



**Mt Ramsay  
Exploration Licence 72/2007**

**Annual Report for the period 4/04/2017 to 3/04/2018**

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April 2017  
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# 1 Summary

Exploration Licence 72/2007 located in western Tasmania is prospective for tin, tungsten and magnetite mineralisation within meta-sedimentary rocks adjacent to the Meredith Granite. Work to date within EL72/2007 has identified two drill-ready tin and tungsten skarn targets, the RAM A and RAM B skarns. Approval was gained for 5 drill sites to test these targets in 2015 but the proposed drilling has postponed by cuts to Venture's exploration budget. Due to the deteriorating condition of the existing 4wd track Venture was unable to access the priority RAM A, RAM B and EM2 targets and further investigation is recommended utilising helicopter access. Field work during this anniversary year instead focused on an accessible region in the northern part of the lease which contained anomalous Sn & As geochemical signatures.

Petrographic work on the RAM A skarn has indicated the presence of a quartz-carbonate alteration stage comparable with the high grade cassiterite zones within the Mt Lindsay skarns, albeit largely destroyed by the commercially barren amphibole+titanite and biotite alteration stages. By analogy with the Main and No2 Skarns at Mt Lindsay the RAM A skarn is considered prospective for cassiterite mineralisation in a more distal setting than currently drill tested. Microprobe work being undertaken at UTAS is focussing on the use of garnet chemistry and LA-ICPMS work is focussing on the use of tourmaline chemistry to potentially verify this assertion. Results from investigating garnet in the CAF series of holes support the idea that the RAM A target has potential for significant Sn mineralisation. Results of LA-ICPMS analysis of tourmaline from around the margins of the Meredith Granite are pending.

# 2 Introduction

Exploration Licence 72/2007 is situated in the tin-tungsten province of western Tasmania within the eastern contact metamorphic aureole of the Meredith Granite. The Meredith Granite is part of a suite of Devonian granites which is very important to tin-tungsten mineralisation in Tasmania, and deposits associated with this suite include the world class Renison Bell tin mine (26 Mt at 1.46% Sn), Mount Bischoff (10.54 Mt at 1.1% Sn), Cleveland (12.4 Mt at 0.62% Sn, 0.25% Cu) and King Island (17 Mt at 0.85% W<sub>3</sub>). Cleveland and Mount Bischoff are situated around the northern margin of the Meredith Granite, and Renison Bell is associated with the smaller Pine Hill Granite c. 15 km to the southeast of the Meredith Granite.

Previous exploration activities mainly for tin and tungsten within the area now covered by E72/2007 also indicate the presence of potentially economic magnetite skarns. There are currently two producing magnetite mines in Tasmania, the Kara magnetite-scheelite mine located near Hampshire approximately 40 km northeast of EL72/2007 and the Savage River magnetite mine (371 Mt at 31.9% Fe in magnetite) situated c. 20 km west, north-west of the Mt Ramsay.

### 3 Location and Access

EL72/2007 currently covers 24 km<sup>2</sup> and is located approximately 80 km by road southwest of the coastal port of Burnie, and c. 16 km by road from the nearest town of Waratah (**Figure 1**). The tenement is on Crown Land entirely within the Meredith Range Regional Reserve. The terrain is characterised by steeply incised valleys into broad forested plateaux and mountains. Elevation ranges from 180 m above sea level in the Ramsay River valley to 855 m on a spur to the north east of Mt Ramsay. Average annual rainfall is approximately 2000 mm and vegetation is dominated by temperate rainforest with relatively open understory away from the Meredith Granite. Eucalyptus forest and dense sub-alpine scrub cover granitic basement in the western part of the tenement, and any areas of regenerating rainforest.

Ground access to the licence can currently be made via Waratah from the north, and via Huskisson Drive from the southeast (Figure 1). From Waratah access is via the Wombat Flat – Mt Ramsay 4WD track which branches off the Waratah Road c. 7 km south west of Waratah.

From the Waratah Rd to the RAM A target area beneath Mt Ramsay the trip takes approx. one hour on quadbike and 4 hours on foot. For the most part road conditions comprise rocky track in rainforest locally covered with loose cobbles and small boulders and water scoured track on granite through scrubby forest. There are some deeply rutted sections, particularly around 372167mE 5399795mN (MGA55 GDA94) where there are permanent bog holes up to c. 1m deep and 50m along the road. ATV access is not recommended after heavy rain. The 4WD road is open to the public and there is evidence of irregular public ATV or 4WD use.

From the South access is via Huskisson Drive, a gravel Forestry road which branches off the Murchison Highway c.12 km south of Fingerpost intersection. Access to Huskisson Drive can also be made from Pearsefield Road. Huskisson Drive is in good condition and driveable to within 1km of the Hatfield River crossing. A recent landslide has restricted passage to ATV's only past this point and at the Hatfield River crossing the forestry bridge has been washed out. The Forestry bridges across the Que and Huskisson rivers have also been washed away. Between the Hatfield and Huskisson rivers the road travels through low-lying rainforest and is gravelly with significant potholes. After the Huskisson River crossing the 4WD road traverses rainforest with locally very steep sections but there are no large bog holes. Four wheel drive access is also possible from the Huskisson-Hatfield confluence north to Waratah via a rough ridgeline track on the west side of the Coldstream River, as shown on the 1:25,000 and 1:100,000 topographic map sheets known locally as "The million dollar track". The southern part of this track was used to access, on foot, the Ramsay River area for prospecting during the 2016 field season.

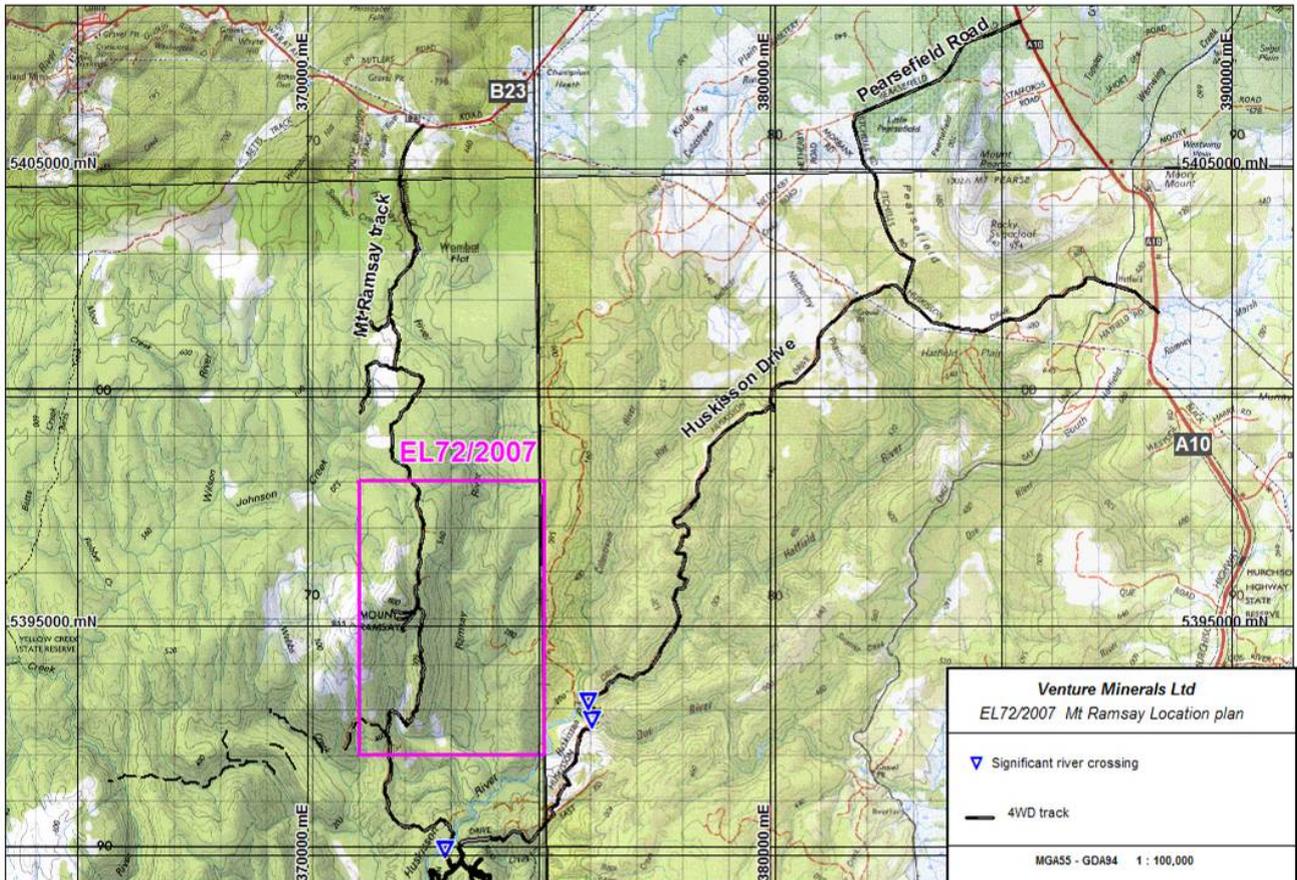


Figure 1: EL72/2007 Location & Access Map

## 4 Geological Setting

Mapping by the Tasmanian Geological Survey (Brown 1986) and mineral explorer Comstaff Pty Ltd (“Comstaff”) shows the area now covered by EL72/2007 is underlain from east to west by the Neoproterozoic Oonah Formation and Crimson Creek Formation, or correlate, and the Devonian Meredith Granite (**Figure 2**). In the northern part of EL72/2007 these basement units are partly overlain by Tertiary basalt. There are also Quaternary fluvial gravel terraces in the larger river valleys.

The Oonah Formation is mainly comprised of strongly deformed (characteristically isoclinally folded) thin to medium bedded quartz sandstone with carbonaceous siltstone, shale, and phyllite. Mapping by Comstaff along the Ramsay River indicates the presence of dolomite units within the Oonah Fm. A fault separates the Oonah Fm. from the younger Crimson Creek Fm. within EL72/2007. The Crimson Creek Fm. consists of thin to thick bedded dark green grey volcanic lithic sandstone, siltstone and thin bedded mudstone with thin to thick bedded calcareous sandstone units with distinctive thin bedded intraclast breccias (flakestone), and locally abundant basalt (flows?), dolerite and microgabbro intrusions.

The Meredith Granite intrudes the Crimson Creek Fm. in the western part of EL72/2007. Historic exploration drilling suggests the granite margin dips moderately to steeply east.

The Meredith Granite is an I-type biotite granite, at Mt Ramsay comprising an equigranular adamellite and porphyritic adamellite. The granite contains numerous quartz+tourmaline veins and commonly has roughly circular patches of quartz+tourmaline alteration. A zone of massive quartz-tourmaline alteration is developed in the margin of the Meredith Granite adjacent to the RAM A calc-silicate, amphibole, biotite, magnetite and sulphide skarn within the Crimson Creek Formation on the south eastern flank of Mt Ramsay. Mapping and drilling by Comstaff shows the proximal part of the RAM A skarn dips steeply east and most likely plunges south-southwest. The skarn is approx. c. 80 m wide and exposed for c. 800 m strike extent from the granite contact. End of exposure appears to coincide with a northeast striking fault. A prominent magnetic ridge can be traced a further 2 km along strike, but it is unclear at this stage whether it represents subsurface magnetite-skarn or a stratigraphically separate magnetite-rich hornfels.

An inspection report to the Tasmanian Department of Mines in 1909 on the small shafts and adit at Mt Ramsay is the earliest description of the RAM A skarn. An amphibole-rich mineral assemblage was recorded including native bismuth, arsenopyrite, pyrite, chalcopyrite, ilmenite, magnetite, scheelite, fluorite, garnet and rare axinite. It was noted that specks and "large pieces" of native bismuth were commonly associated with scheelite. Venture Minerals has encountered similar assemblages and associations in the Main and No. 2 Sn-W-magnetite deposits at Mt Lindsay c. 15 km to the southwest of Mt Ramsay. Comstaff drilled several diamond core holes into the RAM A skarn in the 1980s and report a mineral assemblage comprising variable percentages of coarsely crystalline garnet, vesuvianite, diopside and ferrohastingsite with characteristic compositional banding. Massive crystalline and banded magnetite was also recorded throughout the skarn. Fluorite and calcite were reported as common interstitial minerals, with lesser pyrrhotite, pyrite, tourmaline and minor chalcopyrite, ilmenite, arsenopyrite, scheelite and native bismuth. Cassiterite was not identified in hand specimen or thin section. The skarn is typically enveloped by mottled pyroxene, amphibole and biotite hornfels, locally with andalusite pseudomorphs.

Drill testing of other magnetic and EM targets has identified the presence of widespread pyrrhotite mineralisation occurring as minor disseminations, veins and in hydrothermal breccia. Well-developed hydrothermal breccia zones intersected in Malachite Resource drill hole MRD1 c. 750m to the east of the RAM A indicate repeated mineralisation and brecciation from multiple fluid stages. The breccia zones have well-developed amphibole, quartz, pyroxene, biotite and sulphide alteration halos. A petrographic report by B. J. Barron suggests the mineral assemblage of the breccia vein fill would have been formed in high temperature fluid conditions too proximal to the granite to have been conducive for Sn mineralisation. Similar hydrothermal breccia zones have been observed by Venture Minerals at Mt Lindsay in hornfels adjacent to skarn or carbonate protolith.

