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Jonathan Bachtel

AUTEUR DE LA THÈSE / AUTHOR OF THESIS

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**Zircon Alteration in Wallrock of Pamour and Hoyle Pond au Deposits, Abitibi Granite-Greenstone
Belt: Constraints on Timescales of Fluid Flow From Depth-Profiling Techniques**

TITRE DE LA THÈSE / TITLE OF THESIS

David Schneider

DIRECTEUR (DIRECTRICE) DE LA THÈSE / THESIS SUPERVISOR

CO-DIRECTEUR (CO-DIRECTRICE) DE LA THÈSE / THESIS CO-SUPERVISOR

Mark Hannington

Keiko Hattori

Gary W. Slater

Le Doyen de la Faculté des études supérieures et postdoctorales / Dean of the Faculty of Graduate and Postdoctoral Studies

Zircon alteration in wallrock of Pamour and Hoyle Pond Au deposits, Abitibi granite-greenstone belt: Constraints on timescales of fluid flow from depth-profiling techniques

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ABSTRACT

Quartz-carbonate vein Au deposits in the Timmins-Porcupine gold camp, Abitibi Subprovince, have equivocal protracted parageneses and formed during late to post-Kenoran (2750-2670 Ma) deformation and metamorphism. SIMS U-Pb and $\delta^{18}\text{O}$ depth-profiling and LA-ICPMS REE depth-profiling techniques were employed on unpolished wallrock zircons to resolve temporal constraints on mineralization and hydrothermal fluid sources at Hoyle Pond and Pamour mines. Depth-profiling techniques successfully uncovered $<3\ \mu\text{m}$ alteration domains in zircon rims based on Th/U, REE, and isotopic signatures, and rim $^{207}\text{Pb}/^{206}\text{Pb}$ ages are significantly younger than host rock ages. Zircon alteration is from a complex interplay of recrystallization and localized dissolution-reprecipitation of metamict to fully crystalline zircon during hydrothermal fluid flow. Alteration of Hoyle Pond and Pamour zircons at 2660 Ma correlates to intensely mineralized and deformed quartz-carbonate-Au shear veins, and this age represents peak fluid infiltration at the mines coinciding with peak regional metamorphism. Subsequent zircon alteration correlating to thin, shallow-dipping and less altered / mineralized vein networks occurred at 2640 Ma, and this age likely represents a late hydrothermal fluid pulse at the end of regional retrograde metamorphism. Protracted hydrothermal alteration along discrete zones within the camp continued into the Proterozoic. Th/U and ^{18}O values of zircon alteration domains suggest that fluids were most likely derived from lower crustal metamorphic and/or plutonic activity. While the underutilized depth-profiling technique has resolved ~ 200 m.y. of continuous crustal evolution and fluid flow in the southern Abitibi, further investigation of the southern Abitibi is required to clarify the genetic relationship between Au mineralization and zircon alteration.

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A Gift from the Earth

Jonathan Bachtel

The earth.

We search for answers in her bosom,

By drilling holes and taking samples.

Looking deeply we see rocks, minerals, and elements.

Looking deeply we find exactly what is there,

A gift from the earth, our Mother.

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Introduction

Zircon is remarkably stable under most crustal and upper mantle conditions (Rubatto et al., 2001; Valley, 2003). An increasing number of studies, however, have revealed that zircon is not always stable in these environments (even in upper crustal sub-greenschist facies conditions) especially in the presence of aqueous fluids where it is prone to alteration (Hoskin and Black, 2000; Geisler et al., 2007; Hay and Dempster 2009; Soman et al., 2010). Zircon alteration is characterized by structural, textural, isotopic, and geochemical changes or modifications to the original crystal, usually exhibited as distinct micrometer to sub-micrometer mineral domains caused by re-equilibration, recrystallization, dissolution-reprecipitation, neoblastic growth, and/or metamictization. Zircon alteration zones are widely overlooked, under utilized, and often removed for conventional U-Pb geochronology (e.g., TIMS) since it disturbs normally concordant isotopic systems. However, it has been demonstrated that the chemical and isotopic systems of these alteration zones have distinct signatures that can reveal valuable geological information regarding the timing and nature of fluid influx (Geisler et al., 2007), as well as fluid-mineral interaction at the sub-grain level during tectonothermal events (Carson et al., 2002; Gordon et al., 2009).

Modern developments in geochronometric techniques now permit for high resolution U-Pb dating of these thin alteration zones or "rims" by SIMS ion drilling (a.k.a. depth-profiling). Depth-profiling techniques utilize the primary beam to sputter into unpolished zircon or other crystal species, and changes in isotope concentrations are resolved into age-depth profiles as drilling progresses into the crystal's interior (e.g. Grove and Harrison, 1999; Carson et al., 2002; Mojzsis and Harrison, 2002; Breeding et al., 2004). This allows for unparalleled spatial detection (down to $\sim 0.2 \mu\text{m}$) of changes in the U-Th-Pb isotopic system within zircon. The slightly lower spatial resolution of LA-ICPMS depth-profiling allows detection of geochemical changes accurately to $\sim 5 \mu\text{m}$ (Mrank and Mason, 1999; Woodhead et al., 2004). With either methodology, zircon must be characterized carefully in order to gain meaningful information from depth-profiling due to the complexities of zircon crystallization and its interaction with fluids. For example: i) multiple fluid events with

different temperatures and compositions can affect the same zircon, ii) zircon is likely subjected simultaneously to multiple alteration mechanisms, iii) alteration products often retain some parent zircon isotopic signatures regardless of the extent of structural and trace element re-equilibration, and iv) elemental modification may be complete, partial and patchy, or localized along fractures yielding inconsistent isotope ratios (Carson et al., 2002; Geisler et al., 2007; Hay and Dempster, 2009).

In this contribution, we focus on zircon geochronology and alteration associated with hydrothermal fluid flow in the Abitibi granite-greenstone belt, which hosts many of the world's largest Archean orogenic lode gold deposits (Mueller et al., 1996; Robert and Poulsen, 1997; Goldfarb et al., 2005; Bateman et al., 2008). Orogenic gold deposits in the Abitibi formed during regional deformation concurrent with regional greenschist facies metamorphism. Gold in these deposits is hosted by quartz-carbonate vein networks associated with regional Abitibi-transecting fault zones such as the Porcupine Destor Deformation Zone (PDDZ) and the Larder Lake Cadillac Deformation Zone (LLCDZ) in the southern Abitibi (fig. 1; Ayers et al., 2005; Goldfarb et al., 2005; Robert et al., 2005). The many gold camps partitioned along the PDDZ and LLCDZ exhibit little correlation in size, timing, or mineralization style with respect to metamorphic grade or spatial distribution. Thus the genetic history of gold deposits in the Abitibi is complex, and discrete thermal pulses localized along fault reactivation zones in the Abitibi contributed to ore deposition and subsequent deposit alteration (Powell et al., 1995a).

Obvious post-mineralization intrusions that cross-cut ore bodies are lacking in most gold camps, and consequently, determining lower age brackets on mineralization in the southern Abitibi is quite difficult (Kerrick and King, 1993). In the Timmins-Porcupine gold camp, the study area of this contribution, geochronology of robust minerals with high closure temperatures (zircon) is confined to host lithologies and dikes emplaced prior to or during mineralization, and these zircons have provided upper age constraints of mineralization at ca. 2680 to 2670 Ma (Corfu et al., 1993; Ayer et al., 2005; Kerrich and King, 1993). In contrast, other minerals (e.g. monazite, rutile, biotite, muscovite, and others) with less robust isotope systems from Au veins and wallrock yield ages of ca. 2660 to 2400 Ma (Kerrick and King, 1993; Powell et al., 1995b). These late mineral ages do not likely

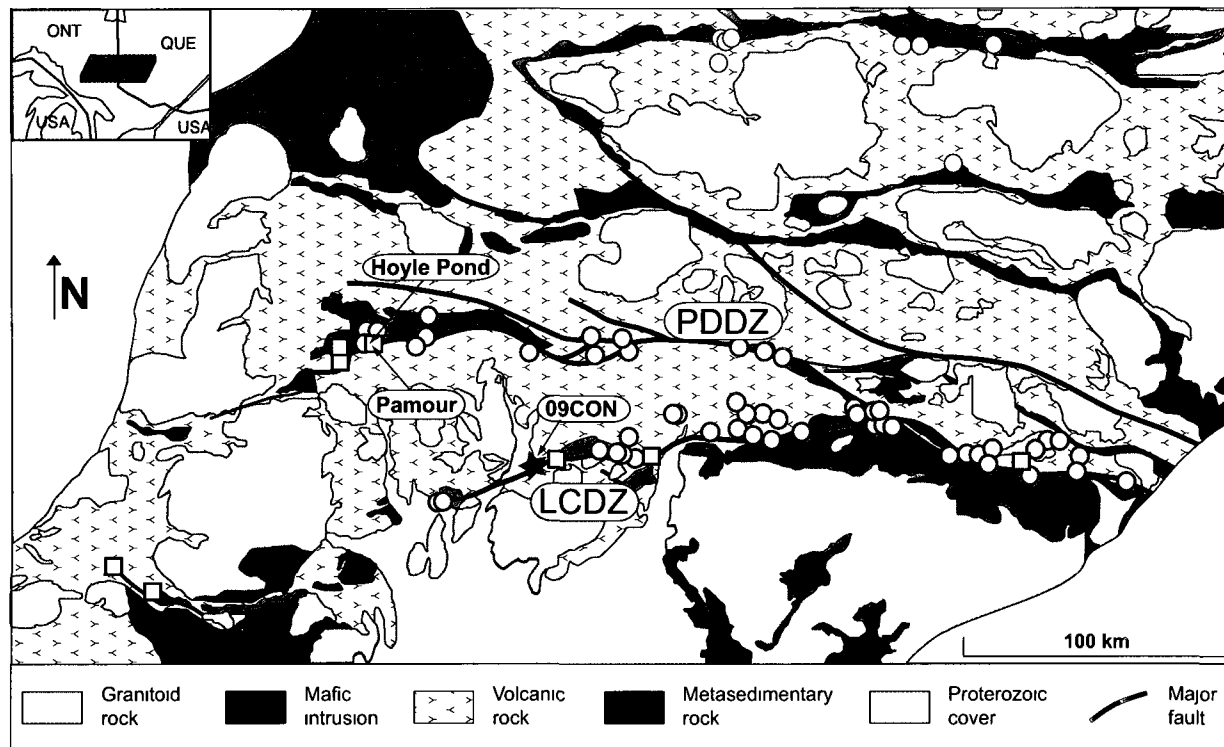


Fig. 1. Simplified geologic map of the Abitibi Subprovince (after Dube & Gosselin, 2007) showing the distribution of gold deposits along regional deformation zones. Samples were collected at Hoyle Pond mine, Pamour mine, and Chaput Hughes outcrop (09CON).

represent primary gold mineralization, but the younger signatures are probably from isotopic resetting (such as Ar-Ar or Rb-Sr) of these minerals (which have lower closure temperatures than zircon) during secondary hydrothermal events along brittle structures (Kerrick and King, 1993). Hence, additional reliable geochronology on robust geochronometers such as zircon is needed in the Timmins camp to further refine mineralization timescales. In addition, hydrothermal fluid sources are ambiguous and include: i) widespread metamorphic dehydration reactions, ii) rising mid- to lower-crustal plutonic fluids, iii) rising mantle derived fluids, or iv) descending surface fluids (fig. 2; Groves et al., 2003; Goldfarb et al., 2005; Robert et al., 2005).

We applied the underutilized U-Pb SIMS depth-profiling technique to gold deposits by examining thin alteration mineral zones in 114 zircons. Analyzing these unbiased zircon populations was conducted in an attempt to resolve temporal and paragenetic constraints in two orogenic gold deposits in the Abitibi. Zircons from Hoyle Pond and Pamour mines exhibit clear isotopic and trace element evidence for fluid alteration that produced complex re-equilibrated crystal domains. Furthermore, the U-Pb ages attained from the thin altered zones form two discrete age populations younger than host rock emplacement, coinciding with peak and retrograde metamorphic conditions. In addition, zircons from a Hoyle Pond sample record protracted fluid flow along the regional faults approximately 200 m.y. after parent zircon crystallization. However, the changes observed in the U-Pb age-depth relationship of zircons are not always present, are sometimes oscillatory and irregular, and may not always correspond to changes in REE chemistry, $\delta^{18}\text{O}$, and Th/U values. The various age-depth relationships suggest that zircon had unique heterogeneous responses (structural, chemical, and isotopic) to low temperature (greenschist facies) hydrothermal fluid flow. Zircons were likely subjected to recrystallization with some degree of dissolution-reprecipitation causing heterogeneous alteration zones during hydrothermal fluid flow. The ages obtained from altered rim zones are consistent with published dates on other minerals in the region and closely match Au mineralization constraints. The alteration rim ages are reliable and accurate chronometers for fluid influx, especially if combined with REE depth-profiling and SEM imaging.

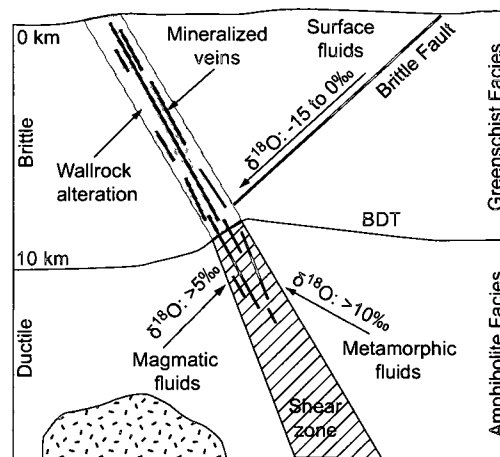


Fig. 2. Simplified cross-section showing the possible fluid sources and $\delta^{18}\text{O}$ values responsible for orogenic gold deposition (after Koons and Craw, 1991; Goldfarb et al., 2005). BDT: brittle-ductile transition.

Geologic setting

Abitibi granite-greenstone belt

The Abitibi granite-greenstone belt, located in the Superior Province of the Canada Shield, consists of Late Archean metavolcanic and metasedimentary rocks intruded by pre-tectonic (syn-volcanic), syn-tectonic, and post-tectonic plutons. The accretionary history of the Abitibi spans 2750 to 2660 Ma, and evolved from a tholeiitic basaltic and komatiitic volcanic and tonalite-trondhjemite-granodiorite (TTG) plutonic complex (before 2695) Ma to a syn-orogenic sedimentation and increasing magmatic regime after 2695 Ma (Corfu et al., 1993; Ayer et al., 2005). Accretion culminated with regional greenschist to sub-greenschist facies metamorphism, intense folding and faulting, and continued plutonism during the province-wide Kenoran orogeny (2700-2680 Ma; Card, 1990; Powell et al., 1995a; Thompson, 2005). Chemically enriched post-tectonic (<2695 Ma) granodiorites, syenites, monzonites, and monzodiorites are classified as sanukitoid-type (Suttcliffe et al., 1993), and have slightly elevated $\delta^{18}\text{O}$ zircon values up to $6.4 \pm 0.2\text{‰}$ compared to earlier Superior TTG plutons ($5.5 \pm 0.4\text{‰}$; King et al., 1998). In the Superior Province igneous $\delta^{18}\text{O}$ zircon values change little through time and average $5.8 \pm 0.6\text{‰}$ (mantle-like), which indicates that low amounts of crustal reworking and subduction recycling occurred during crustal growth and maturation (King et al., 1998; Peck et al., 2000; Valley et al., 2003).

Deep crustal metamorphism in the Superior Province occurred during orogen parallel mid- to lower-crustal ductile flow from 2660 to 2630 Ma, which closely followed Kenoran polyphase shortening and folding of all crustal levels (Moser et al., 2008). Similarly, upper crustal greenschist facies metamorphism of Abitibi rocks occurred between 2677 and 2643 Ma culminating at 2660 Ma, which is coeval to mid-crustal granulitization exposed in the Kapuskasing Structural Zone to the west (Powell et al., 1995a; Moser et al., 2008). Many Abitibi metamorphic textures and fabrics record the final tectonic strain field of the evolving orogen, and the geometry and nature of the isograds indicate that metamorphism here was synchronous with and/or slightly postdated late deformation (Powell et al., 1995a). Peak metamorphic P-T estimates illustrate that the Abitibi attained depths of 10 km (200-300 MPa) and temperatures of 200 to 450°C (Powell et al., 1995a; Thompson, 2005). Protracted

stress along high strain zones in the Abitibi likely contributed to continued retrograde fabric development to as young as 2415 Ma after low strain zones had reached equilibrium (Powell et al., 1995a, 1995b). Similarly, Huronian rifting of the Superior lithosphere to the south occurred at approximately 2500 to 2400 Ma and resulted in lower-crustal metamorphism and upper-crustal intrusion of Matachewan mafic dike swarms in the Abitibi (Heaman, 1988; Moser and Heaman, 1997; Moser et al., 2008). Moser and Heaman (1997) note that these events are indicative of the onset of rigid crustal behavior and that the rift-related metamorphism occurred ~150 to 200 m.y. after crustal accretion; they further suggest the rifting was likely responsible for the post-orogenic alteration seen in many Abitibi gold camps.

Timmins-Porcupine gold camp

The Porcupine Camp is located in the western portion of the southern Abitibi, and four of the eight main supracrustal lithotectonic assemblages identified by Ayer et al. (2005) are present (fig. 3). i) The Deloro assemblage (2730-2724 Ma) is composed mostly of calc-alkaline volcanic rocks. ii) The Tisdale assemblage (2710-2704 Ma) is predominantly tholeiitic basalt with localized komatiite flows. iii) The Porcupine assemblage (2690-2685 Ma) consists of quartz-lithic sandstones, siltstones, and mudstones interpreted as bouma sequences that unconformably overly the Tisdale. The felsic volcanic Krist Formation (2691-2684 Ma) is located at the base of the Porcupine. iv) The youngest assemblage, the Timiskaming (2676-2670 Ma), occurs as narrow bands of syn-tectonic clastic rocks immediately north of the PDDZ. It is mostly composed of greywacke sandstones and siltstones, but it has a basal polymictic conglomerate with pebble to boulder size clasts that were deposited on an angular unconformity surface. Intermediate feldspar $\pm$ quartz porphyritic stocks and dikes locally intrude Tisdale volcanics, are truncated by the Timiskaming unconformity, and their emplacement was coeval with Krist volcanism (Ayer et al., 2005; Bateman et al., 2008). Matachewan dikes cross-cut all camp lithologies and mineralization, and they have a crystallization age of 2454 ± 2 Ma in the Timmins area (Heaman, 1988).

The Porcupine camp has a protracted history of successive gold deposition with various styles of mineralization. Early gold events that predate Timiskaming sedimentation

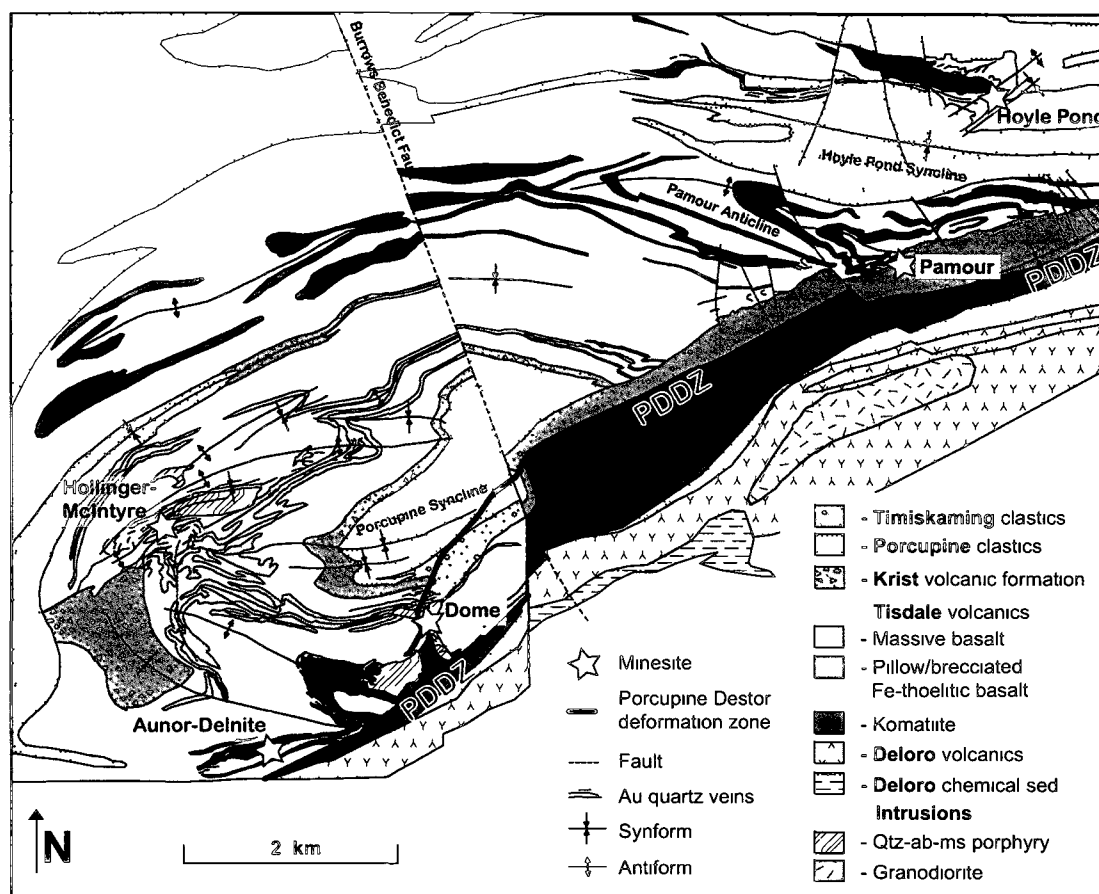


Fig. 3. Geologic map of the Timmins-Porcupine gold camp. Hoyle Pond and Pamour mines are separated by ~2 km in the northeast corner of the region (after Rhys, unpublished data).

are postulated from quartz-sulfide vein clasts, colloform-crustiform ankerite vein clasts, and gold in detrital pyrite clasts from the Timiskaming conglomerate (Gray and Hutchinson, 2001; Dubé et al., 2003). Later events include porphyry Cu-Au-Ag-Mo mineralization, and multiple stages of quartz-carbonate shear and extensional veining (Ayer et al., 2005; Robert et al., 2005; Bateman et al., 2008). The quartz-carbonate shear veins, however, host the bulk of gold mineralization in Timmins and most of them cross-cut Timiskaming clastics indicating Au formation after 2670 Ma. This contribution is aimed at studying zircon alteration products associated with quartz-carbonate Au shear veins at two orogenic gold deposits in the Porcupine camp. Pamour open pit mine, ~0.5 km north of the PDDZ was chosen to study detrital zircons from the Timiskaming assemblage, and Hoyle Pond underground mine (2 km northeast of Pamour mine) was chosen to investigate igneous zircons in porphyritic stocks emplaced during Krist volcanism (fig. 3). These two mine-sites provide lithological end members for a comparative study of gold mineralization and associated zircon alteration in the Porcupine camp.

Pamour mine

The Pamour open pit is transected by the east-west Keewatin-Timiskaming angular unconformity, and it is situated on the north limb of the overturned Porcupine syncline (Bateman et al., 2008; fig. 3). Bedding strikes east-west, is vertical to overturned, and youngs to the south. Tisdale volcanics lie to the north of the unconformity while Timiskaming metasedimentary rocks are exposed to the south. Small-scale folds and nested conjugate reverse faults occur on both sides of the unconformity, and the Pamour fault, a late offset, is to the west (Bateman et al., 2008). A large carbonate alteration halo surrounds the mine, and more intense sericite-albite-carbonate alteration is focused around Au veins. Vein mineralogy consists of quartz-albite-carbonate (ankerite)-gold±tourmaline±sulfides. Aitken (1990) described three vein styles at Pamour. Style 1 veins cross cut Tisdale volcanics and dip moderately to the north. Style 2 Three Nations veins (TN) dip steeply to the south and cross cut the Timiskaming clastic rocks. TN veins are associated with ankerite and ≤6% sulfides disseminated in the wallrock. Both style 1 and 2 veins are fault fill veins (~500 m in dip and strike length) that approach one another eastward (Bateman et al., 2008). Style 3 veins are hosted in Timiskaming rocks and form quartz-pyrite extension fracture arrays in

the footwalls of style 1 and 2 shear veins (fig. 4a). Style 3 veins are flat, less altered, less mineralized, and they straddle the conglomerate unit defining a bulk ore zone where style 1 and 2 veins converge in dip. The Pamour conglomerate contains consistently higher gold grades and more intense mineralization than other lithologies. This is likely due to the higher permeability and brittle nature of the conglomerate, which promoted ore structure development and hydrothermal fluid flow.

Hoyle Pond mine

The Hoyle Pond underground mine exploits a wedge of poly-deformed mineralized lower Tisdale metavolcanics, which define a broad northeast dipping antiformal structure belonging to a larger scale z-fold (Bateman et al., 2008; fig. 3). Smaller scale folds exist on the limbs of this structure, and the volcanics are in faulted contact to the north and unconformable contact to the south with Porcupine assemblage turbidites. The 1060 fault (a PDDZ splay) trends NE-SW and is marked by highly strained carbonitized zones (80-90% graphite) at the core of the antiformal structure. Intermediate quartz and quartz-albite porphyritic bodies intrude mine stratigraphy conformably to semi-conformably and are locally mineralized (D. Rhys, 2003, unpublished data). Sericite, albite, graphite, carbonate, and local fuchsite alteration surrounds veining, and veining predominantly occurs along volcanic flow or lithological contacts in high strain zones. The quartz carbonate veins exhibit strong structural controls and have three styles/stages as described by D. Rhys (2003, unpublished data). Style 1 ribboned gray quartz veins are the oldest vein sets and contain albite-tourmaline-hydromuscovite-carbonate and coarse visible gold. These veins are folded and boudinaged in the main foliation and deformed by the map-scale z-fold (fig. 4b-c; Bateman et al., 2008). In contrast, style 2 ribboned white quartz veins are younger, not as intensely deformed, and contain chlorite-muscovite-carbonate-pyrite-gold. These veins dilate or form extensional fracture arrays off of earlier grey quartz veins and locally cross cut earlier grey veins and the map-scale z-fold (fig. 4c). Style 3 veins are lower grade late thin (1-10 cm) extension quartz veins up to 4 m long, and they form south dipping extension fracture arrays that cross cut style 2 and 3 veining.

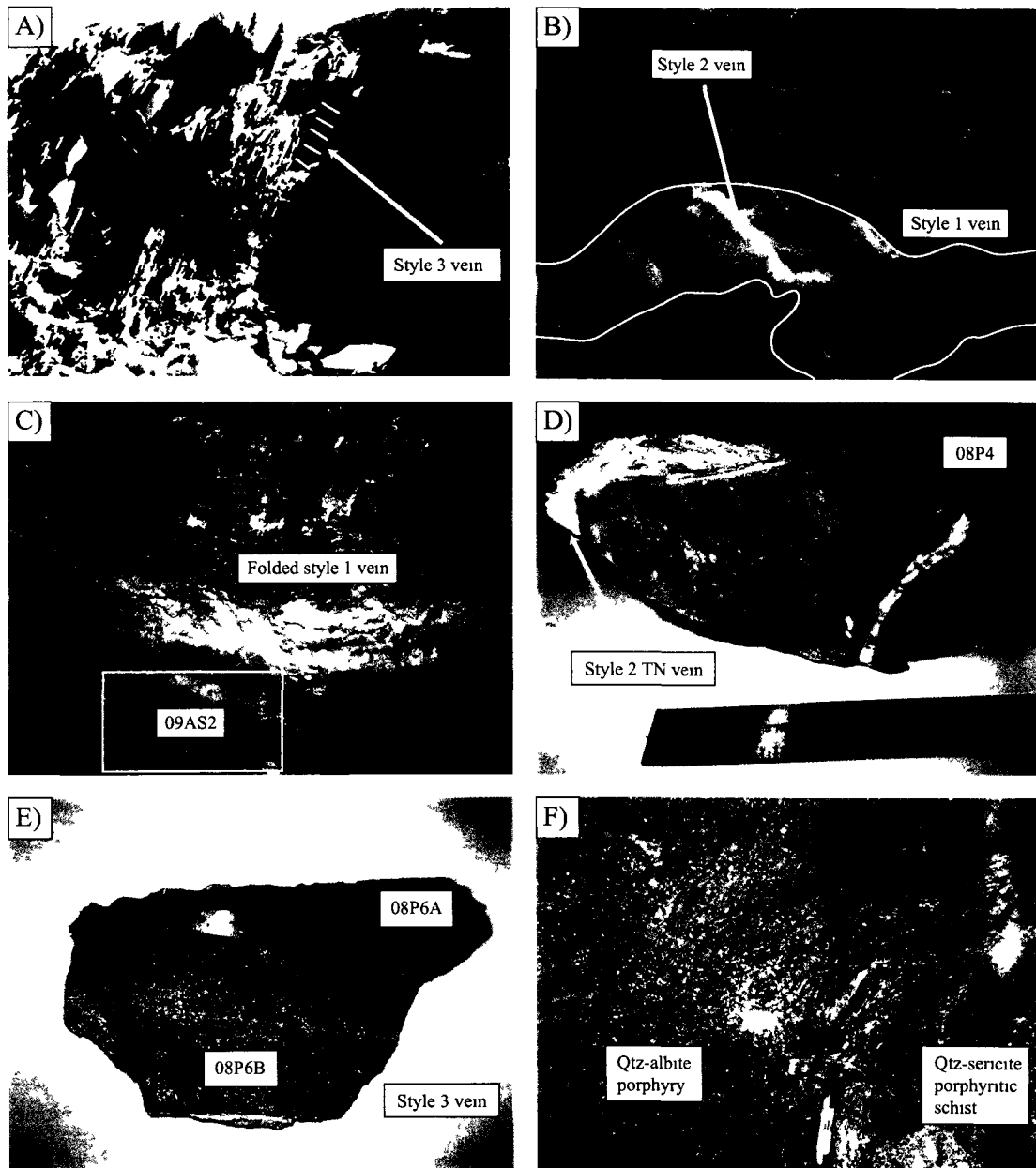


Fig. 4. A) Style 3 shallow-dipping extensional veins hosted in Timiskaming slate and greywacke unit at Pamour mine. B) Folded Hoyle Pond style 1 grey quartz vein cross-cut by later style 2 white quartz veins. Visible gold is present in style 1 vein. C) Style 1 ribboned vein at Hoyle Pond with graphite shear margins and visible gold. D) Mineralized polymictic Timiskaming conglomerate sampled (08P4) adjacent to style 2 TN veining at Pamour. E) Low grade ore sample (08P6A and 08P6B) containing style 3 veining from Pamour. F) Porphyry intrusion (04ED-198) and schist (09AS2, 03ED-096A) lithologies at Hoyle Pond mine.

Analytical Methodology

Sample locations and lithologies are presented in table 1. Basal Timiskaming conglomerate was sampled (09CON) from the Chaput Hughes outcrop near Kirkland Lake, ON (~100 km southeast of Timmins) to provide a non-mineralized analog for Hoyle Pond and Pamour mine samples. Wallrock samples in the gold mines were collected as close as possible to auriferous quartz veining consisting of different grades, veining styles, and lithologies. Mine samples contain thin veins (≤ 1 cm), disseminated quartz, and trace amounts of Au in heavy mineral separates. At Pamour open pit, sample 08P4 was collected from basal Timiskaming conglomerate adjacent to style 2 TN veining in the northern pit wall (fig. 4d), and Timiskaming greywacke sandstone containing type 3 thin extensional veining was sampled from the southern pit wall (fig. 4a). The latter sample was split to test isotopic and trace elemental variations between a 1 cm vein plus its alteration halo (08P6B) and the less altered country rock (08P6A; fig. 4e).

At Hoyle Pond mine, sample 09AS2 was collected from quartz-sericite porphyry schist adjacent to high-grade shear veining in the 1060 ore zone (fig. 4f), which is described by Dinel et al. (2008). Hoyle Pond zircon mineral separates from non-mineralized samples 04ED-198 (also a quartz-sericite-porphyritic schist; fig. 4d) and 03ED-096A (quartz-albite porphyry intrusion; fig. 4d) were obtained from M. Hamilton (University of Toronto) for analysis, with aliquots already dated via ID-TIMS (Ayers et al., 2005). The schist has an abraded zircon crystallization age of 2687 ± 2 Ma and the porphyry intrusion is dated at 2684 ± 2 Ma (Ayer et al., 2005). These porphyritic units are interpreted to be shallow-dipping, conformable to semi-conformable intermediate sills and pods emplaced contemporaneously with deformation (Dinel et al., 2008). Porcupine sandstone, in drill core deep beneath the underground mine workings, was also sampled (09TVZ) adjacent to a grey/white quartz-Au vein.

Depth-profiling SIMS U-Pb & O-isotope analyses

The samples were washed thoroughly to remove mine dust and other contaminants, and standard crushing, heavy liquid, and magnetic techniques were used to isolate heavy mineral concentrates at the University of Ottawa. The most intact zircons with usable crystal faces

Table 1 Description of wallrock samples from Abitibi Subprovince

Sample	Description and Location details	$^{207}\text{Pb}/^{206}\text{Pb}$ Integrated Ages	U-Pb TIMS Age Ayer et al (2005)	Th/U Zircon Average	$\delta^{18}\text{O}$ Zircon	REE Zircon Patterns
Kirkland Lake, Chaput Hughes outcrop (NAD83 Zone 17 UTM 569041E 5330996N)						
09CON	Zircons are from non mineralized basal Timiskaming assemblage greywacke sandstone. Represents the least altered Timiskaming exposure in the region	2708±10 Ma 2645±9 Ma		0.91		Magmatic interiors ± LREE-enriched rims
Pamour Mine (NAD83 Zone 17 UTM 491934E 5374439N)						
08P4	Timiskaming polymictic conglomerate wallrock abutting a 15cm qtz-ab-ank-Au-py shear vein. Contains trace Au <5% sulfides and is cut by 1cm veinlets (Fig. 4d)	2692±5 Ma 2659±5 Ma		0.74		Magmatic interiors ± LREE-enriched rims
08P6A	Timiskaming greywacke sandstone wallrock abutting altered selvage of style 3 vein (08P6B) (Fig. 4e)	2671±8 Ma 2634±9 Ma		0.37	5.88±0.4‰	Magmatic interiors ± LREE-enriched rims
08P6B	Timiskaming greywacke sandstone wallrock cross cut by 1cm style 3 vein. Sample contains style 3 vein and its alteration halo (Fig. 4e)	2685±5 Ma 2642±10 Ma		0.57	6.07±0.4‰	Magmatic interiors ± LREE-enriched rims
Hoyle Pond Mine (NAD83, zone 17 UTM 492687E 5377143N)						
03ED-096A	Non mineralized quartz-albite porphyritic intrusion not proximal to vein mineralization. Zircons from M. Hamilton (U. Toronto, Ayer et al., 2005)	2643±13 Ma	2684±2 Ma	0.17	5.75±0.4‰	LREE-enriched or depleted rims & interiors
04ED-198	Non mineralized quartz-sericite porphyritic schistose intrusion not proximal to vein mineralization. Zircons from M. Hamilton (U. Toronto, Ayer et al., 2005)	2632±15 Ma	2687±2 Ma	0.19	5.43±0.3‰	LREE-enriched interior LREE-depleted rim
09AS2	Quartz-sericite porphyritic schistose intrusion abutting a 30cm grey stylolitic folded qtz-ab-tur-cb shear vein. Sample contains trace Au and ~5% vein material (Fig. 4c)	2658±3 Ma		0.20		Moderate LREE-enriched rims & interiors
08TVZ	Porcupine greywacke sandstone wallrock abutting a 10cm grey stylolitic qtz-tur-Au-py shear vein. Sample contains trace Au and arsenopyrite	2635±13 Ma 2620 - 2485 Ma		0.53		Magmatic interior ± LREE-enriched rim

(flat and $\geq 30 \mu\text{m}$ in width) and those lacking noticeable cracks and outgrowths were chosen using a binocular microscope. The handpicked unpolished zircons were ultrasonically cleaned, washed with alcohol, and pressed (crystal faces parallel to mount) into pre-polished indium (In) metal mounts containing standards using a piston-press assembly. Zircon standard AS3 (U-Pb: $1099 \pm 1 \text{ Ma}$, Paces & Miller, 1993; $\delta^{18}\text{O}$: 5.34‰; Trail et al., 2007) was used for both the U-Pb and oxygen isotope analyses. All measurements were made using the CAMECA ims1270 ion microprobe housed within the National Ion Microprobe Facility at the University of California, Los Angeles. Results are reported with 1σ errors, except for weighted mean ages that have 2σ errors. The U-Pb measurements were made with a $\sim 20 \mu\text{m}$ O⁻ beam according to the methods of Breeding et al. (2004) for the depth-profiling of unpolished crystals and Schmitt et al. (2003) for analyses of polished zircon standards. When analyzing in depth-profiling mode, zircons remain unpolished in order to analyze the most recent zircon growth event by sputtering directly into the outermost extents of the grain. In addition to U-Pb ratios, Th/U ratios were determined from ion microprobe measurements. Th/U ratios can be used to decipher between magmatic ($\text{Th/U} > 0.1$) and metamorphic ($\text{Th/U} < 0.1$) zircon growth (Rubatto & Hermann, 2007).

A Cs⁺ beam and multicollection of ^{16}O and ^{18}O was utilized for O-isotope analyses, also in depth-profiling mode, in order to detect any outgrowth that was smaller than the lateral resolution of the ion beam. Analytical settings for O-isotope measurements are described in Trail et al. (2007) with the modification that unpolished crystals were pressed into indium metal. Because there is a possibility that mounting and sample topography can cause bias in SIMS oxygen isotope analysis (Kita et al., 2009), we prepared a mount that contained polished fragments of NIST 610 glass and two sets of polished and unadulterated zircon crystals from AS3 and the Ig2E unit of the Bishop Tuff ($\delta^{18}\text{O}$: 5.83‰; Bindeman & Valley, 2002 for Bishop Tuff ignimbrite with equivalent eruption temperatures). The reproducibility of raw $^{18}\text{O}/^{16}\text{O}$ on 10 NIST 610 glass over an ~ 12 hour analysis period was 0.24‰ (1σ ; n: 50), similar to that of polished AS3 which was used to correct for oxygen-in-zircon instrumental mass fractionation (0.26‰ 1σ ; n: 20; table 2). The average $\delta^{18}\text{O}$ value for unpolished AS3 on pristine crystal faces ($5.41 \pm 0.29\text{‰}$ 1σ ; n: 12) agrees with the bulk value. Ig2E polished zircon $\delta^{18}\text{O}$ averages $5.47 \pm 0.68\text{‰}$ (1σ ; n: 20), whereby the comparatively large scatter is due to two crystals that yielded anomalously high values in

Table 2. SIMS analytical data for O isotope composition on zircon standards

Name	crystal	spot	16O cps	18O/16O raw	1 s e	d18O permil	1 s e	remarks
AS3 polished	1	1	2.78E+09	0.0020174	0.0000001	5.03	0.04	
AS3 polished	1	2	2.74E+09	0.0020183	0.0000001	5.49	0.07	
AS3 polished	1	3	2.71E+09	0.0020178	0.0000002	5.26	0.08	
AS3 polished	1	4	2.72E+09	0.0020186	0.0000001	5.62	0.06	
AS3 polished	2	1	2.77E+09	0.0020177	0.0000001	5.17	0.04	
AS3 polished	2	2	2.80E+09	0.0020173	0.0000001	4.97	0.07	
AS3 polished	2	3	2.76E+09	0.0020176	0.0000001	5.12	0.07	
AS3 polished	2	4	2.83E+09	0.0020177	0.0000001	5.17	0.05	
AS3 polished	3	1	2.82E+09	0.0020179	0.0000001	5.29	0.06	
AS3 polished	3	2	2.85E+09	0.0020186	0.0000002	5.62	0.08	
AS3 polished	3	3	2.87E+09	0.0020183	0.0000001	5.49	0.07	
AS3 polished	3	4	2.84E+09	0.0020184	0.0000001	5.53	0.04	
AS3 polished	3	5	2.78E+09	0.0020176	0.0000001	5.14	0.04	
AS3 polished	4	1	2.84E+09	0.0020182	0.0000001	5.44	0.06	
AS3 polished	5	1	2.85E+09	0.0020178	0.0000001	5.25	0.05	
AS3 polished	5	2	2.78E+09	0.0020196	0.0000001	6.11	0.06	
AS3 polished	6	1	2.80E+09	0.0020183	0.0000001	5.48	0.06	
AS3 polished	6	2	2.84E+09	0.0020181	0.0000001	5.40	0.07	
AS3 polished	6	3	2.81E+09	0.0020185	0.0000001	5.61	0.03	
AS3 polished	6	4	2.81E+09	0.0020181	0.0000001	5.39	0.05	
AS3 unpolished	1	1	2.82E+09	0.0020214	0.0000003	7.02	0.15	surface overgrowth
AS3 unpolished	1	2	2.84E+09	0.0020202	0.0000004	6.41	0.19	surface overgrowth
AS3 unpolished	2	1	2.78E+09	0.0020172	0.0000002	4.95	0.09	
AS3 unpolished	2	2	2.79E+09	0.0020182	0.0000002	5.44	0.08	
AS3 unpolished	2	3	2.81E+09	0.0020186	0.0000001	5.63	0.04	
AS3 unpolished	3	1	2.88E+09	0.0020189	0.0000001	5.78	0.05	
AS3 unpolished	3	2	2.85E+09	0.0020190	0.0000002	5.84	0.08	
AS3 unpolished	4	1	3.01E+09	0.0020335	0.0000004	13.07	0.19	surface overgrowth
AS3 unpolished	4	2	3.02E+09	0.0020284	0.0000003	10.52	0.14	surface overgrowth
AS3 unpolished	4	3	2.99E+09	0.0020309	0.0000003	11.77	0.13	surface overgrowth
AS3 unpolished	5	1	2.88E+09	0.0020187	0.0000002	5.66	0.08	
AS3 unpolished	6	1	2.89E+09	0.0020174	0.0000001	5.05	0.05	
AS3 unpolished	7	1	2.83E+09	0.0020179	0.0000002	5.29	0.08	
AS3 unpolished	8	1	2.91E+09	0.0020221	0.0000004	7.38	0.19	surface overgrowth
AS3 unpolished	8	2	2.86E+09	0.0020202	0.0000003	6.41	0.13	surface overgrowth
AS3 unpolished	8	3	2.93E+09	0.0020242	0.0000007	8.43	0.36	surface overgrowth
AS3 unpolished	9	1	2.85E+09	0.0020184	0.0000001	5.54	0.05	
AS3 unpolished	9	2	2.79E+09	0.0020177	0.0000001	5.18	0.05	
AS3 unpolished	10	1	2.83E+09	0.0020177	0.0000001	5.20	0.07	
AS3 unpolished	10	2	2.86E+09	0.0020182	0.0000002	5.41	0.08	
Bishop Tuff Ig2E polished	1	1	2.78E+09	0.0020171	0.0000001	4.90	0.06	
Bishop Tuff Ig2E polished	1	2	2.76E+09	0.0020171	0.0000001	4.88	0.06	
Bishop Tuff Ig2E polished	2	1	2.75E+09	0.0020172	0.0000001	4.91	0.07	
Bishop Tuff Ig2E polished	2	2	2.70E+09	0.0020178	0.0000001	5.24	0.06	
Bishop Tuff Ig2E polished	3	1	2.74E+09	0.0020199	0.0000001	6.26	0.06	potential xenocryst
Bishop Tuff Ig2E polished	3	2	2.77E+09	0.0020202	0.0000001	6.42	0.07	potential xenocryst
Bishop Tuff Ig2E polished	4	1	2.81E+09	0.0020174	0.0000001	5.04	0.05	
Bishop Tuff Ig2E polished	4	2	2.80E+09	0.0020180	0.0000001	5.32	0.05	
Bishop Tuff Ig2E polished	5	1	2.75E+09	0.0020180	0.0000001	5.32	0.06	
Bishop Tuff Ig2E polished	6	1	2.82E+09	0.0020173	0.0000001	4.98	0.07	
Bishop Tuff Ig2E polished	7	1	2.79E+09	0.0020178	0.0000002	5.23	0.08	
Bishop Tuff Ig2E polished	8	1	2.80E+09	0.0020180	0.0000001	5.32	0.04	
Bishop Tuff Ig2E polished	8	2	2.84E+09	0.0020173	0.0000001	4.99	0.05	
Bishop Tuff Ig2E polished	9	1	2.77E+09	0.0020179	0.0000001	5.26	0.07	
Bishop Tuff Ig2E polished	10	1	2.88E+09	0.0020217	0.0000001	7.16	0.05	potential xenocryst
Bishop Tuff Ig2E polished	10	2	2.85E+09	0.0020213	0.0000001	6.96	0.06	potential xenocryst
Bishop Tuff Ig2E polished	11	1	2.81E+09	0.0020180	0.0000002	5.33	0.08	
Bishop Tuff Ig2E polished	11	2	2.80E+09	0.0020178	0.0000001	5.24	0.06	
Bishop Tuff Ig2E polished	12	1	2.79E+09	0.0020172	0.0000001	4.94	0.05	
Bishop Tuff Ig2E polished	13	1	2.78E+09	0.0020188	0.0000001	5.74	0.06	
Bishop Tuff Ig2E unpolished	1	1	2.83E+09	0.0020169	0.0000001	4.79	0.06	
Bishop Tuff Ig2E unpolished	2	1	2.76E+09	0.0020183	0.0000001	5.50	0.05	
Bishop Tuff Ig2E unpolished	3	1	2.73E+09	0.0020180	0.0000001	5.31	0.07	
Bishop Tuff Ig2E unpolished	4	1	2.80E+09	0.0020182	0.0000002	5.44	0.10	
Bishop Tuff Ig2E unpolished	5	1	2.81E+09	0.0020170	0.0000001	4.83	0.05	
Bishop Tuff Ig2E unpolished	5	1	2.86E+09	0.0020176	0.0000001	5.15	0.06	
Bishop Tuff Ig2E unpolished	6	1	2.81E+09	0.0020181	0.0000001	5.38	0.05	
Bishop Tuff Ig2E unpolished	6	2	2.82E+09	0.0020180	0.0000001	5.33	0.06	
Bishop Tuff Ig2E unpolished	7	1	2.83E+09	0.0020186	0.0000002	5.65	0.09	
Bishop Tuff Ig2E unpolished	8	1	2.82E+09	0.0020177	0.0000001	5.18	0.06	
Bishop Tuff Ig2E unpolished	9	1	2.83E+09	0.0020188	0.0000001	5.74	0.06	
Bishop Tuff Ig2E unpolished	11	1	2.82E+09	0.0020180	0.0000001	5.31	0.04	
Bishop Tuff Ig2E unpolished	12	1	2.84E+09	0.0020188	0.0000001	5.72	0.07	
Bishop Tuff Ig2E unpolished	13	1	2.85E+09	0.0020174	0.0000001	5.05	0.06	
Bishop Tuff Ig2E unpolished	14	1	2.85E+09	0.0020177	0.0000001	5.20	0.06	
Bishop Tuff Ig2E unpolished	15	1	2.78E+09	0.0020180	0.0000001	5.33	0.04	
Bishop Tuff Ig2E unpolished	16	1	2.86E+09	0.0020170	0.0000001	4.82	0.07	
Bishop Tuff Ig2E unpolished	17	1	2.77E+09	0.0020182	0.0000002	5.41	0.09	
Bishop Tuff Ig2E unpolished	17	2	2.82E+09	0.0020178	0.0000001	5.25	0.06	
Bishop Tuff Ig2E unpolished	18	1	2.70E+09	0.0020165	0.0000001	4.59	0.07	

replicate. Excluding these two crystals as potential xenocrysts, the average value for Ig2E polished zircon becomes $5.17 \pm 0.23\%$ (1σ ; n: 16), which is indistinguishable from the average of Ig2E unpolished zircon ($5.25 \pm 0.31\%$ 1σ ; n: 20). This demonstrates that SIMS depth-profiling using In-mounting yields accurate and precise $\delta^{18}\text{O}$ values for μm -sized zircon rims that otherwise cannot be resolved by any other analysis technique. However, as discussed below, it is important to inspect crystals prior to and after analysis using microbeam methods to rule out any non-zircon phases within the analyzed volume.

Following SIMS analysis, the mount was imaged with a MicroXAM surface profilometer (UCLA) and via SEM techniques (Geological Survey of Canada). This was performed in order to determine the depth of the analysis pits for construction of age-depth profile plots (fig. 5), and to image the topography of each grain to ensure analyses were performed on flat crystal faces and avoided outgrowths (e.g. xenotime, quartz, albite).

U-Pb isotopic ratios and ages were calculated from measured ion intensities using in-house software written by C.D. Coath (ZIPS v3.4). ISOPLOT v3.0 (Ludwig, 2003) was used to plot weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ ages, age probability diagrams, and O-isotope composition probability diagrams. Depth-profiling results are presented in table 3 (appendix). Due to the nature of the zircon alteration rims and their age vs. depth plots (see results), individual cycles from shorter analyses were integrated and treated as a single surface spot analysis for each U-Pb ion drilling session. Age results are reported with 1σ errors (table 4), while weighted mean ages have 2σ errors. Some analyses yielded less than ideal results with large errors, anomalous ages, elevated common lead, and/or low percent Pb*. Based on SEM imaging these analyses are the result of the ion beam drilling into surface inclusions and outgrowths, fractured crystal faces, or sub-horizontal crystal surfaces. Such analyses were excluded from the calculation of results. The Vienna standard mean ocean water (V-SMOW) was used to calculate $\delta^{18}\text{O}$ zircon values, and uncertainties are reported at 1σ confidence level (table 5). Some zircons have narrow crystal widths ($<30\ \mu\text{m}$), and therefore the ion beam analyzed portions of the indium mount, which contains silica particles (fig. 6) from polishing the standards. These analyses and other analyses that intercepted inclusions or sub-horizontal crystal faces were not used to calculate results.

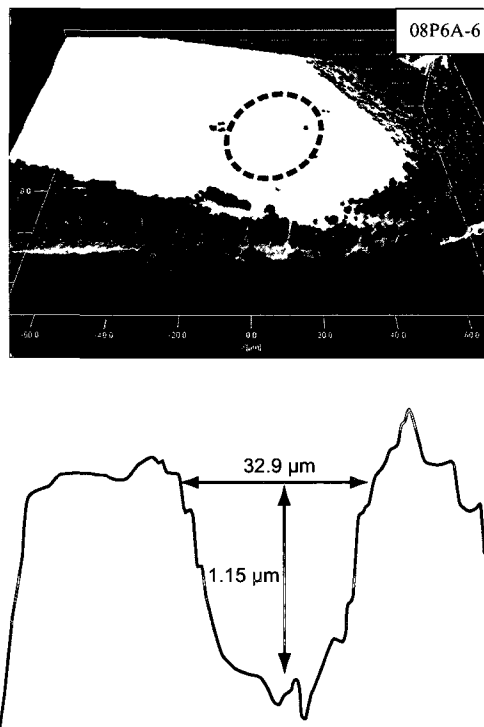


Fig. 5. MicroXAM imaging of zircon showing the geometry of ion pits. Note this zircon 08P6A-6 has a bumpy heterogeneous surface topography. Scale: H V. See fig. 6f for SEM imaging of this grain.

Table 4. SIMS U-Pb isotopic data of zircon integrated ages from depth-profiling of sample

Sample*	U		Th		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{203}\text{Pb}^*$		Correlation of Concordia Ellipse*	% Radiogenic		% Radiogenic		$^{206}\text{Pb}/^{208}\text{Pb}$		$^{207}\text{Pb}/^{209}\text{Pb}$		$^{207}\text{Pb}/^{206}\text{Pb}^*$	
	(est ppm)	(est ppm)	value	1 s.e.	value	1 s.e.	value	1 s.e.	^{206}Pb	^{238}U		^{206}Pb	^{238}U	Age (Ma)	1 s.e.	Age (Ma)	1 s.e.	Age (Ma)	1 s.e.		
08P6A <i>Timiskaming greywacke sandstone adjacent to vein & altered selvage - Pamour Mine (NAD83, Zone 17 UTM 491934E 5374439N)</i>																					
1	675	102	0.162	0.5632	0.0454	14.8600	0.1400	0.1824	0.0005	1.00	99.9	99.8	2682.0	185.0	2794.0	73.9	2674.0	4.7			
2	164	141	0.912	0.4687	0.0267	11.2300	0.6654	0.1776	0.0010	1.00	99.7	99.7	2434.0	118.0	2643.0	55.2	2631.0	9.5			
3	176	40	0.239	0.5099	0.0392	12.5400	0.9559	0.1784	0.0008	1.00	99.9	99.8	2658.0	163.0	2646.0	71.7	2638.0	7.9			
5	87	41	0.461	0.4549	0.0308	11.4300	0.7598	0.1822	0.0010	1.00	99.8	99.8	2417.0	136.0	2559.0	82.1	2673.0	9.5			
(6)	1867	279	0.156	0.3427	0.0211	7.4370	0.4549	0.1574	0.0004	1.00	99.9	99.5	1900.0	101.0	2165.0	54.7	2428.0	4.6			
spB	1234	89	0.075	0.4591	0.0263	10.8100	0.6311	0.1707	0.0010	1.00	100.0	99.8	2436.0	116.0	2507.0	54.3	2565.0	9.3			
7	142	41	0.300	0.4894	0.0278	12.5000	0.7015	0.1818	0.0008	1.00	99.9	99.3	2607.0	120.0	2643.0	52.8	2671.0	7.3			
(8)	2216	122	0.069	0.2669	0.0613	7.6800	2.6240	0.1992	0.0288	0.95	99.9	99.3	1626.0	307.0	2217.0	300.0	2620.0	236.0			
spB	673	74	0.117	0.4831	0.0330	12.7500	0.9026	0.1875	0.0011	1.00	100.0	99.8	2564.0	142.0	2661.0	66.6	2721.0	9.9			
9	643	168	0.269	0.4955	0.0302	12.3900	0.7696	0.1813	0.0008	1.00	100.0	99.9	2584.0	130.0	2634.0	58.4	2665.0	6.9			
10	233	110	0.491	0.4285	0.0263	10.7500	0.6502	0.1818	0.0011	1.00	99.4	97.3	2289.0	119.0	2502.0	56.2	2670.0	9.6			
11	183	125	0.651	0.3725	0.0268	9.1240	0.6462	0.1776	0.0012	1.00	99.6	98.2	2041.0	126.0	2351.0	84.6	2631.0	11.2			
(12)	1844	204	0.129	0.3433	0.0224	7.7370	0.5112	0.1835	0.0010	1.00	99.5	97.3	1903.0	108.0	2201.0	56.4	2492.0	10.1			
13	93	33	0.371	0.4731	0.0266	11.6000	0.6449	0.1779	0.0010	0.99	99.4	97.2	2467.0	116.0	2573.0	52.0	2633.0	9.7			
(14)	1425	314	0.230	0.4893	0.0362	11.3800	0.8463	0.1690	0.0007	1.00	99.9	99.5	2563.0	157.0	2555.0	66.4	2548.0	6.5			
08P6B <i>1cm quartz vein + 5cm altered selvage from Timiskaming greywacke sandstone - Pamour Mine (NAD83 Zone 17, UTM 491934E, 5374439N)</i>																					
1	178	97	0.568	0.4155	0.0213	10.4300	0.5499	0.1820	0.0011	0.99	99.8	94.8	2240.0	97.1	2473.0	48.9	2671.0	9.6			
sp1	86	47	0.565	0.4080	0.0235	10.2400	0.5999	0.1830	0.0010	1.00	99.8	98.1	2197.0	108.0	2457.0	54.2	2680.0	9.6			
sp1	161	96	0.620	0.5139	0.0262	13.1000	0.6705	0.1846	0.0008	1.00	99.8	99.1	2673.0	112.0	2687.0	48.3	2697.0	7.3			
2	54	40	0.772	0.5080	0.0310	12.5700	0.7751	0.1795	0.0011	1.00	99.9	99.8	2648.0	133.0	2648.0	58.0	2648.0	9.9			
3	147	102	0.725	0.5488	0.0346	13.9400	0.8890	0.1842	0.0011	1.00	98.7	94.2	2820.0	144.0	2748.0	59.0	2691.0	9.5			
4	352	153	0.463	0.4445	0.0281	11.2600	0.7099	0.1837	0.0010	1.00	99.9	99.4	2371.0	125.0	2545.0	58.7	2687.0	9.3			
5	105	28	0.254	0.3636	0.0193	8.9470	0.4776	0.1785	0.0013	0.99	99.3	96.8	1999.0	91.2	2333.0	48.8	2639.0	12.2			
6	267	187	0.730	0.5117	0.0324	12.5900	0.8076	0.1784	0.0008	1.00	99.4	97.3	2664.0	138.0	2648.0	80.4	2638.0	7.7			
7	207	159	0.795	0.5941	0.0377	15.0300	0.9514	0.1835	0.0005	1.00	99.9	99.7	3006.0	152.0	2617.0	80.2	2685.0	4.8			
8	81	25	0.299	0.4818	0.0280	12.2100	0.7035	0.1838	0.0012	0.98	99.7	98.7	2534.0	122.0	2621.0	54.1	2668.0	10.4			
9	94	42	0.469	0.5169	0.0275	12.9700	0.8668	0.1819	0.0009	1.00	99.8	99.3	2686.0	117.0	2677.0	49.9	2671.0	8.6			
sp9	147	77	0.540	0.5040	0.0294	12.4800	0.7298	0.1796	0.0007	1.00	99.8	99.1	2631.0	126.0	2641.0	55.0	2649.0	6.2			
10	312	213	0.713	0.4898	0.0327	12.1800	0.7894	0.1778	0.0006	1.00	99.8	99.2	2600.0	141.0	2618.0	61.5	2632.0	6.0			
sp10	282	195	0.721	0.4971	0.0293	12.3500	0.7278	0.1803	0.0010	1.00	99.8	99.3	2601.0	126.0	2632.0	55.3	2655.0	8.9			
11	115	42	0.375	0.5380	0.0324	13.5800	0.8191	0.1832	0.0025	0.97	98.6	94.0	2775.0	136.0	2722.0	57.0	2682.0	22.5			
08P4 <i>Timiskaming polymictic conglomerate adjacent to qtz-carbonate vein - Pamour Mine (NAD83 Zone 17 UTM 491685E 5374577N)</i>																					
(1)	820	256	0.294	0.2934	0.0078	6.6430	0.2600	0.1892	0.0044	0.73	84.3	52.3	1658.0	38.8	2091.0	33.7	2549.0	43.6			
2	328	315	0.904	0.4112	0.0149	10.3800	0.3632	0.1831	0.0006	1.00	99.6	99.1	2220.0	67.8	2469.0	32.4	2681.0	5.7			
3	530	223	0.404	0.3513	0.0103	8.7760	0.2485	0.1812	0.0021	0.92	93.5	76.0	1841.0	49.0	2315.0	25.6	2684.0	19.3			
4	694	249	0.372	0.4588	0.0134	11.6700	0.3405	0.1846	0.0002	1.00	99.9	99.7	2433.0	59.2	2578.0	27.3	2694.0	2.2			
5	216	256	1.113	0.5133	0.0160	13.0700	0.4019	0.1847	0.0004	1.00	99.9	99.5	2671.0	68.1	2685.0	29.0	2696.0	3.4			
sp5	205	244	1.122	0.5188	0.0141	13.1500	0.3579	0.1845	0.0004	1.00	99.9	99.4	2685.0	60.1	2690.0	25.7	2694.0	3.9			
(6)	49	793	15.040	0.0662	0.0055	0.5560	0.0589	0.0717	0.0021	0.98	86.6	72.3	352.3	33.8	449.3	37.1	978.4	60.2			
sp6	250	230	0.889	0.4520	0.0140	11.4000	0.3553	0.1830	0.0005	1.00	99.8	98.4	2404.0	62.4	2557.0	29.1	2680.0	4.5			
7	185	144	0.819	0.4613	0.0141	11.5300	0.3581	0.1812	0.0005	1.00	99.8	98.1	2445.0	62.1	2567.0	28.9	2684.0	4.8			
8	185	71	0.361	0.4857	0.0131	12.0600	0.3249	0.1801	0.0005	0.98	98.7	98.8	2552.0	57.0	2609.0	25.3	2654.0	4.8			
9	249	115	0.431	0.3935	0.0129	9.6190	0.3463	0.1810	0.0009	0.99	98.7	98.8	2139.0	59.5	2419.0	32.5	2682.0	7.8			
10	224	97	0.406	0.4694	0.0135	11.8300	0.3394	0.1843	0.0005	1.00	98.8	99.0	2481.0	59.0	2569.0	26.8	2692.0	4.3			
11	271	269	0.936	0.4209	0.0104	10.5000	0.2609	0.1810	0.0005	0.99	98.8	94.7	2284.0	47.1	2460.0	23.0	2682.0	4.7			
12	235	280	1.156	0.4545	0.0147	11.5400	0.3695	0.1842	0.0005	1.00	98.8	99.3	2415.0	65.0	2568.0	28.8	2681.0	4.2			
13	356	480	1.272	0.3630	0.0085	9.1520	0.2178	0.1828	0.0010	0.97	99.1	98.1	1896.0	40.2	2353.0	21.8	2678.0	9.1			
14	54	18	0.319	0.2630	0.0194	8.5740	0.3810	0.1813	0.0055	0.92	94.2	77.8	1505.0	98.8	2056.0	51.1	2684.0	48.9			
15	245	168	0.846	0.5309	0.0157	13.1400	0.3829	0.1794	0.0007	0.99	98.7	94.3	2745.0	66.0	2668.0	28.2	2646.0	6.9			
09CON <i>Timiskaming greywacke interbedded with conglomerate - Chaput Hughes (NAD83 Zone 17 UTM 569041E 5330996N)</i>																					
1	155	179	1.086	0.4066	0.0111	9.6730	0.2724	0.1779	0.0007	0.99	99.3	96.6	2198.0	50.7	2432.0	25.2	2633.0	6.3			
sp1	130	105	0.761	0.4316	0.0132	10.7200	0.3220	0.1801	0.0009	0.99	99.2	96.3	2313.0	59.5	2499.0	27.9	2654.0	8.4			
2	231	140	0.568	0.4876	0.0138	12.7300	0.3554	0.1855	0.0010	0.99	98.7	94.5	2603.0	58.2	2680.0	26.3	2703.0	6.7			
3	493	150	0.288	0.4842	0.0130	12.4000	0.3294	0.1857	0.0005	0.99	99.4	97.5	2545.0	56.5	2635.0	25.0	2704.0	4.7			
4	322	51	0.149	0.4877	0.0130	12.5700	0.3324	0.1869	0.0003	1.00	99.7	98.7	2581.0	58.1	2648.0	24.8	2715.0	2.9			
5	451	95	0.199	0.4954	0.0137	12.6300	0.3503	0.1849	0.0008	0.99	99.3	97.1	2594.0	58.0	2652.0	26.1	2697.0	6.8			
6	233	263	1.065	0.4287	0.0143	10.7000	0.3569	0.1811	0.0004	1.00	99.7	98.7	2300.0	64.4	2488.0	31.0	2663.0	4.1			
7	448	327	0.680	0.4291	0.0109	10.5500	0.2702	0.1784	0.0004	1.00	99.8	98.0	2302.0	49.2	2485.0	23.7	2638.0	3.4			
sp7	570	420	0.688	0.4455	0.0115	10.9000	0.2867	0.1775	0.0005	0.99	99.7	98.5	2375.0	51.4	2515.0	2					

