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HETEROGENEITY OF CLASTIC PROVENANCE TO THE ANADARKO BASIN AND IMPLICATIONS FOR PALEOGEOGRAPHY

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Abstract

Thin section petrography and U/Pb detrital zircon geochronology were used to reconstruct Middle-Late Pennsylvanian drainage pathways into the Anadarko Basin, and evaluating the relative proportion of sediment originating from the Wichita-Amarillo Uplift and the Appalachian Orogen. Framework mineralogy indicates three petrographic populations: quartzose and quartzolithic sandstone, and arkose. Concentrations of chert clasts and regionally distinct feldspar textures within these populations correlated with drainage patterns determined by detrital zircon provenance spectra and known regional paleotopography. Detrital zircon geochronology indicates four distinct provenance types during the Middle Pennsylvanian. The Wichita type contains a single age peak at 535 Ma that correlates with igneous rocks of the Southern Oklahoma Aulacogen and is present proximal to the uplift only. The Appalachian type contains a dominant 900-1300 Ma age peak that correlates to the Grenville Orogeny and is found east of the Anadarko Basin. The Paleo-Proterozoic type contains two dominant age peaks, which are correlated to Appalachian and Peri-Gondwanan basement rock, with a minor peak of Archean age attributed to Pan-African terranes on the eastern margin of North America. The Paleo-Proterozoic type does not contain a Grenville age peak and characterizes sandstone in northern Oklahoma only. The Mixed type contains a roughly equal number of zircons from each basement terrane present across the Anadarko Basin, and is found only in deep basin sandstone on the eastern and western corners of the Anadarko Basin. Arenites with a Mixed detrital zircon signature are differentiated by abundances of lithic components and are sourced from upslope sandstone on their respective sides of the basin. These spatially discrete petrographic

and detrital zircon populations suggest partitioned drainage networks during the Middle Pennsylvanian that reflect complex local paleotopography and reactivated basement structures. In contrast, Late Pennsylvanian samples reveal that Appalachian-type sandstone is deposited uniformly across northern Oklahoma and into the deep Anadarko Basin, adjacent to Wichita-type proximal deposits. The Anadarko Basin's high subsidence rate, unique in the region, facilitated capture of this local- to Appalachian-derived sediment transition between the Middle and Late Pennsylvanian. This sedimentation record allows high-resolution correlation with other basins on the North American continent to reconstruct Middle and Late Pennsylvanian sediment pathways to the Anadarko Basin.

Chapter 1. Introduction

The Anadarko Basin is the deepest Paleozoic sedimentary basin on the North American craton, and contains an exceptionally thick Pennsylvanian sedimentary record across Oklahoma, Texas, Kansas and Colorado (Perry, 1998). The basin is a prolific source of hydrocarbons, producing over 1250 BCF and 5400 MMBO from Paleozoic strata as of 2012, with sandstone as an important reservoir in stratigraphic and structural traps (Mitchell, 2011). Rifting, magmatism and crustal deformation events during the development of the Late Proterozoic Southern Oklahoma Aulacogen (SOA) produced complex basement geology underlying the region (Perry 1988). Reactivation of these structures influenced basin formation in the Pennsylvanian during thrust loading of the Wichita-Amarillo Uplift (herein Wichita Uplift; Price, 2016). Understanding the paleogeography and provenance of river systems entering the Anadarko Basin is important for predicting siliciclastic composition pertinent to large-scale reservoir quality modeling and for basic understanding of the influence of basement geology on foreland basin paleogeography and paleogeomorphology.

To date, no single, large-scale provenance study has resolved sediment transport into the Anadarko Basin during peak subsidence, despite extensive field-scale studies of structures, mineralogy, and sedimentation patterns within the basin. Studies of paleochannel directions and framework mineralogy indicate sediment transport pathways approached the Pennsylvanian midcontinent from the north, east, west and southwest, with inferences of sediment provenance from the Wichita Uplift, northern Ancestral Rocky Mountains (ARM), Kansas Uplift and Appalachian Foreland Basin (Hentz 1994; Lambert, 2006; Alsalem et al., 2018; Kissock et al., 2018). Detrital zircon

dating of strata onlapping the Arbuckle Mountains, and from the Ouachita foredeep strata suggests recycled pre-Ordovician continental margin sedimentary rock and Appalachian orogenic rocks as potential additional provenance regions (Sharrah, 2006; Thomas et al., 2016). Changes in relative contributions from these source regions can be correlated with compositional shifts, which influences secondary porosity and permeability in sandstone (Parsons et al., 2005; Mitchell, 2011). The Arkoma and Black Warrior Basins to the east (Fig. 1) show a strong recycled orogenic provenance signal matching the provenance of coeval strata in the Appalachian Foreland Basin, introducing the concept of an interconnected, trunk-like axial drainage network in Equatorial Pangaea during the Late Paleozoic Pangaean suture (Archer and Greb, 1995; Sharrah, 2006; Boothroyd, 2012; Yezerski, 2013; Xie et al., 2016; Kissock et al., 2018).

This study has three main objectives to resolve sediment pathways into the Anadarko Basin during peak subsidence. The first is to determine provenance for Middle Pennsylvanian sandstone in the Anadarko Basin, utilizing petrographic framework composition and detrital zircon geochronology. The second objective is to use this provenance data to locate sediment pathways into the Anadarko Basin. The final objective is to compare these sediment pathways to petrographic and detrital zircon populations from other Pennsylvanian basins in North America, primarily to test the ideas of large-scale drainage networks derived primarily from the southern Appalachian Foreland Basin. If the Wichita Uplift was consistently supplying enough sediment to fill the Anadarko Basin, provenance signatures should be homogeneous within the sandstone of the foredeeps, with a primary provenance peak around 535 Ma. Additionally, a consistent population of perthitic feldspar should also be observed,

especially of granophyric texture regionally unique to the Wichita Mountains (Morgan and London, 2012). Connectivity to the Appalachian drainage network as the primary source for the deep-water and shelfal sandstone would be indicated by a homogeneous, Appalachian-derived provenance signal.

Chapter 2. Background

Global and Regional Paleogeography

During the Pennsylvanian, Pangaean assembly occurred by complex, rotational suturing of Laurussia and Gondwana near the paleoequator (Kroner et al, 2016). This suture occurred along a complex belt of orogenic uplifts referred to as the Central Pangaean Mountain Belt (CPMB), and the associated foreland basins which include the Appalachian, Black Warrior, Arkoma, Fort Worth and Marathon Basins (Fig. 1.; Thomas, 1977; Perry, 1988). Far-field stresses from this collision also reactivated subsidence and sedimentation in the intracratonic Michigan, Williston and Illinois Basins (Klein and Hsui, 1987). Fluvial interconnectivity of these paleobasins of the North American craton is one mechanism for deposition of Appalachian-derived sediments as far west as modern-day Colorado, although precise transport pathways for this sediment remain debated (Gehrels et al., 2011; Kissock et al., 2018). In southern Laurentia (mid-continent US), flooded continental interior deposits were abruptly overprinted and incised by fluvial-deltaic and deep basin deposits as uplift of the Wichita Uplift occurred contemporaneously with a pulse of subsidence within the Anadarko Basin (Tomlinson and McBee, 1959; Ambrose, 2011). Though the Wichita Uplift is the eastern extent of Ancestral Rocky Mountain tectonism, the high-angle reverse faults in the Wichita Uplift are parallel to the SOA trend (Price, 2016).

Late Paleozoic Paleoclimate

Late Paleozoic paleoclimate transitioned from an everwet climate in the Middle Pennsylvanian to an arid climate dominated by mega-monsoonal circulation in the Permian, with a seasonal period between these extremes (Parrish, 1993). The primary

driving force behind these fluctuations is still debated; but is often attributed to Gondwanan glaciation (Tabor et al., 2008). Whereas lowland basins in the Pennsylvanian of the Ouachita-Appalachian region preserve abundant coal, signifying wet conditions, these strata occur intercalated with drought-tolerant plants that recolonized these basins during dry intervals (DiMichelle et al., 2010). Glacial-interglacial fluctuations during the Pennsylvanian drove eustatic sea level variations of 40-120 m (Rygel et al., 2008); in intercratonic basins such as the Appalachian Foreland Basin, these fluctuations cause large lateral facies shifts (DiMichelle et al., 2010). In addition to glacioeustatic influences, glacial-interglacial climate change could increase the number of wet months in these basins by 20-40% (Cecil et al., 2003). These coupled eustatic and climatic fluctuations are recorded by, in part, extensive incised paleovalleys and lithologically-diverse cyclothem deposits in basins across North America (Perry, 1988; Archer and Greb, 1995; Cecil et al., 2003; Kissock et al., 2018). Although this work focuses on paleogeographic and tectonic controls on composition and provenance, paleoclimate influences weathering rates, sediment composition and dominant sediment transport processes which affect fluvial geomorphology and depositional lithology (Boucot et al., 2013). In the case of the Anadarko Basin, both fluvial and deep-water sandstone deposits are utilized in this work to characterize sediment sources for the basin.

Formation of the Anadarko Basin

The regional geology of southwest Oklahoma was shaped by four tectonic events, each recorded by a distinct stratigraphic sequence (Perry, 1988). The first event was the formation of the Late Proterozoic Southern Oklahoma Aulacogen, which began

with extension-driven intrusion of the mafic Glenn Mountain Layered Complex and Roosevelt Gabbro, eruption of the Carlton Rhyolite and intrusion of the Wichita Granite Group; all a response to the separation of Rodinia ~535 Ma (Powell et al., 1980). These igneous events are collectively referred to as the Wichita Igneous Suite. The second event was Early Paleozoic thermal subsidence, recorded by 4 km of passive-margin clastic and carbonate sedimentary rocks (Ham, 1973; descriptions in Ball, Henry and Frezon, 1991). The third event was Mississippian-Pennsylvanian thrust-loading of the Wichita Uplift and coeval flexural subsidence, forming the Anadarko Basin (Perry, 1988). The Anadarko Basin and shelf comprises a 10 km thick package of surface and subsurface rocks in Oklahoma, Kansas, Colorado and Texas, with 6 km of sedimentary rock deposited during the Pennsylvanian-Permian (Fig. 2, Witt et al., 1971). The uplift is the easternmost extension of the ARM Orogeny, and is trend-parallel with structures of previous rifting and intrusive events (Soreghan et al., 2012; Price, 2016). The fourth event includes minor uplift pulses in the Permian, and subsidence and burial of both the Anadarko Basin and Wichita Uplift—the Wichita Mountains in Oklahoma today are exhumed Permian topography (Soreghan et al., 2012; Price, 2016).

Study Area

This study samples Pennsylvanian fluvial, deltaic and turbidite sandstone strata across Oklahoma and northwest Texas, and Pennsylvanian conglomerates in southwestern Oklahoma along the northern edge of the Wichita Uplift. Table 1 lists GPS locations and lithofacies for each sample, and Figure 3 shows their locations within the Anadarko Basin. Middle Pennsylvanian sandstone formations include the Boggy (informal red fork subsurface equivalent) and Chelsea, sampled from both

fluvial channel deposits from the tectonically stable Anadarko and Cherokee Platforms (BG1, CH1 and RF 1-4) and deep-basin slope-fan deposits in the Anadarko foredeep (RF5-6; Andrews, 1997). Two Late Pennsylvanian sandstone units, the Tonkawa and Gypsy, were sampled to test for changes in provenance between the Middle Pennsylvanian and Late Pennsylvanian stages. The Granite Wash is a Pennsylvanian deposit proximal to the Wichita Uplift, which contains boulder- to pebble-sized clasts derived from the Wichita Igneous Suite and Lower Paleozoic carbonates, and occurs interbedded with sandstone of similar mixed composition (Mitchell, 2011). Well records and lithostratigraphy were used to place Granite Wash well core intervals in well-mapped, discrete lobes deposited during the Middle Pennsylvanian (GW2 and GW3) and Late Pennsylvanian (GW1; Mitchell, 2011).

Chapter 3. Methods

Rock Description and Petrography

Eight subsurface core intervals and two outcrops of Middle Pennsylvanian strata, and one subsurface core interval and outcrop of Late Pennsylvanian strata were described at the centimeter scale, detailing lithology, grain size, contacts and sedimentary structures (Table 1; Fig. 3). Petrographic samples, from sandstone intervals at least 7 meters thick (in core), were taken every 30 cm for stratigraphic description and point counting. Outcrop samples used 1-3 representative thin sections; published whole rock and petrographic descriptions were used for the Gypsy Sandstone outcrop. Point counts classified 400 clastic sand-sized (>62.5 um) framework grains into 11 compositional and textural categories using Gazzi-Dickinson method (Table 1; Dickinson, 1970; Ingersoll et al., 1984). Use of additional feldspar textures enhances characterization of possible Wichita Igneous Suite sources by the presence of diagnostic granophyric (Morgan and London, 2012) and rapakivi (Price et al., 1996) feldspar grains.

Detrital Zircon Geochronology

Zircon ($ZrSiO_4$) is a durable mineral that is ubiquitous in metamorphic and igneous rocks and is resistant to physical and chemical weathering and U-Th-Pb isotopic alteration (Gehrels et al., 2008). Detrital zircon geochronology is used to trace siliciclastic sediment to their source basement rocks (Fig. 4). Five kilograms of sandstone from each outcrop and two kilograms from each core was crushed, milled and sifted on a Wilfley table. Detrital mineral fractions were separated by heavy liquids and magnets, and acid washing removed organic contaminants. Extracted (unknown)

detrital zircon grains were hand-mounted with standard (known) plutonic zircon grains in Buehler Epo-Thin epoxy. Cathode luminescence (CL) images were used to pick 20 µm LA-ICPMS analysis spots on 315 unknown crystals at random. The CL images assisted in distinguishing detrital zircon grains from detrital monazite grains, and in choosing spot locations free of zoning, inclusions and cracks. Cleaning shots of 40 µm diameter were used to re-check the integrity of analysis spots before taking the final measurement. Standard zircon grains were sampled between groups of 5 detrital grains; this allowed U-Th-Pb fractionation to be corrected for unknown samples during data processing (Gehrels et al., 2008). Normal and reverse concordance within samples was tolerated to 20 and 5 percent respectively.

The detrital zircon ages for each sample were plotted on relative probability curves to compare age populations and quantify similarity and dissimilarity among samples. Visual comparisons of age groupings among the curves were verified using two statistical tests, the K-S and Overlap-Similarity tests. The K-S test generates a P value for every possible sample pair; if $P > 0.05$, the null hypothesis (the samples are not genetically related) is rejected (Press et. al., 1986). The K-S test is a common tool in detrital zircon studies, but it cannot determine a degree of similarity between two samples (Guynn and Gehrels, 2010). The Overlap-Similarity test was used in conjunction with the K-S test to determine how similar the relative probability plots are between all possible combinations of sample pairs (Gehrels, 2000). Visual comparison, the K-S test, and the Overlap-Similarity test were used together to quantify similarity and dissimilarity between samples, and ultimately to evaluate drainage changes in the Anadarko Basin.

Chapter 4. Results

Presented here are general lithologic descriptions of the sampled intervals, as well as petrography and detrital zircon geochronology data for each of the ten core and three outcrop sites sampled in this study. Results are grouped spatially, based on their modern positions within the Anadarko Basin: eastern, northern, western and southwestern (proximal to uplift). Where applicable, samples are described in stratigraphic order. Table 1 lists summary data for each interval. Fig. 5 shows a ternary plot (OmFLt) of the petrographic data from all cores, and Fig. 6 shows probability density plots of the detrital zircon data. Data tables for both datasets are presented in Appendices A and B, respectively.

Southwestern (Proximal) Samples

Samples proximal to the Wichita Mountains include two cores of Granite Wash (GW1, 2). Conglomerates observed in these cores contain pebbles of lithologies identical to the Wichita Igneous Suite, clasts of massive or bedded carbonate sedimentary rocks, and rarely, gabbro or diabase.

Sample GW1

The rock encasing GW1 (1652.7 m depth, study interval 36 m thick) contains massive conglomerate units (pebble to cobble) interbedded with tan, rippled to cross-stratified calcareous and mica-rich subarkose, with coal seams up to 2.5 cm thick bearing plant fossil casts. These 7.5-30 cm thick facies packages represent a high-energy fluvial system with cobble-sized channel lag (clasts in core up to 40 cm in diameter) as well as vegetated overbank and floodplain deposits. Average QmFLt petrographic composition of sandstone units in GW1 is 33/59/8%, with about half of the

Qm fraction occurring in granophyric igneous rock fragments (Fig. 6). Thin sections throughout GW1 exhibit abundant perthitic feldspar grains with diagnostic Wichita Granite Group granophyres (Morgan and London, 2012) but show variation in polycrystalline quartz, calcite and dolomite cement and lithic chert concentration (Appendix A). Abundance of carbonate cement, and perthitic feldspar grains partially replaced by carbonate, increases with depth. Untwinned feldspar and altered feldspar also occur, as well as rounded monocrystalline quartz grains. GW1 contains detrital zircons that range in age from 450 to 1373 Ma, but over 90% of the grains exhibit ages from 510 to 550 Ma.

Sample GW2

The rock encasing GW2 (3482 m depth, study interval 18 m thick) contains conglomerate and graded gravel-sandstone intervals 1-3 m thick, topped by intercalations of gray, cross-stratified subarkose above scoured black shale up to 1 m thick. While both GW1 and GW2 contain significant conglomerate deposits, GW1 facies include coal and suggest fluvial deposition, GW2 facies include black shale beds scoured by sandstone, more suggestive of deep-water turbidite flows similar to Granite Wash cores described by Mitchell (2011). Average QmFLt petrographic composition of sandstone units in GW2 is 41/48/11% (Fig. 5). Thin sections contain abundant feldspars, including graphic and perthitic feldspars characteristic of the Wichita Granite Group, but petrographic samples within this interval exhibit variation in carbonate cement and in opaque mineral concentration. GW2 contains detrital zircon ages that range from 410 to 2950 Ma, but with 70% between 510 to 550 Ma. A moderate number of zircons range in age between 1000 and 1200 Ma (12%). Zircon grains also exhibit

ages between 1350 to 2000 Ma (10%) and 2500-3000 Ma (2%) (Fig. 6). There is also a single grain of Devonian age.

Western Oklahoma

Samples from Western Oklahoma, all taken from core, include foredeep deposits of the Pennsylvanian Granite Wash (GW3), Middle Pennsylvanian Boggy sandstone (RF5, 6) and Late Pennsylvanian Tonkawa sandstone (TK1).

Sample RF5

Sample RF5 (3868.5 m depth, study interval 18 m thick) is encased by a normal-graded sequence of fine-grained massive quartz arenite to dark gray mudstone 3 m thick, the former containing mud drapes, pyrite nodules and fluid-escape structures. Below the sampled unit, wavy-laminated, iron-stained gray shale yields upward to a quartzose sandstone within 10 m; the sandstone contains deformed mudstone lenses and rip-up clasts up to 3 cm in diameter. Graded and deformed bedding, fluid escape structures and mud drapes throughout the core suggest that the depositional environment of sample RF5 is a turbidite deposit, with facies analogous to those in cores of the Boggy Sandstone interpreted by Andrews (1997). The average QmFLt composition for RF5 is 66/3/30%. Thin sections from the interval surrounding RF5 reveal a quartz arenite with fine, subrounded grains. Sparse intergranular space is filled with silt, clay and carbonate cement. Composition throughout the interval is homogenous, with a small increase in chert and carbonate cement in shallower samples. Detrital zircons in RF5 range in age from 337 to 3296 Ma and contain age groups of 300 to 700 Ma (32%), 900 to 1250 Ma (32%) and 1300 to 2100 Ma (32%), with smaller groups between 700 to 900 Ma (5%) and 2500 to 3000 Ma (5%).

Sample RF6

Sample RF6 (4102.6 m depth, study interval 24 m thick) is encased by a series of beds of normal-graded bed of fine-grained, gray calcareous quartz arenite to dark gray mudstone 80 cm thick. Structures within these strata include (from bottom to top): massive sandstone containing rip-up clasts of laminated mudstone, thin horizontal sandstone laminations topped with rippled mudstone, cross-bedded sandstone with mud-draped foresets and mudstone lenses, thin interbeds of sandstone and mudstone, and chaotic sandstone and interbedded mudstone containing sandstone rip-up clasts. Below the sampled section are small, normal-graded sandstone and shale intervals up to 30 cm thick; occasionally the sandstone units appear slumped, with deformed bedding. Above the sampled section is approximately 80 m of black, calcareous and non-calcareous laminated shale. The depositional environment of sample RF6, based on the presence of rip-up clasts and normal-graded, ripple-topped sandstone and mudstone packages, is a deep basin slope fan built by turbidity currents. This sequence is also observed in other cores of Boggy Sandstone cores studied by Andrews (1997). The average QmFLt composition for RF6 is 69/4/27%. Thin sections surrounding RF6 are composed of angular quartz grains in a silt matrix. Some samples contain trace granophyric feldspar that are partially replaced by carbonate cement. Trace chlorite (after biotite) and glaucophane are also observed in thin section. RF6 contains detrital zircon grains that range from 341 to 2831 Ma, with large populations of 500 to 700 Ma (22%) and 900 to 1250 Ma (27%), 1300 to 2100 Ma (32%), and smaller groups of zircons with ages between 300 to 500 Ma (5%) and 2400 to 2900 Ma (5%).

Sample GW3

Sample GW3 (2762.3 m depth, study interval 28 m thick) is encased by normal graded, interbedded fine-grained gray lithic quartz arenite and dark gray mudstone 10-40 cm thick. The arenite contains iron nodules 2-3 mm in diameter. Fluid escape structures, sand- and mudstone rip-up clasts and chaotic bedding are interspersed through the interval. Near the base of the core is a 60 cm thick unit of interbedded mudstone and iron-stained packstone. The strata above this are mudstone-dominated, gradually transitioning to cross-bedded sandstone just below the sampled unit over 8 m. The depositional environment of sample GW3 is a deep basin slope fan. The average QmFLt composition for GW3 is 56/5/39%. Unlike GW1 and GW2, this sample contains trace biotite and chlorite, and very little feldspar. Detrital zircon grains sampled in GW3 range in age from 310 to 3241 Ma. Most zircon grains exhibit ages between 900 to 1350 Ma (40%), but also 1500 to 2100 Ma (27%), and minor groups with ages between 400 to 500 Ma (8%) and 550 to 700 Ma (9%).

Sample TK1

Sample TK1 (2964 m deep, study interval 23 m thick) is encased within 3 m thick intercalated deposits of normal-graded gray fine- to medium- grained quartz arenite and black shale. Irregular wavy mudstone lenses are present throughout the sandstone. The core becomes more sand-rich toward the top of the studied interval, though deformed sandstone and mudstone layers 6 to 20 cm thick occur at all depths. Based on the presence of normal-graded sandstone and shale deposits, as well as deformed sandstone bedding throughout the study interval, the depositional environment of sample TK1 is a deep basin slope fan built by turbidity flows. The

average QmFLt composition for TK1 is 62/2/36%, however the Qm/Lt fraction varies 30% toward either axis (Fig. 5). Thin sections all contain polycrystalline quartz in quartzite and foliated metamorphic rock fragments, and trace chert and feldspar grains. TK1 contains detrital zircon grains that range in age from 370 to 2918 Ma. Many zircons exhibit ages between 900 to 1200 Ma (45%) and 1250 to 1425 Ma (18%), with minor groups of zircons that range from 300 to 500 Ma (9%) and 1450 to 1800 Ma (16%).

Northern Oklahoma

In Northern Oklahoma, sandstone units were sampled on either side of the Nemaha Arch from the deep basin Middle Pennsylvanian Boggy Sandstone (RF2, RF3 and RF4) and the fluvial Late Pennsylvanian Gypsy Sandstone (GY1).

Sample RF2

Sample RF2 (973 m deep, study interval 15 m thick) was sampled from light gray micaceous quartz arenite that is locally laminated, cross-stratified, or rippled in 5-20 cm thick intervals and contains diagenetic iron or glauconite. The arenite also hosts green-gray shale interbeds that contains rip-up clasts of the surrounding arenite up to 2 cm in diameter. The base of this core contains a calcareous black shale with a wackestone lens 2 cm thick. Above the sampled arenites is a package of wavy calcareous shale, which coarsens upward to glauconitic sandstone. The shale contains lenses of wackestone containing brachiopods, crinoids and bivalves. These graded glauconitic sandstones with high-energy sedimentary structures, green shales containing rip-up clasts of local sandstones, and wackestones represent turbidites deposited downslope of a carbonate shelf, consistent with regional proximity to the Cherokee

Platform (Ball et al., 1991). The average QmFLt composition for RF2 is 67/1/33%. Thin sections share high concentration of Qm (70-80%) except for the top two samples in the core, which contain more than twice as much polycrystalline quartz as the other samples. Concentrations of chert lithic fragments increases with depth. Detrital zircon ages in RF2 range from 308 2to 3628 Ma, with a large population of 550 to 670 Ma zircons (34%) and a minor grouping of 1000 to 1200 Ma zircons (12%). There are scattered grains between 1350 to 2000 Ma (10%), and 5 grains (2%) between 2500-3000 Ma (Fig. 6). There is also a lone zircon grain of Eoarchean age.

Sample RF3-1 and RF 3-2

Samples RF3-1 (1571 m depth) and RF3-2 (1705 m depth) are encased within micaceous quartz arenite with silt laminations. Both detrital zircon samples are within core RF3 (study interval 47 m thick, bisected by 134 m of missing core) but are distinct sandstone units separated by several meters of laminated black shale. Sample RF3-2 is encased in normal graded green-gray sand to black laminated shale about 2 m thick, with flecks of organic material throughout. Sand units contain mud stringers and mud rip-up clasts up to 3 cm in diameter, as well as local calcareous silt and mudstone lenses. Sample RF1 contains similar graded sandstone-shale packages as below, but up to 6 m thick. The top 35 cm of the core is a black shale with a rippled base and plant impressions. The graded beds, rip-up clasts and organic material suggest a deltaic depositional environment for core RF3, matching descriptions of other Boggy Sandstone cores interpreted in this region by Andrews (1997). The average QmFLt composition for RF3 is 76/3/21%. Thin sections share common lithologies within two main groups. The upper section of the core contains quartzolithic sandstone rich in

opaques, with foliated quartzose metamorphic rock fragments as the lithic component, in a clay matrix. The base of the core contains calcareous quartz arenite (>90% Qm). Detrital zircons in sample RF3-1 (mid-core) range in age from 326 to 3001 Ma, with many grains that range from 550 to 700 Ma (38%) and minor populations with ages between 325 to 500 Ma (9%) and 1000 to 1300 Ma (11%). RF3-2 (base core) contains detrital zircons aged 326 to 3005 Ma, with similar age distributions as RF3-1. However, 325 to 500 Ma (23%) is a major zircon age population in RF3-2 instead of a minor one.

Sample RF4

The strata encasing sample RF4 (1974.2 m depth, study interval 17 m thick) are normal-graded massive very fine-grained light gray micaceous quartz arenite to dark gray mudstone 2 m thick. Just above these strata are units of deformed mudstone and sandstone and steeply dipping (75°), normal-graded mudstone and sandstone. The dips of these lessen and the grain size coarsens upward into horizontally stratified and trough cross-stratified quartz arenite. This sandstone is truncated by an erosional surface and overlain by ripple-cross-laminated light and dark gray mudstone. Based on the stack of steeply-dipping to trough cross-stratified sandstones truncated by rippled mudstone, the depositional environment of sample RF4 is a marginal marine slope fan, analogous to facies described in other Boggy Sandstone cores by Andrews (1997). The average QmFLt composition for RF4 is 67/2/31%. Thin sections are homogeneous, containing angular, well-cemented lithic quartz arenite. Silt and clay occupy sparse intergranular space in roughly equal ratios, with trace carbonate cement. RF4 contains detrital zircons with ages between 337 to 3296 Ma, with many grains that range from 550 to 700 Ma

(35%), and minor groupings between 325 to 500 Ma (13%), 1000 to 1300 Ma (16%) and 1900 to 2300 Ma (15%). There is a single zircon grain of Paleoarchean age.

Sample GY1

Sample GY1 (elevation 236 m) is encased by cross- and planar-stratified fine- to medium-grained sublitharenite in beds up to 1 m thick, with sand- to cobble-sized mudstone intraclasts concentrated on foreset surfaces (Doyle and Sweet, 1995). The lithic component of this sandstone consists of potassium and plagioclase feldspar, igneous and metamorphic rock fragments and chert (Doyle and Sweet, 1995). Previous work at this outcrop determined that the depositional environment of sample GY1 is a group of fluvial channel bodies (Doyle and Sweet, 1995). Sandstones an average, homogeneous QmFLt composition of 82/2/16% (Dyman, 1987; Doyle and Sweet, 1995). Detrital zircon grains in GY1 range in age from 392 to 2949 Ma, with abundant grains with ages from 900 to 1300 Ma (45%), and minor groups between 1400 to 1550 Ma (11%) and 1600 to 1750 Ma (13%).

Eastern Oklahoma

One well core interval and one outcrop of Boggy Sandstone (RF1, BG1), as well as one outcrop of the Chelsea Sandstone (CH1), were sampled.

Sample BG1

Sample BG1 (elevation 186 m, study interval 10 m thick) is encased by medium- to coarse-grained, ferruginous subangular quartz arenite in 50 cm thick wavy beds separated by mudstone and shale rip-up clasts. The base of the outcrop consists of 8 m of black, fissile non-calcareous shale. This shale is scoured by coarse-grained sandstone with tree trunk casts up to 2 m in length chaotically juxtaposed at the base of

the unit. Iron nodules up to 10 cm in diameter occur at the base of the sandstone strata. The depositional environment of sample BG1 is a vegetated fluvial-deltaic system, based on the presence of non-calcareous shales and tree trunk casts at the base of the sampled cross-stratified channel sandstones. Representative thin sections of BG1 from this study, supplemented by data from Dyman (1987), indicate an average QmFLt composition of 81/1/18%. BG1 contains detrital zircons with ages between 284 to 2822 Ma, with abundant grains between 900 to 1300 Ma (54%), and fewer grains between 300 to 500 Ma (13%) and 2500 to 2900 Ma (6%). Zircons with ages from 1400 to 1900 Ma comprise 16% of the total detrital zircon population (Fig. 6).

Sample RF1

Sample RF1 (1466 m depth, study interval 43 m thick) is encased by brown-tan massive and cross-stratified sandstone beds with rippled tops up to 1 m thick. Above the sampled interval, gray micaceous mudstone lenses and fluid escape structures predominate, with interspersed wavy mudstone beds containing sandstone rip-up clasts. These upward-fining sandstone packages with mud containing sandstone lenses and fluid escape structures represent a channel migration event within a marginal marine setting, like many Boggy cores studied by Andrews (1997). The average QmFLt composition for RF1 is 78/1/21%. Sandstone thin sections throughout the core encasing RF1 vary little in composition and grain size but do exhibit an increase in opaque mineral concentration with depth (Appendix A). Detrital zircon grains in RF1 range in age from 376 to 2706 Ma, with many grains between 900 to 1300 Ma (53%), and fewer grains between ages 300 to 500 Ma (7%), 1400 to 1550 (13%) and 2500 to 2900 Ma (3%).

Sample CH1

Sample CH1 (elevation 229 m, study interval 8 m thick) is encased by fine-grained massive and cross-stratified tan quartz arenite in beds up to 40 cm thick. Local outcrop availability was limited and homogeneous in composition and structure, but other workers have observed calcareous, fossiliferous, iron-rich clay and black shale with interbedded clay and sandstone in the Chelsea Sandstone; the strata were likely deposited in a terrestrial fluvial setting (Austin, 1946). Representative thin sections from this work and Dyman (1987) for CH1 exhibit an average QmFLt composition of 71/3/26%. In thin section, the quartz grains are subrounded and well compacted with minor iron staining. CH1 contains detrital zircon grains that range in age between 310 to 3547 Ma, with abundant zircons between 300 to 500 Ma (26%) and 900 to 1300 Ma (34%), and minor groups between 550 to 700 Ma (9%) and 1500 to 1850 (9%).

Potential Detrital Zircon Source Regions

Detrital zircon ages in this study range from 300 to 3628 Ma. These ages correlate to potential basement rock sources in North America and accreting Gondwanan terranes (Figs. 4, 6). While not all detrital zircons are assumed to originate from first-cycle weathering of age-correlated basement rock, these age populations can also be compared to sedimentary rocks in neighboring basins, and Lower Paleozoic rocks that may have been eroded and deposited as recycled sediments in the Anadarko Basin.

Archean and Paleoproterozoic (>1825 Ma)

Zircons of this age range constitute 10% of sampled zircons in the Anadarko Basin and have two distinct potential source regions: 1) the Canadian Shield and

associated orogenic belts; and 2) Gondwanan and Peri-Gondwanan terranes of the Alleghenian orogeny. Terranes north of the Anadarko Basin that potentially could have yielded zircons of this age include the Superior and Wyoming cratons (3600-2500 Ma) and the Trans-Hudson, Penokean and Great Falls orogenic belts (1800-1900 Ma, Hoffman, 1989; Van Schmus et al., 1996). The Superior and Wyoming craton was covered in late Paleozoic time, although sediment derived from the craton could have been sourced from recycling of lower Paleozoic strata; detrital zircons from these sources are found in recycled sandstone units east and west of the Anadarko Basin (Becker et al., 2005; Sharrah, 2006; Link et al., 2014; Kissock et al., 2018). The potential southern source for detrital zircon grains in this age range is ultimately the Trans-Amazonian and Eberian orogenic belts (1950-2250 Ma) that were exposed during exhumation of Gondwanan terranes along the CPMB, recycled from lower-Paleozoic units within Peri-Gondwanan terranes or the Arkoma Basin strata (Sharrah, 2006; Neves, 2015; Thomas et al., 2017). This 1950-2250 Ma detrital zircon population is not derived from the North American craton, but zircons of this age occur in Lower Paleozoic and Pennsylvanian strata of the Fort Worth Basin in Texas (Alsalem et al., 2018).

Late Paleoproterozoic-Early Mesoproterozoic (1300–1825 Ma)

Zircons in this age range correlate with known ages of the midcontinent Yavapai-Matzatzal, Central Plains and Granite-Rhyolite basement provinces, as well as plutons throughout these provinces (Hoffman, 1989; Van Schmus et al., 1996; Soreghan et al., 2002); these ages include 19% of the total detrital zircons sampled in the Anadarko Basin. The Yavapai-Matzatzal terrane was exposed in the Ancestral Rocky

Mountains (excluding the Amarillo-Wichita Uplift) during Pennsylvanian-Permian time, and the Central Plains and Granite-Rhyolite terranes were exposed along the Transcontinental Arch during Cambrian-Mississippian time (Billo, 1985; Van Schmus et al., 1996). Late Paleoproterozoic-Early Mesoproterozoic detrital zircons are present within Paleozoic strata of the Grand Canyon and are especially prevalent in Lower Paleozoic sandstone (Gehrels et al., 2011). Zircons of this age range also occur in Mesoproterozoic-Lowest Cambrian arenites in the western US and the Fort Worth Basin in Texas, as well as within Ordovician strata of the Arbuckle Mountains (Oklahoma; Stewart et al., 2001; Thomas et al., 2017; Alsalem et al., 2018). Their dominance persists through Lower Pennsylvanian strata in the Arkoma Basin (Sharrah, 2006).

Middle–Late Mesoproterozoic (920–1300 Ma)

Zircons of this age range constitute 30% of sampled zircons in the Anadarko Basin and correlate in age with the Midcontinent Rift and Grenville basement regions. The Grenville basement (900-1300 Ma) is a remnant of an orogenic belt that sutured the supercontinent Rodinia, while the Midcontinent rift (1100 Ma) is a failed arm of the subsequent breakup of Rodinia (Kissock et al., 2018). The Grenville basement contains abundant zircons and is documented as a detrital component in ancient and modern fluvial sediments across North America and as far as northwest Canada (Eriksson et al., 2004; Becker et al., 2005; Sharrah, 2006; Gehrels et al., 2011; Boothroyd, 2012; Alsalem et al., 2018; Kissock et al., 2018). The lateral extent of the Grenville basement rock (Fig. 4), its zircon fertility, and its prominence in many Paleozoic strata greatly diminishes the utility of Grenville-aged zircons in sediment transport studies.

Neoproterozoic–Early Paleozoic (490–790 Ma)

Detrital zircons within this age range represent 30% of grains studied in the Anadarko Basin and can be correlated with basement rock ages of the Wichita Mountains in Oklahoma, Peri-Gondwanan Terranes of the Early Appalachian and Ouachita orogenies, and Early Paleozoic igneous intrusions in the western US. The Wichita Mountain Igneous Suite formed during rifting of Rodinia in the early Paleozoic and was exhumed during the suturing of Pangaea; crystallization ages of the various plutons, dikes and layered deposits that range in age between 525-545 Ma, with a zircon age peak at 535 Ma (Hanson et al., 2013 and sources therein). Sedimentary rocks derived from the Amarillo-Wichita Uplift are laterally restricted, and outside of the Anadarko Basin include only a handful of grains in the Pennsylvanian Fort Worth Basin and Permian strata in the Grand Canyon (Gehrels et al., 2011; Alsalem et al., 2018).

The Neoproterozoic-Early Paleozoic age population also encompasses the basement ages of Peri-Gondwanan terranes, a term encompassing the Avalonian, Carolinian, Suwanee, and Yucatan-Maya terranes accreted to southern Laurentia during the Paleozoic and unroofed during the Alleghanian Orogeny (Murphy et al., 2004; Thomas et al., 2004; Sharrah, 2006; Mueller et al., 2014). This age population can be found in basins across North America but is usually less abundant than the Grenville, Granite-Rhyolite and Yavapai-Matzatzal source regions (Thomas et al., 2004; Eriksson et al., 2004; Becker et al., 2005; Sharrah, 2006; Xie et al., 2016; Alsalem et al., 2018; Kissock et al., 2018). Early Paleozoic igneous plutons in New Mexico and Colorado (574-427 Ma) were unroofed in the ARM and could source zircons of this age

population to strata in the western Anadarko Basin (McMillan and McLemore, 2004; Soreghan and Soreghan, 2013).

Paleozoic (300 to 490 Ma)

Zircons in this age group on the North American paleocontinent are sourced from the Alleghenian orogeny, the final collision event to form the Appalachian Mountains, and age-correlative detrital zircons compose 11% of the total sample population in the Anadarko Basin. The Alleghenian orogeny contain these detrital zircon components: Taconic (490–430 Ma), Acadian (420–350 Ma), and Alleghenian (330–270 Ma; Miller et al., 2000), originating from the three collision events that formed the Appalachian Mountains. Late Mississippian volcanic arcs formed during subduction of southern Laurentia beneath Gondwana, as documented in sedimentary rocks in Oklahoma and Arkansas (Shaulis et al., 2012). Paleozoic detrital zircons are common in North American basins; they occur in varying ratios with Neoproterozoic-Early Paleozoic zircons and are usually a supplementary component compared to Grenville-aged zircons (Becker et al., 2005; Sharrah, 2006; Xie et al., 2016; Alsalem et al., 2018; Kissock et al., 2018).

Chapter 5. Discussion

Spatial and Temporal Trends

The thirteen detrital zircon populations contain an overall age range from 3628 Ma to 300 Ma and each sample is classified as one of four assemblage types based on distinct visual differences in one or more dominant age groupings in each sample's relative probability curve (Fig. 8). These visual age populations were verified using two statistical tests, the K-S test and Overlap-Similarity test (Appendix C; Press et al., 1986; Gehrels, 2000). The values given by the K-S test matched most of the visual interpretations; where they differed, the highest Overlap-Similarity values were used to verify visual age populations. The Wichita type contains one major population of U-Pb ages between 510 to 550 Ma and includes samples GW1 and GW2. The Appalachian type contains a dominant Grenville-aged signal from 900 to 1300 Ma (about 50%), with minor populations 300 to 500 Ma (10%) and 2700 Ma (5%), and minor mixed peaks between 1400 to 1900 Ma (15%). The Appalachian type signature in this work is analogous to the Appalachian type signature of Thomas (2017); samples include BG1, RF1, TK1 and GY1. The Paleo-Proterozoic type contains a major age population of 550 to 700 Ma (about 35%) and minor zircon populations of ages 300 to 500 Ma (10-15%); it includes samples RF2, RF3-1 and RF3-2 (where 300-500 Ma is a major population), and RF4. The Paleo-Proterozoic type signature is notable for its lack of a major Grenville-aged (900 to 1300 Ma) detrital zircon population. The final assemblage, Mixed type, includes detrital zircons with equal populations of 300 to 500 Ma, 550-700 Ma and 900-1300 Ma (roughly 25% each), with a minor signal from 1400-2300 Ma.

The Mixed type includes samples RF5, RF6 CH1 and GW3 (with a 40% Grenville population).

During the Middle Pennsylvanian (and persisting into the Late Pennsylvanian), the Wichita type assemblage is restricted to clastic deposits shed directly from the Wichita Uplift (Fig. 9, 10). However, time-equivalent deep basinal strata contain a Mixed type detrital zircon assemblage that contain only 3% and 4% of detrital zircon grains with ages that comprise the major population (60-90% or more) in the Wichita type assemblage (Fig.8). This rapid lateral shift indicates that the Wichita Uplift contributed very little sediment to the Anadarko Basin overall, with only very restricted deposits proximal to the uplift. Mixed type detrital zircon signatures are consistent with paleocurrents of incised channels studied by Ambrose (2011). This recycling is also indicated by trace perthitic feldspar grains, usually partially replaced by carbonate cement, characteristic of the igneous rocks contained within the Wichita Uplift. In northern Oklahoma, the Paleo-Proterozoic type assemblage predominates. The Paleo-Proterozoic type assemblage is notable because it 1) lacks a Grenville (900 to 1300 Ma) detrital zircon signature so ubiquitous for Late Paleozoic samples in North America and 2) by Late Pennsylvanian time sandstone deposited over the same area transition to an Appalachian type provenance that matches Appalachian-derived sediments across the continent (Fig. 10). Eastern Oklahoma sandstone exhibits an Appalachian type zircon assemblage during the Middle Pennsylvanian and Late Pennsylvanian. This Appalachian type assemblage is also present within the Atokan Arkoma Basin (stratigraphically below the units analyzed in this study; Sharrah, 2006), southern Appalachian Basin and in the Fort Worth Basin (Thomas, 2017; Alsalem et al., 2018).

Petrographic data indicate three distinct types based on framework mineralogy: quartzose, quartzolithic and arkosic (Fig. 5; see Appendix A for numeric data). The quartzose type has framework grains that are over 90% Qm (Fig. 5b) and are present in northeast Oklahoma during the Middle Pennsylvanian only. The arkosic type contains a quartzo-feldspathic framework with granophyric feldspar grains derived from the Wichita Granite Group and characterizes samples proximal to the uplift. The quartzolithic type contains polycrystalline quartz fragments with metamorphic textures and 5% or fewer feldspar grains; most samples fall within this population (BG1, CH1, GY1, RF1, RF2, RF3-2, RF4, RF5, RF6, TK1 and GW3). This composition is common in recycled North American sandstone units, and plots in the "recycled orogen" field from Dickinson et al. (1983). The quartzose samples may correlate with the north-south sourced fluvial pulses recorded in the Arkoma Basin, as it carries almost pure quartz sand (Sutherland, 1988). These fluvial pulses traveled west of the Ozark dome, potentially recycling early Paleozoic sedimentary cover to form the very mature arenites observed in sample RF3-1. The arkosic samples correlates with the Wichita type detrital zircon signature (Fig. 8). Due to overlapping point count uncertainty of feldspar components, the QmFLt compositions of the quartzolithic samples were not useful for provenance distinction (van der Plas and Tobi, 1965).

Spatial trends in individual lithic and feldspar components from each sample, however, were comparable to detrital zircon assemblages and paleogeographic regions. Chert abundance increases toward the northeast and exhibits a sharp decline in both maximum and average chert concentration west of the Nemaha Uplift fault trace (Fig. 7). These chert-bearing sandstone units may have received recycled sediment from

Lower Paleozoic sedimentary rocks from the various uplifts inland of the CPMB; transport of chert was not necessarily inhibited by the Nemaha Arch (Fig. 1; McKee and Crosby, 1975; Brenner, 1989; Lambert, 2006 and sources therein). In western and southwestern Oklahoma, trace glaucophane was observed in core RF6, and both RF6 and GW3 contain trace chlorite and biotite. Based on regional paleogeography, paleocurrent data and structural contours, these units may be partially sourced from sandstone proximal to the ARM uplifts, specifically the Apishapa Uplift (McKee and Crosby, 1975; Perry, 1988; Ambrose, 2011).

Pennsylvanian Sediment Pathways to the Anadarko Basin

As shown by unique petrographic characteristics and distinct detrital zircon age populations (Fig. 5, 6 and 7), the Wichita Uplift forms a laterally restricted, subordinate source of clastic influx into the Anadarko Basin. Significant contributions from other provenance regions, including the northern ARM, midcontinent, and the Appalachian Basin were needed to fill the 6 km-thick Pennsylvanian succession in the Anadarko Basin. Spatially-discrete detrital zircon populations, defined as Wichita, Appalachian, Paleo-Proterozoic and Mixed in this work, indicate partitioned drainage systems which deposited sediment into the Anadarko Basin during the Middle Pennsylvanian (Fig. 9).

Southwestern Oklahoma

Wichita Uplift-derived sediment dominates through Pennsylvanian (this study) and Permian time (Thomas et al., 2016). This is indicated by the 535 Ma detrital zircon age peak of the Wichita type assemblage signature, and by the prominence of granophyric feldspars in subarkose proximal to the uplift. These features are characteristic of the proximal Wichita Uplift. Both subaerial and submarine fans

delivered this sediment to the Anadarko Basin; granophyric feldspar grains were also reworked in sandstone in the east Anadarko foredeep (Mitchell, 2011). More petrographic samples are required to determine whether these grains were delivered by an uplift pulse or were reworked from older sandstone; data from this work currently support the latter.

Western Oklahoma

Middle Pennsylvanian sandstone of western Oklahoma show a Mixed type detrital zircon signature with no predominant age grouping (Fig. 8, 9a); Late Pennsylvanian sandstone shows an Appalachian type signature. Based on detrital zircon samples and unique trace minerals documented in this study, as well as previous studies of incised paleochannels and structural contours of the basin, a west-to-east sediment pathway best explains samples GW3 and RF6 and an east-to-west sediment pathway for RF5 (McKee and Crosby, 1975; Perry, 1988; Lambert, 2006 and sources therein, Ambrose, 2011). The similar detrital zircon signature on opposite sides of the Anadarko Basin could have been caused by mixing of Paleo-Proterozoic type sandstones from northern Oklahoma with the Mixed- and Appalachian type sediments from western and eastern Oklahoma, although additional samples local to this mixing zone are needed. The west-east fluvial system emanated from eroded Lower Paleozoic strata along the Wichita Uplift in northwest Texas, and perhaps ultimately within the ARM in southeast Colorado (Lambert, 2006 and sources therein). The east-west transport pathway contains a Mixed type detrital zircon signature, which combines dominant age groupings found in both Appalachian type and Paleo-Proterozoic type sandstone to the north and east (Fig. 9). By Late Pennsylvanian time, the Mixed type signature is

replaced completely by the Appalachian type signature preserved in the Tonkawa sandstone (Fig. 10), indicating an upstream drainage change with sediment derived from non-local strata.

Northern Oklahoma

Northern Oklahoma is dominated by the unusual Paleo-Proterozoic type detrital zircon signature during the Middle Pennsylvanian, lacking the large Grenville population found in most Late Paleozoic sandstone of North America. Additionally, of the eight Early Alleghenian zircons (<320 Ma) from this work, seven were deposited in northern Oklahoma, and five of these seven were deposited in core RF2. This supports a connection to the Northern Appalachians, with these zircons originating from Northern Appalachian volcanism or rapid unroofing of granite plutons. Kissock et al. (2018) found a Paleo-Proterozoic type detrital zircon signature (referred to as type 2) at the top of the time-equivalent Floris Formation in the Forest City, also interpreting a North Appalachian connection with headwaters in southern New England. Increased sedimentation in the Middle Pennsylvanian overcame the Bourbon Arch as a depositional barrier between the Forest City Basin and Cherokee platform, allowing for sedimentation to extend from Kansas into NE Oklahoma (Brenner, 1989). By Middle Pennsylvanian time sedimentation was also burying the Nemaha Uplift from south to north; previous workers have traced Boggy sand channel bodies to cross the Nemaha arch with little impedance by the Middle Pennsylvanian (Brenner, 1989; Lambert, 2006 and sources therein). Eroded Early Paleozoic sediment from the Nemaha Arch is another possible source for Early Paleozoic and Late Proterozoic detrital zircon grains; however, the <320 Ma detrital zircon grains disprove an exclusive, locally-recycled

source for the Middle Pennsylvanian sandstone in northern Oklahoma. By Late Pennsylvanian time the Paleo-Proterozoic type detrital zircon signature dominates deposition, as seen in the fluvial Gypsy sandstone (Fig. 8, 9). Like samples in western Oklahoma, this signature change is indicative of a regional drainage shift.

Eastern Oklahoma

Sandstone units in eastern Oklahoma have an Appalachian type detrital zircon signature matching the Appalachian type signature of Thomas et al. (2017). Local sediment recycling as rivers cross over the filled Arkoma Basin, as well as recycled sediment transported axially along the CPMB from the southern Appalachian Foreland Basin are two possible sources for sandstone in eastern Oklahoma (Thomas et al., 2017). The relatively high chert abundance in this area suggest that local recycling of sedimentary cover on the Appalachian, Ozark, Nemaha, and Arkoma uplifts was a large contributor of sediment. Sandstone of similar detrital zircon makeup was also documented by Alsalem et al. in the Fort Worth Basin in Texas (2018).

Relationship Between the Anadarko and southern Appalachian Foreland Basin

During the Middle Pennsylvanian, only sandstone in eastern Oklahoma contains an Appalachian type detrital zircon signature (also the Appalachian type signature of Thomas et al., 2017). Northern Oklahoma contains a Paleo-Proterozoic type signature, which can be traced through paleocurrent and detrital zircon geochronology the Forest City, Illinois and Michigan Basins and to recycled Cambrian-Early Pennsylvanian sandstone of Northern-Central Appalachian origin (Gray and Zietler, 1997; Boothroyd, 2012; Thomas et al., 2017; Kissock et al., 2018). However, by Late Pennsylvanian time the Appalachian type signature is preserved in fluvial sandstone in northern Oklahoma

and in deep basin slope fan deposits in the Anadarko foredeep. This provenance change is driven by both climatic and tectonic changes, some unique to the Anadarko Basin region. High subsidence in the Anadarko Basin during the Early-Middle Pennsylvanian influenced local drainage patterns and sediment recycling, as shown by provenance data in this work and previous studies of Pennsylvanian paleochannels (Fig. 9; Hentz, 1998; Lambert, 2006 and sources therein). Subsidence in the Anadarko Basin decreases during the Middle-Late Pennsylvanian, contributing to a shallower paleoslope across the basin and decreased local sediment transport across Oklahoma (Witt et al., 1971; Mitchell, 2011; Soreghan et al., 2012). Increased sediment load from the Appalachian Foreland Basin, influenced by increased seasonality in the Late Pennsylvanian, shifted CPMB fluvial systems from axial to transverse transport across the North American continent (Cecil et al., 2003; DiMichelle et al., 2010; Thomas et al., 2017; Kissock et al., 2018). This drainage shift enables deposition of southern Appalachian Basin sediments across Oklahoma and into the Anadarko foredeep, overwhelming the low-relief orogen-parallel arches in the midcontinent (McKee and Crosby, 1975; Kissock et al., 2018, and sources therein). Similar provenance changes were also observed in the adjacent Arkoma and Ft. Worth Basins (Figure 13; Sutherland, 1988; Alsalem et al., 2018).

Chapter 6. Conclusion

Petrographic and detrital zircon data from Late Pennsylvanian sandstone in the Anadarko Basin demonstrate a drainage shift from partitioned, local drainage networks partially linked to the Northern Appalachian Basin, to a regional east-to-west drainage network derived from the southern Appalachian Basin. Middle Pennsylvanian sandstone units in the Anadarko Basin exhibit spatially discrete petrographic and detrital zircon populations derived from partitioned drainage networks with restricted influence of Wichita Uplift clastic fans to the southwest. Southern Appalachian-derived sediments, including recycled sandstone from the Arkoma Basin and Cherokee platform, are restricted to eastern and south-central Oklahoma during the Middle Pennsylvanian. Northern Oklahoma was connected to the northern Appalachian Foreland Basin through the Forest City Basin in Kansas. Western Oklahoma received axial sediment transport from the northern Ancestral Rocky Mountains, though a lack of regional provenance data limits the resolution of this drainage pathway. However, Late Pennsylvanian samples reveal that southern Appalachian-derived, recycled sandstone traveled east to west across northern Oklahoma and into the proximal Anadarko Basin. Increased seasonality and sedimentation along the Appalachian Mountains, as well as reduced subsidence rates in the Anadarko Basin are two drivers recognized in this axial to transverse sediment transport shift. This sedimentation pattern is also detected in the Illinois and Forest City Basins north of the Anadarko, as well as in the Grand Canyon to the west. Middle Pennsylvanian through Late Pennsylvanian sandstone in Oklahoma captures this regional sediment transport shift in part due to the Anadarko Basin's high relief during rotational collision of Laurentia with Gondwana during the Late Paleozoic.

Future tests for this transport shift could include both a comprehensive study of sandstone transport in Oklahoma through the Paleozoic, as well as increased resolution of western and northwestern transport of Middle Pennsylvanian sandstone along the Ancestral Rocky Mountains and ultimately into the Anadarko Basin.

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Table 1. Summary data for samples used in this study.

Unit name	Well name	Location Lat., Lon (DMS)	Sample Elevation (m)	Lithologic Description
Late Pennsylvanian Samples				
Gypsy Sandstone[1]				
GY1	N.A.[2]	36.226992 -96.390475	236	Medium-grained, planar and cross-bedded sublitharenite with mudstone intraclasts
Tonkawa Sandstone[3]				
TK1	Farris 1-22	35.495470 -99.413220	-2964	Interbedded mudstone and fine-medium-grained arenite with mud lenses
Granite Wash[4]				
GW1	Bowie 1	35.176820 -99.318380	-1658	Tan, rippled and cross-bedded, calcareous and micaceous subarkose, conglomeratic
Middle Pennsylvanian Samples				
Chelsea Sandstone[5]				
CH1	N.A.	36.263804 -95.571598	186	Fine-grained, massive and cross-bedded tan arenites in 40 cm thick beds
Boggy Sandstone[6,7]				
BG1	N.A.	35.251254 -95.572337	229	Coarse-grained, cross-bedded arenite with mudstone rip-up clasts and tree casts
RF1	Farris 1-16	35.334000 -96.971700	-2964	Fine-grained, massive and cross-bedded brown arenite with rippled tops
RF2	Goodson 1	36.896820 -96.935540	-973	Fine-grained, massive and cross-bedded, glauconitic arenite with iron nodules
RF3-1	Flasch 1-2	35.980060 -97.381320	-1571	Medium-grained, massive arenite interbedded with silt, chaotic bedding
RF3-2			-1705	within some arenite units. Samples are separated by laminated black shale
RF4	Sackett 1	36.443720 -98.562980	-1989	Very fine-grained, massive light gray micaceous arenite, cross-bedded
RF5	Opitz 1-1	35.279830 -98.316360	-3871	Fine-grained arenite with mud drapes, pyrite nodules, fluid escape structures
RF6	Sprowls 1-1	35.578920 -99.657420	-4179	Fine-grained, massive and cross-bedded calcareous arenite with mud rip-up clasts
Granite Wash[3]				
GW2	Hinds Unit 1-36	35.302230 -99.165520	-3487	Gray, cross-bedded subarkose, scours black shale below, conglomeratic
GW3	Sprowls 1-1	35.917085 -100.237637	-2762	Interbedded mudstone and fine-grained, lithic arenite with iron nodules

[1]Doyle and Sweet, 1995, correlation and sample description
[2]N.A. = not applicable (surface sample)
[3]Fitzjarrald, 2016, correlation only
[4]Mitchell, 2011, correlation only
[5]Stanley and Miller, 2005, correlation and outcrop location
[6]Koontz, 1967, correlation and outcrop location
[7]Andrews, 1997, correlation only

Table 2. Compositional and textural categories used for point counting of sandstone in this study.