The Ramsay region has been affected by multiple northeast striking faults which appear to post-date granite emplacement and sinistrally offset the prominent north trending magnetic fabric within the Oonah and Crimson Creek formations.

## 5 Exploration and Mining History

The earliest recorded exploration efforts in the Mt Ramsay area were conducted by the Tasmanian Bismuth and Gold Mining Company who constructed shafts and adits into the Mt Ramsay Skarn close to the granite. In the late 1800's Mt Ramsay was considered to be a significant bismuth deposit but later extension of exploration tunnels identified no further enrichment with the best grades found at surface. Although scheelite was identified the tungsten potential was apparently not considered. There are also no records of tin mineralisation or any mention of tin mining or prospecting being pursued in any significant way.

Comstaff Pty Ltd ("Comstaff") took up the Mt Ramsay area in the 1970's and in the following 15 years conducted geological mapping, geophysical surveying, geochemical sampling and 10 diamond core drill holes. After early reconnaissance works Comstaff established four cut grids named CAF, CAI, CAE and CAL. Each grid was auger sampled and geologically mapped. The western central CAF grid covering the RAM A target was the most extensively sampled area where the soil assay results showed significant Sn (up to 800 ppm) and W (up to 320 ppm W) anomalism over an area up to 60-100m wide with a strike extent of 1.4 km. Grid CAE to the far north contained no soil anomalism; the grid is situated slightly to the east of a large magnetic feature and Comstaff may have missed an interesting target. Grids CAL and CAI have moderate As anomalism but with no significant Sn and/or W anomalism.

Comstaff completed seven (7) diamond drill holes CAF1 to CAF7 totalling 1110.6 m within and adjacent to the historically identified Mt Ramsay Skarn (the "RAM A" target) within the CAF grid (**Figure 2**). CAF2, CAF3 and CAF5 were drilled in the north of the CAF grid close the granite contact and intersected metasediments, minor calc-silicate skarn and granite. Economic grades were not encountered and intersection of the granite at shallow levels indicates limited exoskarn potential. Approx. 200 m south of CAF2, 3 and 5 thicker more substantial calc-silicate skarn zones were intersected and the drill holes were anomalous for Sn, WO<sub>3</sub>, Cu, Fe and Bi. The best results are in the southernmost drill holes; CAF7 intersected 73 m of skarn inclusive of 7.3 m at 0.16 % Sn from 143.3 m down hole, and CAF1 encountered 83 m of skarn including 17 m at 0.17 % Sn from 199.25 m down hole. Cassiterite was not identified in any of the holes. Holes CAF4 and CAF6 were drilled to the east away from the CAF geochemical-magnetic target and significant mineralisation and alteration were not encountered.

Comstaff also drilled one diamond hole at the northern CAL grid and two holes at the southern CAI grid encountering extensive pyrrhotite alteration as disseminations, veins and fracture infill. A little calc-silicate alteration was intersected, but significant mineralisation was recorded. The extensive pyrrhotite veining and alteration and magnetite-rich hornfels encountered by the Comstaff drill holes indicate the presence of non-skarn sources for magnetic anomalism in the Ramsay area.

Malachite Resources ("Malachite") explored the Mt Ramsay area during the 2004 to 2008 period and represents the only significant works subsequent to the Comstaff relinquishment. Malachite was focussed on identifying Mt Bischoff-Renison Bell style

cassiterite-bearing massive sulphides. A previous (2001-2002) helicopter EM survey by the Tasmanian Geological Survey showed the presence of a significant conductor about 800 m east of the Mt Ramsay Skarn, and a partial (due to very steep terrain) ground EM survey by Malachite confirmed these results. Several conductors potentially representing sulphide mineralisation were identified and checked on the ground. Geological mapping located electrically conductive graphitic shales and minor sulphide veining, but the conductors to the east of the CAF grid were selected to be drill tested due to the favourable logistics, coupled with high magnetic anomalism and the presence of calcareous strata at surface. Malachite drilled one diamond core hole MRDD1 for 408 m which intersected a thick hydrothermally brecciated pyroxene and biotite hornfels unit from approx. 265 m to 408 m end of hole. The breccia returned a best intersection of 30 m at 117 ppm Sn and 50 ppm WO<sub>3</sub> from 354 m. Breccia vein and cement is comprised of pyrrhotite-actinolite with minor chalcopyrite, pyrite and marcasite. No significant exploration has been conducted at Mt Ramsay since 2008.

## **6 2017-2018 Anniversary Year Exploration Activities**

Venture intended prospecting the RAM A, RAM B and EM2 targets in the 2017-2018 summer (Figure 2). However, it was not possible to efficiently access the RAM A and EM2 targets because of deterioration of the 4WD access track combined with an extended period of wet spring and summer weather, and one of the quad bikes was eventually completely submerged when trying to pass the bog holes on the northern 4WD track around 5397500mN. The southern access via Huskisson drive is also currently essentially inaccessible by ATV because of washouts at the Hatfield and Que river fords. Hence field work was largely restricted to the CAL area where historic soil sampling by Comstaff showed the presence of discrete Sn and As anomalies (Figure 3) but a single drill hole (CAL1) had failed to encounter mineralisation or significant alteration. It is recommended that helicopter access (will require helipad construction) be used for the proposed follow up sampling of the RAM B and EM2 targets, or significant commitment will be required to rejuvenate the ATV access.

Some 32 soil samples and 18 rock chip samples were obtained from northern CAL area (Figure 3) to verify the Sn and As anomalies identified by Comstaff. Hornfels with abundant disseminated and vein fracture infill pyrrhotite and traces of disseminated arsenopyrite were observed in the CAL area, especially at the northern end of the RAM B target (Figure 3). All of the known Sn and W skarns in the south Meredith area including Mt Lindsay are associated with As in soil anomalism and arsenopyrite-bearing samples have been selected for assay and petrography. Sample locations are given in Appendices A and D, and at the time of writing assays and petrographic results are pending.

Tourmaline vein orientations were recorded in the Meredith Granite along the western margin of the CAL zone (Appendix C) and samples were collected for tourmaline trace element chemical analysis using the LA-ICPMS facility at the University of Tasmania. Several tourmaline specimens previously collected from the RAM A target were retrieved from Venture's storage in Tullah to be included as part of the LA-ICPMS work. Venture has been conducting a broader study of tourmaline chemistry around the margins of the Meredith granite from all of its exploration and mining leases and has found that tourmaline chemistry as well as colour can be correlated to Sn mineralisation. Specifically, elevated

Fe, Sr & Sb have been correlated with higher Sn while Zn and Li are inversely correlated with Sn. Results of the LA-ICPMS analysis are currently pending.

The core from Comstaff drill hole CAL1 which is currently stored at the MRT rock library in Mornington was re-logged to evaluate alteration and correlation with Crimson Creek Fm stratigraphy in the Mt Lindsay area. CAL1 is dominated by biotite hornfels after tuffaceous sandstone and siltstone with a c. 5 m zone of metabasalt near the end of hole, lithologies which are broadly compatible with the barren hornfels zones within the Crimson Creek Fm at Mt Lindsay. Sedimentary structures and stratigraphic markers characteristic of the Main and No2 skarn carbonate protoliths were not observed. Summary relog for CAL1 is given in Appendix E. Some 12 ¼core samples were collected from CAL1 for petrographic analysis.

Samples from historic drill holes MRD1 (Malachite Resources), CAF1, CAF5 and CAF7 (Comstaff) were subjected to microprobe analysis at the University of Tasmania Central Science Laboratory. The main target mineral was garnet. The garnets in MRD1 (RAM B target) proved too fine grained (<5 µm diameter) for clean analysis, but the samples from CAF1, CAF5 and CAF7 (RAM A skarn) returned encouraging results with some of the highest Sn and Fe levels of any garnets in the suite of samples observed from the south Meredith area (Figure 4) to date. Comparison with the Main Skarn at Mt Lindsay where garnets with elevated Fe and Sn occur proximal to the cassiterite suggest the RAM A skarn could be fertile for cassiterite mineralisation (Figure 5). Due to the small number of data points acquired to date and presence of temporal zoning the usefulness of garnet chemistry as a vector is still unclear and the analytical work is hindered by difficulty of finding fresh garnet of adequate grain size and/or that has not been significantly replaced by vesuvianite.

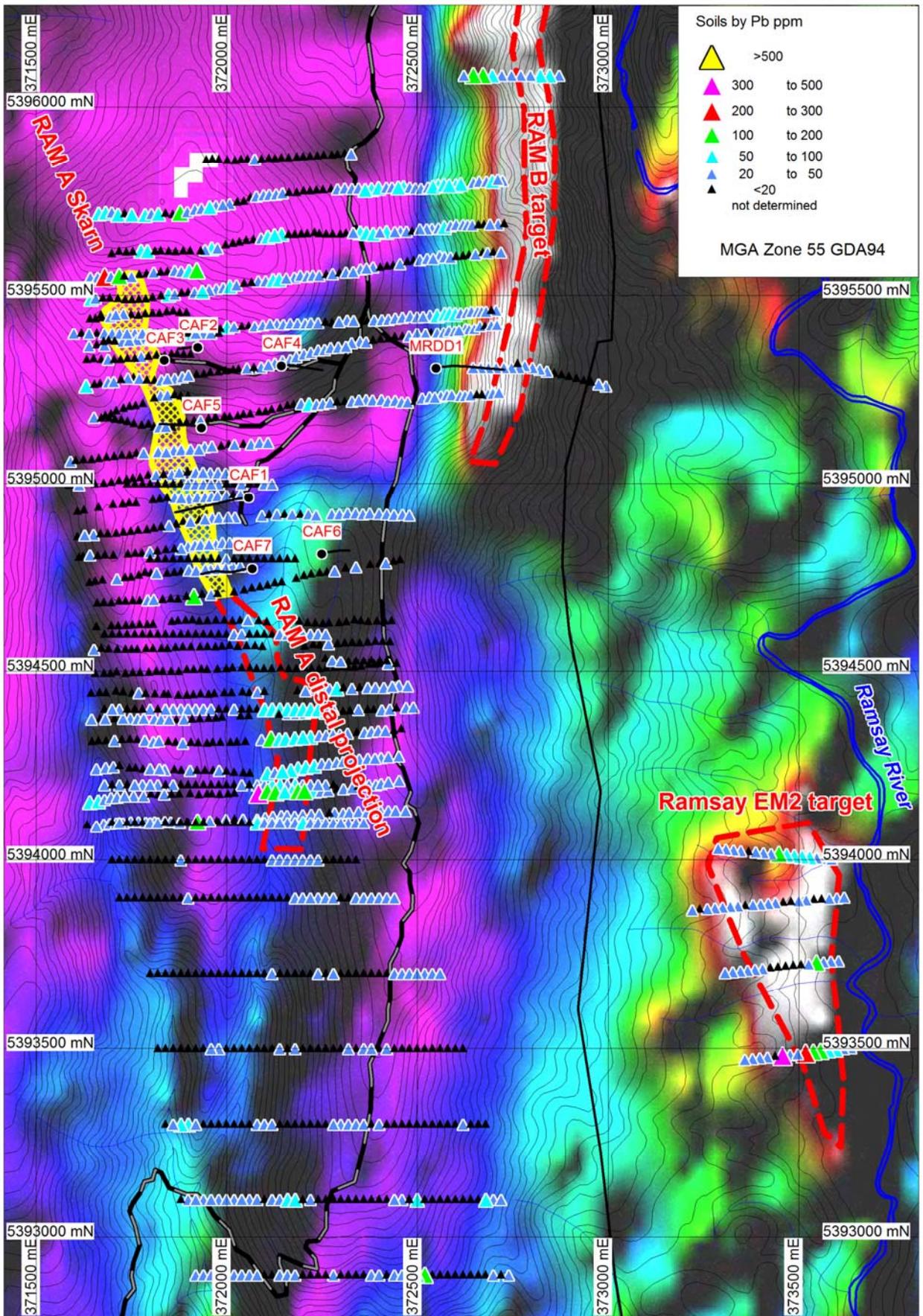


Figure 2: Priority Sn+W targets, drill holes, soil Pb and 10m topographic contours over heliborne EM 980 Hz vertical coaxial conductivity image.

