METANA MINERALS N.L.

Tennant Creek Gold Ltd. Joint Venture

EXPLORATION LICENCE 5706
"MYSTERY"

SUMMARY REPORT ON EXPLORATION
FOR THE PERIOD 5th APRIL 1988
TO
1st MARCH 1989

Geological 1:250,000 Tennant Creek Sheet

Compiled by
A.H. Eeles
Project
Geologist
6/3/89
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1. SUMMARY

A photogeological and aeromagnetic interpretation have been completed over this Exploration Licence. The aeromagnetic interpretation identified two anomalies. More detailed work has been carried out over the first magnetic target, M1. This work has included ground magnetic traverses and modelling, geological mapping, soil geochemistry, petrology and rock chip geochemistry. The ground magnetic modelling did not suggest an ironstone source to the M1 target and geological mapping revealed that the anomaly is underlain by a large lamprophyre intrusion. Rock chip geochemistry has revealed that the lamprophyre is possibly anomalous in the light rare earth elements. The second, most northerly aeromagnetic target is covered by mineral claims and is associated with the Hidden Mystery workings.

Twelve stream sediment samples were taken throughout the Exploration Licence as part of a regional survey. Only one sample was weakly anomalous in gold, copper and bismuth. However this enhancement may be due to extensive windblown contamination from existing mine workings to the east of Tennant Creek.

2. RECOMMENDATIONS

To test the potential of the lamprophyre, bedrock samples should be taken in traverses drilled across the intrusion, and submitted for multi element ICP analysis.

Elsewhere in the Exploration Licence reconnaissance bedrock traverses should be drilled to investigate the underlying lithology and to test the potential for shallow mineralisation. There is potential for non magnetic mineralisation along the shear zones, in particular the Mary Lane Shear.

The anomalous stream sediment sample should be resampled and follow up samples taken to investigate the validity and source of the anomaly.
4. **LOCATION AND ACCESS**

The exploration licence is located about 6.5 kilometres west of the Tennant Creek township and covers a total area of 30 square kilometres. See figure 1.

5. **TENURE**

Exploration Licence 5706 "Mystery" is held by Tennant Creek Gold Ltd. and is being explored by Metana Minerals N.L. under a joint venture agreement. The Exploration Licence was granted on the 6th April 1988, and has a minimum Mines Dept. Expenditure Covenant of $40,000.00.

6. **REGIONAL GEOLOGY**

The regional geology will not be repeated here as it has been adequately described in numerous previous publications. For example the Geological Survey, 1:250,000 series Tennant Creek Sheet explanatory notes. Figure 2 shows a regional geology map taken from Le Messurier et al, "The Tennant Creek Inlier : Regional Geology and Mineralisation": in Economic Geology of Australia and Papua New Guinea - Metals. In Press.

7. **PHOTOGEOLOGICAL INTERPRETATION**

A photogeological interpretation has been made by K. Fox. The interpretation is shown on figure 3. Numerous east west, north west and north east trending photolineaments cross the Exploration Licence.

8. **STREAM SEDIMENT SAMPLING**

A regional stream sediment sampling programme was carried out over the entire Tennant Creek field. Twelve of the samples were collected from within Exploration Licence 5706. A 3 kg sample of -2mm size fraction was collected at each site and analysed for gold by the Bulk Cyanide Leach method. A 50 g split of -180 micron size fraction was taken from each sample and analysed for copper and bismuth. The results are shown on figure 4. Only one sample returned weakly anomalous gold (1.2 ppb), copper (3 ppm) and bismuth (1.3 ppm). However from analysing the regional results there is a possibility that this enhanced results may be due to extensive windblown contamination from the Peko, Eldorado, Nobles Nob and other mine workings to the east.

9. **AEROMAGNETIC INTERPRETATION**

A geophysical interpretation was made on the data that was purchased by Metana from Austirex International Limited. An airborne geophysical survey was conducted by Austirex between June & July 1984. The flight lines were spaced by 200 metres, with tie lines separated by 4000 metres. A
proton precession magnetometer was used for data collection. This had a resolution of 0.1 nano Tesla, a cycle rate of 0.5 seconds and a sample interval of 30 metres.

The Exploration Licence can be divided into three domains. The most westerly part is comprised of two bulls-eye targets and east west trending magnetic sediments which are truncated by the west north west trending Mary Lane shear zone. The north easterly portion is affected by numerous north west trending faults. These faults cut magnetic igneous possibly units. The third domain is essentially magnetically quiescent with a number of east west trending sedimentary units.

