ANNUAL REPORT

NEWMONT AUSTRALIA

NEWMONT TANAMI PTY LTD

1ST ANNUAL REPORT FOR SEL 23658 (LENNARDS)

for the period
03/04/2003 to **02/04/2004**

Central Tanami
NORTHERN TERRITORY

Volume **1** of **1**

1:250,000 SHEET:	The Granites	SF52-03
1:100,000 SHEET:	Ptilotus	4957

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TENEMENT HOLDERS: Newmont Tanami Pty Ltd

DISTRIBUTION:

- ❑ Northern Territory Department of Business, Industry & Resource Development
- ❑ Newmont Australia

SUMMARY

This is the first annual report for SEL 23658 (Lennards) covering the year to the 2nd April 2004.

Substitute Exploration Licence SEL 23658 is centred approximately 33km northwest of The Granites Gold Mine. It is readily accessible via roads and tracks leading from the Tanami Road, which bisects the licence (Figure 1). The licence was granted on the 3rd April 2003.

During the reporting period, exploration included an orientation Soil Survey, and a RAB drilling program over the Lennards Ridge prospect.

Work Completed during the reporting period comprised:

TECHNIQUE	SAMPLE TYPE	DESCRIPTION
Geochemical Sampling	Soil	132 Samples
Drilling	RAB	75 holes for 3699m

The SEL was also included in a Tanami-wide regional structural mapping project. This project commenced in October 2003 and is still in progress. In conjunction with the structural project, ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) satellite imagery has been purchased, and is currently being interpreted to provide regional lithological, structural and mineral alteration signatures.

It is proposed that future work will involve the evaluation of prospect areas defined by target generation from the regional structural and ASTER studies. Conceptual targets outlined will be assessed using surface geochemical sampling and/or aircore / RAB drilling, depending on the particular geological and regolith settings.

In addition, it is proposed to recommence exploration of the advanced East Ptilotus mineralised prospect, which contains a non-reportable gold resource in several discrete zones. The East Ptilotus prospect is an extremely structurally complicated area, and past exploration has underestimated the local structural complexities. Future work in the area will involve a systematic and detailed structural analysis, with targets tested using RAB, RC and Diamond drilling.

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1 INTRODUCTION

This report summarises the work carried out by Newmont Exploration Pty Ltd, on behalf of Newmont Tanami Pty Ltd on the Lennards substitution exploration licence during the period 03/04/2003 to 02/04/2004.

2 LICENCE DETAILS

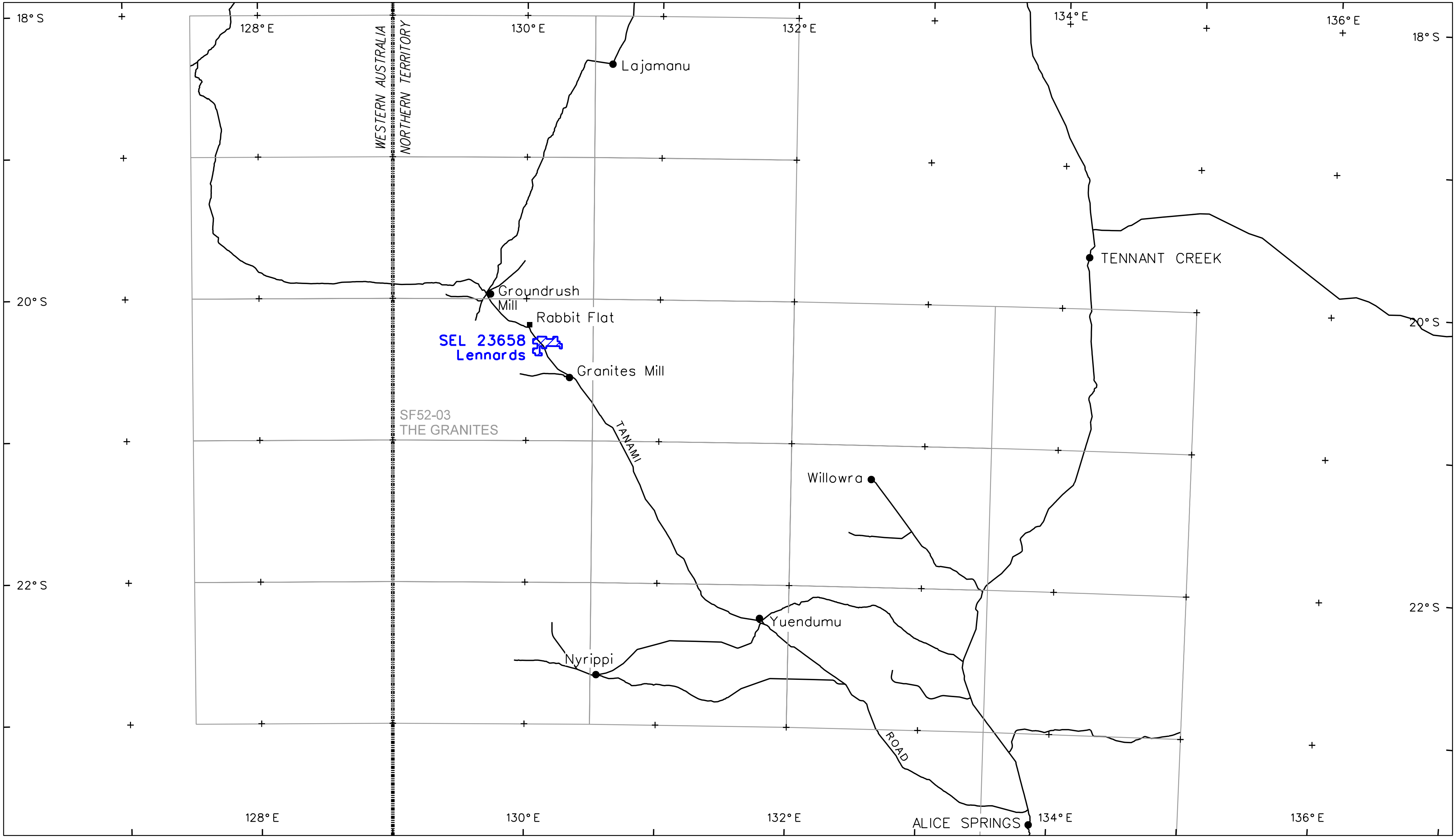
Newmont Tanami Pty Limited is the current holder of substitute licence 23658. It was granted on the 3rd April 2003, replacing EL 2367 and the eastern section of EL 2370.

