MINERALOGICAL REPORT No. 8274

by Alan C. Purvis, PhD

PRELIMINARY SUMMARY

October 24, 2002

TO :	Mr Peter Simpson Giant's Reef Mining Ltd PO Box 1244 TENNANT CREEK NT 0861
YOUR REFERENCE :	Order No. 200981
MATERIAL :	RC Drill chip samples EL8882, 8883, 9309, 10402 Sample Nos. 81642 to 81665 (total 24)
WORK REQUESTED :	Thin section preparation, description and report with comments and interpretations as specified.
SAMPLES & SECTIONS :	Returned to you with this report.
DIGITAL COPY :	Enclosed with hard copy of this report.

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SUMMARY COMMENTS

Twenty-four samples of RC-chips are described in this report from thin sections made from multiple chips mounted in epoxy. They are all from the Bluebush area southwest of Tennant Creek in the Northern Territory.

Various partly variolitic and/or pyroxene-porphyritic **basalt** lavas, hyaloclastites, breccias and tuffs are seen in BBRC-029 to 031 and 033, mostly with chlorite-sericite-quartz-carbonate alteration, but with actinolite and sericite in BBRC-033. **Veins**, with quartz, carbonate or adularia are common and seem to have an epithermal character. It is not clear from the present study whether these have any economic potential. **Interbedded sediments** include dolomite and carbonaceous slate (BBRC-029, 103-104m) sandy dolomite (BBRC-030, 70-71m) and sandy shale or greywacke (BBRC-031, 119-120m). Sediment is also seen in BBRC-028, probably siltstone but totally flooded by limonite. Altered **gabbro** is seen in BBRC-023, with some actinolite-albite-rich chips (± chlorite, biotite) and some **potassic-altered biotite-rich chips** with patches of quartz containing **limonite after pyrite**. Quite different mafic lithologies occur in SHRC-001 (altered and partly recrystallised **hypersthene-dolerite** passing into quartz-rich pegmatite zones) and MORC-001 (uralitised and sericitised **oxide-poor gabbro**).

Holes BBRC-026 and 027 contain altered high-level **granitoids**, ranging from granodiorite to monzogranite. One has albitised K-spar (BBRC026, 69-70m), but the others have fresh microcline as well as red sericite-albite-hematite-altered plagioclase. Altered biotite is also abundant with clays and K-spar in lenses parallel to the cleavage. Fresh, oxidised and leucoxenised opaque oxides occur as well as apatite and zircon. The quartz is partly bipyramidal and partly in graphic patches, indicating a shallow emplacement level.

Fine-grained **gneissic tonalite** in BBRC-021 is quite different to the granitoids described above, but also has chlorite and clay after biotite as well as partly red albite ± sericite-rich altered plagioclase. Finer-grained, chloritised and albitised **quartz-plagioclase-biotite-schist** is also present in this sample as well as a totally clay-chlorite-altered chip, with leucoxene, limonite and quartz, of uncertain origin. **Veins** with quartz, chlorite and adularia occur in some of the granitoid samples, again indicating epithermal temperatures.

There is also a sheared, quartz-poor, fine-grained **felsic igneous lithology** in BBRC032, with albite, chlorite and muscovite as well as rutile or leucoxene. This may represent a quartz microdiorite or andesitic intrusion.

The following petrographic summaries for each sample will basically constitute headers to the individual descriptions in the final report.

TABLE 1: SAMPLES DESCRIBED IN REPORT NO. 8274

81642 BBRC-021, 85-86m	Altered foliated fine-grained tonalite with albite-sericite-chlorite-clay-leucoxene-limonite alteration and altered quartz-biotite-plagioclase schist with altered possible cordierite. One chip totally altered to clay (sericite/ smectite), chlorite, hematite and leucoxene with minor quartz but poor textural preservation.
81643 BBRC-023, 89-90m	Two large chips and one small chip of amphibole-rich altered gabbro and two large chips of biotite-rich altered gabbro with rutile ± leucoxene after opaque oxide and quartz-rich lenses containing limonite after pyrite.
81644 BBRC-026, 69-70m	Weakly deformed and albite-sericite-chlorite-altered granitoid with albite ± sericite-rich altered plagioclase, albitised K-spar, chloritised biotite and leucoxenised opaque oxide. Apatite and rare zircon (<0.1mm) are present and there are chlorite-rich veins.
81645 BBRC-026, 83-84m	Coarse heterogeneous granitoid (granodiorite to monzogranite): some chips are quartz-rich and lack K-spar, others have minor or very abundant, coarse-grained K-spar (microcline) locally with graphic zones. Quartz is partly interstitial but partly bipyramidal with anhedral K-spar. Biotite is partly coarse-grained partly fine-grained and decussate, partly altered, with clays parallel to the cleavage and patches of epidote. Sericite and rare epidote also occur in the plagioclase. Clay-hematite veins occur. Accessory apatite, oxides and zircon, with zircon to 0.35mm long.
81646 BBRC-027, 78-79m	Altered probable monzogranite with red sericite-albite-altered plagioclase and fresh perthitic microcline. Altered biotite partly as large flakes and partly decussate. Some bipyramidal quartz suggesting shallow emplacement. Oxides, apatite and zircon (0.05-0.2mm) occur. Rare veins with adularia and clay.

