

**MINERALOGICAL REPORT ON FIVE HEAVY MINERAL
CONCENTRATE SAMPLES FROM TASMANIA**

For

McArthur Ore Deposit Assessments Pty Ltd

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Five heavy mineral sand concentrates from Tasmania were submitted from MODA Pty Ltd for mineralogical examination.

The samples were labelled A through to E. They were initially examined under a binocular microscope, and transmitted light observation in oil immersion mounts under a petrological microscope. As four of the samples contained apparent opaque minerals, polished sections were prepared of these samples. The resulting sections were then examined microscopically in reflected light.

Brief descriptions of each of the sample follows.

Heavy mineral concentrate A.

The concentrate is dominated by medium grained (up to 1-1.5 mm) black oxide grains, with scattered spheroidal sulphide grains and a minor population of white silicates and traces of pink to orange silicate grains. The sample is weakly to moderately magnetic, with magnetic susceptibility being $\sim 210 \times 10^{-5}$ SI units.

The sample was examined under a binocular microscope. In addition, since there were abundant opaque grains, a polished grain mount was prepared and examined microscopically under reflected light.

Under the microscope, the following phases, typically forming grains from ~ 0.1 mm to 1.2 mm across, were observed:

Oxides (about 40 volume %)

- a) abundant, medium grey, low-moderate reflectance, isotropic - most likely **chromite**
- b) less common, pale grey, higher reflectance, anisotropic and commonly lamellar twinned grains - most likely **rutile**
- c) rare, medium grey, but slightly more reflective than (a), isotropic - most likely **magnetite**
- d) Rare, medium grey, brown-orange internal reflections - most likely **goethite**
- e) Rare translucent orange-brown grains that have a lower reflectivity than rutile - these may be **cassiterite**.

Pyrite (about 40 volume %)

This is relatively abundant, forming spheroidal to irregular aggregates composed of abundant tiny (< 0.1 mm) framboids (tiny spheres). There are less common aggregates of fine grained pyrite that do not display the framboidal texture, but are simply massive.

Other phases (about 20 volume %)

The other grains include common white to locally clear quartz and possible feldspar, one or two clear to pink grains of probable zircon, and single pale pink, clear grain of probable garnet.

Heavy mineral concentrate B.

The concentrate is dominated by near-colourless and rather clear grains, typically 0.5-2.5 mm across. There are one or two dark brown turbid grains.

This sample was examined microscopically in transmitted light by mounting a selection of grains in immersion oil on a glass slide.

Under the microscope, the sample appears to be essentially mono-minerallic. Grains are mostly clear and colourless, although some have slight amounts of brownish staining (?Fe oxides). Most grains are sub-rounded to irregular (anhedral) in shape although a few have well defined straight cleavage or crystal faces. Grains have high relief and high birefringence under crossed polars and the mineral has straight extinction. The relief and birefringent properties are considered to be far higher than that shown by quartz grains.

Consequently, the mineral is tentatively identified as zircon.

Heavy mineral concentrate C.

The concentrate is dominated by abundant dark grey oxide grains, many of which have a sub-metallic lustre. There are a few smaller bronze-coloured (?sulphide) and silvery coloured (?metallic) grains. Most grains are angular to sub-rounded and in the range 0.5-2.5 mm across. Even though the sample size is small, it is magnetic, with measured susceptibility of about 70×10^{-5} SI units.

The sample was initially examined under a binocular microscope. Because it was rich in apparently opaque minerals, a polished section was prepared. Subsequently, it became apparent that there were many small metallic-appearing grains present in the concentrate and another polished section was prepared. These sections were examined microscopically under reflected light.

The following minerals (or substances) were identified:

Oxides (probably 80 volume %)

- a) most common, under reflected light are pale grey, anisotropic, white to pale orange-brown internal reflections, are commonly twinned (e.g. lamellar twinning) and are considered to be **rutile**.
- b) Several grains are grey, less reflective than (a), strongly magnetic and are probably **magnetite**.
- c) Several grey, isotropic grains, with lower reflectivity than (a), with orange-brown internal reflections - possibly **chromite**.

Sulphides and metallic phase (20 volume %)

- a) several polycrystalline aggregates of fine to medium grained **pyrrhotite** contain tiny silvery metallic grains, commonly in eutectoid intergrowths. The latter could be native iron or iron-nickel. These aggregates are similar to a single large mass identified in sample D. They may not be of natural or terrestrial origin. It could represent portion of a sulphide-rich meteorite, or be a relict from a smelter product.
- b) A single aggregate of fine grained framboidal **pyrite**, similar to that observed in samples A and D.
- c) A couple of grains, one about 0.7 mm across, of a hard, silvery white metallic phase that is isotropic under crossed polars. This phase does not have any surface coating of Fe oxide and is hence unlikely to be native iron or anthropogenic steel. It is tentatively suggested to be a platinum-group element phase, e.g. **osmiridium**.

d) Heavy mineral concentrate D.