The licence is on Aboriginal Freehold and is therefore subject to agreements with the Central Land Council (CLC). The location of the licence is illustrated in Figure 1 and tenure details are summarised in Table 1.

TABLE 1: Lennards Exploration Licence Statistics.

TENEMENT		DATE OF		NUMBER OF BLOCKS	Area
Number	**Name**	**Grant**	**Expiry**	**Current**	**Km^2**
SEL 23658	**Lennards**	03/04/2003	02/04/2007	55	117.1

Under sections 26 and 28 of the NT Mining Act, the licence area was due to be reduced by 50% in March 2003. An application to waive this reduction is currently with DBIRD.



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Transverse Mercator Projection - UTM Zone 52
Australian Geodetic Datum - AGD66

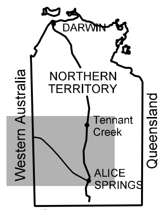
NEWMONT EXPLORATION

SEL 23658 (LENNARDS)
CENTRAL TANAMI PROJECT

TENEMENT LOCATION MAP

01/04/2004

NT Location



NEWMONT AUSTRALIA

FIGURE 1

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3 LOCATION, ACCESS, INFRASTRUCTURE, SURVEY CONTROL & ENVIRONMENTAL PRACTICE

3.1 LOCATION & ACCESS

The Lennards SEL is centred approximately 33km northwest of The Granites Gold Mine. It is readily accessible via roads and tracks leading from the Tanami Road, which bisects the licence (Figure 1).

Geographically, the area lies in the western part of the Tanami Desert, a generally flat and featureless sand-covered landscape of spinifex and low scrub. The tenement lies within Aboriginal freehold land.

The annual average rainfall is of the order of 200mm, which is mostly derived from summer monsoonal and storm activity. Daily temperatures vary from minima of near freezing in winter to summer maxima of approximately 48°C. The area is devoid of surface water except in small soaks after heavy rain.

Access to the area is by air or via the Tanami Highway. A basic network of pre-existing and newly formed tracks link individual prospect areas to the major exploration camps at The Granites and Wilsons (Figure 2). A bitumen ore haulage road connects the Dead Bullock Soak mining operation with The Granites mill processing and camp facilities.