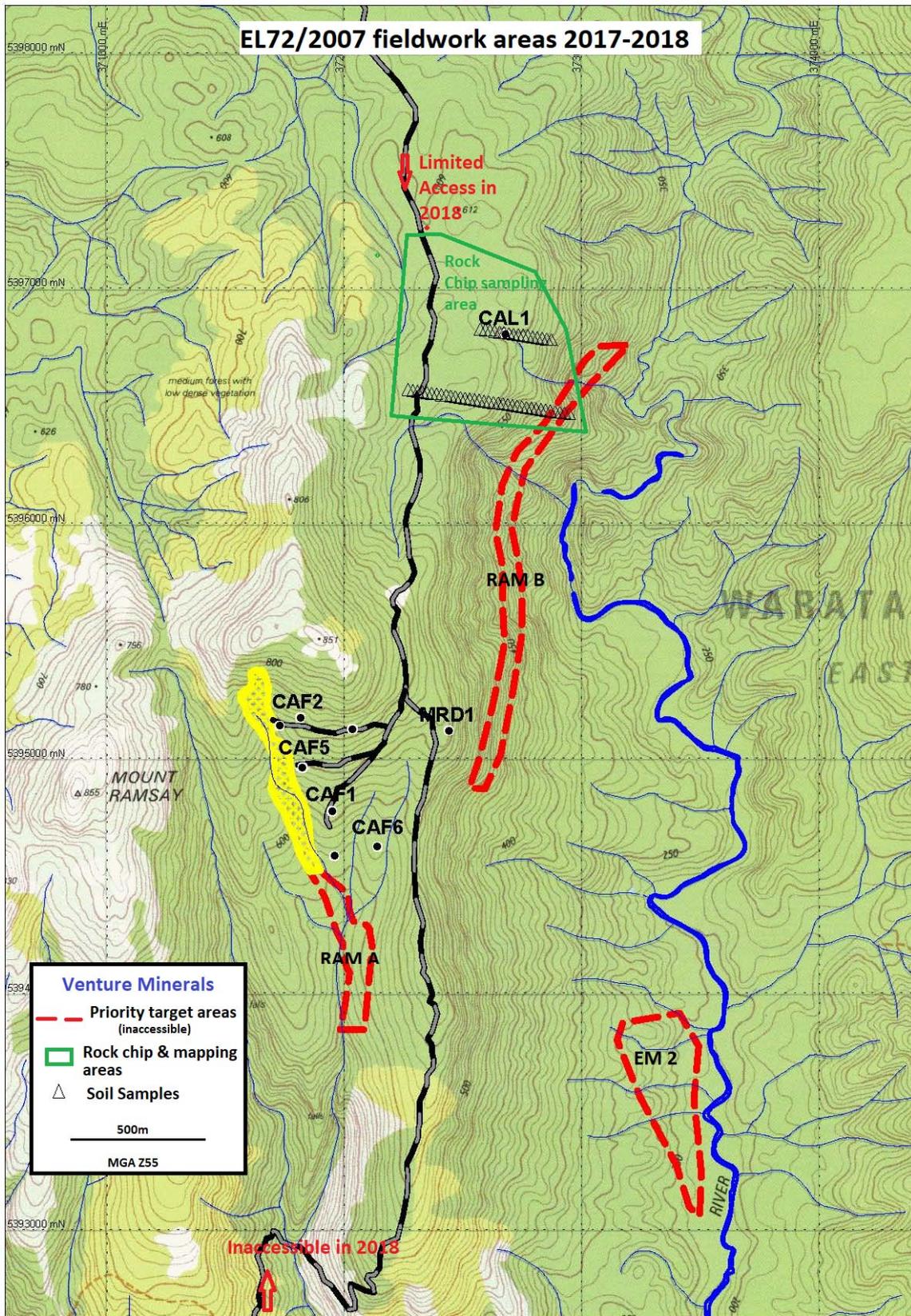


Figure 3 locations of field works carried out in 2017-18. Track conditions prevented access to the priority target areas so fieldwork was constrained to a limited area accessible from the north.

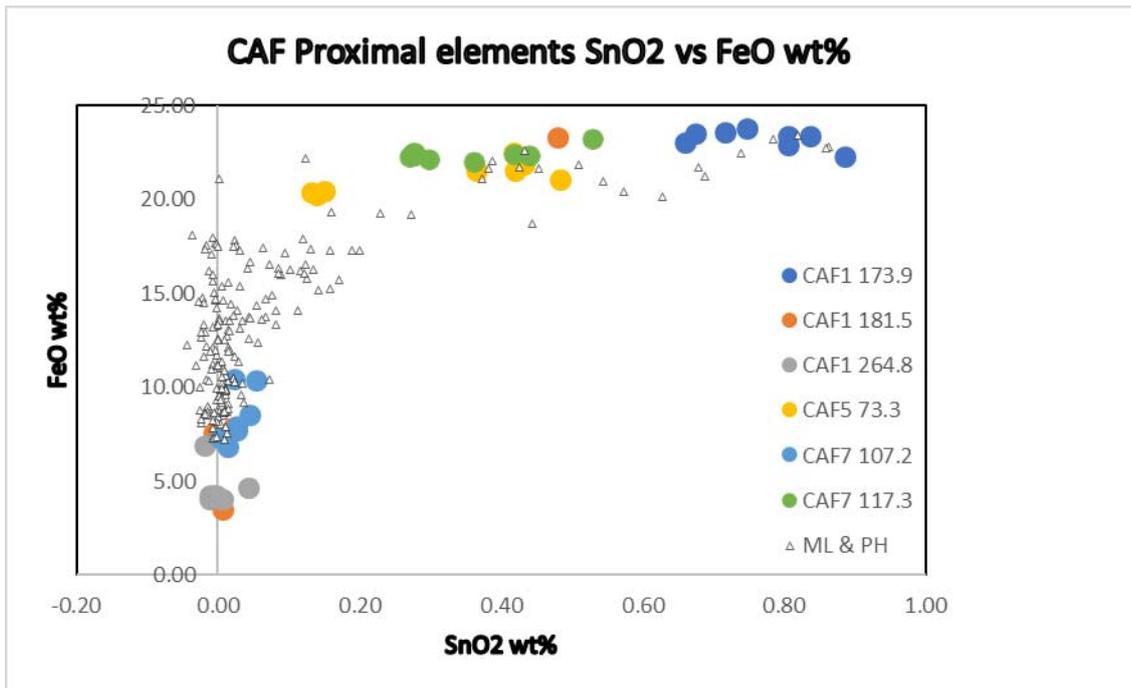


Figure 4: Microprobe of garnet chemistry from the CAF series showing high Sn-Fe in shallower samples of CAF1 & deeper samples in CAF 7. All CAF samples contained some garnet with relatively high Sn & Fe compared to the majority of Mount Lindsay and Parsons Hood garnet analyzed to date.

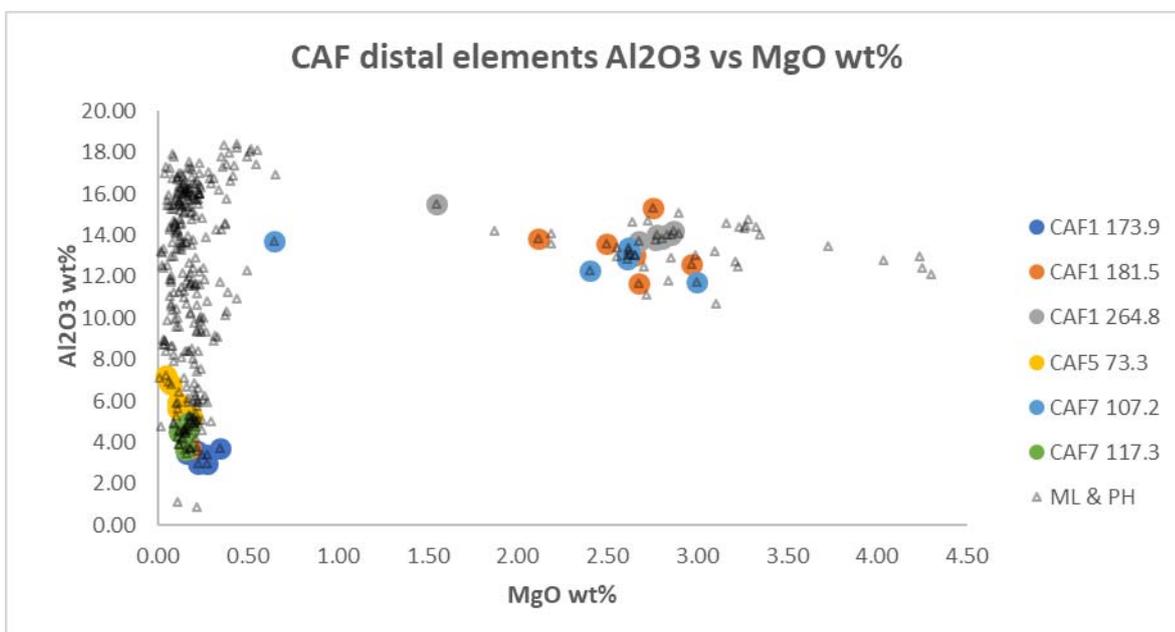


Figure 5: Plot of elements thought to be correlated distal to Sn mineralization showing deeper CAF1 samples and shallower CAF7 samples being relatively distal to Sn mineralization.

## 7 Conclusions and Recommendations

Prospecting CAL grid zone in the northern part of EL72/2007 has confirmed the presence of disseminated and vein infill pyrrhotite and disseminated arsenopyrite. Assay results are pending. Re-logging of CAL1 confirms the hole was drilled in an unfavourable protolith for skarn mineralisation (tuffaceous sandstone and siltstone), and while narrow quartz-tourmaline vein or greisen was encountered near the bottom of the hole CAL1 did not penetrate the Meredith Granite and therefore test for greisen mineralisation. Access issues prevented Venture minerals from prospecting the RAM A, RAM B and EM2 targets.

Microprobe analysis of MRD1 (RAM B target) was unsuccessful due to the fine (<5 µm) grain size of the target garnet but garnets from the CAF holes returned high Sn and Fe levels supporting the idea that the RAM A target may have a significant cassiterite zone.

Given the now very poor condition of 4WD track access into EL72/2007 it is recommended that the proposed prospecting and geochemical sampling of the RAM A, RAM B & EM 2 target areas is done with helicopter support and that the necessary approvals to clear the now overgrown helipads are sought early enough to allow exploration to occur during the driest months of summer for greatest ease of access to site with the minimum of environmental disturbance.

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## **Appendix A: Soil sample locations**

## Appendix A: Soil Sample Locations

H0002	Version	3		
H0003	Date_generated	5/04/2018		
H0004	Reporting_period_end_date	3/04/2018		
H0005	State	TAS		
H0100	Tenement	EL72/2007		
H0101	Tenement_holder	Venture Minerals Ltd		
H0102	Project_name	Mt Ramsay		
H0106	Tenement_operator	Venture Minerals Ltd		
H0150	250K_map_sheet	SK5503 Burnie		
H0151	100K_map_sheet	7914 Pieman		
H0152	50K_map_sheet	na		
H0153	25K_map_sheet	3639 Ramsay		
H0200	Start_date_of_data_acquisition	4/04/2017		
H0201	End_date_of_data_acquisition	3/04/2018		
H0202	Data_format	SG3		
H0203	Number_of_data_records	32		
H0204	Date_of_metadata_update	5/04/2018		
H0500	Feature_Located	Sample Point		
H0501	Geodetic_datum	GDA94		
H0502	Vertical_datum	not applicable		
H0503	Projection	MGA		
H0531	Projection_zone	55		
H0532	Surveying_instrument	Garmin GPS62CSx		
H0533	Surveying_Company	see data		
H0600	Sample_code	SOIL		
H0601	Sample_type	hand augered -3mm soil		
H0602	Sample_description	see data		
H0700	Sample_preparation_code	na		
H0701	Sample_preparation_details	dried & screened to 100% passing 3mm		
H0702	Job_no	na		
H0800	Assay_code	na		
H0801	Assay_company	na		
H0802	Assay_description	na		
H0900	Remarks:	assays pending		
H1000	Sample	E_MGA55	N_MGA55	Description
H1001		metres	metres	
H1002		10	10	
D	RMBS097	373058	5396646	loamy organic rich clay
D	RMBS098	373040	5396648	loamy organic rich clay
D	RMBS099	373021	5396654	loamy clay
D	RMBS100	373000	5396657	loamy clay
D	RMBS101	372979	5396661	loamy clay
D	RMBS102	372962	5396661	clay
D	RMBS103	372937	5396607	clay
D	RMBS104	372916	5396668	clay
D	RMBS105	372901	5396673	clay
D	RMBS106	372879	5396675	clay
D	RMBS107	372861	5396680	clay
D	RMBS108	372840	5396681	clay
D	RMBS109	372820	5396683	clay
D	RMBS110	372799	5396687	clay
D	RMBS111	372780	5396691	clay
D	RMBS112	372759	5396694	clay
D	RMBS113	372741	5396696	clay
D	RMBS114	372721	5396700	loamy clay
D	RMBS115	372700	5396703	clay
D	RMBS116	372680	5396705	clay
D	RMBS117	372662	5396706	gravelly clay
D	RMBS118	372639	5396711	clay
D	RMBS119	372622	5396706	clay
D	RMBS120	372598	5396717	clay
D	RMBS121	372580	5396721	clay
D	RMBS122	372560	5396723	loamy clay
D	RMBS123	372540	5396731	gravelly clay
D	RMBS124	372520	5396729	sandy clay
D	RMBS125	372497	5396731	gravelly clay
D	RMBS126	372480	5396735	gravelly clay
D	RMBS127	372462	5396738	gravel
D	RMBS128	372440	5396741	gravelly clay
EOF				