Table 4. SIMS U-Pb isotopic data of zircon integrated ages from depth-profiling of sample

Table 4. SIMS U-Pb isotopic data of zircon intercalated from depth profiles of sample																	
	U	Th	Th/U	$^{206}\text{Pb}/^{238}\text{U}$	$^{207}\text{Pb}/^{235}\text{U}$	$^{207}\text{Pb}/^{206}\text{Pb}$	Correlation of Concordia Ellipse*	% Radiogenic ^{206}Pb	% Radiogenic ^{207}Pb	$^{206}\text{Pb}/^{238}\text{U}$	Age (Ma)	1 s.e.	Age (Ma)	1 s.e.	Age (Ma)	1 s.e.	
Sample*	(est ppm)	(est ppm)		value	1 s.e.	value	1 s.e.										
5	124	28	0.223	0.4613	0.0257	12.0800	0.6571	0.1818	0.0009	1.00	99.8	99.3	2533.0	112.0	2609.0	51.1	
6	154	9	0.063	0.5680	0.0441	13.9900	1.0630	0.1786	0.0007	1.00	99.9	99.7	2800.0	181.0	2749.0	73.4	
7	139	32	0.234	0.4627	0.0273	11.7900	0.6660	0.1771	0.0007	1.00	99.7	99.5	2539.0	119.0	2688.0	52.9	
8	144	16	0.117	0.5053	0.0335	12.3600	0.7889	0.1774	0.0014	0.99	99.8	99.2	2638.0	144.0	2632.0	80.0	
(9)	142	10	0.070	0.4708	0.0280	11.3600	0.6844	0.1751	0.0010	1.00	99.6	99.3	2487.0	123.0	2553.0	56.2	
11	124	11	0.093	0.4993	0.0286	12.4900	0.7309	0.1814	0.0011	1.00	99.8	99.8	2611.0	123.0	2642.0	55.0	
12	132	12	0.081	0.4840	0.0286	11.9500	0.7332	0.1791	0.0012	0.99	99.7	99.6	2545.0	128.0	2601.0	57.5	
13	145	22	0.159	0.4864	0.0277	12.0600	0.6896	0.1798	0.0005	1.00	99.7	99.6	2555.0	120.0	2609.0	53.6	
14	183	11	0.062	0.5305	0.0328	12.9600	0.8182	0.1772	0.0010	1.00	99.9	99.6	2744.0	138.0	2677.0	58.4	
04ED-198 Quartz-albite porphyritic intrusion Hoyle Pond Mine (NAD83 Zone 17 UTM 492518E 5377038N)																	
1	177	53	0.280	0.4887	0.0247	11.8500	0.5874	0.1759	0.0008	1.00	99.9	99.5	2565.0	107.0	2593.0	47.2	
2	155	23	0.148	0.5501	0.0373	13.3900	0.8157	0.1786	0.0015	0.99	99.9	99.9	2825.0	155.0	2709.0	84.6	
(3)	135	7	0.055	0.3430	0.0218	8.2020	0.5202	0.1734	0.0014	0.99	99.7	99.8	1901.0	125.0	2254.0	57.4	
4	147	28	0.194	0.4686	0.0263	11.5200	0.6626	0.1791	0.0008	1.00	99.9	99.5	2469.0	115.0	2568.0	53.7	
(5)	232	21	0.095	2.3890	0.1261	40.7600	3.0380	0.1237	0.0062	0.75	85.4	22.0	7869.0	240.0	3789.0	73.9	
6	180	38	0.206	0.4696	0.0252	11.5100	0.6129	0.1778	0.0009	1.00	99.5	97.9	2482.0	110.0	2568.0	48.7	
7	167	34	0.204	0.4239	0.0219	10.4800	0.5334	0.1793	0.0010	0.99	99.9	99.6	2278.0	98.9	2478.0	47.2	
8	181	17	0.095	0.3951	0.0222	9.6300	0.5393	0.1763	0.0013	0.99	99.8	99.2	2151.0	120.0	2400.0	51.5	
(9)	153	14	0.094	0.4637	0.0267	10.6600	0.6746	0.1667	0.0035	0.95	95.2	80.1	2456.0	118.0	2494.0	58.8	
09AS2 Quartz-feldspar porphyritic xenite schist Hoyle Pond Mine (NAD83 Zone 17 UTM 492375E 5374578N)																	
1	158	28	0.251	0.4780	0.0142	11.9600	0.3557	0.1803	0.0006	0.99	99.4	97.5	2519.0	82.0	2605.0	28.0	
2	185	50	0.452	0.3892	0.0139	9.1950	0.3508	0.1805	0.0007	1.00	99.8	99.0	2026.0	85.6	2359.0	34.9	
sp2	157	31	0.233	0.3157	0.0104	7.6230	0.2605	0.1797	0.0008	0.99	99.4	97.4	1768.0	50.8	2211.0	30.0	
3	174	38	0.138	0.5013	0.0153	12.5000	0.3756	0.1809	0.0006	0.99	99.4	97.4	2619.0	65.6	2642.0	28.3	
4	226	33	0.187	0.2489	0.0071	8.0670	0.1759	0.1768	0.0008	0.99	99.5	97.7	1433.0	36.7	1985.0	25.3	
sp4	154	77	0.132	0.3752	0.0108	9.3270	0.2698	0.1803	0.0005	1.00	99.7	99.6	2054.0	50.4	2371.0	26.5	
5	153	17	0.312	0.4109	0.0161	10.2300	0.3988	0.1808	0.0008	0.99	99.4	93.1	2219.0	73.6	2458.0	35.9	
6	212	71	0.203	0.4679	0.0143	11.6700	0.3556	0.1810	0.0006	0.99	99.3	97.1	2474.0	63.0	2578.0	28.5	
7	177	37	0.182	0.4139	0.0124	10.0800	0.2959	0.1789	0.0009	0.99	99.2	92.3	2233.0	56.6	2443.0	27.1	
8	174	29	0.188	0.4723	0.0147	11.7100	0.3691	0.1799	0.0007	0.99	99.2	96.6	2494.0	64.5	2562.0	29.4	
10	162	20	0.105	0.4833	0.0143	12.0400	0.3614	0.1807	0.0005	1.00	99.7	99.5	2541.0	62.3	2608.0	28.1	
11	182	35	0.122	0.4804	0.0146	11.9200	0.3680	0.1800	0.0009	0.99	99.9	95.2	2529.0	63.4	2598.0	28.6	
sp11	158	43	0.157	0.4473	0.0141	11.1300	0.3514	0.1805	0.0008	0.99	99.6	98.1	2383.0	62.7	2534.0	29.4	
12	128	13	0.187	0.4350	0.0136	10.9400	0.3487	0.1824	0.0007	0.99	99.5	97.9	2328.0	60.9	2518.0	29.5	
13	186	23	0.273	0.5291	0.0158	13.1200	0.3873	0.1798	0.0009	0.99	99.5	97.7	2738.0	85.6	2669.0	27.8	
14	164	34	0.256	0.4844	0.0147	12.1200	0.3655	0.1815	0.0005	1.00	99.7	99.5	2546.0	63.9	2614.0	28.3	
15	168	22	0.193	0.4587	0.0148	11.4000	0.3810	0.1803	0.0008	1.00	99.7	98.6	2434.0	65.5	2557.0	31.2	
16	151	27	0.097	0.4418	0.0120	10.9900	0.3035	0.1804	0.0005	0.99	99.5	97.7	2359.0	53.6	2522.0	25.7	
17	187	54	0.116	0.5044	0.0153	12.5500	0.3819	0.1805	0.0006	0.99	99.4	97.3	2633.0	65.7	2646.0	28.6	
18	343	85	0.182	0.2158	0.0060	5.3360	0.2122	0.1795	0.0018	0.97	94.8	80.0	1259.0	42.5	1875.0	34.0	
19	182	35	0.197	0.4473	0.0141	11.1300	0.3514	0.1805	0.0006	0.99	99.6	98.1	2383.0	62.7	2534.0	29.4	
09TVZ Procupine greywacke sandstone adjacent to mineralized qtz carbonate lamination vein Hoyle Pond Mine (NAD83 Zone 17 UTM 492325E 5374808N)																	
1	245	217	0.818	0.2815	0.0059	8.7330	0.1429	0.1735	0.0004	0.99	99.8	99.1	1599.0	29.7	2077.0	18.8	
2	316	85	0.195	0.3499	0.0078	7.8160	0.1751	0.1641	0.0004	0.99	99.8	99.8	1834.0	37.4	2222.0	19.9	
3	35	16	0.418	0.4249	0.0114	10.2200	0.2922	0.1744	0.0017	0.94	99.1	91.8	2283.0	51.7	2455.0	26.4	
4	408	304	0.899	0.3472	0.0076	8.0460	0.1768	0.1681	0.0004	0.99	99.9	99.2	1921.0	38.1	2238.0	19.8	
5	120	50	0.467	0.3879	0.0092	9.7110	0.2230	0.1770	0.0006	0.99	99.5	99.3	2159.0	42.2	2408.0	21.1	
6	258	152	0.557	0.4182	0.0157	10.3400	0.3945	0.1802	0.0005	1.00	99.7	99.8	2243.0	71.3	2469.0	35.3	
7	486	306	0.598	0.3219	0.0085	7.6190	0.2173	0.1717	0.0007	0.99	99.9	99.4	1798.0	41.5	2187.0	25.6	
8	545	749	1.281	0.3876	0.0111	8.7000	0.2483	0.1628	0.0005	0.99	99.2	98.0	2112.0	51.4	2307.0	25.8	
9	318	118	0.351	0.3424	0.0084	7.6600	0.1659	0.1655	0.0005	0.99	99.6	99.1	1899.0	40.2	2215.0	22.5	
10	164	90	0.508	0.3386	0.0079	9.1520	0.1694	0.1746	0.0005	0.99	99.7	99.5	1890.0	38.0	2248.0	21.1	
11	435	450	0.948	0.2581	0.0074	5.8170	0.1709	0.1647	0.0004	1.00	99.8	99.1	1470.0	37.8	1949.0	25.5	
12	419	119	0.268	0.3171	0.0077	7.1400	0.1726	0.1633	0.0004	1.00	99.8	99.1	1775.0	37.5	2129.0	21.5	
13	252	97	0.363	0.3879	0.0135	9.1080	0.3199	0.1702	0.0008	1.00	99.7	99.8	2113.0	82.5	2349.0	32.1	
14	128	87	0.491	0.4158	0.0116	10.1000	0.2659	0.1782	0.0011	0.99	99.2	96.2	2241.0	52.9	2444.0	27.1	
15	241	39	0.155	0.4010	0.0104	9.3150	0.2527	0.1685	0.0008	0.99	99.7	99.5	2174.0	48.0	2389.0	24.9	
16	252	201	0.744	0.4042	0.0108	9.8870	0.2708	0.1774	0.0008	0.99	99.5	97.8	2188.0	48.5	2424.0	25.2	
17	541	233	0.410	0.3679	0.0143	8.9700	0.3555	0.1768	0.0004	1.00	99.7	99.8	2020.0	67.2	2335.0	36.2	
18	110	47	0.407	0.4303	0.0116	10.6500	0.2828	0.1795	0.0007	0.99	99.5	97.9	2307.0	52.5	2493.0	25.5	
19	241	86	0.372	0.3894	0.0089	9.2520	0.2150	0.1723	0.0005	0.99	99.7	99.8	2120.0	41.1	2363.0	21.3	
20	110	55	0.463	0.3270	0.0072	7.9320	0.1789	0.1760	0.0007	0.99	99.5	97.7	1824.0	34.8	2223.0	20.3	

* sp denotes a separate spot analyses on the same grain

Table 5 SIMS oxygen isotope compositions of zircon (Abitibi Subprovince)

Grain	$^{18}\text{O}/^{16}\text{O}$ measured (x 1000)	Internal precision (1 σ x 1000)	delta ^{18}O V-SMOW	
			(‰)	(1 σ ‰)
08P6A Timiskaming less altered country rock sandstone				
<i>Pamour mine (NAD83, Zone 17 UTM 491934E, 5374439N)</i>				
1	2 0170	0 0004	6.3	0.2
2*	2 0183	0 0006	6.9	0.3
3	2 0148	0 0004	5.2	0.2
4*	2 0166	0 0004	6.1	0.2
5	2 0166	0 0003	6.1	0.2
6	2 0188	0 0004	7.0	0.2
7	2 0163	0 0003	5.8	0.1
8*	1 9916	0 0005	-6.6	0.2
9	2 0155	0 0005	5.4	0.2
10	2 0172	0 0004	6.2	0.2
08P6B Timiskaming 1cm quartz vein plus alteration halo				
<i>Pamour mine (NAD83, Zone 17 UTM 491934E, 5374439N)</i>				
1*	1 9981	0 0005	3.3	0.2
2	2 0165	0 0004	5.9	0.2
3*	2 0194	0 0004	7.4	0.2
4	2 0216	0 0004	8.5	0.2
5	2 0162	0 0005	5.8	0.2
6*	2 0175	0 0003	6.5	0.1
7	2 0133	0 0004	4.4	0.2
8	2 0119	0 0005	3.7	0.2
9	2 0168	0 0004	6.2	0.2
10	2 0173	0 0005	6.4	0.3
03ED-096A quartz porphyritic sericite schist				
<i>Hoyle Pond mine (NAD83 zone 17 UTM 492687E 5377143N)</i>				
1*	2 0354	0 0013	15.3	0.7
2*	2 0115	0 0011	3.4	0.5
3*	2 0156	0 0003	5.5	0.1
4*	2 0136	0 0006	4.5	0.3
5*	2 0131	0 0007	4.2	0.4
6*	2 0136	0 0005	4.3	0.2
7	2 0154	0 0004	5.2	0.2
8	2 0164	0 0004	5.7	0.2
9	2 0166	0 0004	5.8	0.2
10*	2 0129	0 0003	3.9	0.2
11	2 0159	0 0005	5.6	0.2
12	2 0170	0 0003	6.2	0.1
13	2 0159	0 0004	5.6	0.2
04ED-198 Quartz-albite porphyritic intrusion				
<i>Hoyle Pond Mine (NAD83, Zone 17, UTM 492516E, 5377036N)</i>				
1*	2 0095	0 0005	2.3	0.3
2*	2 0181	0 0004	6.7	0.2
3*	2 0148	0 0003	5.0	0.2
4*	2 0014	0 0008	-1.7	0.4
5*	2 0142	0 0005	4.7	0.2
6*	2 0144	0 0007	4.8	0.4
7	2 0153	0 0004	5.3	0.2
8	2 0157	0 0003	5.5	0.2
9*	1 9979	0 0004	-3.4	0.2

* indicates analysis was rejected see text for discussion

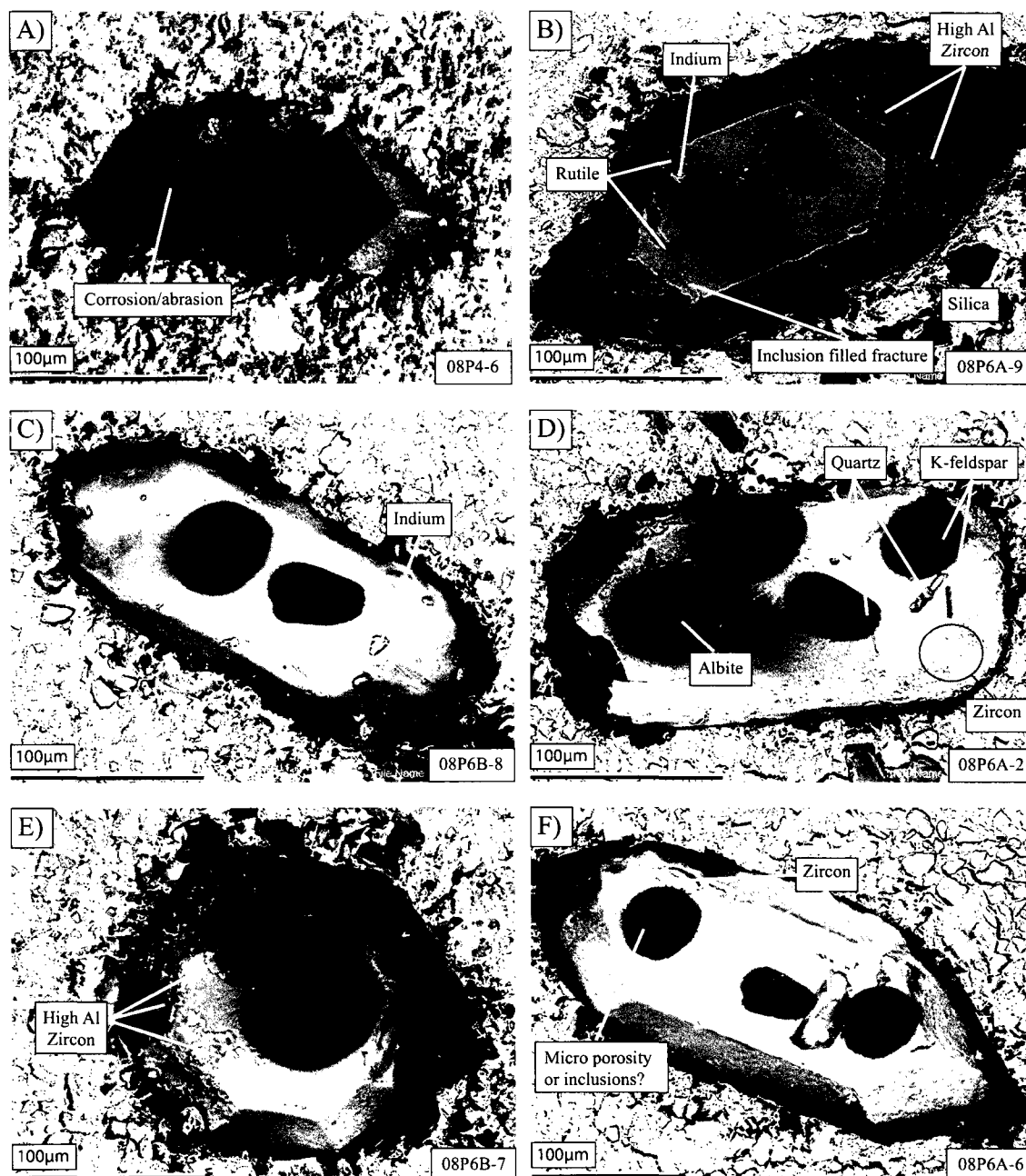


Fig. 6. SEM images of analyzed zircons showing notable external morphologies and structures of zircon. SIMS U-Pb primary beam pits are the darker craters and SIMS O isotope primary beam pits are lighter. Notable features include: high Al zircon outgrowths (B, D, and E), pod shaped zircon growths (F), inclusions (D), inclusion filled fractures (B), corrosion/abrasion (A), and spotted ion pits (F).

LA-ICPMS geochemical depth-profiling

A New Wave Nd:YAG 213 nm laser coupled to a quadrupole Thermo X Series 2 ICPMS at Laurentian University was used to collect trace element analysis of zircon by laser ablation inductively-coupled plasma mass spectrometry (LA-ICPMS). The use of helium gas has been shown to reduce elemental fractionation during LA-ICPMS depth-profiling (Mrank and Mason, 1999). Therefore, the cell that held the sample was constantly flushed with helium, and argon gas was added to the carrier gas prior to its entry into the ICPMS. Depth-profiling on unpolished zircon surfaces was conducted with a 15 μm spot size and a laser repetition rate of 10 Hz. The energy density was kept constant at ~ 6 to 7 J/cm^2 with a 5 ns beam width. The NIST 611 synthetic glass standard was used as the external standard, and the trace elements concentrations in NIST 611 are nominal at about 400 to 500 ppm. The internal standard used was Zr (43.14 wt%). Depth-profiling analysis was accomplished in the form of single spot ablation where laser ablation time varied between 30 and 45 seconds. Prior to ablation 30 seconds of background signal was acquired. Ablation depths range from 30 to 50 μm and several analyses breached opposing crystal faces. Woodhead et al. (2004) show that LA-ICPMS depth-profiling is a viable method to resolve elemental changes with depth in zircon if depth/width ratios are kept $\leq 2:1$. Therefore, elemental concentrations were calculated using only the first 30 micrometers of each analysis.

Analytical results are presented in table 6, and distinct chemical rim domains unique to the zircon interior REE signatures, if present, were separated based on REE concentration vs. ablation time plots using PlasmaLab software (Thermo Electron Corporation, 2006). The REE concentrations were normalized to C-1 chondrite values (McDonough and Sun, 1995), and plotted $\log_{10}$ versus REE (La-Lu). Some analyses showed that thin zones within the crystals contain anomalously high P concentrations indicating solid or fluid inclusion, and these zones were omitted from the final calculations. One zircon crystal (09CON-14) had aberrantly high Th and P concentrations suggesting that the zircon contained xenotime inclusions, and therefore, it was excluded from the REE and U-Pb results.

Table A5 LA-ICPMS REE analytical data* for zircon from Abitibi Subprovince

Zircon	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
08P6A <i>Trmskaming greywacke sandstone adjacent to vein & altered selvage, Pamour Mine (NAD83 Zone 17, UTM 491934E, 5374439N)</i>														
1	1 24	54 88	6 98	21 95	143 78	58 52	546 23	1084 49	1790 24	3025 64	4655 00	7757 09	12627 33	11808 94
r1	359 75	771 94	1577 58	2365 43	2973 65	2699 82	2570 85	3286 09	3703 25	4873 63	7312 50	11020 24	22453 42	19829 27
2	1 30	48 27	5 39	10 46	42 35	36 87	121 36	191 44	257 80	394 87	558 81	1075 71	1688 34	1447 56
r2	132 24	345 84	753 34	1084 03	2888 65	2286 43	5688 44	5180 06	6378 05	10892 31	9137 50	12522 27	21124 22	12443 09
3	1402 53	2859 71	2207 97	3295 40	9040 54	2690 28	18658 29	32299 17	52032 52	79908 42	112887 50	182348 18	293105 59	230000 00
4*	78 36	210 80	362 28	766 74	1770 27	1088 89	4146 73	8520 78	11632 52	15817 58	22350 00	32157 89	63354 04	44878 05
5	0 82	88 51	4 50	22 34	102 43	86 96	274 62	453 74	827 24	1300 00	1917 50	3202 83	5829 57	5304 86
r5	70 76	188 07	132 00	354 49	758 45	613 50	1950 25	1523 82	3489 43	2970 70	4801 68	8323 89	15347 83	12588 43
6+	52 24	184 18	126 51	193 30	224 53	369 27	432 51	655 40	938 62	1458 24	2147 50	3735 63	8857 14	8906 50
7	0 24	2 70	0 18	0 04	4 96	4 71	28 16	50 08	109 07	241 58	473 06	820 65	1352 60	1302 03
r7	395 11	514 03	914 12	1343 98	1514 19	1089 34	1629 15	4138 50	3901 63	5659 34	9937 50	15242 91	19508 32	16914 63
8	3 78	34 98	15 58	42 89	268 99	179 57	1037 19	3285 32	4235 77	6149 35	14925 00	25024 29	33962 73	32418 70
r8	187 83	222 19	367 88	464 55	506 48	768 45	460 50	797 78	721 95	1131 32	1773 13	3188 07	5685 71	5227 84
9	2 97	4 71	2 70	4 45	8 26	8 05	30 88	97 01	128 21	258 23	494 50	872 87	1341 61	1330 08
r9	31 86	90 90	110 99	302 19	553 99	584 01	1332 16	3088 64	3430 89	3329 67	4213 13	6777 33	12770 19	11848 34
10	2 90	127 57	15 12	44 20	234 73	103 38	791 91	1792 24	2587 40	4887 44	7931 25	13587 04	20570 81	18243 90
r10	396 50	721 53	1018 86	1121 44	1244 59	1322 74	1307 54	2247 92	2771 54	5181 32	9400 00	20097 17	37881 99	38156 54
11	1 75	56 10	9 34	32 76	160 20	76 13	590 95	1021 05	1782 60	2838 63	4389 38	7194 33	12552 60	10768 29
r11	431 65	857 75	2258 47	3286 65	3543 24	2511 55	2808 55	4224 38	4051 22	4714 28	6013 75	6858 30	11770 19	8881 78
12	70 80	180 10	286 54	373 96	461 89	264 90	795 98	1877 01	2250 81	3655 68	6225 00	10684 21	15099 38	15813 82
r13	0 07	8 63	0 31	0 24	2 98	2 98	8 82	28 01	36 56	79 89	180 13	344 90	781 30	800 81
13	4 01	56 28	24 49	30 55	35 57	64 58	123 07	398 08	408 84	763 74	843 13	1113 77	1785 71	1116 87
14	40 46	139 38	99 59	185 75	561 42	219 18	1520 10	3434 80	5654 47	9613 55	15962 50	27400 81	40684 60	35207 32
08P6B <i>1cm quartz vein + 5cm altered selvage from Trmskaming greywacke sandstone, Pamour Mine (NAD83 Zone 17, UTM 491934E, 5374439N)</i>														
1	68 14	280 70	206 68	309 19	588 99	367 19	1530 15	2405 82	4207 32	6534 80	10118 75	17469 64	31795 03	27764 23
2	1 14	311 75	21 85	83 87	456 48	301 78	1164 82	1525 76	2491 87	3540 29	5003 75	7955 47	13478 26	10362 11
3	4 39	23 75	18 11	29 50	51 70	32 31	102 81	147 73	228 05	344 51	529 63	834 41	1480 87	1309 35
r3	378 27	830 83	1339 44	1422 76	1450 68	1289 34	1085 43	834 63	942 68	946 70	886 76	1278 85	1981 37	1527 24
4	0 34	48 65	1 39	2 76	20 14	11 83	58 74	85 57	150 41	222 16	342 63	561 54	995 27	878 45
r4	82 74	188 42	204 83	231 73	238 73	228 24	258 10	270 81	315 37	393 96	440 19	768 70	1457 14	1133 33
5	53 62	51 84	22 44	38 47	82 43	61 56	212 66	334 63	582 93	880 22	1408 75	2557 08	4624 22	5174 80
r5	183 67	723 00	2564 66	5772 43	12304 05	11085 26	12381 91	13764 54	16817 07	13745 42	10863 75	13607 29	20111 80	13658 54
6	173 78	498 08	154 53	182 87	285 07	258 66	781 41	927 88	1682 52	2423 08	3825 63	6404 88	12149 07	10858 54
7	0 43	28 61	4 01	18 74	103 78	58 04	358 23	624 93	1128 87	1728 48	2363 75	3683 97	5848 07	4438 02
8	1 35	43 63	4 52	9 89	22 87	27 42	93 57	139 70	305 93	498 70	838 88	1685 99	2984 60	3053 86
r8	55 81	108 29	194 81	298 47	147 43	78 95	270 95	288 82	441 46	538 26	1102 50	1589 23	3209 94	3303 25
9	215 44	854 81	683 97	885 34	1350 00	784 90	2116 58	2806 54	3740 65	5152 01	7143 75	11473 68	18288 14	15846 53
10	11 76	351 71	29 11	97 75	438 58	442 63	1126 63	1722 44	2774 39	4324 18	6212 50	10740 89	17726 71	15487 80
r10	148 82	1102 77	453 45	755 58	1674 32	1288 03	3302 51	4130 18	6158 54	8216 12	10462 50	16827 53	27380 25	22784 55
11	48 10	247 80	478 83	638 95	1154 05	826 64	1459 30	3077 56	3891 48	7042 12	9643 75	8708 50	18896 65	14573 17
r11	0 19	13 23	0 57	1 25	9 03	9 43	51 01	92 80	179 23	335 71	574 13	1120 24	2020 50	1984 55
08P4 <i>Trmskaming polymictic conglomerate adjacent to qtz-carbonate vein, Pamour Mine (NAD83 Zone 17, UTM 491865E, 5374577N)</i>														
1	7 28	142 37	24 68	41 55	78 65	66 59	184 32	275 71	406 38	622 16	1075 00	1893 52	3414 28	3908 13
r1	307 43	782 97	1156 25	1347 92	965 54	902 13	847 74	583 16	551 63	554 21	798 25	1185 02	2318 01	2335 37
2	2 37	95 88	20 82	40 94	158 11	83 14	401 11	504 16	685 93	942 12	1387 50	2012 15	3021 12	3075 20
r2	38 38	127 05	121 86	158 56	154 86	134 96	151 11	214 90	280 85	380 40	624 44	1089 89	2061 48	1958 94
3	0 72	23 77	3 65	8 49	31 27	15 88	80 20	118 14	183 88	261 54	380 63	572 47	819 88	779 27
r3	118 46	243 23	331 57	417 51	281 49	280 46	288 14	340 44	339 07	455 31	723 13	1278 95	2431 68	2528 48
4	78 98	232 79	296 23	365 65	500 14	271 05	767 34	1085 10	1494 31	2289 38	3480 00	5356 28	8186 34	7650 41
5	8 80	61 71	54 99	99 91	187 77	116 04	274 42	299 08	345 73	399 90	495 25	725 51	1031 06	889 21
r5	0 26	47 21	4 22	9 05	47 25	48 28	182 76	218 40	365 00	533 70	780 00	1138 68	1930 43	1888 28
6	2 95	148 55	20 88	26 35	57 01	38 72	129 80	209 47	339 96	481 50	638 13	1381 78	2428 57	2663 41
7	5 82	142 59	32 85	89 72	167 36	124 25	377 94	514 40	747 56	1070 51	1437 50	2278 52	3408 83	3291 06
8	0 73	74 83	1 84	4 35	17 14	34 17	74 02	118 87	185 85	301 65	581 13	1035 63	1885 84	2153 25
r8	4 28	38 77	25 77	31 88	38 38	32 83	53 42	73 63	103 21	149 85	240 56	445 75	823 80	859 76
9	1 27	16 02	4 58	6 54	18 82	11 74	56 58	112 49	205 00	361 90	567 81	937 65	1656 52	1817 07
r9	8 14	27 19	29 59	43 00	86 45	49 61	88 59	82 52	142 44	208 96	313 38	658 82	1242 24	1028 05
10	0 05	10 74	0 23	1 02	14 60	6 93	75 08	157 48	287 03	480 96	757 50	1163 16	1788 14	1889 82
11	7 11	86 90	31 08	52 71	104 66	75 81	260 65	318 07	425 20	505 49	699 13	929 96	1388 20	1320 73
r11	43 78	126 85	157 55	217 75	242 03	160 76	246 38	285 87	283 74	315 57	348 50	517 81	823 80	561 79
12	0 38	72 27	6 58	24 07	110 85	58 45	300 40	418 28	570 33	813 55	1093 13	1604 45	2282 11	2092 11
13	5 82	65 99	19 32	34 31	99 46	99 73	248 74	372 65	569 51	893 96	1302 50	2016 19	3526 09	3710 98
r13	250 84	890 05	1022 20	1248 36	1318 22	1470 69	943 72	1087 87	1258 13	1837 00	2758 28	4607 29	8472 06	8207 32
14	0 03	2 00	0 24	1 46	8 32	3 81	40 45	82 02	154 18	251 83	391 61	631 98	980 06	927 24
15	1 20	72 54	8 11	11 02	36 78	23 59	87 74	115 93	154 67	246 34	429 19	581 38	964 60	1008 54
r15	137 13	276 18	373 06	465 85	560 54	322 81	580 40	605 26	632 93	854 03	918 75	1133 20	1748 45	1754 88

Table A6 LA-ICPMS REE analytical data* for zircon from Abitibi Subprovince

Zircon	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
09CON <i>Timiskaming greywacke interbedded with conglomerate</i> Chaput Hughes (NAD83 Zone 17 UTM 569041E 5330996N)														
1	0.28	10.51	1.31	2.10	15.97	7.83	43.38	57.04	85.41	140.57	214.44	325.83	540.82	498.37
r1	94.18	195.92	273.06	358.96	661.28	313.50	523.12	403.88	737.40	752.56	1013.13	1844.53	3757.76	3136.37
2	0.26	8.41	0.38	1.27	8.87	2.50	20.95	39.47	68.62	92.25	181.75	300.00	530.56	540.65
r2	383.42	1758.93	3083.68	2987.18	3644.59	3355.24	2491.46	8252.08	14910.57	23406.59	27843.75	38311.74	66148.07	48738.84
3	0.14	6.31	0.23	1.67	7.76	7.50	32.29	59.20	83.37	151.18	251.60	412.55	695.03	713.01
r3	5.59	19.72	18.18	31.27	39.57	38.95	64.72	107.15	129.39	225.09	362.56	811.34	1736.02	1725.61
4	0.54	6.60	1.83	2.19	8.64	8.86	37.77	88.58	128.94	189.27	328.08	529.15	841.81	854.07
r4	1317.30	6721.04	6138.65	8938.73	13832.43	8588.38	9361.61	11063.71	9794.55	9813.55	13506.25	13056.89	17527.95	15846.34
5	0.19	9.17	0.97	2.36	7.39	6.36	32.96	51.69	100.16	162.42	303.13	507.29	868.32	979.05
r5	228.62	1244.54	6375.00	7582.06	20020.27	12547.07	10839.20	14191.14	12898.37	18736.26	24812.50	43886.84	85341.61	70162.80
6	2.49	57.93	16.72	40.00	117.57	96.34	214.37	286.57	380.41	481.94	699.38	882.19	1499.38	1334.86
7	0.00	6.40	0.00	1.92	1.14	6.63	36.33	35.21	83.09	114.52	200.00	296.56	525.22	589.51
r7	51.56	179.77	113.15	252.30	284.80	307.46	381.26	805.54	808.10	1245.42	1846.25	2826.72	6022.38	3806.94
8	0.94	50.10	7.80	24.88	116.62	66.63	316.16	527.70	781.30	1172.34	1716.88	2633.20	4102.48	3548.18
9	0.98	18.76	0.88	1.88	10.93	13.36	44.23	70.83	130.81	228.37	388.94	741.30	1305.59	1346.34
10	0.23	8.53	0.25	1.98	9.16	8.48	81.16	108.84	234.86	343.58	558.44	811.74	1137.89	1152.44
r10	0.20	29.12	6.15	27.07	140.88	63.11	480.75	831.02	1409.35	2137.36	3071.88	4165.99	5849.68	4995.93
11	0.36	24.57	0.96	2.53	18.28	8.51	67.94	81.86	121.42	178.32	265.31	380.99	501.80	508.50
r11	10.94	113.80	31.35	43.44	171.82	148.34	229.95	246.73	387.36	408.52	507.88	734.01	1353.42	927.64
12	0.09	3.33	0.12	1.01	5.88	7.32	30.80	59.20	102.15	148.18	303.44	479.76	732.92	809.54
r12	40.43	128.54	176.40	167.99	426.15	450.98	564.92	500.83	777.24	1352.20	2089.38	2535.83	3210.56	2873.17
13	0.57	9.26	1.24	2.43	16.71	9.15	76.68	146.70	254.47	513.92	879.38	1306.07	1988.20	2058.11
r13	46.33	162.02	195.58	337.64	292.09	263.58	855.28	924.38	1286.18	1610.99	2016.25	3073.28	5155.90	3427.64
15	2.94	21.60	11.10	14.14	77.36	37.55	232.11	440.44	684.86	950.73	1588.38	2389.88	3375.16	3817.89
r15	38.77	94.88	112.61	135.91	252.70	232.50	277.88	339.06	454.07	654.21	1033.13	1740.89	3155.80	2944.31
16	5.79	53.56	6.37	22.04	81.15	65.75	193.92	365.37	480.89	716.30	1051.25	1503.64	2280.75	2364.23
r16	261.14	542.41	825.54	861.71	1009.46	588.52	840.70	755.68	639.02	552.01	945.63	1487.57	2194.41	2516.45
17	2.38	131.16	6.38	16.08	34.90	43.11	116.88	205.96	382.88	657.88	1180.00	2048.96	3174.53	3434.55
r17	112.11	333.61	273.17	383.59	719.59	977.80	1287.94	1865.93	1736.59	2421.25	3538.75	6271.26	11155.28	7979.67
03ED-096A <i>Quartz porphyritic xenite schist</i> Hoyle Pond Mine (NAD83 zone 17 UTM 482687E 5377143N)														
1	3.54	6.86	7.32	11.99	18.06	13.53	15.90	13.16	14.48	17.97	33.50	77.09	138.07	153.33
2	0.82	2.76	0.92	0.86	23.76	65.67	176.33	323.55	473.17	667.03	1089.38	1985.43	3124.84	3239.43
r2	52.62	462.84	353.23	371.99	259.73	1092.80	2330.15	2914.13	2793.90	5119.05	5924.38	6971.66	15236.02	13613.82
3	36.17	58.24	72.53	91.03	97.57	189.84	285.53	388.48	479.27	490.84	591.44	798.79	1047.83	895.77
r3	1.14	3.01	2.47	4.71	16.36	22.24	62.21	108.40	158.86	233.33	291.38	455.87	719.25	589.82
4	3.18	17.60	8.55	21.19	71.55	114.88	312.61	528.53	739.02	1085.38	1353.13	1975.71	3341.61	3029.67
r4	437.13	984.67	1099.14	1318.89	2052.70	2000.00	3849.75	4307.48	2465.04	1930.40	2046.25	2382.59	3220.50	2826.83
5	0.55	0.31	0.23	1.05	1.33	0.43	5.86	2.94	17.72	33.79	69.94	140.85	284.86	280.81
r5	22.94	49.71	50.50	48.01	141.15	114.80	171.96	613.85	485.12	674.36	901.25	1414.98	2036.02	1791.46
6	40.99	122.71	138.36	213.54	274.39	282.90	437.39	544.32	567.48	581.90	602.94	686.64	1234.16	1101.22
7	0.89	5.86	2.38	4.84	81.89	103.84	289.80	395.84	485.53	491.03	592.25	829.15	1091.30	1178.02
r7	343.16	613.39	777.26	875.93	1003.39	667.03	915.58	856.23	983.82	1029.67	1502.50	2283.40	3300.62	3113.82
8	39.96	114.31	158.70	237.84	268.26	185.97	241.91	191.99	189.51	221.06	288.25	423.48	642.86	584.86
10	584.81	751.22	594.18	591.03	482.30	427.35	876.88	870.64	1060.98	1179.30	1477.60	1902.43	2530.43	2083.33
r10	17.70	26.77	27.17	28.03	22.61	31.67	62.86	82.47	149.82	204.76	315.44	520.24	857.14	747.15
11	149.75	337.03	309.27	368.71	280.27	260.04	383.47	388.70	482.88	603.30	875.00	1293.93	2012.42	2154.47
r11	9.41	30.39	44.63	43.28	68.58	62.77	109.10	158.31	184.31	221.98	308.38	460.61	757.76	638.99
12	0.49	3.85	0.25	3.63	58.14	134.53	337.99	431.86	463.01	428.75	454.25	602.83	772.67	769.61
13	239.78	312.56	291.92	303.28	228.05	244.05	401.06	484.48	710.18	1023.63	1453.13	2278.11	3532.82	3596.53
r13	8.27	15.41	21.19	25.88	27.23	23.06	39.21	57.31	82.07	150.40	232.00	442.11	830.43	648.78
14	0.19	0.25	0.16	0.09	2.36	4.48	20.79	43.21	43.94	52.58	65.50	86.11	115.90	96.50
15	68.95	215.01	344.94	489.72	1145.27	771.05	1178.39	1178.39	1158.54	1188.83	1286.88	1573.28	2007.45	1814.23
r15	0.08	2.14	1.12	1.11	11.48	26.28	77.94	138.58	181.06	243.41	328.65	548.58	833.54	651.22
16	266.58	471.29	345.37	359.52	445.47	505.51	879.90	980.61	1161.38	1263.55	1683.75	2448.58	3578.88	2758.35
r16	6.81	19.72	13.76	23.44	52.26	48.80	98.03	137.92	188.29	236.08	328.94	520.65	818.01	674.38
04ED-198 <i>Quartz albite porphyritic intrusion</i> - Hoyle Pond Mine (NAD83 Zone 17 UTM 492516E 5377036N)														
1	7.48	32.63	44.33	76.06	146.22	125.83	223.82	213.16	260.81	313.55	400.25	537.65	817.38	780.98
2	32.86	138.61	180.50	268.37	518.85	475.31	747.24	785.10	827.64	826.18	1084.38	1433.60	1997.62	1737.40
3	22.42	94.23	122.31	208.03	380.34	284.14	598.99	690.88	731.71	737.18	853.13	1151.01	1679.50	1497.15
r3	0.48	0.91	0.31	0.34	8.86	21.05	71.21	73.13	122.03	214.10	411.88	466.80	709.32	900.00
4	7.70	42.76	44.40	78.34	146.01	118.93	212.06	178.92	168.82	189.34	224.31	287.37	408.45	370.61
r4	0.98	1.74	0.54	1.01	7.95	13.29	57.99	87.26	127.68	180.48	251.44	359.68	540.31	517.48
5	78.98	317.94	416.27	638.95	1032.43	782.42	1430.15	1294.46	1120.73	1030.40	1115.63	1335.63	1867.70	1807.72
6	29.08	153.33	225.43	382.93	857.97	498.58	715.08	728.53	656.50	708.79	806.88	935.63	1334.16	1252.03
r6	1.76	8.23	3.48	7.55	16.81	20.82	70.75	85.79	180.57	229.12	297.00	504.86	725.47	786.34

Table A5 LA-ICPMS REE analytical data* for zircon from Abitibi Subprovince

Zircon	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
7	91.55	415.33	621.12	985.12	1972.30	1590.05	2728.63	2394.18	1837.80	1494.14	1528.75	1774.09	2142.24	1783.33
r7	0.04	1.78	0.02	1.30	7.20	16.76	59.95	104.43	137.44	201.83	269.50	429.34	665.94	592.28
8	2.25	17.70	6.73	8.86	48.14	68.52	180.25	235.12	268.41	300.37	412.55	572.05	878.26	778.66
9	49.26	183.03	233.73	329.23	672.36	536.72	873.87	891.68	814.23	854.21	999.38	1323.89	1804.87	1536.21
r9	1.08	5.97	8.20	13.34	31.26	38.79	87.64	111.25	155.85	191.58	279.69	422.27	755.90	653.25
09AS2 Quartz feldspar porphyritic xenite schist - Hoyle Pond Mine (NAD83 Zone 17 UTM 492375E 5374576N)														
1	1.84	4.62	4.91	6.71	23.75	26.75	82.11	123.41	187.80	251.47	371.13	527.94	798.14	773.17
r1	6.38	22.58	20.52	28.65	84.20	58.38	113.27	126.93	147.07	188.45	287.88	481.78	827.33	831.30
2	0.38	0.61	0.25	0.57	2.10	7.58	16.70	32.63	44.88	57.09	97.94	134.60	201.18	202.52
r2	2.50	14.80	8.65	16.05	31.55	30.14	72.11	73.77	146.34	234.43	383.69	540.89	985.71	810.57
3	3.81	14.86	14.21	24.29	38.89	37.28	83.97	122.55	172.60	223.63	354.81	616.19	873.91	1086.85
r3	0.08	2.17	0.39	1.16	9.45	18.13	66.79	103.80	160.98	221.25	314.00	501.21	801.24	701.63
4	0.71	1.89	1.45	3.01	12.32	24.28	75.33	139.94	193.99	236.26	341.94	504.45	813.04	715.85
r4	118.28	341.27	270.58	425.60	814.32	574.25	732.16	434.63	780.08	787.18	887.50	913.77	1304.87	839.43
5	15.57	41.42	49.43	64.50	112.23	63.02	210.30	313.57	441.06	630.77	830.00	1144.13	1537.27	1370.73
r5	27.03	73.07	67.88	91.68	196.55	124.35	232.71	257.34	309.31	324.36	405.06	563.40	908.21	648.75
6	38.76	126.05	119.07	207.35	293.85	171.31	391.06	488.48	561.38	684.28	930.63	1266.40	1717.38	1538.84
r6	5.65	23.41	26.30	32.39	82.37	60.37	129.70	172.83	184.72	243.77	310.69	487.04	804.97	545.53
7	3.95	8.97	9.29	12.65	5.11	17.58	19.57	27.73	33.58	28.78	32.08	34.78	36.24	39.09
r7	10.38	32.10	22.94	37.09	57.27	68.12	78.99	98.03	98.46	100.82	108.56	128.92	172.73	118.13
8	12.67	39.12	40.34	49.12	85.64	67.23	149.80	148.45	134.07	157.55	191.63	218.66	294.53	250.08
r8	14.76	51.35	38.13	48.21	83.65	74.83	131.76	168.84	200.53	249.45	305.06	440.89	826.71	512.60
10	8.51	22.09	19.42	26.74	43.40	31.10	56.13	56.70	62.44	60.77	71.44	87.69	123.04	95.00
r10	2.69	9.10	5.61	9.00	15.86	21.05	32.03	44.43	58.54	76.83	111.63	179.39	294.29	269.89
11	1.93	7.08	4.28	8.08	31.60	37.80	107.84	142.74	166.83	197.82	227.13	263.00	365.58	302.72
r11	23.76	77.63	76.08	110.98	264.53	201.24	470.75	555.12	712.60	874.73	1145.63	1627.94	2475.78	2258.54
12	8.67	28.52	21.43	30.09	61.86	82.54	132.16	159.75	198.09	226.01	263.66	339.11	450.00	380.99
r12	0.86	4.42	3.58	4.15	15.99	23.13	68.84	112.62	157.20	208.81	282.60	484.21	803.73	632.11
13	14.51	18.99	13.22	13.54	15.26	12.28	29.12	33.68	34.93	38.37	62.41	63.81	133.35	131.28
r13	0.09	1.87	0.11	0.51	8.26	14.78	48.42	69.42	93.54	120.27	174.19	278.14	476.21	404.76
14	11.42	55.12	38.09	63.57	182.70	149.27	353.37	517.17	821.85	1173.99	1766.88	2634.82	3403.11	3076.42
r14	1.81	6.57	6.34	8.80	21.26	30.98	93.47	117.20	166.26	248.53	380.38	631.17	1071.43	815.04
15	0.23	2.57	0.44	1.52	24.72	25.03	81.16	76.68	79.94	92.07	120.06	144.29	222.92	199.92
r15	0.76	3.93	1.58	4.08	19.88	26.41	70.60	101.52	149.92	177.86	227.38	332.02	563.80	436.58
16	0.70	2.17	1.76	4.13	6.08	16.07	36.66	46.32	66.54	88.70	124.25	170.04	215.16	216.79
r16	0.11	2.05	0.05	1.32	9.93	17.78	58.84	92.52	125.29	167.09	249.13	414.17	711.18	601.63
17	1.78	5.48	3.25	8.14	9.11	6.83	19.09	28.09	23.37	34.21	48.19	71.34	95.18	84.02
r17	4.84	14.60	12.53	18.05	36.14	33.84	79.95	114.16	141.10	180.84	258.68	413.36	686.34	552.65
18	5.52	17.63	15.83	26.46	51.67	37.80	92.46	95.24	90.61	99.11	122.94	166.15	212.42	181.99
r18	19.21	61.27	55.60	75.89	128.65	93.07	160.00	158.87	203.74	222.16	295.69	447.37	752.17	542.28
091V2 Procupine greywacke sandstone adjacent to mineralized qtz carbonate tourmaline vein - Hoyle Pond Mine (NAD83 Zone 17 UTM 492325E, 5374908N)														
1	2.06	27.77	2.93	7.66	52.65	36.11	182.91	352.91	634.55	1091.38	1890.63	3028.74	4900.62	4776.42
r1	148.52	403.26	678.34	1083.59	1368.78	3461.81	2389.94	4271.47	6879.67	7276.56	10250.00	9975.71	18453.42	9813.01
2	0.23	15.88	1.53	3.22	28.54	20.18	112.48	197.15	344.07	633.88	1073.75	1871.28	3037.86	3148.78
3	0.48	22.15	0.69	3.54	24.61	17.88	146.88	266.58	480.65	793.77	1366.25	2315.79	3598.14	3297.15
4	0.86	31.53	3.28	6.85	37.70	29.80	178.64	283.66	500.41	783.33	1336.88	2327.94	3752.60	3958.13
r4	198.75	1138.01	2367.46	3175.05	5067.43	7326.82	7025.13	10994.48	11875.61	10446.05	10781.25	14388.88	18770.19	10878.05
5	0.37	21.04	1.29	4.26	26.84	17.07	178.96	361.77	668.70	1119.95	1878.75	3048.99	4905.69	4914.63
r5	52.07	142.28	210.24	387.31	458.45	650.05	579.40	1042.94	1223.58	1341.94	1260.00	1970.85	3339.13	3019.51
6	1.16	180.91	13.80	40.98	249.73	234.28	787.44	1285.93	2121.14	3357.14	5388.75	8797.57	13397.52	13243.90
r6	50.63	130.18	172.84	166.04	306.62	465.56	678.38	753.74	1113.41	1449.82	1863.75	2722.67	5147.63	4085.37
7	2.27	20.13	3.62	8.21	33.86	23.84	126.73	242.16	453.25	785.53	1385.00	2462.35	4056.52	4382.11
r7	136.54	488.52	464.12	577.24	945.95	1251.87	1245.73	1880.58	1638.43	2173.88	2716.00	4105.28	6453.42	5304.88
8	10.06	84.57	24.95	49.47	205.68	254.35	771.36	1137.12	1818.29	2389.27	3314.38	4744.84	6577.64	6857.72
9	6.41	41.89	26.05	48.53	113.16	147.64	351.21	534.90	927.24	1417.22	2190.00	3342.11	5057.14	5069.11
10	0.32	9.59	0.38	2.13	22.86	12.24	110.20	198.32	401.30	860.26	1035.63	1632.79	2480.06	2517.88
11	1.37	37.77	2.51	5.97	31.19	38.33	150.95	231.58	438.88	684.85	1108.13	1872.87	3039.75	3384.72
r11	311.16	1665.58	4270.47	6538.29	11277.03	28277.08	28708.54	40997.23	51097.56	102271.06	113437.50	211336.03	240745.34	209878.05
12	0.83	22.85	2.93	15.39	82.30	70.57	350.15	588.98	981.06	1430.65	2290.00	3367.21	5189.44	4516.28
r12	28.07	139.98	305.50	278.77	1011.48	2507.99	3475.36	3293.63	6272.36	11841.03	22412.50	37181.94	53012.42	38865.85
13	0.35	35.01	1.37	4.43	25.09	26.48	95.58	169.58	269.43	454.58	695.00	1250.61	2179.88	2235.77
r13	4.55	35.42	23.19	26.67	63.75	149.40	110.70	183.82	263.13	349.27	699.88	1059.51	1667.08	1232.11
14	0.54	13.57	1.02	9.37	45.70	20.30	153.07	242.30	347.40	480.11	748.66	1140.48	1637.88	1815.85
r14	54.98	125.50	181.92	201.53	382.70	883.76	988.44	1624.65	2844.72	4708.78	5846.00	10603.24	14745.34	11146.34
15	0.21	1.15	0.00	0.14	1.61	0.00	12.51	23.93	37.93	67.07	81.81	153.88	241.74	268.55
16	0.32	14.70	0.63	3.09	30.23	36.89	153.97	274.82	455.69	787.55	1105.00	1643.32	2432.30	2384.96
r16	38016.88	29298.53	72500.00	111708.78	280945.85	1215830.55	722813.07	1859279.78	1750408.50	2089743.58	3057600.00	5267208.48	5381625.47	4388818.70

Table A6 LA-ICPMS REE analytical data* for zircon from Abitibi Subprovince

Zircon	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
17	0.68	1.54	0.25	1.51	3.55	3.37	15.57	28.01	58.70	99.36	171.38	266.80	450.81	488.18
r17	16.06	209.95	249.03	909.95	2250.68	1080.28	5185.93	3041.55	3097.58	4496.34	7391.25	13340.08	15279.50	13362.11
18	0.43	10.03	0.00	0.64	5.20	8.45	37.28	88.91	106.50	166.19	280.38	438.88	740.98	870.33
r18	4.68	35.48	33.51	53.55	115.95	72.61	128.04	488.42	667.89	738.46	976.88	1591.09	2468.94	1910.16
18	0.85	6.67	1.70	2.17	8.04	5.80	34.40	70.33	98.29	161.74	252.81	411.74	613.85	688.89
20	0.77	42.64	0.72	4.45	35.26	31.15	144.67	251.89	430.49	731.32	1141.25	1874.09	3045.34	3135.37

*analyses excluded from calculated results

*concentrations in ppm. Cl normalized

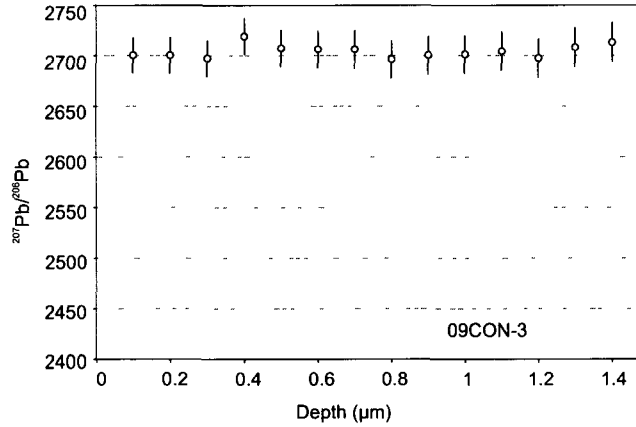
r denotes rim zone

Analytical Results

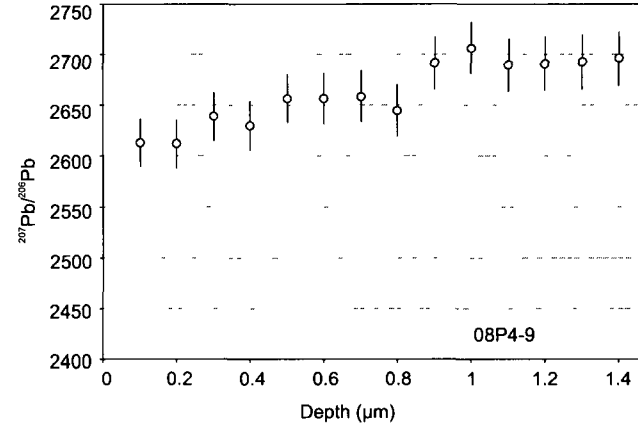
Zircon characteristics including SEM imaging results and a brief overview of SIMS results are given below, followed by more detailed sample-by-sample discussion of petrography and analytical results. The presence of thin alteration zones, $\sim 1\text{-}3\ \mu\text{m}$ thick, in zircon were resolved based on ion drilling. We employ the term "rims" herein to describe these thin alteration zones. Oxygen analyses by SIMS were conducted first, then SIMS U-Pb, followed by LA-ICPMS analyses. Because of the conditions required for reliable SIMS experiments (e.g., horizontal surface) and to achieve our goal of obtaining rim ages on unpolished zircon, we had limited crystal surface area to analyze multiple spots on single grains. Thus, we attempted to analyze ~ 10 spots/sample to characterize the O signature, leaving adequate surface area for reliable U-Pb and LA-ICPMS depth-profiling. A total of 114 zircons were analyzed using U-Pb depth-profiling with SIMS, and most of these crystals were also chosen for REE depth-profiling with LA-ICPMS. Only samples 08P6A, 08P6B, 04ED-198, and 03ED-096A were chosen for stable oxygen isotope analysis via SIMS.

Zircons generally display a vague to clear increase in $^{207}\text{Pb}/^{206}\text{Pb}$ age with depth, although age-depth relationships vary in some analyses. Precise ages with statistically valid errors were resolved when cycles of a specific analytical run were combined and a single integrated age was calculated for each depth-profiling analysis. Integrated ages comprise clear sample distributions with discrete intra-sample populations. Based on the integrated $^{207}\text{Pb}/^{206}\text{Pb}$ ages and depth-profile patterns we have classified the zircons into four types. Representative age vs. depth plots are shown in fig. 7. Type 1 zircons have integrated ages that are older than host rock deposition or crystallization, and they have little to no younger age signature. If young ages exist, they tend to be more proximal to the crystal surface ($<0.5\ \mu\text{m}$) and do not significantly affect integrated age values or errors. Type 2 zircons have young integrated ages, and their ages increase with depth. Young ages proximal to the crystal surface range between ca. 2660 and 2600 Ma, but may extend to as young as ca. 2450 Ma (especially in sample 09TVZ, where integrated $^{207}\text{Pb}/^{206}\text{Pb}$ ages commonly range down to 2485 Ma). Ages increase with depth by either sharp step-like, steady slope, or oscillating patterns. Type 3 zircons have young integrated ages with few to no old ages, and they have consistent (non-increasing) or slightly oscillating age-depth profiles. Type 4 zircons have

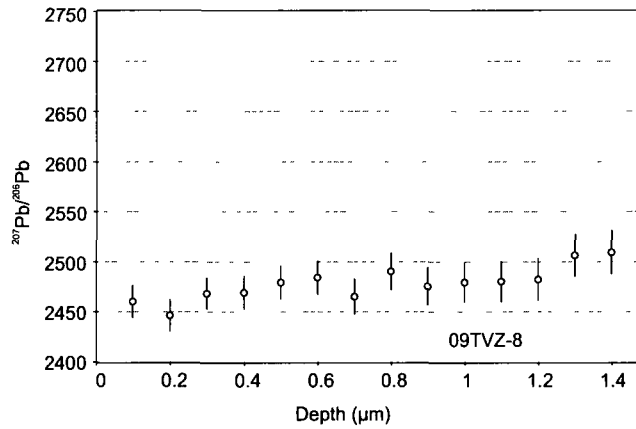
A) Type 1 depth-profile



B) Type 2 depth-profile



C) Type 3 depth-profile



D) Type 4 depth-profile

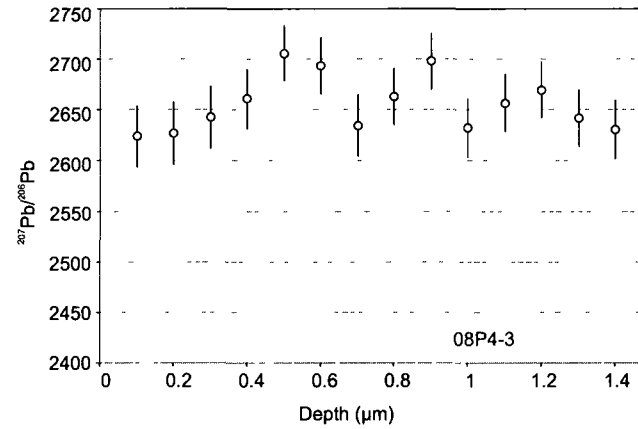


Fig. 7. Examples of the four general age-depth profiles found in our zircons. A) Type 1 are older than sedimentation constraints. B) Type 2 trends clearly increase in age with depth. C) Type 3 trends have consistently young ages. D) Type 4 trends have irregular and highly oscillatory patterns. See Table 1 for analytical details.

irregular age vs. depth trends, and individual cycle ages vary from approximately 50 to 150 m.y. within 0.1-0.2 μm for all or part of the analysis. The oscillatory (young-old-young, and vice versa) nature of type 4 trends suggests that alteration was heterogeneous and only affected localized areas in these zircons. Type 4 zircons typically have relatively young integrated ages that are not anomalous compared to the respective sample population. Samples 03ED-096A and 04ED-198 had more oscillations in $^{207}\text{Pb}/^{206}\text{Pb}$ ages as drilling progressed and have higher integrated age errors than other samples in this study. This could be explained by the smaller crystal sizes of these zircons.

Zircon characteristics

Zircons generally have patchy, corroded, and irregular surface topographies (fig. 5), and some zircons show evidence for annealed surface cracks. Ion beam crater depths average approximately 1 to 1.5 μm and 3 μm for deeper analyses, and pit diameters are ~ 30 to 40 μm . The unpolished zircons were further imaged with a scanning electron microscope (SEM) following analysis to examine detailed external morphologies, textures, outgrowths, and inclusions. A range of external textures was discovered and includes: highly corroded zircon, patchy layered textures, smooth and rounded, smooth and flat, or highly irregular zircons riddled with inclusions (fig. 6). Many zircons exhibit a low degree of corrosion/abrasion on crystal faces and/or edges (fig. 6a). These corrosion/abrasion features are ubiquitous in all samples (detrital and igneous), and thus abrasion from sedimentary erosion and transport can be ruled out. Abrasion from crushing and pulverizing the samples, however, is a viable source for the textures, but fluid induced corrosion/dissolution of radiation damaged areas could also be a possible cause of the features. Many zircons also have slightly rounded edges (even in igneous samples; fig. 6d), while others have extremely sharp edges (even in detrital samples; fig. 6b). However, zircons with a more moderate degree of rounding (fig. 6c) only occur in detrital samples, and therefore these more rounded ovoid morphologies are likely from grain transport during sedimentation rather than fluid induced dissolution.

Energy dispersive X-ray spectroscopy (EDS) was used in conjunction with SEM imaging to identify qualitative elemental concentrations of inclusions and irregular surface

textures. Some zircons contained inclusions of rutile, quartz, albite, calcite, and/or potassium feldspar (fig. 6b, 6d). Several other zircons contained pod-like or flakey subtle outgrowths identified as zircon (fig. 6b, 6e, 6f). Direct EDS analysis of flaky, patchy textures, and the tiny outgrowths yielded high Al concentrations but concentrations of K, Na, and Ca typical for zircon. Therefore, feldspar and mica inclusions are not the source of elevated Al concentrations, and the Al is likely present either as cation constituents in the crystal lattice or cations trapped in nano-scale pore spaces (Geisler et al., 2007). Dark spots ($\leq 1 \mu\text{m}$ diameter) are present in SIMS pits from greywacke samples 08P6A and 08P6B (fig. 6f). These spots are likely from either small pore spaces in the zircon surface or micro-inclusions with low melt temperatures that were preferentially ablated during analysis (fig. 6f). Also, many of the subtle zircon and high Al outgrowths are only present on crystal faces that were not analyzed (i.e. not the crystal tops), and we suggest that physically pressing the zircons into the indium mount freed the fragile outgrowths from the crystal tops.

