1131.7	48.3	96.4
KE2-31	26	20028	1.2	12.9163	3.0	2.0536	4.1	0.1924	2.7	0.66	1134.2	28.1	1133.5	27.8	1132.1	60.5	1132.1	60.5	100.2
KE2-66	293	316574	2.8	12.7436	0.6	2.1636	1.7	0.2000	1.6	0.94	1175.2	17.3	1169.4	11.9	1158.8	11.6	1158.8	11.6	101.4
KE2-73	66	40571	2.6	12.7435	1.3	2.1294	3.7	0.1968	3.5	0.94	1158.2	37.2	1158.4	25.9	1158.8	26.0	1158.8	26.0	99.9
KE2-93	48	53308	2.6	12.7371	2.4	2.1630	4.7	0.1998	4.0	0.86	1174.3	43.4	1169.2	32.6	1159.8	47.2	1159.8	47.2	101.3
KE2-86	102	84876	2.0	12.6988	1.1	2.1865	1.7	0.2014	1.3	0.77	1182.7	13.9	1176.8	11.6	1165.8	21.2	1165.8	21.2	101.5
KE2-90	47	34807	2.0	12.6974	2.2	2.1597	4.0	0.1989	3.3	0.83	1169.3	35.3	1168.2	27.6	1166.0	43.8	1166.0	43.8	100.3
KE2-85	63	59030	3.2	12.6949	1.6	2.1706	2.8	0.1998	2.3	0.83	1174.5	24.7	1171.7	19.3	1166.4	30.9	1166.4	30.9	100.7
KE2-77	45	44535	1.1	12.6589	1.6	2.1545	2.4	0.1978	1.8	0.74	1163.5	19.0	1166.5	16.7	1172.0	32.0	1172.0	32.0	99.3
KE2-64	66	69758	4.0	12.6529	0.8	2.1926	2.7	0.2012	2.6	0.95	1181.8	27.9	1178.7	18.9	1173.0	16.1	1173.0	16.1	100.8
KE2-6	74	60640	1.4	12.6417	1.1	2.1704	2.9	0.1990	2.7	0.92	1169.9	29.1	1171.6	20.5	1174.7	22.3	1174.7	22.3	99.6
KE2-51	38	120750	2.1	12.5867	2.1	2.1854	3.7	0.1995	3.0	0.82	1172.6	32.2	1176.4	25.6	1183.4	41.6	1183.4	41.6	99.1
KE2-21	29	50685	2.1	12.5609	3.0	2.1806	4.4	0.1987	3.3	0.74	1168.1	35.0	1174.9	30.8	1187.4	58.8	1187.4	58.8	98.4
KE2-2	57	71446	2.8	12.5409	2.5	2.2381	4.4	0.2036	3.6	0.82	1194.5	39.4	1193.1	31.0	1190.5	49.9	1190.5	49.9	100.3
KE2-22	53	146659	1.6	12.4955	2.0	2.2188	3.6	0.2011	3.0	0.82	1181.1	31.9	1187.0	25.1	1197.7	39.9	1197.7	39.9	98.6
KE2-18	95	69144	1.0	12.4212	1.2	2.2804	2.3	0.2054	2.0	0.85	1204.5	21.5	1206.2	16.3	1209.5	24.2	1209.5	24.2	99.6
KE2-96	36	39594	1.6	12.2523	2.5	2.4431	3.1	0.2171	1.8	0.59	1266.6	21.3	1255.4	22.4	1236.4	49.0	1236.4	49.0	102.4
KE2-14	182	204135	2.9	12.2518	0.5	2.3893	3.0	0.2123	3.0	0.99	1241.1	33.8	1239.4	21.8	1236.4	10.2	1236.4	10.2	100.4
KE2-101	56	113826	1.3	12.1883	1.9	2.4353	2.5	0.2153	1.6	0.66	1256.8	18.7	1253.1	18.0	1246.6	36.8	1246.6	36.8	100.8
KE2-61	78	100592	3.4	12.0719	3.5	2.1758	7.3	0.1905	6.5	0.88	1124.1	66.6	1173.3	51.2	1265.4	68.6	1265.4	68.6	88.8
KE2-39	45	81080	1.7	11.8172	2.2	2.6605	4.3	0.2280	3.6	0.86	1324.1	43.5	1317.6	31.4	1306.9	42.7	1306.9	42.7	101.3
KE2-36	24	24989	2.2	11.7916	4.7	2.6414	7.2	0.2259	5.4	0.75	1313.0	64.5	1312.3	53.1	1311.1	91.9	1311.1	91.9	100.1
KE2-102	112	73102	1.8	11.6804	0.6	2.6853	2.2	0.2275	2.1	0.96	1321.3	25.1	1324.4	16.1	1329.5	11.2	1329.5	11.2	99.4
KE2-40	275	452169	2.9	11.6770	0.3	2.7307	2.4	0.2313	2.4	0.99	1341.1	29.1	1336.8	18.0	1330.0	6.0	1330.0	6.0	100.8
KE2-79	253	301855	0.5	11.6257	0.3	2.6931	1.0	0.2271	1.0	0.95	1319.1	11.7	1326.6	7.6	1338.5	6.3	1338.5	6.3	98.6
KE2-92	36	42868	1.8	11.3252	2.1	2.8293	3.8	0.2324	3.2	0.84	1347.0	39.1	1363.3	28.8	1389.0	40.0	1389.0	40.0	97.0
KE2-49	74	57290	2.4	11.2369	1.2	3.0237	4.6	0.2464	4.4	0.97	1420.0	56.3	1413.6	34.9	1404.0	23.0	1404.0	23.0	101.1
KE2-5	101	110636	1.5	11.0243	0.9	3.1212	2.7	0.2496	2.5	0.94	1436.2	32.2	1437.9	20.4	1440.5	16.9	1440.5	16.9	99.7
KE2-100	85	113732	1.3	10.9904	0.5	3.1575	3.1	0.2517	3.1	0.99	1447.1	39.8	1446.8	24.0	1446.3	9.0	1446.3	9.0	100.1
KE2-42	138	108666	2.3	10.8496	0.3	3.3002	2.2	0.2597	2.2	0.99	1488.2	29.5	1481.1	17.5	1470.9	6.5	1470.9	6.5	101.2
KE2-70	166	352368	0.8	9.8539	0.5	4.1196	1.1	0.2944	1.0	0.90	1663.5	14.4	1658.2	8.9	1651.4	8.9	1651.4	8.9	100.7
KE2-24	110	152919	1.8	9.6511	0.7	4.2827	2.3	0.2998	2.2	0.95	1690.2	32.3	1690.0	18.8	1689.8	12.9	1689.8	12.9	100.0
KE2-28	103	182718	1.1	9.3250	0.5	4.4760	2.5	0.3027	2.4	0.98	1704.8	36.1	1726.5	20.5	1753.0	9.8	1753.0	9.8	97.2
KE2-103	57	123128	1.1	9.2690	1.1	4.7204	1.4	0.3173	0.8	0.60	1776.7	13.1	1770.9	11.8	1764.0	20.6	1764.0	20.6	100.7
KE2-33	84	173470	1.5	9.2142	0.3	4.8262	3.7	0.3225	3.6	1.00	1802.1	57.3	1789.5	30.8	1774.8	5.9	1774.8	5.9	101.5
KE2-11	66	93317	4.6	9.1485	0.8	4.8519	2.2	0.3219	2.1	0.94	1799.2	32.2	1793.9	18.4	1787.9	13.8	1787.9	13.8	100.6
KE2-38	289	464338	1.8	9.0614	0.1	4.7521	3.1	0.3123	3.1	1.00	1752.0	47.7	1776.5	26.1	1805.3	2.5	1805.3	2.5	97.0
KE2-20	20	51854	0.7	9.0520	2.1	4.9585	2.8	0.3255	1.8	0.67	1816.7	29.0	1812.3	23.2	1807.2	37.3	1807.2	37.3	100.5
KE2-72	99	378926	2.2	8.9548	0.5	5.1575	1.4	0.3350	1.3	0.92	1862.4	21.2	1845.6	12.0	1826.8	9.8	1826.8	9.8	101.9
KE2-98	47	61626	0.9	8.9413	0.6	5.1356	1.7	0.3330	1.6	0.94	1853.1	26.0	1842.0	14.6	1829.5	10.6	1829.5	10.6	101.3
KE2-78	50	82126	2.3	8.8497	1.0	5.2701	2.3	0.3383	2.1	0.90	1878.3	33.9	1864.0	19.7	1848.2	18.3	1848.2	18.3	101.6
KE2-50	28	39865	2.9	8.8494	1.4	5.4537	3.2	0.3500	2.9	0.91	1934.7	48.7	1893.3	27.6	1848.2	24.5	1848.2	24.5	104.7
KE2-56	60	137983	2.1	8.8215	0.3	5.3575	2.3	0.3428	2.2	0.99	1900.0	36.8	1878.1	19.3	1853.9	5.0	1853.9	5.0	102.5
KE2-99	41	62191	4.6	8.7982	1.3	5.2202	2.0	0.3331	1.5	0.75	1853.4	23.6	1855.9	16.7	1858.7	23.4	1858.7	23.4	99.7
KE2-44	104	214560	2.2	8.7880	0.3	5.1473	2.7	0.3281	2.7	0.99	1829.0	42.3	1844.0	22.8	1860.8	6.3	1860.8	6.3	98.3
KE2-80	19	35918	0.7	8.5984	2.7	5.2508	3.1	0.3274	1.4	0.46	1826.0	22.3	1860.9	26.1	1900.1	48.9	1900.1	48.9	96.1
KE2-69	133	398153	2.9	8.4724	0.3	5.7111	1.1	0.3509	1.1	0.96	1939.1	18.2	1933.1	9.8	1926.6	5.4	1926.6	5.4	100.6
KE2-54	91	155133	1.9	8.0069	0.5	6.5063	2.4	0.3778	2.3	0.98	2066.2	40.8	2046.8	20.7	2027.2	8.4	2027.2	8.4	101.9
KE2-60	160	327056	2.1	7.7309	0.3	6.9995	3.5	0.3925	3.4	1.00	2134.2	62.7	2111.4	30.7	2089.2	4.8	2089.2	4.8	102.2
KE2-34	101	247865	2.0	5.8845	0.2	11.1628	3.3	0.4764	3.3	1.00	2511.6	68.7	2536.8	30.9	2557.0	4.1	2557.0	4.1	98.2
KE2-32	54	103800	1.2	5.8747	0.4	11.2988	4.1	0.4814	4.1	1.00	2533.4	86.4	2548.1	38.6	2559.8	5.9	2559.8	5.9	99.0
KE2-84	92	378849	2.0	5.8104	0.5	11.5993	1.4	0.4888	1.3	0.95	2565.5	28.5	2572.6	13.3	2578.2	7.6	2578.2	7.6	99.5
KE2-57	89	328045	0.9	5.8037	0.1	11.8324	2.6	0.4981	2.6	1.00	2605.4	54.8	2591.2	24.0	2580.1	2.4	2580.1	2.4	101.0
KE2-43	92	182194	2.1	5.7427	0.5	11.0417	4.0	0.4599	3.9	0.99	2439.0	79.5	2526.7	36.8	2597.8	8.9	2597.8	8.9	93.9
KE2-105	73	243690	0.9	5.4985	0.4	12.9791	1.0	0.5176	1.0	0.91	2688.9	21.0	2678.1	9.9	2670.0	7.1	2670.0	7.1	100.7
KE2-7	19	86195	1.0	5.4966	1.1	12.6059	3.5	0.5025	3.4	0.96	2624.7	73.0	2650.7	33.4	2670.5	17.4	2670.5	17.4	98.3
KE2-82	20	20770	0.5	5.4813	1.8	12.8048	2.2	0.5090	1.2	0.56	2652.5	26.5	2665.4	20.5	2675.2	29.7	2675.2	29.7	99.2
KE2-10	53	194935	1.2	5.4698	0.3	13.0217	1.9	0.5166	1.9	0.99	2684.6	41.2	2681.2	17.9	2678.6	4.3	2678.6	4.3	100.2
KE2-12	70	237012	0.9	5.4677	0.2	13.0443	2.1	0.5173	2.1	1.00	2687.6	46.7	2682.9	20.1	2679.3	3.4	2679.3	3.4	100.3
KE2-97	43	104297	0.9	5.4541	0.4	13.3632	1.5	0.5286	1.5	0.97	2735.6	32.5	2705.7	14.2	2683.4	6.4	2683.4	6.4	101.9
KE2-104	171	230998	2.2	5.4450	1.7	12.5230	2.7	0.4945	2.2	0.79	2590.3	45.9	2644.5	25.7	2686.1	27.8	2686.1	27.8	96.4
KE2-94	25	72584	0.9	5.4021	0.9	13.5747	2.6	0.5319	2.4	0.94	2749.3	53.7	2720.5	24.2	2699.2	14.5	2699.2	14.5	101.9
KE2-71	56	265310	0.7	5.3936	0.4	13.5907	1.9	0.5316	1.9	0.98	2748.4	41.5	2721.6	17.9	2701.8	6.6	2701.8	6.6	101.7
KE2-29	175	336498	1.7	5.3495	0.3	13.1158	3.6	0.5089	3.5	1.00	2651.8	77.0	2688.0	33.5	2715.4	4.9	2715.4	4.9	97.7
KE2-62	47	347041	0.9	5.3107	0.3	13.8466	3.4	0.5333	3.4	1.00	2755.5	77.0	2739.3	32.6	2727.4	4.3	2727.4	4.3	101.0
KE2-81	31	89808	1.6	5.2778	0.6	13.7718	3.1	0.5272	3.1	0.98	2729.5	68.8	2734.1	29.8	2737.6	9.4	2737.6	9.4	99.7
KE2-9	31	96023	0.6	5.1473	0.7	14.1764	2.7	0.5292	2.6	0.97	2738.2	59.1	2761.6	26.0	2778.7	11.5	2778.7	11.5	98.5
KE2-68	60	101509	1.0	5.0585	0.5	14.7012	3.1	0.5393	3.0	0.99	2780.7	68.3	2796.1	29.1	2807.2	7.5	2807.2	7.5	99.1
KE2-4	42	64635	1.8	5.0188	0.1	15.0369	3.0	0.5473	3.0	1.00	2814.1	68.1	2817.6	28.5	2820.1	2.3	2820.1	2.3	99.8

KE3 (1AA/08-19-084-06W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
KE3-65	409	38078	0.5	20.0932	3.0	0.1766	3.3	0.0257	1.3	0.39	163.8	2.1	165.1	5.0	184.2	70.5	163.8	2.1	NA
KE3-103	289	41792	1.9	19.5473	3.4	0.2709	3.9	0.0384	1.7	0.45	242.9	4.1	243.4	8.4	248.0	79.4	242.9	4.1	NA
KE3-84	48	1028	0.9	17.0406	21.0	0.4094	21.3	0.0506	3.0	0.14	318.2	9.5	348.5	62.8	555.3	463.5	318.2	9.5	NA
KE3-101	674	420764	0.9	18.8878	0.9	0.3805	3.6	0.0521	3.5	0.97	327.5	11.3	327.4	10.2	326.4	19.5	327.5	11.3	NA
KE3-91	130	48853	0.9	18.6318	5.9	0.4461	6.3	0.0603	2.0	0.32	377.3	7.4	374.5	19.6	357.3	133.7	377.3	7.4	NA
KE3-45	233	51085	1.6	18.5927	2.9	0.4874	3.2	0.0657	1.2	0.37	410.3	4.7	403.1	10.6	362.0	66.4	410.3	4.7	113.3
KE3-96	467	182895	13.5	18.2355	1.1	0.4999	1.2	0.0661	0.6	0.46	412.7	2.3	411.6	4.2	405.6	24.8	412.7	2.3	101.7
KE3-58	119	33673	0.7	17.8867	3.0	0.5110	3.3	0.0663	1.4	0.41	413.8	5.5	419.1	11.3	448.7	66.8	413.8	5.5	92.2
KE3-20	132	82353	0.9	17.7315	3.4	0.5231	3.7	0.0673	1.3	0.36	419.7	5.4	427.2	12.8	468.0	76.0	419.7	5.4	89.7
KE3-94	47	15448	1.1	17.9183	11.0	0.5341	11.7	0.0694	3.9	0.34	432.6	16.5	434.5	41.4	444.8	245.9	432.6	16.5	97.3
KE3-4	40	12815	1.2	19.8979	10.7	0.4855	11.0	0.0701	2.6	0.24	436.5	11.0	401.8	36.5	206.9	248.1	436.5	11.0	211.0
KE3-30	100	26760	1.1	17.9065	2.5	0.5511	2.9	0.0716	1.5	0.51	445.6	6.5	445.7	10.5	446.2	55.5	445.6	6.5	99.9
KE3-17	165	29053	0.7	17.0578	4.7	0.5856	4.7	0.0725	0.8	0.17	450.9	3.6	468.1	17.8	553.2	101.9	450.9	3.6	81.5
KE3-86	271	83671	1.1	17.8818	1.7	0.5640	2.3	0.0732	1.6	0.68	455.1	7.1	454.2	8.6	449.3	38.0	455.1	7.1	101.3
KE3-50	159	56674	1.3	17.8738	3.5	0.5909	3.9	0.0766	1.7	0.43	475.8	7.7	471.5	14.7	450.3	78.1	475.8	7.7	105.7
KE3-8	129	37059	1.2	17.3062	3.4	0.6746	4.3	0.0847	2.6	0.60	523.9	12.9	523.5	17.6	521.5	75.7	523.9	12.9	100.5
KE3-3	34	18006	1.8	14.4237	3.0	1.4474	3.4	0.1514	1.7	0.50	908.9	14.5	908.8	20.6	908.6	61.5	908.6	61.5	100.0
KE3-6	159	138102	2.7	14.3540	0.7	1.4995	1.3	0.1561	1.2	0.87	935.1	10.2	930.2	8.2	918.6	13.6	918.6	13.6	101.8
KE3-80	193	147511	1.8	14.0811	1.0	1.5750	1.8	0.1609	1.5	0.83	961.5	13.1	960.4	11.0	957.9	20.3	957.9	20.3	100.4
KE3-66	86	139990	1.7	13.9659	1.5	1.5948	1.9	0.1615	1.2	0.63	965.3	10.7	968.2	11.8	974.7	29.9	974.7	29.9	99.0
KE3-57	40	45558	3.1	13.8784	4.3	1.6151	4.9	0.1626	2.2	0.44	971.0	19.4	976.1	30.5	987.5	88.5	987.5	88.5	98.3
KE3-11	27	9793	0.9	13.8755	6.3	1.4575	7.0	0.1467	3.0	0.43	882.3	24.8	913.0	42.3	987.9	129.2	987.9	129.2	89.3
KE3-90	81	31956	1.8	13.8367	2.2	1.6646	2.4	0.1670	1.0	0.41	995.8	9.3	995.1	15.5	993.6	45.3	993.6	45.3	100.2
KE3-35	69	41262	2.2	13.8193	1.1	1.7042	2.0	0.1708	1.7	0.83	1016.6	16.0	1010.1	13.1	996.2	22.8	996.2	22.8	102.0
KE3-105	118	118436	1.1	13.7433	1.1	1.6919	2.2	0.1686	1.9	0.87	1004.6	17.9	1005.5	14.2	1007.3	22.6	1007.3	22.6	99.7
KE3-70	209	127137	2.2	13.7140	0.6	1.7264	3.5	0.1717	3.4	0.98	1021.6	32.5	1018.4	22.4	1011.7	12.4	1011.7	12.4	101.0
KE3-52	322	448897	2.7	13.7076	0.4	1.7299	1.0	0.1720	0.9	0.90	1023.0	8.7	1019.7	6.6	1012.6	9.0	1012.6	9.0	101.0
KE3-62	196	125739	7.0	13.6707	0.9	1.7387	1.6	0.1724	1.4	0.84	1025.3	12.8	1023.0	10.4	1018.1	17.9	1018.1	17.9	100.7
KE3-75	23	13163	1.9	13.5922	5.5	1.8303	5.9	0.1804	2.1	0.35	1069.3	20.6	1056.4	38.9	1029.7	112.0	1029.7	112.0	103.8
KE3-59	121	256948	1.7	13.5765	1.1	1.7433	2.7	0.1717	2.5	0.91	1021.2	23.4	1024.7	17.5	1032.1	22.3	1032.1	22.3	98.9
KE3-56	114	451440	0.8	13.5587	1.4	1.7681	2.3	0.1739	1.8	0.78	1033.4	17.3	1033.8	15.1	1034.7	29.2	1034.7	29.2	99.9
KE3-55	74	36322	1.1	13.5584	2.5	1.7257	2.9	0.1697	1.4	0.49	1010.4	13.2	1018.2	18.5	1034.8	50.5	1034.8	50.5	97.7
KE3-22	362	557502	2.0	13.5186	0.3	1.7701	1.1	0.1736	1.1	0.96	1031.7	10.1	1034.6	7.2	1040.7	6.0	1040.7	6.0	99.1
KE3-74	82	36149	2.1	13.5157	1.7	1.8002	1.9	0.1765	0.7	0.38	1047.6	6.8	1045.5	12.3	1041.1	35.2	1041.1	35.2	100.6
KE3-88	90	76010	1.5	13.4510	1.1	1.8502	2.3	0.1805	2.0	0.88	1069.7	19.9	1063.5	15.2	1050.8	22.4	1050.8	22.4	101.8
KE3-15	845	27923	4.0	13.4469	0.8	1.7688	2.0	0.1725	1.8	0.91	1025.9	17.4	1034.1	13.0	1051.4	16.5	1051.4	16.5	97.6
KE3-1	33	30091	1.3	13.4449	4.4	1.8488	4.7	0.1803	1.5	0.31	1068.5	14.4	1063.0	30.7	1051.8	89.0	1051.8	89.0	101.6
KE3-43	138	143808	2.3	13.4423	1.1	1.8408	1.5	0.1795	1.0	0.68	1064.0	9.8	1060.1	9.6	1052.1	21.5	1052.1	21.5	101.1
KE3-76	81	54282	2.4	13.3940	2.6	1.8344	2.9	0.1782	1.3	0.44	1057.1	12.5	1057.9	19.3	1059.4	53.0	1059.4	53.0	99.8
KE3-18	72	98879	0.8	13.3727	1.8	1.8020	2.5	0.1748	1.8	0.72	1038.4	17.5	1046.2	16.6	1062.6	35.6	1062.6	35.6	97.7
KE3-89	300	199205	2.6	13.3702	0.6	1.7663	2.2	0.1713	2.1	0.96	1019.1	20.0	1033.2	14.4	1063.0	12.7	1063.0	12.7	95.9
KE3-97	125	114341	2.6	13.3165	1.8	1.8229	3.6	0.1761	3.2	0.87	1045.4	30.6	1053.7	23.8	1071.1	35.6	1071.1	35.6	97.6
KE3-44	46	35932	0.9	13.2119	2.5	1.8522	2.7	0.1775	0.9	0.34	1053.2	8.8	1064.2	17.7	1086.9	50.7	1086.9	50.7	96.9
KE3-40	54	43917	1.2	13.1767	2.6	1.9059	3.4	0.1821	2.2	0.64	1078.6	21.4	1083.1	22.5	1092.2	52.0	1092.2	52.0	98.8
KE3-82	126	10105	1.2	13.1582	3.5	1.8284	3.7	0.1745	1.2	0.33	1036.8	11.7	1055.7	24.0	1095.0	69.1	1095.0	69.1	94.7
KE3-79	54	61980	1.8	12.9035	2.1	2.0263	2.9	0.1896	2.0	0.68	1119.4	20.1	1124.4	19.4	1134.0	41.5	1134.0	41.5	98.7
KE3-9	96	77423	3.0	12.8533	1.4	2.1451	2.8	0.2000	2.5	0.87	1175.1	26.4	1163.5	19.5	1141.8	27.3	1141.8	27.3	102.9
KE3-16	128	78934	1.6	12.8375	1.2	2.1478	1.7	0.2000	1.2	0.71	1175.2	12.9	1164.4	11.8	1144.2	23.8	1144.2	23.8	102.7
KE3-85	87	119970	1.9	12.8345	0.8	2.1083	1.4	0.1963	1.2	0.84	1155.2	12.5	1151.5	9.7	1144.7	15.4	1144.7	15.4	100.9
KE3-33	105	107845	4.0	12.7797	0.8	2.2086	2.8	0.2047	2.6	0.96	1200.5	29.0	1183.8	19.4	1153.2	16.3	1153.2	16.3	104.1
KE3-38	115	104542	4.2	12.7698	0.8	2.1294	1.8	0.1972	1.7	0.91	1160.4	17.7	1158.4	12.6	1154.7	15.0	1154.7	15.0	100.5
KE3-10	86	98485	1.7	12.7628	1.1	2.1220	2.1	0.1964	1.8	0.86	1156.1	19.0	1156.0	14.4	1155.8	21.1	1155.8	21.1	100.0
KE3-48	182	156971	1.8	12.7617	0.5	2.1195	1.2	0.1962	1.1	0.91	1154.7	11.6	1155.2	8.3	1156.0	9.9	1156.0	9.9	99.9
KE3-12	46	45171	1.9	12.7594	1.4	2.1651	1.8	0.2004	1.1	0.61	1177.2	11.8	1169.9	12.5	1156.3	28.2	1156.3	28.2	101.8
KE3-60	239	248265	2.8	12.7334	0.7	2.1594	1.4	0.1994	1.1	0.84	1172.2	12.2	1168.1	9.4	1160.4	14.6	1160.4	14.6	101.0
KE3-47	73	77973	2.6	12.7188	1.4	2.1560	2.5	0.1989	2.1	0.83	1169.3	22.7	1167.0	17.7	1162.7	27.8	1162.7	27.8	100.6
KE3-27	202	284670	1.9	12.7143	0.6	2.2227	2.0	0.2050	1.9	0.96	1201.9	21.3	1188.2	14.2	1163.4	11.2	1163.4	11.2	103.3
KE3-93	130	181755	2.1	12.7062	1.1	2.1439	1.6	0.1976	1.1	0.70	1162.2	11.8	1163.1	11.0	1164.6	22.7	1164.6	22.7	99.8
KE3-31	50	113335	2.3	12.6964	2.8	2.1357	3.2	0.1967	1.6	0.49	1157.4	16.9	1160.4	22.3	1166.1	55.4	1166.1	55.4	99.2
KE3-19	50	66234	1.1	12.5953	2.2	2.1475	3.4	0.1962	2.5	0.75	1154.7	26.6	1164.3	23.2	1182.0	43.7	1182.0	43.7	97.7
KE3-42	45	53738	1.1	12.5539	3.3	2.1489	3.7	0.1957	1.6	0.44	1152.0	16.9	1164.7	25.5	1188.5	65.4	1188.5	65.4	96.9
KE3-54	67	156344	3.2	12.5325	2.0	2.2498	2.2	0.2045	1.0	0.45	1199.4	10.9	1196.7	15.6	1191.9	39.1	1191.9	39.1	100.6
KE3-51	78	67841	2.2	12.4837	1.1	2.2807	1.6	0.2065	1.1	0.71	1210.1	12.3	1206.3	11.0	1199.6	21.7	1199.6	21.7	100.9
KE3-21	26	87012	1.6	12.1424	5.2	2.3891	5.5	0.2104	1.8	0.33	1230.9	20.2	1239.3	39.2	1254.0	101.3	1254.0	101.3	98.2
KE3-14	108	131563	1.3	12.1070	1.1	2.4654	2.1	0.2165	1.9	0.87	1263.2	21.5	1261.9	15.5	1259.7	20.6	1259.7	20.6	100.3
KE3-33	20	17179	0.7	11.9464	4.0	2.4778	4.5	0.2147	2.0	0.44	1253.7	22.3	1265.6	32.3	1285.7	78.2	1285.7	78.2	97.5
KE3-5	69	109538	1.3	11.9297	1.1	2.5812	2.3	0.2233	2.0	0.88	1299.5	24.0	1295.3	16.9	1288.5	21.2	1288.5	21.2	100.9
KE3-100	47	36740	2.1	11.9272	1.8	2.5071	2.5	0.2169	1.7	0.70	1265.3	20.1	1274.1	18.1	1288.9	34.8	1288.9	34.8	98.2
KE3-61	123	91010	2.7	11.7647	1.3	2.4981	2.0	0.2132	1.5	0.77	1245.6	17.4	1271.5	14.5	1315.5	25.0	1315.5	25.0	94.7
KE3-64	41	30519	2.2	11.6274	1.8	2.7297	2.4	0.2302	1.6	0.65	1335.5	18.9	1336.6	17.8	1338.2	35.0	1338.2	35.0	99.8
KE3-71	28	12800	0.7	11.4462	4.5	2.7691	4.8	0.2299	1.7	0.36	1333.9	20.8	1347.3	36.0	1368.5	86.8	1368.5	86.8	97.5
KE3-37	224	126444	1.6	11.4099	0.4	2.7938	1.2	0.2312	1.1	0.94	1340.8	13.8	1353.9	9.1	1374.7	8.1	1374.7	8.1	97.5
KE3-81	30	9650	0.8	11.3367	3.6	2.8102	4.3	0.2311	2.3	0.54	1340.0	28.1	1358.3	31.9	1387.0	68.6	1387.0	68.6	96.6
KE3-77	120	179360	2.2	11.3189	0.7	2.9096	1.9	0.2389	1.8	0.92	1380.7	21.9	1384.4	14.4	1390.0	14.2	1390.0	14.2	99.3
KE3-24	38	53127	1.0	11.2472	2.0	2.8857	2.2	0.2354	1.0	0.43	1362.7	12.0	1378.2	17.0	1402.2	38.8	1402.2	38.8	97.2
KE3-46	29	34158	1.6	11.2336	2.4	2.9293	2.7	0.2387	1.3	0.47	1379.7	15.7	1389.5	20.3	1404.5	45.1	1404.5	45.1	98.2
KE3-83	168	158607	2.7	10.9976	0.5	3.1545	1.4	0.2516	1.3	0.92	1446.8	16.4	1446.1	10.6	1445.1	10.4	1445.1	10.4	100.1
KE3-63	149	131757	1.6	10.9307	0.8	3.2777	2.6	0.2598	2.5	0.96	1489.1	33.1	1475.8	20.3	1456.7	14.6	1456.7	14.6	102.2
KE3-99	75	76000	1.9	10.9290	1.8	3.0639	3.4	0.2429	2.9	0.85	1401.6	36.6	1423.7	26.2	1457.0	34.2	1457.0	34.2	96.2
KE3-72	67	67473	1.1	9.6093	1.2	4.3073	1.6	0.3002	1.1	0.66	1692.2	16.0	1694.8	13.4	1697.8	22.4	1697.8	22.4	99.7
KE3-32	262	204589	0.8	9.2096	0.2	4.7071	0.9	0.3144	0.8	0.97	1762.4	12.9	1768.5	7.2	1775.7	4.1	1775.7	4.1	99.2
KE3-1	20	32134	0.6	8.9463	3.1	5.0402	3.9	0.3270	2.4	0.61	1824.0	37.8	1826.1	32.9	1828.5	55.5	1828.5	55.5	99.8
KE3-69	41	68132	0.7	8.8829	1.2	5.2372	1.5	0.3374	0.8	0.56	1874.2	13.4	1858.7	12.5	1841.4	22.1	1841.4	22.1	101.8
KE3-53	101	101892	1.1	8.8661	0.3	5.2948	1.4	0.3405	1.3	0.98	1889.0	21.8	1868.0	11.6	1844.8	4.5	1844.8	4.5	102.4
KE3-49	41	58567	0.8	8.7818	1.1	5.2502	2.5	0.3344	2.3	0.90	1859.6	36.6	1860.8	21.6	1862.1	20.3	1862.1	20.3	99.9
KE3-78	16	31620	0.9	8.7512	3.3	5.1665	4.0	0.3279	2.2	0.54	1828.3	34.3	1847.1	33.8	1868.4	60.2	1868.4	60.2	97.9
KE3-28	30	36489	1.0	8.7457	1.9	5.2100	4.1	0.3305	3.6	0.89	1840.6	58.0	1854.2	34.8	1869.5	33.9	1869.5	33.9	98.5
KE3-36	33	51066	0.4	8.6772	1.4	5.2840	2.2	0.3325	1.7	0.78	1850.7	27.3	1866.3	18.6	1883.7	24.7	1883.7	24.7	98.2
KE3-98	50	115604	1.4	6.0105	0.4	11.0867	1.5	0.4833	1.4	0.96	2541.6	29.8	2530.4	13.7	2521.5	6.5	2521.5	6.5	100.8
KE3-67	55	80334	0.7	5.4069	0.4	13.3506	0.9	0.5235	0.8	0.90	2714.1	18.3	2704.8	8.6	2697.8	6.6	2697.8	6.6	100.6
KE3-92	24	40695	1.1	5.3595	0.7	13.4900	2.6	0.5244	2.5	0.97	2717.7	55.8	2714.6	24.6	2712.3	10.9	2712.3	10.9	100.2
KE3-87	105	321641	1.0	5.3306	0.2	13.5578	2.6	0.5242	2.6	1.00	2716.8	57.9	2719.3	24.7	2721.2	2.7	2721.2	2.7	99.8
KE3-39	45	67547	0.6	5.2945	0.5	13.7580	1.8	0.5283	1.8	0.96	2734.3	39.3	2733.2	17.4	2732.4	8.6	2732.4	8.6	100.1
KE3-13	114	318959	1.9	5.1506	0.4	14.5455	1.3	0.5434	1.2	0.95	2797.5	27.4	2786.0	12.1	2777.7	6.5	2777.7	6.5	100.7
KE3-41	47	185835	1.3	5.1425	0.6	14.3203	3.2	0.5341	3.2	0.98	2758.7	71.5	2771.2	30.7	2780.2	9.2	2780.2	9.2	99.2