81647 BBRC-027, 93-94m	Altered granodiorite to monzogranite with red sericite and hematite-stained coarse plagioclase, undeformed quartz, partly bipyramidal and resorbed with resorption channels and interstitial areas of microcline passing into coarse microcline. Abundant biotite has been altered to chlorite and leucoxene. Accessories include apatite, oxides and zircon 50-150μm long.
81648 BBRC-027, 85-86m	Altered monzogranite with red sericite-hematite-albite-altered euhedral plagioclase and coarse K-spar (orthoclase to microcline) as well as coarse and decussate altered biotite. Oxide, apatite and zircon (0.05-0.15mm) occur.
81649 BBRC028, 57-58m	Limonite-flooded possible siltstones with disseminated very fine-grained quartz.
81650 BBRC-029, 68-69m	Albite-sericite-carbonate-leucoxene-limonite-altered partly variolitic basalt and fragmental basaltic rock with a clay-quartz matrix. Adularia-quartz veins and clay veins are present.
81651 BBRC-029, 87-88m	Weakly to strongly deformed (mylonitic), sparsely plagioclase-porphyritic basalt, mostly albite-rich, partly chlorite-rich, flooded and veined by carbonate and cut by quartz veins containing adularia.
81652 BBRC-029, 103-104m	Four chips of laminated dolomite, remaining abundant chips of laminated carbonaceous slate with abundant veins containing quartz and/or carbonate and irregular patches of carbonate.
81653 BBRC-029, 109-110m	One chip of very fine-grained tremolite-actinolite-rich schist with folded lenses of chlorite and disseminated leucoxene. The other chips are more massive and rich in tremolite-actinolite with amphibole-opaque oxide pseudomorphs of pyroxene phenocrysts to 2.5mm long and chlorite-tremolite possibly after olivine and plagioclase phenocrysts.
81654 BBRC-029, 119-120m	Massive lava and hyaloclastites with uralitic actinolite after pyroxene phenocrysts and recrystallised amphibole after possible olivine in amphibole-rich altered glass, devitrified glass with microspherulitic textures or recrystallised possibly glassy material. Vesicles are present and the hyaloclastites have a cement of carbonate, clouded epidote and clinopyroxene.

81655 BBRC-029, 144-145m	Massive and vesicular pyroxene-porphyritic lava and hyaloclastite, tremolite-actinolite-rich, with carbonate, quartz, leucoxene and opaque oxide. Veins contain albite, epidote, carbonate and adularia.
81656 BBRC-030, 70-71m	Weathered impure dolarenite with disseminated fine sand-sized quartz and minor microcline.
81657 BBRC-030, 87-88m	Chlorite-carbonate-leucoxene schists with very minor quartz. The chlorite has replaced plagioclase to 1.5mm in grainsize, with carbonate after pyroxene and possibly late magmatic quartz in a fine-grained metadolerite, sheared and altered.
81658 BBRC-031, 79-80m	Chlorite-quartz-sericite-leucoxene-altered basaltic rocks with poor textural preservation: aphyric, pyroxene porphyritic and fragmented, locally flooded by quartz and/or carbonate. Several chips contain or consist of coarse-grained deformed carbonate from large veins.
81659 BBRC-031, 89-90m	Partly brecciated altered mafic rocks with albitised plagioclase and chlorite ± quartz after pyroxene as well as leucoxene after partly dendritic oxides. Some variolitic areas. Matrix of chlorite and hydrothermal quartz in the breccias. One chip of coarse carbonate with lenses or fragments of granular to prismatic hydrothermal quartz,
81660 BBRC-031, 99-100m	Massive and brecciated plagioclase-porphyritic, partly variolitic basalts with albite, chlorite, quartz and leucoxene. Leucoxene has replaced partly dendritic opaque oxides. The brecciated chips have a chlorite-quartz matrix as in the previous sample.
81661 BBRC-031, 119-120m	Schistose matrix-rich greywacke or sandy shale with single-crystal quartz grains to 0.5mm (medium-grained sandstone) and rare lithic grains: also has slate composed of sericite ± quartz. Narrow veins of sparry quartz.
81662 BBRC-032, 115-117m	Albite-chlorite-muscovite-leucoxene/anatase schist with minor quartz, accessory apatite and zircon. Veins of chlorite and of albite. Metamorphosed felsic igneous rock.

81663 BBRC-033, 89-91m	Albite-actinolite-epidote-leucoxene-altered sparsely pyroxene porphyritic basalt with rare vesicles. Rare tuff with pyroxene and basalt fragments in a clouded epidote-rich matrix and some chips altered to clay, chlorite, carbonate and quartz. Sparse veins of quartz ± carbonate and irregular lenses of quartz.
81664 SHRC-001, 76-78m	Recrystallised hypersthene dolerite with partly ophitic and partly recrystallised orthopyroxene, recrystallised clinopyroxene, clear plagioclase laths, biotite and opaque oxide. Some areas are highly altered to actinolite and sericite with clays after orthopyroxene. In other areas fresh rock passes into quartz-rich areas that seem to represent mafic pegmatites.
81665 MORC-001, 158-160m	Altered gabbro with albite ± sericite-rich altered plagioclase and largely uralitised clinopyroxene. Has some recrystallised amphibole and patches of chlorite rimming the amphibole. One chip has commonly fresh clinopyroxene and oriented clays replacing orthopyroxene, with curious altered symplectites. Rare chlorite after biotite. Oxides are rare and fine-grained and apatite is rare or absent.