"The Age and Sediments Source of the Amadeus Basin Cryogenian-Ediacaran Stratigraphy"

Thesis submitted in accordance with the requirements of the University of Adelaide for an Honours Degree in Geology

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Contents

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ABSTRACT

The Amadeus Basin is a big intracratonic elongate basin that is mainly exposed in the Northern Territory. The sedimentation of the basin began in the Neoproterozoic and ended in Late Devonian/Early Carboniferous. The Amadeus Basin stratigraphy age and source of sediments are not well constrained. This study is trying to better constrain the age and sediments source for the Johnnys Creek formation, Areyonga formation, Pioneer sandstone, Pertatataka formation and the Arumbera sandstone.
U-Pb detrital zircon analysis were conducted using Laser Ablation Inductively Coupled Plasma Mass Spectrometry technique (LA-ICP-MS) along with Hf isotopic analysis. The U-Pb data further constrained the depositional age of Pertatataka formation and Areyonga formation with a maximum depositional age (derived from the youngest zircon grain) of 651 ±19 Ma and 683 ±20 Ma respectively. The Main source of sediments for the Arumbera sandstone, Pertatataka formation and Areyonga formation is the Musgrave Province, while it is the Arunta region for the Pioneer sandstone. This is based on zircon ages peaks when plotted as probability density function. The epsilon Hf data yielded positive and negative values across all formations age. This is indicative of mix juvenile and recycled crust host magmas.

1. INTRODUCTION
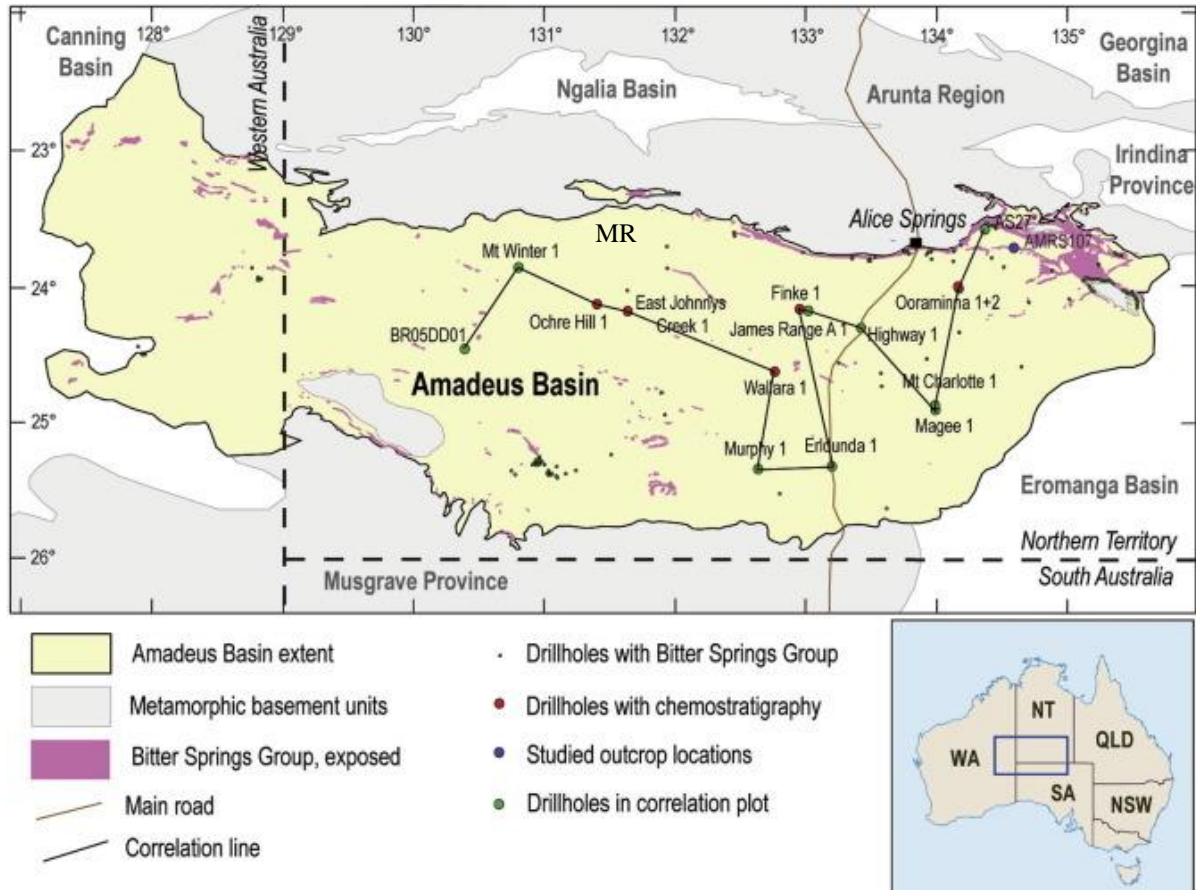
Figure 1:The Amadeus Basin location and its extent. The location of BR05DD01,Wallara-1 cores and MacDonnell Ranges (MR), from which this research samples were obtained. Figure from Susanne (2017).

The Amadeus Basin is a big intracratonic elongate basin that is mainly exposed in the

Northern Territory and formed as part of the Centralian Superbasin. Its range extends

about 300 km north–south and 800 km east–west and has a sedimentation record that

began in the Neoproterozoic and ended in Late Devonian/Early Carboniferous (Edgoose, 2013). Alice Springs Orogeny 450–300 Ma and Petermann Orogeny 580–530 Ma are two major tectonic events that has modified the Amadeus Basin (Edgoose, 2013).

The Amadeus Basin, with proven petroleum reserves, is the most unexplored basin in Australia. The petroleum exploration is focused on Paleozoic rocks (Dentith & Cowan, 2011). Therefore, conducting detrital zircon dating analysis of the Cryogenian – Ediacaran formations of the Amadeus Basin is needed for better understanding of the basin during this period. That is the age of the formations, the source of sediments and the tectonic activity.

Detrital Zircon mineral is highly resistant to chemical attack and abrasion and hence it can be found almost in every siliciclastic sediments. In addition, it can preserve its U-Pb isotopic systematics throughout erosion, weathering, deposition, transport, low-grade metamorphism and diagenesis. Therefore, sedimentary provenance studies can be done using this important tool, detrital zircon dating. It can tell us the sediment contribution of each terrain to a basin and this in turn can tell us the regional and local tectonics as they are strongly linked. However, unique solutions may not be provided by zircon ages because zircons recycling can make the spectra of age more complicated by mixing zircon grains at different times from the same source and separate terrains can be characterised by coeval zircon crystallising events. Therefore, in order to draw a strong correlations in a complex basin with several possible sources, an additional information is required. Hafnium isotope data could possibly distinguish between terrains with

coeval zircon-crystallising events provided that the detrital zircons have dissimilar fractionation histories (Haines et al., 2016).

In this paper, we aim to provide new detrital zircon data for the Amadeus Basin during the Cryogenian - Ediacaran period using six samples from two cores, Wallara-1 and BR05DD01, and three field samples from Western Macdonell Ranges. Samples were taken from the following formations: Areyonga, Johnny Creek, Arumbera, Pioneer and Pertatataka formations. The data includes U-Pb age, hafnium isotopic ratios and REEs concentrations.

2. GEOLOGICAL BACKGROUND

2.1 Basin Evolution

The Amadeus Basin early history is regarded as part of the Neoproterozoic Centralian A Super-Basin. This A Super-Basin includes Georgina, Victoria, Murraba, Wolfe, Ngalia and Officer Basins, and potentially other smaller basins in north-eastern western Australia. The evolution can be described by three phases named Centralian I, II and III. Centralian I is the break-up between Australia and North America at 830 Ma and sedimentation continue until 750 Ma. Sturtian glaciation 700-690 Ma associated sedimentation happened and this phase is Centralian II. Centralian III is related to the sedimentation of Elatina glaciation. This sedimentation was ended by the 580-530 Petermann Orogeny. Musgrave Province is uplifted and exhumated by Petermann Orogeny, which led to the separation of the Officer Basin. The Alice Springs Orogeny 450-300 Ma divided the Super basin, but sedimentation continued until it ended in most areas in mid-Carboniferous (Edgoose, 2013).

The basin overlies the basement of Aileron and Warumpi Provinces to the North and Musgrave Province to the South. In the west it is overlain by Palaeozoic Canning Basin and in the Southeast overlain by Eromanga basin (Edgoose, 2013).

2.2 Formation location and lithology
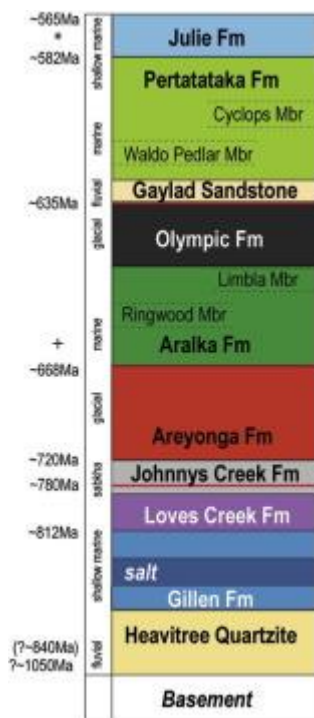
Figure 2 The Northern Amadeus Basin Neoproterozoic stratigraphy. The approximate depositional age is shown and the formations of interest are shown as well. The figured from (Susanne, 2017).

2.2.1 Johnnays Creek Formation

Johnnays Creek Formation, formerly known as Johnnays creek beds, is the upper formation of Better Springs Group, formerly Better springs Formation (Normington, 2018). It is extensive in the central western part of the Amadeus Basin and it is made up of dolomitic limestone, red-beds or dolostone with stromatolitic, siltstone and sometimes sandstone beds (Kositcin et al., 2015). The Areyonga Formation disconformably overlain Johnnays Creek formation and this is characteristically

noticeable by rubbly, fractured regolith development (Lindsay, 1993). The thickness of

Johnnays Creek Formation varies up to approximately 400m in BR05DD01 and its

depositional age is well constrained to a certain degree at approximately 820 Ma

(Edgoose, 2013).

2.2.2 Areyonga Formation

The glaciogene to fluvial Areyonga formation mainly made up of diamictite of different

texture and composition yet contains interbeds of conglomerate, sandstone, dolostone,

siltstone and shale (Edgoose, 2013; Kositcin et al., 2015; Walter et al, 1995).

Carbonates and siliciclastic of the Aralka Formation rests conformably on the Areyonga

formation, but the Areyonga Formation lies disconformably on Johnnays creek

formation. The Areyonga Formation glacial sediments represent 700-690 Ma Sturtian

glaciation event based on the correlation of the successions of cap carbonate and the

glacial sediments across Australia and globally (Kositcin et al., 2015). The Areyonga

formation thickness in both Wallara-1 and BR05DD01 cores are relatively similar. It is

approximately 120 m in Wallara-1 (Smith, 2014), while it is 100 m in BR05DD01

(Smith, 2013).

2.2.3 Pioneer Sandstone

The pioneer sandstone is a shallow marine to tidal unit that is confined to the central

northern part of the Amadeus Basin. It is coarse to medium grained, arkosic and

feldspathic with sedimentary structures often found. Some cross laminations and mainly

planar laminations are found in the lower part, while it is dolomitic in the upper part

(Kositcin et al., 2015). The Pioneer sandstone formation age is only constrained by its

position stratigraphically and it was recognized that the Pioneer formation correspond to the Olympic Formation. Therefore, the assumption is that are similar in age (Walter et al., 1995). The Olympic formation age is correlated to the Elatina glaciation with lower and upper age limits of ~ 580 Ma and ~640 Ma (Williams et al., 2008; Grey et al., 2011). The Pioneer sandstone formation thickness is approximately 9 m in Wallara-1 core (Smith, 2014), while it is not recognized in BR05DD01 core (Smith, 2013).

2.2.4 Pertatataka Formation

The formation is made up mainly of green and red shale, siltstone and feldspathic sandstone. Two members have been recognized in the northeast of the Amadeus Basin, Waldo Pedlar and Cyclops members; while in the central western part three members have been named, (sandstone, siltstone and shale), (sandstone/quartzite) and (siltstone) as Member III, II and I respectively (Edgoose, 2013). The formation has an inferred depositional age of approximately 580 Ma (Maidment, 2005). Pertatataka formation varies in thickness up to 1400 m (Walter et al., 1995) and it is about 600 m in Wallara-1 core (Smith, 2014) but it is not recognised in BR05DD01 core (Smith, 2013).

2.2.5 Arumbera Sandstone

Arumbera sandstone is divided into two successions of deposition: low-stand systems tract in the early Cambrian and high-stand systems tact in the Neoproterozoic of the upper and lower part respectively. The formation thickness varies significantly. While

the upper succession maximum thickness is 500 m, the lower part is 800 m (Edgoose, 2013). The Arumbera sandstone thickness in Wallara-1 core is approximately less than 100 m (Smith, 2014).

3.0 METHODOLOGY

3.1 U-Pb Geochronology

A Total of ten Siltstone and sandstone samples were collected based on the Cryogenian-Ediacaran formations of the Amadeus Basin. The samples were collected from Wallara-1 core (5 samples), BR05DD01 core (2 samples) and from the Macdonell Ranges (3 samples). The location of Wallara-1, BR05DD01 and Macdonell Ranges is shown in figure 1 above

Grains of zircon were obtained by standard magnetic and heavy liquid techniques after crushing the samples. zircon grains were handpicked and mounted in epoxy resin. The mounts were grinded, polished and carbon coated to remove the charges on the surface for Cathodoluminescence (CL) imaging using Scanning Electron Microscope (SEM) at Adelaide Microscopy. Laser spots were targeted from the images and LA-ICP-MS analysis was made with 30 μm spot size.

The data was processed using Iolite with GEMOC GJ-1 is being used as a reference material and Plesovice Standard to control the accuracy of the zircon age; and Excel add-in Isoplot was used to plot the data (age and REEs) based on formations. Concordia plots and probability density function graphs of the ages were produced. The Concordia plots contain only the grains within 10% discordant. Concordance was calculated by the equation $(^{206}Pb/^{238}U)/(^{207}Pb/^{206}Pb)*100$.

In this paper, the zircon ages chosen for the graphs and plots are following Yang et al., (2018). For ages higher than 1.2Ga, $^{207}Pb/^{206}Pb$ age was used, while for ages younger than 1 Ga, $^{206}Pb/^{238}U$ was used. In case where the ages are in between the more precise one was chosen. For the maximum depositional age, a single grain approach was used.

4.0 BSERVATIONS AND RESULTS

4.1 U-Pb Geocryology

4.1.1 Arumbera Sandstone

Figure 3 : U-Pb probability density diagrams and Concordia plot for the Arumbera formation. a) U-Pb probability density diagram for concordant zircon grains in Wallara-1 core sample. b) U-Pb Concordia diagram (n=71) for Wallara-1 core sample. c) U-Pb probability density diagram for concordant zircon grains in MacDonnell Ranges sample. d) U-Pb Concordia diagram (n=106) for MacDonnell Ranges sample.

Two samples were analysed from this unit, one from MacDonnell Ranges and the other from Wallara-1 core in Central Australia. Ninety-nine and one hundred and nine analyses were conducted from Wallara-1 and MacDonnell Ranges samples respectively. Seventy-one analyses were below 10% discordance in Wallara-1, while one hundred and six in MacDonnell Ranges sample. The analyses that were above 10% discordance were removed from the graphs and from further interpretation. The ages range is 949 ±24 Ma to 3543 ±61 Ma in Wallara-1, whereas it is 922 ± 24 to 2604 ± 73 Ma in MacDonnell Ranges. Three clear population groups of ages in Wallara-1. They are 1070-1300 Ma, 1700-1900 Ma and 2450-1600 Ma groups, with the first group being the most dominant as seen from Figure 2 above. Similarly, three population groups were identified in MacDonnell Ranges sample and they are 1050-1200 Ma, 1350-1600 Ma and 1650-1800 Ma. However, the first group 1050-1200 is by very far the most dominant with more than 65 grains and the other two groups with less than fifteen grains each.

4.1.2 Pertatataka Formation
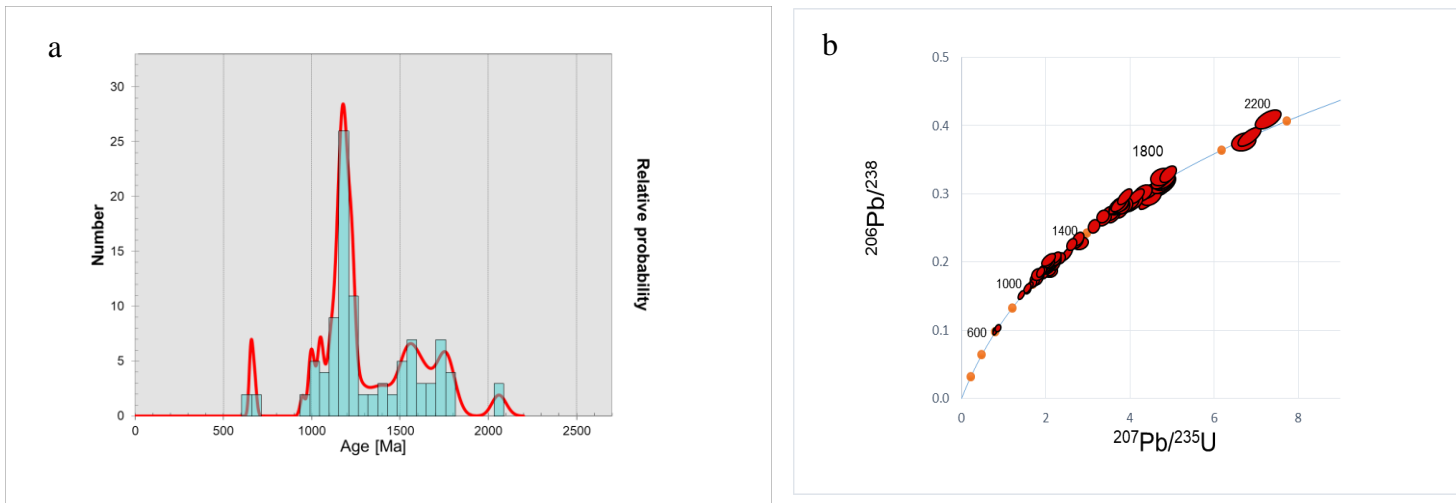
Figure 4 U-Pb probability density diagrams and Concordia plot for the Pertatataka formation. . a) U-Pb probability density diagram for concordant zircon grains in MacDonnell Ranges sample. b) U-Pb Concordia diagram (n=102) for MacDonnell Ranges sample.

One sample was analysed from this formation and that was from MacDonnell Ranges as seen from figure 1. One hundred and nineteen analyses were conducted. One hundred and two analyses were below 10% discordance and hence plotted in Concordia and Probability density function graphs. Seventeen analyses were above 10% discordance and were removed from the graphs and from further interpretation. The ages ranged from 651 ±19 Ma to 2070 ±81 Ma, with two clear population groups. One population group is 1000-1300 Ma while the other 1500-1700 Ma. The 1000-1300 group is by far the most dominant group.

4.1.3 Pioneer Sandstone
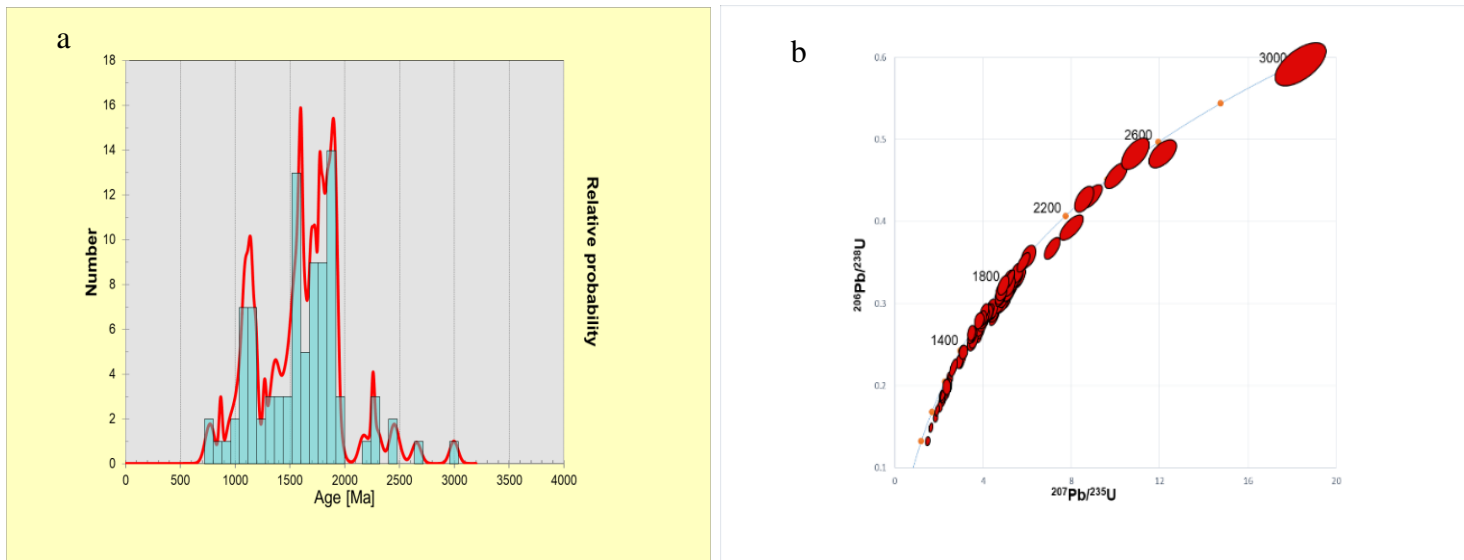
Figure 5: U-Pb probability density diagrams and Concordia plot for the Pioneer sandstone . a) U-Pb probability density diagram for concordant zircon grains in Wallara-1 core sample. b) U-Pb Concordia diagram (n=92) for Wallara-1 core sample.

One sample was analysed from this unit from Wallara-1 core in central Australia. One hundred and twenty-one analyses were conducted. From these analyses, ninety-two were below 10% discordance and twenty-nine were above 10% discordance. The analyses that were above 10% discordance were removed from the graphs and from further interpretations. The ages range is 769 ±23 Ma and 2996 ±78 Ma. Three main groups of population were recognized in figure 4. The groups are 1000-1250 Ma, 1500-1600 Ma and 1700-2000 Ma, with the last two groups being the dominant.

4.1.4 Areyonga Formation
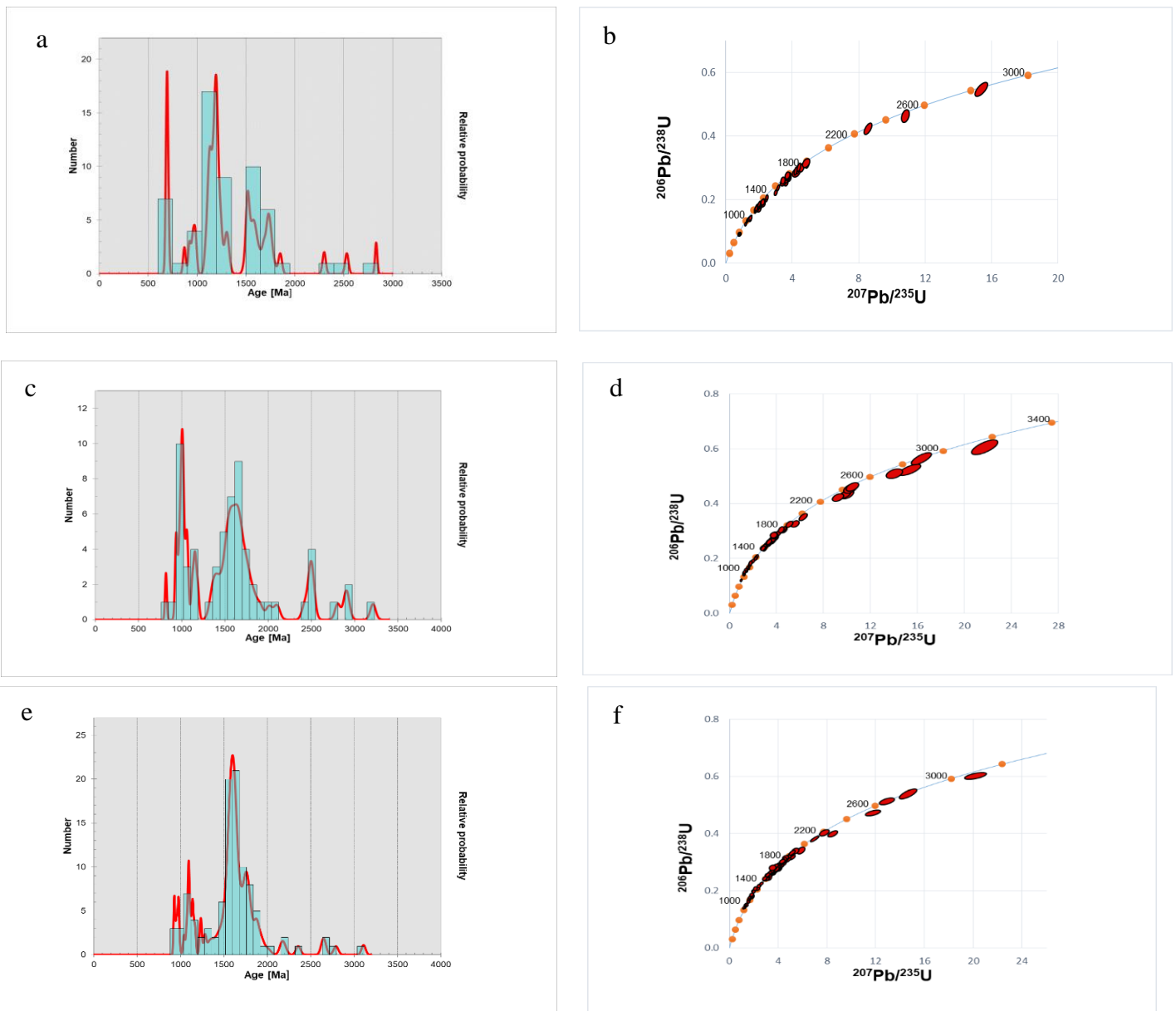
Figure 6 : U-Pb probability density diagrams and Concordia plots for the Areyonga formation. a) U-Pb probability density diagram for concordant zircon grains in BR05DD01 core sample. b) U-Pb Concordia diagram (n=58) for BR05DD01 core sample. c) and d) from Wallara-1 core sample (n=72). e) and f) from MacDonnell Ranges sample (n=103), where n is the number of concordant analyses.