Abbreviation	Explanation
Qm	Monocrystalline quartz, including undulose extinction
Qp*	Polycrystalline quartz, foliated and nonfoliated
Ch*	Cryptocrystalline quartz (chert)
Ft	Carlsbad twinned feldspar
Fr	Rapakivi feldspar, from Price et al., 1996
Fg	Granophyric feldspar, from Morgan and London, 2008
Fa	Untwinned feldspar, identified by cleavage and grain morphology
Fk	Potassium feldspar

Note: while cement, matrix and other mineral components were also counted, they are not utilized in the clastic framework total. They are, however, listed in Appendix A.
*These categories are plotted on the lithic ternary apex, as described in Dickinson, 1970

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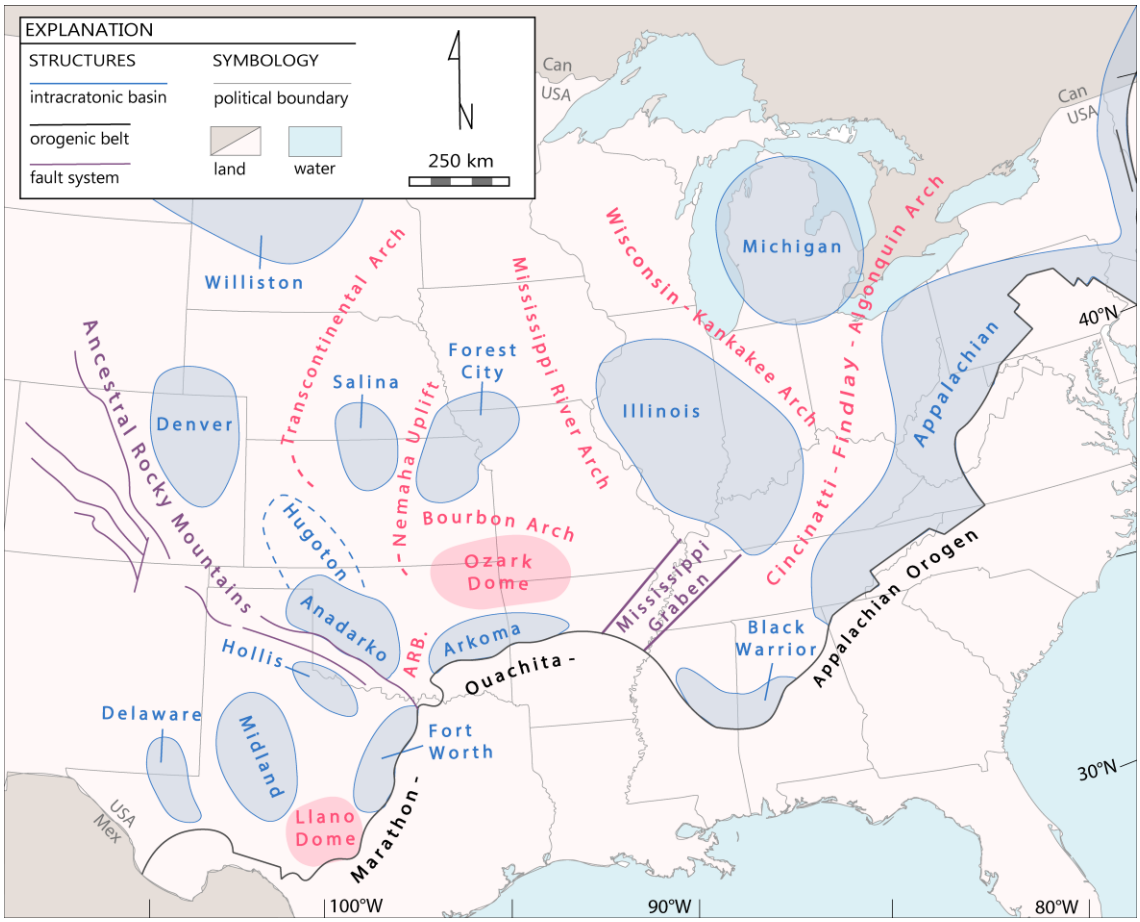

Fig. 1. Middle Pennsylvanian paleogeography of North America. The Marathon-Ouachita-Appalachian Orogen is roughly 10° south of the equator. ARB=Arbuckle Uplift (modified from Thomas, 2011; Kissock et al., 2018; adapted from Hoyt, 1962; McKee and Crosby, 1975; Dickinson and Lawton, 2003).

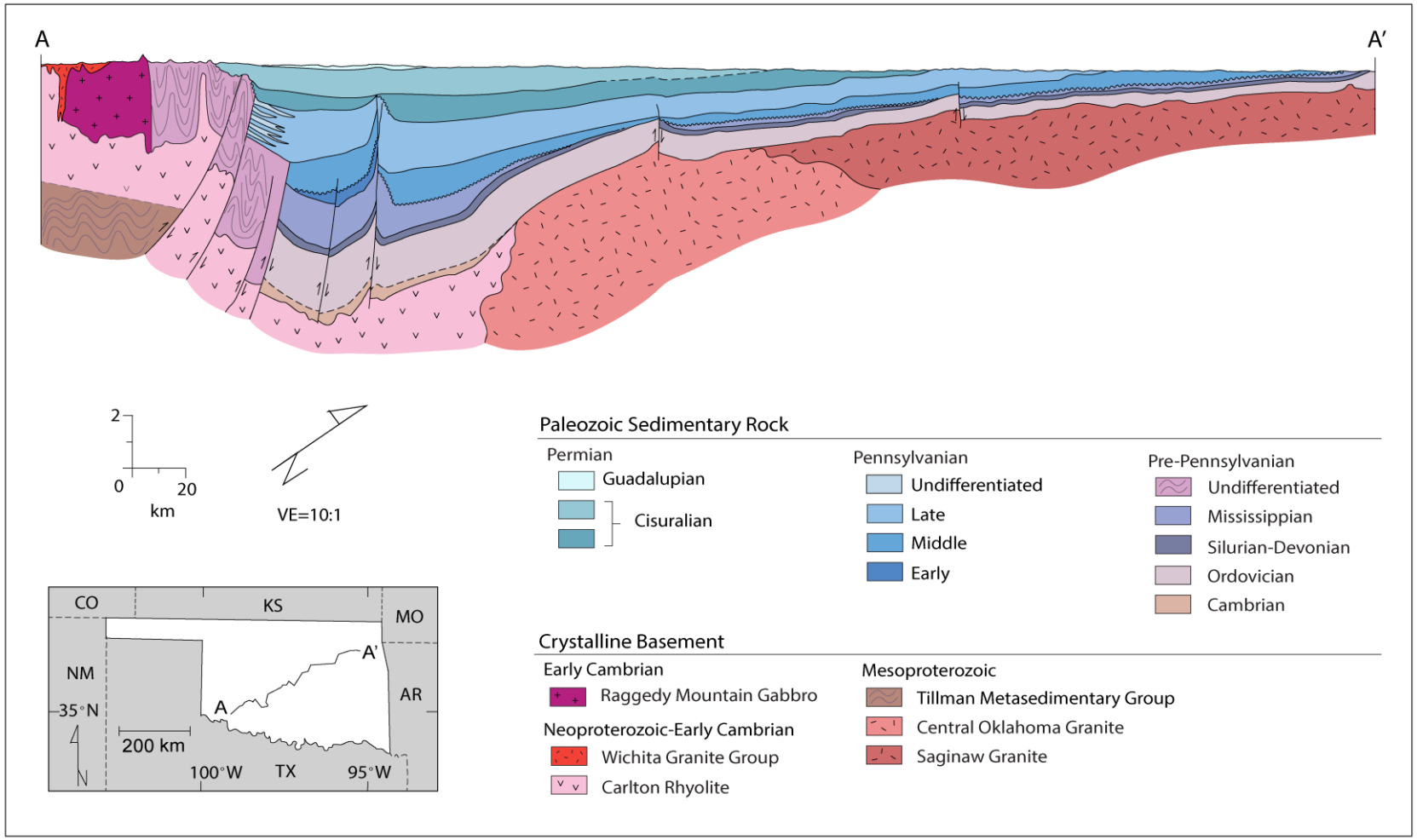

Fig. 2. General cross section of the Anadarko Basin. Note the relative thickness of proximal-distal Pennsylvanian strata (Modified from Witt et al., 1971).

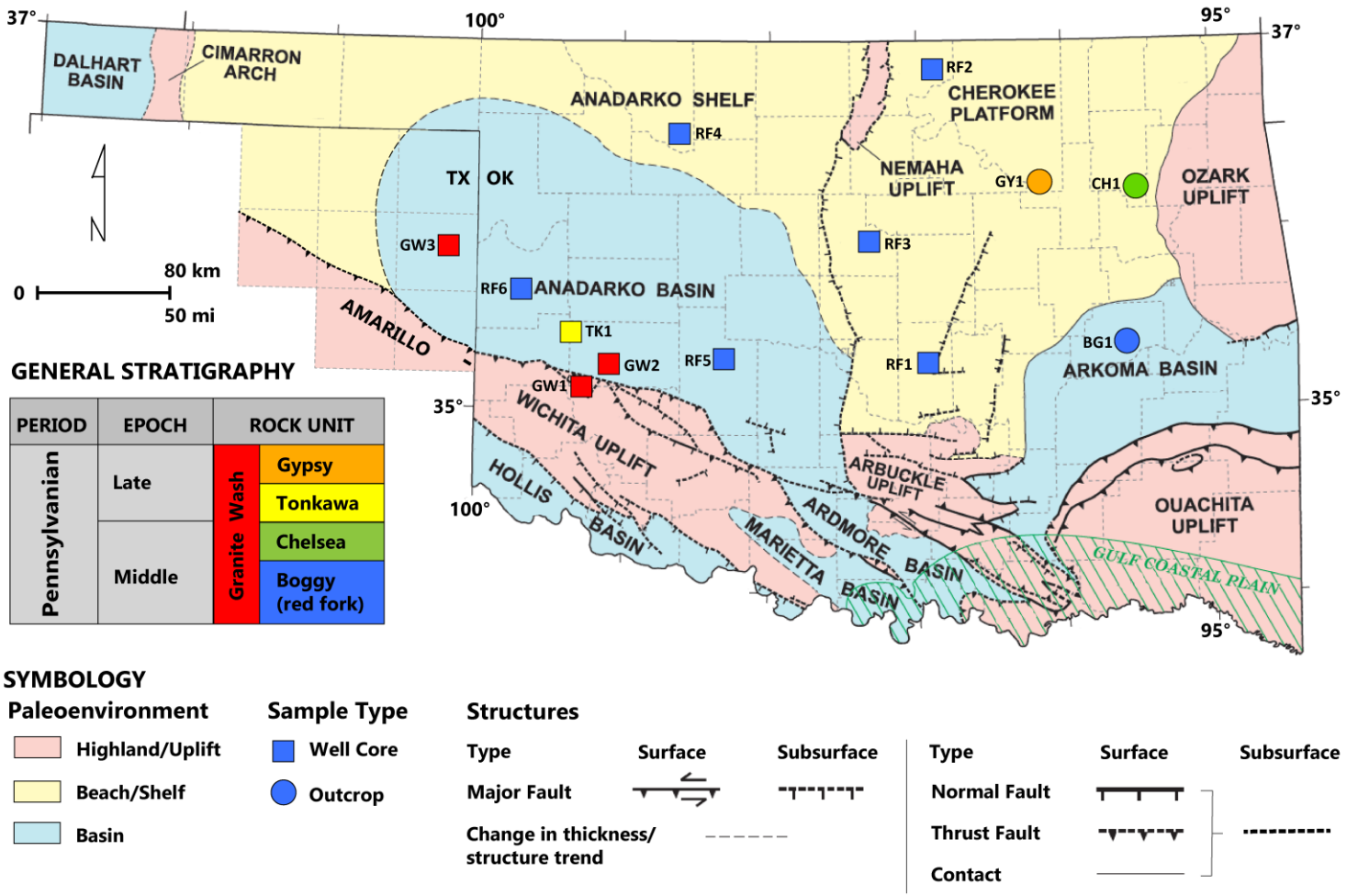

Fig. 3. Oklahoma state map with Pennsylvanian geologic provinces and sample locations for this study (modified from Caldwell, 1991, Johnson, 2008).

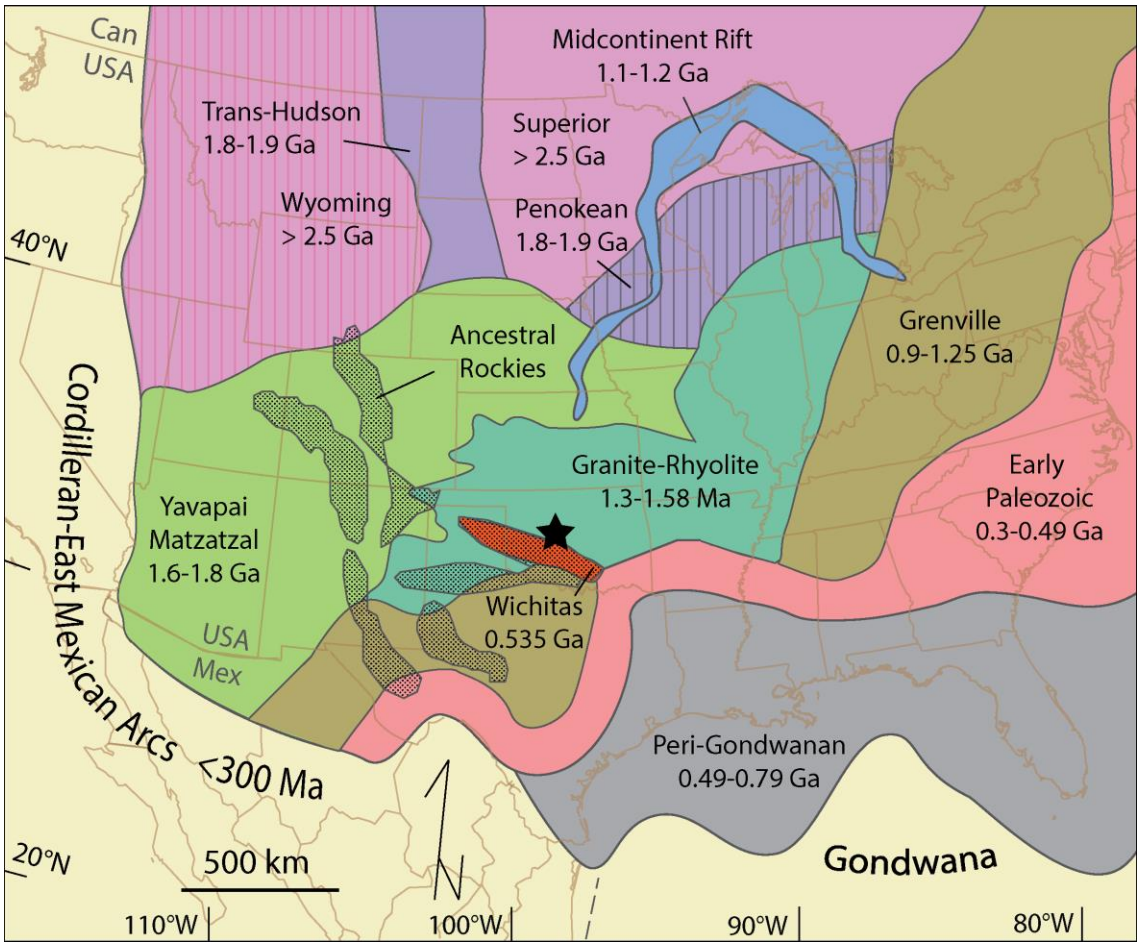

Fig. 4. Basement map of North America, the Anadarko Basin is noted by the black star (modified from Soreghan et al., 2002; Gehrels et al., 2011).

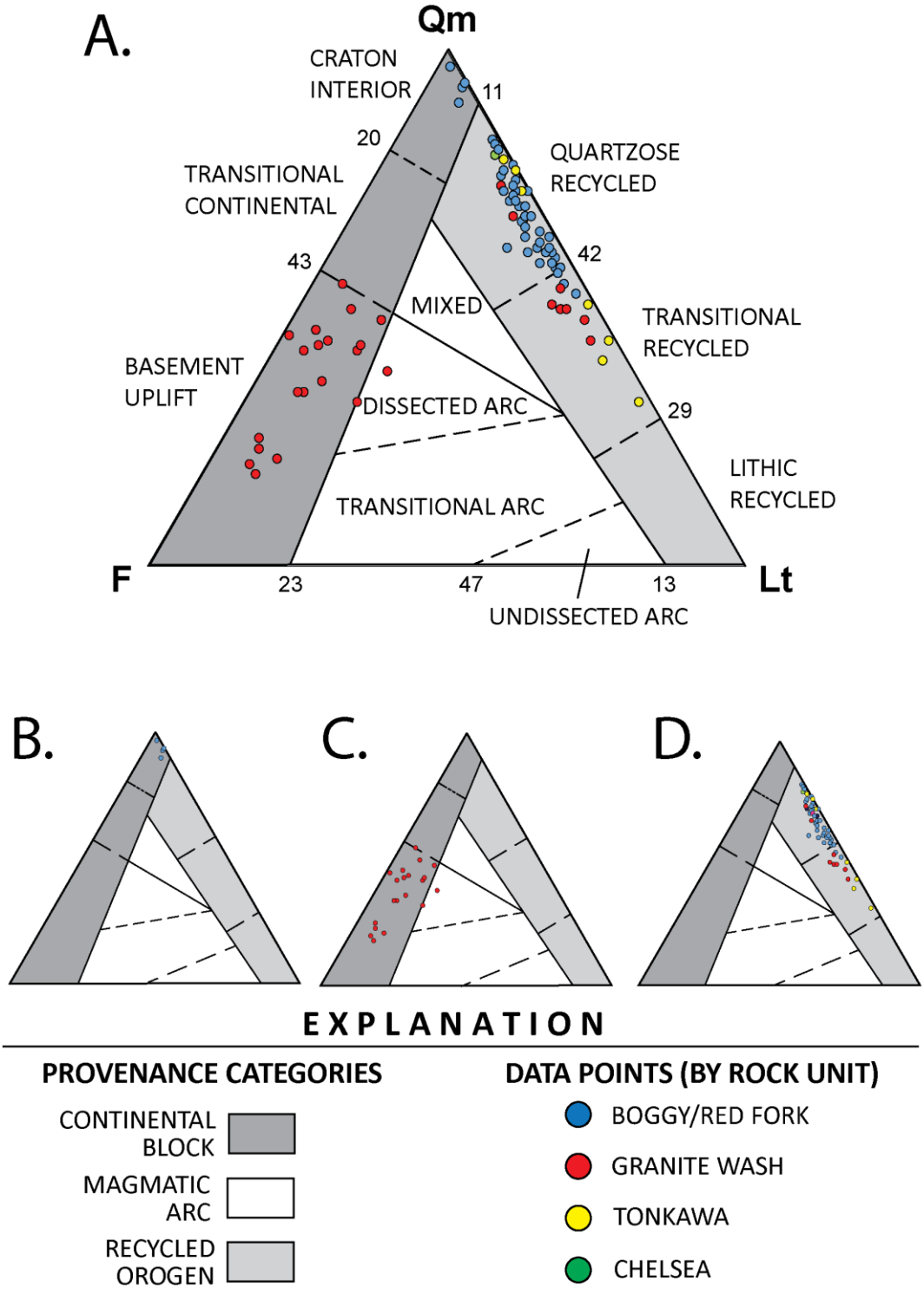

Fig. 5. Ternary plots for thin section petrography of the Middle Pennsylvanian Anadarko Basin. A) All thin sections plotted on one diagram, B) quartzose samples only, C) arkosic samples only, D) quartzolithic samples only (ternary base adapted from Dickinson et al., 1983).

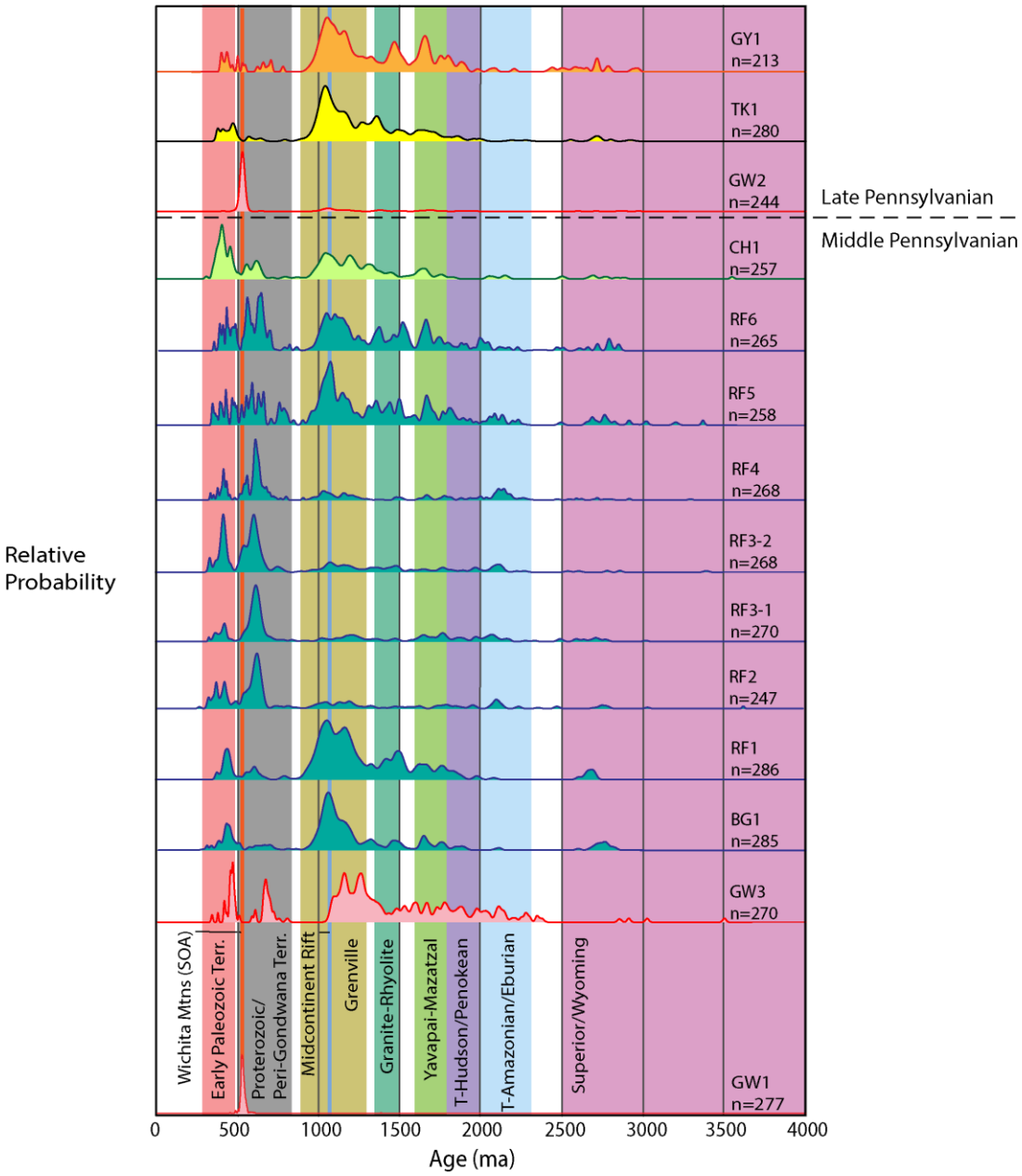

Fig. 6. Relative probability curves for each detrital zircon data set. Note the heterogeneity throughout the Middle Pennsylvanian samples; see locations on fig. 3. Terr.: Terrane, T.: Trans-.

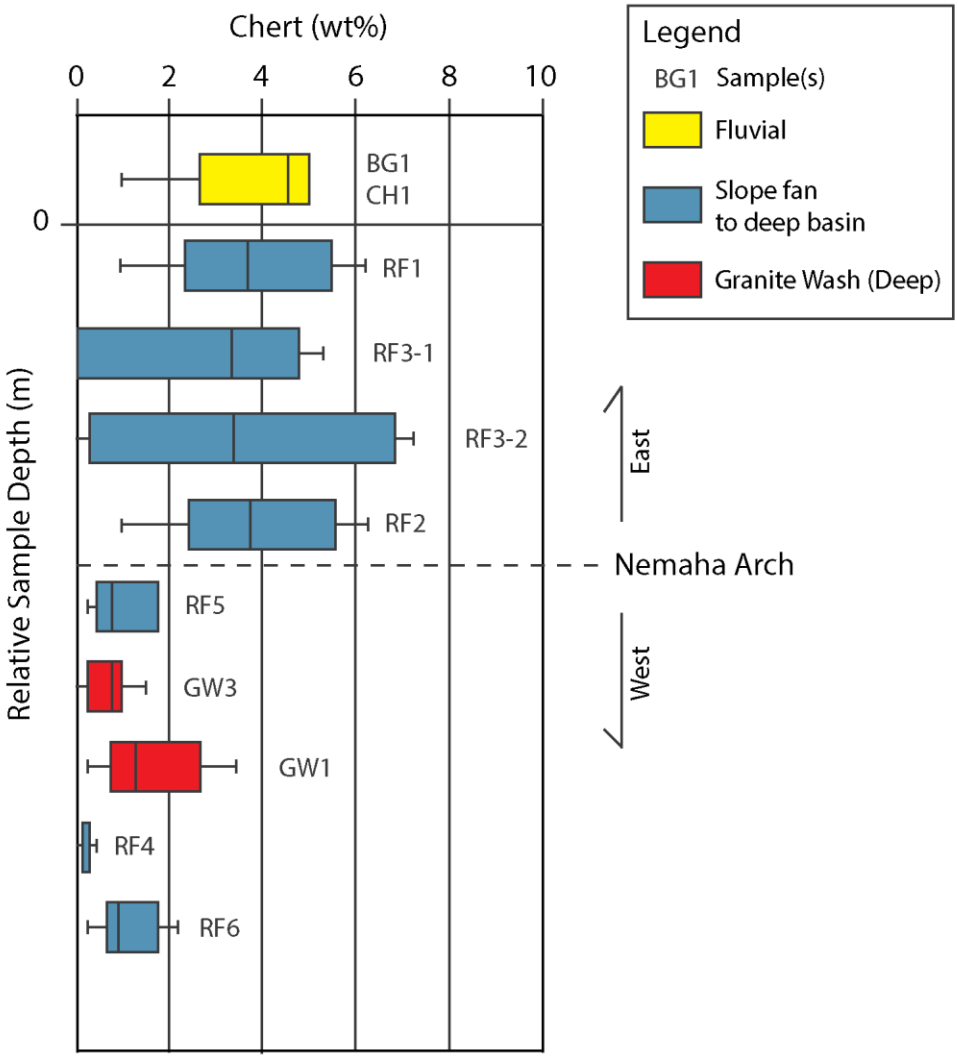

Fig. 7. Box and whisker plot showing changes in chert wt% with relative sample depth and longitude relative to the Nemaha Arch in the Anadarko Basin.

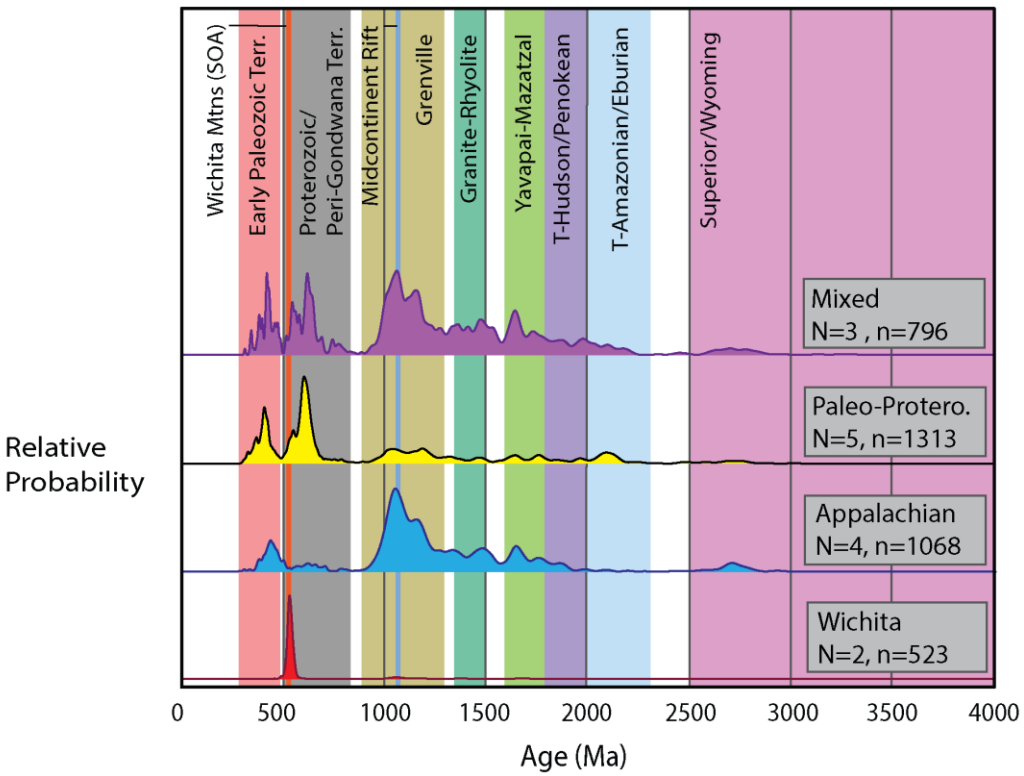

Fig. 8. Relative probability plots representing each of the four types of detrital zircon assemblages in the Anadarko Basin. The sample shown for each type is labeled; Wichita type has been vertically condensed. Paleo-Protero: Paleo-Proterozoic, Terr.: Terrane, T.: Trans.

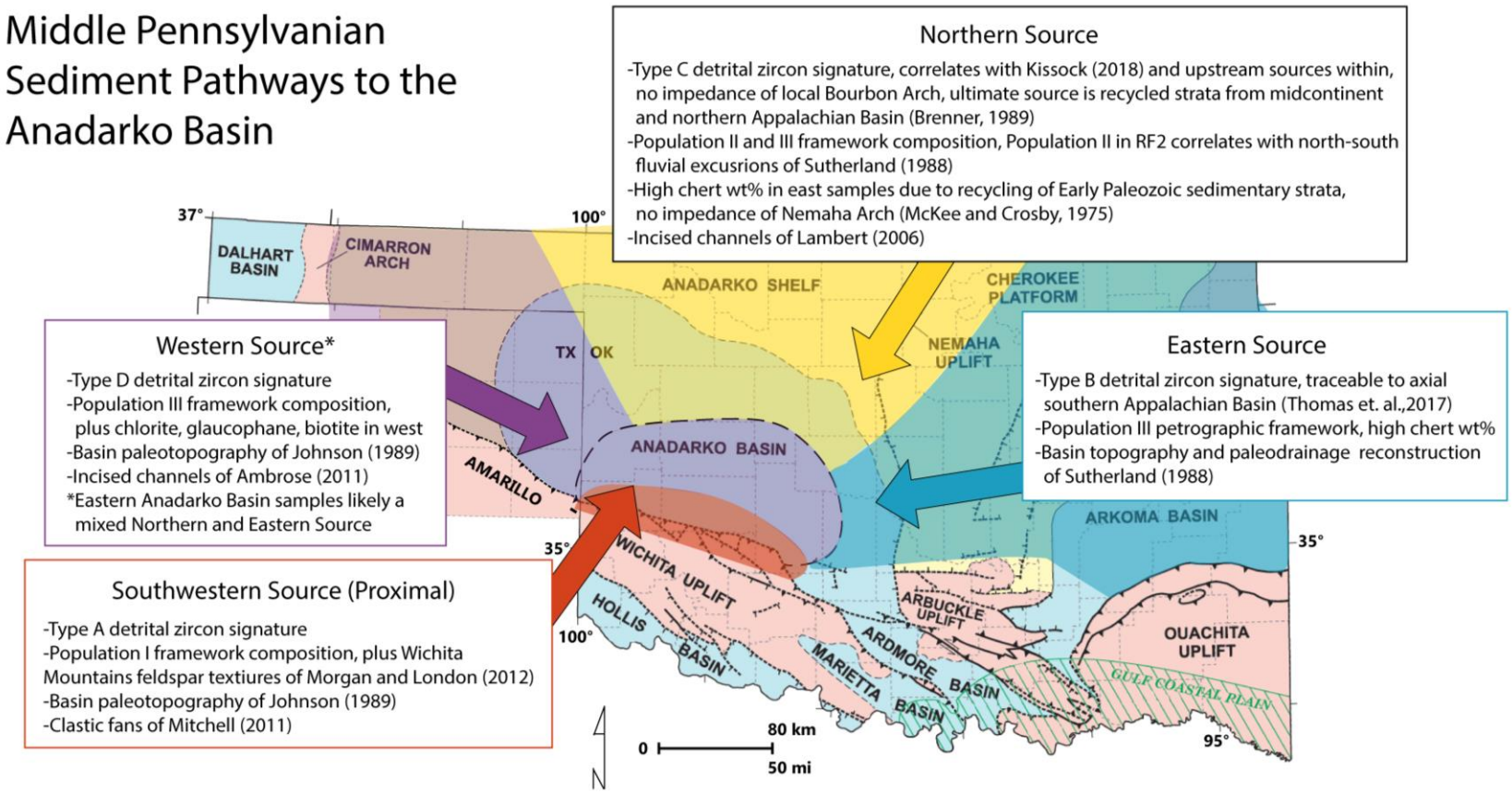

Fig. 9. Proposed sediment pathways for Middle Pennsylvanian sandstone in the Anadarko Basin, based on this work and those cited for each source region. Dashed line around Anadarko Basin represents deep basin margin determined by samples from this study, although this margin fluctuated during the Pennsylvanian (Ambrose, 2011; modified from Caldwell, 1991, Johnson, 2008).

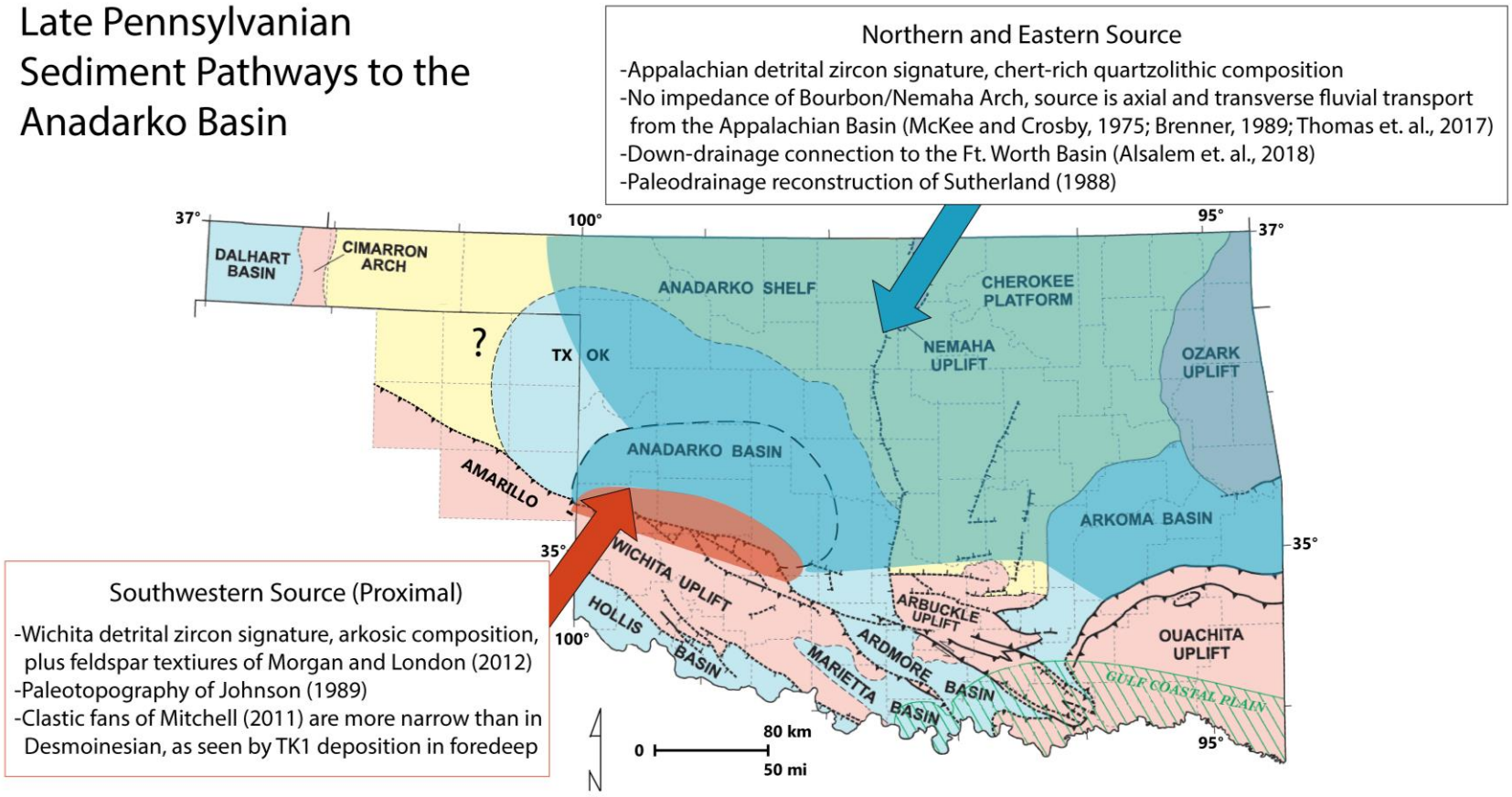

Fig. 10. Proposed sediment pathways for Late Pennsylvanian sandstone in the Anadarko Basin, based on this work and those cited for each source region. (modified from Caldwell, 1991, Johnson, 2008).

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Appendix A. Petrographic Data Tables

Header Legend: Site: core site name, D (m): Depth of sample (in meters), Qm: Monocrystalline quartz, Qp: Polycrystalline Quartz, Ch: Cryptocrystalline Quartz (chert), Ft: Carlsbad Twinned Feldspar, Fg: Granophyric Feldspar, Fr: Rapakivi Feldspar, Fa: Altered/Untwinned Feldspar, Fk: Potassium Feldspar, Mat: Matrix (usually quartz or clay), CO3: Carbonate (any form, commonly cement), Opx: Opaque minerals/Iron oxides, Net: Total points counted per slide, Cls: Clastic points counted per slide (always 400), M: Mica

Site	D (m)	Qm	Qp	Ch	Ft	Fg	Fr	Fa	Fk	Mat	CO3	Opx	Net	Cls	M
RF1	1459.0	332	63	3	1	0	0	1	0	17	18	27	462	400	6
	1461.2	312	82	4	2	0	0	0	0	16	24	3	443	400	2
	1463.6	328	66	4	2	0	0	0	0	25	22	8	455	400	5
	1484.8	298	97	2	2	0	0	1	0	26	21	15	462	400	8
	1486.6	339	50	4	5	0	0	2	0	30	11	59	500	400	24
	1487.9	318	54	22	1	0	0	5	0	39	3	70	512	400	1
	1488.8	306	82	4	7	0	0	1	0	14	8	15	437	400	7
	1490.6	292	100	6	2	0	0	0	0	52	2	23	477	400	12
	1492.0	294	96	4	3	0	0	3	0	41	6	33	480	400	35
	1495.9	289	102	4	4	0	0	1	0	32	5	86	523	400	8
RF2	963.8	174	196	21	4	0	0	5	0	16	57	11	484	400	3
	965.9	190	193	10	6	0	0	1	0	49	0	3	452	400	8
	966.2	274	112	8	4	1	0	1	0	31	4	76	511	400	4
	966.5	278	117	4	1	0	0	0	0	44	8	67	519	400	10
	967.1	297	88	12	3	0	0	0	0	51	26	20	497	400	2
	967.4	298	86	11	4	0	0	1	0	49	28	53	530	400	3
	967.9	279	97	18	6	0	0	0	0	35	2	89	526	400	8
	968.3	315	62	22	1	0	0	0	0	43	1	45	489	400	9
	969.2	300	78	22	0	0	0	0	0	16	1	35	452	400	5
	969.6	290	84	25	1	0	0	0	0	14	3	77	494	400	2
RF3	1569.1	174	196	21	4	0	0	5	0	16	57	11	484	400	3
	1573.9	248	117	0	13	1	0	21	0	49	1	23	473	400	8
	1591.1	278	104	7	2	0	0	9	0	9	57	97	563	400	4
	1705.1	371	23	3	0	0	0	3	0	4	143	2	549	400	0
	1706.5	373	21	3	0	0	0	3	0	4	169	2	575	400	0
	1706.3	375	25	0	0	0	0	0	0	1	191	5	597	400	0
	1575.8	268	99	17	6	0	0	10	0	29	4	35	468	400	6
	1575.5	248	117	0	13	1	0	21	0	49	1	23	473	400	8
	1570.3	304	69	13	8	2	0	4	0	69	18	18	505	400	10
	1703.5	392	6	0	0	0	0	2	0	0	330	4	734	400	0
RF4	3868.8	226	160	1	12	0	0	1	0	15	1	3	419	400	1
	3869.8	246	145	1	5	0	0	3	0	20	12	4	436	400	8

	3870.4	255	140	3	2	0	0	0	0	25	8	2	435	400	4
	3870.7	284	102	1	9	0	0	4	0	11	0	7	418	400	11
	3871.3	279	109	2	6	0	0	4	0	19	4	6	429	400	6
	3871.8	259	132	1	4	0	0	4	0	18	5	3	426	400	5
	3869.5	281	112	1	5	0	0	1	0	9	2	12	423	400	2
	3869.5	271	120	1	7	0	0	1	0	21	5	9	435	400	5
	3869.4	285	102	0	10	0	0	3	0	19	5	4	428	400	2
	3870.2	291	92	0	11	0	0	6	0	42	3	1	446	400	1
RF5	1976.5	246	121	16	13	0	0	4	0	73	49	15	537	400	14
	1977.5	255	130	5	9	0	0	1	0	42	43	11	496	400	6
	1978.2	236	142	3	17	0	0	2	0	20	68	15	503	400	7
	1979.1	291	89	3	16	0	0	1	0	4	274	89	767	400	6
	1979.8	288	98	1	11	0	0	2	0	96	7	15	518	400	9
	1980.1	257	117	7	15	0	0	4	0	51	16	24	491	400	12
	1980.7	297	92	3	6	0	0	2	0	52	11	57	520	400	3
	1981.5	280	111	2	7	0	0	0	0	66	13	22	501	400	3
	1987.7	245	138	7	8	0	0	2	0	29	3	19	451	400	8
	1992.0	262	123	1	13	0	0	1	0	41	21	17	479	400	2
RF6	4178.9	257	126	3	7	0	0	7	0	64	14	29	507	400	11
	4179.1	273	106	7	11	0	0	3	0	45	33	22	500	400	19
	4179.4	293	97	2	6	0	0	2	0	35	33	28	496	400	16
	4180.0	262	111	9	13	0	0	5	0	21	30	23	474	400	6
	4181.4	280	102	3	14	0	0	1	0	25	33	27	485	400	8
	4182.3	291	95	1	12	0	0	1	0	31	25	35	491	400	10
	4184.6	267	111	6	13	0	0	3	0	28	48	28	504	400	7
	4185.4	282	101	3	11	0	0	3	0	13	103	32	548	400	3
	4185.7	270	112	4	12	0	0	2	0	26	36	22	484	400	2
	4186.5	298	77	7	10	0	0	8	0	6	128	16	550	400	3
GW1	2964.4	103	22	1	15	176	0	83	0	13	8	13	434	400	2
	3485.6	91	22	5	14	179	0	89	0	16	4	20	440	400	4
	3484.2	85	43	2	12	169	0	89	0	11	3	7	421	400	2
	3485.1	78	25	1	16	149	0	131	0	6	0	22	428	400	1
	3486.1	174	17	9	10	3	0	187	1	15	2	25	443	400	2
	3489.0	70	31	4	18	135	0	142	0	1	5	35	441	400	0
	3489.4	177	19	12	7	4	0	181	0	1	17	39	457	400	11
	3488.0	220	15	4	12	22	0	127	0	1	30	47	478	400	1
	3486.4	182	9	14	9	40	0	146	0	4	0	66	470	400	2
	3488.4	128	68	8	31	122	0	43	0	7	43	16	466	400	0
GW2	1685.5	204	30	2	10	5	0	149	0	0	52	55	507	400	2
	1692.9	134	37	0	21	0	0	208	0	4	11	184	599	400	15
	1692.9	181	5	0	6	1	0	207	0	0	62	89	551	400	5
	1684.6	135	27	5	52	102	1	78	0	0	717	20	1137	400	7
	1651.7	167	38	22	37	43	0	93	0	0	879	16	1295	400	1

	1659.9	171	29	29	21	83	0	67	0	0	547	74	1021	400	0
	1696.5	153	77	7	27	52	0	84	0	1	456	42	899	400	7
	1700.2	168	19	1	12	91	0	109	0	0	97	21	518	400	0
	1698.3	192	58	2	19	88	0	41	0	0	456	9	865	400	0
	1653.8	147	43	0	33	90	0	87	0	0	1466	3	1869	400	2
GW3	2775.4	297	85	1	16	0	0	1	0	50	96	42	588	400	20
	2771.4	244	128	4	16	0	0	8	0	35	43	15	493	400	13
	2770.9	235	142	2	18	0	0	3	0	41	12	6	459	400	2
	2770.3	190	199	1	10	0	0	0	0	18	7	18	443	400	12
	2769.9	199	172	4	24	0	0	1	0	23	35	10	468	400	4
	2762.1	202	167	4	19	0	0	8	0	69	6	31	506	400	38
	2767.8	176	206	1	16	0	0	1	0	30	32	20	482	400	17
	2764.0	273	109	0	18	0	0	0	0	46	54	56	556	400	19
	2763.7	214	163	6	15	0	0	2	0	63	27	21	511	400	12
	2762.7	199	178	3	17	0	0	3	0	67	5	20	492	400	22
TK1	2964.4	128	253	8	7	4	0	0	0	12	32	14	458	400	25
	2961.0	160	223	1	3	0	0	13	0	6	38	25	469	400	24
	2962.3	322	71	2	2	0	0	3	0	5	51	18	474	400	5
	2962.5	342	56	0	1	0	0	1	0	1	66	10	477	400	2
	2964.0	176	214	3	1	4	0	2	0	18	33	13	464	400	16
	2964.4	128	253	8	7	4	0	0	0	12	32	14	458	400	25
	2966.3	317	79	1	2	0	0	1	0	11	62	23	496	400	8
	2966.5	328	76	0	7	0	0	2	0	22	29	29	493	400	14
	2962.3	322	71	2	2	0	0	3	0	5	51	18	474	400	5
	2971.8	246	145	0	5	0	0	4	0	8	27	18	453	400	1
BG1	220.0	325	66	4	3	0	0	2	0	5	0	92	497	400	2
CH1	185.0	237	143	10	8	0	0	2	0	14	1	50	465	400	17

Appendix B. Detrital Zircon Data Tables

Apparent age (ma) given for each analysis spot in given well core sample. Sample depth and location can be found in Table 1. See methodology for more details. Header Legend: Conc: Concordance, Pb: lead, U: uranium.

RF1

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
376.1	9.2	374.2	8.8	364.0	27.5	376.1	9.2	NA
382.4	12.2	383.5	11.4	391.6	31.4	382.4	12.2	NA
402.9	11.3	411.2	10.6	459.2	27.6	402.9	11.3	87.8
418.3	10.3	431.3	10.0	502.3	28.1	418.3	10.3	83.3
423.5	11.2	424.5	10.6	431.0	30.7	423.5	11.2	98.3
425.3	11.5	432.4	10.5	471.8	22.1	425.3	11.5	90.1
427.0	11.4	432.8	11.9	464.5	42.5	427.0	11.4	91.9
427.8	12.9	430.7	11.9	446.8	29.8	427.8	12.9	95.8
429.8	10.6	427.9	9.9	418.8	27.4	429.8	10.6	102.6
435.0	11.7	434.6	10.6	433.2	24.8	435.0	11.7	100.4
441.1	8.8	439.6	8.9	432.8	31.4	441.1	8.8	101.9
441.7	11.5	444.1	10.8	457.0	29.2	441.7	11.5	96.6
442.9	13.6	445.5	12.2	460.2	24.9	442.9	13.6	96.2
452.0	10.9	449.8	10.5	439.8	32.6	452.0	10.9	102.8
452.3	14.3	463.1	13.0	518.4	26.6	452.3	14.3	87.2
453.4	10.0	454.9	9.4	463.2	26.1	453.4	10.0	97.9
453.5	11.7	464.9	10.8	522.6	24.7	453.5	11.7	86.8
457.9	12.6	458.1	11.5	460.4	28.9	457.9	12.6	99.5
460.9	10.5	474.3	9.6	540.7	19.1	460.9	10.5	85.2
472.5	11.1	484.6	10.9	543.4	31.5	472.5	11.1	87.0
489.3	13.7	488.9	12.5	488.3	30.8	489.3	13.7	100.2
519.9	13.4	532.4	12.2	587.5	26.7	519.9	13.4	88.5
552.7	11.3	557.4	11.1	577.5	31.3	552.7	11.3	95.7
563.9	14.3	577.9	13.0	634.3	28.0	563.9	14.3	88.9
574.3	13.8	584.3	12.3	624.2	24.3	574.3	13.8	92.0
590.2	14.1	597.2	13.1	624.8	31.7	590.2	14.1	94.5
605.9	13.9	604.2	12.5	598.4	28.7	605.9	13.9	101.3
611.6	14.3	621.2	12.7	657.4	26.2	611.6	14.3	93.0
613.4	15.5	631.2	20.3	696.4	72.5	613.4	15.5	88.1
615.3	16.4	622.4	15.1	649.2	35.5	615.3	16.4	94.8
619.2	18.7	628.1	15.7	661.4	23.7	619.2	18.7	93.6
644.4	12.8	646.2	11.9	653.6	29.3	644.4	12.8	98.6
671.6	17.1	674.1	14.3	683.5	24.5	671.6	17.1	98.3

792.1	21.6	797.2	17.2	812.4	24.2	792.1	21.6	97.5
796.2	20.7	824.8	17.5	903.5	29.2	796.2	20.7	88.1
881.3	34.6	880.6	26.6	879.9	34.7	881.3	34.6	100.1
916.7	20.3	917.9	15.5	921.5	19.8	921.5	19.8	99.5
903.5	16.3	914.0	13.3	940.6	21.7	940.6	21.7	96.0
931.6	28.2	934.0	20.9	940.7	22.2	940.7	22.2	99.0
917.4	20.2	924.4	16.0	942.2	23.7	942.2	23.7	97.4
900.2	17.7	916.7	14.5	957.4	23.5	957.4	23.5	94.0
957.3	21.8	958.1	16.9	960.7	24.6	960.7	24.6	99.6
962.2	24.9	961.7	19.1	961.6	26.4	961.6	26.4	100.1
1021.4	23.7	1007.1	17.3	977.0	20.8	977.0	20.8	104.5
1017.8	26.7	1005.0	19.7	978.0	24.6	978.0	24.6	104.1
921.4	25.1	938.0	19.1	978.0	22.9	978.0	22.9	94.2
1019.1	25.9	1007.0	19.5	981.8	26.5	981.8	26.5	103.8
989.4	22.0	987.3	16.7	983.7	22.8	983.7	22.8	100.6
945.9	22.6	958.8	17.3	989.5	22.4	989.5	22.4	95.6
1039.4	27.3	1025.5	20.3	997.0	27.4	997.0	27.4	104.3
1023.3	24.3	1015.5	18.2	999.4	24.5	999.4	24.5	102.4
1009.1	21.8	1006.4	17.1	1001.4	26.4	1001.4	26.4	100.8
990.1	24.8	994.1	18.9	1003.9	25.9	1003.9	25.9	98.6
1024.2	24.7	1018.5	18.1	1007.1	21.2	1007.1	21.2	101.7
1009.5	22.6	1009.4	16.5	1010.0	17.6	1010.0	17.6	99.9
1019.0	26.0	1016.0	19.6	1010.3	26.5	1010.3	26.5	100.9
978.3	28.4	988.1	21.6	1011.0	27.7	1011.0	27.7	96.8
1016.5	21.3	1015.6	16.0	1014.5	21.2	1014.5	21.2	100.2
1051.0	33.1	1039.2	24.0	1015.5	28.0	1015.5	28.0	103.5
932.6	26.6	957.5	20.5	1016.1	25.3	1016.1	25.3	91.8
1032.6	31.3	1027.7	23.5	1018.2	32.0	1018.2	32.0	101.4
977.0	21.0	990.0	16.7	1019.8	25.9	1019.8	25.9	95.8
1002.5	23.6	1008.1	17.7	1021.2	21.6	1021.2	21.6	98.2
1019.1	23.8	1019.5	18.4	1021.4	27.1	1021.4	27.1	99.8
1013.2	27.4	1016.2	21.2	1023.6	31.0	1023.6	31.0	99.0
976.4	23.7	991.0	17.9	1024.2	21.9	1024.2	21.9	95.3
997.5	24.0	1005.9	18.2	1025.1	23.6	1025.1	23.6	97.3
1018.9	22.7	1022.1	17.2	1029.9	23.0	1029.9	23.0	98.9
984.9	23.6	1000.0	17.9	1034.1	22.3	1034.1	22.3	95.2
1013.7	26.0	1020.0	19.2	1034.3	22.2	1034.3	22.2	98.0
1019.9	21.7	1024.6	17.0	1035.6	26.2	1035.6	26.2	98.5
1004.6	22.7	1014.4	17.4	1036.3	24.0	1036.3	24.0	96.9
1021.4	20.0	1026.3	16.1	1037.5	26.5	1037.5	26.5	98.4
1035.4	23.1	1035.9	17.5	1038.0	23.8	1038.0	23.8	99.7
1042.3	29.5	1041.3	21.3	1040.0	22.5	1040.0	22.5	100.2
1068.8	22.4	1059.4	16.8	1041.0	23.1	1041.0	23.1	102.7

1037.5	28.9	1038.9	21.2	1042.7	25.1	1042.7	25.1	99.5
1058.0	20.2	1053.3	15.6	1044.3	24.1	1044.3	24.1	101.3
987.8	29.6	1005.8	22.1	1046.2	25.4	1046.2	25.4	94.4
994.5	22.8	1010.6	17.7	1046.4	25.1	1046.4	25.1	95.0
898.6	25.2	942.6	20.4	1047.9	28.8	1047.9	28.8	85.8
1070.9	30.0	1063.5	22.7	1049.3	32.5	1049.3	32.5	102.1
1024.7	22.8	1033.1	17.3	1051.9	23.3	1051.9	23.3	97.4
995.0	23.8	1013.3	18.5	1054.0	26.1	1054.0	26.1	94.4
1053.6	29.3	1054.4	21.2	1057.0	23.6	1057.0	23.6	99.7
1038.7	22.1	1044.4	16.7	1057.2	22.3	1057.2	22.3	98.3
982.9	28.2	1006.8	22.0	1059.9	30.8	1059.9	30.8	92.7
1007.1	23.8	1023.7	18.0	1060.3	23.0	1060.3	23.0	95.0
1049.4	23.3	1053.5	17.3	1062.8	21.4	1062.8	21.4	98.7
1020.3	23.3	1033.8	17.6	1063.5	23.0	1063.5	23.0	95.9
1028.4	28.2	1040.4	20.7	1066.6	23.5	1066.6	23.5	96.4
983.9	30.3	1009.7	22.3	1066.8	21.5	1066.8	21.5	92.2
1054.7	28.0	1058.4	20.3	1066.9	22.7	1066.9	22.7	98.9
1115.8	30.7	1099.1	21.1	1067.2	18.8	1067.2	18.8	104.6
1000.5	26.3	1021.9	19.7	1068.8	23.2	1068.8	23.2	93.6
1075.1	22.3	1072.9	16.6	1069.3	21.9	1069.3	21.9	100.5
1022.9	22.6	1037.7	17.2	1070.0	22.8	1070.0	22.8	95.6
1048.5	21.6	1055.9	16.2	1072.0	21.1	1072.0	21.1	97.8
998.6	25.6	1021.6	20.2	1072.2	29.4	1072.2	29.4	93.1
1094.6	28.6	1088.1	20.1	1075.8	20.1	1075.8	20.1	101.7
989.6	26.0	1017.6	20.2	1079.3	27.2	1079.3	27.2	91.7
1032.4	30.3	1047.9	21.6	1081.4	18.9	1081.4	18.9	95.5
1063.7	27.1	1069.5	19.5	1082.4	20.1	1082.4	20.1	98.3
1045.0	21.7	1057.5	17.3	1084.1	27.5	1084.1	27.5	96.4
1049.6	31.3	1061.0	21.9	1085.4	15.8	1085.4	15.8	96.7
1070.0	25.9	1074.9	19.0	1085.9	22.8	1085.9	22.8	98.5
1137.4	22.3	1120.8	16.8	1089.6	24.9	1089.6	24.9	104.4
1084.5	20.7	1087.1	15.8	1093.2	23.1	1093.2	23.1	99.2
1037.9	26.0	1056.2	19.3	1095.1	22.3	1095.1	22.3	94.8
1018.0	30.9	1043.0	22.7	1096.7	23.3	1096.7	23.3	92.8
1062.9	26.5	1076.4	19.7	1104.8	24.5	1104.8	24.5	96.2
1110.3	35.5	1108.5	24.8	1105.7	23.9	1105.7	23.9	100.4
1070.5	24.5	1082.1	17.8	1106.5	19.3	1106.5	19.3	96.8
1074.0	23.3	1085.2	17.0	1108.4	20.1	1108.4	20.1	96.9
997.6	19.8	1033.4	17.6	1110.9	33.4	1110.9	33.4	89.8
1142.2	29.1	1132.6	20.7	1115.2	24.1	1115.2	24.1	102.4
1161.2	23.9	1146.3	17.0	1119.2	20.5	1119.2	20.5	103.8
1133.2	31.7	1128.3	21.9	1119.7	20.3	1119.7	20.3	101.2
1072.7	28.9	1089.0	20.6	1122.7	19.7	1122.7	19.7	95.6