Control: Chaput Hughes outcrop, Kirkland Lake

Sample 09CON: The Timiskaming assemblage sampled here is a non-mineralized greywacke sandstone bed resting between polymictic conglomerate, and it represents one of the least altered Timiskaming exposures in the area (W. Bleeker pers. comm.). Quartz grains are small and sub-angular with undulatory extinction indicating weak strain. Feldspars are replaced by fine-grained sericite, which defines a weak planar fabric, and amorphous metamorphic chlorite has grown in the groundmass. Sample 09CON has the largest zircon crystals (w:l: 1:2; 200-250 μm long axis), and they are much less corroded, and have less surface outgrowths and inclusions. Their edges are sharper and more intact, and their faces are more homogeneous than other zircons in this study. Seventeen zircons were analyzed and they have integrated $^{207}\text{Pb}/^{206}\text{Pb}$ ages ranging from 2629 to 2715 Ma with a bimodal distribution (fig. 8).

The zircons with rim ages that predate Timiskaming sedimentation have homogeneous and relatively clean morphologies, and they have type 1 depth-profiles. Therefore they were not subjected to significant post-crystallization re-equilibration, and their U-Pb isotope systems are similar to, or the same as, the original parent zircons' isotope system. This "older" population has an integrated weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of $2708 \pm$

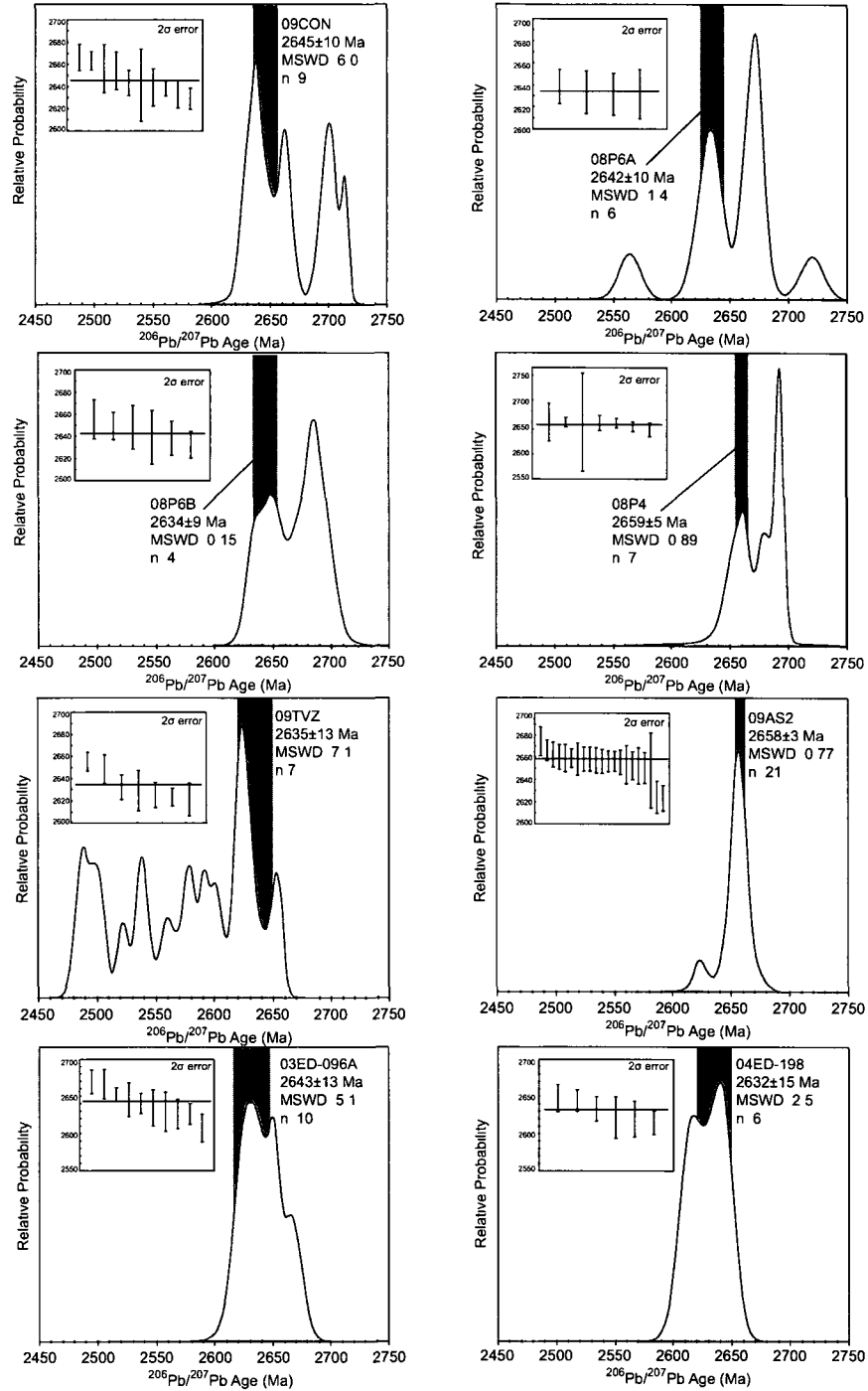


Fig. 8. Probability density diagrams and weighted mean averages for integrated $^{207}\text{Pb}/^{206}\text{Pb}$ ages represented by highlighted bar. Only resolved young rim ages for the metasedimentary samples are shown since the older component is likely detrital.

10 Ma (MSWD: 3.1; n: 5; fig. 8). Zircon interiors have typical igneous patterns, and LREE enrichment is present in some zircons as rim domains (fig. 9). LREE rim enrichment is independent of $^{207}\text{Pb}/^{206}\text{Pb}$ age.

Zircons with integrated $^{207}\text{Pb}/^{206}\text{Pb}$ ages that are younger than sedimentation have type 2, 3, and 4 depth-profile trends, and they constitute a second population which has a weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2645 ± 9 Ma (MSWD: 6.0; n: 10; fig. 8). These young zircons are slightly smaller and more elongate (100-300 μm long axis) than older zircons. They have faint corrosion pits with irregular surfaces and inclusions, but some have clean homogeneous textures similar to zircons in the older than sedimentation. These young zircons have the same patterns as the older zircons, and they may or may not have LREE-enriched rims. A few of the zircons with LREE-enriched rims have modest positive Ce and negative Eu anomalies that resemble interior igneous REE patterns. Longer depth-profiles and stable oxygen isotope analyses were not conducted on this sample. Both old and young zircons exhibit the same general REE characteristics.

Metasedimentary dominated assemblage: Pamour mine

Sample 08P4: Timiskaming basal conglomerate was sampled adjacent to a 15 cm crack-fill style white quartz-albite-ankerite-gold-pyrite shear vein (Pamour style 2 vein). Thin wormy calcite and quartz-carbonate veins (1-3 cm) locally cross-cut the sample (fig. 4a). The polymictic pebbles to cobbles are poorly sorted, and the unit is moderately to intensely altered (sericite, muscovite, carbonate, and/or fuchsite). The fine-grained micas define a planar fabric in the groundmass. Small quartz grains and vein quartz crystals are partially recovered or highly strained. Pyrite and arsenopyrite are disseminated throughout the sample (~5% by volume). Small sulfides define fabric parallel strain shadows of larger pyrite crystals, and they indicate that sulfide growth was contemporaneous with deformation and metamorphism. Zircons are euhedral to subhedral (w:l: 1:2; 100-150 μm long axis) and most have sharp edges, smooth faces, and isolated pitted corroded areas. Some grains have rounded edges, and their faces have pervasive layered, patchy, pitted, and irregular textures. Inclusions and outgrowths are present in some zircons regardless of morphology or texture.

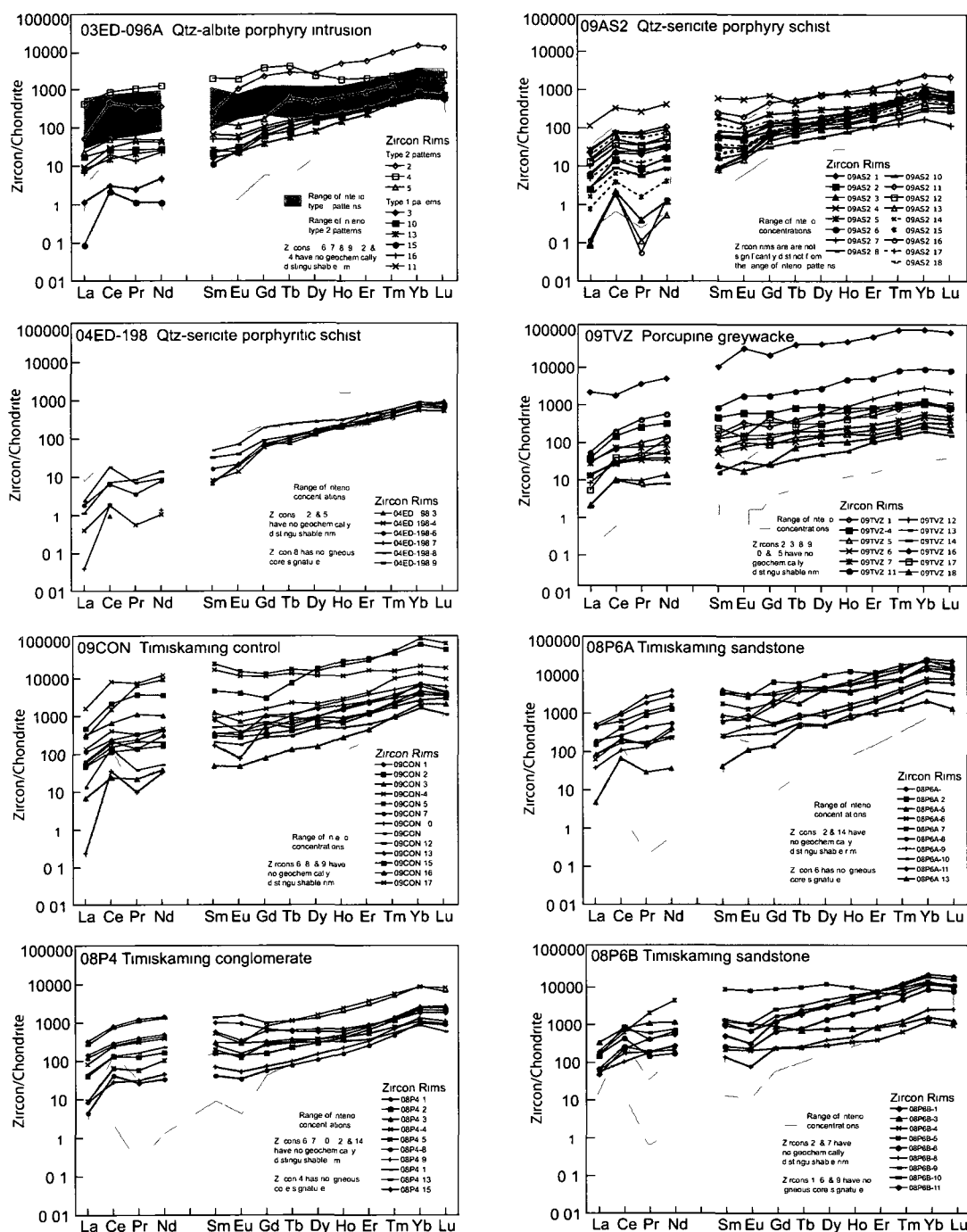


Fig. 9. LA-ICPMS REE depth-profile plots. Interior zones and rim zones were separated based on time vs. concentration plots using PlasmaLab software. Note the LREE enriched rims in the clastic samples average 5 μm in thickness. Not all zircons contain chemically distinct rim domains.

Fifteen zircons were analyzed to a depth of approximately 1.5 μm , and they have integrated $^{207}\text{Pb}/^{206}\text{Pb}$ ages that range from 2648 to 2696 Ma.

The zircons analyzed have a bimodal age distribution, and weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ ages for the populations are 2692 ± 5 Ma (MSWD: 2.2, n: 8) and 2659 ± 5 Ma (MSWD: 0.89, n: 7; fig. 8). No morphological or external textural dissimilarities separate zircons in the old and young populations. Zircons have predominantly types 1, 2, and 3 U-Pb depth-profile trends, and only a few zircons have type 4 trends. Deep drilling of type 2 zircons shows a clear increase in $^{207}\text{Pb}/^{206}\text{Pb}$ age with depth, and this indicates that U-Pb isotopic rims are generally ~ 1 μm (08P4-1) to 3 μm (08P4-7; table 1) thick.

All zircons have the same general REE characteristics as sample 09CON (fig. 9). Zircon interiors have standard igneous patterns, and the majority of zircons from both populations have LREE-enriched rim domains that are independent of $^{207}\text{Pb}/^{206}\text{Pb}$ age and are characterized by shallow La-Lu slopes and no major element anomalies. A few zircons have rims with patterns that reflect their respective interior igneous signatures, but they are slightly REE-enriched with tiny positive Ce and negative Eu anomalies. This could indicate partial re-equilibration of zircon or partial retention of parent REE chemistry. One zircon (08P4-4; table 6) has LREE enrichment with a slight negative Eu anomaly in the entire zircon, which could be from more intensive alteration.

Samples 08P6A and 08P6B: Timiskaming assemblage, greywacke sandstone samples 08P6A (less altered country rock) and 08P6B (vein plus wallrock alteration halo) were analyzed separately (fig. 4e). These samples are stratigraphically higher than 08P4, and they are crosscut by 1-3 cm shallow dipping extensional quartz-carbonate veins with visible alteration halos (~ 15 cm). These extensional veins are not as intensely mineralized, are less altered, and have lower gold grades than the TN vein adjacent to sample 08P4. Both greywacke samples contain fine-grained sericite, muscovite, and quartz in the groundmass. However, these alteration minerals are more abundant in the vein, and minor chlorite is only present in the less altered country rock. Feldspars in both are locally preserved but commonly replaced by sericite, and the micas define a weak microfabric. Sub-rounded quartz grains and vein quartz have undulatory extinction indicating strain, but less strain than

displayed by quartz from sample 08P4. Zircons from both samples are similar in texture and morphology, and they consist of rectangular to elongate sub-rounded to euhedral crystals (w:l: 1:2; 200-250 μm long axis). U-Pb depth-profiles average approximately 1 μm in depth, and zircons have type 2 and 3 age-depth trends with a low to moderate degree of oscillation. Both samples have bimodal $^{207}\text{Pb}/^{206}\text{Pb}$ age distributions with integrated ages ranging from 2428 Ma to 2721 Ma (country rock) and 2632 Ma to 2697 Ma (altered wallrock plus vein).

Both samples have populations comprised of zircons that predate Timiskaming sedimentation, and these zircon populations have weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ ages of 2685 ± 5 Ma (MSWD: 1.05; n: 9) for 08P6B (altered wallrock plus vein) and 2671 ± 6 Ma (MSWD: 0.30; n: 5) for 08P6A (country rock; fig. 8). Compared to zircons that have younger rim $^{207}\text{Pb}/^{206}\text{Pb}$ ages, these older zircons from both samples typically have smoother textures with semi-rounded morphologies that are probably from sedimentary transport. The younger zircon populations from both samples have integrated weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ ages of 2642 ± 10 (MSWD: 1.4, n: 6) and 2634 ± 9 (MSWD: 0.15; n: 4) for the altered wallrock plus vein (08P6B) and country rock (08P6A) samples, respectively (fig. 8). These zircons with younger $^{207}\text{Pb}/^{206}\text{Pb}$ rim ages tend to be more corroded than older zircons, and they have patchy textures with surface outgrowths of zircon.

REE geochemistry results for these Timiskaming greywacke samples are generally indistinguishable from samples 09CON and 08P4. Also, no geochemical differences could be found between zircons older than and zircons younger than sedimentation from both samples. Most zircons have consistent LREE rim enrichment (5-10 μm thick), and these zircons display REE patterns with shallow La-Lu slopes and no major element anomalies (fig. 9). Several zircons from both samples have slightly REE-enriched rims, but they retain a general igneous pattern similar to their interior. Multiple zircons from the vein and country rock fractions have igneous signatures from rim to core that lack a chemically distinct rim zone.

The vein-bearing wall rock and less altered country rock have few isotopic and chemical differences. The vein-bearing sample contains less zircons that have LREE-enriched rims than the country rock sample, which has more zircons with outlier $^{207}\text{Pb}/^{206}\text{Pb}$

age dates. Crystal 08P6A-8 has a $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2721 ± 10 Ma, which is ~ 20 m.y. older than other detrital zircons in this study and suggests an older more distal provenance such as the Stoughton-Roquemaure assemblage (2723- 2720 Ma; Ayer et al., 2005). Crystal 08P6A-6 has two $^{207}\text{Pb}/^{206}\text{Pb}$ ages (2428 Ma and 2565 Ma) that are significantly (100 to 200 m.y.) younger than the populations for this sample, and this zircon has an irregular patchy surface texture with unique pod-shaped surface growths of zircon. Zircon 08P6A-6 also has LREE enrichment rim to core, and no igneous signature is present in the interior, which has a slight positive Ce anomaly. The $\delta^{18}\text{O}$ value for this zircon is anomalously high at $7.0 \pm 0.2\text{‰}$. Crystal 08P6A-14 has a rim $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2428 ± 7 Ma, but the analyzed surface has an irregular pitted texture riddled with inclusions. Two ion microprobe analyses of crystal 08P6B-9 yielded both young (2649 ± 6 Ma) and old (2671 ± 9 Ma) integrated $^{207}\text{Pb}/^{206}\text{Pb}$ ages. The U-Pb isotopic system thus varies considerably along the crystal surface, which is likely a product of conditional and heterogeneous isotopic re-equilibration.

Zircon from the sample cut by a style 3 vein (Pamour) have slightly higher $\delta^{18}\text{O}$ values of $6.07 \pm 0.4\text{‰}$ (MSWD: 1.2, n: 7) than zircon from the country rock ($5.88 \pm 0.4\text{‰}$; MSWD: 4.2; n: 7; table 5). The vein sample also has three outlying values two of which are texturally unique and have irregular surfaces. Zircon 08P6B-4 has an elevated value of $8.5 \pm 0.2\text{‰}$, and has a heterogeneous, pitted, and rounded surface was analyzed. Zircon 08P6B-7 has a comparatively lower $\delta^{18}\text{O}$ value of $4.4 \pm 0.2\text{‰}$, but flakey zircon outgrowths were analyzed (fig. 4e). Zircon 08P6B-8 also has a low $\delta^{18}\text{O}$ value of $3.7 \pm 0.2\text{‰}$, and this zircon has a clean homogeneous surface. Even though zircons from the vein sample are 0.2‰ heavier than zircons from the country rock, this is not a significant enough difference to declare alteration or re-equilibration of the ^{18}O - ^{16}O isotope system in zircon. Also both vein and country rock $\delta^{18}\text{O}$ values match other Abitibi $\delta^{18}\text{O}$ zircon values for plutonic rocks (average 5.8‰; King et al., 1998).

Meta-igneous dominated assemblage: Hoyle Pond mine

Sample 09AS2: A quartz-sericite altered porphyritic intrusion was sampled adjacent to a high-grade, intensely mineralized, and deformed grey stylolitic quartz-albite-tourmaline-muscovite-carbonate-Au vein. This is the most intensely altered and deformed sample of this

investigation. Quartz phenocrysts (2-10 mm diameter) are euhedral to subhedral and have recovered polygonal textures indicating that the rocks endured either a prolonged thermal event that outlasted deformation or secondary post-deformation reheating event(s). The schistosity is defined by muscovite, which is kinked around quartz phenocrysts. Pressure shadows are locally developed adjacent to pyrite and quartz phenocrysts. Carbonate, mica, and fine-grained quartz are present in the groundmass. Zircons, often broken and cracked, generally have elongate prismatic morphologies (1:3, width:length; 150-200 μm long axis), and they lack inclusions. A few zircons have equant 40 μm polygonal, rectangular, or diamond like morphologies. Texturally, most crystal faces are smooth and flat with sharp pristine edges or corroded/abraded to rounded edges. Some zircons have corroded, pitted, and bumpy surface textures, and several zircons have faint micro-fractures with inclusions of rutile and zircon infilling the fractures. Eighteen zircons were analyzed in 21 spots to a depth of ~ 1.5 μm , yielding integrated single spot $^{207}\text{Pb}/^{206}\text{Pb}$ ages from 2623 to 2674 Ma.

Zircons from sample 09AS2 form a single population that has a weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2658 ± 3 Ma (MSWD: 0.77; n: 21; fig. 8), which is approximately 25 m.y. younger than the reported TIMS U-Pb age (2687-2684 Ma; Ayer et al., 2005) for zircons from this suite of rocks at Hoyle Pond. All zircons are younger than the TIMS crystallization age and have type 2 depth-profile trends except for one, which has a type 3 trend. Zircon 09AS2-7 has an unusual age-depth profile where $^{207}\text{Pb}/^{206}\text{Pb}$ age decreases in discrete steps with depth.

Many zircons from this sample have whole-crystal LREE enrichment with shallow continuous La-Lu slopes and no Ce or Eu anomalies (fig. 9). However, a few zircons have small positive Ce and negative Eu anomalies (e.g., zircons 14 and 15; table 6). Zircons 3, 13, and 16 (table 6) have LREE-depleted rims relative to the crystal interior, which is LREE-enriched. These zircons have steeper slopes and prominent positive Ce anomalies but no Eu anomaly. Zircons 2 and 4 (table 6) have LREE-enriched rims relative to the interior. The patterns of zircons with either LREE-enriched or depleted rims do not fall outside of the range of LREE-enriched interior patterns (fig. 9). Oxygen isotope data were not collected for this sample.

Sample 04ED-198: Also an altered quartz-sericite-porphyratic intrusion, sample 04ED-198 is not intensely mineralized or spatially proximal to veining. Zircons (w:l: 1:2-1:3; 50-100 μm long axis) are clear to cloudy, colorless to pink/brown, doubly prisms, and they are often broken and cracked. Crystals generally have flat faces with sharp or rounded edges, and they have clean or patchy, flakey, and corroded surface textures. Ayers et al. (2005) reported internal alteration zones, inclusions, and cracks for zircons from this sample. A single integrated $^{207}\text{Pb}/^{206}\text{Pb}$ age population ranging from 2614 to 2647 Ma has a weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2632 ± 15 Ma (MSWD: 2.5, n: 6), which is ca. 55 m.y. younger than the TIMS U-Pb age (2687 ± 2 Ma; Ayer et al., 2005) for zircons from this sample. Zircons have type 3 and 4 depth-profile trends with little to no individual old ages (cycles), and the $^{207}\text{Pb}/^{206}\text{Pb}$ age does not clearly increase with depth. Longer depth-profiles do not correlate well with short depth-profiles, and they are highly scattered with large cycle age oscillations. The oscillations suggest that zircon rims are a heterogeneous mix of re-equilibrated zones and zones with original parent signatures. Zircon 04ED-198-1, however, has cycle ages that clearly increase from ca. 2575 to 2685 Ma over the first 2 μm depth, which is followed by old to young age oscillations (table 3, appendix).

Zircon interiors are LREE-enriched, similar to sample 09AS2, and they have REE patterns with shallow La-Lu slopes and slight negative Eu anomalies. In contrast, many of the rims (0 to 5-10 μm) of these zircons have lower LREE concentrations and moderate Ce and slight Eu anomalies. Zircon 04ED-198-8 has low LREE concentrations in both the rim and crystal interior. Zircons 1, 2, and 5 are LREE-enriched in their rims and interiors, which is similar to most zircons from sample 09AS2.

Zircons from sample 04ED-198 have narrow widths (typically less than the SIMS primary beam, ≤ 30 μm), which led us to exclude the majority of stable oxygen isotope analyses of zircons from this sample. Only two analyses (zircons 7 and 8; table 6) were clean and analyzed flat crystal faces free from mount contamination, inclusions, and broken or chipped surfaces. Zircons 7 and 8 have a weighted mean $\delta^{18}\text{O}$ value of $5.43 \pm 0.3\text{‰}$ (MSWD: 0.45), which is indistinguishable from accepted mantle $\delta^{18}\text{O}$ values (5.5‰) and average Abitibi plutons ($\delta^{18}\text{O}$ zircon: 5.8‰; King et al., 1998; Valley, 2003).

Sample 03ED-096A: Zircons from a non-mineralized quartz-albite porphyry intrusion with a strong penetrative fabric were also analyzed. This unit occurs as small sheets and pods, and it has a trachytic texture in a fine-grained microlitic groundmass containing euhedral quartz and albite phenocrysts (Ayer et al., 2005). Zircons are identical in morphology to sample 04ED-198 with the exception of a few narrow elongate prisms (w:l: 1:4; 100 μm long axis) that have sharp or rounded edges and bumpy corroded or flat smooth faces. In contrast to the polished TIMS U-Pb age of 2684 ± 2 Ma for this sample (Ayer et al., 2005), U-Pb depth-profiling yielded a single $^{207}\text{Pb}/^{206}\text{Pb}$ age population ranging from 2607 to 2669 Ma with a weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2643 ± 13 Ma (MSWD: 5.1; n: 10). Zircons have type 2 and 3 depth-profiles with oscillations in $^{207}\text{Pb}/^{206}\text{Pb}$ age (50-100 m.y. per 0.2 μm) indicating that alteration zones are likely heterogeneous.

Deeper ion drilling was conducted on previously unanalyzed zircons. Zircons 3 and 10 have type 4 age-depth relationships with oscillations in $^{207}\text{Pb}/^{206}\text{Pb}$ age (50-100 m.y. per 0.2 μm). In contrast, zircon 15 (fig. 10) has a smooth increase in $^{207}\text{Pb}/^{206}\text{Pb}$ age (2650 to 2700 Ma) from 0 to 2 μm that is followed by cycle oscillations. A 0.2 μm thick young zone also occurs at 1.3 μm depth in zircon 10. This young deflection in age could represent isotopic weakness along an internal fracture that allowed fluids to penetrate deeper into the zircon, or it could be from preferential alteration of parent magmatic sector zoning during fluid flow (Hay and Dempster, 2009).

REE geochemical results from 03ED-096A are highly variable, and zircons have multiple types of interior and rim patterns. Most zircon interiors display LREE enrichment with no element anomalies similar to other Hoyle Pond porphyry intrusion samples. Some of these zircons with enriched interiors do not have chemically distinct rims, while others have rims that are similar in REE pattern to interiors but LREE-depleted with steep La-Lu slopes and positive Ce anomalies (fig. 9). Some zircons from this sample have igneous REE interior patterns that lack pronounced Eu anomalies. These igneous interior patterns occur in zircons that either do not have a chemically distinguishable rim, or have LREE-enriched rims with shallow slopes and no major anomalies (fig. 9). No morphological, textural, or geochronological distinctions could be found between zircons with igneous and LREE-enriched interior patterns.

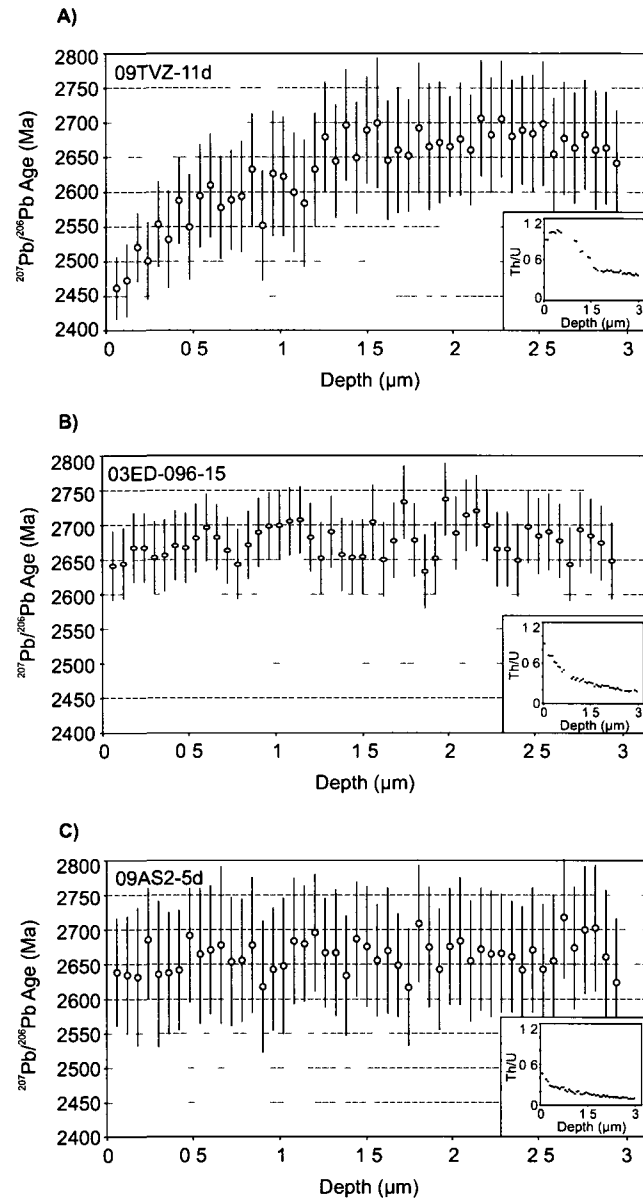


Fig. 10. Results of deeper depth-profiles: A) clear increase in age over 1 to 3 μm , B) increasing age-depth relationship over 1 μm with evidence heterogeneous alteration, and C) oscillatory age-depth relationship. Elevated Th/U ratios correspond to younger rim age domains.

Oxygen isotope analysis of zircon surfaces yielded $\delta^{18}\text{O}$ values that range from 5.2‰ to 5.8‰. Zircon 12 has a heavy $\delta^{18}\text{O}$ value of $6.2 \pm 0.1\text{‰}$, and it is not unique to the sample in respect to texture, morphology, age, or REE geochemistry. The average weighted mean $\delta^{18}\text{O}$ value including zircon 12 is $5.75 \pm 0.4\text{‰}$ (MSWD: 4.1; n: 6), and excluding zircon 12 it is $5.57 \pm 0.3\text{‰}$ (MSWD: 1.7; n: 5). Both Hoyle Pond samples analyzed (03ED-096A and 04ED-198) have near identical $\delta^{18}\text{O}$ values with a combined $\delta^{18}\text{O}$ weighted mean of $5.67 \pm 0.3\text{‰}$ (MSWD: 1.3). These are consistent with mantle values ($\sim 5.5\text{‰}$) and accepted average Superior Province plutonic $\delta^{18}\text{O}$ zircon values ($\sim 5.8\text{‰}$; King et al., 1998).

Sample 09TVZ: A Porcupine sandstone sample was collected from drill core beneath the underground mine immediately adjacent to a 10 cm grey stylolitic quartz-tourmaline-Au vein with pyrite and arsenopyrite in its contacts. Moderate sericitization defines a weak fabric that anastomizes around sub-rounded quartz grains. Feldspars are replaced by sericite, and fine-grained quartz is present while chlorite is absent in the matrix. Zircons are euhedral, rectangular (w:l: 1:2; 100-150 μm long axis) to elongate (w:l: 1:3-1:4; 150-250 μm long axis) prisms that have pitted and highly corroded surface textures that often contain potholes and irregular outgrowths of zircon. A few zircons have smooth clean faces with sharp to slightly rounded edges, however most zircons are corroded/abraded. A total of 20 zircons underwent U-Pb depth-profiling.

Zircons have a nearly continuous range of integrated $^{207}\text{Pb}/^{206}\text{Pb}$ ages from 2485 to 2655 Ma, and a distinct population of zircons (>2620 Ma) has a weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2635 ± 13 Ma (MSWD: 7.1; n: 7; fig. 8). This population is separated by 20 m.y. from the other zircons, which are younger than the population and range in age from 2602 to 2485 Ma. The younger zircons with $^{207}\text{Pb}/^{206}\text{Pb}$ ages <2620 Ma do not have a coherent weighted mean, and they significantly increased the MSWD and error of the >2620 Ma population weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age. The zircons in the 2635 Ma population are not chemically, texturally, or morphologically distinct from the younger zircons in this sample. Zircons have type 2 and 3 depth-profile trends with the exception of one zircon (09TVZ-5), which has a type 4 depth-profile. Two of the three deeper U-Pb analyses increase in age with

depth, but they have highly oscillatory age-depth trends that often oscillate up to ca. 200 m.y. in less than 0.3 μm (table 1). These large oscillations in the age-depth relationship could represent a progressive heterogeneous decrease in young re-equilibrated or altered rim material with depth in zircon. This is supported by zircon 09TVZ-1, which has a clear and steady increase in age from ca. 2465 to 2700 Ma over 2.2 μm (fig. 10). This zircon also has decreasing Th/U and $^{208}\text{Pb}/^{206}\text{Pb}$ ratios over a similar depth interval.

Geochemical signatures for zircons from sample 03ED-096A are similar to the clastic samples from Pamour and Chaput Hughes as discussed above (igneous interior REE patterns and possible LREE-enriched rims; fig. 9). Chemical distinctions could not be made between the 2635 Ma population zircons and the younger zircons. Zircons with LREE-enriched rims generally do not have element anomalies except for zircons 17 and 18, which have subtle positive Ce and negative Eu anomalies. Many zircons (2, 3, 6, 7, 9, 15, 19, and 20; table 6) have whole crystal igneous zircon patterns, and they do not have LREE-enriched rims. Compared to zircons with LREE-enriched rims, these zircons probably had stronger more fully crystalline pre-alteration crystalline structures, which made them less susceptible to trace element exchange with the alteration fluids.

Discussion

SIMS U-Pb depth-profiling overview

Abitibi zircon U-Pb age vs. depth profiles display a range of individual drilling cycle $^{207}\text{Pb}/^{206}\text{Pb}$ ages (ca. 2725 to 2450 Ma), and the age-depth relationship may increase, remain consistent, or oscillate with depth into the crystal. Some degree of variability was not entirely unexpected due to the analysis of natural zircons with diverse textures and morphologies from different lithologies. Precise $^{207}\text{Pb}/^{206}\text{Pb}$ ages with low errors and acceptable MSWD were resolved when age cycles were combined into a single integrated age for each analysis. Integrated ages constitute clear sample distributions, which have discrete intra-sample populations. U-Pb concordia plots for the same, integrated age data show that most individual single spot ellipses are concordant, while a few zircons have slight

discordance. Metamict zircon naturally expels radiogenic Pb and is susceptible to trace element gain or loss, which results in discordant ages (Hoskin and Black, 2000; Cherniak and Watson, 2001). Therefore we suggest that later metamictization and mobilization of Pb* affected the discordant zircons. Despite the few discordant ages, regression yielded upper concordia intercept ages that are equal to or overlap in error with weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ ages.

Bimodal intra-sample age populations occur only in Timiskaming metasedimentary samples, and populations are separated by ca. 30 to 40 m.y. at Pamour mine and ca. 60 m.y. at the Chaput Hughes outcrop (fig. 8). Older Timiskaming zircons have integrated $^{207}\text{Pb}/^{206}\text{Pb}$ ages ranging from 2721 to 2671 Ma and weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ ages of 2708 ± 10 Ma (Chaput Hughes greywacke), 2691 ± 5 Ma (Pamour conglomerate), 2684 ± 4 Ma (Pamour greywacke vein), 2671 ± 6 Ma (Pamour less altered greywacke). The older population ages are in accord with published temporal constraints on sedimentation in the region (Ayer et al., 2005), and we interpret retention of parent zircon U-Th-Pb systematics. The single age distribution indicates a somewhat localized provenance, however older zircons may be from more distal older assemblages. Younger detrital zircon $^{207}\text{Pb}/^{206}\text{Pb}$ rim age populations correlate to Hoyle Pond porphyry zircon rim ages.

All samples have relatively high and variable Th/U values (0.05 to 2.1), and no relationship with age could be found (fig. 11). However, most zircon rims have Th/U ratios >0.1 , which is consistent with an igneous origin (Rubatto and Hermann, 2007). Depth profiles revealed that many Th/U ratios decrease in value with depth over 1 to 1.5 μm . Deeper drilling (fig. 10) also revealed that Th/U consistently decreases in value (0.1 to 0.7 magnitude) over 1 to 3 μm . This is further evidence for isotopically distinguishable re-equilibrated domains in zircon that are <3 μm deep. Both Th and U have significantly higher concentrations (table 3, appendix) at the surface of nearly all zircons analyzed. This suggests that zircons underwent near surface Th/U re-equilibration/enrichment from interaction with a fluid (likely magmatic) rather than intra-grain diffusion of Th and U, which is not as likely as Pb diffusion in zircon (Cherniak and Watson, 2001; Hoskin and Schaltegger, 2003; Fu et al., 2009).

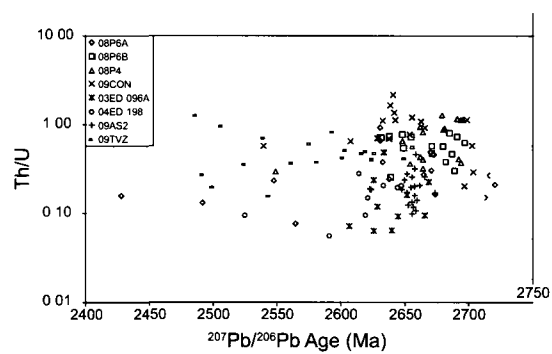


Fig. 11. Plot of Th/U vs. age for each sample. No correlation of Th/U with age could be found, and values indicate magmatic origin (>0.1).

SIMS O-isotope overview

Many oxygen isotope analyses had to be excluded due to small crystal sizes (<30 μm widths) as discussed above, therefore the data set is smaller than the number of zircons analyzed (table 5). However $\delta^{18}\text{O}$ zircon values are consistent between samples from Hoyle Pond and Pamour mines, and all usable zircon analyses have a weighted average $\delta^{18}\text{O}$ value of $5.86 \pm 0.2\text{‰}$ (MSWD: 5.5; n: 22; fig. 12). These zircons from Hoyle Pond and Pamour mines show no difference from $\delta^{18}\text{O}$ igneous zircon values from Superior Province and Abitibi plutons of $(5.8 \pm 0.6\text{‰})$; King et al., 1998), and they resemble mantle $\delta^{18}\text{O}$ values. Only slight differences between mine-sites and samples were discovered, and a discernable correlation with age and $\delta^{18}\text{O}$ values could not be found (fig. 12). Therefore, zircons likely retained their protolith ^{18}O and ^{16}O values through hydrothermal alteration, or all of the zircon was affected by the same hydrothermal fluid. King et al. (1997) demonstrated that zircon is highly refractory and can easily retain oxygen isotope values during 400°C hydrothermal alteration. That study, however, did not investigate natural zircon crystal faces, which are more prone to ion exchange by direct zircon-fluid interaction. Oxygen isotope exchange with a fluid is still a possibility, as seen by 0.2‰ higher values in the mineralized (vein plus alteration) Timiskaming greywacke studied compared to its less altered country rock. If oxygen isotope alteration did occur, it is likely that the fluid had similar $\delta^{18}\text{O}$ values as the parent zircons and other Abitibi igneous zircons; indicating a deeper magmatic or mantle-like hydrothermal fluid source (fig. 2).

LA-ICPMS REE depth-profiling overview

Zircon's rare earth element system can easily be enriched or depleted by interaction with a fluid phase (Hoskin and Black, 2000). Alteration is evident in all Abitibi samples as chemically distinct rim alteration zones that were revealed by REE depth-profiling of zircons (fig. 9). REE alteration zones are 1 to 15 μm thick (5-10 μm average). REE re-equilibration varied in extent and degree as shown by zircons that have rims with REE patterns that are entirely distinct from interior patterns, rims with REE patterns that relict interior patterns but have different element concentrations, and zircons with no REE distinct rims. U-Pb isotopic

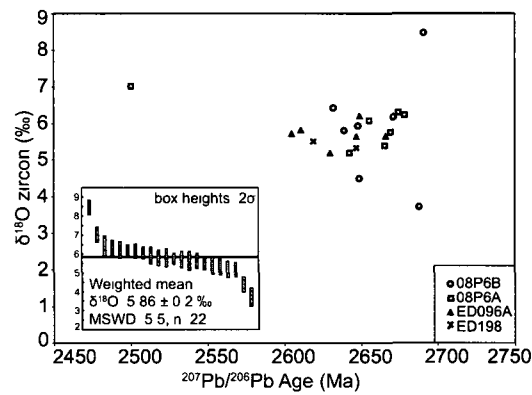


Fig. 12. Stable oxygen isotope results are consistent with $\delta^{18}\text{O}$ igneous zircon values from Superior Province and Abitibi plutons of $(5.8 \pm 0.6$ ‰; King et al., 1998). The three outliers did not affect the weighted mean significantly, and no relationship with $^{207}\text{Pb}/^{206}\text{Pb}$ age could be determined.

re-equilibration was independent of REE gain or loss during hydrothermal fluid flow. Moderate LREE enrichment is seen even in old clastic zircons that do not have evidence for significant U-Pb re-equilibration, and in contrast, some clastic zircons with clear rim U-Pb isotope re-equilibration do not have REE distinct rims. We interpret that the REE system in zircon is more susceptible to diffusion and ion exchange with fluids than the U-Pb isotopic system of zircon.

Alteration occurs as light REE-enriched "rims" in all clastic samples from Pamour (08P4, 08P6B, 08P6A), Chaput Hughes (09CON), and Hoyle Pond (09TVZ). LREE-enriched rim patterns are characterized by shallow La-Lu slopes with no or small positive Ce and negative Eu anomalies. Nearly all of the clastic zircons, regardless of age, display interior patterns that resemble igneous zircon REE signatures, which are characterized by steep La-Lu slopes and prominent positive Ce and negative Eu anomalies (Hoskin and Schaltegger, 2003; Hoskin et al., 2005). Typical igneous zircon patterns arise from the preferential exclusion of LREE from the zircon lattice during crystallization due to small ionic radii. We interpret that detrital zircons retain unaltered protolith igneous REE signatures in their interiors where REE fluid induced alteration could not penetrate. Several detrital zircons exhibit whole crystal igneous signatures and do not have chemically distinguishable rim zones.

Only six zircons from Hoyle Pond intrusive rocks have typical igneous zircon REE interior patterns, and most Hoyle Pond igneous zircons have LREE enrichment throughout the entire zircon (e.g., 09AS2 fig. 9). This suggests that these grains either had different primary compositions or they underwent more complete REE re-equilibration. LREE-depleted rims with igneous like signatures also occur in several Hoyle Pond zircons from the intrusive rocks that have LREE-enriched interiors (e.g. 04ED-198; fig. 9). Intra-grain REE mobility is not likely and cannot explain the multiple REE signatures observed in Hoyle Pond zircons. Therefore, LREE alteration observed in zircon is from direct ion exchange with fluids; indicating that fluids penetrated to $<10\ \mu\text{m}$ deep and altered REE systematics of zircon.

Alternatively, detrital zircon rim enrichment may be from the beam overlap of nano- to micrometer inclusions during analysis, but no geochemical evidence (high P, Y, Ti) was found that supports the presence of fluid or solid inclusions of xenotime, apatite, monazite, and rutile in the detrital zircons or Hoyle Pond intrusive zircons. Ayer et al. (2005) documented internal inclusions in zircons from samples 03ED-096A and 04ED-198, and thus contamination of REE signatures from internal inclusions in Hoyle Pond igneous zircons cannot be dismissed entirely. We interpret that detrital zircons and likely Hoyle Pond zircons have undergone REE enrichment directly from a fluid phase.

Low-temperature hydrothermal alteration of zircon

Fully crystalline zircon is exceptionally stable and known to survive high-grade metamorphism, therefore its alteration during greenschist facies metamorphism seems unlikely (Rubatto et al., 2001; Hay and Dempster, 2009). Zircons in this contribution have clearly undergone heterogeneous isotopic and trace element re-equilibration during greenschist facies conditions, and similar low-temperature alteration of zircon is increasingly documented in many areas (e.g., Hay and Dempster, 2009). External textures combined with changes in $^{207}\text{Pb}/^{206}\text{Pb}$ age, Th/U ratio, REE signatures, and common Pb show that re-equilibrated zircon rim domains are $<3\text{ }\mu\text{m}$ thick (commonly $<1\text{ }\mu\text{m}$), and REE alteration penetrated up to $\sim 10\text{ }\mu\text{m}$ deep.

We interpret that re-equilibration of Abitibi zircons was facilitated by fluid interaction within or along structurally weak metamict areas in the crystal during hydrothermal fluid flow. Metamict zircon is characterized by the overlap of amorphous lattice domains from radioactive decay of U and Th, and these amorphous domains make metamict zircon 2-3 times structurally weaker than non-metamict zircon and thus more sensitive to hydrothermal fluids (Ewing et al., 2003; Geisler et al., 2007). Fluid access to radiation damaged and amorphous lattice areas can drive alteration further facilitated by fracturing induced from tectonism, sedimentary transport, and/or swelling of amorphous regions from metamictization (Ewing et al., 2003; Hay and Dempster, 2009). Hence the structural characteristics of zircon greatly affect its susceptibility to alteration by aqueous

fluids in greenschist facies conditions (250°C) where alteration of metamict zircon seems to be ubiquitous (Rasmussen, 2005; Hay and Dempster 2009; Hay et al., 2010).

The degree to which metamictization affects zircons susceptibility to re-equilibration was especially evident in the sedimentary samples where alteration was heterogeneous, resulting in prominent elemental variations unique to individual grains. In any one clastic rock, zircon can have a variety of crystalline states including fully metamict zircon, partially metamict zircon, or fully crystalline zircon with or without lattice stress or solid solution states. Differences in provenance likely supplied a range of zircons with multiple chemistries and structural states, which caused each zircon to respond somewhat uniquely to low temperature (greenschist facies) hydrothermal alteration (Hay and Dempster, 2009). Fully crystalline zircon able to withstand hydrothermal alteration will preferentially survive sedimentary transport more than radiation-damaged zircon. Therefore, detrital zircon populations are generally composed of a significant proportion of fully crystalline zircons, which easily explains the bimodal populations and protolith rim ages in detrital zircons in this contribution that have clear REE re-equilibration that were not seen in the igneous samples.

Non-coupled dissolution-reprecipitation of zircon is traditionally thought to occur only in high-grade metamorphic settings where discrete (potentially thick) "metamorphic" rims grow around zircon cores (Hoskin and Black, 2000; Ayers et al., 2003; Geisler et al., 2007). "Metamorphic" rim overgrowths would have easily been resolved in the depth-profiling as discontinuous age-depth signatures with discrete steps in age if present (e.g. Mojzsis and Harrison, 2002), but the SIMS depth-profiling technique did not reveal substantial rim overgrowths. This type of rim overgrowth cannot account for the heterogeneous thin alteration rim zones observed in Abitibi zircons that formed at lower temperatures. Abitibi zircons more likely underwent recrystallization and some degree of coupled dissolution-reprecipitation, which Geisler et al. (2007) proposes as a two end-member processes that cause re-equilibration of zircon in aqueous solutions. These mechanisms have been witnessed to occur in natural and experimental conditions by diffusion-reaction processes along an inward transgressing front, and forming different textural and chemical features in the "new" zircon. Despite the differences observed in re-

equilibrated zircons from the end-member processes, both likely occur simultaneously in most natural settings (Geisler et al., 2007). We interpret that zircon rims formed from the recrystallization of partially to completely metamict zircons causing unique isotopic and trace-element signatures near the zircon surfaces. The oscillating changes in U-Pb isotopic systematics observed in depth-profiles indicate that re-equilibration was heterogeneous and original zircon is locally preserved in recrystallized zones.

Further evidence of fluid mediated recrystallization is exhibited by small holes ($<1\ \mu\text{m}$) visible in the ion craters from Pamour zircons are likely nano- to micro-scale porosity that facilitated ion exchange and continued nucleation growth of new zircon. These holes are too large and spherical in diameter to be diffusion tracks from radiation damage, and no geochemical evidence was found that supports preferential ablation of solid or fluid inclusions. Zircon surfaces and outgrowths with high Al concentrations support enrichment in "non-formula" solvent cations (Ca, Ba, Al, Fe, and Mn), which is common, depending on fluid chemistry, during recrystallization of zircon (Geisler et al., 2007). Clear REE enrichment is observed in most zircons, and many zircon studies have documented similar REE enrichment in recrystallized zircon (e.g. Hoskin, 2005; Kirkland et al., 2009). Rayner et al. (2005) show that recrystallized zircon is often enriched in common Pb, and many zircons in this contribution also exhibit relatively minor rim enrichment of common Pb.

If zircon is out of equilibrium with the fluid phase, Zr can be easily mobilized into solution by hydrothermal leaching (Rasmussen, 2005; Hay and Dempster 2009; Hay et al., 2010). Pore spaces will develop in the crystalline zircon and the Zr saturated fluids will precipitate neocrystalline zircon along with inclusions (e.g. xenotime, thorite, coffinite) in the pore spaces. Larger pore spaces containing inclusions were not observed in Abitibi zircons indicating that coupled dissolution-reprecipitation was not the primary process that caused zircon re-equilibration. However, some Abitibi zircons have surface corrosion/dissolution features, but these textures may be from abrasion during sample processing. This coupled dissolution-reprecipitation affects fully crystalline zircon that is under substantial internal stress caused by impure elements in the lattice or other phases (e.g. thorite, hafron, coffinite) that coexist with zircon in solid solution (Hoskin and Black, 2000; Geisler et al., 2007). It often results in complete isotopic re-equilibration, and lower minor

and trace element concentrations (e.g. U, Th, common Pb) in the neocrystalline zircon zones, all of which were not observed in this contribution. Therefore recrystallization was the main mechanism that re-equilibrated zircon rim domains.

In addition to intra-crystalline domains as a result of alteration, precipitation of small (typically $\leq 3 \mu\text{m}$) outgrowths of zircon and/or xenotime that fringe the original zircon can form in low temperature environments down to prehnite-pumpellyite facies (Rasmussen, 2005; Hay et al., 2010). Subtle zircon outgrowths (sometimes high Al) are observed in all samples, and are especially pervasive in detrital grains. Localized and confined dissolution or etching of metamict zircon likely freed Zr for outgrowth precipitation. Outgrowths are very fragile and therefore formed after sedimentary deposition, and likely formed contemporaneously with rim recrystallization.

Although the chemical re-equilibration of zircon in the presence of low temperature fluids is well documented, many uncertainties still remain, such as the behavior of oxygen isotopes in zircon during alteration. King et al. (1997) showed that zircon interiors can easily retain original protolith $\delta^{18}\text{O}$ values during low temperature hydrothermal alteration. We suggest that Hoyle Pond ($\delta^{18}\text{O}$: 5.7‰) and Pamour ($\delta^{18}\text{O}$: 6.0‰) zircon rims retained initial isotope values, because they have much lighter signatures than metamorphic zircon rims from the lower crustal rocks in the Kapuskasing uplift ($\delta^{18}\text{O}$: 8.4 to 10.4‰; Moser et al., 2008) ruling out oxygen isotopic exchange with lower-crustal metamorphic fluids. $\delta^{18}\text{O}$ values from the mine zircons are also lower than Superior Province sedimentary rocks (whole rock $\delta^{18}\text{O}$: ~ 8.0 ‰; King et al., 1998), which rules out significant isotope exchange with upper-crustal metamorphic fluids. $\delta^{18}\text{O}$ values of zircons from Hoyle Pond and Pamour are identical to other igneous Abitibi $\delta^{18}\text{O}$ zircon values (5.8‰ King et al., 1998; Peck et al., 2000; Valley et al., 2003). Therefore oxygen isotope exchange with hydrothermal fluids was unlikely. Zircon rims from the Pamour extensional vein sample are 0.2‰ heavier than the zircons from the less altered wallrock. Hence it is possible that zircons underwent partial or local oxygen isotope exchange with the hydrothermal fluids during alteration. If this is the case, then the alteration fluids likely had some magmatic component to them as shown by the magmatic $\delta^{18}\text{O}$ values of zircon rims, which is also consistent with the igneous Th/U ratios of rims.

Timescales of fluid flow and regional implications

Altered wall-rock zircons collected adjacent to quartz-carbonate Au veins have weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ rim ages that are younger than host rock deposition or crystallization. As discussed above, the presence of fluids during metamorphism greatly enhances zircon alteration (Hay and Dempster, 2009); therefore these rim ages are reasonable estimates of the timing of peak fluid infiltration. Zircons from wallrock adjacent to intensely mineralized higher (ore) grade shear veins at Hoyle Pond (folded, and boudinaged style 1; Rhys, 2003: unpublished data) and Pamour (TN style 2; Aitken, 1990) have alteration ages of approximately 2660 Ma (fig. 13). The overlap of this age with peak greenschist facies metamorphism in the southern Abitibi (2660 Ma; e.g., Powell et al., 1995a) further supports the interpretation that the timing of zircon rim alteration was synchronous with peak fluid infiltration in the late stages of major orogenic deformation and crustal shortening. Zircons from non-mineralized Timiskaming meta-conglomerate in Kirkland Lake do not record this 2660 Ma event in their alteration rims. Therefore the 2660 Ma zircon alteration found in these two samples occurred directly from hydrothermal fluids.

Crystallization of porphyry intrusions in the Timmins camp predates the timing of zircon alteration in the wallrocks of veins at the two mine sites. Albitite dikes at McIntyre mine (fig. 3) were emplaced synchronously with Cu-Au-Ag-Mo mineralization (Molybdenite Re-O: 2672 ± 7 Ma; Ayer et al., 2004) and have an age of 2672 ± 1 Ma (Ayer et al., 2004). The Cu-Au-Ag-Mo mineralization at McIntyre is cross cut by younger quartz carbonate Au veins (similar in style to Hoyle Pond and Pamour veins with wallrock zircon alteration at 2660 Ma), which comprise the largest single concentration of gold in the Timmins camp (Bateman et al., 2008). Re-Os geochronology of molybdenite from a quartz vein in the West Porphyry at Dome mine (fig. 3) yielded an age of 2670 ± 10 Ma (Ayer et al., 2003), which roughly coincides with upper age constraints of Timiskaming sedimentation (2670 Ma; Ayer et al., 2005). These older ages predate the alteration ages of zircon obtained from the wallrock of veins at Pamour and Hoyle Pond by 10 m.y., and can be used as an upper age constraint for camp-wide quartz-carbonate Au shear vein formation (e.g. Ayer et al., 2004). In contrast, molybdenite from an altered porphyry intrusion at McIntyre mine (fig. 3) has a similar Re-Os age of 2661 ± 13 (Creaser, 2003), which is

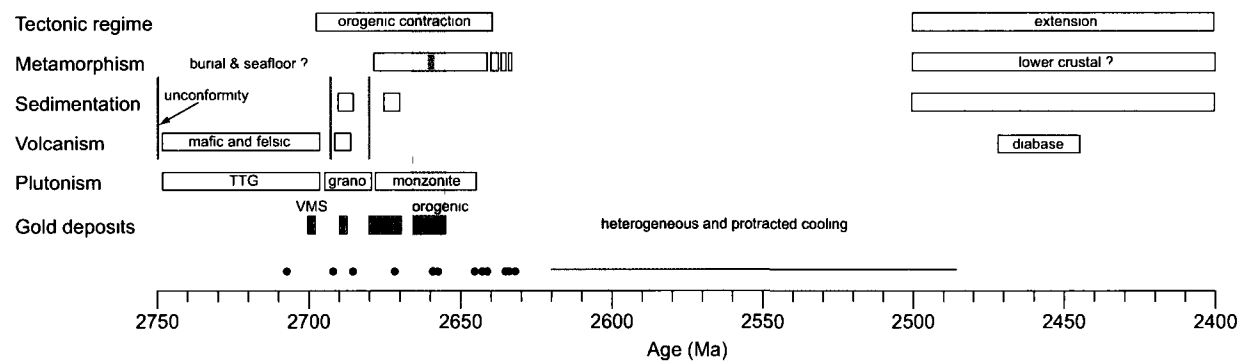


Fig. 13. Time-line showing the geologic history of the southern Abitibi granite greenstone belt. Data points represent weighted mean 207Pb/206Pb ages of wallrock zircon alteration obtained from the Hoyle Pond and Pamour mines. Grey bars denote estimates on primary and secondary vein formation. Geological data compiled from Claoué-Long and Kerrich (1990), Schandl et al. (1990), Schandl and Gorton (1991), Corfu (1993), Kerrich and King (1993), Kerrich and Kyser (1994), Powell et al., (1995a, 1995b), Moser Heaman (1997), Ayer et al., (2003, 2004, 2005), Robert et al. (2005), and Moser et al. (2008).

consistent with the alteration ages of zircons from Hoyle Pond and Pamour veins. Therefore, quartz-carbonate vein formation and associated gold deposition in the Timmins-Porcupine camp likely occurred progressively during the late stages of Kenoran deformation from 2670 to 2660 Ma. After 2660 Ma and subsequent to peak P-T conditions, fluid infiltration was less pervasive during retrograde metamorphism, and zircon alteration less diffuse.

Much of the quartz from sample 08P4 is partially recovered and quartz phenocrysts from sample 09AS2 are completely recovered. These textures indicate that either heating outlasted deformation and wallrock zircon alteration at 2660 Ma or a second post-tectonic thermal event occurred at both mines. Both are consistent with style 3 extensional quartz veins at both Pamour and Hoyle Pond mines, which are less intensely mineralized and not ductily deformed. Style 3 veins also locally cross-cut the older higher (ore) grade vein-sets (style 1 and 2 at Pamour and style 1 at Hoyle Pond) with associated wallrock zircon alteration at 2660 Ma. Zircon rims from the altered greywacke that hosts these extensional veins at Pamour record a second fluid event at 2634 ± 9 (08P6A) Ma and 2642 ± 10 Ma (08P6B; fig. 8). Similarly, Hoyle Pond wallrock zircon rims from the non-altered porphyritic sills (03ED-096A and 04ED-198) and the Porcupine sandstone (09TVZ) adjacent to deep quartz-carbonate-Au veins (Hoyle Pond style 1) also record a second younger zircon alteration event, respectively, at 2643 ± 13 , 2632 ± 15 , and 2635 ± 13 Ma (fig. 8). These ages overlap within error, and given the range of individual integrated ages for each sample, it is appropriate to postulate a second fluid flow event for both mines at ca. 2640 Ma (fig. 13). This event post-dates deformation and overlaps with the lower age constraint for regional retrograde metamorphism (2643 Ma; Powell et al., 1995a). Zircon alteration rims from non-mineralized Timiskaming sandstone in Kirkland Lake have identical alteration characteristics as wallrock zircons from the mines, and Kirkland Lake zircons have an alteration rim age of $^{207}\text{Pb}/^{206}\text{Pb}$ ages of 2645 ± 10 Ma, which overlaps with the ca. 2640 Ma fluid event interpreted from Hoyle Pond and Pamour zircon rims. This shows that widespread hydrothermal events continued to affect the region even after primary mineralization had occurred.

The late shallow-dipping extensional vein sets associated with alteration of zircon in the adjacent wallrock at ca. 2640 Ma at Pamour and Hoyle Pond mines have lower gold

grades, and they are similar in character to late, shallow extensional veins that cross cut the Kidd Creek VMS deposit (24 km north of Timmins). The Kidd Creek veins formed after Prosser porphyry intrusion (ca. 2663 Ma; Bleeker et al., 1999), and titanite from these veins has a U-Pb age of 2639 ± 7 Ma (Bleeker et al., 1999), which is similar to the ca. 2640 Ma ages resolved from Hoyle Pond, Pamour, and Chaput Hughes zircon rims. Similarly, monazite separated from quartz-sericite-tourmaline±pyrite veins at Dome mine has a U-Pb age of 2640 ± 5 Ma (Ayer et al., 2003). Therefore, this secondary hydrothermal event that postdates orogenic deformation is widespread and likely related to the style 3 extensional veining across the region. Significant quantities of gold were probably not reintroduced to the ore deposits during this hydrothermal event, which is more likely related to a late thermal pulse during regional retrograde metamorphism that could have remobilized gold in the deposits. Numerous authors have suggested that secondary hydrothermal events occurred across the southern Abitibi (e.g., Schandl et al., 1990; Schandl and Gorton, 1991; Kerrich and King, 1992; Claoué-Long et al., 1990; Kerrich and Kyser, 1994; Powell et al., 1995b). The metamorphic nature of this overprint is supported by the abundant metamorphic chlorite in the groundmass of the Chaput Hughes Timiskaming sandstone in Kirkland Lake, which has zircon alteration age also at ca. 2640 Ma.

The nearly continuous span of integrated rim $^{207}\text{Pb}/^{206}\text{Pb}$ ages that do not define a population in sample 09TVZ (2600 Ma down to 2485 Ma) is significantly younger than published ranges for orogenic Au mineralization and the 2640 Ma secondary overprinting event discussed above (fig. 13). One zircon from Pamour mine (08P6A-6) also has a young rim age of 2565 Ma. These younger ages are consistent with many mineral ages from other gold camps and shear zones across the southern Abitibi. Powell et al. (1995a, b) showed that radiometric dates of minerals exhibit a protracted evolution from ca. 2500 to 2420 Ma. Similarly, Val-d'Or gold deposits have quartz veins that formed at 2680 Ma (hydrothermal zircon), but they contain rutile, titanite, and scheelite that range in age from 2630 to 2579 Ma (Kerrich and King, 1993). Moser and Heaman (1999) found that zircons from lower-crustal kimberlites in Kirkland Lake underwent growth in stages at 2585 Ma and ca. 2500 to 2400 Ma, and they interpret that zircon growth formed from metamorphism in the lower crust. These studies all suggest that the late mineral ages represent secondary hydrothermal alteration events that are likely from discrete protracted thermal pulses along the regional

fault zones rather than primary hydrothermal activity associated with gold mineralization (Powell et al., 1995a, b). Abitibi lower crustal metamorphism may be related to Huronian rifting to the south (ca. 2500-2400 Ma), as Moser and Heaman (1999) interpret rifting and consequent lower-crustal metamorphism supplied the fluids that caused prolonged post-orogenic hydrothermal alteration of Abitibi gold deposits.

It is now clear from the mass of geochronologic data, including our youngest zircon ages, that protracted fluid flow along regional structural zones caused continued post-mineralization alteration after ca. 2660 Ma. Primary hydrothermal alteration of zircon occurred at 2660 Ma during peak metamorphic conditions and correlates to primary quartz-carbonate-Au veins (likely 2670-2660 Ma; Robert et al., 2005). A secondary hydrothermal event related to retrograde metamorphism at 2640 Ma probably contributed to the formation of little to non-mineralized veining at the mines, which may have only re-mobilized gold. Protracted fluid flow along the regional deformation zones continued into the Paleoproterozoic (to ca. 2400 Ma) possibly causing additional alteration of the gold deposits. This late alteration was likely from widespread lower crustal fluid release caused by rifting to the south. Young rim ages were not discovered in the Chaput Hughes Timiskaming sample from Kirkland Lake, therefore we suggest that these late events were localized secondary hydrothermal pulses along previously established conduits following primary mineralization and regional metamorphism. The clear distribution and proximity of Abitibi gold deposits along these regional deformation zones (fig. 1) suggests that only province-wide events could have supplied the mineralizing fluids. Huronian rifting and resultant lower crustal metamorphism in the Abitibi is also responsible for emplacement of Matachewan dikes in the Abitibi (Moser and Heaman, 1999). Therefore these faults probably tapped lower crustal metamorphic or magmatic fluids (supported by O and Th/U data), and mafic magmatism in the mantle lithosphere probably supplied the heat engine for metamorphism (Moser and Heaman, 1999).