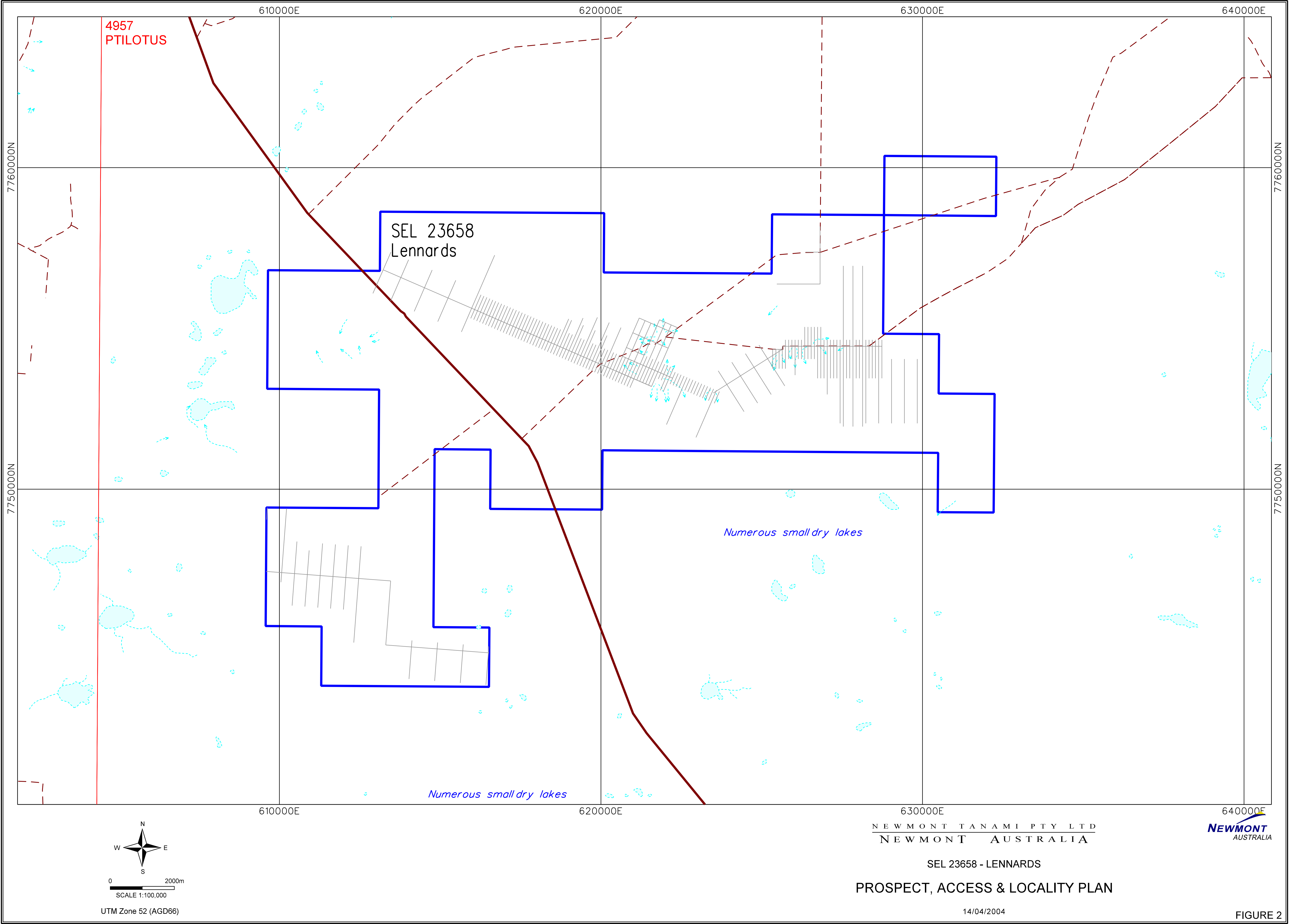
3.2 INFRASTRUCTURE

Prior to the presence of Newmont Exploration and predecessor companies in this part of the Tanami region, infrastructure was almost completely lacking. Currently supplies are trucked or flown to the permanent camp at the Granites from Alice Springs. Telephone and fax using microwave links service this camp. Water is provided by two remote borefields. One borefield lies 35km east of The Granites (Billabong) and the other 10km northeast of Dead Bullock Soak (Jumbuck). Power is locally generated at exploration bases and mine sites. The nearest settlements are the Rabbit Flat roadhouse 50km to the northwest of The Granites on the Tanami Road and Tanami Downs pastoral homestead 60km to the west. The nearest town is Yuendumu Aboriginal community some 250km southeast of The Granites on the Tanami Road.

3.3 ENVIRONMENTAL PRACTICE

Rehabilitation of exploration sites is carried out pursuant to Section 24(e) of the NT Mining Act and in accordance with the Departments “Guidelines for Rehabilitation of Exploration Sites”;

- all drillholes are capped on completion
- all grid lines and tracks are rehabilitated when no longer needed.



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SEL 23658 - LENNARDS

PROSPECT, ACCESS & LOCALITY PLAN

14/04/2004

FIGURE 2

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4 PREVIOUS EXPLORATION

SEL 23658 has replaced the 55 sub blocks of EL2369 and the 27 eastern sub blocks of EL 2370 previously held by Newmont Exploration.

All details of the work completed during the tenure of these licences can be found in the reports listed in the bibliographic section of this report.

5 EXPLORATION OBJECTIVES

Exploration and mine-based reasearch studies indicate that gold mineralisation in the region has an association with a broad range of geological environments, all displaying common characteristics. Models of gold occurrence for which the Tanami is believed to be most prospective include:

- Disseminated, stratabound deposits hosted by ‘banded iron formations’, and chemically reactive iron-rich lithologies (The Granites, Dead Bullock Soak, Windy Hill);
- Relatively late stage discordant stockwork and sheeted quartz veins, controlled by anticlinal folding, shear zones and chemically reactive carbonaceous lithologies (Callie, Titania, Coyote);
- Shear zone-controlled quartz veining with strong alteration characteristics, hosted in both sediments and mafic intrusives (Groundrush, East Ptilotus);
- Brittle fault-controlled quartz veins in mafic extrusives (Hurricane, Repulse, Jim’s);
- Deposits in regolith containing gold concentrated by alluvial, eluvial or lateritic processes (Titania, Tanami, Coyote).

With these models in mind, the Company’s geologists have selected prospective target exploration areas based on regional geological, structural, geophysical and geochemical data.

Detailed assessment of the targets is undertaken using a range of exploration techniques. These are designed to reveal the geology of the target area and the presence of indicator elements, particularly gold itself, in anomalous quantities.

Effective exploration is made difficult in places by the extensive cover of windblown sand and other transported material, which conceals the rock and associated soil, typically to a thickness of several metres. This blanket covers a large proportion of the region. Consequently the exploration process relies heavily on point samples obtained by drilling to expose bedrock.