KE4 (1AA/08-19-084-06W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
KE4-31	123	15972	0.8	19.6677	6.6	0.2838	7.0	0.0405	2.2	0.31	255.8	5.4	253.7	15.7	233.8	153.1	255.8	5.4	NA
KE4-63	215	27612	2.4	19.2540	4.1	0.3370	4.3	0.0471	0.9	0.22	296.4	2.7	294.9	10.9	282.7	94.9	296.4	2.7	NA
KE4-68	155	48801	2.4	18.2714	2.3	0.4565	3.9	0.0605	3.2	0.81	378.7	11.8	381.9	12.5	401.2	51.1	378.7	11.8	NA
KE4-35	192	65812	1.7	18.0747	2.0	0.5068	2.3	0.0664	1.2	0.51	414.7	4.7	416.3	7.8	425.4	43.6	414.7	4.7	97.5
KE4-101	218	61112	0.9	18.4938	3.6	0.4974	4.1	0.0667	1.9	0.48	416.3	7.8	409.9	13.7	374.0	80.5	416.3	7.8	111.3
KE4-60	205	50118	1.3	18.2569	2.2	0.5045	2.5	0.0668	1.1	0.44	416.9	4.4	414.8	8.4	403.0	49.7	416.9	4.4	103.5
KE4-20	282	71386	3.3	18.2145	1.6	0.5131	2.0	0.0678	1.2	0.62	422.7	5.0	420.5	6.9	408.2	35.3	422.7	5.0	103.6
KE4-5	145	20740	0.8	17.4964	2.5	0.5598	2.7	0.0710	1.0	0.37	442.4	4.3	451.4	9.9	497.5	55.4	442.4	4.3	88.9
KE4-102	187	24696	1.5	18.0816	2.7	0.5466	3.2	0.0717	1.7	0.53	446.3	7.2	442.8	11.3	424.5	59.8	446.3	7.2	105.1
KE4-70	82	17288	1.0	18.6298	3.9	0.5445	4.4	0.0736	2.0	0.46	457.6	8.9	441.4	15.6	357.5	87.3	457.6	8.9	128.0
KE4-7	102	35302	1.9	17.9948	4.7	0.5722	4.9	0.0747	1.1	0.23	464.3	5.0	459.4	17.9	435.3	105.2	464.3	5.0	106.7
KE4-15	44	8463	0.5	17.0998	10.3	0.6125	10.6	0.0760	2.1	0.20	472.0	9.7	485.1	40.7	547.8	226.4	472.0	9.7	86.2
KE4-69	47	87108	2.0	14.1373	4.4	1.5354	4.8	0.1574	1.9	0.40	942.5	16.9	944.7	29.6	949.7	90.1	949.7	90.1	99.2
KE4-86	103	116048	1.7	13.7713	1.5	1.7332	1.9	0.1731	1.2	0.63	1029.2	11.6	1021.0	12.6	1003.2	30.9	1003.2	30.9	102.6
KE4-55	202	163768	2.4	13.7013	0.9	1.7464	1.5	0.1735	1.2	0.80	1031.6	11.1	1025.8	9.4	1013.5	17.5	1013.5	17.5	101.8
KE4-10	17	9031	1.8	13.6992	6.2	1.7751	6.8	0.1764	2.7	0.40	1047.1	26.4	1036.4	44.1	1013.8	125.9	1013.8	125.9	103.3
KE4-41	52	29520	1.7	13.6624	2.2	1.7676	2.8	0.1751	1.7	0.62	1040.4	16.6	1033.6	18.1	1019.3	44.2	1019.3	44.2	102.1
KE4-94	75	68334	3.6	13.6417	2.5	1.7792	3.1	0.1760	1.8	0.58	1045.3	17.4	1037.9	20.3	1022.4	51.6	1022.4	51.6	102.2
KE4-67	263	257750	2.9	13.6075	0.6	1.7403	2.1	0.1718	2.0	0.97	1021.8	19.2	1023.6	13.6	1027.4	11.1	1027.4	11.1	99.4
KE4-43	242	122268	2.5	13.6059	0.5	1.7897	1.7	0.1766	1.6	0.95	1048.4	15.9	1041.7	11.2	1027.7	10.4	1027.7	10.4	102.0
KE4-4	73	58908	2.2	13.5920	1.9	1.7417	2.2	0.1717	1.1	0.50	1021.4	10.2	1024.1	14.0	1029.8	37.9	1029.8	37.9	99.2
KE4-29	124	105166	2.9	13.5810	1.0	1.7834	1.3	0.1757	0.7	0.59	1043.2	7.1	1039.4	8.2	1031.4	20.7	1031.4	20.7	101.1
KE4-62	26	18613	1.7	13.5563	5.1	1.8402	5.4	0.1809	1.7	0.33	1072.0	17.2	1059.9	35.3	1035.1	102.6	1035.1	102.6	103.6
KE4-33	79	78252	1.2	13.5212	2.1	1.7934	2.7	0.1759	1.7	0.64	1044.3	16.6	1043.0	17.6	1040.3	41.9	1040.3	41.9	100.4
KE4-89	28	77446	0.8	13.5127	5.5	1.8561	5.8	0.1819	1.8	0.32	1077.4	18.2	1065.6	38.2	1041.6	111.0	1041.6	111.0	103.4
KE4-54	191	204026	5.1	13.5044	0.8	1.8205	1.1	0.1783	0.8	0.71	1057.7	7.4	1052.9	7.0	1042.8	15.2	1042.8	15.2	101.4
KE4-19	345	287306	3.4	13.4957	0.6	1.8476	1.1	0.1808	0.9	0.84	1071.6	9.1	1062.6	7.2	1044.1	12.2	1044.1	12.2	102.6
KE4-93	131	110115	1.7	13.4825	1.1	1.8321	1.8	0.1791	1.4	0.78	1062.3	13.5	1057.0	11.5	1046.1	22.0	1046.1	22.0	101.5
KE4-96	30	41324	2.3	13.4644	4.3	1.7592	4.5	0.1718	1.4	0.31	1022.0	13.3	1030.6	29.1	1048.8	86.2	1048.8	86.2	97.4
KE4-48	57	68364	2.4	13.4417	3.4	1.8102	3.7	0.1765	1.2	0.34	1047.7	12.0	1049.1	24.0	1052.2	69.4	1052.2	69.4	99.6
KE4-88	58	52471	1.2	13.4075	1.5	1.8221	1.9	0.1772	1.2	0.60	1051.6	11.2	1053.4	12.6	1057.4	31.0	1057.4	31.0	99.5
KE4-52	67	59374	1.4	13.3322	1.3	1.8484	1.8	0.1787	1.2	0.68	1060.0	11.8	1062.8	11.8	1068.7	26.5	1068.7	26.5	99.2
KE4-98	46	46156	0.9	13.3218	2.4	1.8597	2.7	0.1797	1.1	0.41	1065.2	10.6	1066.9	17.6	1070.3	49.0	1070.3	49.0	99.5
KE4-103	122	69499	1.9	13.3207	1.9	1.8917	2.2	0.1828	1.1	0.51	1082.0	11.2	1078.2	14.6	1070.4	37.9	1070.4	37.9	101.1
KE4-51	86	66284	1.3	13.3024	1.3	1.8679	3.5	0.1802	3.3	0.93	1068.1	32.2	1069.8	23.3	1073.2	25.6	1073.2	25.6	99.5
KE4-13	73	88688	1.2	13.2806	1.6	1.9465	1.9	0.1875	1.0	0.52	1107.8	9.9	1097.2	12.7	1076.5	32.4	1076.5	32.4	102.9
KE4-28	60	52712	1.2	13.2267	2.2	1.9301	2.5	0.1852	1.1	0.46	1095.0	11.5	1091.6	16.7	1084.6	44.5	1084.6	44.5	101.0
KE4-12	35	28426	1.2	13.2062	4.6	1.9119	6.2	0.1831	4.2	0.68	1084.0	42.0	1085.2	41.6	1087.8	92.1	1087.8	92.1	99.7
KE4-47	56	67758	0.8	13.1806	1.3	1.9112	2.0	0.1827	1.5	0.75	1081.7	15.3	1085.0	13.6	1091.6	27.0	1091.6	27.0	99.1
KE4-73	38	26632	1.1	13.1728	4.6	1.8494	5.2	0.1767	2.4	0.46	1048.9	22.9	1063.2	34.1	1092.8	92.2	1092.8	92.2	96.0
KE4-16	47	26059	0.8	13.1276	2.4	1.9218	3.1	0.1830	1.9	0.61	1083.2	18.6	1088.7	20.4	1099.7	48.5	1099.7	48.5	98.5
KE4-95	148	77680	2.1	13.0416	0.6	1.9864	1.4	0.1879	1.3	0.91	1109.9	13.2	1110.9	9.6	1112.8	11.8	1112.8	11.8	99.7
KE4-79	68	46817	1.3	12.9662	1.3	2.0524	2.3	0.1930	1.9	0.83	1137.6	20.0	1133.1	15.7	1124.4	25.3	1124.4	25.3	101.2
KE4-39	52	60591	2.4	12.9497	1.4	2.0265	1.7	0.1903	0.8	0.50	1123.1	8.6	1124.4	11.3	1126.9	28.6	1126.9	28.6	99.7
KE4-23	27	16380	0.8	12.8720	5.1	2.1653	5.9	0.2021	3.0	0.50	1186.8	32.3	1170.0	41.1	1138.9	101.6	1138.9	101.6	104.2
KE4-81	54	58779	0.9	12.8718	2.9	2.1120	3.2	0.1972	1.3	0.40	1160.1	13.6	1152.7	21.9	1139.0	57.8	1139.0	57.8	101.9
KE4-75	143	104126	2.2	12.8236	0.8	2.1354	1.4	0.1986	1.2	0.84	1167.8	12.8	1160.3	9.9	1146.4	15.4	1146.4	15.4	101.9
KE4-92	88	45846	1.4	12.8074	1.7	2.1335	3.0	0.1982	2.4	0.82	1165.5	25.8	1159.7	20.5	1148.9	33.9	1148.9	33.9	101.4
KE4-58	101	115796	1.2	12.7787	0.6	2.1553	1.2	0.1997	1.1	0.87	1174.0	11.4	1166.7	8.5	1153.3	12.2	1153.3	12.2	101.8
KE4-71	272	153492	2.2	12.7529	0.6	2.0946	3.1	0.1937	3.0	0.98	1141.6	31.8	1147.0	21.3	1157.3	12.0	1157.3	12.0	98.6
KE4-82	109	86699	0.8	12.7301	1.3	2.0925	2.5	0.1932	2.1	0.85	1138.6	22.4	1146.3	17.4	1160.9	26.8	1160.9	26.8	98.1
KE4-30	31	27006	1.9	12.7051	3.3	2.1862	3.4	0.2014	0.8	0.25	1183.1	9.1	1176.6	23.4	1164.8	64.6	1164.8	64.6	101.6
KE4-104	79	98431	4.3	12.6800	1.0	2.2069	2.4	0.2030	2.2	0.91	1191.2	24.0	1183.2	16.9	1168.7	19.7	1168.7	19.7	101.9
KE4-27	246	264464	1.1	12.6584	0.4	2.1621	2.8	0.1985	2.7	0.99	1167.3	29.2	1169.0	19.1	1172.1	7.0	1172.1	7.0	99.6
KE4-87	27	37467	2.7	12.6423	4.4	2.1642	5.8	0.1984	3.8	0.65	1166.9	40.4	1169.6	40.5	1174.6	87.8	1174.6	87.8	99.3
KE4-50	84	114991	2.1	12.5770	1.7	2.2425	2.5	0.2046	1.8	0.73	1199.7	20.2	1194.4	17.7	1184.9	34.2	1184.9	34.2	101.3
KE4-90	67	26286	1.7	12.5237	2.0	2.2431	2.8	0.2037	2.0	0.69	1195.4	21.3	1194.6	19.8	1193.3	40.2	1193.3	40.2	100.2
KE4-40	106	69923	1.7	12.4723	1.5	2.1342	2.1	0.1931	1.5	0.71	1137.9	15.7	1160.0	14.8	1201.3	29.8	1201.3	29.8	94.7
KE4-24	70	45686	2.2	12.4656	1.8	2.2680	2.5	0.2051	1.7	0.70	1202.4	18.8	1202.4	17.3	1202.4	34.7	1202.4	34.7	100.0
KE4-14	76	43359	1.9	12.3982	1.5	2.3313	1.9	0.2096	1.2	0.64	1226.8	13.5	1221.9	13.4	1213.1	28.6	1213.1	28.6	101.1
KE4-85	94	72348	0.8	12.3391	0.7	2.3039	1.7	0.2062	1.5	0.90	1208.4	16.8	1213.5	11.9	1222.5	14.2	1222.5	14.2	98.8
KE4-9	24	38109	2.4	12.2514	5.2	2.2320	5.5	0.1983	1.8	0.32	1166.3	18.9	1191.2	38.6	1236.5	102.2	1236.5	102.2	94.3
KE4-17	99	129344	1.1	12.0073	0.9	2.5594	1.2	0.2229	0.8	0.68	1297.1	9.3	1289.1	8.5	1275.8	16.7	1275.8	16.7	101.7
KE4-100	16	13214	0.7	11.7042	4.6	2.6846	5.3	0.2279	2.7	0.51	1323.4	32.2	1324.2	39.2	1325.5	88.4	1325.5	88.4	99.8
KE4-83	72	73718	0.7	11.4339	1.4	2.9150	2.2	0.2417	1.7	0.79	1395.7	21.6	1385.8	16.6	1370.6	26.1	1370.6	26.1	101.8
KE4-42	72	85838	1.4	11.3067	1.1	2.8905	2.7	0.2370	2.4	0.91	1371.3	29.8	1379.4	20.1	1392.1	21.7	1392.1	21.7	98.5
KE4-3	58	59752	2.1	11.2981	1.3	2.9150	1.7	0.2389	1.2	0.68	1380.8	14.5	1385.8	13.0	1393.6	24.2	1393.6	24.2	99.1
KE4-74	111	34147	1.6	11.1372	1.5	2.7822	2.4	0.2247	2.0	0.80	1306.8	23.1	1350.8	18.3	1421.0	28.3	1421.0	28.3	92.0
KE4-36	80	76938	1.0	11.0408	1.5	3.1259	5.2	0.2503	5.0	0.96	1440.1	64.3	1439.1	40.1	1437.6	28.8	1437.6	28.8	100.2
KE4-59	61	73335	1.2	10.9395	1.1	3.2085	2.0	0.2546	1.7	0.84	1462.0	21.7	1459.2	15.2	1455.2	20.0	1455.2	20.0	100.5
KE4-84	120	109249	1.0	10.9262	0.7	3.2826	2.4	0.2601	2.3	0.96	1490.5	30.9	1476.9	18.9	1457.5	13.7	1457.5	13.7	102.3
KE4-77	126	183314	3.4	10.8660	1.0	3.2663	1.5	0.2574	1.1	0.75	1476.6	14.7	1473.1	11.6	1468.0	18.7	1468.0	18.7	100.6
KE4-97	70	62918	1.2	10.7677	1.3	3.3128	2.2	0.2587	1.7	0.78	1483.2	22.3	1484.1	16.8	1485.2	25.6	1485.2	25.6	99.9
KE4-38	53	96090	1.7	10.0199	1.1	3.9959	1.4	0.2904	0.9	0.63	1643.5	12.6	1633.4	11.2	1620.4	19.9	1620.4	19.9	101.4
KE4-21	71	117117	1.1	9.9405	0.8	4.0730	1.7	0.2936	1.5	0.89	1659.7	22.4	1648.9	14.1	1635.1	14.9	1635.1	14.9	101.5
KE4-65	47	53525	0.8	9.8699	2.4	4.0871	4.0	0.2926	3.2	0.79	1654.4	46.4	1651.7	32.7	1648.4	45.0	1648.4	45.0	100.4
KE4-53	47	41957	1.2	9.3088	1.5	4.7390	2.1	0.3199	1.5	0.69	1789.5	22.7	1774.2	17.7	1756.2	28.0	1756.2	28.0	101.9
KE4-1	62	65891	1.4	9.2230	0.8	4.6859	1.6	0.3134	1.3	0.85	1757.6	20.5	1764.7	13.2	1773.1	15.3	1773.1	15.3	99.1
KE4-45	71	107167	2.3	8.8986	1.3	5.2160	2.0	0.3366	1.6	0.76	1870.4	25.2	1855.2	17.3	1838.2	23.6	1838.2	23.6	101.8
KE4-34	75	98886	1.4	8.8671	0.8	5.2180	1.3	0.3356	1.0	0.78	1865.3	16.0	1855.6	10.7	1844.6	14.2	1844.6	14.2	101.1
KE4-18	11	20736	3.3	8.4898	3.2	5.5472	3.9	0.3416	2.3	0.59	1894.2	38.3	1907.9	33.8	1922.9	56.8	1922.9	56.8	98.5
KE4-37	57	136448	1.4	7.7762	1.0	6.7969	1.5	0.3833	1.2	0.77	2091.8	21.4	2085.3	13.7	2078.9	17.3	2078.9	17.3	100.6
KE4-99	109	283698	1.6	5.5959	0.3	12.1223	2.2	0.4920	2.2	0.99	2579.3	46.2	2613.9	20.6	2640.9	5.5	2640.9	5.5	97.7
KE4-22	51	76119	0.9	5.4809	0.6	13.0870	1.4	0.5202	1.3	0.90	2700.1	27.7	2685.9	13.1	2675.3	9.8	2675.3	9.8	100.9
KE4-66	38	97301	0.7	5.4683	0.7	13.1135	1.1	0.5201	0.9	0.80	2699.5	19.6	2687.8	10.5	2679.1	11.2	2679.1	11.2	100.8
KE4-32	77	156024	0.6	5.4311	0.3	13.3421	0.8	0.5255	0.7	0.90	2722.7	16.3	2704.2	7.7	2690.4	5.8	2690.4	5.8	101.2
KE4-91	63	90750	1.0	5.3924	0.5	13.2110	1.0	0.5167	0.8	0.87	2685.1	18.5	2694.8	9.1	2702.2	7.7	2702.2	7.7	99.4
KE4-25	73	98013	1.7	5.3731	0.3	13.9069	1.0	0.5419	0.9	0.94	2791.6	21.1	2743.4	9.4	2708.1	5.6	2708.1	5.6	103.1
KE4-57	21	92609	0.5	5.2653	1.3	13.9020	1.7	0.5309	1.0	0.61	2745.2	22.6	2743.1	15.7	2741.5	21.7	2741.5	21.7	100.1

LA1(100/10-20-077-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LA1-94	232	33532	1.7	19.7952	3.2	0.2902	3.6	0.0417	1.6	0.44	263.1	4.0	258.7	8.1	218.9	74.0	263.1	4.0	NA
LA1-9	162	16941	0.7	17.9292	3.7	0.4833	4.6	0.0628	2.7	0.59	392.9	10.2	400.3	15.1	443.4	82.2	392.9	10.2	NA
LA1-97	97	44579	2.0	18.2198	8.0	0.5065	8.2	0.0669	1.7	0.21	417.7	7.0	416.1	28.0	407.5	179.4	417.7	7.0	102.5
LA1-57	241	86294	0.7	17.6059	1.4	0.5741	2.3	0.0733	1.8	0.78	456.1	7.9	460.7	8.5	483.8	31.3	456.1	7.9	94.3
LA1-50	273	122966	1.0	17.6527	1.1	0.6023	1.8	0.0771	1.4	0.78	478.8	6.4	478.7	6.8	477.9	24.6	478.8	6.4	100.2
LA1-33	287	179994	2.2	16.7302	1.4	0.7893	2.3	0.0958	1.8	0.80	589.6	10.3	590.7	10.2	595.4	29.3	589.6	10.3	99.0
LA1-17	135	110342	2.5	14.4505	1.6	1.3451	2.8	0.1410	2.3	0.82	850.2	18.2	865.4	16.3	904.7	33.3	850.2	18.2	94.0
LA1-101	79	114970	2.0	13.7874	1.0	1.6800	1.7	0.1680	1.4	0.82	1001.0	12.6	1001.0	10.6	1000.8	19.3	1000.8	19.3	100.0
LA1-72	788	834048	18.2	13.7475	0.3	1.7480	1.6	0.1743	1.6	0.98	1035.7	14.9	1026.4	10.3	1006.7	6.0	1006.7	6.0	102.9
LA1-45	99	102954	2.1	13.7389	0.9	1.7293	1.8	0.1723	1.5	0.86	1024.9	14.6	1019.5	11.5	1008.0	18.5	1008.0	18.5	101.7
LA1-51	48	27609	0.7	13.6958	3.0	1.7901	3.4	0.1778	1.7	0.50	1055.0	16.6	1041.9	22.3	1014.3	60.1	1014.3	60.1	104.0
LA1-46	63	41487	2.4	13.6762	1.7	1.7850	2.4	0.1771	1.8	0.73	1050.9	17.1	1040.0	15.8	1017.3	33.8	1017.3	33.8	103.3
LA1-92	72	65972	0.7	13.6455	1.5	1.7235	2.1	0.1706	1.6	0.73	1015.2	14.7	1017.3	13.7	1021.8	29.4	1021.8	29.4	99.4
LA1-1	59	62515	2.8	13.5292	2.1	1.8163	2.6	0.1782	1.5	0.57	1057.2	14.2	1051.3	16.8	1039.1	42.6	1039.1	42.6	101.7
LA1-18	125	88678	2.5	13.5257	0.9	1.8191	2.0	0.1785	1.8	0.89	1058.5	17.5	1052.4	13.3	1039.6	19.0	1039.6	19.0	101.8
LA1-69	32	33778	0.6	13.5245	4.9	1.8184	6.2	0.1784	3.7	0.61	1058.0	36.5	1052.1	40.5	1039.8	99.1	1039.8	99.1	101.8
LA1-16	46	58119	1.0	13.5092	2.9	1.8381	3.2	0.1801	1.5	0.45	1067.5	14.3	1059.2	21.2	1042.1	58.0	1042.1	58.0	102.4
LA1-100	89	75184	1.4	13.5086	1.4	1.8446	1.9	0.1807	1.3	0.68	1070.9	12.6	1061.5	12.4	1042.2	28.1	1042.2	28.1	102.8
LA1-83	120	130696	1.4	13.4397	1.3	1.8892	2.0	0.1841	1.5	0.77	1089.6	15.1	1077.3	13.0	1052.5	25.3	1052.5	25.3	103.5
LA1-54	131	83404	1.7	13.4214	0.8	1.8714	1.1	0.1822	0.8	0.71	1078.8	7.7	1071.0	7.2	1055.3	15.4	1055.3	15.4	102.2
LA1-21	115	89669	2.7	13.3780	1.4	1.9138	2.0	0.1857	1.4	0.71	1098.0	14.1	1085.9	13.2	1061.8	28.2	1061.8	28.2	103.4
LA1-49	71	52392	0.2	13.3482	2.2	1.8619	2.7	0.1802	1.5	0.57	1068.3	15.1	1067.7	17.8	1066.3	44.4	1066.3	44.4	100.2
LA1-32	176	194930	2.5	13.3350	1.1	1.8952	2.0	0.1833	1.6	0.83	1084.9	16.1	1079.4	13.0	1068.3	22.2	1068.3	22.2	101.6
LA1-102	133	122476	2.2	13.3259	0.8	1.9481	1.3	0.1883	1.1	0.80	1112.1	11.0	1097.8	9.0	1069.6	16.2	1069.6	16.2	104.0
LA1-95	43	25171	1.0	13.2855	2.9	1.8643	3.5	0.1796	2.0	0.57	1065.0	19.8	1068.5	23.3	1075.7	58.1	1075.7	58.1	99.0
LA1-6	72	114378	1.7	13.2591	1.2	1.9143	1.8	0.1841	1.4	0.77	1089.3	13.8	1086.1	12.0	1079.7	23.2	1079.7	23.2	100.9
LA1-4	102	199362	4.6	13.0830	0.9	2.0145	1.7	0.1912	1.4	0.83	1127.6	14.6	1120.4	11.5	1106.5	18.7	1106.5	18.7	101.9
LA1-63	93	87493	2.0	13.0771	1.1	2.0263	3.1	0.1922	2.9	0.93	1133.2	29.9	1124.4	21.0	1107.4	22.8	1107.4	22.8	102.3
LA1-65	400	405717	3.8	12.8374	0.3	2.1558	0.9	0.2007	0.9	0.95	1179.2	9.3	1166.9	6.3	1144.2	5.5	1144.2	5.5	103.1
LA1-38	117	112259	2.1	12.7904	0.8	2.1105	2.1	0.1958	1.9	0.92	1152.6	19.9	1152.3	14.1	1151.5	16.1	1151.5	16.1	100.1
LA1-61	107	96083	2.5	12.7596	0.9	2.1919	2.0	0.2028	1.8	0.89	1190.6	19.1	1178.5	13.7	1156.3	17.5	1156.3	17.5	103.0
LA1-7	202	61493	1.3	12.6214	0.6	2.1753	1.9	0.1991	1.8	0.95	1170.6	19.0	1173.2	13.0	1177.9	11.3	1177.9	11.3	99.4
LA1-48	27	2380	0.9	12.4620	8.6	2.0257	11.8	0.1831	8.0	0.68	1083.8	80.1	1124.2	80.2	1203.0	169.8	1203.0	169.8	90.1
LA1-84	17	24579	1.3	12.3829	4.9	2.4327	5.7	0.2185	2.9	0.51	1273.8	33.8	1252.3	41.4	1215.5	97.4	1215.5	97.4	104.8
LA1-44	115	126295	1.0	12.3449	1.1	2.3576	2.0	0.2111	1.7	0.85	1234.6	19.0	1229.9	14.2	1221.6	20.7	1221.6	20.7	101.1
LA1-66	335	345660	1.1	11.8632	0.4	2.6464	0.8	0.2277	0.8	0.90	1322.4	9.0	1313.6	6.2	1299.3	7.2	1299.3	7.2	101.8
LA1-93	35	64997	1.9	11.8053	1.8	2.5795	2.5	0.2209	1.8	0.71	1286.4	20.7	1294.8	18.3	1308.8	34.3	1308.8	34.3	98.3
LA1-96	28	2570	1.3	11.7323	7.6	2.4160	8.3	0.2056	3.3	0.40	1205.2	36.7	1247.4	59.8	1320.9	147.7	1320.9	147.7	91.2
LA1-68	31	24252	1.3	11.2811	2.8	3.0467	3.1	0.2493	1.4	0.46	1434.7	18.4	1419.4	23.8	1396.5	53.1	1396.5	53.1	102.7
LA1-73	193	616806	3.3	10.8613	0.4	3.3903	1.0	0.2671	1.0	0.92	1525.9	12.9	1502.2	8.1	1468.8	7.5	1468.8	7.5	103.9
LA1-28	93	165830	1.1	10.0356	0.7	4.0651	2.0	0.2959	1.9	0.94	1670.8	27.5	1647.3	16.2	1617.5	12.5	1617.5	12.5	103.3
LA1-53	105	138822	1.3	9.8621	0.7	4.1428	1.5	0.2963	1.3	0.88	1673.0	19.5	1662.8	12.3	1649.9	13.0	1649.9	13.0	101.4
LA1-29	199	368838	10.2	9.0572	0.3	5.0541	0.7	0.3320	0.7	0.93	1848.1	10.8	1828.4	6.1	1806.1	4.8	1806.1	4.8	102.3
LA1-64	149	190053	3.7	9.0445	0.4	5.1155	1.1	0.3356	1.1	0.95	1865.3	17.7	1838.7	9.8	1808.7	6.5	1808.7	6.5	103.1
LA1-2	100	112164	0.8	8.9955	0.9	5.1078	1.2	0.3332	0.8	0.69	1854.1	13.1	1837.4	10.0	1818.6	15.5	1818.6	15.5	102.0
LA1-58	84	179737	3.3	8.9928	0.5	5.1995	0.9	0.3391	0.8	0.83	1882.4	12.3	1852.5	7.8	1819.1	9.3	1819.1	9.3	103.5
LA1-23	71	336810	3.4	8.9835	0.5	5.0911	1.3	0.3317	1.2	0.93	1846.6	19.4	1834.6	11.1	1821.0	8.9	1821.0	8.9	101.4
LA1-71	26	41269	3.7	8.9605	1.7	5.2072	2.1	0.3384	1.2	0.60	1879.0	19.9	1853.8	17.5	1825.6	29.9	1825.6	29.9	102.9
LA1-35	92	179424	1.4	8.9539	0.9	5.2250	1.6	0.3393	1.3	0.81	1883.3	21.0	1856.7	13.6	1827.0	17.1	1827.0	17.1	103.1
LA1-31	82	102320	1.0	8.9230	0.7	5.2062	1.5	0.3369	1.3	0.89	1871.8	21.6	1853.6	12.8	1833.2	12.6	1833.2	12.6	102.1
LA1-81	75	149152	1.9	8.9194	0.7	5.3328	1.1	0.3450	0.9	0.80	1910.6	14.3	1874.1	9.3	1834.0	11.9	1834.0	11.9	104.2
LA1-86	10	18387	0.4	8.9187	5.1	5.2965	5.6	0.3426	2.2	0.39	1899.2	35.4	1868.3	47.5	1834.1	92.8	1834.1	92.8	103.5
LA1-89	53	163842	0.9	8.9162	0.9	5.2683	1.5	0.3407	1.2	0.82	1890.0	20.4	1863.7	13.0	1834.6	15.8	1834.6	15.8	103.0
LA1-104	278	160595	5.7	8.9134	0.4	4.0566	2.0	0.2622	1.9	0.98	1501.3	25.6	1645.6	15.9	1835.2	7.3	1835.2	7.3	81.8
LA1-91	29	44471	0.6	8.9086	1.0	5.2642	2.2	0.3401	1.9	0.89	1887.3	31.7	1863.1	18.5	1836.2	17.9	1836.2	17.9	102.8
LA1-59	77	139504	2.0	8.9073	0.7	5.2256	1.2	0.3376	1.0	0.85	1875.1	17.1	1856.8	10.5	1836.4	11.9	1836.4	11.9	102.1
LA1-105	74	113579	1.6	8.9051	0.6	5.2203	0.9	0.3372	0.7	0.76	1873.0	11.6	1855.9	7.9	1836.9	10.9	1836.9	10.9	102.0
LA1-14	62	83944	0.9	8.8992	0.8	5.2170	2.0	0.3367	1.8	0.92	1870.9	29.4	1855.4	16.8	1838.1	13.9	1838.1	13.9	101.8
LA1-103	77	240049	1.1	8.8948	0.6	5.1879	1.0	0.3347	0.8	0.78	1861.0	12.6	1850.6	8.5	1839.0	11.3	1839.0	11.3	101.2
LA1-40	27	42562	0.9	8.8898	2.1	5.3169	2.2	0.3428	0.8	0.34	1900.2	12.4	1871.6	18.7	1840.0	37.2	1840.0	37.2	103.3
LA1-12	179	387799	1.1	8.8895	0.2	5.3230	1.8	0.3432	1.8	0.99	1902.0	29.3	1872.6	15.3	1840.0	4.0	1840.0	4.0	103.4
LA1-3	95	169349	1.0	8.8840	0.6	5.2636	1.3	0.3392	1.1	0.88	1882.6	18.3	1863.0	10.8	1841.2	10.8	1841.2	10.8	102.3
LA1-99	57	90844	0.9	8.8832	0.8	5.2150	1.5	0.3360	1.3	0.85	1867.3	20.9	1855.1	13.0	1841.3	14.6	1841.3	14.6	101.4
LA1-8	57	101576	0.9	8.8553	0.8	5.3380	1.4	0.3428	1.2	0.83	1900.3	19.0	1875.0	11.9	1847.0	14.1	1847.0	14.1	102.9
LA1-27	67	176095	0.7	8.8465	0.5	5.3656	2.2	0.3443	2.1	0.98	1907.2	34.9	1879.4	18.5	1848.8	8.6	1848.8	8.6	103.2
LA1-56	26	46592	0.9	8.8443	1.1	5.1504	1.9	0.3304	1.6	0.80	1840.2	24.9	1844.5	16.4	1849.3	20.8	1849.3	20.8	99.5
LA1-24	63	160178	3.2	8.8393	0.7	5.3572	1.8	0.3434	1.7	0.91	1903.2	27.4	1878.0	15.6	1850.3	13.5	1850.3	13.5	102.9
LA1-60	122	216233	1.8	8.8108	0.5	5.3673	3.2	0.3430	3.2	0.99	1901.0	52.3	1879.7	27.5	1856.1	9.1	1856.1	9.1	102.4
LA1-25	77	104316	0.8	8.8101	0.7	5.2354	1.6	0.3345	1.5	0.92	1860.3	24.3	1858.4	14.0	1856.3	11.8	1856.3	11.8	100.2
LA1-20	78	96546	1.2	8.8094	0.5	5.4199	1.7	0.3463	1.6	0.95	1916.8	26.5	1888.0	14.4	1856.4	9.0	1856.4	9.0	103.3
LA1-37	107	216246	1.2	8.8070	0.6	5.3549	1.3	0.3420	1.1	0.89	1896.5	18.4	1877.7	10.8	1856.9	10.4	1856.9	10.4	102.1
LA1-85	75	138848	2.8	8.7965	1.0	5.5113	1.4	0.3516	1.0	0.73	1942.3	17.0	1902.4	12.0	1859.1	17.2	1859.1	17.2	104.5
LA1-67	174	542177	4.6	8.7775	0.5	4.6660	2.7	0.2970	2.6	0.98	1676.6	39.0	1761.2	22.5	1863.0	8.6	1863.0	8.6	90.0
LA1-55	83	116140	3.8	8.7442	0.5	5.4991	1.7	0.3487	1.7	0.96	1928.6	27.7	1900.5	14.9	1869.8	8.9	1869.8	8.9	103.1
LA1-21	84	6720	1.1	8.7279	1.4	5.3434	2.0	0.3382	1.5	0.73	1878.2	24.1	1875.8	17.4	1873.2	25.2	1873.2	25.2	100.3
LA1-5	59	151981	2.8	8.7271	1.2	5.4016	1.4	0.3419	0.8	0.53	1895.8	12.5	1885.1	12.3	1873.4	22.1	1873.4	22.1	101.2
LA1-79	37	113723	1.4	8.6126	1.0	5.5589	1.6	0.3472	1.3	0.78	1921.4	20.9	1909.8	14.0	1897.1	18.4	1897.1	18.4	101.3
LA1-61	41	84455	1.6	8.5695	0.8	5.5891	1.6	0.3474	1.4	0.88	1922.0	23.5	1914.4	13.9	1906.2	14.0	1906.2	14.0	100.8
LA1-10	145	235499	1.7	8.5493	0.4	5.7296	1.3	0.3553	1.2	0.95	1959.7	20.4	1935.8	11.0	1910.4	7.4	1910.4	7.4	102.6
LA1-15	8	12004	0.8	8.5050	4.1	5.4172	4.7	0.3342	2.4	0.51	1858.5	38.8	1887.6	40.5	1919.7	72.9	1919.7	72.9	96.8
LA1-52	83	433208	1.7	6.2994	0.4	10.1814	1.3	0.4652	1.2	0.95	2462.3	25.2	2451.4	11.9	2442.3	6.5	2442.3	6.5	100.8
LA1-36	78	167273	0.8	6.0448	0.3	11.1810	1.5	0.4902	1.4	0.97	2571.5	30.3	2538.3	13.7	2511.9	5.6	2511.9	5.6	102.4
LA1-43	45	102923	2.0	6.0125	1.5	10.6145	4.2	0.4629	3.9	0.94	2452.2	80.0	2490.0	38.9	2520.9	24.8	2520.9	24.8	97.3
LA1-82	40	74678	1.4	5.8912	0.6	11.4739	2.5	0.4902	2.4	0.97	2571.7	51.1	2562.5	23.1	2555.1	9.5	2555.1	9.5	100.6
LA1-90	56	133354	1.3	5.8430	0.3	11.8313	1.0	0.5014	0.9	0.94	2619.7	19.4	2591.1	9.0	2568.9	5.6	2568.9	5.6	102.0
LA1-80	85	158274	1.5	5.8054	0.3	12.2658	1.1	0.5164	1.1	0.96	2684.1	23.1	2625.0	10.3	2579.7	5.0	2579.7	5.0	104.0
LA1-30	117	373523	1.7	5.6909	0.4	12.0264	1.2	0.4964	1.2	0.96	2598.2	25.6	2606.5	11.7	2612.9	6.0	2612.9	6.0	99.4
LA1-39	64	166763	1.6	5.6612	1.2	12.6275	2.4	0.5185	2.1	0.87	2692.7	45.6	2652.3	22.3	2621.6	19.3	2621.6	19.3	102.7
LA1-77	94	245951	1.0	5.5436	0.2	13.1694	1.2	0.5295	1.2	0.99	2739.3	27.5	2691.9	11.7	2656.4	2.6	2656.4	2.6	103.1
LA1-34	89	177742	1.0	5.4718	0.3	13.4739	2.2	0.5347	2.2	0.99	2761.3	50.1	2713.5	21.3	2678.0	5.0	2678.0	5.0	103.1
LA1-47	52	343746	1.4	5.4642	0.4	13.3488	1.4	0.5290	1.4	0.95	2737.3	30.4	2704.6	13.5	2680.3	7.0	2680.3	7.0	102.1
LA1-19	45	179678	1.3	5.4618	0.4	13.4960	1.2	0.5346	1.1	0.94	2760.9	24.6	2715.0	10.9	2681.0	6.3	2681.0	6.3	103.0
LA1-13	55	223817	1.4	5.4440	0.4	13.5274	1.1	0.5341	1.0	0.92	2758.8	23.0	2717.2	10.5	2686.4	7.1	2686.4	7.1	102.7
LA1-87	156	251265	0.8	5.4321	0.2	13.7608	1.8	0.5421	1.8	0.99	2792.4	40.3	2733.4	16.9	2690.1	3.0	2690.1	3.0	103.8
LA1-88	55	170382	1.3	5.4161	0.3	13.5267	0.8	0.5313	0.8	0.95	2747.1	16.9	2717.2	7.5	2694.9	4.1	2694.9	4.1	101.9
LA1-42	24	51189	2.0	5.3978	0.9	13.4194	3.1	0.5254	3.0	0.96	2721.8	66.7	2709.6	29.5	2700.5	14.1	2700.5	14.1	100.8
LA1-70	47	136008	3.0	5.3851	0.3	13.7778	0.9	0.5381	0.9	0.95	2775.5	20.1	2734.6	8.9	2704.4	5.1	2704.4	5.1	102.6
LA1-41	20	39316	2.0	5.3541	0.8	14.2092	1.9	0.5518	1.7	0.91	2832.5	39.5	2763.8	18.0	2713.9	13.2	2713.9	13.2	104.4
LA1-78	67	370373	1.4	4.9927	0.6	15.3151	2.1	0.5546	2.0	0.96	2844.1	46.7	2835.0	20.1	2828.6	9.4	2828.6	9.4	100.5