Of the two magnetic "bulls eye" type magnetic targets (see figure 3), the notherly one is covered by mineral claims and is associated with the "Hidden Mystery" workings. The southern magnetic target, M1, lies within the Exploration Licence and more detailed work has been conducted over this target.

10. M1 MAGNETIC TARGET EXPLORATION

10.1 Ground magnetic interpretation
A ground magnetic survey was carried out by Solo Geophysics to accurately position the southern airborne anomaly. Readings were taken at a height of 8 feet at 5 metre intervals along 40 metre spaced grid lines. The contoured results are shown in figure 6. The modelling of these results did not suggest an Ironstone source.

10.2 Soil Geochemistry
Soil samples were taken on a 40 X 80 metre grid covering the ground magnetic target. From orientation elsewhere in the Tennant Creek field, the optimum size fraction for sampling soils for gold was found to be -180 microns. Samples of this fraction were submitted for for aqua regia/GTA gold analysis. Most of the soils appear to be a thin, residual accumulation over shallow bedrock, but the development of laterite could be more widespread than is apparent from surface inspection.

The results are shown on figure 8. A soil anomaly on the south western edge of the grid appears to correlate with the Warrego road, perhaps resulting from metalliferous dust spread by passing trucks.

Anomalous soil assays from line 4480E lie outside E.L. 5706. A field check revealed that the highest result, at 1560N, is from a sample of alluvium collected in a creek bed at a point where heavier ironstone cobbles have accumulated. The other two samples are from an area of thin soil cover over mudstones.
10.3 Geological Mapping

The area covered by the grid was geologically mapped by D. Tonkin. Figure 7 shows the geology. Mudstones and greywackes of the Carraman Formation outcrop or sub-outcrop over most of the area. These sediments are ubiquitously veined with quartz. Veining is particularly heavy on the east and north east sides of the area and suggest a dilational structural regime, which could be due to the presence of a fold axis or a buried intrusive.

A feature of the area is the large (100 m x 180 m) lamprophyre intrusive, which appears to form a stock-like body from which radiate several dykes and sills. The contact zone with the enclosing sediments is characterised by ferruginisation and quartz veining. There are 2 main phases of lamprophyre: a coarse, green/brown mica phase and a pink feldspar phase. The lamprophyres weather readily, and are responsible for an anomalous drainage pattern (see Fig 7). Several creeks have eroded along lamprophyre dykes. In places stream direction changes abruptly at lamprophyre contacts.

A magnetic, quartz-hematite ironstone lens crops out at 3720E/1680N. Small lenses were mapped elsewhere. Ironstone float is more widespread, and appears to be concentrated along two major lineaments that trend NE and NNW through the area, intersecting at the lamprophyre intrusion (see photogeology map in Marathon Petroleum report).

Foliated quartz-porphyry is present, probably representing a tuffaceous unit. A quartz-feldspar porphyry dyke crops out in the creek near the northern margin of the lamprophyre.

A laterite profile, comprising a limonitic cap 0.5 m thick overlying a kaolinitic pallid zone, is exposed on line 4480E, between 1560N and 1600N. The limonite forms a cement holding scree-like clasts of Carraman Fm. In places where there is no incision of the surface by drainage channels, it would be difficult to discriminate between float derived directly from Carraman Fm. and float derived from laterite.
10.4 Petrology
Seven rock samples were submitted to Mintek Services in Perth for petrographic examination. A full report for each is given in appendix 2. The rock samples submitted were:

PR8 3795E 1875N Weakly weathered and ferruginised, 
minette (Biotite-orthoclase 
lamprophyre)

PR9 3880E 1845N Weakly weathered and ferruginised, 
feldspathic lamprophyre (weakly 
biotic)

PR10 4120E 1960N Weakly weathered and ferruginised, 
silicified and sericitised, ?pyritic, 
tuffaceous lithic arenite (possibly a 
greywacke).

PR11 3770E 1845N Weakly weathered, ferruginised and 
microfractured, ?mineralised, 
sericitic (cherty) hornfels.

R12 3710E 1925N Weakly weathered and ferruginised, 
silicified, sericitised and 
pyritised quartz-feldspar porphyry.