Three samples were analysed from this formation, from BR05DD01 core, Wallara-1

core and MacDonnell Ranges. Sixty-seven analyses were conducted from BR05DD01

core sample. From these analyses, fifty-eight were below 10% discordance and nine

were above 10% discordance. The age's range of BR05DD01 core sample is between 683 ±20 Ma and 2831 ±23 Ma. Three population groups were identified. They are 700-800 Ma, 1000-1250 Ma and 1500-1700 Ma. The 1000-1250 Ma group is the most dominant in this sample. They are also a few individual grains scattered around different ages that are not part of the previous groups.

Ninety-nine analyses were conducted from Wallara-1 core. From these analyses, seventy-two were below 10% discordance and twenty-seven above 10% discordance. The range of ages is between 949 ± 24 Ma and 3543 ±61 Ma. Three population groups can be seen in figure 5. The groups are 1000-1300 Ma, 1550-1900 Ma and 2450-2600 Ma. The population group 1000-1300 Ma is the most dominant and 1550-1900 Ma being the second.

One hundred and twenty analyses were conducted from MacDonnell Ranges sample. One hundred and three from these were below 10% discordance and seventeen were above 10% discordance. The ages ranged from 927 ±16 Ma to 3109 ±47 Ma. Two population groups were recognized. They are 950-1250 Ma group and 1500-1750 Ma, with the latter group being the most dominant by far.
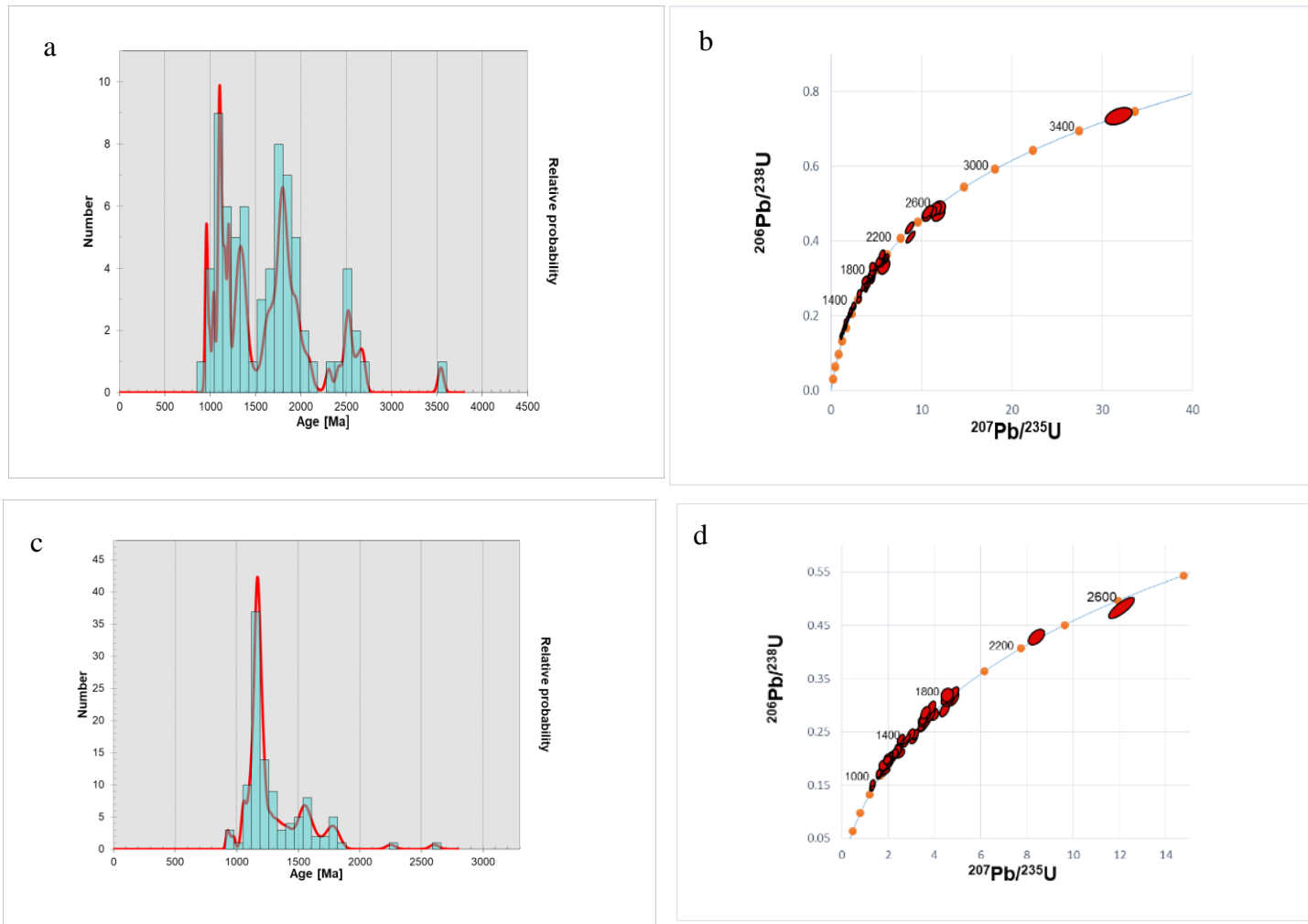
4.1.5 Johnnys Creek Formation
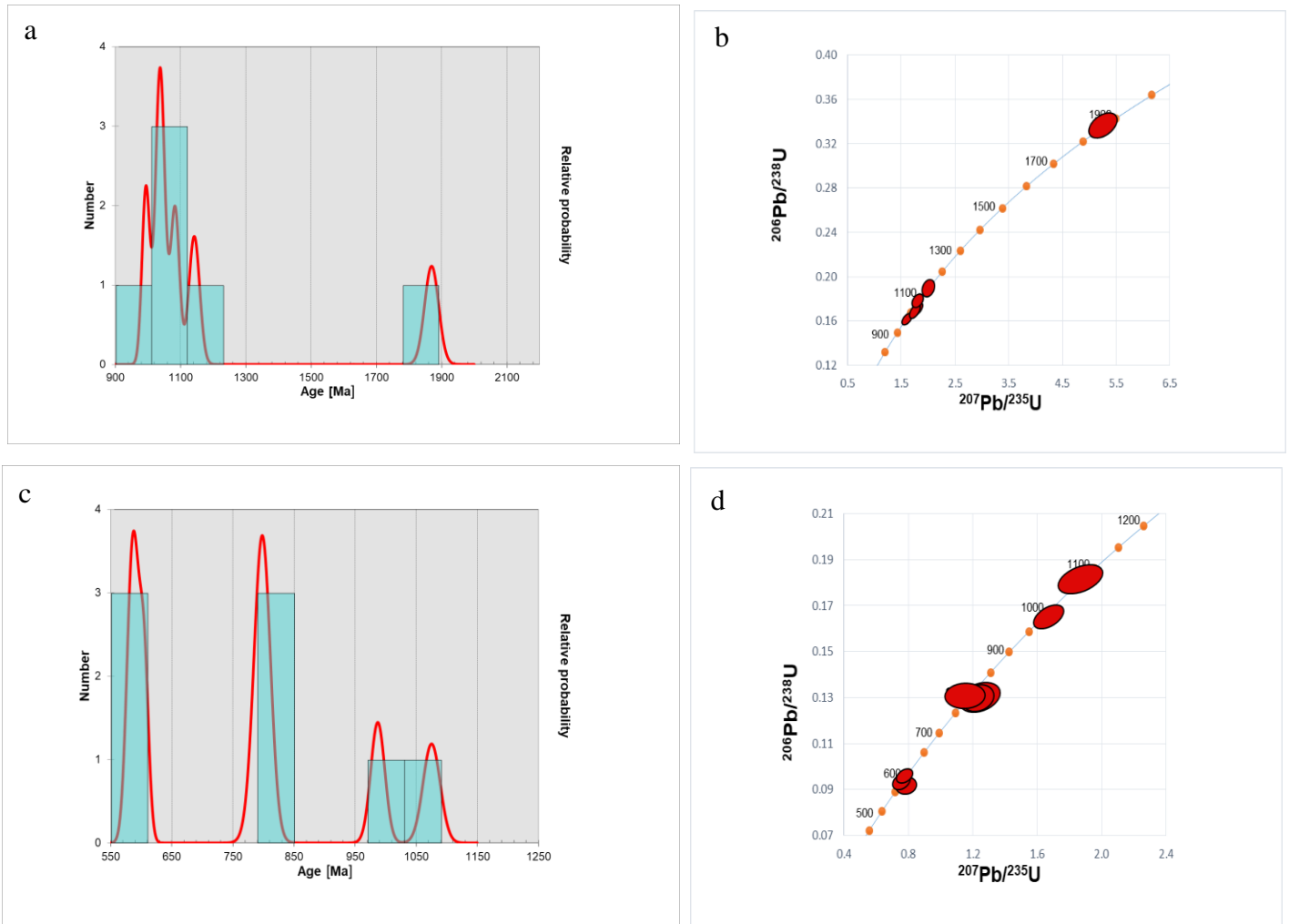
Figure 7 : U-Pb probability density diagrams and Concordia plot for the Johnnys Creek formation. a) U-Pb probability density diagram for concordant zircon grains in Wallara-1 core sample. b) U-Pb Concordia diagram (n=8) for Wallara-1 core sample. c)) U-Pb probability density diagram for concordant zircon grains in BR05DD01 core sample. d) U-Pb Concordia diagram (n=6) for BR05DD01 core sample.

Two samples were analysed from this formation, from Wallara-1 core and BR05DD01.

Seventeen analyses were conducted from BR05DD01 sample, while only eleven

analyses in Wallara-1 core. The lack of more analyses is due the fact that not a lot of

zircon grains were found in these samples. Eight analyses are below 10% discordance in

BR05DD01, while six analyses in Wallara-1 core. The analyses from both samples that

are above 10% discordance were removed from graphs and from further interpretations.

The ages ranged from 582 ±17 Ma to 1075 Ma in BR05DD01, while they ranged from

994 ±24 Ma to 1869 ±43 Ma in Wallara-1 core sample. One group of population is recognised in Wallara-1 core sample and that is 1000-1100 Ma, with only three grains. On the other hand, two groups of population is seen in BR05DD01 core sample which are 600 Ma and 800-850 Ma with three grains each.

4.2 HF and REES Data
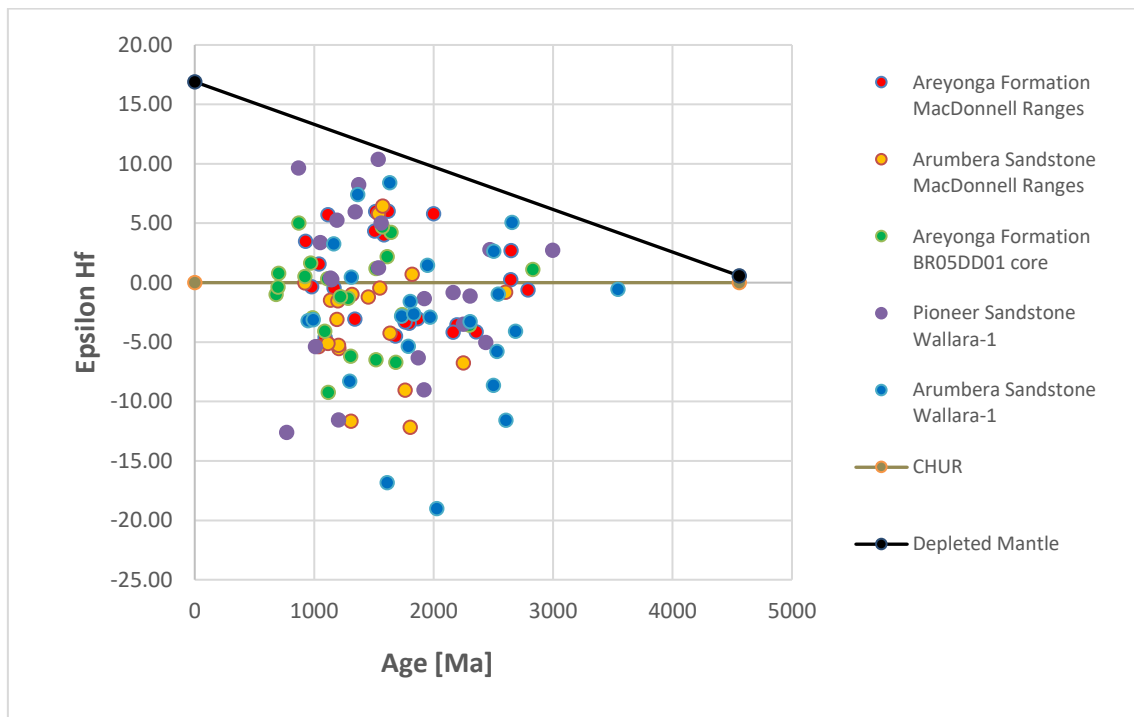
Figure 8: Shows the Epsilon Hf values relative to depleted Mantle and CHUR for different formations. All of the zircons concordant and represent different population groups.
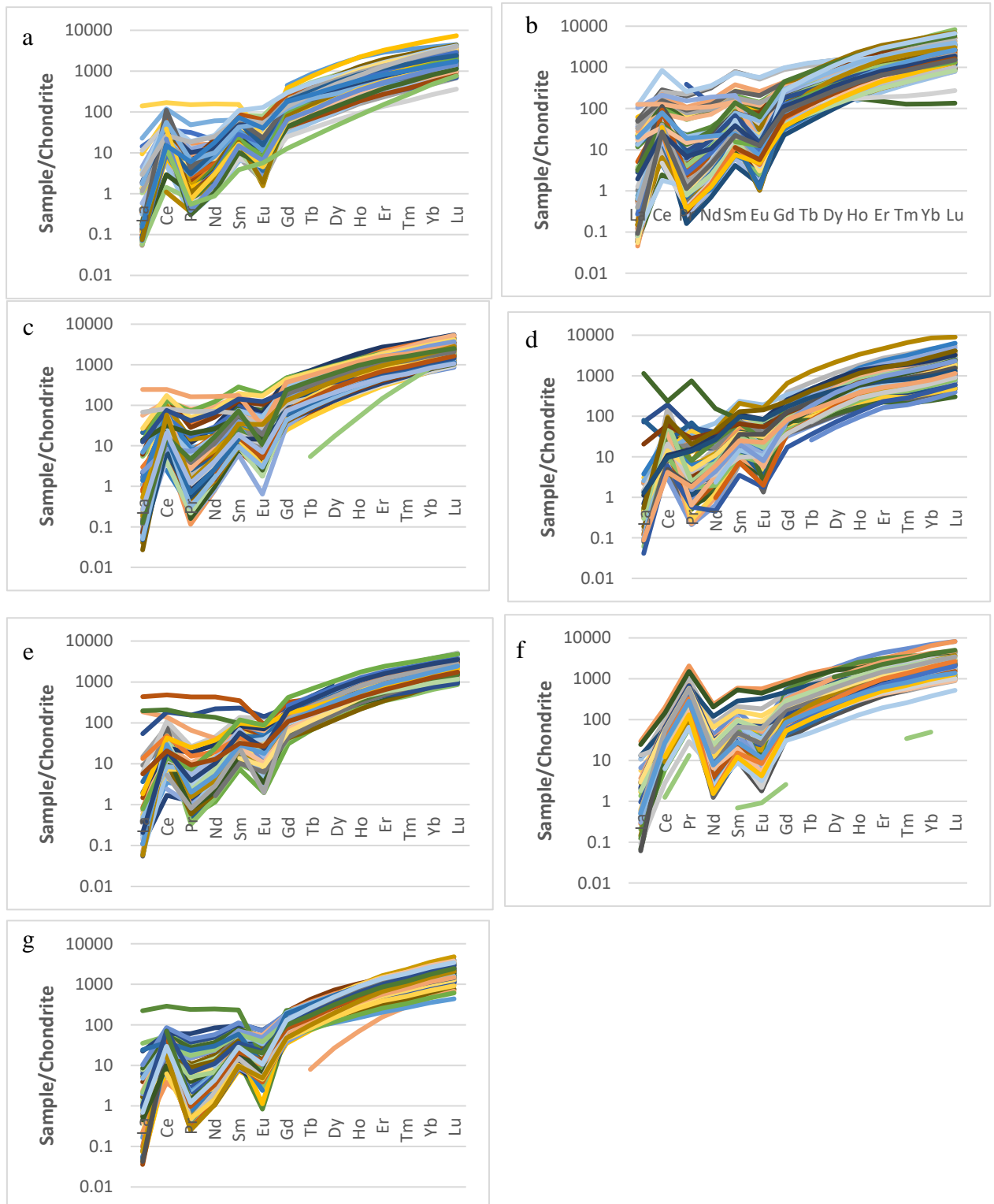
Figure 9: shows the patterns of rare earth elements for the dated zircon grains. This is normalised to CHUR. a) Arumbera sandstone of Wallara-1 sample b) Arumbera sandstone of the MacDonnell Ranges sample d) Pertatataka formation of the MacDonnell Ranges sample e) Areyonga formation, Wallara-1 core sample f) Areyonga formation, BR05DD01 core sample g) Pioneer sandstone, Wallar-1 core sample

5.0 DISCUSSION

5.1 Age constrains of the formations

5.1.1 Arumbera Sandstone

The youngest zircon grain in the sample determines the maximum depositional age. The maximum depositional age of this formation is 922 ±24 Ma as recoded in MacDonnell Ranges sample. This age is by far higher than the maximum depositional age of late Neoproterozoic mentioned previously (Edgoose, 2013). Therefore, this age is not very useful.

5.1.2 Pertatataka Formation

Pertatataka formation was recorded to have a maximum depositional age of 650 ± 13 Ma in other study done by Kositcin et al. (2015) in the north-eastern part of the Amadeus Basin. Similarly, in this study 651 ±19 Ma maximum deposition age was recorded. This age is also very close from the inferred depositional age of 580 Ma (Maidment, 2005).

5.1.3 Pioneer Sandstone

In this study, the Pioneer sandstone has a maximum depositional age of 769 ±23 recoded in Wallara-1 core sample. However, it was recorded by Kositcin et al. (2015) study that the formation has a maximum depositional age of 709 ± 15 Ma. This is far from the inferred age of 580-640 Ma (Williams et al., 2008; Grey et al 2011).

5.1.4 Areyonga Formation

It was previously recorded by Kositcin et al. (2015) to have a maximum depositional age of 876 ± 14 Ma and it was suggested to have an age equivalent to the Sturtian glaciation of 690-700 Ma. The maximum depositional age of the Areyonga Formation recoded in this paper is 683 ±20 Ma. It was recorded in BR05DD01 core sample. This provide a better age constrains to this formation and it coincide with the inferred age suggested earlier.

5.1.5 Johnnys Creek Formation.

The Johnnys Creek formation is thought to have a depositional age of 820 Ma (Edgoose, 2013). However, in BR05DD01 sample of this study, it was recoded to have a very young age of 582 ±17 Ma. This is a very young age, unreasonable and does not agree with literature and hence was interpreted to be a result of contamination. However, the Wallara-1 recoded a maximum depositional age of 994 ±24 Ma. This age constrain is better than the one recoded by Kositcin et al. (2015) of 1029 ± 23 Ma.

5.2 Sediments Source

5.2.1 Arumbera Sandstone

Musgrave province to the South of the Amadeus Basin is potentially the main source of sediments for this formation. The main age group of 1050-1300 Ma in both Wallara-1 and MacDonnell samples potential sources can be from 1.22–1.15 Ga Musgrave Orogeny granites and metamorphic rocks or 1.09–1.04 Ga Giles complex and Tjauwata Group in the Musgrave province (Haines, 2016; Close, 2013). In addition to that,

1.15–1.13 Ga granite and metamorphic rocks of the Teapot Event in Warumpi Province

can likely be the source. Another age group of 1350-1600 Ma in MacDonnell Ranges

sample possible sources are 1345–1293 Ma Wankanki Supersuite granites, c. 1400 Ma

Papulankutja Supersuite or c. 1575 Ma Warlawurru Supersuite rocks West Musgrave

province. 1590-1560 Ma Chewings Orogeny high grade metamorphic rocks in Warumpi

& Aileron Province and 1600 -1540 Ma Musgravian gneiss (Haines, 2016). The age

group 1600-1900 Ma in both Arumbera samples potential sources can be 1.61–1.60 Ga

granites in the Warumpi province, 1.64–1.63 Ga Metamorphism and magmatism in the

Warumpi province due to Liebig Orogeny event or the 1.69–1.66 Ga granite in the

Warumpi Province. 1.73–1.69 Ga, 1.78–1.77 Ga or 1.81–1.79 Ga granite of the

Strangways, Yamba or Stafford geologic events respectively in the Aileron Province

can be possible sources (Haines, 2016). The epsilon Hf values of this formation along

different age groups have both negative and positive, values, with the negative values

being the dominant. This suggests the host magma is a combination of juvenile and

recycled crust magmas, but the recycled crust magma is dominant along the age group.

5.2.2 Pertatataka formation

Musgrave province to the South of the Amadeus Basin is possibly the main source of

sediments for this formation. This formation has two age groups 1000-1300 Ma and

1500-1700 Ma. There are a number of possible sources for the 1000-1300 Ma group.

Some possible sources include .22–1.15 Ga Musgrave Orogeny granites and

metamorphic rocks or 1.09–1.04 Ga Giles complex and Tjauwata Group in the

Musgrave province (Haines, 2016; Close, 2013). Other possible sources can be 1.15–

1.13 Ga granite and metamorphic rocks of the Teapot Event in Warumpi Province. As

for the second age group 1500-1700 Ma, c. 1575 Ma Warlawurru Supersuite rocks West

Musgrave province, 1590-1560 Ma Chewings Orogeny high grade metamorphic rocks in Warumpi and Aileron Province, 1600 -1540 Ma Musgravian gneiss, 1.61–1.60 Ga granites in the Warumpi province, 1.64–1.63 Ga Metamorphism and magmatism in the Warumpi province or the 1.69–1.66 Ga granite in the Warumpi Province can all be possible sources (Haines, 2016).

5.2.3 Pioneer Sandstone

Pioneer sandstone main source of sediments came possibly from the Arunta region, north the Amadeus Basin. The age groups are 1000-1300 Ma, 1500-1600 Ma and 1700-1950 Ma, with the last two groups being the dominant. Possible sources for the 1000-1300 Ma group include .22–1.15 Ga Musgrave Orogeny granites and metamorphic rocks or 1.09–1.04 Ga Giles complex and Tjauwata Group in the Musgrave province (Haines, 2016; Close, 2013). Other possible sources can be 1.15–1.13 Ga granite and metamorphic rocks of the Teapot Event in Warumpi Province. As for the 1500-1600 Ma group, sources can be from 1590-1560 Ma Chewings Orogeny high grade metamorphic rocks in Warumpi and Aileron Province, c. 1575 Ma Warlawurru Supersuite rocks West Musgrave province and 1600 -1540 Ma Musgravian gneiss (Haines, 2016). The last age group 1700-1950 sediments can be derived from 1.73–1.69 Ga, 1.78–1.77 Ga or 1.81–1.79 Ga granite of the Strangways, Yamba or Stafford geologic events respectively in the Aileron Province (Haines, 2016). This formation has negative and positive epsilon Hf value and this is indicative of a mix of juvenile and recycled crust host magmas.