LA2(100/10-20-077-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LA2-21	17	5131	1.3	17.6218	24.6	0.5012	24.8	0.0641	3.4	0.14	400.3	13.4	412.5	84.4	481.8	550.9	400.3	13.4	83.1
LA2-61	148	65213	1.0	17.8620	2.5	0.5045	2.9	0.0654	1.5	0.50	408.1	5.9	414.7	10.0	451.7	56.4	408.1	5.9	90.3
LA2-5	198	66733	8.6	18.1699	2.2	0.4969	3.2	0.0655	2.4	0.73	408.9	9.4	409.6	10.9	413.7	49.2	408.9	9.4	98.8
LA2-95	110	111041	0.9	18.6531	4.1	0.4919	4.5	0.0665	1.8	0.40	415.3	7.2	406.2	15.0	354.7	92.7	415.3	7.2	117.1
LA2-83	472	206712	1.8	17.9664	0.5	0.5186	0.9	0.0676	0.7	0.79	421.5	2.8	424.2	3.0	438.8	12.0	421.5	2.8	96.1
LA2-57	70	20895	1.4	17.2489	4.4	0.5545	4.9	0.0694	2.1	0.42	432.4	8.6	448.0	17.7	528.8	97.4	432.4	8.6	81.8
LA2-22	66	28304	0.8	17.7376	7.3	0.5460	7.8	0.0702	2.8	0.36	437.6	12.0	442.4	28.1	467.3	162.1	437.6	12.0	93.7
LA2-63	130	70233	1.0	17.5764	2.5	0.6121	2.7	0.0780	1.0	0.35	484.3	4.5	484.9	10.5	487.5	56.0	484.3	4.5	99.4
LA2-78	45	21529	1.6	17.3159	10.0	0.7014	10.2	0.0881	2.0	0.20	544.2	10.6	539.7	42.7	520.3	219.8	544.2	10.6	104.6
LA2-101	90	52963	0.9	14.4859	4.1	0.8980	9.0	0.0943	8.0	0.89	581.2	44.7	650.6	43.4	899.7	84.4	581.2	44.7	64.6
LA2-90	73	42417	1.1	16.5271	2.6	0.8063	2.9	0.0966	1.3	0.45	594.7	7.4	600.4	13.3	621.7	56.7	594.7	7.4	95.7
LA2-1	263	166024	1.2	16.5416	0.8	0.8071	2.0	0.0968	1.8	0.91	595.8	10.4	600.8	9.1	619.8	18.1	595.8	10.4	96.1
LA2-7	95	61134	0.9	16.4118	3.6	0.8263	4.0	0.0984	1.6	0.39	604.8	9.0	611.6	18.2	636.8	78.2	604.8	9.0	95.0
LA2-72	255	49721	0.5	16.5119	0.8	0.8305	1.1	0.0995	0.7	0.67	611.2	4.3	613.9	5.1	623.7	18.0	611.2	4.3	98.0
LA2-69	57	26136	1.4	16.3483	4.2	0.8569	4.7	0.1016	2.1	0.45	623.8	12.4	628.4	21.9	645.2	90.1	623.8	12.4	96.7
LA2-24	69	26363	0.8	16.2854	2.1	0.8725	3.3	0.1031	2.6	0.77	632.3	15.4	636.9	15.6	653.5	44.8	632.3	15.4	96.8
LA2-31	201	109513	2.4	15.3302	1.5	0.9455	1.9	0.1051	1.2	0.60	644.4	7.1	675.7	9.5	781.8	32.1	644.4	7.1	82.4
LA2-84	59	47426	1.4	14.4757	1.6	1.4707	3.2	0.1544	2.7	0.87	925.6	23.6	918.4	19.1	901.1	32.3	901.1	32.3	102.7
LA2-96	119	150488	1.8	13.9937	1.1	1.5814	1.6	0.1605	1.1	0.68	959.5	9.5	962.9	9.8	970.6	23.4	970.6	23.4	98.9
LA2-103	37	35647	2.7	13.9426	3.5	1.4450	3.9	0.1461	1.7	0.43	879.2	13.7	907.8	23.5	978.1	72.2	978.1	72.2	89.9
LA2-41	112	151341	2.3	13.9334	1.2	1.6793	1.8	0.1697	1.3	0.74	1010.5	12.3	1000.7	11.2	979.4	24.1	979.4	24.1	103.2
LA2-99	144	60502	1.7	13.8257	0.5	1.6670	3.4	0.1672	3.4	0.99	996.4	31.0	996.1	21.5	995.2	9.3	995.2	9.3	100.1
LA2-50	32	28715	3.2	13.7888	3.1	1.7380	3.5	0.1738	1.6	0.45	1033.1	15.2	1022.7	22.7	1000.6	63.9	1000.6	63.9	103.2
LA2-37	76	90765	2.4	13.7635	1.0	1.6818	1.6	0.1679	1.3	0.81	1000.4	12.2	1001.7	10.4	1004.3	19.5	1004.3	19.5	99.6
LA2-79	63	65942	1.7	13.7316	1.8	1.7191	3.3	0.1712	2.7	0.84	1018.7	25.8	1015.7	20.9	1009.1	35.7	1009.1	35.7	101.0
LA2-100	380	253012	4.9	13.7212	0.5	1.6747	1.4	0.1667	1.3	0.94	993.7	11.8	999.0	8.7	1010.6	9.7	1010.6	9.7	98.3
LA2-86	196	190763	5.9	13.6841	0.7	1.7260	1.2	0.1713	1.0	0.82	1019.3	9.4	1018.3	7.8	1016.1	14.0	1016.1	14.0	100.3
LA2-67	43	44939	1.3	13.6835	2.6	1.7904	2.9	0.1777	1.2	0.43	1054.3	12.1	1042.0	18.7	1016.2	52.4	1016.2	52.4	103.8
LA2-29	20	15338	1.1	13.6101	5.6	1.8268	5.9	0.1803	2.0	0.33	1068.7	19.4	1055.1	38.8	1027.1	112.9	1027.1	112.9	104.1
LA2-73	17	20501	1.1	13.5880	3.8	1.7233	5.2	0.1698	3.6	0.68	1011.2	33.3	1017.2	33.5	1030.3	76.8	1030.3	76.8	98.1
LA2-27	47	75410	2.2	13.5336	3.4	1.7858	4.8	0.1753	3.4	0.71	1041.2	32.7	1040.3	31.3	1038.5	68.5	1038.5	68.5	100.3
LA2-66	335	277506	2.5	13.4550	0.3	1.8157	1.5	0.1772	1.4	0.97	1051.6	13.7	1051.1	9.5	1050.2	7.0	1050.2	7.0	100.1
LA2-98	100	86537	1.5	13.4409	1.8	1.8254	2.2	0.1779	1.2	0.54	1055.7	11.5	1054.6	14.3	1052.4	36.9	1052.4	36.9	100.3
LA2-88	66	55041	2.3	13.4304	1.2	1.8618	1.7	0.1813	1.2	0.71	1074.3	12.0	1067.6	11.2	1053.9	24.0	1053.9	24.0	101.9
LA2-97	201	115265	0.9	13.4174	0.7	1.8209	1.6	0.1772	1.4	0.90	1051.6	13.7	1053.0	10.3	1055.9	13.9	1055.9	13.9	99.6
LA2-80	123	99138	1.1	13.4110	0.7	1.8045	1.9	0.1755	1.8	0.93	1042.4	17.5	1047.1	12.7	1056.8	14.3	1056.8	14.3	98.6
LA2-75	98	86879	1.9	13.4021	1.0	1.8090	2.5	0.1758	2.3	0.92	1044.2	22.1	1048.7	16.3	1058.2	19.7	1058.2	19.7	98.7
LA2-10	72	59611	1.6	13.3837	1.0	1.8990	1.7	0.1843	1.4	0.82	1090.6	14.1	1080.7	11.4	1060.9	19.7	1060.9	19.7	102.8
LA2-25	98	65627	5.2	13.3569	1.3	1.9310	2.2	0.1871	1.8	0.81	1105.4	17.8	1091.9	14.5	1065.0	25.7	1065.0	25.7	103.8
LA2-56	96	113676	1.4	13.3190	1.5	1.8397	2.3	0.1777	1.8	0.78	1054.5	17.8	1059.8	15.4	1070.7	29.4	1070.7	29.4	98.5
LA2-9	59	43018	2.6	13.3087	2.1	1.8382	2.5	0.1774	1.5	0.58	1052.9	14.4	1059.2	16.8	1072.2	41.7	1072.2	41.7	98.2
LA2-2	93	62768	1.7	13.2969	1.6	1.9315	1.9	0.1863	1.1	0.57	1101.2	10.9	1092.1	12.7	1074.0	31.5	1074.0	31.5	102.5
LA2-87	101	218251	2.9	13.2934	0.7	1.9174	2.6	0.1849	2.5	0.96	1093.5	25.5	1087.2	17.6	1074.5	14.7	1074.5	14.7	101.8
LA2-104	32	51539	1.3	13.2765	2.7	1.8390	3.2	0.1771	1.6	0.51	1051.0	16.0	1059.5	21.1	1077.1	55.1	1077.1	55.1	97.6
LA2-48	66	58356	1.6	13.2569	2.7	1.8501	3.1	0.1779	1.6	0.51	1055.4	15.6	1063.5	20.5	1080.0	53.6	1080.0	53.6	97.7
LA2-12	121	99789	0.7	13.2405	1.2	1.8672	1.9	0.1793	1.5	0.77	1063.2	14.7	1069.5	12.8	1082.5	24.7	1082.5	24.7	98.2
LA2-26	48	63169	1.3	13.2117	2.1	1.8849	2.4	0.1806	1.1	0.44	1070.3	10.4	1075.8	15.7	1086.9	42.5	1086.9	42.5	98.5
LA2-49	109	161569	1.4	13.0771	1.7	1.9569	2.3	0.1856	1.5	0.66	1097.5	15.3	1100.8	15.4	1107.4	34.4	1107.4	34.4	99.1
LA2-92	53	104233	1.1	13.0456	1.8	2.0503	2.1	0.1940	1.2	0.55	1143.0	12.2	1132.4	14.6	1112.2	35.6	1112.2	35.6	102.8
LA2-39	98	78255	2.0	12.9424	1.4	2.0876	1.8	0.1960	1.2	0.65	1153.6	12.4	1144.7	12.4	1128.1	27.5	1128.1	27.5	102.3
LA2-44	38	30242	1.2	12.8983	2.7	2.1158	3.7	0.1979	2.5	0.68	1164.2	26.8	1154.0	25.6	1134.8	54.5	1134.8	54.5	102.6
LA2-64	101	100159	1.4	12.7700	0.9	2.1339	4.0	0.1976	3.9	0.97	1162.6	41.2	1159.8	27.5	1154.7	17.8	1154.7	17.8	100.7
LA2-20	151	78043	2.2	12.7584	0.7	2.0802	2.2	0.1925	2.1	0.95	1134.8	22.3	1142.3	15.4	1156.5	13.4	1156.5	13.4	98.1
LA2-94	203	227338	1.6	12.7006	0.5	2.1693	1.5	0.1998	1.4	0.95	1174.4	15.4	1171.3	10.5	1165.5	8.9	1165.5	8.9	100.8
LA2-52	184	135748	2.2	12.6505	0.5	2.1927	2.4	0.2012	2.4	0.97	1181.7	25.8	1178.7	17.1	1173.4	10.8	1173.4	10.8	100.7
LA2-54	60	101917	1.6	12.6468	1.1	2.1673	1.9	0.1988	1.6	0.81	1168.8	16.9	1170.6	13.5	1173.9	22.4	1173.9	22.4	99.6
LA2-39	59	72791	2.0	12.5871	1.8	2.1996	2.5	0.2008	1.7	0.67	1179.6	17.9	1180.9	17.3	1183.3	36.5	1183.3	36.5	99.7
LA2-28	189	144545	9.5	12.5795	0.6	2.2395	1.8	0.2043	1.6	0.93	1198.5	18.0	1193.5	12.4	1184.5	12.4	1184.5	12.4	101.2
LA2-62	217	252338	18.1	12.5629	0.5	2.2265	1.4	0.2029	1.3	0.93	1190.7	13.7	1189.4	9.5	1187.1	10.1	1187.1	10.1	100.3
LA2-42	70	128214	1.6	12.4937	1.2	2.1801	2.7	0.1975	2.5	0.90	1162.1	26.3	1174.7	19.1	1198.0	23.4	1198.0	23.4	97.0
LA2-45	35	78718	0.7	12.1823	2.0	2.3978	2.5	0.2119	1.4	0.58	1238.7	16.2	1241.9	17.7	1247.6	39.4	1247.6	39.4	99.3
LA2-13	108	105126	2.4	11.8502	1.0	2.6514	1.6	0.2279	1.3	0.77	1323.4	15.1	1315.0	12.1	1301.5	20.3	1301.5	20.3	101.7
LA2-14	77	65497	1.7	11.7539	1.0	2.5839	2.9	0.2203	2.7	0.94	1283.3	31.9	1296.1	21.3	1317.3	18.8	1317.3	18.8	97.4
LA2-71	67	136413	1.4	11.7223	1.3	2.6451	1.7	0.2249	1.0	0.63	1307.6	12.2	1313.3	12.2	1322.5	24.9	1322.5	24.9	98.9
LA2-47	69	82196	1.6	11.7172	1.1	2.7005	1.6	0.2295	1.1	0.71	1331.8	13.6	1328.6	11.8	1323.4	21.6	1323.4	21.6	100.6
LA2-33	69	49063	2.2	11.6370	1.1	2.8070	2.3	0.2369	2.0	0.88	1370.6	24.8	1357.4	17.0	1336.7	20.6	1336.7	20.6	102.5
LA2-58	31	8968	2.0	11.4039	4.7	2.6914	5.9	0.2226	3.6	0.60	1295.6	42.0	1326.1	43.9	1375.7	91.0	1375.7	91.0	94.2
LA2-53	99	108888	2.0	11.3548	0.6	2.9269	2.7	0.2410	2.6	0.97	1392.1	33.1	1388.9	20.5	1384.0	11.7	1384.0	11.7	100.6
LA2-6	112	156084	1.0	11.1819	0.7	2.9848	1.7	0.2421	1.5	0.90	1397.4	18.7	1403.8	12.6	1413.4	13.9	1413.4	13.9	98.9
LA2-3	99	148568	2.4	11.1427	1.0	3.0301	2.4	0.2449	2.2	0.91	1412.0	27.9	1415.2	18.5	1420.1	19.7	1420.1	19.7	99.4
LA2-36	133	139810	0.9	10.8395	0.5	3.2118	1.8	0.2525	1.7	0.95	1451.3	22.2	1460.0	13.8	1472.6	10.1	1472.6	10.1	98.6
LA2-23	57	157319	1.6	10.6544	0.9	3.4486	2.1	0.2665	1.9	0.91	1522.9	26.3	1515.5	16.7	1505.2	16.4	1505.2	16.4	101.2
LA2-19	80	125969	1.1	10.6277	0.5	3.3868	1.3	0.2611	1.2	0.92	1495.2	15.8	1501.4	10.1	1510.0	9.8	1510.0	9.8	99.0
LA2-59	33	43866	1.9	10.6096	1.4	3.4562	2.1	0.2659	1.7	0.77	1520.2	22.5	1517.3	16.9	1513.2	25.8	1513.2	25.8	100.5
LA2-34	167	151676	2.4	10.4835	0.4	3.5962	1.3	0.2734	1.2	0.95	1558.2	16.7	1548.7	10.1	1535.7	7.5	1535.7	7.5	101.5
LA2-8	83	115091	2.0	9.8351	0.6	4.1192	0.8	0.2938	0.6	0.72	1660.6	8.4	1658.1	6.5	1654.9	10.2	1654.9	10.2	100.3
LA2-60	42	80258	1.6	9.3674	1.1	4.5770	2.7	0.3110	2.5	0.91	1745.4	38.1	1745.1	22.8	1744.7	20.4	1744.7	20.4	100.0
LA2-82	168	223471	1.5	9.3417	0.4	4.4176	3.4	0.2993	3.4	0.99	1687.9	50.3	1715.6	28.3	1749.7	7.7	1749.7	7.7	96.5
LA2-11	37	60781	1.6	9.0854	0.8	5.0230	1.4	0.3310	1.1	0.79	1843.1	17.7	1823.2	11.7	1800.5	15.3	1800.5	15.3	102.4
LA2-30	28	49969	2.2	9.0710	1.5	5.0347	2.2	0.3312	1.6	0.74	1844.3	25.8	1825.2	18.4	1803.4	26.6	1803.4	26.6	102.3
LA2-55	110	518226	2.2	9.0447	0.5	4.9831	1.1	0.3269	0.9	0.87	1823.3	14.7	1816.5	9.0	1808.6	9.7	1808.6	9.7	100.8
LA2-89	101	199856	1.8	8.9719	2.0	4.9736	2.7	0.3236	1.8	0.67	1807.4	28.3	1814.8	22.7	1823.3	36.2	1823.3	36.2	99.1
LA2-38	76	93217	4.1	8.8965	0.6	5.2494	2.1	0.3387	2.0	0.96	1880.5	33.2	1860.7	18.1	1838.6	11.2	1838.6	11.2	102.3
LA2-65	96	313068	1.2	8.8576	0.4	5.1946	1.4	0.3337	1.4	0.96	1856.3	21.9	1851.7	12.0	1846.5	6.8	1846.5	6.8	100.5
LA2-18	91	142755	22.4	8.7582	0.4	5.2791	2.5	0.3353	2.5	0.99	1864.2	40.3	1865.5	21.5	1866.9	7.6	1866.9	7.6	99.9
LA2-70	254	319485	1.4	8.2117	0.2	6.0124	2.9	0.3581	2.9	1.00	1973.1	49.8	1977.6	25.6	1982.4	3.4	1982.4	3.4	99.5
LA2-61B	46	147001	0.9	6.1001	0.5	10.1758	2.1	0.4502	2.0	0.97	2396.1	40.7	2450.9	19.5	2496.6	9.2	2496.6	9.2	96.0
LA2-74	214	254511	1.7	5.8321	0.2	10.3646	0.8	0.4384	0.8	0.97	2343.5	15.8	2467.9	7.7	2572.0	3.3	2572.0	3.3	91.1
LA2-77	27	60836	1.5	5.6881	1.3	10.8134	3.1	0.4461	2.8	0.90	2377.9	55.7	2507.2	28.9	2613.7	22.4	2613.7	22.4	91.0
LA2-91	51	138755	1.8	5.4341	0.5	13.1185	0.8	0.5170	0.6	0.81	2686.5	14.1	2688.2	7.5	2689.5	7.6	2689.5	7.6	99.9
LA2-32	44	400153	1.1	5.2808	0.6	13.5402	1.3	0.5186	1.2	0.90	2693.2	25.6	2718.1	12.2	2736.6	9.2	2736.6	9.2	98.4
LA2-16	44	183621	1.5	5.1429	0.3	14.4072	1.4	0.5374	1.4	0.98	2772.5	31.3	2776.9	13.5	2780.1	4.9	2780.1	4.9	99.7
LA2-85	44	143174	1.7	5.1256	0.8	14.0345	2.0	0.5217	1.9	0.91	2706.5	41.3	2752.0	19.4	2785.6	13.5	2785.6	13.5	97.2
LA2-35	76	218469	1.0	5.1009	0.6	12.8117	2.4	0.4740	2.3	0.96	2501.0	48.1	2665.9	22.6	2793.5	10.4	2793.5	10.4	89.5
LA2-81	25	97538	0.9	4.9413	1.0	14.9679	3.9	0.5364	3.8	0.97	2768.4	86.0	2813.2	37.6	2845.4	16.1	2845.4	16.1	97.3
LA2-76	17	62610	0.9	3.0161	1.4	34.2178	3.4	0.7485	3.1	0.91	3602.1	84.8	3616.3	33.2	3624.3	21.1	3624.3	21.1	99.4

LA3(100/10-20-077-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LA-3-103	73	24165	3.2	17.7396	5.8	0.5150	6.0	0.0663	1.6	0.26	413.6	6.3	421.8	20.6	467.0	127.7	413.6	6.3	88.6
LA-3-71	274	103558	1.4	18.1855	1.3	0.5078	2.4	0.0670	2.0	0.84	417.9	8.1	417.0	8.2	411.8	29.4	417.9	8.1	101.5
LA-3-49	92	99782	1.1	17.5988	3.7	0.5456	3.9	0.0696	1.4	0.36	433.9	6.0	442.1	14.1	484.7	81.0	433.9	6.0	89.5
LA-3-93	196	60236	1.5	17.6728	1.5	0.5729	2.1	0.0734	1.4	0.67	456.8	6.1	459.9	7.6	475.3	33.9	456.8	6.1	96.1
LA-3-28	95	52823	1.8	17.5317	4.8	0.5983	5.1	0.0761	1.6	0.32	472.7	7.5	476.2	19.4	493.1	106.9	472.7	7.5	95.9
LA-3-80	220	57494	1.5	17.4560	2.1	0.6172	3.8	0.0781	3.2	0.83	485.0	14.8	488.1	14.8	502.6	47.1	485.0	14.8	96.5
LA-3-51	118	40974	1.2	17.7586	2.6	0.6147	2.8	0.0792	1.1	0.38	491.2	5.1	486.5	10.8	464.6	57.2	491.2	5.1	105.7
LA-3-74	133	54741	3.3	17.2079	2.5	0.6443	3.6	0.0804	2.6	0.73	498.5	12.5	504.9	14.3	534.0	53.8	498.5	12.5	93.4
LA-3-1	123	49232	1.3	17.1257	2.9	0.6807	4.2	0.0846	2.9	0.71	523.2	14.8	527.2	17.1	544.5	64.3	523.2	14.8	96.1
LA-3-88	270	27629	1.1	16.9659	1.7	0.7318	1.8	0.0900	0.5	0.31	555.8	2.9	557.6	7.7	564.9	37.0	555.8	2.9	98.4
LA-3-27	126	48796	0.9	16.8132	1.1	0.7749	1.5	0.0945	1.0	0.68	582.0	5.6	582.6	6.6	584.6	23.9	582.0	5.6	99.6
LA-3-9	80	26790	0.9	14.6022	22.3	0.8969	23.1	0.0950	6.2	0.27	585.0	34.4	650.1	111.3	883.2	465.6	585.0	34.4	66.2
LA-3-105	167	79926	0.7	16.4776	1.5	0.8454	2.1	0.1010	1.5	0.69	620.5	8.6	622.1	9.9	628.2	33.2	620.5	8.6	98.8
LA-3-85	209	91514	1.5	16.3476	1.5	0.8810	5.0	0.1045	4.8	0.96	640.4	29.3	641.5	23.9	645.3	32.0	640.4	29.3	99.3
LA-3-38	174	160967	2.6	14.2237	1.1	1.5311	1.3	0.1580	0.7	0.53	945.4	5.8	942.9	7.7	937.3	21.8	937.3	21.8	100.9
LA-3-79	154	178699	3.0	14.2186	1.2	1.4774	3.5	0.1523	3.3	0.94	914.1	28.0	921.1	21.2	938.0	25.1	938.0	25.1	97.5
LA-3-37	79	155240	2.1	14.0858	2.6	1.5526	3.0	0.1586	1.4	0.47	949.0	12.3	951.5	18.3	957.2	53.5	957.2	53.5	99.1
LA-3-44	61	61626	4.7	13.9947	1.5	1.6395	1.7	0.1664	0.9	0.51	992.3	8.0	985.5	10.9	970.5	30.3	970.5	30.3	102.2
LA-3-76	57	38763	1.3	13.9734	2.2	1.6162	2.6	0.1638	1.2	0.49	977.8	11.3	976.5	16.1	973.6	45.8	973.6	45.8	100.4
LA-3-95	60	36992	1.9	13.7699	1.8	1.7229	2.0	0.1721	0.9	0.47	1023.5	9.0	1017.1	13.0	1003.4	36.3	1003.4	36.3	102.0
LA-3-10	58	54807	1.7	13.6390	2.2	1.7585	2.5	0.1740	1.2	0.47	1033.9	11.3	1030.3	16.3	1022.8	45.0	1022.8	45.0	101.1
LA-3-5	164	189635	4.9	13.5945	0.8	1.7703	2.4	0.1745	2.3	0.94	1037.1	21.6	1034.6	15.6	1029.4	16.5	1029.4	16.5	100.8
LA-3-6	164	102369	1.7	13.5740	0.5	1.7968	1.0	0.1769	0.9	0.86	1050.0	8.7	1044.3	6.8	1032.4	10.7	1032.4	10.7	101.7
LA-3-47	205	209995	23.9	13.5643	0.7	1.7452	1.4	0.1717	1.2	0.86	1021.4	11.3	1025.4	9.0	1033.9	14.5	1033.9	14.5	98.8
LA-3-22	123	136439	3.9	13.5550	0.9	1.7535	1.2	0.1724	0.7	0.64	1025.2	7.1	1028.4	7.5	1035.3	18.1	1035.3	18.1	99.0
LA-3-62	88	69936	1.2	13.4934	1.7	1.8264	2.0	0.1787	1.1	0.55	1060.1	10.8	1055.0	13.1	1044.5	33.5	1044.5	33.5	101.5
LA-3-59	123	115484	2.8	13.4764	0.6	1.7672	1.5	0.1727	1.3	0.92	1027.1	12.6	1033.5	9.4	1047.0	11.7	1047.0	11.7	98.1
LA-3-66	43	29701	1.8	13.4260	3.3	1.8530	3.8	0.1804	1.8	0.47	1069.3	17.5	1064.5	24.8	1054.6	66.8	1054.6	66.8	101.4
LA-3-14	182	199557	2.3	13.4194	0.6	1.7857	0.9	0.1738	0.6	0.71	1033.0	6.1	1040.3	5.8	1055.6	12.7	1055.6	12.7	97.9
LA-3-61	137	127824	2.8	13.4153	1.4	1.8003	3.2	0.1752	2.8	0.89	1040.5	27.0	1045.6	20.6	1056.2	29.0	1056.2	29.0	98.5
LA-3-96	118	68236	1.6	13.3643	1.1	1.9019	1.8	0.1843	1.5	0.80	1090.7	14.8	1081.8	12.3	1063.9	22.4	1063.9	22.4	102.5
LA-3-78	65	78443	2.0	13.1948	2.2	1.8998	3.9	0.1818	3.2	0.82	1076.8	31.5	1081.0	25.7	1089.5	44.2	1089.5	44.2	98.8
LA-3-58	61	43932	1.2	13.1676	1.9	1.9345	2.4	0.1847	1.4	0.60	1092.8	14.4	1093.1	16.0	1093.6	38.3	1093.6	38.3	99.9
LA-3-98	44	47354	0.8	13.0715	1.9	1.9096	2.4	0.1810	1.4	0.59	1072.6	14.0	1084.4	15.9	1108.2	38.5	1108.2	38.5	96.8
LA-3-86	44	34906	2.0	13.0587	3.2	2.0665	3.3	0.1957	0.7	0.22	1152.3	7.7	1137.8	22.3	1110.2	63.4	1110.2	63.4	103.8
LA-3-30	62	68642	2.3	13.0221	1.4	2.0523	1.7	0.1938	1.0	0.58	1142.1	10.6	1133.1	11.9	1115.8	28.3	1115.8	28.3	102.4
LA-3-52	160	103789	2.5	12.9843	0.5	2.0329	1.2	0.1914	1.1	0.91	1129.2	11.3	1126.6	8.1	1121.6	9.7	1121.6	9.7	100.7
LA-3-34	35	27104	1.5	12.9294	2.6	1.8382	4.3	0.1724	3.4	0.80	1025.2	32.2	1059.2	28.1	1130.1	51.5	1130.1	51.5	90.7
LA-3-31	42	37522	0.9	12.9040	2.7	2.0720	3.3	0.1939	1.8	0.56	1142.6	19.1	1139.6	22.4	1133.9	53.8	1133.9	53.8	100.8
LA-3-50	29	17849	1.3	12.8440	4.7	2.0135	5.2	0.1876	2.3	0.44	1108.2	23.5	1120.1	35.4	1143.2	93.0	1143.2	93.0	96.9
LA-3-64	73	82134	1.5	12.8357	1.4	2.0681	3.0	0.1925	2.6	0.88	1135.1	27.5	1138.3	20.6	1144.5	28.4	1144.5	28.4	99.2
LA-3-53	103	109003	2.2	12.8096	0.8	2.0972	1.3	0.1948	1.0	0.76	1147.5	10.5	1147.9	9.0	1148.5	16.8	1148.5	16.8	99.9
LA-3-3	139	282261	1.6	12.7320	0.9	2.2411	1.4	0.2069	1.0	0.75	1212.5	11.4	1194.0	9.6	1160.6	17.8	1160.6	17.8	104.5
LA-3-8	46	45818	1.4	12.7068	1.9	2.0749	2.2	0.1912	1.0	0.45	1128.0	10.1	1140.5	14.9	1164.5	38.5	1164.5	38.5	96.9
LA-3-12	75	106418	1.7	12.7002	1.5	2.1562	1.9	0.1986	1.3	0.67	1167.8	13.8	1167.0	13.5	1165.6	28.8	1165.6	28.8	100.2
LA-3-40	68	155792	2.0	12.6865	1.4	2.0876	2.1	0.1921	1.6	0.74	1132.6	16.3	1144.7	14.6	1167.7	28.4	1167.7	28.4	97.0
LA-3-35	30	18899	0.9	12.6500	2.1	2.0989	2.5	0.1926	1.3	0.52	1135.3	13.7	1148.5	17.3	1173.4	42.4	1173.4	42.4	96.7
LA-3-55	47	55066	0.9	12.6300	2.0	2.1559	3.8	0.1975	3.2	0.84	1161.8	33.8	1167.0	26.1	1176.6	40.0	1176.6	40.0	98.7
LA-3-41	127	137829	2.2	12.5152	0.9	2.2204	1.2	0.2015	0.8	0.64	1183.6	8.4	1187.5	8.4	1194.6	18.2	1194.6	18.2	99.1
LA-3-54	32	48964	0.9	12.5023	2.3	2.2104	2.5	0.2004	1.0	0.39	1177.6	10.4	1184.3	17.3	1196.6	44.8	1196.6	44.8	98.4
LA-3-81	160	154642	1.2	12.4774	0.9	2.3470	2.8	0.2124	2.7	0.95	1241.5	30.0	1226.6	20.0	1200.6	18.0	1200.6	18.0	103.4
LA-3-60	56	102298	2.7	12.4415	1.8	2.2682	1.9	0.2047	0.8	0.40	1200.4	8.6	1202.5	13.7	1206.2	35.0	1206.2	35.0	99.5
LA-3-26	80	79450	1.2	12.4028	0.8	2.2557	1.5	0.2029	1.3	0.85	1190.9	14.1	1198.6	10.7	1212.4	15.8	1212.4	15.8	98.2
LA-3-24	143	146553	2.9	12.3750	0.9	2.2617	2.7	0.2030	2.6	0.95	1191.4	28.3	1200.4	19.3	1216.8	16.9	1216.8	16.9	97.9
LA-3-17	49	40433	1.6	12.2183	2.5	2.4067	2.7	0.2133	0.9	0.33	1246.2	9.9	1244.6	19.1	1241.8	49.4	1241.8	49.4	100.4
LA-3-19	45	51549	4.3	12.2144	2.3	2.3720	3.5	0.2101	2.6	0.75	1229.5	29.5	1234.2	25.2	1242.4	45.9	1242.4	45.9	99.0
LA-3-77	10	8345	1.5	12.1450	4.0	2.0508	6.4	0.1806	5.0	0.78	1070.5	49.1	1132.6	43.5	1253.6	77.7	1253.6	77.7	85.4
LA-3-15	140	53692	1.3	12.0434	1.3	2.4341	1.5	0.2126	0.8	0.51	1242.7	9.0	1252.7	11.1	1270.0	25.9	1270.0	25.9	97.9
LA-3-91	35	43116	1.6	12.0033	2.9	2.4337	5.6	0.2119	4.8	0.86	1238.8	54.6	1252.6	40.6	1276.5	56.2	1276.5	56.2	97.0
LA-3-67	59	78154	1.9	11.9378	2.1	2.5691	2.4	0.2224	1.0	0.43	1294.7	11.8	1291.9	17.2	1287.1	41.4	1287.1	41.4	100.6
LA-3-101	37	7317	2.3	11.7516	9.4	2.4836	10.3	0.2117	4.3	0.42	1237.7	48.5	1267.3	74.6	1317.7	181.6	1317.7	181.6	93.9
LA-3-84	74	114272	1.7	11.7052	0.9	2.7453	1.5	0.2331	1.2	0.79	1350.5	14.1	1340.8	10.8	1325.3	17.1	1325.3	17.1	101.9
LA-3-43	29	27428	1.4	11.6920	4.5	2.5679	4.7	0.2178	1.6	0.33	1270.0	18.2	1291.5	34.6	1327.5	86.3	1327.5	86.3	95.7
LA-3-102	62	153386	1.2	11.5426	1.7	2.8641	1.9	0.2398	0.9	0.46	1385.5	11.0	1372.5	14.4	1352.4	32.8	1352.4	32.8	102.4
LA-3-75	62	123889	0.9	11.1350	1.3	3.0999	2.0	0.2503	1.5	0.75	1440.2	19.2	1432.7	15.3	1421.4	25.4	1421.4	25.4	101.3
LA-3-57	91	108813	2.1	11.0357	0.8	3.0678	2.9	0.2455	2.8	0.97	1415.5	35.8	1424.7	22.4	1438.5	14.3	1438.5	14.3	98.4
LA-3-13	73	90239	2.3	11.0219	1.0	3.2036	1.4	0.2561	1.0	0.71	1469.8	13.1	1458.0	10.8	1440.9	18.7	1440.9	18.7	102.0
LA-3-99	204	422221	3.0	10.9998	0.4	3.1447	1.5	0.2509	1.5	0.96	1443.0	18.8	1443.7	11.6	1444.7	7.8	1444.7	7.8	99.9
LA-3-36	55	132646	3.7	10.7236	1.9	3.3633	2.1	0.2616	0.8	0.38	1497.9	10.7	1495.9	16.3	1493.0	36.3	1493.0	36.3	100.3
LA-3-70	112	146998	1.6	10.7099	0.7	3.3981	1.3	0.2639	1.1	0.86	1510.0	14.6	1504.0	9.9	1495.4	12.3	1495.4	12.3	101.0
LA-3-20	189	312562	4.1	10.6724	0.5	3.3550	1.1	0.2597	1.0	0.91	1488.3	13.8	1494.0	8.9	1502.1	9.0	1502.1	9.0	99.1
LA-3-69	162	310409	2.4	10.6571	0.6	3.4658	0.9	0.2679	0.6	0.70	1530.0	8.5	1519.5	7.0	1504.8	12.0	1504.8	12.0	101.7
LA-3-32	178	181931	1.9	10.6148	0.7	3.4216	1.0	0.2634	0.8	0.77	1507.3	10.8	1509.4	8.2	1512.3	12.4	1512.3	12.4	99.7
LA-3-16	72	137109	0.5	9.8840	0.7	4.0419	2.2	0.2897	2.1	0.95	1640.3	30.5	1642.7	18.0	1645.7	12.2	1645.7	12.2	99.7
LA-3-48	12	24385	0.4	9.8242	4.5	4.0490	5.2	0.2885	2.5	0.48	1634.0	35.4	1644.1	42.0	1657.0	83.9	1657.0	83.9	98.6
LA-3-4	67	79263	1.4	9.8182	0.6	4.1644	1.6	0.2965	1.4	0.93	1674.1	21.3	1667.0	12.7	1658.1	10.6	1658.1	10.6	101.0
LA-3-25	230	656492	1.6	9.4496	0.6	4.1248	2.4	0.2827	2.3	0.97	1604.9	33.3	1659.2	19.7	1728.7	10.6	1728.7	10.6	92.8
LA-3-39	213	208774	3.2	9.3291	0.4	4.6115	1.3	0.3120	1.3	0.94	1750.6	19.2	1751.4	11.1	1752.2	8.0	1752.2	8.0	99.9
LA-3-97	187	163985	3.5	9.3179	0.3	4.7919	1.3	0.3238	1.3	0.97	1808.4	19.8	1783.5	10.9	1754.4	5.7	1754.4	5.7	103.1
LA-3-72	53	111011	0.6	8.8691	1.3	5.1666	2.2	0.3323	1.7	0.81	1849.7	27.9	1847.1	18.4	1844.2	23.1	1844.2	23.1	100.3
LA-3-11	70	150222	2.1	8.8678	0.4	5.1649	1.1	0.3322	1.0	0.94	1848.9	16.8	1846.8	9.4	1844.5	6.7	1844.5	6.7	100.2
LA-3-29	64	95580	0.9	8.7656	0.8	5.4272	1.1	0.3450	0.9	0.75	1910.8	14.3	1889.2	9.9	1865.4	13.7	1865.4	13.7	102.4
LA-3-21	66	121605	2.1	8.7009	0.8	5.3403	1.1	0.3370	0.8	0.74	1872.2	13.4	1875.3	9.5	1878.8	13.6	1878.8	13.6	99.6
LA-3-45	109	171900	0.8	8.1512	0.3	6.0114	1.1	0.3554	1.0	0.95	1960.3	17.1	1977.5	9.3	1995.6	6.0	1995.6	6.0	98.2
LA-3-73	25	26159	1.5	8.1326	1.9	6.1719	3.5	0.3640	3.0	0.84	2001.3	51.0	2000.5	30.9	1999.6	34.3	1999.6	34.3	100.1
LA-3-63	12	17430	1.1	7.6570	3.3	6.8877	3.8	0.3825	1.9	0.51	2088.0	34.8	2097.1	33.9	2106.0	57.8	2106.0	57.8	99.1
LA-3-83	49	117050	1.7	6.0958	0.5	10.7963	1.3	0.4773	1.2	0.93	2515.5	25.4	2505.7	12.2	2497.8	8.1	2497.8	8.1	100.7
LA-3-90	110	317883	1.7	5.8130	0.3	11.6868	2.2	0.4927	2.2	0.99	2582.4	46.6	2579.6	20.6	2577.4	4.4	2577.4	4.4	100.2
LA-3-42	80	240474	0.7	5.4681	0.2	12.8127	1.9	0.5081	1.9	0.99	2648.6	41.4	2666.0	18.1	2679.1	3.5	2679.1	3.5	98.9
LA-3-65	80	48620	2.5	5.3924	0.8	13.8447	3.5	0.5415	3.4	0.98	2789.5	77.7	2739.1	33.3	2702.2	12.6	2702.2	12.6	103.2
LA-3-2	81	210403	0.5	5.3789	0.2	12.8713	1.1	0.5021	1.1	0.98	2623.0	24.0	2670.3	10.7	2706.3	3.3	2706.3	3.3	96.9
LA-3-7	22	137533	1.7	5.3094	1.0	13.8513	1.9	0.5334	1.6	0.83	2755.7	34.9	2739.6	17.7	2727.7	17.1	2727.7	17.1	101.0
LA-3-100	39	188978	1.9	5.2822	0.2	14.0498	1.4	0.5382	1.4	0.99	2776.1	30.8	2753.1	13.1	2736.2	3.7	2736.2	3.7	101.5
LA-3-46	52	142164	1.3	5.2555	0.4	13.9932	2.2	0.5334	2.2	0.99	2755.7	48.5	2749.2	20.8	2744.5	6.0	2744.5	6.0	100.4
LA-3-23	209	305966	0.8	5.2261	0.2	13.3787	1.2	0.5071	1.2	0.98	2644.2	25.2	2706.8	11.2	2753.8	3.9	2753.8	3.9	96.0
LA-3-87	104	247172	1.2	4.7750	0.1	16.6541	1.1	0.5768	1.1	0.99	2935.5	24.9	2915.1	10.2	2901.1	2.2	2901.1	2.2	101.2
LA-3-82	216	847713	1.5	4.0966	0.2	21.3761	1.3	0.6351	1.3	0.99	3169.8	32.3	3155.8	12.6	3146.9	2.8	3146.9	2.8	100.7