## **Appendix B: Geological locations**

Appendix B: Geological Locations

H0002	Version		3			
H0003	Date_generated		5/04/2018			
H0004	Reporting_period_end_date		3/04/2018			
H0005	State		TAS			
H0100	Tenement		EL72/2007			
H0101	Tenement_holder		Venture Minerals Ltd			
H0102	Project_name		Mt Ramsav			
H0106	Tenement_operator		Venture Minerals Ltd			
H0150	250K_map_sheet		SK5503 Burnie			
H0151	100K_map_sheet		7914 Pieman			
H0152	50K_map_sheet		na			
H0153	25K_map_sheet		3639 Ramsav			
H0200	Start_date_of_data_acquisition		4/04/2017			
H0201	End_date_of_data_acquisition		3/04/2018			
H0202	Data_format		SG3			
H0203	Number_of_data_records		24			
H0204	Date_of_metadata_update		5/04/2018			
H0500	Feature_Located		Sample Point			
H0501	Geodetic_datum		GDA94			
H0502	Vertical_datum		not applicable			
H0503	Projection		MGA			
H0531	Projection_zone		55			
H0532	Surveying_instrument		Garmin GPS62CSx			
H0533	Surveying_Company		Venture Minerals Ltd			
H0600	Sample_code		GEOLOC			
H0601	Sample_type		geological location			
H0602	Sample_description		see data			
H0700	Sample_preparation_code		not applicable			
H0800	Assay_code		not applicable			
H0900	Remarks:					
H1000	Location	E_MGA55	N_MGA55	Description		Type
H1001		metres	metres			
H1002			10	10		
D	MRTH001		372415	5396640	2-4mm bands of bk tu replacing fsp in road subcrop of granite	subcrop
D	MRTH002		372431	5396666	2-4mm bladed bk tu replacing fsp	outcrop
D	MRTH003		372433	5396711	img granite with 20%bt road subcrop	subcrop
D	MRTH004		372447	5396760	euh img-icg granite with 15% bt	outcrop
D	MRTH005		372675	5397023	dgy svfg ST float in creek bed	float
D	MRTH006		372928	5397170	barren gy svfg sandstone & siltstone	subcrop
D	MRTH007		372945	5397180	gy svfg sandstone & siltstone with 0.1% dis py & trace po. sx appears primary	subcrop
D	MRTH008		372968	5397198	gy sandstone & siltstone with trace sx. Cliff face outcrop	outcrop
D	MRTH009		372479	5397152	40cm wide qz-tourmaline vein in road based subcrop, 50-57% bk 1-2mm bladed tu replacing fsp	subcrop
D	MRTH010		372494	5397195	50mm wide bk ifg qz-tourmaline vein in granite road subcrop. 5m composite channel sample	subcrop
D	MRTH011		372490	5397009	600mm wide qz-tourmaline vein in granite	outcrop
D	MRTH012		372462	5396937	400mm wide qz-tourmaline vein in granite	subcrop
D	MRTH013		372804	5396680	dgy sandstone & siltstone with 5% dis po & asp	outcrop
D	MRTH014		372641	5396709	gy sandstone & siltstone with 1mm quartz vein, dis po (2%) and trace asp	outcrop
D	MRTH015		372981	5396966	dgy svfg sandstone & siltstone outcrop with 2-4mm prismatic qz infilling veins, drd ?go ?he alteration	outcrop
D	MRTH016		372966	5396967	rd-og-cm ?gossan weathered he-go-ja with prismatic quartz vein infill. Float	float
D	MRTH017		372907	5396971	dgy sandstone & siltstone with trace dis po and drd feo weathering on joint surfaces	outcrop
D	MRTH018		372504	5397224	100mm wide tourmaline vein in granite. Road base subcrop	subcrop
D	MRTH019		372491	5397280	80mm wide tourmaline vein in granite. Road base subcrop	subcrop
D	MRTH020		372437	5397315	100mm wide tourmaline vein in granite. Road base subcrop	subcrop
D	MRTH021		372470	5397334	200mm wide tourmaline vein in granite. Road base subcrop	subcrop
D	MRTH022		372449	5397410	100mm wide tourmaline vein in granite. Road base subcrop	subcrop
D	MRTH023		372430	5397461	zone of multiple qz-tourmaline vein 10-20mm thick	subcrop
D	MRTH024		372423	5397479	10mm wide tourmaline vein in granite. Road base subcrop	subcrop
EOF						

## **Appendix C: Geological observations**

Appendix C: Geological Observations

H0002	Version		3				
H0003	Date_generated		5/04/2018				
H0004	Reporting_period_end_date		3/04/2018				
H0005	State	TAS					
H0100	Tenement	EL72/2007					
H0101	Tenement_holder	Venture Minerals Ltd					
H0102	Project_name	Mt Ramsay					
H0106	Tenement_operator	Venture Minerals Ltd					
H0150	250K_map_sheet	SK5503 Burnie					
H0151	100K_map_sheet	7914 Pieman					
H0152	50K_map_sheet	na					
H0153	25K_map_sheet	3639 Ramsay					
H0200	Start_date_of_data_acquisition		4/04/2017				
H0201	End_date_of_data_acquisition		3/04/2018				
H0202	Data_format	SG3					
H0203	Number_of_data_records		12				
H0204	Date_of_metadata_update		5/04/2018				
H0500	Feature_Located	Sample Point					
H0501	Geodetic_datum	GDA94					
H0502	Vertical_datum	not applicable					
H0503	Projection	MGA					
H0531	Projection_zone		55				
H0532	Surveying_instrument	Garmin GPS62CSx					
H0533	Surveying_Company	Venture Minerals Ltd					
H0600	Sample_code	GEOLOB					
H0601	Sample_type	geological observation					
H0602	Sample_description	see data					
H0700	Sample_preparation_code	not applicable					
H0800	Assay_code	not applicable					
H0900	Remarks:						
H1000	Location	E_MGA55	N_MGA55	Structure	Dip/Plunge	Dip_Direction/Trend	Description
H1001		metres	metres		degrees	degrees MGA	
H1002		10	10				
D	MRTH002	372431	5396666	tourmaline vein	90	049	assumed vertical dip
D	MRTH010	372494	5397195	tourmaline vein	70	283	
D	MRTH011	372490	5397009	tourmaline vein	80	295	
D	MRTH012	372462	5396937	tourmaline vein	82	343	2 intersecting veins at the same location
D	MRTH012	372462	5396937	tourmaline vein	78	293	2 intersecting veins at the same location
D	MRTH018	372504	5397224	tourmaline vein	90	173	assumed vertical dip
D	MRTH019	372491	5397280	tourmaline vein	90	125	assumed vertical dip
D	MRTH020	372437	5397315	tourmaline vein	90	136	assumed vertical dip
D	MRTH021	372470	5397334	tourmaline vein	90	131	assumed vertical dip
D	MRTH022	372449	5397410	tourmaline vein	90	011	assumed vertical dip
D	MRTH023	372430	5397461	tourmaline vein	90	343	assumed vertical dip
D	MRTH024	372423	5397479	tourmaline vein	90	018	assumed vertical dip
EOF							

## **Appendix D: Rock sample locations**

Appendix D: Rock Sample Locations

H0002	Version	3			
H0003	Date_generated	5/04/2018			
H0004	Reporting_period_end_date	3/04/2018			
H0005	State	TAS			
H0100	Tenement	EL72/2007			
H0101	Tenement_holder	Venture Minerals Ltd			
H0102	Project_name	Mt Ramsay			
H0106	Tenement_operator	Venture Minerals Ltd			
H0150	250K_map_sheet	SK5503 Burnie			
H0151	100K_map_sheet	7914 Pieman			
H0152	50K_map_sheet	na			
H0153	25K_map_sheet	3639 Ramsay			
H0200	Start_date_of_data_acquisition	4/04/2017			
H0201	End_date_of_data_acquisition	3/04/2018			
H0202	Data_format	SG3			
H0203	Number_of_data_records	15			
H0204	Date_of_metadata_update	5/04/2018			
H0500	Feature_Located	Sample Point			
H0501	Geodetic_datum	GDA94			
H0502	Vertical_datum	not applicable			
H0503	Projection	MGA			
H0531	Projection_zone	55			
H0532	Surveying_instrument	Garmin GPS62CSx			
H0533	Surveying_Company	see data			
H0600	Sample_code	ROCK			
H0601	Sample_type	rock			
H0602	Sample_description	see data			
H0700	Sample_preparation_code	PREP-21			
H0701	Sample_preparation_details	dry, crush, pulverised in ring mill to P80 75 microns			
H0702	Job_no	na			
H0800	Assay_code	na			
H0801	Assay_company	ALS Minerals			
H0802	Assay_description	na			
H0900	Remarks:	assays pending			
H1000	Sample	E_MGA55	N_MGA55	Stype	Description
H1001		m	m		
H1002		10	10		
D	MRTH001	372415	5396640	subcrop	2-4mm bands of bk tourmaline replacing fsp in road subcrop of granite
D	MRTH002	372431	5396666	outcrop	2-4mm bladed bk tourmaline replacing fsp
D	MRTH004	372447	5396760	outcrop	euh mg-cg granite with 15% biotite
D	MRTH006	372928	5397170	subcrop	barren gy vfg sandstone & siltstone
D	MRTH007	372945	5397180	subcrop	gy vfg sandstone & siltstone with 0.1% diss pyrite & trace pyrrhotite
D	MRTH008	372968	5397198	outcrop	gy sandstone & siltstone with trace sulfide. Cliff face outcrop
D	MRTH009	372479	5397152	subcrop	40cm wide quartz-tourmaline vein in road based subcrop, 50-57% bk 1-2mm bladed tourmaline replacing fsp
D	MRTH010	372494	5397195	subcrop	50mm wide bk fg quartz-tourmaline vein in granite road subcrop. 5m composite channel sample
D	MRTH011	372490	5397009	outcrop	600mm wide quartz-tourmaline vein in granite
D	MRTH012	372462	5396937	subcrop	400mm wide quartz-tourmaline vein in granite
D	MRTH013	372804	5396680	outcrop	dgy sandstone & siltstone with 5% dis pyrrhotite & arsenopyrite
D	MRTH014	372641	5396709	outcrop	gy sandstone & siltstone with 1mm quartz vein, dissem pyrrhotite (2%) and trace arsenopyrite
D	MRTH015	372981	5396966	outcrop	dgy vfg sandstone & siltstone outcrop with 2-4mm prismatic quartz infilling veins, drd ?goethite alteration surrounding quartz vein
D	MRTH016	372966	5396967	float	float rd-og-cm ?gossan weathered goethite & jarosite with prismatic quartz vein infill
D	MRTH017	372907	5396971	outcrop	dgy sandstone & siltstone with trace diss pyrrhotite and drd feox weathering on joint surfaces
EOF					

## **Appendix E: CAL1 summary re-log**

## Appendix E: CAL1 re-log

H0002	Version	3						
H0003	Date_generated	5/04/2018						
H0004	Reporting_period_end_date	3/04/2018						
H0005	State	TAS						
H0100	Tenement	EL72/2007						
H0101	Tenement_holder	Venture Minerals Ltd						
H0102	Project_name	Mt Ramsay						
H0106	Tenement_operator	Venture Minerals Ltd						
H0150	250K_map_sheet	SK5503 Burnie						
H0151	100K_map_sheet	7914 Pieman						
H0152	50K_map_sheet	na						
H0153	25K_map_sheet	3639 Ramsay						
H0200	Start_date_of_data_acquisition	4/04/2017						
H0201	End_date_of_data_acquisition	3/04/2018						
H0202	Data_format	SG3						
H0203	Number_of_data_records	32						
H0204	Date_of_metadata_update	5/04/2018						
H0500	Feature_Located	Rock Unit Interval						
H0501	Geodetic_datum	not applicable						
H0502	Vertical_datum	not applicable						
H0503	Projection	not applicable						
H0531	Projection_zone	not applicable						
H0900	Remarks:							
H1000	Hole	From_m	To_m	Colour	Weathering	Grainsize	Lith1	Lith2
H1001		metres	metres					
H1002		0.1	0.1					
D	CAL1	0	6	na	na		NREC	
D	CAL1	6	10.8	bn-lbn	ww	sfvg	SST	
D	CAL1	10.8	34.3	rd bn	ww	sfvg	btZHF	
D	CAL1	34.3	94.2	gy bn	fr	sfvg	btZHF	
D	CAL1	94.2	100.3	gy bn	fr	sfvg	SST	btZHF
D	CAL1	100.3	129.4	bn gy	fr	sfvg	btZHF	amZHF
D	CAL1	129.4	143.5	gn gy	fr	≤4mm	btZHF	amZHF
D	CAL1	143.5	157.5	gn gy bn	ww	sfvg	btZHF	XHB
D	CAL1	157.5	200.6	gy dgy	fr	sfvg	btZHF	amZHF
D	CAL1	200.6	205	gy gn	fr	ifg	MB	
D	CAL1	205	227.4	gy dgy	fr	sfvg	btZHF	SST
EOF								