5.2.4 Areyonga Formation

Musgrave province to the South of the Amadeus Basin is possibly the main source of sediments for this formation in Both Wallara-1 and BR05DD01 core samples. On the other hand, the sample from MacDonnell Ranges main possible source is the Arunta region. The group age 700-800 Ma in BR05DD01 core possible source is c. 747 Ma Mafic intrusive rocks West Musgrave Province (Haines, 2016). Other age groups 1000-1300 Ma and 1500-1900 Ma can be derived from a number of possible sources. These sources are 1.22–1.15 Ga Musgrave Orogeny granites and metamorphic rocks or 1.09–1.04 Ga Giles complex and Tjauwata Group in the Musgrave province and 1.15–1.13 Ga granite and metamorphic rocks of the Teapot Event in Warumpi Province. (Haines, 2016; Close, 2013). As for the 1500-1600 Ma group, sources can be from 1590-1560 Ma Chewings Orogeny high grade metamorphic rocks in Warumpi and Aileron Province, c. 1575 Ma Warlawurru Supersuite rocks West Musgrave province and 1600 - 1540 Ma Musgravian gneiss (Haines, 2016). 1.73–1.69 Ga, 1.78–1.77 Ga or 1.81–1.79 Ga granite of the Strangways, Yamba or Stafford geologic events respectively in the Aileron Province can be possible sources for the age group 1700-1900 Haines 2016). This formation has no clear Epsilon Hf pattern, but rather both positive and negative values all around 1000-1900 Ma ages. This suggest a mixture of juvenile and recycled crust host magmas.

5.2.5 Johnnys Creek Formation

This formation only has eight concordant zircon amylases in BR05DD01 core and six in Wallara-1. As a result, the source sediment source cannot be determined with high confidence level. However, three grains out of six have an age between 100-1100 Ma. A

possible source for these grains is the 1.09–1.04 Ga Giles complex and Tjauwata Group

in the Musgrave province (Haines, 2016)

6.0 CONCLUSIONS

The main conclusions of this research are:

1.   This research further constrains the maximum depositional age of Pertatataka

formation and Areyonga formation, with 651 ±19 Ma and 683 ±20 Ma respectively.

2.   The Main source of sediments for the Arumbera sandstone, Pertatataka

formation and Areyonga formation is the Musgrave Province, while it is the Arunta

region for the Pioneer sandstone.

7.0 ACKNOWLEDGMENTS

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APPENDIX A:

Table 1: U-Pb data for Wallara-1 core sample, Arumbera formation.

Comments	ARU-001	ARU-002	ARU-003	ARU-004	ARU-005	ARU-006	ARU-007	ARU-008	ARU-009	ARU-010	ARU-011	ARU-012	ARU-013	ARU-014	ARU-015	ARU-016	ARU-017	ARU-018	ARU-019
Final207_235	1.466	0.991	2.043	2.679	11.37	2.198	2.691	1.633	11.79	0.97	1.477	1.566	5	1.568	2.024	3.88	12.2	2.297	1.835
Final207_235_Prop2SE	0.068	0.05	0.09	0.12	0.45	0.11	0.11	0.074	0.5	0.049	0.096	0.069	0.21	0.076	0.087	0.18	0.55	0.098	0.087
Final206_238	0.1377	0.0709	0.1913	0.2268	0.4837	0.1896	0.2284	0.1587	0.4921	0.1071	0.1075	0.0887	0.3155	0.1613	0.1867	0.2497	0.4952	0.2057	0.176
Final206_238_Prop2SE	0.0041	0.0028	0.0049	0.0058	0.012	0.0051	0.0054	0.0042	0.014	0.0027	0.0083	0.0029	0.0085	0.0041	0.0046	0.0072	0.014	0.0052	0.005
ErrorCorrelation_6_38vs7_35	0.63432	0.90665	0.29676	0.26054	0.40615	0.22151	0.23004	0.38235	0.35544	0.16251	0.95394	0.79855	0.4098	0.126	0.19665	0.57018	0.14083	0.56286	0.42412
Concordance	75.6831	26.3126	100.267	97.1302	100.197	85.6159	99.1031	91.6908	98.8876	85.0195	39.7693	26.3588	94.5425	105.125	93.8723	78.0011	97.7427	102.032	95.173
FinalAge206_238	831	441	1128	1320	2546	1119	1326	949	2578	655.5	655	548	1767	964	1103	1436	2598	1205	1045
FinalAge206_238_Prop2SE	23	17	27	30	53	28	28	24	60	16	48	17	42	23	25	37	60	28	27
FinalAge207_206	1098	1676	1125	1359	2541	1307	1338	1035	2607	771	1647	2079	1869	917	1175	1841	2658	1181	1098
FinalAge207_206_Prop2SE	85	68	88	85	63	92	72	92	68	110	79	65	74	110	80	77	76	85	86
Final_U_Th_Ratio	1.237	1.596	2.128	1.212	1.832	1.388	1.34	1.511	0.736	1.679	1.623	0.598	2.021	1.255	1.365	0.664	1.866	1.377	4.418

Comments	ARU-020	ARU-021	ARU-022	ARU-023	ARU-024	ARU-025	ARU-026	ARU-027	ARU-028	ARU-029	ARU-030	ARU-031	ARU-032	ARU-033	ARU-034	ARU-035	ARU-036	ARU-037	ARU-038
Final207_235	3.52	3.565	1.511	2.036	11.01	1.721	10.87	1.353	6.56	2.236	3.429	1.529	3.965	9.01	2.94	3.027	6.02	5.98	4.98
Final207_235_Prop2SE	0.19	0.15	0.069	0.097	0.43	0.072	0.44	0.067	0.3	0.1	0.15	0.063	0.17	0.37	0.15	0.16	0.26	0.24	0.22
Final206_238	0.2569	0.2136	0.145	0.1839	0.4756	0.1602	0.4771	0.1345	0.3209	0.2059	0.2448	0.146	0.287	0.443	0.2381	0.2412	0.3738	0.3633	0.3426
Final206_238_Prop2SE	0.0078	0.0063	0.0037	0.0058	0.013	0.0042	0.013	0.0052	0.0085	0.0053	0.0075	0.004	0.0069	0.012	0.0069	0.0065	0.0096	0.0091	0.0092
ErrorCorrelation_6_38vs7_35	0.43088	0.7586	0.16564	0.4669	0.63348	0.66108	0.27538	0.78087	0.68781	0.21964	0.82616	0.44039	0.41455	0.72351	0.27973	0.33991	0.43283	0.3582	0.0997
Concordance	90.2021	64.2452	81.5716	90.1327	99.0514	84.507	100.319	79.4721	77.0288	104.961	85.0422	79.6733	101.057	102.384	96.0223	102.053	106.674	102.463	109.521
FinalAge206_238	1473	1247	872	1087	2506	960	2512	813	1794	1206	1410	878	1626	2362	1376	1392	2046	1997	1898
FinalAge206_238_Prop2SE	40	33	21	32	55	24	56	30	42	28	39	23	35	52	36	34	45	43	44
FinalAge207_206	1633	1941	1069	1206	2530	1136	2504	1023	2329	1149	1658	1102	1609	2307	1433	1364	1918	1949	1733
FinalAge207_206_Prop2SE	92	66	93	86	63	77	69	87	70	89	70	81	76	65	94	100	73	70	82
Final_U_Th_Ratio	0.695	2.82	1.96	1.625	1.045	3.18	0.694	2.12	2.954	1.138	2.709	1.985	1.285	0.88		2.054	0.724	2.564	1.138

Comments	ARU-039	ARU-040	ARU-041	ARU-042	ARU-043	ARU-044	ARU-045	ARU-046	ARU-047	ARU-048	ARU-049	ARU-050	ARU-051	ARU-052	ARU-053	ARU-054	ARU-055	ARU-056	ARU-057
Final207_235	31.57	2.667	2.109	2.76	6.45	1.741	1.641	1.715	4.347	4.15	2.107	2.883	5.07	2.844	2.61	no value	1.687	12.13	2.689
Final207_235_Prop2SE	1.2	0.13	0.09	0.14	0.28	0.082	0.07	0.075	0.18	0.18	0.1	0.12	0.21	0.12	0.15	NaN	0.083	0.55	0.12
Final206_238	0.734	0.2303	0.1874	0.1704	0.3633	0.1541	0.1609	0.1624	0.2853	0.2902	0.195	0.2249	0.3282	0.2326	0.2053	no value	0.1666	0.4773	0.2208
Final206_238_Prop2SE	0.018	0.0063	0.0046	0.0052	0.0099	0.0049	0.0044	0.005	0.0075	0.0081	0.0059	0.0057	0.0086	0.0066	0.0083	NaN	0.0047	0.013	0.0058
ErrorCorrelation_6_38vs7_35	0.42821	0.36468	0.44139	-0.40726	0.44118	0.61426	0.22955	0.32942	0.50681	0.17664	0.42662	0.53738	0.17285	0.24666	-0.12061	NaN	0.23474	0.47195	0.61025
Concordance	100.141	101.521	91.715	54.4868	95.5024	74.616	91.09	85.9043	90.4362	97.5104	100.349	87.9195	99.673	97.0461	82.3288	#VALUE!	96.9727	93.5592	93.2511
FinalAge206_238	3548	1335	1107	1014	1996	923	961	969	1617	1645	1150	1310	1829	1347	1202	no value	993	2513	1285
FinalAge206_238_Prop2SE	65	33	25	29	47	28	24	27	38	40	31	31	42	34	45	NaN	26	58	31
FinalAge207_206	3543	1315	1207	1861	2090	1237	1055	1128	1788	1687	1146	1490	1835	1388	1460	no value	1024	2686	1378
FinalAge207_206_Prop2SE	61	85	80	100	70	80	90	88	71	85	93	72	75	85	120	NaN	93	65	70
Final_U_Th_Ratio	2.71	0.4163	1.162	3.23	0.931	1.93	0.519	1.349	2.225	0.71	0.559	1.954	2.612	0.954	0.899	no value	3.18	1.317	1.083

Comments	ARU-058	ARU-059	ARU-060	ARU-061	ARU-062	ARU-063	ARU-064	ARU-065	ARU-066	ARU-067	ARU-068	ARU-069	ARU-070	ARU-071	ARU-072	ARU-073	ARU-074	ARU-075	ARU-076
Final207_235	3.56	4.95	4.75	6.25	4.17	6.03	4.297	5.2	4.859	2.022	1.821	4.487	2.182	1.169	4.95	4.54	2	4.99	4.34
Final207_235_Prop2SE	0.19	0.22	0.2	0.25	0.23	0.26	0.17	0.22	0.2	0.11	0.09	0.19	0.12	0.1	0.21	0.19	0.14	0.25	0.2
Final206_238	0.2717	0.3087	0.3117	0.36	0.3071	0.3597	0.2965	0.3345	0.3163	0.1867	0.1433	0.2959	0.1978	0.1375	0.3259	0.3097	0.1972	0.33	0.3078
Final206_238_Prop2SE	0.0084	0.0085	0.0081	0.0086	0.0085	0.0092	0.0086	0.0077	0.0085	0.0054	0.0071	0.0077	0.0053	0.0089	0.0092	0.0083	0.006	0.01	0.0089
ErrorCorrelation_6_38vs7_35	0.25214	0.34034	0.39518	0.43276	0.46333	0.24014	0.32258	0.45344	0.22164	0.0013	0.65896	0.3574	0.27115	0.18108	0.11902	0.69493	0.33297	0.25257	0.49419
Concordance	101.775	92.6243	98.092	97.9763	107.01	101.331	98.5277	100.27	98.1163	94.7595	58.8275	92.9844	97.1596	117.324	100.498	99.5415	113.529	103.204	104.6
FinalAge206_238	1548	1733	1748	1985	1725	1980	1673	1859	1771	1103	863	1670	1163	833	1817	1737	1158	1836	1728
FinalAge206_238_Prop2SE	43	42	40	41	42	44	37	41	38	28	31	36	31	30	43	45	45	48	44
FinalAge207_206	1521	1871	1782	2026	1612	1954	1698	1854	1805	1164	1467	1796	1197	710	1808	1745	1020	1779	1652
FinalAge207_206_Prop2SE	100	79	75	69	99	78	69	73	70	110	73	74	100	180	83	72	150	83	75
Final_U_Th_Ratio	1.805	1.131	1.893	7.82	1.071	0.6647	1.64	4.616	2.35	1.144	2.51	1.397	1.284	0.594	1.492	2.499	1.259	1.455	1.416

Comments	ARU-077	ARU-078	ARU-079	ARU-080	ARU-081	ARU-082	ARU-083	ARU-084	ARU-085	ARU-086	ARU-087	ARU-088	ARU-089	ARU-090	ARU-091	ARU-092	ARU-093	ARU-094	ARU-095
Final207_235	2.59	2.93	2.032	4.519	4.781	10.97	2.587	2.006	5.73	6.18	2.069	2.259	2.553	9.09	2.521	2.384	2.053	2.623	4.83
Final207_235_Prop2SE	0.14	0.21	0.11	0.19	0.19	0.46	0.13	0.091	0.3	0.52	0.1	0.096	0.12	0.38	0.1	0.097	0.11	0.11	0.22
Final206_238	0.2224	0.213	0.1983	0.2961	0.3137	0.4849	0.2212	0.1847	0.3569	0.344	0.191	0.2044	0.2201	0.4195	0.2155	0.2028	0.1879	0.2252	0.3219
Final206_238_Prop2SE	0.0065	0.015	0.0057	0.0084	0.0082	0.013	0.0063	0.0049	0.011	0.017	0.0053	0.0057	0.006	0.012	0.0056	0.0056	0.0067	0.0062	0.0089
ErrorCorrelation_6_38vs7_35	0.18808	0.93146	0.18077	0.48227	0.51568	0.58844	0.35729	0.40208	0.44912	0.30371	0.31081	0.6929	0.43113	0.7938	0.42562	0.40569	0.77767	0.12439	0.47362
Concordance	99.7687	77.1854	109.492	91.5616	98.545	101.799	96.2603	94.1379	103.312	91.7391	95.9114	98.358	99.5342	93.3361	95.9573	89.7436	94.8674	102.028	102.098
FinalAge206_238	1294	1245	1165	1671	1761	2546	1287	1092	1965	1899	1126	1198	1282	2255	1258	1190	1109	1308	1801
FinalAge206_238_Prop2SE	34	81	31	41	41	57	33	27	54	80	29	30	32	56	29	30	36	32	44
FinalAge207_206	1297	1613	1064	1825	1787	2501	1337	1160	1902	2070	1174	1218	1288	2416	1311	1326	1169	1282	1764
FinalAge207_206_Prop2SE	100	75	110	69	70	67	98	85	91	170	100	77	86	62	77	79	83	90	78
Final_U_Th_Ratio	1.134	1.55	0.853	1.704	2.259	3.95	0.877	1.048	0.93	0.433	0.6387	1.49	1.443	1.484	2.346	1.544	5.7	1.086	1.528

Comments	ARU-096	ARU-097	ARU-098	ARU-099	ARU-100
Final207_235	0.752	5.51	1.812	2.38	5.96
Final207_235_Prop2SE	0.041	0.34	0.09	0.18	0.27
Final206_238	0.0631	0.3206	0.1736	0.176	0.3527
Final206_238_Prop2SE	0.0023	0.009	0.0049	0.0082	0.0099
ErrorCorrelation_6_38vs7_35	0.51792	0.49573	0.17956	0.07578	0.46023
Concordance	29.403	88.7073	96.2687	63.9877	98.9346
FinalAge206_238	394	1791	1032	1043	1950
FinalAge206_238_Prop2SE	14	44	27	45	48
FinalAge207_206	1340	2019	1072	1630	1971
FinalAge207_206_Prop2SE	90	96	98	170	75
Final_U_Th_Ratio	1.199	1.631	1.518	0.3963	0.94

Table 2: U-Pb data for MacDonnell Ranges sample, Arumbera formation.

Comments	ARu001	ARu002	ARu003	ARu004	ARu005	ARu006	ARu007	ARu008	ARu009	ARu010	ARu011	ARu012	ARu013	ARu014	ARu015	ARu016	ARu017	ARu018	ARu019	ARu020	ARu021
Final207_235	2.059	2.104	2.62	3.371	2.175	1.547	2.162	3.318	8.44	3.27	2.153	2.08	2.107	2.145	2.317	3.65	3.177	2.135	2.957	1.834	4.576
Final207_235_Prop2SE	0.11	0.08	0.11	0.11	0.086	0.087	0.076	0.12	0.28	0.14	0.11	0.15	0.088	0.078	0.08	0.15	0.13	0.085	0.11	0.074	0.16
Final206_238	0.194	0.1929	0.2246	0.2528	0.2016	0.1576	0.1997	0.2518	0.4298	0.2452	0.1959	0.1882	0.1969	0.1994	0.2035	0.2667	0.2521	0.1979	0.2383	0.1785	0.2964
Final206_238_Prop2SE	0.007	0.0059	0.0067	0.0076	0.0062	0.0052	0.0063	0.0077	0.012	0.0081	0.0058	0.0068	0.0058	0.0056	0.008	0.0078	0.0062	0.0076	0.0052		0.01
ErrorCorrelation_6_38vs7_35	0.2787	0.477	0.1565	0.6366	0.1498	0.4171	0.2827	0.314	0.4953	0.4578	0.2142	0.1033	0.2467	0.2146	0.5246	0.477	0.4461	0.3538	0.7	0.2117	0.5423
Concordance	105.42	100.26	100	94.408	103.95	98.332	101.73	94.343	102.44	92.052	99.741	99.196	100.78	102.27	94.537	96.149	99.656	100.95	96.972	102.42	91.767
FinalAge206_238	1147	1136	1309	1452	1184	943	1173	1451	2305	1413	1156	1111	1158	1172	1194	1523	1448	1166	1377	1058	1672
FinalAge206_238_Prop2SE	36	32	37	39	33	29	34	39	52	42	37	37	31	31	30	41	40	34	40	29	51
FinalAge207_206	1088	1133	1309	1538	1139	959	1153	1538	2250	1535	1159	1120	1149	1146	1263	1584	1453	1155	1420	1033	1822
FinalAge207_206_Prop2SE	120	95	100	85	100	130	94	85	77	93	110	160	99	91	85	93	97	98	85	100	84
Approx_Pb_PPM	594	784	793	2157	522	186.6	622	794	4165	353	409	393	684	662	1632	684	181.8	862	768	416	1074
Approx_Pb_PPM_Int2SE	30	23	30	98	15	9.2	18	41	69	16	13	17	37	17	38	29	8.1	18	50	15	60
Final_U_Th_Ratio	0.89	1.613	0.76	1.466	1.383	1.681	1.602	0.937	1.12	1.979	0.69	0.761	0.982	1.827	1.187	1.013	3.697	0.6591	2.47	1.824	1.999
Final_U_Th_Ratio_Int2SE	0.018	0.03	0.012	0.069	0.046	0.027	0.032	0.013	0.014	0.04	0.012	0.014	0.067	0.027	0.016	0.028	0.069	0.0091	0.14	0.025	0.047
Final238_206	5.1546	5.184	4.4524	3.9557	4.9603	6.3452	5.0075	3.9714	2.3267	4.0783	5.1046	5.3135	5.0787	5.015	4.914	3.7495	3.9667	5.0531	4.1964	5.6022	3.3738
Final238_206_Prop2SE	0.186	0.1586	0.1328	0.1189	0.1525	0.2094	0.158	0.1214	0.065	0.1347	0.185	0.192	0.1496	0.1459	0.1352	0.1125	0.1227	0.1583	0.1338	0.1632	0.1138
Final207_206	0.0749	0.0779	0.0855	0.0955	0.0781	0.0711	0.0785	0.0951	0.1417	0.0956	0.0783	0.0783	0.0782	0.0781	0.0827	0.0982	0.0915	0.0782	0.09	0.0737	0.1116
Final207_206_Prop2SE	0.0044	0.0037	0.0045	0.0042	0.0039	0.0041	0.0037	0.0045	0.0061	0.0048	0.0046	0.006	0.0039	0.0037	0.0036	0.0051	0.0045	0.0039	0.0041	0.0038	0.005
ErrorCorrelation_38_6vs7_6	0.2629	0.1089	0.2853	0.3684	0.3983	0.1291	0.3828	0.3832	0.2347	0.247	0.2526	0.3362	0.2643	0.3786	0.0449	-0.1242	0.298	0.2907	-0.0823	0.2874	0.5113
Approx_U_PPM	131.5	291.4	116.8	599	161.7	84.3	218.1	129.7	487	124	60.5	67.65	139.9	250.5	382.3	108.4	111.5	115.6	372.1	163.3	308
Approx_Th_PPM	148.8	180.8	155.4	420	117.8	50.39	135.5	138.2	437.4	62.5	87.7	87.7	146	136.7	321.5	108.4	29.93	174	150	89.4	155
Th\U	1.1316	0.6205	1.3305	0.7012	0.7285	0.5977	0.6213	1.0655	0.8982	0.504	1.4496	1.2964	1.0436	0.5457	0.841	1	0.2684	1.5052	0.4031	0.5475	0.5032

Comments	ARu085	ARu086	ARu087	ARu088	ARu089	ARu090	ARu091	ARu092	ARu093	ARu094	ARu095	ARu096	ARu097	ARu098	ARu099	ARu100	ARu101	ARu102	ARu103	ARu104	ARu105
Final207_235	2.166	3.76	3.633	2.257	2.428	4.62	2.49	2.055	2.731	2.191	2.11	2.259	2.05	2.01	3.648	2.71	1.961	1.96	1.809	2.459	3.646
Final207_235_Prop2SE	0.076	0.15	0.14	0.08	0.088	0.16	0.23	0.1	0.12	0.089	0.094	0.1	0.13	0.15	0.12	0.16	0.075	0.14	0.081	0.11	0.14
Final206_238	0.2003	0.2921	0.2759	0.2062	0.2101	0.3181	0.2117	0.1935	0.243	0.2038	0.1969	0.2082	0.1946	0.1958	0.2786	0.2177	0.188	0.1915	0.1815	0.2166	0.2687
Final206_238_Prop2SE	0.0057	0.0091	0.0084	0.006	0.0061	0.0091	0.01	0.0068	0.0071	0.0061	0.0069	0.0065	0.0078	0.0073	0.008	0.0074	0.0057	0.0077	0.0056	0.0073	0.0086
ErrorCorrelation_6_38vs7_35	0.5094	0.4165	0.1782	0.7056	0.3371	0.5734	-0.0157	0.4993	0.6369	0.2941	0.308	0.5092	0.1339	0.1529	0.6187	0.4641	0.1603	0.293	0.2733	0.3226	0.4731
Concordance	101.9	109.7	102.4	101.68	95.271	102.12	95	101.33	108.6	104.9	101.4	102.78	103.06	107.66	102.39	92.041	100.73	113.94	106.12	99.292	97.775
FinalAge206_238	1179	1651	1581	1208	1229	1780	1235	1140	1402	1198	1158	1219	1144	1152	1584	1272	1110	1128	1075	1263	1538
FinalAge206_238_Prop2SE	29	46	43	32	33	45	56	37	37	32	32	35	42	39	40	40	31	41	30	39	42
FinalAge207_206	1157	1505	1544	1188	1290	1743	1300	1125	1291	1142	1142	1186	1110	1070	1547	1382	1102	990	1013	1272	1573
FinalAge207_206_Prop2SE	86	95	94	87	90	80	200	110	110	100	100	100	150	160	81	110	100	160	110	100	88
Approx_Pb_PPM	1632	406	513	784	1061	759	178.3	613	1132	768	544	581	135.8	494	2129	715	279.6	245	96.4	313	856
Approx_Pb_PPM_Int2SE	49	14	18	23	36	26	8.7	22	34	32	29	16	6.5	20	55	41	9.6	13	6	14	26
Final_U_Th_Ratio	0.965	1.586	1.164	2.334	1.101	2.04	0.545	1.274	0.5134	1.008	0.998	1.209	1.209	1.859	0.814	3.317	0.473	3.99	2.25	1.292	
Final_U_Th_Ratio_Int2SE	0.013	0.028	0.016	0.032	0.017	0.028	0.01	0.021	0.0058	0.027	0.023	0.018	0.021	0.0062	0.029	0.025	0.048	0.012	0.12	0.055	0.015
Final238_206	4.9925	3.4235	3.6245	4.8497	4.7596	3.1437	4.7237	5.168	4.1152	4.9068	5.0787	4.8031	5.1387	5.1073	3.5894	4.5935	5.3191	5.2219	5.5096	4.6168	3.7216
Final238_206_Prop2SE	0.1421	0.1067	0.1104	0.1411	0.1382	0.0899	0.2231	0.1816	0.1202	0.1469	0.1548	0.15	0.206	0.1904	0.1031	0.1561	0.1613	0.21	0.17	0.1556	0.1191
Final207_206	0.0785	0.0945	0.0964	0.0798	0.0838	0.1068	0.0901	0.0778	0.0842	0.0779	0.0787	0.0803	0.0762	0.0743	0.0962	0.0903	0.0765	0.0748	0.0725	0.0833	0.0978
Final207_206_Prop2SE	0.0035	0.0047	0.0048	0.0036	0.0039	0.0047	0.01	0.0041	0.0044	0.0039	0.0041	0.004	0.0054	0.006	0.0041	0.0059	0.0058	0.004	0.0044	0.0046	
ErrorCorrelation_38_6vs7_6	0.2459	0.266	0.4462	0.0029	0.2608	0.2071	0.3608	0.1577	0.0008	0.3099	0.2481	0.0337	0.3317	0.2038	0.3842	-0.1501	0.4217	0.1188	0.2174	0.3629	0.3689
Approx_U_PPM	326.8	93.7	93.1	368	225.4	208.3	19.88	159.1	95.6	152.7	114.5	151	31.6	28.23	605	104.2	195.9	24.51	84.7	131.9	167.7
Approx_Th_PPM	337.8	60.1	80.6	157.5	205.1	103.5	36.67	124.4	184.8	150.9	113.3	113	26.13	99.8	327.9	131.4	58.93	53	20.93	58.5	129.3
Th\U	1.0337	0.6414	0.8657	0.428	0.9099	0.4969	1.8446	0.7819	1.9331	0.9882	0.9895	0.7483	0.8269	3.5352	0.542	1.261	0.3008	2.1624	0.2471	0.4435	0.771