LA4(100/10-20-077-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LA4-58	93	12187	1.2	18.7499	9.7	0.3060	10.0	0.0416	2.6	0.26	262.8	6.7	271.1	23.9	343.0	220.2	262.8	6.7	NA
LA4-82	96	28868	0.7	17.9733	2.8	0.5065	3.3	0.0660	1.8	0.54	412.2	7.2	416.1	11.3	437.9	62.2	412.2	7.2	94.1
LA4-1	133	58734	2.7	18.4155	4.1	0.5048	4.7	0.0674	2.2	0.47	420.6	8.9	414.9	15.9	383.6	92.4	420.6	8.9	109.6
LA4-33	53	16084	1.2	19.0888	9.5	0.5275	9.8	0.0730	2.8	0.28	454.4	12.1	430.1	34.5	302.3	215.9	454.4	12.1	150.3
LA4-90	100	40287	2.2	17.1989	3.1	0.6260	3.9	0.0781	2.4	0.61	484.7	11.1	493.6	15.2	535.2	67.3	484.7	11.1	90.6
LA4-3	74	39317	1.6	14.3250	1.7	1.5484	2.2	0.1609	1.4	0.65	961.6	12.5	949.9	13.4	922.7	33.9	922.7	33.9	104.2
LA4-6	51	46571	1.6	14.1587	4.0	1.5721	4.7	0.1614	2.5	0.54	964.8	22.6	959.3	29.1	946.7	81.0	946.7	81.0	101.9
LA4-5	65	54774	2.9	13.8030	1.4	1.7155	2.3	0.1717	1.8	0.79	1021.7	17.1	1014.3	14.7	998.5	28.8	998.5	28.8	102.3
LA4-55	280	217184	1.5	13.7279	0.6	1.7147	1.6	0.1707	1.5	0.92	1016.1	14.0	1014.0	10.4	1009.6	12.8	1009.6	12.8	100.6
LA4-49	187	84995	2.5	13.6489	0.6	1.7719	1.8	0.1754	1.7	0.94	1041.8	16.3	1035.2	11.7	1021.3	12.8	1021.3	12.8	102.0
LA4-47	57	30727	1.1	13.6174	2.3	1.8224	3.0	0.1800	2.0	0.66	1066.9	19.6	1053.5	19.9	1026.0	46.3	1026.0	46.3	104.0
LA4-36	68	56792	0.9	13.5701	2.1	1.7824	2.6	0.1754	1.5	0.58	1041.9	14.3	1039.0	16.6	1033.0	42.1	1033.0	42.1	100.9
LA4-61	47	64228	1.3	13.5322	2.4	1.8647	3.5	0.1830	2.6	0.74	1083.4	25.9	1068.6	23.3	1038.7	48.3	1038.7	48.3	104.3
LA4-94	196	229032	3.0	13.5040	0.8	1.8019	1.3	0.1765	1.0	0.79	1047.7	9.7	1046.2	8.3	1042.9	15.5	1042.9	15.5	100.5
LA4-54	146	81890	2.4	13.4991	1.2	1.8623	2.1	0.1823	1.7	0.80	1079.7	16.5	1067.8	13.6	1043.6	24.7	1043.6	24.7	103.5
LA4-73	69	48125	2.8	13.4738	2.3	1.8197	3.1	0.1778	2.1	0.67	1055.1	20.3	1052.6	20.5	1047.4	47.1	1047.4	47.1	100.7
LA4-21	104	77948	2.1	13.4163	1.8	1.8624	2.8	0.1812	2.2	0.78	1073.6	21.6	1067.8	18.5	1056.0	35.3	1056.0	35.3	101.7
LA4-78	122	70627	4.7	13.4150	0.9	1.8774	1.7	0.1827	1.5	0.85	1081.5	14.8	1073.1	11.6	1056.2	18.4	1056.2	18.4	102.4
LA4-63	25	34105	2.2	13.3607	3.3	1.7810	4.2	0.1726	2.6	0.62	1026.3	24.8	1038.5	27.4	1064.4	66.5	1064.4	66.5	96.4
LA4-29	83	90323	1.9	13.3441	1.6	1.8798	2.0	0.1819	1.2	0.60	1077.5	12.2	1074.0	13.5	1066.9	32.9	1066.9	32.9	101.0
LA4-62	106	113707	1.6	13.3183	2.1	1.9019	2.4	0.1837	1.0	0.44	1087.2	10.4	1081.8	15.7	1070.8	42.6	1070.8	42.6	101.5
LA4-70	104	91480	3.7	13.3076	1.4	1.9355	2.3	0.1868	1.8	0.80	1104.1	18.7	1093.4	15.4	1072.4	27.6	1072.4	27.6	103.0
LA4-79	81	64930	3.0	13.2972	1.7	1.8404	2.2	0.1775	1.5	0.66	1053.2	14.1	1060.0	14.5	1074.0	33.3	1074.0	33.3	98.1
LA4-26	42	21736	2.6	13.2627	1.7	1.9681	2.4	0.1893	1.7	0.69	1117.7	17.0	1104.7	16.1	1079.2	34.6	1079.2	34.6	103.6
LA4-19	26	21797	1.4	13.2578	5.0	1.9030	5.2	0.1830	1.2	0.23	1083.2	11.8	1082.1	34.5	1079.9	101.2	1079.9	101.2	100.3
LA4-103	80	40066	2.0	13.2231	2.1	1.8754	2.4	0.1799	1.2	0.50	1066.2	11.8	1072.4	16.0	1085.2	41.9	1085.2	41.9	98.3
LA4-39	63	73806	1.8	13.1933	0.9	1.9537	2.4	0.1869	2.3	0.92	1104.8	22.9	1099.7	16.4	1089.7	18.8	1089.7	18.8	101.4
LA4-85	160	80757	1.6	13.0768	0.9	1.8522	2.6	0.1757	2.4	0.94	1043.3	23.5	1064.2	17.1	1107.4	17.7	1107.4	17.7	94.2
LA4-43	34	20819	1.7	13.0616	3.4	1.9869	4.2	0.1882	2.5	0.59	1111.7	25.3	1111.1	28.2	1109.7	67.1	1109.7	67.1	100.2
LA4-69	37	41391	0.8	13.0028	2.4	2.0756	3.4	0.1957	2.4	0.70	1152.4	25.1	1140.8	23.2	1118.8	47.9	1118.8	47.9	103.0
LA4-87	29	30279	2.4	12.9932	4.6	2.0896	5.1	0.1969	2.3	0.45	1158.7	24.5	1145.4	35.1	1120.3	90.8	1120.3	90.8	103.4
LA4-8	124	206929	1.5	12.9871	0.8	2.0338	1.5	0.1916	1.3	0.86	1129.8	13.8	1126.9	10.5	1121.2	15.6	1121.2	15.6	100.8
LA4-27	25	21893	2.8	12.9231	3.6	2.0425	5.2	0.1914	3.7	0.72	1129.1	38.3	1129.8	35.2	1131.0	71.8	1131.0	71.8	99.8
LA4-10	254	115615	1.2	12.9111	0.5	2.1184	1.3	0.1984	1.2	0.92	1166.6	13.2	1154.8	9.3	1132.9	10.7	1132.9	10.7	103.0
LA4-64	54	78445	2.4	12.8545	1.7	2.1852	4.6	0.2037	4.2	0.93	1195.3	46.1	1176.3	31.7	1141.6	34.0	1141.6	34.0	104.7
LA4-22	29	23130	2.6	12.8013	5.3	2.1677	5.9	0.2013	2.7	0.46	1182.1	29.2	1170.7	41.2	1149.8	104.6	1149.8	104.6	102.8
LA4-25	114	160199	4.0	12.7506	0.9	2.1931	1.7	0.2028	1.4	0.83	1190.4	15.0	1178.8	11.6	1157.7	18.4	1157.7	18.4	102.8
LA4-23	20	15298	1.0	12.7172	6.9	2.1239	7.5	0.1959	2.7	0.37	1153.2	28.9	1156.6	51.6	1162.9	137.7	1162.9	137.7	99.2
LA4-16	79	110630	1.8	12.6952	0.8	2.0908	1.8	0.1925	1.6	0.89	1135.0	16.4	1145.8	12.1	1166.3	15.6	1166.3	15.6	97.3
LA4-99	95	302925	1.2	12.6940	1.1	2.1434	3.0	0.1973	2.8	0.93	1161.0	29.6	1162.9	20.8	1166.5	21.8	1166.5	21.8	99.5
LA4-81	156	121534	1.8	12.6376	0.6	2.1908	1.8	0.2008	1.7	0.94	1179.6	18.3	1178.1	12.6	1175.4	12.5	1175.4	12.5	100.4
LA4-44	89	86015	0.8	12.5431	1.0	2.2860	2.3	0.2080	2.1	0.90	1217.9	23.4	1208.0	16.5	1190.2	19.8	1190.2	19.8	102.3
LA4-20	106	81092	1.7	12.5429	1.1	2.2374	1.8	0.2035	1.5	0.81	1194.3	16.3	1192.8	12.9	1190.2	21.1	1190.2	21.1	100.3
LA4-100	41	43536	1.1	12.4939	3.0	2.2867	4.1	0.2072	2.9	0.69	1213.9	31.6	1208.2	29.2	1197.9	58.8	1197.9	58.8	101.3
LA4-102	79	59069	1.6	12.4622	1.5	2.2475	3.5	0.2031	3.2	0.90	1192.2	34.4	1196.0	24.7	1202.9	29.9	1202.9	29.9	99.1
LA4-91	125	227697	2.3	12.4005	0.6	2.3724	2.1	0.2134	2.0	0.95	1246.7	22.8	1234.3	15.1	1212.7	12.6	1212.7	12.6	102.8
LA4-17	56	16682	1.4	12.3466	1.9	2.3594	2.3	0.2113	1.3	0.56	1235.6	14.3	1230.4	16.2	1221.3	37.0	1221.3	37.0	101.2
LA4-15	35	51206	1.1	12.2272	2.7	2.4346	3.1	0.2159	1.5	0.47	1260.2	16.7	1252.9	22.2	1240.4	53.1	1240.4	53.1	101.6
LA4-76	317	9640	2.0	12.2164	1.4	2.4029	1.8	0.2129	1.1	0.60	1244.3	11.9	1243.5	12.6	1242.1	27.5	1242.1	27.5	100.2
LA4-45	38	25433	2.3	11.7777	3.3	2.6549	4.3	0.2268	2.8	0.64	1317.6	32.8	1316.0	31.5	1313.4	63.3	1313.4	63.3	100.3
LA4-68	39	54040	2.0	11.7050	1.6	2.6977	2.0	0.2290	1.3	0.63	1329.3	15.4	1327.8	15.0	1325.4	30.4	1325.4	30.4	100.3
LA4-35	73	74047	1.2	11.4170	1.3	2.9955	1.9	0.2480	1.4	0.73	1428.3	17.6	1406.5	14.4	1373.5	24.9	1373.5	24.9	104.0
LA4-83	16	11797	0.7	11.3814	5.1	3.0470	5.4	0.2515	1.7	0.31	1446.3	21.5	1419.5	41.1	1379.5	98.1	1379.5	98.1	104.8
LA4-52	53	37405	1.6	11.2844	1.3	2.9992	1.9	0.2455	1.4	0.73	1415.0	17.6	1407.4	14.4	1395.9	24.6	1395.9	24.6	101.4
LA4-40	24	36635	1.9	11.2345	4.9	3.0264	5.2	0.2466	1.8	0.34	1420.9	22.6	1414.3	39.4	1404.4	93.0	1404.4	93.0	101.2
LA4-67	132	165155	1.9	11.0833	0.5	3.1969	2.1	0.2570	2.0	0.97	1474.4	26.5	1456.4	16.1	1430.3	10.0	1430.3	10.0	103.1
LA4-60	56	55358	2.3	11.0697	1.3	3.1865	2.2	0.2558	1.7	0.79	1468.5	22.7	1453.9	16.9	1432.6	25.5	1432.6	25.5	102.5
LA4-57	90	101571	0.9	11.0667	1.3	3.1282	2.1	0.2511	1.6	0.79	1444.0	21.3	1439.6	16.0	1433.2	24.1	1433.2	24.1	100.8
LA4-92	75	94725	1.7	10.8837	0.9	3.2791	1.7	0.2588	1.4	0.84	1483.9	18.9	1476.1	13.2	1464.9	17.5	1464.9	17.5	101.3
LA4-28	8	9313	1.1	10.8260	8.5	3.2483	9.2	0.2550	3.3	0.36	1464.4	43.7	1468.8	71.3	1475.0	162.3	1475.0	162.3	99.3
LA4-96	70	98030	1.1	10.7700	1.0	3.3193	2.5	0.2593	2.3	0.91	1486.1	30.8	1485.6	19.8	1484.8	19.8	1484.8	19.8	100.1
LA4-105	123	172646	2.4	10.7530	0.8	3.4313	1.7	0.2676	1.5	0.88	1528.6	20.1	1511.6	13.2	1487.8	15.0	1487.8	15.0	102.7
LA4-2	31	40688	1.0	10.5826	1.2	3.5065	2.3	0.2691	1.9	0.83	1536.4	25.7	1528.7	17.8	1518.0	23.5	1518.0	23.5	101.2
LA4-75	54	56663	1.3	10.4413	1.3	3.5096	1.6	0.2658	0.9	0.59	1519.3	12.8	1529.4	12.7	1543.3	24.5	1543.3	24.5	98.4
LA4-50	39	35534	1.1	9.9768	1.7	4.0130	3.2	0.2904	2.8	0.85	1643.4	40.0	1636.8	26.3	1628.4	31.2	1628.4	31.2	100.9
LA4-51	305	266117	1.0	9.5612	0.4	3.6313	2.2	0.2518	2.2	0.99	1447.8	28.7	1556.4	17.9	1707.1	6.9	1707.1	6.9	84.8
LA4-31	59	74885	1.0	9.3893	0.9	4.5668	2.0	0.3110	1.8	0.88	1745.6	27.3	1743.2	16.8	1740.4	17.2	1740.4	17.2	100.3
LA4-98	218	276113	7.4	9.1606	0.3	4.8305	2.1	0.3209	2.1	0.99	1794.3	33.0	1790.2	17.9	1785.5	4.8	1785.5	4.8	100.5
LA4-11	141	166370	4.9	9.0598	0.5	4.8505	1.2	0.3187	1.1	0.90	1783.5	16.5	1793.7	10.0	1805.6	9.6	1805.6	9.6	98.8
LA4-9	120	364731	1.1	8.9805	0.2	5.0893	1.8	0.3315	1.8	0.99	1845.5	28.6	1834.3	15.3	1821.6	3.9	1821.6	3.9	101.3
LA4-38	49	109841	3.1	8.9476	1.2	5.1423	1.7	0.3337	1.3	0.72	1856.3	20.2	1843.1	14.8	1828.2	22.0	1828.2	22.0	101.5
LA4-77	78	105053	1.5	8.9158	0.6	5.2491	1.2	0.3394	1.0	0.85	1883.9	16.6	1860.6	10.2	1834.7	11.3	1834.7	11.3	102.7
LA4-32	33	54488	0.6	8.8655	2.6	5.2084	3.1	0.3349	1.7	0.54	1862.1	27.0	1854.0	26.5	1844.9	47.4	1844.9	47.4	100.9
LA4-101	51	74563	0.6	8.8528	0.5	5.2751	2.6	0.3387	2.6	0.98	1880.4	41.7	1864.8	22.2	1847.5	8.9	1847.5	8.9	101.8
LA4-34	90	127850	3.0	8.8419	0.6	5.3317	1.2	0.3419	1.0	0.88	1895.8	16.6	1874.0	9.9	1849.8	10.1	1849.8	10.1	102.5
LA4-42	61	55823	1.8	8.8393	0.7	5.3069	1.7	0.3402	1.5	0.90	1887.7	25.1	1870.0	14.5	1850.3	13.1	1850.3	13.1	102.0
LA4-14	31	50448	0.7	8.8070	1.5	5.2836	2.8	0.3375	2.4	0.85	1874.6	39.2	1866.2	24.3	1856.9	27.3	1856.9	27.3	101.0
LA4-13	45	56624	2.1	8.7719	1.1	5.3179	2.5	0.3383	2.2	0.89	1878.6	36.6	1871.7	21.6	1864.1	20.7	1864.1	20.7	100.8
LA4-71	94	240454	0.6	8.7666	0.4	5.3784	1.6	0.3420	1.5	0.96	1896.1	25.4	1881.4	13.8	1865.2	8.0	1865.2	8.0	101.7
LA4-84	34	41161	3.2	8.7604	1.6	5.3838	2.2	0.3421	1.6	0.70	1896.6	25.6	1882.3	19.0	1866.5	28.5	1866.5	28.5	101.6
LA4-18	64	70998	1.5	8.7555	0.7	5.2818	1.2	0.3354	1.0	0.83	1864.5	16.3	1865.9	10.4	1867.5	12.3	1867.5	12.3	99.8
LA4-30	62	60130	2.6	8.7431	0.5	5.3288	3.3	0.3379	3.2	0.99	1876.6	52.3	1873.5	27.9	1870.1	9.9	1870.1	9.9	100.3
LA4-104	176	305982	2.1	8.5994	0.2	5.6376	1.6	0.3516	1.6	0.99	1942.3	26.7	1921.9	13.8	1899.9	3.5	1899.9	3.5	102.2
LA4-4	67	100068	1.3	8.5428	0.5	5.7243	1.8	0.3547	1.7	0.95	1956.9	28.2	1935.0	15.2	1911.8	9.7	1911.8	9.7	102.4
LA4-95	49	70277	0.6	8.4004	1.0	5.8834	2.1	0.3584	1.9	0.89	1974.8	32.3	1958.8	18.5	1941.9	17.4	1941.9	17.4	101.7
LA4-74	27	65942	1.2	8.0564	1.6	6.4785	3.0	0.3785	2.5	0.84	2069.5	44.6	2043.0	26.5	2016.3	29.2	2016.3	29.2	102.6
LA4-97	45	167828	1.2	6.3005	0.4	10.3302	4.0	0.4720	4.0	0.99	2492.5	82.7	2464.8	37.3	2442.0	7.5	2442.0	7.5	102.1
LA4-12	71	270632	1.0	5.5135	0.2	12.8233	1.4	0.5128	1.3	0.98	2668.4	29.1	2666.8	12.7	2665.5	4.0	2665.5	4.0	100.1
LA4-48	32	93584	0.6	5.4842	0.6	13.2000	2.4	0.5250	2.3	0.97	2720.5	52.1	2694.1	22.8	2674.3	9.4	2674.3	9.4	101.7
LA4-24	36	78164	0.6	5.4614	0.5	13.1682	1.5	0.5216	1.5	0.95	2705.9	32.4	2691.8	14.5	2681.2	7.6	2681.2	7.6	100.9
LA4-66	68	224417	0.8	5.4384	0.5	13.3960	1.2	0.5284	1.1	0.91	2734.6	24.3	2708.0	11.3	2688.1	8.2	2688.1	8.2	101.7
LA4-88	77	272196	1.1	5.4103	0.4	13.4460	2.3	0.5276	2.3	0.99	2731.4	50.3	2711.5	21.6	2696.7	6.1	2696.7	6.1	101.3
LA4-59	121	470960	1.0	5.4041	0.1	13.5769	1.4	0.5321	1.4	1.00	2750.5	31.7	2720.7	13.5	2698.6	2.1	2698.6	2.1	101.9
LA4-80	14	100561	0.5	5.3828	1.3	13.6437	2.8	0.5326	2.5	0.89	2752.6	55.6	2725.3	26.5	2705.1	21.5	2705.1	21.5	101.8
LA4-41	60	175989	0.6	5.1194	0.4	14.9103	1.2	0.5536	1.1	0.95	2840.2	25.4	2809.5	11.1	2787.6	5.9	2787.6	5.9	101.9
LA4-7	25	94584	1.1	5.0205	0.7	15.2608	2.6	0.5557	2.5	0.96	2848.7	57.5	2831.7	24.8	2819.5	11.9	2819.5	11.9	101.0
LA4-86	79	189136	1.4	4.7941	0.2	16.3710	1.7	0.5692	1.7	1.00	2904.6	39.4	2898.7	16.2	2894.6	2.7	2894.6	2.7	100.3

LB1(1AB/08-14-077-08W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LB-1-98	194	14206	1.4	18.9337	9.0	0.1778	9.3	0.0244	2.5	0.27	155.5	3.9	166.1	14.3	320.9	204.6	155.5	3.9	NA
LB-1-31	118	6998	1.9	17.9959	19.1	0.1876	19.9	0.0245	5.7	0.29	156.0	8.8	174.6	31.9	435.1	428.0	156.0	8.8	NA
LB-1-17	83	23415	0.7	18.6569	15.6	0.3509	16.2	0.0475	4.4	0.27	299.1	12.8	305.4	42.8	354.2	354.4	299.1	12.8	NA
LB-1-106	14	1649	73.1	11.0006	117.4	0.6522	117.7	0.0520	8.6	0.07	327.0	27.4	509.8	510.9	1444.6	118.8	327.0	27.4	NA
LB-1-104	387	67787	1.3	18.4603	3.0	0.3985	7.1	0.0533	6.4	0.90	335.1	20.9	340.5	20.5	378.1	67.8	335.1	20.9	NA
LB-1-4	260	36674	2.8	18.8868	3.9	0.4100	4.7	0.0562	2.7	0.57	352.2	9.3	348.8	14.0	326.5	88.0	352.2	9.3	NA
LB-1-4	553	103507	0.9	18.4428	1.9	0.4381	2.0	0.0586	0.7	0.35	367.1	2.5	368.9	6.2	380.2	42.1	367.1	2.5	NA
LB-1-42	100	14132	1.3	18.7569	9.6	0.4426	9.9	0.0602	2.7	0.27	376.9	9.7	372.1	31.0	342.2	217.5	376.9	9.7	NA
LB-1-30	87	15278	1.5	18.6643	11.5	0.4600	12.0	0.0623	3.4	0.28	389.4	12.9	384.3	38.5	353.4	261.4	389.4	12.9	NA
LB-1-66	131	18289	1.0	19.2183	8.2	0.4585	10.2	0.0639	6.0	0.59	399.4	23.4	383.2	32.5	286.9	187.4	399.4	23.4	NA
LB-1-70	64	8399	2.5	20.5530	9.7	0.4392	10.6	0.0655	4.4	0.41	408.8	17.3	369.7	33.0	131.2	228.5	408.8	17.3	311.5
LB-1-84	94	18966	1.3	16.8802	10.4	0.5430	10.6	0.0665	2.0	0.19	414.9	8.0	440.4	37.8	575.9	226.3	414.9	8.0	72.0
LB-1-86	133	19241	1.7	18.6775	4.1	0.4923	4.8	0.0667	2.6	0.53	416.2	10.4	406.5	16.2	351.8	92.5	416.2	10.4	118.3
LB-1-110	91	20093	1.1	17.5230	8.2	0.5298	8.6	0.0673	2.5	0.29	420.1	10.3	431.7	30.3	494.1	181.7	420.1	10.3	85.0
LB-1-62	193	56090	1.1	18.1815	3.9	0.5225	4.4	0.0689	2.1	0.48	429.5	8.6	426.8	15.2	412.2	86.1	429.5	8.6	104.2
LB-1-108	120	17548	1.0	18.8449	8.1	0.5073	8.5	0.0693	2.4	0.29	432.1	10.2	416.6	28.9	331.6	184.0	432.1	10.2	130.3
LB-1-15	295	69083	1.0	17.8061	2.5	0.5452	2.7	0.0704	1.0	0.38	438.6	4.3	441.9	9.8	458.7	56.2	438.6	4.3	95.6
LB-1-112	370	63791	3.5	17.9718	2.4	0.5638	3.4	0.0735	2.3	0.69	457.1	10.3	454.0	12.3	438.1	53.9	457.1	10.3	104.3
LB-1-18	205	54005	4.9	16.1010	4.0	0.6382	7.8	0.0745	6.7	0.86	463.4	29.8	501.2	30.8	677.9	86.2	463.4	29.8	68.4
LB-1-80	241	36647	1.4	17.4635	3.4	0.5893	4.0	0.0746	2.1	0.52	464.0	9.3	470.4	15.1	501.7	75.4	464.0	9.3	92.5
LB-1-61	31	9859	1.5	23.2442	35.3	0.4450	35.5	0.0750	4.0	0.11	466.3	18.0	373.8	111.5	-166.3	902.4	466.3	18.0	NA
LB-1-37	240	37694	0.9	17.6154	2.6	0.5948	8.0	0.0760	7.5	0.95	472.2	34.3	473.9	30.2	482.6	56.7	472.2	34.3	97.8
LB-1-96	106	24299	1.5	17.5938	6.3	0.5991	6.6	0.0764	1.9	0.29	474.9	8.7	476.7	24.9	485.3	138.6	474.9	8.7	97.9
LB-1-13	58	18136	0.8	18.3360	12.8	0.5859	13.0	0.0779	2.4	0.19	483.7	11.3	468.3	48.9	393.3	287.9	483.7	11.3	123.0
LB-1-34	128	31288	1.3	17.2036	4.0	0.7608	4.2	0.0949	1.3	0.32	584.6	7.5	574.5	18.6	534.6	88.1	584.6	7.5	109.4
LB-1-27	326	86490	13.2	16.5121	1.7	0.8349	2.0	0.1000	1.1	0.55	614.3	6.6	616.3	9.5	623.7	36.9	614.3	6.6	98.5
LB-1-102	220	118432	1.9	16.4350	2.6	0.8591	2.9	0.1024	1.3	0.43	628.5	7.5	629.6	13.6	633.8	56.3	628.5	7.5	99.2
LB-1-35	174	127341	2.7	14.2307	2.1	1.5629	2.7	0.1613	1.8	0.65	964.0	15.9	955.6	16.9	936.2	42.3	936.2	42.3	103.0
LB-1-105	62	33605	1.9	13.9577	6.3	1.5851	6.4	0.1605	1.3	0.20	959.4	11.6	964.4	40.1	975.9	128.8	975.9	128.8	98.3
LB-1-23	85	31678	8.8	13.8553	2.0	1.7402	4.2	0.1749	3.7	0.88	1038.9	35.8	1023.5	27.3	990.9	40.3	990.9	40.3	104.8
LB-1-39	66	24341	2.0	13.7953	3.5	1.7115	4.1	0.1712	2.1	0.52	1018.9	20.0	1012.9	26.2	999.7	70.9	999.7	70.9	101.9
LB-1-40	159	61630	7.1	13.7927	2.2	1.6952	2.9	0.1696	1.9	0.65	1009.8	17.5	1006.7	18.2	1000.0	43.8	1000.0	43.8	101.0
LB-1-54	71	52068	2.2	13.6352	2.8	1.7790	3.5	0.1759	2.1	0.60	1044.7	20.1	1037.8	22.6	1023.3	56.2	1023.3	56.2	102.1
LB-1-60	274	96610	2.7	13.6185	1.4	1.7599	2.8	0.1738	2.3	0.85	1033.1	22.4	1030.8	17.8	1025.8	29.1	1025.8	29.1	100.7
LB-1-85	48	22749	1.6	13.5828	3.7	1.7559	4.4	0.1730	2.4	0.54	1028.5	22.7	1029.3	28.5	1031.1	74.8	1031.1	74.8	99.7
LB-1-68	40	17645	1.9	13.5821	4.3	1.7034	4.8	0.1678	2.1	0.44	999.9	19.8	1009.8	30.9	1031.2	87.6	1031.2	87.6	97.0
LB-1-8	164	203342	2.0	13.5797	2.2	1.7153	2.5	0.1689	1.3	0.51	1006.3	12.0	1014.3	16.2	1031.6	43.9	1031.6	43.9	97.5
LB-1-2	160	92698	2.1	13.5205	0.8	1.7976	1.4	0.1763	1.2	0.81	1046.6	11.1	1044.6	9.3	1040.4	16.7	1040.4	16.7	100.6
LB-1-63	463	185164	9.0	13.3966	0.5	1.8726	1.4	0.1819	1.3	0.92	1077.6	12.9	1071.5	9.3	1059.0	11.0	1059.0	11.0	101.8
LB-1-100	107	48638	0.8	13.3940	1.8	1.8977	4.3	0.1844	3.8	0.90	1090.7	38.6	1080.3	28.3	1059.4	36.5	1059.4	36.5	103.0
LB-1-89	107	71206	3.0	13.3695	2.9	1.8365	3.4	0.1781	1.9	0.55	1056.4	18.5	1058.6	22.6	1063.1	57.6	1063.1	57.6	99.4
LB-1-2	282	135902	3.1	13.3389	0.6	1.9334	2.7	0.1870	2.6	0.97	1105.4	26.4	1092.7	17.9	1067.7	13.0	1067.7	13.0	103.5
LB-1-10	116	47361	1.1	13.3272	2.4	1.9379	3.3	0.1873	2.3	0.69	1106.8	23.1	1094.3	22.2	1069.4	48.4	1069.4	48.4	103.5
LB-1-94	90	32590	1.6	13.3207	2.7	1.8075	3.1	0.1746	1.6	0.51	1037.6	14.9	1048.2	20.1	1070.4	53.3	1070.4	53.3	96.9
LB-1-14	299	94904	4.1	13.2355	1.2	1.7151	3.3	0.1646	3.1	0.94	982.5	28.5	1014.2	21.4	1083.3	23.4	1083.3	23.4	90.7
LB-1-114	267	119518	2.8	13.2293	0.8	1.9184	1.9	0.1841	1.7	0.91	1089.2	16.9	1087.5	12.5	1084.3	15.8	1084.3	15.8	100.5
LB-1-95	488	222320	10.0	13.1519	0.9	1.9190	1.6	0.1830	1.2	0.80	1083.6	12.4	1087.7	10.4	1096.0	18.8	1096.0	18.8	98.9
LB-1-59	39	34273	0.7	13.0279	8.4	1.9545	8.9	0.1847	2.9	0.33	1092.5	29.3	1100.0	59.9	1114.9	168.4	1114.9	168.4	98.0
LB-1-69	45	25371	1.8	12.9654	3.3	2.1152	4.2	0.1989	2.5	0.61	1169.4	27.2	1153.8	28.7	1124.5	65.6	1124.5	65.6	104.0
LB-1-12	111	43552	2.5	12.9370	1.6	2.0193	4.4	0.1895	4.1	0.93	1118.5	42.0	1122.0	29.9	1128.9	32.5	1128.9	32.5	99.1
LB-1-52	76	32995	1.6	12.9168	2.2	2.1561	3.6	0.2020	2.8	0.78	1186.0	30.0	1167.0	24.7	1132.0	44.5	1132.0	44.5	104.8
LB-1-33	64	9684	0.8	12.8988	6.7	1.7959	11.1	0.1680	8.8	0.80	1001.1	82.0	1044.0	72.3	1134.7	132.6	1134.7	132.6	88.2
LB-1-6	316	191817	3.1	12.8495	0.8	2.1489	1.0	0.2003	0.6	0.59	1176.7	6.3	1164.7	6.9	1142.4	16.1	1142.4	16.1	103.0
LB-1-53	68	28957	1.9	12.8306	2.4	2.1629	4.5	0.2013	3.8	0.85	1182.2	41.4	1169.2	31.3	1145.3	47.1	1145.3	47.1	103.2
LB-1-1	535	327601	1.5	12.7427	0.4	2.2290	1.6	0.2060	1.6	0.97	1207.5	17.4	1190.2	11.5	1158.9	8.4	1158.9	8.4	104.2
LB-1-74	74	39805	1.7	12.7266	3.8	2.0830	4.4	0.1923	2.2	0.50	1133.6	22.6	1143.2	30.0	1161.5	75.2	1161.5	75.2	97.6
LB-1-73	215	77907	5.7	12.7237	0.9	2.1819	2.1	0.2013	1.9	0.89	1182.6	20.1	1175.3	14.5	1161.9	18.8	1161.9	18.8	101.8
LB-1-113	163	123580	1.8	12.7236	1.3	2.1606	1.9	0.1994	1.4	0.74	1172.0	14.9	1168.5	13.1	1161.9	25.3	1161.9	25.3	100.9
LB-1-78	35	34127	2.1	12.7072	2.9	2.1170	4.5	0.1951	3.4	0.75	1149.0	35.3	1154.4	30.8	1164.5	58.4	1164.5	58.4	98.7
LB-1-25	230	140331	2.1	12.6652	1.1	2.1404	1.4	0.1966	0.9	0.66	1157.1	9.9	1162.0	9.8	1171.1	20.9	1171.1	20.9	98.8
LB-1-67	117	64048	2.2	12.6611	1.9	2.2159	3.9	0.2035	3.4	0.87	1194.0	37.1	1186.1	27.3	1171.7	38.0	1171.7	38.0	101.9
LB-1-99	157	163364	1.5	12.6510	1.6	2.2234	3.9	0.2040	3.6	0.91	1196.8	39.0	1188.5	27.5	1173.3	32.4	1173.3	32.4	102.0
LB-1-21	67	29380	2.1	12.6311	2.2	2.2636	3.2	0.2074	2.3	0.73	1214.8	25.7	1201.0	22.6	1176.4	43.6	1176.4	43.6	103.3
LB-1-49	286	28793	2.9	12.6152	1.3	2.1246	2.2	0.1944	1.9	0.83	1145.1	19.4	1156.8	15.5	1178.9	24.9	1178.9	24.9	97.1
LB-1-115	222	104289	1.7	12.6055	1.2	2.2852	3.6	0.2089	3.4	0.94	1223.1	37.8	1207.7	25.4	1180.4	23.3	1180.4	23.3	103.6
LB-1-29	28	11081	1.6	12.5426	7.9	2.1079	8.2	0.1917	2.4	0.29	1130.8	24.8	1151.4	56.7	1190.3	155.5	1190.3	155.5	95.0
LB-1-28	54	26511	2.3	12.4548	4.2	2.2316	5.4	0.2016	3.4	0.62	1183.8	36.6	1191.0	38.1	1204.1	83.7	1204.1	83.7	98.3
LB-1-64	178	64702	1.5	12.4158	1.8	2.3339	3.0	0.2102	2.4	0.80	1229.7	26.7	1222.7	21.2	1210.3	35.4	1210.3	35.4	101.6
LB-1-77	63	31632	3.0	12.3704	2.8	2.3835	3.8	0.2138	2.6	0.69	1249.2	29.5	1237.6	27.1	1217.5	54.2	1217.5	54.2	102.6
LB-1-101	69	67169	2.4	12.3490	2.7	2.3790	3.4	0.2131	2.0	0.59	1245.2	22.6	1236.3	24.2	1220.9	53.7	1220.9	53.7	102.0
LB-1-45	90	59748	1.5	12.1999	2.0	2.4220	2.5	0.2143	1.5	0.62	1251.7	17.6	1249.2	17.9	1244.7	38.3	1244.7	38.3	100.6
LB-1-81	233	79047	3.2	12.1004	0.6	2.4821	1.8	0.2178	1.7	0.94	1270.4	19.7	1266.8	13.2	1260.8	11.9	1260.8	11.9	100.8
LB-1-76	86	60153	2.3	12.0272	1.9	2.5373	3.0	0.2213	2.4	0.78	1288.9	27.6	1282.8	21.9	1272.6	36.4	1272.6	36.4	101.3
LB-1-75	176	131902	1.8	11.9956	0.8	2.6328	1.8	0.2291	1.6	0.89	1329.5	19.6	1309.8	13.4	1277.7	16.0	1277.7	16.0	104.1
LB-1-16	44	31300	1.4	11.9690	5.8	2.6377	6.7	0.2290	3.3	0.50	1329.1	40.0	1311.2	49.4	1282.1	113.4	1282.1	113.4	103.7
LB-1-103	52	23796	2.1	11.8792	2.8	2.5979	3.9	0.2238	2.7	0.69	1302.0	31.6	1300.0	28.4	1296.7	54.3	1296.7	54.3	100.4
LB-1-11	149	165891	2.1	11.0417	1.1	3.1134	2.8	0.2493	2.5	0.91	1435.0	32.6	1436.0	21.3	1437.5	21.5	1437.5	21.5	99.8
LB-1-107	115	51161	2.4	11.0336	1.4	3.2322	2.8	0.2587	2.5	0.87	1482.9	32.5	1464.9	21.9	1438.9	26.7	1438.9	26.7	103.1
LB-1-7	29	18948	1.4	10.9631	2.9	3.0467	4.4	0.2423	3.4	0.76	1398.4	42.6	1419.4	34.0	1451.1	54.7	1451.1	54.7	96.4
LB-1-91	203	126107	1.8	10.9061	0.7	3.2633	1.6	0.2581	1.4	0.91	1480.2	18.8	1472.3	12.2	1461.0	12.7	1461.0	12.7	101.3
LB-1-19	71	45435	1.4	10.8601	1.9	3.2352	2.9	0.2548	2.2	0.75	1463.3	28.9	1465.6	22.8	1469.0	36.7	1469.0	36.7	99.6
LB-1-44	106	103445	2.0	10.8201	1.1	3.2883	2.4	0.2580	2.1	0.89	1479.8	27.8	1478.3	18.5	1476.0	20.9	1476.0	20.9	100.3
LB-1-83	60	29200	0.6	10.7399	1.9	3.4017	3.1	0.2650	2.5	0.80	1515.2	34.0	1504.8	24.6	1490.1	35.2	1490.1	35.2	101.7
LB-1-57	450	86804	1.2	10.3943	0.5	3.7379	5.0	0.2818	5.0	0.99	1600.4	71.0	1579.5	40.3	1551.8	9.6	1551.8	9.6	103.1
LB-1-51	48	33455	1.4	9.9823	2.4	4.1721	3.5	0.3021	2.6	0.73	1701.5	38.6	1668.6	29.0	1627.4	45.0	1627.4	45.0	104.6
LB-1-92	120	117260	0.9	9.8653	0.8	4.1387	2.5	0.2961	2.3	0.94	1672.1	34.4	1662.0	20.3	1649.3	15.5	1649.3	15.5	101.4
LB-1-26	109	61501	1.1	9.8401	0.9	4.0522	1.8	0.2892	1.5	0.85	1637.5	21.7	1644.7	14.3	1654.0	16.9	1654.0	16.9	99.0
LB-1-79	196	110719	2.6	9.8382	1.8	3.6587	2.3	0.2611	1.3	0.58	1495.3	17.6	1562.4	18.0	1654.3	34.0	1654.3	34.0	90.4
LB-1-36	110	110428	1.3	8.9723	1.2	4.9077	2.6	0.3194	2.3	0.88	1786.6	35.6	1803.6	21.9	1823.2	22.6	1823.2	22.6	98.0
LB-1-47	195	164338	1.1	8.9333	0.6	5.1418	1.5	0.3331	1.4	0.92	1853.6	22.5	1843.0	12.9	1831.1	11.1	1831.1	11.1	101.2
LB-1-93	112	103301	1.2	8.8220	1.3	5.2255	2.9	0.3343	2.6	0.90	1859.4	41.9	1856.8	24.7	1853.8	23.3	1853.8	23.3	100.3
LB-1-43	111	95514	3.1	8.7715	0.4	5.3327	2.0	0.3392	1.9	0.98	1883.1	31.3	1874.1	16.7	1864.2	7.4	1864.2	7.4	101.0
LB-1-82	137	284508	7.1	8.4982	0.9	5.7277	3.0	0.3530	2.9	0.96	1949.0	49.0	1935.6	26.3	1921.1	15.7	1921.1	15.7	101.5
LB-1-71	120	73639	2.1	8.3235	1.1	5.4260	2.9	0.3276	2.7	0.93	1826.5	43.5	1889.0	25.2	1958.3	19.2	1958.3	19.2	93.3
LB-1-38	262	254837	3.0	8.1152	0.7	5.3302	2.1	0.3137	2.0	0.95	1759.0	30.3	1873.7	17.8	2003.4	12.0	2003.4	12.0	87.8
LB-1-55	14	18666	1.1	8.0563	4.6	6.2857	6.7	0.3673	4.9	0.73	2016.5	84.3	2016.5	58.5	2016.4	80.9	2016.4	80.9	100.0
LB-1-50	45	26812	2.0	7.5952	0.8	7.1591	1.6	0.3944	1.4	0.87	2143.0	24.6	2131.4	13.9	2120.2	13.7	2120.2	13.7	101.1
LB-1-41	39	57713	0.9	5.7174	0.7	11.0795	2.0	0.4594	1.8	0.94	2437.0	37.1	2529.8	18.2	2605.1	11.4	2605.1	11.4	93.5
LB-1-111	162	226217	5.6	5.4651	0.3	13.2342	1.6	0.5246	1.6	0.98	2718.5	35.8	2696.5	15.5	2680.0	4.9	2680.0	4.9	101.4
LB-1-22	121	170871	1.3	5.3263	0.4	13.5220	2.4	0.5224	2.3	0.99	2709.2	51.9	2716.8	22.5	2722.5	6.3	2722.5	6.3	99.5
LB-1-72	130	460938	0.6	5.2450	0.5	14.2431	2.6	0.5418	2.5	0.98	2791.0	57.0	2766.0	24.3	2747.8	7.5	2747.8	7.5	101.6
LB-1-90	59	98309	1.5	4.7850	0.5	16.5620	1.5	0.5748	1.4	0.95	2927.4	32.5	2909.8	14.0	2897.7	7.7	2897.7	7.7	101.0
LB-1-46	58	105867	0.9	4.6588	0.5	17.9941	2.8	0.6080	2.7	0.98	3062.0	66.5	2989.4	26.7	2941.0	8.4	2941.0	8.4	104.1