## Appendix E: CAL1 re-log

H0002	Version	3		
H0003	Date_generated	5/04/2018		
H0004	Reporting_period_end_date	3/04/2018		
H0005	State	TAS		
H0100	Tenement	EL72/2007		
H0101	Tenement_holder	Venture Minerals Ltd		
H0102	Project_name	Mt Ramsay		
H0106	Tenement_operator	Venture Minerals Ltd		
H0150	250K_map_sheet	SK5503 Burnie		
H0151	100K_map_sheet	7914 Pieman		
H0152	50K_map_sheet	na		
H0153	25K_map_sheet	3639 Ramsay		
H0200	Start_date_of_data_acquisition	4/04/2017		
H0201	End_date_of_data_acquisition	3/04/2018		
H0202	Data_format	SG3		
H0203	Number_of_data_records	32		
H0204	Date_of_metadata_update	5/04/2018		
H0500	Feature_Located	Rock Unit Interval		
H0501	Geodetic_datum	not applicable		
H0502	Vertical_datum	not applicable		
H0503	Projection	not applicable		
H0531	Projection_zone	not applicable		
H0900	Remarks:			
H1000	Hole	From_m	To_m	Description
H1001		metres	metres	
H1002		0.1	0.1	
D	CAL1	0	6	triconed
D	CAL1	6	10.8	weathered tuffaceous ss w/ interbeds of ST
D	CAL1	10.8	34.3	fractured oxidised sediments composed of dgy gy tuffaceous ss w/ mnr sr altered to ZHF. common py veins + scattered grains, mnr dis po + trace veins w/ cpy.
D	CAL1	34.3	94.2	bt-cordierite ZHF irregularly interbedded bn tuffaceous SS w/ gy st. weak lgy calc silicate veining. Irreg patchy po assoc w/ calc-silc alt.
D	CAL1	94.2	100.3	tuffaceous well sorted SS, interbedded w. gy sfg SS + mnr bn-gy sm & bn btZHF. Generally less alt-mnr bn colouring. Calc-silc alt confined to mnr patches and irreg veins. Rare small po veinlets.
D	CAL1	100.3	129.4	bt-cordierite, am ZHF after irreg interbedded-deformed sfg tuffaceous ss w/ st and mnr pelite units. Common lgy-gn calc-silc alt bnds. Patchy po+ trace py assoc w/ calc silicate alt. rare <1mm qzV & 40mm angular qz clasts at 124.2m
D	CAL1	129.4	143.5	gn-gy alt seds-blt am replacment, + sig gn-lgn irreg veins of am. Variable % of bt= bt-am-cordierite ZHF. w/ ilmenite. Discontinuous patchy po veins.
D	CAL1	143.5	157.5	frc bt-am-cordierite ZHF w/ ilmenite. Discontinuous patch po veins assoc w/ calc-silicate. qz carbonate XHB from 154.8 - 157.0
D	CAL1	157.5	200.6	bt-am-cordierite ZHF w/ variable am:bt%, mas sfg ss interbedded w/ mnr dgy ST. ss is preferentially alt by bt.discontinuous po veinlets with trace blebby py.
D	CAL1	200.6	205	ppy MB, very hard, ?recrystallised. Alt to gy-gn calc-silicate. Rare po +py occuring dis and on trace veins.
D	CAL1	205	227.4	interbedded SS and ST w/ mnr bt alt zones. Irreg patchy po veinlets and rare blebby py. ZQT inclusion at 214.7-214.8
EOF				

Appendix E: CAL1 re-log

H0002	Version	3								
H0003	Date_generated	5/04/2018								
H0004	Reporting_period_end_date	3/04/2018								
H0005	State	TAS								
H0100	Tenement	EL72/2007								
H0101	Tenement_holder	Venture Minerals Ltd								
H0102	Project_name	Mt Ramsay								
H0106	Tenement_operator	Venture Minerals Ltd								
H0150	250K_map_sheet	SK5503 Burnie								
H0151	100K_map_sheet	7914 Pieman								
H0152	50K_map_sheet	na								
H0153	25K_map_sheet	3639 Ramsay								
H0200	Start_date_of_data_acquisition	4/04/2017								
H0201	End_date_of_data_acquisition	3/04/2018								
H0202	Data_format	SG3								
H0203	Number_of_data_records	32								
H0204	Date_of_metadata_update	5/04/2018								
H0500	Feature_Located	Rock Unit Interval								
H0501	Geodetic_datum	not applicable								
H0502	Vertical_datum	not applicable								
H0503	Projection	not applicable								
H0531	Projection_zone	not applicable								
H0900	Remarks:									
H1000	Hole	From_m	To_m	Alteration	Texture	Bedding	Structures	Vein_type	Vein%	Amphibole%
H1001		metres	metres							
H1002		0.1	0.1							
D	CAL1	0	6		bkn				0	0
D	CAL1	6	10.8		bkn				0	0
D	CAL1	10.8	34.3	am px py po±cpy		mdb-vtkb	frc	py,po, feo	0.01	0.01
D	CAL1	34.3	94.2	am px-am-qz cl		tnb-tkb	ssd	py, po, px	1	0.01
D	CAL1	94.2	100.3	am-px-qz-po-py		mdb		py, po, px	0.01	0.01
D	CAL1	100.3	129.4	px-am am qz-cb		mdb	ssd	qz, am	0.01	10
D	CAL1	129.4	143.5	po am px qz-cb		mdb-tkb	ssd	am, po	0.05	5
D	CAL1	143.5	157.5	cb cl	brc	mdb-tkb	frc	qz, cc	0.05	5
D	CAL1	157.5	200.6	qz±am cb		mdb-tkb	ssd	po,	0.1	5
D	CAL1	200.6	205	am-px cb	mas, ppy			po, py, cc	0.01	1
D	CAL1	205	227.4	cb am-px		mdb	ssd	px	0.01	2
EOF										

## Appendix E: CAL1 re-log

H0002	Version	3									
H0003	Date_generated	5/04/2018									
H0004	Reporting_period_end_date	3/04/2018									
H0005	State	TAS									
H0100	Tenement	EL72/2007									
H0101	Tenement_holder	Venture Minerals Ltd									
H0102	Project_name	Mt Ramsay									
H0106	Tenement_operator	Venture Minerals Ltd									
H0150	250K_map_sheet	SK5503 Burnie									
H0151	100K_map_sheet	7914 Pieman									
H0152	50K_map_sheet	na									
H0153	25K_map_sheet	3639 Ramsay									
H0200	Start_date_of_data_acquisition	4/04/2017									
H0201	End_date_of_data_acquisition	3/04/2018									
H0202	Data_format	SG3									
H0203	Number_of_data_records	32									
H0204	Date_of_metadata_update	5/04/2018									
H0500	Feature_Located	Rock Unit Interval									
H0501	Geodetic_datum	not applicable									
H0502	Vertical_datum	not applicable									
H0503	Projection	not applicable									
H0531	Projection_zone	not applicable									
H0900	Remarks:										
H1000	Hole	From_m	To_m	Bt+Phl%	Carbonate%	Chalcopyrite%	Fe-oxide%	Pyrite%	Pyroxene%	Pyrrhotite%	
H1001		metres	metres								
H1002		0.1	0.1								
D	CAL1	0	6	0	0	0	0	0	0	0	0
D	CAL1	6	10.8	0	0	0	0	0	0	0	0
D	CAL1	10.8	34.3	30	0	0.01	0.1	0.05	0.01	0.05	
D	CAL1	34.3	94.2	25	0	0	0.1	1	0.5	1	
D	CAL1	94.2	100.3	5	0	0	0.01	0.05	0.1	0.05	
D	CAL1	100.3	129.4	5	0	0	0.01	0.01	0.05	0.02	
D	CAL1	129.4	143.5	5	0	0	0	0.01	0.01	1	
D	CAL1	143.5	157.5	5	0.01	0	0	0.01	0.01	0.01	
D	CAL1	157.5	200.6	5	0.01	0	0	0.01	0.01	0.05	
D	CAL1	200.6	205	0	0.1	0	0	0.01	2	0.01	
D	CAL1	205	227.4	3	0.05	0	0	0.01	0.05	0.01	
EOF											

Appendix E: CAL1 re-log

H0002	Version	3			
H0003	Date_generated	5/04/2018			
H0004	Reporting_period_end_date	3/04/2018			
H0005	State	TAS			
H0100	Tenement	EL72/2007			
H0101	Tenement_holder	Venture Minerals Ltd			
H0102	Project_name	Mt Ramsay			
H0106	Tenement_operator	Venture Minerals Ltd			
H0150	250K_map_sheet	SK5503 Burnie			
H0151	100K_map_sheet	7914 Pieman			
H0152	50K_map_sheet	na			
H0153	25K_map_sheet	3639 Ramsay			
H0200	Start_date_of_data_acquisition	4/04/2017			
H0201	End_date_of_data_acquisition	3/04/2018			
H0202	Data_format	SG3			
H0203	Number_of_data_records	32			
H0204	Date_of_metadata_update	5/04/2018			
H0500	Feature_Located	Rock Unit Interval			
H0501	Geodetic_datum	not applicable			
H0502	Vertical_datum	not applicable			
H0503	Projection	not applicable			
H0531	Projection_zone	not applicable			
H0900	Remarks:				
H1000	Hole	From_m	To_m	Quartz%	Tourmaline%
H1001		metres	metres		
H1002		0.1	0.1		
D	CAL1	0	6	0	0
D	CAL1	6	10.8	0	0
D	CAL1	10.8	34.3	0	0
D	CAL1	34.3	94.2	0	0
D	CAL1	94.2	100.3	0	0
D	CAL1	100.3	129.4	0.05	0
D	CAL1	129.4	143.5	0	0
D	CAL1	143.5	157.5	0.01	0
D	CAL1	157.5	200.6	0.01	0
D	CAL1	200.6	205	0	0
D	CAL1	205	227.4	0.1	0.05
EOF					

# Venture Minerals Lithologic Codes

Code	Description	Code	Description	Code	Description
<b>Regolith</b>					
R	undifferentiated regolith	RL	undifferentiated laterite	RCLY	in situ clay
RCAC	calcrete	RLG	lateritic gravel	RSAP	undifferentiated saprolite
RSIC	silcrete	RLI	in situ laterite	RGOS	gossan ("iron cap"); textural or mineral prefix as appropriate
RFEC	ferricrete	RLT	transported laterite		
<b>Unconsolidated Sediments</b>		<b>Breccias, Faults and Shear Rocks</b>		<b>No Recovery &amp; Cavities</b>	
S	undifferentiated sediment	XHB	hydrothermal breccia	NCAV	cavity
SLG	lateritic gravel	XMYL	mylonite	NREC	no sample recovery
SGVL	unconsolidated gravel	XFB	Fault breccia - incohesive >30% clastic	NSAV	sample no longer available
SPCS	unconsolidated pebbly/cobbly sand			NCTM	contaminated interval
SAND	unconsolidated sand	XFG	Fault gouge - incohesive <30% clastic	<b>Veins</b>	
SILT	unconsolidated silt	XFC	Fault cataclasite - cohesive more than >30% clastic		
SMUD	unconsolidated mud			*V	Veins, ≤2 mineral prefixes
SCLY	unconsolidated clay (transported)			*VB	Vein breccia, ≤2 cement prefixes
cyRB	regolith breccia with clay matrix				
<b>Sedimentary Rocks (S*)</b>					
SS qzSS	>75% sandstone (undifferentiated) over	SMP	phyllite	SCB, ooSCB,	undifferentiated carbonate, prefixes oo=oolitic, st=stromatolitic, bc=bioclastic
volcSS	minimum 5m logging interval, prefixes qz	SGRT	grit		
lithSS	= quartz, lith = lithic, volc = volcanogenic,	SSPC	pebbly or cobbly sandstone	stSCB,	
ccSS	cc = calcareous	SSIC	intraclastic SS & SCG	SLST	limestone
SM	>75% mudstone over ≥5m	SCG	conglomerate	SDOL	dolomite
ST	>75% siltstone over ≥5m	SCGR	mud chip conglomerate (rip-ups)	SCHT	chert
SSM	25-75% SS & SM over ≥5m	SCGM	monomict conglomerate	SBIF	banded iron formation
SST	25-75% SS & ST over ≥5m	SCGP	polymict conglomerate	SLIG	lignite
SMH	shale	SBRM	monomict breccia	STIL	tillite
SML	slate	SBRP	polymict breccia	STUF	tuffite (redeposited)
SMA	argillite			SLAP	redeposited lapilli-stone
<b>Igneous Rocks (U* for Ultramafic, M* for Mafic, I* for Intermediate, F* for Felsic)</b>					
UM	undifferentiated ultramafic	UKoMC	olivine mesocumulate; komatiite flow	ID	diorite
UDUN	dunite			F	undifferentiated felsic rock
UHAR	harzburgite	MG	gabbro	FG	undifferentiated granitoid
UPX	pyroxenite	MGL	leucogabbro	FGRA	granite
USERP	serpentinite	MD	dolerite	FGRD	granodiorite
UKIM	kimberlite	MB	basalt	FDIO	diorite
ULAP	lamproite	MBHM	high-magnesium basalt	FMOZ	monzonite
ULAY	ultramafic lamprophyre	MBP	pillow-basalt	FSYE	syenite
UK	komatiite (undifferentiated)	MBHY	basaltic hyaloclastite	FTUF	felsic tuff
UKSTX	spinfex textured; komatiite flow	MLAP	mafic lapilli-stone	FV	undifferentiated felsic volcanic rock
UKoOC	olivine orthocumulate; komatiite flow	MTUF	mafic tuff		
		IA	andesite	FRHY	rhyolite
				FDAC	dacite
<b>Metamorphic &amp; Metasomatic Rocks (Z*)</b>					
ZSCH	undifferentiated schist	ZMRB	marble, >50% cb; ≤1 key mineral prefix	mtZXS	>50% magnetite; matrix replacement to massive bands. <am, po & cb. Grn, or aci after vo.
mZSCH	undifferentiated mafic schist; >am, cl &/or bt; <fp, qz, lx etc...	doMRB			
fZSCH	undifferentiated felsic schist; >qz, fp, mu; <mafic minerals	gtZXS	pbl gt in px+cc matrix (<10% px = gtZMRB) ± minor matrix am, mt, po etc. gt→ve; gradational with veZXS	voZXS	>50% vonsenite; aci, radiating
btZSCH	use mineral code prefixes for only the	veZXS	tab, pbl, & orb ve in px-cc matrix.	poZXS	>50% pyrrhotite; bnd, semi-mas to mas
ZGNS	undifferentiated gneiss	olZXS	>50% grn ol; ± ol→sr, hrn, dis mt, patches wt-lgn px.	pyZXS	>50% pyrite; semi-mas to mas
btZGNS	bt-gneiss, K-fp-gneiss, etc... using mineral code prefixes for only the distinguishing minerals	lpZXS	leopard skarn = olZXS w/ irregular granitic blobs/dyklets→px, rimmed by pk gt, lgn px, gn ph.	sdZXS	>25% siderite; includes sqp & s+p, <cs + ksp
ksp-ZGNS					
ZAMP	undifferentiated amphibolite	amZXS	>50% amphibole; mas felted bands &/or pseudomorphs of pbl gt. <cb, mt, po, vo.	btZXS	>50% biotite; bn-bk, "books" common ± fl
ZHF	hornfels, ifg; ≤2 mineral prefixes as appropriate (eg. muZHF, andZHF)				
amZHF	amphibole (>20%) hornfels	am-voZXS	amphibole (25-50%) + vonsenite (25-50%); vo often radiating aci between am &/or ve after pbl gt.	srZXS	>50% serpentine; mas translucent to flakey lgn-dgn, after olZXS.
btZHF	biotite (>20%) hornfels; brownish, brown streak				
pxZHF	pyroxene (>20%) hornfels; whitish to whitish-green	ammt-ZXS	amphibole (25-50%) + magnetite (25-50%); typically matrix around ex-gt pbl	ZGRS	Undifferentiated greisen; saccharoidal qz-mu aggregate. Ppy fp→po.
axZHF	axinite (>20%) hornfels; purplish				
qzZHF	quartz (>20%) hornfels; hard, bronze-grey, microcrystalline qz w/ po, black streak	ampo-ZXS	amphibole (25-50%) + pyrrhotite (25-50%); pbl	ZQT	tourmaline "greisen" = FGRA w/ ppy fp→tu, saccharoidal qz groundmass ± ifg mu.