Comments	ARu064	ARu065	ARu066	ARu067	ARu068	ARu069	ARu070	ARu071	ARu072	ARu073	ARu074	ARu075	ARu076	ARu077	ARu078	ARu079	ARu080	ARu081	ARu082	ARu083	ARu084
Final207_235	2.266	2.087	2.629	2.123	3.697	2.415	1.558	2.146	1.88	2.117	1.78	2.988	2.044	1.803	2.192	2.113	1.508	2.156	2.017	3.829	2.069
Final207_235_Prop2SE	0.091	0.11	0.12	0.087	0.13	0.096	0.075	0.092	0.079	0.069	0.069	0.11	0.089	0.079	0.091	0.091	0.061	0.091	0.079	0.14	0.11
Final206_238	0.2081	0.1908	0.2255	0.1961	0.282	0.2148	0.1633	0.189	0.1851	0.199	0.1785	0.244	0.1935	0.1775	0.2015	0.1971	0.1537	0.1971	0.1941	0.2867	0.2015
Final206_238_Prop2SE	0.0064	0.0067	0.0072	0.0058	0.0082	0.0066	0.005	0.0059	0.0059	0.0055	0.0052	0.0071	0.0067	0.0057	0.0059	0.0059	0.0044	0.0063	0.0056	0.0086	0.0063
ErrorCorrelation_6_38vs7_35	0.4157	-0.1079	0.1392	0.2513	0.3894	0.629	0.3007	0.2086	0.2578	0.5715	0.1616	0.7481	0.2339	0.3018	0.1939	0.2765	0.1124	0.2762	0.0463	0.5632	0.0299
Concordance	104.27	93.75	99.544	98.046	103.48	98.507	107.5	91.028	103.8	101.65	103.42	99.858	99.65	100.1	101.55	100.35	98.294	95.47	105.44	102.46	114.6
FinalAge206_238	1221	1125	1310	1154	1604	1254	975	1116	1094	1170	1058	1407	1139	1053	1183	1159	922	1159	1143	1624	1185
FinalAge206_238_Prop2SE	33	36	38	32	40	35	28	32	32	29	29	37	36	31	32	32	24	34	30	43	35
FinalAge207_206	1171	1200	1316	1177	1550	1273	907	1124	1054	1151	1023	1409	1143	1052	1165	1155	938	1214	1084	1585	1034
FinalAge207_206_Prop2SE	95	140	110	95	85	92	120	100	110	84	97	84	110	100	100	110	100	110	100	88	120
Approx_Pb_PPM	580	387	274	584	2540	944	334	670	422	587	576	2268	407	284	164	899	373	359	1046	549	182
Approx_Pb_PPM_Int2SE	14	21	12	19	150	53	12	19	17	17	47	62	14	17	11	25	13	11	60	16	9.1
Final_U_Th_Ratio	1.1	0.557	1.172	1.301	0.674	0.873	1.365	0.7415	1.804	5.087	1.013	0.821	0.829	2.19	5.24	0.75	2.111	0.991	0.704	1.358	1.653
Final_U_Th_Ratio_Int2SE	0.013	0.011	0.036	0.019	0.012	0.022	0.021	0.0093	0.025	0.075	0.034	0.012	0.015	0.036	0.38	0.01	0.032	0.013	0.012	0.021	0.031
Final238_206	4.8054	5.2411	4.4346	5.0994	3.5461	4.6555	6.1237	5.291	5.4025	5.0251	5.6022	4.0984	5.168	5.6338	4.9628	5.0736	6.5062	5.0736	5.152	3.488	4.9628
Final238_206_Prop2SE	0.1478	0.184	0.1416	0.1508	0.1031	0.143	0.1875	0.1652	0.1722	0.1389	0.1632	0.1193	0.1789	0.1809	0.1453	0.1519	0.1863	0.1622	0.1486	0.1046	0.1552
Final207_206	0.079	0.0821	0.0863	0.0794	0.0965	0.0832	0.0684	0.0813	0.0744	0.0782	0.073	0.0896	0.0773	0.0687	0.079	0.0786	0.0706	0.0811	0.0757	0.0974	0.0746
Final207_206_Prop2SE	0.0039	0.0056	0.0049	0.0039	0.0042	0.004	0.0038	0.0044	0.0038	0.0033	0.0037	0.004	0.0042	0.004	0.004	0.004	0.0036	0.0042	0.004	0.0047	0.0045
ErrorCorrelation_38_6vs7_6	0.2065	0.5102	0.3499	0.3262	0.3943	0.1594	0.2168	0.2731	0.3225	0.2284	0.3392	-0.0865	0.3926	0.2729	0.3024	0.2143	0.363	0.3494	0.5173	0.1224	0.3649
Approx_U_PPM	126.2	46.4	59.55	156.9	257	158.9	116.4	104.2	170.8	619.1	126.9	312.9	70.6	138.4	165	136.9	212.5	76.4	158.6	112.8	63.13
Approx_Th_PPM	115.3	83.6	50.5	121.3	380	185	85	139	95	122	131.2	378	84.4	63.2	34.1	182	102	76.9	226	82.9	38.26
Th\U	0.9136	1.8017	0.848	0.7731	1.4786	1.1643	0.7302	1.334	0.5562	0.1971	1.0339	1.2081	1.1955	0.4566	0.2067	1.3294	0.48	1.0065	1.425	0.7349	0.6061

Comments	ARu043	ARu044	ARu045	ARu046	ARu047	ARu048	ARu049	ARu050	ARu051	ARu052	ARu053	ARu054	ARu055	ARu056	ARu057	ARu058	ARu059	ARu060	ARu061	ARu062	ARu063
Final207_235	4.026	3.95	1.823	2.161	4.959	2.157	2.099	2.097	2.08	1.666	2.213	3.725	2.698	4.72	2.143	4.7	2.574	2.21	2.184	2.14	2.25
Final207_235_Prop2SE	0.14	0.18	0.098	0.11	0.17	0.11	0.073	0.087	0.12	0.083	0.11	0.13	0.092	0.2	0.083	0.21	0.11	0.2	0.088	0.18	0.33
Final206_238	0.3016	0.2867	0.186	0.1969	0.3271	0.2046	0.1957	0.1982	0.1908	0.1748	0.2003	0.27	0.2277	0.3151	0.2053	0.324	0.2163	0.2041	0.2018	0.2018	0.188
Final206_238_Prop2SE	0.0094	0.011	0.006	0.0062	0.01	0.0061	0.0056	0.0064	0.0069	0.0054	0.0061	0.0079	0.0065	0.01	0.0062	0.01	0.0067	0.0098	0.0063	0.0092	0.015
ErrorCorrelation_6_38vs7_35	0.4403	0.6462	0.3178	0.1465	0.581	0.2606	0.4171	0.4026	0.076	0.2004	0.2061	0.4814	0.6001	0.3298	0.4986	0.1178	0.5156	0.2322	0.2876	0.0273	-0.0263
Concordance	109.41	99.266	114.36	100.78	101.05	109.2	99.139	103.65	97.241	110.07	96.314	94.319	99.398	99.492	106.65	102.55	92.794	112.15	103.85	114.76	91.901
FinalAge206_238	1698	1623	1099	1158	1823	1199	1152	1165	1128	1038	1176	1544	1322	1764	1203	1808	1262	1200	1187	1182	1112
FinalAge206_238_Prop2SE	47	53	32	33	50	33	30	35	38	30	33	39	34	50	33	51	36	51	35	49	79
FinalAge207_206	1552	1635	961	1149	1804	1098	1162	1124	1160	943	1221	1637	1330	1773	1128	1763	1360	1070	1143	1030	1210
FinalAge207_206_Prop2SE	87	94	120	120	83	110	89	100	130	110	110	86	87	91	94	100	95	210	100	200	330
Approx_Pb_PPM	628	509	438	421	1053	1269	1627	345	397	723	345	519	989	2356	722	831	1469	225.2	842	202.9	27.7
Approx_Pb_PPM_Int2SE	26	43	22	13	28	29	35	28	12	15	19	40	41	26	17	23	40	9.2	26	9.9	3.1
Final_U_Th_Ratio	1.505	1.323	0.858	0.898	1.235	0.4441	0.81	1.19	0.5234	0.958	0.694	1.654	1.487	0.4483	1.792	0.4091	0.714	0.3379	1.365	0.3327	0.976
Final_U_Th_Ratio_Int2SE	0.02	0.04	0.018	0.013	0.017	0.0058	0.012	0.037	0.0075	0.014	0.01	0.047	0.018	0.0066	0.023	0.0068	0.01	0.0072	0.022	0.0057	0.044
Final238_206	3.3157	3.488	5.3763	5.0787	3.0572	4.8876	5.1099	5.0454	5.2411	5.7208	4.9925	3.7037	4.3917	3.1736	4.8709	3.0864	4.6232	4.8996	4.9554	4.9554	5.3191
Final238_206_Prop2SE	0.1033	0.1338	0.1734	0.1599	0.0935	0.1457	0.1462	0.1629	0.1895	0.1767	0.152	0.1084	0.1254	0.1007	0.1471	0.0953	0.2353	0.1547	0.2259		0.4244
Final207_206	0.0966	0.1009	0.0707	0.0791	0.11	0.077	0.0789	0.0767	0.0793	0.0703	0.0813	0.101	0.0859	0.1091	0.0778	0.1065	0.0875	0.0799	0.0776	0.0761	0.092
Final207_206_Prop2SE	0.0045	0.0051	0.004	0.0047	0.0049	0.0042	0.0035	0.0038	0.0052	0.004	0.0047	0.0046	0.0038	0.0055	0.0037	0.0061	0.0044	0.0078	0.0038	0.0072	0.015
ErrorCorrelation_38_6vs7_6	0.3363	0.1786	0.2125	0.2642	0.2308	0.0788	0.2373	0.3377	0.4279	0.2301	0.1356	0.2798	0.2143	0.3379	0.1698	0.3991	-0.0111	0.2177	0.3007	0.3689	0.3546
Approx_U_PPM	128.4	95.7	84.8	76.4	154.9	114.2	269.4	174	39.23	88.1	73.5	247.8	629	63.8	266.1	44.12	208.8	15.25	246	13.89	5.48
Approx_Th_PPM	85.7	71.6	98.3	85.1	125.7	259.1	332.7	143.6	75	92.2	107	151.9	419.8	144.4	148.5	107.2	292.5	45.45	179.6	41.7	5.64
Th\U	0.6674	0.7482	1.1592	1.1139	0.8115	2.2688	1.235	0.8253	1.9118	1.0465	1.4558	0.613	0.6674	2.2633	0.5581	2.4297	1.4009	2.9803	0.7301	3.0022	1.0292

Comments	ARu022	ARu023	ARu024	ARu025	ARu026	ARu027	ARu028	ARu029	ARu030	ARu031	ARu032	ARu033	ARu034	ARu035	ARu036	ARu037	ARu038	ARu039	ARu040	ARu041	ARu042
Final207_235	2.598	4.79	2.174	2.28	3.82	12.02	2.173	3.689	2.048	2.18	2.23	2.481	2.129	4.11	2.177	2.19	4.95	2.22	2.31	2.279	2.133
Final207_235_Prop2SE	0.088	0.2	0.075	0.091	0.15	0.44	0.084	0.13	0.09	0.15	0.12	0.11	0.1	0.17	0.11	0.13	0.18	0.1	0.084	0.12	0.076
Final206_238	0.2233	0.3195	0.1999	0.2085	0.2769	0.483	0.1972	0.2803	0.1839	0.2004	0.1993	0.2175	0.203	0.2898	0.1977	0.2062	0.3178	0.2021	0.2114	0.2105	0.1997
Final206_238_Prop2SE	0.0063	0.0095	0.0055	0.0063	0.0096	0.016	0.0058	0.0094	0.0059	0.008	0.0068	0.0066	0.0067	0.009	0.0063	0.0086	0.011	0.0067	0.0061	0.0075	0.0058
ErrorCorrelation_6_38vs7_35	0.473	0.4324	0.3483	0.4464	0.6157	0.7961	0.2589	0.4531	0.1549	0.3205	0.342	0.1295	0.1064	0.1106	0.1128	0.534	0.2394	0.327	0.44		0.4239
Concordance	99.846	100.96	101.99	101.67	98.622	97.773	97.973	105.29	90.667	105	92.937	101.68	107.1	96.185	98.142	108.74	98.888	98.998	105.1	104.68	102.53
FinalAge206_238	1299	1786	1177	1220	1575	2546	1160	1592	1088	1176	1171	1268	1191	1639	1162	1207	1778	1186	1236	1230	1173
FinalAge206_238_Prop2SE	33	47	30	34	49	71	31	42	32	43	36	35	36	45	34	46	56	36	32	40	31
FinalAge207_206	1301	1769	1154	1200	1597	2604	1184	1512	1200	1120	1260	1247	1112	1704	1184	1110	1798	1198	1176	1175	1144
FinalAge207_206_Prop2SE	86	92	89	92	87	73	99	89	110	170	140	110	120	96	120	130	88	100	95	120	89
Approx_Pb_PPM	2059	515	1309	1076	1885	1560	799	671	409	288	967	233	354	544	807	274	2293	592	384	139.1	1141
Approx_Pb_PPM_Int2SE	50	14	33	24	62	54	22	19	18	14	40	11	11	18	51	17	77	22	17	6.2	28
Final_U_Th_Ratio	1.263	1.081	1.84	0.677	0.917	1.174	1.296	1.391	1.286	0.447	0.423	1.662	0.762	0.9	0.356	0.4613	0.837	0.81	3.725	1.772	1.784
Final_U_Th_Ratio_Int2SE	0.014	0.019	0.028	0.0074	0.014	0.021	0.016	0.02	0.028	0.03	0.013	0.028	0.015	0.011	0.016	0.0088	0.015	0.015	0.079	0.028	0.023
Final238_206	4.4783	3.1299	5.0025	4.7962	3.6114	2.0704	5.071	3.5676	5.4377	4.99	5.0176	4.5977	4.9261	3.4507	5.0582	4.8497	3.1466	4.948	4.7304	4.7506	5.0075
Final238_206_Prop2SE	0.1263	0.0931	0.1376	0.1449	0.1252	0.0686	0.1491	0.1069	0.1745	0.1992	0.1712	0.1395	0.1626	0.1072	0.1612	0.2023	0.1089	0.164	0.1365	0.1693	0.1454
Final207_206	0.0843	0.1085	0.0779	0.08	0.0982	0.1751	0.08	0.0944	0.0797	0.0797	0.0834	0.0815	0.0765	0.1048	0.0813	0.0769	0.1091	0.0808	0.0798	0.0792	0.0781
Final207_206_Prop2SE	0.0037	0.0056	0.0035	0.004	0.0046	0.0077	0.0039	0.0044	0.0042	0.0066	0.0043	0.0045	0.0045	0.0052	0.005	0.0051	0.0044	0.0038	0.0045		0.0035
ErrorCorrelation_38_6vs7_6	0.3452	0.1571	0.2367	0.1982	0.2551	0.1694	0.3396	0.245	0.3474	0.3203	0.297	0.2314	0.3655	0.3486	0.2897	0.3496	0.4697	0.3154	0.313	0.2434	0.3657
Approx_U_PPM	481	72.7	494	145.7	260.5	166	212.5	139.1	109.6	25.7	81.7	72.31	53.94	71.6	53.4	26	259.1	96.4	264.4	46.13	416.8
Approx_Th_PPM	378.1	67	265.2	212.3	281.7	140.6	162	99.6	84.7	56.7	191.9	43.23	70.05	78.4	159	55.2	306.3	117	70.9	25.94	230.6
Th\U	0.7861	0.9216	0.5368	1.4571	1.0814	0.847	0.7624	0.716	0.7728	2.2062	2.3488	0.5978	1.2987	1.095	2.9775	2.1231	1.1822	1.2137	0.2682	0.5623	0.5533

Comments	ARu106	ARu107	ARu108	ARu109
Final207_235	2.27	2.153	2.229	2.663
Final207_235_Prop2SE	0.12	0.085	0.087	0.11
Final206_238	0.2049	0.1996	0.2027	0.2191
Final206_238_Prop2SE	0.0066	0.0061	0.0061	0.0065
ErrorCorrelation_6_38vs7_35	0.1633	0.3559	0.2597	0.295
Concordance	99.256	100.26	98.59	90.76
FinalAge206_238	1201	1173	1189	1277
FinalAge206_238_Prop2SE	35	33	33	34
FinalAge207_206	1210	1170	1206	1407
FinalAge207_206_Prop2SE	120	100	97	95
Approx_Pb_PPM	343	783	889	311
Approx_Pb_PPM_Int2SE	14	25	22	11
Final_U_Th_Ratio	1.114	0.945	0.809	1.781
Final_U_Th_Ratio_Int2SE	0.018	0.013		0.052
Final238_206	4.8804	5.01	4.9334	4.5641
Final238_206_Prop2SE	0.1572	0.1531	0.1485	0.1354
Final207_206	0.0812	0.0788	0.0808	0.0894
Final207_206_Prop2SE	0.005	0.0039	0.0039	0.0045
ErrorCorrelation_38_6vs7_6	0.2922	0.2607	0.3461	0.2445
Approx_U_PPM	75.4	149.3	149.5	111.6
Approx_Th_PPM	68	157.5	184.4	63.2
Th\U	0.9019	1.0549	1.2334	0.5663

Table 3: U-Pb data for MacDonnell Ranges sample, Pertatataka formation.

Comments	Per001	Per002	Per003	Per004	Per005	Per006	Per007	Per008	Per009	Per010	Per011	Per012	Per013	Per014	Per015	Per016	Per017	Per018	Per019	Per020
Final207_235	4.85	2.826	4.75	1.817	3.53	1.484	2.169	3.57	2.191	2.213	3.82	2.15	5.35	4.77	3.771	2.163	3.717	2.007	0.899	1.93
Final207_235_Prop2SE	0.19	0.1	0.2	0.075	0.5	0.053	0.085	0.15	0.11	0.092	0.17	0.1	0.33	0.18	0.15	0.089	0.13	0.08	0.038	0.15
Final206_238	0.3162	0.2336	0.3271	0.178	0.1869	0.1473	0.2038	0.2749	0.2013	0.2086	0.2858	0.1999	0.3175	0.3125	0.2878	0.202	0.2828	0.1946	0.1075	0.1694
Final206_238_Prop2SE	0.011	0.007	0.01	0.0055	0.01	0.0042	0.0061	0.0079	0.0062	0.0064	0.0095	0.0063	0.0098	0.01	0.0062	0.0086	0.0053	0.0032	0.0058	
ErrorCorrelation_6_38vs7_35	0.5442	0.5029	0.2384	0.2297	0.6143	0.5459	0.1456	0.1997	0.2394	0.3553	0.1254	0.3514	0.7306	0.5237	0.6111	0.071	0.4155	0.2489	0.1481	-0.067
Concordance	98.772	97.196	104.17	100.48	53.805	87.909	106.41	102.15	101.03	107.27	103.98	103.16	89.833	96.847	107.24	101.45	104.29	108.01	100.3	84
FinalAge206_238	1770	1352	1823	1056	1103	887	1195	1565	1182	1224	1619	1174	1776	1751	1630	1186	1605	1146	658	1008
FinalAge206_238_Prop2SE	55	37	49	30	56	24	33	40	33	33	48	34	48	49	43	33	43	29	18	32
FinalAge207_206	1792	1391	1750	1051	2050	1009	1123	1532	1170	1141	1557	1138	1977	1808	1520	1169	1539	1061	656	1200
FinalAge207_206_Prop2SE	88	89	96	97	220	85	100	93	120	100	110	110	110	84	87	100	87	97	110	170
Approx_Pb_PPM	1085	2002	675	333	338	1085	673	665	501	383	472	361	529	1027	1294	505	480	523	494	291
Approx_Pb_PPM_Int2SE	44	37	22	21	34	80	17	32	18	13	18	13	28	26	40	20	13	18	14	18
Final_U_Th_Ratio	1.143	0.716	0.834	1.796	1.028	1.77	0.995	0.763	0.7201	1.748	1.148	1.034	2.349	0.902	0.6181	1.097	4.907	1.77	1.332	0.752
Final_U_Th_Ratio_Int2SE	0.019	0.01	0.012	0.042	0.031	0.2	0.011	0.011	0.009	0.026	0.02	0.018	0.097	0.019	0.0089	0.02	0.091	0.023	0.015	0.044

Comments	Per100	Per101	Per102	Per103	Per104	Per105	Per106	Per107	Per108	Per109	Per110	Per111	Per112	Per113	Per114	Per115	Per116	Per117	Per118	Per119
Final207_235	1.661	2.135	3.193	3.774	1.648	1.655	2.13	3.518	2.88	1.838	2.172	2.223	4.46	4.1	0.962	1.78	1.928	2.154	2.142	2.17
Final207_235_Prop2SE	0.055	0.084	0.11	0.14	0.066	0.062	0.12	0.14	0.15	0.074	0.089	0.086	0.18	0.18	0.059	0.064	0.073	0.1	0.092	0.14
Final206_238	0.1553	0.1965	0.2564	0.2815	0.1678	0.1658	0.197	0.2491	0.2323	0.1772	0.2037	0.2044	0.2943	0.2908	0.1109	0.1758	0.1764	0.1979	0.1958	0.193
Final206_238_Prop2SE	0.0044	0.0062	0.0074	0.0084	0.0055	0.0044	0.0069	0.01	0.0071	0.0057	0.006	0.0065	0.011	0.0088	0.0041	0.005	0.0054	0.0062	0.0061	0.0071
ErrorCorrelation_6_38vs7_35	0.7234	0.2894	0.1861	0.5526	0.5068	0.3564	-0.012	0.7675	0.1999	0.5093	0.4512	0.295	0.7774	0.4248	0.251	0.2907	0.6033	0.4311	0.512	0.0423
Concordance	82.593	101.14	104.85	101.46	103.95	102.06	98.136	86.703	96.557	101.94	108.05	101.27	93.577	101.48	104.15	102.25	88.729	102.37	99.568	91.613
FinalAge206_238	930	1156	1471	1598	999	989	1158	1441	1346	1051	1195	1198	1661	1645	677	1044	1047	1164	1152	1136
FinalAge206_238_Prop2SE	24	34	38	42	31	25	37	52	37	31	32	35	55	44	24	28	30	34	33	38
FinalAge207_206	1126	1143	1403	1575	961	969	1180	1662	1394	1031	1106	1183	1775	1621	650	1021	1180	1157	1240	
FinalAge207_206_Prop2SE	82	96	91	89	99	93	140	83	110	96	97	95	84	98	150	93	95	110	110	150
Approx_Pb_PPM	525	1196	826	427	387	479	304	1530	183.9	245	344	4.6	688	557	204.3	714	507	500	786	361
Approx_Pb_PPM_Int2SE	15	24	26	15	13	13	16	150	8.1	10	11	1.3	53	22	8.5	41	17	17	27	22
Final_U_Th_Ratio	5.069	0.831	1.654	2.481	1.533	3.261	0.53	0.607	1.65	2.635	1.548	229	1.456	1.58	0.95	1.498	2.642	1.08	0.7386	0.643
Final_U_Th_Ratio_Int2SE	0.07	0.013	0.021	0.04	0.025	0.058	0.015	0.025	0.028	0.035	0.025	26	0.034	0.027	0.016	0.04	0.061	0.016	0.0084	0.011

