

# *Pontifex & Associates Pty Ltd*

MINERALOGY – PETROLOGY · SECTION PREPARATION

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## **MINERALOGICAL REPORT No. 9762**

*by Alan C. Purvis, PhD & Ian R. Pontifex, MSc.*

August 26th, 2010

**TO :** Jim McKinnon-Matthews  
Mithril Resources Ltd  
60 King William Road  
GOODWOOD SA 5034

**YOUR REFERENCE :** Samples received 30/7/10

**MATERIAL & IDENTIFICATION :** 2 rock samples  
IND-1 and IND-2

**WORK REQUESTED :** Polished thin section preparation, description and report including a check for the presence of graphite.

**SAMPLES & SECTIONS :** Returned to you with this report.

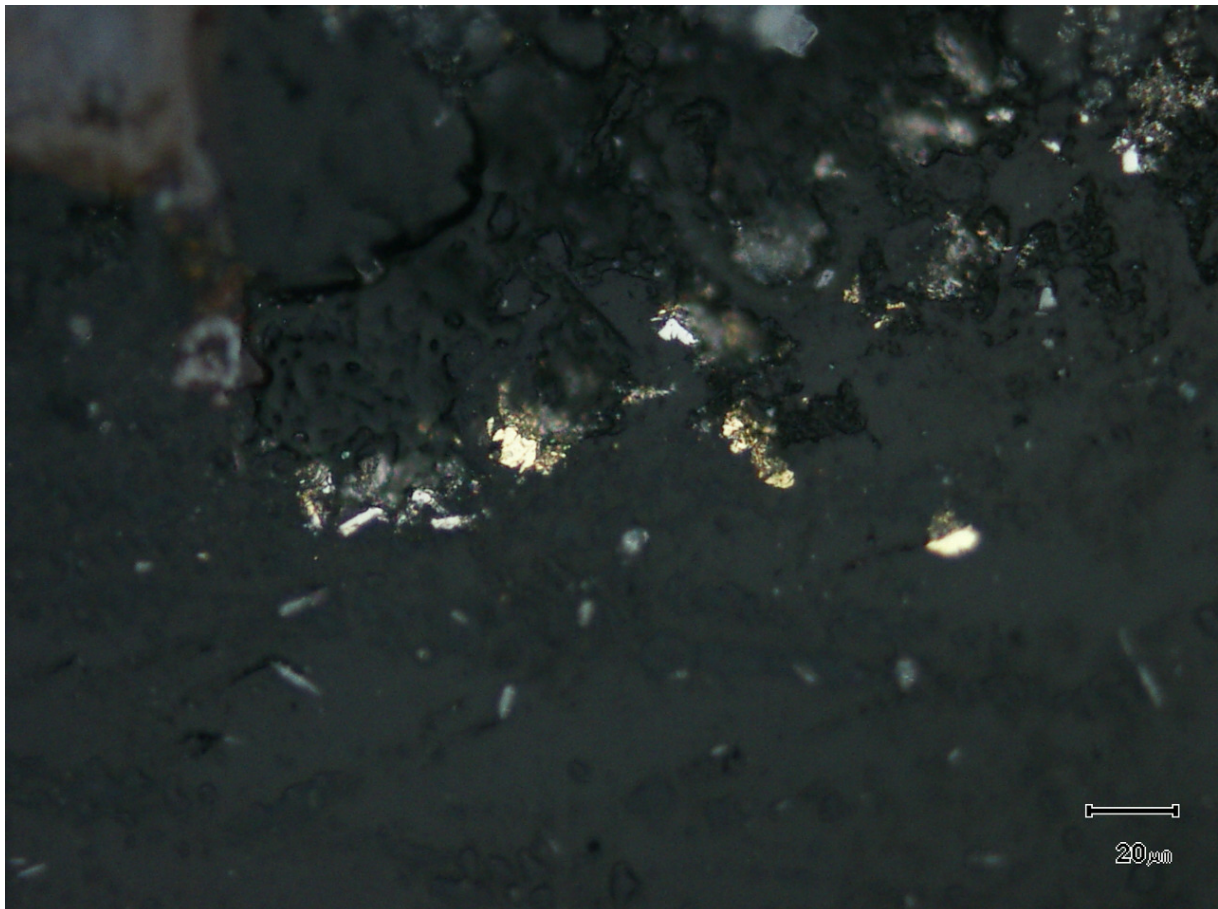
**DIGITAL COPY :** Emailed 30/8/10 to:  
<jimm@mithrilresources.com.au>

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## SUMMARY COMMENTS

The two samples IND-1 and IND-2 described from polished thin sections in this report were submitted by Jim McKinnon-Matthews particularly to check for the presence of graphite. Both samples are oxidised with major to abundant quartz, together with subequal oxidised granular material, which seems to be largely ex-feldspar mixed with clay or hematite/limonite ex-biotite, also numerous limonite-filled fractures and veins. Graphite was not seen in either of these polished thin sections. Both samples are identified as oxidised and altered quartz-feldspar-mica-gneiss, with residual fresh muscovite in IND-2.