## **Appendix F: Garnet analyses**



Appendix F: Garnet Analyses

H1000	SAMPLE	Element wt% detection limit filtered														Precision wt% element 1 sigma													
H1001		Si	Ti	Sn	Al	Cr	Fe	Mn	Mg	Ca	Cl	F	O	H	Total	Si	Ti	Sn	Al	Cr	Fe	Mn	Mg	Ca	Cl	F	SiO2	TiO2	SnO2
H1002		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
D	CAF7_117.3	17.08	0.25	0.23	2.53	<0.01	17.23	0.38	0.10	24.16	<0.01	0.16	36.62	0.00	98.74	0.073	0.013	0.016	0.021	0.009	0.098	0.014	0.007	0.059	0.006	0.017	36.53	0.42	0.30
D	CAF7_117.3	16.93	0.31	0.28	2.62	<0.01	17.12	0.37	0.10	24.19	<0.01	0.13	36.59	0.00	98.64	0.073	0.014	0.016	0.022	0.009	0.097	0.014	0.008	0.059	0.006	0.018	36.22	0.52	0.36
D	CAF7_117.3	16.85	0.22	0.42	1.94	<0.01	18.05	0.37	0.09	24.05	<0.01	0.12	36.07	0.00	98.18	0.073	0.013	0.018	0.019	0.009	0.100	0.014	0.008	0.059	0.006	0.017	36.05	0.37	0.53
D	CAF7_117.3	16.96	0.33	0.35	2.35	<0.01	17.36	0.36	0.09	24.08	0.02	0.14	36.41	0.00	98.44	0.073	0.014	0.017	0.021	0.008	0.098	0.014	0.008	0.059	0.006	0.017	36.28	0.55	0.44
D	CAF7_117.3	16.84	0.33	0.33	2.37	<0.01	17.45	0.35	0.09	24.15	<0.01	0.15	36.35	0.00	98.40	0.073	0.014	0.017	0.021	0.009	0.098	0.014	0.008	0.059	0.006	0.017	36.02	0.56	0.42
D	CAF1_173.9	16.91	0.23	0.53	2.01	<0.01	18.26	0.32	0.10	23.99	<0.01	<0.03	36.31	0.00	98.67	0.073	0.013	0.019	0.019	0.009	0.100	0.014	0.008	0.059	0.006	0.017	36.18	0.39	0.67
D	CAF1_173.9	16.72	0.58	0.63	1.58	0.02	18.19	0.32	0.17	24.15	<0.01	0.05	36.06	0.00	98.48	0.072	0.018	0.020	0.017	0.009	0.100	0.014	0.009	0.059	0.006	0.016	35.78	0.97	0.81
D	CAF1_173.9	16.69	0.33	0.59	1.57	<0.01	18.51	0.30	0.13	24.01	<0.01	0.05	35.84	0.00	98.04	0.072	0.015	0.019	0.017	0.009	0.101	0.014	0.009	0.059	0.006	0.016	35.72	0.56	0.75
D	CAF1_173.9	16.76	0.42	0.66	1.81	<0.01	18.16	0.35	0.15	24.02	<0.01	0.07	36.13	0.00	98.55	0.073	0.016	0.020	0.018	0.009	0.100	0.014	0.009	0.059	0.006	0.017	35.86	0.70	0.84
D	CAF1_173.9	16.88	0.15	0.56	1.85	<0.01	18.33	0.34	0.10	23.99	<0.01	0.07	36.09	0.00	98.36	0.073	0.011	0.019	0.019	0.008	0.101	0.014	0.008	0.059	0.006	0.016	36.11	0.24	0.72
D	CAF1_173.9	16.77	0.75	0.70	1.96	<0.01	17.32	0.32	0.21	24.10	<0.01	0.11	36.32	0.00	98.56	0.072	0.020	0.021	0.019	0.009	0.098	0.014	0.009	0.059	0.007	0.017	35.88	1.25	0.88
D	CAF1_173.9	16.90	0.53	0.52	1.79	<0.01	17.92	0.31	0.16	23.99	<0.01	0.08	36.21	0.00	98.41	0.073	0.017	0.019	0.018	0.009	0.099	0.014	0.009	0.059	0.006	0.017	36.15	0.88	0.66
D	CAF1_173.9	16.96	0.26	0.63	1.90	<0.01	17.80	0.32	0.13	24.22	<0.01	0.08	36.27	0.00	98.58	0.073	0.013	0.020	0.019	0.009	0.099	0.014	0.009	0.059	0.006	0.016	36.27	0.44	0.81
D	CAF7_107.2	16.79	0.31	0.04	6.50	<0.01	8.07	0.29	1.45	24.79	0.31	1.76	37.56	0.00	97.86	0.073	0.014	0.013	0.033	0.008	0.068	0.013	0.019	0.060	0.013	0.031	35.92	0.51	0.05
D	CAF7_107.2	16.55	0.28	<0.02	7.28	<0.01	8.12	0.35	0.39	24.59	0.48	1.97	37.09	0.00	97.09	0.072	0.014	0.013	0.035	0.009	0.068	0.014	0.011	0.060	0.015	0.032	35.41	0.46	0.02
D	CAF7_107.2	16.86	0.76	<0.02	6.91	<0.01	5.68	0.29	1.58	25.09	0.36	2.15	37.64	0.00	97.32	0.073	0.020	0.013	0.034	0.008	0.058	0.013	0.020	0.061	0.014	0.033	36.07	1.27	0.00
D	CAF7_107.2	16.82	0.79	<0.02	7.04	<0.01	5.68	0.30	1.58	25.03	0.40	2.27	37.66	0.00	97.57	0.073	0.021	0.013	0.034	0.008	0.058	0.013	0.020	0.060	0.014	0.034	35.99	1.32	0.01
D	CAF7_107.2	16.61	0.74	<0.02	6.80	<0.01	6.16	0.33	1.57	25.11	0.37	2.15	37.41	0.00	97.26	0.073	0.020	0.013	0.034	0.009	0.060	0.013	0.020	0.061	0.014	0.033	35.54	1.23	0.03
D	CAF7_107.2	16.71	0.64	0.04	6.23	0.02	6.64	0.29	1.81	24.93	0.31	1.95	37.25	0.00	96.80	0.073	0.019	0.013	0.032	0.008	0.062	0.013	0.021	0.060	0.012	0.032	35.74	1.07	0.04
D	CAF7_107.2	17.04	0.92	<0.02	7.09	<0.01	5.33	0.29	1.58	25.00	0.41	2.27	37.91	0.00	97.84	0.073	0.022	0.013	0.034	0.009	0.056	0.013	0.020	0.061	0.014	0.034	36.46	1.53	0.01
D	CAF7_107.2	16.89	0.58	<0.02	6.94	<0.01	5.98	0.30	1.58	25.08	0.36	2.17	37.68	0.00	97.57	0.073	0.018	0.012	0.034	0.000	0.059	0.013	0.020	0.061	0.014	0.033	36.14	0.97	0.03
D	CAF1_181.5	16.79	0.31	0.38	1.96	<0.01	18.11	0.30	0.11	24.05	0.02	0.10	36.09	0.00	98.22	0.072	0.014	0.018	0.019	0.009	0.100	0.014	0.008	0.059	0.007	0.017	35.91	0.52	0.48
D	CAF1_181.5	16.98	1.56	<0.02	8.11	<0.01	2.70	0.17	1.66	25.48	0.17	0.63	39.39	0.00	96.84	0.073	0.028	0.012	0.036	0.008	0.041	0.011	0.020	0.061	0.010	0.022	36.32	2.60	0.01
D	CAF1_181.5	16.84	0.71	<0.02	6.91	<0.01	5.75	0.29	1.60	24.95	0.34	2.09	37.61	0.00	97.09	0.073	0.019	0.012	0.034	0.008	0.058	0.013	0.020	0.060	0.013	0.033	36.04	1.18	0.00
D	CAF1_181.5	15.85	0.68	<0.02	6.20	0.02	5.90	0.25	1.61	23.90	0.33	1.84	35.55	0.00	92.12	0.071	0.019	0.012	0.032	0.008	0.059	0.013	0.020	0.059	0.013	0.031	33.90	1.14	-0.01
D	CAF1_181.5	16.95	0.91	<0.02	7.31	0.02	5.74	0.27	1.28	24.98	0.41	2.22	37.94	0.00	98.03	0.073	0.022	0.012	0.035	0.008	0.058	0.013	0.018	0.060	0.014	0.034	36.25	1.52	0.00
D	CAF1_181.5	16.84	0.66	<0.02	7.20	<0.01	5.62	0.32	1.51	25.07	0.40	2.21	37.72	0.00	97.54	0.073	0.019	0.013	0.035	0.009	0.057	0.013	0.019	0.061	0.014	0.034	36.02	1.11	0.01
D	CAF1_181.5	16.62	0.65	<0.02	6.69	<0.01	6.11	0.30	1.79	25.15	0.30	2.05	37.45	0.00	97.11	0.073	0.019	0.012	0.033	0.009	0.060	0.013	0.021	0.061	0.013	0.032	35.55	1.09	0.02
D	CAF1_264.8	16.60	1.59	<0.02	7.52	<0.01	3.16	0.17	1.73	24.97	0.27	0.88	38.31	0.00	95.19	0.072	0.028	0.012	0.035	0.008	0.044	0.012	0.020	0.061	0.012	0.024	35.52	2.66	0.01
D	CAF1_264.8	16.84	2.22	<0.02	7.28	<0.01	3.59	0.19	1.67	25.16	0.31	0.76	38.98	0.00	97.00	0.073	0.033	0.012	0.035	0.008	0.046	0.012	0.020	0.061	0.013	0.023	36.02	3.70	-0.01
D	CAF1_264.8	16.63	0.20	0.03	8.21	0.03	5.36	0.33	0.93	25.44	0.19	1.50	38.14	0.00	97.00	0.073	0.012	0.012	0.037	0.009	0.056	0.014	0.015	0.061	0.011	0.029	35.58	0.33	0.04
D	CAF1_264.8	16.88	1.97	<0.02	7.44	<0.01	3.31	0.17	1.67	25.21	0.35	0.80	38.91	0.00	96.71	0.073	0.031	0.012	0.035	0.009	0.045	0.012	0.020	0.061	0.013	0.024	36.11	3.29	-0.02
D	CAF1_264.8	16.84	2.24	<0.02	7.32	<0.01	3.16	0.19	1.69	25.18	0.36	0.86	38.88	0.00	96.72	0.073	0.033	0.012	0.035	0.008	0.044	0.012	0.020	0.061	0.013	0.025	36.03	3.74	0.00
D	CAF1_264.8	16.70	2.16	<0.02	7.44	<0.01	3.32	0.17	1.72	25.23	0.31	0.90	38.85	0.00	96.79	0.073	0.032	0.012	0.035	0.008	0.045	0.012	0.020	0.061	0.012	0.025	35.73	3.60	0.01
D	CAF1_264.8	16.84	2.22	<0.02	7.42	<0.01	3.30	0.19	1.71	25.14	0.34	0.81	39.00	0.00	96.95	0.073	0.032	0.012	0.035	0.008	0.045	0.012	0.020	0.061	0.013	0.024	36.02	3.70	-0.01
D	CAF1_264.8	16.73	2.42	<0.02	7.27	<0.01	3.39	0.16	1.61	25.07	0.35	0.79	38.82	0.00	96.63	0.073	0.034	0.012	0.035	0.009	0.045	0.012	0.020	0.061	0.013	0.024	35.79	4.05	-0.01
EOF																													



