

Mineral Resources Tasmania

Laboratory Report

LJN2019-128

MINERALOGICAL ANALYSES, SULPHUR CREEK



An unpublished Mineral Resources Tasmania Report for:

R Bottrill

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Date: 26 September 2022

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SUMMARY

The analyses of the basaltic pillow material indicate a typical chloritized felsic metabasalt. The interpillow material is lacking in feldspar and is much more quartz rich, and most likely represents a metamorphosed siliceous sediment.

INTRODUCTION

Two rock samples were collected and submitted for mineralogical determination. This is in relation to determining the difference in composition of pillows in pillow basalts and their interpillow material. The sample details are given in Table 1.

Table 1. Sample details

MRT Reg. No.	Test	Location	Sample Description
G408739	XRD	Sulphur Creek	Basalt Pillow
G408740	XRD	Sulphur Creek	Interpillow material

PROCESS

To determine their mineral composition and origin, some representative parts of the rocks were examined optically and crushed and analysed by X-ray Diffraction (XRD) in the Mineral Resources Tasmania (MRT) Laboratories, Rosny Park and Mornington.

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DESCRIPTION

G408739 (Basalt Pillow) is a moderately hard, fine grained creamy rock with minor limonitic staining in joints (Fig. 1). There are abundant lensoidal greenish blebs to about 1cm long (ringed feldspars?). It appears to be a porphyritic intermediate volcanic rock.



Figure 1: Sample G408739 (Basalt Pillow) showing lensoidal greenish blebs to about 1cm long Plain light, FOV (field of view) ~100mm.

G408740 (Interpillow material) consists of brecciated fragments of weakly foliated, soft, fine grained, pale green, clayey rock, in a similar but unfoliated matrix, weakly iron stained. (Fig. 2 & 3).

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Figure 2: Sample G408740 (Interpillow material) showing a weakly foliated, fine grained, pale green, clayey rock. Plain light, FOV (field of view) ~70mm.



Figure 3: Sample G408740 (Interpillow material) showing a weakly foliated, fine grained, pale green, clayey rock. Plain light, FOV (field of view) ~70mm.

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XRD ANALYSES

The samples were prepared, examined and analysed in the MRT laboratories, Rosny Park, Tasmania. They were run on a Rigaku Miniflex 600 X-Ray Diffractometer system: a 600W generator 150mm goniometer with a Cu tube; 40kV/15mA, sample spinner and a Scintillation counter (SC) with Be window, -3° to $145^{\circ} 2\theta$ scanning range and 2° - $145^{\circ} 2\theta$ measuring range, with a scanning speed of 0.01 to 100 $^{\circ}$ /min, a graphite counter monochromator and a K β Ni- filter. The analysis software used is the PDXL2 using the ICDD database.

The results are shown in Appendix 1 and indicate the pillow material is mostly comprised of chlorite, dioctahedral mica (“sericite”) and plagioclase, with minor quartz, apatite and rutile. The interpillow material comprises mostly dioctahedral mica (“sericite”), quartz, chlorite, and trace apatite, with no detectable plagioclase.

SUMMARY AND DISCUSSION

The results indicate the pillow material, from its appearance and mineralogy, is a highly altered intermediate to mafic volcanic, partly altered to sericite, chlorite and quartz, but is still feldspar rich. The interpillow material is comparatively lacking in feldspar and rutile, and is much more quartz rich, so it is unlikely to represent altered pillow material, but most likely represents siliceous sediment, probably with a minor volcanic component.

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Appendix 1: XRD Analyses

Client: R Bottrill

Sample Source: Penguin

MRT Job Number: LJN2019-128

Analysis: Approximate Mineralogy

Method: X-Ray Diffraction

Analysis Results – G408739

General information

Analysis date	2019/01/15	XRD	Rigaku Miniflex 600
Job Number	LJN2019-128		
Sample ID	G408739	Operator:	T.Coyte
Comment:	Original RIR Method.		