LB2(1AB/08-14-077-08W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LB2-102	378	74921	7.8	18.9691	1.3	0.3502	1.6	0.0482	1.0	0.61	303.3	2.9	304.8	4.3	316.6	29.3	303.3	2.9	NA
LB2-80	48	15274	1.1	18.8610	14.9	0.4219	15.3	0.0577	3.2	0.21	361.7	11.4	357.4	46.0	329.6	339.9	361.7	11.4	NA
LB2-7	169	44959	1.0	17.8103	1.5	0.5401	2.6	0.0698	2.1	0.81	434.7	8.8	438.5	9.2	458.2	34.0	434.7	8.8	94.9
LB2-31	65	25012	1.4	17.5974	8.4	0.5556	8.5	0.0709	1.5	0.18	441.6	6.6	448.7	30.8	484.8	184.7	441.6	6.6	91.1
LB2-59	295	111099	1.8	17.7988	1.2	0.5640	2.1	0.0728	1.8	0.83	453.1	7.8	454.1	7.8	459.6	26.5	453.1	7.8	98.6
LB2-34	169	62572	1.4	17.9989	2.1	0.5586	3.4	0.0729	2.7	0.79	453.7	11.9	450.6	12.5	434.8	46.5	453.7	11.9	104.4
LB2-57	111	43617	1.5	17.8004	2.6	0.5747	3.3	0.0742	2.0	0.62	461.4	9.1	461.1	12.2	459.4	56.9	461.4	9.1	100.4
LB2-43	58	23981	0.9	17.9899	6.2	0.5879	6.4	0.0767	1.5	0.24	476.4	6.9	469.5	24.0	435.9	138.3	476.4	6.9	109.3
LB2-4	46	14827	2.1	17.5058	8.6	0.6551	8.9	0.0832	2.3	0.26	515.0	11.4	511.6	35.8	496.3	189.5	515.0	11.4	103.8
LB2-64	287	136119	0.8	17.1780	1.2	0.6909	3.2	0.0861	3.0	0.93	532.3	15.1	533.3	13.2	537.8	25.7	532.3	15.1	99.0
LB2-82	96	64188	2.1	14.1552	1.1	1.5556	1.5	0.1597	1.0	0.68	955.1	9.0	952.7	9.2	947.2	22.3	947.2	22.3	100.8
LB2-13	108	64585	1.5	14.0912	1.5	1.5163	2.2	0.1550	1.6	0.74	928.7	14.1	937.0	13.5	956.4	30.2	956.4	30.2	97.1
LB2-99	125	79569	3.1	13.9919	1.0	1.6196	2.4	0.1644	2.1	0.90	980.9	19.2	977.8	14.8	970.9	21.2	970.9	21.2	101.0
LB2-96	169	334068	1.9	13.8672	0.6	1.6632	1.6	0.1673	1.5	0.92	997.1	13.7	994.6	10.2	989.1	13.0	989.1	13.0	100.8
LB2-15	52	71074	2.5	13.7957	2.4	1.7137	2.7	0.1715	1.2	0.44	1020.2	11.0	1013.7	17.0	999.6	48.4	999.6	48.4	102.1
LB2-49	58	57788	0.9	13.7719	2.4	1.7252	2.7	0.1723	1.2	0.43	1024.9	11.0	1018.0	17.2	1003.1	49.0	1003.1	49.0	102.2
LB2-22	82	44438	1.7	13.7507	1.8	1.6365	2.8	0.1632	2.2	0.76	974.6	19.5	984.4	17.9	1006.2	37.4	1006.2	37.4	96.9
LB2-81	16	13972	1.8	13.7493	7.0	1.6342	8.0	0.1630	3.7	0.47	973.2	33.8	983.5	50.3	1006.4	143.0	1006.4	143.0	96.7
LB2-72	375	273711	4.0	13.7059	0.5	1.7329	1.0	0.1723	0.9	0.90	1024.5	8.9	1020.8	6.7	1012.9	9.2	1012.9	9.2	101.2
LB2-94	118	108074	2.5	13.6730	1.2	1.7269	1.8	0.1712	1.3	0.74	1019.0	12.3	1018.6	11.3	1017.7	24.0	1017.7	24.0	100.1
LB2-66	180	156514	3.2	13.6629	0.6	1.7463	1.7	0.1730	1.6	0.95	1028.9	15.3	1025.8	11.0	1019.2	11.3	1019.2	11.3	100.9
LB2-11	47	31030	1.8	13.6357	3.4	1.7613	3.9	0.1742	1.7	0.45	1035.1	16.7	1031.3	25.0	1023.3	69.8	1023.3	69.8	101.2
LB2-98	39	32665	2.0	13.6347	3.5	1.7431	3.8	0.1724	1.4	0.37	1025.2	13.2	1024.6	24.3	1023.4	70.7	1023.4	70.7	100.2
LB2-103	207	371215	1.6	13.6153	0.7	1.7673	1.6	0.1745	1.5	0.91	1037.0	14.3	1033.5	10.6	1026.3	13.6	1026.3	13.6	101.0
LB2-63	50	27589	0.8	13.6110	3.0	1.7563	3.4	0.1734	1.5	0.44	1030.7	14.0	1029.5	21.7	1026.9	60.9	1026.9	60.9	100.4
LB2-33	33	27597	1.3	13.5442	2.3	1.7505	3.0	0.1720	1.9	0.63	1022.9	17.5	1027.4	19.1	1036.9	46.4	1036.9	46.4	98.7
LB2-40	55	70102	2.3	13.5374	2.0	1.7974	4.6	0.1765	4.2	0.90	1047.7	40.1	1044.5	30.0	1037.9	40.2	1037.9	40.2	100.9
LB2-1	308	333560	2.1	13.5123	0.4	1.7968	0.9	0.1761	0.8	0.89	1045.6	8.0	1044.3	6.0	1041.6	8.4	1041.6	8.4	100.4
LB2-78	73	73400	2.8	13.4765	1.8	1.8636	3.8	0.1822	3.4	0.89	1078.7	33.7	1068.3	25.3	1047.0	35.9	1047.0	35.9	103.0
LB2-12	71	54817	2.2	13.4703	1.9	1.7966	2.5	0.1755	1.5	0.62	1042.5	14.8	1044.2	16.1	1047.9	38.8	1047.9	38.8	99.5
LB2-69	65	61983	1.4	13.4362	1.4	1.8249	1.7	0.1778	1.0	0.59	1055.1	10.0	1054.5	11.4	1053.1	28.4	1053.1	28.4	100.2
LB2-28	53	33368	1.4	13.4299	2.2	1.8658	5.5	0.1817	5.0	0.92	1076.4	49.6	1069.0	36.1	1054.0	44.4	1054.0	44.4	102.1
LB2-6	57	70864	0.9	13.4188	2.9	1.8459	5.5	0.1797	4.6	0.84	1065.1	45.0	1062.0	35.9	1055.7	59.4	1055.7	59.4	100.9
LB2-21	24	42463	2.3	13.3387	5.5	1.9194	5.6	0.1857	0.9	0.16	1098.0	9.0	1087.9	37.2	1067.7	110.6	1067.7	110.6	102.8
LB2-32	173	201165	1.4	13.3194	1.3	1.9075	3.0	0.1843	2.7	0.90	1090.2	26.9	1083.7	19.9	1070.6	26.5	1070.6	26.5	101.8
LB2-77	106	115262	2.0	13.2825	2.1	1.9060	2.4	0.1836	1.2	0.49	1086.7	11.6	1083.2	15.7	1076.2	41.4	1076.2	41.4	101.0
LB2-92	70	218024	1.6	13.2379	2.1	1.8676	2.5	0.1793	1.4	0.56	1063.2	13.8	1069.7	16.5	1082.9	41.4	1082.9	41.4	98.2
LB2-42	23	12742	2.0	13.2155	4.8	1.7349	5.2	0.1663	2.1	0.40	991.6	19.1	1021.6	33.7	1086.3	96.2	1086.3	96.2	91.3
LB2-104	66	82248	1.9	13.2132	1.7	1.8380	2.4	0.1761	1.7	0.70	1045.8	16.0	1059.1	15.6	1086.7	33.9	1086.7	33.9	96.2
LB2-48	82	80025	2.2	13.1972	1.6	1.8783	2.2	0.1798	1.5	0.70	1065.8	15.2	1073.5	14.6	1089.1	31.6	1089.1	31.6	97.9
LB2-24	35	44706	1.0	13.1838	2.2	1.9783	4.0	0.1892	3.3	0.83	1116.8	33.8	1108.1	26.8	1091.1	44.4	1091.1	44.4	102.4
LB2-3	194	72152	1.0	13.1818	1.3	1.9134	1.6	0.1829	1.0	0.60	1083.0	9.8	1085.8	10.9	1091.4	26.0	1091.4	26.0	99.2
LB2-60	67	57413	2.4	13.1687	1.0	1.8737	2.1	0.1790	1.8	0.89	1061.3	17.9	1071.9	13.6	1093.4	19.1	1093.4	19.1	97.1
LB2-36	56	86252	1.3	12.9020	2.2	1.9699	3.0	0.1843	2.0	0.67	1090.6	20.1	1105.3	20.1	1134.3	44.3	1134.3	44.3	96.2
LB2-87	111	108411	1.9	12.8512	0.9	2.0906	3.8	0.1949	3.6	0.97	1147.6	38.3	1145.7	25.8	1142.1	17.9	1142.1	17.9	100.5
LB2-19	72	54707	2.1	12.8346	2.1	2.1020	2.3	0.1957	1.0	0.43	1152.0	10.7	1149.5	16.0	1144.7	41.7	1144.7	41.7	100.6
LB2-16	88	97145	1.7	12.8023	2.1	2.1430	2.8	0.1990	1.8	0.63	1169.8	18.8	1162.8	19.2	1149.7	42.6	1149.7	42.6	101.8
LB2-61	157	123593	1.7	12.7792	1.1	2.1607	1.6	0.2003	1.2	0.74	1176.7	12.8	1168.5	11.1	1153.3	21.3	1153.3	21.3	102.0
LB2-74	21	13697	1.5	12.7597	3.0	2.1994	3.5	0.2035	1.7	0.49	1194.3	18.3	1180.9	24.1	1156.3	60.0	1156.3	60.0	103.3
LB2-29	49	44387	2.8	12.7546	1.2	2.1524	1.8	0.1991	1.4	0.77	1170.5	14.9	1165.8	12.5	1157.1	22.9	1157.1	22.9	101.2
LB2-54	80	111083	1.4	12.7273	0.8	2.1028	1.7	0.1941	1.4	0.86	1143.6	15.0	1149.7	11.5	1161.3	16.9	1161.3	16.9	98.5
LB2-89	71	82149	2.3	12.7133	1.8	2.1170	2.5	0.1952	1.7	0.67	1149.5	17.8	1154.4	17.3	1163.5	36.6	1163.5	36.6	98.8
LB2-35	47	43848	2.6	12.6828	2.7	2.1355	3.5	0.1964	2.3	0.66	1156.1	24.6	1160.4	24.4	1168.3	52.7	1168.3	52.7	99.0
LB2-62	200	227930	3.0	12.6468	0.3	2.2293	1.2	0.2045	1.2	0.96	1199.3	13.0	1190.3	8.7	1173.9	6.9	1173.9	6.9	102.2
LB2-30	77	56333	1.6	12.6169	1.3	2.1808	2.1	0.1996	1.7	0.80	1172.9	18.1	1174.9	14.6	1178.6	24.7	1178.6	24.7	99.5
LB2-23	41	41003	1.8	12.4701	1.1	2.2875	1.9	0.2069	1.6	0.82	1212.2	17.3	1208.4	13.4	1201.7	21.1	1201.7	21.1	100.9
LB2-84	35	44698	1.5	12.4496	2.5	2.2758	2.8	0.2055	1.2	0.44	1204.7	13.5	1204.8	19.7	1204.9	49.5	1204.9	49.5	100.0
LB2-67	87	112903	1.0	12.4191	1.1	2.2546	1.8	0.2031	1.4	0.80	1191.8	15.7	1198.2	12.7	1209.8	21.4	1209.8	21.4	98.5
LB2-14	63	135699	1.5	12.3081	1.3	2.3562	1.7	0.2103	1.2	0.68	1230.6	13.1	1229.4	12.2	1227.4	24.7	1227.4	24.7	100.3
LB2-5	126	575634	2.6	12.2585	1.0	2.3590	1.5	0.2097	1.1	0.76	1227.4	12.6	1230.3	10.5	1235.4	18.8	1235.4	18.8	99.4
LB2-90	101	91158	2.2	12.2488	1.0	2.3505	2.4	0.2088	2.2	0.91	1222.5	24.0	1227.7	16.9	1236.9	19.4	1236.9	19.4	98.8
LB2-75	84	101438	2.6	12.2473	1.5	2.3986	2.2	0.2131	1.6	0.74	1245.1	18.4	1242.2	15.7	1237.2	28.7	1237.2	28.7	100.6
LB2-26	53	67990	1.8	12.1333	1.6	2.4889	2.0	0.2190	1.3	0.62	1276.7	14.8	1268.8	14.8	1255.5	31.3	1255.5	31.3	101.7
LB2-76	17	23218	2.0	12.0779	4.5	2.4425	5.6	0.2140	3.3	0.60	1249.9	37.9	1255.2	40.4	1264.4	87.9	1264.4	87.9	98.8
LB2-20	79	102058	2.1	11.8447	1.0	2.6925	2.0	0.2313	1.7	0.87	1341.3	20.9	1326.4	14.6	1302.4	18.8	1302.4	18.8	103.0
LB2-93	57	134314	1.7	11.7747	1.2	2.6711	1.6	0.2281	1.1	0.68	1324.6	13.3	1320.5	12.0	1313.9	23.0	1313.9	23.0	100.8
LB2-39	28	3376	1.6	11.7317	10.0	2.1956	11.3	0.1868	5.2	0.46	1104.1	52.4	1179.7	78.9	1321.0	195.0	1321.0	195.0	83.6
LB2-51	78	147689	1.6	11.6710	0.9	2.7337	2.6	0.2314	2.4	0.94	1341.8	29.5	1337.7	19.3	1331.0	17.5	1331.0	17.5	100.8
LB2-56	53	13820	1.1	11.6189	2.3	2.8171	4.8	0.2374	4.2	0.88	1373.2	52.3	1360.1	36.2	1339.7	44.9	1339.7	44.9	102.5
LB2-97	50	52029	1.5	11.5331	2.3	2.8377	2.4	0.2374	0.9	0.38	1373.0	11.4	1365.6	18.3	1354.0	43.4	1354.0	43.4	101.4
LB2-27	196	129291	1.5	11.3943	0.3	2.8793	1.2	0.2379	1.2	0.97	1376.0	14.6	1376.5	9.1	1377.3	5.3	1377.3	5.3	99.9
LB2-45	137	140018	1.5	11.3925	0.6	2.9036	1.0	0.2399	0.9	0.85	1386.2	11.1	1382.8	7.9	1377.6	10.7	1377.6	10.7	100.6
LB2-10	50	68058	2.1	11.3867	1.5	2.9841	2.2	0.2464	1.6	0.72	1420.1	20.5	1403.6	17.0	1378.6	29.8	1378.6	29.8	103.0
LB2-73	49	51455	2.1	11.3461	1.4	2.8178	2.4	0.2319	2.0	0.82	1344.3	24.2	1360.3	18.2	1385.4	26.4	1385.4	26.4	97.0
LB2-85	23	33940	2.1	11.3001	4.0	2.9830	4.6	0.2445	2.2	0.48	1409.9	27.9	1403.3	35.0	1393.2	77.4	1393.2	77.4	101.2
LB2-100	36	30706	1.0	11.2407	2.0	3.1400	2.4	0.2560	1.4	0.59	1469.3	19.0	1442.5	18.9	1403.3	37.8	1403.3	37.8	104.7
LB2-65	84	69893	2.0	11.0292	1.0	3.0513	2.3	0.2441	2.1	0.90	1407.8	26.6	1420.6	17.9	1439.6	19.3	1439.6	19.3	97.8
LB2-41	125	76324	2.0	10.8897	0.7	3.1723	2.5	0.2505	2.4	0.96	1441.3	30.9	1450.4	19.2	1463.8	12.6	1463.8	12.6	98.5
LB2-52	6	9990	1.6	10.8741	6.9	3.0546	8.4	0.2409	4.9	0.58	1391.4	61.0	1421.4	64.6	1466.6	130.7	1466.6	130.7	94.9
LB2-83	105	114102	2.2	10.6863	0.6	3.4504	1.8	0.2674	1.7	0.95	1527.7	23.5	1516.0	14.3	1499.6	10.8	1499.6	10.8	101.9
LB2-37	81	90610	2.0	10.5710	0.8	3.4672	1.7	0.2658	1.5	0.87	1519.6	20.1	1519.8	13.4	1520.1	15.6	1520.1	15.6	100.0
LB2-8	21	21906	0.4	9.8976	3.5	4.0297	4.0	0.2893	2.0	0.51	1637.9	29.4	1640.2	32.6	1643.2	64.1	1643.2	64.1	99.7
LB2-95	59	75073	1.1	9.8839	0.9	4.1487	2.4	0.2974	2.3	0.92	1678.4	33.3	1663.9	20.0	1645.8	17.3	1645.8	17.3	102.0
LB2-58	73	124603	0.8	9.8421	1.0	4.0443	1.7	0.2887	1.4	0.81	1635.0	19.6	1643.2	13.6	1653.6	18.0	1653.6	18.0	98.9
LB2-88	191	239577	0.6	9.6865	0.2	4.2443	1.0	0.2982	1.0	0.97	1682.3	14.1	1682.6	8.1	1683.1	4.5	1683.1	4.5	100.0
LB2-25	36	32145	1.5	8.8642	1.0	5.1659	1.6	0.3321	1.3	0.79	1848.6	20.7	1847.0	13.9	1845.2	18.3	1845.2	18.3	100.2
LB2-79	57	97641	1.6	8.8148	1.2	5.3041	1.7	0.3391	1.3	0.74	1882.3	21.0	1869.5	14.8	1855.3	21.1	1855.3	21.1	101.5
LB2-38	63	64624	1.8	8.7988	0.5	5.2895	1.7	0.3375	1.7	0.96	1874.9	27.3	1867.2	14.9	1858.6	8.5	1858.6	8.5	100.9
LB2-50	77	152196	0.9	8.7748	0.6	5.2997	1.8	0.3373	1.6	0.94	1873.6	26.7	1868.8	15.0	1863.5	11.2	1863.5	11.2	100.5
LB2-46	36	45653	2.8	8.7718	1.2	5.3188	1.5	0.3384	1.0	0.65	1878.9	16.2	1871.9	13.2	1864.1	21.2	1864.1	21.2	100.8
LB2-47	86	177425	1.0	8.5553	0.3	5.5157	1.2	0.3422	1.2	0.97	1897.4	19.8	1903.0	10.7	1909.1	5.3	1909.1	5.3	99.4
LB2-53	135	270529	4.4	6.2149	0.6	9.9417	3.0	0.4481	2.9	0.98	2386.9	57.6	2429.4	27.3	2465.2	10.8	2465.2	10.8	96.8
LB2-68	18	43522	0.4	5.4757	1.2	12.9505	2.4	0.5143	2.0	0.86	2675.0	44.8	2676.1	22.4	2676.8	20.0	2676.8	20.0	99.9
LB2-2	68	207530	0.5	5.4492	0.6	13.0691	1.7	0.5165	1.6	0.94	2684.4	34.5	2684.7	15.8	2684.9	9.6	2684.9	9.6	100.0
LB2-70	56	244554	1.2	5.4249	0.4	13.3090	1.2	0.5236	1.1	0.93	2714.6	25.1	2701.8	11.5	2692.2	7.2	2692.2	7.2	100.8

LB3(1AB/08-14-077-08W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LB3-1	117	161208	2.7	9.6544	0.5	4.3753	1.0	0.3064	0.8	0.84	1722.7	12.2	1707.7	7.9	1689.2	9.6	1689.2	9.6	102.0
LB3-2	67	82294	1.7	12.6558	2.2	2.1887	2.7	0.2009	1.5	0.57	1180.1	16.6	1177.4	18.7	1172.5	43.4	1172.5	43.4	100.6
LB3-3	69	188798	2.8	9.0749	0.8	4.9317	1.8	0.3246	1.6	0.91	1812.1	25.9	1807.7	15.3	1802.6	14.0	1802.6	14.0	100.5
LB3-4	42	30602	1.0	13.5215	1.8	1.7628	2.4	0.1729	1.6	0.64	1027.9	14.8	1031.9	15.6	1040.3	37.2	1040.3	37.2	98.8
LB3-5	52	97889	1.6	12.4727	1.2	2.2150	2.6	0.2004	2.3	0.88	1177.3	24.3	1185.8	18.0	1201.3	24.4	1201.3	24.4	98.0
LB3-6	62	30351	1.0	18.2601	4.8	0.5393	5.0	0.0714	1.6	0.31	444.7	6.7	438.0	17.8	402.6	106.6	444.7	6.7	110.5
LB3-7	33	102310	0.6	5.1572	0.5	14.3540	1.3	0.5369	1.2	0.93	2770.4	26.5	2773.4	12.0	2775.5	7.5	2775.5	7.5	99.8
LB3-8	37	31188	1.2	11.9271	2.8	2.5136	3.2	0.2174	1.6	0.48	1268.3	17.9	1276.0	23.3	1288.9	54.7	1288.9	54.7	98.4
LB3-9	94	56518	2.1	11.4324	1.4	2.6828	2.7	0.2224	2.3	0.86	1294.8	27.0	1323.7	19.9	1370.9	26.6	1370.9	26.6	94.4
LB3-10	79	58693	1.8	13.7527	1.6	1.7314	2.6	0.1727	2.0	0.78	1026.9	19.0	1020.3	16.5	1005.9	32.2	1005.9	32.2	102.1
LB3-11	58	81887	0.5	13.7877	1.6	1.7125	2.1	0.1712	1.3	0.63	1019.0	12.4	1013.2	13.3	1000.8	32.6	1000.8	32.6	101.8
LB3-12	97	62435	2.0	14.1213	1.5	1.5476	2.1	0.1585	1.5	0.71	948.4	13.3	949.5	13.0	952.1	30.4	952.1	30.4	99.6
LB3-13	140	291516	1.0	11.3364	0.8	2.9173	1.3	0.2399	1.0	0.76	1386.0	12.1	1386.4	9.7	1387.1	16.0	1387.1	16.0	99.9
LB3-14	33	33245	1.3	10.8047	1.8	3.2621	2.7	0.2556	2.1	0.77	1467.4	27.7	1472.1	21.3	1478.7	33.2	1478.7	33.2	99.2
LB3-15	102	97139	2.4	13.7462	1.0	1.6826	1.7	0.1678	1.3	0.78	999.7	12.1	1002.0	10.6	1006.9	20.9	1006.9	20.9	99.3
LB3-16	59	67273	2.1	14.1068	1.3	1.5688	1.8	0.1605	1.1	0.65	959.6	10.2	958.0	10.9	954.2	27.5	954.2	27.5	100.6
LB3-17	48	64497	2.2	13.5603	2.2	1.7819	2.5	0.1753	1.1	0.45	1041.0	10.7	1038.9	16.0	1034.5	44.3	1034.5	44.3	100.6
LB3-18	222	48076	1.0	19.3185	2.6	0.3068	3.0	0.0430	1.4	0.49	271.3	3.9	271.7	7.1	275.0	59.2	271.3	3.9	NA
LB3-19	109	279180	12.7	10.9142	0.9	3.1851	1.3	0.2521	1.0	0.75	1449.4	13.1	1453.6	10.4	1459.6	17.0	1459.6	17.0	99.3
LB3-20	64	124872	1.3	8.7816	0.8	5.1405	3.4	0.3274	3.3	0.97	1825.8	52.1	1842.8	28.7	1862.1	14.4	1862.1	14.4	98.0
LB3-21	57	156597	2.2	8.6478	1.0	5.4406	1.4	0.3412	1.0	0.70	1892.6	16.4	1891.3	12.3	1889.8	18.5	1889.8	18.5	100.1
LB3-23	79	105576	1.4	11.8012	1.3	2.6036	1.8	0.2228	1.3	0.70	1296.9	14.8	1301.6	13.3	1309.5	25.3	1309.5	25.3	99.0
LB3-24	26	18458	1.8	11.5780	2.7	2.7280	3.6	0.2291	2.4	0.67	1329.6	29.0	1336.1	26.7	1346.5	51.5	1346.5	51.5	98.7
LB3-25	110	101458	2.0	13.5667	1.0	1.7349	3.1	0.1707	3.0	0.94	1016.0	27.9	1021.6	20.3	1033.5	21.0	1033.5	21.0	98.3
LB3-26	46	99156	2.6	8.8205	1.2	5.2307	1.5	0.3346	1.0	0.64	1860.7	16.1	1857.6	13.2	1854.1	21.4	1854.1	21.4	100.4
LB3-27	15	22985	0.7	14.0403	9.5	1.5582	9.7	0.1587	2.3	0.24	949.4	20.2	953.7	60.4	963.9	193.9	963.9	193.9	98.5
LB3-28	134	84138	0.5	16.5297	1.6	0.8580	2.2	0.1029	1.5	0.70	631.2	9.2	629.0	10.2	621.4	33.5	631.2	9.2	101.6
LB3-29	118	162730	2.1	11.0834	0.8	3.1027	2.3	0.2494	2.1	0.93	1435.4	27.3	1433.4	17.5	1430.3	16.0	1430.3	16.0	100.4
LB3-30	70	106330	2.4	13.7104	1.6	1.7699	2.1	0.1760	1.5	0.68	1045.1	14.0	1034.5	13.9	1012.2	32.1	1012.2	32.1	103.2
LB3-31	93	17763	2.5	12.6137	0.8	2.1546	2.6	0.1971	2.5	0.96	1159.8	26.9	1166.5	18.3	1179.1	14.8	1179.1	14.8	98.4
LB3-32	46	52770	2.3	12.5354	2.4	2.2214	2.7	0.2020	1.1	0.41	1185.8	12.1	1187.8	18.8	1191.4	48.4	1191.4	48.4	99.5
LB3-33	39	113355	1.6	5.3287	0.5	13.2375	1.3	0.5116	1.1	0.91	2663.4	24.8	2696.7	11.8	2721.8	8.8	2721.8	8.8	97.9
LB3-34	82	234588	2.4	8.7500	0.5	5.3392	1.1	0.3388	0.9	0.86	1881.0	15.1	1875.2	9.2	1868.6	9.7	1868.6	9.7	100.7
LB3-35	61	279714	1.0	8.8069	1.1	5.3310	1.8	0.3405	1.4	0.78	1889.1	22.8	1873.9	15.3	1856.9	20.3	1856.9	20.3	101.7
LB3-37	17	13977	1.6	14.1329	7.7	1.5880	7.9	0.1628	1.9	0.23	972.2	16.8	965.5	49.5	950.4	158.1	950.4	158.1	102.3
LB3-38	101	81038	1.7	12.5555	1.7	2.2176	2.1	0.2019	1.2	0.60	1185.7	13.4	1186.6	14.5	1188.3	32.8	1188.3	32.8	99.8
LB3-39	71	124720	2.5	13.3741	1.1	1.7869	2.2	0.1733	1.9	0.85	1030.4	17.8	1040.7	14.3	1062.4	23.1	1062.4	23.1	97.0
LB3-40	113	59823	1.4	19.1160	3.9	0.4948	4.3	0.0686	1.7	0.39	427.7	6.9	408.2	14.3	299.1	89.6	427.7	6.9	143.0
LB3-41	78	155876	1.1	8.9468	0.6	5.0253	1.5	0.3261	1.4	0.93	1819.4	21.8	1823.6	12.6	1828.4	10.2	1828.4	10.2	99.5
LB3-42	58	108715	2.6	8.6358	0.7	5.4883	1.1	0.3437	0.8	0.74	1904.7	13.0	1898.8	9.1	1892.3	12.7	1892.3	12.7	100.7
LB3-43	131	37173	0.9	17.7971	4.1	0.5817	4.2	0.0751	0.8	0.19	466.7	3.6	465.6	15.7	459.8	91.3	466.7	3.6	101.5
LB3-44	19	18346	0.5	12.8237	8.9	1.9388	9.5	0.1803	3.2	0.33	1068.7	31.1	1094.6	63.6	1146.4	177.8	1146.4	177.8	93.2
LB3-45	73	123167	1.3	9.9126	1.1	4.1565	1.7	0.2988	1.3	0.75	1685.5	18.9	1665.5	13.9	1640.4	20.7	1640.4	20.7	102.7
LB3-46	99	79886	1.2	13.0087	1.1	1.9700	4.5	0.1859	4.4	0.97	1098.9	44.5	1105.3	30.5	1117.9	21.7	1117.9	21.7	98.3
LB3-47	152	235367	1.1	13.5670	1.4	1.7534	2.9	0.1725	2.5	0.87	1026.0	23.7	1028.4	18.5	1033.5	28.4	1033.5	28.4	99.3
LB3-48	54	51844	1.2	9.2481	1.0	4.6846	1.6	0.3142	1.2	0.75	1761.4	18.1	1764.5	13.1	1768.1	19.1	1768.1	19.1	99.6
LB3-49	192	287644	1.3	12.5243	0.4	2.2849	0.7	0.2075	0.6	0.81	1215.7	6.6	1207.6	5.2	1193.2	8.4	1193.2	8.4	101.9
LB3-50	72	48156	1.2	14.2445	1.8	1.5633	2.2	0.1615	1.3	0.57	965.1	11.4	955.8	13.9	934.3	37.8	934.3	37.8	103.3
LB3-60	204	18669	2.0	20.1338	6.9	0.1649	7.1	0.0241	1.7	0.24	153.4	2.6	155.0	10.3	179.4	161.8	153.4	2.6	NA
LB3-82	75	22287	0.7	17.9992	3.3	0.5283	4.0	0.0690	2.2	0.55	429.9	9.1	430.7	14.0	434.7	74.4	429.9	9.1	98.9
LB3-106	54	12195	0.9	17.4111	7.1	0.5888	7.5	0.0744	2.4	0.32	462.3	10.8	470.1	28.2	508.3	156.1	462.3	10.8	91.0
LB3-98	121	50478	2.1	17.4659	4.4	0.5875	5.4	0.0744	3.1	0.58	462.7	14.0	469.3	20.4	501.4	97.6	462.7	14.0	92.3
LB3-85	368	159427	1.7	17.7661	1.2	0.5913	1.8	0.0762	1.4	0.77	473.3	6.4	471.7	6.9	463.7	25.6	473.3	6.4	102.1
LB3-65	258	7802	1.2	17.0995	3.0	0.6558	3.7	0.0813	2.1	0.56	504.0	10.0	512.0	14.7	547.8	66.0	504.0	10.0	92.0
LB3-76	46	20910	2.1	13.9695	3.1	1.5350	4.4	0.1555	3.1	0.71	931.9	27.1	944.5	27.1	974.1	63.5	974.1	63.5	95.7
LB3-74	166	282278	3.7	13.6912	0.5	1.7280	1.5	0.1716	1.4	0.93	1020.8	13.2	1019.0	9.6	1015.0	10.9	1015.0	10.9	100.6
LB3-89	73	50357	2.2	13.6270	1.4	1.7567	1.6	0.1736	0.8	0.49	1032.0	7.2	1029.6	10.0	1024.5	27.4	1024.5	27.4	100.7
LB3-55	240	184954	8.1	13.6137	0.5	1.7625	1.2	0.1740	1.1	0.90	1034.2	10.1	1031.7	7.6	1026.5	10.4	1026.5	10.4	100.7
LB3-63	61	47424	2.3	13.6001	1.6	1.7766	2.1	0.1752	1.4	0.67	1040.9	13.9	1036.9	14.0	1028.5	32.1	1028.5	32.1	101.2
LB3-66	77	83335	2.7	13.5653	1.2	1.8090	1.8	0.1780	1.3	0.74	1055.9	12.7	1048.7	11.5	1033.7	23.6	1033.7	23.6	102.1
LB3-54	64	37157	2.4	13.5509	1.1	1.7517	1.9	0.1722	1.5	0.80	1024.0	14.1	1027.8	12.0	1035.9	22.3	1035.9	22.3	98.9
LB3-98	119	35230	1.6	13.5338	1.7	1.7971	2.3	0.1764	1.6	0.69	1047.2	15.5	1044.4	15.3	1038.4	34.3	1038.4	34.3	100.8
LB3-77	42	55278	2.1	13.5292	2.3	1.7274	2.9	0.1695	1.7	0.59	1009.3	16.0	1018.8	18.5	1039.1	46.8	1039.1	46.8	97.1
LB3-61	150	110115	1.4	13.4887	0.9	1.8040	2.0	0.1765	1.8	0.90	1047.8	17.8	1046.9	13.4	1045.2	18.0	1045.2	18.0	100.2
LB3-70	110	72633	2.4	13.4869	1.5	1.8281	2.0	0.1788	1.3	0.66	1060.5	12.7	1055.6	13.0	1045.5	30.0	1045.5	30.0	101.4
LB3-88	52	37910	1.7	13.4282	3.1	1.8376	3.6	0.1790	1.9	0.52	1061.3	18.4	1059.0	23.7	1054.3	62.1	1054.3	62.1	100.7
LB3-97	142	155867	1.4	13.3883	1.1	1.8463	1.8	0.1793	1.5	0.79	1063.0	14.2	1062.1	12.1	1060.3	22.5	1060.3	22.5	100.3
LB3-62	248	160953	2.7	13.3421	0.5	1.8793	1.7	0.1819	1.6	0.95	1077.1	16.2	1073.8	11.4	1067.2	10.5	1067.2	10.5	100.9
LB3-68	92	72153	2.7	13.2026	0.8	1.9007	2.0	0.1820	1.8	0.92	1077.9	17.8	1081.3	13.0	1088.3	15.5	1088.3	15.5	99.0
LB3-64	87	144640	1.1	12.8715	1.0	2.0553	1.6	0.1919	1.3	0.80	1131.5	13.0	1134.1	10.7	1139.0	18.9	1139.0	18.9	99.3
LB3-73	60	270704	2.9	12.7580	1.5	2.0994	1.9	0.1943	1.2	0.62	1144.4	12.3	1148.6	13.0	1156.6	29.6	1156.6	29.6	98.9
LB3-91	353	212764	4.2	12.6669	0.3	2.1864	1.3	0.2009	1.3	0.97	1179.9	13.7	1176.7	9.1	1170.8	6.6	1170.8	6.6	100.8
LB3-94	149	216676	4.5	12.6502	0.9	2.2248	2.2	0.2041	2.1	0.92	1197.4	22.4	1188.9	15.6	1173.4	17.0	1173.4	17.0	102.0
LB3-100	166	162828	1.9	12.6336	0.7	2.1718	1.6	0.1990	1.5	0.89	1169.9	15.7	1172.1	11.5	1176.0	14.8	1176.0	14.8	99.5
LB3-78	72	49302	0.9	12.5999	1.0	2.2376	1.6	0.2045	1.2	0.77	1199.3	13.5	1192.9	11.3	1181.3	20.2	1181.3	20.2	101.5
LB3-58	16	12444	1.6	12.4677	9.7	2.1519	10.5	0.1946	4.0	0.38	1146.1	42.0	1165.6	72.9	1202.1	191.8	1202.1	191.8	95.3
LB3-92	138	85385	2.3	12.2465	1.2	2.3812	2.3	0.2115	2.0	0.86	1236.8	22.1	1237.0	16.4	1237.3	23.0	1237.3	23.0	100.0
LB3-57	141	144248	2.5	12.0579	0.5	2.4741	1.4	0.2164	1.3	0.92	1262.6	14.5	1264.5	9.9	1267.7	10.6	1267.7	10.6	99.6
LB3-102	67	1133	1.4	11.9266	11.6	2.0884	11.7	0.1806	1.9	0.16	1070.5	18.9	1145.0	80.6	1289.0	225.5	1289.0	225.5	83.0
LB3-95	247	221491	1.1	11.5210	0.3	2.7908	1.6	0.2332	1.6	0.98	1351.2	19.1	1353.1	11.9	1356.0	5.7	1356.0	5.7	99.6
LB3-72	29	24292	1.3	11.2815	3.4	2.8300	3.9	0.2316	2.0	0.51	1342.6	24.0	1363.5	29.3	1396.4	64.4	1396.4	64.4	96.2
LB3-104	143	261688	1.2	11.1200	0.8	3.1237	1.5	0.2519	1.3	0.84	1448.4	16.6	1438.5	11.7	1424.0	15.7	1424.0	15.7	101.7
LB3-93	33	38963	1.7	10.6814	2.8	3.4506	3.8	0.2673	2.5	0.66	1527.2	34.0	1516.0	29.7	1500.5	53.4	1500.5	53.4	101.8
LB3-59	92	139974	2.5	10.6262	0.3	3.4148	2.1	0.2632	2.1	0.99	1506.1	28.6	1507.8	16.9	1510.3	5.8	1510.3	5.8	99.7
LB3-101	15	18573	0.5	9.9796	4.1	3.9690	4.8	0.2873	2.5	0.51	1627.9	35.3	1627.9	38.8	1627.9	76.2	1627.9	76.2	100.0
LB3-86	39	43683	1.1	9.9528	1.5	4.0082	2.2	0.2893	1.6	0.71	1638.2	22.4	1635.9	17.8	1632.9	28.6	1632.9	28.6	100.3
LB3-51	65	174255	1.2	9.5171	0.8	4.4032	1.5	0.3039	1.2	0.83	1710.8	18.0	1712.9	12.0	1715.6	15.0	1715.6	15.0	99.7
LB3-90	492	207842	1.1	9.4760	0.2	4.0865	1.4	0.2808	1.4	0.99	1595.6	19.5	1651.6	11.3	1723.6	3.2	1723.6	3.2	92.6
LB3-87	275	508275	2.4	9.4640	0.3	4.4077	1.1	0.3025	1.1	0.96	1703.9	16.5	1713.8	9.4	1725.9	5.5	1725.9	5.5	98.7
LB3-53	74	92545	1.7	9.2271	1.0	4.7264	1.5	0.3163	1.1	0.73	1771.6	17.0	1771.9	12.7	1772.3	18.9	1772.3	18.9	100.0
LB3-103	80	210073	0.8	8.8880	0.8	5.0983	1.5	0.3286	1.2	0.83	1831.8	19.7	1835.8	12.7	1840.4	15.1	1840.4	15.1	99.5
LB3-107	152	207648	4.8	8.6967	0.3	5.4443	1.4	0.3434	1.4	0.97	1903.0	22.8	1891.9	12.3	1879.7	6.3	1879.7	6.3	101.2
LB3-80	61	99870	1.0	8.1895	0.7	5.9517	1.0	0.3535	0.8	0.74	1951.3	12.9	1968.8	9.1	1987.2	12.6	1987.2	12.6	98.2
LB3-83	64	222717	1.5	5.8123	0.4	11.8249	1.5	0.4985	1.4	0.96	2607.2	30.3	2590.6	13.7	2577.7	6.5	2577.7	6.5	101.1
LB3-84	61	183489	2.0	5.1318	0.3	14.4583	1.7	0.5381	1.7	0.98	2775.6	38.4	2780.3	16.4	2783.6	5.0	2783.6	5.0	99.7
LB3-67	57	165094	2.0	5.0218	0.4	15.0150	1.6	0.5469	1.5	0.97	2812.1	34.6	2816.2	14.9	2819.1	6.2	2819.1	6.2	99.8
LB3-56	52	17960	1.5	4.9774	0.3	15.4920	2.6	0.5593	2.6	0.99	2863.6	59.6	2846.0	24.8	2833.6	5.6	2833.6	5.6	101.1
LB3-52	27	79395	1.0	4.8805	1.1	15.9028	2.6	0.5629	2.4	0.92	2878.6	56.2	2871.0	25.2	2865.6	17.2	2865.6	17.2	100.5
LB3-96	82	134547	0.9	4.7663	0.5	16.2974	1.5	0.5634	1.4	0.93	2880.6	31.8	2894.4	14.1	2904.0	8.8	2904.0	8.8	99.2
LB3-75	18	30394	0.9	4.1483	5.2	17.2722	5.8	0.5197	2.4	0.42	2697.7	53.6	2950.1	55.6	3127.0	83.6	3127.0	83.6	86.3