Appendix F: Garnet Analyses

H1000	SAMPLE	Oxide wt%											Atomic % normalised to 100% total														Oxide mole % no					
H1001		Al2O3	Cr2O3	FeO	MnO	MgO	CaO	Cl	F	O	H2O	Total	Si	Ti	Sn	Al	Cr	Fe	Mn	Mg	Ca	Cl	F	O	H	Si	Ti	Sn	Al	Cr	Fe	
H1002		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
D	CAF7_117.3	4.78	0.00	22.16	0.50	0.16	33.80	0.01	0.16	-0.07	0.00	98.74	15.48	0.13	0.05	2.38	0.00	7.85	0.18	0.10	15.34	0.00	0.22	58.26	0.00	38.16	0.33	0.12	2.94	0.00	19.36	
D	CAF7_117.3	4.94	0.01	22.03	0.47	0.17	33.84	-0.01	0.13	-0.05	0.00	98.64	15.37	0.17	0.06	2.47	0.00	7.82	0.17	0.11	15.38	0.00	0.17	58.29	0.00	37.96	0.41	0.15	3.05	0.00	19.31	
D	CAF7_117.3	3.67	-0.02	23.22	0.47	0.15	33.66	0.00	0.12	-0.05	0.00	98.17	15.49	0.12	0.09	1.86	-0.01	8.34	0.17	0.10	15.49	0.00	0.16	58.19	0.00	37.88	0.29	0.22	2.27	-0.01	20.41	
D	CAF7_117.3	4.43	0.01	22.33	0.47	0.16	33.69	0.00	0.14	-0.06	0.00	98.45	15.46	0.18	0.07	2.23	0.00	7.96	0.17	0.10	15.38	0.01	0.19	58.26	0.00	38.05	0.43	0.18	2.74	0.00	19.59	
D	CAF7_117.3	4.47	0.02	22.45	0.46	0.15	33.79	-0.01	0.15	-0.06	0.00	98.41	15.36	0.18	0.07	2.25	0.01	8.01	0.17	0.10	15.44	0.00	0.20	58.23	0.00	37.80	0.44	0.17	2.76	0.01	19.70	
D	CAF1_173.9	3.80	0.01	23.50	0.41	0.16	33.57	0.00	0.03	-0.01	0.00	98.71	15.47	0.13	0.11	1.92	0.00	8.40	0.15	0.10	15.38	0.00	0.04	58.30	0.00	37.97	0.31	0.28	2.35	0.00	20.62	
D	CAF1_173.9	2.99	0.03	23.40	0.41	0.28	33.79	0.00	0.05	-0.02	0.00	98.48	15.39	0.31	0.14	1.51	0.01	8.42	0.15	0.18	15.57	0.00	0.07	58.25	0.00	37.54	0.76	0.34	1.85	0.01	20.53	
D	CAF1_173.9	2.98	-0.01	23.81	0.38	0.22	33.60	-0.01	0.05	-0.02	0.00	98.02	15.44	0.18	0.13	1.52	0.00	8.61	0.14	0.14	15.57	-0.01	0.07	58.20	0.00	37.63	0.44	0.31	1.85	0.00	20.98	
D	CAF1_173.9	3.42	0.00	23.37	0.45	0.25	33.61	0.00	0.07	-0.03	0.00	98.55	15.39	0.23	0.14	1.73	0.00	8.39	0.17	0.16	15.46	0.00	0.10	58.24	0.00	37.64	0.56	0.35	2.12	0.00	20.51	
D	CAF1_173.9	3.50	0.01	23.58	0.44	0.16	33.57	0.00	0.07	-0.03	0.00	98.37	15.51	0.08	0.12	1.77	0.00	8.47	0.16	0.10	15.45	0.00	0.09	58.23	0.00	37.94	0.19	0.30	2.17	0.01	20.72	
D	CAF1_173.9	3.71	0.01	22.29	0.42	0.35	33.72	-0.01	0.11	-0.04	0.00	98.56	15.34	0.40	0.15	1.87	0.00	7.97	0.15	0.22	15.45	0.00	0.15	58.31	0.00	37.63	0.99	0.37	2.29	0.01	19.55	
D	CAF1_173.9	3.39	-0.01	23.05	0.40	0.27	33.57	0.00	0.08	-0.03	0.00	98.41	15.49	0.28	0.11	1.71	0.00	8.26	0.14	0.17	15.42	0.00	0.11	58.29	0.00	37.92	0.70	0.28	2.09	0.00	20.23	
D	CAF1_173.9	3.59	0.01	22.90	0.42	0.22	33.89	0.00	0.08	-0.03	0.00	98.58	15.52	0.14	0.14	1.81	0.00	8.19	0.15	0.14	15.53	0.00	0.10	58.27	0.00	38.02	0.34	0.34	2.21	0.00	20.07	
D	CAF7_107.2	12.28	0.00	10.38	0.38	2.40	34.68	0.31	1.76	-0.81	0.00	97.86	14.50	0.16	0.01	5.84	0.00	3.50	0.13	1.45	15.00	0.21	2.25	56.94	0.00	36.13	0.39	0.02	7.28	0.00	8.73	
D	CAF7_107.2	13.75	0.02	10.45	0.45	0.64	34.40	0.48	1.97	-0.94	0.00	97.12	14.44	0.14	0.00	6.61	0.01	3.56	0.16	0.39	15.03	0.33	2.54	56.79	0.00	36.18	0.36	0.01	8.28	0.01	8.93	
D	CAF7_107.2	13.05	0.00	7.31	0.37	2.61	35.10	0.36	2.15	-0.99	0.00	97.32	14.48	0.38	0.00	6.17	0.00	2.46	0.13	1.56	15.10	0.25	2.73	56.74	0.00	36.04	0.96	0.00	7.68	0.00	6.11	
D	CAF7_107.2	13.30	0.00	7.31	0.39	2.62	35.03	0.40	2.27	-1.04	0.00	97.58	14.41	0.40	0.00	6.27	0.00	2.45	0.13	1.56	15.02	0.27	2.87	56.62	0.00	35.80	0.99	0.00	7.79	0.00	6.08	
D	CAF7_107.2	12.85	0.01	7.93	0.43	2.61	35.14	0.37	2.15	-0.99	0.00	97.29	14.32	0.37	0.00	6.11	0.00	2.67	0.15	1.57	15.18	0.25	2.74	56.64	0.00	35.54	0.93	0.01	7.57	0.00	6.63	
D	CAF7_107.2	11.76	0.03	8.54	0.37	3.00	34.88	0.31	1.95	-0.89	0.00	96.80	14.51	0.33	0.01	5.63	0.01	2.90	0.13	1.82	15.17	0.21	2.51	56.79	0.00	35.92	0.81	0.02	6.97	0.01	7.18	
D	CAF7_107.2	13.39	-0.01	6.86	0.37	2.61	34.98	0.41	2.27	-1.05	0.00	97.84	14.52	0.46	0.00	6.29	0.00	2.28	0.12	1.55	14.93	0.28	2.86	56.71	0.00	36.16	1.14	0.01	7.83	0.00	5.69	
D	CAF7_107.2	13.12	0.00	7.69	0.39	2.63	35.09	0.36	2.17	-0.99	0.00	97.59	14.48	0.29	0.00	6.20	0.00	2.58	0.13	1.57	15.06	0.25	2.75	56.69	0.00	36.01	0.73	0.01	7.70	0.00	6.41	
D	CAF1_181.5	3.71	0.00	23.30	0.39	0.18	33.65	0.02	0.10	-0.05	0.00	98.22	15.42	0.17	0.08	1.88	0.00	8.37	0.14	0.12	15.48	0.01	0.14	58.19	0.00	37.73	0.41	0.20	2.30	0.00	20.48	
D	CAF1_181.5	15.33	0.01	3.48	0.21	2.75	35.65	0.17	0.63	-0.30	0.00	96.85	14.42	0.78	0.00	7.17	0.00	1.15	0.07	1.63	15.16	0.12	0.79	58.71	0.00	38.24	2.06	0.00	9.51	0.00	3.06	
D	CAF1_181.5	13.07	0.02	7.39	0.37	2.65	34.91	0.34	2.09	-0.96	0.00	97.10	14.49	0.36	0.00	6.19	0.01	2.49	0.13	1.59	15.04	0.23	2.65	56.81	0.00	36.16	0.89	0.00	7.72	0.01	6.20	
D	CAF1_181.5	11.71	0.03	7.59	0.32	2.67	33.44	0.33	1.84	-0.85	0.00	92.12	14.43	0.37	0.00	5.88	0.01	2.70	0.12	1.70	15.25	0.24	2.47	56.84	0.00	35.89	0.91	0.00	7.30	0.01	6.72	
D	CAF1_181.5	13.82	0.03	7.38	0.35	2.12	34.96	0.41	2.22	-1.03	0.00	98.03	14.44	0.46	0.00	6.49	0.01	2.46	0.12	1.26	14.92	0.28	2.80	56.76	0.00	36.12	1.14	0.00	8.11	0.01	6.15	
D	CAF1_181.5	13.60	0.02	7.23	0.42	2.50	35.08	0.40	2.21	-1.02	0.00	97.55	14.41	0.33	0.00	6.41	0.00	2.42	0.14	1.49	15.04	0.27	2.79	56.68	0.00	35.94	0.83	0.00	8.00	0.01	6.03	
D	CAF1_181.5	12.63	0.01	7.87	0.38	2.97	35.20	0.30	2.05	-0.93	0.00	97.13	14.34	0.33	0.00	6.01	0.00	2.65	0.13	1.78	15.21	0.21	2.61	56.73	0.00	35.61	0.82	0.01	7.46	0.00	6.59	
D	CAF1_264.8	14.20	0.02	4.07	0.22	2.86	34.93	0.27	0.88	-0.43	0.00	95.22	14.40	0.81	0.00	6.79	0.01	1.38	0.08	1.73	15.17	0.18	1.13	58.32	0.00	37.62	2.12	0.00	8.86	0.01	3.60	
D	CAF1_264.8	13.76	0.00	4.62	0.24	2.76	35.21	0.31	0.76	-0.39	0.00	96.99	14.39	1.11	0.00	6.48	0.00	1.55	0.08	1.65	15.07	0.21	0.96	58.49	0.00	37.62	2.90	0.00	8.47	0.00	4.04	
D	CAF1_264.8	15.52	0.05	6.90	0.43	1.55	35.60	0.19	1.50	-0.67	0.00	97.00	14.29	0.10	0.01	7.34	0.01	2.32	0.15	0.93	15.32	0.13	1.90	57.51	0.00	36.81	0.26	0.02	9.46	0.02	5.97	
D	CAF1_264.8	14.05	-0.01	4.26	0.22	2.78	35.27	0.35	0.80	-0.42	0.00	96.69	14.44	0.99	0.00	6.62	0.00	1.43	0.07	1.65	15.11	0.24	1.01	58.43	0.00	37.75	2.59	-0.01	8.66	0.00	3.73	
D	CAF1_264.8	13.82	0.02	4.06	0.25	2.80	35.23	0.36	0.86	-0.45	0.00	96.73	14.41	1.12	0.00	6.52	0.01	1.36	0.08	1.67	15.10	0.25	1.09	58.39	0.00	37.58	2.93	0.00	8.50	0.01	3.54	
D	CAF1_264.8	14.05	-0.01	4.28	0.22	2.86	35.30	0.31	0.90	-0.45	0.00	96.79	14.29	1.08	0.00	6.62	0.00	1.43	0.07	1.70	15.12	0.21	1.13	58.34	0.00	37.26	2.82	0.00	8.63	0.00	3.73	
D	CAF1_264.8	14.02	0.01	4.24	0.24	2.83	35.17	0.34	0.81	-0.42	0.00	96.95	14.37	1.11	0.00	6.59	0.00	1.42	0.08	1.68	15.04	0.23	1.02	58.45	0.00	37.58	2.90	-0.01	8.62	0.00	3.70	
D	CAF1_264.8	13.73	0.03	4.36	0.20	2.68	35.08	0.35	0.79	-0.41	0.00	96.64	14.35	1.22	0.00	6.49	0.01	1.46	0.07	1.60	15.08	0.24	1.01	58.48	0.00	37.50	3.19	0.00	8.48	0.01	3.82	
EOF																																