PR13 3715E 1920N Weathered, ferruginised and sheared, 
silicified, sericitised and 
pyritised, quartz-feldspar porphyry 
(?subvolcanic).

PR14 3715E 1735N Weakly sheared, weathered and 
oxidised, silicified, sericitised and 
?pyritised, quartz porphyry (with 
xenoliths).

10.5 Rock Chip Geochemistry
Four rock chip samples were submitted to Analabs 
in Perth for ICP multi-element analysis. The results are 
tabled in appendix 3. Three of the rock samples R4, R5 
and R6 were taken of the lamprophyry. Rock sample R3 was 
taken from the ferruginised siltstone found on the 
lamprophyry contact. The following is an average of rock 
samples R4, R5 and R6 converted to the oxide percentage 
for selected elements.

0.25% Na 0
5%  MgO
16%  Al 0
50%  SiO
0.7%  P 0
10%  K 0
0.6%  CaO
1.7%  TiO
10%  Fe 0
From comparison of the results with known rare earth orebodies for instance West Coast Holdings' Brockman "orebody" near Halls Creek, the rock samples R4, R5 and R6 are enhanced in the rare earth oxides, predominantly the light rare earths La, Ce, Pr and Nd. However they are significantly low in Nb, Ta, Y and Zr.

A.H. Eeles
Project Geologist
8.3.89
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TENNANT CREEK PROJECT

EL.5706 MYSTERY

LOCATION PLAN

Scale: 1:100,000  Date: NOV. 1988  Plan No.: 1

METANA MINERALS N.L.
# TENNANT CREEK

**REGIONAL GEOLOGICAL MAP**

From LeMessurier et al. — ECONOMIC GEOLOGY OF AUSTRALIA and PAPUA NEW GUINEA METAL. IN PRESS.

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**METANA MINERALS N.L.**
APPENDIX 1

PETROLOGY REPORTS
MINTEK SERVICES

PETROGRAPHIC DESCRIPTION

Sample No. PR8 METANA Registered No. IL 28728
Thin section

MEGASCOPIC CHARACTERISTICS

Field Name: A lamprophyre (micaceous).
Nature of Sample: Small ferruginized rock sample from 3795/1875N
Minerals Visible: Biotite, feldspar and opaques.
Texture: Crystalline and micaceous.
Colour: Reddish brown and pink.
Grain Size: Very fine and fine-grained.
Other Comments: This weakly weathered and ferruginized rock appears under a binocular microscope to be a lamprophyre, probably the variety minette, composed of fine interlocking aggregates of alkali feldspar and biotite dusted by Fe-oxides.

MICROSCOPIC CHARACTERISTICS

Constituents: (Percent visual estimate)

80% Orthoclase (alkali feldspar) and biotite of essential origin occur in about equal abundance as fine randomly oriented tabular and lath shaped clusters of the former, and as flakes, clusters and micaceous aggregates of the latter that exhibit some evidence of orientation, but none of metasomatic alteration or recrystallization. Quartz, primary or metasomatic, is not exposed.

20% Opaques occur as dusty granules, clusters and patchy granular aggregates composed of exotic Fe-oxides, and as discrete intergranular replicas after oxidized accessory iron ore, and possibly some pyrite.

Texture: Crystalline and micaceous.
Surficial Alteration: Weak weathering and ferruginization (oxidation).
Metasomatic Alteration: None exposed.

Petrogenesis: A weakly weathered and ferruginized, minette (biotite-orthoclase lamprophyre).

Remarks: It should here be mentioned that lamprophyres are often associated with gold deposits in various parts of Asia and North America. This minette was not metasomatically altered or recrystallized. It could be weakly pyritic.

ROCK NAME: WEAKLY WEATHERED AND FERRUGINIZED, MINETTE (BIOTITE-ORTHOCLOASE LAMPROPHYRE)
PETROGRAPHIC DESCRIPTION

Sample No. PR 9 METANA Registered No. IL 28729
Thin section

MEGASCOPIC CHARACTERISTICS

Field Name: A feldspathic lamprophyre phase.
Nature of Sample: Small rock sample from 3880E/1845N
Texture: Crystalline and granular.
Colour: Pale brown and reddish brown.
Grain Size: Very fine and fine-grained.
Other Comments: This weakly weathered and ferruginized, feldspathic igneous rock appears under a binocular microscope to contain little or no biotite, and could thus be classified as a feldspathic lamprophyre. Lamprophyres vary considerably in their mineralogy and chemical composition. Alkali feldspar is dominant in this case.