6 GEOLOGY

The Granites-Tanami Goldfields lie in the eastern part of the Early Proterozoic Granites-Tanami Inlier, which is part of the Northern Australian Orogenic Province (Plumb, 1990). The Inlier abuts the Arunta Complex to the south and east and is probably a continuation of the Halls Creek Orogen in Western Australia (Hendrickx, et al, 2000). The Inlier underlies younger cover sequences including the extensive Paleozoic Wiso Basin on its northeastern margin, and Victoria River Basin to the north. To the west, clastic sediments of the Middle Proterozoic Birrindudu Basin overlie and separate the Inlier from the similar age rocks in the Halls Creek Province.

The oldest rocks of the Tanami region belong to the Billabong Complex, a suite of Archaean age gneiss and schist. This is unconformably overlain by the Proterozoic MacFarlanes Peak Group (mafic volcanic and volcanoclastic rocks), followed by a thick succession of clastic sediments of the Tanami Group. (Hendrickx et al, 2000). A suite of syn-to post-deformation dolerites and gabbros are found intruding both the MacFarlane Peak and Tanami Groups.

Complex, polyphase deformation during the Barramundi Orogeny (1845 – 1840Ma) has affected the entire Granites-Tanami Inlier. It appears to have been largely controlled by two sets of regional scale fundamental crustal fractures that trend NNE and WNW. This is evidenced by the orientation of successive phases of macroscopic folding in the region and the consistent sympathetic trends of late tectonic faults.

Peak metamorphism during the Barramundi Orogeny reached amphibolite facies (The Granites Gold Mine), but is more generally greenschist facies through the Inlier (Callie Gold Mine). Contact metamorphic aureoles, commonly identified in pelitic schist units by randomly orientated andalusite porphyroblasts, are well developed at the margins of the syn- and post-orogenic granite plutons.

Localised extension followed, forming small basins which filled with shallow marine sediments to the west (Pargee Sandstone) and pillow basalts and turbiditic sediments to the east (Mt. Charles Formation).

Following the period if extension, widespread granite intrusion and volcanism followed in the period 1830 – 1810 Ma. At least three suites of granitic intrusives and two volcanic complexes are present. The last intrusion of (undeformed) granite occurred at around 1800 – 1795Ma, with intrusion of The Granites Suite (Hendrickx et al, 2000).

Residual hills of gently folded Carpentarian Gardiner Sandstone unconformably overlie Early Proterozoic lithologies. Younger flatlying Cambrian Antrim Plateau Basalts are also preserved as platform cover in areas protected from erosional stripping.

Tertiary drainage channels, now completely filled with alluvial and lacustrine clays and calcrete are a major feature of the region. Some drainage profiles are 10 km wide and greater than 100m deep.

A desert terrain comprising transported and residual colluvial cover sediments and aeolian sand blanket a large portion of the Inlier, with an estimated outcrop exposure of less than 10% of the early Proterozoic lithological units.

Gold mineralisation within the Newmont Tanami tenement holdings is dominantly hosted by the Tanami Group, a sequence of fine to medium-grained turbiditic metagreywackes with lesser amounts of metapelite, carbonaceous siltstone and schist, banded iron-formation, chert and calcsilicates. (Hendrickx et al, 2000). Owing to their more resistant nature, only the cherts and iron-formations and associated interbedded graphitic schists tend to outcrop above the sand plain. The interlayered pillow basalts and sediments of the Mt.Charles Formation at the Tanami Mine deposits also host significant gold mineralisation.