1067.4	19.6	1086.8	15.6	1126.6	24.4	1126.6	24.4	94.7
1109.0	26.4	1115.4	19.3	1128.7	23.6	1128.7	23.6	98.3
1063.9	21.7	1085.2	16.3	1129.2	20.8	1129.2	20.8	94.2
1108.2	28.3	1115.1	20.5	1129.5	23.6	1129.5	23.6	98.1
1063.6	24.6	1085.2	18.2	1129.6	21.4	1129.6	21.4	94.2
1156.2	30.5	1147.4	21.7	1131.5	25.7	1131.5	25.7	102.2
1145.2	24.5	1141.1	17.9	1134.1	23.1	1134.1	23.1	101.0
1112.4	30.4	1120.4	22.5	1136.9	28.8	1136.9	28.8	97.8
1009.4	22.5	1050.5	18.5	1137.8	29.5	1137.8	29.5	88.7
1085.9	26.9	1103.6	19.8	1139.5	23.6	1139.5	23.6	95.3
1100.1	24.1	1113.9	18.6	1141.9	27.5	1141.9	27.5	96.3
1034.8	28.9	1070.1	22.1	1143.6	28.4	1143.6	28.4	90.5
1151.3	32.0	1148.3	22.3	1143.6	22.2	1143.6	22.2	100.7
1135.9	28.3	1139.2	19.8	1146.2	20.0	1146.2	20.0	99.1
1054.9	21.5	1085.0	17.4	1146.7	28.0	1146.7	28.0	92.0
1155.9	21.8	1152.9	16.1	1148.1	21.5	1148.1	21.5	100.7
1152.3	21.1	1152.0	16.0	1152.4	23.7	1152.4	23.7	100.0
1156.1	33.9	1155.4	23.7	1155.0	24.7	1155.0	24.7	100.1
1174.7	26.2	1168.1	18.9	1156.8	24.3	1156.8	24.3	101.5
1146.4	30.2	1150.7	21.5	1159.7	24.3	1159.7	24.3	98.9
1128.2	22.6	1139.8	16.2	1162.8	18.1	1162.8	18.1	97.0
1179.1	29.6	1173.2	21.3	1163.3	26.4	1163.3	26.4	101.4
1125.9	23.5	1138.7	17.5	1164.1	22.7	1164.1	22.7	96.7
1159.6	31.6	1161.2	21.4	1165.0	16.8	1165.0	16.8	99.5
1169.4	26.2	1167.8	19.0	1165.7	24.4	1165.7	24.4	100.3
1173.8	35.1	1171.6	24.8	1168.5	28.0	1168.5	28.0	100.5
1144.1	28.4	1153.2	20.7	1171.1	25.5	1171.1	25.5	97.7
1147.7	24.9	1155.8	17.5	1171.9	18.4	1171.9	18.4	97.9
965.0	20.4	1030.4	17.1	1172.9	26.2	1172.9	26.2	82.3
1166.2	29.3	1169.3	20.4	1176.0	20.6	1176.0	20.6	99.2
1127.4	26.1	1144.1	19.1	1177.0	23.1	1177.0	23.1	95.8
1162.8	26.4	1167.8	18.5	1178.1	19.4	1178.1	19.4	98.7
1158.3	33.4	1166.4	23.4	1182.3	23.7	1182.3	23.7	98.0
1160.3	32.8	1168.2	22.9	1183.9	22.8	1183.9	22.8	98.0
1155.4	34.2	1165.9	23.5	1186.3	19.6	1186.3	19.6	97.4
1167.1	26.4	1173.8	18.5	1187.1	19.3	1187.1	19.3	98.3
1155.2	29.5	1166.4	20.7	1188.2	20.9	1188.2	20.9	97.2
1169.1	25.4	1177.2	20.0	1193.0	31.9	1193.0	31.9	98.0
1133.0	30.3	1154.4	22.9	1195.6	30.9	1195.6	30.9	94.8
1225.9	26.5	1215.1	19.0	1196.9	24.7	1196.9	24.7	102.4
1132.2	23.6	1154.3	18.3	1197.0	26.7	1197.0	26.7	94.6
1160.7	27.2	1173.5	19.9	1197.9	25.0	1197.9	25.0	96.9
1170.1	27.9	1180.2	20.0	1199.5	23.3	1199.5	23.3	97.6

1132.2	23.9	1157.6	18.3	1206.3	26.1	1206.3	26.1	93.9
1168.6	33.8	1182.6	23.3	1209.1	21.0	1209.1	21.0	96.7
1181.7	31.1	1191.5	21.6	1210.1	21.3	1210.1	21.3	97.7
1186.9	32.8	1195.5	22.5	1212.0	20.1	1212.0	20.1	97.9
1171.2	33.5	1185.4	24.3	1212.4	29.5	1212.4	29.5	96.6
1148.3	38.8	1170.6	27.6	1212.9	28.5	1212.9	28.5	94.7
1139.4	29.9	1165.7	21.6	1215.9	24.2	1215.9	24.2	93.7
1237.6	30.6	1229.9	21.5	1217.3	25.9	1217.3	25.9	101.7
1152.5	22.1	1175.0	16.1	1217.6	19.4	1217.6	19.4	94.7
1074.3	32.2	1123.2	25.6	1219.8	37.4	1219.8	37.4	88.1
1178.0	22.9	1193.6	18.5	1222.7	30.5	1222.7	30.5	96.3
1161.0	27.7	1182.9	19.9	1224.1	22.6	1224.1	22.6	94.8
1155.6	24.6	1183.1	17.8	1234.4	20.3	1234.4	20.3	93.6
1016.4	30.1	1090.4	23.6	1242.2	29.4	1242.2	29.4	81.8
1217.1	23.2	1228.9	16.2	1250.5	17.3	1250.5	17.3	97.3
1136.9	26.6	1176.9	20.1	1252.2	26.2	1252.2	26.2	90.8
1179.9	30.0	1206.2	21.7	1254.5	25.3	1254.5	25.3	94.1
1268.5	30.4	1263.8	21.1	1256.7	24.4	1256.7	24.4	100.9
1298.4	26.9	1283.1	18.0	1258.5	18.0	1258.5	18.0	103.2
1251.0	31.3	1258.9	22.1	1273.2	26.3	1273.2	26.3	98.3
1155.3	22.6	1199.7	17.5	1281.3	24.6	1281.3	24.6	90.2
1236.0	27.1	1253.6	19.6	1284.7	24.4	1284.7	24.4	96.2
1205.3	33.5	1234.2	23.1	1285.8	21.0	1285.8	21.0	93.7
1033.9	22.7	1119.0	25.9	1289.1	58.2	1289.1	58.2	80.2
1217.9	29.7	1243.9	21.6	1290.1	26.7	1290.1	26.7	94.4
1266.0	30.1	1275.8	20.5	1293.1	19.9	1293.1	19.9	97.9
1311.6	22.9	1316.5	16.4	1325.2	21.6	1325.2	21.6	99.0
1314.9	33.2	1319.2	21.8	1327.2	18.2	1327.2	18.2	99.1
1312.2	30.0	1318.0	19.8	1328.2	17.7	1328.2	17.7	98.8
1310.0	32.4	1317.1	22.4	1329.4	25.3	1329.4	25.3	98.5
1348.2	33.3	1342.3	21.9	1333.7	20.6	1333.7	20.6	101.1
1289.2	35.2	1309.3	23.3	1343.2	18.9	1343.2	18.9	96.0
1381.2	30.7	1366.9	20.4	1345.5	21.8	1345.5	21.8	102.7
1300.8	28.9	1326.1	20.0	1368.2	21.8	1368.2	21.8	95.1
1336.9	27.1	1354.5	20.6	1383.2	30.5	1383.2	30.5	96.6
1357.9	35.1	1368.1	22.8	1385.0	18.8	1385.0	18.8	98.0
1283.5	40.8	1322.3	27.7	1386.5	25.8	1386.5	25.8	92.6
1130.5	26.6	1222.4	30.1	1389.2	64.7	1389.2	64.7	81.4
1380.7	23.4	1386.3	16.7	1395.8	21.9	1395.8	21.9	98.9
1382.0	26.1	1392.3	17.4	1408.9	17.7	1408.9	17.7	98.1
1317.7	25.6	1354.0	19.5	1412.5	28.2	1412.5	28.2	93.3
1404.5	35.3	1407.9	23.0	1413.9	21.6	1413.9	21.6	99.3
1395.0	29.4	1402.5	19.4	1414.7	19.3	1414.7	19.3	98.6

1378.9	33.5	1395.0	21.8	1420.6	19.0	1420.6	19.0	97.1
1438.2	39.7	1431.8	25.5	1423.1	24.0	1423.1	24.0	101.1
1423.5	33.2	1425.7	21.5	1429.9	20.1	1429.9	20.1	99.5
1387.8	41.2	1404.6	27.3	1431.0	26.7	1431.0	26.7	97.0
1386.6	28.2	1404.9	18.5	1433.6	17.2	1433.6	17.2	96.7
1458.9	35.3	1451.6	22.8	1441.8	22.8	1441.8	22.8	101.2
1464.1	26.5	1456.8	17.1	1447.0	17.0	1447.0	17.0	101.2
1461.2	36.5	1459.9	23.3	1458.9	21.5	1458.9	21.5	100.2
1483.2	37.0	1474.0	23.7	1461.6	23.4	1461.6	23.4	101.5
1492.7	29.8	1485.4	19.3	1475.7	19.9	1475.7	19.9	101.1
1458.3	32.7	1465.2	20.1	1475.9	12.4	1475.9	12.4	98.8
1439.9	42.8	1455.0	27.5	1478.0	24.2	1478.0	24.2	97.4
1465.3	37.2	1470.9	23.8	1479.7	22.0	1479.7	22.0	99.0
1477.5	37.8	1478.1	24.0	1479.9	21.4	1479.9	21.4	99.8
1465.3	36.3	1472.3	23.5	1483.3	23.1	1483.3	23.1	98.8
1426.1	32.0	1449.5	21.3	1484.9	22.3	1484.9	22.3	96.0
1447.2	29.5	1465.5	19.0	1492.8	16.9	1492.8	16.9	96.9
1471.6	34.9	1481.9	22.1	1497.6	18.7	1497.6	18.7	98.3
1443.7	31.3	1466.2	20.9	1499.8	22.2	1499.8	22.2	96.3
1455.7	35.0	1476.1	23.3	1506.5	24.8	1506.5	24.8	96.6
1449.3	33.0	1472.8	22.0	1507.6	23.7	1507.6	23.7	96.1
1476.7	37.4	1491.8	24.6	1514.2	25.8	1514.2	25.8	97.5
1437.7	31.7	1468.5	21.2	1514.2	22.3	1514.2	22.3	94.9
1471.8	42.0	1488.9	27.1	1514.3	25.5	1514.3	25.5	97.2
1488.3	29.2	1499.6	19.3	1516.5	21.1	1516.5	21.1	98.1
1574.0	37.3	1549.5	23.3	1517.0	23.1	1517.0	23.1	103.8
1532.9	31.8	1526.7	20.5	1518.8	21.5	1518.8	21.5	100.9
1523.0	37.6	1521.5	23.8	1520.3	22.6	1520.3	22.6	100.2
1476.4	26.6	1496.8	18.9	1526.6	24.9	1526.6	24.9	96.7
1467.5	27.9	1492.4	19.1	1528.7	22.7	1528.7	22.7	96.0
1572.3	30.0	1554.0	19.5	1530.1	22.3	1530.1	22.3	102.8
1474.0	36.2	1502.3	24.2	1543.3	26.2	1543.3	26.2	95.5
1347.6	36.6	1435.6	25.1	1569.2	23.9	1569.2	23.9	85.9
1547.6	36.9	1565.0	23.9	1589.3	24.9	1589.3	24.9	97.4
1582.9	39.3	1587.4	24.1	1594.1	20.1	1594.1	20.1	99.3
1614.7	42.8	1611.4	25.4	1607.7	17.8	1607.7	17.8	100.4
1535.8	30.9	1566.8	21.0	1609.7	24.9	1609.7	24.9	95.4
1625.9	41.7	1624.1	25.8	1622.6	24.7	1622.6	24.7	100.2
1607.7	45.1	1614.2	27.2	1623.6	20.8	1623.6	20.8	99.0
1547.2	34.2	1581.3	21.0	1628.0	15.4	1628.0	15.4	95.0
1686.3	42.3	1662.2	26.0	1632.7	26.0	1632.7	26.0	103.3
1641.8	32.7	1640.8	20.9	1640.2	22.9	1640.2	22.9	100.1
1424.8	41.1	1515.8	27.9	1646.2	27.6	1646.2	27.6	86.5

1586.6	43.2	1615.5	26.6	1654.2	21.8	1654.2	21.8	95.9
1612.8	36.9	1632.9	23.6	1659.6	24.6	1659.6	24.6	97.2
1617.8	37.4	1636.8	23.0	1662.0	19.9	1662.0	19.9	97.3
1640.9	35.2	1654.2	21.7	1672.0	20.0	1672.0	20.0	98.1
1667.2	35.4	1671.9	22.0	1678.7	21.8	1678.7	21.8	99.3
1652.7	36.5	1664.3	22.2	1679.6	19.1	1679.6	19.1	98.4
1575.7	34.5	1625.0	23.2	1690.2	26.7	1690.2	26.7	93.2
1507.5	41.2	1585.3	26.1	1691.1	20.4	1691.1	20.4	89.1
1725.7	36.6	1716.2	21.9	1705.3	19.6	1705.3	19.6	101.2
1731.8	38.9	1729.5	23.8	1727.4	23.5	1727.4	23.5	100.3
1710.6	35.9	1724.3	21.1	1741.8	15.9	1741.8	15.9	98.2
1729.2	43.7	1736.0	25.7	1745.0	20.5	1745.0	20.5	99.1
1614.2	35.2	1673.3	24.9	1748.9	32.5	1748.9	32.5	92.3
1742.6	32.5	1750.6	19.5	1761.0	17.5	1761.0	17.5	99.0
1685.8	44.9	1721.1	26.9	1765.0	21.4	1765.0	21.4	95.5
1770.3	38.0	1768.1	21.9	1766.2	16.6	1766.2	16.6	100.2
1727.3	42.3	1751.1	24.9	1780.5	19.3	1780.5	19.3	97.0
1770.8	44.5	1775.4	25.6	1781.5	18.5	1781.5	18.5	99.4
1743.0	33.1	1763.9	20.5	1789.4	21.0	1789.4	21.0	97.4
1762.2	44.8	1779.9	26.6	1801.6	23.1	1801.6	23.1	97.8
1769.3	37.7	1790.7	23.4	1816.5	24.2	1816.5	24.2	97.4
1766.0	35.9	1793.7	22.0	1826.7	21.6	1826.7	21.6	96.7
1857.0	38.5	1846.1	22.7	1834.6	21.8	1834.6	21.8	101.2
1840.9	41.0	1840.6	23.3	1841.1	17.8	1841.1	17.8	100.0
1821.9	38.2	1840.3	23.0	1861.8	22.1	1861.8	22.1	97.9
1828.4	57.7	1851.1	33.2	1877.5	25.5	1877.5	25.5	97.4
1871.3	47.1	1877.3	26.8	1884.8	21.2	1884.8	21.2	99.3
1935.0	48.2	1957.4	27.6	1982.0	23.7	1982.0	23.7	97.6
1945.9	39.7	1963.3	22.3	1982.4	17.8	1982.4	17.8	98.2
1967.2	57.3	2025.4	31.5	2085.9	21.4	2085.9	21.4	94.3
2655.2	48.5	2628.9	22.8	2609.4	16.0	2609.4	16.0	101.8
2517.7	54.5	2590.6	26.8	2648.8	19.4	2648.8	19.4	95.1
2647.2	62.4	2655.5	28.8	2662.5	17.2	2662.5	17.2	99.4
2685.2	46.6	2675.6	21.7	2669.1	14.8	2669.1	14.8	100.6
2550.2	49.3	2620.1	24.6	2675.2	19.6	2675.2	19.6	95.3
2716.1	67.2	2701.4	30.2	2691.1	16.7	2691.1	16.7	100.9
2567.7	61.6	2644.4	29.4	2704.3	19.0	2704.3	19.0	94.9
2699.8	46.4	2702.5	22.3	2705.1	17.6	2705.1	17.6	99.8
2682.2	53.1	2695.3	24.5	2705.8	15.7	2705.8	15.7	99.1

RF2

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
260.3	10.7	354.3	13.2	1028.4	26.8	260.3	10.7	NA
307.9	8.3	315.0	8.7	368.8	36.9	307.9	8.3	NA
313.4	7.1	317.1	7.2	345.8	27.3	313.4	7.1	NA
317.4	7.6	399.9	9.1	910.7	25.4	317.4	7.6	NA
318.8	7.0	321.4	6.8	341.8	22.6	318.8	7.0	NA
320.5	8.6	321.7	8.4	331.3	29.0	320.5	8.6	NA
332.7	8.8	325.8	9.4	278.0	45.0	332.7	8.8	NA
337.3	9.4	399.3	10.1	776.7	21.6	337.3	9.4	NA
341.4	7.6	357.1	8.7	461.1	39.4	341.4	7.6	NA
343.8	8.5	443.7	11.3	1002.5	37.7	343.8	8.5	NA
348.2	10.5	349.4	10.0	358.2	32.0	348.2	10.5	NA
356.8	10.1	336.3	16.9	197.8	119.1	356.8	10.1	NA
357.6	11.4	354.0	11.9	331.5	50.6	357.6	11.4	NA
360.9	7.0	382.0	7.8	512.9	31.8	360.9	7.0	NA
362.1	8.2	383.9	10.0	518.5	45.9	362.1	8.2	NA
362.8	7.2	355.5	6.9	309.3	24.2	362.8	7.2	NA
363.3	9.0	368.0	8.9	398.7	29.4	363.3	9.0	NA
364.3	8.4	367.8	7.9	390.8	22.0	364.3	8.4	NA
364.6	11.8	368.2	10.9	392.2	25.3	364.6	11.8	NA
365.7	8.5	366.9	8.0	375.5	23.4	365.7	8.5	NA
366.1	6.7	363.4	6.6	347.3	23.7	366.1	6.7	NA
367.8	9.2	366.3	8.9	357.4	29.3	367.8	9.2	NA
369.1	6.5	353.2	12.2	250.6	84.2	369.1	6.5	NA
379.3	8.7	377.4	8.1	367.1	24.1	379.3	8.7	NA
384.6	8.8	421.7	8.8	630.8	21.2	384.6	8.8	NA
388.3	11.8	402.4	11.6	485.1	34.4	388.3	11.8	NA
391.2	9.2	382.8	9.0	333.2	32.8	391.2	9.2	NA
397.5	8.5	401.1	8.1	422.9	23.0	397.5	8.5	NA
400.2	6.8	403.9	6.4	425.5	17.1	400.2	6.8	94.1
402.4	11.4	404.9	10.4	420.4	23.3	402.4	11.4	95.7
407.2	10.0	414.7	9.6	457.5	26.6	407.2	10.0	89.0
408.2	8.7	414.1	8.3	448.1	22.6	408.2	8.7	91.1
411.7	7.5	416.8	7.2	446.0	21.3	411.7	7.5	92.3
412.4	8.8	415.8	8.5	435.6	26.0	412.4	8.8	94.7
412.6	11.4	414.1	10.3	423.5	22.7	412.6	11.4	97.4
414.2	7.4	417.8	7.3	438.8	23.8	414.2	7.4	94.4
415.8	9.4	420.5	9.2	447.3	28.4	415.8	9.4	92.9
417.6	6.6	415.4	6.5	404.0	22.5	417.6	6.6	103.4
418.5	7.4	420.6	7.2	432.7	22.5	418.5	7.4	96.7

419.6	11.2	418.5	10.3	413.1	25.5	419.6	11.2	101.6
419.7	9.9	419.2	9.2	417.7	23.7	419.7	9.9	100.5
423.4	9.2	425.9	8.6	440.6	22.9	423.4	9.2	96.1
424.5	10.0	422.0	9.1	409.3	22.4	424.5	10.0	103.7
429.8	7.8	427.8	7.7	417.9	26.0	429.8	7.8	102.8
434.1	9.6	430.7	8.9	413.6	24.3	434.1	9.6	105.0
438.3	12.3	443.1	11.4	469.1	27.7	438.3	12.3	93.4
442.2	8.9	442.1	8.6	442.3	26.5	442.2	8.9	100.0
464.8	24.9	470.8	22.9	501.3	54.1	464.8	24.9	92.7
465.9	9.7	469.5	9.1	488.1	23.9	465.9	9.7	95.5
469.4	12.4	473.7	11.2	495.5	24.7	469.4	12.4	94.7
485.7	10.3	484.5	9.3	479.9	22.4	485.7	10.3	101.2
488.2	12.2	503.2	11.8	573.1	31.4	488.2	12.2	85.2
488.7	10.3	488.1	9.6	486.2	25.4	488.7	10.3	100.5
497.6	12.4	511.5	11.8	575.0	29.8	497.6	12.4	86.5
521.4	12.0	546.1	14.8	651.2	55.1	521.4	12.0	80.1
527.2	13.9	529.5	12.2	540.4	23.5	527.2	13.9	97.5
527.9	12.4	539.5	11.8	589.9	30.0	527.9	12.4	89.5
530.2	11.4	538.4	10.2	574.3	21.1	530.2	11.4	92.3
531.9	11.5	533.0	10.1	538.5	20.0	531.9	11.5	98.8
534.4	12.1	534.0	10.8	533.1	23.6	534.4	12.1	100.3
535.6	10.1	539.6	9.2	557.3	21.8	535.6	10.1	96.1
538.4	12.5	534.9	11.7	521.0	31.4	538.4	12.5	103.3
546.5	14.2	547.9	12.3	554.5	23.2	546.5	14.2	98.6
546.5	12.9	560.4	11.5	618.2	22.6	546.5	12.9	88.4
550.2	13.7	551.5	12.2	557.6	26.2	550.2	13.7	98.7
552.9	10.0	558.4	8.9	582.0	19.2	552.9	10.0	95.0
557.2	11.7	565.1	11.3	598.3	30.4	557.2	11.7	93.1
558.3	11.5	565.4	10.1	594.8	19.5	558.3	11.5	93.9
558.4	18.1	556.0	15.9	546.7	33.2	558.4	18.1	102.1
563.2	10.4	590.0	10.7	695.4	30.5	563.2	10.4	81.0
563.3	11.4	571.4	10.7	604.4	26.7	563.3	11.4	93.2
564.1	11.5	573.9	10.6	613.8	24.7	564.1	11.5	91.9
565.8	12.6	571.7	11.1	596.1	22.3	565.8	12.6	94.9
576.6	13.6	591.4	12.3	649.5	25.6	576.6	13.6	88.8
577.5	11.0	578.7	9.7	584.4	20.9	577.5	11.0	98.8
579.2	14.4	581.9	12.4	593.4	22.0	579.2	14.4	97.6
580.5	10.2	607.7	10.3	711.4	28.0	580.5	10.2	81.6
585.0	15.2	593.1	13.4	624.9	27.3	585.0	15.2	93.6
587.4	12.7	594.7	11.2	623.2	21.9	587.4	12.7	94.3
587.6	12.9	608.7	11.7	689.1	23.9	587.6	12.9	85.3
590.0	11.4	590.1	10.5	591.7	26.1	590.0	11.4	99.7
590.1	15.4	592.8	15.5	604.0	45.9	590.1	15.4	97.7

592.1	14.4	603.9	12.1	649.7	17.0	592.1	14.4	91.1
593.6	16.1	589.3	15.1	574.0	39.8	593.6	16.1	103.4
594.3	13.0	597.7	11.2	611.5	20.2	594.3	13.0	97.2
595.1	16.1	597.7	13.5	608.7	20.5	595.1	16.1	97.8
595.7	14.7	607.8	12.7	654.2	21.5	595.7	14.7	91.1
596.9	15.4	596.7	13.1	596.9	23.0	596.9	15.4	100.0
598.9	13.6	595.7	12.2	584.5	27.6	598.9	13.6	102.5
599.4	13.2	602.2	11.4	613.9	21.6	599.4	13.2	97.6
599.4	13.4	597.2	11.8	589.8	24.6	599.4	13.4	101.6
600.4	11.9	602.8	10.7	612.7	23.9	600.4	11.9	98.0
601.1	13.3	596.2	11.6	578.8	23.6	601.1	13.3	103.9
601.9	16.1	606.7	13.9	625.5	25.2	601.9	16.1	96.2
602.8	12.8	602.2	11.2	600.7	23.2	602.8	12.8	100.3
605.0	15.9	606.2	13.5	611.6	23.5	605.0	15.9	98.9
605.7	16.4	608.6	13.9	620.6	24.2	605.7	16.4	97.6
608.9	11.1	607.0	10.1	600.9	24.4	608.9	11.1	101.3
609.4	13.3	612.2	11.6	623.5	23.3	609.4	13.3	97.7
610.3	15.6	626.1	13.6	684.3	24.3	610.3	15.6	89.2
610.9	18.7	613.4	15.6	623.5	23.5	610.9	18.7	98.0
611.0	13.7	608.2	11.9	599.0	24.3	611.0	13.7	102.0
611.0	12.5	615.4	10.6	632.7	17.2	611.0	12.5	96.6
611.1	13.8	607.9	11.6	596.8	19.9	611.1	13.8	102.4
612.0	13.2	631.9	11.6	704.6	20.7	612.0	13.2	86.9
612.3	17.7	627.2	15.7	682.6	30.8	612.3	17.7	89.7
612.7	14.9	608.6	12.7	594.2	23.1	612.7	14.9	103.1
613.1	14.9	616.4	12.9	629.2	24.0	613.1	14.9	97.5
613.3	16.3	625.1	14.3	669.1	27.2	613.3	16.3	91.7
613.7	14.5	617.7	12.0	633.3	17.3	613.7	14.5	96.9
613.7	12.7	610.9	10.5	601.3	16.7	613.7	12.7	102.1
616.5	12.2	616.7	11.1	618.6	25.9	616.5	12.2	99.6
616.8	13.7	613.6	11.9	602.7	24.6	616.8	13.7	102.3
616.8	15.2	616.0	13.2	614.0	26.5	616.8	15.2	100.5
617.7	12.6	613.6	10.9	599.4	21.7	617.7	12.6	103.1
618.0	16.4	619.9	14.1	628.0	26.0	618.0	16.4	98.4
618.2	17.4	612.0	14.6	590.0	24.6	618.2	17.4	104.8
618.8	11.7	624.3	11.4	645.2	30.5	618.8	11.7	95.9
620.1	13.9	624.3	12.3	640.6	25.9	620.1	13.9	96.8
623.3	11.2	625.6	10.4	635.1	25.1	623.3	11.2	98.1
623.4	15.4	632.8	13.8	667.6	29.8	623.4	15.4	93.4
623.6	17.7	619.3	15.2	604.8	29.9	623.6	17.7	103.1
625.1	14.1	619.6	12.4	600.5	26.9	625.1	14.1	104.1
625.3	13.1	631.6	12.0	655.0	27.8	625.3	13.1	95.5
625.7	11.0	619.3	9.6	596.6	21.0	625.7	11.0	104.9

626.2	14.5	636.6	12.7	674.4	23.8	626.2	14.5	92.9
628.1	9.4	623.2	9.1	606.4	25.6	628.1	9.4	103.6
629.4	14.0	629.9	12.4	632.8	26.3	629.4	14.0	99.5
629.7	13.0	629.1	11.5	627.8	24.9	629.7	13.0	100.3
630.3	16.3	633.2	14.0	644.5	25.0	630.3	16.3	97.8
631.2	15.2	626.4	13.4	610.0	29.0	631.2	15.2	103.5
632.1	12.8	641.3	10.9	674.9	18.8	632.1	12.8	93.7
636.9	15.0	643.4	12.6	667.5	20.2	636.9	15.0	95.4
637.1	16.5	632.3	14.1	616.0	26.7	637.1	16.5	103.4
637.9	16.1	631.2	13.9	608.1	28.2	637.9	16.1	104.9
640.3	15.5	636.6	13.4	624.3	26.8	640.3	15.5	102.6
640.8	14.8	647.5	12.9	672.0	24.7	640.8	14.8	95.4
640.8	16.0	650.6	13.7	685.7	24.4	640.8	16.0	93.5
641.0	14.5	644.0	13.4	655.6	32.2	641.0	14.5	97.8
642.1	13.6	657.4	11.8	711.4	20.8	642.1	13.6	90.2
643.4	14.3	645.3	12.5	653.1	25.2	643.4	14.3	98.5
644.5	14.1	650.1	12.2	670.2	23.6	644.5	14.1	96.2
644.7	11.7	650.0	10.5	669.4	23.2	644.7	11.7	96.3
646.7	13.1	651.0	11.9	667.0	27.3	646.7	13.1	96.9
647.5	15.7	651.7	14.1	667.1	30.9	647.5	15.7	97.1
650.6	13.1	651.2	11.7	654.5	25.6	650.6	13.1	99.4
656.3	13.6	667.9	11.7	708.0	21.6	656.3	13.6	92.7
661.5	16.4	664.1	13.8	673.8	23.6	661.5	16.4	98.2
665.8	16.7	664.8	14.6	662.6	29.6	665.8	16.7	100.5
724.9	18.6	761.8	15.7	872.5	23.0	724.9	18.6	83.1
727.3	14.4	728.8	11.9	734.4	19.4	727.3	14.4	99.0
759.0	18.3	753.6	14.6	738.6	20.8	759.0	18.3	102.8
763.7	17.1	759.8	13.9	749.4	22.7	763.7	17.1	101.9
803.2	17.8	809.5	14.1	827.9	18.7	803.2	17.8	97.0
808.4	13.9	847.4	11.9	951.8	19.8	808.4	13.9	84.9
832.7	19.6	838.9	15.4	856.2	20.2	832.7	19.6	97.3
866.6	19.8	884.9	15.3	931.7	18.2	866.6	19.8	93.0
941.9	17.3	941.6	13.7	941.9	21.7	941.9	21.7	100.0
883.0	25.8	908.9	19.8	973.2	20.6	973.2	20.6	90.7
977.8	23.5	977.5	18.2	977.7	26.6	977.7	26.6	100.0
917.1	27.6	936.3	21.8	982.8	30.5	982.8	30.5	93.3
953.1	16.2	964.7	13.0	991.9	20.6	991.9	20.6	96.1
818.2	17.0	869.4	14.1	1003.0	19.5	1003.0	19.5	81.6
1030.6	26.3	1025.3	19.2	1015.0	22.5	1015.0	22.5	101.5
1023.6	24.2	1022.0	18.2	1019.6	23.8	1019.6	23.8	100.4
986.1	28.5	1000.4	20.8	1032.9	20.4	1032.9	20.4	95.5
1055.7	22.4	1048.9	16.4	1035.5	19.8	1035.5	19.8	101.9
1007.8	19.8	1017.2	15.0	1038.2	19.6	1038.2	19.6	97.1

1043.4	18.5	1046.2	13.5	1053.0	15.6	1053.0	15.6	99.1
1061.7	22.4	1059.5	16.5	1055.8	21.0	1055.8	21.0	100.6
1021.8	23.6	1034.0	17.6	1060.7	21.3	1060.7	21.3	96.3
981.0	30.9	1009.4	23.6	1072.5	29.0	1072.5	29.0	91.5
1009.0	23.2	1034.6	17.8	1089.8	23.4	1089.8	23.4	92.6
1087.6	26.1	1096.8	19.1	1116.0	23.3	1116.0	23.3	97.4
1032.5	18.1	1060.9	14.1	1120.8	20.2	1120.8	20.2	92.1
1128.1	20.0	1125.5	14.5	1121.3	18.1	1121.3	18.1	100.6
1057.9	25.4	1078.7	18.9	1121.9	22.6	1121.9	22.6	94.3
1143.8	24.0	1138.4	17.3	1128.9	21.2	1128.9	21.2	101.3
1125.3	25.8	1130.3	18.4	1140.8	20.2	1140.8	20.2	98.6
1045.7	22.1	1078.5	16.9	1146.1	21.9	1146.1	21.9	91.2
1147.6	20.5	1148.6	15.2	1151.4	20.8	1151.4	20.8	99.7
1141.9	25.1	1155.1	18.3	1180.8	22.3	1180.8	22.3	96.7
955.8	22.6	1027.2	17.2	1183.2	15.5	1183.2	15.5	80.8
1185.1	22.8	1185.8	16.4	1187.9	20.5	1187.9	20.5	99.8
1205.9	27.0	1199.3	19.0	1188.3	22.6	1188.3	22.6	101.5
1144.4	22.6	1160.1	16.4	1190.5	19.7	1190.5	19.7	96.1
1145.9	21.6	1162.5	16.4	1194.3	23.3	1194.3	23.3	95.9
1083.3	33.7	1121.7	24.6	1197.5	25.9	1197.5	25.9	90.5
1200.8	25.7	1204.8	18.2	1212.8	21.4	1212.8	21.4	99.0
1210.6	33.0	1216.6	23.4	1228.3	27.4	1228.3	27.4	98.6
1214.7	27.9	1222.0	19.6	1235.8	22.4	1235.8	22.4	98.3
1235.3	27.4	1245.7	18.5	1264.5	16.3	1264.5	16.3	97.7
1272.4	29.5	1282.2	19.9	1299.5	18.6	1299.5	18.6	97.9
1312.1	30.4	1314.9	20.1	1320.3	18.3	1320.3	18.3	99.4
1253.7	32.8	1278.9	23.3	1322.3	27.4	1322.3	27.4	94.8
1350.1	31.2	1344.7	20.3	1336.8	17.9	1336.8	17.9	101.0
1375.5	32.1	1384.4	21.0	1398.8	19.3	1398.8	19.3	98.3
1488.4	28.3	1474.4	18.4	1455.2	19.4	1455.2	19.4	102.3
1504.5	28.1	1494.4	18.7	1480.9	21.8	1480.9	21.8	101.6
1442.7	29.0	1459.0	19.8	1483.7	23.2	1483.7	23.2	97.2
1551.2	31.8	1538.4	19.7	1521.8	17.3	1521.8	17.3	101.9
1524.8	28.0	1540.9	18.6	1563.8	21.3	1563.8	21.3	97.5
1562.8	30.1	1563.2	19.2	1564.4	19.6	1564.4	19.6	99.9
1612.4	32.1	1609.7	19.9	1606.9	18.7	1606.9	18.7	100.3
1615.4	35.4	1618.2	22.2	1622.7	21.8	1622.7	21.8	99.5
1624.9	36.0	1627.4	21.6	1631.3	16.7	1631.3	16.7	99.6
1621.1	36.0	1663.6	22.0	1718.5	17.4	1718.5	17.4	94.3
1709.9	35.8	1717.4	21.6	1727.3	19.5	1727.3	19.5	99.0
1764.4	37.7	1754.7	22.2	1744.0	19.4	1744.0	19.4	101.2
1676.7	42.0	1714.7	25.0	1762.1	18.6	1762.1	18.6	95.2
1743.9	35.9	1759.0	21.9	1777.8	21.0	1777.8	21.0	98.1

1811.6	36.6	1797.1	21.5	1781.1	19.7	1781.1	19.7	101.7
1682.1	26.4	1732.9	16.1	1795.5	13.9	1795.5	13.9	93.7
1823.9	29.5	1817.1	18.8	1810.1	22.3	1810.1	22.3	100.8
1822.0	41.1	1823.4	23.8	1825.7	19.9	1825.7	19.9	99.8
1676.7	58.1	1755.5	34.2	1851.3	20.1	1851.3	20.1	90.6
1776.6	30.9	1814.3	18.8	1858.6	18.1	1858.6	18.1	95.6
1821.3	30.5	1854.4	18.6	1892.5	18.5	1892.5	18.5	96.2
1873.3	45.6	1907.9	26.0	1946.4	20.0	1946.4	20.0	96.2
1773.0	39.4	1854.4	23.7	1947.6	20.0	1947.6	20.0	91.0
1887.5	38.7	1918.7	22.0	1953.4	17.1	1953.4	17.1	96.6
1609.0	29.1	1771.7	19.6	1970.1	20.2	1970.1	20.2	81.7
2029.3	29.0	2042.6	16.4	2056.8	14.9	2056.8	14.9	98.7
1831.9	36.3	1949.6	21.3	2077.7	16.4	2077.7	16.4	88.2
1988.7	46.3	2032.7	25.6	2078.4	18.8	2078.4	18.8	95.7
1948.8	32.3	2015.0	18.7	2084.3	16.3	2084.3	16.3	93.5
1944.8	45.2	2018.0	24.5	2094.4	13.1	2094.4	13.1	92.9
1871.0	42.2	1980.7	23.7	2098.1	14.0	2098.1	14.0	89.2
2027.2	28.1	2064.2	16.2	2102.2	15.3	2102.2	15.3	96.4
2083.8	37.5	2093.1	20.7	2103.0	17.5	2103.0	17.5	99.1
2149.7	49.6	2130.6	26.1	2113.0	19.5	2113.0	19.5	101.7
1924.3	44.3	2016.7	24.8	2113.5	16.6	2113.5	16.6	91.0
2125.3	38.9	2121.4	21.7	2118.3	20.2	2118.3	20.2	100.3
1982.1	42.1	2056.6	23.3	2133.0	16.5	2133.0	16.5	92.9
2081.1	47.6	2108.1	25.6	2135.4	18.6	2135.4	18.6	97.5
2216.9	44.1	2224.2	23.2	2231.6	18.4	2231.6	18.4	99.3
1877.5	54.3	2055.1	30.5	2239.1	15.8	2239.1	15.8	83.8
1958.0	53.9	2159.5	30.1	2357.7	18.0	2357.7	18.0	83.0
2455.6	42.0	2464.5	20.6	2472.5	14.1	2472.5	14.1	99.3
2072.9	43.0	2282.4	24.5	2476.5	19.9	2476.5	19.9	83.7
2621.2	49.5	2668.5	24.1	2705.2	18.4	2705.2	18.4	96.9
2736.8	51.1	2741.1	23.4	2745.0	15.3	2745.0	15.3	99.7
2665.9	49.5	2712.8	23.9	2748.7	18.4	2748.7	18.4	97.0
2680.7	43.2	2727.4	21.7	2762.8	19.3	2762.8	19.3	97.0
2676.6	47.0	2737.8	23.1	2783.9	19.2	2783.9	19.2	96.1
2667.8	44.1	2735.4	21.8	2786.5	18.1	2786.5	18.1	95.7
2618.5	49.8	2859.4	23.8	3034.5	14.8	3034.5	14.8	86.3
3595.5	55.3	3616.2	20.4	3628.3	7.5	3628.3	7.5	99.1

RF3-1

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc. (%)
325.6	4.8	328.4	5.4	349.2	27.4	325.6	4.8	NA
336.1	10.7	420.4	20.5	914.9	102.3	336.1	10.7	NA
358.4	8.2	308.2	25.8	NA	NA	358.4	8.2	NA
359.3	9.9	371.7	10.3	450.4	38.3	359.3	9.9	NA
361.7	10.6	370.3	11.0	425.7	41.4	361.7	10.6	NA
365.0	8.9	373.7	8.5	429.1	22.8	365.0	8.9	NA
371.6	8.9	377.5	8.8	414.8	28.1	371.6	8.9	NA
375.6	8.8	378.6	8.8	397.5	30.8	375.6	8.8	NA
386.6	10.6	386.0	10.3	383.3	33.6	386.6	10.6	NA
387.0	9.4	396.6	9.2	454.0	28.4	387.0	9.4	NA
391.2	10.1	393.6	9.6	408.7	28.2	391.2	10.1	NA
398.5	9.8	395.3	9.0	377.1	24.0	398.5	9.8	NA
407.6	10.8	411.5	9.9	434.5	23.4	407.6	10.8	93.8
408.3	8.8	412.7	8.2	438.2	21.6	408.3	8.8	93.2
412.9	12.0	411.3	10.9	402.8	26.6	412.9	12.0	102.5
416.0	10.5	421.9	9.5	455.0	19.6	416.0	10.5	91.4
416.2	9.0	427.5	9.7	489.8	36.8	416.2	9.0	85.0
418.2	10.6	421.2	9.9	438.9	26.7	418.2	10.6	95.3
420.9	11.2	421.6	10.2	426.4	24.3	420.9	11.2	98.7
424.7	8.5	424.6	8.1	425.1	23.9	424.7	8.5	99.9
425.0	9.9	432.2	9.6	471.9	28.7	425.0	9.9	90.1
425.4	10.3	424.8	9.4	422.6	22.5	425.4	10.3	100.7
426.2	10.1	425.8	9.0	424.6	20.1	426.2	10.1	100.4
427.9	10.0	434.0	9.3	467.2	23.5	427.9	10.0	91.6
429.5	9.6	435.9	9.1	471.0	24.2	429.5	9.6	91.2
430.2	10.9	432.0	10.0	442.7	25.4	430.2	10.9	97.2
455.3	11.0	456.9	10.0	466.3	23.8	455.3	11.0	97.6
467.0	12.4	467.5	11.1	470.6	24.3	467.0	12.4	99.2
503.3	13.5	501.2	11.7	492.5	22.3	503.3	13.5	102.2
531.6	11.1	544.6	10.8	600.0	29.6	531.6	11.1	88.6
538.4	13.4	551.7	12.1	607.7	25.0	538.4	13.4	88.6
539.1	12.5	543.4	11.1	562.3	22.3	539.1	12.5	95.9
541.1	14.2	543.3	12.8	553.7	28.8	541.1	14.2	97.7
547.6	15.3	565.1	14.2	637.3	32.1	547.6	15.3	85.9
549.5	16.7	545.3	14.8	528.8	33.1	549.5	16.7	103.9
552.0	14.4	547.9	12.6	532.2	26.5	552.0	14.4	103.7
552.8	12.1	575.9	11.0	669.0	21.8	552.8	12.1	82.6
558.1	12.1	556.5	11.4	550.6	30.8	558.1	12.1	101.4
558.7	10.4	563.7	9.9	585.0	25.8	558.7	10.4	95.5

574.4	12.9	582.6	11.2	615.8	19.7	574.4	12.9	93.3
574.9	15.4	587.6	13.0	637.9	18.1	574.9	15.4	90.1
576.4	13.5	593.4	12.3	659.9	26.3	576.4	13.5	87.3
576.7	16.9	575.2	14.3	570.3	23.5	576.7	16.9	101.1
578.6	12.6	590.7	11.1	638.3	20.9	578.6	12.6	90.7
580.1	13.2	582.4	12.1	592.5	29.1	580.1	13.2	97.9
584.5	14.2	590.8	12.2	615.8	21.1	584.5	14.2	94.9
585.6	14.2	603.4	12.6	672.1	23.7	585.6	14.2	87.1
586.2	16.2	599.2	14.5	650.0	29.5	586.2	16.2	90.2
586.7	13.5	589.1	11.9	599.0	24.1	586.7	13.5	97.9
586.8	17.2	589.8	14.8	602.1	27.2	586.8	17.2	97.5
587.7	13.6	599.8	13.9	646.5	40.5	587.7	13.6	90.9
587.9	13.6	591.9	11.9	607.9	23.5	587.9	13.6	96.7
589.0	13.5	589.8	11.9	594.0	25.0	589.0	13.5	99.2
590.6	18.2	596.2	15.6	618.3	26.2	590.6	18.2	95.5
593.4	17.4	589.3	15.0	574.7	29.4	593.4	17.4	103.2
594.9	17.8	600.3	14.9	621.7	22.1	594.9	17.8	95.7
595.5	13.6	604.3	12.0	638.5	24.2	595.5	13.6	93.3
596.0	15.5	611.4	13.4	670.1	22.7	596.0	15.5	88.9
597.0	14.2	601.8	13.1	620.7	31.7	597.0	14.2	96.2
597.1	22.1	615.7	18.8	685.4	26.0	597.1	22.1	87.1
598.4	16.3	595.5	13.8	585.4	24.1	598.4	16.3	102.2
598.5	15.2	610.2	13.6	654.7	28.8	598.5	15.2	91.4
598.5	13.8	602.4	12.2	618.2	24.6	598.5	13.8	96.8
599.8	15.3	601.2	12.9	607.4	20.7	599.8	15.3	98.8
600.6	14.6	599.8	12.8	597.5	27.3	600.6	14.6	100.5
601.3	13.8	605.3	13.2	621.3	34.5	601.3	13.8	96.8
603.7	12.4	603.5	10.9	603.6	23.1	603.7	12.4	100.0
604.5	13.2	614.8	11.8	653.8	24.6	604.5	13.2	92.5
604.9	16.6	610.1	14.1	630.5	23.8	604.9	16.6	95.9
605.5	10.4	602.6	9.7	592.7	24.9	605.5	10.4	102.2
605.6	17.8	617.7	15.6	663.3	29.2	605.6	17.8	91.3
605.8	13.2	609.2	11.5	622.6	22.9	605.8	13.2	97.3
605.8	14.8	609.8	13.3	625.7	29.1	605.8	14.8	96.8
606.4	15.1	603.6	13.1	594.0	27.0	606.4	15.1	102.1
606.8	17.6	607.4	15.1	610.3	27.8	606.8	17.6	99.4
607.3	17.0	607.3	14.6	608.4	26.6	607.3	17.0	99.8
607.6	14.5	610.3	13.0	621.2	29.2	607.6	14.5	97.8
607.7	13.0	612.2	11.7	630.0	25.7	607.7	13.0	96.4
609.2	14.5	605.2	12.3	591.4	21.5	609.2	14.5	103.0
610.6	15.8	615.5	14.1	634.3	29.9	610.6	15.8	96.3
610.9	15.0	616.9	14.1	640.3	35.5	610.9	15.0	95.4
612.9	14.2	624.2	13.2	666.5	31.2	612.9	14.2	91.9

613.2	18.6	613.6	15.4	616.3	21.6	613.2	18.6	99.5
615.1	12.9	616.3	11.4	621.3	24.5	615.1	12.9	99.0
615.2	14.0	612.5	13.3	603.3	35.6	615.2	14.0	102.0
615.7	14.5	615.9	12.2	617.4	19.7	615.7	14.5	99.7
616.0	17.0	621.8	15.0	643.9	30.7	616.0	17.0	95.7
616.5	14.6	614.7	12.2	609.1	19.8	616.5	14.6	101.2
616.6	12.0	619.0	10.8	628.4	24.0	616.6	12.0	98.1
617.1	20.8	616.6	18.1	615.4	36.9	617.1	20.8	100.3
617.4	15.7	625.3	13.6	654.8	25.8	617.4	15.7	94.3
618.2	14.3	621.5	12.6	634.2	26.2	618.2	14.3	97.5
618.3	14.7	622.5	13.0	638.9	26.5	618.3	14.7	96.8
618.5	12.5	614.5	10.8	601.0	21.9	618.5	12.5	102.9
619.0	14.4	622.5	12.8	636.1	27.3	619.0	14.4	97.3
619.2	16.0	630.9	13.7	674.0	22.7	619.2	16.0	91.9
620.7	14.2	621.9	12.9	627.2	30.0	620.7	14.2	99.0
621.2	15.2	627.8	12.9	652.8	21.1	621.2	15.2	95.2
621.7	14.1	616.4	12.1	598.1	23.2	621.7	14.1	103.9
622.4	13.6	627.1	11.7	645.0	22.1	622.4	13.6	96.5
622.6	18.6	630.8	17.1	661.0	39.5	622.6	18.6	94.2
624.1	12.9	617.8	12.9	595.8	37.5	624.1	12.9	104.8
626.3	13.8	634.2	12.5	663.5	27.4	626.3	13.8	94.4
626.6	18.3	631.2	15.9	648.5	30.6	626.6	18.3	96.6
626.8	13.2	638.3	12.0	680.3	26.0	626.8	13.2	92.1
627.6	13.7	639.0	12.1	680.4	24.1	627.6	13.7	92.2
628.4	15.0	640.8	13.1	685.8	24.5	628.4	15.0	91.6
628.5	15.2	633.6	12.8	652.5	20.9	628.5	15.2	96.3
630.0	13.7	636.8	12.1	661.8	24.6	630.0	13.7	95.2
631.0	14.4	632.5	12.1	639.0	20.1	631.0	14.4	98.8
631.9	18.1	631.5	15.1	631.0	24.2	631.9	18.1	100.2
632.0	14.1	628.4	12.3	616.3	25.1	632.0	14.1	102.6
632.1	21.1	632.9	17.3	636.9	23.3	632.1	21.1	99.3
633.7	16.4	631.8	14.1	625.9	27.4	633.7	16.4	101.2
634.9	16.7	646.4	14.0	687.7	20.9	634.9	16.7	92.3
635.1	14.8	636.4	13.7	641.8	33.2	635.1	14.8	98.9
635.1	12.1	639.8	10.4	657.3	19.3	635.1	12.1	96.6
636.0	11.8	637.3	10.8	643.1	25.7	636.0	11.8	98.9
637.4	12.8	634.8	11.8	626.8	28.6	637.4	12.8	101.7
638.3	11.3	638.5	10.5	640.0	25.9	638.3	11.3	99.7
639.4	13.4	640.2	12.5	643.9	30.8	639.4	13.4	99.3
639.6	14.7	642.8	13.2	654.8	29.2	639.6	14.7	97.7
639.9	16.8	637.4	14.3	629.6	26.7	639.9	16.8	101.6
645.8	12.7	653.5	11.7	680.9	27.2	645.8	12.7	94.9
646.8	12.8	645.3	11.0	641.2	21.5	646.8	12.8	100.9

650.0	14.0	645.8	12.1	632.1	24.6	650.0	14.0	102.8
654.7	17.3	657.6	14.7	668.6	26.1	654.7	17.3	97.9
654.8	12.9	654.3	12.1	653.3	30.3	654.8	12.9	100.2
658.4	16.3	656.8	13.6	652.6	22.5	658.4	16.3	100.9
658.7	19.5	657.1	16.3	652.4	27.8	658.7	19.5	101.0
659.6	14.1	661.6	12.4	669.4	25.6	659.6	14.1	98.5
661.3	13.9	664.2	11.9	674.9	22.1	661.3	13.9	98.0
663.6	17.1	660.0	14.8	648.6	29.3	663.6	17.1	102.3
669.9	17.1	681.6	14.4	721.5	23.2	669.9	17.1	92.8
689.7	19.3	716.0	16.1	800.2	21.2	689.7	19.3	86.2
690.3	18.6	721.5	16.2	820.9	27.5	690.3	18.6	84.1
696.2	16.7	704.8	14.0	733.4	23.3	696.2	16.7	94.9
702.8	17.2	700.3	14.5	693.1	26.2	702.8	17.2	101.4
710.5	18.3	704.4	14.8	685.9	21.9	710.5	18.3	103.6
736.1	22.9	764.3	18.9	848.7	26.4	736.1	22.9	86.7
745.0	23.3	737.0	18.5	713.5	25.5	745.0	23.3	104.4
774.8	19.9	775.4	16.6	778.0	29.1	774.8	19.9	99.6
787.0	18.4	792.2	15.0	807.5	24.0	787.0	18.4	97.5
832.6	15.0	828.5	12.0	818.3	19.4	832.6	15.0	101.7
848.7	19.3	855.0	15.4	872.5	22.5	848.7	19.3	97.3
932.4	22.4	924.6	16.4	906.8	16.5	906.8	16.5	102.8
959.4	22.6	955.5	17.4	947.3	24.5	947.3	24.5	101.3
999.4	23.4	1000.7	17.4	1004.5	21.3	1004.5	21.3	99.5
1012.0	20.3	1011.9	14.7	1012.8	15.7	1012.8	15.7	99.9
1005.5	23.2	1009.2	16.9	1018.1	18.2	1018.1	18.2	98.8
1040.3	26.2	1038.7	19.6	1036.1	25.5	1036.1	25.5	100.4
1030.8	24.3	1036.6	17.7	1049.9	19.5	1049.9	19.5	98.2
1093.3	23.8	1078.8	17.4	1050.7	22.5	1050.7	22.5	104.1
1034.1	24.6	1049.5	18.0	1082.6	19.6	1082.6	19.6	95.5
1088.6	21.9	1095.3	16.2	1109.4	20.3	1109.4	20.3	98.1
1158.8	24.0	1142.6	16.8	1113.0	18.3	1113.0	18.3	104.1
1111.7	22.3	1112.4	16.2	1114.5	19.5	1114.5	19.5	99.7
1137.4	27.8	1134.6	19.8	1130.1	22.8	1130.1	22.8	100.6
1119.6	26.1	1131.3	18.9	1154.5	22.5	1154.5	22.5	97.0
1142.8	26.1	1148.4	19.2	1159.9	25.1	1159.9	25.1	98.5
1172.8	28.6	1169.0	20.1	1163.0	22.0	1163.0	22.0	100.8
1173.0	27.2	1169.6	18.5	1164.1	16.0	1164.1	16.0	100.8
1187.1	27.2	1183.2	19.5	1176.8	24.1	1176.8	24.1	100.9
1189.3	26.7	1186.4	18.9	1182.0	22.2	1182.0	22.2	100.6
1137.7	26.1	1154.4	18.6	1187.0	19.8	1187.0	19.8	95.8
1205.2	21.5	1201.2	16.0	1194.9	22.7	1194.9	22.7	100.9
1256.0	23.2	1235.5	16.3	1200.7	20.3	1200.7	20.3	104.6
1196.0	29.7	1200.3	20.8	1209.0	22.8	1209.0	22.8	98.9