Feasibility of depth-profiling techniques

SIMS U-Pb depth-profiling is currently the only way to isotopically characterize thin (often sub-micrometer) rim alteration features in zircon (Carson et al., 2002; Breeding et al., 2004;

Gordon et al., 2009), and LA-ICPMS depth-profiling can accurately resolve elemental changes in zircon from the surface of the crystal to depths of a few microns (Mrank and Mason, 1999; Woodhead et al., 2004). Despite the resolution and advantages of the depth-profiling technique, many factors can influence the accuracy and precision of the results from analysis of unpolished zircon crystals. Zircon surfaces may possess minute outgrowths of secondary minerals (e.g. xenotime, monazite, apatite) causing contamination of the sample volume during ablation (Rasmussen, 2005; Hay et al., 2010). Zircon outgrowths were observed in this study, but they were avoided during analysis. The analysis of unknown internal solid or fluid inclusions could also contribute to variability of the results, especially with LA-ICPMS depth-profiling. Monitoring of Y, P, Ti, and other elements during REE depth-profiling helped us to gauge contamination from inclusions. The oscillating age-depth profiles, on the other hand, were the result of heterogeneous alteration of zircon whereby any combination of non-, partially-, or completely re-equilibrated areas in the zircon is sampled. This is likely the case with Hoyle Pond and Pamour zircons, which have variable age-depth and REE-depth relationships. Nonetheless, the average analysis of intra-crystal zones with varying degrees of alteration did not seem to significantly affect the outcome of the integral weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ ages. Also, progressively evolving fluid and thermal regimes during metamorphism and ore deposition could cause a successive series of alteration events that can potentially yield variable isotope and chemical concentrations within zircon (e.g. Hay et al., 2010). Depth-profiling results indicate the REE system of zircon appears to be more susceptible to alteration and therefore it could have easily been modified by secondary lower temperature events that did not affect the U-Pb systematics of zircon. Fluid chemistry, the degree of radiation damage, and zircon chemistry can cause differences in element diffusion or intra-grain element mobility during alteration. Overall, zircon is less robust in a fluid-rich environment, and its alteration is the result of complex evolving fluid-crystal interactions.

Since it is sometimes difficult to find crystal surfaces that are $\geq 30\text{ }\mu\text{m}$ in width, homogeneous, and flat, which yield reliable results, several precautions can be taken to ensure efficient analysis with usable results. Pre-analysis SEM imaging of the zircons in the mount is highly recommended to avoid inaccurate primary beam or laser targeting. Also, the largest zircons should be carefully selected for analysis to accommodate wider LA-ICPMS

spot sizes, which will yield more accurate results (Mrank and Mason, 1999; Woodhead et al., 2004). Many zircons in this study had widths close to the spatial limits of the SIMS primary beam. One recommendation is that depth-profiling analysis should occur in conjunction with a complete internal and external textural and structural characterization of zircon from high-resolution microbeam imaging.

Despite the inherent complications involved in of ion drilling into altered zircon surfaces, this study revealed the isotopic and trace element characteristics of altered rim zones in zircon. Integrating individual U-Pb $^{207}\text{Pb}/^{206}\text{Pb}$ age cycles into single collective rim ages allowed us to accurately determine the timing of fluid infiltration and consequential zircon recrystallization at Hoyle Pond and Pamour mines. Notable rim ages conform well to regional tectonic and metamorphic constraints, and they suggest that zircons were subjected to multiple hydrothermal alteration events likely associated with quartz-carbonate Au veining. Structural, mineralogical, and alteration observations also support the rim ages obtained. Therefore the rim ages provide a more complete temporal constraint on hydrothermal fluid flow in the Timmins camp. When depth-profiling is conducted as a complete structural, textural, isotopic, and elemental study of zircon it can be a highly applicable technique to ore deposit settings, where zircons can be used to track the timing and nature of hydrothermal fluid infiltration and concomitant ore formation.

Conclusions

- Zircons from Hoyle Pond and Pamour mines (Abitibi Subprovince) have undergone trace elemental and isotopic re-equilibration in the presence of hydrothermal fluids that may be related to orogenic gold deposition. A complex interplay of recrystallization enhanced by dissolution-reprecipitation mechanisms caused heterogeneous alteration of metamict to partially metamict zircon, and significant grain-scale isotopic resetting of zircon. Recrystallization penetrated to $<3\ \mu\text{m}$ depths and did not significantly affect fully crystalline zircons, which retained the protolith U-Pb signatures through deformation, metamorphism, and mineralization. Depending on the degree of metamictization, metamorphic conditions, fluid characteristics, and

amount of deformation zircon can have a wide variety of responses to low-temperature fluid alteration.

- Wallrock zircon alteration dated at 2.66 Ga correspond to the published ages of intensely mineralized and deformed veins at Pamour and Hoyle Pond mines, which are accepted to be from primary quartz-carbonate Au vein mineralization in the Timmins-Porcupine gold camp. The 2.66 Ga zircon alteration occurred near the end of crustal shortening during peak fluid infiltration and peak greenschist facies metamorphism. Accepted upper age constraints for gold mineralization in the Timmins camp are approximately 2.67 Ga, and therefore initial main stage quartz-carbonate Au shear vein formation likely began to develop at 2.67 Ga and may have continued for 10 m.y. (Ayer et al., 2005; Robert et al., 2005).
- A second more regional and lower temperature hydrothermal alteration event is recorded in zircon rim alteration dated at ca. 2.64 Ga, and this event likely formed from a hydrothermal pulse at the end of retrograde metamorphism. This secondary hydrothermal event would have overprinted and remobilized gold that was deposited during the main 2.67 to 2.66 Ga event and may have influenced the formation of thin brittle extensional quartz carbonate veins in camp.
- Metamorphic fluid release probably contributed to fluid over pressures and facilitated shear vein development at 2.66 Ga. However stable oxygen isotopes and Th/U ratios indicate that hydrothermal fluids could have a deeper source such as plutonism or even lower crustal metamorphism. The proximity of southern Abitibi gold mines to regional deformation zones and the link between late (ca. 2500 to 2400 Ma) gold deposit alteration and lower crustal plutonic or metamorphic or fluid release supports a wide-spread deep crustal fluid source. Lower crustal metamorphism from Huronian rifting continued into the early Proterozoic (Moser and Heaman, 1997), and it is one possible source that could have supplied the fluids causing localized yet prolonged hydrothermal alteration in the upper crust.
- We conclude that depth-profiling of natural zircon surfaces is a highly useful technique that is underutilized in ore deposit geological studies. Depth-profiling was

used in this contribution to investigate otherwise inaccessible U-Pb and REE signatures in zircon rim zones. These altered rim zones can yield the timing and nature of fluid influx. However, alteration of zircon is often heterogeneous and complex, and thus caution should be taken when interpreting the isotopic and trace element results. Despite the complexities of zircon alteration and the risks of U-Pb and REE depth-profiling into natural altered zircon surfaces, these techniques successfully yield meaningful results for ore deposit geologists if conducted in conjuncture with a detailed textural, mineralogical, and structural characterization of zircon.

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Appendix

Table 3 SIMS U-Pb isotopic data of zircon from depth-profiling of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³⁸ Pb*		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁶ Pb	% Radiogenic ²⁰⁷ Pb	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³⁸ Pb†	
	(est ppm)	(est ppm)		value	1 s.e	value	1 s.e	value	1 s.e	value		1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	
08P6A	Timiskaming greywacke sandstone adjacent to vein & altered selvage Pamour Mine (NAD83 Zone 17 UTM 491934E 5374439N)																		
08P6A 1	480 65	108 38	0 235	0 5808	0 0502	14 5746	1 2640	0 1820	0 0026		0 9863	99 57	99 91	2951 9	204 7	2787 9	82 4	2671 2	23 7
Cycle 2	547 18	96 11	0 183	0 5874	0 0518	14 6515	1 2961	0 1809	0 0024		0 9885	99 53	99 90	2978 8	210 4	2792 9	84 1	2661 2	22 2
Cycle 3	617 05	93 66	0 158	0 5606	0 0473	14 0402	1 1876	0 1816	0 0023		0 9890	99 58	99 91	2869 2	195 3	2752 4	80 2	2667 8	20 7
Cycle 4	670 02	102 55	0 159	0 5360	0 0412	13 6186	1 0503	0 1843	0 0022		0 9879	99 68	99 93	2766 6	173 0	2723 6	73 0	2691 8	19 8
Cycle 5	720 14	101 18	0 146	0 5671	0 0455	14 2600	1 1467	0 1824	0 0021		0 9897	99 83	99 96	2896 0	187 1	2767 2	76 3	2674 5	19 1
Cycle 6	772 08	104 59	0 141	0 6311	0 0553	15 6899	1 3777	0 1803	0 0020		0 9917	99 85	99 97	3153 7	218 6	2858 1	83 8	2655 9	18 7
Cycle 7	768 12	105 14	0 143	0 5854	0 0463	14 6855	1 1637	0 1819	0 0020		0 9901	99 92	99 98	2970 8	188 2	2795 1	75 3	2670 6	18 4
Cycle 8	752 13	102 91	0 143	0 6114	0 0501	15 6342	1 2827	0 1855	0 0020		0 9911	99 91	99 98	3075 5	200 3	2854 7	78 3	2702 4	18 1
Cycle 9	750 71	106 93	0 148	0 6023	0 0467	15 1542	1 1774	0 1825	0 0020		0 9902	99 86	99 97	3039 1	187 9	2825 0	74 0	2675 6	18 0
08P6A 2	285 63	223 38	0 815	0 4199	0 0238	10 1092	0 5830	0 1746	0 0032		0 9497	97 76	99 52	2259 9	108 3	2444 8	53 3	2602 4	30 3
Cycle 2	217 10	159 00	0 763	0 4477	0 0280	10 6621	0 6786	0 1727	0 0036		0 9463	97 66	99 50	2384 9	124 7	2494 1	59 1	2584 3	34 6
Cycle 3	177 62	141 80	0 832	0 4690	0 0326	11 3361	0 7988	0 1753	0 0039		0 9495	98 30	99 64	2479 1	142 9	2551 2	65 8	2609 0	37 1
Cycle 4	153 44	137 08	0 931	0 4126	0 0261	10 3696	0 6658	0 1823	0 0043		0 9330	99 15	99 81	2227 0	119 0	2468 3	59 5	2673 5	38 6
Cycle 5	146 76	130 94	0 929	0 4341	0 0297	10 4564	0 7278	0 1747	0 0042		0 9384	99 07	99 80	2324 2	133 7	2476 1	64 5	2603 2	40 4
Cycle 6	139 76	129 31	0 964	0 4557	0 0337	11 0904	0 8337	0 1765	0 0045		0 9422	98 40	99 65	2420 6	149 2	2530 8	70 0	2620 3	42 2
Cycle 7	129 87	118 76	0 953	0 5038	0 0407	12 6360	1 0339	0 1819	0 0047		0 9499	99 31	99 85	2630 0	174 6	2652 9	77 0	2670 4	42 7
Cycle 8	125 14	119 89	0 998	0 4929	0 0404	12 3761	1 0257	0 1821	0 0048		0 9499	99 59	99 91	2583 4	174 4	2633 4	77 9	2672 0	43 2
Cycle 9	113 87	111 54	1 020	0 5117	0 0431	12 6020	1 0755	0 1786	0 0049		0 9488	99 27	99 84	2663 9	183 9	2650 4	80 3	2640 0	45 1
08P6A 3	267 40	70 73	0 276	0 5266	0 0418	12 8409	1 0265	0 1768	0 0032		0 9749	98 18	99 60	2727 2	176 4	2668 0	75 3	2623 5	29 7
Cycle 2	237 61	52 89	0 232	0 5015	0 0381	12 7018	0 9710	0 1837	0 0033		0 9720	99 57	99 90	2620 3	163 5	2657 8	72 0	2686 4	29 8
Cycle 3	232 43	57 77	0 259	0 4175	0 0277	10 2185	0 6844	0 1775	0 0033		0 9606	98 84	99 75	2249 0	125 7	2454 7	61 9	2629 9	31 1
Cycle 4	208 78	46 41	0 232	0 5071	0 0400	12 4429	0 9888	0 1780	0 0035		0 9698	99 44	99 88	2644 3	171 1	2638 4	74 7	2633 9	32 3
Cycle 5	167 93	35 45	0 220	0 5836	0 0485	14 5633	1 2174	0 1810	0 0038		0 9688	100 00	100 00	2963 3	197 3	2787 1	79 4	2662 0	34 5
Cycle 6	167 63	37 88	0 235	0 5136	0 0402	12 5218	0 9881	0 1768	0 0038		0 9631	99 87	99 97	2672 2	171 2	2644 4	74 2	2623 1	35 5
Cycle 7	162 42	38 43	0 246	0 5661	0 0510	14 1932	1 2875	0 1818	0 0040		0 9712	99 48	99 89	2891 7	209 9	2762 7	86 0	2669 8	36 0
Cycle 8	151 49	35 63	0 245	0 4912	0 0383	11 9297	0 9392	0 1762	0 0040		0 9589	99 75	99 95	2575 8	165 6	2598 9	73 8	2617 0	37 4
Cycle 9	142 13	32 16	0 236	0 5160	0 0418	12 6305	1 0336	0 1775	0 0041		0 9606	99 78	99 95	2682 1	178 0	2652 5	77 0	2630 0	38 0
08P6A 5	412 97	175 66	0 443	0 4114	0 0309	9 8727	0 7472	0 1740	0 0028		0 9765	98 77	99 74	2221 5	141 1	2423 0	69 8	2596 8	27 3
Cycle 2	282 75	112 24	0 414	0 4612	0 0355	10 9638	0 8515	0 1724	0 0033		0 9697	98 44	99 67	2444 7	156 5	2520 1	72 3	2581 3	31 8
Cycle 3	204 93	78 82	0 401	0 5150	0 0431	12 4699	1 0528	0 1756	0 0038		0 9674	99 27	99 85	2677 8	183 4	2640 5	79 4	2612 0	35 8
Cycle 4	156 62	59 19	0 394	0 4771	0 0397	12 0258	1 0121	0 1828	0 0044		0 9577	98 87	99 75	2514 8	173 2	2606 4	78 9	2678 4	40 3
Cycle 5	116 49	52 07	0 466	0 4241	0 0315	10 6813	0 8045	0 1827	0 0050		0 9327	99 69	99 93	2279 1	142 5	2495 8	69 9	2677 2	45 4
Cycle 6	100 95	45 99	0 475	0 4366	0 0355	10 8690	0 9015	0 1805	0 0055		0 9306	98 48	99 66	2335 6	159 3	2512 0	77 1	2657 8	50 8
Cycle 7	81 66	30 54	0 390	0 5300	0 0519	13 0387	1 2972	0 1784	0 0060		0 9426	98 69	99 72	2741 7	218 7	2682 5	93 8	2638 1	55 6
Cycle 8	66 01	30 71	0 485	0 4077	0 0337	10 2957	0 8724	0 1832	0 0067		0 9047	98 68	99 70	2204 3	154 3	2461 7	78 4	2681 7	60 5
Cycle 9	59 96	28 72	0 499	0 4729	0 0468	12 1199	1 2224	0 1859	0 0071		0 9264	99 14	99 81	2496 4	205 0	2613 7	94 6	2705 9	63 3
08P6A 6	1848 37	323 95	0 183	0 3218	0 0198	7 0032	0 4324	0 1578	0 0013		0 9914	98 99	99 81	1798 7	96 6	2111 8	54 9	2432 4	13 7
Cycle 2	1892 00	300 18	0 165	0 3277	0 0203	7 1467	0 4448	0 1582	0 0012		0 9920	99 57	99 92	1827 3	98 8	2129 9	55 4	2436 1	13 3
Cycle 3	1863 55	294 20	0 164	0 3341	0 0205	7 2257	0 4449	0 1568	0 0012		0 9919	99 52	99 91	1858 3	99 1	2139 7	54 9	2421 9	13 3
Cycle 4	1845 84	273 66	0 154	0 3326	0 0199	7 2787	0 4373	0 1587	0 0012		0 9916	99 50	99 90	1851 2	96 4	2146 2	53 6	2421 8	13 2
Cycle 5	1913 19	275 45	0 150	0 3406	0 0207	7 3338	0 4476	0 1561	0 0012		0 9919	99 62	99 93	1889 7	99 7	2152 9	54 5	2414 3	13 2
Cycle 6	1861 80	274 54	0 154	0 3363	0 0195	7 3033	0 4244	0 1575	0 0012		0 9911	99 53	99 91	1868 8	94 0	2149 2	51 9	2429 0	13 2
Cycle 7	1886 91	266 78	0 147	0 3614	0 0224	7 7405	0 4805	0 1553	0 0012		0 9924	99 61	99 93	1988 7	106 0	2201 3	55 8	2405 6	13 0
Cycle 8	1839 28	243 86	0 138	0 3671	0 0228	7 9444	0 4950	0 1570	0 0012		0 9926	99 70	99 94	2015 7	107 6	2224 7	56 2	2423 2	12 9
Cycle 9	1849 20	257 54	0 145	0 3697	0 0233	7 9801	0 5045	0 1565	0 0012		0 9927	99 64	99 93	2028 2	109 8	2228 8	57 0	2418 5	12 9
08P6A 6b	1257 17	113 93	0 094	0 4035	0 0210	9 3289	0 4879	0 1677	0 0014		0 9879	99 88	99 98	2185 2	96 6	2370 9	48 0	2534 6	13 7
Cycle 2	1238 77	99 37	0 084	0 4266	0 0228	10 0270	0 5365	0 1705	0 0014		0 9886	99 76	99 95	2290 4	102 9	2437 3	49 4	2562 3	13 5
Cycle 3	1254 75	92 32	0 077	0 4343	0 0232	10 0934	0 5404	0 1686	0 0014		0 9886	99 69	99 94	2325 0	104 2	2443 4	49 5	2543 4	13 5
Cycle 4	1206 99	90 50	0 078	0 4635	0 0248	11 3628	0 6093	0 1778	0 0014		0 9891	99 86	99 97	2454 8	109 2	2553 4	50 0	2632 6	13 2
Cycle 5	1233 72	93 43	0 079	0 4775	0 0257	11 1742	0 6037	0 1697	0 0013		0 9894	99 74</							

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from denit-profiling of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³⁸ Pb*		Correlation of Concordia Ellipses	% Radiogenic		²⁰⁶ Pb/U		²⁰⁷ Pb/U		²⁰⁶ Pb/ ²³⁸ Pb†	
	(est ppm)	(est ppm)			value	1 s.e	value	1 s.e	value	1 s.e		²⁰⁶ Pb	²⁰⁷ Pb	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e
Cycle 2	746 96	216 72	0 302	0 4995	0 0304	12 3675	0 7538	0 1796	0 0017	0 9882	99 92	99 98	2611 6	130 6	2632 7	57 3	2649 0	15 5	
Cycle 3	696 38	184 85	0 276	0 4845	0 0278	12 0903	0 6966	0 1810	0 0017	0 9864	99 98	99 99	2546 7	120 9	2611 4	54 0	2662 0	15 7	
Cycle 4	667 82	173 50	0 271	0 4567	0 0242	11 4550	0 6086	0 1819	0 0018	0 9831	99 89	99 98	2424 9	107 0	2560 9	49 6	2670 5	16 2	
Cycle 5	615 70	152 89	0 259	0 5289	0 0326	13 3280	0 8242	0 1828	0 0018	0 9870	99 89	99 97	2736 9	137 6	2703 2	58 4	2678 1	16 5	
Cycle 6	576 46	138 31	0 250	0 5088	0 0300	12 9045	0 7642	0 1839	0 0019	0 9851	99 91	99 98	2651 5	128 4	2672 7	55 8	2688 8	16 9	
Cycle 7	572 03	134 74	0 245	0 5160	0 0310	13 0865	0 7886	0 1839	0 0019	0 9852	99 99	100 00	2682 3	131 8	2685 9	56 8	2688 6	17 1	
Cycle 8	571 01	129 49	0 236	0 5235	0 0324	12 9684	0 8049	0 1797	0 0019	0 9859	99 95	99 99	2714 0	137 1	2677 4	58 5	2649 8	17 3	
Cycle 9	556 98	131 91	0 247	0 5351	0 0334	13 4660	0 8431	0 1825	0 0019	0 9857	100 00	100 00	2762 9	140 3	2712 9	59 2	2675 9	17 5	
08P6A 10	486 53	740 30	1 585	0 3356	0 0249	8 3039	0 6313	0 1795	0 0033	0 9709	85 06	96 33	1865 5	119 9	2264 7	68 9	2647 8	30 2	
Cycle 2	332 35	363 60	1 140	0 3778	0 0262	9 4597	0 6699	0 1816	0 0032	0 9686	91 73	98 06	2066 0	122 7	2383 6	65 0	2667 5	29 2	
Cycle 3	275 54	203 13	0 768	0 4025	0 0277	10 3346	0 7205	0 1862	0 0032	0 9687	95 73	99 01	2180 7	127 2	2465 2	64 5	2709 0	28 6	
Cycle 4	238 26	139 36	0 609	0 3951	0 0254	9 9402	0 6476	0 1825	0 0033	0 9615	96 74	99 26	2146 4	117 2	2429 2	60 1	2675 5	29 7	
Cycle 5	228 04	109 64	0 501	0 4275	0 0287	10 6511	0 7229	0 1807	0 0033	0 9637	97 57	99 46	2294 4	129 4	2493 2	63 0	2659 3	30 2	
Cycle 6	233 90	88 60	0 395	0 4616	0 0336	11 4172	0 8388	0 1794	0 0032	0 9695	97 85	99 53	2446 8	148 1	2557 8	68 6	2647 1	30 0	
Cycle 7	211 05	89 24	0 440	0 4111	0 0247	10 3815	0 6329	0 1831	0 0034	0 9536	97 65	99 47	2220 0	112 8	2469 4	56 5	2681 5	30 5	
Cycle 8	228 72	114 90	0 523	0 4681	0 0319	11 7323	0 8106	0 1818	0 0033	0 9655	96 86	99 29	2475 3	140 3	2583 3	64 6	2669 1	29 9	
Cycle 9	257 81	118 84	0 480	0 4177	0 0263	10 6150	0 6780	0 1843	0 0032	0 9638	97 08	99 34	2249 8	119 8	2490 0	59 3	2692 2	28 2	
08P6A 11	485 48	408 14	0 876	0 2727	0 0150	6 5854	0 3684	0 1751	0 0027	0 9623	95 57	99 03	1554 5	75 8	2057 4	49 3	2607 4	25 4	
Cycle 2	274 97	200 44	0 759	0 3371	0 0189	8 1697	0 4690	0 1758	0 0032	0 9489	96 38	99 21	1872 8	91 4	2250 0	51 9	2613 2	30 3	
Cycle 3	188 90	122 42	0 675	0 3898	0 0248	9 5680	0 6209	0 1780	0 0038	0 9458	97 37	99 42	2121 9	115 1	2394 1	59 7	2634 5	35 2	
Cycle 4	142 36	92 59	0 677	0 3549	0 0207	8 7043	0 5186	0 1779	0 0041	0 9224	98 87	99 76	1958 0	98 5	2307 5	54 3	2633 1	38 7	
Cycle 5	127 10	73 05	0 599	0 3989	0 0266	9 6254	0 6527	0 1750	0 0043	0 9332	99 18	99 83	2164 1	122 5	2399 6	62 4	2606 0	41 0	
Cycle 6	118 97	69 79	0 611	0 4067	0 0284	9 9015	0 7037	0 1766	0 0045	0 9349	98 91	99 77	2199 7	130 1	2425 6	65 5	2621 1	42 3	
Cycle 7	106 73	58 14	0 567	0 3830	0 0250	9 8461	0 6533	0 1864	0 0049	0 9218	99 23	99 83	2090 4	116 3	2420 5	61 2	2711 0	42 9	
Cycle 8	109 05	58 21	0 556	0 4485	0 0336	10 8943	0 8285	0 1762	0 0046	0 9396	99 08	99 80	2388 7	149 4	2514 1	70 7	2617 0	43 7	
Cycle 9	109 38	56 13	0 535	0 4261	0 0303	10 4332	0 7560	0 1776	0 0047	0 9315	98 86	99 75	2288 2	137 1	2474 0	67 1	2630 3	44 2	
08P6A 12	2791 26	390 31	0 146	0 2066	0 0118	4 4161	0 2541	0 1550	0 0012	0 9909	96 70	99 36	1210 9	63 2	1715 4	47 6	2401 9	13 2	
Cycle 2	2133 34	270 91	0 132	0 2985	0 0175	6 5814	0 3868	0 1599	0 0012	0 9915	97 24	99 45	1683 7	86 8	2056 9	51 8	2454 8	12 9	
Cycle 3	1804 31	228 33	0 132	0 3562	0 0213	7 9563	0 4784	0 1620	0 0013	0 9917	97 98	99 60	1963 9	101 5	2226 1	54 2	2476 9	13 1	
Cycle 4	1621 82	190 65	0 122	0 3737	0 0234	8 3053	0 5225	0 1612	0 0013	0 9914	97 06	99 41	2046 6	109 9	2264 9	57 0	2468 4	13 9	
Cycle 5	1536 01	177 59	0 120	0 3582	0 0220	8 3160	0 5117	0 1684	0 0014	0 9910	97 99	99 58	1973 7	104 3	2266 1	55 8	2541 5	13 8	
Cycle 6	1445 72	182 19	0 131	0 3537	0 0216	7 9894	0 4909	0 1638	0 0014	0 9900	97 04	99 40	1952 3	103 0	2229 8	55 5	2495 4	14 6	
Cycle 7	1455 42	187 21	0 134	0 3392	0 0205	7 5262	0 4580	0 1609	0 0014	0 9893	96 49	99 30	1882 8	98 8	2176 1	54 5	2465 4	15 0	
Cycle 8	1480 86	186 88	0 131	0 3599	0 0221	8 4342	0 5199	0 1700	0 0015	0 9895	95 09	99 85	1981 8	104 6	2278 9	56 0	2557 2	14 9	
Cycle 9	1543 25	198 84	0 134	0 3337	0 0211	7 3718	0 4690	0 1602	0 0014	0 9901	96 47	99 30	1856 2	102 1	2157 6	56 9	2458 1	15 1	
08P6A 13	160 02	73 08	0 476	0 3347	0 0198	8 0291	0 4991	0 1740	0 0045	0 9111	93 14	98 48	1861 4	95 8	2234 3	56 1	2596 1	42 9	
Cycle 2	122 39	52 37	0 446	0 4550	0 0331	11 1609	0 8336	0 1779	0 0048	0 9338	95 93	99 10	2417 4	146 8	2536 7	69 6	2633 5	44 7	
Cycle 3	104 10	37 09	0 371	0 4634	0 0343	11 3801	0 8624	0 1781	0 0050	0 9287	97 43	99 44	2454 7	151 3	2554 8	70 7	2635 3	47 1	
Cycle 4	94 18	34 56	0 382	0 4523	0 0340	10 8956	0 8443	0 1747	0 0054	0 9190	95 67	99 05	2405 5	150 7	2514 3	72 1	2603 3	51 3	
Cycle 5	89 21	33 40	0 390	0 4581	0 0361	11 2980	0 9133	0 1789	0 0055	0 9255	96 67	99 26	2431 0	159 5	2548 0	75 4	2642 6	51 2	
Cycle 6	88 95	29 52	0 346	0 5305	0 0485	12 7018	1 1856	0 1737	0 0054	0 9441	97 09	99 38	2743 4	204 5	2657 8	87 9	2593 2	51 6	
Cycle 7	84 69	28 46	0 350	0 4897	0 0416	12 1342	1 0514	0 1797	0 0055	0 9362	98 15	99 59	2569 2	180 2	2614 8	81 3	2650 4	50 9	
Cycle 8	80 29	29 53	0 383	0 4751	0 0392	11 6648	0 9792	0 1781	0 0055	0 9316	98 80	99 74	2506 0	171 2	2577 9	78 5	2634 8	51 2	
Cycle 9	79 50	22 79	0 299	0 4703	0 0393	11 7990	1 0066	0 1820	0 0057	0 9320	97 92	99 53	2484 8	172 4	2588 6	79 9	2670 9	51 6	
08P6A 14	1217 69	283 97	0 243	0 4933	0 0369	11 6682	0 8750	0 1716	0 0017	0 9907	99 57	99 91	2584 9	159 3	2578 2	70 1	2572 9	17 0	
Cycle 2	1391 51	315 08	0 236	0 5110	0 0410	11 9410	0 9596	0 1695	0 0017	0 9926	99 43	99 88	2660 9	174 8	2599 8	75 3	2552 5	16 3	
Cycle 3	1441 67	300 50	0 217	0 4803	0 0371	11 1778	0 8647	0 1688	0 0015	0 9930	99 59	99 92	2528 7	161 5	2538 1	72 1	2545 6	15 3	
Cycle 4	1452 87	311 50	0 223	0 4620	0 0343	10 8519	0 8083	0 1704	0 0015	0 9928	99 50	99 90	2448 5	151 4	2510 5	69 3	2561 1	15 0	
Cycle 5	1376 50	319 31	0 242	0 5163	0 0399	12 1487	0 9406	0 1707	0 0015	0 9932	99 59	99 91	2683 4	169 6	2610 6	72 6	2564 2	15 1	
Cycle 6	1416 51	305 08	0 224	0 4788	0 0354	10 9516	0 8126	0 1659	0 0015	0 9925	99 51	99 90	2521 9	154 5	2519 0	69 0	2516 7	15 2	
Cycle 7	1450 82	321 39	0 231	0 4886	0 0378	11 3132	0 8763	0 1679	0 0015	0 9933	99 47	99 89</							

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from depth-profiles of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		Correlation of Concordia Elongates	% Radiogenic		% Radiogenic		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb	
	(est ppm)	(est ppm)	(est ppm)	value	1 s.e	value	1 s.e	value		1 s.e	²⁰⁶ Pb	²³⁸ Pb	²⁰⁶ Pb	²³⁵ Pb	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)
Cycle 2	66.88	53.96	0.840	0.4681	0.0369	11.3737	0.9108	0.1762	0.0056	0.9215	99.75	99.95	2475.2	74.7	2554.3	74.7	2617.6	52.4	
Cycle 3	62.90	49.43	0.819	0.5245	0.0502	13.0804	1.2708	0.1809	0.0061	0.9394	98.86	99.75	2718.4	91.6	2685.5	91.6	2660.8	55.7	
Cycle 4	56.81	36.96	0.678	0.5169	0.0495	12.9529	1.2582	0.1817	0.0063	0.9352	99.31	99.85	2686.0	91.6	2676.2	91.6	2668.9	57.5	
Cycle 5	51.36	35.45	0.719	0.5128	0.0491	12.9862	1.2626	0.1837	0.0066	0.9310	99.44	99.88	2668.6	91.7	2678.7	91.7	2686.2	59.3	
Cycle 6	48.64	40.22	0.861	0.4801	0.0438	11.8887	1.1007	0.1796	0.0066	0.9207	100.00	100.00	2527.8	86.7	2595.7	86.7	2649.1	60.7	
Cycle 7	48.83	34.90	0.744	0.5671	0.0599	13.7627	1.4722	0.1760	0.0065	0.9391	99.82	99.96	2895.9	101.3	2733.5	101.3	2615.6	61.8	
Cycle 8	49.67	35.73	0.749	0.5411	0.0570	13.3820	1.4313	0.1794	0.0067	0.9382	99.37	99.86	2788.2	101.0	2707.0	101.0	2646.9	62.0	
Cycle 9	45.41	33.29	0.764	0.4702	0.0434	11.5758	1.0859	0.1785	0.0068	0.9156	100.00	100.00	2484.6	87.7	2570.7	87.7	2639.3	63.5	
08P6B 3	145.34	103.82	0.744	0.5243	0.0386	13.5760	1.0182	0.1878	0.0043	0.9528	94.94	98.81	2717.4	70.9	2720.6	70.9	2722.9	37.7	
Cycle 2	143.97	99.02	0.716	0.5424	0.0415	13.6265	1.0671	0.1822	0.0044	0.9522	92.57	98.27	2793.6	74.1	2724.1	74.1	2672.9	39.7	
Cycle 3	140.68	99.22	0.735	0.5279	0.0393	13.4192	1.0219	0.1844	0.0044	0.9501	93.71	98.53	2732.7	72.0	2709.6	72.0	2692.4	39.4	
Cycle 4	143.55	102.62	0.745	0.5546	0.0432	14.0890	1.1197	0.1842	0.0044	0.9548	93.95	98.59	2844.3	75.3	2755.7	75.3	2691.5	39.2	
Cycle 5	150.13	101.12	0.702	0.5519	0.0441	14.1948	1.1535	0.1865	0.0043	0.9594	94.71	98.76	2833.2	77.1	2762.8	77.1	2711.8	37.9	
Cycle 6	144.99	108.08	0.776	0.5414	0.0418	13.5126	1.0686	0.1810	0.0043	0.9535	92.71	98.31	2789.1	74.8	2716.2	74.8	2662.4	39.6	
Cycle 7	148.32	95.75	0.673	0.5548	0.0437	14.1379	1.1329	0.1848	0.0042	0.9594	95.17	98.88	2845.3	76.0	2759.0	76.0	2696.5	37.5	
Cycle 8	152.23	112.17	0.768	0.5265	0.0392	13.5052	1.0252	0.1861	0.0042	0.9542	94.40	98.68	2726.5	71.8	2715.7	71.8	2707.6	37.6	
Cycle 9	152.70	97.63	0.666	0.6268	0.0551	15.6804	1.3947	0.1814	0.0040	0.9688	96.04	99.10	3136.9	84.9	2857.5	84.9	2666.1	36.6	
08P6B 4	763.11	254.36	0.347	0.3943	0.0329	9.6670	0.8107	0.1778	0.0024	0.9872	98.96	99.77	2142.8	77.2	2403.6	77.2	2632.5	22.3	
Cycle 2	587.78	176.62	0.313	0.4019	0.0307	9.9084	0.7617	0.1788	0.0026	0.9814	98.26	99.62	2177.6	70.9	2426.3	70.9	2642.0	24.5	
Cycle 3	489.46	161.56	0.344	0.4290	0.0322	10.6679	0.8059	0.1803	0.0028	0.9786	98.67	99.71	2301.3	70.1	2494.6	70.1	2656.0	25.8	
Cycle 4	421.32	150.53	0.372	0.4320	0.0303	11.0297	0.7792	0.1852	0.0029	0.9748	99.30	99.84	2314.9	65.8	2525.6	65.8	2699.6	26.1	
Cycle 5	358.30	155.12	0.451	0.4531	0.0316	11.5315	0.8103	0.1846	0.0030	0.9728	99.55	99.90	2409.2	65.7	2567.1	65.7	2694.3	27.0	
Cycle 6	339.28	149.69	0.460	0.4868	0.0353	12.4051	0.9063	0.1848	0.0031	0.9735	99.22	99.82	2556.9	68.6	2635.6	68.6	2696.5	27.7	
Cycle 7	314.84	160.07	0.530	0.4832	0.0338	11.9399	0.8405	0.1792	0.0031	0.9704	99.46	99.88	2541.1	66.0	2599.7	66.0	2645.7	28.3	
Cycle 8	293.61	147.78	0.524	0.4428	0.0279	11.4148	0.7257	0.1870	0.0032	0.9633	99.56	99.90	2363.2	59.3	2557.6	59.3	2715.6	28.3	
Cycle 9	274.28	147.21	0.559	0.4125	0.0236	10.5691	0.6101	0.1858	0.0033	0.9537	99.86	99.97	2226.3	53.5	2486.0	53.5	2705.6	28.9	
08P6B 5	256.73	84.26	0.342	0.3410	0.0254	8.3038	0.6294	0.1766	0.0036	0.9638	95.20	98.94	1891.5	68.7	2264.7	68.7	2621.3	33.7	
Cycle 2	160.87	51.74	0.335	0.3561	0.0253	8.4722	0.6228	0.1726	0.0043	0.9398	93.48	98.57	1963.7	66.8	2283.0	66.8	2582.6	42.1	
Cycle 3	115.44	30.68	0.277	0.3837	0.0285	9.1637	0.7044	0.1732	0.0049	0.9314	94.96	98.90	2093.4	70.4	2354.5	70.4	2589.0	46.9	
Cycle 4	87.17	20.58	0.246	0.3618	0.0252	8.9020	0.6408	0.1784	0.0054	0.9087	96.89	99.31	1990.8	65.7	2328.0	65.7	2638.5	50.4	
Cycle 5	77.75	18.41	0.247	0.3501	0.0242	8.7634	0.6236	0.1815	0.0056	0.9027	98.21	99.60	1935.1	64.9	2313.7	64.9	2667.0	51.4	
Cycle 6	70.82	14.36	0.211	0.3637	0.0260	8.9486	0.6611	0.1785	0.0059	0.8988	97.49	99.45	1999.5	67.5	2332.8	67.5	2638.6	54.4	
Cycle 7	66.35	14.25	0.224	0.3974	0.0308	9.8040	0.7840	0.1789	0.0060	0.9109	97.35	99.42	2157.2	73.7	2416.5	73.7	2642.8	55.3	
Cycle 8	60.07	12.23	0.212	0.3804	0.0278	9.9176	0.7442	0.1891	0.0063	0.8999	98.67	99.69	2078.2	69.2	2427.1	69.2	2734.2	54.6	
Cycle 9	62.53	11.30	0.188	0.3966	0.0293	9.7615	0.7402	0.1785	0.0060	0.9010	98.45	99.66	2153.4	69.8	2412.5	69.8	2639.0	55.4	
08P6B 6	282.94	216.43	0.797	0.4641	0.0314	11.2105	0.7700	0.1752	0.0033	0.9622	95.73	99.07	2457.8	64.0	2540.8	64.0	2607.7	31.3	
Cycle 2	259.04	186.83	0.751	0.4858	0.0325	11.8015	0.8002	0.1762	0.0033	0.9609	96.52	99.24	2552.6	63.5	2588.8	63.5	2617.2	31.4	
Cycle 3	261.82	169.51	0.674	0.5613	0.0440	13.8184	1.0937	0.1785	0.0033	0.9733	97.31	99.41	2872.1	74.9	2737.3	74.9	2639.4	30.3	
Cycle 4	253.55	175.03	0.719	0.4821	0.0315	11.8757	0.7860	0.1787	0.0033	0.9617	97.70	99.49	2536.3	62.0	2594.6	62.0	2640.5	30.3	
Cycle 5	264.98	182.89	0.719	0.5167	0.0353	12.6165	0.8711	0.1771	0.0032	0.9663	98.11	99.59	2685.0	65.0	2651.5	65.0	2625.9	29.7	
Cycle 6	281.04	190.49	0.706	0.5328	0.0392	12.9165	0.9605	0.1758	0.0032	0.9706	96.99	99.35	2753.4	70.1	2673.6	70.1	2613.8	29.9	
Cycle 7	263.56	186.16	0.736	0.5051	0.0347	12.5848	0.8731	0.1807	0.0032	0.9663	97.81	99.37	2635.5	65.3	2649.1	65.3	2659.5	29.7	
Cycle 8	267.32	187.19	0.729	0.5781	0.0450	14.6433	1.1478	0.1837	0.0032	0.9750	97.97	99.54	2940.9	74.5	2792.3	74.5	2686.7	28.9	
Cycle 9	267.36	190.01	0.740	0.4970	0.0330	12.3223	0.8278	0.1798	0.0032	0.9651	97.96	99.55	2600.8	63.1	2629.3	63.1	2651.2	29.3	
08P6B 7	222.26	105.22	0.493	0.5520	0.0363	13.5509	0.9003	0.1781	0.0031	0.9649	98.11	99.59	2833.4	62.8	2718.8	62.8	2634.8	29.1	
Cycle 2	179.06	108.95	0.634	0.5758	0.0383	14.2451	0.9562	0.1794	0.0034	0.9596	98.72	99.72	2931.6	63.7	2766.2	63.7	2647.6	31.5	
Cycle 3	180.30	125.44	0.725	0.5563	0.0377	14.0506	0.9589	0.1832	0.0034	0.9624	99.61	99.91	2851.2	64.7	2753.1	64.7	2682.0	30.8	
Cycle 4	193.78	145.01	0.779	0.5567	0.0390	14.1928	1.0031	0.1849	0.0034	0.9666	99.10	99.80	2852.8	67.0	2762.7	67.0	2697.5	30.1	
Cycle 5	207.60	156.49	0.785	0.6318	0.0499	16.0973	1.2771	0.1848	0.0033	0.9751	99.70	99.93	3156.7	75.8	2882.6	75.8	2696.3	29.2	
Cycle 6	209.68	157.92																	

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from depth-profiles of samples from Ahtu Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb*		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁷ Pb		% Radiogenic ²⁰⁶ Pb		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb†	
	(est ppm)	(est ppm)	(est ppm)	value	1 s.e	value	1 s.e	value	1 s.e	value		1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	
Cycle 4	328 38	225 10	0 714	0 4889	0 0339	11 9894	0 8360	0 1779	0 0027	0 9765	99 23	99 83	2565 8	65 3	2603 6	65 3	2633 1	25 1			
Cycle 5	324 94	210 73	0 676	0 5463	0 0432	13 2008	1 0500	0 1753	0 0027	0 9813	98 87	99 76	2809 7	75 1	2694 1	75 1	2608 5	25 6			
Cycle 6	306 45	213 79	0 727	0 4768	0 0328	11 6437	0 8070	0 1771	0 0028	0 9743	98 65	99 71	2513 5	64 8	2576 2	64 8	2625 9	26 0			
Cycle 7	307 60	209 97	0 711	0 5207	0 0383	12 8717	0 9533	0 1793	0 0028	0 9780	99 19	99 82	2702 3	69 8	2670 3	69 8	2646 2	25 7			
Cycle 8	307 12	210 34	0 713	0 4744	0 0316	11 5912	0 7775	0 1772	0 0027	0 9733	99 48	99 89	2502 6	62 7	2572 0	62 7	2627 1	25 7			
Cycle 9	298 78	210 78	0 735	0 4809	0 0324	11 9365	0 8081	0 1800	0 0028	0 9739	99 54	99 90	2531 1	63 4	2599 4	63 4	2653 1	25 6			
08P6B sp10	291 49	195 21	0 698	0 5011	0 0336	12 4827	0 8432	0 1807	0 0028	0 9730	99 21	99 83	2618 6	63 5	2641 4	63 5	2659 0	25 9			
Cycle 2	287 00	200 37	0 727	0 4984	0 0333	12 4776	0 8386	0 1816	0 0028	0 9726	99 26	99 84	2607 0	63 2	2641 0	63 2	2667 2	26 0			
Cycle 3	285 00	196 73	0 719	0 4915	0 0328	12 3074	0 8270	0 1816	0 0029	0 9721	98 93	99 76	2577 4	63 1	2628 1	63 1	2667 5	26 2			
Cycle 4	295 82	207 60	0 731	0 5122	0 0351	12 5949	0 8675	0 1783	0 0028	0 9742	99 67	99 93	2666 1	64 8	2649 8	64 8	2637 5	25 9			
Cycle 5	276 87	191 38	0 720	0 4919	0 0318	12 0678	0 7860	0 1779	0 0028	0 9701	99 39	99 87	2579 0	61 1	2609 7	61 1	2633 6	26 4			
Cycle 6	281 56	189 21	0 700	0 4871	0 0322	12 3970	0 8242	0 1846	0 0029	0 9715	98 89	99 75	2558 1	62 5	2634 9	62 5	2694 5	26 1			
Cycle 7	281 78	196 11	0 725	0 5412	0 0392	13 3587	0 9742	0 1790	0 0028	0 9762	99 10	99 80	2788 4	68 9	2705 3	68 9	2643 9	26 3			
Cycle 8	274 94	191 49	0 726	0 4756	0 0309	11 9697	0 7832	0 1825	0 0029	0 9703	99 52	99 89	2508 3	61 3	2602 0	61 3	2675 9	26 3			
Cycle 9	262 76	186 32	0 739	0 4791	0 0309	11 6455	0 7555	0 1763	0 0028	0 9689	99 49	99 89	2523 4	60 7	2576 3	60 7	2618 3	26 8			
08P6B 11	148 84	56 99	0 399	0 4920	0 0343	12 0939	0 8915	0 1783	0 0051	0 9229	85 67	96 52	2579 4	69 1	2611 7	69 1	2636 8	47 2			
Cycle 2	129 85	51 28	0 411	0 4935	0 0347	12 4061	0 9048	0 1823	0 0050	0 9288	91 83	98 08	2585 7	68 5	2635 6	68 5	2674 2	44 9			
Cycle 3	128 87	42 99	0 347	0 6145	0 0542	15 2538	1 3728	0 1800	0 0048	0 9545	94 28	98 70	3088 1	85 8	2831 2	85 8	2653 1	44 7			
Cycle 4	117 28	41 69	0 370	0 5402	0 0432	14 1214	1 1555	0 1896	0 0052	0 9434	94 84	98 77	2784 3	77 6	2757 9	77 6	2738 6	44 9			
Cycle 5	109 49	38 15	0 363	0 5315	0 0420	13 3392	1 0800	0 1820	0 0051	0 9380	94 94	98 84	2747 6	76 5	2704 0	76 5	2671 5	46 7			
Cycle 6	102 51	37 07	0 377	0 5247	0 0411	13 5041	1 0833	0 1867	0 0054	0 9340	95 08	98 85	2719 2	75 8	2715 6	75 8	2712 9	47 6			
Cycle 7	98 44	35 68	0 378	0 5231	0 0410	13 1829	1 0586	0 1828	0 0053	0 9329	95 86	99 06	2712 3	75 8	2692 8	75 8	2678 3	48 2			
Cycle 8	102 06	37 20	0 380	0 5885	0 0518	14 6684	1 3156	0 1808	0 0052	0 9473	96 53	99 22	2983 2	85 3	2794 0	85 3	2660 1	47 9			
Cycle 9	101 06	34 04	0 351	0 5517	0 0466	14 2549	1 2249	0 1874	0 0053	0 9441	97 36	99 39	2832 3	81 5	2766 8	81 5	2719 4	47 0			
08P4	Timiskaming polymictic conglomerate adjacent to qtz-carbonate vein Pamous Mine (NAD83 Zone 17 UTM 491865E 5374577N)																				
08P4 1	907 92	239 15	0 274	0 2716	0 0076	6 2055	0 2676	0 1657	0 0047	0 7681	47 39	81 83	1549 1	38 6	2005 2	37 7	2514 5	0 0			
Cycle 2	881 80	236 67	0 280	0 2797	0 0079	0 0000	0 2750	0 1689	0 0045	0 7780	49 28	82 65	1589 8	39 8	2047 9	37 2	2547 2	0 0			
Cycle 3	866 31	241 28	0 290	0 2772	0 0076	6 3599	0 2663	0 1664	0 0045	0 7683	49 40	82 93	1577 1	38 4	2026 8	36 7	2521 9	0 0			
Cycle 4	854 95	240 47	0 293	0 2789	0 0079	6 3356	0 2752	0 1648	0 0047	0 7669	48 31	82 45	1585 8	39 8	2023 4	38 1	2505 0	0 0			
Cycle 5	835 63	239 32	0 298	0 2833	0 0080	6 5347	0 2748	0 1673	0 0045	0 7761	50 44	83 44	1608 1	40 1	2050 6	37 0	2530 6	0 0			
Cycle 6	810 63	225 55	0 290	0 3017	0 0088	7 2039	0 2961	0 1732	0 0043	0 7994	53 09	84 41	1699 9	43 6	2137 0	36 6	2588 4	0 0			
Cycle 7	811 74	231 54	0 297	0 2959	0 0084	7 0246	0 2844	0 1722	0 0043	0 7921	53 14	84 51	1670 8	41 7	2114 5	36 0	2579 1	0 0			
Cycle 8	793 91	226 95	0 298	0 3009	0 0085	7 1281	0 2827	0 1718	0 0041	0 7976	54 75	85 37	1695 9	42 2	2127 6	35 3	2575 2	0 0			
Cycle 9	782 69	222 76	0 296	0 3060	0 0088	7 1733	0 2868	0 1700	0 0041	0 8009	54 92	85 58	1720 8	43 4	2133 2	35 6	2558 0	0 0			
Cycle 10	763 82	218 22	0 298	0 3123	0 0089	7 5809	0 2907	0 1760	0 0039	0 8151	57 59	86 47	1752 1	43 8	2182 6	34 4	2616 0	0 0			
Cycle 11	774 00	227 42	0 306	0 3046	0 0085	7 1565	0 2805	0 1704	0 0041	0 7974	55 22	85 70	1714 0	42 2	2131 1	34 9	2561 6	0 0			
Cycle 12	771 64	226 50	0 306	0 3128	0 0090	7 0553	0 2836	0 1636	0 0040	0 7940	54 85	86 02	1754 5	44 1	2118 4	35 8	2493 1	0 0			
08P4 d1	1868 14	329 98	0 184	0 1800	0 0047	4 4259	0 1625	0 1784	0 0039	0 8046	62 86	88 71	1066 7	25 9	1717 2	30 4	2637 8	36 6			
Cycle 2	1614 30	299 39	0 193	0 1922	0 0055	4 5650	0 1823	0 1722	0 0042	0 7984	62 91	89 08	1133 4	29 6	1742 9	33 3	2579 6	40 6			
Cycle 3	1372 69	248 27	0 188	0 1962	0 0055	4 9678	0 1917	0 1836	0 0042	0 8073	66 13	89 80	1154 8	29 8	1813 9	32 6	2686 1	38 0			
Cycle 4	1228 00	243 46	0 207	0 1884	0 0053	4 4661	0 1820	0 1719	0 0044	0 7818	64 93	89 92	1112 9	28 8	1724 7	33 8	2576 1	42 9			
Cycle 5	1219 65	253 88	0 217	0 1906	0 0055	4 7290	0 1901	0 1799	0 0044	0 8014	67 51	90 54	1124 8	30 0	1772 4	33 7	2652 2	40 2			
Cycle 6	1194 71	254 42	0 222	0 1843	0 0054	4 6753	0 1869	0 1840	0 0044	0 8054	68 73	90 82	1090 4	29 3	1762 8	33 4	2689 1	39 5			
Cycle 7	1174 96	261 08	0 231	0 1886	0 0055	4 7573	0 1884	0 1830	0 0043	0 8087	69 74	91 25	1113 7	29 9	1777 4	33 2	2680 0	38 8			
Cycle 8	1108 09	238 67	0 224	0 1961	0 0059	5 0277	0 1997	0 1860	0 0042	0 8205	71 09	91 63	1154 1	31 9	1824 0	33 6	2707 0	37 7			
Cycle 9	1054 06	238 65	0 236	0 1981	0 0058	4 9920	0 1959	0 1828	0 0042	0 8101	71 03	91 74	1165 1	31 2	1818 0	33 2	2678 2	38 3			
Cycle 10	1030 49	242 17	0 245	0 2047	0 0061	5 3814	0 2059	0 1906	0 0041	0 8311	74 18	92 58	1200 8	32 8	1881 9	32 8	2747 6	35 1			
Cycle 11	969 93	244 18	0 262	0 2028	0 0061	5 1857	0 2009	0 1854	0 0041	0 8205	73 94	92 69	1190 5	32 4	1850 3	33 0	2702 0	36 7			
Cycle 12	922 76	232 05	0 262	0 2048	0 0063	5 4152	0 2096	0 1918	0 0041	0 8352	75 76	93 10	1201 2	33 6	1887 3	33 2	2757 3	35 1			
Cycle 13	903 30	252 54	0 291	0 2018	0 0060	5 1807	0 2012	0 1862	0 0042	0 8194	74 91										

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from dentition of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁷ Pb	% Radiogenic ²⁰⁶ Pb	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁷ Pb/ ²⁰⁶ Pb†		
	(est ppm)	(est ppm)			value	1 s e	value	1 s e				value	1 s e	Age (Ma)	1 s e	Age (Ma)	1 s e	Age (Ma)
Cycle 46	493 27	189 28	0 400	0 2878	0 0091	7 3068	0 2563	0 1841	0 0033	0 8643	91 13	97 88	1630 5	45 6	2149 6	31 3	2690 4	29 2
Cycle 47	493 80	187 91	0 396	0 2829	0 0088	7 0728	0 2406	0 1813	0 0031	0 8660	92 75	98 32	1606 2	44 1	2120 6	30 3	2664 8	28 3
Cycle 48	479 34	192 79	0 419	0 2844	0 0087	7 1613	0 2404	0 1826	0 0031	0 8609	92 63	98 28	1613 3	43 6	2131 7	29 9	2677 0	28 4
Cycle 49	482 14	184 20	0 398	0 2907	0 0091	7 3159	0 2494	0 1826	0 0031	0 8676	93 04	98 38	1644 8	45 4	2150 7	30 5	2676 2	28 2
08P4-2	326 84	317 30	1 011	0 3350	0 0115	8 4680	0 3026	0 1833	0 0028	0 9085	96 39	99 18	1862 6	55 4	2282 5	32 5	2683 2	0 0
Cycle 2	323 68	308 70	0 993	0 3637	0 0126	9 1711	0 3312	0 1829	0 0027	0 9143	96 36	99 17	1999 7	59 7	2355 2	33 1	2679 2	0 0
Cycle 3	329 05	286 67	0 908	0 3882	0 0134	9 8374	0 3516	0 1838	0 0026	0 9194	97 07	99 33	2114 5	62 4	2419 7	32 9	2687 4	0 0
Cycle 4	334 50	282 63	0 880	0 4090	0 0145	10 4071	0 3792	0 1845	0 0025	0 9280	97 55	99 44	2210 6	66 4	2471 7	33 8	2694 0	0 0
Cycle 5	321 08	277 23	0 899	0 3968	0 0132	10 0159	0 3418	0 1831	0 0025	0 9197	98 03	99 56	2154 2	60 9	2436 2	31 5	2680 9	0 0
Cycle 6	334 08	276 29	0 861	0 4319	0 0154	10 8135	0 3965	0 1816	0 0025	0 9303	97 45	99 43	2314 1	69 5	2507 2	34 1	2667 5	0 0
Cycle 7	324 75	272 81	0 875	0 4339	0 0152	11 0197	0 3925	0 1842	0 0024	0 9308	98 72	99 71	2323 3	68 2	2524 8	33 2	2691 0	0 0
Cycle 8	324 65	258 10	0 828	0 4410	0 0155	11 1680	0 3992	0 1837	0 0024	0 9337	99 35	99 86	2355 0	69 4	2537 2	33 3	2686 3	0 0
Cycle 9	325 70	264 12	0 845	0 4413	0 0153	11 2163	0 3962	0 1840	0 0024	0 9311	99 12	99 80	2356 5	68 6	2541 3	32 9	2692 3	0 0
Cycle 10	321 23	264 25	0 857	0 4398	0 0152	10 9105	0 3846	0 1799	0 0024	0 9282	98 28	99 62	2349 6	67 9	2515 5	32 8	2652 3	0 0
Cycle 11	320 44	267 43	0 869	0 4290	0 0143	10 6867	0 3631	0 1807	0 0024	0 9233	98 54	99 68	2301 3	64 4	2496 3	31 5	2658 9	0 0
Cycle 12	332 14	289 98	0 909	0 4347	0 0151	11 0320	0 3894	0 1841	0 0024	0 9318	98 89	99 75	2326 7	67 7	2525 8	32 9	2690 0	0 0
Cycle 13	339 18	303 41	0 932	0 4381	0 0156	11 1217	0 4033	0 1841	0 0024	0 9351	98 92	99 76	2342 0	70 0	2533 4	33 8	2690 4	0 0
Cycle 14	340 42	323 63	0 990	0 4073	0 0139	10 2151	0 3565	0 1819	0 0024	0 9293	98 93	99 76	2202 7	63 9	2454 4	32 3	2670 1	0 0
08P4 3	947 01	213 89	0 235	0 2602	0 0073	6 3460	0 2206	0 1769	0 0032	0 8563	66 78	90 40	1490 8	37 6	2024 8	30 5	2623 9	0 0
Cycle 2	868 01	189 86	0 228	0 2801	0 0082	6 8436	0 2451	0 1772	0 0032	0 8611	66 93	90 44	1592 0	41 4	2091 4	31 7	2626 7	0 0
Cycle 3	768 17	179 69	0 244	0 3009	0 0088	7 4223	0 2643	0 1789	0 0033	0 8601	67 79	90 69	1695 9	43 7	2163 7	31 9	2642 5	0 0
Cycle 4	692 55	155 62	0 234	0 3137	0 0092	7 8250	0 2752	0 1809	0 0032	0 8667	70 38	91 58	1759 0	45 4	2211 1	31 7	2661 1	0 0
Cycle 5	641 04	173 43	0 282	0 3279	0 0097	8 4011	0 2889	0 1858	0 0030	0 8797	74 21	92 77	1828 1	47 2	2275 3	31 2	2705 6	0 0
Cycle 6	608 33	177 76	0 304	0 3332	0 0099	8 4775	0 2931	0 1845	0 0031	0 8760	74 08	92 77	1853 9	47 8	2283 5	31 4	2694 0	0 0
Cycle 7	569 51	187 90	0 344	0 3325	0 0098	8 1625	0 2862	0 1781	0 0032	0 8610	72 32	92 40	1850 4	47 3	2249 2	31 7	2634 8	0 0
Cycle 8	578 05	203 19	0 366	0 3467	0 0105	8 6552	0 3043	0 1811	0 0030	0 8783	75 33	93 32	1918 6	50 5	2302 4	32 0	2662 8	0 0
Cycle 9	542 85	207 64	0 398	0 3453	0 0101	8 8056	0 2989	0 1849	0 0030	0 8746	76 55	93 60	1912 3	48 6	2318 1	31 0	2697 6	0 0
Cycle 10	522 67	214 47	0 427	0 3526	0 0104	8 6466	0 2989	0 1778	0 0031	0 8674	75 67	93 54	1947 0	49 7	2301 5	31 5	2632 9	0 0
Cycle 11	492 20	217 35	0 460	0 3606	0 0108	8 9716	0 3106	0 1804	0 0031	0 8701	76 35	93 68	1985 2	50 9	2335 1	31 6	2656 8	0 0
Cycle 12	473 55	210 24	0 462	0 3703	0 0113	9 2844	0 3229	0 1818	0 0030	0 8801	78 31	94 27	2031 0	53 1	2366 5	31 9	2669 5	0 0
Cycle 13	447 52	207 40	0 483	0 3816	0 0117	9 4096	0 3293	0 1788	0 0030	0 8802	78 95	94 56	2083 8	54 8	2378 8	32 1	2642 1	0 0
Cycle 14	440 37	214 88	0 508	0 3708	0 0109	9 0825	0 3093	0 1777	0 0030	0 8657	78 42	94 43	2033 1	51 3	2346 3	31 1	2631 2	0 0
08P4 4	523 82	403 03	0 801	0 4276	0 0135	10 7605	0 3445	0 1825	0 0020	0 9428	99 05	99 79	2295 1	61 0	2502 7	29 7	2675 7	0 0
Cycle 2	528 34	342 83	0 676	0 4385	0 0139	11 1707	0 3575	0 1847	0 0019	0 9477	99 54	99 90	2344 1	62 2	2537 5	29 8	2695 9	0 0
Cycle 3	544 95	287 34	0 549	0 4321	0 0132	11 0182	0 3413	0 1849	0 0018	0 9474	99 59	99 91	2315 4	59 6	2524 7	28 8	2697 5	0 0
Cycle 4	570 65	256 22	0 468	0 4428	0 0135	11 3107	0 3495	0 1853	0 0018	0 9494	99 51	99 89	2363 1	60 5	2549 1	28 8	2700 5	0 0
Cycle 5	609 07	233 12	0 399	0 4638	0 0147	11 8462	0 3798	0 1853	0 0018	0 9563	99 79	99 95	2456 3	65 0	2592 3	30 0	2700 4	0 0
Cycle 6	630 58	216 87	0 358	0 4549	0 0139	11 6174	0 3585	0 1852	0 0017	0 9546	99 78	99 95	2416 8	61 7	2574 1	28 9	2700 3	0 0
Cycle 7	646 68	197 83	0 319	0 4637	0 0143	11 9281	0 3716	0 1866	0 0017	0 9579	99 73	99 94	2455 9	63 1	2598 8	29 2	2712 1	0 0
Cycle 8	679 35	195 25	0 299	0 4591	0 0139	11 6181	0 3544	0 1835	0 0016	0 9584	99 70	99 93	2435 8	61 4	2574 1	28 5	2684 9	0 0
Cycle 9	718 28	185 52	0 269	0 4725	0 0144	11 9653	0 3677	0 1836	0 0016	0 9614	99 73	99 94	2494 7	63 1	2601 7	28 8	2686 1	0 0
Cycle 10	771 59	181 28	0 245	0 4822	0 0149	12 2548	0 3810	0 1843	0 0015	0 9650	99 76	99 95	2537 0	64 8	2624 1	29 2	2692 1	0 0
Cycle 11	811 53	170 80	0 219	0 4722	0 0144	12 0006	0 3694	0 1843	0 0015	0 9668	99 73	99 94	2493 4	63 3	2604 5	28 9	2692 0	0 0
Cycle 12	874 25	174 45	0 208	0 4734	0 0145	12 0564	0 3719	0 1847	0 0014	0 9689	99 80	99 96	2498 3	63 5	2608 8	28 9	2695 7	0 0
Cycle 13	873 30	165 45	0 197	0 4694	0 0140	11 9041	0 3565	0 1839	0 0014	0 9678	99 83	99 96	2480 8	61 3	2596 9	28 1	2688 7	0 0
Cycle 14	877 56	167 61	0 199	0 4743	0 0142	12 0978	0 3650	0 1850	0 0014	0 9690	99 93	99 98	2502 3	62 2	2612 0	28 3	2698 2	0 0
08P4 5	203 50	210 33	1 077	0 4710	0 0169	11 8817	0 4385	0 1830	0 0030	0 8989	97 92	99 53	2488 0	74 0	2595 1	34 6	2679 9	0 0
Cycle 2	198 94	213 83	1 120	0 4851	0 0172	12 1642	0 4433	0 1819	0 0030	0 8977	98 20	99 60	2549 2	74 7	2617 1	34 2	2670 1	0 0
Cycle 3	213 26	214 14	1 046	0 5385	0 0209	13 5773	0 5354	0 1829	0 0029	0 9206	99 17	99 82	2777 1	87 5	2720 7	37 3	2679 1	0 0
Cycle 4	202 31	212 83	1 096	0 5261	0 0191	13 2165	0 4894	0 1822	0 0029	0 9076	99 22	99 83	2724 9	80 8	2695 2	35 0	2673 1	0 0
Cycle 5	211 09	225 26	1 112	0 5317	0 0196	13 5012	0 5060	0 1842										

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from depth-profile of samples from Abitibi Subprovince