LB4(1AB/08-14-077-08W4/00)

Analysis	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± (%)	207Pb* 235U*	± (%)	206Pb* 238U	± (%)	error corr.	206Pb* 238U*	± (Ma)	207Pb* 235U	± (Ma)	206Pb* 207Pb*	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
LB4-35	45	6087	0.7	28.2844	56.9	0.0971	57.4	0.0199	7.8	0.14	127.1	9.8	94.1	51.6	-680.6	#####	127.1	9.8	NA
LB4-85	521	86717	1.5	20.2018	3.1	0.1690	3.6	0.0248	1.9	0.53	157.7	3.0	158.6	5.3	171.6	72.0	157.7	3.0	NA
LB4-57	184	16703	1.1	19.6990	6.1	0.2190	7.2	0.0313	3.8	0.52	198.6	7.4	201.1	13.2	230.1	142.1	198.6	7.4	NA
LB4-66	99	12000	1.6	20.2966	6.6	0.2148	6.8	0.0316	1.8	0.26	200.7	3.5	197.6	12.3	160.7	154.2	200.7	3.5	NA
LB4-97	141	26239	1.3	19.3088	3.7	0.2842	4.7	0.0398	2.9	0.62	251.6	7.2	254.0	10.6	276.1	84.6	251.6	7.2	NA
LB4-14	188	6695	1.4	15.2802	13.8	0.5362	16.7	0.0594	9.5	0.57	372.1	34.4	435.9	59.3	788.6	290.0	372.1	34.4	NA
LB4-22	41	12049	1.3	20.2258	17.0	0.4058	17.7	0.0595	4.9	0.28	372.8	17.6	345.9	52.0	168.8	400.3	372.8	17.6	NA
LB4-49	113	26401	1.2	18.2975	5.0	0.4971	5.3	0.0660	1.7	0.32	411.8	6.6	409.7	17.7	398.0	111.8	411.8	6.6	103.5
LB4-76	129	50505	0.6	18.4336	4.1	0.4962	4.4	0.0663	1.7	0.38	414.1	6.7	409.1	14.9	381.4	92.1	414.1	6.7	108.6
LB4-39	159	43616	1.3	17.9143	3.0	0.5206	4.2	0.0676	3.0	0.70	421.9	12.1	425.6	14.7	445.3	66.9	421.9	12.1	94.8
LB4-71	107	53973	1.3	17.8165	6.3	0.5242	6.5	0.0677	1.8	0.28	422.5	7.5	427.9	22.8	457.5	139.0	422.5	7.5	92.4
LB4-69	154	51838	2.1	18.0787	3.6	0.5169	5.0	0.0678	3.5	0.70	422.7	14.1	423.1	17.2	424.9	79.6	422.7	14.1	99.5
LB4-62	160	90960	1.5	17.5370	2.3	0.5347	5.2	0.0680	4.7	0.90	424.2	19.3	434.9	18.5	492.4	49.8	424.2	19.3	86.1
LB4-87	75	25602	0.8	17.6255	4.8	0.5604	5.4	0.0716	2.6	0.49	446.0	11.4	451.8	19.8	481.3	105.1	446.0	11.4	92.7
LB4-24	194	32234	2.0	17.5908	1.7	0.5826	2.6	0.0743	2.0	0.76	462.2	8.8	466.2	9.8	485.6	37.7	462.2	8.8	95.2
LB4-46	93	24907	1.2	17.9986	3.7	0.5718	4.9	0.0746	3.3	0.66	464.0	14.6	459.2	18.2	434.8	81.9	464.0	14.6	106.7
LB4-68	97	35101	1.5	17.5449	4.2	0.5990	5.0	0.0762	2.7	0.55	473.6	12.5	476.6	19.0	491.4	92.0	473.6	12.5	96.4
LB4-45	47	23096	1.3	18.2442	13.6	0.5766	13.9	0.0763	2.9	0.21	474.0	13.1	462.3	51.5	404.5	305.1	474.0	13.1	117.2
LB4-9	174	122567	1.0	16.7050	2.9	0.7711	3.3	0.0934	1.7	0.51	575.7	9.4	580.4	14.7	598.6	61.9	575.7	9.4	96.2
LB4-6	97	18250	1.2	16.4656	3.7	0.8028	4.3	0.0959	2.1	0.48	590.2	11.6	598.4	19.3	629.8	80.7	590.2	11.6	93.7
LB4-19	118	48870	0.7	16.5387	3.7	0.8270	3.9	0.0992	1.4	0.36	609.7	8.2	612.0	18.1	620.2	79.5	609.7	8.2	98.3
LB4-95	250	143757	3.8	16.1199	0.7	0.9501	1.2	0.1111	1.0	0.81	679.0	6.4	678.1	6.0	675.3	15.4	679.0	6.4	100.5
LB4-100	114	149043	2.2	14.1484	1.5	1.4830	2.4	0.1522	1.8	0.76	913.1	15.5	923.4	14.5	948.2	31.7	948.2	31.7	96.3
LB4-79	44	40202	0.9	14.0984	3.7	1.5340	4.0	0.1568	1.4	0.34	939.2	11.9	944.1	24.5	955.4	76.7	955.4	76.7	98.3
LB4-53	209	174487	1.1	14.0581	0.5	1.5383	1.3	0.1568	1.2	0.92	939.2	10.8	945.8	8.3	961.3	10.7	961.3	10.7	97.7
LB4-33	233	208353	3.2	14.0396	0.8	1.4866	2.5	0.1514	2.4	0.94	908.7	20.3	924.9	15.4	964.0	17.1	964.0	17.1	94.3
LB4-104	124	78431	2.7	13.9806	1.2	1.6249	1.5	0.1648	0.9	0.62	983.2	8.7	979.9	9.6	972.5	24.2	972.5	24.2	101.1
LB4-94	67	45692	1.7	13.8562	2.3	1.6739	2.9	0.1682	1.7	0.59	1002.3	15.7	998.7	18.2	990.7	46.9	990.7	46.9	101.2
LB4-4	17	17009	0.4	13.8413	6.9	1.7280	7.1	0.1735	1.9	0.27	1031.2	18.0	1019.0	45.8	992.9	139.7	992.9	139.7	103.9
LB4-2	84	68559	2.4	13.8377	2.3	1.6940	3.4	0.1700	2.6	0.75	1012.2	24.1	1006.3	22.0	993.5	46.6	993.5	46.6	101.9
LB4-50	112	105621	1.1	13.8240	1.1	1.6526	1.8	0.1657	1.4	0.79	988.3	13.1	990.5	11.5	995.5	22.6	995.5	22.6	99.3
LB4-12	47	32062	2.0	13.7292	6.9	1.6336	7.1	0.1627	1.9	0.26	971.5	16.8	983.2	45.0	1009.4	140.0	1009.4	140.0	96.2
LB4-52	34	16655	1.7	13.7229	3.1	1.7134	3.9	0.1705	2.4	0.62	1015.0	22.4	1013.6	24.8	1010.3	61.9	1010.3	61.9	100.5
LB4-99	29	27176	1.9	13.7036	4.3	1.7313	4.9	0.1721	2.3	0.47	1023.5	21.8	1020.2	31.6	1013.2	87.9	1013.2	87.9	101.0
LB4-5	35	18912	1.0	13.6996	5.1	1.7311	5.4	0.1720	1.8	0.34	1023.1	17.1	1020.2	34.7	1013.8	102.9	1013.8	102.9	100.9
LB4-43	71	78365	1.5	13.6308	2.1	1.7789	2.5	0.1759	1.4	0.55	1044.3	13.4	1037.8	16.3	1024.0	42.3	1024.0	42.3	102.0
LB4-64	140	122626	1.5	13.6296	1.3	1.7251	2.4	0.1705	2.1	0.86	1015.0	19.7	1017.9	15.7	1024.2	25.4	1024.2	25.4	99.1
LB4-44	18	9847	0.6	13.6254	8.3	1.7773	8.6	0.1756	2.3	0.26	1043.1	21.8	1037.2	56.1	1024.8	168.6	1024.8	168.6	101.8
LB4-63	67	58525	2.0	13.6112	1.4	1.6945	2.3	0.1673	1.8	0.78	997.1	16.3	1006.5	14.4	1026.9	28.5	1026.9	28.5	97.1
LB4-29	161	296627	1.2	13.5588	1.2	1.7893	2.2	0.1760	1.9	0.86	1044.8	18.6	1041.6	14.7	1034.7	23.4	1034.7	23.4	101.0
LB4-86	92	65741	1.7	13.5529	1.9	1.7605	2.7	0.1730	1.9	0.71	1028.9	18.2	1031.0	17.4	1035.6	38.3	1035.6	38.3	99.4
LB4-15	125	128664	0.8	13.5322	1.1	1.7537	2.8	0.1721	2.5	0.92	1023.8	24.0	1028.5	17.8	1038.7	22.2	1038.7	22.2	98.6
LB4-80	38	34011	1.9	13.5284	2.5	1.8363	3.9	0.1802	2.9	0.76	1067.9	29.0	1058.5	25.5	1039.2	50.9	1039.2	50.9	102.8
LB4-90	85	62348	2.5	13.5116	1.7	1.7938	2.5	0.1758	1.8	0.72	1043.9	17.0	1043.2	16.0	1041.7	34.6	1041.7	34.6	100.2
LB4-65	100	112558	2.3	13.4716	1.5	1.8336	5.9	0.1792	5.7	0.97	1062.4	55.5	1057.6	38.5	1047.8	29.4	1047.8	29.4	101.4
LB4-1	24	13832	1.1	13.4441	4.3	1.8099	5.1	0.1765	2.8	0.54	1047.7	26.7	1049.0	33.2	1051.9	86.0	1051.9	86.0	99.6
LB4-10	23	13066	1.5	13.3727	3.9	1.8688	4.4	0.1813	2.1	0.48	1073.8	21.2	1070.1	29.4	1062.6	78.4	1062.6	78.4	101.1
LB4-28	119	152394	1.9	13.3520	2.0	1.7985	3.0	0.1742	2.3	0.76	1035.0	22.1	1044.9	19.7	1065.7	39.4	1065.7	39.4	97.1
LB4-54	62	39787	1.1	13.3513	1.3	1.8247	2.1	0.1767	1.7	0.81	1048.9	16.7	1054.4	14.1	1065.8	25.5	1065.8	25.5	98.4
LB4-18	117	99429	1.8	13.3288	0.7	1.8621	1.6	0.1800	1.4	0.89	1067.0	13.6	1067.7	10.3	1069.2	14.5	1069.2	14.5	99.8
LB4-91	40	39563	1.5	13.3123	3.0	1.8504	3.4	0.1787	1.7	0.49	1059.7	16.7	1063.6	22.7	1071.7	60.3	1071.7	60.3	98.9
LB4-51	59	7338	1.3	13.2646	2.8	1.7724	3.7	0.1705	2.4	0.64	1014.9	22.3	1035.4	24.1	1078.9	57.1	1078.9	57.1	94.1
LB4-103	53	50593	1.8	13.2604	2.4	1.8957	3.2	0.1823	2.1	0.65	1079.6	20.7	1079.6	21.3	1079.5	48.7	1079.5	48.7	100.0
LB4-25	266	51046	1.9	13.2418	0.6	1.6010	2.1	0.1538	2.0	0.95	922.0	17.2	970.6	13.1	1082.3	12.9	1082.3	12.9	85.2
LB4-20	32	64359	1.0	13.1850	2.0	1.8606	2.4	0.1779	1.3	0.54	1055.6	12.7	1067.2	16.0	1090.9	41.0	1090.9	41.0	96.8
LB4-13	160	39948	2.5	13.1789	1.0	1.5247	1.8	0.1457	1.6	0.85	877.0	12.9	940.4	11.3	1091.9	19.1	1091.9	19.1	80.3
LB4-58	189	211126	2.0	12.9867	0.6	2.0272	1.9	0.1909	1.8	0.95	1126.5	18.6	1124.7	12.9	1121.3	12.3	1121.3	12.3	100.5
LB4-61	65	55662	2.5	12.9694	1.6	2.0249	2.8	0.1905	2.3	0.82	1123.9	23.8	1123.9	19.1	1123.9	32.0	1123.9	32.0	100.0
LB4-47	41	86593	1.6	12.9560	3.0	2.0800	4.4	0.1955	3.1	0.71	1150.8	32.8	1142.2	29.8	1126.0	60.7	1126.0	60.7	102.2
LB4-88	41	27903	1.7	12.9321	3.9	2.1209	4.3	0.1989	1.7	0.39	1169.5	18.0	1155.6	29.5	1129.6	78.4	1129.6	78.4	103.5
LB4-11	56	38294	0.8	12.8818	2.6	2.0950	5.2	0.1957	4.4	0.86	1152.4	46.9	1147.2	35.5	1137.4	52.4	1137.4	52.4	101.3
LB4-101	98	90585	3.5	12.8537	1.1	2.0625	2.0	0.1923	1.6	0.83	1133.7	17.0	1136.4	13.5	1141.8	22.2	1141.8	22.2	99.3
LB4-102	108	60169	1.7	12.8162	1.1	2.0787	1.7	0.1932	1.3	0.76	1138.8	13.7	1141.8	11.8	1147.5	22.1	1147.5	22.1	99.2
LB4-42	67	51986	1.9	12.7383	1.4	2.1047	1.9	0.1944	1.3	0.66	1145.4	13.2	1150.3	13.1	1159.6	28.1	1159.6	28.1	98.8
LB4-47	21	14780	0.7	12.6834	5.8	2.0363	7.5	0.1873	4.7	0.63	1106.8	48.3	1127.7	51.3	1168.2	115.9	1168.2	115.9	94.7
LB4-30	62	67164	1.9	12.6763	1.4	2.2484	2.0	0.2067	1.4	0.71	1211.3	15.7	1196.3	14.2	1169.3	28.3	1169.3	28.3	103.6
LB4-72	280	548300	5.4	12.6651	0.3	2.1939	2.6	0.2015	2.6	0.99	1183.5	27.8	1179.1	18.0	1171.1	5.4	1171.1	5.4	101.1
LB4-32	21	17467	1.8	12.6480	3.8	2.1070	4.7	0.1933	2.7	0.57	1139.1	28.1	1151.1	32.3	1173.8	76.1	1173.8	76.1	97.0
LB4-105	70	36046	2.0	12.6157	1.0	2.2143	1.9	0.2026	1.6	0.84	1189.3	17.7	1185.6	13.5	1178.8	20.6	1178.8	20.6	100.9
LB4-16	268	216229	6.9	12.4786	0.5	2.2943	2.0	0.2076	2.0	0.97	1216.2	21.7	1210.5	14.2	1200.4	9.6	1200.4	9.6	101.3
LB4-82	48	49165	1.0	12.4762	2.5	2.2844	3.9	0.2067	3.0	0.76	1211.3	33.3	1207.5	27.9	1200.8	50.3	1200.8	50.3	100.9
LB4-60	245	313325	0.9	12.3857	0.6	2.2958	1.4	0.2062	1.2	0.90	1208.7	13.4	1211.0	9.6	1215.1	11.7	1215.1	11.7	99.5
LB4-78	18	26845	2.5	12.3111	4.0	2.1643	5.0	0.1932	2.9	0.58	1138.9	30.2	1169.6	34.4	1226.9	79.0	1226.9	79.0	92.8
LB4-31	47	266935	1.0	12.0268	1.7	2.4193	2.2	0.2110	1.4	0.63	1234.3	15.6	1248.3	15.9	1272.7	33.7	1272.7	33.7	97.0
LB4-40	355	279616	0.7	11.6395	0.4	2.6033	1.7	0.2198	1.7	0.98	1280.6	19.8	1301.6	12.8	1336.2	7.0	1336.2	7.0	95.8
LB4-93	101	34402	1.5	11.2354	0.6	2.8916	1.7	0.2356	1.6	0.94	1363.9	19.6	1379.7	12.8	1404.2	10.7	1404.2	10.7	97.1
LB4-74	42	65633	0.7	10.9571	1.0	3.1868	1.9	0.2532	1.6	0.84	1455.2	21.3	1454.0	15.0	1452.1	19.8	1452.1	19.8	100.2
LB4-75	91	114408	0.7	10.8841	0.8	3.2126	1.6	0.2536	1.4	0.86	1457.0	18.0	1460.2	12.4	1464.8	15.5	1464.8	15.5	99.5
LB4-36	149	172623	1.6	10.8816	0.5	3.1853	2.3	0.2514	2.2	0.98	1445.6	28.7	1453.6	17.5	1465.3	8.8	1465.3	8.8	98.7
LB4-81	28	44733	1.1	10.8314	2.1	3.1080	3.7	0.2442	3.1	0.82	1408.3	39.0	1434.7	28.7	1474.0	40.1	1474.0	40.1	95.5
LB4-37	114	160109	1.1	10.7464	0.6	3.2163	1.5	0.2507	1.3	0.91	1442.0	17.3	1461.1	11.4	1489.0	11.4	1489.0	11.4	96.8
LB4-70	68	57091	1.5	10.6900	1.0	3.3181	2.9	0.2573	2.7	0.94	1475.8	35.6	1485.3	22.4	1498.9	18.8	1498.9	18.8	98.5
LB4-89	185	237420	2.7	10.6543	0.7	3.3529	1.5	0.2591	1.3	0.89	1485.2	17.5	1493.5	11.7	1505.3	13.1	1505.3	13.1	98.7
LB4-96	96	49623	1.5	10.6419	0.9	3.3819	1.9	0.2610	1.6	0.88	1495.1	21.8	1500.2	14.6	1507.5	16.7	1507.5	16.7	99.2
LB4-26	65	93048	1.4	10.2868	1.1	3.6996	2.2	0.2760	1.9	0.86	1571.3	26.3	1571.3	17.6	1571.3	21.2	1571.3	21.2	100.0
LB4-56	50	82761	1.5	10.2716	1.0	3.6940	2.7	0.2752	2.6	0.94	1567.1	35.7	1570.1	21.9	1574.1	18.1	1574.1	18.1	99.6
LB4-84	114	142166	1.0	10.0985	0.4	3.7848	1.6	0.2772	1.5	0.96	1577.2	21.2	1589.5	12.7	1605.8	8.3	1605.8	8.3	98.2
LB4-98	73	121857	1.1	9.9937	1.7	4.0224	2.8	0.2915	2.3	0.80	1649.2	33.0	1638.7	23.0	1625.2	31.4	1625.2	31.4	101.5
LB4-21	47	163709	1.0	9.8507	0.9	4.1354	1.5	0.2954	1.3	0.83	1668.7	18.9	1661.3	12.6	1652.0	15.9	1652.0	15.9	101.0
LB4-59	192	428244	0.7	9.8403	0.4	4.1226	0.9	0.2942	0.8	0.89	1662.6	11.9	1658.8	7.5	1654.0	7.7	1654.0	7.7	100.5
LB4-92	45	93651	1.3	8.9204	0.7	5.0756	1.3	0.3284	1.1	0.85	1830.5	18.2	1832.0	11.4	1833.8	13.0	1833.8	13.0	99.8
LB4-34	38	178153	1.4	7.0020	3.3	7.5976	5.5	0.3858	4.4	0.80	2103.5	79.8	2184.6	49.8	2261.6	57.3	2261.6	57.3	93.0
LB4-23	63	146050	1.3	5.9845	0.5	10.9585	2.4	0.4756	2.3	0.98	2508.2	48.1	2519.6	22.0	2528.8	7.8	2528.8	7.8	99.2
LB4-67	55	123025	1.1	5.4570	0.5	13.3312	1.7	0.5276	1.6	0.95	2731.4	36.1	2703.4	16.1	2682.5	8.8	2682.5	8.8	101.8
LB4-3	43	470187	1.7	5.4236	0.3	13.0901	1.4	0.5149	1.4	0.98	2677.5	30.2	2686.2	13.2	2692.7	4.3	2692.7	4.3	99.4
LB4-41	120	748463	3.8	5.3621	0.4	12.5651	3.0	0.4887	3.0	0.99	2564.9	63.1	2647.6	28.3	2711.5	6.8	2711.5	6.8	94.6