An initial examination of IND-1 by reflected light microscopy indicates rare 10 micron-size possible gold (see photomicrograph below). Subsequent detailed scanning by reflected light microscopy failed to “find” these same grains and it is recommended that the immediate offcuts of this rock be analysed to check for anomalous gold.



**Fig 1**

**IND-1**

Polished section, high magnification (x500). An initial ID of three bright grains of apparent gold, 5  $\mu\text{m}$  to 10  $\mu\text{m}$  size, associated less definite possible pyrite, largely within quartz, also with scattered indefinite clay-limonite. This occurrence was not located by rescanning, but it is recommended that the offcuts were assayed for gold.

## INDIVIDUAL DESCRIPTIONS

<i>Sample No</i>	<i>IND-1</i>
Rock type from TS	Heterogeneous granulose quartz-rich rock including subordinately oxidised probable ex-feldspar, altered minor biotite and subparallel limonite-filled microfractures as veinlets perpendicular to the gneissic layering. Graphite was not seen. [Trace gold grains about 10µm size tentatively identified in quartz limonite, but this needs to be checked by gold assay.]
Hand specimen	Limonitic oxidised granulose quartz-rich rock with limonite ± hematite disseminated and in parallel microfractures.

Visually estimated mineralogy:

<i>Mineral</i>	<i>Abundance</i>	<i>Origin/location</i>
Quartz	Dominant	As amoeboid-granular grains to 7mm size with undulose extinction.
Limonite/hematite ± kaolinite ± quartz (replicas)	~15%	Ex-granular mineral(s) to 2mm grainsize, forming a mosaic with granulose quartz, possibly ex-feldspar.
Clay and limonite-altered biotite	~10%	Ex-biotite to 2mm size, weakly layered
Limonite	5-7%	In parallel microfissures to 2mm wide and in random fractures
Possible trace gold	Trace	Three grains to 10µm size with associated trace microcrystalline possible pyrite in quartz-limonite.

As indicated above, this sample is dominated by a mosaic of amoeboid quartz grains to 7mm long with undulose extinction with lesser smaller granulose grains of apparent ex-feldspar but completely altered to clay-limonite. Minor biotite is completely altered to clay (?vermiculite) and limonite and has a weakly layered schistose distribution through the quartz-rich mosaic.

Three grains of possible gold 5-10µm in size and trace microcrystalline pyrite were initially tentatively identified within quartz-limonite but the presence of gold needs to be checked by gold assay.

Graphite was not seen by reflected light microscopy of this polished thin section.

Sample No	Ind-2. Interpreted as altered and oxidised.
Rock type from TS	Quartz-feldspar-biotite-muscovite gneiss. Non-quartz minerals have advanced clay-limonite alteration but with minor residual muscovite. Extensive secondary hematite and limonite are interstitial and occur in random microfractures. Graphite not seen.
Hand specimen	Limonite/hematite-altered granulose quartz-rich rock.

Visually estimated mineralogy:

<i>Mineral</i>	<i>Abundance</i>	<i>Origin/location</i>
Quartz	Major (~50%)	Massive granulose, similar to quartz in the previous sample but mostly less than 5mm grainsize
Limonite/secondary hematite ± kaolinite ± quartz	Major (~40%)	Derived from anhedral grains to 5mm in diameter, interstitial and in microfractures.
Porous hematite-limonite	3-5%	Ex-biotite to 2mm grainsize
Muscovite	3-5%	Micro-fractured and invaded by limonite
Limonite-filled fractures	Minor	Cutting quartz

This sample is interpreted as a granitoid gneiss or related quartz-feldspar-biotite metasedimentary gneiss. It has less quartz compared to the previous sample and more oxidised material, including lamellar of schistose hematite/limonite, ex-biotite. There is minor residual muscovite, but graphite was not seen.