Comments	Per080	Per081	Per082	Per083	Per084	Per085	Per086	Per087	Per088	Per089	Per090	Per091	Per092	Per093	Per094	Per095	Per096	Per097	Per098	Per099
Final207_235	6.67	2.199	1.946	6.8	2.179	2.225	2.167	3.92	2.236	2.077	3.8	1.955	3.42	3.79	1.695	2.211	2.261	7.23	1.19	2.293
Final207_235_Prop2SE	0.23	0.093	0.076	0.22	0.086	0.076	0.081	0.17	0.094	0.081	0.15	0.073	0.14	0.13	0.072	0.094	0.087	0.25	0.42	0.11
Final206_238	0.3768	0.1967	0.1914	0.3844	0.2013	0.2058	0.198	0.3021	0.2042	0.1961	0.2862	0.1876	0.2659	0.2768	0.1702	0.1913	0.2073	0.4084	0.118	0.2071
Final206_238_Prop2SE	0.011	0.0057	0.0061	0.011	0.0057	0.0057	0.0057	0.0091	0.0062	0.0063	0.0081	0.0055	0.0077	0.0073	0.0053	0.0061	0.0063	0.011	0.017	0.0068
ErrorCorrelation_6_38vs7_35	0.2381	0.3825	0.4085	0.6912	0.0971	0.4928	0.2137	0.4215	0.3497	0.5259	0.457	0.5316	0.4517	0.3165	0.5883	0.4249	0.0276	0.5596	0.289	0.4988
Concordance	99.806	96.103	108.98	102.29	100.51	104.15	98.394	113.97	105.56	104.62	105.67	104.23	103.19	96.744	103.68	89.809	106.49	106.62	705	102.62
FinalAge206_238	2060	1159	1129	2096	1182	1206	1164	1705	1197	1154	1622	1108	1519	1575	1013	1128	1214	2207	705	1213
FinalAge206_238_Prop2SE	51	30	33	53	31	31	31	46	34	34	41	30	39	37	29	33	34	52	94	36
FinalAge207_206	2064	1206	1036	2049	1176	1158	1183	1496	1134	1103	1535	1063	1472	1628	977	1256	1140	2070	100	1182
FinalAge207_206_Prop2SE	82	100	98	74	100	89	92	94	100	94	95	92	94	86	100	95	97	81	1000	100
Approx_Pb_PPM	805	632	369	1715	1190	2390	603	730	549	503	403	1217	912	1388	847	531	570	610	1.19	340
Approx_Pb_PPM_Int2SE	22	23	16	30	110	43	16	23	16	19	14	25	28	32	28	45	25	18	0.78	15
Final_U_Th_Ratio	1.103	0.986	3.09	1.693	0.61	0.845	1.204	1.075	1.114	1.822	1.653	1.158	0.8033	1.065	0.766	1.55	1.274	2.009	######	1.689
Final_U_Th_Ratio_Int2SE	0.012	0.017	0.08	0.019	0.01	0.022	0.053	0.019	0.026	0.026	0.012	0.0091	0.02	0.013		0.21	0.018		######	0.033

Comments	Per060	Per061	Per062	Per063	Per064	Per065	Per066	Per067	Per068	Per069	Per070	Per071	Per072	Per073	Per074	Per075	Per076	Per077	Per078	Per079
Final207_235	1.76	4.04	2.315	2.675	0.883	4.72	2.004	4.45	2.18	1.98	2.193	0.93	4.32	2.11	2.154	1.684	2.274	2.14	2.303	1.42
Final207_235_Prop2SE	0.11	0.16	0.095	0.094	0.083	0.17	0.074	0.19	0.077	0.13	0.082	0.18	0.14	0.081	0.077	0.13	0.082			0.28
Final206_238	0.1753	0.29	0.2104	0.2306	0.106	0.3215	0.1928	0.3063	0.1928	0.1723	0.1994	0.1095	0.3033	0.198	0.1995	0.1679	0.2057	0.2085	0.2093	0.127
Final206_238_Prop2SE	0.0062	0.009	0.0065	0.0071	0.0032	0.0095	0.0055	0.0087	0.006	0.0071	0.0062	0.004	0.0098	0.0067	0.0057	0.0055	0.0059	0.0074	0.0061	0.012
ErrorCorrelation_6_38vs7_35	0.0721	0.4078	0.2133	0.2947	0.4653	0.4653	0.4824	0.5504	0.4641	0.169	0.3397	0.351	0.3991	-0.057	0.4737	-0.178	0.3453	0.4039	0.1161	
Concordance	110.64	101.86	102.84	104.86	102.52	103.28	108.19	99.538	92.735	81.27	99.744	111.5	100.83	104.86	103.17	103.41	101.77	109.32	103.55	89.765
FinalAge206_238	1040	1644	1230	1337	651	1796	1136	1722	1136	1024	1171	669	1706	1164	1172	1000	1205	1220	1225	763
FinalAge206_238_Prop2SE	34	44	35	37	19	47	30	43	32	39	33	23	48	36	31	30	32	40	32	69
FinalAge207_206	940	1614	1196	1275	635	1739	1050	1730	1225	1260	1174	600	1692	1110	1136	967	1184	1183	850	
FinalAge207_206_Prop2SE	140	89	99	92	100	85	91	89	87	150	91	150	92	150	89	120	88	120	93	480
Approx_Pb_PPM	204	509	355	1079	519	536	1097	1203	1889	135.4	527	221	556	169.6	1418	243	1326	273	1030	4.5
Approx_Pb_PPM_Int2SE	15	16	11	27	17	19	32	70	84	9	15	11	18	8.9	28	20	29	15	24	1.5
Final_U_Th_Ratio	0.771	1.458	2.353	1.412	2.542	1.585	1.493	1.188	1.104	0.754	1.524	1.051	0.947	1.222	1.705	1.16	1.72	1.396	1.473	13.1
Final_U_Th_Ratio_Int2SE	0.019	0.018	0.032	0.018	0.033	0.029	0.02	0.019	0.02	0.017	0.039	0.053	0.014	0.029	0.018	0.082	0.023	0.029	0.014	4.4

Comments	Per040	Per041	Per042	Per043	Per044	Per045	Per046	Per047	Per048	Per049	Per050	Per051	Per052	Per053	Per054	Per055	Per056	Per057	Per058	Per059
Final207_235	2.021	2.17	2.177	4.84	2.125	2.278	3.718	2.287	2.316	4.79	3.841	3.901	2.261	4.5	2.405	1.499	4.77	1.85	1.925	2.311
Final207_235_Prop2SE	0.085	0.14	0.11	0.18	0.091	0.1	0.14	0.1	0.092	0.21	0.14	0.15	0.093	0.2	0.097	0.062	0.19	0.12	0.08	0.1
Final206_238	0.1887	0.1916	0.2021	0.3217	0.1997	0.2075	0.2842	0.2085	0.2062	0.3149	0.2885	0.2862	0.2101	0.2993	0.2108	0.1586	0.3196	0.1809	0.1841	0.2119
Final206_238_Prop2SE	0.0056	0.0077	0.0065	0.0095	0.0059	0.0064	0.0086	0.0066	0.006	0.01	0.0082	0.009	0.0061	0.011	0.0067	0.005	0.01	0.007	0.0058	0.0066
ErrorCorrelation_6_38vs7_35	0.2278	0.2083	0.2005	0.5247	0.1659	0.3025	0.4286	0.1464	0.3185	0.6351	0.2473	0.2048	0.1709	0.3069	0.2072	0.5521	0.1932	0.1477	0.2376	0.4422
Concordance	97.723	86.183	101.72	102.33	103.81	100.91	104.68	107.11	98.693	100.57	104.27	101.95	107.06	98.713	95.95	109.33	101.65	101.04	100.74	107.56
FinalAge206_238	1116	1129	1186	1798	1173	1215	1612	1220	1208	1764	1637	1621	1229	1687	1232	949	1786	1071	1089	1238
FinalAge206_238_Prop2SE	31	41	35	47	31	34	43	35	32	51	42	45	32	53	36	28	51	38	32	35
FinalAge207_206	1142	1310	1166	1757	1130	1204	1540	1139	1224	1754	1570	1590	1148	1709	1284	868	1757	1060	1081	1151
FinalAge207_206_Prop2SE	100	130	120	85	110	100	90	110	96	91	93	95	100	100	100	99	94	150	110	100
Approx_Pb_PPM	446	179.8	284	644	413	708	586	363	964	889	643	537	355	486	740	341	549	208.5	532	511
Approx_Pb_PPM_Int2SE	16	8.8	11	23	19	20	18	11	23	36	39	18	12	23	23	13	21	8.8	19	20
Final_U_Th_Ratio	1.5	0.626	1.216	2.483	1.339	0.834	1.45	1.407	0.964	1.517	1.152	1.242	1.752	1.231	1.092	2.321	0.891	0.772	1.061	1.174
Final_U_Th_Ratio_Int2SE	0.034	0.013	0.021	0.046	0.019	0.011	0.021	0.019	0.015	0.026	0.022	0.018	0.024	0.027	0.015	0.043	0.013	0.023	0.016	0.036

Comments	Per021	Per022	Per023	Per024	Per025	Per026		Per027	Per028	Per029	Per030	Per031	Per032	Per033	Per034	Per035	Per036	Per037	Per038	Per039
Final207_235	3.904	2.822	2.17	2.147	1.035		0.98	4.02	4.912	1.99	2.267	3.4	2.566	2.217	3.693	7.73	2.194	1.886	4.169	3.658
Final207_235_Prop2SE	0.14	0.11	0.1	0.084	0.072		0.17	0.16	0.16	0.21	0.097	0.12	0.1	0.098	0.13	0.25	0.1	0.11	0.15	0.14
Final206_238	0.2986	0.2384	0.2089	0.2049	0.1026		0.1049	0.2878	0.3308	0.1922	0.2023	0.2708	0.2165	0.2113	0.2837	0.3425	0.1944	0.1879	0.2989	0.2736
Final206_238_Prop2SE	0.0089	0.0077	0.0058	0.006	0.0063		0.0071	0.0083	0.0094	0.0078	0.0065	0.0074	0.0078	0.0062	0.0083	0.01	0.0072	0.0066	0.0088	0.01
ErrorCorrelation_6_38vs7_35	0.6446	0.3747	0.5988	0.5403	0.8033	0.0086513		0.3086	0.5069	0.1098	0.214	0.178	0.6871	0.0929	0.7202	0.8466	0.2804	0.1991	0.6264	0.528
Concordance	108.09	101.62	110.68	109.18	60.794	114.4642857		97.957	104.48	122.37	100.68	107.22	95.317	111.36	107.05	76.263	96.218	107.67	101.94	98.048
FinalAge206_238	1683	1377	1223	1201	628		641	1630	1842	1138	1187	1545	1262	1235	1609	1902	1145	1109	1685	1557
FinalAge206_238_Prop2SE	44	40	31	32	37		42	41	45	41	35	38	42	33	42	49	39	36	44	51
FinalAge207_206	1557	1355	1105	1100	1033		560	1664	1763	930	1179	1441	1324	1109	1503	2494	1190	1030	1653	1588
FinalAge207_206_Prop2SE	87	95	110	93	110		380	87	80	230	110	90	93	100	83	71	110	130	81	85
Approx_Pb_PPM	706	326	1166	463	1910		2	482	484	239	585	336	972	633	2142	3600	720	167.1	3730	996
Approx_Pb_PPM_Int2SE	17	16	28	16	190		0.95	18	11	14	17	14	36	19	76	130	43	8.6	160	38
Final_U_Th_Ratio	1.648	2.601	0.588	1.402	0.252		-7.00E+05	1.304	3.959	0.562	0.999	3.129	1.368	1.036	1.134	1.053	0.843	1.112	0.609	0.778
Final_U_Th_Ratio_Int2SE	0.023	0.056	0.01	0.027	0.044		1.90E+05	0.02	0.055	0.013	0.013	0.047	0.025	0.015	0.017	0.014	0.018	0.019	0.0089	0.012

Table 4: Table 1: U-Pb data for Wallara-1 core sample, Pioneer sandstone.

Comments	PIO-020	PIO-021	PIO-022	PIO-023	PIO-024	PIO-025	PIO-026	PIO-027	PIO-028	PIO-029	PIO-030	PIO-031	PIO-032	PIO-033	PIO-034	PIO-035	PIO-036	PIO-037	PIO-038	PIO-039
Final207_235	2.658	5.63	3.5	5.25	1.928	4.94	4.007	2.269	1.894	4.9	3.71	4.12	4.117	1.98	4.662	2.722	2.148	4.552	5.35	4.5
Final207_235_Prop2SE	0.13	0.28	0.22	0.28	0.08	0.22	0.18	0.1	0.091	0.24	0.21	0.21	0.18	0.1	0.2	0.12	0.12	0.2	0.24	0.2
Final206_238	0.2252	0.2485	0.1569	0.3296	0.1022	0.3276	0.2844	0.1955	0.184	0.3126	0.256	0.2605	0.2671	0.1829	0.304	0.2251	0.1983	0.2726	0.3288	0.305
Final206_238_Prop2SE	0.0068	0.01	0.0067	0.011	0.0029	0.0094	0.0086	0.0058	0.0054	0.0098	0.014	0.011	0.008	0.0054	0.0092	0.0068	0.0059	0.0077	0.0099	0.008
ErrorCorrelation_6_38vs7_35	0.20458	0.85434	0.84146	0.5188	0.72842	0.51354	0.51181	0.51694	0.49768	0.37356	0.83098	0.84778	0.47833	0.29293	0.32157	0.3542	0.10601	0.27329	0.43958	0.5563
Concordance	100.153	56.8698	38.1922	98.9752	29.0028	101.388	97.2859	89.7116	102.254	95.581	84.7713	82.5055	84.022	97.6598	94.4751	97.3214	103.737	80.7173	95.9141	97.945
FinalAge206_238	1309	1428	938	1835	628.2	1826	1613	1151	1089	1752	1464	1495	1525	1085	1308	1166	1553		1831	171
FinalAge206_238_Prop2SE	36	53	37	51	18	46	43	31	29	48	71	57	41	28	46	36	32	39	48	4
FinalAge207_206	1307	2511	2456	1854	2166	1801	1658	1283	1065	1833	1727	1812	1815	1111	1810	1344	1124	1924	1909	175
FinalAge207_206_Prop2SE	100	70	76	94	73	81	88	91	29	92	86	82	74	100	85	94	120	83	76	8
Final_U_Th_Ratio	0.736	0.533	0.2612	1.023	0.386	2.434	1.073	0.3814	2.056	0.859	0.672	0.959	1.69	2.488	1.84	1.721	1.082	0.643	1.853	1.18
Final_U_Th_Ratio_Int2SE	0.02	0.046	0.0091	0.028	0.009	0.077	0.023	0.0056	0.041	0.017	0.038	0.032	0.12	0.044	0.049	0.028	0.021	0.011	0.041	0.01

Comments	PIO-001	PIO-002	PIO-003	PIO-004	PIO-005	PIO-006	PIO-007	PIO-008	PIO-009	PIO-010	PIO-011	PIO-012	PIO-013	PIO-014	PIO-015	PIO-016	PIO-017	PIO-018	PIO-019
Final207_235	5.21	2.07	3.215	2.207	3.81	4.388	11.94	3.175	2.808	2.97	2.84	2.08	9.92	3.958	1.552	3.7	2.045	2.023	1.89
Final207_235_Prop2SE	0.23	0.15	0.15	0.1	0.17	0.19	0.57	0.15	0.14	0.32	0.16	0.14	0.43	0.17	0.084	0.17	0.12	0.11	0.13
Final206_238	0.3132	0.1944	0.2576	0.2053	0.2872	0.2829	0.418	0.1946	0.2372	0.189	0.2373	0.193	0.4562	0.2874	0.1566	0.2786	0.1877	0.1911	0.1829
Final206_238_Prop2SE	0.0098	0.0076	0.0076	0.0062	0.0083	0.009	0.015	0.0077	0.0076	0.017	0.0071	0.0082	0.013	0.0081	0.0046	0.0084	0.0064	0.0061	0.0069
ErrorCorrelation_6_38vs7_35	0.75825	0.00553	0.49015	0.08145	0.47424	0.7033	0.89305	0.80223	0.21673	0.98206	0.1695	0.41339	0.63795	0.41542	0.18599	0.40416	3.48E-05	0.43933	0.19094
Concordance	87.27	107.29	101.234	101.348	102.715	85.4178	77.5868	57.6536	99.492	60.4269	101.18	96.2712	99.3027	99.8161	95.9058	103.054	96.5248	100.803	97.4775
FinalAge206_238	1755	1148	1477	1203	1627	1605	2257	1145	1371	1104	1372	1136	2421	1628	937	1586	1111	1130	1082
FinalAge206_238_Prop2SE	48	40	39	33	42	45	68	41	40	95	37	45	59	40	26	41	34	34	38
FinalAge207_206	2011	1070	1459	1187	1584	1879	2909	1986	1378	1827	1356	1180	2438	1631	977	1539	1151	1121	1110
FinalAge207_206_Prop2SE	77	170	90	97	85	78	70	80	99	88	110	140	73	83	110	91	120	110	140
Final206_204	1.80E+05	1.10E+04	1.20E+05	5.80E+04	1.18E+05	1.97E+05	1.68E+05	8.90E+04	4.60E+04	4.80E+04	3.50E+04	1.24E+04	1.29E+04	7.50E+04	3.50E+04	7.50E+04	1.82E+04	3.40E+04	1.11E+04
Final_U_Th_Ratio	2.11	1.454	2.301	16.2	1.683	1.264	1.097	0.771	1.524	0.535	0.96	0.977	1.551	3.445	0.963	1.407	0.988	0.982	0.61
Final_U_Th_Ratio_Int2SE	0.11	0.033	0.035	1.6	0.027	0.048	0.057	0.03	0.048	0.03	0.024	0.031	0.061	0.061	0.024	0.018	0.016	0.01	

Comments	PIO-100	PIO-101	PIO-102	PIO-103	PIO-104	PIO-105	PIO-106	PIO-107	PIO-108	PIO-109	PIO-110	PIO-111	PIO-112	PIO-113	PIO-114	PIO-115	PIO-116	PIO-117	PIO-118	PIO-119
Final207_235	2.35	2.35	1.345	4.028	4.4	5.81	4.14	2.207	4.17	4.238	4.7	2.47	2.07	5.11	5.42	7.86	3.632	4.6	2.627	3.9
Final207_235_Prop2SE	0.17	0.15	0.077	0.18	1.8	0.29	0.19	0.11	0.22	0.19	0.22	0.17	0.13	0.23	0.24	0.45	0.15	0.21	0.13	0.1
Final206_238	0.145	0.1424	0.1442	0.2869	0.233	0.3527	0.2888	0.2031	0.291	0.285	0.3202	0.19	0.1962	0.3206	0.3297	0.3917	0.2634	0.2979	0.1608	0.285
Final206_238_Prop2SE	0.011	0.008	0.0045	0.0085	0.048	0.011	0.0093	0.0062	0.01	0.0085	0.0097	0.011	0.0067	0.01	0.01	0.013	0.0098	0.006	0.008	
ErrorCorrelation_6_38vs7_35	0.96106	0.9244	0.3408	0.51257	0.5673	0.67894	0.17308	0.50112	0.28096	0.32791	0.46242	0.724	0.12146	0.7966	0.59376	0.68892	0.50754	0.73318	0.78238	0.1548
Concordance	44.6677	44.1237	102.844	99.7549	66.3366	100.777	96.0611	103.565	97.6247	93.2487	104.07	75.2011	105.872	94.8121	96.978	94.5527	94.4236	93.7639	50.0261	100.93
FinalAge206_238	867	856	868	1628	1340	1946	1634	1191	1644	1616	1790	1122	1154	1791	1836	2135	1507	1684	960	161
FinalAge206_238_Prop2SE	61	45	25	44	260	54	47	33	51	43	47	59	36	49	48	56	39	50	33	4
FinalAge207_206	1941	1940	844	1632	2020	1931	1701	1150	1684	1733	1720	1492	1090	1884	1905	2258	1596	1796	1919	160
FinalAge207_206_Prop2SE	78	80	130	82	660	85	92	96	100	84	89	97	130	74	84	83	82	78	81	9
Final_U_Th_Ratio	0.424	0.475	4.33	1.407	0.4	0.929	1.078	0.965	0.811	1.305	1.241	1.1	0.57	1.498	1.91	1.03	2.95	0.362	0.91	
Final_U_Th_Ratio_Int2SE	0.014	0.018	0.13	0.032	0.1	0.014	0.015	0.014	0.018	0.043	0.022	0.13	0.026	0.16	0.032	0.052	0.016	0.42	0.013	0.01

Comments	PIO-080	PIO-081	PIO-082	PIO-083	PIO-084	PIO-085	PIO-086	PIO-087	PIO-088	PIO-089	PIO-090	PIO-091	PIO-092	PIO-093	PIO-094	PIO-095	PIO-096	PIO-097	PIO-098	PIO-099
Final207_235	10.81	30.44	5.85	1.198	5.13	4.94	2.761	3.71	3.25	3.22	3.58	4.27	3.28	3.851	4.606	5.11	2.11	2.39	~~3.732~~	2.02
Final207_235_Prop2SE	0.53	1.2	0.28	0.082	0.24	0.23	0.11	0.19	0.19	0.15	0.18	0.19	0.15	0.17	0.2	0.23	0.14	0.14	~~0.17~~	0.09
Final206_238	0.483	0.2433	0.3562	0.1275	0.3232	0.3212	0.1451	0.273	0.2494	0.261	0.2763	0.2814	0.2579	0.297	0.3132	0.1931	0.2178	~~0.2742~~	0.184	
Final206_238_Prop2SE	0.016	0.0066	0.011	0.0047	0.0096	0.0095	0.0043	0.0085	0.0082	0.0075	0.0081	0.0089	0.0075	0.0074	0.0092	0.011	0.0059	0.0088	~~-0.01572~~	0.005
ErrorCorrelation_6_38vs7_35	0.57171	0.72993	0.41812	0.13829	0.36118	0.34369	0.69513	0.22678	0.33546	0.23456	0.2627	0.62995	0.47502	0.81706	0.53101	0.87385	0.09922	0.57908		0.3921
Concordance	102.588	27.0067	102.08	97.8481	97.4649	99.0618	39.7541	99.8079	93.3594	104.695	104.8	90.1464	100.819	73.5247	90.4428	91.3066	100.708	109.784	~~98.5489~~	94.14
FinalAge206_238	2537	1403	1963	773	1807	1795	873	1559	1434	1494	1572	1601	1478	1383	1675	1754	1138	1268	~~1562~~	109
FinalAge206_238_Prop2SE	70	34	52	27	47	46	24	42	43	39	41	43	38	38	46	52	32	46	~~41~~	3
FinalAge207_206	2473	5195	1923	790	1854	1812	2196	1562	1536	1427	1500	1776	1466	1881	1852	1921	1130	1155	~~1585~~	116
FinalAge207_206_Prop2SE	83	83	90	160	88	88	76	100	110	99	91	81	87	76	78	76	140	110	~~84~~	9
Final_U_Th_Ratio	1.182	0.9269	1.37	0.38	1.333	0.892	0.76	1.413	1.649	1.137	1.216	0.932	1.061	1.368	0.78	0.681	0.641	1.894	~~2.033~~	0.92
Final_U_Th_Ratio_Int2SE	0.027	0.0073	0.024	0.006	0.019	0.014	0.014	0.036	0.014	0.037	0.02	0.027	0.014	0.046	0.019	0.022	0.011	0.045	~~0.051~~	0.02