MICROSCOPIC CHARACTERISTICS

 Constituents: (Percent visual estimate)

78% Orthoclase of essential (primary) origin occurs as fine, interlocking, randomly oriented tabular and lath shaped grains that have been dusted and stained by Fe-oxide minerals. Minor biotite, quartz and scattered opaque euhedral and clusters are enclosed. The alkali feldspar grains have a turbid appearance due to the effects of weathering to clay minerals.

20% Opaques occur as dusty granules, clusters and granular aggregates composed of exotic goethite and/or hematite, and as scattered discrete anhedral to euhedral grains and clusters that can only be identified in reflected light. Accessory iron ore is probably dominant.

1% Biotite occurs as very fine, exotic Fe-oxides dusted and stained flakes and clusters locked in orthoclase that show evidence of retrograde chloritization.

1% Quartz occurs as interstitial anhedral at the feldspar grain interfaces. It is of primary origin.

Texture: Crystalline and granular.
Surficial Alteration: Weak weathering and ferruginization.
Metasomatic Alteration: None exposed.

Petrogenesis: A weakly weathered and ferruginized, feldspathic lamprophyre (weakly biotitic).
Sample No. PR9  METANA
Thin section

Remarks: This alkali feldspar dominant feldspathic lamprophyre could also be classified as an orthoclaseite. It could again have been weakly pyritic. Dusty hematite is probably also present.

ROCK NAME: WEAKLY WEATHERED AND FERRUGINIZED, FELDSPATHIC LAMPROPHYRE (WEAKLY BIOTITIC).
MEGASCOPIHC CHARACTERISTICS

Field Name: A silicified greywacke.
Nature of Sample: Small rock sample from 4120E/1960N
Minerals Visible: Quartz, sericite and opaques.
Texture: Relic clastic, and possibly also volcaniclastic.
Colour: Pale brown and grey.
Grain Size: Very fine and fine-grained.
Other Comments: This weakly weathered and oxidized rock appears under a binocular microscope to be a strongly sericitized arenaceous sediment (sandstone), or a tuffaceous arenite if a pyroclastic component is present as quartz volcaniclasts.

MICROSCOPIC CHARACTERISTICS

Constituents: (Percent visual estimate)

38% Quartz occurs as often suboriented and
oriented, angular to subrounded, loosely packed, arenite sized
clasts, and as several subrounded embayed volcaniclasts set
in an altered, opaques dusted matrix composed of cryptocrystalline
quartz interlocked with sericite. Several fine cherty clasts are also present. The quartz clasts are poorly sorted
and ungraded.

38% Sericite, possibly of K-metasomatic origin,
occurs as finely matted aggregates in the altered matrix, and
as pseudomorphs after feldspar clasts and lithoclasts that
exhibit no relic igneous or clastic textures.

24% Opaques occur as very fine anhedra and
clusters, and as scattered, discrete, interstitial and inter-
granular subhedral and euhedral grains and crystalline clusters
that appear to be composed of oxidized magnetite and pyrite
replicas. Identification is only possible in reflected light
with the aid of a polished section.

Texture: Relic clastic and volcaniclastic.
Surficial Alteration: Weak weathering and oxidation.
Metasomatic Alteration: Silicification and sericitization.

Petrogenesis: A weakly weathered and ferruginized, silici-
fied and sericitized, ?pyritic, tuffaceous lithic
arenite (possibly a greywacke).
Sample No. PR 10 METANA
Thin section

Remarks: Many greywackes have a tuffaceous ingredient in the form of minor quartz volcaniclasts and lithic fragments of volcanic origin. Magnetite and pyrite replicas appear to be represented.

ROCK NAME: WEAKLY WEATHERED AND FERRUGINIZED, SILICIFIED AND SERICITIZED, ?PYRITIC, TUFFACEOUS LITHIC ARENITE (POSSIBLY A GREYWACKE)
MINTEK SERVICES

PETROGRAPHIC DESCRIPTION

Sample No. PR 11 METANA Registered No. IL 28731
Thin section

MEGASCOPIC CHARACTERISTICS

Field Name: A hornfels.
Nature of Sample: Small ferruginized rock sample. 3770E/1845N
Minerals Visible: Quartz, minor sericite and opaques.
Texture: Finely mosaic textured and granular.
Colour: Brown, tan and grey.
Grain Size: Very fine and fine-grained.
Other Comments: This weakly weathered and ferruginized, siliceous rock appears under a binocular microscope to be predominantly composed of cryptocrystalline quartz, minor sericite and abundant euohedral opaque replicas after oxidized pyrite and/or magnetite. Relic clastic and volcanioclastic textures are absent.