1146.9	22.2	1170.2	16.6	1214.4	22.1	1214.4	22.1	94.4
1214.6	31.9	1215.1	21.6	1216.9	19.3	1216.9	19.3	99.8
1253.6	23.0	1242.2	16.8	1223.4	23.2	1223.4	23.2	102.5
1288.7	27.7	1266.6	18.8	1230.1	21.0	1230.1	21.0	104.8
1256.9	29.9	1248.8	20.5	1235.8	22.3	1235.8	22.3	101.7
1278.5	24.3	1265.8	18.6	1245.1	29.0	1245.1	29.0	102.7
1233.3	30.5	1240.6	20.8	1254.1	20.2	1254.1	20.2	98.3
1225.9	24.6	1238.7	17.4	1261.9	20.0	1261.9	20.0	97.1
1349.3	30.2	1327.1	20.3	1292.2	22.6	1292.2	22.6	104.4
1205.3	22.2	1239.9	17.9	1301.2	28.5	1301.2	28.5	92.6
1374.7	35.2	1356.6	22.6	1328.9	19.9	1328.9	19.9	103.4
1359.1	30.9	1348.2	20.4	1331.8	20.1	1331.8	20.1	102.1
1281.4	30.2	1308.7	20.1	1354.7	16.5	1354.7	16.5	94.6
1360.7	36.3	1365.9	23.9	1374.9	22.7	1374.9	22.7	99.0
1354.7	29.5	1363.8	19.7	1378.9	20.0	1378.9	20.0	98.2
1312.8	34.7	1361.2	23.4	1438.8	21.0	1438.8	21.0	91.2
1492.9	37.7	1475.7	23.3	1451.8	18.9	1451.8	18.9	102.8
1537.5	42.3	1509.2	25.2	1470.6	16.3	1470.6	16.3	104.5
1407.8	37.9	1437.7	24.8	1482.9	22.6	1482.9	22.6	94.9
1502.5	25.3	1494.8	17.1	1484.8	21.0	1484.8	21.0	101.2
1557.9	38.9	1558.8	23.3	1560.8	15.7	1560.8	15.7	99.8
1604.9	33.0	1595.2	21.3	1583.2	23.6	1583.2	23.6	101.4
1587.3	28.8	1594.8	18.5	1605.5	19.7	1605.5	19.7	98.9
1626.0	33.8	1619.1	20.8	1611.0	19.2	1611.0	19.2	100.9
1611.3	39.2	1617.2	24.1	1625.8	21.1	1625.8	21.1	99.1
1607.3	32.2	1615.1	20.8	1626.0	22.6	1626.0	22.6	98.8
1441.3	39.1	1523.2	25.0	1639.9	17.0	1639.9	17.0	87.9
1648.8	35.8	1645.2	21.3	1641.4	16.3	1641.4	16.3	100.5
1577.7	43.3	1606.3	26.5	1644.7	20.3	1644.7	20.3	95.9
1568.7	39.3	1604.2	24.9	1652.0	23.4	1652.0	23.4	95.0
1627.9	41.7	1638.7	24.7	1653.4	16.8	1653.4	16.8	98.5
1659.6	37.7	1657.0	23.0	1654.6	20.7	1654.6	20.7	100.3
1642.3	40.0	1654.7	24.3	1671.2	20.8	1671.2	20.8	98.3
1583.1	61.9	1629.5	37.1	1690.8	21.9	1690.8	21.9	93.6
1734.4	40.3	1716.5	23.2	1695.7	17.1	1695.7	17.1	102.3
1703.4	41.6	1700.4	24.8	1697.4	21.1	1697.4	21.1	100.4
1703.7	30.0	1701.3	18.3	1699.1	17.6	1699.1	17.6	100.3
1720.4	40.8	1719.3	24.5	1718.7	21.8	1718.7	21.8	100.1
1710.5	34.9	1722.0	20.9	1736.7	17.9	1736.7	17.9	98.5
1750.3	39.3	1747.6	23.2	1745.0	19.7	1745.0	19.7	100.3
1756.5	38.0	1751.6	22.0	1746.6	16.5	1746.6	16.5	100.6
1758.8	39.9	1755.9	23.5	1753.3	20.2	1753.3	20.2	100.3
1741.6	37.9	1747.3	22.4	1754.9	18.7	1754.9	18.7	99.2

1747.9	43.6	1752.7	25.5	1759.3	20.0	1759.3	20.0	99.4
1793.2	38.3	1779.6	22.2	1764.5	18.3	1764.5	18.3	101.6
1747.2	33.0	1755.8	20.1	1766.8	19.6	1766.8	19.6	98.9
1768.6	41.0	1768.1	23.4	1768.1	16.2	1768.1	16.2	100.0
1729.0	34.0	1746.8	20.5	1769.0	18.6	1769.0	18.6	97.7
1682.1	33.8	1722.8	21.0	1773.3	20.1	1773.3	20.1	94.9
1811.9	40.5	1799.8	23.4	1786.7	19.4	1786.7	19.4	101.4
1710.1	34.0	1753.2	21.2	1805.7	20.9	1805.7	20.9	94.7
1928.1	35.9	1884.2	21.7	1836.9	24.0	1836.9	24.0	105.0
1823.8	49.9	1831.0	28.1	1840.0	18.8	1840.0	18.8	99.1
1811.9	36.6	1827.6	21.1	1846.3	16.6	1846.3	16.6	98.1
1862.0	38.8	1861.1	22.3	1860.9	18.5	1860.9	18.5	100.1
1819.6	35.4	1843.5	21.7	1871.4	22.3	1871.4	22.3	97.2
1675.4	41.0	1768.6	24.5	1881.2	16.6	1881.2	16.6	89.1
1878.4	42.5	1883.7	24.0	1890.4	18.1	1890.4	18.1	99.4
1903.7	47.3	1902.3	26.2	1901.6	18.6	1901.6	18.6	100.1
1921.0	45.3	1937.6	24.8	1956.2	16.0	1956.2	16.0	98.2
1935.6	48.4	1946.1	27.4	1958.0	23.0	1958.0	23.0	98.9
1650.0	36.3	1790.6	22.5	1959.4	16.8	1959.4	16.8	84.2
1926.8	37.7	1944.8	21.2	1964.7	16.7	1964.7	16.7	98.1
1984.7	37.0	1974.9	21.2	1965.4	19.7	1965.4	19.7	101.0
1903.3	44.5	1944.3	25.5	1989.0	20.9	1989.0	20.9	95.7
1865.6	42.7	1931.3	24.6	2003.4	18.9	2003.4	18.9	93.1
2023.3	50.6	2016.5	27.4	2010.2	20.2	2010.2	20.2	100.7
2079.8	52.4	2054.5	27.3	2030.0	16.7	2030.0	16.7	102.5
1857.2	40.1	1941.8	23.4	2034.0	18.8	2034.0	18.8	91.3
2038.9	45.8	2040.2	25.3	2042.2	21.3	2042.2	21.3	99.8
2066.2	39.1	2057.1	21.8	2048.7	19.5	2048.7	19.5	100.9
2028.3	59.2	2039.2	31.3	2050.9	18.6	2050.9	18.6	98.9
2059.2	41.4	2060.1	22.6	2061.7	17.9	2061.7	17.9	99.9
2044.6	50.5	2053.3	27.0	2062.9	17.9	2062.9	17.9	99.1
2097.1	41.5	2080.8	22.2	2065.3	17.0	2065.3	17.0	101.5
1924.6	62.5	1995.7	34.2	2070.9	19.4	2070.9	19.4	92.9
1948.4	41.2	2010.6	23.1	2075.9	17.5	2075.9	17.5	93.9
2091.3	39.6	2092.3	22.3	2094.1	20.7	2094.1	20.7	99.9
1991.9	49.1	2043.2	27.0	2096.2	19.0	2096.2	19.0	95.0
2013.9	39.2	2055.1	22.4	2097.5	20.2	2097.5	20.2	96.0
2167.4	45.3	2153.3	24.2	2140.6	19.6	2140.6	19.6	101.2
2163.7	49.4	2155.0	25.5	2147.5	17.0	2147.5	17.0	100.8
2078.1	39.4	2113.3	22.0	2148.5	19.3	2148.5	19.3	96.7
2170.0	48.2	2169.9	24.3	2170.6	12.8	2170.6	12.8	100.0
2072.5	45.4	2171.7	24.9	2267.6	18.5	2267.6	18.5	91.4
2231.1	46.1	2279.4	23.8	2323.7	16.1	2323.7	16.1	96.0

2481.7	44.4	2475.7	22.1	2471.5	17.2	2471.5	17.2	100.4
2324.3	43.9	2409.5	22.5	2483.0	16.0	2483.0	16.0	93.6
2515.4	54.0	2498.5	26.1	2485.5	18.3	2485.5	18.3	101.2
2417.7	40.5	2504.4	20.8	2576.2	16.7	2576.2	16.7	93.9
2147.4	43.1	2376.4	24.0	2579.9	18.6	2579.9	18.6	83.2
2272.6	51.5	2440.7	27.1	2584.6	19.6	2584.6	19.6	87.9
2289.5	48.8	2470.1	24.6	2622.9	13.0	2622.9	13.0	87.3
2459.2	58.9	2556.6	29.0	2635.4	19.3	2635.4	19.3	93.3
2744.5	67.1	2699.0	29.9	2665.9	16.5	2665.9	16.5	102.9
2359.1	54.4	2538.5	27.2	2685.9	15.8	2685.9	15.8	87.8
2609.6	59.6	2659.5	27.3	2698.3	13.9	2698.3	13.9	96.7
2710.0	62.0	2705.5	28.6	2702.9	18.8	2702.9	18.8	100.3
2709.9	55.0	2709.3	25.2	2709.5	15.8	2709.5	15.8	100.0
2661.8	59.8	2702.3	27.8	2733.4	17.6	2733.4	17.6	97.4
2671.5	46.9	2721.5	22.5	2759.4	16.9	2759.4	16.9	96.8
2689.6	52.2	2733.4	24.7	2766.5	17.6	2766.5	17.6	97.2
2988.9	73.2	2997.9	30.7	3004.6	14.5	3004.6	14.5	99.5

RF3-2

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
330.1	7.1	330.6	7.1	335.4	27.5	330.1	7.1	NA
332.7	7.4	335.8	7.1	358.4	22.6	332.7	7.4	NA
333.1	9.4	333.6	8.7	338.2	22.8	333.1	9.4	NA
336.7	9.4	339.4	9.2	358.6	32.0	336.7	9.4	NA
337.3	8.5	332.0	8.0	296.3	25.8	337.3	8.5	NA
338.3	8.0	337.3	8.2	330.8	33.9	338.3	8.0	NA
360.2	8.8	360.9	9.0	366.4	36.3	360.2	8.8	NA
363.2	8.3	356.2	9.1	311.3	43.1	363.2	8.3	NA
371.4	8.0	379.6	9.4	430.8	44.3	371.4	8.0	NA
373.2	7.7	375.5	8.5	390.6	38.0	373.2	7.7	NA
379.8	13.4	425.3	15.3	681.0	53.6	379.8	13.4	NA
380.7	8.7	383.2	8.2	399.3	23.3	380.7	8.7	NA
387.7	10.4	387.4	9.7	386.9	26.7	387.7	10.4	NA
391.7	7.9	383.4	8.2	334.4	34.3	391.7	7.9	NA
396.6	10.6	413.8	10.1	511.7	24.6	396.6	10.6	NA
398.9	9.9	396.2	9.3	381.5	28.2	398.9	9.9	NA
399.7	8.3	442.8	8.7	674.2	23.7	399.7	8.3	NA
402.0	11.2	411.0	10.6	462.9	28.8	402.0	11.2	86.8
405.0	12.1	410.3	11.9	441.5	37.4	405.0	12.1	91.7
405.4	9.4	409.3	8.9	432.4	24.0	405.4	9.4	93.7

406.7	10.3	406.0	9.4	402.8	23.1	406.7	10.3	101.0
411.0	9.5	415.5	9.3	441.7	29.2	411.0	9.5	93.1
411.5	9.3	415.3	8.5	437.8	20.3	411.5	9.3	94.0
411.8	9.7	416.5	9.0	444.1	23.4	411.8	9.7	92.7
412.3	10.4	422.3	10.1	478.3	29.5	412.3	10.4	86.2
412.3	10.3	417.5	9.5	447.2	22.7	412.3	10.3	92.2
415.1	9.3	415.9	8.6	421.2	21.9	415.1	9.3	98.6
415.5	11.4	417.8	10.4	431.5	25.3	415.5	11.4	96.3
416.2	11.1	422.1	10.0	455.5	20.3	416.2	11.1	91.4
417.1	9.7	415.1	9.4	404.6	30.6	417.1	9.7	103.1
417.2	11.5	422.2	10.7	450.7	27.0	417.2	11.5	92.6
417.7	9.2	422.5	9.2	450.0	30.7	417.7	9.2	92.8
417.8	12.9	415.5	11.7	403.9	28.3	417.8	12.9	103.4
417.8	9.7	418.1	9.1	420.9	25.6	417.8	9.7	99.3
418.2	12.7	418.1	11.5	418.7	26.5	418.2	12.7	99.9
418.9	10.9	420.1	10.1	427.9	27.3	418.9	10.9	97.9
419.0	12.0	418.0	11.1	413.2	28.7	419.0	12.0	101.4
419.5	12.8	427.1	11.5	469.2	22.0	419.5	12.8	89.4
419.7	12.2	421.0	11.0	429.2	24.4	419.7	12.2	97.8
420.1	12.2	419.1	10.9	414.5	23.4	420.1	12.2	101.4
420.2	15.1	422.5	13.3	436.0	22.6	420.2	15.1	96.4
420.2	9.9	421.1	9.4	427.2	27.5	420.2	9.9	98.4
420.8	11.1	420.3	10.6	418.2	31.7	420.8	11.1	100.6
423.7	10.6	427.7	9.9	450.3	25.3	423.7	10.6	94.1
423.9	8.8	425.4	8.3	434.0	23.0	423.9	8.8	97.7
427.1	9.8	430.0	9.3	446.3	26.8	427.1	9.8	95.7
427.4	12.9	424.2	11.3	407.9	21.1	427.4	12.9	104.8
427.6	12.6	426.1	11.2	419.0	22.6	427.6	12.6	102.0
428.1	12.6	426.0	11.2	415.3	22.8	428.1	12.6	103.1
431.1	9.0	441.9	8.9	499.1	26.4	431.1	9.0	86.4
431.8	14.3	442.2	13.2	497.6	30.6	431.8	14.3	86.8
431.8	11.5	431.9	10.6	433.5	27.1	431.8	11.5	99.6
433.3	12.5	436.9	11.3	456.9	25.1	433.3	12.5	94.8
437.5	10.8	440.3	10.8	456.0	35.8	437.5	10.8	95.9
438.4	7.8	445.0	7.6	479.9	22.5	438.4	7.8	91.3
441.3	9.9	440.7	9.2	438.2	24.3	441.3	9.9	100.7
441.7	10.1	443.5	9.2	453.9	22.9	441.7	10.1	97.3
442.0	105.1	286.1	61.8	NA	NA	442.0	105.1	NA
452.5	13.7	456.2	12.8	475.6	33.3	452.5	13.7	95.2
460.8	9.2	457.7	9.0	443.1	28.8	460.8	9.2	104.0
465.0	10.1	461.3	9.2	443.8	22.6	465.0	10.1	104.8
467.5	11.0	470.9	10.5	488.4	29.2	467.5	11.0	95.7
505.9	12.8	519.9	12.7	582.6	36.6	505.9	12.8	86.8

510.1	12.9	514.4	12.1	534.7	31.8	510.1	12.9	95.4
520.7	11.7	526.0	10.1	549.8	17.6	520.7	11.7	94.7
521.3	11.2	530.1	11.1	569.0	32.9	521.3	11.2	91.6
525.6	13.8	537.4	12.7	589.0	29.5	525.6	13.8	89.2
527.0	14.1	542.4	12.5	608.8	21.9	527.0	14.1	86.6
530.4	12.8	545.3	11.5	609.2	23.2	530.4	12.8	87.1
532.1	9.9	527.6	10.0	509.2	32.1	532.1	9.9	104.5
539.1	12.4	552.6	11.2	609.4	23.3	539.1	12.4	88.5
540.2	17.5	550.4	15.5	593.8	29.7	540.2	17.5	91.0
540.5	12.5	559.5	11.8	638.3	28.5	540.5	12.5	84.7
541.6	12.3	538.1	11.4	524.3	30.0	541.6	12.3	103.3
541.7	14.1	552.2	12.3	596.6	20.4	541.7	14.1	90.8
544.1	11.5	542.2	10.6	535.2	27.0	544.1	11.5	101.7
544.2	15.0	550.6	13.5	578.2	28.7	544.2	15.0	94.1
549.2	15.4	551.5	13.5	562.0	27.0	549.2	15.4	97.7
549.6	16.1	551.1	13.8	558.2	23.2	549.6	16.1	98.5
549.8	13.4	554.2	12.1	572.9	27.2	549.8	13.4	96.0
549.9	13.3	551.8	12.1	560.6	28.4	549.9	13.3	98.1
551.9	15.2	548.4	13.5	534.7	29.6	551.9	15.2	103.2
554.2	14.1	549.4	12.8	530.7	30.6	554.2	14.1	104.4
556.8	13.6	559.4	12.8	571.0	33.7	556.8	13.6	97.5
558.5	14.1	570.2	12.6	617.8	25.6	558.5	14.1	90.4
565.7	14.9	569.1	13.0	583.6	24.3	565.7	14.9	96.9
567.9	15.5	572.9	13.3	593.9	23.3	567.9	15.5	95.6
570.9	14.1	577.5	12.9	604.5	29.9	570.9	14.1	94.4
572.9	15.6	568.6	13.7	552.5	29.7	572.9	15.6	103.7
573.5	14.8	587.7	12.9	644.1	21.6	573.5	14.8	89.0
574.4	17.7	578.6	14.8	596.0	20.8	574.4	17.7	96.4
577.2	13.4	574.8	11.8	566.3	25.3	577.2	13.4	101.9
582.1	16.7	586.1	14.4	602.7	26.5	582.1	16.7	96.6
585.0	16.2	591.5	14.3	617.4	29.2	585.0	16.2	94.7
585.6	14.6	600.8	12.8	659.7	23.3	585.6	14.6	88.8
585.8	12.1	613.4	12.3	717.5	33.6	585.8	12.1	81.6
586.5	15.4	584.1	13.4	575.9	27.1	586.5	15.4	101.8
588.4	11.4	596.7	10.4	629.2	23.7	588.4	11.4	93.5
588.6	18.1	597.2	15.4	631.1	24.1	588.6	18.1	93.3
590.2	12.2	594.5	11.3	612.0	27.1	590.2	12.2	96.4
590.8	15.2	616.8	13.4	714.3	23.3	590.8	15.2	82.7
592.1	17.4	600.8	15.1	634.5	27.8	592.1	17.4	93.3
594.0	16.6	596.2	14.7	605.6	31.3	594.0	16.6	98.1
594.7	16.5	613.4	14.3	684.0	23.5	594.7	16.5	86.9
596.5	14.0	599.0	13.3	609.6	35.1	596.5	14.0	97.8
598.2	13.3	603.0	12.2	622.3	28.0	598.2	13.3	96.1

598.8	15.2	604.2	13.4	625.3	27.0	598.8	15.2	95.7
599.7	15.4	594.4	13.4	575.2	28.0	599.7	15.4	104.3
600.9	13.5	596.5	11.9	581.0	26.3	600.9	13.5	103.4
601.4	13.8	604.8	11.6	618.2	18.3	601.4	13.8	97.3
602.2	17.3	608.8	14.8	634.6	25.7	602.2	17.3	94.9
602.8	14.0	602.7	12.2	603.4	24.7	602.8	14.0	99.9
603.1	14.5	618.0	16.1	674.0	51.1	603.1	14.5	89.5
603.6	12.6	610.2	12.2	635.6	32.5	603.6	12.6	95.0
604.2	14.5	609.4	12.7	629.7	24.4	604.2	14.5	95.9
605.2	18.2	623.2	15.9	690.3	27.6	605.2	18.2	87.7
605.3	17.4	601.4	14.7	587.8	25.4	605.3	17.4	103.0
605.5	14.0	601.9	12.2	589.2	25.5	605.5	14.0	102.8
605.9	13.8	601.5	11.8	585.8	21.7	605.9	13.8	103.4
606.7	17.5	609.0	15.0	618.7	27.4	606.7	17.5	98.1
607.7	19.7	611.5	16.5	626.7	24.1	607.7	19.7	97.0
607.8	15.9	609.4	13.2	616.3	19.0	607.8	15.9	98.6
607.8	17.0	615.5	15.1	644.6	31.0	607.8	17.0	94.3
608.1	15.7	616.5	14.3	648.5	31.9	608.1	15.7	93.8
608.6	14.8	605.2	12.3	593.6	19.3	608.6	14.8	102.5
608.7	19.7	610.7	16.5	619.4	26.0	608.7	19.7	98.3
610.5	15.8	606.5	13.6	592.4	27.2	610.5	15.8	103.0
611.2	18.9	617.5	15.7	641.4	21.7	611.2	18.9	95.3
611.3	15.4	606.9	13.3	591.7	27.0	611.3	15.4	103.3
613.0	14.6	610.6	12.5	602.4	23.8	613.0	14.6	101.8
613.3	13.4	611.0	12.5	603.3	31.7	613.3	13.4	101.7
614.1	10.7	612.5	9.8	607.7	23.8	614.1	10.7	101.1
615.0	16.9	624.7	14.6	660.7	26.4	615.0	16.9	93.1
615.2	13.5	614.6	12.0	613.2	25.6	615.2	13.5	100.3
616.7	13.7	618.7	11.9	627.2	23.3	616.7	13.7	98.3
616.9	12.1	622.6	10.8	644.4	23.3	616.9	12.1	95.7
621.1	15.1	628.4	13.3	656.0	26.7	621.1	15.1	94.7
621.1	15.4	629.3	13.0	659.9	20.3	621.1	15.4	94.1
622.2	17.0	617.3	14.8	600.1	31.2	622.2	17.0	103.7
624.6	17.2	620.0	15.0	603.9	31.4	624.6	17.2	103.4
626.7	16.3	620.7	14.0	599.9	27.9	626.7	16.3	104.5
626.7	18.5	624.7	15.5	618.1	26.2	626.7	18.5	101.4
629.9	12.9	628.6	11.9	625.0	28.9	629.9	12.9	100.8
630.9	17.2	643.6	15.0	689.3	27.4	630.9	17.2	91.5
631.6	15.8	630.6	14.2	627.6	32.8	631.6	15.8	100.7
632.5	14.4	633.4	13.8	637.6	36.5	632.5	14.4	99.2
634.4	16.2	628.9	14.6	610.3	34.4	634.4	16.2	104.0
638.2	13.3	641.0	12.1	651.5	27.7	638.2	13.3	98.0
638.8	16.2	635.7	13.9	625.5	26.1	638.8	16.2	102.1

639.6	15.5	639.0	13.4	637.8	26.4	639.6	15.5	100.3
640.3	15.7	651.5	13.6	691.5	24.7	640.3	15.7	92.6
641.3	19.0	641.3	15.9	642.3	27.2	641.3	19.0	99.8
642.8	14.9	645.2	12.8	654.5	24.6	642.8	14.9	98.2
643.0	17.1	642.5	14.4	641.5	25.3	643.0	17.1	100.2
645.4	15.2	644.1	13.0	640.2	24.5	645.4	15.2	100.8
649.9	16.2	657.9	13.9	686.0	24.9	649.9	16.2	94.7
656.6	15.7	691.2	13.8	806.6	23.6	656.6	15.7	81.4
658.9	19.4	654.8	16.1	641.9	25.7	658.9	19.4	102.7
664.8	18.6	663.3	15.5	659.1	25.7	664.8	18.6	100.9
667.4	15.8	688.7	13.9	759.7	25.5	667.4	15.8	87.8
668.8	13.0	663.0	12.4	644.5	32.7	668.8	13.0	103.8
677.3	16.1	682.6	13.7	700.9	25.1	677.3	16.1	96.6
686.9	16.1	687.3	13.5	689.4	22.6	686.9	16.1	99.6
727.0	20.4	723.9	16.6	715.5	25.5	727.0	20.4	101.6
738.5	16.2	735.0	13.9	725.3	27.5	738.5	16.2	101.8
751.8	16.7	773.2	13.8	836.4	20.8	751.8	16.7	89.9
753.3	18.2	756.9	15.2	768.6	26.6	753.3	18.2	98.0
761.7	16.6	753.3	14.0	729.3	27.1	761.7	16.6	104.4
778.9	24.9	818.2	20.2	927.3	24.2	778.9	24.9	84.0
784.0	16.3	792.0	13.1	815.6	18.9	784.0	16.3	96.1
897.0	20.5	897.0	16.1	897.8	23.9	897.0	20.5	99.9
1002.8	23.7	989.0	17.4	959.2	21.6	959.2	21.6	104.6
958.8	22.5	965.2	17.5	980.6	25.5	980.6	25.5	97.8
1018.2	28.7	1006.1	21.8	980.9	31.5	980.9	31.5	103.8
1017.4	28.9	1015.4	21.1	1012.1	23.6	1012.1	23.6	100.5
1011.4	27.6	1016.0	20.0	1026.9	20.5	1026.9	20.5	98.5
995.4	23.7	1014.3	17.8	1056.2	21.1	1056.2	21.1	94.2
1022.8	24.5	1035.8	18.4	1064.2	22.6	1064.2	22.6	96.1
1086.2	27.2	1078.7	20.1	1064.4	26.4	1064.4	26.4	102.1
1037.9	17.2	1048.1	13.6	1070.3	21.1	1070.3	21.1	97.0
1075.3	23.9	1074.6	17.8	1074.0	23.2	1074.0	23.2	100.1
1106.5	24.3	1095.7	17.7	1075.3	22.8	1075.3	22.8	102.9
1086.7	19.4	1083.2	15.6	1077.1	26.3	1077.1	26.3	100.9
1039.9	21.0	1052.2	16.2	1078.8	22.7	1078.8	22.7	96.4
1083.5	23.2	1082.7	17.1	1081.9	22.0	1081.9	22.0	100.1
1104.2	30.2	1097.1	21.5	1084.0	24.1	1084.0	24.1	101.9
1079.8	24.5	1087.3	17.8	1103.2	19.9	1103.2	19.9	97.9
1031.5	17.3	1054.6	14.6	1103.6	25.8	1103.6	25.8	93.5
1019.0	26.4	1047.0	19.8	1106.8	22.9	1106.8	22.9	92.1
1129.6	29.8	1129.8	21.1	1131.0	23.2	1131.0	23.2	99.9
1061.7	29.5	1085.3	21.8	1133.9	24.9	1133.9	24.9	93.6
1163.5	26.8	1155.6	18.4	1141.7	17.4	1141.7	17.4	101.9

1121.6	27.3	1134.2	20.1	1159.3	24.9	1159.3	24.9	96.7
1203.2	27.2	1187.6	18.7	1160.0	20.2	1160.0	20.2	103.7
1156.3	25.8	1157.8	18.6	1161.4	22.8	1161.4	22.8	99.6
1128.7	26.5	1142.1	18.6	1168.4	18.3	1168.4	18.3	96.6
1164.6	24.7	1165.9	17.9	1169.1	22.3	1169.1	22.3	99.6
1088.9	24.8	1123.8	18.0	1192.7	18.5	1192.7	18.5	91.3
1115.2	22.6	1142.2	16.4	1194.7	17.9	1194.7	17.9	93.3
1147.4	22.0	1167.6	16.5	1206.1	22.3	1206.1	22.3	95.1
1178.2	33.8	1188.0	23.3	1206.9	21.2	1206.9	21.2	97.6
1239.2	27.0	1233.7	18.4	1225.1	18.3	1225.1	18.3	101.2
1192.8	28.9	1204.7	20.7	1227.0	24.5	1227.0	24.5	97.2
1235.9	28.7	1241.6	20.1	1252.4	22.7	1252.4	22.7	98.7
1297.4	26.1	1286.2	17.9	1268.3	20.1	1268.3	20.1	102.3
1300.7	29.7	1300.9	21.1	1302.0	27.1	1302.0	27.1	99.9
1218.5	31.1	1249.2	22.4	1303.5	26.4	1303.5	26.4	93.5
1315.4	26.0	1313.4	18.9	1311.1	26.2	1311.1	26.2	100.3
1324.2	23.0	1326.3	15.6	1330.5	16.9	1330.5	16.9	99.5
1349.8	32.1	1346.4	21.2	1341.8	20.1	1341.8	20.1	100.6
1330.1	30.0	1335.8	20.7	1345.7	23.7	1345.7	23.7	98.8
1248.4	27.7	1291.7	19.6	1365.2	21.3	1365.2	21.3	91.4
1317.2	27.3	1340.2	18.6	1377.9	19.0	1377.9	19.0	95.6
1334.2	25.9	1352.5	17.7	1382.4	19.1	1382.4	19.1	96.5
1416.7	27.1	1407.9	18.2	1395.4	21.0	1395.4	21.0	101.5
1424.0	30.7	1423.4	20.5	1423.4	22.6	1423.4	22.6	100.0
1371.3	27.8	1394.6	18.1	1431.1	15.3	1431.1	15.3	95.8
1405.8	46.0	1421.5	30.0	1446.0	27.4	1446.0	27.4	97.2
1480.7	40.2	1467.6	24.9	1449.6	19.9	1449.6	19.9	102.2
1418.7	42.0	1437.5	26.6	1466.2	19.5	1466.2	19.5	96.8
1509.0	33.4	1496.0	21.1	1478.4	19.6	1478.4	19.6	102.1
1514.0	36.9	1499.5	23.0	1479.9	20.3	1479.9	20.3	102.3
1560.7	37.6	1529.4	23.2	1487.2	21.1	1487.2	21.1	104.9
1364.0	22.5	1415.1	15.8	1493.7	18.5	1493.7	18.5	91.3
1520.5	37.6	1511.3	23.4	1499.3	20.6	1499.3	20.6	101.4
1503.8	34.7	1505.2	21.4	1507.9	16.6	1507.9	16.6	99.7
1493.7	36.5	1521.9	23.4	1562.1	21.6	1562.1	21.6	95.6
1546.4	32.3	1558.5	20.0	1575.7	16.8	1575.7	16.8	98.1
1516.2	36.9	1555.6	23.6	1610.4	21.3	1610.4	21.3	94.1
1660.7	41.3	1646.1	25.7	1628.2	26.0	1628.2	26.0	102.0
1635.7	32.2	1643.4	20.6	1654.1	22.2	1654.1	22.2	98.9
1579.6	32.9	1612.3	20.7	1656.0	19.1	1656.0	19.1	95.4
1603.7	45.9	1637.3	27.6	1681.5	19.0	1681.5	19.0	95.4
1699.8	36.4	1706.2	22.0	1714.9	19.5	1714.9	19.5	99.1
1722.2	40.6	1735.9	23.5	1753.2	15.8	1753.2	15.8	98.2

1746.2	36.8	1753.7	22.4	1763.3	21.8	1763.3	21.8	99.0
1749.9	33.1	1761.9	19.7	1777.0	17.4	1777.0	17.4	98.5
1775.6	45.9	1776.5	26.4	1778.3	19.7	1778.3	19.7	99.8
1740.1	36.4	1761.5	21.7	1787.6	18.5	1787.6	18.5	97.3
1783.6	39.2	1803.2	24.2	1826.7	25.0	1826.7	25.0	97.6
1825.9	39.6	1826.2	22.6	1827.3	17.2	1827.3	17.2	99.9
1858.6	56.3	1864.3	31.3	1871.6	20.2	1871.6	20.2	99.3
1655.5	33.3	1766.7	20.3	1901.6	14.9	1901.6	14.9	87.1
1624.6	33.4	1769.1	21.8	1944.9	20.9	1944.9	20.9	83.5
1977.0	52.3	1974.3	28.8	1972.2	22.1	1972.2	22.1	100.2
1935.7	39.3	1954.9	22.3	1976.1	18.9	1976.1	18.9	98.0
1617.4	56.6	1780.0	34.6	1977.1	20.6	1977.1	20.6	81.8
1841.5	34.6	1906.6	20.6	1978.9	18.5	1978.9	18.5	93.1
2016.1	44.6	2014.3	24.4	2013.3	18.6	2013.3	18.6	100.1
1910.2	51.3	1976.5	28.8	2047.4	20.0	2047.4	20.0	93.3
2019.1	46.3	2046.9	26.0	2075.7	22.2	2075.7	22.2	97.3
2019.3	53.4	2050.4	27.9	2082.7	13.3	2082.7	13.3	97.0
2020.6	33.3	2054.1	20.0	2088.7	21.4	2088.7	21.4	96.7
1843.6	47.8	1964.3	28.0	2094.7	21.6	2094.7	21.6	88.0
2093.7	44.5	2099.3	23.4	2105.6	15.3	2105.6	15.3	99.4
2099.7	53.4	2103.9	28.3	2108.8	20.1	2108.8	20.1	99.6
2096.8	41.3	2108.9	22.1	2121.6	16.0	2121.6	16.0	98.8
1965.4	39.9	2043.2	23.6	2123.5	22.3	2123.5	22.3	92.6
2060.5	44.3	2096.7	24.6	2133.1	20.6	2133.1	20.6	96.6
1941.5	51.4	2036.3	29.5	2134.5	23.6	2134.5	23.6	91.0
2133.1	44.9	2134.1	23.8	2135.9	17.8	2135.9	17.8	99.9
2048.1	46.8	2094.9	25.3	2142.0	17.4	2142.0	17.4	95.6
1901.8	42.9	2063.3	25.2	2229.5	20.3	2229.5	20.3	85.3
2030.6	45.5	2156.8	25.2	2279.9	18.2	2279.9	18.2	89.1
2136.3	51.9	2352.9	28.1	2547.1	18.7	2547.1	18.7	83.9
2602.6	49.3	2607.9	23.7	2612.8	17.4	2612.8	17.4	99.6
2822.9	76.5	2803.0	32.8	2789.4	13.2	2789.4	13.2	101.2
2818.8	57.4	2847.0	25.1	2867.7	12.8	2867.7	12.8	98.3
3185.0	68.4	3318.8	28.2	3401.2	14.8	3401.2	14.8	93.6

RF4

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
328.5	4.8	337.7	5.3	401.6	23.7	328.5	4.8	NA
331.4	3.3	332.6	4.2	341.2	24.2	331.4	3.3	NA
346.3	5.6	368.8	9.0	512.3	52.7	346.3	5.6	NA
351.5	4.4	344.5	5.1	297.4	27.6	351.5	4.4	NA
368.4	5.8	361.7	9.8	318.7	63.0	368.4	5.8	NA
374.2	4.8	388.4	8.9	473.9	53.5	374.2	4.8	NA
374.7	3.7	371.7	7.4	352.8	48.7	374.7	3.7	NA
375.4	4.6	372.8	6.1	356.6	33.4	375.4	4.6	NA
386.7	6.9	380.3	7.1	341.8	29.1	386.7	6.9	NA
390.8	5.8	402.0	6.0	466.8	21.1	390.8	5.8	NA
395.3	4.4	390.5	4.9	362.2	22.2	395.3	4.4	NA
398.2	4.6	398.4	4.5	399.7	15.3	398.2	4.6	NA
404.5	5.1	418.7	5.4	497.5	19.6	404.5	5.1	81.3
404.7	4.6	409.7	4.8	437.9	18.2	404.7	4.6	92.4
407.8	4.2	410.5	4.9	425.9	22.5	407.8	4.2	95.7
408.0	4.6	421.7	5.2	497.5	21.1	408.0	4.6	82.0
408.7	4.0	421.8	4.5	494.2	17.9	408.7	4.0	82.7
409.4	5.6	412.5	5.7	429.8	19.9	409.4	5.6	95.3
410.1	11.1	416.9	9.9	454.8	17.9	410.1	11.1	90.2
410.5	4.5	417.6	4.7	457.2	16.9	410.5	4.5	89.8
411.7	5.3	411.1	5.7	407.8	22.9	411.7	5.3	101.0
412.4	3.9	422.4	4.9	477.1	22.7	412.4	3.9	86.4
413.0	4.6	417.0	4.8	438.9	18.2	413.0	4.6	94.1
415.3	4.0	429.5	4.8	506.7	21.2	415.3	4.0	82.0
417.0	4.5	416.1	5.1	411.5	22.5	417.0	4.5	101.3
425.0	3.8	430.4	4.2	459.2	16.9	425.0	3.8	92.5
427.6	4.8	432.2	5.3	456.4	20.8	427.6	4.8	93.7
428.0	4.7	430.3	4.7	442.6	15.8	428.0	4.7	96.7
429.3	5.6	432.1	5.5	447.3	17.2	429.3	5.6	96.0
430.0	3.9	436.3	4.8	469.3	21.1	430.0	3.9	91.6
432.2	5.8	429.5	5.4	414.5	16.0	432.2	5.8	104.3
434.5	5.3	432.5	5.4	422.0	19.5	434.5	5.3	102.9
448.1	4.0	451.5	6.4	468.9	32.9	448.1	4.0	95.6
450.5	8.4	449.8	7.8	446.5	19.8	450.5	8.4	100.9
479.1	6.1	478.8	5.9	477.3	17.8	479.1	6.1	100.4
506.6	6.0	516.8	7.0	562.2	26.0	506.6	6.0	90.1
509.5	5.7	516.7	7.4	548.4	30.4	509.5	5.7	92.9
516.6	5.3	514.3	7.6	504.2	34.0	516.6	5.3	102.5
525.8	7.5	526.3	7.2	528.4	20.1	525.8	7.5	99.5

528.3	5.6	540.2	7.4	590.6	29.7	528.3	5.6	89.5
529.9	5.9	549.5	6.0	631.3	17.0	529.9	5.9	83.9
535.6	6.5	543.6	7.0	577.5	23.8	535.6	6.5	92.7
535.6	4.8	539.3	5.6	555.1	20.9	535.6	4.8	96.5
538.1	5.3	548.0	6.2	589.3	22.5	538.1	5.3	91.3
539.2	8.0	538.6	7.4	536.4	19.2	539.2	8.0	100.5
540.1	6.3	544.1	6.7	560.6	21.9	540.1	6.3	96.3
548.2	6.2	561.0	6.4	613.2	19.2	548.2	6.2	89.4
548.7	6.8	546.4	6.5	537.1	17.9	548.7	6.8	102.2
551.2	5.9	553.5	5.9	563.1	18.2	551.2	5.9	97.9
551.2	6.1	567.1	5.9	631.0	15.4	551.2	6.1	87.4
552.9	8.9	560.0	8.5	589.0	22.5	552.9	8.9	93.9
553.7	6.3	556.9	6.6	569.9	21.4	553.7	6.3	97.2
554.5	5.4	570.7	6.8	635.8	25.5	554.5	5.4	87.2
556.0	7.2	568.3	6.7	618.1	16.7	556.0	7.2	89.9
556.7	6.5	571.6	6.5	631.0	17.9	556.7	6.5	88.2
557.5	6.6	557.4	6.7	557.1	21.0	557.5	6.6	100.1
558.1	4.6	568.5	5.1	610.5	16.9	558.1	4.6	91.4
561.2	7.2	574.5	7.3	627.5	21.2	561.2	7.2	89.4
572.0	8.1	578.1	9.0	602.1	30.2	572.0	8.1	95.0
580.3	6.2	583.9	8.1	597.9	31.5	580.3	6.2	97.1
584.6	6.7	581.1	6.6	567.7	19.3	584.6	6.7	103.0
587.1	6.8	596.1	7.1	630.2	21.3	587.1	6.8	93.2
588.0	5.1	584.9	5.6	572.6	19.1	588.0	5.1	102.7
590.0	6.2	618.5	10.4	724.3	41.5	590.0	6.2	81.5
591.6	8.4	592.1	10.2	594.1	37.4	591.6	8.4	99.6
591.7	13.5	607.0	12.3	664.3	26.5	591.7	13.5	89.1
593.7	7.0	613.2	7.8	686.0	25.2	593.7	7.0	86.5
595.8	6.9	593.0	6.5	582.2	16.9	595.8	6.9	102.3
596.1	5.3	600.2	5.2	615.9	14.9	596.1	5.3	96.8
596.2	5.3	611.0	5.5	666.2	16.2	596.2	5.3	89.5
597.8	7.4	595.5	9.4	586.8	35.2	597.8	7.4	101.9
598.3	5.6	599.8	5.8	605.7	17.7	598.3	5.6	98.8
600.9	8.2	597.8	7.6	586.0	19.6	600.9	8.2	102.5
601.2	6.4	599.7	7.6	594.0	27.3	601.2	6.4	101.2
601.3	6.6	616.1	6.7	671.3	19.5	601.3	6.6	89.6
601.5	8.0	605.8	8.5	622.0	27.0	601.5	8.0	96.7
601.6	7.3	601.9	6.3	603.1	12.5	601.6	7.3	99.8
601.6	6.5	617.0	6.9	673.7	20.6	601.6	6.5	89.3
601.7	7.1	598.8	7.1	587.9	21.1	601.7	7.1	102.4
602.0	7.0	608.7	7.6	633.7	24.4	602.0	7.0	95.0
602.4	7.5	616.8	7.7	669.9	22.0	602.4	7.5	89.9
602.9	6.5	598.9	6.6	583.8	20.5	602.9	6.5	103.3

603.0	7.2	605.6	7.7	615.2	24.1	603.0	7.2	98.0
603.2	6.9	612.9	6.8	649.1	18.5	603.2	6.9	92.9
604.1	6.9	606.1	6.7	613.4	18.3	604.1	6.9	98.5
604.5	9.3	627.2	9.4	710.0	25.7	604.5	9.3	85.1
604.6	6.9	609.6	7.0	628.3	20.8	604.6	6.9	96.2
605.7	6.3	615.3	6.0	650.9	15.1	605.7	6.3	93.0
605.8	7.3	611.4	6.7	632.2	15.9	605.8	7.3	95.8
607.4	5.2	609.6	5.4	617.6	16.9	607.4	5.2	98.3
608.8	6.6	606.1	7.2	596.1	23.3	608.8	6.6	102.1
609.3	6.8	606.6	6.6	596.8	17.9	609.3	6.8	102.1
609.7	8.1	609.9	7.8	610.9	20.8	609.7	8.1	99.8
610.0	5.7	617.5	6.9	644.9	24.2	610.0	5.7	94.6
610.3	8.1	622.7	8.7	667.8	27.1	610.3	8.1	91.4
612.7	8.4	617.9	8.0	636.9	21.1	612.7	8.4	96.2
612.8	6.0	617.0	5.5	632.2	12.7	612.8	6.0	96.9
613.3	6.2	608.6	5.6	591.0	13.2	613.3	6.2	103.8
613.4	6.5	635.9	6.8	716.5	19.2	613.4	6.5	85.6
613.8	6.1	612.8	6.6	609.1	21.1	613.8	6.1	100.8
614.1	8.4	617.9	7.8	631.8	19.0	614.1	8.4	97.2
614.8	9.5	613.6	8.2	609.1	15.7	614.8	9.5	100.9
617.4	6.4	637.5	6.4	709.7	17.0	617.4	6.4	87.0
617.5	6.3	638.1	6.2	711.4	15.9	617.5	6.3	86.8
618.0	6.8	636.9	7.8	704.8	25.2	618.0	6.8	87.7
618.8	8.3	613.8	7.9	595.5	21.0	618.8	8.3	103.9
619.7	7.2	617.2	6.6	607.9	16.1	619.7	7.2	101.9
620.8	9.0	621.7	7.8	624.8	15.2	620.8	9.0	99.4
622.6	9.8	628.1	8.8	648.0	19.5	622.6	9.8	96.1
622.8	6.5	618.3	6.8	601.9	21.4	622.8	6.5	103.5
622.9	6.2	618.1	5.8	600.5	15.0	622.9	6.2	103.7
624.8	6.2	630.8	6.5	652.1	19.6	624.8	6.2	95.8
625.1	7.7	623.8	7.9	619.1	23.8	625.1	7.7	101.0
625.7	6.3	627.8	6.9	635.6	22.1	625.7	6.3	98.4
625.7	6.8	635.5	6.1	670.6	12.9	625.7	6.8	93.3
626.4	9.1	629.3	8.1	639.4	17.5	626.4	9.1	98.0
627.2	7.5	640.6	12.2	688.2	47.8	627.2	7.5	91.1
628.0	6.3	638.5	7.0	675.9	21.8	628.0	6.3	92.9
629.8	6.9	627.4	6.7	619.0	18.8	629.8	6.9	101.7
632.3	6.5	627.1	6.2	608.4	16.4	632.3	6.5	103.9
632.8	7.9	628.9	7.0	614.8	15.6	632.8	7.9	102.9
634.3	7.6	638.6	7.3	653.6	19.1	634.3	7.6	97.0
635.0	9.4	643.9	9.0	675.0	22.7	635.0	9.4	94.1
636.5	6.4	643.2	6.6	666.8	19.4	636.5	6.4	95.4
637.1	6.9	633.5	6.7	620.3	18.5	637.1	6.9	102.7

645.8	8.7	652.8	8.3	676.8	21.2	645.8	8.7	95.4
647.5	7.2	650.3	7.7	659.9	24.0	647.5	7.2	98.1
648.1	6.8	646.1	6.7	639.2	18.9	648.1	6.8	101.4
649.7	7.0	661.6	8.1	702.1	25.7	649.7	7.0	92.5
654.5	7.2	657.2	8.1	666.4	25.9	654.5	7.2	98.2
658.2	5.7	659.1	5.9	662.2	17.0	658.2	5.7	99.4
661.9	10.3	666.3	11.3	681.6	34.7	661.9	10.3	97.1
663.0	7.9	675.9	8.8	719.2	27.0	663.0	7.9	92.2
666.4	8.5	691.1	7.3	772.2	11.2	666.4	8.5	86.3
671.0	5.2	685.5	6.4	733.2	21.3	671.0	5.2	91.5
673.3	6.7	682.2	6.7	711.8	18.2	673.3	6.7	94.6
673.4	6.9	678.2	6.0	694.4	12.1	673.4	6.9	97.0
674.3	7.7	683.8	7.1	715.2	16.3	674.3	7.7	94.3
686.4	8.5	709.9	7.9	784.6	17.4	686.4	8.5	87.5
689.0	8.3	694.5	7.4	712.5	16.0	689.0	8.3	96.7
691.8	6.4	707.0	7.1	755.5	21.3	691.8	6.4	91.6
694.4	7.2	700.2	8.0	718.7	24.3	694.4	7.2	96.6
710.5	7.3	720.4	6.8	751.4	15.7	710.5	7.3	94.6
716.6	7.3	724.8	7.1	750.4	18.3	716.6	7.3	95.5
731.2	7.0	733.3	8.4	739.7	26.5	731.2	7.0	98.9
757.9	8.5	774.6	10.4	823.0	31.5	757.9	8.5	92.1
789.4	8.6	806.5	13.3	853.9	43.4	789.4	8.6	92.5
793.9	7.4	801.2	7.8	821.4	20.7	793.9	7.4	96.7
895.4	6.7	896.5	6.8	899.2	16.7	895.4	6.7	99.6
976.9	13.7	963.9	11.6	934.4	22.5	934.4	22.5	104.5
936.5	11.0	941.1	8.9	951.9	14.4	951.9	14.4	98.4
951.4	7.8	955.6	6.8	965.3	13.1	965.3	13.1	98.6
971.0	9.7	976.3	9.2	988.2	20.2	988.2	20.2	98.3
947.2	10.6	961.4	9.3	994.1	18.2	994.1	18.2	95.3
867.7	13.7	907.4	13.1	1005.1	28.3	1005.1	28.3	86.3
971.9	12.8	983.6	11.4	1009.7	22.6	1009.7	22.6	96.3
975.8	9.4	987.5	7.8	1013.5	13.5	1013.5	13.5	96.3
999.4	12.6	1004.0	10.8	1014.1	20.5	1014.1	20.5	98.5
1023.0	12.4	1020.5	10.3	1015.2	18.6	1015.2	18.6	100.8
976.7	8.4	989.4	7.1	1017.5	12.8	1017.5	12.8	96.0
1027.1	8.1	1024.5	6.7	1019.0	11.9	1019.0	11.9	100.8
1023.3	13.5	1023.5	11.1	1023.8	19.6	1023.8	19.6	100.0
1053.9	12.8	1044.4	10.6	1024.7	19.3	1024.7	19.3	102.9
1066.3	12.5	1057.4	9.6	1039.0	14.5	1039.0	14.5	102.6
990.1	10.9	1007.1	9.4	1044.3	17.3	1044.3	17.3	94.8
1038.1	12.5	1040.8	10.4	1046.6	18.7	1046.6	18.7	99.2
1052.4	10.6	1050.9	8.5	1047.8	14.3	1047.8	14.3	100.4
973.8	12.1	998.7	10.3	1053.7	18.5	1053.7	18.5	92.4

1013.9	9.3	1030.1	8.3	1064.8	16.0	1064.8	16.0	95.2
1012.8	9.4	1029.6	8.1	1065.3	15.1	1065.3	15.1	95.1
1044.6	12.0	1055.2	9.4	1077.1	14.5	1077.1	14.5	97.0
1050.6	15.5	1061.9	13.1	1085.2	23.5	1085.2	23.5	96.8
1070.1	11.1	1077.0	9.6	1091.1	18.1	1091.1	18.1	98.1
1023.6	12.6	1045.3	11.7	1091.1	23.8	1091.1	23.8	93.8
1118.4	14.6	1122.2	11.2	1129.5	16.6	1129.5	16.6	99.0
948.1	12.4	1007.1	13.8	1137.9	32.4	1137.9	32.4	83.3
1101.2	11.2	1114.6	9.5	1140.9	17.2	1140.9	17.2	96.5
1147.7	10.5	1146.4	8.1	1144.0	12.6	1144.0	12.6	100.3
1096.8	10.6	1112.8	10.9	1144.2	24.4	1144.2	24.4	95.9
1149.7	10.8	1148.7	8.5	1146.9	14.0	1146.9	14.0	100.2
1171.2	14.9	1163.5	11.3	1149.1	16.8	1149.1	16.8	101.9
1094.6	15.9	1114.1	12.9	1152.5	21.4	1152.5	21.4	95.0
1115.3	17.5	1128.1	13.2	1152.7	17.9	1152.7	17.9	96.8
1188.6	14.4	1188.0	11.1	1186.7	16.8	1186.7	16.8	100.2
1152.5	10.4	1164.5	9.2	1186.8	17.8	1186.8	17.8	97.1
1215.1	11.5	1208.7	10.1	1197.2	19.3	1197.2	19.3	101.5
1234.2	14.3	1221.9	11.3	1200.4	18.8	1200.4	18.8	102.8
1155.6	18.6	1172.2	13.9	1202.9	18.9	1202.9	18.9	96.1
1165.0	11.6	1178.7	10.2	1203.9	19.1	1203.9	19.1	96.8
1252.0	9.8	1244.5	7.6	1231.5	12.0	1231.5	12.0	101.7
1117.3	14.8	1162.0	21.4	1246.2	53.5	1246.2	53.5	89.7
1242.2	11.0	1245.1	9.1	1250.0	15.9	1250.0	15.9	99.4
1203.2	14.6	1234.0	11.1	1288.2	15.8	1288.2	15.8	93.4
1263.5	12.4	1301.0	11.1	1363.5	20.5	1363.5	20.5	92.7
1449.2	13.4	1451.7	9.2	1455.3	11.1	1455.3	11.1	99.6
1455.7	13.7	1459.1	9.6	1464.0	12.4	1464.0	12.4	99.4
1431.4	13.1	1452.4	10.3	1483.1	16.3	1483.1	16.3	96.5
1453.8	19.2	1468.9	13.1	1490.8	15.2	1490.8	15.2	97.5
1424.3	14.6	1454.4	11.4	1498.6	17.8	1498.6	17.8	95.0
1614.7	16.3	1611.1	11.7	1606.3	16.5	1606.3	16.5	100.5
1586.8	16.1	1598.0	11.2	1612.7	14.6	1612.7	14.6	98.4
1496.4	23.6	1557.2	14.9	1640.6	11.3	1640.6	11.3	91.2
1645.3	19.3	1646.1	12.1	1647.1	12.2	1647.1	12.2	99.9
1653.8	18.1	1652.3	11.7	1650.4	13.3	1650.4	13.3	100.2
1607.1	15.8	1630.8	10.5	1661.6	12.3	1661.6	12.3	96.7
1535.8	14.6	1590.1	11.6	1662.9	17.9	1662.9	17.9	92.4
1622.4	23.7	1644.0	15.4	1671.7	17.1	1671.7	17.1	97.1
1710.4	17.3	1717.4	11.1	1726.0	12.7	1726.0	12.7	99.1
1637.6	15.5	1686.2	11.4	1747.1	16.1	1747.1	16.1	93.7
1763.1	16.3	1759.8	10.0	1755.8	10.3	1755.8	10.3	100.4
1759.4	16.3	1758.1	11.1	1756.6	14.6	1756.6	14.6	100.2

1747.7	16.0	1757.8	11.5	1769.8	16.2	1769.8	16.2	98.7
1739.7	15.7	1757.1	10.5	1777.9	13.2	1777.9	13.2	97.8
1675.2	14.5	1728.8	10.1	1794.3	13.2	1794.3	13.2	93.4
1813.6	20.4	1808.7	12.1	1803.1	11.3	1803.1	11.3	100.6
1830.0	21.9	1843.4	13.0	1858.5	12.2	1858.5	12.2	98.5
1800.9	22.6	1830.3	14.3	1863.9	16.1	1863.9	16.1	96.6
1849.1	17.4	1877.3	12.4	1908.6	17.2	1908.6	17.2	96.9
1901.6	25.2	1908.9	14.4	1916.8	11.9	1916.8	11.9	99.2
1917.6	26.2	1930.7	14.7	1944.7	11.4	1944.7	11.4	98.6
1883.9	23.0	1926.0	14.2	1971.5	15.2	1971.5	15.2	95.6
1830.8	13.2	1900.3	9.2	1977.0	12.1	1977.0	12.1	92.6
1985.7	25.3	1984.2	13.8	1982.5	10.2	1982.5	10.2	100.2
1831.4	20.5	1911.7	22.3	1999.9	40.0	1999.9	40.0	91.6
1947.2	15.6	1979.2	8.9	2012.8	7.4	2012.8	7.4	96.7
1919.2	21.9	1973.3	12.9	2030.4	12.0	2030.4	12.0	94.5
2036.6	26.6	2047.4	14.6	2058.4	11.6	2058.4	11.6	98.9
2076.9	26.4	2071.0	14.8	2065.2	13.5	2065.2	13.5	100.6
2133.7	21.4	2099.2	11.9	2065.5	11.5	2065.5	11.5	103.3
2077.4	23.3	2073.8	13.2	2070.3	12.7	2070.3	12.7	100.3
2153.7	24.3	2114.0	13.7	2075.5	13.9	2075.5	13.9	103.8
1996.5	20.5	2037.2	12.6	2078.6	13.9	2078.6	13.9	96.1
2182.9	15.6	2132.4	9.2	2084.1	10.4	2084.1	10.4	104.7
2131.3	16.3	2108.5	9.2	2086.2	9.0	2086.2	9.0	102.2
2144.2	22.3	2117.5	11.8	2091.6	9.1	2091.6	9.1	102.5
2047.2	29.6	2070.6	16.6	2094.0	14.5	2094.0	14.5	97.8
2085.2	21.9	2089.7	12.2	2094.1	10.7	2094.1	10.7	99.6
2105.9	21.0	2100.7	12.1	2095.7	12.3	2095.7	12.3	100.5
2060.9	27.2	2084.3	15.4	2107.5	14.1	2107.5	14.1	97.8
2109.8	21.3	2109.0	12.6	2108.3	13.6	2108.3	13.6	100.1
2039.5	25.0	2074.4	14.1	2109.3	12.2	2109.3	12.2	96.7
2152.2	20.1	2133.3	11.9	2115.2	13.4	2115.2	13.4	101.7
2023.3	24.3	2071.5	13.4	2119.7	10.1	2119.7	10.1	95.5
2015.6	14.9	2068.8	9.6	2122.2	11.8	2122.2	11.8	95.0
2053.2	18.2	2088.6	10.5	2123.8	10.0	2123.8	10.0	96.7
2108.7	18.6	2116.5	10.4	2124.1	9.3	2124.1	9.3	99.3
2050.5	14.9	2091.5	11.5	2132.1	17.2	2132.1	17.2	96.2
2079.0	24.2	2106.1	15.4	2132.7	18.7	2132.7	18.7	97.5
2144.8	22.0	2141.1	12.1	2137.4	10.9	2137.4	10.9	100.3
2180.5	22.8	2162.2	13.9	2144.9	16.7	2144.9	16.7	101.7
2064.5	19.9	2109.7	11.3	2154.0	10.4	2154.0	10.4	95.8
2149.2	14.8	2152.0	11.0	2154.6	16.1	2154.6	16.1	99.7
2086.8	25.9	2124.8	14.2	2161.8	11.6	2161.8	11.6	96.5
2223.5	22.5	2194.5	11.9	2167.4	9.9	2167.4	9.9	102.6