Comments	PIO-060	PIO-061	PIO-062	PIO-063	PIO-064	PIO-065	PIO-066	PIO-067	PIO-068	PIO-069	PIO-070	PIO-071	PIO-072	PIO-073	PIO-074	PIO-075	PIO-076	PIO-077	PIO-078	PIO-079
Final207_235	5.321	1.85	8.8	3.359	4.498	5.06	2.32	3.328	3.206	3.96	8.44	1.899	3.798	5.12	3.83	10.48	4.966	4.61	4.572	3.51
Final207_235_Prop2SE	0.23	0.12	0.39	0.16	0.2	0.24	0.15	0.16	0.15	0.2	0.36	0.097	0.18	0.24	0.18	0.87	0.21	0.21	0.2	0.1
Final206_238	0.3313	0.1771	0.4301	0.2441	0.2807	0.3156	0.1931	0.2517	0.2097	0.2858	0.4268	0.1816	0.278	0.3246	0.2818	0.405	0.3105	0.3128	0.3117	0.258
Final206_238_Prop2SE	0.0096	0.006	0.012	0.0084	0.0083	0.011	0.0062	0.008	0.0075	0.0087	0.013	0.0056	0.0087	0.0099	0.0087	0.031	0.009	0.0094	0.0089	0.007
ErrorCorrelation_6_38vs7_35	0.45854	0.25841	0.66938	0.76637	0.40472	0.84013	0.11887	0.43958	0.70739	0.33872	0.53401	0.20507	0.62995	0.42319	0.9684	0.50643	0.27791	0.50477	0.1600	
Concordance	98.5043	90.2146	99.9566	87.7182	84.9468	94.2523	84.9254	94.8197	68.1111	101.778	100.655	99.2462	96.9486	102.5	79.4702	93.6193	101.858	100.806	94.327	
FinalAge206_238	1844	1051	2305	1407	1597	1771	1138	1446	1226	1623	2290	1075	1580	1811	1599	2160	1746	1754	1751	148
FinalAge206_238_Prop2SE	47	33	56	44	41	54	34	41	40	45	57	31	44	48	44	140	45	46	43	4
FinalAge207_206	1872	1165	2306	1604	1880	1879	1340	1525	1800	1607	2250	1068	1592	1868	1560	2718	1865	1722	1737	156
FinalAge207_206_Prop2SE	80	120	77	87	81	76	130	94	83	99	83	110	89	82	87	70	78	92	100	13
Final_U_Th_Ratio	2.115	1.115	2.048	0.611	0.525	2.69	0.889	1.361	0.481	1.19	0.744	1.663	1.437	0.893	1.114	3.94	0.664	1.787	1.821	1.2
Final_U_Th_Ratio_Int2SE	0.039	0.021	0.047	0.018	0.01	0.038	0.021	0.031	0.015	0.023	0.011	0.027	0.024	0.018	0.017	0.78	0.033	0.027	0.023	0.07

Comments	PIO-040	PIO-041	PIO-042	PIO-043	PIO-044	PIO-045	PIO-046	PIO-047	PIO-048	PIO-049	PIO-050	PIO-051	PIO-052	PIO-053	PIO-054	PIO-055	PIO-056	PIO-057	PIO-058	PIO-059
Final207_235	1.692	5.33	4.791	1.859	4.701	6.96	~~4.2~~	12.07	1.625	5.34	4.569	3.78	18.46	1.759	5.625	3.8	3.58	2.804	1.913	1.18
Final207_235_Prop2SE	0.075	0.23	0.2	0.12	0.2	0.3	~~0.29~~	0.52	0.089	0.24	0.2	0.19	0.96	0.091	0.24	0.18	0.17	0.14	0.095	0.0
Final206_238	0.1202	0.3353	0.3018	0.1809	0.2982	0.3662	~~0.2899~~	0.483	0.1652	0.3334	0.3072	0.2768	0.594	0.1698	0.3486	0.2772	0.2676	0.2315	0.1739	0.126
Final206_238_Prop2SE	0.0034	0.0098	0.0086	0.0058	0.0088	0.011	~~0.011~~	0.014	0.0052	0.0099	0.0091	0.0068	0.0054	0.0053	0.0097	0.0085	0.0084	0.0078	0.0076	0.00
ErrorCorrelation_6_38vs7_35	0.66291	0.33843	0.36548	0.29902	0.59403	0.6254	~~-0.03763~~	0.5446	0.41816	0.72844	0.41509	0.43529	0.60691	0.1611	0.65923	0.59092	0.22823	0.40947	0.20645	0.1632
Concordance	44.9846	99.5192	92.0411	112.737	92.2106	92.8835	~~97.5~~	95.6309	98.4064	99.4635	101.232	101.942	100.134	95.2875	102.228	98.685	99.2208	97.8894	87.9354	92.427
FinalAge206_238	731	1863	1700	1071	1681	2010	~~1638~~	2539	988	1854	1726	1575	3000	1011	1927	1576	1528	1345	1035	76
FinalAge206_238_Prop2SE	20	47	43	32	44	51	~~55~~	60	29	48	45	43	88	28	47	43	43	41	29	2
FinalAge207_206	1625	1872	1847	950	1823	2164	~~1680~~	2655	1004	1864	1705	1545	2996	1061	1885	1597	1540	1374	1177	83
FinalAge207_206_Prop2SE	81	85	78	130	75	73	~~130~~	72	110	79	78	92	77	110	73	85	90	97	100	13
Final_U_Th_Ratio	0.806	2.248	2.52	1.756	1.024	1.302	~~1.105~~	1.895	0.86	2.734	1.533	1.433	2.278	1.503	1.306	1.312	0.865	1.972	0.704	0.52
Final_U_Th_Ratio_Int2SE	0.019	0.038	0.37	0.048	0.02	0.048	~~0.025~~	0.038	0.019	0.069	0.039	0.025	0.07	0.017	0.025	0.018	0.032	0.027	0.01	

Comments	PIO-120	PIO-121
Final207_235	4.967	4.92
Final207_235_Prop2SE	0.21	0.26
Final206_238	0.3271	0.3204
Final206_238_Prop2SE	0.0098	0.011
ErrorCorrelation_6_38vs7_35	0.75285	0.32592
Concordance	102.878	101.527
FinalAge206_238	1823	1795
FinalAge206_238_Prop2SE	48	53
FinalAge207_206	1772	1768
FinalAge207_206_Prop2SE	79	100
Final_U_Th_Ratio	8.44	1.124
Final_U_Th_Ratio_Int2SE	0.62	0.022

Table 5: Table 1: U-Pb data for Wallara-1 core sample, Areyonga formation.

Comments	ARE-021	ARE-022	ARE-023	ARE-024	ARE-025	ARE-026	ARE-027	ARE-028	ARE-029	ARE-030	ARE-031	ARE-032	ARE-033	ARE-034	ARE-035	ARE-036	ARE-037	ARE-038	ARE-039	ARE-040
Final207_235	4.92	4.1	1.711	2.3	3.13	3.98	1.712	2.015	4.104	1.626	3.03	3.53	3.684	1.782	1.583	1.319	4.61	1.575	3.601	4.02
Final207_235_Prop2SE	0.21	0.19	0.081	0.13	0.17	0.18	0.077	0.088	0.17	0.07	0.18	0.18	0.16	0.16	0.072	0.068	0.21	0.065	0.16	0.23
Final206_238	0.314	0.296	0.1364	0.202	0.2485	0.2828	0.1625	0.1792	0.2935	0.1552	0.2226	0.2532	0.254	0.1702	0.1521	0.1339	0.2356	0.1426	0.2682	0.2954
Final206_238_Prop2SE	0.0086	0.0093	0.0035	0.006	0.0065	0.0081	0.0039	0.0057	0.0083	0.0044	0.0064	0.0086	0.0067	0.006	0.0047	0.0038	0.0071	0.0043	0.0079	0.0083
ErrorCorrelation_6_38vs7_35	0.52697	0.26951	0.481	0.45987	0.14556	0.5284	0.23239	0.24432	0.32647	0.5027	0.25118	0.76938	0.55263	0.39371	0.46076	0.09811	0.35791	0.54528	0.35642	0.14844
Concordance	95.5459	100.421	56.7103	94.8759	98.7569	95.933	88.4335	86.9067	100.852	83.4081	81.7551	88.114	85.1636	94.403	86.673	84.375	60.9298	74.7607	98.1398	101.337
FinalAge206_238	1759	1670	824	1185	1430	1604	971	1062	1658	930	1295	1453	1458	1012	917	810	1363	859	1530	1667
FinalAge206_238_Prop2SE	42	46	20	32	34	41	22	31	41	25	34	44	35	33	28	21	37	24	40	42
FinalAge207_206	1841	1663	1453	1249	1448	1672	1098	1222	1644	1115	1584	1649	1712	1072	1058	960	2237	1149	1559	1645
FinalAge207_206_Prop2SE	70	82	84	96	110	79	83	85	78	80	120	77	74	97	94	110	71	79	78	110
Final_U_Th_Ratio	1.607	1.76	1.042	2.104	1.62	1.47	2.479	3.442	1.598	3.46	1.026	1.341	0.958	1.053	1.474	1.99	1.635	1.513	1.261	0.5555

Comments	ARE-001	ARE-002	ARE-003	ARE-004	ARE-005	ARE-006	ARE-007	ARE-008	ARE-009	ARE-010	ARE-011	ARE-012	ARE-013	ARE-014	ARE-015	ARE-016	ARE-017	ARE-018	ARE-019	ARE-020
Final207_235	1.41	2.731	1.77	2.98	4.26	12.04	2.669	6.21	3.605	3.88	3.618		10.58		14.07	1.761	3.77		10.39	1.31
Final207_235_Prop2SE	0.062	0.13	0.13	0.14	0.21	0.87	0.11	0.33	0.15	0.083	0.19	0.16	0.42	0.067	0.55	0.07	0.18	0.16	0.44	0.065
Final206_238	0.1326	0.2172	0.1577	0.2267	0.2802	0.3448	0.213	0.316	0.2693	0.1726	0.2736	0.2626	0.4663	0.1652	0.5133	0.1674	0.2628	0.1648	0.4599	0.1354
Final206_238_Prop2SE	0.0042	0.0058	0.0053	0.0065	0.0085	0.01	0.0064	0.012	0.0073	0.0048	0.0078	0.007	0.012	0.0041	0.014	0.0038	0.0076	0.0049	0.013	0.0037
ErrorCorrelation_6_38vs7_35	0.68178	0.24775	-0.0457	0.2284	0.27062	0.73064	0.6352	0.36313	0.10259	0.38589	0.20759	0.34074	0.50547	0.24032	0.42683	0.2201	0.45916	0.34111	0.45625	0.37377
Concordance	70.8481	88.4777	72.4427	86.0131	89.9378	59.1261	88.3523	79.8825	98.6538	80.4706	94.2203	94.0513	98.7585	96.474	95.1837	93.5333	88.7249	69.2254	97.8715	90.5869
FinalAge206_238	802	1267	949	1316	1591	1908	1244	1767	1539	1026	1565	1502	2466	985	2668	998	1503	983	2437	818
FinalAge206_238_Prop2SE	24	31	31	34	43	49	34	58	37	25	40	36	55	23	58	21	39	27	57	21
FinalAge207_206	1132	1432	1310	1530	1769	3227	1408	2212	1560	1275	1661	1597	2497	1021	2803	1067	1694	1420	2490	903
FinalAge207_206_Prop2SE	78	84	150	85	82	90	75	81	81	76	90	77	65	81	62	78	82	130	70	100
Final_U_Th_Ratio	3.17	3.06	2.022	1.203	1.169	1.274	1.46	0.81	1.061	1.745	0.943	0.766	1.567	5.85	1.485	5.733	1.485	1.124	0.718	1.062

Comments	ARE-101	ARE-102	ARE-103	ARE-104	ARE-105	ARE-106	ARE-107	ARE-108	ARE-109	ARE-110	ARE-111	ARE-112	ARE-113	ARE-114	ARE-115	ARE-116	ARE-117	ARE-118	ARE-119	ARE-120
Final207_235	21.56	2.274	3.678	3.26	2.105	1.626	2.92	5.84	4.63	4.821	4.65	3.372	1.892	9.38	3.855	2.5	4.419	4.219	3.72	5.8
Final207_235_Prop2SE	0.91	0.1	0.16	0.16	0.12	0.072	0.14	0.5	0.31	0.19	0.2	0.14	0.085	0.39	0.15	0.18	0.18	0.17	0.17	0.27
Final206_238	0.607	0.1957	0.2689	0.2515	0.1955	0.1568	0.2224	0.166	0.282	0.2652	0.3143	0.2591	0.1807	0.4278	0.2551	0.1872	0.3023	0.2862	0.2699	0.3349
Final206_238_Prop2SE	0.021	0.0059	0.0075	0.0079	0.0069	0.0045	0.0073	0.012	0.0079	0.0068	0.0086	0.0064	0.0047	0.011	0.0059	0.0061	0.0082	0.0085	0.0079	0.01
ErrorCorrelation_6_38vs7_35	0.68896	0.31197	0.43256	0.34238	0.356	0.42646	0.56668	0.24015	0.69257	0.4726	0.3726	0.21319	0.55925	0.4387	0.17053	0.10074	0.45678	0.46949	0.38892	0.37626
Concordance	95.0483	86.747	97.0272	98.6395	102.496	87.5116	85.234	30.4615	83.4637	71.577	100.114	97.8261	99.1667	94.7173	81.8792	71.2903	97.9287	91.7894	96.4375	92.4913
FinalAge206_238	3052	1152	1534	1450	1150	939	1293	990	1600	1516	1761	1485	1071	2295	1464	1105	1702	1621	1543	1860
FinalAge206_238_Prop2SE	83	32	38	42	37	25	38	65	40	35	42	33	26	51	30	33	40	43	39	49
FinalAge207_206	3211	1328	1581	1470	1122	1073	1517	3250	1917	2118	1759	1518	1080	2423	1788	1550	1738	1766	1600	2011
FinalAge207_206_Prop2SE	63	85	82	90	120	86	85	150	98	67	75	85	67	70	140	73	75	85	73	
Final_U_Th_Ratio	2.03	0.799	1.256	0.967	0.363	2.082	1.123	0.1572	1.041	1.621	1.134	1.563	2.185	1.455	1.032	1.09	1.432	1.007	1.144	1.438

Comments	ARE-081	ARE-082	ARE-083	ARE-084	ARE-085	ARE-086	ARE-087	ARE-088	ARE-089	ARE-090	ARE-091	ARE-092	ARE-093	ARE-094	ARE-095	ARE-096	ARE-097	ARE-098	ARE-099	ARE-100
Final207_235	3.15	1.677	16.3	2.214	3.24	4.78	3.57	2.209	1.324	3.46	3.62	4.02	1.434	2.044	1.551	3.82	2.739	10.11	1.557	15.34
Final207_235_Prop2SE	0.15	0.07	0.69	0.1	0.17	0.21	0.17	0.1	0.061	0.18	0.17	0.19	0.061	0.11	0.069	0.19	0.12	0.44	0.069	0.74
Final206_238	0.248	0.1622	0.566	0.1493	0.2082	0.3138	0.2488	0.1599	0.1249	0.224	0.2703	0.2838	0.1337	0.1659	0.1469	0.2765	0.1957	0.4398	0.1562	0.526
Final206_238_Prop2SE	0.0071	0.0043	0.017	0.0058	0.0079	0.0096	0.0075	0.005	0.0034	0.0067	0.0077	0.0089	0.0043	0.008	0.0041	0.0095	0.0064	0.013	0.0042	0.016
ErrorCorrelation_6_38vs7_35	0.44299	0.43674	0.7313	0.05507	0.81998	0.64989	0.61911	0.83134	0.12383	0.19571	0.49307	0.42236	0.64553	0.76746	0.50092	0.42904	0.70529	0.46038	0.47112	0.70037
Concordance	99.6508	89.5564	99.5858	51.6724	66.7215	97.3422	84.8754	59.601	69.0346	70.7993	101.64	98.595	70.6912	70.2954	78.4889	96.5009	68.5119	93.6331	93.8755	93.4409
FinalAge206_238	1427	969	2885	896	1217	1758	1431	956	758	1302	1549	1614	808	987	883	1572	1151	2353	935	2721
FinalAge206_238_Prop2SE	36	24	70	32	42	47	39	28	20	35	39	46	25	45	23	48	34	60	23	69
FinalAge207_206	1432	1082	2897	1734	1824	1806	1686	1604	1098	1839	1524	1637	1143	1430	1125	1629	1680	2513	996	2912
FinalAge207_206_Prop2SE	90	82	64	110	68	75	82	70	93	100	85	82	80	78	85	93	71	68	82	67
Final_U_Th_Ratio	1.396	3.45	0.873	0.78	2.5	1.016	0.658	0.793	2.146	3.653	1.614	1.127	3.056	1.08	1.361	0.752	1.13	1.449	1.536	2.123

Comments	ARE-061	ARE-062	ARE-063	ARE-064	ARE-065	ARE-066	ARE-067	ARE-068	ARE-069	ARE-070	ARE-071	ARE-072	ARE-073	ARE-074	ARE-075	ARE-076	ARE-077	ARE-078	ARE-079	ARE-080
Final207_235	5.24	1.585	5.65	2.639	1.6	4.017	1.93	2.457	4.24	3.24	3.457	1.345	1.755	2.062	1.384	4.1	2.558	1.795	1.9	6.47
Final207_235_Prop2SE	0.23	0.07	0.25	0.11	0.12	0.17	0.1	0.11	0.18	0.16	0.16	0.078	0.091	0.1	0.075	0.21	0.13	0.076	0.082	0.27
Final206_238	0.3139	0.1528	0.3263	0.2177	0.1367	0.2781	0.1687	0.1856	0.2922	0.2479	0.2497	0.1291	0.1711	0.1902	0.1353	0.2922	0.2136	0.1705	0.1768	0.3586
Final206_238_Prop2SE	0.01	0.004	0.011	0.0059	0.0049	0.0072	0.0049	0.0072	0.008	0.0073	0.0079	0.0059	0.0056	0.0041	0.0041	0.0094	0.0052	0.0048	0.01	
ErrorCorrelation_6_38vs7_35	0.64805	0.27636	0.62118	0.50015	0.75454	0.28634	0.18547	0.33108	0.59473	0.27483	0.30074	0.90019	0.76317	0.338	0.91466	0.29327	0.5433	0.52657	0.16483	0.62555
Concordance	89.2386	87.4046	89.6841	90.9677	65.3207	93.7722	79.4933	70.0511	96.1583	93.8199	88.4781	73.0589	96.6762	95.0847	80.2554	100.668	90.823	92.0145	92.2603	93.9553
FinalAge206_238	1758	916	1817	1269	825	1581	1004	1097	1652	1427	1436	781	1018	1122	817	1657	1247	1014	1049	1974
FinalAge206_238_Prop2SE	50	22	55	31	35	36	27	26	40	38	41	34	31	31	31	48	36	29	26	47
FinalAge207_206	1970	1048	2026	1395	1263	1686	1363	1566	1718	1521	1623	1069	1053	1180	1018	1646	1373	1102	1137	2101
FinalAge207_206_Prop2SE	71	89	73	76	88	76	90	83	72	94	85	74	81	100	75	99	88	84	86	69
Final_U_Th_Ratio	1.318	1.097	1.061	1.43	0.691	0.892	1.907	0.4661	1.151	1.643	1.025	2.44	2.43	0.906	1.245	1.321	2.17	1.639	2.837	2.123

Comments	ARE-041	ARE-042	ARE-043	ARE-044	ARE-045	ARE-046	ARE-047	ARE-048	ARE-049	ARE-050	ARE-051	ARE-052	ARE-053	ARE-054	ARE-055	ARE-056	ARE-057	ARE-058	ARE-059	ARE-060
Final207_235	2.523	2.125	1.602	1.649	2.081	1.688	1.69	1.938	1.919	1.534	1.576	12.73	5.52	9.89	2.98	3.38	1.703	1.574	3.659	
Final207_235_Prop2SE	0.11	0.093	0.08	0.072	0.089	0.069	0.084	0.12	0.083	0.064	0.089	0.59	0.71	0.23	0.42	0.17	0.16	0.084	0.079	0.16
Final206_238	0.2114	0.1962	0.1638	0.1355	0.1844	0.1583	0.1689	0.1252	0.1787	0.1458	0.1561	0.449	0.264	0.3338	0.4366	0.215	0.2572	0.1709	0.1606	0.2715
Final206_238_Prop2SE	0.006	0.0053	0.0045	0.0043	0.0053	0.0042	0.0048	0.0068	0.004	0.0041	0.0049	0.014	0.012	0.009	0.011	0.0064	0.0086	0.0053	0.0049	0.0076
ErrorCorrelation_6_38vs7_35	0.65544	0.41775	0.29653	0.68913	0.48203	0.6253	0.18587	0.86096	0.54563	0.61291	0.03901	0.46984	0.86219	0.48934	0.60396	0.58546	0.3501	0.12027	0.2577	0.39663
Concordance	91.4878	98.3802	104.716	59.9854	88.7622	85.1619	98.2422	41.0367	93.634	79.5826	95.3061	82.8136	65.2814	97.4278	93.6597	79.4807	96.3399	103.462	98.359	99.7434
FinalAge206_238	1236	1154	977	823	1090	947	1006	760	1059	877	934	2390	1508	1856	2334	1255	1474	1016	959	1555
FinalAge206_238_Prop2SE	32	29	25	24	29	23	26	39	28	23	27	63	62	43	49	34	44	29	27	39
FinalAge207_206	1351	1173	933	1372	1228	1112	1024	1852	1131	1102	980	2886	2310	1905	2492	1579	1530	982	975	1559
FinalAge207_206_Prop2SE	73	87	100	74	83	76	100	74	86	79	130	70	150	70	62	95	81	110	99	79
Final_U_Th_Ratio	2.197	1.606	1.692	0.879	1.28	0.718	1.575	0.872	1.991	2.015	1.561	0.808	1.092	3.205	0.909	2.423	0.949	1.232	1.239	0.822

Table 6: Table 1: U-Pb data for BR05DD01 core sample, Areyonga formation.