MICROSCOPIC CHARACTERISTICS

 Constituents: (Percent visual estimate)

50% Quartz, probably of metasomatic (exhalative) origin, occurs as opaques (Fe-oxides) dusted, cryptocrystalline mosaic textured aggregates with cherty fabric that exhibit no relic igneous or clastic textures. The quartz encloses abundant opaque euohedra and clusters and minor sericite.

30% Opaques occur abundantly as dusty granules, clusters and granular aggregates composed of exotic goethite and/or hematite, and dominantly as discrete interstitial and intergranular anhedral to euohedral grains and crystalline clusters that appear to be composed of oxidized pyrite and/or magnetite (maghemite). Relic sulphide textures can only be identified in reflected light. Fe-oxides filled microfractures are also present.

20% Sericite occurs as very fine flakes, clusters and patchy matted aggregates, and as a microfracture filling that could be of metasomatic origin. It was stained and masked by Fe-oxides.

Texture: Finely mosaic textured and granular.
Surficial Alteration: Weak weathering and ferruginization.
Metasomatic Alteration: Weak sericitization and silicification.
Sample No. PR 11 METANA
Thin section


Remarks: This cherty hornfels with abundant pyrite and/or magnetite replicas, and minor sericite, was probably derived from a pelitic sediment, or fine-grained igneous rock. Sericitization was highly irregular.

ROCK NAME: WEAKLY WEATHERED, FERRUGINIZED AND MICROFRACTURED, ?MINERALIZED, SERICITIC (CHERTY) HORNFELS.
MINTEK SERVICES

PETROGRAPHIC DESCRIPTION

Sample No. PR12 METANA Registered No. IL 28732
Thin section

MEGASCOPIC CHARACTERISTICS

Field Name: A quartz - feldspar porphyry.
Nature of Sample: Small ferruginized rock sample from 3710E/1925N
Minerals Visible: Quartz, sericite and opaques (Fe-oxides).
Texture: Relic porphyritic and granular.
Colour: Reddish brown, brown and pink.
Grain Size: Very fine and fine-grained.
Other Comments: This weathered and ferruginized rock appears under a hand lens to be a strongly metasomatically altered, quartz - feldspar porphyry in which only the quartz phenocrysts survived alteration. Late quartz filled microfractures are present.

MICROSCOPIC CHARACTERISTICS

Constituents: (Percent visual estimate)

40% Quartz occurs as often embayed (corroded) subangular, subrounded, ovoid shaped and rarely subhedral relic microphenocrysts and phenocrysts set in an exotic Fe-oxides dusted and stained, altered groundmass composed of cryptocrystalline and microcrystalline secondary quartz and sericite that enclose oxidized opaque (?pyrite) replicas. Quartz filled microfractures are rare.

36% Sericite, possibly of K-metasomatic origin, occurs as exotic Fe-oxides dusted, stained and occasionally masked matted aggregates interlocked with the groundmass quartz, and as several tabular and lath shaped pseudomorphs after feldspar phenocrysts stained and masked by Fe-oxides.

24% Opaques occur abundantly as very fine grains, clusters and granular aggregates composed of exotic goethite and/or hematite, and as scattered, discrete, interstitial and intergranular anhedral to euhedral replicas after oxidized primary pyrite, and probably accessory magnetite.

Texture: Relic porphyritic and granular.
Surficial Alteration: Weathering and ferruginization.
Metasomatic Alteration: Silicification and sericitization (K-metasomatism).

Petrogenesis: A weakly weathered and ferruginized, silicified, sericitized and pyritized quartz - feldspar porphyry.

...2
Sample No. PR 12  METANA
Thin section

Remarks: The relic quartz phenocrysts, and altered feldspar phenocrysts, suggest that the precursor was a quartz-feldspar porphyry. It appears to have been pyritized and microfractured.