2076.6	25.8	2134.0	14.9	2189.6	14.2	2189.6	14.2	94.8
2257.2	30.9	2234.1	16.6	2213.0	15.1	2213.0	15.1	102.0
2164.9	21.9	2202.9	13.1	2238.4	14.4	2238.4	14.4	96.7
2054.9	21.4	2152.4	14.5	2246.7	18.7	2246.7	18.7	91.5
1949.5	17.8	2110.8	15.8	2271.8	24.7	2271.8	24.7	85.8
2301.4	19.3	2380.0	11.8	2448.0	13.7	2448.0	13.7	94.0
2569.6	24.5	2543.3	13.1	2522.4	13.3	2522.4	13.3	101.9
2613.8	22.8	2586.1	11.0	2564.4	8.6	2564.4	8.6	101.9
2475.6	26.0	2541.9	13.3	2595.2	11.0	2595.2	11.0	95.4
2800.4	34.5	2727.7	16.5	2674.2	14.4	2674.2	14.4	104.7
2722.4	23.7	2705.3	11.0	2692.6	7.6	2692.6	7.6	101.1
2810.0	31.7	2768.4	15.8	2738.2	15.1	2738.2	15.1	102.6
2735.3	34.8	2758.3	17.6	2775.2	16.6	2775.2	16.6	98.6
2817.2	28.6	2857.8	13.4	2886.5	10.2	2886.5	10.2	97.6
2764.6	36.0	3059.7	17.3	3259.6	12.5	3259.6	12.5	84.8

RF5

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
337.2	4.4	343.4	5.8	385.9	32.5	337.2	4.4	NA
337.9	5.3	338.3	5.0	340.7	16.2	337.9	5.3	NA
345.0	4.5	343.4	4.5	332.6	17.1	345.0	4.5	NA
354.9	4.4	350.0	4.4	318.1	16.5	354.9	4.4	NA
366.2	5.1	364.9	5.1	356.5	19.3	366.2	5.1	NA
382.6	4.7	370.1	5.8	293.0	31.9	382.6	4.7	NA
383.2	3.9	382.9	6.8	380.7	42.0	383.2	3.9	NA
391.8	4.5	387.6	4.3	362.4	14.3	391.8	4.5	NA
394.0	4.6	398.8	5.4	426.3	24.6	394.0	4.6	NA
402.6	4.9	406.1	5.5	425.9	23.6	402.6	4.9	94.5
416.3	5.4	424.1	5.2	466.9	15.1	416.3	5.4	89.2
418.2	3.7	419.2	3.8	424.5	14.7	418.2	3.7	98.5
419.8	4.2	417.9	4.8	407.1	21.3	419.8	4.2	103.1
424.8	4.8	425.9	5.2	432.0	21.0	424.8	4.8	98.4
429.9	5.2	427.0	5.2	411.4	17.5	429.9	5.2	104.5
453.4	4.6	454.2	5.3	458.1	21.9	453.4	4.6	99.0
457.6	5.5	458.6	6.0	463.5	23.0	457.6	5.5	98.7
458.9	4.7	456.8	4.6	446.3	14.7	458.9	4.7	102.8
465.1	6.0	462.3	6.5	448.2	24.8	465.1	6.0	103.8
473.0	4.4	473.2	4.8	474.3	18.7	473.0	4.4	99.7
473.1	5.4	486.6	5.8	550.5	19.5	473.1	5.4	85.9
484.1	4.3	484.4	4.6	485.4	16.1	484.1	4.3	99.7

486.5	5.3	488.3	6.4	496.3	26.5	486.5	5.3	98.0
512.7	8.0	511.8	7.6	507.4	21.3	512.7	8.0	101.1
513.9	5.9	516.0	5.8	525.5	17.2	513.9	5.9	97.8
515.3	6.6	516.8	6.3	523.1	17.9	515.3	6.6	98.5
533.1	8.6	548.9	8.3	614.9	21.0	533.1	8.6	86.7
539.4	5.1	539.2	6.2	538.4	24.3	539.4	5.1	100.2
542.8	5.5	541.4	5.3	535.9	15.2	542.8	5.5	101.3
546.4	5.4	543.6	5.3	531.9	15.4	546.4	5.4	102.7
548.7	5.6	553.5	6.2	573.3	21.3	548.7	5.6	95.7
560.2	5.8	582.4	6.4	669.9	20.1	560.2	5.8	83.6
562.9	5.0	568.1	6.0	589.0	21.8	562.9	5.0	95.6
567.4	6.0	565.9	5.8	559.8	16.7	567.4	6.0	101.3
574.9	5.9	574.8	5.5	574.6	13.7	574.9	5.9	100.1
576.3	5.6	573.3	6.1	561.2	20.9	576.3	5.6	102.7
577.8	7.1	579.9	6.9	588.5	19.5	577.8	7.1	98.2
580.0	5.6	584.4	5.8	601.5	18.2	580.0	5.6	96.4
581.1	6.6	589.9	6.6	624.2	18.7	581.1	6.6	93.1
582.9	10.8	591.2	9.2	623.1	15.6	582.9	10.8	93.5
587.1	6.8	592.0	6.7	611.1	18.9	587.1	6.8	96.1
601.1	6.5	605.9	7.0	624.2	22.2	601.1	6.5	96.3
612.7	4.6	608.1	5.4	591.0	19.0	612.7	4.6	103.7
615.1	5.4	611.5	5.0	598.3	12.7	615.1	5.4	102.8
615.7	9.5	621.0	10.7	640.4	35.1	615.7	9.5	96.1
620.7	9.4	620.1	8.1	617.8	15.5	620.7	9.4	100.5
623.1	8.0	628.3	8.0	647.0	22.7	623.1	8.0	96.3
624.9	6.0	624.2	6.0	621.6	16.8	624.9	6.0	100.5
639.7	7.6	645.5	7.1	666.0	17.5	639.7	7.6	96.1
641.5	8.5	635.7	7.7	615.1	18.5	641.5	8.5	104.3
644.4	6.8	641.0	7.1	628.9	21.7	644.4	6.8	102.5
648.0	6.1	648.5	5.9	650.3	15.5	648.0	6.1	99.6
648.4	7.3	649.7	6.9	654.2	17.3	648.4	7.3	99.1
651.1	6.5	654.9	7.6	668.1	25.0	651.1	6.5	97.4
691.6	7.7	690.5	8.0	686.8	23.1	691.6	7.7	100.7
726.6	31.2	736.2	25.0	765.4	30.6	726.6	31.2	94.9
737.7	8.4	752.9	7.2	798.2	13.4	737.7	8.4	92.4
739.1	9.4	747.6	8.3	773.0	17.4	739.1	9.4	95.6
742.8	9.8	749.4	10.7	769.1	30.5	742.8	9.8	96.6
745.2	6.4	739.0	6.7	720.2	19.1	745.2	6.4	103.5
763.8	7.6	780.6	7.6	828.9	18.8	763.8	7.6	92.1
766.8	12.1	798.5	11.3	887.9	24.2	766.8	12.1	86.4
776.3	9.7	805.2	8.5	886.0	15.9	776.3	9.7	87.6
777.4	10.9	790.4	9.7	827.5	19.9	777.4	10.9	93.9
779.2	32.9	824.8	26.0	949.5	20.9	779.2	32.9	82.1

792.1	8.1	816.1	7.8	882.0	18.1	792.1	8.1	89.8
827.8	9.9	839.7	8.7	871.4	17.5	827.8	9.9	95.0
883.2	9.3	878.3	8.3	866.2	18.0	883.2	9.3	102.0
914.5	11.9	917.8	9.4	925.5	14.0	925.5	14.0	98.8
898.3	10.7	907.5	9.3	929.9	18.1	929.9	18.1	96.6
942.4	11.1	940.4	8.6	935.8	12.2	935.8	12.2	100.7
942.0	10.2	942.6	8.4	944.1	14.6	944.1	14.6	99.8
901.0	11.9	918.2	10.0	959.8	17.1	959.8	17.1	93.9
858.1	22.4	888.0	17.5	963.5	19.8	963.5	19.8	89.1
961.6	10.2	963.4	8.3	967.6	14.4	967.6	14.4	99.4
959.8	12.0	966.0	10.9	980.0	22.8	980.0	22.8	97.9
969.1	9.5	975.2	8.7	988.9	18.6	988.9	18.6	98.0
920.5	12.4	941.0	10.3	989.3	17.8	989.3	17.8	93.0
900.2	11.6	926.4	9.8	989.3	16.9	989.3	16.9	91.0
912.9	10.2	936.6	8.4	992.6	13.5	992.6	13.5	92.0
994.7	9.9	994.4	8.3	993.7	15.1	993.7	15.1	100.1
1033.8	10.2	1021.9	10.2	996.4	23.5	996.4	23.5	103.8
957.9	12.9	970.4	11.0	998.6	20.0	998.6	20.0	95.9
963.1	9.7	975.2	8.8	1002.4	18.4	1002.4	18.4	96.1
953.1	15.7	969.3	13.1	1006.2	23.0	1006.2	23.0	94.7
950.5	11.1	968.1	10.8	1008.1	23.8	1008.1	23.8	94.3
1034.3	11.5	1026.2	8.9	1008.9	13.7	1008.9	13.7	102.5
1027.3	9.4	1021.5	7.5	1009.0	12.4	1009.0	12.4	101.8
879.3	12.2	917.2	10.4	1009.5	17.6	1009.5	17.6	87.1
991.8	10.9	999.2	10.2	1015.6	22.2	1015.6	22.2	97.7
973.9	10.4	987.5	8.5	1018.0	14.4	1018.0	14.4	95.7
1029.7	9.4	1027.0	8.4	1021.1	17.0	1021.1	17.0	100.8
996.5	11.4	1004.2	9.3	1021.2	15.9	1021.2	15.9	97.6
1064.6	10.4	1050.7	8.1	1021.8	12.8	1021.8	12.8	104.2
966.5	12.3	984.3	10.2	1024.1	17.6	1024.1	17.6	94.4
989.5	10.0	1001.8	9.0	1028.6	18.4	1028.6	18.4	96.2
1038.2	9.2	1036.2	7.9	1032.1	15.3	1032.1	15.3	100.6
1000.7	11.3	1011.1	8.5	1033.9	10.8	1033.9	10.8	96.8
1041.2	8.1	1038.9	6.7	1034.0	11.7	1034.0	11.7	100.7
1045.8	10.1	1044.1	8.2	1040.6	14.0	1040.6	14.0	100.5
1063.2	11.9	1056.6	9.8	1042.9	17.8	1042.9	17.8	101.9
1065.2	19.3	1058.2	14.3	1043.9	18.8	1043.9	18.8	102.0
1008.0	11.5	1020.7	9.2	1048.1	14.6	1048.1	14.6	96.2
1032.8	9.7	1037.8	7.7	1048.4	12.4	1048.4	12.4	98.5
894.8	26.3	940.5	20.3	1049.0	20.7	1049.0	20.7	85.3
1008.9	9.5	1022.3	7.5	1051.1	11.5	1051.1	11.5	96.0
1060.8	9.1	1058.0	8.2	1052.2	16.6	1052.2	16.6	100.8
1086.0	12.2	1075.1	9.3	1053.2	14.0	1053.2	14.0	103.1

1066.4	11.8	1062.4	9.3	1054.2	14.9	1054.2	14.9	101.2
961.7	14.3	990.6	11.6	1055.2	17.8	1055.2	17.8	91.1
1030.5	9.6	1039.1	7.8	1057.3	12.9	1057.3	12.9	97.5
1092.5	9.1	1081.3	8.3	1058.8	17.3	1058.8	17.3	103.2
1026.0	13.0	1036.7	10.3	1059.5	16.3	1059.5	16.3	96.8
1079.1	13.0	1072.7	9.9	1059.7	14.3	1059.7	14.3	101.8
1102.4	17.7	1088.7	13.8	1061.5	22.2	1061.5	22.2	103.9
1045.7	10.5	1050.9	12.9	1061.8	33.2	1061.8	33.2	98.5
1044.2	13.1	1050.1	10.0	1062.3	14.1	1062.3	14.1	98.3
954.8	11.0	988.0	10.4	1062.4	21.5	1062.4	21.5	89.9
1042.2	10.7	1049.1	9.4	1063.4	18.3	1063.4	18.3	98.0
1081.0	10.8	1075.9	8.0	1065.6	10.5	1065.6	10.5	101.5
1099.1	11.9	1089.8	9.5	1071.4	16.1	1071.4	16.1	102.6
1031.6	11.0	1047.2	8.6	1079.8	12.7	1079.8	12.7	95.5
1105.9	8.2	1100.7	7.3	1090.2	14.4	1090.2	14.4	101.4
987.0	16.3	1021.5	13.7	1096.0	23.3	1096.0	23.3	90.1
1142.8	13.9	1128.6	9.8	1101.3	11.2	1101.3	11.2	103.8
985.0	15.6	1022.0	12.1	1102.2	15.7	1102.2	15.7	89.4
1014.8	24.0	1044.8	17.4	1107.9	15.9	1107.9	15.9	91.6
1166.6	11.2	1147.6	8.1	1111.8	11.0	1111.8	11.0	104.9
1172.4	15.0	1153.5	11.0	1118.3	15.4	1118.3	15.4	104.8
1128.4	12.1	1125.4	9.0	1119.5	12.3	1119.5	12.3	100.8
1123.0	10.7	1122.0	8.5	1120.0	13.8	1120.0	13.8	100.3
1119.3	11.6	1119.9	8.9	1121.1	13.5	1121.1	13.5	99.8
1136.5	20.2	1133.8	13.6	1128.6	9.5	1128.6	9.5	100.7
1163.8	9.9	1153.7	9.4	1134.9	19.8	1134.9	19.8	102.5
1182.7	10.8	1166.3	8.7	1135.8	15.1	1135.8	15.1	104.1
1168.7	9.2	1158.5	7.3	1139.4	12.2	1139.4	12.2	102.6
1085.9	11.3	1104.7	8.9	1141.8	13.2	1141.8	13.2	95.1
1151.1	10.9	1151.9	9.4	1153.4	17.8	1153.4	17.8	99.8
1116.4	10.8	1130.3	8.1	1157.1	11.1	1157.1	11.1	96.5
1176.2	10.7	1170.1	8.8	1158.9	15.3	1158.9	15.3	101.5
1113.1	15.6	1129.6	11.4	1161.5	13.9	1161.5	13.9	95.8
1068.6	16.7	1099.7	13.3	1161.7	20.0	1161.7	20.0	92.0
941.3	17.7	1010.0	13.8	1162.1	14.9	1162.1	14.9	81.0
1202.3	8.5	1192.7	6.9	1175.4	11.8	1175.4	11.8	102.3
1129.1	12.6	1145.8	10.0	1177.6	15.6	1177.6	15.6	95.9
1137.6	14.5	1157.6	11.0	1195.2	15.3	1195.2	15.3	95.2
1156.7	17.7	1173.8	12.7	1205.6	14.0	1205.6	14.0	95.9
1198.8	10.1	1202.4	7.9	1208.9	12.5	1208.9	12.5	99.2
1203.0	14.3	1211.7	10.2	1227.1	12.5	1227.1	12.5	98.0
1161.4	27.9	1186.2	20.4	1231.6	24.8	1231.6	24.8	94.3
1140.7	13.4	1177.5	11.7	1245.6	21.2	1245.6	21.2	91.6

1083.2	14.9	1146.2	11.3	1267.5	13.3	1267.5	13.3	85.5
1222.3	16.5	1242.2	12.0	1276.8	15.1	1276.8	15.1	95.7
1078.4	17.9	1146.2	13.6	1276.9	16.0	1276.9	16.0	84.5
1307.4	11.1	1298.5	9.1	1283.9	16.1	1283.9	16.1	101.8
1257.3	14.1	1267.3	9.7	1284.2	10.3	1284.2	10.3	97.9
1261.5	13.7	1271.9	12.0	1289.6	22.5	1289.6	22.5	97.8
1141.3	21.4	1196.4	19.0	1297.3	34.1	1297.3	34.1	88.0
1217.5	12.4	1250.7	9.5	1308.3	13.9	1308.3	13.9	93.1
1346.5	11.6	1332.8	8.7	1310.8	13.2	1310.8	13.2	102.7
1316.9	11.2	1317.1	9.2	1317.3	16.1	1317.3	16.1	100.0
1386.8	14.5	1362.0	9.9	1323.3	11.9	1323.3	11.9	104.8
1256.2	13.6	1282.5	10.6	1326.8	16.1	1326.8	16.1	94.7
1213.8	12.7	1256.4	9.3	1330.1	11.4	1330.1	11.4	91.3
1282.5	16.5	1300.8	11.6	1331.2	13.5	1331.2	13.5	96.3
1269.0	18.6	1295.8	13.2	1340.3	15.5	1340.3	15.5	94.7
1398.3	19.3	1379.4	13.2	1350.2	16.2	1350.2	16.2	103.6
1333.0	11.7	1342.1	9.5	1356.5	16.0	1356.5	16.0	98.3
1421.5	13.5	1400.4	10.8	1368.5	18.2	1368.5	18.2	103.9
1104.7	14.4	1198.5	25.6	1371.7	64.5	1371.7	64.5	80.5
1394.5	12.6	1388.3	8.6	1378.8	10.3	1378.8	10.3	101.1
1338.9	13.1	1355.9	9.6	1382.7	13.4	1382.7	13.4	96.8
1312.7	22.2	1346.3	15.2	1400.2	15.5	1400.2	15.5	93.7
1373.2	12.4	1384.3	9.4	1401.3	13.9	1401.3	13.9	98.0
1406.6	11.9	1405.9	9.0	1404.8	13.6	1404.8	13.6	100.1
1312.9	13.3	1348.4	9.5	1405.1	11.8	1405.1	11.8	93.4
1311.5	19.9	1347.7	15.5	1405.7	23.5	1405.7	23.5	93.3
1413.1	12.8	1414.3	9.3	1416.1	13.1	1416.1	13.1	99.8
1410.8	19.0	1413.2	12.5	1416.8	13.0	1416.8	13.0	99.6
1409.8	13.2	1416.0	9.7	1425.3	13.8	1425.3	13.8	98.9
1465.8	17.2	1459.1	12.3	1449.3	17.3	1449.3	17.3	101.1
1432.1	11.9	1441.2	8.1	1454.6	9.3	1454.6	9.3	98.4
1390.2	17.6	1416.6	11.9	1456.4	13.0	1456.4	13.0	95.5
1466.6	17.5	1463.4	11.6	1458.8	12.9	1458.8	12.9	100.5
1527.2	9.2	1502.8	7.4	1468.7	12.4	1468.7	12.4	104.0
1399.2	24.6	1427.2	16.2	1469.2	15.1	1469.2	15.1	95.2
1390.3	15.3	1422.2	10.2	1470.3	10.1	1470.3	10.1	94.6
1491.2	18.9	1485.6	12.7	1477.6	15.0	1477.6	15.0	100.9
1526.6	12.6	1506.8	9.2	1479.2	13.6	1479.2	13.6	103.2
1465.3	19.8	1473.3	13.4	1485.0	15.9	1485.0	15.9	98.7
1446.7	12.7	1474.0	8.9	1513.5	11.1	1513.5	11.1	95.6
1596.0	17.5	1565.0	12.4	1523.4	17.8	1523.4	17.8	104.8
1507.4	18.4	1519.2	11.9	1535.7	11.8	1535.7	11.8	98.2
1481.9	13.8	1511.7	9.7	1553.8	12.2	1553.8	12.2	95.4

1477.5	19.4	1511.0	12.8	1558.3	13.0	1558.3	13.0	94.8
1598.4	16.7	1587.3	10.9	1572.5	12.4	1572.5	12.4	101.7
1579.8	21.2	1590.8	12.9	1605.3	10.4	1605.3	10.4	98.4
1645.6	16.0	1630.7	10.2	1611.5	11.3	1611.5	11.3	102.1
1424.5	19.3	1501.5	16.9	1611.9	28.8	1611.9	28.8	88.4
1312.0	26.5	1432.4	17.8	1616.0	11.6	1616.0	11.6	81.2
1682.2	15.6	1656.6	9.7	1624.2	10.1	1624.2	10.1	103.6
1624.0	18.6	1625.1	11.1	1626.6	8.6	1626.6	8.6	99.8
1578.8	14.4	1601.5	9.8	1631.5	12.3	1631.5	12.3	96.8
1620.9	21.1	1626.0	13.1	1632.6	12.5	1632.6	12.5	99.3
1593.2	16.8	1613.2	11.0	1639.4	12.2	1639.4	12.2	97.2
1624.3	17.4	1631.3	11.3	1640.2	12.8	1640.2	12.8	99.0
1621.7	15.9	1631.1	11.3	1643.2	15.5	1643.2	15.5	98.7
1558.8	20.6	1595.4	12.8	1644.1	10.8	1644.1	10.8	94.8
1701.5	16.1	1681.7	10.7	1657.0	13.6	1657.0	13.6	102.7
1450.9	14.6	1537.9	10.0	1659.6	10.8	1659.6	10.8	87.4
1682.1	17.0	1679.8	10.8	1677.0	11.9	1677.0	11.9	100.3
1683.1	29.1	1682.4	17.1	1681.6	12.6	1681.6	12.6	100.1
1673.1	19.9	1678.0	12.8	1684.0	14.5	1684.0	14.5	99.4
1671.7	12.0	1691.4	8.7	1715.8	12.1	1715.8	12.1	97.4
1695.6	14.5	1709.7	9.0	1727.0	9.0	1727.0	9.0	98.2
1703.0	15.7	1714.1	10.0	1727.7	11.1	1727.7	11.1	98.6
1724.3	20.7	1731.6	12.5	1740.4	11.4	1740.4	11.4	99.1
1748.8	14.6	1750.8	9.2	1753.2	10.0	1753.2	10.0	99.8
1738.0	17.3	1749.2	10.7	1762.7	11.1	1762.7	11.1	98.6
1678.7	17.5	1716.9	10.9	1763.7	10.4	1763.7	10.4	95.2
1703.4	20.9	1735.8	12.9	1775.0	12.2	1775.0	12.2	96.0
1796.9	13.7	1788.8	9.0	1779.4	11.2	1779.4	11.2	101.0
1579.9	16.8	1670.6	12.5	1786.4	17.2	1786.4	17.2	88.4
1781.7	19.6	1784.8	12.2	1788.5	13.1	1788.5	13.1	99.6
1860.7	24.7	1832.3	14.1	1800.2	11.9	1800.2	11.9	103.4
1716.3	17.7	1763.0	11.5	1818.6	12.8	1818.6	12.8	94.4
1771.8	22.7	1805.7	14.0	1845.1	14.1	1845.1	14.1	96.0
1839.5	22.3	1845.2	13.7	1851.7	14.3	1851.7	14.3	99.3
1895.7	17.3	1886.0	12.1	1875.2	17.0	1875.2	17.0	101.1
1728.9	23.5	1804.6	13.9	1893.1	9.9	1893.1	9.9	91.3
1901.3	21.7	1913.8	12.8	1927.3	12.6	1927.3	12.6	98.6
1991.0	27.7	1980.2	15.4	1968.9	12.8	1968.9	12.8	101.1
2089.4	26.0	2044.2	14.7	1998.9	14.6	1998.9	14.6	104.5
2000.9	17.4	2005.9	10.2	2011.1	10.3	2011.1	10.3	99.5
1999.3	17.4	2011.8	12.0	2024.6	16.5	2024.6	16.5	98.7
1986.5	16.4	2013.3	9.7	2040.8	9.8	2040.8	9.8	97.3
1930.2	16.7	1984.7	10.3	2042.0	11.2	2042.0	11.2	94.5

1995.8	21.0	2028.8	14.7	2062.6	20.2	2062.6	20.2	96.8
2029.9	20.5	2055.8	11.7	2081.9	10.6	2081.9	10.6	97.5
1998.1	20.1	2044.2	13.1	2091.1	16.1	2091.1	16.1	95.5
1906.5	16.6	1998.4	10.8	2094.8	12.7	2094.8	12.7	91.0
2071.0	22.6	2109.6	12.7	2147.5	11.3	2147.5	11.3	96.4
2191.8	21.8	2186.3	11.8	2181.1	10.4	2181.1	10.4	100.5
2076.9	19.4	2135.3	19.0	2191.9	31.7	2191.9	31.7	94.8
2363.6	29.8	2404.3	16.3	2438.9	15.9	2438.9	15.9	96.9
2629.9	27.8	2611.6	14.3	2597.4	13.5	2597.4	13.5	101.2
2635.0	21.4	2629.4	11.0	2625.1	10.4	2625.1	10.4	100.4
2632.9	23.5	2632.9	12.2	2632.9	11.7	2632.9	11.7	100.0
2338.1	27.5	2512.5	14.8	2656.6	12.4	2656.6	12.4	88.0
2375.8	47.3	2550.5	23.4	2692.4	13.2	2692.4	13.2	88.2
2656.3	31.6	2683.0	15.1	2703.2	11.0	2703.2	11.0	98.3
2748.9	23.1	2724.0	12.6	2705.6	13.9	2705.6	13.9	101.6
2496.4	31.0	2625.5	15.8	2726.7	12.5	2726.7	12.5	91.6
2652.0	26.8	2715.5	13.8	2763.0	12.8	2763.0	12.8	96.0
2938.1	24.0	2886.2	11.7	2850.1	10.9	2850.1	10.9	103.1
2479.8	42.3	2705.3	42.4	2878.4	64.9	2878.4	64.9	86.2
2857.6	30.5	2914.0	14.6	2953.2	12.2	2953.2	12.2	96.8
3013.7	62.3	3084.9	26.8	3131.6	15.8	3131.6	15.8	96.2
3144.7	22.1	3237.6	10.4	3295.7	9.4	3295.7	9.4	95.4

RF6

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
340.7	4.5	336.6	4.9	308.4	23.4	340.7	4.5	NA
369.2	4.9	374.9	5.6	410.2	25.3	369.2	4.9	NA
373.5	4.8	371.1	5.1	356.0	22.5	373.5	4.8	NA
376.9	3.9	374.0	4.3	356.0	20.0	376.9	3.9	NA
380.3	5.0	390.0	4.9	448.2	16.1	380.3	5.0	NA
388.6	4.9	414.9	6.0	564.2	25.5	388.6	4.9	NA
393.5	4.8	398.0	5.8	424.1	27.4	393.5	4.8	NA
397.8	5.0	387.8	5.4	329.0	23.9	397.8	5.0	NA
398.5	4.7	398.7	5.5	399.9	25.4	398.5	4.7	NA
415.4	4.5	420.4	4.9	447.5	19.4	415.4	4.5	92.8
417.0	5.1	415.5	5.3	407.2	20.6	417.0	5.1	102.4
417.6	4.1	419.4	4.4	429.6	17.0	417.6	4.1	97.2
419.0	4.5	417.3	5.0	407.7	21.0	419.0	4.5	102.8
423.7	5.0	421.7	5.5	411.2	23.1	423.7	5.0	103.0
424.3	6.2	424.2	5.9	423.8	18.1	424.3	6.2	100.1
432.2	4.9	432.9	5.4	437.1	22.4	432.2	4.9	98.9

434.0	4.5	432.1	5.3	422.1	23.2	434.0	4.5	102.8
445.3	5.1	446.3	6.1	451.0	26.1	445.3	5.1	98.7
449.8	7.0	463.2	7.7	530.2	28.3	449.8	7.0	84.8
450.2	5.9	462.6	6.8	524.6	27.0	450.2	5.9	85.8
456.7	5.6	453.7	6.2	438.9	24.4	456.7	5.6	104.1
460.1	4.8	462.3	5.3	473.3	20.2	460.1	4.8	97.2
467.2	5.4	465.5	5.7	457.2	21.2	467.2	5.4	102.2
472.2	5.5	472.5	5.7	473.9	20.4	472.2	5.5	99.6
473.0	5.8	469.4	5.7	452.0	18.7	473.0	5.8	104.6
475.1	5.9	477.9	6.3	491.5	22.1	475.1	5.9	96.7
486.8	6.8	486.9	7.6	487.2	29.6	486.8	6.8	99.9
514.3	5.1	517.9	5.7	533.7	21.4	514.3	5.1	96.4
525.0	8.4	522.6	7.8	512.4	20.0	525.0	8.4	102.5
528.9	5.9	534.3	6.2	557.2	20.5	528.9	5.9	94.9
530.3	9.0	527.7	8.1	516.4	19.3	530.3	9.0	102.7
536.6	6.1	540.9	6.9	559.5	24.8	536.6	6.1	95.9
540.7	5.8	541.8	6.5	546.5	23.2	540.7	5.8	98.9
541.0	7.1	537.5	10.0	523.0	43.4	541.0	7.1	103.4
541.7	5.2	543.8	7.3	552.8	30.6	541.7	5.2	98.0
545.4	5.0	546.4	5.4	550.5	18.8	545.4	5.0	99.1
546.3	6.8	544.3	6.0	535.7	13.0	546.3	6.8	102.0
550.9	6.2	546.5	6.3	528.3	20.3	550.9	6.2	104.3
551.3	6.2	547.9	6.2	533.8	19.0	551.3	6.2	103.3
552.0	9.8	562.1	9.1	603.4	22.1	552.0	9.8	91.5
553.4	14.1	571.0	12.1	641.9	15.8	553.4	14.1	86.2
555.5	5.5	554.1	5.9	548.2	20.0	555.5	5.5	101.3
558.4	9.4	575.8	8.8	645.1	20.6	558.4	9.4	86.6
562.7	8.5	581.0	7.5	653.2	13.5	562.7	8.5	86.1
563.4	6.7	565.1	7.2	571.9	24.1	563.4	6.7	98.5
566.3	10.9	563.0	9.9	549.8	24.0	566.3	10.9	103.0
567.9	8.8	572.2	8.2	589.2	20.1	567.9	8.8	96.4
576.0	4.7	580.1	4.9	596.3	15.3	576.0	4.7	96.6
581.9	4.9	587.1	5.4	607.3	18.1	581.9	4.9	95.8
582.5	8.0	579.0	7.0	565.4	14.9	582.5	8.0	103.0
592.3	6.8	591.8	7.2	589.5	23.2	592.3	6.8	100.5
596.6	5.8	597.1	6.2	598.9	19.5	596.6	5.8	99.6
602.7	6.1	598.5	6.9	582.6	23.8	602.7	6.1	103.5
605.2	6.6	607.1	6.6	614.2	18.8	605.2	6.6	98.5
608.3	5.5	604.5	5.6	590.3	16.8	608.3	5.5	103.0
611.4	6.6	608.0	6.5	595.4	18.9	611.4	6.6	102.7
612.9	5.7	609.6	5.5	597.7	15.1	612.9	5.7	102.5
613.4	7.9	614.7	7.4	619.8	18.6	613.4	7.9	99.0
614.5	7.4	610.2	7.2	594.3	19.8	614.5	7.4	103.4

618.6	6.3	616.4	6.3	608.1	18.5	618.6	6.3	101.7
619.9	9.0	620.3	8.4	621.5	21.3	619.9	9.0	99.8
620.8	24.5	630.2	20.7	663.9	32.6	620.8	24.5	93.5
621.0	7.9	618.5	7.7	609.2	21.8	621.0	7.9	101.9
622.5	7.8	623.2	7.9	625.7	23.2	622.5	7.8	99.5
624.3	7.0	619.1	7.5	600.2	24.1	624.3	7.0	104.0
627.9	6.4	626.0	6.2	619.1	17.3	627.9	6.4	101.4
629.7	7.0	639.7	7.3	675.2	21.7	629.7	7.0	93.3
631.2	11.5	651.1	11.1	721.0	27.5	631.2	11.5	87.5
632.3	6.4	628.9	6.9	616.7	22.0	632.3	6.4	102.5
632.9	6.1	636.8	6.0	650.9	16.4	632.9	6.1	97.2
636.1	12.4	632.7	12.3	620.7	35.1	636.1	12.4	102.5
636.5	6.5	635.0	7.3	629.4	24.0	636.5	6.5	101.1
639.5	6.2	634.1	6.0	615.2	16.1	639.5	6.2	103.9
642.1	7.1	643.9	7.4	650.1	21.6	642.1	7.1	98.8
642.1	7.7	645.1	7.8	655.8	22.5	642.1	7.7	97.9
648.7	13.9	642.0	11.5	618.7	18.8	648.7	13.9	104.8
650.1	6.2	644.2	5.7	623.5	13.9	650.1	6.2	104.3
651.5	6.5	651.2	6.3	650.2	17.3	651.5	6.5	100.2
660.3	5.3	656.2	5.4	642.0	15.7	660.3	5.3	102.8
673.7	7.8	673.9	8.8	674.3	28.1	673.7	7.8	99.9
676.2	6.4	680.1	6.8	693.2	19.8	676.2	6.4	97.5
682.8	7.8	684.5	7.2	690.1	17.2	682.8	7.8	98.9
689.6	7.3	686.8	6.6	677.7	15.4	689.6	7.3	101.8
689.9	6.3	693.1	7.5	703.5	24.1	689.9	6.3	98.1
700.3	24.3	717.1	20.3	770.2	30.7	700.3	24.3	90.9
776.3	12.5	783.1	10.5	802.5	18.5	776.3	12.5	96.7
805.9	6.8	797.1	6.5	772.6	16.1	805.9	6.8	104.3
848.6	11.2	865.1	9.4	907.7	16.0	848.6	11.2	93.5
929.8	12.0	931.0	10.4	933.7	20.5	933.7	20.5	99.6
854.1	9.0	886.8	9.1	969.2	21.4	969.2	21.4	88.1
934.3	9.3	947.8	8.7	979.1	18.8	979.1	18.8	95.4
967.1	10.3	971.2	8.6	980.5	15.3	980.5	15.3	98.6
985.8	13.6	984.3	10.9	981.2	18.0	981.2	18.0	100.5
901.3	11.3	928.4	9.8	993.3	18.3	993.3	18.3	90.7
973.9	15.7	980.4	11.7	994.9	13.9	994.9	13.9	97.9
1007.3	9.5	1007.6	7.5	1008.4	12.0	1008.4	12.0	99.9
973.7	8.9	984.4	8.2	1008.4	17.0	1008.4	17.0	96.6
1042.5	8.3	1031.7	7.4	1009.0	15.2	1009.0	15.2	103.3
989.7	10.7	996.5	9.5	1011.6	19.1	1011.6	19.1	97.8
976.1	10.0	989.0	10.7	1017.7	26.2	1017.7	26.2	95.9
1021.4	12.0	1020.5	9.3	1018.6	14.1	1018.6	14.1	100.3
997.2	13.2	1006.0	11.4	1025.3	21.9	1025.3	21.9	97.3

1012.6	8.9	1016.9	7.1	1026.1	11.4	1026.1	11.4	98.7
1043.1	16.5	1038.9	12.4	1030.1	16.7	1030.1	16.7	101.3
1036.7	12.4	1035.5	10.0	1032.8	16.5	1032.8	16.5	100.4
1069.5	19.1	1057.9	15.3	1033.8	25.9	1033.8	25.9	103.5
1026.7	10.0	1029.1	8.1	1034.2	13.7	1034.2	13.7	99.3
1066.4	10.4	1056.4	9.7	1035.8	21.0	1035.8	21.0	102.9
1090.3	12.0	1073.5	9.8	1039.4	17.6	1039.4	17.6	104.9
987.1	10.3	1003.5	9.9	1039.5	21.4	1039.5	21.4	95.0
1036.3	9.0	1037.7	7.0	1040.5	10.9	1040.5	10.9	99.6
1070.9	11.7	1062.6	10.3	1045.5	20.6	1045.5	20.6	102.4
1035.7	15.0	1039.7	12.6	1048.1	22.8	1048.1	22.8	98.8
1074.8	10.4	1067.1	9.5	1051.3	19.8	1051.3	19.8	102.2
1050.8	12.0	1051.7	9.4	1053.5	14.4	1053.5	14.4	99.7
1026.0	13.2	1036.9	10.4	1059.9	15.7	1059.9	15.7	96.8
1019.8	10.9	1034.2	9.0	1064.8	15.5	1064.8	15.5	95.8
1053.6	13.6	1057.6	12.5	1065.9	25.9	1065.9	25.9	98.9
1031.1	10.8	1045.3	8.6	1075.0	13.5	1075.0	13.5	95.9
1111.6	9.8	1100.1	7.7	1077.5	12.6	1077.5	12.6	103.2
1104.1	13.1	1096.1	11.1	1080.2	21.0	1080.2	21.0	102.2
1112.9	11.6	1103.0	8.4	1083.5	10.2	1083.5	10.2	102.7
1105.2	8.7	1098.2	8.3	1084.1	17.9	1084.1	17.9	101.9
1076.7	10.2	1080.2	8.6	1087.3	16.0	1087.3	16.0	99.0
1098.2	14.4	1095.4	13.6	1089.9	28.9	1089.9	28.9	100.8
1076.6	17.5	1081.2	12.8	1090.3	15.6	1090.3	15.6	98.7
1045.9	14.9	1060.8	11.4	1091.8	15.8	1091.8	15.8	95.8
1108.7	12.4	1103.6	11.5	1093.3	24.2	1093.3	24.2	101.4
1098.7	12.1	1098.1	9.7	1096.8	15.9	1096.8	15.9	100.2
1154.7	11.7	1138.7	9.2	1108.4	15.4	1108.4	15.4	104.2
1034.7	17.9	1058.9	13.1	1109.1	13.7	1109.1	13.7	93.3
1037.3	11.3	1060.8	9.7	1109.4	17.9	1109.4	17.9	93.5
1088.7	14.0	1096.4	13.4	1111.6	28.4	1111.6	28.4	97.9
1043.5	16.5	1066.9	13.3	1115.2	20.8	1115.2	20.8	93.6
1088.7	12.3	1099.2	10.4	1120.1	18.6	1120.1	18.6	97.2
1163.9	11.0	1150.7	8.8	1126.1	14.9	1126.1	14.9	103.4
1155.3	14.5	1145.3	11.2	1126.2	17.6	1126.2	17.6	102.6
1120.1	18.0	1123.6	13.1	1130.5	15.9	1130.5	15.9	99.1
1167.3	11.7	1154.5	9.8	1130.6	17.9	1130.6	17.9	103.2
1112.0	13.4	1118.4	11.1	1130.8	19.4	1130.8	19.4	98.3
1114.6	20.1	1121.3	16.0	1134.2	26.0	1134.2	26.0	98.3
1088.5	11.5	1104.8	10.9	1136.9	22.4	1136.9	22.4	95.7
1092.1	11.7	1108.6	9.1	1141.1	13.9	1141.1	13.9	95.7
1189.1	17.1	1172.2	11.8	1141.3	12.7	1141.3	12.7	104.2
1052.7	23.4	1084.1	18.0	1147.7	24.5	1147.7	24.5	91.7

1160.2	9.4	1157.9	7.8	1153.7	13.7	1153.7	13.7	100.6
1055.0	14.3	1088.5	11.3	1156.2	16.6	1156.2	16.6	91.2
1171.2	11.4	1168.6	9.7	1163.8	18.0	1163.8	18.0	100.6
1170.9	13.3	1169.0	10.0	1165.4	14.8	1165.4	14.8	100.5
1193.9	13.1	1184.7	9.3	1167.9	11.1	1167.9	11.1	102.2
1153.2	9.9	1161.2	7.8	1176.1	12.7	1176.1	12.7	98.0
1126.7	13.9	1144.3	11.2	1177.8	18.2	1177.8	18.2	95.7
1053.8	14.2	1100.0	11.5	1192.4	17.5	1192.4	17.5	88.4
1202.4	12.8	1200.2	9.8	1196.1	15.1	1196.1	15.1	100.5
1163.7	16.4	1181.2	14.2	1213.3	26.2	1213.3	26.2	95.9
1186.0	13.3	1199.1	10.6	1222.9	17.1	1222.9	17.1	97.0
1153.6	13.4	1179.2	9.7	1226.6	10.9	1226.6	10.9	94.0
1201.8	21.2	1211.3	18.9	1228.3	36.4	1228.3	36.4	97.8
1152.5	14.1	1180.3	11.5	1231.7	18.9	1231.7	18.9	93.6
1232.0	10.8	1232.9	8.4	1234.6	13.3	1234.6	13.3	99.8
1235.0	12.3	1241.9	9.9	1253.9	16.6	1253.9	16.6	98.5
1249.3	10.7	1255.1	7.8	1265.1	10.6	1265.1	10.6	98.8
1262.8	19.4	1267.2	14.0	1274.6	18.6	1274.6	18.6	99.1
1262.5	12.6	1273.4	9.7	1291.9	14.7	1291.9	14.7	97.7
1323.6	13.7	1320.2	9.5	1314.6	11.4	1314.6	11.4	100.7
1188.1	32.7	1235.0	22.7	1317.9	19.6	1317.9	19.6	90.1
1315.4	11.7	1320.8	8.8	1329.4	12.7	1329.4	12.7	98.9
1270.6	11.3	1293.6	8.4	1332.0	11.8	1332.0	11.8	95.4
1282.0	17.3	1306.9	12.7	1347.9	16.9	1347.9	16.9	95.1
1321.7	32.2	1332.1	22.1	1349.0	24.2	1349.0	24.2	98.0
1218.3	16.4	1268.3	12.1	1354.0	15.0	1354.0	15.0	90.0
1246.6	13.5	1287.1	11.1	1355.3	18.2	1355.3	18.2	92.0
1312.2	17.3	1329.2	12.9	1356.7	18.6	1356.7	18.6	96.7
1312.5	14.8	1330.1	12.4	1358.6	21.5	1358.6	21.5	96.6
1388.9	16.0	1377.2	11.6	1359.1	16.3	1359.1	16.3	102.2
1245.0	13.7	1288.9	9.8	1362.7	11.4	1362.7	11.4	91.4
1373.7	15.0	1370.2	11.7	1364.8	18.7	1364.8	18.7	100.7
1342.4	13.8	1352.8	12.6	1369.3	24.1	1369.3	24.1	98.0
1381.3	15.6	1385.8	12.1	1392.7	19.1	1392.7	19.1	99.2
1366.7	12.2	1384.1	8.8	1410.9	11.5	1410.9	11.5	96.9
1320.9	41.6	1356.2	29.1	1412.3	33.3	1412.3	33.3	93.5
1425.3	14.9	1423.8	11.1	1421.6	16.5	1421.6	16.5	100.3
1408.3	18.9	1420.5	12.7	1438.8	13.8	1438.8	13.8	97.9
1446.3	15.9	1445.1	11.6	1443.2	16.6	1443.2	16.6	100.2
1464.3	13.2	1456.4	8.8	1444.8	10.2	1444.8	10.2	101.3
1404.7	16.8	1421.3	11.6	1446.1	14.1	1446.1	14.1	97.1
1458.0	14.1	1459.7	9.5	1462.1	10.9	1462.1	10.9	99.7
1494.9	17.2	1484.4	12.1	1469.5	16.3	1469.5	16.3	101.7

1362.7	23.4	1411.2	15.6	1485.1	14.4	1485.1	14.4	91.8
1455.8	12.0	1468.1	9.3	1485.8	14.6	1485.8	14.6	98.0
1513.9	13.5	1504.2	9.9	1490.6	14.6	1490.6	14.6	101.6
1414.2	14.4	1447.9	10.5	1497.7	14.3	1497.7	14.3	94.4
1461.6	17.8	1476.4	12.3	1497.8	15.4	1497.8	15.4	97.6
1390.9	13.2	1434.1	9.7	1498.8	13.2	1498.8	13.2	92.8
1441.6	23.6	1465.7	16.3	1500.9	19.9	1500.9	19.9	96.0
1463.2	14.4	1480.5	10.2	1505.3	13.3	1505.3	13.3	97.2
1513.6	13.5	1510.3	10.2	1505.6	15.5	1505.6	15.5	100.5
1550.8	18.6	1532.2	12.2	1506.6	14.1	1506.6	14.1	102.9
1477.2	15.8	1492.7	11.3	1514.6	15.4	1514.6	15.4	97.5
1465.9	16.6	1489.4	11.0	1523.0	11.8	1523.0	11.8	96.3
1479.4	13.0	1498.5	9.9	1525.7	14.9	1525.7	14.9	97.0
1533.6	16.4	1534.1	12.8	1534.7	20.5	1534.7	20.5	99.9
1515.4	12.1	1523.6	8.3	1535.0	10.4	1535.0	10.4	98.7
1341.9	21.4	1418.9	15.4	1536.4	18.1	1536.4	18.1	87.3
1482.7	16.2	1513.3	11.6	1556.3	15.4	1556.3	15.4	95.3
1446.3	15.8	1509.4	11.3	1599.2	14.1	1599.2	14.1	90.4
1518.6	16.2	1557.4	11.3	1610.4	14.3	1610.4	14.3	94.3
1673.1	13.5	1646.9	9.4	1613.7	12.9	1613.7	12.9	103.7
1672.1	16.5	1648.0	11.2	1617.3	15.0	1617.3	15.0	103.4
1622.8	15.1	1624.8	11.3	1627.3	17.2	1627.3	17.2	99.7
1512.0	17.3	1562.0	12.1	1630.2	15.1	1630.2	15.1	92.7
1555.1	12.4	1588.6	8.8	1633.3	11.6	1633.3	11.6	95.2
1604.0	23.5	1619.6	15.4	1639.9	17.4	1639.9	17.4	97.8
1619.5	13.6	1628.5	9.9	1640.2	14.0	1640.2	14.0	98.7
1638.4	23.0	1639.4	14.8	1640.7	16.4	1640.7	16.4	99.9
1642.3	20.9	1643.4	12.7	1644.7	10.9	1644.7	10.9	99.9
1697.8	24.1	1675.2	14.6	1647.0	14.0	1647.0	14.0	103.1
1635.9	22.0	1642.8	13.6	1651.7	12.8	1651.7	12.8	99.0
1625.1	15.7	1638.0	11.8	1654.5	17.6	1654.5	17.6	98.2
1568.1	21.6	1606.2	14.4	1656.4	16.1	1656.4	16.1	94.7
1687.1	21.0	1674.9	13.3	1659.5	14.6	1659.5	14.6	101.7
1584.9	19.7	1617.5	12.8	1660.3	13.6	1660.3	13.6	95.5
1593.5	15.0	1626.7	10.4	1670.0	13.5	1670.0	13.5	95.4
1647.0	13.2	1659.0	8.9	1674.2	11.0	1674.2	11.0	98.4
1694.9	21.2	1698.4	14.0	1702.7	17.1	1702.7	17.1	99.5
1723.2	17.4	1714.7	10.9	1704.3	11.9	1704.3	11.9	101.1
1710.4	20.8	1714.3	12.7	1719.0	12.4	1719.0	12.4	99.5
1705.2	17.0	1712.2	11.1	1720.7	13.0	1720.7	13.0	99.1
1606.0	18.2	1661.0	12.1	1731.3	13.7	1731.3	13.7	92.8
1727.4	20.8	1732.1	12.5	1737.8	11.2	1737.8	11.2	99.4
1670.7	21.0	1703.8	13.4	1744.6	14.4	1744.6	14.4	95.8

1761.1	13.6	1763.8	11.0	1767.1	17.8	1767.1	17.8	99.7
1746.6	13.0	1759.0	9.1	1773.8	12.6	1773.8	12.6	98.5
1758.3	19.0	1773.0	12.3	1790.3	14.6	1790.3	14.6	98.2
1754.6	17.9	1776.4	12.4	1802.1	16.4	1802.1	16.4	97.4
1698.2	21.9	1758.7	13.9	1831.4	14.4	1831.4	14.4	92.7
1904.9	18.7	1884.1	11.2	1861.2	11.8	1861.2	11.8	102.3
1888.5	16.3	1876.5	10.0	1863.2	10.9	1863.2	10.9	101.4
1883.2	17.1	1887.5	10.5	1892.1	11.2	1892.1	11.2	99.5
1844.0	18.2	1866.9	11.7	1892.5	13.7	1892.5	13.7	97.4
1623.4	14.9	1765.1	10.8	1937.2	13.5	1937.2	13.5	83.8
1960.3	19.3	1965.9	10.8	1971.8	8.7	1971.8	8.7	99.4
1932.9	19.5	1953.9	12.1	1976.2	13.6	1976.2	13.6	97.8
1933.5	24.5	1956.3	14.7	1980.4	15.2	1980.4	15.2	97.6
1929.1	19.0	1958.3	11.5	1989.2	12.2	1989.2	12.2	97.0
1850.6	20.8	1919.9	13.0	1995.4	13.7	1995.4	13.7	92.7
2010.5	15.9	2013.9	10.7	2017.4	14.2	2017.4	14.2	99.7
1987.2	17.7	2007.4	11.6	2028.3	14.6	2028.3	14.6	98.0
1912.9	24.0	1970.6	13.9	2031.6	11.9	2031.6	11.9	94.2
2041.8	28.4	2066.7	16.0	2091.6	13.9	2091.6	13.9	97.6
2166.7	20.9	2142.6	13.0	2119.6	15.8	2119.6	15.8	102.2
2111.6	25.6	2133.9	14.3	2155.5	12.8	2155.5	12.8	98.0
2246.3	17.3	2226.6	10.1	2208.5	11.4	2208.5	11.4	101.7
2318.6	34.6	2333.0	27.6	2345.6	41.8	2345.6	41.8	98.8
2444.0	23.1	2448.0	12.4	2451.4	12.0	2451.4	12.0	99.7
2379.0	20.8	2438.3	12.1	2488.1	13.3	2488.1	13.3	95.6
2424.8	60.6	2515.8	29.4	2590.0	16.3	2590.0	16.3	93.6
2649.2	23.4	2644.8	12.0	2641.5	11.4	2641.5	11.4	100.3
2558.4	26.7	2636.7	13.9	2697.4	12.6	2697.4	12.6	94.8
2648.7	23.2	2679.2	11.9	2702.2	11.1	2702.2	11.1	98.0
2289.9	36.2	2550.4	18.8	2764.6	11.8	2764.6	11.8	82.8
2862.8	24.3	2807.8	11.6	2768.6	10.2	2768.6	10.2	103.4
2462.5	23.1	2640.4	12.8	2779.7	12.4	2779.7	12.4	88.6
2792.9	28.3	2785.9	14.2	2780.8	13.5	2780.8	13.5	100.4
2651.0	29.8	2753.3	14.9	2829.1	12.6	2829.1	12.6	93.7
2856.2	27.9	2841.4	13.9	2830.9	13.2	2830.9	13.2	100.9

BOG1

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
286.9	20.0	385.0	23.5	1028.5	33.9	286.9	20.0	NA

301.6	6.4	307.6	6.3	354.3	21.0	301.6	6.4	NA
326.9	8.5	376.9	9.1	698.0	24.5	326.9	8.5	NA
334.3	13.7	368.1	14.0	587.8	37.2	334.3	13.7	NA
362.6	9.0	360.0	8.9	344.6	33.5	362.6	9.0	NA
366.5	12.8	368.7	11.8	384.0	29.7	366.5	12.8	NA
376.9	10.1	379.0	9.3	392.8	23.2	376.9	10.1	NA
377.6	9.4	378.3	9.1	383.3	29.4	377.6	9.4	NA
380.1	10.8	380.8	10.2	386.0	30.2	380.1	10.8	NA
400.5	8.5	408.2	8.3	452.6	24.5	400.5	8.5	88.5
400.7	10.0	405.5	9.7	433.9	29.0	400.7	10.0	92.4
410.0	7.9	409.5	7.3	407.4	19.1	410.0	7.9	100.6
411.6	10.5	409.8	9.7	400.9	26.1	411.6	10.5	102.7
416.6	8.9	421.3	8.9	448.0	30.0	416.6	8.9	93.0
417.9	10.9	424.7	9.9	462.3	21.1	417.9	10.9	90.4
418.6	7.9	427.2	8.3	474.6	30.5	418.6	7.9	88.2
419.3	13.3	416.6	12.3	402.6	33.2	419.3	13.3	104.1
419.8	8.3	426.9	8.1	466.0	24.7	419.8	8.3	90.1
420.9	12.6	420.4	11.3	418.5	25.7	420.9	12.6	100.6
426.4	9.1	426.7	8.6	429.8	25.2	426.4	9.1	99.2
427.7	9.0	437.5	9.1	490.6	29.8	427.7	9.0	87.2
430.9	10.3	430.1	9.4	426.5	23.2	430.9	10.3	101.0
433.0	11.3	430.5	10.2	418.2	24.2	433.0	11.3	103.5
435.3	11.6	438.0	10.6	453.3	24.1	435.3	11.6	96.0
440.2	9.1	441.1	8.4	447.0	22.2	440.2	9.1	98.5
440.3	11.9	439.2	11.9	434.0	39.7	440.3	11.9	101.5
441.0	8.4	446.6	8.3	476.2	25.9	441.0	8.4	92.6
446.2	10.8	451.0	9.8	476.6	21.2	446.2	10.8	93.6
446.6	10.8	445.4	9.6	440.2	20.4	446.6	10.8	101.4
448.2	10.4	445.5	9.9	432.1	30.4	448.2	10.4	103.7
453.8	11.9	463.6	10.7	513.6	20.5	453.8	11.9	88.3
455.9	12.4	457.8	11.0	468.3	22.0	455.9	12.4	97.3
462.7	13.5	460.6	11.8	451.0	21.8	462.7	13.5	102.6
472.1	12.5	472.3	11.3	473.8	26.7	472.1	12.5	99.7
472.9	9.4	474.8	8.8	485.2	23.4	472.9	9.4	97.5
490.1	14.9	491.5	14.8	498.9	46.3	490.1	14.9	98.2
499.6	12.6	509.3	11.2	554.1	21.7	499.6	12.6	90.2
500.7	11.1	504.0	11.0	519.9	33.1	500.7	11.1	96.3
505.2	13.9	505.2	12.2	506.5	23.9	505.2	13.9	99.7
561.9	13.9	570.7	13.3	607.0	35.4	561.9	13.9	92.6
567.3	16.5	569.4	14.8	578.5	33.0	567.3	16.5	98.1
597.5	11.9	609.7	10.8	656.4	23.7	597.5	11.9	91.0
604.7	14.3	615.5	12.6	656.4	24.8	604.7	14.3	92.1
624.8	12.6	624.7	10.9	625.0	21.1	624.8	12.6	100.0

628.0	16.0	632.5	13.6	649.2	23.7	628.0	16.0	96.7
650.1	13.0	648.5	11.8	644.0	27.1	650.1	13.0	101.0
660.2	14.1	669.6	12.6	702.6	26.0	660.2	14.1	94.0
665.8	18.0	659.6	15.3	639.7	29.2	665.8	18.0	104.1
686.1	14.2	690.3	12.7	704.8	27.7	686.1	14.2	97.3
695.8	15.6	697.1	12.5	702.0	15.9	695.8	15.6	99.1
698.4	16.2	710.0	13.3	747.8	18.8	698.4	16.2	93.4
733.7	23.1	736.2	18.6	744.5	25.7	733.7	23.1	98.6
801.2	16.1	792.0	13.2	766.9	22.9	801.2	16.1	104.5
851.7	18.4	858.4	14.9	876.5	23.6	851.7	18.4	97.2
948.5	18.9	939.8	14.4	920.3	20.3	920.3	20.3	103.1
961.7	26.1	953.3	19.5	934.9	24.6	934.9	24.6	102.9
951.9	21.9	950.4	16.6	947.8	21.5	947.8	21.5	100.4
940.6	21.8	946.0	16.4	959.4	18.8	959.4	18.8	98.0
962.7	20.0	963.5	15.5	966.3	22.3	966.3	22.3	99.6
967.1	18.8	966.7	14.4	966.9	19.8	966.9	19.8	100.0
1014.2	20.9	1001.7	15.5	975.3	20.3	975.3	20.3	104.0
964.1	20.6	967.9	15.8	977.6	21.6	977.6	21.6	98.6
980.5	20.3	980.8	16.6	982.4	28.7	982.4	28.7	99.8
976.7	23.1	981.3	17.6	992.5	23.2	992.5	23.2	98.4
1004.3	21.1	1000.4	16.0	992.8	21.7	992.8	21.7	101.2
944.1	21.3	958.8	16.5	993.4	22.3	993.4	22.3	95.0
975.8	25.6	981.0	19.0	993.5	21.8	993.5	21.8	98.2
963.8	24.3	973.4	18.3	995.8	22.0	995.8	22.0	96.8
981.8	21.4	987.2	16.2	1000.3	20.9	1000.3	20.9	98.2
1024.3	22.4	1016.5	17.3	1000.6	26.1	1000.6	26.1	102.4
981.3	27.3	988.4	20.5	1005.0	25.1	1005.0	25.1	97.6
998.8	24.2	1001.0	19.4	1006.5	31.8	1006.5	31.8	99.2
1029.1	21.0	1022.2	16.9	1008.3	28.4	1008.3	28.4	102.1
998.2	19.3	1001.8	15.1	1010.4	23.0	1010.4	23.0	98.8
1060.1	29.9	1043.7	21.4	1010.4	24.5	1010.4	24.5	104.9
961.8	15.6	976.6	13.1	1010.8	23.2	1010.8	23.2	95.2
1000.0	22.5	1003.4	16.7	1011.8	20.3	1011.8	20.3	98.8
992.8	18.7	999.1	14.0	1013.8	16.7	1013.8	16.7	97.9
1043.0	26.1	1033.4	20.2	1013.9	31.3	1013.9	31.3	102.9
1007.4	23.2	1009.2	17.9	1014.1	26.1	1014.1	26.1	99.3
992.9	23.5	1001.0	17.4	1019.4	19.8	1019.4	19.8	97.4
1050.6	21.2	1040.7	16.2	1020.8	23.9	1020.8	23.9	102.9
985.5	23.6	996.7	18.1	1022.2	24.3	1022.2	24.3	96.4
1051.5	22.3	1042.4	16.6	1024.2	22.2	1024.2	22.2	102.7
1016.2	25.3	1019.0	18.4	1026.1	20.0	1026.1	20.0	99.0
1002.1	26.1	1009.5	19.5	1026.5	23.6	1026.5	23.6	97.6
1020.8	21.3	1022.4	15.8	1026.7	19.1	1026.7	19.1	99.4