The concentrate is rather coarse grained, with rounded to angular grains being between 0.5-4 mm across. Near-colourless silicate grains seem to predominate, but there are relatively abundant grey to dark brown oxide grains, some of which have a sub-metallic lustre. There are also one or two apparent sulphide grains. Despite the sample being small, it is weakly to moderately magnetic, with magnetic susceptibility up to 170×10^{-5} SI units.

The sample was examined microscopically by using an oil immersion grain mount on a slide under transmitted light. In addition, since there were abundant opaque grains, a polished grain mount was prepared and examined microscopically under reflected light.

Under the microscope, the following phases, were observed:

Silicates (about 70 volume %)

- a) the most abundant grains are near-colourless, rather clear and have high birefringence under crossed polars, as well as having high relief (high refractive index). This phase is considered to be **zircon**.
- b) minor amounts of a near-colourless, lower birefringence and lower relief phase, considered to be **quartz**.

Oxides (about 25 volume %)

- a) several angular to sub-rounded grains of pale grey colour, white to pale grey and pale yellow internal reflections and commonly with twinning. This phase is considered to be **rutile** (similar to that in sample A).
- b) minor amounts of a less reflective, grey, isotropic phase, with dark red-brown internal reflections; this phase may be **chromite**.
- c) a single grain that in transmitted light was orange-brown and translucent, but is anisotropic and has high relief; this phase may be **cassiterite**.

Sulphides (about 5 volume %)

The sample has several grains up to 1 mm or so across of fine grained **pyrite**. Some retain fine framboidal texture, but other are more massive and may be recrystallised (as in sample A). There is a single aggregate about 3 mm across of polycrystalline, fine to medium grained **pyrrhotite** in which there are fine grained eutectoid intergrowths of a **silvery metallic phase** (e.g. iron or iron-nickel). This composite aggregate may not be of natural or terrestrial origin. It could represent portion of a sulphide-rich meteorite, or be a relict from a smelter product.

The concentrate also has one ragged grain about 0.5 mm long of a silvery metallic phase, around which there is a thin rind of Fe oxide. This may be either **native iron**, or an artifact such as a small piece of **steel**.

Heavy mineral concentrate E.

The concentrate is dominated by a mixture of dark orange-brown to dark brown oxide mineral grains, as well as a few greyish silicate grains.

The sample was examined in transmitted light with grains being mounted on a slide under oil immersion. In addition, a polished grain mount was prepared and examined microscopically under reflected light.

With microscope observation, the following phases, typically forming grains from ~0.1 mm to 1.2 mm across, were observed:

Cassiterite

This is the most common phase, forming angular to sub-rounded grains up to 1 mm or so across. It ranges from yellowish-orange to dark orange-brown in colour in transmitted light and is commonly twinned. In comparison to abundant rutile in other samples (e.g. sample A), the style of twinning is different (not lamellar twinning) and the reflectivity under reflected light is considerably less.

Less common phases in the sample include **quartz**, as single grains, but most typically as fine grained polycrystalline aggregates (i.e. these are small rock fragments), a few grains of pale pink-mauve to pale brown/colourless **zircon** and a few aggregates up to 0.7 mm across of **pyrite**.

Pyrite textures include framboidal and massive fine grained and are thus similar to those present in the abundant pyrite aggregates in sample A.