ROCK NAME: WEAKLY WEATHERED AND FERRUGINIZED, SILICIFIED, SERICITIZED AND PYRITIZED QUARTZ-FELDSPAR PORPHYRY.
MINTEK SERVICES

PETROGRAPHIC DESCRIPTION

Sample No. PR 13 METANA Registered No. IL 28733
Thin section

MEGASCOPIC CHARACTERISTICS

Field Name: A ?foliated quartz porphyry.
Nature of Sample: Small ferruginized rock sample from 3715E/
1920N
Minerals Visible: Quartz, sericite and opaques.
Texture: Foliated and relic porphyritic.
Colour: Brown and tan.
Grain Size: Very fine and fine-grained.
Other Comments: This weakly weathered, ferruginized and shear-
ed rock appears under a binocular microscope to be a strongly
metasomatically altered, subvolcanic quartz porphyry, or quartz-
feldspar porphyry in which only the quartz phenocrysts survived
alteration and recrystallization. It could again be weakly
pyritic. Shearing produced in places pseudo-pyroclastic tex-
tures.

MICROSCOPIC CHARACTERISTICS

Constituents: (Percent visual estimate)

40% Quartz occurs as suboriented and orient-
ed angular to rounded, occasionally embayed, relic micropheno-
crysts and phenocrysts that exhibit undulose extinction due
to stress, and as rare lenticular aggregates set in an exotic
Fe-oxides dusted and stained, altered and recrystallized ground-
mass composed of cryptocrystalline quartz interlocked with sub-
ordinate sericite and scattered, indeterminate opaque euhedra
and clusters. Most of the groundmass quartz could be of meta-
somatic origin.

36% Sericite occurs as very fine flakes,
clusters and shear oriented lenticular aggregates with matted
fabric in the sheared groundmass, and as pseudomorphs after
feldspar microphenocrysts. Biotite and chlorite are absent.

24% Opaques occur as dusty granules, clust-
ers and discontinuous shear fillings composed of exotic goethite
and/or hematite, and as discrete interstitial and intergranular
subhedral and euhedral grains and clusters that appear in trans-
mitt ed light to be composed of oxidized accessory iron ore and
pyrite replicas with cubic habit.

Texture: Relic porphyritic and weakly foliated (sheared).
Surficial Alteration: Weathering and ferruginization (oxi-
dation).

...2
Sample No.  PR 13  METANA  
Thin section  

Metasomatic Alteration: Silicification and sericitization  
(K-metasomatism)  

Petrogenesis: A weathered, ferruginized and sheared, silicified, sericitized and pyritized, quartz-feldspar porphyry (?subvolcanic).  

Remarks: Despite the effects of weathering, shearing and metasomatic alteration, sufficient igneous textures survived to suggest that the precursor was a quartz-feldspar porphyry, possibly of subvolcanic origin. It was probably also pyritized since cubic replicas can be seen.  

ROCK NAME: WEATHERED, FERRUGINIZED AND SHEARED, SILICIFIED, SERICITIZED AND PYRITIZED, QUARTZ-FELDSPAR PORPHYRY (?SUBVOLCANIC).
MINTEK SERVICES

PETROGRAPHIC DESCRIPTION

Sample No. PR 14 METANA
Thin section
Registered No. IL 28734

MEGASCOPIC CHARACTERISTICS

Field Name: A silicified greywacke.
Nature of Sample: Small rock sample from location 3770E/1735N
Minerals Visible: Quartz, sericite and opaques.
Texture: Weakly foliated (sheared), relic porphyritic or fragmental.
Colour: Beige, buff and cream.
Grain Size: Very fine and fine-grained.
Other Comments: This weakly weathered, oxidized and sheared felsic igneous rock appears under a hand lens to be a strongly metasomatically altered quartz porphyry, quartz-feldspar porphyry or fragmental in which only the resistant quartz phenocrysts or volcaniclasts survived, thus making identification of the precursor possible.

MICROSCOPIC CHARACTERISTICS

Constituents: (Percent visual estimate)

45% Quartz occurs as erratically distributed, subangular to rounded, often embayed relic microphenocrysts and phenocrysts set in an Fe-oxides dusted, sheared, altered and recrystallized groundmass composed of cryptocrystalline and microcrystalline mosaic textured quartz with granoblastic fabric, that are interlocked with often shear oriented sericite. Several subrounded siliceous xenoliths are also present.

38% Sericite occurs as exotic Fe-oxides dusted clusters, matted aggregates and shear oriented lenticular aggregates, and as discontinuous shear fillings in the groundmass. It is probably of K-metasomatic origin.