1074.2	25.9	1058.6	18.4	1027.5	19.6	1027.5	19.6	104.5
1031.1	23.6	1029.7	17.2	1027.6	19.1	1027.6	19.1	100.3
1013.7	21.9	1018.1	16.2	1028.6	19.1	1028.6	19.1	98.6
1059.6	27.3	1050.4	19.3	1032.3	19.5	1032.3	19.5	102.6
1007.6	23.2	1015.4	17.7	1033.1	23.8	1033.1	23.8	97.5
1001.7	24.8	1011.3	18.2	1033.1	19.8	1033.1	19.8	97.0
1013.0	28.5	1019.5	21.0	1034.2	23.8	1034.2	23.8	98.0
1004.7	20.0	1014.1	15.7	1035.2	23.5	1035.2	23.5	97.0
922.2	19.0	956.2	15.0	1036.2	19.8	1036.2	19.8	89.0
1054.8	19.3	1048.5	14.1	1036.2	17.3	1036.2	17.3	101.8
1048.2	26.1	1044.0	19.2	1036.2	23.9	1036.2	23.9	101.2
1033.1	14.3	1034.3	11.0	1037.6	16.2	1037.6	16.2	99.6
1016.7	21.2	1023.3	15.9	1038.1	20.7	1038.1	20.7	97.9
1049.1	21.8	1045.3	16.4	1038.2	22.2	1038.2	22.2	101.1
993.9	24.1	1008.5	18.1	1041.4	21.9	1041.4	21.9	95.4
1074.8	25.7	1063.7	19.3	1042.1	27.2	1042.1	27.2	103.1
1050.4	24.6	1047.6	18.1	1042.4	21.9	1042.4	21.9	100.8
1074.4	23.0	1063.8	16.6	1043.0	19.9	1043.0	19.9	103.0
1017.9	24.8	1025.7	18.1	1043.3	19.4	1043.3	19.4	97.6
1088.8	32.5	1073.6	22.4	1043.8	19.4	1043.8	19.4	104.3
1015.7	22.9	1024.6	17.6	1044.6	25.0	1044.6	25.0	97.2
1027.0	17.4	1033.5	13.4	1048.1	19.3	1048.1	19.3	98.0
1016.1	23.7	1026.0	18.0	1048.2	23.8	1048.2	23.8	96.9
1020.5	24.4	1029.1	18.5	1048.5	24.4	1048.5	24.4	97.3
1050.0	24.2	1051.1	18.1	1054.3	24.0	1054.3	24.0	99.6
1101.0	24.9	1085.2	18.0	1054.6	22.4	1054.6	22.4	104.4
1017.6	23.2	1029.2	17.1	1054.8	19.8	1054.8	19.8	96.5
1057.0	24.3	1056.0	17.6	1054.8	19.6	1054.8	19.6	100.2
989.5	18.4	1010.3	14.6	1056.7	22.0	1056.7	22.0	93.6
1024.1	20.0	1034.4	15.1	1057.0	19.5	1057.0	19.5	96.9
1052.6	20.9	1053.9	15.4	1057.6	18.7	1057.6	18.7	99.5
1031.1	24.7	1039.5	17.6	1058.0	15.4	1058.0	15.4	97.5
1062.1	27.6	1060.6	19.8	1058.4	20.7	1058.4	20.7	100.3
1063.1	21.7	1061.6	16.2	1059.4	21.6	1059.4	21.6	100.4
1039.7	24.1	1045.9	17.6	1059.7	19.7	1059.7	19.7	98.1
1055.0	27.3	1056.6	20.8	1060.8	29.9	1060.8	29.9	99.4
1049.1	24.6	1052.7	17.6	1061.1	18.0	1061.1	18.0	98.9
999.1	21.0	1018.8	16.2	1062.3	21.9	1062.3	21.9	94.1
1083.9	29.2	1076.7	20.8	1062.9	22.1	1062.9	22.1	102.0
1055.3	24.6	1057.6	18.2	1063.3	22.9	1063.3	22.9	99.2
1028.3	25.4	1039.8	19.0	1065.0	23.3	1065.0	23.3	96.6
1081.6	23.1	1076.0	16.9	1065.6	20.8	1065.6	20.8	101.5
1009.9	26.9	1028.0	20.0	1067.6	22.9	1067.6	22.9	94.6

1095.6	23.0	1087.0	16.7	1070.6	20.4	1070.6	20.4	102.3
1073.7	20.6	1072.7	16.2	1071.8	25.7	1071.8	25.7	100.2
1057.7	24.1	1062.5	17.5	1073.2	19.4	1073.2	19.4	98.6
1068.2	23.4	1069.7	16.8	1073.6	18.0	1073.6	18.0	99.5
1070.0	29.8	1071.1	22.4	1074.2	30.5	1074.2	30.5	99.6
1063.9	25.4	1067.0	18.0	1074.2	16.6	1074.2	16.6	99.0
1082.6	28.5	1079.6	20.7	1074.3	24.4	1074.3	24.4	100.8
1105.8	22.9	1095.4	16.4	1075.7	18.7	1075.7	18.7	102.8
1109.1	25.3	1099.3	19.4	1080.8	29.6	1080.8	29.6	102.6
1052.7	23.9	1061.8	17.2	1081.4	18.1	1081.4	18.1	97.3
1063.2	23.5	1069.1	17.2	1081.9	19.8	1081.9	19.8	98.3
1027.3	27.0	1045.2	20.3	1083.7	25.4	1083.7	25.4	94.8
1084.8	23.6	1084.6	17.4	1085.0	22.5	1085.0	22.5	100.0
1025.8	23.8	1044.7	18.1	1085.4	23.3	1085.4	23.3	94.5
1076.2	23.0	1079.4	16.8	1086.7	20.1	1086.7	20.1	99.0
1056.9	23.3	1066.6	17.2	1087.5	20.7	1087.5	20.7	97.2
1046.5	23.1	1059.8	16.7	1088.2	17.6	1088.2	17.6	96.2
1048.9	28.6	1061.6	21.1	1088.7	24.8	1088.7	24.8	96.4
880.2	64.1	942.1	48.5	1090.6	25.4	1090.6	25.4	80.7
1144.7	27.4	1127.9	18.8	1096.5	17.8	1096.5	17.8	104.4
1055.8	28.3	1069.3	20.4	1097.7	21.2	1097.7	21.2	96.2
1129.9	24.5	1118.7	17.2	1098.0	18.9	1098.0	18.9	102.9
1064.1	25.1	1075.2	19.6	1098.5	29.6	1098.5	29.6	96.9
1089.8	25.5	1092.5	18.4	1098.7	20.6	1098.7	20.6	99.2
1123.0	24.5	1115.8	17.9	1102.5	23.0	1102.5	23.0	101.9
1007.1	22.1	1038.0	17.1	1104.5	22.5	1104.5	22.5	91.2
1125.5	21.5	1121.0	15.8	1113.1	20.6	1113.1	20.6	101.1
1063.6	29.4	1079.8	21.5	1113.3	24.4	1113.3	24.4	95.5
1063.4	28.6	1080.0	20.9	1114.4	24.0	1114.4	24.0	95.4
1074.2	27.1	1087.7	20.2	1115.5	25.5	1115.5	25.5	96.3
1081.2	30.7	1093.5	21.6	1118.8	19.2	1118.8	19.2	96.6
1098.9	28.4	1106.3	20.1	1121.8	20.1	1121.8	20.1	98.0
1079.2	27.4	1093.3	19.7	1122.4	20.2	1122.4	20.2	96.1
1120.3	20.4	1121.3	15.5	1124.1	22.7	1124.1	22.7	99.7
1182.2	32.6	1162.5	22.6	1126.8	24.7	1126.8	24.7	104.9
1132.9	26.6	1131.4	18.6	1129.4	18.2	1129.4	18.2	100.3
1115.4	23.8	1120.0	17.2	1129.8	20.1	1129.8	20.1	98.7
1124.8	24.4	1126.4	17.4	1130.5	19.2	1130.5	19.2	99.5
1153.4	27.1	1145.5	19.5	1131.5	24.2	1131.5	24.2	101.9
1059.9	24.6	1087.0	18.4	1142.5	22.2	1142.5	22.2	92.8
1137.8	26.4	1139.5	18.6	1143.6	19.5	1143.6	19.5	99.5
1165.8	23.9	1158.1	16.7	1144.5	18.2	1144.5	18.2	101.9
1121.0	25.9	1129.1	18.9	1145.6	23.5	1145.6	23.5	97.9

1158.7	33.8	1153.8	23.1	1145.7	20.4	1145.7	20.4	101.1
1082.7	21.3	1103.7	16.5	1146.4	23.9	1146.4	23.9	94.4
1168.6	25.2	1160.6	17.6	1146.7	19.3	1146.7	19.3	101.9
1132.5	27.7	1137.8	19.8	1148.6	22.5	1148.6	22.5	98.6
1130.1	27.0	1136.5	19.2	1149.6	21.0	1149.6	21.0	98.3
1170.6	25.7	1163.3	18.5	1150.6	23.6	1150.6	23.6	101.7
1179.5	25.8	1171.2	17.9	1156.9	19.3	1156.9	19.3	102.0
1170.4	22.7	1166.5	16.5	1160.2	21.6	1160.2	21.6	100.9
1047.9	27.7	1085.7	22.6	1163.3	36.0	1163.3	36.0	90.1
1131.3	19.9	1142.1	15.4	1163.5	23.1	1163.5	23.1	97.2
1133.3	25.8	1143.5	18.6	1163.7	21.9	1163.7	21.9	97.4
1170.0	27.1	1168.7	19.7	1167.3	25.2	1167.3	25.2	100.2
1159.8	29.7	1163.3	20.5	1170.8	19.5	1170.8	19.5	99.1
1150.8	25.8	1157.5	18.4	1171.1	20.7	1171.1	20.7	98.3
1167.7	27.0	1169.5	18.6	1173.8	17.2	1173.8	17.2	99.5
1154.9	23.5	1161.8	17.0	1175.7	20.7	1175.7	20.7	98.2
1143.8	24.2	1155.1	17.2	1177.2	18.3	1177.2	18.3	97.2
1148.8	27.2	1158.5	19.0	1177.7	18.4	1177.7	18.4	97.5
1173.3	28.3	1177.2	20.1	1185.3	23.2	1185.3	23.2	99.0
1207.0	23.5	1198.9	16.7	1185.4	20.3	1185.4	20.3	101.8
1239.7	24.2	1220.6	17.1	1187.8	21.5	1187.8	21.5	104.4
1149.0	23.4	1163.9	16.9	1192.4	20.0	1192.4	20.0	96.4
1166.9	26.6	1178.1	18.4	1199.4	17.3	1199.4	17.3	97.3
1152.9	26.0	1170.1	18.7	1203.0	21.4	1203.0	21.4	95.8
1103.0	26.6	1137.6	19.0	1205.2	18.0	1205.2	18.0	91.5
1239.9	30.0	1227.5	20.4	1206.7	21.4	1206.7	21.4	102.8
1196.9	25.4	1203.1	17.7	1215.0	18.1	1215.0	18.1	98.5
1227.4	23.7	1226.3	17.0	1225.4	21.5	1225.4	21.5	100.2
1248.8	33.1	1244.6	22.2	1238.3	20.6	1238.3	20.6	100.8
1212.3	32.6	1222.1	22.4	1240.3	21.9	1240.3	21.9	97.7
1253.3	24.4	1257.2	17.0	1264.6	19.3	1264.6	19.3	99.1
1183.9	21.7	1214.0	15.7	1268.8	18.2	1268.8	18.2	93.3
1237.8	28.5	1252.0	20.2	1277.2	23.9	1277.2	23.9	96.9
1248.0	29.4	1260.3	20.6	1282.1	23.1	1282.1	23.1	97.3
1267.1	25.7	1272.9	17.7	1283.5	19.4	1283.5	19.4	98.7
1258.6	23.9	1274.1	16.8	1301.3	19.5	1301.3	19.5	96.7
1328.1	27.9	1318.6	19.0	1304.2	21.3	1304.2	21.3	101.8
1331.0	27.2	1323.6	18.7	1312.5	21.8	1312.5	21.8	101.4
1182.3	29.1	1229.6	21.0	1314.2	23.1	1314.2	23.1	90.0
1347.2	33.0	1334.9	21.3	1316.1	17.8	1316.1	17.8	102.4
1313.6	32.3	1315.3	22.1	1318.9	24.5	1318.9	24.5	99.6
1346.3	29.3	1336.3	19.4	1321.1	19.3	1321.1	19.3	101.9
1321.7	22.3	1324.0	16.0	1328.5	20.8	1328.5	20.8	99.5

1291.0	31.8	1305.6	21.9	1330.5	23.7	1330.5	23.7	97.0
1329.0	31.7	1337.1	21.2	1350.9	20.9	1350.9	20.9	98.4
1345.0	30.6	1351.4	20.3	1362.3	19.3	1362.3	19.3	98.7
1420.7	25.7	1404.4	17.1	1380.5	19.3	1380.5	19.3	102.9
1335.2	22.5	1353.8	16.0	1384.1	20.0	1384.1	20.0	96.5
1415.7	35.4	1421.0	23.0	1429.8	21.3	1429.8	21.3	99.0
1342.7	30.1	1379.4	20.4	1437.5	20.3	1437.5	20.3	93.4
1435.6	29.5	1436.2	19.2	1438.0	18.9	1438.0	18.9	99.8
1448.5	36.2	1447.9	22.9	1447.8	19.0	1447.8	19.0	100.1
1440.7	27.0	1443.7	17.7	1448.8	18.5	1448.8	18.5	99.4
1393.0	46.9	1415.5	29.9	1450.2	22.0	1450.2	22.0	96.1
1473.3	32.1	1463.8	20.9	1450.8	21.9	1450.8	21.9	101.5
1461.8	33.1	1464.2	21.2	1468.6	19.4	1468.6	19.4	99.5
1471.2	30.1	1471.3	19.6	1472.2	20.3	1472.2	20.3	99.9
1436.7	35.5	1454.2	23.1	1480.6	21.8	1480.6	21.8	97.0
1452.6	25.7	1464.7	16.8	1483.0	16.8	1483.0	16.8	97.9
1527.6	34.7	1512.4	21.4	1491.9	18.1	1491.9	18.1	102.4
1455.5	29.5	1473.7	19.5	1500.8	20.2	1500.8	20.2	97.0
1424.6	29.7	1456.1	19.5	1503.2	18.6	1503.2	18.6	94.8
1396.1	28.9	1451.8	19.2	1534.9	17.8	1534.9	17.8	91.0
1585.5	28.5	1578.9	18.0	1570.9	18.3	1570.9	18.3	100.9
1589.1	45.6	1605.8	27.3	1628.5	18.6	1628.5	18.6	97.6
1641.4	32.1	1636.8	20.1	1631.8	20.7	1631.8	20.7	100.6
1616.5	39.0	1622.9	23.5	1632.1	18.7	1632.1	18.7	99.0
1670.5	34.0	1654.0	20.9	1634.0	20.6	1634.0	20.6	102.2
1650.2	44.5	1643.9	27.2	1636.7	24.7	1636.7	24.7	100.8
1620.6	36.4	1627.6	22.0	1637.5	17.8	1637.5	17.8	99.0
1628.9	42.1	1632.5	25.2	1637.9	19.4	1637.9	19.4	99.4
1608.6	39.5	1621.4	23.7	1638.7	17.5	1638.7	17.5	98.2
1685.2	37.9	1664.6	22.5	1639.5	19.0	1639.5	19.0	102.8
1650.9	29.3	1646.3	18.3	1641.2	18.4	1641.2	18.4	100.6
1602.3	40.7	1622.5	25.1	1649.7	21.7	1649.7	21.7	97.1
1654.9	37.3	1652.6	22.9	1650.6	21.3	1650.6	21.3	100.3
1650.0	38.5	1661.8	23.5	1677.6	20.8	1677.6	20.8	98.4
1629.6	38.0	1650.8	23.0	1678.6	18.5	1678.6	18.5	97.1
1631.3	26.6	1653.1	16.6	1681.7	16.2	1681.7	16.2	97.0
1638.1	37.7	1671.6	23.3	1714.8	21.1	1714.8	21.1	95.5
1728.4	28.1	1727.1	17.6	1726.3	18.7	1726.3	18.7	100.1
1705.3	34.8	1718.8	20.7	1736.2	16.5	1736.2	16.5	98.2
1741.1	38.1	1739.9	21.8	1739.3	14.5	1739.3	14.5	100.1
1713.5	37.8	1728.2	22.6	1746.7	18.9	1746.7	18.9	98.1
1590.3	33.8	1663.1	20.9	1757.0	15.6	1757.0	15.6	90.5
1821.4	39.6	1794.8	22.5	1764.8	17.9	1764.8	17.9	103.2

1770.3	40.2	1769.7	23.0	1769.9	16.5	1769.9	16.5	100.0
1784.7	34.5	1778.1	20.6	1771.2	19.1	1771.2	19.1	100.8
1769.2	33.5	1793.1	19.9	1821.7	17.6	1821.7	17.6	97.1
1824.2	43.1	1828.9	24.2	1835.1	16.5	1835.1	16.5	99.4
1857.2	33.7	1857.2	20.2	1858.1	20.1	1858.1	20.1	100.0
1936.0	38.8	1900.8	22.2	1863.4	20.4	1863.4	20.4	103.9
1781.4	33.5	1826.9	19.7	1880.0	15.9	1880.0	15.9	94.8
1930.7	33.9	1914.9	19.4	1898.7	17.5	1898.7	17.5	101.7
2081.4	57.8	2082.5	30.3	2084.4	19.0	2084.4	19.0	99.9
2115.8	47.2	2111.2	24.3	2107.5	14.1	2107.5	14.1	100.4
2378.1	50.9	2494.9	25.3	2592.2	15.5	2592.2	15.5	91.7
2680.9	56.2	2675.2	26.7	2671.6	19.7	2671.6	19.7	100.3
2675.6	45.0	2677.8	22.3	2680.1	19.3	2680.1	19.3	99.8
2767.2	45.2	2725.9	21.1	2696.2	16.2	2696.2	16.2	102.6
2742.9	59.0	2719.8	26.1	2703.3	13.5	2703.3	13.5	101.5
2720.5	59.2	2721.0	26.9	2722.0	16.1	2722.0	16.1	99.9
2510.9	53.7	2629.1	25.8	2722.2	15.7	2722.2	15.7	92.2
2674.2	59.1	2706.0	27.2	2730.5	16.5	2730.5	16.5	97.9
2631.4	45.1	2689.1	21.8	2733.6	16.2	2733.6	16.2	96.3
2704.3	60.1	2733.1	27.1	2755.1	14.8	2755.1	14.8	98.2
2283.4	60.1	2542.1	30.4	2756.2	15.1	2756.2	15.1	82.8
2453.9	50.7	2624.4	24.7	2759.4	14.2	2759.4	14.2	88.9
2768.5	60.6	2765.8	28.4	2764.5	21.3	2764.5	21.3	100.1
2683.9	48.9	2732.8	22.6	2769.8	14.2	2769.8	14.2	96.9
2778.3	49.1	2783.5	22.9	2788.0	16.9	2788.0	16.9	99.7
2798.8	53.1	2801.7	24.2	2804.5	16.2	2804.5	16.2	99.8
2840.9	45.2	2829.5	20.9	2822.1	15.8	2822.1	15.8	100.7

CH1

206Pb* 238U*	± (Ma)	207Pb* 235U	± (Ma)	206Pb* 207Pb*	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
310.4	10.3	374.4	11.8	793.4	35.0	310.4	10.3	NA
346.9	7.2	351.9	6.9	385.7	21.6	346.9	7.2	NA
354.3	10.6	489.4	19.3	1185.4	77.0	354.3	10.6	NA
355.1	8.6	617.6	20.1	1753.8	64.9	355.1	8.6	NA
358.5	11.1	369.9	10.8	443.1	31.8	358.5	11.1	NA
365.8	10.1	365.8	9.8	366.4	32.6	365.8	10.1	NA
367.7	9.0	367.2	8.3	365.1	21.5	367.7	9.0	NA
367.9	9.7	326.2	10.6	39.4	63.2	367.9	9.7	NA
370.9	8.4	363.5	7.7	317.6	22.5	370.9	8.4	NA
374.5	11.4	408.3	11.7	605.4	33.4	374.5	11.4	NA
377.8	8.7	382.8	8.4	414.3	26.3	377.8	8.7	NA

378.1	10.6	385.4	10.0	430.5	26.7	378.1	10.6	NA
378.9	10.2	449.0	10.8	827.0	22.5	378.9	10.2	NA
379.7	9.7	391.3	9.2	461.0	23.0	379.7	9.7	NA
380.6	10.7	386.6	10.0	424.2	24.9	380.6	10.7	NA
382.8	10.5	378.9	10.2	356.7	35.3	382.8	10.5	NA
386.3	7.1	373.0	6.9	292.3	26.5	386.3	7.1	NA
390.0	11.7	395.6	11.0	429.4	29.2	390.0	11.7	NA
391.2	8.2	422.4	9.1	597.3	33.2	391.2	8.2	NA
391.2	11.1	400.3	10.3	453.6	24.4	391.2	11.1	NA
394.6	9.4	396.8	8.9	410.7	25.3	394.6	9.4	NA
396.7	8.2	402.9	8.2	439.6	28.4	396.7	8.2	NA
398.6	11.1	407.2	10.3	457.1	23.8	398.6	11.1	NA
399.0	10.3	395.8	9.9	377.9	31.9	399.0	10.3	NA
399.7	9.9	398.4	9.6	391.6	32.0	399.7	9.9	NA
400.2	8.8	409.1	9.2	460.6	33.8	400.2	8.8	86.9
400.4	9.6	401.4	8.8	408.3	21.7	400.4	9.6	98.1
401.5	8.3	403.9	8.0	419.0	24.3	401.5	8.3	95.8
404.6	9.9	408.8	9.6	433.3	29.1	404.6	9.9	93.4
405.5	9.6	408.4	9.2	425.5	27.4	405.5	9.6	95.3
405.8	7.1	408.1	7.2	422.2	26.4	405.8	7.1	96.1
406.6	9.7	410.1	8.9	430.5	22.0	406.6	9.7	94.5
407.5	9.2	413.8	9.5	450.1	34.6	407.5	9.2	90.5
408.2	9.8	409.7	9.3	418.5	26.6	408.2	9.8	97.5
408.8	8.2	419.5	8.1	479.8	25.0	408.8	8.2	85.2
408.9	8.5	411.4	8.7	426.6	31.2	408.9	8.5	95.8
414.8	10.7	418.3	10.2	438.6	29.8	414.8	10.7	94.6
415.3	8.3	424.0	8.3	472.8	27.4	415.3	8.3	87.8
416.6	8.9	414.3	8.2	402.2	22.4	416.6	8.9	103.6
417.2	10.8	419.6	11.3	434.0	42.2	417.2	10.8	96.1
421.0	9.8	431.2	9.3	487.3	24.4	421.0	9.8	86.4
421.1	10.5	423.0	9.7	434.2	24.8	421.1	10.5	97.0
422.3	10.2	421.7	9.2	419.1	20.6	422.3	10.2	100.8
422.8	8.9	420.0	8.9	405.8	31.1	422.8	8.9	104.2
423.8	12.6	431.4	11.5	472.9	25.3	423.8	12.6	89.6
424.7	9.1	424.7	8.9	425.4	28.3	424.7	9.1	99.8
428.1	7.9	441.3	8.1	511.7	26.3	428.1	7.9	83.7
430.0	13.2	428.4	11.7	420.6	23.8	430.0	13.2	102.2
437.3	10.2	441.3	9.4	463.3	22.8	437.3	10.2	94.4
441.1	10.8	448.9	9.9	490.3	21.6	441.1	10.8	90.0
444.3	17.8	447.5	15.5	464.9	23.6	444.3	17.8	95.6
449.5	7.6	459.9	8.7	512.9	34.5	449.5	7.6	87.6
450.2	10.9	451.0	9.8	456.5	22.6	450.2	10.9	98.6
453.2	11.3	449.5	10.3	431.9	26.6	453.2	11.3	104.9

454.2	12.0	458.1	11.1	479.0	26.8	454.2	12.0	94.8
454.8	12.2	460.4	10.9	489.4	21.9	454.8	12.2	92.9
456.0	9.9	474.1	9.5	563.5	24.2	456.0	9.9	80.9
457.3	9.0	454.6	8.4	441.4	23.5	457.3	9.0	103.6
458.4	10.8	456.8	10.1	449.6	27.3	458.4	10.8	102.0
459.4	10.8	459.3	10.2	459.8	28.9	459.4	10.8	99.9
460.5	8.2	458.4	7.5	449.0	19.2	460.5	8.2	102.6
463.4	11.6	467.3	10.8	487.9	28.2	463.4	11.6	95.0
465.9	9.6	467.5	9.1	476.4	26.1	465.9	9.6	97.8
472.9	12.2	473.2	10.9	475.3	24.2	472.9	12.2	99.5
475.3	11.1	474.4	9.9	471.3	21.6	475.3	11.1	100.8
480.0	12.3	483.2	11.0	499.0	23.1	480.0	12.3	96.2
481.2	8.8	484.2	8.5	499.3	24.8	481.2	8.8	96.4
495.4	13.6	512.9	12.4	592.7	26.0	495.4	13.6	83.6
507.6	14.6	514.9	12.7	548.5	21.3	507.6	14.6	92.5
509.4	10.8	507.4	10.5	499.6	31.1	509.4	10.8	102.0
537.5	15.7	537.2	15.7	536.5	48.3	537.5	15.7	100.2
546.4	14.3	545.5	12.8	542.6	28.7	546.4	14.3	100.7
552.4	13.9	572.8	12.4	655.7	22.1	552.4	13.9	84.2
553.5	12.3	563.9	12.0	607.0	32.5	553.5	12.3	91.2
554.8	14.2	556.8	12.2	566.0	21.1	554.8	14.2	98.0
556.5	13.5	560.0	12.2	575.2	27.6	556.5	13.5	96.8
564.3	11.9	577.0	11.7	628.6	32.2	564.3	11.9	89.8
568.2	12.5	565.0	10.7	553.2	20.0	568.2	12.5	102.7
568.9	16.2	577.5	14.2	612.4	26.8	568.9	16.2	92.9
584.9	15.5	587.5	13.4	598.6	25.3	584.9	15.5	97.7
595.2	11.4	594.4	11.1	592.3	31.2	595.2	11.4	100.5
596.1	17.0	600.8	14.4	619.5	24.0	596.1	17.0	96.2
605.0	14.2	606.0	13.1	610.8	32.2	605.0	14.2	99.1
607.4	12.2	610.4	10.9	622.2	23.9	607.4	12.2	97.6
612.0	14.4	626.8	12.7	681.7	24.2	612.0	14.4	89.8
612.7	12.8	612.1	11.2	610.6	22.5	612.7	12.8	100.3
617.0	11.7	620.8	11.1	635.6	28.1	617.0	11.7	97.1
622.8	13.1	648.7	12.9	740.8	32.9	622.8	13.1	84.1
628.3	19.3	636.5	16.0	666.5	21.7	628.3	19.3	94.3
628.8	14.8	639.1	13.5	676.7	30.5	628.8	14.8	92.9
629.6	14.9	631.0	13.6	637.2	31.8	629.6	14.9	98.8
632.1	13.4	628.7	11.7	617.2	24.4	632.1	13.4	102.4
636.0	13.3	646.3	13.3	683.4	36.3	636.0	13.3	93.1
640.5	19.8	645.5	16.4	664.0	24.0	640.5	19.8	96.5
648.8	14.2	644.6	11.9	630.9	20.2	648.8	14.2	102.8
658.7	16.1	670.4	13.6	710.7	21.1	658.7	16.1	92.7
716.2	19.1	740.0	16.0	813.9	23.8	716.2	19.1	88.0

784.2	20.0	780.5	16.3	770.6	27.0	784.2	20.0	101.8
807.5	19.8	814.6	15.7	835.1	21.9	807.5	19.8	96.7
862.3	20.5	866.7	15.8	879.0	20.2	862.3	20.5	98.1
928.9	17.5	918.8	14.6	895.6	27.0	895.6	27.0	103.7
924.4	19.9	933.4	15.7	955.4	23.5	955.4	23.5	96.8
975.3	20.8	974.3	16.0	972.7	22.8	972.7	22.8	100.3
957.9	17.6	963.2	14.2	976.2	23.3	976.2	23.3	98.1
1018.9	23.6	1006.0	18.2	978.7	27.9	978.7	27.9	104.1
913.1	22.8	933.5	17.8	982.9	23.3	982.9	23.3	92.9
1002.1	23.2	998.7	17.5	992.2	23.9	992.2	23.9	101.0
979.9	23.8	984.0	18.1	993.9	23.9	993.9	23.9	98.6
1035.9	20.4	1023.0	15.2	996.3	20.6	996.3	20.6	104.0
968.5	21.4	980.6	16.9	1008.7	25.3	1008.7	25.3	96.0
1004.2	24.8	1006.0	18.7	1010.7	24.3	1010.7	24.3	99.4
1007.8	19.4	1010.4	14.8	1016.8	20.9	1016.8	20.9	99.1
1002.3	28.3	1008.0	21.2	1021.3	26.0	1021.3	26.0	98.1
1021.0	24.3	1022.0	19.9	1025.0	34.6	1025.0	34.6	99.6
1045.3	22.8	1038.6	17.2	1025.5	24.1	1025.5	24.1	101.9
960.7	25.0	980.6	18.9	1026.2	22.0	1026.2	22.0	93.6
994.9	27.1	1004.7	19.7	1027.1	19.5	1027.1	19.5	96.9
1032.8	23.6	1031.8	16.9	1030.6	16.9	1030.6	16.9	100.2
1074.5	22.7	1062.3	17.0	1038.0	23.7	1038.0	23.7	103.5
1013.1	24.2	1020.8	18.3	1038.3	24.2	1038.3	24.2	97.6
1042.2	25.0	1040.8	18.8	1038.8	25.4	1038.8	25.4	100.3
1049.4	20.4	1046.0	16.6	1039.8	28.6	1039.8	28.6	100.9
1015.7	26.2	1023.2	19.5	1040.1	24.1	1040.1	24.1	97.7
1043.4	21.2	1042.0	15.6	1040.1	18.9	1040.1	18.9	100.3
905.0	23.4	945.5	19.1	1041.8	28.6	1041.8	28.6	86.9
1013.3	24.9	1022.4	18.1	1042.8	18.9	1042.8	18.9	97.2
978.9	24.3	999.2	18.2	1044.9	21.0	1044.9	21.0	93.7
1036.4	24.5	1040.6	18.1	1050.4	22.4	1050.4	22.4	98.7
988.0	21.1	1009.1	16.3	1056.3	22.0	1056.3	22.0	93.5
1065.5	25.0	1063.6	18.3	1060.4	22.4	1060.4	22.4	100.5
922.3	19.8	963.9	16.8	1061.1	28.5	1061.1	28.5	86.9
995.3	20.7	1016.0	16.1	1061.9	22.3	1061.9	22.3	93.7
900.9	20.6	949.8	17.6	1065.6	29.7	1065.6	29.7	84.5
1040.3	24.9	1049.6	18.4	1069.9	22.3	1069.9	22.3	97.2
1041.2	24.5	1050.3	17.9	1070.2	20.1	1070.2	20.1	97.3
1034.0	22.6	1045.7	16.9	1071.1	20.9	1071.1	20.9	96.5
1108.0	22.5	1096.6	17.2	1075.1	26.2	1075.1	26.2	103.1
1082.4	20.8	1079.9	15.2	1075.8	18.8	1075.8	18.8	100.6
1046.5	22.2	1058.4	16.1	1083.9	17.5	1083.9	17.5	96.5
1012.7	25.8	1035.4	19.0	1084.7	19.8	1084.7	19.8	93.4

1049.3	29.3	1060.9	21.8	1085.7	27.3	1085.7	27.3	96.7
1058.6	20.0	1068.5	15.6	1089.5	23.4	1089.5	23.4	97.2
1069.9	24.0	1077.9	17.6	1095.1	20.8	1095.1	20.8	97.7
1089.6	25.0	1092.0	18.2	1097.5	21.6	1097.5	21.6	99.3
1123.8	32.8	1117.0	23.1	1104.6	24.4	1104.6	24.4	101.7
1158.1	32.8	1140.6	22.7	1108.3	23.2	1108.3	23.2	104.5
1023.3	23.4	1050.5	17.7	1108.3	21.6	1108.3	21.6	92.3
1040.1	19.0	1062.7	15.3	1110.2	24.5	1110.2	24.5	93.7
1079.5	27.8	1089.8	20.1	1111.1	22.1	1111.1	22.1	97.2
907.6	14.9	969.6	12.3	1113.6	17.1	1113.6	17.1	81.5
1058.3	22.4	1077.2	17.5	1116.5	26.0	1116.5	26.0	94.8
1101.9	25.2	1107.5	18.4	1119.3	22.7	1119.3	22.7	98.4
1041.6	22.9	1069.6	17.4	1127.9	21.9	1127.9	21.9	92.4
1176.6	32.5	1164.0	22.4	1141.4	23.1	1141.4	23.1	103.1
1167.5	25.4	1160.7	17.7	1148.9	18.6	1148.9	18.6	101.6
1162.4	28.4	1159.3	20.0	1154.1	22.5	1154.1	22.5	100.7
1170.7	32.9	1165.4	23.2	1156.5	26.4	1156.5	26.4	101.2
1175.7	20.8	1169.6	15.1	1159.1	19.5	1159.1	19.5	101.4
1157.6	23.0	1160.8	17.0	1167.5	23.0	1167.5	23.0	99.2
1164.7	29.3	1167.3	20.0	1173.1	17.4	1173.1	17.4	99.3
1178.9	26.0	1177.4	18.6	1175.3	22.8	1175.3	22.8	100.3
1137.6	21.0	1151.2	16.2	1177.8	23.8	1177.8	23.8	96.6
1035.7	23.9	1082.4	18.2	1178.7	22.4	1178.7	22.4	87.9
1229.9	29.9	1213.1	20.3	1184.2	20.5	1184.2	20.5	103.9
1155.8	23.3	1166.1	16.2	1186.3	15.5	1186.3	15.5	97.4
1165.2	26.8	1173.1	18.9	1188.5	20.6	1188.5	20.6	98.0
1194.1	29.0	1192.1	20.4	1189.3	23.2	1189.3	23.2	100.4
1179.1	26.1	1184.5	18.9	1195.1	23.8	1195.1	23.8	98.7
1138.4	18.9	1158.1	14.7	1196.0	22.2	1196.0	22.2	95.2
1154.7	26.1	1169.4	18.7	1197.6	21.2	1197.6	21.2	96.4
1132.1	25.1	1154.9	18.4	1198.7	22.3	1198.7	22.3	94.4
1151.1	31.5	1168.3	21.9	1201.3	20.6	1201.3	20.6	95.8
1148.9	29.7	1167.4	21.3	1202.7	23.3	1202.7	23.3	95.5
1092.1	24.5	1129.8	18.7	1203.8	24.7	1203.8	24.7	90.7
1179.7	24.3	1188.9	17.4	1206.6	20.8	1206.6	20.8	97.8
1180.8	24.1	1191.2	17.8	1210.9	23.7	1210.9	23.7	97.5
1224.8	29.4	1219.7	21.0	1211.7	26.8	1211.7	26.8	101.1
1221.8	23.1	1220.0	16.2	1217.7	18.9	1217.7	18.9	100.3
1148.7	19.6	1172.9	16.5	1218.8	28.7	1218.8	28.7	94.2
1229.6	27.7	1226.7	19.8	1222.5	24.7	1222.5	24.7	100.6
1207.8	24.6	1213.8	17.0	1225.4	17.0	1225.4	17.0	98.6
1207.3	34.9	1214.2	24.6	1227.3	27.8	1227.3	27.8	98.4
1142.3	23.1	1175.0	16.5	1236.6	17.1	1236.6	17.1	92.4

1254.2	30.7	1248.0	21.0	1238.3	22.7	1238.3	22.7	101.3
1014.5	14.9	1092.5	12.9	1252.2	21.2	1252.2	21.2	81.0
1212.3	23.7	1228.9	16.4	1259.0	16.8	1259.0	16.8	96.3
1151.8	29.2	1190.5	23.4	1262.2	36.5	1262.2	36.5	91.3
1263.6	25.2	1267.1	18.5	1273.9	25.7	1273.9	25.7	99.2
1304.8	33.4	1293.6	22.4	1276.0	23.2	1276.0	23.2	102.3
1228.3	23.2	1250.2	16.5	1288.8	18.9	1288.8	18.9	95.3
1319.2	28.5	1307.9	19.1	1290.2	19.9	1290.2	19.9	102.3
1168.0	30.4	1211.5	20.8	1290.6	14.8	1290.6	14.8	90.5
1303.2	26.7	1303.1	17.9	1303.7	17.7	1303.7	17.7	100.0
1287.2	38.5	1293.8	25.5	1305.7	22.3	1305.7	22.3	98.6
1190.6	21.4	1232.0	17.1	1306.0	26.4	1306.0	26.4	91.2
1285.0	26.5	1294.6	18.6	1311.3	21.9	1311.3	21.9	98.0
1298.1	23.8	1303.2	16.4	1312.5	18.7	1312.5	18.7	98.9
1240.3	28.4	1270.4	20.1	1322.6	22.4	1322.6	22.4	93.8
1323.7	30.8	1323.4	20.6	1323.7	20.8	1323.7	20.8	100.0
1272.6	28.9	1292.3	19.9	1325.9	20.8	1325.9	20.8	96.0
1137.0	28.7	1205.4	21.1	1331.1	22.5	1331.1	22.5	85.4
1307.7	29.1	1318.2	19.1	1336.2	15.4	1336.2	15.4	97.9
1278.2	28.1	1301.2	18.8	1340.2	16.2	1340.2	16.2	95.4
1342.9	40.4	1342.7	26.0	1343.3	19.9	1343.3	19.9	100.0
1345.2	34.4	1351.0	23.2	1361.0	24.3	1361.0	24.3	98.8
1167.1	27.3	1237.4	25.8	1362.8	49.0	1362.8	49.0	85.6
1371.6	33.4	1372.3	21.3	1374.1	16.4	1374.1	16.4	99.8
1362.3	23.9	1367.7	16.4	1377.0	19.1	1377.0	19.1	98.9
1346.9	31.3	1362.7	21.4	1388.4	23.6	1388.4	23.6	97.0
1376.4	37.9	1381.5	24.4	1390.3	20.5	1390.3	20.5	99.0
1334.8	23.5	1360.5	16.9	1401.9	21.7	1401.9	21.7	95.2
1314.4	25.0	1356.3	16.9	1423.8	15.8	1423.8	15.8	92.3
1489.4	34.9	1468.9	21.9	1440.1	19.6	1440.1	19.6	103.4
1452.2	39.7	1449.6	25.6	1446.6	25.0	1446.6	25.0	100.4
1481.1	26.3	1467.9	16.8	1449.6	16.7	1449.6	16.7	102.2
1496.0	37.5	1482.6	23.7	1464.2	21.8	1464.2	21.8	102.2
1442.1	34.5	1452.6	22.3	1468.7	20.8	1468.7	20.8	98.2
1458.7	29.8	1478.7	21.0	1508.3	26.9	1508.3	26.9	96.7
1495.8	29.1	1509.5	18.5	1529.6	16.8	1529.6	16.8	97.8
1528.2	24.1	1540.7	16.0	1558.8	18.1	1558.8	18.1	98.0
1375.6	36.2	1456.1	23.9	1576.5	18.9	1576.5	18.9	87.3
1507.1	37.1	1546.2	24.9	1601.0	27.6	1601.0	27.6	94.1
1330.9	24.4	1443.4	18.2	1614.0	22.2	1614.0	22.2	82.5
1537.7	25.0	1571.3	17.8	1617.4	23.5	1617.4	23.5	95.1
1581.5	39.3	1598.2	24.6	1621.0	22.7	1621.0	22.7	97.6
1618.7	34.8	1621.0	21.3	1624.8	18.4	1624.8	18.4	99.6

1530.5	37.7	1571.9	24.8	1628.7	26.1	1628.7	26.1	94.0
1605.6	29.0	1618.3	19.0	1635.7	21.4	1635.7	21.4	98.2
1633.5	36.7	1637.3	22.3	1643.0	18.8	1643.0	18.8	99.4
1657.3	35.6	1654.7	22.2	1652.3	22.3	1652.3	22.3	100.3
1599.1	40.4	1625.0	24.1	1659.3	15.9	1659.3	15.9	96.4
1648.1	36.7	1653.9	21.8	1662.2	16.1	1662.2	16.1	99.2
1660.8	34.6	1664.7	21.9	1670.3	23.2	1670.3	23.2	99.4
1562.6	34.3	1610.1	21.9	1673.5	20.4	1673.5	20.4	93.4
1623.1	33.7	1649.2	21.3	1683.3	21.2	1683.3	21.2	96.4
1720.5	35.8	1723.7	21.3	1728.4	18.0	1728.4	18.0	99.5
1703.2	40.8	1723.9	24.6	1749.9	21.2	1749.9	21.2	97.3
1789.2	34.3	1775.5	20.6	1760.3	20.2	1760.3	20.2	101.6
1609.6	36.0	1676.2	22.3	1761.5	18.5	1761.5	18.5	91.4
1767.7	47.0	1782.0	28.1	1799.7	25.3	1799.7	25.3	98.2
1745.6	44.4	1786.3	26.0	1835.0	19.5	1835.0	19.5	95.1
2067.5	50.7	2056.5	26.8	2046.2	17.6	2046.2	17.6	101.0
1896.5	42.8	1972.6	24.7	2054.0	19.7	2054.0	19.7	92.3
1969.0	37.3	2025.6	20.8	2084.6	15.8	2084.6	15.8	94.5
2183.9	45.9	2161.6	24.1	2141.3	18.3	2141.3	18.3	102.0
1942.8	55.6	2042.9	31.6	2146.2	24.1	2146.2	24.1	90.5
1921.6	46.2	2038.5	26.2	2159.7	18.6	2159.7	18.6	89.0
2293.2	44.7	2403.0	23.9	2498.1	19.7	2498.1	19.7	91.8
2425.8	45.1	2468.1	23.3	2503.9	19.7	2503.9	19.7	96.9
2632.0	53.7	2652.1	26.2	2668.2	20.9	2668.2	20.9	98.6
2641.3	43.8	2667.9	21.8	2688.9	18.6	2688.9	18.6	98.2
2632.1	55.5	2669.4	25.7	2698.4	15.4	2698.4	15.4	97.5
2226.0	66.6	2512.2	34.7	2753.0	19.8	2753.0	19.8	80.9
2510.4	58.4	2659.6	28.0	2775.9	16.1	2775.9	16.1	90.4
2566.0	57.7	2718.9	27.7	2835.2	17.7	2835.2	17.7	90.5
2842.7	45.8	2866.4	21.5	2883.9	16.9	2883.9	16.9	98.6
3469.7	62.1	3518.4	24.0	3546.9	12.1	3546.9	12.1	97.8

TK1

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
370.1	9.1	376.1	9.1	414.1	31.7	370.1	9.1	NA
371.1	9.0	374.6	8.8	397.4	29.0	371.1	9.0	NA
373.7	10.2	373.0	9.4	369.6	24.5	373.7	10.2	NA

378.7	12.6	379.1	11.9	382.8	35.3	378.7	12.6	NA
379.9	12.1	396.1	12.0	492.8	35.9	379.9	12.1	NA
397.5	9.1	398.0	8.8	402.3	27.8	397.5	9.1	NA
404.9	13.9	404.6	12.3	403.8	22.2	404.9	13.9	100.3
405.0	10.8	409.3	10.6	434.9	33.1	405.0	10.8	93.1
407.4	11.3	417.3	10.8	473.4	29.0	407.4	11.3	86.1
414.9	13.5	423.0	12.4	468.5	27.5	414.9	13.5	88.6
423.4	11.4	425.6	10.8	438.3	31.0	423.4	11.4	96.6
433.5	12.8	435.9	11.4	449.4	22.4	433.5	12.8	96.5
435.6	10.0	443.3	10.0	484.2	31.8	435.6	10.0	90.0
445.6	15.2	451.8	13.8	484.6	29.4	445.6	15.2	92.0
456.5	11.8	457.9	11.2	466.0	31.6	456.5	11.8	97.9
456.8	13.1	456.7	12.1	457.0	31.9	456.8	13.1	100.0
462.9	12.9	459.2	12.4	441.8	37.1	462.9	12.9	104.8
466.6	13.0	474.7	12.0	515.1	28.2	466.6	13.0	90.6
467.2	10.8	481.4	10.6	550.7	29.9	467.2	10.8	84.8
467.5	11.9	469.0	11.4	477.2	32.9	467.5	11.9	98.0
470.4	14.8	478.7	13.0	519.5	22.1	470.4	14.8	90.5
475.3	16.5	472.5	14.5	459.9	29.9	475.3	16.5	103.4
481.9	9.3	500.5	9.6	587.6	29.5	481.9	9.3	82.0
488.0	16.5	504.3	14.7	580.1	25.2	488.0	16.5	84.1
497.7	14.4	500.7	12.5	515.5	21.9	497.7	14.4	96.6
559.3	11.0	563.7	10.4	582.6	26.9	559.3	11.0	96.0
570.0	14.2	572.5	12.9	583.1	29.8	570.0	14.2	97.8
589.7	16.9	599.7	14.9	638.8	28.8	589.7	16.9	92.3
628.9	20.8	628.1	17.8	625.9	32.9	628.9	20.8	100.5
640.9	17.6	638.7	15.6	631.9	34.4	640.9	17.6	101.4
786.6	16.9	796.3	13.6	824.2	20.2	786.6	16.9	95.4
924.1	27.1	912.5	20.3	885.3	25.3	885.3	25.3	104.4
924.7	23.5	915.9	18.5	895.5	29.3	895.5	29.3	103.3
950.2	21.1	947.0	16.7	940.6	25.9	940.6	25.9	101.0
917.7	24.0	925.6	19.0	945.2	28.5	945.2	28.5	97.1
957.9	24.0	956.9	18.2	955.4	23.6	955.4	23.6	100.3
975.1	21.4	971.9	17.2	965.4	29.0	965.4	29.0	101.0
1010.5	27.6	996.2	21.2	965.8	31.8	965.8	31.8	104.6
970.8	24.4	971.9	19.6	975.2	32.1	975.2	32.1	99.6
1025.8	21.7	1011.2	16.6	980.6	25.0	980.6	25.0	104.6
921.4	18.7	939.0	15.2	981.6	24.3	981.6	24.3	93.9
936.2	25.1	950.2	19.5	983.6	26.9	983.6	26.9	95.2
1009.2	26.3	1002.2	19.6	988.1	25.5	988.1	25.5	102.1
1003.3	32.8	998.6	24.0	989.2	27.0	989.2	27.0	101.4
1019.4	27.5	1009.8	20.4	990.0	26.2	990.0	26.2	103.0
1023.5	24.1	1013.4	18.5	992.6	27.1	992.6	27.1	103.1

969.6	27.2	976.8	21.3	994.1	31.2	994.1	31.2	97.5
983.8	21.3	988.0	16.8	998.2	25.8	998.2	25.8	98.6
1018.1	27.5	1012.1	19.7	1000.1	19.3	1000.1	19.3	101.8
951.1	25.0	965.9	18.8	1000.4	21.3	1000.4	21.3	95.1
1032.4	23.9	1022.1	17.8	1001.0	23.7	1001.0	23.7	103.1
1052.0	28.9	1037.1	21.7	1006.9	30.7	1006.9	30.7	104.5
992.4	24.5	998.2	18.7	1012.0	25.5	1012.0	25.5	98.1
948.4	21.5	967.8	17.1	1013.0	25.1	1013.0	25.1	93.6
1001.3	33.3	1004.8	24.2	1013.3	25.3	1013.3	25.3	98.8
1022.3	26.3	1019.2	19.5	1013.3	24.3	1013.3	24.3	100.9
961.7	28.0	977.4	22.0	1013.7	31.8	1013.7	31.8	94.9
1037.7	25.8	1029.7	19.6	1013.8	28.6	1013.8	28.6	102.4
1005.0	34.1	1009.3	24.8	1019.4	25.3	1019.4	25.3	98.6
1023.9	26.1	1022.2	20.2	1019.5	29.8	1019.5	29.8	100.4
1008.8	26.5	1012.1	19.8	1019.9	24.6	1019.9	24.6	98.9
1027.3	31.8	1025.2	23.2	1021.5	26.9	1021.5	26.9	100.6
1068.4	29.6	1052.9	22.7	1021.7	34.9	1021.7	34.9	104.6
1015.4	27.8	1017.3	21.0	1022.3	27.8	1022.3	27.8	99.3
1027.1	30.0	1025.7	21.8	1023.6	24.3	1023.6	24.3	100.3
1056.0	31.0	1045.6	21.8	1024.9	20.5	1024.9	20.5	103.0
1058.0	33.6	1047.2	24.0	1025.6	25.3	1025.6	25.3	103.2
1038.8	32.8	1034.4	23.4	1025.9	23.5	1025.9	23.5	101.3
1000.1	25.1	1008.1	20.6	1026.4	35.0	1026.4	35.0	97.4
1019.6	28.6	1022.6	21.7	1029.9	29.0	1029.9	29.0	99.0
1044.6	27.5	1039.7	20.2	1030.4	24.7	1030.4	24.7	101.4
993.1	24.1	1004.5	18.0	1030.5	20.9	1030.5	20.9	96.4
1042.0	23.9	1038.4	18.3	1031.6	27.0	1031.6	27.0	101.0
1036.2	33.8	1034.6	24.4	1032.0	26.3	1032.0	26.3	100.4
1048.0	31.3	1042.6	22.5	1032.2	24.2	1032.2	24.2	101.5
909.9	28.6	946.3	22.2	1032.8	26.0	1032.8	26.0	88.1
987.0	24.8	1001.1	18.8	1032.8	23.9	1032.8	23.9	95.6
1031.9	27.0	1032.2	20.5	1033.7	29.0	1033.7	29.0	99.8
1047.0	22.0	1042.8	17.4	1034.9	28.2	1034.9	28.2	101.2
1028.2	28.2	1030.4	20.5	1036.0	22.0	1036.0	22.0	99.2
1021.8	33.0	1026.1	24.5	1036.1	30.0	1036.1	30.0	98.6
1089.0	27.1	1071.7	19.5	1037.4	23.9	1037.4	23.9	105.0
1038.3	28.2	1038.4	20.4	1039.7	22.1	1039.7	22.1	99.9
1023.8	36.3	1028.7	26.6	1039.9	30.5	1039.9	30.5	98.5
1007.0	22.9	1017.3	17.4	1040.4	23.1	1040.4	23.1	96.8
1040.4	24.8	1040.5	18.6	1041.5	24.3	1041.5	24.3	99.9
1011.0	22.8	1020.5	17.2	1041.8	22.4	1041.8	22.4	97.0
1080.7	27.1	1068.3	20.1	1043.9	27.5	1043.9	27.5	103.5
986.7	30.6	1005.0	22.7	1046.2	24.5	1046.2	24.5	94.3

1020.0	29.4	1028.2	22.1	1046.7	28.3	1046.7	28.3	97.5
1018.2	31.2	1027.3	23.0	1047.7	26.5	1047.7	26.5	97.2
1057.7	29.0	1054.4	20.9	1048.3	23.4	1048.3	23.4	100.9
989.2	22.3	1007.6	17.4	1048.8	25.0	1048.8	25.0	94.3
1010.6	22.6	1023.5	18.6	1052.2	31.6	1052.2	31.6	96.0
991.0	29.4	1012.3	22.2	1059.5	26.3	1059.5	26.3	93.5
1012.5	23.5	1027.2	18.7	1059.5	29.0	1059.5	29.0	95.6
1086.1	29.2	1077.2	21.0	1060.2	24.8	1060.2	24.8	102.5
1034.7	18.9	1043.0	15.4	1061.1	26.0	1061.1	26.0	97.5
1052.2	29.5	1055.1	22.2	1061.9	29.7	1061.9	29.7	99.1
1077.7	29.4	1072.4	21.5	1062.7	26.9	1062.7	26.9	101.4
1066.2	33.5	1065.1	24.2	1063.6	27.1	1063.6	27.1	100.3
1039.9	25.3	1047.6	19.7	1064.7	29.3	1064.7	29.3	97.7
1049.4	34.1	1054.8	24.6	1066.9	25.9	1066.9	25.9	98.4
1042.1	24.7	1049.9	18.4	1067.2	22.9	1067.2	22.9	97.6
1006.0	23.4	1025.3	19.0	1067.7	31.2	1067.7	31.2	94.2
1048.9	29.1	1055.1	21.4	1068.9	25.6	1068.9	25.6	98.1
1040.5	25.6	1050.2	19.1	1071.3	24.2	1071.3	24.2	97.1
1056.7	24.6	1062.9	18.6	1076.4	25.0	1076.4	25.0	98.2
1017.4	30.9	1036.4	23.0	1077.5	26.2	1077.5	26.2	94.4
1064.4	24.6	1068.8	18.7	1078.8	26.2	1078.8	26.2	98.7
1050.7	29.6	1059.6	22.2	1079.0	29.0	1079.0	29.0	97.4
985.3	24.2	1014.7	20.5	1079.5	35.5	1079.5	35.5	91.3
1077.5	25.9	1079.0	19.5	1082.9	26.9	1082.9	26.9	99.5
1055.5	24.1	1064.4	18.0	1083.4	23.0	1083.4	23.0	97.4
1076.8	29.1	1080.2	22.0	1087.9	30.4	1087.9	30.4	99.0
1060.3	25.8	1069.5	20.7	1089.0	34.0	1089.0	34.0	97.4
986.2	23.9	1019.2	18.5	1091.7	23.7	1091.7	23.7	90.3
1063.3	26.8	1074.1	21.4	1097.0	34.1	1097.0	34.1	96.9
1076.0	35.0	1082.9	25.4	1097.6	28.6	1097.6	28.6	98.0
1122.2	24.9	1113.9	18.1	1098.6	23.3	1098.6	23.3	102.2
1090.8	28.3	1093.4	21.1	1099.3	28.1	1099.3	28.1	99.2
1009.1	31.3	1038.2	23.3	1100.9	25.8	1100.9	25.8	91.7
1132.3	28.0	1122.1	19.5	1103.2	19.4	1103.2	19.4	102.6
1073.1	27.1	1083.2	20.3	1104.5	26.2	1104.5	26.2	97.2
1003.0	31.0	1035.7	23.6	1106.2	28.9	1106.2	28.9	90.7
1115.0	30.1	1114.8	21.7	1115.3	25.4	1115.3	25.4	100.0
1095.9	34.7	1102.6	24.9	1116.8	27.5	1116.8	27.5	98.1
917.8	27.0	978.4	24.0	1117.9	43.0	1117.9	43.0	82.1
1130.7	26.0	1126.5	18.8	1119.3	23.1	1119.3	23.1	101.0
1051.9	29.5	1075.8	22.9	1125.5	32.2	1125.5	32.2	93.5
1162.0	33.0	1149.2	23.3	1125.8	26.8	1125.8	26.8	103.2
1102.5	30.0	1110.4	21.8	1126.8	25.7	1126.8	25.7	97.8