95

94

Sunday Creek

sample B

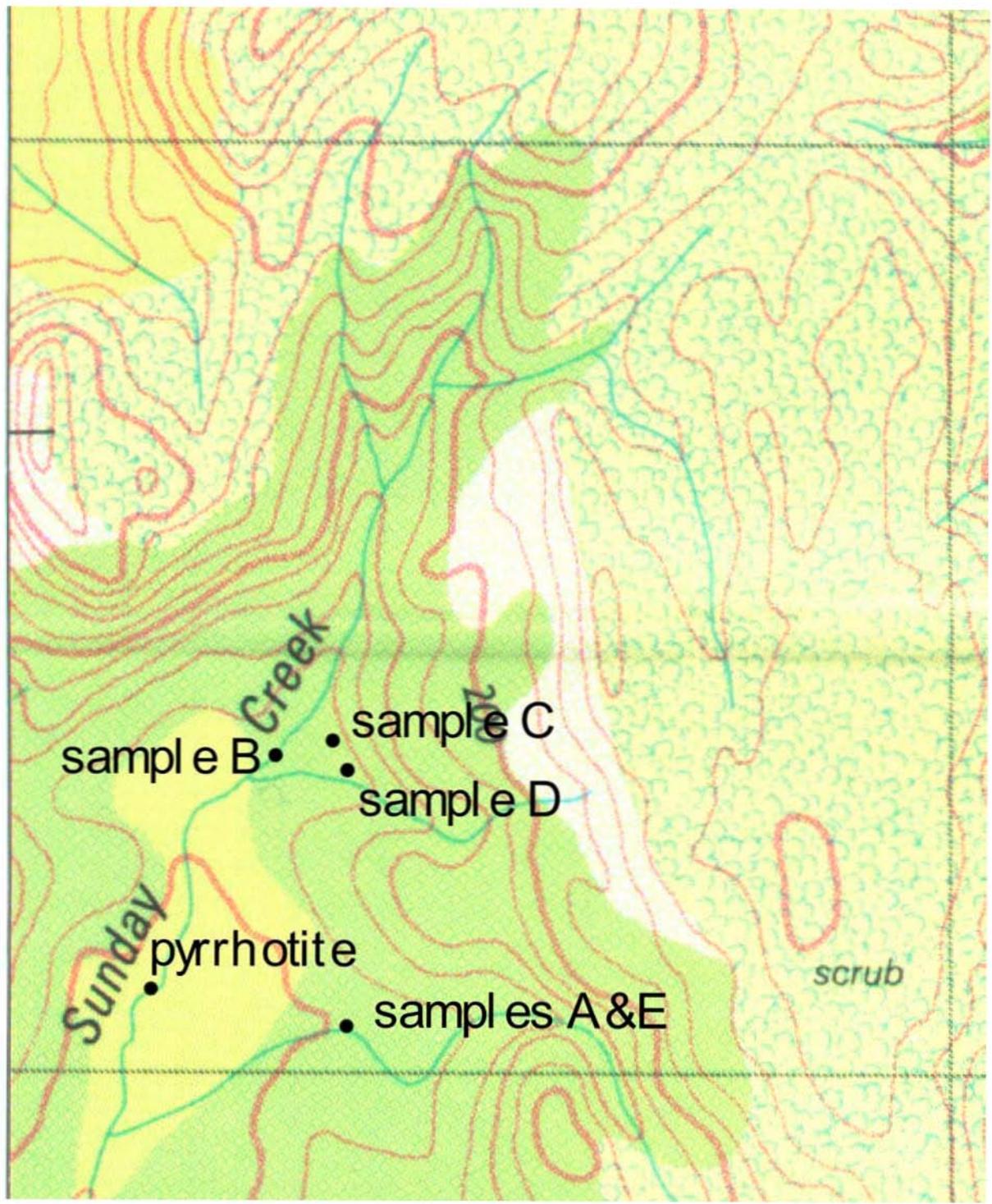
sample C

sample D

pyrrhotite

samples A&E

scrub



(d) PROPOSED WORK .

More samples will be taken up stream of sample sites A,B,C,D, and E.

(e) EXPENDITURE.

The total expenditure for 2004/2005 financial year was \$7300.00.

SINCERELY.
M.SWEENEY

15 August 2005

EXPLORATION LICENCE EL 17/2004 ANNUAL REPORT.

Tenement EL172004_200508_01.pdf.

PDF.FILE 1; EXPLORATION REPORT, SUNDAY CREEK TENEMENT.

CONTENTS; (a) Assay analysis of mineral sample.

(b) Report on five heavy mineral concentrate samples.

(c) Map of exploration area.

(d) Proposed work.

(e) Expenditure.

(a) ASSAY ANALYSIS OF MINERAL SAMPLE.

A mineral hand sample from a vein in Sunday Creek, was assayed at SGS. Burnie.

It was described as most likely to be pyrrhotite.

The sample site is approximately ;55GCP401941.AGD66.