7 WORK COMPLETED

7.1 ORIENTATION SOIL SAMPLE SURVEY

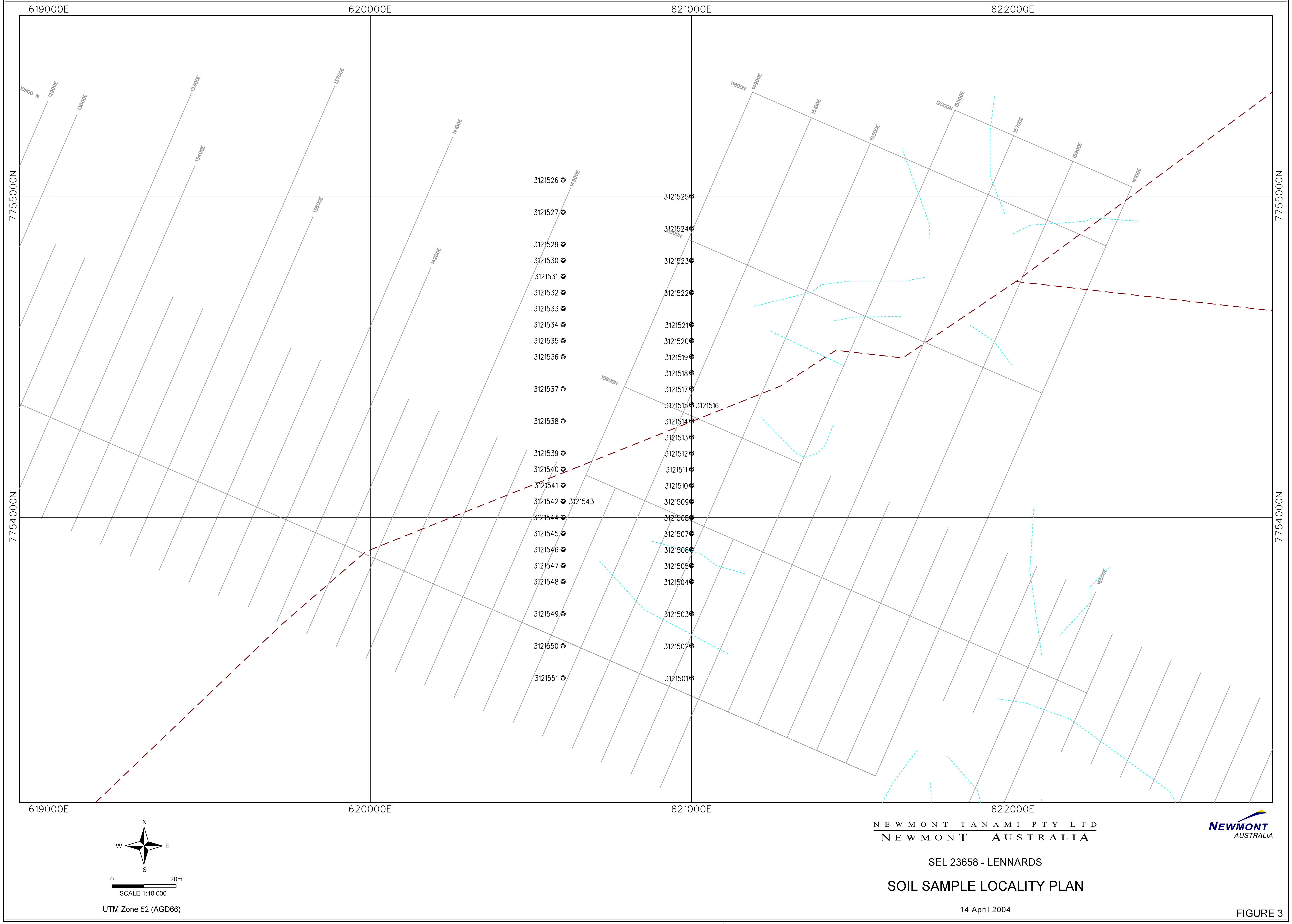
An orientation geochemical soil sampling program was undertaken on the SEL in late 2003. The program comprised a single traverse of 48 samples collected over the Lennards Ridge prospect area, using GPS control. The sample spacings ranging from 50 to 100 metres. Refer Figure 3 for sample locations.

The aim of the survey was to collect bulk samples (~5kg) for sieving and analysis in the Newmont in-house geochemical laboratory in Perth, to determine if a large mafic dolerite intrusive body could be accurately defined beneath deep transported cover using geochemical analysis of trace elements.

TABLE 2. Soil Sample Details.

Sample Type	Sample ID	No. Samples	Elements Analysed	Lab Method
Soil	3121501-551	48	No samples analysed	
Dup		2		
				Total: 50 samples

At the time of writing this report, the geochemical analyses of these samples had not been completed. All results from this survey will be reported in the next annual report for the SEL.



UTM Zone 52 (AGD66)

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SEL 23658 - LENNARDS

SOIL SAMPLE LOCALITY PLAN

14 April 2004

FIGURE 3

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7.2 LENNARDS RIDGE – MT. PTILOTUS RAB DRILLING

A drilling program at the Mt Ptilotus/Lennards Ridge area was completed. In total, 75 drill holes were completed for 3694m drilled and 1265 samples submitted for analysis. Refer Figure 4 for drillhole locations.

TABLE 3. RAB Drillhole/Sample Details.

Hole ID	Drillhole Type	No.	Metres	No. Samples	Elements Analysed	ALS Lab Method
PRB1836-PRB1910	Blade RAB	52	2521	871	Au	AU-GF42
	Hammer RAB	23	1173	394	As, Bi, Cu, Fe, Mn	ME-ICP43
	Total:	**75**	**3694**	**1265 samples**		

<u>Results</u>:

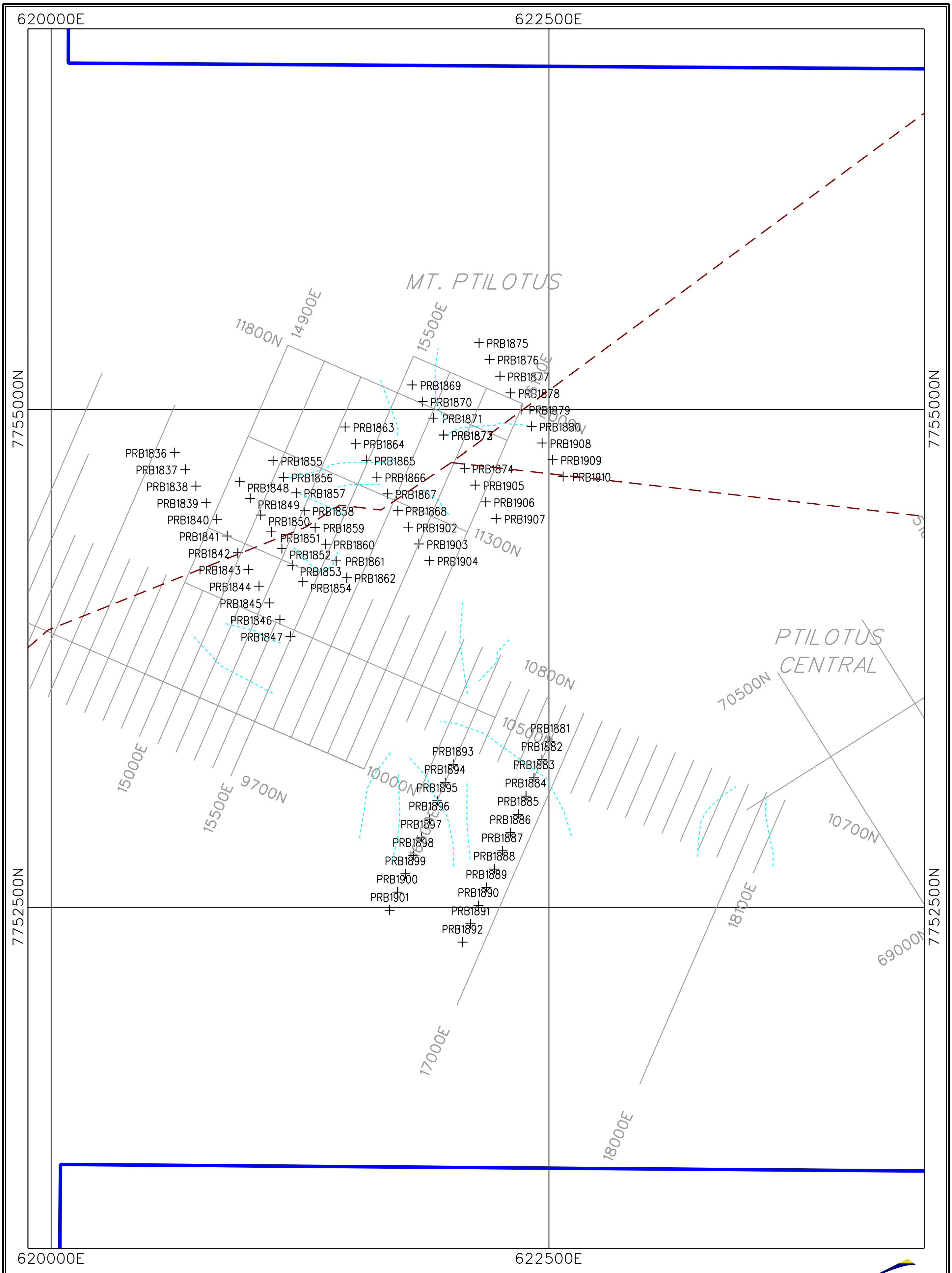
The program was designed to confirm the interpretation of an anticlinal structure, from both previous mapping and new airborne magnetics data. This area coincided with the location of Mt Ptilotus. Data obtained from drilling could be used to confirm the presence of an anticlinal structure. However the axial strike of the anticline differs from the original mapped interpretation by about 20 degrees, and the stratigraphy is more complicated. The sequence as mapped from youngest to eldest included a metamorphosed granite (Inningarra Granite?) a graphitic schist, a haematitic/biotite amphibole schist and a metabasalt/chloritic schist. The northern limb of the anticline has been stoped out by another younger granite. Rock-chip results greater than 1000ppm As that were once mapped to occur on the southern limb of this anticline, now appear to occupy the nose. Also the presence of chert units is not as extensive as first mapped, and these may be over-represented compared to other rock types in the rock-chip data from this area.

Assay results from the 75 RAB drill holes (1265 samples) were returned and assessed. Results from the samples collected from drill holes centered over the anticlinal structure did not indicate the presence of a body of gold mineralisation of any significance. There was a small zone of arsenic alteration within the nose of the anticline in haematitic graphitic schist, however there were no gold results >0.1ppm associated with it.

Results from the samples collected from the drill holes centered over the southern magnetic target did show that there is a zone of arsenic alteration with low level gold mineralisation ((between 0.02 and 0.2ppm Au) that occurs along the northern margin of this magnetic anomaly. These results were obtained from a fine-grained graphitic schist. There may be scope here for one or two more traverses of RAB drilling, following this part of the magnetic anomaly looking for better occurrences of mineralisation, however the size of any body of economic mineralisation would now be small (≈50,000oz)

<u>Best results:</u>

PRB1872 3m@0.11g/t Au
PRB1864 3m@0.102g/t Au



UTM Zone 52 (AGD66)

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SEL 23658 - LENNARDS

RAB DRILLHOLE LOCALITY PLAN

APRIL 2004

FIGURE 4

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Next Steps:

The Anticlinal structure within the Mt Ptilotus area has been downgraded as a target for gold mineralisation. No further work is warranted. The southern magnetic feature may still have limited scope for a small body of gold mineralisation. However, a review of historic data with drill chips from this area is recommended, as the potential is considered marginal. No further fieldwork is therefore considered warranted in the immediate future.