LL2 (1AA/02-13-086-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LL2-65	180	25482	0.7	20.0362	4.2	0.1812	4.4	0.0263	1.4	0.33	167.6	2.4	169.1	6.8	190.8	96.6	167.6	2.4	NA
LL2-72	77	15455	1.0	21.5013	16.0	0.2241	16.2	0.0349	2.4	0.15	221.4	5.1	205.3	30.1	24.1	386.0	221.4	5.1	NA
LL2-16	161	42541	0.9	19.8621	3.7	0.2819	4.5	0.0406	2.5	0.56	256.6	6.3	252.1	10.0	211.0	85.6	256.6	6.3	NA
LL2-45	169	78399	0.9	18.6903	2.5	0.4019	2.7	0.0545	0.9	0.36	341.9	3.1	343.0	7.7	350.2	56.1	341.9	3.1	NA
LL2-58	46	27876	1.8	17.3216	5.7	0.5214	6.1	0.0655	2.1	0.34	409.0	8.3	426.1	21.3	519.6	126.0	409.0	8.3	78.7
LL2-32	102	24005	1.9	18.6181	4.7	0.5026	5.0	0.0679	1.6	0.31	423.3	6.4	413.5	16.9	358.9	106.5	423.3	6.4	117.9
LL2-68	169	76337	1.8	18.4249	1.3	0.5086	2.0	0.0680	1.5	0.75	423.9	6.1	417.5	6.7	382.4	29.1	423.9	6.1	110.8
LL2-30	184	140628	1.1	18.1821	1.5	0.5240	2.2	0.0691	1.6	0.71	430.7	6.5	427.8	7.6	412.2	34.4	430.7	6.5	104.5
LL2-13	76	34554	1.4	18.6774	4.5	0.5110	5.5	0.0692	3.1	0.57	431.4	13.1	419.1	18.8	351.8	101.2	431.4	13.1	122.6
LL2-104	246	98863	0.9	17.9128	1.9	0.5400	2.5	0.0702	1.6	0.66	437.1	7.0	438.4	8.9	445.4	42.1	437.1	7.0	98.1
LL2-41	22	5545	0.9	18.9171	9.5	0.5124	10.1	0.0703	3.5	0.34	437.9	14.8	420.0	34.9	322.9	216.5	437.9	14.8	135.6
LL2-6	195	188039	2.0	18.1252	2.8	0.5426	4.5	0.0713	3.6	0.79	444.2	15.3	440.2	16.1	419.2	61.6	444.2	15.3	106.0
LL2-93	155	45983	1.0	17.7327	3.3	0.5580	3.4	0.0718	0.8	0.24	446.8	3.5	450.2	12.4	467.8	73.3	446.8	3.5	95.5
LL2-99	61	18832	1.9	17.6248	6.1	0.5616	6.2	0.0718	1.1	0.17	447.0	4.7	452.6	22.7	481.4	135.5	447.0	4.7	92.9
LL2-27	85	25344	1.1	18.3495	6.2	0.5421	6.4	0.0721	1.8	0.28	449.0	7.8	439.8	23.0	391.6	138.9	449.0	7.8	114.7
LL2-98	377	168926	1.8	17.2707	0.9	0.6789	1.3	0.0850	0.9	0.71	526.1	4.7	526.1	5.3	526.1	19.9	526.1	4.7	100.0
LL2-77	102	37179	0.9	16.6181	3.1	0.8528	3.4	0.1028	1.5	0.44	630.7	9.1	626.2	16.0	609.9	66.5	630.7	9.1	103.4
LL2-8	29	37512	1.6	14.3241	5.4	1.5420	6.3	0.1602	3.3	0.51	957.8	29.0	947.3	39.1	922.9	112.0	922.9	112.0	103.8
LL2-28	123	38155	1.5	14.0118	1.0	1.5264	1.5	0.1551	1.1	0.74	929.6	9.8	941.0	9.3	968.0	20.6	968.0	20.6	96.0
LL2-37	70	90251	2.2	13.9605	1.7	1.6401	2.8	0.1661	2.2	0.79	990.4	20.4	985.8	17.8	975.5	35.4	975.5	35.4	101.5
LL2-76	23	17623	1.3	13.8882	7.4	1.6104	7.6	0.1622	1.6	0.21	969.0	14.6	974.3	47.7	986.0	151.4	986.0	151.4	98.3
LL2-36	25	30228	1.6	13.8859	3.1	1.6859	4.2	0.1698	2.8	0.67	1010.9	26.1	1003.2	26.5	986.4	63.0	986.4	63.0	102.5
LL2-52	26	45480	1.3	13.8262	3.9	1.5769	4.3	0.1581	1.8	0.41	946.3	15.5	961.1	26.8	995.1	79.9	995.1	79.9	95.1
LL2-53	312	260553	4.3	13.7337	0.3	1.6663	1.4	0.1660	1.4	0.97	989.9	12.4	995.8	8.9	1008.8	7.1	1008.8	7.1	98.1
LL2-75	66	53267	0.8	13.7170	1.8	1.7406	2.0	0.1732	0.9	0.43	1029.5	8.3	1023.7	13.1	1011.2	37.1	1011.2	37.1	101.8
LL2-48	39	41818	1.3	13.6666	3.8	1.7402	4.0	0.1725	1.4	0.35	1025.8	13.4	1023.5	26.1	1018.7	76.8	1018.7	76.8	100.7
LL2-47	91	120612	2.2	13.6451	1.6	1.7242	2.9	0.1706	2.5	0.84	1015.6	23.3	1017.6	18.9	1021.9	32.0	1021.9	32.0	99.4
LL2-38	31	41860	1.0	13.6227	3.9	1.7561	4.3	0.1735	1.7	0.40	1031.4	16.4	1029.4	27.7	1025.2	79.4	1025.2	79.4	100.6
LL2-4	67	85663	2.7	13.6122	2.3	1.8062	3.3	0.1783	2.3	0.70	1057.8	22.2	1047.7	21.2	1026.7	46.9	1026.7	46.9	103.0
LL2-43	28	25087	0.8	13.5567	5.2	1.7956	5.3	0.1765	1.2	0.22	1048.1	11.2	1043.9	34.9	1035.0	105.6	1035.0	105.6	101.3
LL2-35	43	36976	2.4	13.5372	2.5	1.7550	3.2	0.1723	2.0	0.62	1024.8	18.8	1029.0	20.6	1037.9	50.1	1037.9	50.1	98.7
LL2-21	148	132858	3.4	13.5082	1.3	1.6972	1.9	0.1663	1.3	0.71	991.6	12.2	1007.5	11.8	1042.2	26.2	1042.2	26.2	95.1
LL2-9	39	5566	2.9	13.5056	3.8	1.8170	4.2	0.1780	1.8	0.42	1055.9	17.4	1051.6	27.7	1042.6	77.3	1042.6	77.3	101.3
LL2-14	116	72239	2.7	13.4725	0.7	1.8203	1.4	0.1779	1.1	0.85	1055.3	11.1	1052.8	8.9	1047.6	14.5	1047.6	14.5	100.7
LL2-29	75	53479	1.7	13.4628	2.7	1.7786	2.8	0.1737	0.9	0.33	1032.3	8.8	1037.7	18.3	1049.1	53.7	1049.1	53.7	98.4
LL2-74	38	50525	1.5	13.4370	2.9	1.7903	3.5	0.1745	1.8	0.53	1036.7	17.4	1041.9	22.5	1052.9	59.1	1052.9	59.1	98.5
LL2-92	75	71392	2.5	13.4295	2.6	1.8107	4.4	0.1764	3.5	0.80	1047.1	33.9	1049.3	28.7	1054.1	53.1	1054.1	53.1	99.3
LL2-10	214	178222	3.5	13.4247	0.9	1.8172	1.2	0.1769	0.8	0.65	1050.2	7.5	1051.7	7.8	1054.8	18.2	1054.8	18.2	99.6
LL2-5	88	54479	2.9	13.4165	0.9	1.8607	1.7	0.1811	1.4	0.86	1072.7	14.3	1067.2	11.1	1056.0	17.2	1056.0	17.2	101.6
LL2-46	25	16597	2.2	13.3960	5.2	1.7179	5.6	0.1669	2.1	0.37	995.1	19.3	1015.2	36.2	1059.1	105.3	1059.1	105.3	94.0
LL2-64	80	69178	2.8	13.3879	0.8	1.8288	1.9	0.1776	1.7	0.91	1053.7	16.7	1055.9	12.4	1060.3	16.0	1060.3	16.0	99.4
LL2-59	90	75238	1.5	13.3546	1.1	1.7964	1.7	0.1740	1.3	0.76	1034.1	12.2	1044.2	11.0	1065.3	21.9	1065.3	21.9	97.1
LL2-55	183	199413	2.3	13.3021	0.4	1.8621	1.2	0.1796	1.1	0.92	1065.0	10.7	1067.7	7.8	1073.2	9.0	1073.2	9.0	99.2
LL2-33	47	38621	1.5	13.2413	1.9	1.8474	2.4	0.1774	1.4	0.59	1052.8	13.7	1062.5	15.7	1082.4	38.4	1082.4	38.4	97.3
LL2-56	59	7835	1.9	13.2244	2.4	1.8351	2.9	0.1760	1.5	0.54	1045.1	14.8	1058.1	18.8	1085.0	48.3	1085.0	48.3	96.3
LL2-17	192	177848	1.7	13.1614	0.6	1.9402	0.8	0.1852	0.6	0.69	1095.3	5.7	1095.1	5.5	1094.6	11.9	1094.6	11.9	100.1
LL2-86	30	29755	1.2	13.1253	4.9	1.8827	5.0	0.1792	1.0	0.21	1062.7	10.2	1075.0	32.9	1100.1	97.1	1100.1	97.1	96.6
LL2-18	191	234601	1.2	13.0816	0.5	1.9722	1.6	0.1871	1.5	0.96	1105.7	15.2	1106.0	10.6	1106.7	9.2	1106.7	9.2	99.9
LL2-95	83	79408	1.2	13.0589	1.9	1.9575	2.2	0.1854	1.2	0.53	1096.4	11.8	1101.0	14.8	1110.2	37.4	1110.2	37.4	98.8
LL2-61	588	414312	2.9	12.9020	0.2	2.0497	3.3	0.1918	3.3	1.00	1131.1	34.0	1132.2	22.4	1134.3	4.7	1134.3	4.7	99.7
LL2-91	60	80617	2.9	12.8761	1.8	2.0602	2.3	0.1924	1.5	0.62	1134.4	15.1	1135.7	16.0	1138.3	36.3	1138.3	36.3	99.7
LL2-31	69	101223	2.2	12.8666	1.2	2.0434	2.0	0.1907	1.5	0.79	1125.1	16.0	1130.1	13.3	1139.7	23.7	1139.7	23.7	98.7
LL2-67	151	162039	1.9	12.7681	0.9	2.1473	1.3	0.1988	1.0	0.73	1169.1	10.4	1164.2	9.3	1155.0	18.1	1155.0	18.1	101.2
LL2-79	98	226053	3.1	12.7647	0.8	2.1165	1.3	0.1959	1.0	0.77	1153.5	10.5	1154.2	8.9	1155.5	16.5	1155.5	16.5	99.8
LL2-15	67	78768	1.9	12.7294	2.3	2.1527	2.8	0.1987	1.5	0.53	1168.6	15.7	1165.9	19.2	1161.0	46.6	1161.0	46.6	100.7
LL2-73	11	22551	3.0	12.5366	6.8	2.1608	7.5	0.1965	3.2	0.43	1156.3	34.4	1168.5	52.1	1191.2	133.6	1191.2	133.6	97.1
LL2-19	222	259193	0.8	12.5240	0.5	2.1866	1.6	0.1986	1.5	0.95	1167.9	16.3	1176.8	11.2	1193.2	10.0	1193.2	10.0	97.9
LL2-57	105	103524	2.0	12.4285	1.4	2.2355	1.6	0.2015	0.8	0.50	1183.4	8.8	1192.2	11.4	1208.3	27.5	1208.3	27.5	97.9
LL2-1	39	60055	0.7	12.4119	1.6	2.2524	2.9	0.2028	2.5	0.84	1190.1	26.7	1197.5	20.5	1210.9	31.2	1210.9	31.2	98.3
LL2-22	167	195506	2.0	12.4001	0.4	2.3039	1.2	0.2072	1.1	0.93	1213.9	12.4	1213.5	8.5	1212.8	8.8	1212.8	8.8	100.1
LL2-62	68	80294	2.8	12.3779	0.8	2.4309	2.2	0.2182	2.0	0.93	1272.5	23.7	1251.8	15.8	1216.3	15.4	1216.3	15.4	104.6
LL2-105	46	63252	1.9	12.2874	1.9	2.3302	2.2	0.2077	1.2	0.51	1216.3	12.8	1221.5	15.9	1230.8	37.7	1230.8	37.7	98.8
LL2-44	175	111210	2.8	12.2752	0.7	2.3077	1.3	0.2054	1.1	0.85	1204.5	12.4	1214.6	9.3	1232.7	13.5	1232.7	13.5	97.7
LL2-88	52	29471	1.2	12.1928	2.0	2.3201	2.7	0.2052	1.8	0.68	1203.0	19.8	1218.5	18.9	1245.9	38.3	1245.9	38.3	96.6
LL2-96	9	9801	2.2	12.1073	7.7	2.5807	8.3	0.2266	3.1	0.37	1316.7	36.7	1295.2	61.1	1259.6	151.7	1259.6	151.7	104.5
LL2-66	78	75550	1.9	12.0724	0.9	2.5385	1.5	0.2223	1.1	0.79	1293.8	13.5	1283.1	10.6	1265.3	17.6	1265.3	17.6	102.3
LL2-78	72	79515	1.8	11.6914	0.9	2.7481	1.5	0.2330	1.2	0.80	1350.3	14.8	1341.6	11.3	1327.6	17.7	1327.6	17.7	101.7
LL2-80	66	95291	2.0	11.4900	1.5	2.7466	1.9	0.2289	1.1	0.61	1328.7	13.7	1341.2	13.8	1361.2	28.2	1361.2	28.2	97.6
LL2-69	80	64032	2.1	11.4456	1.2	2.8577	1.7	0.2372	1.3	0.74	1372.2	15.8	1370.8	13.0	1368.7	22.3	1368.7	22.3	100.3
LL2-101	108	112856	1.4	11.2538	0.7	2.9955	4.5	0.2445	4.5	0.99	1410.0	56.4	1406.5	34.4	1401.1	13.8	1401.1	13.8	100.6
LL2-103	17	33517	1.9	11.1275	3.1	2.9498	3.6	0.2381	1.7	0.49	1376.6	21.6	1394.8	27.2	1422.7	59.8	1422.7	59.8	96.8
LL2-39	173	328192	2.2	11.0294	0.5	3.1732	1.4	0.2538	1.3	0.94	1458.2	17.3	1450.7	10.9	1439.6	9.3	1439.6	9.3	101.3
LL2-63	54	72947	1.3	11.0228	1.1	3.1799	1.4	0.2542	0.9	0.63	1460.2	11.6	1452.3	10.8	1440.7	20.7	1440.7	20.7	101.4
LL2-2	127	95481	1.2	10.8323	0.9	3.2755	1.5	0.2573	1.2	0.81	1476.2	16.2	1475.3	11.8	1473.9	17.0	1473.9	17.0	100.2
LL2-25	79	179034	1.2	10.8175	0.8	3.3084	1.6	0.2596	1.4	0.86	1487.6	18.1	1483.0	12.3	1476.5	15.2	1476.5	15.2	100.8
LL2-71	135	223334	1.1	10.8000	0.4	3.3334	1.2	0.2611	1.2	0.96	1495.5	15.9	1488.9	9.7	1479.5	6.6	1479.5	6.6	101.1
LL2-23	217	213195	1.9	10.7252	0.3	3.3667	1.0	0.2619	0.9	0.94	1499.5	12.6	1496.7	7.8	1492.7	6.5	1492.7	6.5	100.5
LL2-42	151	255588	1.8	9.9741	0.5	3.8636	1.9	0.2795	1.8	0.96	1588.8	25.4	1606.1	15.1	1628.9	9.5	1628.9	9.5	97.5
LL2-12	25	30321	2.4	9.8703	2.1	4.0857	3.2	0.2925	2.5	0.77	1653.9	36.1	1651.5	26.3	1648.3	38.4	1648.3	38.4	100.3
LL2-7	257	397580	2.1	9.3574	0.3	4.5372	1.3	0.3079	1.3	0.98	1730.5	19.3	1737.8	10.9	1746.6	5.2	1746.6	5.2	99.1
LL2-94	162	443714	1.9	9.3234	0.3	4.6008	0.7	0.3111	0.6	0.90	1746.2	9.8	1749.4	5.9	1753.3	5.6	1753.3	5.6	99.6
LL2-90	108	215569	2.0	9.3102	0.7	4.7152	1.2	0.3184	1.0	0.80	1781.8	15.2	1769.9	10.2	1755.9	13.5	1755.9	13.5	101.5
LL2-83	47	99900	0.6	9.2602	0.8	4.7560	1.1	0.3194	0.8	0.71	1786.9	12.8	1777.2	9.6	1765.8	14.7	1765.8	14.7	101.2
LL2-100	197	606125	4.5	8.9827	0.4	4.9817	1.9	0.3246	1.9	0.98	1811.9	29.4	1816.2	16.0	1821.2	6.4	1821.2	6.4	99.5
LL2-102	84	167696	0.9	8.9712	0.5	5.0653	1.2	0.3296	1.1	0.90	1836.3	17.3	1830.3	10.1	1823.5	9.3	1823.5	9.3	100.7
LL2-40	167	222660	2.4	8.9592	0.3	5.0675	0.9	0.3293	0.9	0.94	1834.9	14.0	1830.7	7.9	1825.9	5.8	1825.9	5.8	100.5
LL2-50	139	306006	1.0	8.9500	0.3	5.0679	1.1	0.3290	1.1	0.97	1833.4	17.5	1830.8	9.6	1827.8	4.9	1827.8	4.9	100.3
LL2-81	91	238234	0.8	8.9137	0.4	5.0797	1.5	0.3284	1.5	0.96	1830.6	23.4	1832.7	13.0	1835.1	8.1	1835.1	8.1	99.8
LL2-3	39	74949	1.6	8.8974	0.7	5.1530	1.4	0.3325	1.2	0.86	1850.6	19.0	1844.9	11.7	1838.4	12.6	1838.4	12.6	100.7
LL2-34	49	69694	0.7	8.8487	1.1	5.1956	1.4	0.3334	0.9	0.62	1855.0	14.4	1851.9	12.2	1848.4	20.4	1848.4	20.4	100.4
LL2-70	92	142062	0.8	8.7813	0.5	5.2085	1.0	0.3317	0.8	0.84	1846.7	13.1	1854.0	8.3	1862.2	9.7	1862.2	9.7	99.2
LL2-82	29	40979	3.5	8.7584	1.8	5.1097	3.3	0.3246	2.8	0.84	1812.1	44.3	1837.7	28.2	1866.9	32.1	1866.9	32.1	97.1
LL2-26	60	120065	4.6	8.7264	0.8	5.3881	1.5	0.3410	1.2	0.82	1891.5	19.6	1883.0	12.5	1873.5	15.0	1873.5	15.0	101.0
LL2-49	14	29516	0.6	8.5808	2.5	5.2709	3.2	0.3280	2.1	0.64	1828.8	32.9	1864.2	27.5	1903.8	44.5	1903.8	44.5	96.1
LL2-84	71	257538	1.9	5.9114	0.4	11.2230	2.1	0.4812	2.0	0.98	2532.4	42.3	2541.8	19.2	2549.4	6.8	2549.4	6.8	99.3
LL2-87	43	140646	1.7	5.8502	0.5	11.5899	0.9	0.4918	0.7	0.83	2578.3	15.6	2571.9	8.3	2566.8	8.3	2566.8	8.3	100.4
LL2-51	101	225763	0.8	5.4073	0.2	13.2193	0.8	0.5184	0.8	0.96	2692.5	16.6	2695.4	7.4	2697.6	3.7	2697.6	3.7	99.8
LL2-20	52	139146	0.9	5.3972	0.3	13.4079	1.8	0.5248	1.7	0.98	2719.7	38.7	2708.8	16.8	2700.7	5.6	2700.7	5.6	100.7
LL2-97	68	261029	1.1	5.3874	0.5	13.2889	2.0	0.5192	2.0	0.97	2696.0	43.2	2700.4	19.1	2703.7	8.3	2703.7	8.3	99.7
LL2-85	26	77930	1.5	5.3059	0.7	13.7986	1.9	0.5310	1.8	0.94	2745.7	40.9	2736.0	18.4	2728.8	10.8	2728.8	10.8	100.6
LL2-24	73	231591	1.3	4.7693	0.5	16.4058	2.3	0.5675	2.2	0.98	2897.4	51.9	2900.7	21.8	2903.0	8.1	2903.0	8.1	99.8

LL3 (1AA/02-13-086-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LL3-17	179	35716	0.5	19.5991	6.0	0.1846	6.2	0.0262	1.4	0.23	167.0	2.4	172.0	9.8	241.8	139.2	167.0	2.4	NA
LL3-69	248	138305	0.5	18.6524	1.6	0.4137	2.7	0.0560	2.2	0.81	351.1	7.4	351.6	8.0	354.8	35.9	351.1	7.4	NA
LL3-43	50	9916	1.9	19.1688	11.0	0.4249	11.5	0.0591	3.4	0.29	370.0	12.2	359.5	34.9	292.8	252.2	370.0	12.2	NA
LL3-76	52	17631	1.3	18.0189	13.9	0.4833	14.0	0.0632	1.8	0.13	394.8	7.0	400.3	46.3	432.3	310.4	394.8	7.0	NA
LL3-41	444	24120	14.6	17.8950	3.1	0.5009	3.7	0.0650	2.0	0.55	406.1	8.0	412.3	12.6	447.6	69.1	406.1	8.0	90.7
LL3-44	130	38507	0.9	18.3172	2.6	0.4953	3.0	0.0658	1.4	0.47	410.8	5.6	408.5	10.0	395.6	59.0	410.8	5.6	103.9
LL3-60	146	63228	1.3	18.0298	2.9	0.5080	3.1	0.0664	1.0	0.34	414.6	4.1	417.1	10.5	430.9	64.2	414.6	4.1	96.2
LL3-28	93	16766	1.7	18.8628	3.5	0.4885	3.9	0.0668	1.7	0.44	417.0	6.9	403.9	13.0	329.4	79.4	417.0	6.9	126.6
LL3-56	237	31507	1.8	18.0395	3.4	0.5350	4.9	0.0700	3.6	0.73	436.2	15.1	435.1	17.4	429.7	74.9	436.2	15.1	101.5
LL3-85	84	30019	0.9	17.8971	4.7	0.5446	4.8	0.0707	1.2	0.25	440.3	5.1	441.5	17.3	447.4	103.8	440.3	5.1	98.4
LL3-52	218	71641	1.1	17.9932	2.2	0.5431	2.4	0.0709	0.8	0.34	441.5	3.4	440.5	8.4	435.5	49.4	441.5	3.4	101.4
LL3-104	261	101083	0.6	18.0688	1.5	0.5584	2.1	0.0732	1.4	0.68	455.2	6.2	450.5	7.5	426.1	34.0	455.2	6.2	106.8
LL3-58	175	62772	1.6	17.8934	2.7	0.5678	3.1	0.0737	1.5	0.48	458.3	6.7	456.6	11.5	447.8	60.7	458.3	6.7	102.3
LL3-98	151	79177	2.7	17.5466	3.9	0.6056	3.9	0.0771	0.9	0.22	478.6	4.0	480.8	15.1	491.2	85.0	478.6	4.0	97.4
LL3-72	71	38797	0.8	17.3700	5.9	0.6656	6.0	0.0839	1.5	0.25	519.1	7.4	518.0	24.5	513.4	128.8	519.1	7.4	101.1
LL3-49	78	21841	1.4	16.1230	1.9	0.8817	2.7	0.1031	1.9	0.69	632.6	11.2	641.9	12.7	674.9	41.1	632.6	11.2	93.7
LL3-92	106	70112	2.0	16.3400	1.3	0.9032	2.4	0.1070	2.0	0.85	655.5	12.7	653.5	11.6	646.3	27.0	655.5	12.7	101.4
LL3-64	118	101506	1.8	14.0863	1.2	1.5327	1.5	0.1566	0.8	0.55	937.8	7.1	943.6	9.1	957.1	25.5	957.1	25.5	98.0
LL3-24	100	127467	4.6	14.0364	1.8	1.5875	2.4	0.1616	1.6	0.67	965.7	14.6	965.3	15.1	964.4	36.6	964.4	36.6	100.1
LL3-34	122	10597	1.8	14.0208	1.7	1.5436	2.1	0.1570	1.3	0.60	939.9	11.0	947.9	12.8	966.7	33.9	966.7	33.9	97.2
LL3-65	97	69518	1.4	13.9881	1.0	1.5305	2.5	0.1553	2.3	0.91	930.5	19.7	942.7	15.3	971.5	21.1	971.5	21.1	95.8
LL3-89	81	50494	2.7	13.8806	1.0	1.5796	2.3	0.1590	2.1	0.91	951.3	18.3	962.2	14.2	987.2	19.4	987.2	19.4	96.4
LL3-57	63	36235	1.2	13.8724	3.4	1.5600	3.5	0.1570	1.0	0.28	939.8	8.6	954.5	21.9	988.4	69.2	988.4	69.2	95.1
LL3-5	43	41248	0.8	13.8592	1.4	1.6326	1.7	0.1641	0.9	0.56	979.5	8.6	982.9	10.6	990.3	28.3	990.3	28.3	98.9
LL3-25	26	23220	2.2	13.8183	4.4	1.7148	4.8	0.1719	1.9	0.40	1022.3	18.0	1014.1	30.8	996.3	89.6	996.3	89.6	102.6
LL3-9	289	225148	2.2	13.7775	0.6	1.7011	2.6	0.1700	2.5	0.97	1012.0	23.6	1008.9	16.6	1002.3	12.2	1002.3	12.2	101.0
LL3-103	298	314922	3.7	13.7592	0.5	1.7091	0.8	0.1706	0.7	0.85	1015.2	6.8	1012.0	5.4	1005.0	9.1	1005.0	9.1	101.0
LL3-86	96	82940	1.2	13.7432	1.6	1.7357	2.0	0.1730	1.2	0.58	1028.7	11.0	1021.9	12.8	1007.4	32.8	1007.4	32.8	102.1
LL3-31	91	83335	1.4	13.6890	1.3	1.7116	3.2	0.1699	2.9	0.92	1011.7	27.5	1012.9	20.5	1015.4	26.0	1015.4	26.0	99.6
LL3-90	54	82466	2.2	13.6196	1.2	1.7500	1.9	0.1729	1.5	0.78	1027.8	13.8	1027.1	12.0	1025.6	23.4	1025.6	23.4	100.2
LL3-16	30	21783	1.0	13.5681	4.0	1.7485	5.2	0.1721	3.3	0.64	1023.5	31.3	1026.6	33.4	1033.3	80.2	1033.3	80.2	99.0
LL3-48	53	30185	1.2	13.5606	1.9	1.7241	2.9	0.1696	2.1	0.73	1009.7	19.6	1017.6	18.4	1034.4	39.3	1034.4	39.3	97.6
LL3-23	60	58569	0.8	13.5548	1.3	1.8144	2.4	0.1784	2.0	0.84	1058.1	19.8	1050.7	15.8	1035.3	26.5	1035.3	26.5	102.2
LL3-68	92	63109	2.1	13.5520	1.3	1.7660	3.8	0.1736	3.6	0.94	1031.8	34.2	1033.1	24.6	1035.7	25.5	1035.7	25.5	99.6
LL3-7	62	49513	2.3	13.5502	1.6	1.7497	1.9	0.1719	1.2	0.60	1022.8	10.9	1027.0	12.5	1036.0	31.4	1036.0	31.4	98.7
LL3-83	56	51081	2.3	13.5338	2.5	1.8150	3.1	0.1781	1.9	0.60	1056.9	18.4	1050.9	20.5	1038.4	50.5	1038.4	50.5	101.8
LL3-66	67	50302	1.4	13.5280	1.8	1.8790	3.4	0.1844	2.9	0.85	1090.7	28.7	1073.7	22.4	1039.3	36.5	1039.3	36.5	104.9
LL3-101	36	43689	0.9	13.5244	2.9	1.7349	3.3	0.1702	1.5	0.46	1013.1	14.1	1021.6	21.2	1039.8	59.0	1039.8	59.0	97.4
LL3-91	81	93499	1.6	13.4972	2.0	1.7930	2.1	0.1755	0.7	0.34	1042.4	6.9	1042.9	13.9	1043.9	40.5	1043.9	40.5	99.9
LL3-42	73	62909	0.9	13.4937	2.0	1.7236	2.6	0.1687	1.6	0.63	1004.9	15.0	1017.4	16.4	1044.4	40.0	1044.4	40.0	96.2
LL3-12	40	52842	0.5	13.4884	1.8	1.7667	1.9	0.1728	0.8	0.41	1027.7	7.5	1033.3	12.5	1045.2	35.5	1045.2	35.5	98.3
LL3-15	32	27058	0.9	13.4520	4.1	1.8026	4.2	0.1759	1.1	0.26	1044.4	10.5	1046.4	27.6	1050.7	82.5	1050.7	82.5	99.4
LL3-105	184	202097	8.9	13.4189	0.6	1.8437	1.0	0.1794	0.8	0.79	1063.9	8.1	1061.2	6.8	1055.6	12.8	1055.6	12.8	100.8
LL3-75	37	36010	1.1	13.3781	2.2	1.8683	2.7	0.1813	1.5	0.56	1073.9	15.1	1069.9	17.9	1061.8	44.8	1061.8	44.8	101.1
LL3-21	78	97661	0.7	13.3778	1.4	1.7980	1.9	0.1745	1.3	0.70	1036.6	12.7	1044.7	12.4	1061.8	27.4	1061.8	27.4	97.6
LL3-35	73	89277	2.0	13.3542	1.1	1.8669	1.5	0.1808	1.1	0.70	1071.4	10.6	1069.4	10.1	1065.4	22.0	1065.4	22.0	100.6
LL3-6	30	30126	1.1	13.3243	4.3	1.8262	5.0	0.1765	2.6	0.53	1047.7	25.4	1054.9	32.8	1069.9	85.5	1069.9	85.5	97.9
LL3-61	108	194816	1.6	13.2734	1.3	1.7292	2.0	0.1665	1.5	0.76	992.6	14.0	1019.5	12.8	1077.6	25.8	1077.6	25.8	92.1
LL3-37	189	216311	1.2	13.2154	0.9	1.8973	1.2	0.1819	0.8	0.68	1077.1	8.4	1080.2	8.2	1086.3	18.2	1086.3	18.2	99.1
LL3-102	31	21361	2.7	13.1649	3.4	1.7284	3.9	0.1650	2.0	0.51	984.7	18.4	1019.2	25.3	1094.0	67.7	1094.0	67.7	90.0
LL3-10	32	27547	0.8	13.1523	3.0	1.9128	3.5	0.1825	1.7	0.49	1080.4	17.0	1085.6	23.1	1095.9	60.5	1095.9	60.5	98.6
LL3-19	26	28029	3.2	13.1123	3.8	1.9433	5.6	0.1848	4.2	0.74	1093.2	42.1	1096.1	37.8	1102.0	75.7	1102.0	75.7	99.2
LL3-26	132	205544	2.3	12.9530	0.6	2.0561	1.3	0.1932	1.2	0.90	1138.4	12.0	1134.3	8.8	1126.4	11.4	1126.4	11.4	101.1
LL3-20	110	104390	2.0	12.9200	0.7	2.0864	2.6	0.1955	2.5	0.97	1151.1	26.5	1144.3	17.9	1131.5	13.3	1131.5	13.3	101.7
LL3-77	24	31597	1.5	12.9167	3.5	1.8622	4.5	0.1745	2.8	0.62	1036.6	26.6	1067.8	29.5	1132.0	69.5	1132.0	69.5	91.6
LL3-3	80	63808	1.4	12.8412	1.3	2.1780	2.0	0.2028	1.5	0.77	1190.6	16.6	1174.1	13.9	1143.6	25.5	1143.6	25.5	104.1
LL3-78	84	141957	0.9	12.8318	1.2	2.1254	1.9	0.1978	1.4	0.76	1163.5	15.4	1157.1	13.1	1145.1	24.3	1145.1	24.3	101.6
LL3-36	54	39419	2.9	12.7875	2.3	2.1242	2.6	0.1970	1.2	0.46	1159.2	12.6	1156.7	17.9	1152.0	45.8	1152.0	45.8	100.6
LL3-71	101	103042	1.1	12.7358	0.6	2.1427	1.6	0.1979	1.5	0.92	1164.1	15.6	1162.7	11.0	1160.0	12.2	1160.0	12.2	100.4
LL3-18	70	117637	2.9	12.7288	1.1	2.1350	1.9	0.1971	1.5	0.81	1159.7	16.0	1160.2	12.8	1161.1	21.4	1161.1	21.4	99.9
LL3-70	81	45866	2.8	12.7059	1.0	2.2126	1.9	0.2039	1.5	0.84	1196.2	16.9	1185.0	12.9	1164.7	20.2	1164.7	20.2	102.7
LL3-2	56	45454	1.4	12.6884	2.4	2.1729	3.0	0.2000	1.8	0.60	1175.1	19.4	1172.4	21.1	1167.4	48.3	1167.4	48.3	100.7
LL3-38	75	89510	1.2	12.6250	1.5	2.1686	1.9	0.1986	1.2	0.62	1167.6	12.8	1171.0	13.4	1177.4	30.0	1177.4	30.0	99.2
LL3-40	44	36000	1.3	12.5955	3.2	2.1780	3.4	0.1990	1.1	0.34	1169.7	12.2	1174.0	23.6	1182.0	63.1	1182.0	63.1	99.0
LL3-11	81	49997	2.0	12.5862	1.1	2.2266	2.5	0.2032	2.3	0.90	1192.7	24.5	1189.4	17.5	1183.4	21.7	1183.4	21.7	100.8
LL3-95	32	40604	0.6	12.5800	7.3	2.1087	7.5	0.1924	1.6	0.22	1134.3	17.1	1151.7	51.7	1184.4	144.7	1184.4	144.7	95.8
LL3-62	63	73501	2.9	12.5796	1.5	2.1680	1.9	0.1978	1.2	0.60	1163.5	12.3	1170.8	13.4	1184.5	30.6	1184.5	30.6	98.2
LL3-14	190	209433	1.9	12.5761	0.6	2.2341	1.2	0.2038	1.1	0.88	1195.6	11.7	1191.8	8.6	1185.0	11.4	1185.0	11.4	100.9
LL3-51	269	181550	1.4	12.3622	0.8	2.3125	2.2	0.2073	2.0	0.92	1214.6	22.0	1216.1	15.3	1218.8	16.4	1218.8	16.4	99.7
LL3-4	36	31293	2.7	12.3259	1.8	2.3643	2.4	0.2114	1.6	0.68	1236.0	18.4	1231.9	17.1	1224.6	34.4	1224.6	34.4	100.9
LL3-22	86	152835	0.9	12.2137	1.4	2.4168	1.9	0.2141	1.3	0.67	1250.6	14.6	1247.6	13.9	1242.5	28.3	1242.5	28.3	100.6
LL3-93	34	19716	1.2	12.0322	2.1	2.4702	2.5	0.2156	1.3	0.53	1258.4	15.2	1263.4	18.3	1271.8	41.8	1271.8	41.8	98.9
LL3-54	177	47514	1.4	11.9979	0.7	2.5886	2.0	0.2253	1.9	0.94	1309.6	22.4	1297.4	14.8	1277.4	13.7	1277.4	13.7	102.5
LL3-97	209	235622	2.3	11.8431	0.3	2.5744	0.9	0.2211	0.9	0.93	1287.8	10.1	1293.4	6.8	1302.6	6.5	1302.6	6.5	98.9
LL3-27	162	210461	6.8	11.8188	0.4	2.7062	1.7	0.2320	1.6	0.96	1344.8	19.3	1330.2	12.3	1306.6	8.6	1306.6	8.6	102.9
LL3-45	71	69727	1.3	11.7103	0.8	2.6728	1.1	0.2270	0.7	0.66	1318.8	8.6	1321.0	8.1	1324.5	16.1	1324.5	16.1	99.6
LL3-13	59	65095	1.6	11.1252	1.3	3.0465	2.0	0.2458	1.5	0.75	1416.8	18.6	1419.3	14.9	1423.1	24.6	1423.1	24.6	99.6
LL3-47	166	449086	1.9	11.0195	0.3	3.1627	1.7	0.2528	1.6	0.98	1452.7	21.3	1448.1	12.9	1441.3	5.9	1441.3	5.9	100.8
LL3-82	112	89995	1.7	10.9536	0.7	3.2055	2.9	0.2547	2.8	0.97	1462.4	37.0	1458.5	22.5	1452.7	12.9	1452.7	12.9	100.7
LL3-46	118	202697	2.9	10.9485	1.6	3.3225	2.4	0.2638	1.8	0.76	1509.4	24.9	1486.4	19.1	1453.6	30.5	1453.6	30.5	103.8
LL3-29	65	233979	1.9	10.8227	1.4	3.2491	1.9	0.2550	1.3	0.67	1464.4	16.8	1469.0	14.8	1475.6	26.8	1475.6	26.8	99.2
LL3-73	194	162231	1.5	10.7852	0.8	3.2215	2.4	0.2520	2.3	0.95	1448.7	29.8	1462.3	18.8	1482.2	14.6	1482.2	14.6	97.7
LL3-94	81	122061	1.0	10.5134	1.1	3.4579	2.8	0.2637	2.6	0.92	1508.6	35.1	1517.7	22.3	1530.4	20.4	1530.4	20.4	98.6
LL3-53	326	358297	2.5	10.4084	0.1	3.5193	1.0	0.2657	1.0	0.99	1518.8	13.5	1531.6	8.0	1549.2	2.7	1549.2	2.7	98.0
LL3-33	33	27406	0.9	10.0026	1.9	3.9425	2.9	0.2860	2.3	0.77	1621.6	32.6	1622.4	23.9	1623.6	34.8	1623.6	34.8	99.9
LL3-32	116	221662	0.6	9.8781	0.4	4.0652	2.5	0.2912	2.4	0.98	1647.7	35.4	1647.3	20.2	1646.8	8.3	1646.8	8.3	100.1
LL3-74	82	111292	1.6	9.8593	0.8	4.1118	1.5	0.2940	1.3	0.86	1661.6	18.7	1656.6	12.2	1650.4	14.3	1650.4	14.3	100.7
LL3-30	56	161091	2.6	9.8430	1.3	4.1391	1.7	0.2955	1.1	0.66	1668.9	16.4	1662.1	13.9	1653.4	23.7	1653.4	23.7	100.9
LL3-88	35	54402	1.0	9.8183	1.5	4.0875	1.9	0.2911	1.1	0.60	1646.9	16.5	1651.8	15.4	1658.1	27.9	1658.1	27.9	99.3
LL3-67	106	267517	1.0	9.7443	0.6	4.2522	2.3	0.3005	2.2	0.97	1693.9	32.7	1684.2	18.7	1672.1	11.0	1672.1	11.0	101.3
LL3-96	146	510156	1.6	9.6466	0.4	4.2736	2.3	0.2990	2.2	0.98	1686.3	33.1	1688.3	18.6	1690.7	7.4	1690.7	7.4	99.7
LL3-63	12	15322	0.4	9.0055	2.3	4.7714	3.0	0.3116	2.0	0.64	1748.8	30.0	1779.9	25.5	1816.6	42.2	1816.6	42.2	96.3
LL3-59	76	94355	0.7	8.9136	0.5	5.0297	1.3	0.3252	1.2	0.93	1814.9	19.3	1824.3	11.1	1835.1	8.6	1835.1	8.6	98.9
LL3-50	49	138802	0.6	8.8426	1.0	5.1774	1.2	0.3320	0.7	0.55	1848.3	10.5	1848.9	10.2	1849.6	18.1	1849.6	18.1	99.9
LL3-39	59	84050	1.0	8.8253	0.8	5.2857	1.2	0.3383	0.9	0.73	1878.6	14.7	1866.6	10.5	1853.2	15.2	1853.2	15.2	101.4
LL3-1	3	17120	2.6	5.5403	8.7	12.3696	9.5	0.4970	3.9	0.41	2601.0	82.4	2632.9	89.5	2657.4	144.4	2657.4	144.4	97.9
LL3-79	51	163685	0.8	5.4675	0.5	13.0607	1.6	0.5179	1.5	0.94	2690.3	32.7	2684.0	14.9	2679.3	8.6	2679.3	8.6	100.4
LL3-8	83	421204	1.0	5.4073	0.5	13.3263	1.0	0.5226	0.8	0.87	2710.3	18.3	2703.0	9.0	2697.6	7.7	2697.6	7.7	100.5
LL3-87	79	338604	1.4	5.3938	0.3	12.6766	2.3	0.4959	2.3	0.99	2596.2	49.6	2655.9	22.0	2701.8	4.7	2701.8	4.7	96.1

LL4 (1AA/02-13-086-07W4/00)