Sample#	U		Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³² Th*		Correlation of Concordia Ellipses	% Radiogenic		% Radiogenic		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³² Th†	
	(est ppm)	(est ppm)		value	1 s.e	value	1 s.e	value	1 s.e		²⁰⁶ Pb	²⁰⁶ Pb	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e		
Cycle 9	269 51	217 52	0.841	0.4610	0.0169	11 7661	0.4393	0.1851	0.0028	0.9170	99.03	99.78	2444 0	74 5	2586 0	34 9	2699 2	0 0		
Cycle 10	271 57	217 59	0.835	0.4654	0.0172	11 8819	0.4487	0.1852	0.0028	0.9173	98.73	99.71	2463 3	75 7	2595 1	35 4	2699 8	0 0		
Cycle 11	255 17	208 04	0.849	0.4544	0.0163	11 5429	0.4238	0.1842	0.0029	0.9090	98.81	99.73	2414 7	72 3	2568 1	34 3	2691 4	0 0		
Cycle 12	241 75	194 65	0.839	0.4874	0.0178	12 3428	0.4601	0.1837	0.0028	0.9119	99.17	99.81	2559 6	77 3	2630 8	35 0	2686 1	0 0		
Cycle 13	246 38	197 14	0.833	0.4732	0.0170	11 8901	0.4369	0.1822	0.0028	0.9078	98.43	99.65	2497 7	74 2	2595 8	34 4	2673 3	0 0		
Cycle 14	256 93	205 10	0.832	0.4774	0.0174	11 9436	0.4458	0.1814	0.0028	0.9144	98.64	99.70	2516 1	76 0	2600 0	35 0	2666 0	0 0		
08P4 7	206 09	165 88	0.838	0.3964	0.0139	9 7479	0.3607	0.1784	0.0032	0.8776	96.09	99.13	2152 2	64 2	2411 2	34 1	2637 8	0 0		
Cycle 2	193 26	153 76	0.829	0.4175	0.0150	10 3325	0.3864	0.1795	0.0032	0.8835	97.25	99.39	2248 9	68 1	2465 0	34 6	2648 4	0 0		
Cycle 3	180 63	143 00	0.825	0.4491	0.0168	11 0430	0.4291	0.1783	0.0033	0.8858	97.19	99.38	2391 2	74 6	2526 8	36 2	2637 5	0 0		
Cycle 4	168 87	137 78	0.850	0.4614	0.0172	11 3339	0.4386	0.1781	0.0033	0.8829	97.89	99.54	2445 8	76 1	2551 0	36 1	2635 7	0 0		
Cycle 5	166 70	135 31	0.845	0.4566	0.0170	11 5050	0.4405	0.1828	0.0033	0.8831	98.52	99.67	2424 3	75 1	2565 0	35 8	2678 1	0 0		
Cycle 6	151 45	118 32	0.814	0.4526	0.0164	11 2989	0.4229	0.1811	0.0034	0.8716	98.33	99.63	2406 7	72 7	2548 1	34 9	2662 7	0 0		
Cycle 7	152 04	117 03	0.802	0.4693	0.0175	11 8323	0.4556	0.1829	0.0034	0.8780	97.97	99.54	2480 5	76 6	2591 2	36 0	2679 0	0 0		
Cycle 8	160 06	121 79	0.793	0.4793	0.0183	11 8932	0.4725	0.1800	0.0034	0.8848	97.34	99.41	2524 2	79 9	2596 0	37 2	2652 6	0 0		
Cycle 9	157 51	122 04	0.807	0.4842	0.0184	12 1607	0.4745	0.1821	0.0033	0.8871	98.39	99.64	2545 7	79 7	2616 9	36 6	2672 4	0 0		
Cycle 10	158 29	123 08	0.810	0.4740	0.0175	12 0660	0.4595	0.1846	0.0033	0.8838	98.56	99.67	2501 0	76 7	2609 6	35 7	2694 9	0 0		
Cycle 11	154 67	122 79	0.827	0.4716	0.0171	11 8009	0.4398	0.1815	0.0033	0.8789	98.93	99.76	2490 6	75 0	2588 7	34 9	2666 5	0 0		
Cycle 12	158 29	123 35	0.812	0.4777	0.0176	12 0500	0.4548	0.1830	0.0033	0.8863	98.99	99.78	2517 2	76 7	2608 3	35 4	2679 8	0 0		
Cycle 13	155 32	121 73	0.816	0.4931	0.0185	12 4785	0.4798	0.1835	0.0033	0.8914	98.88	99.75	2584 1	79 9	2641 1	36 1	2685 0	0 0		
Cycle 14	157 65	121 56	0.803	0.4977	0.0186	12 4791	0.4767	0.1818	0.0032	0.8933	99.23	99.83	2604 0	80 1	2641 2	35 9	2669 7	0 0		
08P4 d7	240 87	224 41	0.971	0.4900	0.0214	12 3837	0.5529	0.1833	0.0037	0.8984	99.43	99.87	2570 8	92 6	2633 9	41 9	2682 8	33 0		
Cycle 2	218 71	199 44	0.950	0.4799	0.0207	12 0752	0.5343	0.1825	0.0038	0.8844	98.96	99.77	2526 8	90 0	2610 3	41 5	2675 6	34 8		
Cycle 3	208 97	180 71	0.901	0.4972	0.0221	12 6911	0.5753	0.1851	0.0039	0.8894	99.57	99.90	2601 7	95 0	2657 0	42 7	2699 4	34 9		
Cycle 4	197 78	164 19	0.865	0.4861	0.0213	12 0717	0.5431	0.1801	0.0039	0.8824	99.29	99.85	2553 8	92 5	2610 0	42 2	2653 9	35 8		
Cycle 5	184 02	160 33	0.908	0.4761	0.0203	11 9886	0.5234	0.1826	0.0040	0.8710	99.40	99.87	2510 0	88 5	2603 5	40 9	2677 0	36 3		
Cycle 6	191 37	152 23	0.829	0.5046	0.0226	12 5842	0.5777	0.1809	0.0039	0.8853	99.44	99.88	2633 6	97 0	2649 0	43 2	2660 9	36 1		
Cycle 7	186 45	157 81	0.882	0.4842	0.0209	12 2181	0.5428	0.1830	0.0040	0.8735	99.14	99.81	2545 7	90 9	2621 3	41 7	2680 2	36 5		
Cycle 8	181 02	145 69	0.838	0.4830	0.0208	11 8555	0.5225	0.1780	0.0039	0.8724	99.54	99.90	2540 5	90 3	2593 1	41 3	2634 4	36 6		
Cycle 9	181 52	141 88	0.814	0.5185	0.0237	12 7467	0.5956	0.1783	0.0039	0.8881	99.48	99.89	2692 6	100 5	2661 1	44 0	2637 3	36 3		
Cycle 10	182 46	142 67	0.815	0.5002	0.0223	12 5939	0.5720	0.1826	0.0040	0.8835	99.90	99.98	2614 5	95 7	2649 8	42 7	2676 8	35 9		
Cycle 11	177 64	138 14	0.810	0.4948	0.0216	12 3662	0.5533	0.1813	0.0040	0.8741	99.64	99.92	2591 5	93 3	2632 6	42 0	2664 4	36 8		
Cycle 12	181 19	137 30	0.789	0.4879	0.0213	12 3900	0.5549	0.1842	0.0041	0.8737	99.34	99.85	2561 7	92 3	2634 4	42 1	2690 8	36 8		
Cycle 13	184 28	143 92	0.814	0.5145	0.0232	13 0162	0.6031	0.1835	0.0041	0.8796	98.88	99.75	2675 7	98 7	2680 8	43 7	2684 7	37 1		
Cycle 14	181 30	142 29	0.818	0.4760	0.0203	11 9318	0.5224	0.1818	0.0040	0.8680	99.54	99.90	2510 0	88 8	2599 1	41 0	2669 2	36 8		
Cycle 15	173 36	141 56	0.851	0.4741	0.0201	11 9034	0.5173	0.1821	0.0041	0.8630	99.48	99.88	2501 4	87 8	2596 8	40 7	2672 1	37 2		
Cycle 16	169 99	140 02	0.858	0.4577	0.0189	11 6520	0.4931	0.1846	0.0041	0.8576	99.80	99.96	2429 5	83 6	2576 9	39 6	2694 9	36 9		
Cycle 17	162 18	138 26	0.888	0.4655	0.0194	11 7237	0.5044	0.1827	0.0043	0.8472	99.25	99.83	2463 9	85 5	2582 6	40 3	2677 1	38 8		
Cycle 18	169 93	128 75	0.789	0.4757	0.0212	12 3646	0.5661	0.1885	0.0044	0.8694	99.44	99.87	2508 6	92 8	2632 5	43 0	2729 2	38 1		
Cycle 19	154 21	122 55	0.828	0.4330	0.0182	10 8915	0.4715	0.1824	0.0044	0.8409	99.76	99.95	2319 1	82 0	2513 9	40 3	2675 2	39 9		
Cycle 20	146 13	119 57	0.852	0.4366	0.0186	10 6720	0.4688	0.1773	0.0044	0.8339	99.36	99.86	2335 3	83 3	2495 0	40 8	2627 7	41 5		
Cycle 21	143 24	119 08	0.866	0.4348	0.0184	11 0276	0.4793	0.1840	0.0045	0.8363	100.00	100.00	2327 2	82 8	2525 5	40 5	2688 9	40 6		
Cycle 22	142 31	115 00	0.842	0.4386	0.0188	10 9866	0.4828	0.1817	0.0045	0.8396	99.88	99.97	2344 5	84 1	2522 0	40 9	2668 1	40 7		
Cycle 23	133 94	118 14	0.919	0.4082	0.0166	10 4221	0.4375	0.1852	0.0047	0.8130	99.57	99.90	2206 8	76 0	2473 0	38 9	2699 7	41 8		
Cycle 24	145 74	115 45	0.825	0.4611	0.0206	11 6739	0.5368	0.1836	0.0045	0.8533	99.56	99.90	2444 3	91 0	2578 6	43 0	2686 0	40 7		
Cycle 25	124 93	108 96	0.908	0.3993	0.0162	10 2233	0.4294	0.1857	0.0048	0.8072	99.61	99.91	2166 0	74 8	2455 2	38 9	2704 2	42 4		
Cycle 26	157 85	121 05	0.799	0.4983	0.0242	12 4366	0.6178	0.1810	0.0044	0.8806	100.00	100.00	2606 4	104 3	2638 0	46 7	2662 3	39 8		
Cycle 27	147 78	118 11	0.833	0.5155	0.0251	12 8873	0.6421	0.1831	0.0045	0.8758	99.75	99.94	2680 1	106 8	2671 4	46 9	2664 9	40 7		
Cycle 28	165 69	129 41	0.814	0.5145	0.0252	12 9917	0.6520	0.1831	0.0043	0.8865	99.38	99.86	2676 0	107 3	2679 1	47 3	2681 4	39 1		
Cycle 29	185 21	148 33	0.834	0.4928	0.0227	12 3933	0.5832	0.1824	0.0041	0.8850	99.89	99.98	2582 8	98 1	2634 7	44 2	2674 8	37 0		
Cycle																				

Appendix

Table 3 SIMS U-Pb isotope data of zircon from depth-profiling of samples from Abitibi Subprovince

Sample*	U		Th		Th/U		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb*		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁶ Pb		% Radiogenic ²⁰⁷ Pb		²⁰⁶ Pb/U		²⁰⁷ Pb/U		²⁰⁶ Pb/ ²⁰⁷ Pb†	
	(est ppm)	(est ppm)	(est ppm)	(est ppm)	value	1 s.e	value	1 s.e	value	1 s.e	value	1 s.e		Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e
08P4 9	342 85	157 77	0 479	0 3510	0 0109		8 5048	0 2743	0 1757	0 0024	0 9055		97 61	99 48	1939 5	52 2	2286 4	29 3	2612 9	24 3			
Cycle 2	313 63	141 24	0 469	0 3616	0 0115		8 7571	0 2881	0 1756	0 0025	0 9077		98 16	99 60	1989 8	54 6	2313 0	30 0	2612 1	24 5			
Cycle 3	284 35	126 15	0 462	0 3494	0 0107		8 5995	0 2715	0 1785	0 0026	0 8946		98 35	99 64	1931 9	51 0	2296 5	28 7	2638 9	25 5			
Cycle 4	274 98	115 95	0 439	0 3755	0 0124		9 1947	0 3125	0 1776	0 0026	0 9076		98 43	99 66	2055 4	58 1	2357 6	31 1	2630 3	25 6			
Cycle 5	271 79	111 92	0 429	0 3787	0 0126		9 4246	0 3202	0 1805	0 0026	0 9080		98 98	99 78	2070 3	58 7	2380 2	31 2	2657 4	26 0			
Cycle 6	246 86	105 85	0 447	0 3811	0 0121		9 4825	0 3093	0 1804	0 0027	0 8925		99 26	99 84	2081 6	56 6	2385 9	30 0	2657 0	27 0			
Cycle 7	246 14	98 53	0 417	0 4007	0 0137		9 9801	0 3509	0 1806	0 0027	0 9060		98 82	99 74	2172 4	63 2	2432 9	32 4	2658 6	27 2			
Cycle 8	236 55	98 42	0 433	0 3975	0 0134		9 8158	0 3408	0 1791	0 0028	0 8997		98 94	99 77	2157 3	62 0	2417 6	32 0	2644 7	27 5			
Cycle 9	233 93	94 21	0 419	0 4023	0 0138		10 2224	0 3594	0 1843	0 0029	0 9011		98 89	99 75	2179 6	63 4	2455 1	32 5	2691 9	28 5			
Cycle 10	225 15	92 01	0 426	0 4097	0 0141		10 5046	0 3696	0 1859	0 0029	0 9015		99 38	99 86	2213 7	64 5	2480 3	32 6	2706 6	28 8			
Cycle 11	210 00	88 19	0 437	0 4141	0 0142		10 5068	0 3693	0 1840	0 0029	0 8974		99 28	99 84	2233 5	64 9	2480 5	32 6	2689 6	29 0			
Cycle 12	206 73	81 66	0 411	0 4352	0 0156		11 0545	0 4051	0 1842	0 0029	0 9041		99 09	99 80	2329 0	70 0	2527 7	34 1	2691 4	29 3			
Cycle 13	204 89	78 42	0 399	0 4246	0 0149		10 7957	0 3904	0 1844	0 0030	0 8961		98 60	99 69	2281 2	67 6	2505 7	33 6	2693 0	30 0			
Cycle 14	200 57	70 72	0 367	0 4514	0 0167		11 5011	0 4345	0 1848	0 0030	0 9078		99 37	99 86	2401 6	74 2	2564 7	35 3	2696 2	29 7			
08P4-10	312 91	175 03	0 583	0 3841	0 0123		9 8658	0 3244	0 1863	0 0025	0 9128		98 43	99 64	2095 5	57 4	2422 3	30 3	2709 6	25 3			
Cycle 2	291 74	145 85	0 521	0 4189	0 0139		10 3838	0 3530	0 1798	0 0025	0 9150		98 67	99 71	2255 6	63 2	2469 6	31 5	2650 8	25 0			
Cycle 3	268 80	120 94	0 469	0 4351	0 0147		11 0156	0 3811	0 1836	0 0026	0 9151		98 53	99 67	2328 8	66 1	2524 5	32 2	2685 7	25 9			
Cycle 4	252 12	114 49	0 473	0 4436	0 0148		11 3181	0 3853	0 1850	0 0026	0 9103		98 87	99 75	2366 9	66 0	2549 7	31 8	2698 5	26 4			
Cycle 5	245 29	103 59	0 440	0 4452	0 0148		11 4019	0 3875	0 1857	0 0027	0 9069		98 77	99 72	2373 9	66 0	2556 6	31 7	2704 8	27 0			
Cycle 6	241 15	96 09	0 415	0 4697	0 0164		11 9687	0 4253	0 1848	0 0027	0 9145		98 90	99 75	2482 4	71 8	2602 0	33 3	2696 4	26 9			
Cycle 7	230 09	91 78	0 416	0 4700	0 0161		12 0233	0 4221	0 1855	0 0028	0 9080		98 58	99 68	2483 5	70 7	2606 2	32 9	2703 1	27 7			
Cycle 8	226 13	88 01	0 405	0 4893	0 0173		12 3634	0 4462	0 1833	0 0027	0 9134		98 93	99 76	2567 6	74 9	2632 4	33 9	2682 6	27 3			
Cycle 9	212 76	78 66	0 385	0 4647	0 0156		11 8111	0 4055	0 1844	0 0028	0 9020		99 13	99 80	2460 1	68 8	2589 5	32 1	2692 4	27 8			
Cycle 10	212 90	77 93	0 381	0 4792	0 0167		12 1068	0 4307	0 1832	0 0028	0 9092		99 25	99 83	2523 8	72 9	2612 7	33 4	2682 4	27 5			
Cycle 11	206 09	75 00	0 379	0 4869	0 0171		12 4023	0 4453	0 1847	0 0028	0 9088		99 15	99 81	2557 2	74 3	2635 3	33 7	2695 9	28 1			
Cycle 12	206 39	73 77	0 372	0 4871	0 0173		12 5837	0 4553	0 1874	0 0028	0 9106		99 37	99 86	2558 1	75 1	2649 0	34 0	2719 2	28 4			
Cycle 13	196 58	70 67	0 374	0 4815	0 0166		12 0383	0 4236	0 1813	0 0028	0 8987		99 02	99 78	2533 9	72 1	2607 4	33 0	2665 0	28 4			
Cycle 14	194 55	66 89	0 358	0 4896	0 0174		12 3523	0 4469	0 1830	0 0028	0 9060		99 23	99 83	2568 8	75 2	2631 6	34 0	2680 2	28 5			
08P4-11	317 89	249 92	0 819	0 4234	0 0135		10 5256	0 3547	0 1803	0 0027	0 8946		94 08	98 65	2275 7	61 3	2482 2	31 2	2655 8	27 3			
Cycle 2	300 28	239 77	0 832	0 4170	0 0130		10 4144	0 3431	0 1811	0 0028	0 8885		94 27	98 69	2246 9	59 2	2472 3	30 5	2663 2	27 6			
Cycle 3	302 31	246 88	0 851	0 4233	0 0136		10 5825	0 3581	0 1813	0 0028	0 8934		94 08	98 64	2275 2	61 5	2487 2	31 4	2665 1	27 8			
Cycle 4	286 65	245 06	0 891	0 4134	0 0129		10 3222	0 3413	0 1811	0 0028	0 8867		94 30	98 70	2230 3	59 0	2464 1	30 6	2663 0	27 9			
Cycle 5	281 82	242 82	0 898	0 4164	0 0131		10 4172	0 3449	0 1814	0 0028	0 8888		94 85	98 82	2244 3	59 6	2472 6	30 7	2666 0	27 8			
Cycle 6	275 39	243 66	0 922	0 4146	0 0130		10 2827	0 3400	0 1799	0 0028	0 8845		94 60	98 78	2235 8	59 2	2460 5	30 6	2651 9	28 0			
Cycle 7	276 42	247 75	0 934	0 4335	0 0143		10 6197	0 3721	0 1777	0 0029	0 8878		92 86	98 38	2321 3	64 1	2490 4	32 5	2631 4	28 8			
Cycle 8	266 22	252 72	0 989	0 4153	0 0131		10 4878	0 3457	0 1832	0 0028	0 8867		95 53	98 98	2239 1	59 5	2478 8	30 6	2681 7	28 2			
Cycle 9	263 89	237 79	0 939	0 4214	0 0135		10 5484	0 3510	0 1816	0 0027	0 8933		96 48	99 21	2266 6	61 1	2484 2	30 9	2667 2	27 5			
Cycle 10	250 85	235 87	0 979	0 4093	0 0128		10 2776	0 3379	0 1821	0 0029	0 8813		95 15	98 89	2211 8	58 4	2460 1	30 4	2672 2	28 6			
Cycle 11	262 47	248 66	0 987	0 4244	0 0140		10 4669	0 3619	0 1789	0 0028	0 8939		95 13	98 91	2280 4	63 3	2477 0	32 0	2642 5	28 0			
Cycle 12	249 51	235 37	0 983	0 4261	0 0139		10 8101	0 3711	0 1840	0 0029	0 8903		95 17	98 89	2288 1	63 0	2506 9	31 9	2689 2	29 0			
Cycle 13	241 61	242 48	1 045	0 4271	0 0140		10 6910	0 3687	0 1815	0 0029	0 8881		94 77	98 81	2292 8	63 2	2496 6	32 0	2666 9	29 0			
Cycle 14	234 33	233 99	1 040	0 4268	0 0140		10 5584	0 3674	0 1794	0 0030	0 8820		93 85	98 60	2291 4	63 2	2485 1	32 3	2647 4	29 7			
08P4 12	276 57	393 19	1 481	0 3916	0 0126		9 8710	0 3277	0 1828	0 0026	0 9032		98 29	99 62	2130 2	58 5	2422 8	30 6	2678 7	26 4			
Cycle 2	267 30	340 78	1 328	0 4109	0 0135		10 3548	0 3476	0 1828	0 0026	0 9081		99 16	99 81	2219 1	61 7	2467 0	31 1	2678 1	26 1			
Cycle 3	252 17	302 17	1 248	0 4292	0 0145		11 0048	0 3803	0 1860	0 0027	0 9113		99 01	99 78	2302 2	65 5	2523 5	32 2	2706 7	26 8			
Cycle 4	246 11	286 17	1 211	0 4431	0 0153		11 1520	0 3946	0 1825	0 0027	0 9120		98 90	99 75	2364 4	68 5	2535 9	33 0	2676 1	26 8			
Cycle 5	230 93	265 34	1 197	0 4381	0 0147																		

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from depth-profiling of samples from Abitibi Subprovince.

Sample#	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb		Correlation of Concordia Ellipses	% Radiogenic	% Radiogenic	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb		
	(est ppm)	(est ppm)	(est ppm)	value	1 s.e	value	1 s.e	value	1 s.e	% Pb		% Pb	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e		
Cycle 14	42 25	13 28	0 327	0 3804	0 0247	9 7610	0 7501	0 1861	0 0085	0 8040	88 49	97 16	2078 1	115 1	2412 5	70 8	2708 0	85 2		
08PA 15	271 26	166 20	0 638	0 5029	0 0189	12 0979	0 5025	0 1745	0 0036	0 8658	87 54	97 09	2626 2	81 0	2612 0	39 0	2601 1	36 4		
	252 37	173 06	0 714	0 4865	0 0173	11 9085	0 4639	0 1775	0 0036	0 8596	89 94	97 66	2555 4	75 1	2597 2	36 5	2630 0	35 5		
Cycle 3	259 19	166 48	0 669	0 5339	0 0207	13 2471	0 5494	0 1799	0 0034	0 8886	91 47	98 02	2757 9	87 1	2697 4	39 2	2652 4	34 4		
Cycle 4	253 69	169 32	0 695	0 5297	0 0201	12 9043	0 5261	0 1767	0 0034	0 8798	91 07	97 95	2740 4	84 7	2672 7	38 4	2621 9	34 4		
Cycle 5	248 51	166 80	0 699	0 5098	0 0186	12 4419	0 4864	0 1770	0 0034	0 8739	92 04	98 19	2655 7	79 3	2638 3	36 7	2625 1	33 9		
Cycle 6	244 53	154 19	0 657	0 5274	0 0197	13 2443	0 5196	0 1821	0 0033	0 8880	94 24	98 67	2730 5	83 0	2697 2	37 0	2672 4	33 2		
Cycle 7	246 18	153 64	0 660	0 5475	0 0211	13 6454	0 5540	0 1808	0 0033	0 8944	93 84	98 59	2814 8	88 0	2725 4	38 4	2659 8	33 1		
Cycle 8	239 81	152 24	0 651	0 5365	0 0204	13 1411	0 5303	0 1776	0 0033	0 8871	93 07	98 43	2768 8	85 7	2689 8	38 1	2631 0	33 3		
Cycle 9	239 29	156 57	0 682	0 5115	0 0188	12 5607	0 4889	0 1781	0 0033	0 8808	93 52	98 53	2663 1	80 0	2647 3	36 6	2635 2	33 1		
Cycle 10	252 81	156 48	0 645	0 5444	0 0213	13 3556	0 5472	0 1779	0 0032	0 8990	94 36	98 73	2801 9	88 8	2705 1	38 7	2633 6	32 2		
Cycle 11	237 56	150 26	0 659	0 5015	0 0180	12 3208	0 4669	0 1782	0 0033	0 8776	94 22	98 70	2620 2	77 1	2629 2	35 6	2636 0	32 7		
Cycle 12	254 56	156 34	0 640	0 5354	0 0205	13 3835	0 5326	0 1813	0 0032	0 8985	95 96	98 99	2764 0	85 9	2707 1	37 6	2664 9	32 0		
Cycle 13	244 61	148 09	0 631	0 5228	0 0194	12 9940	0 5063	0 1803	0 0032	0 8902	94 33	98 85	2711 2	82 3	2679 2	36 7	2655 2	32 3		
Cycle 14	250 06	142 26	0 593	0 5549	0 0220	13 6786	0 5661	0 1788	0 0032	0 9040	94 87	98 85	2845 6	91 3	2727 7	39 2	2641 6	31 9		
09CON	Timskarring greywackes interbedded with conglomerate										Chaput Hughes (NAD83) Zone 17 UTM 569041E 5330996N)									
09CON 1	245 68	295 21	1 202	0 3683	0 0126	85 0934	1 0356	0 1734	0 0031	0 8766	95 86	99 10	2021 6	59 4	2317 9	33 1	2590 4	29 4		
Cycle 2	218 52	255 26	1 168	0 3606	0 0121	89 7187	1 1484	0 1733	0 0032	0 8575	95 67	99 06	1985 0	57 2	2298 2	32 5	2589 7	31 1		
Cycle 3	197 24	221 49	1 123	0 3850	0 0136	92 9181	1 2197	0 1771	0 0034	0 8651	95 77	99 06	2099 6	63 2	2378 0	34 4	2626 0	31 6		
Cycle 4	179 10	200 00	1 117	0 3898	0 0139	95 8519	1 2962	0 1798	0 0034	0 8642	96 92	99 25	2121 8	64 4	2403 4	34 6	2651 4	31 8		
Cycle 5	168 99	182 78	1 082	0 3857	0 0138	95 3879	1 3283	0 1788	0 0035	0 8587	96 67	99 26	2102 7	64 4	2388 3	34 8	2641 6	32 7		
Cycle 6	167 96	183 95	1 095	0 3982	0 0147	95 8575	1 3658	0 1790	0 0036	0 8621	96 95	99 33	2160 8	67 9	2418 6	35 9	2643 3	33 3		
Cycle 7	154 20	163 23	1 059	0 3964	0 0146	99 3996	1 4531	0 1772	0 0038	0 8451	95 10	98 91	2152 5	67 6	2405 4	36 6	2627 0	35 8		
Cycle 8	153 36	158 50	1 033	0 4072	0 0153	97 3261	1 4410	0 1741	0 0037	0 8516	96 11	99 16	2202 1	70 1	2413 8	36 9	2597 4	35 5		
Cycle 9	145 56	146 10	1 004	0 4177	0 0160	98 9093	1 4756	0 1782	0 0037	0 8603	97 14	99 37	2250 2	72 9	2458 8	37 3	2636 2	34 7		
Cycle 10	135 44	146 94	1 085	0 3988	0 0147	101 1106	1 5429	0 1761	0 0037	0 8445	97 50	99 46	2163 5	67 8	2404 9	35 7	2616 2	35 3		
Cycle 11	143 30	137 79	0 962	0 4303	0 0172	95 1741	1 4286	0 1761	0 0037	0 8679	96 87	99 32	2307 2	77 5	2475 3	38 9	2616 4	35 2		
Cycle 12	139 92	141 51	1 011	0 4322	0 0171	100 7451	1 5247	0 1778	0 0039	0 8573	95 72	99 05	2315 6	76 9	2488 0	39 0	2632 0	36 4		
Cycle 13	136 89	131 80	0 963	0 4221	0 0164	101 7091	1 5421	0 1809	0 0038	0 8585	97 04	99 34	2270 0	74 3	2482 6	37 9	2661 6	35 3		
Cycle 14	137 90	134 84	0 978	0 4254	0 0162	102 4906	1 5560	0 1795	0 0037	0 8583	97 90	99 54	2271 2	73 2	2476 0	37 0	2648 7	34 6		
09CON spl	234 37	181 37	0 774	0 4342	0 0119	96 0706	1 2583	0 1766	0 0037	0 8311	91 31	98 01	1954 6	56 9	2299 3	34 4	2621 2	35 2		
Cycle 2	209 70	167 29	0 798	0 3815	0 0134	101 2540	1 3998	0 1775	0 0038	0 8359	93 02	98 42	2083 1	62 5	2371 8	35 3	2630 0	35 5		
Cycle 3	192 66	144 86	0 752	0 3863	0 0138	101 4574	1 4653	0 1777	0 0038	0 8385	95 03	98 89	2195 6	64 2	2383 9	35 4	2631 1	35 3		
Cycle 4	172 52	127 57	0 739	0 4272	0 0166	104 3146	1 5431	0 1846	0 0039	0 8608	96 22	99 13	2292 9	74 9	2512 4	38 1	2695 0	34 9		
Cycle 5	144 52	115 72	0 801	0 3850	0 0138	113 5192	1 7853	0 1809	0 0041	0 8135	95 32	98 94	2099 6	64 2	2397 3	35 6	2660 7	38 0		
Cycle 6	146 72	109 91	0 749	0 4271	0 0168	106 0094	1 6852	0 1793	0 0041	0 8444	96 08	99 13	2292 6	76 0	2485 0	38 9	2646 2	37 9		
Cycle 7	136 53	101 61	0 744	0 4344	0 0173	110 1781	1 8084	0 1804	0 0042	0 8415	96 92	99 31	2325 7	77 6	2506 6	39 0	2656 7	38 3		
Cycle 8	129 08	90 82	0 704	0 4443	0 0181	111 8767	1 8648	0 1821	0 0043	0 8425	96 56	99 22	2369 9	80 8	2536 4	40 2	2675 5	39 2		
Cycle 9	120 88	86 36	0 714	0 4363	0 0177	111 1647	1 8949	0 1782	0 0044	0 8323	96 11	99 14	2334 1	79 5	2499 4	40 2	2636 5	40 6		
Cycle 10	120 30	85 94	0 714	0 4383	0 0180	111 3465	1 9364	0 1793	0 0043	0 8359	97 43	99 43	2343 2	80 6	2509 1	40 1	2646 2	40 2		
Cycle 11	122 12	85 67	0 702	0 4815	0 0214	111 8115	1 9479	0 1855	0 0045	0 8585	97 38	99 40	2533 7	93 2	2628 8	43 6	2702 9	40 1		
Cycle 12	109 08	81 08	0 743	0 4313	0 0178	113 9391	2 0607	0 1767	0 0046	0 8189	96 34	99 20	2311 6	80 1	2480 4	40 9	2621 7	42 9		
Cycle 13	111 08	76 31	0 687	0 4508	0 0196	111 0096	2 0009	0 1808	0 0047	0 8364	96 18	99 14	2399 0	87 0	2543 3	43 1	2660 5	42 7		
Cycle 14	106 33	75 92	0 714	0 4582	0 0200	116 1938	2 1236	0 1841	0 0048	0 8354	96 59	99 22	2431 6	88 5	2575 3	43 2	2690 5	42 8		
09CON 2	283 27	378 79	1 337	0 3946	0 0134	108 6530	1 1808	0 1823	0 0038	0 8466	92 66	95 59	2144 2	62 0	2427 2	36 4	2673 8	34 8		
Cycle 2	284 99	307 33	1 078	0 4168	0 0141	110 5650	1 2014	0 1850	0 0035	0 8659	87 34	96 86	2245 9	64 2	2491 3	34 9	2698 0	31 2		
Cycle 3	280 55	257 37	0 917	0 4523	0 0160	109 6987	1 2019	0 1805	0 0034	0 8771	88 40	97 22	2405 4	71 0	2544 6	36 1	2657 5	30 9		
Cycle 4	254 86	220 01	0 863	0 4513	0 0153	116 5988	1 3004	0 1838	0 0033	0 8727	90 22	97 65	2401 1	68 2	2559 3	34 5	2687 1	29 9		
Cycle 5	256 04	184 79	0 722	0 4973	0 0183	112 9950	1 2554	0 1857	0 0032	0 8992	92 65	98 25	2602 2	79 0	2660 0	36 7	2704 3	28 3		
Cycle 6	255 10	161 18	0 632	0 4854	0 0174	114 9573	1 2863	0 1866	0 0032	0 8940	93 01	98 33	2550 8	75 6	2642 0	35 7	2712 5	28 2		
Cycle 7	254 61	148 44	0 583	0 4944	0 0183	111 3207	1 2430	0 1852	0 0032	0 9003	93 19	98 39	2589 7	78 8	2652 2	36 6	2700 3	28 2		
Cycle 8	235 88	130 59	0 554	0 4965	0 0178	117 0288	1 3372	0 1864	0 0031	0 8960	94 96	98 82	2598 6	76 5	2662 3	35 2	2711 0	27 6		
Cycle 9	237 60	128 92	0 543	0 5181	0 0193	115 4597	1 3221	0 1853	0 0031	0 9024	94 66	98 75	2691 0	82 0	2696 8	36 8	2701 1	27 9		
Cycle 10	232 44	114 50	0 493	0 5141	0 0190	113 1927	1 3129	0 1805	0 0031	0 8984	94 64	98 78	2674 0	81 1	2664 8	36 5	2657 8	28 5		
Cycle 11	217 33	105 02	0 483	0 5024	0 0182	118 6359	1 3924	0 1873	0 0032	0 8940	95 11	98 85	2624 3	78 2	2677 8	35 7	2718 4	28 3		
Cycle 12	210 43	97 97	0 466	0 4961	0 0177	119 2949	1 4222	0 1855	0 0032	0 8882	95 24	98 89	2597 1	76 5	2656 6	35 2	2702 3	28 7		
Cycle 13	207 10	100 79	0 487	0 4947	0 0176	121 9777	1 4751	0 1876	0 0033	0 8863	95 98	99 06	2591 0	75 8	2665 0	34 9	2721 7	28 6		
Cycle 14	200 55	97 95	0 488	0 4820	0 0167	123 2329	1 5198	0 1849	0 0033	0 8754	95 73	99 01	2535 8	72 7	2626 8	34 1	2697 7	29 4		
09CON 3	633 35	177 12	0 280	0 4423	0 0129	108 1684	0 7930	0 1852	0 0020	0 9366	95 84	99 04	2360 8	57 8	2547 8	28 0	2700 3	17 4		
Cycle 2	595 64	154 66	0 260	0 4689	0 0143	108 9236	0 8084	0 1852	0 0020	0 9415	96 37	99 16	2478 8	62 8	2602 6	29 2	2700			

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from depth-profiles of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		Correlation of % Radiogenic		% Radiogenic		²⁰⁶ Pb/ ²³⁸ U		% Radiogenic		²⁰⁶ Pb/ ²³⁸ U		% Radiogenic		²⁰⁶ Pb/ ²³⁸ U	
	(est ppm)	(est ppm)			value	1 s.e	value	1 s.e	value	1 s.e	Concordia Ellipses	²⁰⁶ Pb	²⁰⁷ Pb	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	
Cycle 11	303.03	40.82	0.135	0.5104	0.0171	116.8634	1.1747	0.1855	0.0025	0.9191	98.85	99.74	2658.3	72.8	2683.6	32.1	2702.7	22.4				
Cycle 12	293.32	37.13	0.127	0.5047	0.0168	116.2519	1.1833	0.1858	0.0025	0.9181	99.29	99.84	2634.0	72.1	2674.6	31.9	2705.5	22.5				
Cycle 13	280.34	36.05	0.129	0.4954	0.0165	116.3730	1.2052	0.1873	0.0026	0.9143	98.97	99.76	2593.9	71.3	2664.5	32.0	2718.5	23.0				
Cycle 14	261.63	36.63	0.140	0.5048	0.0171	118.4353	1.2623	0.1877	0.0027	0.9117	98.81	99.73	2634.4	73.4	2684.4	32.6	2722.3	23.7				
09CON 5	597.74	250.84	0.420	0.4239	0.0131	104.7463	0.8466	0.1805	0.0024	0.9127	89.76	97.57	2278.2	59.1	2484.5	30.3	2657.8	22.2				
Cycle 2	582.16	206.79	0.355	0.4684	0.0154	106.6490	0.8796	0.1814	0.0024	0.9244	91.41	97.98	2476.5	67.5	2581.8	32.2	2665.6	21.8				
Cycle 3	513.67	162.99	0.317	0.4624	0.0145	112.8083	0.9661	0.1853	0.0024	0.9189	93.69	98.52	2450.0	63.8	2589.7	30.5	2700.9	21.3				
Cycle 4	496.04	137.12	0.276	0.4854	0.0161	108.3973	0.9345	0.1843	0.0023	0.9294	94.77	98.79	2550.9	70.0	2630.0	32.2	2691.5	21.0				
Cycle 5	471.09	120.86	0.257	0.4815	0.0155	110.7100	0.9768	0.1836	0.0023	0.9249	95.79	99.03	2533.6	67.6	2618.8	31.2	2685.4	21.1				
Cycle 6	470.13	112.69	0.240	0.5047	0.0172	109.7027	0.9710	0.1853	0.0024	0.9321	95.67	99.00	2634.2	73.9	2672.2	33.1	2701.1	21.1				
Cycle 7	439.90	96.30	0.219	0.4854	0.0157	113.1387	1.0147	0.1868	0.0024	0.9254	96.66	99.23	2550.8	68.2	2643.0	31.2	2714.4	20.9				
Cycle 8	452.55	89.16	0.197	0.4997	0.0166	110.6902	0.9925	0.1846	0.0023	0.9302	96.98	99.31	2612.6	71.5	2659.1	32.1	2694.7	20.8				
Cycle 9	443.06	85.01	0.192	0.5072	0.0170	110.4158	0.9875	0.1842	0.0023	0.9325	97.24	99.37	2644.6	72.9	2671.0	32.3	2691.0	20.7				
Cycle 10	426.57	78.02	0.183	0.4944	0.0160	114.6694	1.0284	0.1868	0.0023	0.9268	97.20	99.36	2589.5	69.0	2659.9	31.2	2713.9	20.7				
Cycle 11	431.08	71.47	0.166	0.4939	0.0158	113.5277	1.0105	0.1846	0.0023	0.9277	97.62	99.46	2587.6	68.3	2648.2	30.8	2694.9	20.4				
Cycle 12	463.95	75.75	0.163	0.5054	0.0168	109.9292	0.9615	0.1838	0.0022	0.9349	97.64	99.47	2636.8	71.8	2665.6	31.9	2687.6	20.0				
Cycle 13	464.23	67.28	0.145	0.4993	0.0164	108.8941	0.9490	0.1830	0.0022	0.9352	98.21	99.60	2610.7	70.4	2650.0	31.4	2680.1	19.7				
Cycle 14	447.90	65.11	0.145	0.4843	0.0151	114.9329	1.0088	0.1865	0.0023	0.9269	97.90	99.52	2545.8	65.8	2638.9	30.0	2711.1	19.9				
09CON 6	270.36	257.08	0.951	0.3637	0.0119	86.8912	0.9831	0.1783	0.0028	0.8897	97.49	99.45	1999.5	56.1	2331.8	31.0	2636.9	26.0				
Cycle 2	257.65	238.91	0.927	0.3878	0.0132	89.4958	1.0236	0.1801	0.0029	0.8958	97.50	99.45	2112.6	61.2	2400.2	32.4	2654.0	26.3				
Cycle 3	239.03	234.57	0.981	0.3954	0.0133	93.0403	1.0851	0.1793	0.0029	0.8919	98.10	99.58	2148.0	61.4	2413.7	32.0	2646.2	26.4				
Cycle 4	233.86	236.44	1.011	0.3991	0.0134	94.9508	1.1121	0.1811	0.0029	0.8931	98.71	99.72	2164.8	61.7	2431.7	31.8	2663.3	26.1				
Cycle 5	236.03	232.61	0.986	0.4301	0.0152	96.4739	1.1220	0.1828	0.0029	0.9042	98.77	99.73	2306.0	68.3	2509.7	33.6	2678.9	25.9				
Cycle 6	227.33	239.50	1.054	0.4153	0.0139	99.5044	1.1668	0.1807	0.0029	0.8915	98.56	99.68	2239.2	63.4	2466.5	31.9	2659.5	26.3				
Cycle 7	227.88	234.07	1.027	0.4430	0.0156	99.3013	1.1505	0.1827	0.0028	0.9050	98.88	99.75	2364.1	69.7	2536.3	33.6	2677.1	25.7				
Cycle 8	222.68	234.15	1.052	0.4356	0.0148	101.7626	1.1901	0.1815	0.0028	0.8983	99.32	99.85	2330.9	66.6	2514.5	32.4	2666.2	25.8				
Cycle 9	223.56	225.69	1.010	0.4588	0.0163	100.2129	1.1684	0.1796	0.0028	0.9061	99.09	99.80	2434.3	72.0	2553.0	33.9	2648.7	25.8				
Cycle 10	225.87	233.64	1.034	0.4570	0.0163	100.6034	1.1616	0.1813	0.0028	0.9060	98.45	99.66	2426.3	72.0	2558.4	34.1	2664.7	25.9				
Cycle 11	224.62	241.14	1.074	0.4421	0.0149	106.5504	1.2395	0.1837	0.0029	0.8960	99.22	99.83	2360.2	66.5	2539.7	32.1	2686.4	25.7				
Cycle 12	229.15	243.27	1.062	0.4699	0.0167	101.4244	1.1679	0.1793	0.0027	0.9098	99.47	99.88	2483.3	73.2	2574.0	33.8	2646.3	25.3				
Cycle 13	226.64	235.07	1.037	0.4710	0.0168	102.4553	1.1765	0.1819	0.0028	0.9109	99.42	99.87	2488.0	73.7	2589.9	34.1	2670.6	25.2				
Cycle 14	217.75	241.56	1.109	0.4607	0.0158	107.3193	1.2484	0.1829	0.0028	0.9009	99.45	99.88	2442.7	69.8	2573.9	32.7	2679.0	25.6				
09CON 7	934.62	702.42	0.752	0.3784	0.0104	88.6007	0.5547	0.1746	0.0016	0.9483	96.31	99.20	2068.6	48.6	2349.0	25.7	2602.3	14.9				
Cycle 2	795.28	582.59	0.733	0.3949	0.0109	93.4579	0.6146	0.1754	0.0016	0.9444	96.70	99.28	2145.4	50.3	2392.4	25.9	2609.5	15.5				
Cycle 3	709.67	500.88	0.706	0.4134	0.0118	95.3411	0.6551	0.1772	0.0017	0.9456	97.63	99.48	2230.3	53.7	2443.8	26.8	2626.5	15.8				
Cycle 4	611.86	431.55	0.705	0.4054	0.0111	99.9091	0.7222	0.1770	0.0018	0.9339	97.39	99.43	2193.9	50.8	2424.8	25.8	2624.7	16.7				
Cycle 5	560.36	377.38	0.673	0.4231	0.0122	99.2344	0.7410	0.1774	0.0019	0.9362	97.21	99.39	2274.5	55.3	2466.6	27.3	2629.0	17.3				
Cycle 6	498.36	339.43	0.681	0.4241	0.0122	100.9580	0.7865	0.1769	0.0019	0.9308	97.49	99.45	2279.0	55.1	2465.9	27.2	2623.7	18.0				
Cycle 7	469.64	310.20	0.661	0.4254	0.0122	104.4324	0.8419	0.1789	0.0020	0.9253	97.48	99.44	2285.1	55.0	2479.6	27.1	2643.1	18.6				
Cycle 8	443.59	291.74	0.658	0.4366	0.0130	102.7738	0.8509	0.1786	0.0020	0.9276	97.63	99.48	2335.2	58.2	2502.0	28.3	2640.4	19.0				
Cycle 9	398.21	255.46	0.642	0.4263	0.0123	105.0546	0.9006	0.1791	0.0021	0.9198	98.16	99.60	2288.8	55.7	2482.3	27.4	2644.6	19.5				
Cycle 10	383.12	247.79	0.647	0.4390	0.0130	105.1353	0.9277	0.1774	0.0021	0.9197	98.43	99.66	2345.9	58.2	2500.4	28.1	2628.4	19.4				
Cycle 11	367.49	224.67	0.611	0.4424	0.0133	105.4378	0.9493	0.1788	0.0022	0.9190	98.28	99.62	2361.3	59.6	2515.2	28.7	2641.9	20.4				
Cycle 12	338.40	217.50	0.643	0.4352	0.0128	110.0054	1.0204	0.1812	0.0023	0.9112	98.89	99.76	2329.1	57.3	2512.5	27.8	2664.2	20.7				
Cycle 13	330.83	200.95	0.607	0.4469	0.0138	105.1365	0.9870	0.1789	0.0023	0.9170	98.53	99.68	2381.3	61.4	2525.3	29.4	2643.2	21.1				
Cycle 14	301.09	181.40	0.603	0.4374	0.0131	108.9047	1.0571	0.1791	0.0024	0.9063	98.69	99.71	2338.9	58.7	2506.0	28.5	2644.4	21.8				
09CON sp7	1096.41	818.11	0.746	0.3688	0.0101	85.6331	0.5515	0.1724	0.0016	0.9462	96.83	99.32	2023.8	47.5	2313.8	25.5	2580.7	15.2				
Cycle 2	976.52	700.75	0.718	0.3973	0.0110	91.2527	0.6053	0.1724	0.0016	0.9456	97.25	99.41	2156.4	50.9	2382.0	26.0	2581.1	15.5				
Cycle 3	874.17	628.65																				

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from depth-profiles of samples from Abukuh Subhorizon

Sample	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb		Correlation of Concordia Ellipse	% Radiogenic ²⁰⁶ Pb	% Radiogenic ²⁰⁷ Pb	²⁰⁶ Pb/238U		²⁰⁷ Pb/235U		²⁰⁶ Pb/ ²⁰⁷ Pb	
	(est ppm)	(est ppm)	value	1 s.e	value	1 s.e	value	1 s.e	Age (Ma)	1 s.e		Age (Ma)	1 s.e	Age (Ma)	1 s.e				
Cycle 10	154.65	184.19	1.191	0.4279	0.0157	113.0420	1.5457	0.1825	0.0040	0.8417	90.58	97.76	2296.2	70.9	2503.0	37.8	2675.3	36.6	
Cycle 11	155.94	167.84	1.076	0.4304	0.0161	108.0761	1.4791	0.1785	0.0040	0.8452	90.65	97.82	2307.7	72.4	2488.3	38.3	2639.2	36.9	
Cycle 12	148.30	158.92	1.072	0.4374	0.0163	110.9598	1.5313	0.1796	0.0039	0.8465	91.57	98.04	2339.2	72.9	2508.8	37.9	2649.1	36.3	
Cycle 13	144.90	151.35	1.045	0.4324	0.0158	113.4711	1.5817	0.1782	0.0040	0.8365	90.98	97.91	2316.5	71.2	2490.9	37.6	2636.3	37.2	
Cycle 14	148.33	152.58	1.029	0.4426	0.0166	111.5621	1.5533	0.1819	0.0039	0.8523	92.80	98.32	2362.3	74.2	2531.5	37.9	2670.1	35.5	
09CON 10	184.62	166.95	0.904	0.4169	0.0161	101.6920	1.3946	0.1776	0.0042	0.8412	88.10	97.19	2246.3	73.2	2453.7	40.5	2630.3	39.4	
Cycle 2	161.64	140.82	0.871	0.4185	0.0160	107.4515	1.5559	0.1814	0.0042	0.8384	91.04	97.89	2253.9	72.7	2477.4	39.3	2666.1	38.5	
Cycle 3	143.06	132.03	0.923	0.4323	0.0169	111.0878	1.6896	0.1810	0.0043	0.8361	92.30	98.21	2316.0	75.9	2505.0	39.8	2662.0	39.3	
Cycle 4	137.95	121.06	0.878	0.4676	0.0196	106.5428	1.6487	0.1784	0.0042	0.8542	93.06	98.42	2473.2	86.0	2564.6	42.4	2637.6	39.5	
Cycle 5	127.15	110.95	0.873	0.4624	0.0190	112.1215	1.7868	0.1791	0.0043	0.8430	93.46	98.51	2450.1	83.8	2558.2	41.6	2645.0	40.2	
Cycle 6	127.53	107.50	0.843	0.4731	0.0200	108.9609	1.7372	0.1817	0.0042	0.8588	95.26	98.92	2497.2	87.5	2592.9	42.1	2668.5	38.6	
Cycle 7	127.14	108.81	0.856	0.4657	0.0195	108.4351	1.7237	0.1809	0.0043	0.8549	94.71	98.79	2464.5	85.8	2574.1	41.9	2661.5	39.0	
Cycle 8	131.16	110.71	0.844	0.4878	0.0214	104.2441	1.6323	0.1818	0.0042	0.8719	94.96	98.85	2561.0	92.9	2622.1	43.8	2669.6	38.2	
Cycle 9	120.72	111.06	0.920	0.4455	0.0178	111.8139	1.7886	0.1828	0.0042	0.8467	96.04	99.10	2375.4	79.5	2542.6	39.6	2678.8	38.0	
Cycle 10	128.85	112.01	0.869	0.4930	0.0212	109.3633	1.7280	0.1807	0.0042	0.8653	95.23	98.92	2583.4	91.4	2626.1	42.8	2659.1	38.3	
Cycle 11	124.01	110.49	0.891	0.4711	0.0193	117.2546	1.8943	0.1816	0.0043	0.8435	94.61	98.77	2488.5	84.5	2588.2	41.1	2667.1	39.6	
Cycle 12	131.51	113.99	0.867	0.4697	0.0194	110.9887	1.7516	0.1836	0.0041	0.8600	96.19	99.13	2482.2	85.2	2596.0	40.8	2686.0	37.3	
Cycle 13	131.77	113.87	0.864	0.4634	0.0189	112.9440	1.7697	0.1833	0.0042	0.8517	94.71	98.78	2454.6	83.3	2581.8	40.8	2683.3	38.3	
Cycle 14	131.76	111.27	0.845	0.4804	0.0204	106.8894	1.6714	0.1821	0.0041	0.8687	96.03	99.10	2529.0	88.8	2609.4	42.0	2672.3	37.2	
09CON 11	360.22	472.61	1.312	0.3795	0.0115	94.7433	0.9406	0.1778	0.0025	0.8957	96.23	99.17	2074.1	53.8	2368.6	29.0	2632.6	23.6	
Cycle 2	332.57	403.66	1.214	0.3953	0.0120	99.1451	1.0051	0.1773	0.0026	0.8929	96.39	99.20	2147.6	55.6	2403.4	29.2	2627.8	24.0	
Cycle 3	314.29	360.86	1.148	0.4083	0.0126	103.1665	1.0609	0.1794	0.0027	0.8910	95.76	99.05	2207.0	57.9	2444.0	30.0	2647.5	24.7	
Cycle 4	289.75	318.99	1.101	0.4118	0.0127	1.7945	0.0000	0.0091	0.0113	0.1460	291.32	99.28	2223.1	57.8	739.2	156.0	1.0	0.0	
Cycle 5	286.31	296.02	1.034	0.4309	0.0140	102.4968	1.1092	0.1775	0.0027	0.8960	97.25	99.40	2310.0	63.0	2483.9	31.2	2629.4	25.1	
Cycle 6	252.69	271.89	1.076	0.4234	0.0135	108.0279	1.2128	0.1813	0.0028	0.8862	97.91	99.53	2275.8	60.9	2487.2	30.5	2664.7	25.6	
Cycle 7	233.16	245.13	1.051	0.4315	0.0141	106.2189	1.2240	0.1791	0.0028	0.8874	98.17	99.60	2312.5	63.4	2493.5	31.2	2644.4	26.2	
Cycle 8	223.40	233.57	1.046	0.4412	0.0147	107.8679	1.2772	0.1790	0.0029	0.8852	98.03	99.57	2356.2	65.7	2514.0	32.0	2643.9	27.0	
Cycle 9	211.00	226.80	1.075	0.4463	0.0152	108.6641	1.3196	0.1811	0.0030	0.8857	98.38	99.64	2378.8	67.7	2535.0	32.6	2662.5	27.4	
Cycle 10	197.09	215.93	1.096	0.4405	0.0148	109.8130	1.3750	0.1777	0.0031	0.8739	97.78	99.51	2352.7	66.4	2505.6	32.5	2632.0	28.7	
Cycle 11	192.01	207.87	1.083	0.4527	0.0157	109.6559	1.3995	0.1766	0.0031	0.8745	97.38	99.43	2407.5	69.7	2525.1	33.6	2621.1	29.6	
09CON 12	73.07	266.35	3.645	0.3158	0.0144	95.0426	2.0958	0.1662	0.0069	0.7203	85.41	96.69	1769.3	70.3	2140.9	53.0	2519.3	69.3	
Cycle 2	68.60	217.25	3.167	0.3583	0.0179	96.5445	2.1883	0.1787	0.0068	0.7706	89.53	97.54	1974.1	84.9	2320.1	54.2	2640.4	63.3	
Cycle 3	58.26	182.66	3.135	0.3790	0.0197	101.9445	2.4492	0.1734	0.0070	0.7616	89.41	97.58	2071.7	91.9	2344.3	56.6	2590.8	67.4	
Cycle 4	56.52	153.47	2.715	0.3896	0.0209	99.2741	2.4153	0.1751	0.0070	0.7747	90.21	97.76	2121.0	97.1	2378.2	58.0	2606.7	67.0	
Cycle 5	51.81	133.59	2.578	0.4023	0.0222	100.7617	2.5373	0.1745	0.0070	0.7806	91.94	98.19	2179.7	101.9	2404.6	58.2	2600.9	66.6	
Cycle 6	49.38	120.13	2.433	0.4179	0.0238	103.2694	2.6609	0.1765	0.0071	0.7872	92.46	98.29	2250.7	108.1	2450.1	59.7	2620.1	67.0	
Cycle 7	44.43	101.70	2.289	0.3996	0.0224	105.2914	2.8048	0.1722	0.0073	0.7652	91.75	98.16	2167.1	103.4	2386.1	59.7	2578.8	70.7	
Cycle 8	44.50	95.68	2.150	0.4266	0.0252	101.2816	2.7082	0.1771	0.0071	0.7990	94.51	98.77	2290.6	113.9	2472.9	60.5	2626.3	66.3	
Cycle 9	40.99	81.68	1.993	0.4272	0.0258	107.9027	2.9577	0.1857	0.0076	0.7978	94.34	98.67	2293.0	116.7	2517.8	62.0	2704.4	67.4	
Cycle 10	36.94	81.64	2.210	0.3947	0.0230	119.2363	3.4102	0.1856	0.0081	0.7617	93.20	98.39	2144.5	106.5	2444.1	61.0	2703.8	71.8	
Cycle 11	41.33	76.50	1.851	0.4612	0.0296	102.1842	2.8567	0.1788	0.0075	0.8116	94.36	98.73	2444.9	130.6	2553.8	65.8	2641.4	69.4	
Cycle 12	36.51	69.45	1.902	0.4284	0.0261	116.3960	3.3649	0.1787	0.0080	0.7711	92.78	98.35	2298.3	117.6	2484.9	63.9	2641.2	73.9	
Cycle 13	38.63	68.31	1.768	0.4426	0.0273	108.1630	3.0383	0.1848	0.0074	0.8084	96.54	99.21	2362.1	122.2	2546.5	61.8	2696.8	65.8	
Cycle 14	37.46	63.01	1.682	0.4275	0.0257	111.8929	3.1789	0.1749	0.0077	0.7729	92.88	98.41	2294.3	115.9	2462.9	63.0	2605.1	73.0	
09CON 13	241.64	303.85	1.257	0.3364	0.0110	88.9043	1.1220	0.1818	0.0032	0.8610	96.88	99.30	1869.3	52.9	2278.8	31.3	2669.7	29.4	
Cycle 2	194.61	238.31	1.225	0.3426	0.0113	96.1405	1.3098	0.1838	0.0034	0.8480	98.20	99.59	1899.3	54.0	2305.4	31.3	2687.6	30.7	
Cycle 3	177.23	203.99	1.151	0.3608	0.0127	96.0633	1.3615	0.1875	0.0036	0.8570	98.28	99.61	1985.8	60.2	2370.7	33.7	2720.4	31.8	
Cycle 4	150.62	178.34	1.184	0.3687	0.0130	101.9433	1.5475	0.1830	0.0037	0.8402	98.77	99.72	2023.2	61.4	2368.4	33.7	2680.6	33.8	
Cycle 5	132.24	155.28	1.174	0.3755	0.0137	103.2958	1.6318	0.1819	0.0039	0.8353	98.58	99.69	2055.4	64.0	2379.4	34.8	2669.8	35.4	
Cycle 6	125.54	144.40	1.150	0.3911	0.0148	104.7055	1.6864	0.1846	0.0040	0.8412	98.49	99.66	2127.9	68.7	2430.5	36.4	2694.6	36.1	
Cycle 7																			

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from depth-profiling of samples from Abitibi Subprovince

