MINERALOGICAL REPORT No. 7742

by Alan C. Purvis, PhD.

December 3rd , 1998

TO :	Mr Paul Melville PNC Exploration (Aust) Pty Ltd Unit 5/4 Durand Court COCONUT GROVE NT 0810
YOUR REFERENCE :	Your letter dated 29th October 1998
MATERIAL & IDENTIFICATION :	RAB cuttings 915), 9597 to 9601
WORK REQUESTED :	Thin section preparation, description and report with comments and interpretations as specified.
SAMPLES & SECTIONS :	Returned to you with this report.

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SUMMARY COMMENTS

This report discusses twenty-nine samples from Arnhem Land in the Northern Territory, mainly as petrographic descriptions of fifteen samples of drill chips which were mounted in epoxy and made into composite thin sections and fourteen rock and core samples examined in normal thin sections. Opaque minerals were identified using low angle incident light.

CHIP SAMPLES

The chip samples include gneisses, (possibly metasediments), a suite of largely sericitised to silicified granitoids, and two altered dolerites, represented as follows:

- Gneiss: 9597, 9598, 9599, 9600, 9601

The gneisses are commonly quartzofeldspathic, and may have muscovite as well as biotite, but they are usually too rich in quartz or in biotite to represent normal igneous protoliths, and a sedimentary precursor is therefore favoured for this suite of five gneissic samples. Some quartz veins may be present and there is minor pyrite in sample 9599.

INDIVIDUAL DESCRIPTIONS

RAB CHIP SAMPLES

9597 **Quartz-rich to partly altered quartzofeldspathic chips with microcline, altered plagioclase and clays after biotite. An objective petrographic interpretation could be metasandstone, or meta-granitoid with quartz veins, but a precise identification/interpretation cannot be confirmed.**

There are two anomalously large chips (to 15mm) in this sample of coarse quartz mosaic, possibly vein quartz, possibly quartzite. All other chips are <5mm and these are dominated by relatively coarse quartz, and (fresh) microcline, from 0.3 to 2mm in grainsize. There is also albite to sericite to clay-altered plagioclase and clay-altered biotite, but these minerals are mostly very fine-grained and of minor to subordinate abundance. Some of the quartz-rich chips, including the very large ones, lack any feldspar but others have minor microcline and altered plagioclase.

It is difficult to know if these chips represent a single quartz-rich lithology, such as a metasandstone, with less than 15% plagioclase + microcline + biotite, or whether the quartz-rich chips represent veins in a granitoid.

9598 Heterogeneous and inequigranular quartz-rich to quartzofeldspathic to micaceous chips, possibly metasediments, less probably granitoid gneiss.

Quartz-rich to quartzofeldspathic to micaceous chips dominate this sample but these are heterogeneous and inequigranular. Some have quartz to 2mm in grainsize (rarely 3mm) and others are dominated by biotite and/or muscovite, also to 2mm in grainsize. Plagioclase, from fresh to albite to sericite-altered, is a minor to major component of some chips, to 1mm in grainsize with weak zoning in the fresh chips, and minor microcline in many of the chips, locally include myrmekite separating microcline from plagioclase. Many of the chips have a schistosity defined by biotite and/or muscovite, but in some of the more micaceous chips the micas are decussate. Rare apatite was noted in one chip.

The heterogeneous and inequigranular nature of these chips would seem to suggest metasediments, rather than a meta-granitoid gneiss.

9599 Quartz-plagioclase-biotite-(microcline-muscovite) gneisses. Probably metasediments, (seemingly far less likely metagranitoid) with accessory pyrite and apatite.

Biotite-rich chips and separate flakes of biotite are more abundant in this sample than in the previous sample, with possibly at least 25% biotite in the sample as a whole. There is also abundant plagioclase and grains of a myrmekite-like plagioclase-quartz intergrowth, unrelated to any alkali feldspar. In some of the chips the plagioclase is uniformly oriented over large areas and there are single plagioclase grains to 5 mm long. Quartz is not as abundant as in the previous samples, but there are quartz-rich layers in some of the chips. Minor microcline in some of the chips is quite unrelated to the myrmekitic patches referred to above, but muscovite is rare. Accessories include apatite, pyrite and ?rutile. The apatite is rounded, and this apparent inherited detrital characteristic suggests a metasediment, more likely than a meta-granitoid.

9600 Quartz-microcline-biotite-muscovite-plagioclase gneisses and possible vein quartz. Probably represents an impure metasandstone unit.

This sample is similar to sample 9597 in having chips of coarse quartz, including grains to 8mm long, as well as small microcline-rich chips with less abundant quartz. Minor muscovite and biotite occur in the more feldspathic chips and there are some large chips with abundant quartz to 3 mm in grainsize, muscovite flakes 1-3 mm long defining a schistosity, microcline and biotite. There is less abundant plagioclase compared to microcline than in samples 9597.

As in sample 9597, it is possible that some of the chips composed entirely of quartz represent veins, but the sample as a whole seems to represent a metasandstone rather than a granitoid gneiss.

9601 Quartz-biotite-microcline-(plagioclase-muscovite) gneiss. Probably a metasediment.

These chips are broadly similar to those in the previous sample 9600, but chips of possible vein quartz are less abundant and biotite-rich chips are more abundant. The biotite has been altered and replaced by expanded clay aggregates with secondary alkali feldspar, possibly adularia, interlaminated with the clays. Quartzofeldspathic chips with microcline and rare plagioclase are also present, but are again less abundant than in the previous sample. These are locally up to 2 mm in grainsize, however. Some chips contain or consist of quartz-plagioclase intergrowths with albite to sericite to clay-altered plagioclase. These may represent metasediments.