SGS Burnie
ABN 44 000 964 278
14 Thirkell St, Burnie
Tasmania 7320
Telephone: (03) 6431 6837
Facsimile: (03) 6431 8890

TAX INVOICE

Mike Sweeney
ABN
1272 West Mooreville Road
Ridgley

TAS 7321

Invoice : BU00007154
Our reference : BU020154
Your reference : Silver Sulphide
Project :
Cost code : C C
Date : 22/12/04

METHOD	DESCRIPTION	ELEMENTS	SMPL	UNIT PRICE	TOTAL
CSA06V	Total Sulphur Analysis	1	2	\$10.00	\$20.00
G151	Sodium peroxide fusion, Geochemical samples	1	2	\$15.00	\$30.00
ICP90Q	ICP-AES analysis, Base metals	1	2	\$4.65	\$9.30
ICP90Q	ICP-AES analysis, Base metals	9	2	\$3.15	\$6.30
CSD06V	Quartz dilution, High Sulphur	1	2	\$16.00	\$32.00
G119	Total acid digest, high ore grade samples	1	2	\$10.00	\$20.00
AAS43B	AAS Analysis	1	2	\$1.50	\$3.00
G105	Total acid digest, Ore grade samples	1	2	\$7.00	\$14.00
AAS42S	AAS analysis	1	2	\$1.50	\$3.00
FAA505	50g fire assay, Lead collection, AAS	1	2	\$10.00	\$20.00
GST	10% Australian GST			%10.00	\$15.76
				NETT	\$157.60
				TAX	\$15.76
				TOTAL	\$173.36

*Paid
w/ft
23/12/04.*

Terms strictly 30 days nett
All prices quoted in AUD unless otherwise noted.
Please pay on invoice. No statement will be issued.

Please send cheques payable to:
SGS Australia
Locked Bag 10
Bentley Delivery Centre
W.A. 6983



Our reference : BU020154
Your reference : **Silver Sulphide**
Project code :
Date received : 23/11/04
Date reported : 22/12/04

SGS Burnie
ABN 44 000 964 278
14 Thirkell St, Burnie
Tasmania 7320
Telephone: (03) 6431 6837
Facsimile: (03) 6431 8890

Mike Sweeney

Number of pages of results : 3
Number of Samples : 2
First Sample : 1
Last Sample : 2

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[Empty box]

Authorised by
On behalf of:

Mr. Ricky Gelston
Laboratory Manager

The results in the following analytical report pertain to the samples provided to this laboratory for preparation and/or analysis as requested by the client.

Our reference : BU020154
 Your reference : Silver Sulphide
 Project code :
 Report date : 22/12/04
 Report Number : 00000368
 Report status : Final
 Page : 1 of 3

SGS Burnie
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ANALYTICAL DATA

Sample	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	MnO	TiO ₂	K ₂ O
1	4.6	0.20	56.00	0.021	0.027	<0.24
2	0.8	0.20	59.00	0.023	0.015	<0.24
Method	ICP90Q	ICP90Q	ICP90Q	ICP90Q	ICP90Q	ICP90Q
Units	%	%	%	%	%	%
Detection Limit	0.53	0.1	0.08	0.01	0.008	0.30

Notes: - = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

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ANALYTICAL DATA

Sample	S	CaO	MgO	P2O5	S	Au
1	<30	0.40	0.15	<0.046	44.50	<0.01
2	<30	0.60	0.35	<0.046	46.30	<0.01
Method	CSA06V	ICP90Q	ICP90Q	ICP90Q	CSD06V	FAA505
Units	%	%	%	%	%	ppm
Detection Limit	0.005	0.035	0.016	0.1	0.05	0.01

Notes: - = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

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ANALYTICAL DATA

Sample	Ni	Ag			
1	<0.01	<5			
2	<0.01	<5			
Method	AAS43B	AAS43B			
Units	%	ppm			
Detection Limit	0.01	50			

Notes: - = not analysed, -- = element not determined, I.S. = insufficient sample, L.N.R. = listed not received

(b) REPORT ON FIVE HEAVY MINERAL CONCENTRATE SAMPLES.

Samples of mineral concentrate were taken from four locations, within the Sunday Creek catchment.

Five samples were delivered to McArthur Ore Deposit Assessments Pty. Ltd, for evaluation.

The four sample site locations are shown below.

Heavy mineral concentrate (A&E), 55GCP403941, AGD66 & GPS ; 55G0340353 , 5394037.

Heavy mineral concentrate (B), 55GCP402943 ,AGD66 & GPS ; 55G0340203 , 5394331.

Heavy mineral concentrate (C), 55GCP404943 ,AGD66 & GPS ; 55G0340355 , 5394349.

Heavy mineral concentrate (D), 55GCP404943 ,AGD66 & GPS ; 55G0340362 , 5394319.

At site (C) breccias , scoria and armoured lapilli, were encountered.