7.3 REGIONAL STRUCTURAL STUDY AND ASTER INTEPRETATION

A major in-house regional structural mapping project commenced in October 2003, encompassing SEL 23658. The project is being undertaken by specialist consultants from RSG-Global Pty Ltd in conjunction with Newmont Exploration geological staff.

The regional mapping and interpretation is still in progress, and it is anticipated this will be finalised by July 2004. At this point in time it would be meaningless to report any outcomes from interpretation of the area within SEL 23658, as the project synthesis needs to be completed to put this in context with the whole Tanami region. Results and targets arising from this project will be reported in the next annual report for the SEL.

In conjunction with the structural project, ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) satellite imagery has been purchased, and is currently being interpreted to provide regional lithological, structural and mineral alteration signatures. Results from this project will also be reported in the forthcoming annual SEL report.

7.4 PETROLOGICAL REPORT

A re-evaluation of a suite of thin and polished thin sections prepared from subsurface rock taken from the East Ptilotus prospect was undertaken by APS.

The 23 sections were primarily taken from diamond core and drillchip. Brief descriptions are included Appendix 2.

8 EXPENDITURE

TABLE 4: Lennards Expenditure for the period 03/04/2003 to 02/04/2004.

	Costs
Employee Costs	57,514
Exploration Overheads and Allocations	21,822
Exploration Operating Costs	30,412
Laboratory Costs	18,601
Drilling Costs	42,171
Specialist Services	9,395
TOTAL:	**179,915**
Covenant:	**80,000**

9 PROPOSED WORK

Proposed exploration for SEL 23658 for the second year of tenure commencing April 2004 will include the following –

- Structural and geological evaluation of the East Ptilotus mineralised prospect, leading to further RAB, RC and diamond drilling;
- Regolith mapping and geochemical surface sampling of the north-western section of the SEL, using Newmonts' proprietary in-house techniques;
- Evaluation of targets defined by the combined regional structural / Aster interpretation to be completed by mid-2004. This will be undertaken using the appropriate geochemical or drilling techniques as determined by the target type and regolith characteristics.

TABLE 5: Lennards Proposed Expenditure for the period 03/04/2004 to 02/04/2005.

	Costs
Employee Costs	25,000
Exploration Overheads and Allocations	10,000
Exploration Operating Costs	15,000
Laboratory Costs	10,000
Drilling Costs	30,000
Specialist Services	10,000
TOTAL:	**100,000**
Covenant:	**100,000**

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Appendix 1:

DIGITAL SAMPLE & DRILLHOLE DATA

(See attached ASCII files)

SEL23658_200404_02_COLLAR.DAT
SEL23658_200404_03_SURVEY.DAT
SEL23658_200404_04_GEOLOGY.DAT
SEL23658_200404_05_ASSAY.DAT
SEL23658_200404_06_SURFACESAMPLES.DAT
SEL23658_200404_07_SURFACEGEOLOGY.DAT
SEL23658_200404_08_STRUCTURE.DAT

Appendix 2:

Petrology Report

Applied Petrological Services

PETROLOGICAL STUDIES
OF
SUBSURFACE SAMPLES
FROM
THE EAST PTILOTUS PROSPECT
CENTRAL TANAMI DESERT

FOR
NEWMONT AUSTRALIA LTD

February 2004

APS Report 264
Project No. 26012

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SUMMARY

1. The petrology of subsurface samples from East Ptilotus provides an example of intrusion hosted mineralisation, in which gold is interpreted to be genetically related to hydrothermal fluids that were sourced externally to the host intrusion(s).

2. Biotite and quartz bearing diorites together with interbedded silty sandstones, silty mudstones, carbonaceous mudstones and cherts have been subjected to a combination of intense metasomatism and thermal metamorphism. The metasomatism and thermal metamorphism are represented by peak-temperature replacement and fracture/cavity filling assemblages comprising one or more of biotite, albite, quartz, alkali feldspar, anthophyllite, pyrrhotite, pyrite, arsenopyrite, rutile, sphene, apatite and carbonate.

3. Variably distributed and developed chlorite and sericite/muscovite are representative of retrograde replacement and/or lower temperature hydrothermal overprinting.

4. The peak temperature metasomatism and thermal metamorphism has taken place within a strain regime that persisted until well after final formation of the replacement and fracture/cavity filling assemblages. The temperatures and fluid flux during peak metasomatism and metamorphism were such that a ductile style of deformation was widely enhanced.

5. Gold is contained in veins genetically related to the peak metasomatic and thermal metamorphic assemblages. Gold, mostly intergrown with quartz, alkali feldspar, biotite, arsenopyrite, rutile and carbonate occupies a mainly late position within the overall host vein paragenesis.

6. Cooling granitoids to the south of and perhaps somewhere beneath the East Ptilotus prospect area are likely to have provided the heat source required to effect the thermal metamorphic component identified in the modification of rocks of this study. The source of fluids, some bearing gold, required to effect the metasomatic component to the modification of the rocks maybe more equivocal. Fluids exsolved from granitoid intrusions, or essentially metamorphic fluids generated in domains of high heat flow leading to granite magma generation are possibilities.

INTRODUCTION

A re-evaluation of a suite of thin and polished thin sections prepared from subsurface rock taken from the East Ptilotus prospect, has been undertaken at the request of Newmont Australia Ltd. The East Ptilotus prospect is located in the central Tanami Desert, some 40 kilometres northwest of the Granites deposit/mill site (Figure 1). The sectioned rocks include diamond core and drill chip.