1124.5	32.8	1125.4	22.9	1128.1	21.8	1128.1	21.8	99.7
1139.4	37.2	1136.9	25.6	1132.9	23.3	1132.9	23.3	100.6
1081.1	28.2	1100.4	20.7	1139.7	24.0	1139.7	24.0	94.9
1146.9	31.6	1145.4	22.3	1143.4	24.7	1143.4	24.7	100.3
1089.5	33.3	1107.6	24.4	1144.2	28.4	1144.2	28.4	95.2
1153.5	24.6	1150.0	17.8	1144.2	22.8	1144.2	22.8	100.8
1080.2	32.8	1101.9	24.6	1146.0	31.6	1146.0	31.6	94.3
1147.4	29.0	1147.1	20.3	1147.2	21.2	1147.2	21.2	100.0
1181.9	21.7	1170.2	15.8	1149.5	21.0	1149.5	21.0	102.8
1170.6	37.7	1163.7	26.3	1151.7	28.1	1151.7	28.1	101.6
1030.2	26.5	1070.0	21.1	1152.8	31.1	1152.8	31.1	89.4
1163.5	25.2	1160.6	19.1	1156.0	28.4	1156.0	28.4	100.6
1147.5	28.9	1150.3	21.6	1156.3	29.8	1156.3	29.8	99.2
1129.7	28.6	1139.5	20.4	1158.9	22.3	1158.9	22.3	97.5
1150.0	31.5	1154.1	22.6	1162.7	26.9	1162.7	26.9	98.9
1163.0	30.0	1162.7	21.7	1162.8	27.4	1162.8	27.4	100.0
1112.8	30.8	1130.0	22.0	1164.0	22.5	1164.0	22.5	95.6
1076.8	33.7	1108.3	24.1	1171.4	22.0	1171.4	22.0	91.9
1182.7	28.6	1178.6	21.2	1171.8	29.9	1171.8	29.9	100.9
1119.7	35.2	1138.2	25.9	1174.3	31.8	1174.3	31.8	95.4
1198.3	29.2	1189.8	20.9	1175.3	26.4	1175.3	26.4	102.0
1142.8	27.6	1154.3	19.5	1176.7	20.2	1176.7	20.2	97.1
1182.9	32.7	1181.8	22.6	1180.8	22.5	1180.8	22.5	100.2
1157.6	29.6	1165.8	20.8	1182.0	21.6	1182.0	21.6	97.9
1130.6	30.7	1148.2	22.8	1182.5	29.3	1182.5	29.3	95.6
1178.8	32.1	1181.1	22.5	1186.3	24.4	1186.3	24.4	99.4
1085.7	26.6	1120.1	20.1	1188.3	25.6	1188.3	25.6	91.4
1123.7	34.2	1146.2	25.1	1189.9	30.2	1189.9	30.2	94.4
1161.5	30.1	1177.4	21.3	1207.7	22.5	1207.7	22.5	96.2
1198.7	35.9	1201.8	25.3	1208.3	28.5	1208.3	28.5	99.2
1193.3	22.0	1199.5	17.3	1211.4	27.9	1211.4	27.9	98.5
1230.9	31.5	1224.8	21.5	1214.9	21.6	1214.9	21.6	101.3
1217.7	26.8	1223.7	18.7	1235.3	20.6	1235.3	20.6	98.6
1233.3	34.2	1235.8	23.5	1240.8	24.0	1240.8	24.0	99.4
1236.3	37.3	1242.0	25.2	1252.9	22.7	1252.9	22.7	98.7
1150.4	25.8	1186.8	19.3	1254.6	24.5	1254.6	24.5	91.7
1164.4	27.0	1196.7	19.5	1256.3	22.2	1256.3	22.2	92.7
1217.1	28.2	1231.4	19.1	1257.2	16.1	1257.2	16.1	96.8
1232.6	29.1	1242.3	20.6	1260.1	24.5	1260.1	24.5	97.8
1157.6	26.9	1194.1	19.2	1261.6	20.0	1261.6	20.0	91.8
1220.6	32.6	1235.5	22.8	1262.5	24.6	1262.5	24.6	96.7
1235.3	28.7	1245.1	20.3	1263.0	23.6	1263.0	23.6	97.8
1233.2	29.7	1244.2	21.1	1264.1	25.1	1264.1	25.1	97.6

1216.9	29.1	1234.0	20.9	1264.9	25.5	1264.9	25.5	96.2
1244.2	35.5	1254.2	24.0	1272.2	22.3	1272.2	22.3	97.8
1261.8	32.9	1271.2	22.3	1288.0	21.4	1288.0	21.4	98.0
1214.5	33.0	1241.3	23.4	1289.0	25.9	1289.0	25.9	94.2
1251.6	36.2	1266.3	26.8	1292.3	37.2	1292.3	37.2	96.8
1300.9	40.0	1298.5	27.0	1295.3	27.6	1295.3	27.6	100.4
1291.3	33.2	1293.3	22.4	1297.4	22.4	1297.4	22.4	99.5
1270.8	34.5	1281.0	23.5	1299.1	23.9	1299.1	23.9	97.8
1113.9	22.0	1180.0	16.9	1304.1	21.3	1304.1	21.3	85.4
1310.9	30.3	1308.5	22.2	1305.5	31.4	1305.5	31.4	100.4
1297.3	40.0	1300.2	26.3	1306.0	21.7	1306.0	21.7	99.3
1363.2	33.3	1346.3	22.2	1320.4	23.8	1320.4	23.8	103.2
1295.9	32.6	1307.3	22.1	1326.9	22.4	1326.9	22.4	97.7
1301.9	26.9	1311.9	19.2	1329.1	24.5	1329.1	24.5	97.9
1338.0	41.1	1337.2	26.9	1336.7	23.6	1336.7	23.6	100.1
1324.3	37.0	1328.7	24.4	1336.7	22.1	1336.7	22.1	99.1
1356.8	37.8	1350.5	25.0	1341.5	24.7	1341.5	24.7	101.1
1353.1	40.0	1349.8	26.2	1345.5	24.1	1345.5	24.1	100.6
1294.2	34.0	1313.5	22.7	1345.8	20.3	1345.8	20.3	96.2
1329.2	32.1	1336.0	22.6	1347.9	28.1	1347.9	28.1	98.6
1364.7	39.4	1359.2	26.1	1351.5	26.7	1351.5	26.7	101.0
1389.4	38.2	1374.5	25.1	1352.2	25.8	1352.2	25.8	102.8
1336.1	31.0	1342.3	21.0	1353.0	22.6	1353.0	22.6	98.8
1364.2	41.1	1360.5	26.3	1355.4	20.3	1355.4	20.3	100.7
1191.5	32.4	1251.5	22.8	1357.1	21.0	1357.1	21.0	87.8
1358.0	37.9	1358.0	24.6	1358.9	20.8	1358.9	20.8	99.9
1354.4	41.2	1356.5	26.9	1360.6	24.4	1360.6	24.4	99.5
1331.9	28.0	1343.1	19.6	1361.8	23.6	1361.8	23.6	97.8
1290.6	27.7	1318.0	18.9	1363.7	18.6	1363.7	18.6	94.6
1390.4	36.6	1381.0	24.2	1367.4	25.2	1367.4	25.2	101.7
1286.8	32.4	1317.4	22.1	1368.4	21.4	1368.4	21.4	94.0
1258.7	32.8	1301.8	24.9	1374.3	34.9	1374.3	34.9	91.6
1342.4	29.3	1355.5	20.8	1377.0	26.0	1377.0	26.0	97.5
1371.2	36.1	1374.1	23.8	1379.5	22.8	1379.5	22.8	99.4
1339.7	41.3	1355.1	28.8	1380.3	33.8	1380.3	33.8	97.1
1293.3	31.8	1328.4	23.2	1386.4	29.8	1386.4	29.8	93.3
1380.6	33.7	1387.5	23.3	1399.1	27.7	1399.1	27.7	98.7
1356.4	27.7	1378.0	18.6	1412.5	18.9	1412.5	18.9	96.0
1453.7	33.2	1436.9	21.7	1413.0	23.4	1413.0	23.4	102.9
1341.2	45.2	1370.6	29.4	1417.6	22.4	1417.6	22.4	94.6
1424.6	29.2	1423.8	19.2	1423.6	19.4	1423.6	19.4	100.1
1416.1	36.7	1422.4	25.9	1432.5	33.4	1432.5	33.4	98.9
1453.5	34.8	1455.6	22.3	1459.5	20.8	1459.5	20.8	99.6

1425.0	33.4	1439.8	21.8	1462.7	20.8	1462.7	20.8	97.4
1487.3	37.3	1479.0	23.7	1468.0	22.1	1468.0	22.1	101.3
1350.0	33.3	1397.6	22.5	1471.8	21.6	1471.8	21.6	91.7
1470.8	43.0	1473.2	27.2	1477.4	23.4	1477.4	23.4	99.5
1478.4	42.5	1478.0	26.0	1478.3	17.1	1478.3	17.1	100.0
1376.2	34.8	1416.5	23.2	1478.4	21.7	1478.4	21.7	93.1
1499.8	36.5	1499.7	24.0	1500.4	26.2	1500.4	26.2	100.0
1484.9	31.7	1491.1	20.3	1500.7	19.1	1500.7	19.1	98.9
1488.5	40.0	1497.8	24.9	1511.9	19.2	1511.9	19.2	98.5
1374.6	27.8	1431.8	20.5	1518.7	27.4	1518.7	27.4	90.5
1471.1	41.7	1491.0	26.0	1520.1	19.3	1520.1	19.3	96.8
1245.8	26.7	1350.1	19.9	1520.3	23.5	1520.3	23.5	81.9
1503.2	45.8	1513.8	29.0	1529.4	26.3	1529.4	26.3	98.3
1437.2	35.6	1476.7	22.9	1534.8	18.7	1534.8	18.7	93.6
1422.3	33.8	1479.0	24.2	1562.2	30.6	1562.2	30.6	91.0
1603.1	41.0	1585.9	25.4	1564.0	24.2	1564.0	24.2	102.5
1479.5	41.9	1516.2	27.1	1568.6	25.3	1568.6	25.3	94.3
1453.0	44.6	1509.2	28.5	1589.8	21.8	1589.8	21.8	91.4
1444.1	46.3	1504.7	30.0	1592.0	24.7	1592.0	24.7	90.7
1484.7	32.5	1532.3	21.4	1599.3	21.0	1599.3	21.0	92.8
1661.3	43.1	1636.4	26.0	1605.2	23.2	1605.2	23.2	103.5
1567.4	33.6	1586.4	22.1	1612.7	24.5	1612.7	24.5	97.2
1486.2	35.9	1539.2	23.5	1613.6	22.8	1613.6	22.8	92.1
1535.8	40.6	1572.6	25.6	1623.0	22.2	1623.0	22.2	94.6
1679.4	40.8	1656.0	25.2	1627.4	25.4	1627.4	25.4	103.2
1648.6	33.1	1640.5	21.5	1630.9	25.0	1630.9	25.0	101.1
1552.9	44.4	1587.4	28.0	1634.3	25.4	1634.3	25.4	95.0
1595.3	34.9	1619.9	21.9	1652.9	20.3	1652.9	20.3	96.5
1691.9	38.0	1674.4	23.1	1653.3	22.1	1653.3	22.1	102.3
1605.6	43.7	1630.7	26.9	1664.2	23.0	1664.2	23.0	96.5
1620.7	44.9	1640.7	27.8	1667.1	24.8	1667.1	24.8	97.2
1668.0	46.8	1667.5	27.9	1667.6	22.7	1667.6	22.7	100.0
1447.2	28.3	1542.9	21.3	1677.3	28.8	1677.3	28.8	86.3
1677.5	38.0	1679.1	23.8	1681.9	24.6	1681.9	24.6	99.7
1635.7	39.5	1663.1	24.7	1698.5	23.5	1698.5	23.5	96.3
1694.7	42.6	1698.1	25.3	1703.0	20.7	1703.0	20.7	99.5
1661.7	44.6	1682.7	27.0	1709.9	22.5	1709.9	22.5	97.2
1745.0	51.8	1730.2	29.5	1713.2	19.5	1713.2	19.5	101.9
1673.6	45.4	1695.9	28.1	1724.4	26.7	1724.4	26.7	97.1
1700.1	39.2	1715.4	24.5	1734.8	25.4	1734.8	25.4	98.0
1732.9	49.0	1738.4	30.9	1745.9	33.7	1745.9	33.7	99.3
1691.5	47.9	1716.7	28.2	1748.3	20.4	1748.3	20.4	96.8
1686.7	51.2	1732.0	30.6	1787.9	23.3	1787.9	23.3	94.3

1776.0	40.2	1782.5	24.2	1791.0	22.7	1791.0	22.7	99.2
1806.1	39.7	1808.9	24.4	1812.9	25.6	1812.9	25.6	99.6
1797.8	51.5	1820.0	30.7	1846.4	28.1	1846.4	28.1	97.4
1908.4	38.7	1880.5	21.8	1850.6	18.2	1850.6	18.2	103.1
1842.3	44.0	1848.2	26.5	1855.6	26.4	1855.6	26.4	99.3
1674.9	42.4	1764.2	26.8	1872.4	25.5	1872.4	25.5	89.5
1855.6	96.9	1863.8	57.1	1873.8	53.0	1873.8	53.0	99.0
1701.3	40.4	1812.1	24.3	1942.8	18.0	1942.8	18.0	87.6
1911.6	50.1	1942.3	28.2	1976.0	21.4	1976.0	21.4	96.7
1973.4	52.0	1987.2	28.4	2002.4	20.0	2002.4	20.0	98.6
1867.2	42.3	2022.9	26.1	2186.5	24.9	2186.5	24.9	85.4
2039.4	47.6	2157.0	27.8	2271.6	26.0	2271.6	26.0	89.8
2491.0	61.9	2523.4	29.6	2550.2	17.7	2550.2	17.7	97.7
2667.8	51.1	2675.2	24.7	2681.5	19.6	2681.5	19.6	99.5
2711.1	67.7	2708.8	31.5	2707.7	21.8	2707.7	21.8	100.1
2726.9	53.2	2716.7	26.0	2709.9	22.2	2709.9	22.2	100.6
2703.7	63.9	2710.0	29.9	2715.5	20.9	2715.5	20.9	99.6
2677.8	63.8	2706.5	29.5	2728.7	18.7	2728.7	18.7	98.1
2726.7	61.4	2766.8	27.7	2796.8	15.2	2796.8	15.2	97.5
2876.9	76.0	2900.7	33.8	2917.9	21.2	2917.9	21.2	98.6

GY1

206Pb/	±	207Pb/	±	206Pb/	±	Best age	±	Conc
238U	(Ma)	235U	(Ma)	207Pb	(Ma)	(Ma)	(Ma)	(%)
392.1	6.4	396.9	6.6	424.9	24.6	392.1	6.4	NA
396.0	6.9	408.2	8.2	477.7	37.1	396.0	6.9	NA
399.5	6.4	399.6	12.9	399.9	79.2	399.5	6.4	NA
411.9	6.1	414.8	7.0	430.9	30.6	411.9	6.1	95.6
423.4	5.2	424.3	6.9	429.4	34.0	423.4	5.2	98.6
431.8	5.9	438.3	8.6	472.6	43.4	431.8	5.9	91.4
431.9	5.9	432.5	8.0	435.7	40.2	431.9	5.9	99.1
443.1	6.0	442.2	8.3	437.5	40.9	443.1	6.0	101.3
463.1	6.7	462.5	7.9	459.8	32.9	463.1	6.7	100.7
494.9	6.4	492.9	12.0	483.7	61.0	494.9	6.4	102.3
496.6	5.3	500.0	7.3	515.8	32.6	496.6	5.3	96.3
525.3	5.5	534.7	6.9	574.8	27.5	525.3	5.5	91.4
541.3	6.8	537.3	7.8	520.4	29.6	541.3	6.8	104.0
617.5	9.0	621.5	10.6	636.2	36.8	617.5	9.0	97.1
646.3	9.0	641.5	9.5	624.8	29.3	646.3	9.0	103.4
655.9	7.8	652.1	9.0	639.1	29.8	655.9	7.8	102.6
679.1	9.0	700.7	9.1	770.7	23.8	679.1	9.0	88.1

699.4	8.3	694.7	12.1	679.2	43.7	699.4	8.3	103.0
701.0	7.9	706.2	8.5	722.7	25.0	701.0	7.9	97.0
773.6	8.7	777.2	10.9	787.5	33.9	773.6	8.7	98.2
945.6	11.1	945.8	10.7	946.2	24.3	946.2	24.3	99.9
970.7	12.4	964.7	11.8	951.1	26.6	951.1	26.6	102.1
980.9	14.1	972.3	13.8	952.9	32.1	952.9	32.1	102.9
906.6	12.3	928.2	12.1	979.8	27.8	979.8	27.8	92.5
974.3	10.1	976.8	9.3	982.6	20.0	982.6	20.0	99.2
965.6	11.8	971.7	10.6	985.6	22.0	985.6	22.0	98.0
982.9	11.5	985.5	12.8	991.3	32.1	991.3	32.1	99.2
1005.1	15.5	1001.4	12.8	993.2	22.7	993.2	22.7	101.2
964.0	12.2	974.4	10.1	998.0	17.7	998.0	17.7	96.6
990.0	11.8	993.2	13.5	1000.2	34.5	1000.2	34.5	99.0
1015.3	9.5	1011.3	11.3	1002.7	29.3	1002.7	29.3	101.3
1032.3	11.0	1024.7	9.9	1008.3	20.4	1008.3	20.4	102.4
1015.0	12.4	1013.5	10.6	1010.3	19.9	1010.3	19.9	100.5
972.0	10.0	983.9	10.4	1010.7	24.8	1010.7	24.8	96.2
1016.2	9.5	1014.7	8.9	1011.5	19.2	1011.5	19.2	100.5
993.2	10.2	1001.7	13.2	1020.1	35.3	1020.1	35.3	97.4
1018.8	12.6	1020.0	11.0	1022.6	21.4	1022.6	21.4	99.6
1001.5	11.3	1008.6	10.1	1024.0	20.2	1024.0	20.2	97.8
1041.2	12.9	1038.1	11.7	1031.6	24.1	1031.6	24.1	100.9
1077.5	13.4	1062.5	12.9	1031.7	28.5	1031.7	28.5	104.4
1064.0	11.7	1053.9	10.0	1032.8	19.2	1032.8	19.2	103.0
1057.4	11.1	1050.5	10.1	1036.2	21.0	1036.2	21.0	102.0
1059.7	12.2	1052.0	11.7	1036.2	25.8	1036.2	25.8	102.3
1031.0	11.8	1032.7	10.2	1036.3	19.9	1036.3	19.9	99.5
1074.8	12.5	1062.4	9.7	1037.0	15.6	1037.0	15.6	103.6
1036.2	10.5	1037.8	12.0	1041.4	30.0	1041.4	30.0	99.5
1022.2	11.8	1028.7	11.7	1042.5	26.2	1042.5	26.2	98.1
1031.2	14.4	1034.9	16.2	1042.8	39.9	1042.8	39.9	98.9
1066.4	12.6	1059.1	10.4	1044.1	18.7	1044.1	18.7	102.1
1011.2	14.9	1021.7	18.3	1044.2	47.6	1044.2	47.6	96.8
996.7	10.5	1013.2	12.2	1048.9	30.7	1048.9	30.7	95.0
1056.1	14.5	1053.9	12.5	1049.3	23.9	1049.3	23.9	100.7
1003.7	13.0	1018.3	12.2	1049.8	26.1	1049.8	26.1	95.6
1078.7	12.6	1069.2	10.8	1050.0	20.7	1050.0	20.7	102.7
1034.7	12.4	1040.1	10.2	1051.5	18.0	1051.5	18.0	98.4
1024.1	12.7	1033.4	10.1	1053.3	16.0	1053.3	16.0	97.2
1072.1	14.6	1067.1	14.4	1056.9	32.3	1056.9	32.3	101.4
1086.5	11.8	1076.8	12.5	1057.3	29.5	1057.3	29.5	102.8
1078.2	12.4	1072.0	11.0	1059.4	22.0	1059.4	22.0	101.8
1066.0	12.9	1066.7	14.2	1068.3	34.2	1068.3	34.2	99.8

994.0	15.2	1017.9	17.1	1069.8	41.8	1069.8	41.8	92.9
1071.6	10.4	1071.5	9.6	1071.5	20.1	1071.5	20.1	100.0
1086.8	10.8	1081.9	9.7	1072.2	19.7	1072.2	19.7	101.4
1050.5	11.0	1060.2	10.5	1080.2	22.7	1080.2	22.7	97.2
1094.9	11.4	1090.8	9.6	1082.5	17.5	1082.5	17.5	101.1
1074.7	9.0	1078.0	9.6	1084.5	22.4	1084.5	22.4	99.1
1063.3	12.7	1071.8	10.8	1089.0	19.9	1089.0	19.9	97.6
1059.5	15.8	1069.2	12.0	1089.2	16.7	1089.2	16.7	97.3
1064.8	11.3	1073.5	10.7	1091.1	22.8	1091.1	22.8	97.6
1068.4	12.2	1076.5	12.9	1093.1	30.1	1093.1	30.1	97.7
1076.1	10.8	1081.9	11.1	1093.6	25.3	1093.6	25.3	98.4
1069.8	14.2	1079.0	13.1	1097.5	26.7	1097.5	26.7	97.5
1049.8	12.4	1065.8	12.4	1098.8	27.5	1098.8	27.5	95.5
1086.9	12.7	1091.2	10.0	1099.9	15.7	1099.9	15.7	98.8
1058.0	12.8	1072.8	14.4	1103.1	34.5	1103.1	34.5	95.9
1103.3	11.3	1103.5	11.3	1103.9	24.9	1103.9	24.9	99.9
1082.9	14.9	1090.4	12.1	1105.3	20.4	1105.3	20.4	98.0
983.4	9.7	1021.9	13.1	1105.5	34.8	1105.5	34.8	89.0
1075.9	13.2	1086.3	14.0	1107.2	32.4	1107.2	32.4	97.2
1150.3	15.1	1141.6	11.6	1125.2	18.2	1125.2	18.2	102.2
1151.8	12.3	1142.7	10.2	1125.5	18.5	1125.5	18.5	102.3
1113.8	10.6	1119.7	9.2	1131.3	17.3	1131.3	17.3	98.5
1132.0	11.3	1131.9	10.6	1131.7	22.1	1131.7	22.1	100.0
1084.0	12.6	1101.5	13.4	1136.3	30.6	1136.3	30.6	95.4
1185.4	13.1	1170.0	12.3	1141.8	25.5	1141.8	25.5	103.8
1150.6	9.6	1149.0	9.1	1145.9	19.2	1145.9	19.2	100.4
1136.0	13.3	1140.4	14.1	1148.6	32.1	1148.6	32.1	98.9
1118.2	14.0	1129.0	10.7	1149.8	15.5	1149.8	15.5	97.3
1089.0	13.7	1109.6	12.1	1150.4	22.8	1150.4	22.8	94.7
1121.7	12.3	1132.1	10.9	1152.1	20.9	1152.1	20.9	97.4
1198.1	15.2	1182.2	11.7	1153.2	18.5	1153.2	18.5	103.9
1146.8	13.9	1149.2	12.0	1153.7	22.6	1153.7	22.6	99.4
1121.0	13.8	1133.2	14.2	1156.8	31.6	1156.8	31.6	96.9
1182.5	14.7	1173.8	11.1	1157.8	16.6	1157.8	16.6	102.1
1130.6	12.0	1142.9	11.9	1166.2	25.5	1166.2	25.5	96.9
1124.6	12.0	1139.0	11.0	1166.6	21.9	1166.6	21.9	96.4
1170.6	13.9	1169.4	12.0	1167.2	22.7	1167.2	22.7	100.3
1128.8	14.2	1142.9	11.4	1169.9	18.7	1169.9	18.7	96.5
1194.8	21.8	1186.5	16.2	1171.5	23.0	1171.5	23.0	102.0
1179.0	13.5	1179.0	11.3	1179.0	20.4	1179.0	20.4	100.0
1171.3	13.3	1176.2	11.0	1185.3	19.2	1185.3	19.2	98.8
1181.3	14.8	1185.6	11.3	1193.4	17.0	1193.4	17.0	99.0
1186.1	11.0	1189.0	10.7	1194.4	22.4	1194.4	22.4	99.3

1199.3	15.0	1202.8	12.1	1209.1	20.0	1209.1	20.0	99.2
1147.1	12.4	1170.4	13.7	1213.7	31.2	1213.7	31.2	94.5
1216.0	15.5	1217.2	11.4	1219.2	15.5	1219.2	15.5	99.7
1220.2	14.4	1221.8	11.5	1224.5	18.8	1224.5	18.8	99.6
1239.1	13.3	1239.5	11.0	1240.3	19.3	1240.3	19.3	99.9
1254.4	9.0	1252.0	9.7	1247.7	21.4	1247.7	21.4	100.5
1242.2	13.7	1244.6	11.3	1248.8	19.9	1248.8	19.9	99.5
1300.1	16.5	1286.5	12.6	1263.8	19.7	1263.8	19.7	102.9
1233.4	11.3	1244.7	9.6	1264.4	17.4	1264.4	17.4	97.5
1267.4	12.4	1273.0	11.1	1282.3	21.3	1282.3	21.3	98.8
1269.8	12.8	1275.6	13.0	1285.3	27.2	1285.3	27.2	98.8
1313.5	22.1	1306.0	19.7	1293.8	37.4	1293.8	37.4	101.5
1328.8	19.1	1320.0	15.3	1305.6	25.9	1305.6	25.9	101.8
1288.7	17.1	1296.2	13.2	1308.7	20.6	1308.7	20.6	98.5
1325.0	14.2	1322.6	11.7	1318.5	20.3	1318.5	20.3	100.5
1302.9	13.7	1309.4	12.4	1320.1	23.7	1320.1	23.7	98.7
1322.7	17.8	1323.1	14.0	1323.7	22.8	1323.7	22.8	99.9
1320.2	14.6	1322.9	13.0	1327.1	24.6	1327.1	24.6	99.5
1300.4	13.3	1322.6	15.2	1358.8	33.2	1358.8	33.2	95.7
1373.1	16.8	1369.0	12.3	1362.6	17.4	1362.6	17.4	100.8
1395.8	14.9	1389.8	13.8	1380.6	26.7	1380.6	26.7	101.1
1353.6	15.2	1368.6	12.2	1392.1	19.7	1392.1	19.7	97.2
1320.9	16.6	1349.8	15.3	1395.8	28.8	1395.8	28.8	94.6
1452.1	18.4	1438.2	12.6	1417.8	15.7	1417.8	15.7	102.4
1432.7	14.7	1430.5	11.7	1427.4	19.1	1427.4	19.1	100.4
1295.8	15.3	1346.9	12.1	1429.0	18.3	1429.0	18.3	90.7
1458.1	14.9	1449.2	11.0	1436.0	16.2	1436.0	16.2	101.5
1462.0	17.0	1455.9	11.5	1446.9	13.6	1446.9	13.6	101.0
1407.0	13.0	1424.2	10.8	1450.0	18.3	1450.0	18.3	97.0
1400.1	17.5	1420.2	13.9	1450.5	22.4	1450.5	22.4	96.5
1411.6	15.4	1428.1	12.1	1452.7	19.2	1452.7	19.2	97.2
1430.2	14.8	1441.8	11.0	1459.1	16.1	1459.1	16.1	98.0
1492.4	16.8	1478.9	13.0	1459.6	20.8	1459.6	20.8	102.3
1224.8	24.6	1313.5	21.0	1461.4	34.5	1461.4	34.5	83.8
1453.7	15.9	1457.3	11.6	1462.5	16.4	1462.5	16.4	99.4
1472.2	14.0	1472.4	14.1	1472.5	27.9	1472.5	27.9	100.0
1479.6	20.3	1476.9	14.3	1472.9	19.0	1472.9	19.0	100.5
1490.2	15.6	1483.9	11.8	1474.8	18.2	1474.8	18.2	101.0
1509.8	23.0	1496.1	15.9	1476.6	21.1	1476.6	21.1	102.2
1489.8	16.2	1485.9	11.9	1480.4	17.4	1480.4	17.4	100.6
1497.2	19.1	1492.7	20.1	1486.2	40.5	1486.2	40.5	100.7
1482.5	11.7	1492.7	10.3	1507.3	18.3	1507.3	18.3	98.4
1538.2	14.3	1526.2	11.6	1509.5	19.4	1509.5	19.4	101.9

1455.8	17.8	1479.3	13.7	1513.2	20.8	1513.2	20.8	96.2
1469.5	16.8	1489.7	13.3	1518.5	21.3	1518.5	21.3	96.8
1531.3	19.3	1539.1	16.6	1549.8	28.9	1549.8	28.9	98.8
1525.9	12.9	1545.0	10.8	1571.1	18.1	1571.1	18.1	97.1
1561.6	19.6	1566.1	14.8	1572.3	22.3	1572.3	22.3	99.3
1591.9	15.9	1586.6	12.7	1579.6	20.8	1579.6	20.8	100.8
1600.1	18.1	1601.3	14.1	1602.8	22.3	1602.8	22.3	99.8
1614.8	14.7	1613.7	12.4	1612.2	21.1	1612.2	21.1	100.2
1637.3	19.4	1627.1	13.8	1613.9	19.6	1613.9	19.6	101.5
1676.3	21.7	1651.2	14.5	1619.4	18.7	1619.4	18.7	103.5
1636.5	16.7	1629.1	12.2	1619.4	18.0	1619.4	18.0	101.1
1600.8	17.0	1610.3	13.4	1622.8	21.4	1622.8	21.4	98.6
1422.1	18.6	1506.8	13.5	1627.9	17.0	1627.9	17.0	87.4
1572.0	21.2	1596.8	14.4	1629.7	17.5	1629.7	17.5	96.5
1644.3	22.2	1641.0	14.6	1636.8	17.4	1636.8	17.4	100.5
1613.0	17.1	1623.8	12.3	1637.9	17.4	1637.9	17.4	98.5
1641.6	14.5	1643.2	14.0	1645.3	26.0	1645.3	26.0	99.8
1692.8	19.6	1671.8	13.1	1645.5	16.8	1645.5	16.8	102.9
1625.7	16.4	1634.9	12.4	1646.8	18.7	1646.8	18.7	98.7
1599.9	18.4	1621.4	13.6	1649.4	19.8	1649.4	19.8	97.0
1629.9	16.1	1639.4	11.6	1651.5	16.4	1651.5	16.4	98.7
1697.7	13.8	1679.0	11.9	1655.7	20.8	1655.7	20.8	102.5
1610.9	16.8	1630.5	12.1	1656.0	16.9	1656.0	16.9	97.3
1437.6	19.3	1528.6	15.3	1657.0	22.6	1657.0	22.6	86.8
1647.2	14.1	1654.4	10.2	1663.5	14.7	1663.5	14.7	99.0
1652.0	18.6	1657.3	14.4	1664.1	22.5	1664.1	22.5	99.3
1708.1	19.4	1691.3	12.8	1670.5	15.9	1670.5	15.9	102.3
1638.8	17.0	1657.8	15.2	1682.0	26.6	1682.0	26.6	97.4
1549.6	15.8	1607.5	12.0	1684.3	17.4	1684.3	17.4	92.0
1679.3	16.9	1696.8	13.1	1718.4	20.3	1718.4	20.3	97.7
1738.4	18.4	1735.3	12.7	1731.5	17.2	1731.5	17.2	100.4
1783.1	20.4	1759.9	13.8	1732.5	18.4	1732.5	18.4	102.9
1708.2	15.4	1719.7	11.1	1733.7	16.0	1733.7	16.0	98.5
1664.7	11.3	1701.8	9.3	1747.7	15.2	1747.7	15.2	95.3
1771.1	18.9	1761.9	13.2	1751.0	18.4	1751.0	18.4	101.1
1747.4	20.5	1755.3	14.4	1764.6	19.7	1764.6	19.7	99.0
1726.8	21.5	1744.0	15.3	1764.8	21.3	1764.8	21.3	97.8
1720.3	14.8	1748.7	9.7	1782.8	11.4	1782.8	11.4	96.5
1754.7	19.6	1767.7	12.1	1783.1	12.3	1783.1	12.3	98.4
1786.0	19.4	1792.7	12.6	1800.4	15.2	1800.4	15.2	99.2
1754.4	15.9	1776.4	11.2	1802.4	15.2	1802.4	15.2	97.3
1778.5	18.9	1792.9	12.4	1809.7	15.3	1809.7	15.3	98.3
1685.0	22.9	1746.9	24.5	1821.9	45.5	1821.9	45.5	92.5

1867.7	18.5	1856.7	15.2	1844.4	25.0	1844.4	25.0	101.3
1848.5	19.8	1854.1	13.4	1860.5	17.5	1860.5	17.5	99.4
1883.0	22.1	1874.1	14.0	1864.2	16.8	1864.2	16.8	101.0
1913.6	19.4	1895.9	13.1	1876.5	17.7	1876.5	17.7	102.0
1921.9	24.7	1908.1	14.4	1893.1	13.6	1893.1	13.6	101.5
2022.8	17.8	1995.6	11.8	1967.5	15.6	1967.5	15.6	102.8
1923.4	21.7	1982.5	14.1	2044.7	16.8	2044.7	16.8	94.1
2082.1	22.3	2078.6	13.3	2075.1	14.8	2075.1	14.8	100.3
2201.1	26.1	2195.8	14.7	2190.8	14.9	2190.8	14.9	100.5
2047.0	45.3	2237.6	26.8	2416.9	24.7	2416.9	24.7	84.7
2309.3	28.0	2372.5	16.3	2427.2	17.5	2427.2	17.5	95.1
2484.8	24.7	2481.3	14.2	2478.4	16.0	2478.4	16.0	100.3
2519.2	23.3	2513.1	14.6	2508.2	18.6	2508.2	18.6	100.4
2589.7	31.6	2571.1	16.7	2556.4	16.8	2556.4	16.8	101.3
2532.8	26.8	2555.4	15.5	2573.3	17.8	2573.3	17.8	98.4
2587.2	28.6	2596.9	15.2	2604.5	15.3	2604.5	15.3	99.3
2668.6	33.9	2650.9	16.3	2637.4	12.7	2637.4	12.7	101.2
2672.6	39.7	2682.0	18.5	2689.1	12.2	2689.1	12.2	99.4
2621.9	27.6	2663.7	14.2	2695.6	13.3	2695.6	13.3	97.3
2641.8	26.6	2673.9	13.3	2698.3	11.6	2698.3	11.6	97.9
2684.0	21.1	2697.1	10.8	2707.0	10.1	2707.0	10.1	99.1
2536.6	26.3	2662.8	13.9	2760.0	13.0	2760.0	13.0	91.9
2780.1	25.9	2777.2	13.7	2775.1	14.3	2775.1	14.3	100.2
2872.8	31.9	2899.1	16.4	2917.4	16.5	2917.4	16.5	98.5
2937.5	30.4	2944.2	15.0	2948.8	14.2	2948.8	14.2	99.6

GW1

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
410.2	8.7	413.5	8.4	432.6	25.3	410.2	8.7	94.8
469.9	9.5	464.8	9.0	440.3	27.1	469.9	9.5	106.7
488.1	13.8	510.9	13.0	615.0	29.4	488.1	13.8	79.4
489.3	12.2	503.8	11.2	571.1	24.0	489.3	12.2	85.7
495.4	14.4	528.6	13.5	675.6	26.5	495.4	14.4	73.3
500.3	13.5	509.7	12.0	552.8	23.6	500.3	13.5	90.5
507.4	10.9	521.3	10.3	583.6	25.4	507.4	10.9	86.9
508.3	15.3	523.5	14.1	591.6	31.1	508.3	15.3	85.9
508.7	16.4	518.8	14.5	564.4	26.3	508.7	16.4	90.1
509.3	12.1	517.0	11.0	552.3	24.1	509.3	12.1	92.2
509.6	11.8	525.5	11.6	596.0	31.7	509.6	11.8	85.5
509.7	12.8	520.8	12.2	570.8	32.1	509.7	12.8	89.3
510.5	9.6	525.3	9.5	591.2	26.9	510.5	9.6	86.3

510.8	12.5	510.6	11.1	510.4	22.9	510.8	12.5	100.1
512.1	13.3	513.6	12.6	521.2	33.8	512.1	13.3	98.3
512.8	15.0	514.2	13.0	521.4	23.3	512.8	15.0	98.3
513.5	13.9	526.4	12.4	583.4	24.7	513.5	13.9	88.0
514.5	11.9	524.0	11.3	566.4	29.5	514.5	11.9	90.8
515.2	11.3	525.9	10.2	573.3	22.2	515.2	11.3	89.9
515.6	12.8	524.6	11.4	565.2	23.5	515.6	12.8	91.2
515.8	13.0	522.2	11.7	551.1	25.6	515.8	13.0	93.6
516.3	10.2	520.1	9.7	537.7	26.8	516.3	10.2	96.0
516.4	12.8	519.5	11.5	534.3	24.7	516.4	12.8	96.7
516.5	11.2	520.9	10.7	541.0	29.7	516.5	11.2	95.5
516.9	13.3	518.0	11.6	523.7	21.0	516.9	13.3	98.7
516.9	12.9	530.4	12.0	589.9	28.4	516.9	12.9	87.6
517.2	11.0	533.6	12.4	605.4	42.9	517.2	11.0	85.4
517.5	11.3	521.7	10.0	540.9	20.7	517.5	11.3	95.7
517.7	13.0	528.8	11.6	578.0	23.0	517.7	13.0	89.6
518.0	10.7	517.6	10.2	516.8	28.6	518.0	10.7	100.2
518.1	9.4	531.9	9.5	592.5	28.4	518.1	9.4	87.4
518.2	9.5	535.3	9.2	610.2	24.4	518.2	9.5	84.9
518.2	12.4	516.1	11.4	507.7	29.1	518.2	12.4	102.1
518.3	10.3	532.9	10.8	596.9	34.0	518.3	10.3	86.8
518.8	9.1	530.6	9.3	582.8	28.4	518.8	9.1	89.0
519.1	11.2	534.8	10.6	603.5	26.2	519.1	11.2	86.0
519.5	11.9	525.3	12.0	551.6	36.6	519.5	11.9	94.2
519.7	13.1	527.6	11.4	562.9	18.8	519.7	13.1	92.3
520.0	13.9	517.8	12.3	509.3	26.6	520.0	13.9	102.1
520.2	9.4	521.2	9.3	526.7	28.7	520.2	9.4	98.8
520.4	10.6	532.7	9.8	586.9	23.0	520.4	10.6	88.7
520.5	13.9	536.6	13.1	606.2	31.5	520.5	13.9	85.9
520.6	11.8	527.2	11.1	556.7	28.9	520.6	11.8	93.5
520.6	13.7	540.1	13.9	624.1	40.6	520.6	13.7	83.4
520.7	12.7	534.4	11.4	594.2	22.8	520.7	12.7	87.6
521.2	11.9	528.7	10.9	562.3	25.8	521.2	11.9	92.7
521.2	11.9	528.3	11.0	559.8	26.8	521.2	11.9	93.1
521.4	14.5	545.3	13.7	647.2	32.1	521.4	14.5	80.6
521.5	12.3	526.1	11.7	547.0	32.2	521.5	12.3	95.3
521.5	14.8	530.0	13.2	567.7	26.4	521.5	14.8	91.9
521.8	14.5	534.2	12.9	588.5	24.5	521.8	14.5	88.7
522.1	12.0	521.3	10.7	518.8	22.8	522.1	12.0	100.6
522.1	10.9	521.3	9.9	518.8	24.4	522.1	10.9	100.6
522.2	11.1	534.0	10.6	585.6	27.6	522.2	11.1	89.2
522.2	10.3	530.0	10.0	564.3	28.1	522.2	10.3	92.6
522.4	12.4	525.0	11.0	537.5	23.1	522.4	12.4	97.2

522.4	12.2	529.0	11.0	558.6	24.5	522.4	12.2	93.5
522.5	10.6	544.7	11.1	639.9	34.1	522.5	10.6	81.7
522.5	10.0	518.1	9.3	500.0	25.1	522.5	10.0	104.5
522.5	10.5	528.5	10.1	555.1	28.2	522.5	10.5	94.1
522.7	10.6	533.3	9.6	579.7	20.2	522.7	10.6	90.2
523.1	13.5	537.0	12.6	597.5	29.4	523.1	13.5	87.5
523.2	11.4	524.5	10.8	531.3	29.2	523.2	11.4	98.5
523.3	12.8	539.0	11.8	606.6	26.5	523.3	12.8	86.3
523.5	13.0	537.3	11.8	597.0	24.7	523.5	13.0	87.7
523.6	10.9	535.0	9.9	584.8	21.4	523.6	10.9	89.5
523.7	11.7	533.7	10.8	577.5	25.4	523.7	11.7	90.7
524.1	11.1	533.6	11.5	575.4	36.4	524.1	11.1	91.1
524.1	10.1	529.8	16.1	555.2	73.1	524.1	10.1	94.4
524.2	12.0	541.0	11.0	613.5	24.0	524.2	12.0	85.4
524.2	12.1	532.4	11.2	568.5	27.3	524.2	12.1	92.2
524.4	12.9	537.5	11.5	594.5	21.3	524.4	12.9	88.2
524.5	9.5	531.9	9.5	565.0	28.5	524.5	9.5	92.8
524.6	10.3	528.2	9.4	544.7	22.4	524.6	10.3	96.3
524.7	9.6	535.9	9.2	584.8	24.7	524.7	9.6	89.7
524.7	10.6	531.0	9.8	558.9	24.3	524.7	10.6	93.9
524.8	12.7	535.9	12.2	584.3	32.1	524.8	12.7	89.8
524.9	13.5	536.5	12.4	587.4	27.4	524.9	13.5	89.3
525.1	11.5	543.0	10.6	619.6	23.2	525.1	11.5	84.8
525.2	13.1	532.1	12.0	562.5	28.4	525.2	13.1	93.4
525.2	14.0	534.0	13.0	572.5	30.8	525.2	14.0	91.8
525.3	13.0	540.5	12.5	606.3	32.4	525.3	13.0	86.6
525.6	11.9	528.4	11.5	541.8	32.5	525.6	11.9	97.0
525.8	11.5	530.5	11.2	552.0	32.0	525.8	11.5	95.3
526.0	13.3	541.1	11.9	606.6	23.6	526.0	13.3	86.7
526.4	10.8	532.3	13.4	559.0	52.7	526.4	10.8	94.2
526.4	12.6	550.6	13.6	652.9	43.1	526.4	12.6	80.6
526.4	12.1	535.4	11.2	575.0	26.7	526.4	12.1	91.6
526.6	12.4	528.9	10.9	540.1	21.9	526.6	12.4	97.5
526.6	12.3	533.2	10.9	562.7	21.2	526.6	12.3	93.6
526.7	15.0	535.3	13.2	573.4	24.1	526.7	15.0	91.9
526.7	12.3	535.9	11.0	576.3	22.1	526.7	12.3	91.4
526.7	10.5	528.6	10.6	537.9	32.6	526.7	10.5	97.9
526.7	16.2	534.2	13.9	567.3	22.1	526.7	16.2	92.8
526.8	12.0	534.1	10.8	566.5	22.9	526.8	12.0	93.0
526.9	13.1	534.6	11.9	568.2	27.3	526.9	13.1	92.7
527.0	11.7	526.2	10.4	523.9	22.7	527.0	11.7	100.6
527.0	12.0	523.6	10.7	510.2	24.1	527.0	12.0	103.3
527.0	12.5	526.3	11.1	523.9	23.4	527.0	12.5	100.6

527.1	14.5	531.9	12.7	553.8	23.3	527.1	14.5	95.2
527.3	11.9	530.2	10.4	543.7	19.3	527.3	11.9	97.0
527.4	12.8	527.6	11.2	529.5	22.3	527.4	12.8	99.6
527.4	11.9	540.6	11.8	597.9	33.5	527.4	11.9	88.2
527.4	10.8	542.1	10.0	605.3	23.3	527.4	10.8	87.1
527.5	12.8	546.3	12.6	626.4	33.9	527.5	12.8	84.2
527.6	11.0	544.0	10.4	614.0	25.1	527.6	11.0	85.9
527.7	13.4	523.9	11.8	508.4	25.4	527.7	13.4	103.8
527.7	11.8	527.2	10.3	526.0	19.9	527.7	11.8	100.3
527.8	10.5	526.7	9.9	523.1	26.3	527.8	10.5	100.9
528.0	13.6	539.0	12.3	587.1	26.0	528.0	13.6	89.9
528.0	14.4	533.8	13.0	559.4	28.0	528.0	14.4	94.4
528.0	12.7	538.5	11.6	584.1	25.0	528.0	12.7	90.4
528.2	14.6	536.3	13.4	572.1	30.8	528.2	14.6	92.3
528.3	12.0	528.2	11.1	528.8	28.7	528.3	12.0	99.9
528.4	15.1	532.1	13.1	549.0	23.9	528.4	15.1	96.3
528.8	13.4	528.5	11.7	528.1	23.1	528.8	13.4	100.1
528.8	10.8	529.0	9.7	530.7	22.1	528.8	10.8	99.6
528.9	14.1	525.8	12.3	513.4	25.2	528.9	14.1	103.0
528.9	11.7	533.6	11.2	554.8	31.2	528.9	11.7	95.3
528.9	12.3	542.6	11.7	601.6	29.5	528.9	12.3	87.9
529.0	9.6	549.8	11.6	638.2	42.4	529.0	9.6	82.9
529.2	13.3	538.1	11.9	577.1	24.8	529.2	13.3	91.7
529.3	11.7	547.3	10.7	623.9	23.0	529.3	11.7	84.8
529.3	15.5	529.7	13.7	532.4	29.2	529.3	15.5	99.4
529.5	14.5	538.5	13.2	578.0	29.0	529.5	14.5	91.6
529.9	12.3	539.2	11.2	579.7	25.6	529.9	12.3	91.4
530.1	14.2	531.6	12.6	538.8	26.1	530.1	14.2	98.4
530.1	11.4	531.8	10.4	540.0	25.0	530.1	11.4	98.2
530.1	19.9	549.7	21.3	632.8	67.4	530.1	19.9	83.8
530.2	12.3	527.6	11.1	517.3	26.6	530.2	12.3	102.5
530.2	13.2	533.0	11.8	545.9	25.6	530.2	13.2	97.1
530.2	12.4	544.6	11.2	606.0	23.0	530.2	12.4	87.5
530.3	14.5	537.6	12.6	569.6	21.5	530.3	14.5	93.1
530.4	11.6	543.7	11.2	600.7	29.7	530.4	11.6	88.3
530.8	13.6	539.9	11.8	579.5	19.1	530.8	13.6	91.6
530.9	11.3	535.7	10.5	557.3	27.0	530.9	11.3	95.3
531.2	10.9	542.9	10.1	593.5	23.9	531.2	10.9	89.5
531.2	9.8	543.6	9.7	596.7	27.7	531.2	9.8	89.0
531.2	14.3	547.7	16.8	617.8	60.9	531.2	14.3	86.0
531.2	12.2	549.3	12.0	626.1	32.3	531.2	12.2	84.9
531.7	12.6	532.5	11.0	536.7	20.6	531.7	12.6	99.1
531.7	9.4	532.6	8.9	537.5	24.3	531.7	9.4	98.9

532.0	15.1	531.2	13.3	528.9	27.7	532.0	15.1	100.6
532.2	12.1	536.4	11.6	555.0	32.3	532.2	12.1	95.9
532.3	14.5	539.2	13.3	569.8	30.7	532.3	14.5	93.4
532.3	13.3	530.8	11.4	525.3	19.8	532.3	13.3	101.3
532.5	13.8	541.6	12.5	581.1	27.3	532.5	13.8	91.6
532.5	12.3	536.4	11.7	554.1	31.7	532.5	12.3	96.1
532.8	12.1	534.6	11.2	542.9	28.1	532.8	12.1	98.1
532.9	12.6	539.3	11.9	567.4	31.1	532.9	12.6	93.9
533.0	9.6	533.3	9.3	535.5	27.2	533.0	9.6	99.5
533.1	14.2	535.0	12.4	543.9	22.8	533.1	14.2	98.0
533.3	14.6	544.8	13.4	594.4	29.9	533.3	14.6	89.7
533.3	13.1	547.7	11.9	609.0	25.5	533.3	13.1	87.6
533.4	9.9	534.5	9.2	540.2	24.2	533.4	9.9	98.7
533.7	13.1	533.3	11.5	532.4	23.4	533.7	13.1	100.2
533.9	11.7	544.1	10.8	588.0	25.8	533.9	11.7	90.8
534.0	12.0	542.7	11.3	580.8	27.9	534.0	12.0	91.9
534.3	15.6	553.1	14.3	632.3	30.0	534.3	15.6	84.5
534.3	11.2	537.3	9.9	550.6	20.5	534.3	11.2	97.1
534.7	11.8	534.6	10.7	535.2	24.5	534.7	11.8	99.9
534.8	11.1	535.3	10.3	538.8	26.1	534.8	11.1	99.2
534.8	11.2	551.9	10.9	624.0	28.7	534.8	11.2	85.7
535.0	12.4	543.5	11.4	580.2	26.9	535.0	12.4	92.2
535.2	14.7	543.8	13.3	581.1	28.7	535.2	14.7	92.1
535.4	15.9	541.5	14.1	568.3	28.9	535.4	15.9	94.2
535.4	11.4	533.4	12.7	526.1	46.4	535.4	11.4	101.8
535.7	14.4	540.5	12.9	561.8	27.0	535.7	14.4	95.3
535.9	12.5	544.4	12.0	580.9	32.3	535.9	12.5	92.3
535.9	16.0	534.8	14.0	531.2	29.3	535.9	16.0	100.9
536.0	10.3	536.6	8.9	540.0	17.3	536.0	10.3	99.3
536.0	12.0	537.6	10.6	545.5	22.8	536.0	12.0	98.3
536.1	11.0	539.0	10.4	552.3	27.3	536.1	11.0	97.1
536.3	13.6	546.5	13.0	590.1	34.2	536.3	13.6	90.9
536.4	10.8	533.3	10.1	521.1	26.3	536.4	10.8	102.9
536.4	9.8	539.3	9.3	552.7	25.0	536.4	9.8	97.1
536.6	13.8	548.0	12.4	596.6	25.2	536.6	13.8	89.9
536.6	11.2	537.8	9.9	543.7	20.7	536.6	11.2	98.7
537.0	10.3	542.3	9.1	565.7	18.7	537.0	10.3	94.9
537.0	14.3	536.9	12.6	537.3	26.5	537.0	14.3	99.9
537.0	13.4	559.4	12.6	652.5	28.6	537.0	13.4	82.3
537.1	12.4	535.5	10.7	529.8	19.6	537.1	12.4	101.4
537.2	15.5	551.1	13.9	610.0	28.7	537.2	15.5	88.1
537.3	13.0	537.8	11.7	541.0	26.2	537.3	13.0	99.3
537.4	9.9	533.1	9.1	516.0	23.0	537.4	9.9	104.1

537.5	10.8	532.9	9.9	514.1	25.1	537.5	10.8	104.5
537.6	14.6	535.3	19.0	526.4	78.8	537.6	14.6	102.1
538.2	14.0	551.5	12.9	607.5	28.7	538.2	14.0	88.6
538.3	14.1	541.6	13.0	556.5	32.1	538.3	14.1	96.7
538.8	11.8	548.3	11.3	589.1	29.8	538.8	11.8	91.5
540.0	14.2	539.5	12.0	538.2	19.3	540.0	14.2	100.3
540.0	12.7	556.3	12.9	624.2	37.5	540.0	12.7	86.5
540.2	13.6	563.7	13.2	660.5	33.5	540.2	13.6	81.8
540.2	16.7	546.3	14.8	572.5	29.2	540.2	16.7	94.4
540.5	13.1	539.5	11.7	536.4	25.7	540.5	13.1	100.8
540.7	15.0	541.1	13.1	543.7	26.0	540.7	15.0	99.5
540.8	9.7	538.1	9.4	527.5	27.8	540.8	9.7	102.5
540.9	14.8	541.6	14.3	545.6	40.7	540.9	14.8	99.1
541.7	12.5	557.2	12.8	622.0	37.7	541.7	12.5	87.1
542.0	13.1	542.8	11.5	547.3	24.3	542.0	13.1	99.0
542.2	14.4	544.2	13.6	553.3	35.7	542.2	14.4	98.0
542.9	12.8	541.1	12.1	534.6	32.5	542.9	12.8	101.6
544.1	14.0	539.2	12.0	519.2	21.9	544.1	14.0	104.8
544.9	16.2	562.2	14.9	633.9	32.8	544.9	16.2	86.0
545.5	12.9	553.0	11.8	585.2	26.6	545.5	12.9	93.2
550.3	13.6	553.3	11.7	566.7	21.3	550.3	13.6	97.1
556.8	12.8	568.0	11.9	613.8	28.2	556.8	12.8	90.7
641.1	14.5	649.6	13.1	680.0	28.8	641.1	14.5	94.3
846.4	17.1	884.1	14.1	980.5	21.1	980.5	21.1	86.3
924.2	21.0	946.8	17.4	1000.8	29.1	1000.8	29.1	92.3
1044.7	27.8	1035.3	20.0	1016.2	21.9	1016.2	21.9	102.8
1038.4	23.3	1033.0	17.0	1022.6	20.4	1022.6	20.4	101.5
1050.7	28.3	1042.3	20.7	1025.7	25.8	1025.7	25.8	102.4
1031.1	25.0	1029.2	17.8	1026.2	17.4	1026.2	17.4	100.5
1064.5	28.3	1053.7	20.6	1032.1	25.1	1032.1	25.1	103.1
1011.5	22.1	1018.7	17.0	1035.0	24.0	1035.0	24.0	97.7
1012.5	20.8	1019.4	15.5	1035.3	18.8	1035.3	18.8	97.8
955.0	20.8	979.5	16.1	1035.6	21.0	1035.6	21.0	92.2
962.3	26.3	985.3	20.1	1037.7	25.0	1037.7	25.0	92.7
1049.3	25.6	1048.5	19.2	1047.8	26.3	1047.8	26.3	100.1
1002.6	14.0	1018.2	11.3	1052.8	18.1	1052.8	18.1	95.2
1047.2	21.0	1048.9	16.5	1053.5	26.0	1053.5	26.0	99.4
1068.2	24.1	1063.3	17.8	1054.1	23.3	1054.1	23.3	101.3
1057.1	21.2	1058.2	15.5	1061.5	18.2	1061.5	18.2	99.6
1033.0	30.6	1042.5	22.0	1063.3	21.6	1063.3	21.6	97.2
1064.9	25.9	1064.3	18.1	1064.0	15.7	1064.0	15.7	100.1
1031.0	20.0	1042.8	15.9	1068.6	25.4	1068.6	25.4	96.5
1036.5	21.3	1048.5	15.9	1074.7	19.6	1074.7	19.6	96.4