Sample*	U (est ppm)	Th (est ppm)	Th/U	²⁰⁶ Pb/ ²³⁸ U value	1 s e	²⁰⁶ Pb/ ²³⁸ U value	1 s e	²⁰⁶ Pb/ ²³⁸ Pb* value	1 s e	Correlation of Concordia Ellipses	% Radiogenic ²⁰⁶ Pb	% Radiogenic ²⁰⁷ Pb	²⁰⁶ Pb/ ²³⁸ U Age (Ma)	1 s e	²⁰⁷ Pb/ ²³⁸ U Age (Ma)	1 s e	²⁰⁶ Pb/ ²⁰⁷ Pb Age (Ma)	1 s e
Cycle 12	585 76	191 99	0 328	0 4411	0 0146	112 8674	0 9616	0 1667	0 0032	0 8638	75 47	93 86	2355 3	65 4	2447 3	35 7	2524 6	32 7
Cycle 13	648 26	195 31	0 301	0 4397	0 0144	108 5374	0 8876	0 1678	0 0029	0 8810	78 59	94 77	2349 4	64 4	2450 7	34 3	2535 8	29 4
Cycle 14	707 09	207 74	0 294	0 4248	0 0132	105 9640	0 8341	0 1701	0 0026	0 8930	82 60	95 85	2282 0	59 6	2431 1	31 7	2558 3	25 8
09CON-16	1388 77	668 93	0 482	0 3587	0 0096	79 4754	0 4756	0 1649	0 0014	0 9532	97 55	99 50	1975 9	45 6	2248 4	24 7	2506 7	13 9
Cycle 2	1377 29	646 69	0 470	0 3680	0 0099	82 3535	0 4831	0 1670	0 0014	0 9548	97 45	99 48	2019 9	46 5	2283 2	24 8	2528 1	13 7
Cycle 3	1381 12	632 18	0 458	0 3784	0 0102	82 9757	0 4837	0 1664	0 0013	0 9574	98 04	99 60	2068 8	47 9	2305 0	25 0	2521 5	13 4
Cycle 4	1405 28	664 57	0 473	0 3733	0 0098	84 3991	0 4912	0 1658	0 0013	0 9552	98 24	99 64	2044 9	45 9	2289 8	24 1	2516 2	13 3
Cycle 5	1345 14	646 06	0 480	0 3801	0 0100	85 2305	0 4959	0 1652	0 0013	0 9553	98 10	99 62	2076 7	46 7	2302 4	24 3	2509 2	13 3
Cycle 6	1270 97	633 10	0 498	0 3953	0 0105	90 0650	0 5275	0 1684	0 0013	0 9554	98 27	99 64	2147 2	48 3	2356 0	24 5	2542 1	13 3
Cycle 7	1205 17	629 92	0 523	0 4158	0 0112	92 2037	0 5464	0 1672	0 0013	0 9561	98 28	99 65	2241 3	51 1	2395 7	25 2	2529 7	13 5
Cycle 8	1165 12	623 00	0 535	0 4295	0 0117	95 8473	0 5721	0 1693	0 0014	0 9563	98 41	99 67	2303 2	52 7	2437 1	25 4	2550 8	13 6
Cycle 9	1134 34	648 86	0 572	0 4303	0 0116	98 1579	0 5924	0 1701	0 0014	0 9537	98 04	99 59	2307 1	52 3	2443 4	25 2	2558 9	13 8
Cycle 10	1090 12	631 71	0 579	0 4325	0 0116	99 3893	0 6074	0 1704	0 0014	0 9529	98 56	99 70	2316 8	52 1	2449 4	25 0	2561 4	13 8
Cycle 11	1060 84	638 55	0 602	0 4353	0 0116	100 6620	0 6197	0 1715	0 0014	0 9527	98 76	99 74	2329 6	52 3	2461 4	25 1	2572 2	13 9
Cycle 12	1005 75	621 68	0 618	0 4436	0 0119	101 9748	0 6378	0 1705	0 0014	0 9513	98 62	99 71	2366 9	53 3	2473 5	25 2	2562 2	14 1
Cycle 13	967 30	635 67	0 657	0 4455	0 0120	102 4733	0 6479	0 1707	0 0015	0 9503	98 46	99 68	2375 0	53 7	2478 7	25 4	2564 8	14 3
Cycle 14	961 76	643 00	0 669	0 4375	0 0116	102 8248	0 6573	0 1704	0 0015	0 9475	98 54	99 70	2339 6	52 0	2460 2	24 9	2561 4	14 5
09CON 17	157 93	311 76	1 974	0 3007	0 0110	84 0243	1 3944	0 1748	0 0044	0 9474	94 36	98 75	1694 9	54 4	2142 6	36 5	2604 5	41 7
Cycle 2	153 80	283 05	1 840	0 3416	0 0137	82 6839	1 4003	0 1756	0 0044	0 8283	95 28	98 96	1894 3	66 0	2261 0	39 8	2611 7	41 5
Cycle 3	130 97	240 04	1 833	0 3521	0 0143	88 5519	1 5798	0 1731	0 0046	0 8130	95 00	98 91	1944 5	68 3	2275 3	40 6	2587 5	44 1
Cycle 4	120 69	213 34	1 768	0 3597	0 0151	88 6439	1 6107	0 1800	0 0045	0 8323	97 46	99 44	1980 6	71 6	2330 5	40 8	2652 9	41 8
Cycle 5	109 10	186 06	1 705	0 3659	0 0155	92 6227	1 7404	0 1765	0 0047	0 8183	96 71	99 28	2010 0	72 9	2328 0	41 4	2619 8	44 2
Cycle 6	104 40	170 96	1 638	0 3796	0 0166	93 2926	1 7699	0 1774	0 0049	0 8212	95 79	99 07	2074 2	77 6	2366 2	43 4	2628 4	45 7
Cycle 7	101 26	160 19	1 582	0 3873	0 0173	95 2300	1 8385	0 1785	0 0050	0 8213	95 76	99 05	2110 1	80 2	2390 3	44 3	2638 5	46 4
Cycle 8	92 32	149 24	1 617	0 3857	0 0171	95 7494	1 9118	0 1748	0 0049	0 8170	97 14	99 38	2103 1	79 7	2367 7	43 5	2604 0	46 6
Cycle 9	86 13	142 06	1 649	0 3811	0 0167	105 7651	2 1655	0 1819	0 0051	0 8081	98 36	99 63	2081 3	77 7	2393 1	42 3	2670 2	46 2
Cycle 10	89 29	137 09	1 535	0 3956	0 0181	99 6554	2 0278	0 1830	0 0051	0 8265	98 16	99 59	2148 9	83 8	2433 4	44 5	2680 6	46 0
Cycle 11	87 59	126 91	1 449	0 4109	0 0193	97 2247	2 0072	0 1860	0 0050	0 8292	97 98	99 56	2219 1	88 2	2436 5	45 7	2623 4	47 1
Cycle 12	85 87	121 29	1 412	0 4368	0 0212	99 0129	2 0479	0 1793	0 0050	0 8421	98 51	99 67	2336 3	95 3	2506 0	47 2	2646 5	46 5
Cycle 13	83 49	117 72	1 410	0 4243	0 0204	97 2045	2 0323	0 1753	0 0050	0 8336	98 27	99 63	2279 8	92 2	2458 0	46 6	2608 9	47 4
Cycle 14	78 51	111 42	1 419	0 4077	0 0190	104 3693	2 2176	0 1799	0 0051	0 8200	98 83	99 74	2204 6	86 9	2445 5	44 9	2652 4	47 4
03ED-096A Quartz porphyritic xenite schist, Hoyte Pond Mine (NAD83 zone 17 UTM 492687E 5377143N)																		
03ED 096A d3	106 49	8 42	0 082	0 5169	0 0356	12 9965	0 9466	0 1823	0 0065	0 8741	94 24	98 67	2686 1	151 4	2679 4	68 7	2674 3	59 2
Cycle 2	98 26	6 68	0 071	0 5051	0 0343	12 2363	0 9002	0 1757	0 0068	0 8516	91 85	98 15	2635 6	146 9	2622 7	69 1	2612 8	64 8
Cycle 3	103 74	7 75	0 078	0 5243	0 0372	12 8655	0 9586	0 1780	0 0064	0 8776	95 22	98 93	2717 3	157 3	2669 9	70 2	2634 1	60 1
Cycle 4	93 92	7 13	0 079	0 5131	0 0354	13 1426	0 9343	0 1858	0 0065	0 8765	98 21	99 59	2670 0	150 9	2689 9	67 1	2704 9	57 6
Cycle 5	85 46	6 10	0 074	0 4902	0 0326	12 5179	0 8555	0 1852	0 0065	0 8632	99 02	99 78	2571 4	141 2	2644 1	64 3	2700 2	58 3
Cycle 6	91 74	5 10	0 058	0 5255	0 0380	13 2975	0 9850	0 1835	0 0064	0 8858	98 86	99 75	2722 5	160 6	2701 0	70 0	2685 0	57 9
Cycle 7	89 66	5 68	0 066	0 5538	0 0413	14 1867	1 0737	0 1858	0 0065	0 8930	100 00	100 00	2841 2	171 3	2762 3	71 8	2705 1	57 4
Cycle 8	89 87	5 83	0 068	0 5489	0 0415	13 9432	1 0736	0 1842	0 0065	0 8943	99 54	99 90	2820 6	172 7	2745 9	73 0	2691 4	58 0
Cycle 9	85 06	5 68	0 070	0 4902	0 0338	12 4269	0 8820	0 1838	0 0066	0 8667	98 60	99 69	2571 7	146 2	2637 2	66 7	2687 9	59 8
Cycle 10	87 83	5 30	0 063	0 5041	0 0357	12 7831	0 9249	0 1839	0 0066	0 8754	99 40	99 87	2631 3	152 9	2663 8	68 1	2688 6	59 1
Cycle 11	83 10	4 96	0 062	0 4567	0 0299	11 5350	0 7713	0 1832	0 0066	0 8538	100 00	100 00	2424 8	132 4	2567 4	62 5	2682 1	59 2
Cycle 12	79 40	5 08	0 067	0 5036	0 0359	12 6805	0 9195	0 1826	0 0065	0 8759	100 00	100 00	2629 2	153 7	2656 2	68 2	2676 8	59 3
Cycle 13	79 05	5 08	0 067	0 5096	0 0373	13 1176	0 9803	0 1867	0 0068	0 8793	99 51	99 89	2655 0	159 3	2688 1	70 5	2713 2	60 0
Cycle 14	79 77	5 02	0 066	0 5301	0 0403	13 1262	1 0257	0 1796	0 0067	0 8826	98 67	99 71	2741 8	169 9	2688 8	73 7	2649 1	62 1
Cycle 15	75 83	5 00	0 069	0 5108	0 0370	13 0732	0 9689	0 1856	0 0071	0 8658	99 49	99 89	2660 2	158 0	2685 0	69 9	2703 7	62 7
Cycle 16	80 83	4 37	0 056	0 5386	0 0417	13 2940	1 0596	0 1790	0 0068	0 8826	98 38	99 64	2777 5	174 8	2700 8	75 3	2643 8	63 3
Cycle 17	74 76	5 95	0 083	0 5152	0 0381	13 0568	0 9900	0 1838	0 0070	0 8694	99 07	99 79	2679 0	162 0	2683 8	71 5	2687 4	63 3
Cycle 18	80 13	3 01	0 039	0 5070	0 0381	12 9051	0 9936	0 1846	0 0069	0 8794	99 07	99 79	2643 9	162 9	2672 7	72 6	2694 7	61 8
Cycle 19	75 17	4 51	0 062	0 5070	0 0382	12 6933	0 9812	0 1816	0 0068	0 8786	99 04	99 79	2643 9	163 5	2657 2	72 8	2667 3	62 4
Cycle 20	77 02	3 71	0 050	0 5035	0 0379	12 7669	0 9828	0 1839	0 0069	0 8771	99 31	99 85	2629 0	162 3	2662 6	72 5	2688 3	62 4
Cycle 21	77 37	4 58	0 062	0 5111	0 0390	13 0704	1 0156	0 1855	0 0069	0 8824	100 00	100 00	2661 5	166 5	2684 8	73 3	2702 3	61 7
Cycle 22	73 99	4 80	0 068	0 4965	0 0367	12 0938	0 9154	0 1767	0 0068	0 8674	99 71	99 94	2598 7	158 3	2611 7	71 0	2621 8	64 2
Cycle 23	78 87	6 16	0 081	0 5511	0 0462	13 6188	1 1650	0 1792	0 0068	0 8995	99 25	99 84	2829 9	191 9	2723 6	80 9	2645 6	63 1
Cycle 24	71 45	3 80	0 055	0 5076	0 0385	12 6928	0 9824	0 1814	0 0071	0 8706	100 00	100 00	2646 3	164 8	2657 1	72 9	2665 3	64 6
Cycle 25	74 55	3 74	0 052	0 5759	0 0495	14 4538	1 2631	0 1820	0 0069	0 9036	99 88	99 97	2931 8	202 6	2780 0	83 0	2671 5	63 1
Cycle 26	70 11	3 80	0 056	0 5057	0 0397	12 6740	1 0216	0 1818	0 0073	0 8742	98 92	99 76	2638 4	169 8	2655 7	75 9	2669 0	66 2
Cycle 27	69 40	4 76	0 072	0 5105	0 0403	13 0530</												

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from dentin-enamel of samples from Ahtubi Subhorizon

Sample*	U		Th		Th/U		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		Correlation of Concordia Ellipses	% Radiogenic		% Radiogenic		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³⁸ Pb†	
	(est ppm)	(est ppm)	(est ppm)	(est ppm)	value	1 s.e	value	1 s.e	value	1 s.e		²⁰⁶ Pb	²³⁸ Pb	²⁰⁶ Pb	²³⁸ Pb	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e
Cycle 2	221.22	170.47	0.803	0.0239	0.0239	8.9720	0.5975	0.1757	0.0047	0.9187	96.85	99.32	2031.0	112.6	2335.2	60.8	2612.7	44.2			
Cycle 3	209.57	113.45	0.564	0.0275	0.0275	8.9884	0.6880	0.1753	0.0051	0.9264	95.10	98.92	2038.0	129.1	2336.8	69.9	2609.1	48.3			
Cycle 4	177.62	89.64	0.526	0.0235	0.0235	8.6871	0.6128	0.1835	0.0054	0.9103	97.35	99.40	1903.0	112.7	2305.7	64.2	2684.5	48.8			
Cycle 5	175.06	57.75	0.344	0.0381	0.0381	10.2458	0.9348	0.1744	0.0053	0.9447	97.97	99.57	2287.6	172.3	2457.2	84.4	2600.7	50.2			
Cycle 6	155.36	53.33	0.358	0.0297	0.0297	9.1468	0.7456	0.1771	0.0056	0.9239	97.53	99.46	2050.6	139.3	2352.8	74.6	2626.3	52.3			
Cycle 7	161.25	44.41	0.287	0.0411	0.0411	10.8345	1.0518	0.1830	0.0057	0.9486	99.49	99.89	2303.4	185.4	2509.0	90.2	2679.9	51.2			
Cycle 8	167.17	39.95	0.249	0.0416	0.0416	10.5564	1.0337	0.1779	0.0055	0.9489	100.00	100.00	2306.9	187.5	2484.9	90.8	2633.8	51.7			
Cycle 9	161.52	30.41	0.196	0.0353	0.0353	9.7571	0.8887	0.1799	0.0056	0.9413	99.69	99.93	2138.1	163.2	2412.1	83.9	2652.2	51.4			
03ED 096A 5	152.72	64.79	0.442	0.0336	0.0336	11.9684	0.8466	0.1797	0.0045	0.9365	97.97	99.55	2540.4	145.9	2601.9	66.3	2650.2	41.5			
Cycle 2	155.60	44.18	0.296	0.0283	0.0283	10.8675	0.7168	0.1806	0.0044	0.9294	98.92	99.76	2334.2	127.0	2511.9	61.3	2658.8	40.8			
Cycle 3	145.38	30.40	0.218	0.0379	0.0379	13.0880	0.9758	0.1845	0.0045	0.9457	99.75	99.94	2675.6	161.5	2686.0	70.3	2693.8	40.4			
Cycle 4	138.50	28.01	0.211	0.0305	0.0305	11.3975	0.7790	0.1829	0.0046	0.9325	99.84	99.97	2403.9	135.3	2556.2	63.8	2679.4	41.3			
Cycle 5	124.38	21.67	0.182	0.0311	0.0311	11.6046	0.7981	0.1830	0.0048	0.9262	99.36	99.86	2439.7	137.5	2573.0	64.3	2679.8	43.4			
Cycle 6	113.60	20.53	0.188	0.0336	0.0336	11.8895	0.8589	0.1823	0.0050	0.9266	99.42	99.87	2496.7	147.3	2595.7	67.7	2674.0	45.5			
Cycle 7	108.01	18.11	0.175	0.0447	0.0447	14.0667	1.1532	0.1845	0.0053	0.9381	99.03	99.78	2838.0	185.7	2754.2	77.7	2693.4	47.3			
Cycle 8	92.43	13.56	0.153	0.0376	0.0376	12.6380	0.9597	0.1826	0.0055	0.9215	99.90	99.98	2621.8	161.3	2653.1	71.5	2677.0	49.5			
Cycle 9	88.33	11.88	0.140	0.0351	0.0351	11.5074	0.8675	0.1759	0.0055	0.9115	99.37	99.87	2503.6	153.5	2565.2	70.4	2614.2	52.4			
03ED 096A 6	161.38	10.90	0.070	0.0516	0.0516	14.3531	1.2985	0.1807	0.0050	0.9534	100.00	100.00	2932.9	211.2	2773.3	85.9	2659.2	45.6			
Cycle 2	151.89	8.76	0.060	0.0500	0.0500	13.6894	1.2223	0.1753	0.0050	0.9483	99.89	99.98	2893.4	205.9	2728.5	84.5	2608.6	47.6			
Cycle 3	145.54	9.70	0.069	0.0417	0.0417	12.7733	1.0651	0.1827	0.0054	0.9372	99.52	99.89	2643.6	178.4	2663.1	78.5	2677.9	48.6			
Cycle 4	146.56	10.04	0.071	0.0374	0.0374	11.6957	0.9251	0.1764	0.0053	0.9274	99.50	99.89	2530.8	163.0	2580.4	74.0	2619.5	49.8			
Cycle 5	170.93	9.05	0.055	0.1050	0.1050	19.6608	2.5893	0.1778	0.0052	0.9756	99.60	99.91	3796.5	375.7	3074.8	127.3	2632.3	48.2			
Cycle 6	151.92	6.85	0.047	0.0555	0.0555	14.2366	1.3877	0.1794	0.0055	0.9499	100.00	100.00	2930.0	227.2	2765.6	92.5	2647.7	51.0			
Cycle 7	150.27	10.61	0.074	0.0551	0.0551	14.1703	1.3777	0.1793	0.0055	0.9494	99.87	99.97	2920.6	225.9	2761.2	92.2	2646.6	51.1			
Cycle 8	160.54	10.49	0.068	0.0473	0.0473	12.7840	1.1766	0.1783	0.0053	0.9463	99.46	99.88	2699.2	200.4	2663.9	86.7	2637.1	49.8			
Cycle 9	151.32	7.57	0.052	0.0594	0.0594	14.6474	1.4706	0.1776	0.0054	0.9540	99.46	99.88	3022.7	239.7	2792.6	95.4	2630.4	50.4			
03ED 096A 7	172.24	97.74	0.591	0.0293	0.0293	10.7240	0.7500	0.1810	0.0043	0.9410	95.63	99.01	2304.9	132.3	2499.5	65.0	2661.7	39.4			
Cycle 2	149.65	66.52	0.463	0.0326	0.0326	11.3514	0.8128	0.1773	0.0043	0.9416	97.58	99.47	2458.5	143.7	2552.4	66.8	2628.0	40.4			
Cycle 3	149.13	44.43	0.310	0.0340	0.0340	11.3189	0.8363	0.1760	0.0042	0.9463	98.76	99.73	2467.8	149.3	2549.8	68.9	2615.6	40.1			
Cycle 4	141.56	38.69	0.285	0.0411	0.0411	12.5676	0.9978	0.1736	0.0043	0.9505	98.04	99.58	2720.2	173.6	2647.8	74.7	2593.0	41.4			
Cycle 5	140.12	24.77	0.184	0.0377	0.0377	12.3980	0.9499	0.1800	0.0044	0.9480	98.49	99.67	2611.8	162.2	2635.0	72.0	2652.9	40.7			
Cycle 6	144.82	27.25	0.196	0.0353	0.0353	11.4919	0.8724	0.1771	0.0043	0.9484	98.96	99.78	2486.8	154.5	2563.9	70.9	2625.5	40.3			
Cycle 7	139.37	22.84	0.171	0.0339	0.0339	11.4667	0.8460	0.1785	0.0044	0.9435	98.96	99.77	2465.7	149.0	2561.9	68.9	2638.9	40.9			
Cycle 8	131.02	15.03	0.120	0.0381	0.0381	12.1711	0.9493	0.1783	0.0045	0.9466	98.75	99.73	2592.7	164.2	2617.7	73.2	2637.0	42.1			
Cycle 9	116.36	16.22	0.145	0.0349	0.0349	11.6791	0.8641	0.1761	0.0047	0.9344	98.20	99.61	2531.8	152.1	2579.0	69.2	2616.3	44.2			
03ED 096A 8	200.47	33.50	0.174	0.0380	0.0380	12.4951	0.9031	0.1707	0.0035	0.9592	99.22	99.84	2744.7	160.0	2642.4	67.9	2564.9	34.4			
Cycle 2	179.64	26.11	0.151	0.0401	0.0401	12.2874	0.9365	0.1674	0.0038	0.9553	98.62	99.72	2750.9	168.5	2626.6	71.6	2532.1	38.0			
Cycle 3	168.92	23.28	0.144	0.0453	0.0453	12.9706	1.0846	0.1713	0.0041	0.9595	98.11	99.60	2821.5	188.7	2677.5	78.8	2570.5	39.6			
Cycle 4	155.26	17.20	0.115	0.0438	0.0438	13.0478	1.0826	0.1775	0.0043	0.9578	99.24	99.84	2754.7	184.1	2683.1	78.3	2629.6	39.9			
Cycle 5	149.44	21.47	0.150	0.0371	0.0371	11.8422	0.9219	0.1781	0.0044	0.9493	99.09	99.80	2537.6	161.2	2592.0	72.9	2634.8	41.0			
Cycle 6	145.01	12.05	0.087	0.0496	0.0496	13.1873	1.1928	0.1728	0.0042	0.9628	99.62	99.92	2839.2	205.8	2693.1	85.4	2585.3	41.0			
Cycle 7	138.68	16.08	0.121	0.0359	0.0359	11.7241	0.9009	0.1800	0.0045	0.9467	99.63	99.92	2493.6	157.0	2582.6	71.9	2653.2	41.4			
Cycle 8	139.51	16.18	0.121	0.0458	0.0458	12.9269	1.1239	0.1759	0.0045	0.9563	99.24	99.84	2753.6	192.7	2674.3	81.9	2615.0	42.6			
Cycle 9	138.50	14.39	0.108	0.0359	0.0359	11.6645	0.9078	0.1806	0.0047	0.9433	98.35	99.63	2477.1	157.5	2577.9	72.8	2658.0	43.2			
03ED 096A 9	155.14	19.34	0.130	0.0265	0.0265	9.9969	0.6452	0.1713	0.0043	0.9208	96.08	99.16	2275.1	120.1	2434.5	59.6	2570.6	42.4			
Cycle 2	155.44	15.58	0.104	0.0300	0.0300	10.7292	0.7375	0.1741	0.0044	0.9314	97.01	99.36	2381.5	133.7	2500.0	63.8	2597.6	42.0			
Cycle 3	162.15	13.60	0.087	0.0411	0.0411	13.0503	1.0534	0.1834	0.0045	0.9534	98.10	99.57	2682.0	174.7	2683.3	76.1	2684.3	40.5			
Cycle 4	148.51	13.12	0.092	0.0366	0.0366	11.8923	0.8993	0.1752	0.0045	0.9405	98.10	99.59	2580.3	158.1	2596.0	70.8	2608.2	43.1			
Cycle 5	139.72	9.96	0.074	0																	

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from depth-profiling of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁷ Pb/ ²⁰⁶ Pb*		Correlation of Concordia Ellipses	% Radiogenic		% Radiogenic		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁷ Pb/ ²⁰⁶ Pb†	
	(est ppm)	(est ppm)			value	1 s e	value	1 s e	value	1 s e		²⁰⁷ Pb	²⁰⁶ Pb	²⁰⁷ Pb	²⁰⁶ Pb	Age (Ma)	1 s e	Age (Ma)	1 s e	Age (Ma)	1 s e
Cycle 31	120 08	8 22	0 071	0 5447	0 0375	13 5966	0 9511	0 1811	0 0054	0 9074	99 57	99 90	2802 9	156 5	2722 0	66 2	2662 5	49 5			
Cycle 32	120 50	6 95	0 060	0 5375	0 0369	13 5545	0 9423	0 1829	0 0053	0 9105	100 00	100 00	2772 8	154 6	2719 1	65 7	2679 5	48 4			
Cycle 33	135 03	7 63	0 059	0 5288	0 0367	13 5429	0 9519	0 1857	0 0054	0 9143	99 84	99 96	2736 5	154 6	2718 3	66 5	2704 8	47 7			
Cycle 34	128 25	8 37	0 068	0 5059	0 0331	12 7142	0 8464	0 1823	0 0054	0 9004	99 57	99 91	2639 0	141 7	2658 7	62 7	2673 8	48 8			
Cycle 35	123 50	7 97	0 067	0 5204	0 0350	13 3472	0 9097	0 1860	0 0054	0 9094	100 00	100 00	2700 9	148 4	2704 5	64 4	2707 3	47 6			
Cycle 36	126 84	8 91	0 073	0 5230	0 0353	12 9120	0 8853	0 1790	0 0052	0 9086	99 83	99 96	2712 0	149 5	2673 3	64 6	2644 1	48 3			
Cycle 37	125 51	9 36	0 078	0 5260	0 0360	13 2489	0 9220	0 1827	0 0054	0 9097	99 41	99 87	2724 7	152 0	2697 5	65 7	2677 3	48 6			
Cycle 38	128 02	8 26	0 067	0 5213	0 0356	13 1487	0 9143	0 1829	0 0054	0 9091	99 40	99 87	2704 9	151 0	2690 4	65 6	2679 5	48 7			
Cycle 39	131 98	9 57	0 076	0 5314	0 0365	13 2416	0 9252	0 1807	0 0054	0 9074	99 39	99 87	2747 2	153 6	2697 0	66 0	2659 7	49 4			
Cycle 40	126 59	8 59	0 071	0 5445	0 0377	14 0226	0 9889	0 1868	0 0056	0 9071	99 24	99 83	2802 0	157 5	2751 2	66 8	2714 2	49 7			
Cycle 41	121 48	6 74	0 058	0 4904	0 0319	12 2215	0 8134	0 1808	0 0055	0 8914	98 76	99 73	2572 3	137 8	2621 6	62 5	2659 8	50 9			
Cycle 42	125 36	9 10	0 076	0 5490	0 0399	13 7082	1 0133	0 1811	0 0054	0 9160	99 10	99 80	2820 9	165 9	2729 8	70 0	2663 0	49 8			
Cycle 43	122 46	6 35	0 054	0 5378	0 0377	13 6352	0 9698	0 1839	0 0055	0 9090	99 65	99 92	2774 4	157 9	2724 7	67 3	2688 0	49 8			
Cycle 44	122 62	7 80	0 066	0 5266	0 0367	13 0615	0 9285	0 1799	0 0055	0 9050	99 07	99 80	2727 3	155 0	2684 1	67 0	2651 7	50 9			
Cycle 45	120 35	7 95	0 069	0 5155	0 0353	12 8307	0 8927	0 1805	0 0054	0 9049	100 00	100 00	2679 9	150 3	2667 3	65 5	2657 8	50 0			
Cycle 46	114 71	8 52	0 077	0 4960	0 0324	12 5352	0 8325	0 1833	0 0056	0 8920	100 00	100 00	2596 7	139 7	2645 4	62 5	2682 9	50 7			
Cycle 47	117 43	6 41	0 057	0 5806	0 0443	14 9974	1 1580	0 1873	0 0057	0 9215	100 00	100 00	2951 2	180 7	2815 1	73 5	2719 0	50 1			
Cycle 48	108 72	6 36	0 061	0 5240	0 0363	13 1466	0 9262	0 1820	0 0057	0 8986	99 81	99 96	2715 9	153 6	2690 2	66 5	2671 0	52 1			
Cycle 49	105 52	6 11	0 060	0 5196	0 0357	12 8643	0 9018	0 1796	0 0058	0 8936	99 50	99 89	2697 3	151 6	2669 8	66 0	2649 0	53 2			
03ED-096A-11	160 55	17 80	0 115	0 0349	0 0349	12 0192	0 8792	0 1804	0 0041	0 9515	98 13	99 59	2541 7	151 5	2605 9	68 6	2656 2	37 5			
Cycle 2	143 90	16 64	0 120	0 0332	0 0332	12 0615	0 8382	0 1811	0 0042	0 9438	99 22	99 83	2540 9	144 1	2609 2	65 2	2662 6	38 4			
Cycle 3	148 80	11 01	0 077	0 0370	0 0370	12 3661	0 9384	0 1815	0 0042	0 9524	98 48	99 66	2588 7	159 7	2632 6	71 3	2666 5	38 6			
Cycle 4	134 74	10 73	0 083	0 0320	0 0320	11 1563	0 7871	0 1756	0 0043	0 9390	98 56	99 69	2442 8	141 1	2536 3	65 7	2611 9	40 7			
Cycle 5	133 99	10 19	0 079	0 0446	0 0446	13 4050	1 1375	0 1829	0 0045	0 9575	99 13	99 81	2747 7	187 8	2708 6	80 2	2679 6	40 8			
Cycle 6	109 54	9 84	0 094	0 0358	0 0358	11 9547	0 9090	0 1812	0 0049	0 9372	98 70	99 71	2520 4	156 1	2600 9	71 2	2664 2	44 3			
Cycle 7	94 25	8 33	0 092	0 0439	0 0439	14 0898	1 1539	0 1886	0 0053	0 9410	99 59	99 91	2790 9	183 4	2755 8	77 6	2730 1	46 1			
Cycle 8	94 38	8 82	0 097	0 0441	0 0441	13 2005	1 1034	0 1790	0 0052	0 9392	99 34	99 86	2762 5	185 3	2694 1	78 9	2643 2	48 1			
Cycle 9	96 73	7 51	0 081	0 0406	0 0406	12 6384	1 0405	0 1829	0 0053	0 9372	98 84	99 74	2618 6	174 4	2653 1	77 5	2679 5	47 9			
03ED 096A-12	150 07	17 34	0 120	0 0427	0 0427	12 9213	1 0980	0 1833	0 0047	0 9547	96 77	99 27	2662 1	182 3	2673 9	80 1	2682 9	42 0			
Cycle 2	143 88	16 65	0 121	0 0423	0 0423	12 0887	1 0274	0 1734	0 0045	0 9523	97 38	99 44	2638 5	181 0	2611 3	79 7	2590 3	43 5			
Cycle 3	128 97	12 37	0 100	0 0340	0 0340	11 3461	0 8691	0 1816	0 0048	0 9394	97 61	99 47	2409 0	151 0	2552 0	71 5	2667 7	43 8			
Cycle 4	131 60	9 26	0 073	0 0389	0 0389	11 9420	0 9810	0 1798	0 0047	0 9478	97 54	99 46	2534 6	169 2	2599 9	77 0	2651 1	43 7			
Cycle 5	134 24	12 97	0 101	0 0458	0 0458	12 9316	1 1475	0 1795	0 0047	0 9569	98 50	99 67	2709 8	193 9	2674 7	83 6	2648 2	43 0			
Cycle 6	129 00	10 96	0 088	0 0377	0 0377	11 9951	0 9571	0 1817	0 0047	0 9461	99 00	99 78	2522 3	164 3	2604 0	74 8	2668 2	43 1			
Cycle 7	133 72	9 67	0 075	0 0387	0 0387	11 8181	0 9697	0 1796	0 0045	0 9522	99 69	99 93	2515 0	169 0	2590 1	76 8	2649 4	41 9			
Cycle 8	125 24	10 63	0 088	0 0413	0 0413	12 5595	1 0491	0 1822	0 0046	0 9533	99 82	99 96	2613 1	177 6	2647 2	78 6	2673 4	42 0			
Cycle 9	128 12	9 84	0 080	0 0357	0 0357	11 1453	0 8771	0 1756	0 0045	0 9464	99 37	99 87	2440 6	157 8	2535 3	73 3	2612 0	42 6			
03ED 096A-13	251 42	175 64	0 728	0 0185	0 0185	7 6179	0 4806	0 1702	0 0047	0 8974	79 27	94 90	1812 7	90 2	2187 0	56 6	2559 1	46 6			
Cycle 2	202 52	107 86	0 555	0 0303	0 0303	10 9824	0 7763	0 1794	0 0042	0 9444	89 98	97 65	2368 9	135 4	2521 6	65 8	2647 0	38 6			
Cycle 3	178 94	64 54	0 376	0 0284	0 0284	10 8216	0 7147	0 1774	0 0041	0 9377	93 78	98 60	2361 0	126 8	2507 9	61 4	2629 1	38 3			
Cycle 4	159 75	45 61	0 297	0 0311	0 0311	11 5841	0 7830	0 1788	0 0041	0 9420	96 17	99 15	2483 3	136 4	2571 4	63 2	2641 6	37 9			
Cycle 5	146 17	32 18	0 229	0 0282	0 0282	11 1774	0 7102	0 1800	0 0041	0 9364	98 55	99 68	2397 2	125 2	2538 0	59 2	2652 6	37 3			
Cycle 6	145 97	23 85	0 170	0 0356	0 0356	12 6952	0 8970	0 1802	0 0041	0 9472	98 13	99 59	2661 2	151 9	2657 3	66 5	2654 4	37 9			
Cycle 7	141 60	20 57	0 151	0 0311	0 0311	11 7298	0 7795	0 1786	0 0041	0 9382	98 31	99 63	2510 9	136 0	2583 1	62 2	2640 2	38 5			
Cycle 8	148 43	18 22	0 128	0 0385	0 0385	13 0448	0 9684	0 1803	0 0041	0 9532	99 10	99 80	2719 0	162 9	2682 9	70 0	2655 8	37 5			
Cycle 9	144 19	15 94	0 115	0 0319	0 0319	11 8142	0 8051	0 1803	0 0041	0 9429	98 81	99 74	2506 6	139 6	2589 8	63 8	2655 5	37 9			
03ED 096A-14	173 62	10 06	0 060	0 0518	0 0518	14 8962	1 2649	0 1754	0 0039	0 9657	97 61	99 49	3094 4	206 5	2808 6	80 8	2609 4	36 9			
Cycle 2	183 10	13 35	0 076	0 0369	0 0369	12 4240	0 9080	0 1768	0 0038	0 9574	99 28	99 85	2655 4	157 5	2637 0	68 7	2622 9	35 3			
Cycle 3	195 58	10 99	0 059	0 0389	0 0389	12 5448	0 9540	0 1761	0 0036	0 9628	999										

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from depth-profiling of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb*		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁶ Pb	% Radiogenic ²⁰⁷ Pb	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb†	
	(est ppm)	(ppm)	value	1 s.e	value	1 s.e	value	1 s.e	value	1 s.e		²⁰⁶ Pb	²⁰⁷ Pb	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e
Cycle 29	133 85	34 09	0 265	0 4761	0 0331	12 3999	0 8803	0 1889	0 0060	0 8974	98 99	99 77	2510 1	144 4	2635 2	66 7	2732 6	52 4	
Cycle 30	125 51	30 42	0 252	0 4927	0 0347	12 4127	0 8892	0 1827	0 0058	0 9004	99 59	99 91	2582 3	149 7	2636 1	67 3	2677 8	52 5	
Cycle 31	128 04	34 12	0 278	0 5198	0 0388	12 7431	0 9719	0 1778	0 0057	0 9113	98 74	99 73	2698 3	164 5	2660 9	71 8	2632 5	52 9	
Cycle 32	132 17	33 91	0 267	0 5103	0 0370	12 6565	0 9336	0 1799	0 0057	0 9078	99 48	99 89	2657 7	157 8	2654 4	69 4	2651 9	52 1	
Cycle 33	129 56	33 41	0 269	0 4508	0 0292	11 7743	0 7777	0 1894	0 0060	0 8840	99 81	99 96	2398 9	129 9	2586 6	61 8	2737 2	51 9	
Cycle 34	133 26	34 47	0 269	0 5156	0 0381	13 0750	0 9835	0 1839	0 0058	0 9119	99 48	99 88	2680 6	162 2	2685 1	71 0	2688 5	51 8	
Cycle 35	132 62	30 51	0 240	0 5070	0 0366	13 0561	0 9567	0 1868	0 0058	0 9091	100 00	100 00	2643 6	156 7	2683 7	69 1	2714 1	51 2	
Cycle 36	130 83	29 90	0 238	0 5012	0 0363	12 9517	0 9507	0 1874	0 0058	0 9111	100 00	100 00	2618 9	155 7	2676 1	69 2	2719 7	50 7	
Cycle 37	132 86	29 87	0 234	0 5095	0 0372	13 0016	0 9649	0 1851	0 0058	0 9105	99 60	99 91	2654 6	158 8	2679 8	70 0	2698 8	51 5	
Cycle 38	134 00	27 90	0 217	0 4984	0 0355	12 4593	0 9089	0 1813	0 0058	0 9006	98 56	99 68	2606 8	152 6	2639 7	68 6	2665 0	53 3	
Cycle 39	129 34	29 52	0 238	0 4933	0 0340	12 3329	0 8702	0 1813	0 0059	0 8930	98 97	99 77	2585 0	146 8	2630 1	66 3	2664 9	53 5	
Cycle 40	136 67	28 10	0 214	0 5049	0 0360	12 4999	0 9042	0 1796	0 0056	0 9063	100 00	100 00	2634 9	154 1	2642 7	68 0	2648 7	51 6	
Cycle 41	134 50	26 25	0 203	0 5001	0 0354	12 7494	0 9164	0 1849	0 0058	0 9021	99 80	99 96	2614 0	151 9	2661 3	67 7	2697 4	52 1	
Cycle 42	126 27	31 11	0 257	0 4512	0 0291	11 4090	0 7583	0 1834	0 0060	0 8746	98 68	99 70	2400 4	129 4	2557 2	62 0	2683 9	54 3	
Cycle 43	131 40	24 37	0 193	0 5258	0 0391	13 3468	1 0218	0 1841	0 0061	0 9052	97 56	99 45	2723 7	165 3	2704 5	72 3	2690 2	54 4	
Cycle 44	131 33	24 40	0 193	0 5142	0 0380	12 9463	0 9759	0 1826	0 0058	0 9080	98 95	99 77	2674 7	161 6	2675 7	71 1	2676 5	53 0	
Cycle 45	129 47	23 29	0 187	0 5234	0 0389	12 9116	0 9725	0 1789	0 0056	0 9117	100 00	100 00	2713 7	164 4	2673 2	71 0	2642 8	52 2	
Cycle 46	118 15	22 53	0 199	0 4917	0 0340	12 5064	0 8801	0 1845	0 0059	0 8946	100 00	100 00	2578 2	147 1	2643 2	66 2	2693 4	53 0	
Cycle 47	115 31	18 48	0 167	0 4677	0 0315	11 8292	0 8102	0 1834	0 0059	0 8875	100 00	100 00	2473 4	138 2	2591 0	64 1	2684 3	53 3	
Cycle 48	124 12	24 56	0 206	0 4887	0 0344	12 2824	0 8776	0 1823	0 0058	0 8977	100 00	100 00	2565 1	148 8	2626 2	67 1	2673 7	53 1	
Cycle 49	118 66	21 43	0 188	0 4942	0 0344	12 2284	0 8693	0 1794	0 0059	0 8912	99 57	99 91	2588 9	148 6	2622 1	66 7	2647 8	54 5	
04ED-198 Quartz-silbite porphyritic intrusion Hoyle Pond Mine (NAD83 Zone 17 UTM 492516E 5377036N)																			
04ED 198 1	270 49	168 39	0 648	0 4951	0 0308	12 3005	0 7711	0 1802	0 0031	0 9614	99 39	99 87	2592 8	132 7	2627 6	58 9	2654 6	28 8	
Cycle 2	201 85	91 22	0 471	0 4991	0 0303	11 9949	0 7379	0 1743	0 0035	0 9477	99 01	99 79	2609 9	130 4	2604 0	57 7	2599 4	33 0	
Cycle 3	179 20	58 21	0 338	0 5332	0 0355	12 7376	0 8568	0 1733	0 0036	0 9511	99 76	99 95	2754 8	149 3	2660 4	63 3	2589 5	34 9	
Cycle 4	166 26	45 45	0 285	0 5068	0 0334	12 3530	0 8219	0 1768	0 0039	0 9449	99 74	99 94	2643 0	142 7	2631 6	62 5	2622 9	36 5	
Cycle 5	157 40	32 59	0 216	0 4735	0 0302	11 6097	0 7497	0 1778	0 0040	0 9378	99 60	99 91	2498 9	132 1	2573 5	60 4	2632 7	37 6	
Cycle 6	152 52	22 52	0 154	0 4825	0 0314	11 4848	0 7585	0 1726	0 0040	0 9386	99 08	99 81	2538 1	136 6	2563 3	61 7	2583 4	38 4	
Cycle 7	155 03	22 41	0 151	0 4859	0 0325	11 8072	0 8009	0 1763	0 0041	0 9413	99 05	99 80	2552 7	141 0	2589 2	63 5	2617 9	38 4	
Cycle 8	155 80	21 58	0 144	0 4687	0 0300	11 2452	0 7303	0 1740	0 0040	0 9373	99 71	99 94	2477 8	131 9	2543 7	60 6	2596 6	38 1	
Cycle 9	154 41	17 33	0 117	0 4598	0 0295	11 2472	0 7318	0 1774	0 0041	0 9377	99 71	99 94	2438 6	130 4	2543 8	60 7	2628 8	38 0	
04ED 198 d1	253 80	143 32	0 588	0 4215	0 0261	10 4070	0 6521	0 1791	0 0035	0 9498	99 75	99 75	2267 1	118 5	2471 7	58 0	2644 5	32 8	
Cycle 2	224 39	106 64	0 495	0 4577	0 0306	11 6383	0 7855	0 1844	0 0038	0 9523	100 00	100 00	2429 3	135 4	2575 8	63 1	2693 1	34 3	
Cycle 3	188 92	92 54	0 510	0 4357	0 0258	11 1236	0 6672	0 1852	0 0041	0 9309	100 00	100 00	2331 2	116 0	2533 5	55 9	2699 8	36 6	
Cycle 4	185 20	69 85	0 393	0 4952	0 0336	12 5305	0 8583	0 1835	0 0041	0 9466	100 00	100 00	2593 1	144 9	2645 0	64 4	2685 0	36 9	
Cycle 5	177 80	57 74	0 338	0 5066	0 0341	12 9431	0 8794	0 1853	0 0043	0 9423	100 00	100 00	2642 1	145 9	2675 5	64 0	2700 8	38 0	
Cycle 6	169 35	46 56	0 286	0 4943	0 0318	12 6478	0 8229	0 1856	0 0044	0 9345	100 00	100 00	2589 3	137 3	2653 8	61 2	2703 3	38 7	
Cycle 7	164 07	36 80	0 234	0 5023	0 0330	12 7971	0 8508	0 1848	0 0044	0 9366	100 00	100 00	2623 8	141 8	2664 8	62 6	2696 1	38 9	
Cycle 8	154 95	29 49	0 198	0 5568	0 0390	14 2675	1 0090	0 1858	0 0045	0 9417	100 00	100 00	2853 4	161 5	2767 7	67 1	2705 7	39 7	
Cycle 9	151 97	26 73	0 183	0 5201	0 0343	13 1598	0 8762	0 1835	0 0045	0 9326	100 00	100 00	2699 7	145 3	2691 2	62 8	2684 8	40 2	
Cycle 10	157 92	19 53	0 129	0 5342	0 0356	13 4496	0 9066	0 1826	0 0044	0 9341	99 88	99 88	2759 2	149 7	2711 7	63 7	2676 6	40 3	
Cycle 11	167 15	18 58	0 116	0 5517	0 0386	14 0769	0 9943	0 1851	0 0044	0 9418	99 70	99 70	2832 1	160 2	2754 9	67 0	2698 8	39 6	
Cycle 12	161 17	15 52	0 100	0 5479	0 0381	13 9460	0 9784	0 1846	0 0044	0 9417	100 00	100 00	2816 4	158 6	2746 0	66 5	2694 7	39 4	
Cycle 13	155 63	13 79	0 092	0 5337	0 0356	13 1953	0 8903	0 1793	0 0044	0 9343	100 00	100 00	2757 2	149 8	2693 7	63 7	2646 5	40 4	
Cycle 14	149 05	13 11	0 092	0 5092	0 0327	12 8905	0 8366	0 1836	0 0046	0 9263	100 00	100 00	2653 3	139 5	2671 7	61 2	2685 7	41 0	
Cycle 15	155 45	13 30	0 089	0 5702	0 0420	14 4889	1 0773	0 1843	0 0045	0 9450	100 00	100 00	2908 5	172 5	2782 3	70 6	2692 0	40 6	
Cycle 16	149 19	11 92	0 083	0 5175	0 0345	13 1909	0 8893	0 1849	0 0047	0 9284	100 00	100 00	2688 4	146 5	2693 4	63 6	2697 1	41 9	
Cycle 17	138 21	10 78	0 081	0 5723	0 0413	14 4440	1 0545	0 1830	0 0047	0 9369	99 86	99 86	2917 4	169 5	2779 3	69 3	2680 6	42 7	
Cycle 18	135 71	11 17	0 086	0 5350	0 0367	13 3463	0 9280	0 1809	0 0048	0 9276	99 50	99 50	2762 5	154 1	2704 5	65 7	2661 4	43 6	
Cycle 19	139 36	10 35	0 077	0 4939	0 0315	12 4690	0 8080	0 1831	0 0048	0 9165	99 64	99 64	2587 6	136 1	2640 4	60 9	2681 1		

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from depth-profiling of samples from Abitibi Subprovince

Sample #	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		Correlation of Concordia Ellipses		% Radiogenic ²⁰⁶ Pb	% Radiogenic ²⁰⁷ Pb	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁷ Pb/ ²⁰⁶ Pb	
	(est ppm)	(est ppm)			value	1 s.e	value	1 s.e	value	1 s.e			Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e
Cycle 3	415 43	87 25	0 219	0 5845	0 0273	14 1992	0 6916	0 1762	0 0049	0 8304	95 89	95 89	2966 9	111 1	2763 1	46 2	2617 4	46 4
Cycle 4	438 55	69 72	0 166	0 6631	0 0345	16 4363	0 8844	0 1798	0 0050	0 8641	96 23	96 23	3279 3	133 9	2902 5	51 5	2650 7	45 9
Cycle 5	408 32	56 24	0 143	0 6503	0 0333	16 0741	0 8479	0 1793	0 0051	0 8487	96 97	96 97	3229 3	129 9	2881 2	50 4	2646 2	47 5
Cycle 6	386 46	47 12	0 127	0 6264	0 0320	15 5266	0 8244	0 1798	0 0053	0 8419	96 18	96 18	3135 4	127 0	2848 1	50 6	2650 7	48 7
Cycle 7	396 98	56 09	0 147	0 6227	0 0326	15 3043	0 8321	0 1782	0 0053	0 8447	95 96	95 96	3120 8	129 4	2834 4	51 8	2636 6	49 5
Cycle 8	389 67	51 29	0 137	0 6300	0 0340	15 9761	0 8884	0 1839	0 0054	0 8589	97 26	97 26	3149 6	134 6	2875 4	53 1	2688 5	48 2
Cycle 9	369 60	44 80	0 126	0 6113	0 0325	15 2678	0 8367	0 1811	0 0054	0 8482	97 40	97 40	3075 3	130 0	2832 1	52 2	2663 3	49 4
Cycle 10	354 80	43 04	0 126	0 6199	0 0338	15 4533	0 8700	0 1808	0 0054	0 8532	97 11	97 11	3109 4	134 6	2843 6	53 7	2660 3	49 9
Cycle 11	364 62	44 43	0 127	0 6018	0 0332	15 1403	0 8646	0 1825	0 0054	0 8596	96 54	96 54	3037 0	133 6	2824 1	54 4	2675 5	49 3
Cycle 12	383 95	41 66	0 113	0 5871	0 0318	14 7854	0 8291	0 1826	0 0055	0 8509	96 91	96 91	2977 9	129 3	2801 5	53 3	2676 9	49 9
Cycle 13	389 51	48 96	0 131	0 5774	0 0311	14 3758	0 7955	0 1806	0 0053	0 8533	98 31	98 31	2938 1	127 2	2774 8	52 5	2658 2	49 1
Cycle 14	376 88	40 57	0 112	0 5698	0 0307	14 2451	0 7847	0 1813	0 0053	0 8564	98 84	98 84	2907 2	126 0	2766 2	52 3	2664 9	48 4
Cycle 15	370 37	40 95	0 115	0 5773	0 0314	14 1010	0 7906	0 1772	0 0053	0 8542	97 69	97 69	2937 6	128 3	2756 5	53 2	2626 5	49 7
Cycle 16	394 38	33 57	0 089	0 5975	0 0344	14 7535	0 8759	0 1791	0 0052	0 8776	97 26	97 26	3019 8	139 0	2799 5	56 5	2644 4	48 1
Cycle 17	372 45	40 10	0 112	0 5750	0 0316	14 4771	0 8180	0 1826	0 0053	0 8629	97 82	97 82	2928 5	129 3	2781 5	53 7	2676 5	48 3
Cycle 18	393 88	37 68	0 100	0 5687	0 0313	14 1939	0 7989	0 1810	0 0052	0 8684	98 71	98 71	2902 6	128 6	2762 7	53 4	2662 1	47 4
Cycle 19	434 23	40 77	0 098	0 5605	0 0307	14 2104	0 7942	0 1839	0 0052	0 8689	99 03	99 03	2868 8	126 8	2763 9	53 0	2688 1	46 9
Cycle 20	413 35	39 74	0 100	0 5816	0 0332	14 8410	0 8707	0 1851	0 0053	0 8779	97 71	97 71	2955 2	135 4	2805 1	55 8	2698 9	47 3
Cycle 21	425 42	42 80	0 105	0 5999	0 0354	14 8433	0 8974	0 1794	0 0050	0 8894	98 06	98 06	3029 5	142 7	2805 2	57 5	2647 8	46 7
Cycle 22	393 16	34 79	0 092	0 5537	0 0305	13 8769	0 7828	0 1818	0 0052	0 8700	98 36	98 36	2840 7	126 4	2741 3	53 4	2668 9	47 1
Cycle 23	393 77	40 28	0 107	0 5905	0 0344	14 6663	0 8743	0 1801	0 0051	0 8846	98 33	98 33	2991 6	139 5	2793 8	56 7	2654 0	47 0
Cycle 24	409 92	37 56	0 095	0 5527	0 0307	13 9830	0 7972	0 1835	0 0052	0 8716	98 24	98 24	2836 5	127 6	2748 6	54 0	2684 6	47 2
Cycle 25	412 42	41 68	0 105	0 5809	0 0336	14 6462	0 8674	0 1829	0 0052	0 8808	97 98	97 98	2952 4	136 8	2792 5	56 3	2679 0	47 3
Cycle 26	363 40	37 95	0 109	0 5458	0 0303	13 6672	0 7774	0 1816	0 0052	0 8706	98 43	98 43	2807 5	126 3	2726 9	53 8	2667 8	47 4
Cycle 27	376 41	38 26	0 106	0 5186	0 0279	13 0869	0 7204	0 1830	0 0052	0 8636	98 85	98 85	2693 1	118 4	2685 9	51 9	2680 5	47 1
Cycle 28	383 16	36 64	0 100	0 5315	0 0285	13 3981	0 7326	0 1828	0 0052	0 8610	99 28	99 28	2747 8	119 8	2708 1	51 7	2678 7	47 2
Cycle 29	423 33	40 61	0 100	0 5713	0 0335	14 6062	0 8705	0 1854	0 0051	0 8905	99 34	99 34	2913 3	137 4	2789 9	56 6	2701 9	45 7
Cycle 30	370 14	34 91	0 098	0 5386	0 0294	13 6627	0 7648	0 1840	0 0053	0 8641	98 73	98 73	2777 6	123 4	2726 6	53 0	2689 1	47 7
Cycle 31	382 87	34 83	0 095	0 5464	0 0309	13 6713	0 7897	0 1815	0 0051	0 8776	98 71	98 71	2810 3	128 6	2727 2	54 7	2666 3	46 9
Cycle 32	368 73	36 09	0 102	0 5215	0 0277	13 0621	0 7091	0 1817	0 0053	0 8542	99 07	99 07	2705 5	117 2	2684 1	51 2	2668 1	48 0
Cycle 33	384 29	40 72	0 110	0 5723	0 0333	14 8431	0 8749	0 1881	0 0052	0 8891	100 00	100 00	2917 1	136 5	2805 2	56 1	2725 8	45 4
Cycle 34	388 26	37 84	0 102	0 5279	0 0291	13 4408	0 7528	0 1847	0 0051	0 8759	99 88	99 88	2732 4	122 8	2711 1	52 9	2695 3	45 8
Cycle 35	366 97	28 03	0 080	0 5597	0 0319	13 9108	0 8075	0 1803	0 0051	0 8809	99 44	99 44	2865 3	131 9	2743 7	55 0	2655 3	46 6
Cycle 36	411 96	36 15	0 091	0 5337	0 0299	13 6251	0 7774	0 1852	0 0052	0 8790	99 27	99 27	2757 1	125 6	2724 0	54 0	2699 6	45 9
Cycle 37	361 30	41 35	0 119	0 4954	0 0258	12 6728	0 6736	0 1855	0 0054	0 8482	99 33	99 33	2594 2	111 1	2655 6	50 0	2702 8	47 9
Cycle 38	377 98	35 17	0 097	0 5682	0 0337	14 4215	0 8704	0 1841	0 0051	0 8910	99 07	99 07	2900 2	138 4	2777 8	57 3	2690 1	46 2
Cycle 39	372 59	33 77	0 094	0 5673	0 0330	14 0870	0 8320	0 1801	0 0051	0 8846	99 63	99 63	2896 6	135 6	2755 6	56 0	2653 9	46 7
Cycle 40	387 66	35 40	0 095	0 5201	0 0288	13 1101	0 7433	0 1828	0 0052	0 8703	98 80	98 80	2699 4	122 2	2687 6	53 5	2678 7	47 3
Cycle 41	393 91	44 22	0 117	0 5499	0 0319	13 8945	0 8233	0 1833	0 0052	0 8846	99 00	99 00	2824 7	132 8	2742 5	56 1	2682 6	46 6
Cycle 42	394 95	28 96	0 076	0 5204	0 0291	12 8913	0 7373	0 1797	0 0051	0 8759	99 03	99 03	2700 8	123 5	2671 7	53 9	2649 8	46 8
Cycle 43	364 76	41 36	0 118	0 5158	0 0278	12 8002	0 7049	0 1800	0 0052	0 8620	99 38	99 38	2681 5	118 3	2665 1	51 9	2652 6	47 5
Cycle 44	395 65	36 35	0 096	0 5447	0 0317	13 8232	0 8251	0 1841	0 0052	0 8856	98 20	98 20	2802 9	132 4	2737 7	56 5	2689 9	46 7
Cycle 45	361 25	32 95	0 095	0 5249	0 0292	13 2435	0 7518	0 1830	0 0052	0 8723	99 00	99 00	2719 9	123 3	2697 2	53 6	2680 1	47 0
Cycle 46	389 24	43 37	0 116	0 5582	0 0329	14 1503	0 8515	0 1839	0 0052	0 8894	98 82	98 82	2859 1	136 2	2759 8	57 1	2688 1	46 4
Cycle 47	368 57	38 37	0 108	0 5355	0 0301	13 3746	0 7678	0 1812	0 0051	0 8754	99 00	99 00	2764 4	126 3	2706 5	54 2	2663 5	47 0
Cycle 48	402 06	38 09	0 099	0 5158	0 0284	12 6699	0 7144	0 1782	0 0051	0 8698	98 90	98 90	2681 3	120 8	2655 4	53 1	2635 8	47 3
Cycle 49	404 57	40 01	0 103	0 5264	0 0292	13 1419	0 7408	0 1811	0 0051	0 8736	99 68	99 68	2726 1	123 1	2689 9	53 2	2662 8	46 6
04ED-198-2	277 78	76 81	0 288	0 5945	0 0480	14 1191	1 1580	0 1723	0 0034	0 9704	92 82	92 82	3007 6	194 1	2757 7	77 8	2579 6	33 2
Cycle 2	221 19	52 27	0 246	0 6532	0 0582	15 9882	1 4433	0 1775	0 0038	0 9713	94 50	98 77	3240 5	227 0	2876 1	86 3	2630 0	35 8
Cycle 3	182 02	33 89	0 194	0 5569	0 0439	13 1101	0 5070	0 1707	0 0041	0 9539	93 46	98 58						

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from depth-profiles of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁷ Pb		% Radiogenic ²⁰⁶ Pb		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁷ Pb/ ²⁰⁶ Pb†	
	(est ppm)	(est ppm)		value	1 s.e	value	1 s.e	value		1 s.e			Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	
04ED-198-6	285 88	92 74	0 338	0 4486	0 0272	11 3303	0 6963	0 1832	0 0035	0 9519	98 31	99 62	2389 1	121 1	2550 7	57 3	2681 8	31 3	
Cycle 2	223 14	65 31	0 305	0 4747	0 0311	11 6669	0 7760	0 1783	0 0038	0 9487	98 41	99 65	2504 0	136 1	2578 0	62 2	2636 8	35 2	
Cycle 3	189 60	46 71	0 257	0 4734	0 0323	11 6028	0 8075	0 1778	0 0042	0 9412	97 03	99 35	2498 4	141 4	2572 9	65 1	2632 1	39 3	
Cycle 4	173 47	34 19	0 205	0 4899	0 0356	11 9171	0 8797	0 1764	0 0043	0 9441	97 94	99 55	2570 4	153 9	2597 9	69 2	2619 4	40 8	
Cycle 5	155 97	28 60	0 191	0 4765	0 0344	11 5439	0 8517	0 1757	0 0046	0 9365	96 60	99 26	2512 0	150 1	2568 1	68 9	2612 7	43 4	
Cycle 6	153 03	22 64	0 154	0 5094	0 0398	12 3710	0 9836	0 1761	0 0046	0 9457	97 57	99 47	2654 2	170 0	2633 0	74 7	2616 7	43 3	
Cycle 7	147 94	21 01	0 148	0 4328	0 0298	10 6709	0 7511	0 1788	0 0048	0 9268	97 33	99 41	2318 4	133 9	2494 9	65 3	2641 9	44 3	
Cycle 8	147 71	18 60	0 131	0 4627	0 0338	11 2860	0 8371	0 1769	0 0046	0 9386	99 35	99 86	2451 5	149 1	2547 0	69 2	2624 0	43 0	
Cycle 9	143 76	17 05	0 124	0 4644	0 0348	11 3697	0 8653	0 1775	0 0047	0 9386	98 68	99 71	2459 2	153 0	2553 9	71 0	2630 1	44 0	
04ED 198 d6	301 76	112 98	0 390	0 3947	0 0210	9 7643	0 5362	0 1794	0 0039	0 9194	96 32	96 32	2144 5	97 0	2412 8	50 6	2647 6	36 1	
Cycle 2	246 03	83 09	0 352	0 4591	0 0270	11 6036	0 6970	0 1833	0 0041	0 9283	98 10	98 10	2435 7	119 4	2573 0	56 1	2683 0	37 3	
Cycle 3	198 67	58 48	0 307	0 4635	0 0262	11 6775	0 6768	0 1827	0 0045	0 9092	98 04	98 04	2454 9	115 5	2578 9	54 2	2677 8	40 4	
Cycle 4	186 54	44 93	0 251	0 4919	0 0292	12 3952	0 7543	0 1828	0 0047	0 9101	97 37	97 37	2578 9	126 0	2634 8	57 2	2678 1	42 2	
Cycle 5	193 27	43 71	0 236	0 5101	0 0321	12 8596	0 8237	0 1828	0 0046	0 9233	98 97	98 97	2657 2	137 2	2669 4	60 3	2678 7	41 2	
Cycle 6	184 33	35 80	0 202	0 5075	0 0318	12 9078	0 8216	0 1845	0 0046	0 9211	99 44	99 44	2645 9	136 1	2672 9	60 0	2693 5	41 5	
Cycle 7	167 92	31 88	0 198	0 5061	0 0315	12 6766	0 8025	0 1817	0 0047	0 9164	99 23	99 23	2639 8	134 9	2655 9	59 6	2668 2	42 6	
Cycle 8	163 13	29 07	0 186	0 5306	0 0342	13 4074	0 8774	0 1833	0 0047	0 9207	99 42	99 42	2743 9	144 1	2708 8	61 8	2682 7	42 8	
Cycle 9	164 39	33 60	0 213	0 4920	0 0305	12 6119	0 7968	0 1859	0 0049	0 9123	98 83	98 83	2579 5	131 8	2651 1	59 4	2706 2	43 3	
Cycle 10	153 50	28 23	0 192	0 5173	0 0333	12 8635	0 8469	0 1804	0 0049	0 9146	98 35	98 35	2687 6	141 6	2669 7	62 0	2656 2	44 7	
Cycle 11	151 96	26 09	0 179	0 5338	0 0344	13 4316	0 8804	0 1825	0 0050	0 9123	99 16	99 16	2757 4	144 6	2710 5	61 9	2675 7	45 1	
Cycle 12	152 57	24 05	0 164	0 5182	0 0336	13 1998	0 8697	0 1847	0 0049	0 9165	99 25	99 25	2691 5	142 6	2694 0	62 2	2696 0	44 1	
Cycle 13	150 35	28 69	0 199	0 5353	0 0353	13 2811	0 8918	0 1800	0 0049	0 9156	98 79	98 79	2763 6	148 1	2699 8	63 4	2652 4	45 4	
Cycle 14	158 57	26 04	0 171	0 5144	0 0333	13 0792	0 8615	0 1844	0 0049	0 9174	99 12	99 12	2675 6	141 8	2685 4	62 1	2692 8	43 9	
Cycle 15	163 86	27 66	0 176	0 4983	0 0312	12 5493	0 8048	0 1826	0 0050	0 9089	98 23	98 23	2606 7	134 4	2646 4	60 3	2677 0	44 8	
Cycle 16	166 03	21 75	0 136	0 5195	0 0334	12 9616	0 8501	0 1809	0 0048	0 9159	98 84	98 84	2697 2	141 9	2676 9	61 8	2661 5	44 2	
Cycle 17	168 69	24 35	0 150	0 5137	0 0332	13 0695	0 8582	0 1845	0 0048	0 9198	99 53	99 53	2672 5	141 6	2684 7	61 9	2693 8	43 2	
Cycle 18	153 60	22 60	0 153	0 4734	0 0279	12 1586	0 7296	0 1863	0 0050	0 8988	99 40	99 40	2498 4	122 0	2616 7	56 3	2709 6	44 2	
Cycle 19	163 87	21 81	0 139	0 5400	0 0369	13 4549	0 9328	0 1807	0 0047	0 9285	99 30	99 30	2783 5	154 5	2712 1	65 5	2659 3	43 2	
Cycle 20	172 62	19 98	0 121	0 5140	0 0337	12 7086	0 8439	0 1793	0 0046	0 9246	99 73	99 73	2673 5	143 4	2658 3	62 5	2646 8	42 5	
Cycle 21	158 93	19 41	0 127	0 4996	0 0311	12 8749	0 8167	0 1869	0 0050	0 9102	98 94	98 94	2612 0	133 7	2670 5	59 8	2715 2	43 9	
Cycle 22	149 98	19 58	0 136	0 5234	0 0334	12 7732	0 8325	0 1770	0 0048	0 9118	98 80	98 80	2713 5	141 5	2663 1	61 4	2625 0	45 1	
Cycle 23	152 22	17 42	0 119	0 5002	0 0316	12 4186	0 7970	0 1801	0 0048	0 9132	99 37	99 37	2614 7	135 6	2636 6	60 3	2653 5	44 0	
Cycle 24	146 19	17 78	0 127	0 4706	0 0278	11 9378	0 7199	0 1840	0 0050	0 8968	99 16	99 16	2486 0	121 9	2599 5	56 5	2689 2	44 9	
Cycle 25	143 96	14 99	0 108	0 5161	0 0333	12 9986	0 8518	0 1827	0 0050	0 9130	99 50	99 50	2682 4	141 6	2679 6	61 8	2674 4	44 9	
Cycle 26	147 81	14 47	0 102	0 5209	0 0339	13 0697	0 8644	0 1820	0 0049	0 9148	99 63	99 63	2703 0	143 9	2684 7	62 4	2670 9	44 9	
Cycle 27	146 22	14 48	0 103	0 5251	0 0342	13 1752	0 8706	0 1820	0 0049	0 9148	99 58	99 58	2720 8	144 5	2692 3	62 4	2670 9	44 8	
Cycle 28	149 23	14 79	0 103	0 5241	0 0341	13 0072	0 8622	0 1800	0 0050	0 9107	98 76	98 76	2716 7	144 0	2680 2	62 5	2652 7	46 0	
Cycle 29	137 38	17 02	0 129	0 4717	0 0274	11 7258	0 6938	0 1803	0 0051	0 8849	99 63	99 63	2491 0	119 9	2582 8	55 4	2655 6	46 7	
Cycle 30	149 16	11 94	0 083	0 5044	0 0320	12 6817	0 8156	0 1823	0 0050	0 9087	99 71	99 71	2632 9	136 9	2656 3	60 5	2674 2	45 2	
Cycle 31	141 15	15 40	0 114	0 4880	0 0297	12 1053	0 7508	0 1799	0 0050	0 8977	99 26	99 26	2561 9	128 6	2612 6	58 2	2652 1	46 1	
Cycle 32	147 61	16 65	0 118	0 4988	0 0314	12 3622	0 7925	0 1797	0 0049	0 9081	99 42	99 42	2608 8	135 2	2632 3	60 2	2650 4	45 2	
Cycle 33	141 09	14 67	0 108	0 4716	0 0282	11 8540	0 7278	0 1823	0 0052	0 8914	98 26	98 26	2490 6	123 5	2592 9	57 5	2673 9	46 8	
Cycle 34	144 01	15 05	0 109	0 4959	0 0308	12 4281	0 7888	0 1818	0 0051	0 9020	98 84	98 84	2596 1	132 8	2637 3	59 6	2669 1	46 1	
Cycle 35	142 98	13 71	0 100	0 4908	0 0302	12 2385	0 7699	0 1808	0 0051	0 8986	98 61	98 61	2574 3	130 5	2622 9	59 1	2660 6	46 5	
Cycle 36	144 26	14 61	0 106	0 4884	0 0300	12 2219	0 7662	0 1815	0 0050	0 9019	99 27	99 27	2563 6	133 0	2621 6	58 8	2666 7	45 6	
Cycle 37	145 23	13 08	0 094	0 5008	0 0311	12 1853	0 7698	0 1765	0 0048	0 9059	99 71	99 71	2617 1	130 7	2618 8	59 3	2620 1	45 3	
Cycle 38	143 04	11 52	0 084	0 4779	0 0290	12 0466	0 7456	0 1828	0 0050	0 9000	99 14	99 14	2518 2	126 5	2608 0	58 0	2678 6	45 4	
Cycle 39	135 31	13 07	0 101	0 4842	0 0288	12 3994	0 7528	0 1857	0 0052	0 8920	99 23	99 23	2545 4	125 2	2635 1	57 0	2704 8	46 1	
Cycle 40	144 54	13 14	0 095	0 5178	0 0337	13 0493	0 8654	0 1828	0 0050	0 9124	98 77	98 77	2689 9	143 0	2683 2	62 5	2678 2	45 5	
Cycle 41	139 56																		