Comments	ARE-001	ARE-002	ARE-003	ARE-004	ARE-005	ARE-006	ARE-007	ARE-008	ARE-009	ARE-010	ARE-011	ARE-012	ARE-013	ARE-014	ARE-015	ARE-016	ARE-017	ARE-018	ARE-019
Final207_235	1.592	2.621	2.13	1.943	2.589	3.57	1.64	2.073	2.225	2.07	1.447	1.367	1.004	2.462	3.144	3.83	3.63	0.958	0.963
Final207_235_Prop2SE	0.077	0.07	0.1	0.051	0.066	0.15	0.081	0.087	0.067	0.061	0.024	0.044	0.021	0.04	0.065	0.11	0.43	0.032	0.04
Final206_238	0.1594	0.2241	0.1895	0.1844	0.2188	0.2698	0.1625	0.1908	0.2029	0.1923	0.1537	0.1448	0.1135	0.1746	0.2389	0.2903	0.2044	0.1118	0.1152
Final206_238_Prop2SE	0.0056	0.0067	0.0066	0.006	0.0067	0.0094	0.0057	0.0063	0.0063	0.0061	0.0045	0.0047	0.0033	0.0052	0.0075	0.0089	0.008	0.0035	0.0037
ErrorCorrelation_6_38vs7_35	0.007	0.19923	0.27528	0.5495	0.41725	0.40852	0.35091	0.50835	0.425	0.42954	0.35387	0.35906	0.65853	0.41019	0.44927	0.28271	0.65517	0.36318	0.36569
Concordance	97.2449	101.48	95.7192	99.1811	97.1059	99.0979	101.147	94.5378	101.796	98.5217	103.017	106.09	94.3129	62.0958	90.9091	107.531	62.3958	108.241	119.591
FinalAge206_238	953	1303	1118	1090	1275	1538	970	1125	1190	1133	922	871	693.2	1037	1380	1642	1198	683	702
FinalAge206_238_Prop2SE	31	35	36	33	36	48	32	34	34	33	25	27	19	28	39	44	43	20	21
FinalAge207_206	980	1284	1168	1099	1313	1552	959	1190	1169	1150	895	821	735	1670	1518	1527	1920	631	587
FinalAge207_206_Prop2SE	110	53	95	45	49	75	96	76	56	57	37	71	37	30	36	52	160	67	81
Final_U_Th_Ratio	1.558	0.849	0.731	1.775	1.42	0.672	1.661	0.837	0.953	1.078	1.871	1.221	1.493	1.5	1.451	1.167	0.527	1.649	1.604

Comments	ARE-039	ARE-040	ARE-041	ARE-042	ARE-043	ARE-044	ARE-045	ARE-046	ARE-047	ARE-048	ARE-049	ARE-050	ARE-051	ARE-052	ARE-053	ARE-054	ARE-055	ARE-056	ARE-057
Final207_235	4.516	1.748	2.52	1.025	1.067	15.28	0.989	2.367	2.173	2.159	0.962	4.69	3.283	3.93	2.355	2.387	2.253	2.512	no value
Final207_235_Prop2SE	0.085	0.066	0.17	0.042	0.022	0.3	0.06	0.086	0.081	0.04	0.12	0.073	0.1	0.089	0.064	0.078	0.064	NAN
Final206_238	0.3142	0.1667	0.17	0.1146	0.1168	0.5482	0.1145	0.2097	0.1942	0.2035	0.1128	0.3145	0.2527	0.2827	0.2104	0.2126	0.1988	0.2049	no value
Final206_238_Prop2SE	0.01	0.0068	0.0064	0.0038	0.0034	0.017	0.0041	0.007	0.0071	0.0063	0.0037	0.011	0.0082	0.009	0.0075	0.0065	0.0066	0.0066	NAN
ErrorCorrelation_6_38vs7_35	0.55763	0.61337	0.35875	0.1624	0.57719	0.68471	0.08218	0.20402	0.26734	0.44121	0.13419	0.50925	0.6939	0.30058	0.23254	0.46065	0.27668	0.53819	NaN
Concordance	102.147	86.1111	58.3718	93.3244	86.8537	99.6468	95.7534	102.244	90.3557	106.233	105.352	101.382	95.6493	99.8138	101.401	101.803	96.7688	85.4804	#VALUE!
FinalAge206_238	1760	992	1011	699	712.2	2821	699	1230	1143	1193	689	1761	1451	1608	1230	1242	1168	1201	no value
FinalAge206_238_Prop2SE	50	38	36	22	20	73	24	39	39	34	21	52	42	47	40	34	36	35	NAN
FinalAge207_206	1723	1152	1732	749	820	2831	730	1203	1265	1123	654	1737	1517	1611	1213	1220	1207	1405	no value
FinalAge207_206_Prop2SE	34	55	97	97	37	23	130	74	75	58	95	51	30	55	83	48	71	42	NAN
Final_U_Th_Ratio	1.56	2.066	2.147	1.134	1.283	1.946	0.994	0.657	0.587	0.713	1.405	9.82	1.307	0.971	0.734	3.262	1.482	2.81	no value

Comments	ARE-020	ARE-021	ARE-022	ARE-023	ARE-024	ARE-025	ARE-026	ARE-027	ARE-028	ARE-029	ARE-030	ARE-031	ARE-032	ARE-033	ARE-034	ARE-035	ARE-036	ARE-037	ARE-038
Final207_235	2.269	4.321	2.37	2.06	3.95	8.58	3.57	1.007	2.419	2.176	4.41	5	1.667	1.008	1.98	3.75	1.672	4.33	2.184
Final207_235_Prop2SE	0.091	0.078	0.11	0.1	0.58	0.18	0.1	0.034	0.063	0.039	0.11	0.1	0.043	0.029	0.072	0.1	0.046	0.19	0.074
Final206_238	0.2017	0.3031	0.2056	0.1959	0.2164	0.4289	0.2745	0.1154	0.2073	0.2045	0.3064	0.3244	0.1586	0.1134	0.192	0.2685	0.1653	0.2993	0.1983
Final206_238_Prop2SE	0.0064	0.0099	0.0073	0.007	0.011	0.014	0.0085	0.0038	0.0064	0.0062	0.0097	0.01	0.0049	0.0034	0.0063	0.0086	0.0051	0.011	0.0066
ErrorCorrelation_6_38vs7_35	0.51146	0.58345	0.19408	0.38798	0.84283	0.62811	0.19474	0.13316	0.60764	0.61358	0.43771	0.38202	0.50467	0.52751	0.50795	0.2405	0.59639	0.3741	0.28427
Concordance	95.4839	101.246	95.5556	100.524	66.2632	99.9565	103.854	98.4615	93.2567	105.453	98.569	98.1632	83.9823	92.5234	102.076	93.1873	97.3346	98.309	98.6452
FinalAge206_238	1184	1706	1204	1152	1259	2299	1563	704	1217	1199	1722	1817	949	693	1131	1532	986	1686	1165
FinalAge206_238_Prop2SE	35	49	39	38	56	62	43	22	36	33	48	51	27	20	34	44	28	52	36
FinalAge207_206	1240	1685	1260	1146	1900	2300	1505	715	1305	1137	1747	1851	1130	749	1108	1644	1013	1715	1181
FinalAge207_206_Prop2SE	69	37	89	93	190	33	50	82	40	34	43	36	47	53	67	54	54	75	68
Final_U_Th_Ratio	2.225	2.62	1.321	0.743	0.6609	1.393	1.281	1.112	0.932	0.918	1.861	2.056	2.626	1.003	1.498	0.611	2.675	1.127	0.758

Comments	ARE-058	ARE-059	ARE-060	ARE-061	ARE-062	ARE-063	ARE-064	ARE-065	ARE-066	ARE-067	ARE-068
Final207_235	2.274	2.234	10.79	1.99	4.93	2.118	3.86	3.79	3.86	2.17	2.215
Final207_235_Prop2SE	0.067	0.042	0.2	0.11	0.17	0.051	0.12	0.11	0.14	0.1	0.054
Final206_238	0.2053	0.2037	0.4678	0.1888	0.3269	0.198	0.2838	0.2794	0.2862	0.2036	0.2053
Final206_238_Prop2SE	0.0068	0.0061	0.015	0.0064	0.011	0.0062	0.0088	0.0089	0.0093	0.0073	0.0064
ErrorCorrelation_6_38vs7_35	0.38973	0.60282	0.35536	0.25427	0.40151	0.68637	0.41238	0.38419	0.47872	0.11299	0.35183
Concordance	100.669	101.704	97.6689	100.632	102.823	104.301	102.417	100.063	104.231	111.589	103.173
FinalAge206_238	1203	1194	2472	1114	1821	1164	1610	1587	1626	1194	1203
FinalAge206_238_Prop2SE	37	33	66	34	56	34	44	45	48	39	34
FinalAge207_206	1195	1174	2531	1107	1771	1116	1572	1586	1560	1070	1166
FinalAge207_206_Prop2SE	62	35	35	99	64	43	56	46	62	100	51
Final_U_Th_Ratio	1.385	1.711	0.753	1.016	1.466	1.227	1.309	1.301	0.532	1.317	0.9

Table 7: U-Pb data for MacDonnell Ranges sample, Areyonga formation.

Comments	ARE020	ARE021	ARE022	ARE023	ARE024	ARE025	ARE026	ARE027	ARE028	ARE029	ARE030	ARE031	ARE032	ARE033	ARE034	ARE035	ARE036	ARE037	ARE038
Final207_235	1.7	5	3.85	3.82	4.04	2.123	1.549	12.92	1.961	4.06	3.407	3.827	3.78	3.77	1.943	3.759	11.82	3.87	1.495
Final207_235_Prop2SE	0.11	0.19	0.19	0.17	0.16	0.14	0.064	0.49	0.074	0.17	0.13	0.15	0.21	0.17	0.072	0.15	0.48	0.17	0.061
Final206_238	0.1638	0.3262	0.2803	0.2817	0.297	0.1984	0.1547	0.5171	0.1858	0.2864	0.2662	0.2878	0.2749	0.2754	0.1849	0.2767	0.4771	0.2823	0.1547
Final206_238_Prop2SE	0.005	0.006	0.007	0.007	0.0054	0.0039	0.0028	0.0096	0.0035	0.0064	0.0049	0.0057	0.0078	0.0055	0.0032	0.0059	0.0084	0.0059	0.0031
ErrorCorrelation_6_38vs7_35	0.1385	0.3926	0.3583	0.0491	0.3495	0.1376	0.1643	0.5639	0.4423	0.2906	0.485	0.6737	0.5088	0.434	0.4519	0.5532	0.5936	0.3411	0.4557
Concordance	93.942	100.55	100.38	101.07	106.07	107.26	93.542	101.36	101.57	98.006	102.84	103.81	100.38	100.51	98.115	102.14	94.938	98.828	100.98
FinalAge206_238	977	1819	1592	1599	1678	1167	927	2685	1100	1622	1521	1633	1572	1567	1093	1577	2513	1602	927
FinalAge206_238_Prop2SE	28	29	35	35	26	21	16	41	19	32	25	29	38	28	17	29	37	30	17
FinalAge207_206	1040	1809	1586	1582	1582	1088	991	2649	1083	1655	1479	1573	1566	1559	1114	1544	2647	1621	918
FinalAge207_206_Prop2SE	130	59	90	79	66	100	76	55	64	75	65	63	91	73	69	70	57	75	72
Approx_Pb_PPM	98	2615	426	346	540	616	275.4	1048	358	550	964	1130	507	377	370	1112	1076	437	600
Approx_Pb_PPM_Int2SE	5.2	50	22	14	14	27	8.9	30	14	19	29	49	19	14	16	32	29	14	20
Final_U_Th_Ratio	1.438	0.5817	1.054	1.186	2.064	0.727	2.663	0.967	4.887	0.888	1.33	1.175	1.37	1.463	5.54	1.111	0.5825	1.452	2.312
Final_U_Th_Ratio_Int2SE	0.027	0.007	0.023	0.022	0.031	0.01	0.038	0.012	0.065	0.012	0.021	0.027	0.026	0.026	0.24	0.024	0.0075	0.018	0.034

Comments	ARE001	ARE002	ARE003	ARE004	ARE005	ARE006	ARE007	ARE008	ARE009	ARE010	ARE011	ARE012	ARE013	ARE014	ARE015	ARE016	ARE017	ARE018	ARE019
Final207_235	1.98	1.595	3.85	3.79	3.972	4.617	4.699	3.6	3.548	4.299	4.323	4.23	3.687	5.28	3.741	4.66	5.16	5.61	3.822
Final207_235_Prop2SE	0.078	0.079	0.16	0.21	0.15	0.17	0.18	0.16	0.14	0.17	0.17	0.18	0.15	0.2	0.16	0.19	0.2	0.24	0.15
Final206_238	0.1848	0.1611	0.279	0.2903	0.2857	0.3093	0.3129	0.2662	0.2538	0.2874	0.2944	0.2989	0.2726	0.3351	0.2737	0.3042	0.3124	0.3473	0.2789
Final206_238_Prop2SE	0.0033	0.004	0.006	0.0078	0.0052	0.0058	0.0058	0.0058	0.0045	0.0051	0.0064	0.0052	0.0061	0.0057	0.006	0.0057	0.0082	0.0056
ErrorCorrelation_6_38vs7_35	0.533	0.373	0.3715	0.1463	0.4157	0.5732	0.5554	0.2483	0.5543	0.5494	0.4272	0.5141	0.4991	0.4933	0.4276	0.3973	0.7161	0.3435	0.4378
Concordance	96.811	99.38	101.15	110.05	99.938	99.2	98.928	95.731	89.059	92.711	96.072	101.26	97.307	99.786	97.316	95.267	89.297	101.32	100
FinalAge206_238	1093	962	1585	1642	1620	1736	1754	1525	1457	1628	1663	1685	1554	1862	1559	1711	1752	1920	1585
FinalAge206_238_Prop2SE	18	23	30	39	24	26	29	30	23	26	25	32	26	30	29	30	28	39	28
FinalAge207_206	1129	968	1567	1492	1621	1750	1773	1593	1636	1756	1731	1664	1597	1866	1602	1796	1962	1895	1585
FinalAge207_206_Prop2SE	71	94	70	100	64	60	62	75	62	58	60	64	68	59	69	68	55	71	63
Approx_Pb_PPM	372	513	604	367	1596	821	1229	552	1300	1465	1237	1259	908	589	577	924	1465	272	819
Approx_Pb_PPM_Int2SE	17	15	16	21	37	29	30	24	64	30	33	54	34	16	26	23	31	13	17
Final_U_Th_Ratio	3.844	0.888	1.405	1.115	0.891	1.296	1.027	1.209	0.854	1.134	0.787	0.696	1.053	1.65	1.219	0.797	1.277	1.437	1.55
Final_U_Th_Ratio_Int2SE	0.073	0.013	0.023	0.021	0.012	0.041	0.012	0.022	0.02	0.015	0.018	0.011	0.014	0.022	0.041	0.014	0.022	0.027	0.02

Comments	ARE096	ARE097	ARE098	ARE099	ARE100	ARE101	ARE102	ARE103	ARE104	ARE105	ARE106	ARE107	ARE108	ARE109	ARE110	ARE111	ARE112	ARE113	ARE114
Final207_235	4.15	1.944	3.97	3.376	3.946	3.853	3.872	2.711	3.92	1.85	3.9	7.17	14.61	3.814	4.5	5.36	4.31	2.426	3.79
Final207_235_Prop2SE	0.2	0.08	0.16	0.12	0.16	0.16	0.16	0.11	0.17	0.14	0.13	0.28	0.58	0.14	0.19	0.2	0.17	0.11	0.16
Final206_238	0.2934	0.189	0.2838	0.2397	0.287	0.2777	0.2828	0.2284	0.2891	0.1751	0.242	0.3885	0.542	0.2809	0.3075	0.3261	0.2865	0.2198	0.2787
Final206_238_Prop2SE	0.0055	0.0034	0.0073	0.0037	0.0066	0.0053	0.0054	0.0047	0.0046	0.0042	0.013	0.0078	0.014	0.0047	0.0059	0.0065	0.0077	0.0055	0.0057
ErrorCorrelation_6_38vs7_35	0.1451	0.4243	0.4443	0.3819	0.7573	0.3649	0.4894	0.2962	0.3813	0.1813	0.869	0.8531	0.7501	0.4893	0.6714	0.5085	0.1813	0.3278
Concordance	101.28	105.39	99.199	83.838	101.37	97.169	100.63	98.808	102.76	92.857	72.689	97.781	99.857	100.82	100.76	93.615	92.002	108.38	98.446
FinalAge206_238	1658	1115	1609	1385	1625	1579	1605	1326	1637	1040	1392	2115	2787	1598	1728	1818	1622	1280	1584
FinalAge206_238_Prop2SE	27	19	37	19	33	27	27	25	23	29	69	37	59	23	29	32	39	29	29
FinalAge207_206	1637	1058	1622	1652	1603	1625	1595	1342	1593	1120	1915	2163	2791	1585	1715	1942	1763	1181	1609
FinalAge207_206_Prop2SE	84	75	70	59	65	69	66	69	74	120	61	55	54	59	69	55	62	83	75
Approx_Pb_PPM	442	231	634	1779	619	582	982	958	488	230.4	1898	747	615	1450	274	914	674	439	858
Approx_Pb_PPM_Int2SE	17	10	21	45	23	14	30	26	16	9.6	76	28	20	42	10	24	22	17	38
Final_U_Th_Ratio	1.488	3.628	1.639	0.902	2.341	1.27	1.476	2.326	1.239	1.221	0.816	4.42	1.695	1.405	2.471	2.321	2.27	1.417	0.77
Final_U_Th_Ratio_Int2SE	0.023	0.058	0.084	0.016	0.037	0.016	0.026	0.047	0.018	0.023	0.077	0.14	0.097	0.019	0.042	0.061	0.17	0.024	0.016

Comments	ARE077	ARE078	ARE079	ARE080	ARE081	ARE082	ARE083	ARE084	ARE085	ARE086	ARE087	ARE088	ARE089	ARE090	ARE091	ARE092	ARE093	ARE094	ARE095
Final207_235	3.76	3.52	4.82	2.009	5.014	3.91	1.938	3.372	1.881	2.306	3.75	4.12	5.86	4.13	3.548	4.481	3.97	3.882	4.15
Final207_235_Prop2SE	0.25	0.15	0.2	0.08	0.19	0.16	0.074	0.14	0.089	0.1	0.16	0.17	0.24	0.18	0.14	0.17	0.26	0.14	0.2
Final206_238	0.234	0.2563	0.3242	0.1932	0.3169	0.2849	0.1806	0.2638	0.1837	0.2103	0.2771	0.2973	0.3196	0.2693	0.2723	0.2976	0.287	0.2732	0.2896
Final206_238_Prop2SE	0.013	0.0069	0.0062	0.0031	0.007	0.0061	0.0033	0.0059	0.0049	0.0055	0.0055	0.0074	0.0076	0.0048	0.0057	0.0079	0.0058	0.0071
ErrorCorrelation_6_38vs7_35	0.8709	0.4013	0.2545	0.342	0.7683	0.2995	0.2849	0.0718	0.4304	0.3368	0.4003	0.5995	0.6948	0.9078	0.4654	0.2728	0.1286	0.3933	0.0994
Concordance	70.166	90.847	101.17	103.64	94.762	100.19	93.695	99.604	102.64	105.85	99.182	102.95	83.38	84.662	102.31	95.519	101.56	92.509	98.973
FinalAge206_238	1350	1469	1809	1138	1773	1615	1070	1508	1087	1230	1576	1677	1786	1540	1552	1684	1625	1556	1639
FinalAge206_238_Prop2SE	70	35	30	17	34	31	18	30	19	26	29	27	36	39	24	29	39	29	35
FinalAge207_206	1924	1617	1788	1098	1871	1612	1142	1514	1059	1162	1589	1629	2142	1819	1517	1763	1600	1682	1656
FinalAge207_206_Prop2SE	68	69	73	70	56	71	70	83	87	80	72	62	56	56	62	63	130	64	98
Approx_Pb_PPM	986	793	416	590	1520	570	1316	507	323	205.4	703	661	793	823	1585	747	374	1770	699
Approx_Pb_PPM_Int2SE	43	28	15	24	80	18	34	22	13	9.5	22	20	24	45	41	30	15	120	31
Final_U_Th_Ratio	0.957	1.115	1.65	2.144	3.27	1.333	1.2	1.394	2.151	2.167	0.94	1.763	1.161	2.49	1.168	1.376	0.476	1.093	0.553
Final_U_Th_Ratio_Int2SE	0.098	0.045	0.045	0.078	0.21	0.019	0.046	0.019	0.035	0.038	0.018	0.029	0.046	0.15	0.017	0.033	0.01	0.025	0.0098

Comments	ARE058	ARE059	ARE060	ARE061	ARE062	ARE063	ARE064	ARE065	ARE066	ARE067	ARE068	ARE069	ARE070	ARE071	ARE072	ARE073	ARE074	ARE075	ARE076
Final207_235	3.36	1.483	3.42	3.31	3.82	2.582	2.12	4.48	10.66	2.318	1.607	4.55	7.93	3.736	3.162	3.828	5.36	3.752	6.06
Final207_235_Prop2SE	0.16	0.11	0.18	0.17	0.16	0.13	0.12	0.18	0.7	0.11	0.064	0.18	0.32	0.14	0.13	0.15	0.21	0.15	0.27
Final206_238	0.2542	0.0901	0.2086	0.2516	0.2726	0.2189	0.1943	0.3057	0.315	0.199	0.1638	0.3118	0.409	0.2594	0.2519	0.2764	0.3419	0.2794	0.3494
Final206_238_Prop2SE	0.0054	0.0063	0.01	0.0055	0.0054	0.0044	0.0052	0.0054	0.013	0.005	0.0026	0.0056	0.0084	0.0048	0.0051	0.0056	0.007	0.0057	0.0094
ErrorCorrelation_6_38vs7_35	0.69	0.9661	0.8105	0.4628	0.2848	0.3153	0.2856	0.455	0.4296	0.335	0.3616	0.3889	0.5276	0.5214	0.2971	0.1175	0.6365	0.3284	0.4986
Concordance	93.846	28.571	62.187	95.889	96.957	96.593	97.279	98.06	56.141	89.337	100.31	102.1	100.64	88.242	100.56	97.945	101.82	102.25	96.452
FinalAge206_238	1464	554	1217	1446	1561	1276	1144	1719	1769	1173	978	1749	2209	1486	1448	1573	1900	1588	1930
FinalAge206_238_Prop2SE	29	37	55	28	29	23	28	27	67	26	14	28	39	25	26	28	32	29	45
FinalAge207_206	1560	1939	1957	1508	1610	1321	1176	1753	3151	1313	975	1713	2195	1684	1440	1606	1866	1553	2001
FinalAge207_206_Prop2SE	66	54	68	87	73	84	110	69	97	83	71	66	60	60	71	73	59	67	74
Approx_Pb_PPM	1172	4680	954	507	736	776	354	481	160	851	823	819	347	2914	642	606	1276	1484	369
Approx_Pb_PPM_Int2SE	53	250	36	17	58	17	16	18	11	27	40	25	13	74	18	17	40	34	19
Final_U_Th_Ratio	1.012	0.564	1.229	1.197	1.063	0.6154	0.891	2.155	69	0.64	1.56	0.953	2.069	0.6039	1.411	1.416	2.338	0.8146	2.579
Final_U_Th_Ratio_Int2SE	0.021	0.016	0.086	0.03	0.041	0.0087	0.018	0.039	11	0.012	0.04	0.02	0.039	0.0095	0.02	0.018	0.034	0.0096	0.092

Comments	ARE039	ARE040	ARE041	ARE042	ARE043	ARE044	ARE045	ARE046	ARE047	ARE048	ARE049	ARE050	ARE051	ARE052	ARE053	ARE054	ARE055	ARE056	ARE057
Final207_235	4.804	2.288	3.697	3.153	3.812	3.083	1.609	4.114	1.544	3.68	5.32	4.035	8.59	4.729	3.291	2.876	4.47	5.07	2.11
Final207_235_Prop2SE	0.17	0.12	0.15	0.13	0.16	0.13	0.067	0.16	0.084	0.16	0.21	0.15	0.32	0.18	0.14	0.12	0.22	0.18	0.16
Final206_238	0.3176	0.2113	0.2768	0.2534	0.275	0.2179	0.1584	0.2886	0.1638	0.2726	0.3367	0.2787	0.4058	0.3172	0.2155	0.2365	0.2817	0.3276	0.1931
Final206_238_Prop2SE	0.0054	0.0044	0.0048	0.0051	0.0068	0.0061	0.0037	0.0056	0.0039	0.0055	0.0066	0.0045	0.0086	0.0056	0.0059	0.0046	0.008	0.005	0.007
ErrorCorrelation_6_38vs7_35	0.4391	0.212	0.4299	0.3758	0.2793	0.6269	0.5597	0.3181	0.3131	0.4544	0.5754	0.4877	0.612	0.502	0.7847	0.531	0.4137	0.5271	0.1709
Concordance	100.06	105.74	101.68	102.03	96.308	77.771	93.769	96.858	114.49	97.981	98.266	92.903	93.124	101.6	68.726	98.987	85.235	100.88	97.179
FinalAge206_238	1778	1235	1578	1458	1565	1270	948	1634	980	1553	1870	1584	2194	1778	1257	1368	1599	1826	1137
FinalAge206_238_Prop2SE	27	24	25	27	34	32	21	28	22	28	32	23	39	27	31	24	40	25	38
FinalAge207_206	1777	1168	1552	1429	1625	1633	1011	1687	856	1585	1903	1705	2356	1750	1829	1382	1876	1810	1170
FinalAge207_206_Prop2SE	58	100	66	72	74	70	73	67	100	73	61	63	53	60	58	72	70	56	160
Approx_Pb_PPM	1049	7.5	1125	762	317	1533	1055	613	807	568	1944	1221	1132	823	2730	1079	975	488	446
Approx_Pb_PPM_Int2SE	22	1.9	45	23	10	61	28	41	23	21	45	55	29	19	110	28	31	15	23
Final_U_Th_Ratio	1.893	110	0.984	1.545	1.551	0.996	1.436	1.782	0.5033	1.34	0.638	0.815	1.948	1.868	0.934	1.075	1.005	3.816	0.3497
Final_U_Th_Ratio_Int2SE	0.034	16	0.026	0.028	0.025	0.033	0.037	0.03	0.0088	0.034	0.01	0.012	0.06	0.023	0.04	0.018	0.035	0.071	0.0068

Comments	ARE115	ARE116	ARE117	ARE118	ARE119	ARE120
Final207_235	4.01	3.69	20.04	3.869	4.05	3.876
Final207_235_Prop2SE	0.18	0.15	0.71	0.14	0.17	0.14
Final206_238	0.2632	0.2763	0.6034	0.2812	0.2896	0.2789
Final206_238_Prop2SE	0.0061	0.0051	0.0099	0.0049	0.0061	0.0052
ErrorCorrelation_6_38vs7_35	0.5095	0.4212	0.6123	0.4428	0.2491	0.3069
Concordance	82.829	101.35	97.845	98.277	99.636	97.478
FinalAge206_238	1505	1575	3042	1597	1642	1585
FinalAge206_238_Prop2SE	31	27	40	25	30	26
FinalAge207_206	1817	1554	3109	1625	1648	1626
FinalAge207_206_Prop2SE	71	65	47	61	67	65
Approx_Pb_PPM	1241	999	2987	2116	1053	1129
Approx_Pb_PPM_Int2SE	55	25	68	48	37	52
Final_U_Th_Ratio	0.823	1.416	0.5186	0.985	0.654	1.074
Final_U_Th_Ratio_Int2SE	0.019	0.021	0.0098	0.013	0.01	0.014

Table 8: U-Pb data for Wallara-1 core sample, Johnnys Creek formation.