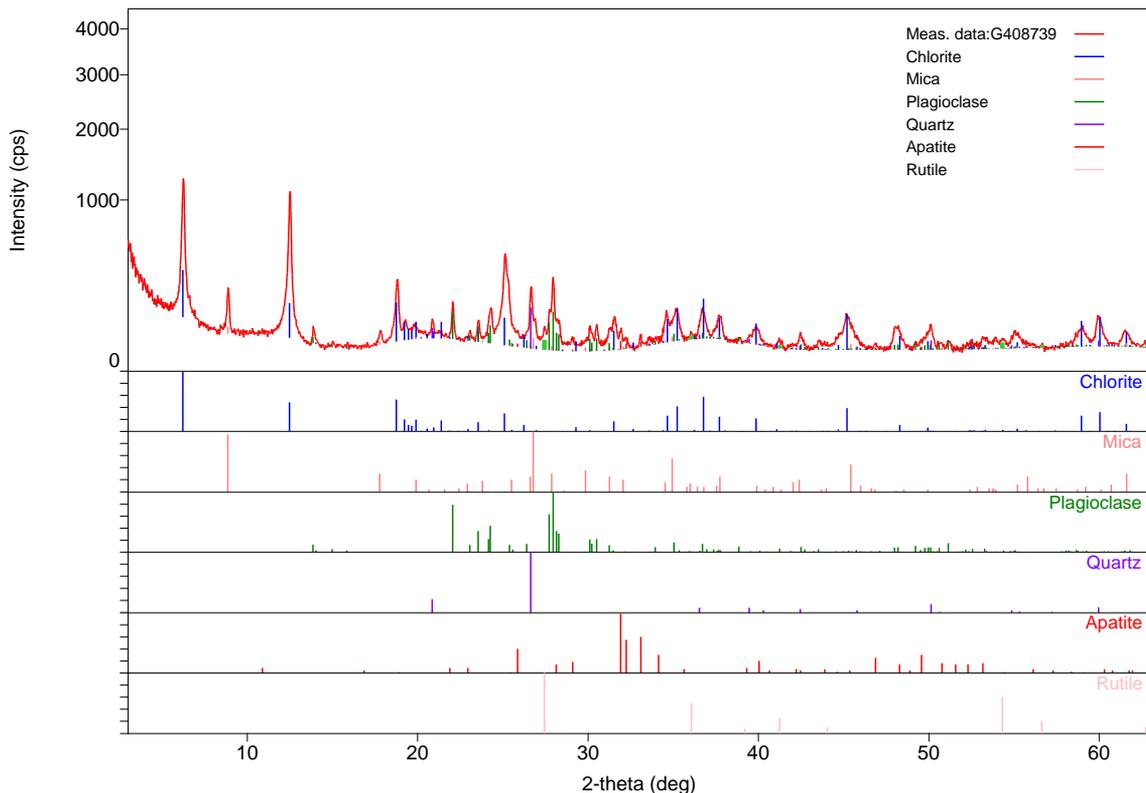
Analysis results

Phase name	Content (%)	Formula
Chlorite	32(±10)	Mg ₅ Al(AlSi ₃ O ₁₀)(OH) ₈
Dioctahedral Mica	28(±8)	KAl ₂ (AlSi ₃ O ₁₀)(OH) ₂
Plagioclase	21(±5)	(Ca,Na)Al(Al,Si)Si ₂ O ₈
Quartz	11(±4)	SiO ₂
Apatite	5(±3)	Ca ₅ (PO ₄) ₃ F
Rutile	4(±2)	TiO ₂

Peak overlap may interfere with identifications and quantitative calculations.

Amorphous minerals and minerals present in trace amounts may not be detected.

Phase data pattern



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Analysis Results – G408740

General information

Analysis date	2019/01/15	XRD	Rigaku Miniflex 600
Job Number	LJN2019-128		
Sample ID	G408740	Operator:	T.Coyte
Comment:	Original RIR Method.		

Analysis results

Phase name	Content (%)	Formula
*Diocahedral Mica	41(±10)	$KAl_2(AlSi_3O_{10})(OH)_2$
Quartz	34(±8)	SiO_2
Chlorite	22(±5)	$Mg_5Al(AlSi_3O_{10})(OH)_8$
Apatite	2(±1)	$Ca_5(PO_4)_3F$
Clinopyroxene	1(±1)	$Ca_xMg_yFe_z(Mg_{y+Fe_z})Si_2O_6$
Rutile	<1	TiO_2
Plagioclase	<1	$(Ca,N)Al(Al,Si)Si_2O_8$

*Mica possibly slightly altered to illite.

Peak overlap may interfere with identifications and quantitative calculations.

Amorphous minerals and minerals present in trace amounts may not be detected.

Phase data pattern