1039.0	22.2	1050.5	16.6	1075.5	20.9	1075.5	20.9	96.6
1058.7	25.4	1064.2	18.3	1076.4	19.7	1076.4	19.7	98.4
1009.3	26.2	1037.0	20.3	1096.7	27.4	1096.7	27.4	92.0
1055.2	23.9	1069.1	17.5	1098.3	20.2	1098.3	20.2	96.1
1064.6	24.2	1077.9	18.0	1105.8	22.4	1105.8	22.4	96.3
1117.4	22.2	1120.9	16.7	1128.5	23.0	1128.5	23.0	99.0
1066.5	28.3	1088.3	20.6	1133.1	21.8	1133.1	21.8	94.1
1134.3	22.5	1135.6	16.6	1139.0	21.6	1139.0	21.6	99.6
1097.6	29.5	1114.1	22.6	1147.3	32.2	1147.3	32.2	95.7
1084.6	27.9	1111.0	21.1	1164.0	27.8	1164.0	27.8	93.2
1121.5	19.2	1138.0	14.7	1170.5	21.0	1170.5	21.0	95.8
1168.5	33.5	1169.6	23.2	1172.5	22.9	1172.5	22.9	99.7
1182.4	30.9	1179.9	21.5	1176.1	22.7	1176.1	22.7	100.5
1124.0	32.6	1144.6	23.3	1184.8	24.2	1184.8	24.2	94.9
1132.7	28.0	1161.2	22.1	1215.7	33.6	1215.7	33.6	93.2
1169.8	33.2	1188.0	23.8	1222.1	26.9	1222.1	26.9	95.7
1301.5	30.9	1315.5	20.8	1339.3	20.4	1339.3	20.4	97.2
1244.9	29.7	1283.3	20.1	1348.9	16.8	1348.9	16.8	92.3
1300.3	29.3	1320.8	19.7	1355.0	18.3	1355.0	18.3	96.0
1344.9	31.3	1352.5	21.3	1365.3	23.1	1365.3	23.1	98.5
1358.3	38.0	1363.1	24.6	1371.6	20.0	1371.6	20.0	99.0
1382.0	36.3	1384.0	23.5	1387.9	20.4	1387.9	20.4	99.6
1353.3	23.5	1366.7	16.0	1388.5	17.1	1388.5	17.1	97.5
1382.9	35.2	1388.9	22.6	1399.0	18.6	1399.0	18.6	98.9
1373.6	39.5	1410.3	26.3	1467.0	25.0	1467.0	25.0	93.6
1498.9	36.3	1500.0	23.3	1502.3	23.2	1502.3	23.2	99.8
1485.4	33.2	1493.9	20.7	1506.8	16.4	1506.8	16.4	98.6
1472.1	33.1	1524.7	21.5	1599.3	19.3	1599.3	19.3	92.0
1611.4	31.4	1611.6	19.7	1612.7	19.5	1612.7	19.5	99.9
1593.3	37.8	1607.0	23.3	1625.8	19.9	1625.8	19.9	98.0
1625.5	36.6	1637.9	22.6	1654.6	20.3	1654.6	20.3	98.2
1680.2	41.3	1669.8	24.1	1657.5	17.5	1657.5	17.5	101.4
1654.4	38.0	1658.3	23.0	1664.0	19.8	1664.0	19.8	99.4
1658.1	34.0	1665.3	21.2	1675.1	20.8	1675.1	20.8	99.0
1652.6	40.3	1665.3	24.2	1682.1	19.4	1682.1	19.4	98.2
1684.2	35.9	1685.3	21.8	1687.5	20.0	1687.5	20.0	99.8
1662.0	36.1	1674.3	22.5	1690.5	22.0	1690.5	22.0	98.3
1653.4	33.4	1670.4	20.1	1692.6	15.8	1692.6	15.8	97.7
1709.7	38.5	1719.3	22.9	1731.8	19.1	1731.8	19.1	98.7
1737.8	34.9	1747.7	20.1	1760.4	14.1	1760.4	14.1	98.7
1838.7	29.1	1841.2	17.9	1844.8	19.3	1844.8	19.3	99.7
1829.5	44.2	1849.7	25.4	1873.2	19.6	1873.2	19.6	97.7
1763.3	44.8	1827.8	26.0	1902.8	17.8	1902.8	17.8	92.7

1844.1	41.9	1876.2	24.9	1912.7	22.9	1912.7	22.9	96.4
1935.3	40.0	1942.2	22.4	1950.4	17.9	1950.4	17.9	99.2
2519.6	53.6	2552.2	25.5	2578.9	15.5	2578.9	15.5	97.7
2636.2	63.1	2666.7	29.2	2690.7	17.2	2690.7	17.2	98.0
2788.1	52.8	2811.9	24.3	2829.7	17.0	2829.7	17.0	98.5
2825.8	55.5	2846.9	25.4	2862.5	18.0	2862.5	18.0	98.7
2875.3	63.5	2918.8	28.7	2949.7	19.8	2949.7	19.8	97.5

GW2

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
449.8	6.6	468.6	7.0	562.0	23.4	449.8	6.6	80.0
479.3	6.9	489.7	7.3	538.7	25.2	479.3	6.9	89.0
483.6	4.3	496.7	4.5	557.8	14.6	483.6	4.3	86.7
483.6	4.8	494.8	5.8	547.2	23.2	483.6	4.8	88.4
487.9	7.5	506.0	7.7	588.5	23.6	487.9	7.5	82.9
497.8	4.4	515.7	5.3	596.1	20.2	497.8	4.4	83.5
498.8	4.1	520.1	4.6	615.1	15.7	498.8	4.1	81.1
500.0	5.7	516.9	6.4	592.4	22.3	500.0	5.7	84.4
500.4	4.9	513.6	6.1	572.7	24.2	500.4	4.9	87.4
506.1	5.2	514.2	5.3	550.8	17.2	506.1	5.2	91.9
507.7	5.6	516.8	5.9	557.1	19.2	507.7	5.6	91.1
508.7	4.3	514.1	4.9	538.3	18.3	508.7	4.3	94.5
509.2	5.2	518.2	5.9	558.3	21.5	509.2	5.2	91.2
509.7	4.7	516.8	4.9	548.4	16.0	509.7	4.7	92.9
510.0	4.4	518.2	4.7	554.6	15.9	510.0	4.4	91.9
510.0	5.1	518.6	5.7	556.9	20.6	510.0	5.1	91.6
511.2	5.2	517.6	5.8	545.9	21.0	511.2	5.2	93.6
511.9	5.4	514.6	5.0	526.7	12.4	511.9	5.4	97.2
512.4	7.2	530.5	8.4	609.3	30.3	512.4	7.2	84.1
512.6	5.6	513.0	5.1	514.5	12.9	512.6	5.6	99.6
512.8	4.4	517.1	5.4	536.6	21.6	512.8	4.4	95.6
513.0	5.0	525.1	5.9	577.7	21.8	513.0	5.0	88.8
513.3	4.6	528.1	5.0	592.6	16.6	513.3	4.6	86.6
513.6	5.2	515.1	5.2	521.9	16.1	513.6	5.2	98.4
513.6	4.8	520.1	5.3	548.8	19.0	513.6	4.8	93.6
514.6	6.7	524.0	6.3	565.0	15.9	514.6	6.7	91.1
514.8	5.3	514.6	5.3	513.6	16.9	514.8	5.3	100.2
515.1	6.1	519.9	6.0	540.7	17.3	515.1	6.1	95.3
515.2	5.7	517.7	6.0	529.1	20.1	515.2	5.7	97.4
515.4	4.4	528.1	5.5	583.2	21.6	515.4	4.4	88.4
516.0	4.6	523.3	5.9	554.9	24.4	516.0	4.6	93.0

516.0	4.6	519.7	5.5	535.7	21.6	516.0	4.6	96.3
516.1	5.4	529.8	5.7	589.3	18.2	516.1	5.4	87.6
516.4	5.1	518.9	5.3	530.1	17.3	516.4	5.1	97.4
516.6	5.0	522.9	5.5	550.9	19.4	516.6	5.0	93.8
516.7	6.4	521.8	6.7	544.5	22.5	516.7	6.4	94.9
517.0	4.8	529.2	7.0	582.2	30.2	517.0	4.8	88.8
517.0	3.4	518.1	3.6	522.7	12.9	517.0	3.4	98.9
517.1	5.3	513.9	6.1	499.9	23.3	517.1	5.3	103.4
517.3	4.8	516.5	5.4	512.8	20.5	517.3	4.8	100.9
517.4	6.4	516.9	7.0	514.8	25.1	517.4	6.4	100.5
517.6	4.9	521.8	8.2	540.5	37.9	517.6	4.9	95.8
517.8	6.0	523.1	7.0	546.1	26.0	517.8	6.0	94.8
517.8	3.9	522.6	4.0	543.8	12.9	517.8	3.9	95.2
518.0	4.6	525.1	4.6	556.3	14.5	518.0	4.6	93.1
518.1	4.5	527.9	5.2	570.4	19.3	518.1	4.5	90.8
518.1	5.7	523.2	5.9	545.8	18.9	518.1	5.7	94.9
518.2	4.3	516.1	5.4	506.8	22.5	518.2	4.3	102.2
518.4	5.6	516.4	6.4	507.6	24.2	518.4	5.6	102.1
518.4	4.9	531.1	5.4	585.9	18.6	518.4	4.9	88.5
518.5	5.3	530.0	5.8	580.1	20.2	518.5	5.3	89.4
518.5	4.0	525.0	5.7	553.2	24.9	518.5	4.0	93.7
518.7	6.1	530.2	7.3	580.1	27.7	518.7	6.1	89.4
518.7	4.9	516.0	5.3	503.8	19.2	518.7	4.9	102.9
518.8	6.2	518.2	6.8	515.5	25.0	518.8	6.2	100.6
519.1	6.4	528.9	5.9	571.6	13.6	519.1	6.4	90.8
519.4	5.0	542.8	6.4	642.6	24.4	519.4	5.0	80.8
519.5	5.3	537.7	6.3	615.6	23.2	519.5	5.3	84.4
519.5	3.6	523.3	4.0	540.0	14.3	519.5	3.6	96.2
519.5	5.9	518.3	6.2	513.2	21.1	519.5	5.9	101.2
519.6	4.4	528.5	5.0	567.3	17.7	519.6	4.4	91.6
519.6	4.5	518.6	4.5	513.8	14.6	519.6	4.5	101.1
519.8	5.5	525.4	5.8	549.9	19.1	519.8	5.5	94.5
520.0	4.9	526.1	5.2	552.6	17.6	520.0	4.9	94.1
520.0	3.7	531.1	4.9	579.1	19.8	520.0	3.7	89.8
520.0	5.5	544.1	7.0	646.4	26.6	520.0	5.5	80.4
520.1	5.7	522.5	6.4	533.0	23.6	520.1	5.7	97.6
520.1	5.2	533.0	5.3	588.4	15.8	520.1	5.2	88.4
520.4	4.3	529.4	4.6	568.5	15.6	520.4	4.3	91.5
520.4	5.2	522.8	6.7	533.5	27.8	520.4	5.2	97.5
520.6	4.5	542.7	7.4	636.7	32.4	520.6	4.5	81.8
520.7	4.0	520.7	4.0	521.1	12.0	520.7	4.0	99.9
520.8	5.5	524.1	6.0	538.4	21.5	520.8	5.5	96.7
520.9	5.7	517.6	6.2	503.1	23.0	520.9	5.7	103.5

521.2	4.2	525.5	4.7	544.3	17.1	521.2	4.2	95.7
521.3	4.7	517.5	5.3	500.9	20.1	521.3	4.7	104.1
521.4	6.2	524.4	6.3	537.5	20.2	521.4	6.2	97.0
521.5	4.9	520.5	6.8	516.0	29.8	521.5	4.9	101.1
521.5	5.7	522.1	5.5	524.4	16.1	521.5	5.7	99.4
521.5	4.7	530.8	5.4	571.1	19.7	521.5	4.7	91.3
521.6	5.2	523.1	5.5	529.3	18.4	521.6	5.2	98.6
521.7	6.7	539.3	6.5	614.5	16.9	521.7	6.7	84.9
521.7	7.1	517.6	6.7	500.0	18.6	521.7	7.1	104.3
521.9	5.5	523.0	5.6	527.8	17.6	521.9	5.5	98.9
522.0	5.3	527.9	4.9	553.4	12.7	522.0	5.3	94.3
522.1	4.0	519.7	4.9	509.3	19.8	522.1	4.0	102.5
522.2	5.8	526.9	6.2	547.3	21.5	522.2	5.8	95.4
522.2	7.2	522.9	9.7	526.1	41.3	522.2	7.2	99.3
522.3	4.3	525.8	4.9	541.1	18.2	522.3	4.3	96.5
522.3	5.7	527.5	5.8	550.1	17.9	522.3	5.7	95.0
522.3	5.9	519.8	5.7	508.8	16.9	522.3	5.9	102.7
522.7	4.8	521.4	4.8	515.9	14.9	522.7	4.8	101.3
522.7	4.6	527.5	5.6	547.9	22.1	522.7	4.6	95.4
522.8	5.4	529.5	5.8	558.5	19.5	522.8	5.4	93.6
522.8	4.3	521.3	5.0	514.9	19.3	522.8	4.3	101.5
523.0	3.7	523.7	4.2	527.0	15.9	523.0	3.7	99.2
523.0	5.8	524.0	6.1	528.4	20.9	523.0	5.8	99.0
523.2	5.7	540.3	6.5	613.3	23.0	523.2	5.7	85.3
523.2	6.3	532.0	8.9	569.9	37.7	523.2	6.3	91.8
523.3	4.5	536.2	6.2	591.3	25.7	523.3	4.5	88.5
523.8	4.7	531.3	5.9	563.8	23.8	523.8	4.7	92.9
524.0	4.9	526.7	5.7	538.3	21.6	524.0	4.9	97.3
524.0	5.1	528.9	4.8	550.1	12.5	524.0	5.1	95.3
524.0	5.7	531.3	6.2	562.6	21.7	524.0	5.7	93.1
524.4	5.6	522.3	5.6	513.1	17.6	524.4	5.6	102.2
524.4	4.7	523.2	5.2	517.6	19.1	524.4	4.7	101.3
524.4	5.0	521.9	5.0	510.6	15.4	524.4	5.0	102.7
524.7	5.0	535.2	5.5	580.3	18.8	524.7	5.0	90.4
524.8	5.5	528.0	5.4	541.7	15.7	524.8	5.5	96.9
524.9	4.2	522.0	4.7	509.4	17.4	524.9	4.2	103.0
525.1	5.4	526.1	6.1	530.4	22.3	525.1	5.4	99.0
525.2	6.1	531.7	6.5	559.5	22.2	525.2	6.1	93.9
525.2	4.1	531.5	4.9	558.4	18.9	525.2	4.1	94.1
525.4	4.2	521.8	5.0	506.2	19.5	525.4	4.2	103.8
525.4	4.1	526.5	5.0	531.1	19.8	525.4	4.1	98.9
525.5	4.3	522.5	5.0	509.6	19.3	525.5	4.3	103.1
525.5	6.3	522.9	6.5	511.7	21.4	525.5	6.3	102.7

525.5	4.3	527.3	5.2	535.1	20.7	525.5	4.3	98.2
525.5	4.9	531.1	5.4	555.3	19.0	525.5	4.9	94.6
525.6	4.7	542.6	6.8	614.7	28.4	525.6	4.7	85.5
525.8	5.7	526.8	6.1	531.3	20.9	525.8	5.7	99.0
526.0	6.1	522.7	6.8	508.4	25.7	526.0	6.1	103.5
526.2	4.9	524.6	5.6	517.5	21.3	526.2	4.9	101.7
526.2	5.0	537.5	6.4	585.6	25.6	526.2	5.0	89.9
526.5	6.1	528.6	6.5	538.1	22.0	526.5	6.1	97.8
526.5	5.7	539.7	5.9	596.1	17.9	526.5	5.7	88.3
526.6	5.0	530.4	5.4	546.6	18.6	526.6	5.0	96.3
526.7	3.0	530.4	3.7	546.2	14.8	526.7	3.0	96.4
526.7	6.3	530.6	6.6	547.5	21.6	526.7	6.3	96.2
526.8	6.3	526.6	6.6	525.5	22.4	526.8	6.3	100.2
527.4	4.1	532.2	4.2	553.2	12.9	527.4	4.1	95.3
527.5	4.3	524.1	4.6	509.2	15.8	527.5	4.3	103.6
527.5	6.3	535.6	6.4	570.4	19.8	527.5	6.3	92.5
527.6	5.3	530.3	5.3	542.2	15.9	527.6	5.3	97.3
527.8	4.8	530.2	6.6	540.7	28.4	527.8	4.8	97.6
528.0	5.7	525.6	6.6	515.0	25.0	528.0	5.7	102.5
528.0	4.5	528.2	4.8	529.1	16.3	528.0	4.5	99.8
528.1	4.1	539.0	5.0	585.6	19.2	528.1	4.1	90.2
528.2	5.7	528.1	5.6	528.0	16.6	528.2	5.7	100.0
528.2	7.3	524.7	7.5	509.3	24.8	528.2	7.3	103.7
528.3	5.4	545.8	6.4	619.5	23.3	528.3	5.4	85.3
528.4	5.3	526.8	5.2	519.6	15.4	528.4	5.3	101.7
528.5	5.4	532.9	5.7	552.0	19.4	528.5	5.4	95.7
528.5	4.7	534.6	6.0	560.8	24.3	528.5	4.7	94.2
528.5	6.2	524.4	7.1	506.4	27.1	528.5	6.2	104.4
528.6	5.7	529.5	5.9	533.5	18.8	528.6	5.7	99.1
528.6	3.8	534.0	5.9	557.1	26.5	528.6	3.8	94.9
528.7	4.0	527.0	4.3	519.3	15.4	528.7	4.0	101.8
529.0	5.1	533.7	8.8	554.1	40.6	529.0	5.1	95.5
529.4	6.2	526.6	6.3	514.1	20.6	529.4	6.2	103.0
529.4	4.6	533.3	5.2	550.0	19.3	529.4	4.6	96.3
529.5	5.0	537.8	5.5	573.3	19.3	529.5	5.0	92.4
529.5	5.6	527.1	5.5	516.3	16.4	529.5	5.6	102.6
529.6	4.9	531.5	4.7	539.8	12.8	529.6	4.9	98.1
529.6	3.3	534.2	4.1	554.1	15.9	529.6	3.3	95.6
529.6	4.5	526.6	5.1	513.3	18.9	529.6	4.5	103.2
529.9	7.1	534.9	7.5	556.1	24.4	529.9	7.1	95.3
529.9	5.8	529.8	7.6	529.0	31.7	529.9	5.8	100.2
530.0	5.4	534.4	5.6	553.1	18.8	530.0	5.4	95.8
530.1	5.7	534.1	5.4	551.2	13.8	530.1	5.7	96.2

530.4	5.0	530.2	5.0	529.5	15.7	530.4	5.0	100.2
530.4	4.3	534.0	6.1	549.5	26.2	530.4	4.3	96.5
530.4	4.5	543.0	5.1	596.1	18.4	530.4	4.5	89.0
530.4	4.8	539.7	6.2	579.2	24.6	530.4	4.8	91.6
530.7	6.3	534.2	6.5	549.3	21.0	530.7	6.3	96.6
530.8	6.8	533.0	6.4	542.7	17.4	530.8	6.8	97.8
531.0	3.8	537.4	4.3	564.6	15.5	531.0	3.8	94.1
531.4	5.8	542.5	6.2	589.5	20.1	531.4	5.8	90.1
531.5	5.4	534.5	6.0	547.4	21.6	531.5	5.4	97.1
531.6	4.8	532.9	5.4	538.6	19.4	531.6	4.8	98.7
532.0	5.2	548.2	5.9	616.1	20.7	532.0	5.2	86.3
532.6	4.9	527.8	7.1	507.5	31.7	532.6	4.9	104.9
532.8	6.6	540.6	7.1	573.7	23.9	532.8	6.6	92.9
533.0	4.9	533.0	5.1	533.1	16.9	533.0	4.9	100.0
533.2	5.2	532.8	5.9	531.0	21.3	533.2	5.2	100.4
533.2	3.8	531.5	4.0	523.9	13.8	533.2	3.8	101.8
533.3	5.6	535.3	5.3	543.8	14.3	533.3	5.6	98.1
533.4	5.4	535.5	6.2	544.6	22.7	533.4	5.4	97.9
533.5	5.5	533.6	5.6	534.1	17.9	533.5	5.5	99.9
533.9	4.4	540.4	5.3	568.3	19.9	533.9	4.4	93.9
533.9	4.2	529.4	4.6	510.1	16.7	533.9	4.2	104.7
534.0	5.5	536.4	5.6	546.3	18.0	534.0	5.5	97.7
534.2	4.9	529.8	5.1	510.9	17.6	534.2	4.9	104.6
534.3	4.6	537.7	8.4	551.9	39.1	534.3	4.6	96.8
534.6	4.6	537.0	5.4	547.3	20.8	534.6	4.6	97.7
534.6	4.3	538.7	4.3	556.2	12.9	534.6	4.3	96.1
534.8	5.8	557.4	7.1	650.7	26.3	534.8	5.8	82.2
535.2	5.7	531.5	5.5	515.3	16.6	535.2	5.7	103.9
535.4	4.2	532.7	4.3	520.9	13.6	535.4	4.2	102.8
535.5	7.1	539.2	8.4	555.0	31.9	535.5	7.1	96.5
535.5	5.4	533.4	6.4	524.4	24.5	535.5	5.4	102.1
535.8	5.1	537.3	5.5	543.7	18.4	535.8	5.1	98.5
536.0	4.9	537.1	5.7	541.6	21.5	536.0	4.9	99.0
536.1	5.7	535.1	6.1	531.1	21.0	536.1	5.7	100.9
536.4	5.6	533.8	5.9	522.5	20.2	536.4	5.6	102.7
536.9	6.5	536.1	7.1	532.6	24.7	536.9	6.5	100.8
537.1	6.0	535.4	6.3	528.4	21.4	537.1	6.0	101.6
537.1	5.3	537.7	6.3	540.2	24.5	537.1	5.3	99.4
537.3	4.6	540.4	4.7	553.3	14.4	537.3	4.6	97.1
537.4	4.7	538.0	4.8	540.4	15.3	537.4	4.7	99.5
537.7	3.9	540.4	5.1	551.6	21.0	537.7	3.9	97.5
537.8	5.4	535.0	5.9	523.1	20.5	537.8	5.4	102.8
537.8	5.8	542.5	6.0	562.1	19.3	537.8	5.8	95.7

538.1	5.2	533.9	5.3	516.0	17.0	538.1	5.2	104.3
538.3	5.4	540.2	5.6	548.1	18.6	538.3	5.4	98.2
539.8	4.4	536.8	4.3	523.9	13.1	539.8	4.4	103.0
539.9	5.3	536.1	4.9	520.0	12.4	539.9	5.3	103.8
540.2	4.3	549.2	4.3	586.6	12.3	540.2	4.3	92.1
540.3	6.1	549.0	6.1	585.4	18.0	540.3	6.1	92.3
540.3	5.8	543.0	5.6	554.5	15.8	540.3	5.8	97.4
540.4	4.4	536.3	4.6	519.0	15.7	540.4	4.4	104.1
540.4	4.8	537.1	6.6	522.8	28.3	540.4	4.8	103.4
540.8	5.2	543.1	4.9	552.9	13.0	540.8	5.2	97.8
541.2	4.8	538.0	5.7	524.4	22.0	541.2	4.8	103.2
542.2	4.2	542.4	4.8	543.2	17.3	542.2	4.2	99.8
542.2	5.6	539.8	5.0	529.4	11.3	542.2	5.6	102.4
542.7	5.1	540.1	6.1	529.5	23.1	542.7	5.1	102.5
543.2	4.9	546.2	4.8	559.1	13.4	543.2	4.9	97.2
544.1	4.9	540.0	4.7	523.0	13.4	544.1	4.9	104.0
544.4	5.5	544.8	5.9	546.2	19.9	544.4	5.5	99.7
545.4	4.6	541.4	4.5	524.6	13.5	545.4	4.6	104.0
545.5	3.8	542.6	4.2	530.5	15.1	545.5	3.8	102.8
546.6	3.8	543.4	4.6	530.0	18.0	546.6	3.8	103.1
546.9	5.4	542.7	5.6	525.4	18.5	546.9	5.4	104.1
547.3	10.6	555.7	9.4	590.0	18.3	547.3	10.6	92.8
547.3	5.7	546.8	5.9	544.5	19.5	547.3	5.7	100.5
547.5	6.3	548.2	6.7	551.5	22.1	547.5	6.3	99.3
547.6	4.0	558.8	4.1	605.0	12.7	547.6	4.0	90.5
548.3	5.9	547.3	6.2	543.3	20.9	548.3	5.9	100.9
548.3	5.3	547.5	4.7	544.0	10.8	548.3	5.3	100.8
548.6	5.9	560.1	6.1	607.1	18.1	548.6	5.9	90.4
549.2	7.9	547.7	7.1	541.2	16.3	549.2	7.9	101.5
552.0	6.8	548.9	8.2	536.1	31.4	552.0	6.8	103.0
552.3	4.4	576.4	5.0	672.6	16.7	552.3	4.4	82.1
553.7	4.7	562.0	5.3	595.8	18.3	553.7	4.7	92.9
553.9	4.8	559.6	5.6	582.7	20.0	553.9	4.8	95.1
554.4	5.6	554.0	5.9	552.3	19.4	554.4	5.6	100.4
556.9	6.4	553.5	6.5	539.2	20.6	556.9	6.4	103.3
565.9	4.3	572.0	8.0	596.4	35.5	565.9	4.3	94.9
572.7	4.5	570.3	4.8	561.1	15.6	572.7	4.5	102.1
576.8	4.9	591.5	5.4	648.4	17.5	576.8	4.9	89.0
583.9	7.0	590.7	7.1	617.1	21.0	583.9	7.0	94.6
589.9	4.9	603.1	6.2	653.1	22.1	589.9	4.9	90.3
599.8	6.1	608.3	6.0	640.1	16.9	599.8	6.1	93.7
1352.9	11.7	1360.5	9.0	1372.5	13.8	1372.5	13.8	98.6

GW3

206Pb/ 238U	± (Ma)	207Pb/ 235U	± (Ma)	206Pb/ 207Pb	± (Ma)	Best age (Ma)	± (Ma)	Conc (%)
310.2	4.8	352.9	7.2	644.4	39.4	310.2	4.8	NA
343.8	3.8	371.4	6.5	547.3	38.2	343.8	3.8	NA
378.7	3.7	393.3	4.7	480.2	22.9	378.7	3.7	NA
381.3	4.9	395.3	5.1	478.1	17.3	381.3	4.9	NA
383.9	4.7	396.5	5.5	470.6	24.1	383.9	4.7	NA
395.1	3.9	402.9	4.2	447.7	16.5	395.1	3.9	NA
409.4	4.4	422.0	4.6	491.5	16.7	409.4	4.4	83.3
411.8	5.0	415.5	5.6	436.4	23.7	411.8	5.0	94.3
412.9	4.3	423.0	5.5	478.0	25.7	412.9	4.3	86.4
415.3	5.5	427.5	5.8	493.8	20.5	415.3	5.5	84.1
415.7	5.8	419.7	5.8	442.0	19.1	415.7	5.8	94.0
417.3	4.1	426.2	4.9	474.9	21.4	417.3	4.1	87.9
418.9	4.2	430.6	4.7	494.0	18.4	418.9	4.2	84.8
420.1	5.2	422.4	5.2	435.5	17.0	420.1	5.2	96.4
421.8	5.1	421.3	5.2	418.3	19.0	421.8	5.1	100.8
428.1	4.1	437.1	4.5	485.2	17.4	428.1	4.1	88.2
428.2	5.9	438.5	6.4	493.0	23.9	428.2	5.9	86.9
428.4	4.4	437.8	5.0	487.7	20.2	428.4	4.4	87.8
428.5	4.2	440.1	4.5	501.2	16.7	428.5	4.2	85.5
428.7	4.1	427.3	4.1	419.2	14.4	428.7	4.1	102.3
432.6	7.5	440.0	7.5	478.8	24.3	432.6	7.5	90.3
433.6	5.1	447.9	5.2	522.0	16.1	433.6	5.1	83.1
434.9	4.7	444.6	4.7	494.7	15.0	434.9	4.7	87.9
438.0	5.9	441.6	5.6	460.3	15.2	438.0	5.9	95.2
441.4	5.7	444.6	5.2	461.1	12.6	441.4	5.7	95.7
444.7	5.9	443.9	5.8	440.1	19.1	444.7	5.9	101.0
465.7	5.4	483.7	5.5	570.1	17.3	465.7	5.4	81.7
539.5	5.9	548.8	5.6	587.3	13.9	539.5	5.9	91.9
555.4	4.9	565.0	5.7	603.9	20.1	555.4	4.9	92.0
560.6	5.4	556.9	5.1	542.1	14.4	560.6	5.4	103.4
602.5	6.9	601.5	7.2	597.7	22.7	602.5	6.9	100.8
603.3	5.2	606.6	5.0	619.0	13.1	603.3	5.2	97.5
606.8	8.7	626.7	9.5	699.1	29.1	606.8	8.7	86.8
607.6	6.0	613.2	5.5	634.0	12.7	607.6	6.0	95.8
612.4	6.6	615.1	6.9	624.8	21.1	612.4	6.6	98.0
615.2	8.5	630.7	7.5	686.5	14.7	615.2	8.5	89.6
616.5	7.1	620.4	6.7	634.8	16.9	616.5	7.1	97.1
617.9	7.6	644.3	7.4	737.8	18.0	617.9	7.6	83.7
618.3	7.2	612.8	7.0	592.8	19.9	618.3	7.2	104.3

620.2	6.7	630.5	7.2	667.5	22.3	620.2	6.7	92.9
620.3	8.9	648.4	8.9	747.4	22.9	620.3	8.9	83.0
620.8	6.2	634.4	6.7	683.3	20.5	620.8	6.2	90.8
627.5	8.8	640.3	8.8	685.7	23.7	627.5	8.8	91.5
629.7	5.0	631.5	7.4	638.3	28.7	629.7	5.0	98.6
635.0	5.5	647.7	5.5	692.0	14.8	635.0	5.5	91.8
640.6	6.6	658.9	6.3	722.1	15.2	640.6	6.6	88.7
640.6	7.3	644.2	6.6	656.7	14.9	640.6	7.3	97.5
643.0	6.3	644.2	6.4	648.3	18.4	643.0	6.3	99.2
650.1	6.0	652.7	5.7	661.6	14.7	650.1	6.0	98.3
662.2	6.0	657.5	5.2	641.3	10.4	662.2	6.0	103.3
667.0	7.8	679.3	15.1	720.2	59.0	667.0	7.8	92.6
692.9	9.9	687.9	8.2	671.4	13.7	692.9	9.9	103.2
740.4	9.4	744.1	8.0	755.3	14.7	740.4	9.4	98.0
948.2	11.7	960.1	9.6	987.4	16.0	987.4	16.0	96.0
997.6	9.9	995.2	7.9	989.7	12.7	989.7	12.7	100.8
1004.4	8.8	1003.1	7.1	1000.3	12.0	1000.3	12.0	100.4
822.4	21.8	872.1	17.1	1000.7	15.4	1000.7	15.4	82.2
999.3	12.5	999.8	9.7	1000.9	14.3	1000.9	14.3	99.8
965.4	8.4	977.5	6.9	1004.7	11.6	1004.7	11.6	96.1
974.5	10.8	984.5	9.5	1006.9	18.4	1006.9	18.4	96.8
977.0	9.3	986.4	8.7	1007.5	18.9	1007.5	18.9	97.0
916.0	10.2	943.5	9.3	1008.2	18.9	1008.2	18.9	90.9
969.1	9.6	982.6	8.0	1012.7	14.4	1012.7	14.4	95.7
956.5	10.0	976.0	10.1	1020.1	23.4	1020.1	23.4	93.8
932.3	10.1	960.0	11.0	1023.8	26.8	1023.8	26.8	91.1
974.3	10.5	990.6	8.6	1026.8	14.1	1026.8	14.1	94.9
1047.4	9.6	1041.4	7.5	1028.6	11.8	1028.6	11.8	101.8
1000.6	13.0	1009.5	9.9	1028.9	13.2	1028.9	13.2	97.2
1049.1	11.1	1043.7	9.4	1032.3	17.4	1032.3	17.4	101.6
1030.8	10.2	1032.7	8.5	1036.9	15.6	1036.9	15.6	99.4
1022.8	12.2	1028.5	9.3	1040.6	12.7	1040.6	12.7	98.3
1046.3	8.7	1045.5	7.2	1043.7	12.7	1043.7	12.7	100.3
997.2	9.8	1013.3	8.1	1048.2	13.9	1048.2	13.9	95.1
979.2	8.3	1001.8	6.8	1051.6	11.1	1051.6	11.1	93.1
1015.6	9.9	1027.3	8.2	1052.4	14.5	1052.4	14.5	96.5
1051.6	9.9	1053.3	7.5	1056.8	10.6	1056.8	10.6	99.5
1074.9	9.6	1070.0	7.7	1060.0	13.0	1060.0	13.0	101.4
1003.6	11.9	1022.4	9.9	1062.9	17.2	1062.9	17.2	94.4
1050.5	10.0	1054.5	8.0	1063.0	13.1	1063.0	13.1	98.8
1058.9	10.0	1060.3	7.7	1063.2	11.4	1063.2	11.4	99.6
1028.0	11.0	1040.0	9.2	1065.4	16.1	1065.4	16.1	96.5
1011.3	13.5	1028.8	10.5	1066.4	14.9	1066.4	14.9	94.8

1065.4	20.3	1066.2	14.1	1067.8	11.0	1067.8	11.0	99.8
1048.0	11.3	1054.5	8.9	1067.9	14.1	1067.9	14.1	98.1
1098.4	10.8	1089.3	8.5	1071.1	13.9	1071.1	13.9	102.6
996.1	12.8	1020.0	9.7	1071.6	11.6	1071.6	11.6	92.9
1043.4	10.0	1052.7	7.9	1072.2	12.4	1072.2	12.4	97.3
1026.0	13.7	1041.1	11.5	1073.0	20.2	1073.0	20.2	95.6
1083.8	8.2	1080.3	6.6	1073.2	11.3	1073.2	11.3	101.0
1084.5	13.4	1082.3	10.6	1077.9	16.9	1077.9	16.9	100.6
1048.6	11.2	1058.9	9.0	1080.0	14.6	1080.0	14.6	97.1
1090.3	9.3	1087.5	7.8	1081.7	14.3	1081.7	14.3	100.8
1060.4	11.1	1068.2	8.1	1084.3	9.3	1084.3	9.3	97.8
935.9	10.4	982.4	8.9	1087.9	15.0	1087.9	15.0	86.0
1063.9	8.4	1073.2	7.9	1092.3	16.5	1092.3	16.5	97.4
1058.0	9.2	1070.2	7.7	1095.0	13.8	1095.0	13.8	96.6
1066.8	8.8	1078.2	11.5	1101.4	29.5	1101.4	29.5	96.9
1055.3	13.3	1071.2	10.3	1103.6	14.6	1103.6	14.6	95.6
1090.6	13.5	1096.3	10.5	1107.7	16.2	1107.7	16.2	98.4
1086.2	10.7	1093.5	8.2	1108.0	11.8	1108.0	11.8	98.0
1047.0	12.1	1068.0	9.8	1110.9	16.1	1110.9	16.1	94.2
1091.1	13.1	1097.9	9.5	1111.4	10.7	1111.4	10.7	98.2
1030.8	9.0	1057.8	9.2	1114.1	20.8	1114.1	20.8	92.5
1074.8	11.7	1089.6	9.0	1119.3	13.0	1119.3	13.0	96.0
1036.9	10.1	1064.3	11.0	1121.0	25.6	1121.0	25.6	92.5
1023.9	15.6	1059.4	12.2	1133.2	16.7	1133.2	16.7	90.4
1033.0	9.7	1066.7	9.1	1136.4	18.6	1136.4	18.6	90.9
1114.4	17.5	1122.6	12.5	1138.4	13.0	1138.4	13.0	97.9
1129.5	14.0	1132.6	10.7	1138.5	15.6	1138.5	15.6	99.2
1096.3	11.4	1111.0	8.8	1140.0	12.9	1140.0	12.9	96.2
1059.2	8.8	1086.1	8.5	1140.5	18.0	1140.5	18.0	92.9
1103.4	18.3	1116.9	13.0	1143.3	12.5	1143.3	12.5	96.5
1077.1	9.9	1099.2	8.1	1143.3	13.4	1143.3	13.4	94.2
1140.5	10.2	1142.0	8.4	1144.7	14.6	1144.7	14.6	99.6
1107.6	12.1	1122.2	10.4	1150.5	19.1	1150.5	19.1	96.3
1196.1	34.8	1180.5	26.6	1152.1	41.6	1152.1	41.6	103.8
1109.7	14.4	1124.8	11.5	1153.9	18.5	1153.9	18.5	96.2
1148.0	12.0	1150.2	9.0	1154.3	12.5	1154.3	12.5	99.5
1133.3	10.9	1140.8	9.1	1155.2	16.4	1155.2	16.4	98.1
1192.4	12.2	1180.0	9.1	1157.4	13.2	1157.4	13.2	103.0
1156.5	13.4	1157.3	9.9	1158.7	13.0	1158.7	13.0	99.8
1041.3	12.6	1080.1	10.1	1159.3	15.3	1159.3	15.3	89.8
1060.3	10.6	1093.4	11.2	1159.8	25.4	1159.8	25.4	91.4
1156.3	11.4	1157.7	8.7	1160.2	13.2	1160.2	13.2	99.7
1019.3	28.2	1067.0	21.7	1165.8	27.0	1165.8	27.0	87.4

1094.8	10.8	1119.1	12.1	1166.7	28.3	1166.7	28.3	93.8
1223.7	13.9	1203.5	9.4	1167.4	9.2	1167.4	9.2	104.8
1188.1	13.0	1180.8	9.5	1167.5	12.7	1167.5	12.7	101.8
1086.0	8.6	1113.8	7.9	1168.5	15.6	1168.5	15.6	92.9
1180.2	12.3	1176.9	9.4	1171.0	14.2	1171.0	14.2	100.8
1186.7	10.5	1181.8	8.5	1173.1	14.5	1173.1	14.5	101.2
1172.5	11.6	1173.2	8.7	1174.5	12.5	1174.5	12.5	99.8
1167.0	9.8	1170.4	7.3	1176.6	10.1	1176.6	10.1	99.2
1152.0	9.8	1162.7	8.3	1182.6	14.7	1182.6	14.7	97.4
1046.5	11.4	1093.3	10.2	1187.6	19.2	1187.6	19.2	88.1
1092.8	10.8	1125.7	10.4	1189.6	21.5	1189.6	21.5	91.9
1081.2	40.6	1118.4	30.7	1191.4	38.6	1191.4	38.6	90.8
1064.3	17.4	1107.7	13.0	1193.8	14.9	1193.8	14.9	89.2
1253.9	11.9	1233.2	9.1	1197.1	14.4	1197.1	14.4	104.7
1163.5	11.3	1176.0	9.0	1199.3	14.4	1199.3	14.4	97.0
1130.7	10.9	1155.7	9.0	1202.9	15.3	1202.9	15.3	94.0
1114.4	10.1	1145.5	8.7	1204.9	15.8	1204.9	15.8	92.5
1109.7	39.1	1142.8	27.1	1206.2	18.4	1206.2	18.4	92.0
1155.8	14.0	1176.6	10.0	1215.0	11.3	1215.0	11.3	95.1
1175.6	8.6	1189.9	8.2	1215.9	16.6	1215.9	16.6	96.7
1217.2	10.9	1222.8	8.1	1232.8	11.3	1232.8	11.3	98.7
1173.9	12.0	1195.1	9.5	1233.6	15.1	1233.6	15.1	95.2
1158.4	12.0	1186.0	10.4	1236.7	19.2	1236.7	19.2	93.7
1195.7	9.0	1210.5	7.7	1237.0	13.9	1237.0	13.9	96.7
1196.3	8.9	1211.8	8.0	1239.6	15.3	1239.6	15.3	96.5
1190.1	9.7	1209.1	9.6	1243.4	20.1	1243.4	20.1	95.7
1269.3	29.1	1261.1	20.4	1247.1	24.9	1247.1	24.9	101.8
1171.0	18.5	1200.0	20.1	1252.6	44.4	1252.6	44.4	93.5
1189.5	13.4	1213.5	10.0	1256.3	13.1	1256.3	13.1	94.7
1170.6	12.6	1203.9	9.8	1264.2	14.3	1264.2	14.3	92.6
1209.1	7.3	1229.3	7.2	1264.9	15.0	1264.9	15.0	95.6
1181.5	13.1	1212.2	10.2	1267.5	15.3	1267.5	15.3	93.2
1197.0	15.2	1225.6	12.1	1276.4	19.1	1276.4	19.1	93.8
1269.6	12.0	1274.7	9.7	1283.3	16.1	1283.3	16.1	98.9
1054.6	11.5	1133.2	18.6	1286.8	47.8	1286.8	47.8	82.0
1105.6	16.4	1169.6	12.1	1290.1	13.1	1290.1	13.1	85.7
1310.1	17.4	1304.2	12.6	1294.7	17.5	1294.7	17.5	101.2
1309.6	14.5	1313.1	9.8	1318.8	9.9	1318.8	9.9	99.3
1306.7	11.6	1314.1	8.6	1326.2	12.3	1326.2	12.3	98.5
1327.8	15.0	1336.0	11.1	1349.1	15.5	1349.1	15.5	98.4
1225.8	12.6	1273.1	10.0	1353.8	15.0	1353.8	15.0	90.5
1309.9	16.4	1328.7	11.5	1359.1	13.4	1359.1	13.4	96.4
1257.6	8.9	1295.6	9.9	1359.2	21.4	1359.2	21.4	92.5

1400.0	15.1	1386.6	10.5	1366.1	13.6	1366.1	13.6	102.5
1374.8	12.3	1374.0	8.4	1372.7	10.0	1372.7	10.0	100.2
1429.6	13.3	1415.0	9.8	1393.0	14.4	1393.0	14.4	102.6
1321.4	16.9	1349.7	11.7	1394.7	13.0	1394.7	13.0	94.7
1146.1	14.3	1236.2	11.6	1397.0	16.8	1397.0	16.8	82.0
1393.2	12.3	1397.9	9.1	1405.0	13.0	1405.0	13.0	99.2
1308.1	13.1	1347.9	9.7	1411.8	12.9	1411.8	12.9	92.7
1395.9	14.1	1403.1	9.6	1414.0	10.8	1414.0	10.8	98.7
1483.9	14.6	1458.6	9.8	1422.0	12.0	1422.0	12.0	104.4
1331.2	17.7	1369.3	12.8	1429.4	16.7	1429.4	16.7	93.1
1437.2	16.5	1436.8	11.5	1436.2	14.8	1436.2	14.8	100.1
1489.6	16.3	1475.8	11.5	1455.9	15.8	1455.9	15.8	102.3
1438.7	20.9	1445.9	14.1	1456.4	16.2	1456.4	16.2	98.8
1499.3	18.1	1482.5	11.7	1458.4	12.6	1458.4	12.6	102.8
1438.2	19.2	1449.0	12.6	1464.8	12.4	1464.8	12.4	98.2
1486.1	14.6	1478.5	10.1	1467.6	13.1	1467.6	13.1	101.3
1464.5	14.2	1466.9	10.2	1470.5	14.1	1470.5	14.1	99.6
1414.4	16.3	1437.6	12.1	1472.1	17.1	1472.1	17.1	96.1
1493.1	11.1	1487.8	7.8	1480.2	10.6	1480.2	10.6	100.9
1441.2	14.3	1459.7	9.2	1486.7	8.6	1486.7	8.6	96.9
1395.0	15.9	1432.6	10.9	1488.9	12.4	1488.9	12.4	93.7
1247.5	14.2	1345.4	21.4	1504.6	48.8	1504.6	48.8	82.9
1426.4	26.0	1458.4	17.1	1505.3	16.1	1505.3	16.1	94.8
1462.6	14.7	1489.1	11.1	1527.0	16.3	1527.0	16.3	95.8
1460.7	15.2	1488.6	10.6	1528.6	13.4	1528.6	13.4	95.6
1522.7	18.5	1526.6	15.8	1532.2	27.6	1532.2	27.6	99.4
1534.4	14.5	1533.9	10.1	1533.2	13.2	1533.2	13.2	100.1
1517.1	15.3	1524.2	11.1	1534.1	15.6	1534.1	15.6	98.9
1486.4	14.3	1508.2	10.5	1539.0	14.8	1539.0	14.8	96.6
1519.7	16.2	1529.9	10.3	1543.9	9.4	1543.9	9.4	98.4
1512.4	14.0	1527.1	9.6	1547.5	12.0	1547.5	12.0	97.7
1293.8	35.1	1394.4	26.1	1551.7	31.6	1551.7	31.6	83.4
1598.4	18.0	1587.9	12.3	1573.9	15.8	1573.9	15.8	101.6
1453.8	14.8	1508.0	11.4	1584.8	17.0	1584.8	17.0	91.7
1629.3	15.7	1614.5	11.0	1595.3	15.2	1595.3	15.2	102.1
1321.8	16.1	1430.5	11.4	1596.1	11.7	1596.1	11.7	82.8
1350.9	17.4	1449.4	12.0	1596.9	11.3	1596.9	11.3	84.6
1620.1	17.4	1615.9	11.4	1610.3	13.3	1610.3	13.3	100.6
1447.5	22.3	1516.6	15.5	1614.5	17.7	1614.5	17.7	89.7
1591.7	17.8	1607.4	12.2	1628.1	15.4	1628.1	15.4	97.8
1571.4	13.8	1596.6	9.2	1630.0	10.6	1630.0	10.6	96.4
1641.3	18.3	1637.7	13.1	1633.0	18.4	1633.0	18.4	100.5
1615.9	16.9	1624.9	10.8	1636.6	11.7	1636.6	11.7	98.7

1645.5	15.6	1643.8	10.3	1641.6	12.2	1641.6	12.2	100.2
1702.2	14.8	1676.1	9.3	1643.6	10.4	1643.6	10.4	103.6
1640.2	18.2	1646.5	12.1	1654.6	14.4	1654.6	14.4	99.1
1641.4	13.7	1648.1	8.9	1656.8	10.3	1656.8	10.3	99.1
1635.2	16.2	1646.2	10.8	1660.2	13.1	1660.2	13.1	98.5
1599.9	31.8	1628.0	21.5	1664.6	26.2	1664.6	26.2	96.1
1653.8	17.5	1663.2	11.2	1675.0	12.4	1675.0	12.4	98.7
1351.7	16.7	1485.7	11.9	1682.7	12.8	1682.7	12.8	80.3
1506.5	16.5	1587.8	13.1	1697.4	19.9	1697.4	19.9	88.8
1660.0	20.7	1678.1	13.1	1700.7	13.6	1700.7	13.6	97.6
1595.0	20.2	1645.2	13.1	1709.8	13.5	1709.8	13.5	93.3
1606.7	15.4	1654.4	11.8	1715.4	17.7	1715.4	17.7	93.7
1449.2	25.6	1564.1	19.2	1722.9	25.4	1722.9	25.4	84.1
1638.9	18.6	1676.2	12.4	1723.3	14.6	1723.3	14.6	95.1
1643.3	24.1	1681.6	14.4	1729.8	10.3	1729.8	10.3	95.0
1727.9	19.0	1729.1	11.9	1730.6	12.8	1730.6	12.8	99.8
1774.4	17.7	1760.2	10.8	1743.4	11.3	1743.4	11.3	101.8
1777.8	18.7	1763.6	11.0	1746.8	9.8	1746.8	9.8	101.8
1751.1	20.6	1754.0	12.8	1757.5	13.4	1757.5	13.4	99.6
1749.2	16.2	1755.7	10.4	1763.5	12.2	1763.5	12.2	99.2
1783.8	19.0	1782.9	11.9	1781.8	13.3	1781.8	13.3	100.1
1877.4	15.4	1842.5	9.5	1803.4	10.8	1803.4	10.8	104.1
1864.7	16.2	1838.9	10.7	1809.9	13.8	1809.9	13.8	103.0
1839.1	17.8	1831.2	10.5	1822.2	9.9	1822.2	9.9	100.9
1792.1	19.2	1807.0	11.6	1824.3	11.4	1824.3	11.4	98.2
1705.4	14.1	1761.9	9.9	1829.5	13.1	1829.5	13.1	93.2
1793.7	11.6	1814.0	8.2	1837.4	11.2	1837.4	11.2	97.6
1769.6	27.4	1804.5	16.2	1845.0	13.6	1845.0	13.6	95.9
1857.7	16.0	1858.4	10.1	1859.2	11.6	1859.2	11.6	99.9
1870.1	11.9	1866.8	8.4	1863.0	11.9	1863.0	11.9	100.4
1762.2	32.0	1813.7	18.8	1873.4	14.3	1873.4	14.3	94.1
1787.7	19.6	1830.7	11.4	1880.0	8.7	1880.0	8.7	95.1
1642.4	24.5	1750.6	16.5	1882.4	18.5	1882.4	18.5	87.2
1882.7	17.7	1889.1	10.1	1896.1	8.6	1896.1	8.6	99.3
1808.6	22.7	1855.1	14.0	1907.6	14.4	1907.6	14.4	94.8
1880.5	25.3	1905.0	14.5	1931.8	12.0	1931.8	12.0	97.3
1954.1	17.9	1945.9	10.4	1937.3	9.9	1937.3	9.9	100.9
2039.7	18.7	1995.4	10.5	1949.7	10.1	1949.7	10.1	104.6
1901.9	21.0	1925.2	12.3	1950.4	11.3	1950.4	11.3	97.5
1946.5	14.1	1948.7	10.1	1951.1	14.5	1951.1	14.5	99.8
1824.1	25.8	1887.6	15.0	1958.1	11.5	1958.1	11.5	93.2
1873.6	21.4	1921.2	12.7	1972.9	11.8	1972.9	11.8	95.0
1748.2	39.1	1854.2	23.7	1975.2	19.7	1975.2	19.7	88.5

1921.0	25.1	1949.9	14.5	1980.7	12.9	1980.7	12.9	97.0
2081.1	16.7	2033.4	9.9	1985.3	11.1	1985.3	11.1	104.8
1763.2	35.0	1879.5	39.1	2010.6	70.3	2010.6	70.3	87.7
1937.8	22.5	1980.6	13.2	2025.6	12.2	2025.6	12.2	95.7
1783.1	18.9	1908.6	11.9	2047.9	11.9	2047.9	11.9	87.1
2003.7	15.5	2040.9	9.0	2078.6	8.6	2078.6	8.6	96.4
2069.1	19.4	2086.8	11.2	2104.3	11.3	2104.3	11.3	98.3
2014.5	19.1	2059.3	11.1	2104.4	10.4	2104.4	10.4	95.7
2057.1	23.8	2083.0	13.6	2108.6	13.1	2108.6	13.1	97.6
2102.9	18.4	2115.6	10.3	2127.9	9.4	2127.9	9.4	98.8
2226.8	19.8	2196.4	10.5	2168.2	8.9	2168.2	8.9	102.7
2144.9	18.7	2160.5	11.4	2175.4	13.3	2175.4	13.3	98.6
2231.3	15.3	2214.4	9.4	2198.9	11.4	2198.9	11.4	101.5
2354.8	19.7	2511.5	11.1	2640.8	11.0	2640.8	11.0	89.2
2599.2	25.8	2652.7	12.5	2693.7	9.3	2693.7	9.3	96.5
2727.9	22.6	2768.9	11.2	2799.0	9.7	2799.0	9.7	97.5
3235.3	26.3	3238.8	11.6	3240.9	9.2	3240.9	9.2	99.8

Appendix C. Detrital Zircon Statistics

Overlap-Similarity Test

Note: lower values signify less overlap or similarity between the two sample sets. See Gehrels (2000) for more details.

Overlap

	RF1	RF2	RF3-1	RF3-2	RF4	RF5	RF6	BG1	CH1	TK1	GY1	GW1	GW2	GW3
RF1		0.83	0.84	0.85	0.82	0.85	0.85	0.90	0.83	0.84	0.83	0.78	0.22	0.83
RF2	0.83		0.91	0.84	0.85	0.85	0.89	0.85	0.85	0.82	0.80	0.67	0.18	0.80
RF3-1	0.84	0.91		0.89	0.90	0.88	0.92	0.87	0.86	0.86	0.84	0.70	0.18	0.80
RF3-2	0.85	0.84	0.89		0.89	0.86	0.88	0.84	0.84	0.86	0.80	0.72	0.19	0.82
RF4	0.82	0.85	0.90	0.89		0.87	0.88	0.82	0.83	0.87	0.84	0.70	0.18	0.81
RF5	0.85	0.85	0.88	0.86	0.87		0.88	0.85	0.86	0.85	0.85	0.75	0.17	0.80
RF6	0.85	0.89	0.92	0.88	0.88	0.88		0.86	0.83	0.75	0.86	0.72	0.18	0.82
BG1	0.90	0.85	0.87	0.84	0.82	0.85	0.86		0.89	0.81	0.79	0.75	0.20	0.80
CH1	0.83	0.85	0.86	0.84	0.83	0.86	0.83	0.89		0.82	0.81	0.70	0.19	0.79
TK1	0.84	0.82	0.86	0.86	0.87	0.85	0.75	0.81	0.82		0.84	0.78	0.19	0.77
GY1	0.83	0.80	0.84	0.80	0.84	0.85	0.86	0.79	0.81	0.84		0.77	0.16	0.79
GW1	0.78	0.67	0.70	0.72	0.70	0.75	0.72	0.75	0.70	0.78	0.77		0.22	0.10
GW2	0.22	0.18	0.18	0.19	0.18	0.17	0.18	0.20	0.19	0.19	0.16	0.22		0.17
GW3	0.83	0.80	0.80	0.82	0.81	0.80	0.82	0.80	0.79	0.77	0.79	0.10	0.17	

Similarity

	RF1	RF2	RF3-1	RF3-2	RF4	RF5	RF6	BG1	CH1	TK1	GY1	GW1	GW2	GW3
RF1		0.67	0.69	0.71	0.67	0.86	0.85	0.90	0.84	0.91	0.89	0.50	0.13	0.87
RF2	0.67		0.67	0.89	0.87	0.77	0.81	0.71	0.80	0.64	0.62	0.47	0.30	0.72
RF3-1	0.69	0.67		0.88	0.88	0.79	0.83	0.69	0.78	0.64	0.67	0.43	0.22	0.76
RF3-2	0.71	0.89	0.88		0.89	0.79	0.84	0.71	0.82	0.67	0.65	0.51	0.33	0.76
RF4	0.67	0.87	0.88	0.89		0.76	0.81	0.69	0.77	0.63	0.64	0.49	0.29	0.74
RF5	0.86	0.77	0.79	0.79	0.76		0.88	0.85	0.86	0.85	0.85	0.75	0.17	0.80
RF6	0.85	0.81	0.83	0.84	0.81	0.88		0.84	0.86	0.83	0.86	0.72	0.18	0.82
BG1	0.90	0.71	0.69	0.71	0.69	0.85	0.84		0.87	0.89	0.79	0.75	0.20	0.80
CH1	0.84	0.80	0.78	0.82	0.77	0.86	0.86	0.87		0.85	0.81	0.70	0.19	0.79
TK1	0.91	0.64	0.64	0.67	0.63	0.85	0.83	0.89	0.85		0.88	0.49	0.10	0.84
GY1	0.89	0.62	0.67	0.65	0.64	0.85	0.86	0.79	0.81	0.88		0.51	0.12	0.84
GW1	0.50	0.47	0.43	0.51	0.49	0.75	0.72	0.75	0.70	0.49	0.51		0.82	0.45
GW2	0.13	0.30	0.22	0.33	0.29	0.17	0.18	0.20	0.19	0.10	0.12	0.82		0.08
GW3	0.87	0.72	0.76	0.76	0.74	0.80	0.82	0.80	0.79	0.84	0.84	0.45	0.08	

K-S Test

Note: yellow boxes are P values greater than 0.05, rejecting the null hypothesis that the samples originate from different, unrelated sources (Press et al., 1986).

	RF1	RF2	RF3-1	RF3-2	RF4	RF5	RF6	BG1	CH1	TK1	GY1	GW1	GW2	GW3
RF1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.9**	0.0	0.0	0.0	**0.2**
RF2	0.0		0.0	**0.9**	**0.2**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RF3-1	0.0	0.0		0.0	**0.3**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RF3-2	0.0	**0.9**	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RF4	0.0	**0.2**	**0.3**	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RF5	0.0	0.0	0.0	0.0	0.0		**0.1**	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RF6	0.0	0.0	0.0	0.0	0.0	**0.1**		0.0	0.0	0.0	0.0	0.0	0.0	0.0
BG1	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
CH1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
TK1	**0.9**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	**0.1**
GY1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	**0.1**
GW1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
GW2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
GW3	**0.2**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.1**	**0.1**	0.0	0.0	