Comments	JohnCW-001	JohnCW-002	JohnCW-003	JohnCW-004	JohnCW-005	JohnCW-006	JohnCW-007	JohnCW-008	JohnCW-009	JohnCW-010	JohnCW-011
Final207_235	1.71	1.862	46.5	1.869	2.065	4.06	5.225	2.48	1.825	5.29	1.676
Final207_235_Prop2SE	0.074	0.081	2	0.083	0.093	0.17	0.21	0.17	0.079	0.25	0.076
Final206_238	0.1633	0.1756	0.525	0.1831	0.1939	0.2708	0.3366	0.1832	0.1739	0.2918	0.1668
Final206_238_Prop2SE	0.0045	0.0048	0.016	0.0049	0.0061	0.0069	0.0089	0.0064	0.005	0.011	0.0043
ErrorCorrelation_6_38vs7_35	0.45015	0.5694	0.45728	0.378	0.26352	0.6815	0.44155	0.60659	0.57133	0.24053	0.54283
Concordance	88.79781421	94.64123524	59.04082955	103.1428571	103.2549729	87.84781374	100.754717	67.10037175	98.75717017	78.56121963	98.02761341
FinalAge206_238	975	1042	2733	1083	1142	1547	1869	1083	1033	1649	994
FinalAge206_238_Prop2SE	25	27	72	27	33	36	43	35	27	52	24
FinalAge207_206	1098	1101	4629	1050	1106	1761	1855	1614	1046	2099	1014
FinalAge207_206_Prop2SE	84	81	62	87	87	68	73	110	81	72	85
Final_U_Th_Ratio	1.528	1.428	0.0726	1.017	1.444	0.877	0.989	1.061	2.304	0.441	3.77

Table 9: U-Pb data for BR05DD01 core sample, Johnnys Creek formation.

comments	JohnC001	JohnC002	JohnC003	JohnC004	JohnC005	JohnC006	JohnC007	JohnC008	JohnC009	JohnC010	JohnC011	JohnC012	JohnC013	JohnC014	JohnC015	JohnC016	JohnC017
Final207_235	1.17	0.781	1.242	1.671	1.37	1.76	0.8	1.862	1.1	1.165	1.261	1.254	1.271	0.839	0.811	1.276	1.198
Final207_235_Prop2SE	0.11	0.044	0.08	0.074	0.11	0.15	0.04	0.11	0.11	0.098	0.085	0.1	0.08	0.051	0.051	0.097	0.1
Final206_238	0.1312	0.096	0.1313	0.1656	0.1312	0.135	0.0983	0.1815	0.1311	0.1323	0.1308	0.1316	0.1312	0.0961	0.0942	0.131	0.1322
Final206_238_Prop2SE	0.0046	0.0028	0.0047	0.0041	0.005	0.0065	0.0025	0.0051	0.0048	0.0044	0.0047	0.0052	0.004	0.0031	0.0029	0.005	0.005
ErrorCorrelation_6_38vs7_35	0.10948	0.34138	0.1873	0.48802	-0.02953	0.13686	0.37179	0.43785	-0.01948	0.045642	-0.07267	0.29901	0.41085	0.3321	0.10819	0.10499	-0.08222
Concordance	115.0725	105.1693	96.0241	98.8978	75.61905	54.63087	107.5445	100.7498	134.5763	108.1081	88.8764	94.7619	88.75278	89.54545	92.38095	88.11111	119.403
FinalAge206_238	794	590	797	987	794	814	604.4	1075	794	800	791	796	797	591	582	793	800
FinalAge206_238_Prop2SE	26	16	26	23	29	37	15	28	27	25	27	30	22	18	17	28	28
FinalAge207_206	690	561	830	998	1050	1490	562	1067	590	740	890	840	898	660	630	900	670
FinalAge207_206_Prop2SE	190	120	140	88	190	180	100	110	230	180	150	180	120	130	140	160	190
Approx_Pb_PPM	173	299	210	1690	131.5	121.5	937	447	106	160	571	107.1	560	305	335	123	121.7
Approx_Pb_PPM_Int2SE	11	15	23	110	8	8.6	43	21	7	14	37	7.6	22	15	16	9.9	8.8
Final_U_Th_Ratio	0.853	1.647	1.246	1.22	0.996	1.113	1.041	0.876	1.304	0.973	0.435	1.144	0.671	1.191	1.143	1.072	1.072
Final_U_Th_Ratio_Int2SE	0.021	0.051	0.066	0.041	0.024	0.032	0.025	0.02	0.03	0.026	0.013	0.026	0.014	0.024	0.023	0.026	0.031

Table 10: Hf isotopic data for a number of samples.

Sample N	Analysis N	Hf176/Hf1	2 S.E.	Lu176/Hf1	U/Pb AGE	error	Hf Chur (t)	Hf DM (t)	Hf NC(t)	Hfi	epsilon	2s	T(DM) (crustal)	T(NC) (crustal)
ARE-F-001		0.281979	3.65E-05	0.000757	1093	18	0.282093	0.282459	0.28238	0.281963	-4.6106	1.276882	2.181735	2.008471
ARE-F-014		0.281526	2.44E-05	0.000462	1866	59	0.281595	0.28189	0.281819	0.281509	-3.04284	0.852914	2.684159	2.533048
ARE-F-016		0.281566	5.2E-05	0.000635	1796	68	0.28164	0.281942	0.28187	0.281544	-3.40851	1.818957	2.651749	2.498691
ARE-F-022		0.281914	3.68E-05	0.000811	1586	90	0.281776	0.282097	0.282023	0.28189	4.021798	1.28973	2.037406	1.876944
ARE-F-025		0.282048	3.28E-05	0.000706	1167	21	0.282046	0.282405	0.282326	0.282033	-0.46595	1.148971	1.984603	1.812698
ARE-F-026		0.282305	2.46E-05	0.000429	927	16	0.282199	0.28258	0.282499	0.282297	3.482255	0.861044	1.553808	1.373981
ARE-F-027		0.281176	2.4E-05	0.000323	2649	55	0.281083	0.281305	0.281244	0.281159	2.698184	0.838659	2.957127	2.827368
ARE-F-036		0.281108	2.8E-05	0.000339	2647	57	0.281085	0.281307	0.281245	0.281091	0.236268	0.980892	3.100912	2.971449
ARE-F-037		0.28196	3.25E-05	0.001211	1621	75	0.281754	0.282071	0.281998	0.281923	6.014304	1.137967	1.943371	1.783568
ARE-F-047		0.282179	3.35E-05	0.001299	980	22	0.282165	0.282542	0.282461	0.282155	-0.35826	1.170984	1.832957	1.655501
ARE-F-051		0.281179	3.19E-05	0.000458	2356	53	0.281276	0.281525	0.28146	0.281159	-4.16002	1.116563	3.132291	2.995291
ARE-F-061		0.28198	3.36E-05	0.001097	1508	87	0.281827	0.282155	0.28208	0.281949	4.335211	1.175376	1.956845	1.794042
ARE-F-064		0.282081	2.73E-05	0.000617	1144	28	0.28206	0.282422	0.282343	0.282067	0.243195	0.95598	1.923143	1.750419
ARE-F-070		0.281293	3.01E-05	0.000279	2195	60	0.281381	0.281645	0.281578	0.281281	-3.55156	1.054279	2.970688	2.829043
ARE-F-076		0.281697	3.13E-05	0.0007	2001	74	0.281507	0.28179	0.281721	0.281671	5.803896	1.095435	2.257271	2.108554
ARE-F-084		0.282014	2.83E-05	0.000782	1514	83	0.281823	0.28215	0.282075	0.281992	5.993934	0.989713	1.860015	1.697079
ARE-F-092		0.281593	5.28E-05	0.000733	1763	63	0.281662	0.281966	0.281894	0.281569	-3.31332	1.849626	2.620402	2.466379
ARE-F-094		0.281638	4.28E-05	0.001603	1682	64	0.281714	0.282026	0.281953	0.281587	-4.50462	1.498674	2.6294	2.473252
ARE-F-097		0.28227	3.08E-05	0.001417	1115	19	0.282079	0.282443	0.282364	0.28224	5.711533	1.079417	1.562844	1.388165
ARE-F-103		0.281872	2.97E-05	0.000998	1342	69	0.281933	0.282277	0.2822	0.281847	-3.06193	1.039143	2.279017	2.112746
ARE-F-105		0.28219	3.27E-05	0.000932	1040	23	0.282127	0.282498	0.282418	0.282171	1.574361	1.144742	1.760158	1.584088
ARE-F-107		0.281314	3.09E-05	0.000709	2163	55	0.281402	0.281669	0.281602	0.281285	-4.16638	1.082899	2.982337	2.839881
ARE-F-108		0.281011	2.72E-05	0.000715	2791	54	0.28099	0.281198	0.281138	0.280973	-0.61188	0.950727	3.264441	3.139126
Aru-F-002		0.282035	2.47E-05	0.000527	1136	32	0.282066	0.282428	0.282349	0.282024	-1.4775	0.863868	2.022707	1.850088
Aru-F-003		0.281637	2.94E-05	0.000456	1309	100	0.281955	0.282301	0.282224	0.281626	-11.6687	1.027988	2.776011	2.610401
Aru-F-010		0.282002	3.15E-05	0.001097	1538	85	0.281807	0.282133	0.282058	0.28197	5.781963	1.101314	1.891963	1.729771
Aru-F-011		0.281168	2.24E-05	0.000314	2250	77	0.281345	0.281604	0.281538	0.281155	-6.76053	0.785521	3.203781	3.064191
Aru-F-022		0.281851	2.62E-05	0.000843	1453	97	0.281862	0.282195	0.28212	0.281828	-1.20591	0.915376	2.252002	2.088621
Aru-F-026		0.281686	3.33E-05	0.001226	1822	84	0.281624	0.281923	0.281851	0.281643	0.694171	1.163921	2.424767	2.27175
Aru-F-033		0.281113	2E-05	0.000451	2604	73	0.281113	0.281339	0.281277	0.28109	-0.80174	0.70033	3.128228	2.997707
Aru-F-041		0.281954	2.65E-05	0.000474	1191	36	0.28203	0.282388	0.282309	0.281943	-3.10109	0.928544	2.164764	1.994081
Aru-F-044		0.281879	2.7E-05	0.000655	1207	46	0.28202	0.282376	0.282297	0.281864	-5.53642	0.943821	2.325897	2.156156
Aru-F-055		0.281326	2.69E-05	0.000961	1804	83	0.281635	0.281936	0.281865	0.281293	-12.1666	0.941736	3.182087	3.030748
Aru-F-071		0.281996	2.81E-05	0.001015	1573	88	0.281785	0.282107	0.282033	0.281966	6.429247	0.983996	1.880014	1.718729
Aru-F-081		0.281996	2.81E-05	0.001015	1038	30	0.282128	0.282499	0.282419	0.281976	-5.38675	0.983996	2.187095	2.01237
Aru-F-083		0.281646	2.28E-05	0.000731	1637	86	0.281743	0.28206	0.281986	0.281624	-4.24736	0.796487	2.579071	2.42158
Aru-F-086		0.28189	2.32E-05	0.000727	1203	33	0.282023	0.282379	0.2823	0.281874	-5.28631	0.811786	2.307563	2.137657
Aru-F-087		0.281434	2.11E-05	0.000809	1763	100	0.281662	0.281966	0.281894	0.281407	-9.05546	0.73739	2.965048	2.812013
Aru-F-089		0.282005	3.51E-05	0.001031	1200	51	0.282025	0.282381	0.282302	0.281982	-1.52346	1.228873	2.075087	1.90436
Aru-F-095		0.281932	2.36E-05	0.000416	1316	110	0.28195	0.282296	0.282219	0.281922	-1.00102	0.824594	2.133068	1.965644
Aru-F-097		0.281828	3.36E-05	0.001412	1550	85	0.2818	0.282124	0.282049	0.281787	-0.46158	1.174632	2.282222	2.121529
Aru-F-100		0.281954	2.51E-05	0.000945	1116	32	0.282078	0.282442	0.282363	0.281934	-5.11065	0.878535	2.230018	2.057529
Aru-F-109		0.28224	4E-05	0.002213	922	24	0.282202	0.282584	0.282502	0.282201	-0.02732	1.398271	1.767556	1.588309
BRw-ARE-003		0.281965	3.2E-05	0.001294	1284	53	0.281971	0.282319	0.282242	0.281934	-1.31821	1.121083	2.127631	1.95933
BRw-ARE-004		0.281824	2.39E-05	0.000332	1118	36	0.282077	0.282441	0.282362	0.281817	-9.22556	0.835724	2.482762	2.311139
BRw-ARE-007		0.281998	2.97E-05	0.000913	1090	33	0.282095	0.282461	0.282382	0.28198	-4.08731	1.040112	2.147355	1.9739
BRw-ARE-010		0.282238	3.61E-05	0.001117	970	32	0.282172	0.282549	0.282468	0.282218	1.634237	1.262142	1.701964	1.523802
BRw-ARE-014		0.282235	3.05E-05	0.001039	922	25	0.282202	0.282584	0.282502	0.282217	0.50562	1.067407	1.734561	1.555204
BRw-ARE-015		0.282394	3.08E-05	0.001108	871	27	0.282235	0.282621	0.282539	0.282376	5.006418	1.076807	1.415143	1.233319
BRw-ARE-018		0.281926	5.49E-05	0.002509	1518	36	0.28182	0.282147	0.282073	0.281854	1.186391	1.921977	2.156953	1.995025
BRw-ARE-021		0.282339	4.28E-05	0.00098	683	20	0.282354	0.282758	0.282673	0.282326	-0.99247	1.499401	1.642714	1.456542
BRw-ARE-024		0.281554	3.64E-05	0.000964	1685	37	0.281712	0.282024	0.281951	0.281523	-6.70762	1.275202	2.764321	2.608646
BRw-ARE-029		0.281257	2.85E-05	0.001048	2300	33	0.281312	0.281567	0.281501	0.281211	-3.58981	0.996891	3.05484	2.916173
BRw-ARE-031		0.282382	4.14E-05	0.001426	704	22	0.282341	0.282742	0.282658	0.282363	0.789516	1.448738	1.547946	1.362017
BRw-ARE-032		0.281802	2.84E-05	0.000786	1305	40	0.281957	0.282304	0.282227	0.281783	-6.18176	0.995505	2.440427	2.273668
BRw-ARE-039		0.281877	3.12E-05	0.000616	1644	54	0.281739	0.282054	0.281981	0.281858	4.239977	1.093473	2.069795	1.910987
BRw-ARE-041		0.282102	3.6E-05	0.001292	986	28	0.282161	0.282537	0.282456	0.282078	-2.96057	1.260349	1.998072	1.821325
BRw-ARE-047		0.282345	3.16E-05	0.000883	699	22	0.282344	0.282746	0.282662	0.282333	-0.38278	1.104697	1.617108	1.431283
BRw-ARE-049		0.281063	0.000156	0.00127	2831	23	0.280963	0.281168	0.281109	0.280994	1.104788	5.466189	3.1953	3.070866
BRw-ARE-055		0.281604	1.73E-05	2.34E-05	1737	51	0.281679	0.281986	0.281913	0.281603	-2.69005	0.606803	2.562652	2.407771
BRw-ARE-056		0.281666	3.33E-05	0.000979	1517	30	0.281821	0.282148	0.282073	0.281638	-6.49888	1.167006	2.622493	2.461941
BRw-ARE-057		0.281839	2.4E-05	0.000587	1611	55	0.28176	0.282079	0.282005	0.281821	2.172463	0.840103	2.16974	2.010344
BRw-ARE-059		0.281999	3.13E-05	0.000904	1220	48	0.282012	0.282366	0.282288	0.281978	-1.18397	1.095384	2.069778	1.899573

BRw-ARE-066	0.282103	3.21E-05	0.000681	1114	34	0.28208	0.282444	0.282364	0.282089	0.336845	1.123307	1.894064	1.720435
BRw-ARE-069	0.281943	2.97E-05	0.000854	1572	56	0.281785	0.282108	0.282033	0.281917	4.676404	1.038394	1.986409	1.825418
PIO-002	0.282076	2.68E-05	0.000495	1148	77	0.282058	0.282419	0.28234	0.282065	0.267318	0.936423	1.924768	1.752157
PIO-004	0.281699	2.11E-05	0.000108	1203	70	0.282023	0.282379	0.2823	0.281697	-11.5632	0.73961	2.689297	2.520598
PIO-012	0.282095	3.28E-05	0.000865	1136	83	0.282066	0.282428	0.282349	0.282076	0.384849	1.146731	1.908208	1.73522
PIO-013	0.281104	2.66E-05	0.000507	2438	76	0.281222	0.281464	0.2814	0.28108	-5.04928	0.932529	3.248722	3.114161
PIO-035	0.282133	3.36E-05	0.001286	1344	85	0.281932	0.282275	0.282199	0.2821	5.962805	1.177065	1.727706	1.559768
PIO-041	0.281447	2.83E-05	0.000956	1872	78	0.281591	0.281886	0.281815	0.281413	-6.32931	0.990333	2.885808	2.735423
PIO-045	0.281415	3.93E-05	0.00091	2164	75	0.281401	0.281669	0.281601	0.281377	-0.8448	1.374208	2.785171	2.642216
PIO-052	0.280967	3.88E-05	0.000634	2996	78	0.280854	0.281043	0.280986	0.280931	2.73413	1.357614	3.230792	3.110739
PIO-053	0.282008	2.67E-05	0.000767	1011	81	0.282145	0.282519	0.282439	0.281993	-5.38749	0.935599	2.166447	1.990928
PIO-056	0.281878	5.15E-05	0.001282	1540	85	0.281806	0.282131	0.282057	0.281841	1.241539	1.803168	2.170798	2.009503
PIO-057	0.282167	3.56E-05	0.000862	1374	81	0.281913	0.282253	0.282177	0.282145	8.234445	1.247288	1.611431	1.443942
PIO-059	0.281952	2.95E-05	0.000597	769	86	0.2823	0.282695	0.282612	0.281944	-12.6109	1.033799	2.425649	2.244489
PIO-061	0.282223	2.51E-05	0.000432	1051	89	0.28212	0.28249	0.28241	0.282215	3.356375	0.877542	1.658519	1.482414
PIO-062	0.281361	4.44E-05	0.001925	2306	78	0.281308	0.281563	0.281497	0.281276	-1.14226	1.552694	2.914222	2.775348
PIO-070	0.281278	2.33E-05	0.000743	2250	99	0.281345	0.281604	0.281538	0.281246	-3.50375	0.814726	3.01073	2.870635
PIO-074	0.281955	2.03E-05	0.000694	1560	82	0.281793	0.282116	0.282042	0.281934	5.01708	0.708847	1.956126	1.794721
PIO-080	0.281287	2.55E-05	0.000225	2473	87	0.281199	0.281437	0.281374	0.281277	2.764803	0.892395	2.813646	2.678909
PIO-082	0.281524	2.04E-05	0.000111	1923	90	0.281558	0.281848	0.281778	0.28152	-1.3482	0.713903	2.626784	2.477022
PIO-088	0.282134	2.97E-05	0.001136	1536	87	0.281809	0.282134	0.28206	0.282101	10.3708	1.038749	1.608674	1.445568
PIO-095	0.281339	2.58E-05	0.000924	1921	34	0.281559	0.281849	0.281779	0.281306	-9.00952	0.902682	3.083543	2.935001
PIO-102	0.282523	2.98E-05	0.00085	868	30	0.282237	0.282623	0.282541	0.282509	9.648183	1.04391	1.122601	0.939698
PIO-107	0.282196	2.59E-05	0.000804	1191	32	0.28203	0.282388	0.282309	0.282178	5.247429	0.908171	1.651333	1.479005
W-ARU-005	0.281146	2.82E-05	0.00038	2541	63	0.281154	0.281386	0.281324	0.281127	-0.95617	0.986985	3.087769	2.9555
W-ARU-008	0.282116	3.52E-05	0.001178	949	24	0.282185	0.282564	0.282483	0.282095	-3.19788	1.23037	1.984202	1.80641
W-ARU-009	0.280815	3.62E-05	0.000595	2607	68	0.281111	0.281337	0.281275	0.280786	-11.5756	1.267126	3.762159	3.633251
W-ARU-017	0.281279	3.95E-05	0.001167	2658	76	0.281077	0.281298	0.281237	0.28122	5.056951	1.381002	2.824659	2.694816
W-ARU-020	0.282009	3.48E-05	0.000857	1633	92	0.281746	0.282063	0.281989	0.281983	8.40687	1.219491	1.806536	1.646648
W-ARU-024	0.281031	2.71E-05	0.000664	2530	63	0.281162	0.281395	0.281332	0.280999	-5.78784	0.949125	3.36384	3.231964
W-ARU-026	0.281294	3.36E-05	0.000867	2504	69	0.281179	0.281414	0.281351	0.281253	2.62887	1.174827	2.846277	2.712438
W-ARU-033	0.281254	2.63E-05	0.000862	2307	65	0.281308	0.281562	0.281496	0.281216	-3.27715	0.92008	3.041763	2.903246
W-ARU-035	0.282157	6.12E-05	0.001116	1364	100	0.281919	0.282261	0.282184	0.282129	7.421592	2.14063	1.653633	1.486004
W-ARU-037	0.281591	2.35E-05	0.000244	1949	70	0.281541	0.281829	0.281759	0.281582	1.445329	0.82315	2.479127	2.329643
W-ARU-038	0.281621	2.8E-05	0.000586	1733	82	0.281681	0.281989	0.281916	0.281602	-2.82298	0.979489	2.567559	2.412587
W-ARU-039	0.280521	3.61E-05	0.000693	3543	61	0.28049	0.280627	0.280576	0.280474	-0.56622	1.264608	3.857324	3.752723
W-ARU-047	0.281548	3.82E-05	0.001577	1788	71	0.281646	0.281948	0.281876	0.281495	-5.36763	1.336112	2.76328	2.610328
W-ARU-051	0.281583	2.89E-05	0.001212	1835	75	0.281615	0.281913	0.281842	0.281541	-2.63367	1.01059	2.635457	2.483387
W-ARU-055	0.282092	3.33E-05	0.001257	993	26	0.282157	0.282532	0.282451	0.282069	-3.11664	1.166198	2.013071	1.836562
W-ARU-056	0.280992	3.54E-05	0.000934	2686	65	0.281059	0.281277	0.281216	0.280944	-4.10467	1.238303	3.386792	3.259032
W-ARU-061	0.280992	3.54E-05	0.000934	2026	69	0.281491	0.281771	0.281702	0.280956	-19.0243	1.238303	3.755774	3.611809
W-ARU-062	0.281319	3.19E-05	0.001112	1612	99	0.28176	0.282078	0.282004	0.281285	-16.8454	1.116347	3.315387	3.159392
W-ARU-066	0.281616	3.03E-05	0.000772	1805	70	0.281635	0.281935	0.281864	0.28159	-1.59013	1.05912	2.549275	2.396162
W-ARU-077	0.281739	2.33E-05	0.000449	1297	100	0.281962	0.28231	0.282233	0.281728	-8.3021	0.817142	2.563071	2.39648
W-ARU-079	0.28216	3.08E-05	0.000948	1165	31	0.282047	0.282407	0.282328	0.282139	3.252446	1.078779	1.75412	1.581419
W-ARU-082	0.280992	4.54E-05	0.001132	2501	67	0.281181	0.281416	0.281353	0.280938	-8.63479	1.588698	3.508464	3.376191
W-ARU-091	0.281998	3.25E-05	0.001263	1311	77	0.281953	0.2823	0.282222	0.281966	0.46116	1.137473	2.039705	1.871855
W-ARU-100	0.281474	2.78E-05	0.000792	1971	75	0.281527	0.281812	0.281743	0.281445	-2.91556	0.973769	2.758228	2.610102

Table 11: The exact location of the samples.

Location	Depth Top	Depth Bottom	Unit
BR05DD01 core	523.8	525.8	Areyonga Fm
BR05DD01 core	753.6	756.2	Johnny Creek fm
Wallara 1 core	711.18	712.8	Arumbera Sst
Wallara 1 core	1286.67	1287.89	Pioneer SSt
Wallara 1 core	1367.17	1370.3	Areyonga Fm
Wallara 1 core	1513.07	1515.14	Johnny Creek fm
Western MacDonnell Samples	S	E	Unit
AM18-01	49.31 40 23	50.07 40 132	Arumbera sandstone
AM18-03	15.85 47 23	26.28 04 133	Areyonga formation
AM18-7	30.88 56 23	26.55 07 132	Pertatataka formatiom