**Appendix F: Garnet Analyses**

H0002	Version																					
H0003	Date_generated																					
H0004	Reporting_period_end_date																					
H0005	State																					
H0100	Tenement																					
H0101	Tenement_holder																					
H0102	Project_name																					
H0106	Tenement_operator																					
H0150	250K_map_sheet																					
H0151	100K_map_sheet																					
H0152	50K_map_sheet																					
H0153	25K_map_sheet																					
H0200	Start_date_of_data_acquisition																					
H0201	End_date_of_data_acquisition																					
H0202	Data_format																					
H0203	Number_of_data_records																					
H0204	Date_of_metadata_update																					
H0500	Feature_Located																					
H0600	Sample_code																					
H0601	Sample_type																					
H0602	Sample_description																					
H0702	Job_no																					
H0800	Assay_code																					
H0801	Assay_company																					
H0802	Assay_description																					
H0900	Remarks																					
H1000	SAMPLE	rmalised to 100% total							Mineral formula, basis 24 oxygens													
H1001		Mn	Mg	Ca	Cl	F	H2O	Total	Si	Ti	Sn	Al	Cr	Fe	Mn	Mg	Ca	Cl	F	O	H	
H1002		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
D	CAF7_131.4	0.63	0.02	37.35	0.01	0.76	0.00	100.00	6.34	0.07	0.02	0.99	0.00	3.36	0.11	0.00	6.27	0.00	0.13	24.00	0.00	
D	CAF7_131.4	0.42	0.18	37.91	0.01	0.46	0.00	100.00	6.38	0.04	0.03	0.95	0.00	3.28	0.07	0.03	6.34	0.00	0.08	24.00	0.00	
D	CAF7_131.4	0.41	0.17	37.96	0.02	0.40	0.00	100.00	6.35	0.07	0.03	0.88	0.00	3.35	0.07	0.03	6.37	0.00	0.07	24.00	0.00	
D	CAF7_131.4	0.43	0.24	38.00	0.05	0.46	0.00	100.00	6.37	0.04	0.03	0.97	0.00	3.25	0.07	0.04	6.35	0.01	0.08	24.00	0.00	
D	CAF7_131.4	0.42	0.18	37.69	0.00	0.35	0.00	100.00	6.41	0.04	0.02	0.81	0.00	3.43	0.07	0.03	6.33	0.00	0.06	24.00	0.00	
D	CAF7_131.4	0.42	0.20	37.89	0.00	0.47	0.00	100.00	6.39	0.06	0.02	0.87	0.00	3.34	0.07	0.03	6.36	0.00	0.08	24.00	0.00	
D	CAF7_131.4	0.44	0.13	38.00	0.01	0.41	0.00	100.00	6.40	0.02	0.02	1.02	0.00	3.21	0.07	0.02	6.33	0.00	0.07	24.00	0.00	
D	CAF7_131.4	0.46	0.16	37.90	0.01	0.41	0.00	100.00	6.39	0.02	0.02	1.08	0.00	3.17	0.08	0.03	6.29	0.00	0.07	24.00	0.00	
D	CAF1_278.1	0.35	7.97	13.23	0.25	1.92	0.00	100.00	7.69	0.01	0.00	1.07	0.00	3.77	0.05	1.25	2.08	0.04	0.30	24.00	0.00	
D	CAF5_73.3	0.41	0.29	38.13	-0.01	0.78	0.00	100.00	6.29	0.12	0.03	1.09	0.00	3.08	0.07	0.05	6.35	0.00	0.13	24.00	0.00	
D	CAF5_73.3	0.41	0.24	37.93	0.00	0.40	0.00	100.00	6.35	0.05	0.03	0.95	0.00	3.30	0.07	0.04	6.34	0.00	0.07	24.00	0.00	
D	CAF5_73.3	0.40	0.25	38.15	0.00	0.56	0.00	100.00	6.31	0.08	0.03	1.00	0.00	3.21	0.07	0.04	6.38	0.00	0.09	24.00	0.00	
D	CAF5_73.3	0.57	0.17	37.88	-0.01	0.85	0.00	100.00	6.32	0.02	0.03	1.16	0.00	3.15	0.10	0.03	6.32	0.00	0.14	24.00	0.00	
D	CAF5_73.3	0.63	0.12	37.26	0.01	1.23	0.00	100.00	6.25	0.14	0.01	1.39	0.00	2.95	0.10	0.02	6.16	0.00	0.20	24.00	0.00	
D	CAF5_73.3	0.80	0.06	37.17	-0.02	1.29	0.00	100.00	6.26	0.08	0.01	1.47	0.00	2.94	0.13	0.01	6.13	0.00	0.21	24.00	0.00	
D	CAF5_73.3	0.58	0.17	37.59	0.00	0.89	0.00	100.00	6.31	0.03	0.03	1.22	0.00	3.13	0.10	0.03	6.25	0.00	0.15	24.00	0.00	
D	CAF5_73.3	0.69	0.09	37.19	0.00	1.31	0.00	100.00	6.30	0.09	0.01	1.41	0.00	2.92	0.11	0.02	6.14	0.00	0.22	24.00	0.00	
D	CAF7_117.3	0.44	0.26	37.79	0.00	0.55	0.00	100.00	6.34	0.07	0.02	0.95	0.00	3.30	0.07	0.04	6.33	0.00	0.09	24.00	0.00	
D	CAF7_117.3	0.42	0.21	37.98	0.01	0.52	0.00	100.00	6.34	0.07	0.02	0.96	0.00	3.27	0.07	0.04	6.36	0.00	0.09	24.00	0.00	
D	CAF7_117.3	0.42	0.18	38.01	-0.01	0.57	0.00	100.00	6.35	0.07	0.02	0.93	0.00	3.29	0.07	0.03	6.37	0.00	0.09	24.00	0.00	
D	CAF7_117.3	0.44	0.22	37.90	0.00	0.57	0.00	100.00	6.35	0.07	0.02	0.95	0.00	3.27	0.07	0.04	6.35	0.00	0.10	24.00	0.00	

**Appendix F: Garnet Analyses**

H1000	SAMPLE	Normalised to 100% total							Mineral formula, basis 24 oxygens												
H1001		Mn	Mg	Ca	Cl	F	H2O	Total	Si	Ti	Sn	Al	Cr	Fe	Mn	Mg	Ca	Cl	F	O	H
H1002		%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
D	CAF7_117.3	0.44	0.25	37.84	0.01	0.54	0.00	100.00	6.38	0.06	0.02	0.98	0.00	3.23	0.07	0.04	6.32	0.00	0.09	24.00	0.00
D	CAF7_117.3	0.42	0.26	38.01	-0.01	0.43	0.00	100.00	6.33	0.07	0.03	1.02	0.00	3.22	0.07	0.04	6.33	0.00	0.07	24.00	0.00
D	CAF7_117.3	0.42	0.23	37.89	0.00	0.38	0.00	100.00	6.39	0.05	0.04	0.77	0.00	3.44	0.07	0.04	6.39	0.00	0.06	24.00	0.00
D	CAF7_117.3	0.41	0.24	37.85	0.03	0.47	0.00	100.00	6.37	0.07	0.03	0.92	0.00	3.28	0.07	0.04	6.33	0.00	0.08	24.00	0.00
D	CAF7_117.3	0.41	0.24	37.99	-0.01	0.48	0.00	100.00	6.33	0.07	0.03	0.93	0.00	3.30	0.07	0.04	6.37	0.00	0.08	24.00	0.00
D	CAF1_173.9	0.37	0.25	37.74	0.00	0.11	0.00	100.00	6.37	0.05	0.05	0.79	0.00	3.46	0.06	0.04	6.33	0.00	0.02	24.00	0.00
D	CAF1_173.9	0.37	0.43	37.99	0.00	0.17	0.00	100.00	6.34	0.13	0.06	0.62	0.00	3.47	0.06	0.07	6.42	0.00	0.03	24.00	0.00
D	CAF1_173.9	0.34	0.35	37.93	-0.01	0.18	0.00	100.00	6.37	0.07	0.05	0.63	0.00	3.55	0.06	0.06	6.42	0.00	0.03	24.00	0.00
D	CAF1_173.9	0.40	0.38	37.80	0.00	0.25	0.00	100.00	6.34	0.09	0.06	0.71	0.00	3.46	0.07	0.06	6.37	0.00	0.04	24.00	0.00
D	CAF1_173.9	0.39	0.25	37.80	0.00	0.23	0.00	100.00	6.39	0.03	0.05	0.73	0.00	3.49	0.07	0.04	6.37	0.00	0.04	24.00	0.00
D	CAF1_173.9	0.37	0.54	37.90	-0.01	0.36	0.00	100.00	6.31	0.17	0.06	0.77	0.00	3.28	0.06	0.09	6.36	0.00	0.06	24.00	0.00
D	CAF1_173.9	0.35	0.42	37.74	-0.01	0.28	0.00	100.00	6.38	0.12	0.05	0.70	0.00	3.40	0.06	0.07	6.35	0.00	0.05	24.00	0.00
D	CAF1_173.9	0.37	0.34	38.05	0.00	0.25	0.00	100.00	6.39	0.06	0.06	0.74	0.00	3.37	0.06	0.06	6.40	0.00	0.04	24.00	0.00
D	CAF7_107.2	0.32	3.60	37.38	0.53	5.61	0.00	100.00	6.11	0.07	0.00	2.46	0.00	1.48	0.05	0.61	6.32	0.09	0.95	24.00	0.00
D	CAF7_107.2	0.39	0.98	37.66	0.83	6.37	0.00	100.00	6.10	0.06	0.00	2.79	0.00	1.51	0.07	0.17	6.35	0.14	1.08	24.00	0.00
D	CAF7_107.2	0.32	3.89	37.58	0.61	6.81	0.00	100.00	6.12	0.16	0.00	2.61	0.00	1.04	0.05	0.66	6.39	0.10	1.16	24.00	0.00
D	CAF7_107.2	0.33	3.88	37.33	0.67	7.13	0.00	100.00	6.11	0.17	0.00	2.66	0.00	1.04	0.06	0.66	6.37	0.11	1.22	24.00	0.00
D	CAF7_107.2	0.36	3.89	37.65	0.62	6.80	0.00	100.00	6.07	0.16	0.00	2.59	0.00	1.13	0.06	0.66	6.43	0.11	1.16	24.00	0.00
D	CAF7_107.2	0.31	4.49	37.56	0.52	6.21	0.00	100.00	6.13	0.14	0.00	2.38	0.00	1.23	0.05	0.77	6.41	0.09	1.06	24.00	0.00
D	CAF7_107.2	0.31	3.87	37.18	0.69	7.12	0.00	100.00	6.15	0.19	0.00	2.66	0.00	0.97	0.05	0.66	6.32	0.12	1.21	24.00	0.00
D	CAF7_107.2	0.33	3.90	37.46	0.61	6.83	0.00	100.00	6.13	0.12	0.00	2.62	0.00	1.09	0.06	0.66	6.38	0.10	1.16	24.00	0.00
D	CAF1_181.5	0.35	0.28	37.89	0.03	0.33	0.00	100.00	6.36	0.07	0.03	0.77	0.00	3.45	0.06	0.05	6.39	0.01	0.06	24.00	0.00
D	CAF1_181.5	0.19	4.32	40.21	0.31	2.10	0.00	100.00	5.89	0.32	0.00	2.93	0.00	0.47	0.03	0.67	6.20	0.05	0.32	24.00	0.00
D	CAF1_181.5	0.32	3.97	37.53	0.58	6.62	0.00	100.00	6.12	0.15	0.00	2.62	0.00	1.05	0.05	0.67	6.36	0.10	1.12	24.00	0.00
D	CAF1_181.5	0.29	4.22	37.93	0.59	6.15	0.00	100.00	6.09	0.15	0.00	2.48	0.00	1.14	0.05	0.72	6.44	0.10	1.04	24.00	0.00
D	CAF1_181.5	0.30	3.14	37.32	0.70	7.00	0.00	100.00	6.11	0.19	0.00	2.74	0.00	1.04	0.05	0.53	6.31	0.12	1.18	24.00	0.00
D	CAF1_181.5	0.35	3.71	37.49	0.67	6.97	0.00	100.00	6.10	0.14	0.00	2.72	0.00	1.02	0.06	0.63	6.37	0.11	1.18	24.00	0.00
D	CAF1_181.5	0.32	4.43	37.77	0.51	6.48	0.00	100.00	6.07	0.14	0.00	2.54	0.00	1.12	0.06	0.75	6.43	0.09	1.10	24.00	0.00
D	CAF1_264.8	0.20	4.52	39.64	0.48	2.94	0.00	100.00	5.93	0.33	0.00	2.79	0.00	0.57	0.03	0.71	6.24	0.07	0.46	24.00	0.00
D	CAF1_264.8	0.22	4.30	39.40	0.56	2.51	0.00	100.00	5.91	0.46	0.00	2.66	0.00	0.63	0.03	0.68	6.19	0.09	0.39	24.00	0.00
D	CAF1_264.8	0.37	2.38	39.47	0.34	4.89	0.00	100.00	5.96	0.04	0.00	3.06	0.01	0.97	0.06	0.39	6.39	0.05	0.79	24.00	0.00
D	CAF1_264.8	0.20	4.33	39.51	0.62	2.64	0.00	100.00	5.93	0.41	0.00	2.72	0.00	0.59	0.03	0.68	6.21	0.10	0.42	24.00	0.00
D	CAF1_264.8	0.22	4.36	39.37	0.64	2.85	0.00	100.00	5.92	0.46	0.00	2.68	0.00	0.56	0.03	0.69	6.20	0.10	0.45	24.00	0.00
D	CAF1_264.8	0.19	4.44	39.43	0.54	2.96	0.00	100.00	5.88	0.45	0.00	2.72	0.00	0.59	0.03	0.70	6.22	0.09	0.47	24.00	0.00
D	CAF1_264.8	0.21	4.40	39.32	0.61	2.66	0.00	100.00	5.90	0.46	0.00	2.71	0.00	0.58	0.03	0.69	6.18	0.10	0.42	24.00	0.00
D	CAF1_264.8	0.18	4.18	39.39	0.63	2.63	0.00	100.00	5.89	0.50	0.00	2.66	0.00	0.60	0.03	0.66	6.19	0.10	0.41	24.00	0.00
EOF																					