Analysis	U	206Pb	U/Th	206Pb*	±	207Pb*	±	206Pb*	±	error	206Pb*	±	207Pb*	±	206Pb*	±	Best age	±	Conc
	(ppm)	204Pb		207Pb*	(%)	235U*	(%)	238U	(%)	corr.	238U*	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	(%)
LL4-1	63	62301	2.2	12.9540	2.5	1.9757	7.0	0.1856	6.5	0.93	1097.6	65.8	1107.2	47.2	1126.3	50.5	1126.3	50.5	97.5
LL4-2	67	117642	1.3	13.3838	2.0	1.8311	3.2	0.1777	2.5	0.78	1054.6	24.1	1056.7	20.9	1060.9	40.5	1060.9	40.5	99.4
LL4-3	109	71952	1.5	11.7074	0.7	2.6822	1.7	0.2277	1.6	0.91	1322.7	18.7	1323.6	12.7	1325.0	13.6	1325.0	13.6	99.8
LL4-4	133	190377	2.6	13.1525	1.1	1.8551	1.8	0.1770	1.5	0.81	1050.4	14.5	1065.3	12.1	1095.9	21.4	1095.9	21.4	95.8
LL4-5	119	70013	2.4	13.3682	1.2	1.8016	1.7	0.1747	1.2	0.68	1037.8	11.2	1046.0	11.1	1063.3	25.0	1063.3	25.0	97.6
LL4-6	31	24000	0.8	13.4619	4.7	1.7936	4.8	0.1751	1.1	0.23	1040.2	10.7	1043.1	31.3	1049.2	94.1	1049.2	94.1	99.1
LL4-7	86	38964	2.9	13.9159	1.6	1.6986	2.5	0.1714	1.9	0.78	1020.0	18.3	1008.0	15.9	982.0	31.6	982.0	31.6	103.9
LL4-8	81	55032	1.6	12.8481	1.3	2.1146	5.0	0.1970	4.8	0.97	1159.4	51.2	1153.6	34.5	1142.6	25.9	1142.6	25.9	101.5
LL4-9	59	36698	1.7	13.0651	2.3	1.9965	2.8	0.1892	1.6	0.59	1117.0	16.9	1114.3	19.0	1109.2	45.6	1109.2	45.6	100.7
LL4-10	76	76186	1.9	9.8628	0.7	4.0442	2.0	0.2893	1.9	0.94	1638.0	27.9	1643.1	16.6	1649.7	12.4	1649.7	12.4	99.3
LL4-11	165	154970	2.1	9.8017	0.6	4.0617	1.6	0.2887	1.5	0.93	1635.2	21.0	1646.7	12.7	1661.2	10.4	1661.2	10.4	98.4
LL4-12	264	109281	2.0	17.7866	2.8	0.5175	3.3	0.0668	1.8	0.53	416.6	7.2	423.5	11.6	461.1	62.7	416.6	7.2	90.3
LL4-13	41	22734	1.5	13.8882	4.1	1.7249	4.5	0.1737	2.0	0.44	1032.7	18.7	1017.8	29.0	986.0	82.6	986.0	82.6	104.7
LL4-14	157	55683	1.1	17.0926	2.0	0.7121	2.5	0.0883	1.5	0.59	545.3	7.9	546.0	10.7	548.7	44.8	545.3	7.9	99.4
LL4-15	25	25618	0.8	13.2403	4.0	1.9140	4.4	0.1838	1.8	0.41	1087.7	18.0	1086.0	29.3	1082.6	80.3	1082.6	80.3	100.5
LL4-16	44	46081	1.6	11.8454	3.8	2.5809	4.2	0.2217	1.8	0.43	1291.0	21.3	1295.2	30.9	1302.3	74.1	1302.3	74.1	99.1
LL4-17	266	69899	1.1	17.5841	1.0	0.5894	1.8	0.0752	1.5	0.85	467.2	7.0	470.5	6.8	486.5	21.0	467.2	7.0	96.0
LL4-18	122	95807	1.4	13.6213	1.5	1.7745	2.8	0.1753	2.3	0.84	1041.3	22.6	1036.2	18.1	1025.4	30.6	1025.4	30.6	101.5
LL4-19	181	110583	1.0	18.1493	2.2	0.5550	2.4	0.0731	1.0	0.41	454.5	4.3	448.2	8.8	416.2	49.6	454.5	4.3	109.2
LL4-20	70	45809	2.3	12.8143	2.2	2.0663	2.7	0.1920	1.6	0.58	1132.4	16.5	1137.7	18.7	1147.8	44.1	1147.8	44.1	98.7
LL4-22	39	47618	2.4	9.6287	1.7	4.1948	2.4	0.2929	1.7	0.70	1656.2	25.1	1673.0	20.1	1694.1	32.1	1694.1	32.1	97.8
LL4-23	117	810393	2.4	4.7860	0.1	16.2337	1.5	0.5635	1.4	1.00	2881.0	33.6	2890.7	13.9	2897.4	2.3	2897.4	2.3	99.4
LL4-24	55	109245	1.3	12.1403	2.2	2.4607	3.0	0.2167	1.9	0.65	1264.2	22.2	1260.6	21.4	1254.3	43.9	1254.3	43.9	100.8
LL4-25	44	82160	193.3	7.6632	0.9	6.6798	4.4	0.3713	4.3	0.98	2035.3	75.6	2069.9	39.0	2104.6	15.4	2104.6	15.4	96.7
LL4-26	18	19467	1.2	12.7116	9.8	2.1753	10.2	0.2005	2.6	0.26	1178.3	28.5	1173.2	70.8	1163.8	194.9	1163.8	194.9	101.2
LL4-27	19	12831	1.4	13.1155	6.8	1.7350	7.2	0.1650	2.5	0.34	984.7	22.7	1021.6	46.5	1101.5	135.7	1101.5	135.7	89.4
LL4-28	100	123740	1.3	11.4205	1.2	2.8282	1.8	0.2343	1.3	0.74	1356.8	16.5	1363.1	13.6	1372.9	23.3	1372.9	23.3	98.8
LL4-29	17	24070	1.5	13.8746	9.8	1.6430	10.5	0.1653	3.8	0.36	986.3	34.6	986.9	66.5	988.0	200.0	988.0	200.0	99.8
LL4-30	41	22888	1.7	13.8134	3.9	1.7038	4.4	0.1707	2.0	0.46	1016.0	19.0	1010.0	28.2	997.0	79.6	997.0	79.6	101.9
LL4-31	535	119765	2.4	20.1182	2.0	0.1809	2.2	0.0264	0.9	0.39	167.9	1.4	168.8	3.4	181.3	47.6	167.9	1.4	NA
LL4-32	292	27819	1.2	20.3649	5.2	0.1789	5.4	0.0264	1.6	0.29	168.1	2.6	167.1	8.4	152.8	122.1	168.1	2.6	NA
LL4-33	103	148543	2.1	11.9943	1.2	2.5300	1.9	0.2201	1.4	0.77	1282.3	16.8	1280.7	13.8	1277.9	23.7	1277.9	23.7	100.3
LL4-34	87	101014	1.5	10.9544	0.8	3.2014	2.4	0.2543	2.3	0.94	1460.9	30.0	1457.5	18.9	1452.6	15.7	1452.6	15.7	100.6
LL4-35	78	41863	1.6	13.2397	1.9	1.8987	3.0	0.1823	2.4	0.79	1079.7	23.9	1080.6	20.2	1082.7	37.2	1082.7	37.2	99.7
LL4-36	71	84965	7.8	12.1570	1.0	2.3260	1.5	0.2051	1.1	0.73	1202.6	12.1	1220.3	10.8	1251.7	20.3	1251.7	20.3	96.1
LL4-38	36	38647	2.2	12.3968	3.5	2.3236	4.1	0.2089	2.0	0.50	1223.0	22.8	1219.5	28.9	1213.3	69.1	1213.3	69.1	100.8
LL4-39	90	225258	2.9	8.8060	0.6	5.2384	2.1	0.3346	2.0	0.96	1860.5	32.6	1858.9	18.0	1857.1	11.2	1857.1	11.2	100.2
LL4-41	28	17058	0.8	13.5836	3.1	1.7418	3.2	0.1716	1.0	0.32	1020.9	9.9	1024.1	20.9	1031.0	62.1	1031.0	62.1	99.0
LL4-42	49	14200	0.7	18.8560	15.0	0.5418	15.8	0.0741	4.8	0.30	460.8	21.2	439.6	56.3	330.2	342.3	460.8	21.2	139.5
LL4-43	409	240783	1.9	12.9592	0.4	2.0144	2.8	0.1893	2.8	0.99	1117.8	28.5	1120.4	19.1	1125.5	7.7	1125.5	7.7	99.3
LL4-44	103	74506	1.8	14.2367	1.5	1.5424	2.2	0.1593	1.6	0.74	952.7	14.5	947.5	13.7	935.4	30.7	935.4	30.7	101.8
LL4-45	277	65705	10.1	18.3139	2.3	0.4919	2.9	0.0653	1.7	0.59	408.0	6.8	406.2	9.7	396.0	52.5	408.0	6.8	103.0
LL4-46	88	132092	1.0	10.9696	1.0	3.3012	3.7	0.2626	3.6	0.96	1503.3	47.9	1481.3	28.9	1450.0	19.3	1450.0	19.3	103.7
LL4-47	103	190645	1.8	11.4595	0.8	2.8052	1.5	0.2331	1.2	0.83	1351.0	14.8	1356.9	10.9	1366.3	15.5	1366.3	15.5	98.9
LL4-48	65	34655	1.1	12.8167	1.9	2.1036	2.3	0.1955	1.4	0.59	1151.3	14.6	1150.0	16.0	1147.5	37.3	1147.5	37.3	100.3
LL4-49	74	67065	2.5	10.7258	1.5	3.2124	2.1	0.2499	1.5	0.72	1437.9	19.8	1460.2	16.6	1492.6	28.3	1492.6	28.3	96.3
LL4-50	51	73170	1.7	13.3409	2.4	1.8585	2.7	0.1798	1.3	0.46	1066.0	12.3	1066.5	17.8	1067.4	48.1	1067.4	48.1	99.9
LL4-51	55	83387	0.9	13.6052	2.8	1.7573	3.2	0.1734	1.6	0.49	1030.8	14.9	1029.9	20.8	1027.8	56.8	1027.8	56.8	100.3
LL4-52	105	63806	2.3	13.7017	1.5	1.7612	2.0	0.1750	1.4	0.70	1039.7	13.5	1031.3	13.1	1013.5	29.5	1013.5	29.5	102.6
LL4-53	67	60555	2.0	14.0008	1.4	1.5877	2.1	0.1612	1.6	0.75	963.5	14.1	965.4	13.0	969.6	28.1	969.6	28.1	99.4
LL4-54	52	87827	1.1	9.3579	1.5	4.6076	2.4	0.3127	1.9	0.78	1754.1	28.6	1750.6	19.9	1746.5	27.4	1746.5	27.4	100.4
LL4-55	28	31561	2.8	13.5839	5.9	1.8435	6.1	0.1816	1.6	0.26	1075.8	15.8	1061.1	40.0	1031.0	118.5	1031.0	118.5	104.4
LL4-56	81	28003	1.0	18.1370	3.8	0.5814	4.1	0.0765	1.5	0.36	475.1	6.8	465.4	15.2	417.7	84.8	475.1	6.8	113.7
LL4-57	26	21984	2.0	13.8863	7.8	1.7180	8.0	0.1730	1.8	0.22	1028.8	16.7	1015.3	51.7	986.3	160.0	986.3	160.0	104.3
LL4-58	78	76379	1.5	12.7730	1.2	2.1387	2.2	0.1981	1.9	0.85	1165.2	20.2	1161.4	15.5	1154.2	23.7	1154.2	23.7	101.0
LL4-59	359	380859	3.1	13.4036	0.2	1.8902	1.5	0.1837	1.5	0.99	1087.4	15.2	1077.6	10.2	1057.9	4.9	1057.9	4.9	102.8
LL4-60	23	14968	1.2	13.9382	6.7	1.6644	7.5	0.1682	3.4	0.45	1002.5	31.4	995.0	47.8	978.7	137.3	978.7	137.3	102.4
LL4-61	100	61373	2.2	11.4167	0.9	2.8280	5.3	0.2342	5.2	0.99	1356.3	64.2	1363.0	39.9	1373.5	17.1	1373.5	17.1	98.7
LL4-62	115	275134	2.4	5.4828	0.2	13.0484	0.9	0.5189	0.9	0.96	2694.4	19.9	2683.2	8.8	2674.7	4.1	2674.7	4.1	100.7
LL4-63	72	55599	2.1	13.9143	1.6	1.6337	2.4	0.1649	1.8	0.74	983.8	16.0	983.3	14.9	982.2	32.2	982.2	32.2	100.2
LL4-64	71	58626	1.8	13.7797	2.0	1.6734	3.1	0.1672	2.4	0.78	996.9	22.4	998.5	19.8	1002.0	39.6	1002.0	39.6	99.5
LL4-65	82	41348	1.7	13.7124	2.3	1.7326	2.7	0.1723	1.4	0.52	1024.8	13.1	1020.7	17.2	1011.9	46.3	1011.9	46.3	101.3
LL4-66	45	27893	0.8	13.3011	4.4	1.7414	5.8	0.1680	3.8	0.66	1001.0	35.4	1024.0	37.5	1073.4	88.3	1073.4	88.3	93.3
LL4-67	188	82777	2.9	17.9544	1.7	0.5436	3.6	0.0708	3.2	0.88	440.9	13.6	440.8	13.0	440.3	38.3	440.9	13.6	100.1
LL4-68	40	52310	1.4	9.8524	3.0	4.0478	3.5	0.2892	1.8	0.51	1637.7	25.6	1643.9	28.4	1651.7	55.8	1651.7	55.8	99.2
LL4-69	106	59279	1.8	12.9951	1.0	2.0309	1.8	0.1914	1.5	0.84	1129.0	15.4	1125.9	12.1	1120.0	19.1	1120.0	19.1	100.8
LL4-70	88	28819	0.8	16.4702	3.8	0.8176	4.1	0.0977	1.5	0.37	600.7	8.5	606.7	18.5	629.2	81.3	600.7	8.5	95.5
LL4-71	72	22722	1.9	18.4448	9.2	0.4621	9.6	0.0618	2.5	0.27	386.6	9.5	385.7	30.7	380.0	207.6	386.6	9.5	NA
LL4-73	131	47811	3.2	13.1943	0.7	1.9342	1.6	0.1851	1.4	0.88	1094.7	13.8	1093.0	10.4	1089.5	14.7	1089.5	14.7	100.5
LL4-75	71	53620	1.6	12.6810	2.1	2.1449	2.2	0.1973	0.9	0.39	1160.7	9.2	1163.4	15.5	1168.6	40.9	1168.6	40.9	99.3
LL4-76	80	70128	1.6	14.2589	2.2	1.5052	2.7	0.1557	1.6	0.60	932.6	14.0	932.5	16.5	932.2	44.5	932.2	44.5	100.0
LL4-77	103	52397	4.0	12.6987	1.3	2.1379	2.0	0.1969	1.5	0.77	1158.7	16.0	1161.2	13.6	1165.8	24.9	1165.8	24.9	99.4
LL4-78	88	43942	2.5	14.0048	1.5	1.5995	2.6	0.1625	2.1	0.81	970.5	18.8	970.0	16.0	969.0	30.5	969.0	30.5	100.2
LL4-79	58	39105	1.1	17.5294	9.6	0.5966	9.7	0.0759	1.5	0.16	471.3	6.8	475.1	36.7	493.4	211.2	471.3	6.8	95.5
LL4-81	182	344059	0.6	10.7416	0.6	3.3483	1.1	0.2609	0.9	0.82	1494.2	11.7	1492.4	8.4	1489.8	11.7	1489.8	11.7	100.3
LL4-82	134	139921	2.7	12.8937	2.3	2.0921	2.6	0.1956	1.2	0.48	1151.8	12.9	1146.2	17.7	1135.5	45.2	1135.5	45.2	101.4
LL4-83	75	109933	0.9	9.9190	0.9	4.0478	2.1	0.2912	1.9	0.90	1647.5	27.0	1643.9	16.8	1639.2	16.8	1639.2	16.8	100.5
LL4-84	42	42619	0.9	12.4038	3.1	2.3227	3.5	0.2090	1.8	0.50	1223.2	19.6	1219.2	25.1	1212.2	60.5	1212.2	60.5	100.9
LL4-85	64	6394	2.3	9.5689	2.8	4.1483	3.6	0.2879	2.2	0.61	1631.0	31.6	1663.9	29.4	1705.6	52.4	1705.6	52.4	95.6
LL4-86	136	187400	2.7	13.6882	1.3	1.7435	1.8	0.1731	1.2	0.67	1029.1	11.3	1024.8	11.5	1015.5	26.6	1015.5	26.6	101.3
LL4-87	77	64504	2.2	12.0558	1.5	2.4683	2.2	0.2158	1.6	0.72	1259.7	18.0	1262.8	15.8	1268.0	29.6	1268.0	29.6	99.3
LL4-88	90	229528	0.9	5.4745	0.3	12.9045	1.3	0.5124	1.2	0.97	2666.8	26.9	2672.7	12.0	2677.2	5.3	2677.2	5.3	99.6
LL4-89	97	81128	1.1	8.9721	0.7	4.9691	1.4	0.3234	1.1	0.84	1806.1	18.0	1814.1	11.5	1823.3	13.5	1823.3	13.5	99.1
LL4-90	49	31664	0.5	13.1381	1.3	1.8430	2.3	0.1756	2.0	0.83	1043.0	18.9	1060.9	15.5	1098.1	25.9	1098.1	25.9	95.0
LL4-92	96	107227	1.2	12.4845	1.1	2.2838	3.1	0.2068	2.9	0.93	1211.7	31.5	1207.3	21.7	1199.4	22.2	1199.4	22.2	101.0
LL4-93	69	17164	1.2	19.0561	6.5	0.4975	6.9	0.0688	2.3	0.34	428.7	9.7	410.0	23.4	306.2	148.7	428.7	9.7	140.0
LL4-95	112	99007	1.4	13.1274	0.8	1.9172	2.0	0.1825	1.8	0.91	1080.8	18.3	1087.1	13.5	1099.7	16.6	1099.7	16.6	98.3
LL4-96	156	41011	0.9	17.7997	3.4	0.5595	4.2	0.0722	2.4	0.58	449.6	10.5	451.2	15.2	459.5	75.7	449.6	10.5	97.8
LL4-97	52	31662	1.7	13.8409	2.8	1.7119	3.3	0.1718	1.6	0.50	1022.3	15.6	1013.0	21.0	993.0	57.7	993.0	57.7	103.0
LL4-98	23	14458	1.4	13.2261	4.2	1.7764	4.9	0.1704	2.5	0.51	1014.3	23.4	1036.9	31.8	1084.7	84.5	1084.7	84.5	93.5
LL4-99	126	51808	3.1	13.7162	2.0	1.7077	2.6	0.1699	1.7	0.64	1011.5	15.6	1011.4	16.7	1011.3	41.0	1011.3	41.0	100.0
LL4-100	104	77734	2.4	13.3703	1.6	1.8962	1.9	0.1839	1.1	0.54	1088.1	10.5	1079.8	12.9	1062.9	33.0	1062.9	33.0	102.4
LL4-101	45	18265	1.0	18.6570	8.6	0.5716	8.9	0.0773	2.6	0.29	480.2	12.1	459.0	33.1	354.2	193.5	480.2	12.1	135.6
LL4-102	41	34149	1.7	10.9930	1.8	3.1621	2.4	0.2521	1.6	0.65	1449.4	20.6	1448.0	18.7	1445.9	34.9	1445.9	34.9	100.2
LL4-103	97	65179	1.4	13.2806	1.1	1.8966	2.5	0.1827	2.3	0.89	1081.6	22.5	1079.9	16.8	1076.5	23.0	1076.5	23.0	100.5
LL4-104	44	13020	1.9	18.1206	17.9	0.4935	18.1	0.0649	2.8	0.15	405.1	10.8	407.3	60.8	419.7	402.5	405.1	10.8	96.5
LL4-105	36	11642	0.9	17.7261	19.3	0.5241	19.9	0.0674	4.7	0.24	420.4	19.1	427.9	69.4	468.7	430.7	420.4	19.1	89.7
LL4-106	229	154288	2.5	12.2271	0.3	2.4192	2.0	0.2145	2.0	0.99	1252.9	22.6	1248.3	14.4	1240.4	6.1	1240.4	6.1	101.0

Kolmogorov-Smirnov (K-S) statistics

Analysis run on: Wednesday, Feb 27, 2013 @ 11:02:04 AM. Version: 1.0.

K-S P-values using error in the CDF

	CW-1	CW-2	CW-3	KE-1	KE-2	KE-3	KE-4	LA-1	LA-2	LA-3	LA-4	LB-1	LB-2	LB-3	LB-4	LL-2	LL-3	LL-4
CW-1		0.764	0.458	0.038	0.274	0.249	0.318	0.000	0.697	0.847	0.216	0.202	0.270	0.860	0.033	0.897	0.085	0.051
CW-2	0.764		0.027	0.330	0.044	0.899	0.989	0.000	0.850	0.554	0.138	0.879	0.831	0.747	0.104	0.999	0.532	0.228
CW-3	0.458	0.027		0.001	0.315	0.003	0.010	0.000	0.058	0.198	0.924	0.010	0.003	0.432	0.000	0.096	0.002	0.001
KE-1	0.038	0.330	0.001		0.007	0.866	0.295	0.000	0.460	0.086	0.004	0.956	0.167	0.066	0.923	0.407	0.757	0.987
KE-2	0.274	0.044	0.315	0.007		0.025	0.019	0.004	0.158	0.174	0.769	0.016	0.003	0.310	0.000	0.161	0.001	0.001
KE-3	0.249	0.899	0.003	0.866	0.025		0.966	0.000	0.840	0.330	0.018	0.777	0.905	0.277	0.484	0.766	0.916	0.739
KE-4	0.318	0.989	0.010	0.295	0.019	0.966		0.000	0.976	0.488	0.058	0.387	0.999	0.419	0.194	0.961	0.734	0.436
LA-1	0.000	0.000	0.000	0.000	0.004	0.000	0.000		0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LA-2	0.697	0.850	0.058	0.460	0.158	0.840	0.976	0.000		0.478	0.051	0.231	0.722	0.742	0.261	0.945	0.418	0.368
LA-3	0.847	0.554	0.198	0.086	0.174	0.330	0.488	0.000	0.478		0.466	0.149	0.405	1.000	0.025	0.626	0.193	0.054
LA-4	0.216	0.138	0.924	0.004	0.769	0.018	0.058	0.001	0.051	0.466		0.016	0.015	0.290	0.001	0.141	0.006	0.003
LB-1	0.202	0.879	0.010	0.956	0.016	0.777	0.387	0.000	0.231	0.149	0.016		0.159	0.186	0.571	0.748	0.667	0.810
LB-2	0.270	0.831	0.003	0.167	0.003	0.905	0.999	0.000	0.722	0.405	0.015	0.159		0.239	0.218	0.581	0.805	0.440
LB-3	0.860	0.747	0.432	0.066	0.310	0.277	0.419	0.000	0.742	1.000	0.290	0.186	0.239		0.033	0.840	0.118	0.074
LB-4	0.033	0.104	0.000	0.923	0.000	0.484	0.194	0.000	0.261	0.025	0.001	0.571	0.218	0.033		0.180	0.903	1.000
LL-2	0.897	0.999	0.096	0.407	0.161	0.766	0.961	0.000	0.945	0.626	0.141	0.748	0.581	0.840	0.180		0.303	0.253
LL-3	0.085	0.532	0.002	0.757	0.001	0.916	0.734	0.000	0.418	0.193	0.006	0.667	0.805	0.118	0.903	0.303		1.000
LL-4	0.051	0.228	0.001	0.987	0.001	0.739	0.436	0.000	0.368	0.054	0.003	0.810	0.440	0.074	1.000	0.253	1.000	

K-S P-values for no error

	CW-1	CW-2	CW-3	KE-1	KE-2	KE-3	KE-4	LA-1	LA-2	LA-3	LA-4	LB-1	LB-2	LB-3	LB-4	LL-2	LL-3	LL-4
CW-1		0.544	0.363	0.023	0.179	0.138	0.242	0.000	0.507	0.749	0.039	0.075	0.187	0.848	0.011	0.754	0.038	0.018
CW-2	0.544		0.018	0.189	0.028	0.565	0.877	0.000	0.465	0.401	0.056	0.717	0.695	0.532	0.031	0.846	0.241	0.091
CW-3	0.363	0.018		0.000	0.315	0.002	0.006	0.000	0.043	0.145	0.454	0.005	0.002	0.339	0.000	0.063	0.001	0.000
KE-1	0.023	0.189	0.000		0.001	0.698	0.155	0.000	0.342	0.025	0.001	0.630	0.104	0.013	0.675	0.138	0.599	0.740
KE-2	0.179	0.028	0.315	0.001		0.010	0.011	0.002	0.034	0.136	0.597	0.012	0.002	0.274	0.000	0.061	0.001	0.000
KE-3	0.138	0.565	0.002	0.698	0.010		0.450	0.000	0.698	0.183	0.006	0.778	0.669	0.082	0.165	0.608	0.851	0.405
KE-4	0.242	0.877	0.006	0.155	0.011	0.450		0.000	0.591	0.279	0.031	0.150	0.959	0.198	0.043	0.748	0.451	0.070
LA-1	0.000	0.000	0.000	0.000	0.002	0.000	0.000		0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LA-2	0.507	0.465	0.043	0.342	0.034	0.698	0.591	0.000		0.123	0.017	0.157	0.691	0.454	0.192	0.941	0.406	0.323
LA-3	0.749	0.401	0.145	0.025	0.136	0.183	0.279	0.000	0.123		0.348	0.075	0.302	0.895	0.004	0.328	0.054	0.017
LA-4	0.039	0.056	0.454	0.001	0.597	0.006	0.031	0.001	0.017	0.348		0.005	0.007	0.046	0.000	0.016	0.002	0.001
LB-1	0.075	0.717	0.005	0.630	0.012	0.778	0.150	0.000	0.157	0.075	0.005		0.129	0.139	0.277	0.643	0.567	0.375
LB-2	0.187	0.695	0.002	0.104	0.002	0.669	0.959	0.000	0.691	0.302	0.007	0.129		0.194	0.080	0.565	0.494	0.176
LB-3	0.848	0.532	0.339	0.013	0.274	0.082	0.198	0.000	0.454	0.895	0.046	0.139	0.194		0.005	0.641	0.062	0.006
LB-4	0.011	0.031	0.000	0.675	0.000	0.165	0.043	0.000	0.192	0.004	0.000	0.277	0.080	0.005		0.097	0.677	0.893
LL-2	0.754	0.846	0.063	0.138	0.061	0.608	0.748	0.000	0.941	0.328	0.016	0.643	0.565	0.641	0.097		0.263	0.174
LL-3	0.038	0.241	0.001	0.599	0.001	0.851	0.451	0.000	0.406	0.054	0.002	0.567	0.494	0.062	0.677	0.263		0.767
LL-4	0.018	0.091	0.000	0.740	0.000	0.405	0.070	0.000	0.323	0.017	0.001	0.375	0.176	0.006	0.893	0.174	0.767	

Average K-S P-values using Monte-Carlo

	CW-1	CW-2	CW-3	KE-1	KE-2	KE-3	KE-4	LA-1	LA-2	LA-3	LA-4	LB-1	LB-2	LB-3	LB-4	LL-2	LL-3	LL-4
CW-1		0.535	0.313	0.027	0.217	0.147	0.214	0.000	0.476	0.731	0.104	0.157	0.176	0.809	0.015	0.730	0.058	0.030
CW-2	0.535		0.017	0.154	0.033	0.572	0.774	0.000	0.559	0.413	0.058	0.549	0.652	0.519	0.045	0.802	0.256	0.124
CW-3	0.313	0.017		0.000	0.315	0.002	0.005	0.000	0.035	0.148	0.650	0.005	0.002	0.317	0.000	0.055	0.001	0.000
KE-1	0.027	0.154	0.000		0.002	0.542	0.187	0.000	0.368	0.033	0.001	0.614	0.106	0.034	0.759	0.245	0.578	0.869
KE-2	0.217	0.033	0.315	0.002		0.015	0.014	0.003	0.066	0.147	0.655	0.012	0.003	0.251	0.000	0.086	0.001	0.000
KE-3	0.147	0.572	0.002	0.542	0.015		0.679	0.000	0.738	0.183	0.007	0.662	0.617	0.144	0.281	0.568	0.780	0.494
KE-4	0.214	0.774	0.005	0.187	0.014	0.679		0.000	0.730	0.275		0.244	0.852	0.233	0.098	0.703	0.422	0.247
LA-1	0.000	0.000	0.000	0.000	0.003	0.000	0.000		0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LA-2	0.476	0.559	0.035	0.368	0.066	0.738	0.730	0.000		0.287	0.022	0.204	0.615	0.467	0.205	0.887	0.399	0.296
LA-3	0.731	0.413	0.148	0.033	0.147	0.183	0.275	0.000	0.287		0.303	0.104	0.307	0.895	0.009	0.443	0.076	0.027
LA-4	0.104	0.058	0.650	0.001	0.655	0.007		0.001	0.022	0.303		0.007	0.009	0.156	0.000	0.050	0.002	0.001
LB-1	0.157	0.549	0.005	0.614	0.012	0.662	0.244	0.000	0.204	0.104	0.007		0.115	0.122	0.311	0.582	0.546	0.513
LB-2	0.176	0.652	0.002	0.106	0.003	0.617	0.852	0.000	0.615	0.307	0.009	0.115		0.149	0.073	0.508	0.372	0.188
LB-3	0.809	0.519	0.317	0.034	0.251	0.144	0.233	0.000	0.467	0.895	0.156	0.122	0.149		0.014	0.641	0.065	0.030
LB-4	0.015	0.045	0.000	0.759	0.000	0.281	0.098	0.000	0.205	0.009	0.000	0.311	0.073	0.014		0.109	0.555	0.787
LL-2	0.730	0.802	0.055	0.245	0.086	0.568	0.703	0.000	0.887	0.443	0.050	0.582	0.508	0.641	0.109		0.282	0.195
LL-3	0.058	0.256	0.001	0.578	0.001	0.780	0.422	0.000	0.399	0.076	0.002	0.546	0.372	0.065	0.555	0.282		0.820
LL-4	0.030	0.124	0.000	0.869	0.000	0.494	0.247	0.000	0.296	0.027	0.001	0.513	0.188	0.030	0.787	0.195	0.820	

D-values using error in the CDF

	CW-1	CW-2	CW-3	KE-1	KE-2	KE-3	KE-4	LA-1	LA-2	LA-3	LA-4	LB-1	LB-2	LB-3	LB-4	LL-2	LL-3	LL-4
CW-1		0.093	0.124	0.200	0.139	0.145	0.139	0.365	0.101	0.087	0.150	0.150	0.143	0.085	0.203	0.081	0.177	0.192
CW-2	0.093		0.212	0.135	0.192	0.081	0.064	0.423	0.087	0.112	0.164	0.082	0.089	0.095	0.173	0.053	0.114	0.147
CW-3	0.124	0.212		0.289	0.139	0.268	0.243	0.305	0.195	0.157	0.080	0.235	0.265	0.127	0.308	0.179	0.267	0.289
KE-1	0.200	0.135	0.289		0.239	0.087	0.144	0.459	0.123	0.180	0.256	0.073	0.161	0.186	0.079	0.127	0.096	0.065
KE-2	0.139	0.192	0.139	0.239		0.210	0.220	0.247	0.160	0.156	0.094	0.217	0.255	0.135	0.304	0.157	0.279	0.285
KE-3	0.145	0.081	0.268	0.087	0.210		0.073	0.428	0.089	0.137	0.221	0.094	0.082	0.142	0.121	0.095	0.080	0.098
KE-4	0.139	0.064	0.243	0.144	0.220	0.073		0.443	0.071	0.123	0.195	0.131	0.053	0.128	0.159	0.073	0.100	0.127
LA-1	0.365	0.423	0.305	0.459	0.247	0.428	0.443		0.390	0.385	0.271	0.429	0.468	0.368	0.512	0.391	0.494	0.508
LA-2	0.101	0.087	0.195	0.123	0.160	0.089	0.071	0.390		0.121	0.195	0.147	0.100	0.097	0.146	0.075	0.126	0.132
LA-3	0.087	0.112	0.157	0.180	0.156	0.137	0.123	0.385	0.121		0.122	0.161	0.129	0.049	0.213	0.107	0.154	0.192
LA-4	0.150	0.164	0.080	0.256	0.094	0.221	0.195	0.271	0.195	0.122		0.220	0.225	0.140	0.280	0.164	0.245	0.260
LB-1	0.150	0.082	0.235	0.073	0.217	0.094	0.131	0.429	0.147	0.161	0.220		0.160	0.153	0.111	0.095	0.102	0.090
LB-2	0.143	0.089	0.265	0.161	0.255	0.082	0.053	0.468	0.100	0.129	0.225	0.160		0.148	0.152	0.111	0.092	0.125
LB-3	0.085	0.095	0.127	0.186	0.135	0.142	0.128	0.368	0.097	0.049	0.140	0.153	0.148		0.205	0.087	0.169	0.183
LB-4	0.203	0.173	0.308	0.079	0.304	0.121	0.159	0.512	0.146	0.213	0.280	0.111	0.152	0.205		0.156	0.081	0.047
LL-2	0.081	0.053	0.179	0.127	0.157	0.095	0.073	0.391	0.075	0.107	0.164	0.095	0.111	0.087	0.156		0.137	0.144
LL-3	0.177	0.114	0.267	0.096	0.279	0.080	0.100	0.494	0.126	0.154	0.245	0.102	0.092	0.169	0.081	0.137		0.047
LL-4	0.192	0.147	0.289	0.065	0.285	0.098	0.127	0.508	0.132	0.192	0.260	0.090	0.125	0.183	0.047	0.144	0.047	

D-values for no error

	CW-1	CW-2	CW-3	KE-1	KE-2	KE-3	KE-4	LA-1	LA-2	LA-3	LA-4	LB-1	LB-2	LB-3	LB-4	LL-2	LL-3	LL-4
CW-1		0.112	0.133	0.212	0.153	0.165	0.149	0.380	0.117	0.096	0.199	0.179	0.155	0.086	0.229	0.095	0.199	0.217
CW-2	0.112		0.221	0.154	0.204	0.112	0.085	0.430	0.121	0.127	0.189	0.097	0.101	0.113	0.205	0.086	0.145	0.175
CW-3	0.133	0.221		0.306	0.139	0.277	0.253	0.331	0.203	0.168	0.126	0.249	0.277	0.137	0.327	0.190	0.279	0.303
KE-1	0.212	0.154	0.306		0.275	0.102	0.166	0.482	0.135	0.213	0.286	0.106	0.176	0.227	0.104	0.165	0.110	0.098
KE-2	0.153	0.204	0.139	0.275		0.232	0.233	0.265	0.203	0.164	0.109	0.223	0.264	0.140	0.307	0.185	0.278	0.304
KE-3	0.165	0.112	0.277	0.102	0.232		0.127	0.438	0.102	0.158	0.246	0.094	0.105	0.181	0.162	0.109	0.088	0.128
KE-4	0.149	0.085	0.253	0.166	0.233	0.127		0.452	0.114	0.146	0.212	0.165	0.075	0.157	0.204	0.099	0.126	0.190
LA-1	0.380	0.430	0.331	0.482	0.265	0.438	0.452		0.409	0.390	0.287	0.430	0.470	0.386	0.513	0.398	0.495	0.515
LA-2	0.117	0.121	0.203	0.135	0.203	0.102	0.114	0.409		0.170	0.222	0.160	0.103	0.123	0.156	0.076	0.128	0.137
LA-3	0.096	0.127	0.168	0.213	0.164	0.158	0.146	0.390	0.170		0.134	0.181	0.140	0.082	0.253	0.135	0.192	0.221
LA-4	0.199	0.189	0.126	0.286	0.109	0.246	0.212	0.287	0.222	0.134		0.246	0.243	0.196	0.324	0.221	0.269	0.285
LB-1	0.179	0.097	0.249	0.106	0.223	0.094	0.165	0.430	0.160	0.181	0.246		0.167	0.162	0.141	0.104	0.111	0.129
LB-2	0.155	0.101	0.277	0.176	0.264	0.105	0.075	0.470	0.103	0.140	0.243	0.167		0.155	0.184	0.113	0.119	0.159
LB-3	0.086	0.113	0.137	0.227	0.140	0.181	0.157	0.386	0.123	0.082	0.196	0.162	0.155		0.248	0.105	0.187	0.244
LB-4	0.229	0.205	0.327	0.104	0.307	0.162	0.204	0.513	0.156	0.253	0.324	0.141	0.184	0.248		0.175	0.103	0.083
LL-2	0.095	0.086	0.190	0.165	0.185	0.109	0.099	0.398	0.076	0.135	0.221	0.104	0.113	0.105	0.175		0.142	0.157
LL-3	0.199	0.145	0.279	0.110	0.278	0.088	0.126	0.495	0.128	0.192	0.269	0.111	0.119	0.187	0.103	0.142		0.095
LL-4	0.217	0.175	0.303	0.098	0.304	0.128	0.190	0.515	0.137	0.221	0.285	0.129	0.159	0.244	0.083	0.157	0.095	

Two std devs. of P-values using Monte-Carlo

	CW-1	CW-2	CW-3	KE-1	KE-2	KE-3	KE-4	LA-1	LA-2	LA-3	LA-4	LB-1	LB-2	LB-3	LB-4	LL-2	LL-3	LL-4
CW-1		0.268	0.144	**0.028**	0.081	**0.101**	0.147	0.000	0.313	0.168	**0.130**	**0.139**	0.097	0.165	0.018	0.270	**0.050**	**0.031**
CW-2	0.268		0.012	**0.195**	0.015	0.353	0.335	0.000	0.383	0.205	**0.057**	0.362	0.184	0.253	**0.081**	0.358	**0.266**	**0.175**
CW-3	0.144	0.012		0.001	0.000	0.002	0.005	0.000	**0.029**	0.077	0.412	0.006	0.002	0.170	0.000	**0.038**	0.001	0.000
KE-1	**0.028**	**0.195**	0.001		0.003	0.333	**0.202**	0.000	0.165	**0.053**	0.002	0.412	**0.103**	**0.042**	0.316	**0.212**	0.310	0.240
KE-2	0.081	0.015	0.000	0.003		0.012	0.007	0.003	**0.063**	0.067	0.210	0.007	0.002	0.086	0.000	**0.055**	0.000	0.000
KE-3	**0.101**	0.353	0.002	0.333	0.012		0.454	0.000	0.174	**0.178**	0.009	0.239	0.326	**0.116**	**0.304**	0.236	0.273	0.398
KE-4	0.147	0.335	0.005	**0.202**	0.007	0.454		0.000	0.375	**0.285**		**0.206**	0.289	0.173	**0.163**	0.303	**0.442**	**0.321**
LA-1	0.000	0.000	0.000	0.000	0.003	0.000	0.000		0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LA-2	0.313	0.383	**0.029**	0.165	**0.063**	0.174	0.375	0.000		**0.269**	**0.037**	0.054	0.250	0.325	0.114	0.195	0.063	0.111
LA-3	0.168	0.205	0.077	**0.053**	0.067	**0.178**	**0.285**	0.000	**0.269**		0.195	**0.067**	0.187	0.234	0.019	0.253	**0.103**	**0.049**
LA-4	**0.130**	**0.057**	0.412	0.002	0.210	0.009		0.001	**0.037**	0.195		0.009	0.010	**0.219**	0.000	**0.077**	0.003	0.001
LB-1	**0.139**	0.362	0.006	0.412	0.007	0.239	**0.206**	0.000	0.054	**0.067**	0.009		**0.084**	**0.077**	**0.333**	0.242	0.189	0.375
LB-2	0.097	0.184	0.002	**0.103**	0.002	0.326	0.289	0.000	0.250	0.187	0.010	**0.084**		0.092	**0.106**	0.152	**0.361**	**0.224**
LB-3	0.165	0.253	0.170	**0.042**	0.086	**0.116**	0.173	0.000	0.325	0.234	**0.219**	**0.077**	0.092		0.019	0.272	**0.048**	**0.034**
LB-4	0.018	**0.081**	0.000	0.316	0.000	**0.304**	**0.163**	0.000	0.114	0.019	0.000	**0.333**	**0.106**	0.019		**0.094**	0.410	0.396
LL-2	0.270	0.358	**0.038**	**0.212**	**0.055**	0.236	0.303	0.000	0.195	0.253	**0.077**	0.242	0.152	0.272	**0.094**		0.087	0.099
LL-3	**0.050**	**0.266**	0.001	0.310	0.000	0.273	**0.442**	0.000	0.063	**0.103**	0.003	0.189	**0.361**	**0.048**	0.410	0.087		0.342
LL-4	**0.031**	**0.175**	0.000	0.240	0.000	0.398	**0.321**	0.000	0.111	**0.049**	0.001	0.375	**0.224**	**0.034**	0.396	0.099	0.342	