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from zircon profiles of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³⁵ Pb*		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁷ Pb		% Radiogenic ²⁰⁶ Pb		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³⁵ Pb†	
	(est ppm)	(est ppm)	(est ppm)	value	1 s e	value	1 s e	value	1 s e	value		1 s e	Age (Ma)	1 s e	Age (Ma)	1 s e	Age (Ma)	1 s e	Age (Ma)	1 s e	
Cycle 8	155 16	13 87	0 093	0 4535	0 0343	11 1304	0 8983	0 1780	0 0058	0 9146	85 06	96 36	2410 6	152 1	2534 1	75 2	2634 6	54 3			
Cycle 9	157 40	11 50	0 076	0 4202	0 0300	9 9696	0 7606	0 1721	0 0054	0 9105	87 05	97 00	2261 3	136 4	2432 0	70 4	2578 0	52 8			
09AS2 Quartz feldspar porphyritic xenite schist Hoyle Pond Mine (NAD83 Zone 17 UTM 492375E 5374576N)																					
09AS2 1	164 54	34 18	0 216	0 4523	0 0183	11 1146	0 4727	0 1782	0 0035	0 8900	95 81	99 07	2405 4	81 3	2532 8	39 6	2636 4	32 5			
Cycle 2	159 12	32 49	0 213	0 4657	0 0189	11 5470	0 4904	0 1798	0 0035	0 8891	95 81	99 06	2464 7	82 9	2568 4	39 7	2651 3	32 6			
Cycle 3	150 98	29 87	0 206	0 4571	0 0178	11 4722	0 4659	0 1820	0 0035	0 8851	97 19	99 37	2426 5	78 9	2562 3	37 9	2671 6	31 7			
Cycle 4	155 31	28 11	0 189	0 4573	0 0179	11 1282	0 4575	0 1765	0 0035	0 8823	96 20	99 17	2427 7	79 2	2533 9	38 3	2620 1	32 6			
Cycle 5	161 17	28 78	0 186	0 4782	0 0195	11 7317	0 4993	0 1779	0 0034	0 8948	96 31	99 18	2519 3	85 0	2583 2	39 8	2633 8	31 9			
Cycle 6	160 30	24 66	0 160	0 4796	0 0194	11 9353	0 4995	0 1805	0 0033	0 9011	97 79	99 51	2525 6	84 7	2599 3	39 2	2657 3	30 4			
Cycle 7	153 37	22 67	0 154	0 4871	0 0195	12 0297	0 4950	0 1791	0 0033	0 8975	98 14	99 59	2558 2	84 3	2606 7	38 6	2644 6	30 5			
Cycle 8	155 42	21 40	0 143	0 5095	0 0213	12 7352	0 5453	0 1813	0 0033	0 9097	98 43	99 65	2654 6	90 9	2660 3	40 3	2664 6	29 8			
Cycle 9	157 63	24 69	0 163	0 4955	0 0202	12 2493	0 5166	0 1793	0 0033	0 9010	97 23	99 39	2594 6	87 0	2623 7	39 6	2646 3	30 7			
Cycle 10	158 59	22 97	0 151	0 5099	0 0212	12 8225	0 5465	0 1824	0 0033	0 9098	98 19	99 60	2656 4	90 4	2666 7	40 1	2674 5	29 6			
Cycle 11	153 92	20 22	0 137	0 4661	0 0178	11 4731	0 4520	0 1785	0 0032	0 8908	98 13	99 59	2466 5	78 2	2562 4	36 8	2639 1	30 2			
Cycle 12	159 79	21 30	0 139	0 4868	0 0195	12 2462	0 5051	0 1825	0 0033	0 9043	97 96	99 54	2556 8	84 6	2623 5	38 7	2675 3	29 5			
Cycle 13	160 34	20 76	0 135	0 4910	0 0195	12 3526	0 5036	0 1825	0 0032	0 9060	98 70	99 71	2575 1	84 5	2631 6	38 3	2675 3	28 9			
Cycle 14	155 56	21 92	0 147	0 4643	0 0173	11 7673	0 4511	0 1838	0 0033	0 8908	98 63	99 69	2458 3	76 2	2586 1	35 9	2687 7	29 3			
09AS2 d1	193 65	33 78	0 182	0 4254	0 0192	10 7518	0 5005	0 1833	0 0043	0 8675	99 30	99 84	2285 2	86 9	2501 9	43 2	2682 8	39 1			
Cycle 2	181 73	28 07	0 161	0 4240	0 0187	10 6933	0 4910	0 1829	0 0045	0 8527	98 66	99 70	2278 6	84 8	2496 8	42 6	2679 5	40 5			
Cycle 3	173 99	22 64	0 136	0 4419	0 0197	10 8002	0 5007	0 1773	0 0044	0 8524	98 75	99 73	2359 0	88 2	2506 1	43 1	2627 5	41 2			
Cycle 4	174 56	18 50	0 110	0 4691	0 0219	11 9603	0 5768	0 1849	0 0045	0 8701	99 00	99 77	2479 7	96 3	2601 3	45 2	2697 4	40 1			
Cycle 5	158 61	18 78	0 123	0 4876	0 0227	12 1265	0 5816	0 1804	0 0045	0 8614	99 04	99 79	2560 3	98 3	2614 2	45 0	2656 2	41 3			
Cycle 6	165 07	16 98	0 107	0 4841	0 0226	12 4023	0 5920	0 1858	0 0045	0 8685	99 88	99 97	2544 9	98 2	2635 4	44 9	2705 6	40 0			
Cycle 7	158 76	14 82	0 097	0 4785	0 0221	12 1984	0 5777	0 1849	0 0045	0 8636	99 68	99 93	2520 7	96 4	2619 8	44 4	2697 3	40 4			
Cycle 8	165 17	16 15	0 102	0 5093	0 0248	12 9206	0 6419	0 1840	0 0045	0 8787	99 75	99 94	2653 8	105 7	2673 9	46 8	2689 1	40 0			
Cycle 9	162 97	15 82	0 101	0 5184	0 0251	12 7348	0 6330	0 1782	0 0045	0 8681	99 34	99 86	2692 3	106 5	2660 2	46 8	2635 9	41 9			
Cycle 10	164 76	16 17	0 102	0 5016	0 0239	12 8826	0 6271	0 1863	0 0046	0 8690	100 00	100 00	2620 6	102 7	2671 1	45 9	2709 5	40 7			
Cycle 11	165 37	12 43	0 078	0 5121	0 0248	13 0947	0 6464	0 1854	0 0045	0 8757	99 88	99 97	2665 8	105 5	2686 5	46 6	2702 1	40 2			
Cycle 12	158 44	12 81	0 084	0 5019	0 0236	12 6943	0 6109	0 1834	0 0046	0 8639	99 68	99 93	2622 0	101 2	2657 2	45 3	2684 2	41 1			
Cycle 13	158 72	13 04	0 086	0 4995	0 0239	12 8356	0 6265	0 1864	0 0046	0 8707	99 88	99 97	2611 8	102 6	2667 7	46 0	2710 3	40 5			
Cycle 14	156 93	11 06	0 073	0 5163	0 0251	12 9281	0 6439	0 1816	0 0045	0 8707	99 67	99 93	2683 5	106 8	2674 4	46 9	2667 6	41 5			
Cycle 15	149 87	13 45	0 093	0 4936	0 0232	12 3929	0 5945	0 1821	0 0046	0 8563	100 00	100 00	2586 0	99 9	2634 6	45 1	2672 2	42 1			
Cycle 16	134 56	10 03	0 078	0 4769	0 0220	12 1865	0 5764	0 1854	0 0048	0 8443	99 74	99 94	2513 5	95 9	2618 9	44 4	2701 3	43 1			
Cycle 17	135 63	9 76	0 075	0 5093	0 0245	12 9099	0 6393	0 1838	0 0048	0 8583	99 33	99 85	2653 8	104 8	2673 1	46 7	2687 7	43 0			
Cycle 18	132 18	9 84	0 078	0 4913	0 0230	12 3872	0 5939	0 1829	0 0048	0 8487	100 00	100 00	2576 2	99 5	2634 2	45 0	2679 1	43 2			
Cycle 19	137 29	9 13	0 069	0 4803	0 0224	12 1791	0 5828	0 1839	0 0048	0 8505	99 87	99 97	2528 6	97 7	2618 3	44 9	2688 4	42 8			
Cycle 20	140 17	9 63	0 072	0 4913	0 0231	12 4288	0 5990	0 1835	0 0048	0 8511	99 66	99 92	2576 4	99 8	2637 4	45 3	2684 5	43 0			
Cycle 21	130 24	10 28	0 082	0 4724	0 0213	11 7988	0 5440	0 1812	0 0048	0 8339	100 00	100 00	2493 9	93 0	2588 6	43 2	2663 5	43 5			
Cycle 22	137 97	10 33	0 078	0 4852	0 0225	12 1974	0 5778	0 1823	0 0047	0 8475	100 00	100 00	2549 9	97 5	2619 7	44 5	2674 1	42 8			
Cycle 23	142 68	9 35	0 068	0 5039	0 0241	12 6780	0 6201	0 1825	0 0046	0 8622	100 00	100 00	2630 5	103 4	2656 0	46 0	2675 6	42 1			
Cycle 24	137 63	8 85	0 067	0 5013	0 0241	12 6064	0 6190	0 1824	0 0047	0 8616	100 00	100 00	2619 6	103 4	2650 7	46 2	2674 5	42 3			
Cycle 25	131 47	9 35	0 074	0 4864	0 0226	12 1837	0 5806	0 1817	0 0048	0 8455	99 95	99 99	2555 2	98 2	2618 7	44 7	2668 1	43 4			
Cycle 26	135 96	9 53	0 073	0 5024	0 0240	12 6433	0 6207	0 1825	0 0047	0 8575	99 53	99 90	2624 3	103 1	2653 4	46 2	2675 8	42 9			
Cycle 27	136 89	9 91	0 060	0 5104	0 0245	12 6126	0 6219	0 1792	0 0046	0 8590	99 66	99 93	2658 1	104 7	2651 2	46 4	2645 8	43 0			
Cycle 28	126 99	8 39	0 069	0 4629	0 0207	11 2205	0 5166	0 1758	0 0047	0 8293	99 86	99 97	2452 5	91 4	2541 6	42 9	2613 6	44 2			
Cycle 29	135 90	8 09	0 062	0 4749	0 0218	11 9691	0 5663	0 1828	0 0047	0 8466	99 53	99 90	2505 1	95 5	2602 0	44 3	2678 3	42 8			
Cycle 30	140 58	7 85	0 058	0 4850	0 0224	12 3609	0 5858	0 1849	0 0047	0 8497	99 67	99 93	2548 9	97 2	2632 2	44 5	2696 9	42 4			
Cycle 31	145 99	8 46	0 060	0 5173	0 0250	12 9506	0 6402	0 1816	0 0045	0 8706	100 00	100 00	2687 6	106 4	2676 1	46 6	2667 4	41 3			
Cycle 32	141 82	7 97	0 059	0 5073	0 0242	13 0289	0 6337	0 1863	0 0046	0 8664	100 00	100 00	2645 2	103 4	2681 7	45 9	2709 4	41 1			
Cycle 33	139 47	8 27	0 062	0 4908	0 0227	12 1648	0 5755	0 1798	0 0045	0 8553	99 87	99 97	2574 2	98 0	2617 2	44 4	2650 6	41 8			

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from dentin profiles of samples from Abitibi Subprovince																		
Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁶ Pb	% Radiogenic ²⁰⁷ Pb	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb†		
	(est ppm)	(est ppm)			value	1 s.e.	value	1 s.e.				value	1 s.e.	Age (Ma)	1 s.e.	Age (Ma)	1 s.e.	Age (Ma)
Cycle 3	168 63	34 29	0 212	0 2883	0 0108	7 0212	0 2811	0 1766	0 0036	0 8619	96 83	99 31	1633 1	54 1	2114 1	35 6	2621 5	34 1
Cycle 4	166 54	35 15	0 220	0 3002	0 0115	7 3139	0 2996	0 1767	0 0037	0 8661	96 63	99 26	1692 4	57 1	2150 5	36 6	2622 0	34 4
Cycle 5	164 14	31 89	0 202	0 3132	0 0122	7 8047	0 3214	0 1807	0 0037	0 8743	97 46	99 43	1756 4	60 0	2208 8	37 1	2659 6	33 5
Cycle 6	155 87	29 08	0 194	0 3021	0 0112	7 6303	0 2977	0 1832	0 0037	0 8597	97 89	99 53	1701 8	55 4	2188 4	35 0	2681 9	33 5
Cycle 7	150 85	28 18	0 195	0 3115	0 0118	7 7718	0 3074	0 1810	0 0036	0 8673	98 40	99 65	1748 0	57 9	2204 9	35 6	2661 7	33 1
Cycle 8	151 22	27 12	0 187	0 3202	0 0123	7 8891	0 3222	0 1787	0 0037	0 8672	97 13	99 37	1790 5	60 3	2218 4	36 8	2641 0	34 2
Cycle 9	152 10	24 07	0 165	0 3302	0 0129	8 1423	0 3354	0 1788	0 0037	0 8709	97 09	99 36	1839 4	62 3	2247 0	37 3	2642 1	34 0
Cycle 10	144 64	23 67	0 170	0 3295	0 0126	8 2332	0 3326	0 1812	0 0037	0 8679	97 46	99 43	1836 1	61 2	2257 0	36 6	2663 9	33 7
Cycle 11	149 24	21 24	0 148	0 3420	0 0134	8 6440	0 3494	0 1833	0 0035	0 8832	98 89	99 75	1896 1	64 1	2301 2	36 8	2683 3	31 8
Cycle 12	149 22	21 39	0 149	0 3430	0 0132	8 5067	0 3406	0 1799	0 0035	0 8766	98 46	99 66	1901 3	63 3	2286 6	36 4	2651 5	32 4
Cycle 13	150 74	20 88	0 144	0 3530	0 0138	8 7282	0 3557	0 1793	0 0035	0 8811	98 19	99 60	1948 8	65 8	2310 0	37 1	2646 8	32 4
Cycle 14	144 93	20 39	0 147	0 3459	0 0131	8 7258	0 3428	0 1830	0 0036	0 8718	98 51	99 67	1914 9	62 6	2309 8	35 8	2679 9	32 4
09AS2-3	192 18	48 35	0 262	0 4503	0 0174	11 3184	0 4564	0 1823	0 0034	0 8878	96 62	99 24	2396 6	77 3	2549 7	37 6	2673 8	31 1
Cycle 2	187 87	46 58	0 258	0 4919	0 0204	12 0764	0 5217	0 1781	0 0034	0 8974	96 14	99 14	2579 0	88 0	2610 4	40 5	2634 8	32 0
Cycle 3	181 41	39 46	0 227	0 4887	0 0201	12 0799	0 5144	0 1793	0 0034	0 8987	97 02	99 34	2565 1	86 9	2610 6	39 9	2646 1	31 3
Cycle 4	177 02	40 72	0 240	0 4958	0 0204	12 3247	0 5239	0 1803	0 0034	0 8990	97 31	99 40	2595 8	87 8	2629 5	39 9	2655 5	31 2
Cycle 5	183 19	38 89	0 221	0 5000	0 0206	12 5345	0 5330	0 1818	0 0034	0 9027	97 71	99 49	2614 0	88 6	2645 3	40 0	2669 4	30 7
Cycle 6	174 36	32 80	0 196	0 4976	0 0202	12 6104	0 5310	0 1838	0 0035	0 8941	96 88	99 29	2603 6	86 9	2651 0	39 6	2687 4	31 5
Cycle 7	172 09	30 44	0 184	0 5025	0 0207	12 6338	0 5399	0 1824	0 0034	0 8997	97 12	99 35	2624 5	89 0	2652 7	40 2	2674 4	31 2
Cycle 8	171 52	30 15	0 183	0 4925	0 0198	12 4750	0 5158	0 1837	0 0034	0 8976	98 04	99 56	2581 4	85 4	2640 8	38 9	2686 7	30 5
Cycle 9	175 00	32 10	0 191	0 5070	0 0207	12 6702	0 5319	0 1812	0 0033	0 9024	98 53	99 68	2643 9	88 7	2655 4	39 5	2664 2	30 4
Cycle 10	169 78	27 36	0 168	0 5189	0 0215	12 8278	0 5449	0 1793	0 0033	0 9038	98 45	99 66	2694 5	91 2	2667 1	40 0	2646 4	30 6
Cycle 11	164 86	29 42	0 186	0 5303	0 0221	13 0896	0 5614	0 1790	0 0034	0 9018	97 94	99 55	2742 7	93 1	2686 1	40 5	2643 9	31 2
Cycle 12	167 37	27 40	0 171	0 5175	0 0213	12 8050	0 5456	0 1795	0 0034	0 8964	97 26	99 39	2688 4	90 5	2665 4	40 1	2648 0	31 7
Cycle 13	166 48	28 43	0 178	0 5192	0 0214	12 9376	0 5510	0 1807	0 0034	0 8980	97 59	99 46	2695 7	90 9	2675 1	40 1	2659 6	31 4
Cycle 14	160 01	26 89	0 175	0 5149	0 0210	12 7457	0 5377	0 1795	0 0035	0 8928	97 25	99 39	2677 4	89 2	2661 0	39 7	2648 6	31 9
09AS2-4	262 64	38 99	0 155	0 5159	0 0066	5 2156	1 1772	0 1752	0 0032	0 8443	95 13	98 93	1260 2	35 2	1855 2	28 9	2608 0	30 5
Cycle 2	246 53	38 13	0 161	0 2324	0 0074	5 5368	0 1914	0 1728	0 0031	0 8563	96 07	99 15	1347 0	38 7	1906 3	29 7	2585 0	30 0
Cycle 3	229 95	36 44	0 165	0 2340	0 0073	5 6705	0 1886	0 1758	0 0031	0 8547	97 22	99 40	1355 4	38 0	1926 9	28 7	2613 3	29 1
Cycle 4	231 74	33 82	0 152	0 2352	0 0073	5 7026	0 1899	0 1758	0 0031	0 8569	97 29	99 41	1361 7	38 2	1931 8	28 8	2614 0	28 9
Cycle 5	231 41	32 45	0 146	0 2459	0 0078	5 8507	0 1989	0 1726	0 0030	0 8619	97 26	99 42	1417 2	40 5	1954 0	29 5	2582 8	29 1
Cycle 6	227 37	29 20	0 134	0 2568	0 0084	6 2539	0 2165	0 1766	0 0030	0 8762	98 01	99 57	1473 6	43 3	2012 0	30 3	2621 2	28 1
Cycle 7	224 18	29 38	0 137	0 2586	0 0085	6 3056	0 2186	0 1768	0 0030	0 8723	97 61	99 48	1482 8	43 4	2019 2	30 4	2623 3	28 5
Cycle 8	221 49	27 65	0 130	0 2468	0 0077	6 0455	0 1979	0 1776	0 0030	0 8589	98 15	99 60	1422 2	39 6	1982 4	28 5	2630 8	28 3
Cycle 9	227 46	27 12	0 124	0 2703	0 0092	6 6348	0 2381	0 1780	0 0031	0 8791	97 21	99 39	1542 4	46 5	2064 0	31 7	2634 4	28 7
Cycle 10	218 04	27 31	0 130	0 2541	0 0081	6 1503	0 2075	0 1756	0 0030	0 8670	97 86	99 54	1459 3	41 7	1997 4	29 5	2611 6	28 3
Cycle 11	221 16	27 36	0 129	0 2634	0 0086	6 4630	0 2209	0 1780	0 0030	0 8779	98 47	99 67	1507 0	43 9	2040 9	30 1	2634 2	27 6
Cycle 12	209 82	26 05	0 129	0 2671	0 0088	6 6268	0 2249	0 1799	0 0029	0 8816	99 45	99 88	1526 1	44 6	2062 9	29 9	2652 3	27 0
Cycle 13	220 74	25 04	0 118	0 2586	0 0086	6 4504	0 2220	0 1809	0 0029	0 8870	99 36	99 86	1482 6	44 1	2039 2	30 3	2661 3	26 7
Cycle 14	203 59	24 28	0 124	0 2552	0 0083	6 2976	0 2154	0 1790	0 0030	0 8733	98 65	99 70	1465 3	42 9	2018 1	30 0	2643 3	28 1
09AS2-sp4	203 76	70 61	0 361	0 3464	0 0128	8 5583	0 3293	0 1792	0 0031	0 8931	97 62	99 47	1917 5	62 2	2292 1	35 0	2645 3	29 0
Cycle 2	198 46	61 60	0 323	0 3607	0 0135	8 9467	0 3503	0 1799	0 0032	0 8934	97 19	99 38	1985 4	64 0	2332 6	35 8	2652 0	29 5
Cycle 3	202 07	62 81	0 324	0 3561	0 0131	8 8074	0 3355	0 1794	0 0031	0 8924	97 95	99 55	1963 8	62 0	2318 3	34 7	2647 0	28 9
Cycle 4	196 34	56 05	0 297	0 3753	0 0143	9 1405	0 3616	0 1767	0 0031	0 9000	97 92	99 55	2054 1	67 1	2352 2	36 2	2621 8	29 0
Cycle 5	184 37	51 83	0 293	0 3692	0 0135	9 1321	0 3455	0 1794	0 0031	0 8914	98 39	99 65	2025 6	63 5	2351 3	34 6	2647 3	28 8
Cycle 6	195 64	50 22	0 267	0 3672	0 0135	9 0649	0 3409	0 1790	0 0030	0 8994	99 42	99 87	2016 2	63 5	2344 6	34 4	2644 1	27 7
Cycle 7	192 53	50 06	0 271	0 3900	0 0148	9 7103	0 3785	0 1806	0 0031	0 9037	98 90	99 76	2122 6	68 6	2407 7	35 9	2658 4	28 0
Cycle 8	189 33	46 32	0 255	0 3791	0 0141	9 3159	0 3586	0 1782	0 0031	0 8976	98 28	99 62	2072 2	66 0	2369 6	35 3	2636 3	28 5
Cycle 9	180 75	43 62	0 251	0 3788	0 0138	9 4619	0 3550	0 1812	0 0031	0 8954	99 01	99 78	2070 5	64 6	2383 9	34 5	2663 7	28 1
Cycle 10	185 26	44 08	0 248	0 3856	0 0144	9 6325	0 3693	0 1812	0 0030	0 9031	99 09	99 80	2102 4	67 0	2400 3	35 3	2663 6	27 7
Cycle 11	183 41	40 67	0 231	0 3927	0 0148	9 9077	0 3818	0 1830	0 0030	0 9048	99 27	99 84	2135 5	68 4				

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from denth-profiling of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁷ Pb/ ²⁰⁶ Pb*		Correlation of Concordia Ellipses	% Radiogenic		% Radiogenic		²⁰⁶ Pb/ ²³⁸ U		% Radiogenic		²⁰⁷ Pb/ ²³⁵ U		²⁰⁷ Pb/ ²⁰⁶ Pb†	
	(est ppm)	(est ppm)	(est ppm)	value	1 s.e	value	1 s.e	value	1 s.e	% Pb		% Pb	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e			
Cycle 16	121.60	24.66	0.211	0.4027	0.0192	9.9316	0.5255	0.1788	0.0054	0.8266	93.28	98.47	2181.7	88.5	2428.5	48.8	2642.2	49.9					
Cycle 17	127.64	24.00	0.196	0.4352	0.0217	10.7632	0.5831	0.1794	0.0051	0.8515	94.23	98.69	2329.1	97.7	2502.9	50.3	2647.1	47.6					
Cycle 18	130.92	21.83	0.174	0.4253	0.0201	10.7486	0.5469	0.1833	0.0051	0.8434	94.93	98.83	2284.3	90.7	2501.6	47.3	2683.1	45.8					
Cycle 19	132.48	26.08	0.205	0.4016	0.0181	10.1258	0.4911	0.1829	0.0049	0.8378	95.70	99.02	2176.2	83.3	2446.3	44.8	2679.2	44.4					
Cycle 20	133.54	27.03	0.211	0.4103	0.0184	10.4430	0.5069	0.1846	0.0050	0.8377	95.02	98.85	2216.4	84.3	2474.9	45.0	2694.5	44.4					
Cycle 21	132.73	21.58	0.169	0.3917	0.0170	9.8007	0.4715	0.1815	0.0051	0.8179	93.21	98.43	2130.8	78.8	2416.2	44.3	2666.3	46.3					
Cycle 22	135.85	21.56	0.165	0.4340	0.0203	10.8563	0.5550	0.1814	0.0050	0.8433	93.19	98.43	2323.8	91.2	2510.9	47.5	2665.8	45.9					
Cycle 23	134.94	23.36	0.180	0.4183	0.0190	10.2601	0.5206	0.1779	0.0051	0.8295	91.81	98.12	2253.0	86.4	2458.5	46.9	2633.1	47.4					
Cycle 24	141.97	26.96	0.198	0.4104	0.0179	10.3923	0.4906	0.1836	0.0048	0.8396	94.84	98.81	2216.9	82.0	2470.4	43.7	2686.1	42.9					
Cycle 25	142.73	24.47	0.179	0.4255	0.0191	10.7010	0.5174	0.1824	0.0047	0.8503	94.84	98.81	2285.2	86.4	2497.5	44.9	2674.9	42.6					
Cycle 26	123.12	19.55	0.165	0.4132	0.0177	10.2704	0.4675	0.1803	0.0046	0.8318	96.91	99.31	2229.5	80.8	2459.4	42.1	2655.4	42.7					
Cycle 27	128.41	19.46	0.158	0.4416	0.0203	11.0699	0.5396	0.1818	0.0046	0.8567	96.41	99.19	2357.8	90.9	2529.0	45.4	2669.5	42.2					
Cycle 28	113.36	18.06	0.166	0.3878	0.0160	9.5999	0.4346	0.1795	0.0049	0.8025	94.87	98.84	2112.8	74.5	2397.2	41.6	2648.4	45.6					
Cycle 29	116.10	16.12	0.145	0.4231	0.0185	10.2689	0.4879	0.1760	0.0048	0.8219	95.07	98.91	2274.6	84.0	2459.3	44.0	2615.7	45.7					
Cycle 30	114.56	17.48	0.159	0.4213	0.0185	10.8117	0.4975	0.1861	0.0047	0.8401	97.77	99.49	2266.5	83.8	2507.1	42.8	2708.1	42.1					
Cycle 31	114.08	14.66	0.134	0.4334	0.0193	10.8922	0.5094	0.1823	0.0047	0.8393	97.59	99.46	2321.1	86.7	2514.0	43.5	2673.6	43.0					
Cycle 32	110.39	13.75	0.130	0.4317	0.0193	10.6443	0.5110	0.1788	0.0048	0.8318	95.81	99.06	2313.4	87.0	2492.6	44.6	2642.0	45.0					
Cycle 33	109.12	16.33	0.156	0.4171	0.0185	10.4883	0.5110	0.1824	0.0052	0.8183	93.60	98.52	2247.3	84.1	2478.9	45.2	2674.6	46.9					
Cycle 34	106.25	13.35	0.131	0.4510	0.0206	11.3955	0.5524	0.1833	0.0050	0.8367	96.41	99.18	2399.7	91.5	2556.1	45.2	2682.6	44.7					
Cycle 35	108.70	15.33	0.147	0.4306	0.0192	10.6938	0.5118	0.1801	0.0049	0.8282	95.88	99.07	2308.2	86.6	2496.9	44.4	2654.1	45.2					
Cycle 36	106.06	12.41	0.122	0.4368	0.0197	10.9606	0.5224	0.1820	0.0048	0.8377	97.19	99.37	2336.4	88.5	2519.8	44.4	2671.0	44.0					
Cycle 37	100.32	12.78	0.133	0.4469	0.0204	11.1682	0.5368	0.1812	0.0049	0.8366	97.17	99.37	2381.6	90.7	2537.3	44.8	2664.2	44.5					
Cycle 38	96.11	11.49	0.125	0.4298	0.0189	10.7450	0.5033	0.1813	0.0050	0.8209	96.80	99.28	2304.8	85.4	2501.3	43.5	2665.0	45.3					
Cycle 39	95.68	11.53	0.125	0.4102	0.0175	10.2227	0.4678	0.1808	0.0050	0.8058	96.34	99.18	2215.6	80.0	2455.1	42.3	2659.9	45.9					
Cycle 40	96.38	11.72	0.127	0.4517	0.0205	11.1283	0.5356	0.1787	0.0049	0.8304	96.95	99.32	2402.8	91.2	2533.9	44.8	2640.6	45.4					
Cycle 41	93.97	10.07	0.112	0.4436	0.0202	11.1248	0.5412	0.1819	0.0051	0.8252	95.93	99.08	2366.8	90.0	2533.6	45.3	2670.1	46.3					
Cycle 42	91.97	10.16	0.115	0.4570	0.0212	11.2671	0.5517	0.1788	0.0049	0.8350	97.38	99.42	2426.3	94.0	2545.5	45.7	2641.9	45.7					
Cycle 43	94.99	11.42	0.125	0.4582	0.0215	11.3795	0.5632	0.1801	0.0050	0.8377	97.28	99.40	2431.8	95.1	2554.8	46.2	2653.8	45.7					
Cycle 44	90.36	10.40	0.120	0.4290	0.0194	11.0715	0.5263	0.1872	0.0051	0.8256	97.89	99.52	2301.3	87.7	2529.2	44.3	2717.4	45.3					
Cycle 45	89.55	10.40	0.121	0.4276	0.0195	10.7404	0.5188	0.1822	0.0051	0.8234	97.17	99.36	2295.1	88.0	2500.9	44.9	2672.6	46.4					
Cycle 46	85.31	8.03	0.098	0.4438	0.0206	11.3275	0.5571	0.1851	0.0053	0.8218	96.77	99.26	2367.5	91.8	2550.5	45.9	2699.4	47.3					
Cycle 47	86.22	8.65	0.105	0.4375	0.0202	11.1866	0.5441	0.1854	0.0052	0.8274	97.61	99.45	2339.9	90.7	2538.8	45.3	2702.1	46.2					
Cycle 48	87.17	8.26	0.099	0.4585	0.0218	11.4271	0.5710	0.1808	0.0050	0.8388	97.78	99.51	2433.0	96.5	2558.6	46.7	2659.8	46.1					
Cycle 49	85.33	8.65	0.106	0.4477	0.0208	10.9152	0.5342	0.1768	0.0050	0.8281	97.67	99.49	2384.9	92.6	2515.9	45.5	2623.4	46.7					
09AS2 6	164.09	21.60	0.137	0.4235	0.0166	10.5200	0.4378	0.1801	0.0036	0.8815	95.20	98.91	2276.5	75.4	2481.7	38.6	2654.2	32.9					
Cycle 2	162.17	19.44	0.125	0.4270	0.0166	10.5627	0.4345	0.1794	0.0035	0.8822	95.63	99.02	2292.2	75.2	2485.4	38.2	2647.4	32.4					
Cycle 3	161.25	19.10	0.123	0.4508	0.0181	11.2669	0.4738	0.1813	0.0035	0.8904	95.82	99.05	2398.9	80.3	2545.5	39.2	2664.4	32.0					
Cycle 4	155.86	17.05	0.114	0.4673	0.0192	11.6356	0.4974	0.1806	0.0034	0.8970	96.40	99.19	2471.8	84.2	2575.5	40.0	2658.2	31.6					
Cycle 5	146.88	15.87	0.113	0.4563	0.0177	11.2896	0.4571	0.1795	0.0034	0.8848	97.06	99.35	2423.1	78.5	2547.3	37.8	2647.8	31.7					
Cycle 6	151.39	15.67	0.108	0.4668	0.0185	11.4303	0.4729	0.1776	0.0034	0.8866	96.46	99.22	2469.6	81.2	2558.9	38.6	2630.5	32.2					
Cycle 7	157.88	15.60	0.103	0.4734	0.0191	11.8422	0.4939	0.1814	0.0034	0.8973	97.43	99.43	2498.2	83.4	2592.0	39.1	2666.1	30.9					
Cycle 8	157.16	14.13	0.094	0.4947	0.0206	12.2090	0.5269	0.1790	0.0034	0.9016	96.76	99.28	2590.8	88.7	2620.6	40.5	2643.7	31.3					
Cycle 9	151.18	14.12	0.097	0.4706	0.0184	11.7590	0.4773	0.1812	0.0034	0.8877	97.12	99.36	2486.2	80.5	2585.4	38.0	2664.1	31.4					
Cycle 10	155.41	14.93	0.100	0.4710	0.0186	11.8802	0.4874	0.1829	0.0034	0.8931	97.23	99.38	2488.2	81.6	2595.0	38.4	2679.5	30.9					
Cycle 11	149.85	12.75	0.089	0.5037	0.0209	12.7673	0.5421	0.1838	0.0033	0.9063	98.45	99.65	2629.7	89.4	2662.6	40.0	2687.7	30.0					
Cycle 12	142.63	12.72	0.093	0.4884	0.0196	12.1013	0.5009	0.1797	0.0033	0.8959	97.94	99.55	2563.9	84.9	2612.3	38.8	2650.0	30.9					
Cycle 13	142.75	13.03	0.095	0.4875	0.0193	12.2219	0.4955	0.1818	0.0033	0.8958	98.95	99.77	2559.7	83.6	2621.6	38.0	2669.8	30.3					
Cycle 14	147.10	11.53	0.082	0.4822	0.0192	12.2751	0.5002	0.1846	0.0034	0.8981	98.79	99.73	2536.8	83.3	2625.7	38.3	2694.9	30.1					
09AS2 7	295.77	97.19	0.342	0.3786	0.01																		

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from depth-profiling of samples from Abitibi Subprovince

Sample*	U (est ppm)	Th (est ppm)	Th/U	²⁰⁶ Pb/ ²³⁸ U value	1 s e	²⁰⁷ Pb/ ²³⁵ U value	1 s e	²⁰⁶ Pb/ ²³⁸ Pb* value	1 s e	Correlation of Concordia Ellipses	% Radiogenic ²⁰⁶ Pb	% Radiogenic ²⁰⁷ Pb	²⁰⁶ Pb/ ²³⁸ U Age (Ma)	1 s e	²⁰⁷ Pb/ ²³⁵ U Age (Ma)	1 s e	²⁰⁶ Pb/ ²⁰⁷ Pb Age (Ma)	1 s e
Cycle 8	173 11	24 88	0 150	0 4828	0 0190	12 1940	0 4915	0 1832	0 0031	0 9092	98 93	99 76	2539 4	82 8	2619 4	37 8	2681 9	28 1
Cycle 9	170 89	24 41	0 149	0 5032	0 0207	12 5933	0 5304	0 1815	0 0031	0 9164	98 75	99 72	2627 4	88 9	2649 7	39 6	2666 8	28 2
Cycle 10	163 17	23 14	0 148	0 4866	0 0191	12 1784	0 4876	0 1815	0 0031	0 9080	99 36	99 86	2556 2	82 8	2618 2	37 6	2666 6	28 2
Cycle 11	164 64	22 54	0 143	0 4781	0 0186	11 7367	0 4668	0 1780	0 0031	0 9034	98 80	99 74	2519 0	80 9	2583 6	37 2	2634 7	28 7
Cycle 12	164 33	20 82	0 132	0 4828	0 0192	12 1974	0 4959	0 1832	0 0031	0 9088	98 66	99 70	2539 5	83 3	2619 7	38 2	2682 3	28 4
Cycle 13	163 90	23 52	0 150	0 4926	0 0198	12 2677	0 5057	0 1806	0 0031	0 9093	98 63	99 70	2582 1	85 6	2625 1	38 7	2658 5	28 8
Cycle 14	157 31	21 39	0 142	0 4812	0 0188	12 0363	0 4830	0 1814	0 0032	0 9029	98 75	99 72	2532 4	82 0	2607 2	37 6	2665 9	29 0
09AS2 11	156 19	21 57	0 144	0 4593	0 0190	11 1359	0 5022	0 1758	0 0039	0 8700	90 79	97 89	2436 6	83 7	2534 6	42 0	2614 0	37 2
Cycle 2	164 02	24 29	0 154	0 4562	0 0185	11 1573	0 4883	0 1774	0 0037	0 8771	92 21	98 22	2423 0	81 9	2536 4	40 8	2628 4	35 1
Cycle 3	157 45	20 06	0 133	0 4391	0 0168	10 8349	0 4419	0 1790	0 0036	0 8746	94 50	98 76	2346 6	75 3	2509 1	37 9	2643 3	33 1
Cycle 4	159 04	18 13	0 119	0 4788	0 0196	11 6998	0 5053	0 1772	0 0035	0 8923	94 62	98 80	2522 2	85 4	2580 7	40 4	2626 9	32 7
Cycle 5	163 63	18 63	0 119	0 4977	0 0209	12 4267	0 5449	0 1811	0 0034	0 9027	95 62	99 01	2603 7	90 0	2637 2	41 2	2663 0	31 5
Cycle 6	164 45	17 96	0 114	0 5066	0 0212	12 5030	0 5464	0 1790	0 0034	0 9003	95 38	98 96	2642 1	90 6	2643 0	41 1	2643 6	31 8
Cycle 7	163 05	16 40	0 105	0 4712	0 0185	11 5127	0 4782	0 1772	0 0034	0 8862	94 64	98 80	2488 9	81 1	2565 6	38 8	2626 8	32 3
Cycle 8	165 35	17 91	0 113	0 4875	0 0198	11 8160	0 5108	0 1758	0 0035	0 8878	93 11	98 45	2560 1	85 7	2589 9	40 5	2613 4	33 3
Cycle 9	161 17	15 73	0 102	0 4953	0 0199	12 3726	0 5188	0 1812	0 0034	0 8971	95 94	99 08	2593 7	85 8	2633 1	39 4	2663 6	31 0
Cycle 10	164 40	16 21	0 103	0 4981	0 0205	12 4579	0 5292	0 1814	0 0033	0 9080	97 17	99 37	2605 6	88 1	2639 6	39 9	2665 7	29 8
Cycle 11	160 48	16 45	0 107	0 4851	0 0192	12 3014	0 5024	0 1839	0 0033	0 9023	97 50	99 43	2549 6	83 3	2627 7	38 4	2688 4	29 4
Cycle 12	164 06	16 33	0 104	0 4887	0 0194	12 5271	0 5122	0 1859	0 0033	0 9050	97 65	99 46	2565 1	84 0	2644 8	38 4	2706 3	29 0
Cycle 13	161 46	16 60	0 107	0 4949	0 0196	12 4657	0 5084	0 1827	0 0032	0 9047	97 61	99 46	2591 8	84 4	2640 1	38 3	2677 4	29 1
Cycle 14	163 57	15 63	0 100	0 4745	0 0184	11 9148	0 4797	0 1821	0 0033	0 8980	96 53	99 22	2503 1	80 3	2597 7	37 7	2672 4	29 6
09AS2 sp11	200 80	46 34	0 240	0 3876	0 0135	9 5811	0 3537	0 1793	0 0032	0 8774	95 68	99 03	2111 9	62 8	2395 4	33 9	2646 1	29 7
Cycle 2	194 27	42 65	0 229	0 4155	0 0152	10 2005	0 3873	0 1781	0 0031	0 8938	97 24	99 39	2239 8	69 1	2453 1	35 1	2635 0	28 6
Cycle 3	185 24	39 54	0 222	0 4199	0 0152	10 1963	0 3859	0 1761	0 0031	0 8879	96 89	99 32	2259 9	69 1	2452 7	35 0	2616 8	29 3
Cycle 4	186 21	36 52	0 204	0 4544	0 0175	11 3211	0 4500	0 1807	0 0031	0 9032	97 39	99 42	2414 6	77 4	2549 9	37 1	2659 4	28 6
Cycle 5	180 33	35 42	0 205	0 4324	0 0158	10 7414	0 4047	0 1802	0 0031	0 8959	98 40	99 65	2316 6	71 2	2501 0	35 0	2654 4	28 1
Cycle 6	179 83	31 95	0 185	0 4392	0 0161	10 8993	0 4128	0 1800	0 0031	0 8960	98 20	99 60	2347 2	72 2	2514 6	35 2	2652 6	28 3
Cycle 7	180 64	31 41	0 181	0 4682	0 0183	11 7190	0 4699	0 1815	0 0030	0 9105	98 42	99 65	2475 5	80 4	2582 2	37 5	2667 1	27 8
Cycle 8	175 90	31 57	0 187	0 4569	0 0173	11 5151	0 4445	0 1828	0 0030	0 9062	99 29	99 84	2425 8	76 4	2565 8	36 1	2678 3	27 4
Cycle 9	174 94	27 32	0 163	0 4435	0 0162	11 2836	0 4228	0 1845	0 0031	0 8994	99 04	99 78	2366 4	72 5	2546 9	34 9	2693 9	27 5
Cycle 10	181 77	27 74	0 159	0 4751	0 0184	11 7141	0 4662	0 1788	0 0030	0 9105	98 54	99 68	2505 9	80 6	2581 8	37 2	2642 0	27 7
Cycle 11	185 09	27 65	0 156	0 4858	0 0193	12 1360	0 4940	0 1812	0 0030	0 9154	98 36	99 64	2552 3	83 7	2615 0	38 2	2663 9	27 5
Cycle 12	176 67	24 51	0 145	0 4664	0 0178	11 5720	0 4516	0 1800	0 0030	0 9085	98 83	99 74	2467 7	78 1	2570 4	36 5	2652 5	27 4
Cycle 13	170 68	23 05	0 141	0 4702	0 0178	11 7533	0 4569	0 1813	0 0030	0 9054	98 70	99 71	2484 6	78 2	2585 0	36 4	2664 6	27 7
Cycle 14	171 84	22 46	0 136	0 4606	0 0173	11 6301	0 4479	0 1831	0 0030	0 9052	98 98	99 77	2442 2	76 5	2575 1	36 0	2681 4	27 5
09AS2 12	203 21	76 25	0 391	0 3752	0 0134	9 2489	0 3500	0 1788	0 0032	0 8804	95 69	99 04	2053 7	62 9	2363 0	34 7	2641 7	30 1
Cycle 2	194 92	63 64	0 340	0 4123	0 0156	10 3000	0 4074	0 1812	0 0032	0 8963	96 84	99 29	2225 5	71 4	2462 1	36 6	2663 7	29 4
Cycle 3	177 54	54 02	0 317	0 4148	0 0154	10 1318	0 3922	0 1771	0 0032	0 8879	97 20	99 39	2237 0	70 2	2446 9	35 8	2626 3	30 0
Cycle 4	167 63	49 71	0 309	0 4097	0 0150	10 2029	0 3917	0 1806	0 0033	0 8875	96 64	99 25	2213 5	68 6	2453 3	35 5	2658 6	30 6
Cycle 5	157 35	42 70	0 283	0 4363	0 0165	11 0500	0 4339	0 1837	0 0034	0 8875	97 57	99 45	2333 8	74 1	2527 4	36 6	2686 6	30 3
Cycle 6	155 12	38 25	0 257	0 4345	0 0165	10 9570	0 4337	0 1829	0 0034	0 8857	97 23	99 38	2326 1	74 3	2519 5	36 8	2679 2	30 7
Cycle 7	152 41	34 98	0 239	0 4304	0 0161	10 8409	0 4206	0 1827	0 0034	0 8820	97 98	99 55	2307 3	72 6	2509 6	36 1	2677 5	30 8
Cycle 8	155 20	34 15	0 229	0 4430	0 0172	11 2781	0 4531	0 1846	0 0035	0 8881	97 54	99 44	2364 0	76 6	2546 4	37 5	2695 0	30 9
Cycle 9	144 71	32 86	0 237	0 4389	0 0167	11 1354	0 4373	0 1840	0 0034	0 8845	98 43	99 65	2345 5	74 8	2534 5	36 6	2689 5	30 8
Cycle 10	146 06	26 78	0 191	0 4550	0 0180	11 7235	0 4752	0 1869	0 0034	0 8978	99 13	98 80	2417 2	79 8	2582 6	37 9	2715 0	29 9
Cycle 11	144 79	27 09	0 195	0 4756	0 0193	12 1868	0 5061	0 1858	0 0034	0 9029	99 35	99 85	2508 3	84 5	2618 9	39 0	2705 6	29 9
Cycle 12	142 65	26 04	0 190	0 4515	0 0175	11 2006	0 4469	0 1799	0 0033	0 8898	98 74	99 72	2401 9	77 8	2540 0	37 2	2652 2	30 7
Cycle 13	144 18	23 83	0 172	0 4627	0 0185	11 6406	0 4779	0 1825	0 0034	0 8965	98 56	99 68	2451 6	81 4	2575 9	38 4	2675 3	30 5
Cycle 14	137 89	22 33	0 169	0 4684	0 0183	11 7849	0 4728	0 1825	0 0034	0 8917	99 20	99 82	2476 6	80 5	2587 5	37 5	2675 5	30 6
09AS2 13	115 34	14 98	0 128	0 5170	0 0239	12 8100	0 6214	0 1797	0 0043	0 8731	96 25	99 16	2686 5	101 5	2665 8	45 7	2650 1	39 7
Cycle 2	123 35	13 19	0 118	0 5179	0 0241	12 6142	0 6157	0 1766	0 0041	0 8796	96 06	99 13	2690 3	102 2	2651 3	45 9	2621 6	39 1
Cycle 3	123 95	13 28	0 112	0 5233	0 0242	12 8593	0 6248	0 1782	0 0041	0 8825	96 11	99 14	2713 0	102 6	2669 4	45 8	2636 5	38 4
Cycle 4	127 78	13 32	0 109	0 5228	0 0241	12 6266	0 6107	0 1752	0 0040	0 8816	95 96	99 12	2711 0	101 9	2652 2	45 5	2607 7	38 4
Cycle 5	129 49	11 84	0 095	0 5259	0 0241	13 2841	0 6348	0 1832	0 0041	0 8866	96 76	99 26	2724 3	101 9	2700 1	45 1	2682 0	37 0
Cycle 6	124 75	12 58	0 105	0 5373	0 0244	13 0903	0 6176	0 1767	0 0039	0 8848	97 30	99 41	2772 2	102 3	2686 2	44 5	2622 1	37 1
Cycle 7	125 21	10 78	0 090	0 5172	0 0227	12 9401	0 5911	0 1815	0 0040	0 8805	97 14	99 36	2687 2	96 5	2675 3	43 1	2666 3	36 4
Cycle 8	129 70	10 88	0 087	0 5126	0 0221	12 6281	0 5612	0 1787	0 0037	0 8883	98 67	99 71	2667 6	94 4	2652 3	41 8	2640 7	34 5
Cycle 9	132 73	13 34	0 105	0 5528	0 0250	13 5463	0 6300	0 1777	0 0037	0 8985	98 39	99 65	2836 8	103 9	2718 5	44 0	2631 8	34 4
Cycle 10	127 47	9 23	0 075	0 5349	0 0231	13 5673	0 6006	0 1839	0 0038	0 8879	98 58	99 68	2762 2	96 8	2720 0	41 9	2	

Appendix

Table 3 SIMS U-Pb isotope data of zircon from depth-profiling of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁷ Pb/ ²⁰⁶ Pb*		Correlation of Concordia Ellipses	% Radiogenic		% Radiogenic		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb	
	(est ppm)	(est ppm)		value	1 s.e	value	1 s.e	value	1 s.e	²⁰⁶ Pb		²⁰⁷ Pb	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e			
Cycle 7	151.61	17.18	0.118	0.4825	0.0237	12.0201	0.6090	0.1807	0.0051	0.8424		99.15	99.81	2538.0	102.9	2606.0	47.5	2659.3	46.5		
Cycle 8	159.97	16.29	0.106	0.5572	0.0302	13.5056	0.7550	0.1758	0.0049	0.8719		98.65	99.71	2854.9	124.9	2715.7	52.8	2613.7	46.4		
Cycle 9	154.09	16.01	0.108	0.5153	0.0263	12.9053	0.6755	0.1816	0.0050	0.8569		99.46	99.88	2679.2	111.7	2672.8	49.3	2667.9	45.8		
Cycle 10	166.02	16.16	0.101	0.4866	0.0239	12.0265	0.6074	0.1793	0.0049	0.8515		99.47	99.88	2555.9	103.5	2606.5	47.3	2646.0	45.1		
Cycle 11	159.17	14.08	0.092	0.5205	0.0265	12.8555	0.6736	0.1791	0.0049	0.8620		99.32	99.85	2701.3	112.4	2669.1	49.4	2644.8	45.1		
Cycle 12	154.64	13.03	0.088	0.5353	0.0280	13.3572	0.7177	0.1810	0.0049	0.8687		99.24	99.83	2763.9	117.5	2705.2	50.8	2661.7	45.1		
Cycle 13	150.06	12.54	0.087	0.5178	0.0265	12.9246	0.6758	0.1810	0.0049	0.8653		100.00	100.00	2689.7	112.5	2674.2	49.3	2662.5	44.5		
Cycle 14	156.25	12.69	0.085	0.5158	0.0264	13.0789	0.6843	0.1839	0.0049	0.8658		99.85	99.97	2681.3	112.2	2685.4	49.4	2688.4	44.3		
Cycle 15	146.37	10.47	0.075	0.4977	0.0245	12.5182	0.6322	0.1824	0.0051	0.8455		99.62	99.92	2603.8	105.3	2644.1	47.5	2675.0	45.9		
Cycle 16	149.18	11.17	0.078	0.5011	0.0250	12.3088	0.6296	0.1782	0.0048	0.8568		100.00	100.00	2618.5	107.6	2628.2	48.0	2635.8	45.0		
Cycle 17	154.50	11.70	0.079	0.5170	0.0263	13.0510	0.6786	0.1831	0.0049	0.8632		100.00	100.00	2686.4	111.8	2683.3	49.0	2681.1	44.5		
Cycle 18	152.32	12.56	0.086	0.4839	0.0236	12.1170	0.6062	0.1816	0.0050	0.8479		100.00	100.00	2544.3	102.7	2613.5	46.9	2667.6	45.2		
Cycle 19	154.28	9.13	0.062	0.5323	0.0277	13.3894	0.7124	0.1824	0.0049	0.8701		100.00	100.00	2750.9	116.7	2707.5	50.3	2675.3	44.5		
Cycle 20	144.26	12.76	0.092	0.4681	0.0223	11.9849	0.5839	0.1857	0.0051	0.8379		100.00	100.00	2475.4	97.7	2603.2	45.7	2704.3	45.3		
Cycle 21	147.36	10.42	0.074	0.5077	0.0255	12.7115	0.6556	0.1816	0.0050	0.8563		99.70	99.93	2646.7	109.2	2658.5	48.6	2667.5	45.3		
Cycle 22	132.97	8.77	0.069	0.4507	0.0209	11.3295	0.5437	0.1823	0.0052	0.8160		99.23	99.83	2398.4	92.8	2550.6	44.8	2674.0	47.4		
Cycle 23	133.89	10.77	0.084	0.4668	0.0222	11.7803	0.5752	0.1830	0.0051	0.8326		100.00	100.00	2469.7	97.7	2587.1	45.7	2680.4	46.2		
Cycle 24	130.05	7.28	0.058	0.4614	0.0217	11.8129	0.5698	0.1857	0.0052	0.8242		100.00	100.00	2445.9	95.7	2589.7	45.2	2704.2	46.7		
Cycle 25	127.82	8.60	0.070	0.4714	0.0225	12.0420	0.5890	0.1853	0.0052	0.8316		99.94	99.99	2489.6	98.5	2607.7	45.9	2700.7	46.3		
Cycle 26	139.06	11.90	0.089	0.4944	0.0245	12.4188	0.6333	0.1822	0.0050	0.8500		99.61	99.91	2589.6	105.9	2636.6	47.9	2672.9	45.7		
Cycle 27	139.39	8.96	0.067	0.4914	0.0245	12.7040	0.6492	0.1875	0.0052	0.8496		99.70	99.93	2576.6	105.8	2658.0	48.1	2720.5	45.6		
Cycle 28	141.10	8.00	0.059	0.5064	0.0257	13.0900	0.6830	0.1875	0.0052	0.8550		99.24	99.83	2641.2	109.9	2686.2	49.2	2720.2	45.7		
Cycle 29	142.26	9.51	0.070	0.4911	0.0245	12.6260	0.6430	0.1865	0.0051	0.8556		100.00	100.00	2575.4	105.7	2652.2	47.9	2711.3	44.7		
Cycle 30	142.96	9.09	0.066	0.5267	0.0274	13.2505	0.7041	0.1824	0.0049	0.8674		99.85	99.97	2727.7	115.6	2697.7	50.2	2675.2	44.8		
Cycle 31	137.87	8.18	0.062	0.4984	0.0249	12.5918	0.6460	0.1832	0.0050	0.8524		99.61	99.91	2607.0	107.1	2649.6	48.3	2682.3	45.5		
Cycle 32	146.51	8.84	0.063	0.5194	0.0268	13.1147	0.6899	0.1831	0.0049	0.8680		100.00	100.00	2696.7	113.5	2687.9	49.6	2681.3	44.3		
Cycle 33	143.20	9.80	0.071	0.4950	0.0244	12.5071	0.6319	0.1833	0.0050	0.8532		100.00	100.00	2592.2	105.4	2643.3	47.5	2682.6	44.8		
Cycle 34	145.87	9.20	0.066	0.4961	0.0247	12.7105	0.6478	0.1858	0.0050	0.8585		100.00	100.00	2597.1	106.6	2658.4	48.0	2705.4	44.3		
Cycle 35	148.54	8.22	0.058	0.5194	0.0267	13.0604	0.6845	0.1824	0.0049	0.8677		100.00	100.00	2696.8	113.1	2684.0	49.4	2674.5	44.2		
Cycle 36	140.44	10.89	0.081	0.4663	0.0222	11.9771	0.5846	0.1863	0.0050	0.8454		100.00	100.00	2467.2	97.7	2602.6	45.7	2709.7	44.3		
Cycle 37	139.20	9.20	0.069	0.4919	0.0240	12.1745	0.6084	0.1795	0.0048	0.8524		100.00	100.00	2579.0	103.8	2617.9	46.9	2648.2	44.6		
Cycle 38	142.63	8.20	0.060	0.5223	0.0268	13.4356	0.7037	0.1866	0.0050	0.8678		100.00	100.00	2708.9	113.5	2710.8	49.5	2712.1	44.0		
Cycle 39	141.35	9.52	0.070	0.4657	0.0220	11.4993	0.5594	0.1791	0.0048	0.8433		99.70	99.94	2464.6	96.9	2564.5	45.4	2644.5	44.6		
Cycle 40	145.97	8.57	0.061	0.5097	0.0255	12.3856	0.6377	0.1762	0.0047	0.8630		99.25	99.84	2655.2	108.8	2634.1	48.4	2617.9	44.3		
Cycle 41	142.34	10.24	0.075	0.4673	0.0218	11.9694	0.5722	0.1858	0.0049	0.8451		100.00	100.00	2471.9	95.9	2602.0	44.8	2704.9	43.4		
Cycle 42	152.61	10.49	0.072	0.4986	0.0243	12.4907	0.6212	0.1817	0.0047	0.8647		100.00	100.00	2607.6	104.4	2642.0	46.8	2668.5	42.4		
Cycle 43	150.17	10.26	0.071	0.4959	0.0237	12.4864	0.6108	0.1826	0.0047	0.8596		100.00	100.00	2596.1	102.2	2641.7	46.0	2676.8	42.4		
Cycle 44	154.91	9.02	0.061	0.4751	0.0221	11.9690	0.5687	0.1827	0.0046	0.8593		100.00	100.00	2505.7	96.4	2602.0	44.5	2677.8	41.3		
Cycle 45	161.29	12.46	0.080	0.4626	0.0208	11.7487	0.5399	0.1842	0.0045	0.8536		100.00	100.00	2451.1	91.6	2584.6	43.0	2691.0	40.7		
Cycle 46	176.43	15.38	0.091	0.4605	0.0204	11.4131	0.5172	0.1798	0.0043	0.8557		100.00	100.00	2441.8	90.0	2557.5	42.3	2650.6	39.9		
Cycle 47	184.01	16.30	0.092	0.4627	0.0205	11.6630	0.5294	0.1828	0.0043	0.8648		99.77	99.95	2451.3	90.3	2577.7	42.5	2678.7	38.6		
Cycle 48	182.60	15.42	0.088	0.4490	0.0191	11.2357	0.4932	0.1815	0.0043	0.8527		99.42	99.87	2390.6	85.2	2542.9	40.9	2666.7	38.9		
Cycle 49	188.77	17.60	0.097	0.4472	0.0189	11.5328	0.4973	0.1870	0.0043	0.8564		100.00	100.00	2382.7	84.0	2567.2	40.3	2716.4	37.7		
09AS2-15	198.68	46.17	0.242	0.3999	0.0148	9.6763	0.3736	0.1755	0.0031	0.8926		97.47	99.45	2168.4	68.3	2404.5	35.5	2610.9	29.3		
Cycle 2	194.67	41.91	0.224	0.4162	0.0156	10.2647	0.3977	0.1789	0.0031	0.8978		98.14	99.59	2243.1	71.1	2458.9	35.9	2642.6	28.7		
Cycle 3	183.78	38.77	0.220	0.4186	0.0152	10.3445	0.3874	0.1792	0.0031	0.8897		98.69	99.71	2254.2	69.2	2466.1	34.7	2645.7	28.8		
Cycle 4	179.09	39.55	0.230	0.4411	0.0166	10.9292	0.4233	0.1797	0.0031	0.8950		98.37	99.64	2355.4	74.1	2517.1	36.0	2650.2	29.1		
Cycle 5	169.52	36.71	0.226	0.4573	0.0173	11.3684	0.4425	0.1803	0.0032	0.8914		98.18	99.60	2427.5	76.3	2553.8	36.3	2655.8	29.7		
Cycle 6	164.30	32.07	0.203	0.4737	0.0183	11.7196	0.4683	0.1794	0.0033	0.8921		97.83	99.52	2499.8	80.1	2582.3	37				

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from depth-profiles of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³⁸ Pb*		Correlation of Concordia Ellipses	% Radiogenic	% Radiogenic	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²³⁸ Pb†		
	(est ppm)	(est ppm)		value	1 s e	value	1 s e	value	1 s e	% Pb		% Pb	Age (Ma)	1 s e	Age (Ma)	1 s e	Age (Ma)	1 s e		
Cycle 13	156 79	25 54	0 170	0 5113	0 0219	12 5853	0 5548	0 1785	0 0034	0 9022		98 21	99 61	2662 0	93 4	2649 1	41 5	2639 3	32 0	
Cycle 14	152 17	27 12	0 186	0 5201	0 0223	12 8666	0 5679	0 1794	0 0035	0 9022		98 22	99 61	2699 7	94 7	2669 9	41 6	2647 5	32 0	
09AS2 18	417 65	112 13	0 280	0 1729	0 0052	4 2207	0 1877	0 1771	0 0053	0 7414		77 53	94 17	1027 9	28 8	1678 1	36 5	2625 7	49 8	
Cycle 2	386 12	102 12	0 276	0 1848	0 0056	4 5318	0 1941	0 1779	0 0051	0 7451		79 66	94 80	1093 1	30 4	1736 8	35 6	2633 0	47 6	
Cycle 3	379 64	97 75	0 268	0 1933	0 0058	4 7222	0 1983	0 1772	0 0050	0 7470		80 80	95 16	1139 0	31 6	1771 2	35 2	2626 9	46 4	
Cycle 4	358 36	89 39	0 260	0 2008	0 0061	4 9905	0 2055	0 1802	0 0049	0 7543		82 01	95 44	1179 8	32 8	1817 7	34 8	2655 0	44 8	
Cycle 5	351 74	84 68	0 251	0 2047	0 0063	4 9385	0 2161	0 1750	0 0052	0 7383		78 73	94 60	1200 5	33 6	1808 9	36 9	2605 8	49 2	
Cycle 6	340 30	74 37	0 228	0 2193	0 0069	5 3536	0 2343	0 1770	0 0052	0 7473		79 22	94 69	1278 2	36 5	1877 5	37 4	2625 3	48 4	
Cycle 7	329 44	77 17	0 244	0 2175	0 0067	5 5055	0 2292	0 1836	0 0050	0 7529		81 12	95 10	1268 7	35 4	1901 5	35 8	2685 5	45 3	
Cycle 8	328 63	70 67	0 224	0 2320	0 0073	5 7484	0 2424	0 1797	0 0049	0 7606		81 52	95 31	1345 2	38 5	1938 7	36 5	2649 8	45 4	
Cycle 9	311 20	62 12	0 208	0 2356	0 0073	5 8885	0 2555	0 1813	0 0053	0 7403		78 15	94 23	1363 6	38 1	1959 5	37 7	2664 8	48 4	
Cycle 10	316 38	67 37	0 222	0 2336	0 0073	5 9599	0 2614	0 1850	0 0054	0 7445		77 16	93 80	1353 5	38 1	1970 0	38 1	2698 4	48 4	
Cycle 11	322 78	64 84	0 209	0 2371	0 0074	5 7825	0 2518	0 1769	0 0051	0 7455		78 48	94 47	1371 8	38 8	1943 8	37 7	2623 6	48 3	
Cycle 12	321 12	60 45	0 196	0 2407	0 0074	5 9983	0 2458	0 1807	0 0048	0 7569		81 33	95 23	1390 5	38 6	1975 6	35 7	2659 4	44 4	
Cycle 13	315 50	61 72	0 204	0 2511	0 0078	6 4727	0 2562	0 1869	0 0047	0 7703		83 10	95 61	1444 3	40 0	2042 2	34 8	2715 4	41 6	
Cycle 14	327 87	62 00	0 197	0 2368	0 0070	5 7912	0 2324	0 1774	0 0047	0 7452		80 88	95 18	1369 9	36 7	1945 1	34 7	2628 7	44 5	
09AS2 19	200 80	46 34	0 240	0 3876	0 0135	9 5811	0 3537	0 1793	0 0032	0 8774		95 68	99 03	2111 9	62 8	2395 4	33 9	2646 1	29 7	
Cycle 2	194 27	42 65	0 229	0 4155	0 0152	10 2005	0 3873	0 1781	0 0031	0 8938		97 24	99 39	2239 8	69 1	2453 1	35 1	2635 0	28 6	
Cycle 3	185 24	39 54	0 222	0 4199	0 0152	10 1963	0 3859	0 1761	0 0031	0 8879		96 89	99 32	2259 9	69 1	2452 7	35 0	2616 8	29 3	
Cycle 4	186 21	36 52	0 204	0 4544	0 0175	11 3211	0 4500	0 1807	0 0031	0 9032		97 39	99 42	2414 6	77 4	2549 9	37 1	2659 4	28 6	
Cycle 5	180 33	35 42	0 205	0 4324	0 0158	10 7414	0 4047	0 1802	0 0031	0 8959		98 40	99 65	2316 6	71 2	2501 0	35 0	2654 4	28 1	
Cycle 6	179 83	31 95	0 185	0 4392	0 0161	10 8993	0 4128	0 1800	0 0031	0 8960		98 20	99 60	2347 2	72 2	2514 6	35 2	2652 6	28 3	
Cycle 7	180 64	31 41	0 181	0 4682	0 0183	11 7190	0 4699	0 1815	0 0030	0 9105		98 42	99 65	2475 0	80 4	2582 2	37 5	2667 1	27 8	
Cycle 8	175 90	31 57	0 187	0 4569	0 0173	11 5151	0 4445	0 1828	0 0030	0 9062		99 29	99 84	2425 8	76 4	2565 8	36 1	2678 3	27 4	
Cycle 9	174 94	27 32	0 163	0 4435	0 0162	11 2836	0 4228	0 1845	0 0031	0 8994		99 04	99 78	2366 4	72 5	2546 9	34 9	2693 9	27 5	
Cycle 10	181 77	27 74	0 159	0 4751	0 0184	11 7141	0 4662	0 1788	0 0030	0 9105		98 54	99 68	2505 9	80 6	2581 8	37 2	2642 0	27 7	
Cycle 11	185 09	27 65	0 156	0 4858	0 0193	12 1360	0 4940	0 1812	0 0030	0 9154		98 36	99 64	2552 3	83 7	2615 0	38 2	2663 9	27 5	
Cycle 12	176 67	24 51	0 145	0 4664	0 0178	11 5720	0 4516	0 1800	0 0030	0 9085		98 83	99 74	2467 7	78 1	2570 4	36 5	2652 5	27 4	
Cycle 13	170 68	23 05	0 141	0 4702	0 0178	11 7533	0 4569	0 1813	0 0030	0 9054		98 70	99 71	2484 6	78 2	2585 0	36 4	2664 6	27 7	
Cycle 14	171 84	22 46	0 136	0 4606	0 0173	11 6301	0 4479	0 1831	0 0030	0 9052		98 98	99 77	2442 2	76 5	2575 1	36 0	2681 4	27 5	
09TVZ Procupine greywacke sandstone adjacent to mineralized qtz carbonate tourmaline vein Hoyle Pond Mine (NAD83 Zone 17 UTM 492325E 5374908N)																				
09TVZ 1	518 14	441 92	0 888	0 2803	0 0070	6 8266	0 1738	0 1766	0 0019	0 9078		99 91	99 91	1593 0	35 1	2089 2	22 5	2621 4	18 0	
Cycle 2	409 80	350 45	0 891	0 2732	0 0069	6 5745	0 1711	0 1746	0 0021	0 8884		99 42	99 88	1556 8	35 0	2055 9	22 9	2601 9	20 2	
Cycle 3	352 91	289 74	0 855	0 2814	0 0077	6 7126	0 1891	0 1730	0 0023	0 8888		99 24	99 84	1598 5	38 7	2074 3	24 9	2586 8	21 9	
Cycle 4	298 65	239 25	0 834	0 2751	0 0076	6 5740	0 1872	0 1733	0 0024	0 8746		99 17	99 82	1566 7	38 2	2055 9	25 1	2589 9	23 4	
Cycle 5	270 35	213 25	0 822	0 2822	0 0081	6 7529	0 2013	0 1735	0 0026	0 8707		98 90	99 77	1602 5	40 7	2079 6	26 4	2592 1	24 9	
Cycle 6	243 34	191 09	0 818	0 2827	0 0083	6 7430	0 2046	0 1730	0 0027	0 8648		99 11	99 81	1605 0	41 5	2078 3	26 8	2586 7	25 9	
Cycle 7	221 07	177 29	0 835	0 2825	0 0083	6 7563	0 2072	0 1734	0 0029	0 8503		98 84	99 76	1604 1	41 7	2080 0	27 1	2591 1	27 5	
Cycle 8	209 22	162 81	0 811	0 2830	0 0086	6 6689	0 2136	0 1709	0 0030	0 8482		98 38	99 66	1606 5	43 3	2068 5	28 3	2566 5	28 9	
Cycle 9	183 31	141 66	0 805	0 2795	0 0085	6 7116	0 2132	0 1742	0 0031	0 8350		98 88	99 76	1588 8	42 7	2074 1	28 1	2598 1	29 8	
Cycle 10	171 12	128 65	0 783	0 2830	0 0089	6 7666	0 2237	0 1734	0 0032	0 8422		99 05	99 80	1606 6	44 9	2081 4	29 2	2590 7	30 4	
Cycle 11	159 75	125 38	0 818	0 2819	0 0089	6 8144	0 2245	0 1753	0 0033	0 8350		99 59	99 91	1600 8	44 9	2087 6	29 2	2609 2	31 0	
Cycle 12	154 65	110 93	0 747	0 2957	0 0099	7 1599	0 2504	0 1756	0 0034	0 8426		99 14	99 82	1670 0	49 3	2131 5	31 2	2611 8	32 1	
Cycle 13	145 71	104 39	0 746	0 2806	0 0092	6 6361	0 2307	0 1715	0 0035	0 8243		98 76	99 74	1594 4	46 5	2064 2	30 7	2572 6	33 7	
Cycle 14	135 65	101 02	0 776	0 2808	0 0093	6 6074	0 2313	0 1707	0 0035	0 8171		99 02	99 80	1595 2	47 0	2060 3	30 9	2564 3	34 6	
09TVZ 2	445 06	87 82	0 206	0 3275	0 0087	7 4591	0 2060	0 1652	0 0020	0 8982		98 25	99 65	1826 0	42 5	2168 1	24 7	2509 7	20 7	
Cycle 2	411 80	81 47	0 206	0 3340	0 0089	7 6027	0 2093	0 1651	0 0021	0 8944		98 82	99 76	1857 5	43 1	2185 2	24 7	2508 7	21 0	
Cycle 3	387 23	73 84	0 199	0 3513	0 0097	7 8725	0 2253	0 1625	0 0021	0 8958		98 65	99 73	1940 7	46 5	2216 5	25 8	2482 2	21 7	
Cycle 4	366 05	69 73	0 198	0 3442	0 0096	7 8067	0 2238	0 1645	0 0022	0 8928		98 65	99 73	1906 7	45 8	2209 0	25 8	2502 6	22 0	
Cycle 5	338 54	61 67	0 190	0 3427	0 0094	7 7978	0 2192	0 1650	0 0022	0 8874		99 43	99 89	1899 7	45 1	2208 0	25 3	2507 8	22 2	
Cycle 6	334 20	60 47	0 188	0 3555	0 0101	8 0234	0 2353	0 1637	0 0022	0 8930		99 13	99 83	1960 9	48 2	2233 7	26 5	2494 1	22 6	