17% Opaques occur as dusty granules and clusters composed of exotic Fe-oxides, and dominantly as discrete interstitial and intergranular anhedral to euhedral grains and crystalline clusters that appear to be predominantly composed of oxidized primary pyrite replicas, and possibly accessory iron ore.

Texture: Weakly foliated (sheared) and relic porphyritic.
Surficial Alteration: Weak weathering and oxidation.
Metasomatic Alteration: Silicification and sericitization (K-metasomatism).
Sample No. PR14 METANA
Thin section

petrogenesis: A weakly sheared, weathered and oxidized, silicified, sericitized and ?pyritized, quartz porphyry (with xenoliths).

Remarks: The effects of irregular shearing produced a pseudo-fragmental fabric in this altered quartz porphyry, hence the superficial resemblance to a felsic lithic crystal tuff. It was strongly metasomatically altered, and probably pyritized. Texturally similar porphyries that resemble felsic fragmentals are found in the Eastern Goldfields of Western Australia.

ROCK NAME: WEAKLY SHEARED, WEATHERED AND OXIDIZED, SILICIFIED, SERICITIZED AND ?PYRITIZED, QUARTZ PORPHYRY (WITH XENOLITHS).
APPENDIX 2
ROCK CHIP GEOCHEMICAL ANALYSIS REPORTS
<table>
<thead>
<tr>
<th>UBE No.</th>
<th>SAMPLE No.</th>
<th>Li</th>
<th>Be</th>
<th>B</th>
<th>Na</th>
<th>Mg (6% HCl)</th>
<th>Al (6% HCl)</th>
<th>Si</th>
<th>P</th>
<th>K</th>
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Rough Average

- 25% Na₂O
- 5% MgO
- 16% Al₂O₃
- 50% SiO₂
- 7% P₂O₅
- 10% K₂O

| DETECTION | 2 | 1 | 10 | 50 | 0.001 | 0.010 | 0.10 | 100 | 0.05 |
| UNITS     | ppm | ppm | ppm | ppm | % | % | % | ppm | % |
| METHOD    | 206 | 206 | 206 | 206 | 206 | 206 | 206 | 206 | 206 |

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
- = element not determined
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<td>10% Fe₂O₃</td>
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Results in ppm unless otherwise specified.
T = element present; but concentration too low to measure
X = element concentration is below detection limit
- = element not determined
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Results in ppm unless otherwise specified
T = element present; but concentration too low to measure
X = element concentration is below detection limit
--- = element not determined
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<td>&lt;1</td>
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<tr>
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<td>R4</td>
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| 23    | DETECTION  | 5  | 100 | 10  | 5  | 15  | 20  | 20  | 5  | 1  |
| 24    | UNITS      | ppm| ppm | ppm | ppm| ppm | ppm | ppm | ppm| ppm|
| 25    | METHOD     | 206| 206 | 206 | 206| 206 | 206 | 206 | 206| 206|

Results in ppm unless otherwise specified
T = element present but concentration too low to measure
X = element concentration is below detection limit
--- = element not determined
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<th>Ho</th>
<th>Er</th>
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<tr>
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<td>&lt;2</td>
<td>&lt;10</td>
<td>&lt;10</td>
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<td>6</td>
<td>&lt;10</td>
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| DETECTION | 10 | 5  | 5  | 20 | 2  | 2  | 2  | 10 | 10 |
| UNITS      | ppm| ppm| ppm| ppm| ppm| ppm| ppm| ppm| ppm|
| METHOD     | 206| 206| 206| 206| 206| 206| 206| 206| 206|

Results in ppm unless otherwise specified.
T = element present; but concentration too low to measure.
X+ = element concentration is below detection limit.
- = element not determined.

AUTHORISED
OFFICER

ANALABS
A Division of MacGregor Hamilton & Co. Pty. Ltd.
ANALYTICAL DATA
SAMPLE PREFIX: 127.4.43.24058
REPORT NUMBER: 32075
REPORT DATE: 11/10/88
CLIENT ORDER NO.: 5 of 6
<table>
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Results in ppm unless otherwise specified:

- X = element present but concentration too low to measure
- - = element not determined

DETECTION 20 10 200 10 200
UNITS ppm ppm ppm ppm ppm
METHOD 206 206 206 206 206