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from dentin profiles of samples from Ahitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁷ Pb	% Radiogenic ²⁰⁶ Pb	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb	
	(est ppm)	(est ppm)	value	1 s.e	value	1 s.e	value	1 s.e	Age (Ma)	1 s.e		Age (Ma)	1 s.e	Age (Ma)	1 s.e				
Cycle 24	22 37	11 10	0 517	0 3626	0 0294	8 7403	0 7571	0 1748	0 0106	0 7411	98 26	99 63	1994 4	139 0	2311 3	78 9	2604 4	100 9	
Cycle 25	23 84	8 55	0 374	0 3866	0 0320	10 0516	0 8601	0 1886	0 0107	0 7712	100 00	100 00	2107 0	148 6	2439 5	79 0	2729 8	93 8	
Cycle 26	26 37	8 96	0 354	0 4270	0 0375	11 0505	1 0104	0 1877	0 0106	0 8031	99 35	99 85	2292 2	169 5	2527 4	85 1	2722 1	92 9	
Cycle 27	26 18	10 35	0 412	0 3984	0 0339	9 3526	0 8503	0 1703	0 0101	0 7752	98 17	99 62	2161 7	156 4	2373 2	83 4	2560 2	99 2	
Cycle 28	25 95	9 66	0 388	0 4824	0 0452	12 5186	1 2047	0 1882	0 0105	0 8292	100 00	100 00	2537 9	196 4	2644 1	90 5	2726 4	91 5	
Cycle 29	26 38	9 73	0 384	0 4523	0 0411	10 8445	1 0173	0 1739	0 0096	0 8201	100 00	100 00	2405 5	182 3	2509 9	87 2	2595 4	92 5	
Cycle 30	27 01	7 69	0 296	0 4919	0 0473	12 2065	1 2176	0 1800	0 0101	0 8377	99 31	99 85	2579 0	204 4	2620 4	93 6	2652 6	92 7	
Cycle 31	24 12	10 06	0 435	0 3903	0 0330	9 8141	0 8818	0 1824	0 0108	0 7719	98 28	99 62	2124 3	153 1	2417 5	82 8	2674 5	97 9	
Cycle 32	28 94	8 12	0 292	0 4679	0 0425	11 7679	1 1007	0 1824	0 0096	0 8367	100 00	100 00	2474 1	186 6	2586 1	87 5	2675 1	87 3	
Cycle 33	26 48	7 28	0 286	0 4200	0 0355	10 6686	0 9323	0 1842	0 0100	0 8004	100 00	100 00	2260 7	161 3	2494 7	81 1	2691 2	89 9	
Cycle 34	26 13	10 58	0 422	0 4191	0 0347	11 0317	0 9420	0 1909	0 0103	0 7932	100 00	100 00	2256 4	157 6	2525 8	79 5	2750 0	88 9	
Cycle 35	30 22	8 44	0 291	0 4626	0 0399	11 5336	1 0336	0 1808	0 0094	0 8245	99 41	99 87	2451 0	176 0	2567 3	83 7	2660 4	86 5	
Cycle 36	26 44	8 41	0 331	0 4314	0 0352	10 8787	0 9352	0 1829	0 0101	0 7830	98 55	99 68	2312 0	158 7	2512 8	79 9	2679 3	91 6	
Cycle 37	29 89	8 87	0 309	0 4546	0 0372	11 6964	0 9845	0 1866	0 0095	0 8114	100 00	100 00	2415 6	164 6	2580 4	78 7	2712 5	84 1	
Cycle 38	32 88	9 64	0 306	0 5004	0 0413	12 6431	1 0726	0 1832	0 0088	0 8353	100 00	100 00	2615 5	177 5	2653 4	79 8	2682 5	79 5	
Cycle 39	34 99	10 28	0 306	0 4723	0 0351	11 5011	0 8813	0 1766	0 0081	0 8140	100 00	100 00	2493 6	153 8	2564 7	71 6	2621 3	76 7	
Cycle 40	46 42	11 58	0 260	0 4586	0 0314	11 6934	0 8230	0 1849	0 0075	0 8283	100 00	100 00	2433 2	138 7	2580 2	65 8	2697 7	67 2	
Cycle 41	51 18	12 52	0 255	0 4388	0 0271	11 0102	0 7033	0 1820	0 0070	0 8115	99 70	99 93	2345 2	121 5	2524 0	59 5	2671 0	64 0	
Cycle 42	59 28	15 16	0 266	0 4250	0 0246	10 7524	0 6477	0 1835	0 0066	0 8140	99 32	99 85	2283 3	111 5	2502 0	56 0	2684 5	59 7	
Cycle 43	64 49	13 08	0 211	0 4613	0 0264	11 7641	0 6925	0 1849	0 0062	0 8313	100 00	100 00	2445 4	116 6	2585 8	55 1	2697 7	55 8	
Cycle 44	72 88	15 99	0 229	0 4321	0 0232	11 3888	0 6285	0 1912	0 0062	0 8256	100 00	100 00	2315 2	104 5	2555 5	51 5	2752 2	52 9	
Cycle 45	77 82	15 20	0 203	0 4522	0 0244	11 8489	0 6559	0 1900	0 0059	0 8399	100 00	100 00	2405 0	108 3	2592 5	51 8	2742 5	50 9	
Cycle 46	80 37	15 22	0 197	0 4545	0 0239	11 3976	0 6146	0 1819	0 0055	0 8372	100 00	100 00	2415 3	105 8	2556 2	50 3	2670 0	50 3	
Cycle 47	85 06	16 39	0 201	0 4568	0 0236	11 1535	0 5938	0 1771	0 0053	0 8350	99 62	99 92	2425 4	104 3	2536 0	49 6	2625 7	50 1	
Cycle 48	86 08	17 54	0 212	0 4339	0 0217	10 8983	0 5649	0 1821	0 0055	0 8247	99 07	99 79	2323 5	97 3	2514 5	48 2	2672 5	49 9	
Cycle 49	89 86	16 79	0 195	0 4805	0 0253	12 1874	0 6575	0 1840	0 0053	0 8545	100 00	100 00	2529 2	110 2	2618 9	50 6	2689 0	47 6	
09TVZ 3	55 08	24 04	0 455	0 4113	0 0218	9 4924	0 6146	0 1674	0 0071	0 7598	87 02	97 07	2220 9	99 5	2386 8	59 5	2531 6	70 9	
Cycle 2	49 59	20 58	0 432	0 4118	0 0226	9 9475	0 6299	0 1752	0 0070	0 7783	91 23	98 01	2223 1	103 1	2429 9	58 4	2607 9	66 9	
Cycle 3	41 69	18 65	0 466	0 3946	0 0217	9 2170	0 6005	0 1694	0 0074	0 7496	90 42	97 88	2144 3	100 4	2359 8	59 7	2551 6	73 0	
Cycle 4	40 26	15 89	0 411	0 4407	0 0268	10 0120	0 7289	0 1648	0 0077	0 7685	88 65	97 52	2353 7	120 0	2435 9	67 2	2505 3	78 8	
Cycle 5	35 99	14 60	0 423	0 4021	0 0236	9 4792	0 6534	0 1710	0 0078	0 7543	90 89	97 97	2178 5	108 5	2385 5	63 3	2567 4	76 5	
Cycle 6	35 62	12 97	0 379	0 4334	0 0273	10 4842	0 7485	0 1754	0 0078	0 7862	92 58	98 33	2321 2	122 7	2478 5	66 2	2610 1	74 4	
Cycle 7	33 34	12 70	0 397	0 4125	0 0260	9 7364	0 7193	0 1712	0 0082	0 7650	90 86	97 96	2226 1	118 7	2410 1	68 0	2569 5	80 3	
Cycle 8	31 04	13 32	0 447	0 4228	0 0273	10 8977	0 7739	0 1869	0 0083	0 7886	94 87	98 79	2273 1	123 7	2514 4	66 0	2715 5	73 4	
Cycle 9	30 62	11 44	0 389	0 4461	0 0301	11 0319	0 8084	0 1794	0 0080	0 8008	95 85	99 07	2377 8	134 2	2525 8	68 2	2647 0	74 3	
Cycle 10	28 78	11 96	0 433	0 4303	0 0292	11 0590	0 8243	0 1864	0 0087	0 7902	94 91	98 81	2307 1	131 6	2528 1	69 4	2710 6	76 8	
Cycle 11	28 17	9 92	0 367	0 4456	0 0311	10 8430	0 8497	0 1765	0 0087	0 7862	93 45	98 53	2375 6	138 8	2509 8	72 9	2620 1	81 7	
Cycle 12	27 76	12 83	0 481	0 4199	0 0288	9 9166	0 8008	0 1713	0 0091	0 7601	90 69	97 92	2260 1	130 9	2427 1	74 5	2570 2	88 6	
Cycle 13	26 67	9 52	0 372	0 4556	0 0330	10 8965	0 9128	0 1735	0 0092	0 7781	91 11	98 00	2420 0	146 3	2514 3	77 9	2591 4	88 6	
Cycle 14	26 68	10 20	0 398	0 4278	0 0307	10 2404	0 8486	0 1736	0 0092	0 7728	91 68	98 13	2296 0	138 5	2456 7	76 7	2592 6	88 6	
09TVZ 4	917 84	648 85	0 736	0 3445	0 0088	7 9170	0 2056	0 1667	0 0014	0 9464	99 34	99 87	1908 3	42 3	2221 6	23 4	2524 5	14 2	
Cycle 2	719 55	493 84	0 715	0 3478	0 0090	8 0373	0 2122	0 1676	0 0016	0 9362	99 47	99 89	1924 2	43 3	2235 2	23 8	2533 8	15 7	
Cycle 3	603 99	417 69	0 720	0 3441	0 0090	7 9588	0 2123	0 1677	0 0017	0 9246	99 28	99 85	1906 4	43 2	2226 4	24 1	2535 3	17 2	
Cycle 4	497 77	353 96	0 741	0 3462	0 0091	8 0178	0 2157	0 1679	0 0019	0 9138	99 39	99 88	1916 6	43 7	2233 0	24 3	2537 3	18 6	
Cycle 5	430 87	285 31	0 690	0 3452	0 0093	7 9568	0 2188	0 1672	0 0020	0 9041	99 08	99 81	1911 5	44 4	2226 1	24 8	2529 7	20 0	
Cycle 6	388 18	257 70	0 692	0 3592	0 0101	8 2436	0 2378	0 1664	0 0021	0 9034	99 11	99 82	1978 4	47 9	2258 1	26 1	2522 2	21 1	
Cycle 7	343 29	228 78	0 694	0 3465	0 0095	7 9308	0 2228	0 1660	0 0022	0 8863	99 21	99 84	1917 6	45 3	2223 2	25 3	2518 0	22 2	
Cycle 8	318 26	210 03	0 687	0 3509	0 0100	8 1281	0 2382	0 1680	0 0023	0 8889	99 29	99 85	1938 8	47 8	2245 4	26 5	2537 9	22 9	
Cycle 9	287 31	198 35	0 719	0 3397	0 0094	7 9808	0 2289	0 1704	0 0024	0 8716	99 15	99 82	1885 5	45 4	2228 9	25 9	2561 3	24 0	
Cycle 10	278 41	180 14	0 674	0 3514	0 0104	8 2364	0 2494	0 1700	0 0025	0 8823	99 42	99 88	1941 3	49 4	2257 4	27 4	2557 5	24 3	
Cycle 11	257 46	168 85	0 683	0 3457															

Appendix

Table 1. SIMS U-Pb isotopic data of zircon from depth-profiles of samples from Abitibi Subprovince

Sample*	U (est ppm)	Th (est ppm)	Th/U	²⁰⁶ Pb/ ²³⁸ U value	1 s.e.	²⁰⁷ Pb/ ²³⁵ U value	1 s.e.	²⁰⁶ Pb/ ²³⁸ U/ ²⁰⁷ Pb/ ²³⁵ U value	1 s.e.	Correlation of Concordia Ellipses	% Radiogenic ²⁰⁷ Pb	% Radiogenic ²⁰⁶ Pb	²⁰⁶ Pb/ ²³⁸ U Age (Ma)	1 s.e.	²⁰⁷ Pb/ ²³⁵ U Age (Ma)	1 s.e.	²⁰⁶ Pb/ ²³⁸ U/ ²⁰⁷ Pb/ ²³⁵ U Age (Ma)	1 s.e.
Cycle 2	706 17	382 41	0 564	0 3103	0 0082	7 2274	0 1943	0 1690	0 0017	0 9280	99 06	99 81	1741 9	40 2	2139 9	24 0	2547 3	16 9
Cycle 3	633 66	349 20	0 574	0 3086	0 0081	7 2229	0 1943	0 1697	0 0018	0 9238	99 38	99 87	1734 0	40 1	2139 3	24 0	2555 0	17 4
Cycle 4	571 01	319 85	0 583	0 3024	0 0078	7 1093	0 1888	0 1705	0 0018	0 9149	99 18	99 83	1703 3	38 8	2125 2	23 6	2562 5	18 2
Cycle 5	562 53	315 04	0 583	0 3107	0 0084	7 1499	0 1969	0 1669	0 0018	0 9197	99 57	99 91	1744 3	41 2	2130 3	24 5	2526 6	18 4
Cycle 6	535 04	298 34	0 581	0 3082	0 0083	7 1988	0 1972	0 1694	0 0019	0 9138	99 57	99 91	1731 9	40 7	2136 4	24 4	2551 8	18 9
Cycle 7	486 52	279 78	0 599	0 3094	0 0083	7 3400	0 2007	0 1721	0 0020	0 9072	99 42	99 88	1737 7	40 7	2153 7	24 4	2577 8	19 5
Cycle 8	448 21	263 84	0 613	0 3146	0 0085	7 5388	0 2090	0 1738	0 0021	0 9055	99 63	99 92	1763 2	41 8	2177 6	24 9	2594 6	19 9
Cycle 9	412 89	242 52	0 612	0 3270	0 0091	7 8675	0 2229	0 1745	0 0021	0 9054	99 89	99 98	1823 8	44 1	2216 0	25 5	2601 3	20 4
Cycle 10	368 97	220 34	0 622	0 3335	0 0094	7 9941	0 2292	0 1738	0 0022	0 9000	99 62	99 92	1855 5	45 2	2230 4	25 9	2594 8	21 2
Cycle 11	349 02	212 85	0 635	0 3386	0 0096	8 0870	0 2341	0 1732	0 0023	0 8966	99 58	99 91	1879 8	46 1	2240 8	26 2	2589 2	21 7
Cycle 12	341 52	200 66	0 612	0 3475	0 0100	8 3186	0 2463	0 1736	0 0023	0 8948	99 24	99 84	1922 7	48 0	2266 3	26 8	2592 8	22 4
Cycle 13	332 51	193 17	0 605	0 3531	0 0103	8 4690	0 2541	0 1739	0 0024	0 8924	99 17	99 83	1949 6	49 2	2282 6	27 2	2595 8	22 9
Cycle 14	317 28	184 12	0 604	0 3499	0 0103	8 4981	0 2558	0 1761	0 0025	0 8890	99 21	99 83	1934 3	49 0	2285 7	27 3	2616 8	23 3
09TVZ-8	1336 11	1495 03	1 166	0 3395	0 0097	7 5081	0 2242	0 1604	0 0015	0 9477	88 77	97 61	1884 2	46 7	2174 0	26 8	2459 9	16 1
Cycle 2	1358 77	1681 30	1 289	0 3424	0 0097	7 5093	0 2222	0 1591	0 0015	0 9506	90 26	97 97	1898 1	46 8	2174 1	26 5	2445 8	15 6
Cycle 3	1188 76	1538 53	1 348	0 3751	0 0110	8 3353	0 2525	0 1611	0 0015	0 9535	92 04	98 34	2053 6	51 6	2268 2	27 5	2467 7	15 4
Cycle 4	942 23	1216 05	1 344	0 3763	0 0106	8 3695	0 2447	0 1613	0 0015	0 9457	93 01	98 56	2059 0	49 8	2271 9	26 5	2469 5	16 1
Cycle 5	806 37	1036 23	1 339	0 3689	0 0105	8 2519	0 2423	0 1622	0 0016	0 9446	94 65	98 91	2024 4	49 5	2259 1	26 6	2478 9	16 3
Cycle 6	744 96	950 78	1 329	0 3661	0 0105	8 2144	0 2418	0 1627	0 0016	0 9425	95 46	99 07	2011 2	49 4	2254 9	26 6	2484 1	16 6
Cycle 7	682 48	880 37	1 344	0 3758	0 0109	8 3362	0 2508	0 1609	0 0017	0 9383	95 00	98 99	2056 7	51 3	2268 3	27 3	2464 9	17 6
Cycle 8	615 66	787 72	1 333	0 3710	0 0105	8 3513	0 2463	0 1632	0 0018	0 9298	94 93	98 96	2034 3	49 6	2269 9	26 7	2489 5	18 4
Cycle 9	550 87	679 93	1 286	0 3861	0 0112	8 6137	0 2591	0 1618	0 0018	0 9311	96 03	99 20	2104 6	52 3	2298 0	27 4	2474 7	18 6
Cycle 10	485 74	579 60	1 243	0 3988	0 0119	8 9200	0 2749	0 1622	0 0019	0 9296	96 39	99 27	2163 7	54 9	2329 9	28 1	2478 8	19 3
Cycle 11	454 06	539 41	1 237	0 4076	0 0123	9 1218	0 2840	0 1623	0 0019	0 9269	96 64	99 32	2203 7	56 4	2350 3	28 5	2480 0	19 8
Cycle 12	399 78	490 53	1 278	0 3936	0 0112	8 8206	0 2602	0 1626	0 0020	0 9119	96 85	99 37	2139 3	51 9	2319 6	26 9	2482 4	20 6
Cycle 13	389 54	455 08	1 217	0 4047	0 0121	9 1985	0 2838	0 1648	0 0020	0 9171	96 98	99 38	2190 8	55 5	2358 0	28 3	2505 8	20 9
Cycle 14	358 84	414 62	1 204	0 4133	0 0125	9 4083	0 2934	0 1651	0 0021	0 9137	96 94	99 37	2230 0	56 9	2378 6	28 6	2508 6	21 5
09TVZ-9	489 42	167 11	0 356	0 3137	0 0083	7 1039	0 1972	0 1642	0 0021	0 8904	97 15	99 42	1758 9	40 9	2124 5	24 7	2499 7	21 5
Cycle 2	442 45	147 40	0 347	0 3259	0 0089	7 5653	0 2139	0 1684	0 0022	0 8906	97 96	99 58	1818 4	43 1	2180 8	25 4	2541 5	21 8
Cycle 3	403 88	135 44	0 349	0 3255	0 0089	7 3789	0 2097	0 1644	0 0022	0 8800	97 77	99 55	1816 4	43 1	2158 4	25 4	2501 7	23 0
Cycle 4	371 41	116 64	0 327	0 3344	0 0095	7 7831	0 2297	0 1688	0 0024	0 8838	97 73	99 53	1859 4	45 8	2206 3	26 6	2546 1	23 4
Cycle 5	344 03	111 46	0 337	0 3342	0 0094	7 5502	0 2207	0 1639	0 0024	0 8750	98 02	99 60	1858 5	45 3	2179 0	26 2	2496 0	24 2
Cycle 6	319 06	102 02	0 333	0 3414	0 0098	7 7978	0 2311	0 1656	0 0024	0 8765	98 61	99 72	1893 5	46 9	2208 0	26 7	2514 1	24 4
Cycle 7	289 97	93 67	0 336	0 3337	0 0093	7 5699	0 2214	0 1645	0 0025	0 8589	97 85	99 57	1856 4	45 0	2181 3	26 2	2502 6	25 6
Cycle 8	290 87	96 33	0 345	0 3493	0 0102	7 9544	0 2447	0 1651	0 0026	0 8649	97 22	99 43	1931 4	48 8	2225 9	27 8	2509 1	26 3
Cycle 9	280 02	91 22	0 339	0 3545	0 0105	8 1963	0 2529	0 1677	0 0026	0 8656	97 68	99 52	1956 3	49 7	2252 9	27 9	2534 5	26 3
Cycle 10	261 64	90 95	0 362	0 3459	0 0100	8 0587	0 2411	0 1690	0 0026	0 8617	98 97	99 79	1914 8	47 9	2237 6	27 0	2547 7	26 0
Cycle 11	257 25	90 30	0 366	0 3578	0 0106	8 2096	0 2540	0 1664	0 0026	0 8639	98 46	99 69	1971 8	50 5	2254 4	28 0	2521 8	26 7
Cycle 12	254 17	89 85	0 368	0 3588	0 0108	8 2882	0 2590	0 1675	0 0026	0 8692	98 89	99 77	1976 5	51 4	2263 0	28 3	2533 1	26 4
Cycle 13	235 36	82 45	0 365	0 3554	0 0105	8 1618	0 2518	0 1665	0 0027	0 8551	98 67	99 73	1960 5	50 1	2249 1	27 9	2523 2	27 4
Cycle 14	241 68	87 86	0 379	0 3734	0 0117	8 6942	0 2807	0 1689	0 0027	0 8718	99 02	99 80	2045 2	54 8	2306 5	29 4	2546 6	27 0
09TVZ-10	246 05	151 68	0 642	0 3368	0 0102	8 1604	0 2590	0 1757	0 0028	0 8673	98 05	99 58	1871 1	49 4	2249 0	28 7	2613 2	26 7
Cycle 2	213 77	127 72	0 622	0 3245	0 0098	7 8001	0 2461	0 1743	0 0030	0 8452	98 09	99 59	1811 7	47 5	2208 2	28 4	2599 7	28 7
Cycle 3	192 47	107 65	0 583	0 3270	0 0102	7 9493	0 2589	0 1763	0 0031	0 8436	98 28	99 63	1823 7	49 3	2225 3	29 4	2618 6	29 7
Cycle 4	179 95	97 59	0 565	0 3295	0 0105	7 9318	0 2642	0 1746	0 0032	0 8412	98 44	99 67	1835 8	50 8	2223 3	30 0	2602 3	30 7
Cycle 5	174 66	86 45	0 516	0 3236	0 0104	7 7803	0 2603	0 1744	0 0033	0 8388	98 84	99 75	1807 3	50 5	2205 9	30 1	2600 1	31 1
Cycle 6	165 66	80 42	0 506	0 3354	0 0111	7 9721	0 2785	0 1724	0 0034	0 8359	97 94	99 56	1864 4	53 6	2227 9	31 5	2581 1	32 7
Cycle 7	154 61	74 11	0 499	0 3220	0 0105	7 6895	0 2655	0 1732	0 0034	0 8279	98 12	99 60	1799 5	51 3	2195 4	31 0	2588 8	33 0
Cycle 8	149 19	71 39	0 498	0 3411	0 0117	8 3398	0 2977	0 1773	0 0035	0 8419	98 77	99 73	1892 2	56 1	2268 7	32 4	2627 8	32 8
Cycle 9	145 28	64 14	0 460	0 3386	0 0116	8 1362	0 2925	0 1743	0 0035	0 8341	98 36	99 65	1880 0	55 8	2246 3	32 5	2599 0	33 8
Cycle 10	143 57	64 18	0 466	0 3542	0 0126	8 5263	0 3204	0 1746	0 0036	0 8413	97 93	99 56	1954 4	60 2	2288 7	34 2	2602 3	34 5
Cycle 11	138 58	56 29	0 423	0 3448	0 0120	8 3422	0 3004	0 1755	0 0036	0 8350	99 33	99 86	1909 7	57 3	2268 9	32 6	2610 6	33 9
Cycle 12	134 45	59 60	0 462	0 3477	0 0122	8 2616	0 3028	0 1723	0 0036	0 8329	98 92	99 77	1923 7	58 4	2260 1	33 2	2580 2	34 7
Cycle 13	133 65	54 64	0 426	0 3639	0 0134	8 6590	0 3333	0 1726	0 0037	0 8414	98 38	99 66	2000 5	63 1	2302 8	35 0	2582 9	35 5
Cycle 14	125 99	53 05	0 439	0 3557	0 0128	8 6777	0 3251	0 1769	0 0037	0 8379	99 35	99 86	1961 9	61 1	2304 7	34 1	2624 2	34 9
09TVZ d10	113 71	41 70	0 382	0 3744	0 0199	9 0143	0 5010	0 1746	0 0054	0 8366	98 91	99 77	2050 3	93 1	2339 5	50 8	2602 2	51 9
Cycle 2	95 77	35 38	0 385	0 3795	0 0209	9 5174	0 5531	0 1819	0 0060	0 8302	98 23	99 61	2073 8	97 7	2389 2	53 4	2670 3	54 8
Cycle 3	92 75	30 67	0 345	0 3860	0 0218	9 5219	0 5695	0 1789	0 0061	0 8316	98 13	99 59	2104 2	101 6	2389 7	55 0	2642 8	56 3
Cycle 4	83 79	29 93	0 372	0 3937	0 0227	9 5905	0 5830	0 1767	0 0062	0 8259	98 30	99 63	2139 9	104 9	2396 3	55 9	2622 0	

Appendix

Table 1 SIMS U-Pb isotopic data of zircon from depth-profiling of samples from Abitibi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb*		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁶ Pb		% Radiogenic ²⁰⁷ Pb		²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁶ Pb/ ²⁰⁷ Pb†	
	(est ppm)	(est ppm)		value	1 s.e	value	1 s.e	value	1 s.e	% Pb		% Pb	Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e			
Cycle 29	45 11	13 90	0.321	0.5170	0.0410	12 7339	1 0411	0.1786	0.0079	0.8493		99 57	99 91	2686 4	174 2	2660 2	77 0	2640 3	73 5		
Cycle 30	38 87	12 96	0.347	0.4063	0.0282	10 4169	0.7612	0.1859	0.0087	0.7843		98 53	99 67	2198 0	129 2	2472 6	67 7	2706 6	77 4		
Cycle 31	38 51	13 72	0.371	0.4674	0.0348	12 0108	0.9307	0.1864	0.0086	0.8149		98 94	99 76	2472 2	152 8	2605 2	72 6	2710 4	76 4		
Cycle 32	40 14	14 05	0.364	0.4475	0.0325	10 8371	0.8123	0.1756	0.0080	0.8110		100 00	100 00	2384 3	144 7	2509 3	69 7	2612 0	75 6		
Cycle 33	40 46	13 41	0.345	0.4786	0.0360	11 7564	0.9096	0.1782	0.0081	0.8236		100 00	100 00	2521 0	156 8	2585 2	72 4	2635 9	75 3		
Cycle 34	40 00	12 44	0.324	0.4534	0.0333	11 3919	0.8610	0.1822	0.0082	0.8158		100 00	100 00	2410 3	147 5	2555 8	70 5	2673 3	74 9		
Cycle 35	41 43	12 70	0.319	0.4681	0.0349	11 8642	0.9088	0.1838	0.0083	0.8231		100 00	100 00	2475 3	153 0	2593 7	71 7	2687 6	74 3		
Cycle 36	40 92	12 38	0.315	0.5107	0.0400	12 7536	1 0246	0.1811	0.0081	0.8426		100 00	100 00	2659 8	170 5	2661 6	75 6	2663 0	73 8		
Cycle 37	39 60	13 42	0.353	0.4380	0.0317	11 0618	0.8244	0.1832	0.0083	0.8111		100 00	100 00	2341 5	141 9	2528 3	69 4	2681 9	74 7		
Cycle 38	40 20	12 91	0.335	0.4901	0.0377	12 8608	1 0147	0.1903	0.0085	0.8348		100 00	100 00	2571 1	163 0	2669 5	74 3	2744 9	73 7		
Cycle 39	38 30	13 11	0.357	0.4284	0.0306	11 1257	0.8196	0.1884	0.0086	0.8008		100 00	100 00	2298 4	138 2	2533 7	68 6	2728 0	75 5		
Cycle 40	40 78	13 66	0.349	0.4646	0.0344	11 2777	0.8600	0.1760	0.0080	0.8174		100 00	100 00	2459 9	151 3	2546 4	71 1	2615 9	75 6		
Cycle 41	37 91	11 70	0.321	0.4389	0.0315	10 5545	0.7822	0.1744	0.0081	0.7968		100 00	100 00	2345 7	141 0	2484 7	68 7	2600 4	77 6		
Cycle 42	36 28	11 38	0.327	0.4383	0.0316	10 7955	0.8023	0.1786	0.0083	0.7997		100 00	100 00	2342 9	141 4	2505 7	69 1	2640 4	77 0		
Cycle 43	41 33	12 07	0.304	0.5201	0.0420	13 1599	1 0908	0.1835	0.0081	0.8547		100 00	100 00	2699 6	178 3	2691 2	78 2	2684 8	73 0		
Cycle 44	39 42	11 44	0.302	0.4447	0.0329	10 8909	0.8303	0.1776	0.0081	0.8174		100 00	100 00	2371 9	146 6	2513 9	70 9	2630 6	75 5		
Cycle 45	34 07	12 26	0.375	0.4309	0.0310	10 3748	0.7711	0.1746	0.0083	0.7886		100 00	100 00	2309 7	139 6	2468 8	68 8	2602 5	79 3		
Cycle 46	37 52	11 96	0.332	0.4476	0.0331	11 1698	0.8521	0.1810	0.0083	0.8138		100 00	100 00	2384 4	147 5	2537 4	71 1	2662 1	76 1		
Cycle 47	35 23	11 67	0.345	0.4351	0.0319	10 8127	0.8188	0.1802	0.0086	0.7974		100 00	100 00	2328 6	143 4	2507 2	70 4	2655 1	78 8		
Cycle 48	35 50	11 39	0.334	0.4074	0.0292	10 6088	0.7844	0.1889	0.0088	0.7934		100 00	100 00	2202 8	133 6	2489 5	68 6	2732 5	77 1		
Cycle 49	39 09	13 29	0.354	0.4679	0.0360	11 7613	0.9316	0.1823	0.0083	0.8286		100 00	100 00	2474 6	158 2	2585 6	74 1	2673 8	75 8		
09TVZ-11	855 17	877 00	1.068	0.2242	0.0055	5 0661	0.1272	0.1639	0.0016	0.9267		99 17	99 84	1304 1	28 9	1830 4	21 3	2496 0	16 0		
Cycle 2	702 91	714 70	1.059	0.2315	0.0058	5 2657	0.1345	0.1650	0.0017	0.9200		99 23	99 85	1342 2	30 1	1863 3	21 8	2507 5	17 0		
Cycle 3	625 71	626 79	1.043	0.2421	0.0063	5 4253	0.1444	0.1625	0.0017	0.9165		98 99	99 80	1397 6	32 5	1888 9	22 8	2482 1	18 1		
Cycle 4	550 44	537 17	1.017	0.2440	0.0063	5 5371	0.1466	0.1646	0.0019	0.9064		99 15	99 83	1407 2	32 5	1906 4	22 8	2503 6	19 0		
Cycle 5	493 26	486 73	1.028	0.2438	0.0063	5 5465	0.1469	0.1650	0.0019	0.8980		99 15	99 83	1406 2	32 4	1907 8	22 8	2507 9	19 8		
Cycle 6	430 29	404 25	0.979	0.2560	0.0068	5 7848	0.1585	0.1639	0.0020	0.8963		99 26	99 85	1469 4	34 9	1944 1	23 7	2496 1	20 7		
Cycle 7	379 80	354 71	0.973	0.2518	0.0066	5 7326	0.1568	0.1651	0.0022	0.8821		98 69	99 74	1447 8	34 1	1936 3	23 6	2508 7	22 0		
Cycle 8	374 23	335 38	0.934	0.2634	0.0072	6 0964	0.1735	0.1678	0.0022	0.8894		99 18	99 83	1507 5	37 0	1989 7	24 8	2536 1	22 1		
Cycle 9	341 16	300 70	0.918	0.2701	0.0074	6 0485	0.1726	0.1624	0.0022	0.8802		99 29	99 86	1541 1	37 8	1982 9	24 9	2481 2	23 2		
Cycle 10	323 88	278 35	0.895	0.2712	0.0077	6 1738	0.1809	0.1651	0.0023	0.8799		99 29	99 86	1547 1	38 9	2000 7	25 6	2508 4	23 8		
Cycle 11	298 84	253 80	0.885	0.2765	0.0079	6 3332	0.1870	0.1661	0.0024	0.8714		99 08	99 81	1573 8	39 7	2023 1	25 9	2518 8	24 7		
Cycle 12	278 70	214 32	0.801	0.2752	0.0080	6 3099	0.1900	0.1663	0.0025	0.8744		99 34	99 87	1567 3	40 4	2019 8	26 4	2520 4	25 0		
Cycle 13	259 90	208 62	0.836	0.2744	0.0078	6 2533	0.1862	0.1653	0.0026	0.8607		99 13	99 82	1562 9	39 7	2011 9	26 1	2510 7	26 0		
Cycle 14	253 31	195 34	0.803	0.2792	0.0083	6 3134	0.1974	0.1640	0.0026	0.8653		98 62	99 72	1587 6	42 0	2020 3	27 4	2497 1	26 8		
09TVZ d11	733 17	632 24	0.898	0.3205	0.0091	7 0921	0.2066	0.1605	0.0019	0.9190		99 51	99 91	1792 1	44 6	2123 1	25 9	2460 9	19 6		
Cycle 2	525 77	451 91	0.895	0.3288	0.0106	7 3265	0.2414	0.1616	0.0022	0.9130		99 78	99 96	1832 8	51 4	2152 1	29 4	2472 3	23 0		
Cycle 3	370 99	357 80	1.005	0.3029	0.0098	6 9431	0.2334	0.1662	0.0027	0.8795		99 04	99 81	1705 7	48 5	2104 2	29 8	2520 2	27 3		
Cycle 4	281 46	273 49	1.012	0.3144	0.0113	7 1196	0.2652	0.1643	0.0030	0.8755		99 18	99 84	1762 1	55 3	2126 5	33 2	2500 0	30 8		
Cycle 5	228 65	220 71	1.006	0.3206	0.0125	7 4946	0.3027	0.1696	0.0034	0.8770		99 71	99 94	1792 5	61 2	2172 3	36 2	2553 4	33 1		
Cycle 6	197 99	189 10	0.995	0.3361	0.0144	7 7550	0.3426	0.1673	0.0036	0.8792		100 00	100 00	1868 0	69 6	2203 0	39 7	2531 1	36 0		
Cycle 7	164 22	164 70	1.045	0.3008	0.0124	7 1758	0.3086	0.1730	0.0041	0.8425		99 68	99 93	1695 3	61 6	2133 5	38 3	2587 0	39 6		
Cycle 8	147 16	144 55	1.023	0.3319	0.0156	7 7404	0.3803	0.1691	0.0043	0.8575		98 86	99 77	1847 8	75 3	2201 3	44 2	2549 0	43 1		
Cycle 9	122 95	118 21	1.002	0.3199	0.0152	7 6618	0.3784	0.1737	0.0046	0.8486		99 48	99 89	1789 3	74 0	2192 1	44 4	2593 7	44 5		
Cycle 10	112 38	111 71	1.035	0.3127	0.0151	7 5581	0.3791	0.1753	0.0048	0.8443		100 00	100 00	1754 0	74 3	2179 9	45 0	2608 9	45 9		
Cycle 11	97 84	102 92	1.096	0.3072	0.0149	7 2817	0.3680	0.1719	0.0051	0.8247		100 00	100 00	1726 7	73 6	2146 6	45 1	2576 6	49 1		
Cycle 12	89 79	86 80	1.007	0.2954	0.0143	7 0483	0.3566	0.1731	0.0053	0.8094		100 00	100 00	1668 2	71 3	2117 5	45 0	2587 6	51 2		
Cycle 13	84 28	85 50	1.057	0.3169	0.0163	7 5851	0.4055	0.1736	0.0055	0.8212		100 00	100 00	1774 5	79 7	2183 1	48 0	2592 7	52 4		
Cycle 14																					

Appendix

Table 3. SIMS U-Pb isotopic data of zircon from dentro-crystalline of samples from Ahtitzi Subprovince

Sample*	U		Th	Th/U	²⁰⁶ Pb/ ²³⁸ U		²⁰⁷ Pb/ ²³⁵ U		²⁰⁷ Pb/ ²⁰⁶ Pb		Correlation of Concordia Ellipses	% Radiogenic ²⁰⁶ Pb	% Radiogenic ²⁰⁷ Pb	²⁰⁶ Pb/U		²⁰⁷ Pb/U		²⁰⁷ Pb/ ²⁰⁶ Pb	
	(est ppm)	(est ppm)			value	1 s.e	value	1 s.e	value	1 s.e		Age (Ma)	1 s.e	Age (Ma)	1 s.e	Age (Ma)	1 s.e		
Cycle 49	155 34	55 98	0 375	0 4397	0 0168	10 8353	0 4246	0 1787	0 0037	0 8568	100 00	100 00	2349 4	75 4	2509 1	36 4	2641 0	34 4	
09TVZ-12	713 16	181 86	0 266	0 3400	0 0092	7 6361	0 2104	0 1629	0 0016	0 9315	99 17	99 84	1886 8	44 2	2189 1	24 7	2485 7	17 1	
Cycle 2	585 83	142 38	0 253	0 3202	0 0087	7 1271	0 1990	0 1615	0 0018	0 9218	99 22	99 85	1790 5	42 7	2127 4	24 9	2471 0	18 5	
Cycle 3	520 72	122 57	0 245	0 2991	0 0080	6 7530	0 1863	0 1637	0 0019	0 9098	98 97	99 79	1686 9	39 8	2079 6	24 4	2494 7	19 5	
Cycle 4	482 88	120 64	0 260	0 2989	0 0080	6 7550	0 1852	0 1639	0 0020	0 9018	99 30	99 86	1686 1	39 6	2079 8	24 3	2496 1	20 2	
Cycle 5	455 28	113 85	0 260	0 3100	0 0086	6 8921	0 1956	0 1612	0 0020	0 9045	99 44	99 89	1740 8	42 2	2097 6	25 2	2468 7	20 7	
Cycle 6	418 48	112 46	0 280	0 3035	0 0082	6 8766	0 1921	0 1643	0 0021	0 8954	99 24	99 85	1708 8	40 7	2095 7	24 8	2500 6	21 2	
Cycle 7	400 24	102 66	0 267	0 3140	0 0087	7 1256	0 2032	0 1646	0 0021	0 8960	99 33	99 87	1760 1	42 7	2127 3	25 4	2503 6	21 6	
Cycle 8	371 67	102 35	0 287	0 3099	0 0084	7 0143	0 1978	0 1642	0 0022	0 8851	98 79	99 76	1740 2	41 5	2113 2	25 1	2499 0	22 4	
Cycle 9	356 77	96 40	0 281	0 3124	0 0085	7 0014	0 1974	0 1625	0 0022	0 8814	98 87	99 78	1752 7	41 8	2111 6	25 0	2482 1	22 8	
Cycle 10	352 50	89 82	0 265	0 3288	0 0094	7 4840	0 2213	0 1651	0 0023	0 8891	98 68	99 73	1832 5	45 6	2171 1	26 5	2508 5	23 1	
Cycle 11	343 50	93 01	0 282	0 3237	0 0091	7 2600	0 2119	0 1627	0 0023	0 8806	98 53	99 71	1807 6	44 3	2143 9	26 1	2483 7	23 7	
Cycle 12	324 58	82 86	0 266	0 3225	0 0090	7 3401	0 2117	0 1651	0 0023	0 8813	99 48	99 90	1801 9	44 1	2153 7	25 8	2508 3	23 3	
Cycle 13	302 10	80 02	0 276	0 3295	0 0094	7 4020	0 2174	0 1629	0 0023	0 8814	99 37	99 87	1835 8	45 5	2161 2	26 3	2486 4	23 8	
Cycle 14	291 67	75 94	0 271	0 3348	0 0096	7 4831	0 2223	0 1621	0 0024	0 8767	99 13	99 83	1861 4	46 5	2171 0	26 6	2478 0	24 5	
09TVZ 13	434 11	151 16	0 363	0 3300	0 0094	7 6796	0 2249	0 1688	0 0021	0 9033	98 30	99 65	1838 5	45 4	2194 2	26 3	2545 5	21 3	
Cycle 2	357 81	122 50	0 357	0 3345	0 0095	7 8926	0 2318	0 1711	0 0023	0 8902	98 35	99 65	1860 1	45 9	2218 8	26 5	2568 7	22 7	
Cycle 3	330 69	112 25	0 354	0 3479	0 0103	8 1085	0 2484	0 1690	0 0024	0 8870	98 10	99 61	1924 5	49 1	2243 2	27 7	2548 2	24 0	
Cycle 4	295 47	99 11	0 349	0 3661	0 0111	8 4418	0 2673	0 1672	0 0025	0 8831	97 95	99 58	2011 3	52 6	2279 7	28 7	2530 0	25 3	
Cycle 5	264 29	86 43	0 341	0 3712	0 0114	8 7745	0 2799	0 1715	0 0026	0 8822	98 49	99 68	2034 9	53 8	2314 8	29 1	2571 9	25 5	
Cycle 6	243 08	85 08	0 365	0 3731	0 0113	8 6995	0 2738	0 1691	0 0027	0 8685	98 25	99 64	2044 1	53 0	2307 0	28 7	2548 7	26 6	
Cycle 7	235 15	82 72	0 366	0 3918	0 0124	9 2170	0 3025	0 1706	0 0027	0 8780	98 39	99 66	2131 0	57 5	2359 8	30 1	2563 9	26 7	
Cycle 8	222 25	73 74	0 346	0 4071	0 0132	9 6182	0 3199	0 1714	0 0027	0 8822	99 21	99 84	2201 6	60 4	2398 9	30 6	2570 9	26 7	
Cycle 9	230 86	80 24	0 362	0 4322	0 0151	10 4106	0 3732	0 1747	0 0028	0 8968	98 86	99 76	2315 7	67 9	2472 0	33 2	2603 1	26 8	
Cycle 10	201 42	72 02	0 372	0 4089	0 0134	9 6637	0 3269	0 1714	0 0029	0 8708	98 43	99 67	2209 9	61 1	2403 3	31 1	2571 4	28 3	
Cycle 11	194 24	71 36	0 383	0 4155	0 0138	9 7374	0 3344	0 1700	0 0029	0 8752	99 05	99 80	2240 1	63 1	2410 2	31 6	2557 2	28 3	
Cycle 12	188 84	65 98	0 364	0 4225	0 0143	9 6273	0 3406	0 1653	0 0029	0 8693	97 74	99 54	2272 0	64 9	2399 8	32 5	2510 1	29 9	
Cycle 13	186 18	66 19	0 370	0 4378	0 0153	10 2858	0 3685	0 1704	0 0029	0 8831	99 60	99 92	2340 7	68 7	2460 8	33 2	2561 6	28 7	
Cycle 14	183 92	69 61	0 394	0 4292	0 0148	10 2446	0 3628	0 1731	0 0030	0 8779	99 57	99 91	2302 1	66 9	2457 1	32 8	2588 0	28 9	
09TVZ 14	184 57	92 76	0 523	0 3927	0 0160	9 2374	0 4258	0 1706	0 0046	0 8145	91 22	98 06	2135 5	73 9	2361 8	42 2	2563 4	45 0	
Cycle 2	157 39	81 02	0 536	0 3818	0 0156	9 3415	0 4228	0 1774	0 0048	0 8098	93 78	98 60	2084 7	72 8	2372 1	41 5	2629 1	44 7	
Cycle 3	153 14	72 40	0 493	0 4154	0 0185	9 6462	0 4735	0 1684	0 0047	0 8277	93 97	98 71	2239 3	84 4	2401 6	45 2	2542 2	46 7	
Cycle 4	137 86	67 54	0 510	0 3915	0 0168	9 2445	0 4324	0 1713	0 0048	0 8102	95 50	99 03	2129 6	77 8	2362 5	42 9	2570 2	46 6	
Cycle 5	137 73	63 89	0 483	0 4168	0 0190	10 2024	0 5010	0 1775	0 0049	0 8323	95 77	99 06	2245 9	86 5	2453 3	45 4	2630 0	45 9	
Cycle 6	132 05	66 76	0 527	0 4247	0 0198	10 2175	0 5087	0 1745	0 0048	0 8381	96 21	99 18	2282 0	89 4	2454 7	46 0	2601 0	46 0	
Cycle 7	118 62	56 76	0 498	0 4046	0 0182	9 7018	0 4711	0 1739	0 0049	0 8176	95 91	99 11	2190 0	83 4	2406 9	44 7	2595 8	47 4	
Cycle 8	119 93	55 56	0 483	0 4154	0 0191	10 0302	0 4977	0 1751	0 0050	0 8247	95 82	99 09	2239 4	87 0	2437 6	45 8	2607 3	47 5	
Cycle 9	120 01	55 18	0 479	0 4227	0 0199	10 1738	0 5167	0 1746	0 0050	0 8299	95 51	99 02	2272 8	90 0	2450 7	47 0	2601 8	47 9	
Cycle 10	120 13	54 44	0 472	0 4239	0 0202	10 4079	0 5262	0 1781	0 0049	0 8438	96 92	99 32	2278 3	91 4	2471 8	46 8	2634 9	45 8	
Cycle 11	123 17	55 84	0 472	0 4512	0 0227	11 3054	0 6066	0 1817	0 0051	0 8536	95 71	99 02	2400 5	100 7	2548 6	50 1	2668 7	46 9	
Cycle 12	122 21	49 88	0 425	0 4427	0 0216	11 0345	0 5584	0 1808	0 0048	0 8595	98 68	99 71	2362 6	96 4	2526 1	47 1	2660 1	43 7	
Cycle 13	110 28	53 49	0 505	0 4084	0 0187	10 0703	0 4792	0 1788	0 0048	0 8356	99 13	99 81	2207 8	85 6	2441 3	43 9	2642 0	44 5	
Cycle 14	114 18	54 12	0 494	0 4137	0 0192	10 2001	0 5006	0 1788	0 0049	0 8344	97 59	99 47	2232 0	87 6	2453 1	45 4	2641 8	45 8	
09TVZ 15	396 09	59 16	0 156	0 3608	0 0103	8 3290	0 2480	0 1674	0 0022	0 8962	97 14	99 41	1985 9	48 9	2267 5	27 0	2532 1	22 4	
Cycle 2	338 42	50 01	0 154	0 3799	0 0112	8 7988	0 2662	0 1680	0 0023	0 8956	98 56	99 70	2076 0	52 1	2317 4	27 6	2537 4	22 7	
Cycle 3	305 20	44 25	0 151	0 3735	0 0108	8 5257	0 2561	0 1655	0 0024	0 8812	97 92	99 58	2045 9	50 7	2288 7	27 3	2513 1	24 2	
Cycle 4	280 47	39 49	0 147	0 3839	0 0112	8 7263	0 2676	0 1648	0 0025	0 8707	97 01	99 39	2094 7	52 3	2309 8	27 9	2505 9	25 7	
Cycle 5	262 08	39 82	0 158	0 3937	0 0115	9 0725	0 2744	0 1671	0 0025	0 8695	98 58	99 71	2140 1	53 2	2345 3	27 7	2529 0	25 6	
Cycle 6	249 54	36 33	0 152	0 4092	0 0123	9 4884	0 2936	0 1682	0 0026	0 8706	98 83	99 76	2211 1	56 1	2386 4	28 4	2539 7	26 0	
Cycle 7	230 27	32 30	0 146	0 4056	0 0121	9 3379	0 2884	0 1670	0 0027	0 8643	99 05	99 81	2194 8	55 7	2371 7	28 3	2527 5	26 6	
Cycle 8	212 21	31 22	0 153	0 4149	0 0126	9 7239	0 3044	0 1700	0 0028	0									

Appendix

Table 3 SIMS U-Pb isotopic data of zircon from depth-profiling of samples from Abitibi Subprovince

Sample*	U		Th	$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{207}\text{Pb}$		Correlation of Concordia Ellipses	% Radiogenic		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{207}\text{Pb}$	
	(est ppm)	(est ppm)	Th/U	value	1 s e	value	1 s e	value	1 s e		^{206}Pb	^{207}Pb	Age (Ma)	1 s e	Age (Ma)	1 s e	Age (Ma)	1 s e
Cycle 2	124 21	41 77	0 350	0 3896	0 0149	9 3743	0 3855	0 1745	0 0041	0 8293	96 10	99 15	2121 0	69 2	2375 3	37 7	2601 3	38 9
Cycle 3	121 69	37 61	0 322	0 4075	0 0164	10 2027	0 4329	0 1816	0 0042	0 8477	97 28	99 39	2203 3	75 2	2453 3	39 2	2667 6	38 0
Cycle 4	123 78	41 42	0 349	0 4272	0 0182	10 4475	0 4666	0 1774	0 0040	0 8654	97 78	99 52	2293 1	82 4	2475 3	41 4	2628 4	37 8
Cycle 5	110 25	37 68	0 356	0 4184	0 0172	10 4863	0 4526	0 1818	0 0043	0 8445	97 55	99 45	2253 3	78 1	2478 7	40 0	2669 1	39 0
Cycle 6	112 94	38 63	0 356	0 4402	0 0191	10 8355	0 4985	0 1785	0 0043	0 8571	96 51	99 23	2351 3	85 7	2509 1	42 8	2639 4	39 9
Cycle 7	112 52	41 02	0 380	0 4299	0 0180	10 4499	0 4582	0 1763	0 0042	0 8501	97 94	99 56	2305 2	81 2	2475 5	40 6	2618 4	39 2
Cycle 8	113 07	42 73	0 394	0 4484	0 0195	11 3325	0 5110	0 1833	0 0042	0 8669	98 41	99 64	2388 0	86 8	2550 9	42 1	2683 1	37 9
Cycle 9	109 83	45 69	0 433	0 4349	0 0183	10 8765	0 4800	0 1814	0 0043	0 8527	97 73	99 49	2327 9	82 4	2512 6	41 0	2665 4	38 9
Cycle 10	103 19	46 01	0 464	0 4290	0 0176	10 6237	0 4513	0 1796	0 0042	0 8464	98 94	99 77	2301 4	79 3	2490 8	39 4	2649 1	38 4
Cycle 11	105 57	43 01	0 424	0 4211	0 0173	10 3633	0 4414	0 1785	0 0041	0 8531	99 21	99 83	2265 3	78 7	2467 8	39 4	2639 1	37 8
Cycle 12	106 39	47 15	0 462	0 4410	0 0189	11 0469	0 4899	0 1817	0 0042	0 8621	98 78	99 73	2354 9	84 5	2527 1	41 3	2668 4	38 0
Cycle 13	106 63	45 33	0 443	0 4626	0 0208	11 4719	0 5362	0 1798	0 0042	0 8681	97 92	99 54	2451 1	91 5	2562 3	43 7	2651 5	39 1
Cycle 14	98 18	43 50	0 461	0 4356	0 0185	10 8498	0 4772	0 1807	0 0043	0 8514	99 11	99 80	2330 8	83 2	2510 3	40 9	2659 0	39 2
Cycle 15	93 17	42 90	0 480	0 4276	0 0182	10 9659	0 4808	0 1860	0 0045	0 8465	99 30	99 84	2295 0	82 0	2520 2	40 8	2707 0	39 5
Cycle 16	95 62	42 44	0 462	0 4535	0 0205	11 0237	0 5216	0 1763	0 0044	0 8566	97 71	99 50	2410 9	90 9	2525 1	44 1	2618 3	41 4
Cycle 17	91 74	40 44	0 459	0 4477	0 0201	11 0854	0 5154	0 1796	0 0044	0 8546	98 89	99 76	2385 0	89 5	2530 3	43 3	2649 1	41 0
09TVZ-19	314 24	132 59	0 440	0 3732	0 0107	8 9054	0 2628	0 1731	0 0025	0 8769	98 55	99 69	2044 3	50 0	2328 4	26 9	2587 6	24 1
Cycle 2	294 91	116 18	0 410	0 3698	0 0106	8 6697	0 2563	0 1700	0 0025	0 8702	98 68	99 73	2028 3	49 7	2303 9	26 9	2558 1	24 8
Cycle 3	283 08	104 70	0 385	0 3819	0 0112	8 9155	0 2713	0 1693	0 0026	0 8700	98 48	99 69	2085 1	52 3	2329 4	27 8	2550 9	25 6
Cycle 4	267 77	95 37	0 371	0 3785	0 0111	8 9161	0 2705	0 1709	0 0027	0 8633	98 32	99 65	2069 2	51 7	2329 4	27 7	2566 1	26 1
Cycle 5	254 90	86 10	0 352	0 3868	0 0115	9 1353	0 2820	0 1713	0 0027	0 8680	98 68	99 72	2107 9	53 7	2351 7	28 2	2570 3	26 1
Cycle 6	243 49	85 89	0 367	0 3702	0 0107	8 7495	0 2633	0 1714	0 0028	0 8503	97 96	99 57	2030 5	50 2	2312 2	27 4	2571 3	27 0
Cycle 7	241 34	82 81	0 357	0 3872	0 0116	9 1610	0 2860	0 1716	0 0028	0 8597	98 00	99 58	2109 7	53 9	2354 2	28 6	2573 4	27 2
Cycle 8	235 40	87 05	0 385	0 3880	0 0117	9 2306	0 2870	0 1725	0 0028	0 8618	98 81	99 75	2113 7	54 2	2361 2	28 5	2582 3	26 9
Cycle 9	231 25	76 85	0 346	0 3977	0 0123	9 6598	0 3062	0 1762	0 0028	0 8715	99 52	99 90	2158 3	56 7	2402 9	29 2	2617 1	26 4
Cycle 10	219 20	76 15	0 362	0 4097	0 0128	9 6698	0 3117	0 1712	0 0028	0 8672	99 21	99 84	2213 3	58 7	2403 8	29 7	2569 4	27 4
Cycle 11	207 34	69 53	0 349	0 3975	0 0122	9 6112	0 3036	0 1754	0 0029	0 8568	99 26	99 84	2157 5	56 2	2398 2	29 1	2609 6	27 8
Cycle 12	206 41	72 49	0 366	0 4026	0 0126	9 6599	0 3125	0 1740	0 0029	0 8616	99 27	99 85	2180 9	58 1	2402 9	29 8	2596 8	28 0
Cycle 13	194 23	66 87	0 359	0 4051	0 0128	9 6801	0 3168	0 1733	0 0030	0 8557	98 88	99 76	2192 3	58 8	2404 8	30 1	2590 0	28 9
Cycle 14	189 89	64 16	0 352	0 4083	0 0132	9 7335	0 3261	0 1729	0 0031	0 8568	98 85	99 76	2206 9	60 5	2409 9	30 9	2586 1	29 5
09TVZ 20	153 75	89 91	0 609	0 3210	0 0110	7 6047	0 2826	0 1718	0 0037	0 8173	95 91	99 12	1794 4	53 5	2185 4	33 3	2575 7	36 3
Cycle 2	136 69	73 98	0 564	0 3311	0 0118	7 9907	0 3061	0 1750	0 0039	0 8234	97 01	99 35	1843 6	57 3	2230 0	34 6	2606 5	36 9
Cycle 3	124 53	60 96	0 510	0 3250	0 0116	7 8153	0 3017	0 1744	0 0041	0 8066	96 56	99 26	1814 2	56 4	2210 0	34 7	2600 3	38 8
Cycle 4	122 91	59 98	0 508	0 3321	0 0124	8 1774	0 3287	0 1786	0 0042	0 8179	96 64	99 26	1848 7	60 0	2250 8	36 4	2639 6	39 1
Cycle 5	115 11	53 86	0 487	0 3091	0 0111	7 3856	0 2886	0 1733	0 0042	0 7951	96 89	99 33	1736 1	54 8	2159 2	34 9	2589 9	40 4
Cycle 6	112 59	49 07	0 454	0 3285	0 0125	7 8333	0 3246	0 1730	0 0043	0 8067	96 32	99 21	1831 0	60 7	2212 0	37 3	2586 4	41 6
Cycle 7	109 75	47 09	0 447	0 3233	0 0124	7 8588	0 3250	0 1763	0 0044	0 8083	96 82	99 31	1806 0	60 3	2215 0	37 3	2618 2	41 3
Cycle 8	105 59	44 33	0 437	0 3294	0 0129	8 1987	0 3343	0 1805	0 0043	0 8264	99 20	99 82	1835 7	62 4	2253 2	36 9	2657 4	39 1
Cycle 9	101 47	40 88	0 420	0 3205	0 0124	7 8612	0 3166	0 1779	0 0042	0 8179	99 51	99 90	1792 2	60 5	2215 2	36 3	2633 3	39 7
Cycle 10	98 90	39 74	0 419	0 3410	0 0137	8 3283	0 3496	0 1771	0 0043	0 8277	99 23	99 83	1891 4	66 0	2267 4	38 1	2626 3	40 2
Cycle 11	93 96	35 97	0 399	0 3322	0 0132	8 0952	0 3422	0 1767	0 0045	0 8059	97 94	99 55	1849 1	63 8	2241 7	38 2	2622 4	42 7
Cycle 12	95 39	38 49	0 420	0 3327	0 0135	8 0100	0 3509	0 1746	0 0046	0 8081	97 09	99 37	1851 7	65 4	2232 2	39 5	2602 1	43 9
Cycle 13	90 02	36 28	0 420	0 3281	0 0131	8 0584	0 3384	0 1781	0 0045	0 8089	99 10	99 80	1829 3	63 8	2237 6	37 9	2635 4	42 2
Cycle 14	85 65	31 89	0 388	0 3251	0 0131	7 8934	0 3355	0 1761	0 0046	0 8055	98 99	99 78	1814 8	63 9	2218 9	38 3	2616 2	43 2

* sp denotes a separate spot analyses on the same grain d denotes deeper ion drilling analysis

† ages of 0 0 are undefined