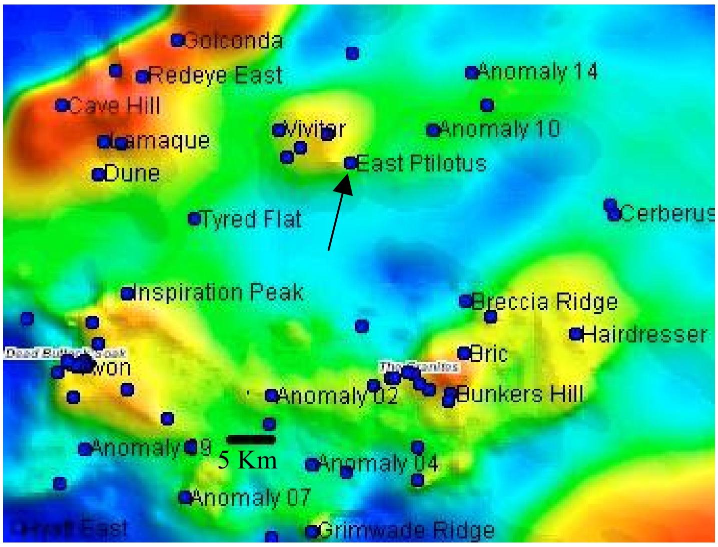

Figure 1. Regional gravity interpretation and East Ptilotus prospect location.

Gold mineralisation at the East Ptilotus prospect is hosted by meta-sedimentary and metamorphosed igneous rocks, which lie proximal to a voluminous acid igneous intrusion complex as may be interpreted from the large negative gravity anomaly situated immediately to the south of East Ptilotus (Figure 1).

The scope of this study is to review the thin section/polished thin section suite, noting essential petrographic/mineragraphic features as they relate to primary rock types, metamorphism, metasomatism, veining, fluid inclusions and mineralisation. From a summary of this review, interpretations of metamorphic and hydrothermal environment will be offered in terms of their significance to gold mineralisation.

Brief notes forming the basis of the petrographic/mineragraphic review are contained in Appendix One. Sections from Newmont reports 6547, 6362 and 5780 have been reviewed.

5780/1792. Thermally metamorphosed, metasomatised and strained quartz diorite.

Mainly tabular to prismatic albitic plagioclase interlocking with ghosted mafic minerals. Anhedral quartz is interstitial to plagioclase and mafic silicate minerals. Ghosted opaques are present also.

Mafic silicate minerals are altered to pervasive biotite overprinted by chlorite and carbonate. Interstitial quartz is recrystallised, and with granoblastic texture. Grains of biotite are intergrown with the recrystallised quartz. Grains and aggregates of arsenopyrite and rutile are intergrown with biotite. Aggregates of rutile and sphene intergrown with biotite have formed after the primary opaques.

Microfractures/fractures are filled with fine-grained anhedral, locally granoblastic to porphyroclastic quartz. Grains of arsenopyrite and rutile are intergrown with the quartz. With plastic deformation of the quartz, strain shadows about the arsenopyrite are filled with very fine-grained anhedral quartz intergrown with biotite (→ chlorite and carbonate). Grains of plastically deformed albite are interlocking with the quartz. Apatite occurs as inclusions within the quartz. Some alkali feldspar is intergrown with the quartz and overgrowths albite at wallrock margins. Preserved primary/pseudosecondary FI are gas-rich CO_2 bearing types. Chalcopyrite is present as inclusions in quartz, together with arsenopyrite.

Early microfracturing of the vein quartz is filled with very fine gained anhedral quartz. Late-stage cavities and fractures are filled with carbonate intergrown with chlorite and enclosing fragments of biotite and other wallrock and early vein/cement material.

5780/1792. A relatively more mafic intrusive rock with modal quartz. Early replacement comprises biotite + amphibole + rutile + Fe-sulphides → chlorite and carbonate. A strain fabric is present. Late hematite overprints all stages of early silicate minerals.

5780/1794. A strong strain fabric is associated with pervasive chlorite and epithermal style quartz.

5780/1790. A quartz diorite with interstitial quartz about 5% of the rock. The quartz is associated with graphic intergrowths of quartz and alkali feldspar, enclosing apatite. Granoblastic quartz and biotite (→ chlorite) is part of the replacement assemblage. The ghosted mafic mineral may have been of amphibole. Biotite and rutile replace the primary opaque minerals.

5790/1798. Primary mafic silicate minerals were less abundant. Biotite has formed along shears. Interstitial alkali feldspar is between 5 and 10% of the rock, intergrown with interstitial quartz and rimming framework plagioclase.

5790/1808, 1809. Brown biotite (→ chlorite) has formed after matrix and some framework clasts in feldspathic/lithic quartz arenites. Pervasive granoblastic quartz and biotite (→ chlorite and carbonate) with superimposed strain fabric has replaced silty mudstones.

6362/2411. Quartz + albite veining hosted by metamorphosed quartz diorite (biotite → chlorite, carbonate). Grains and aggregates of arsenopyrite are interlocking with the quartz and albite. Selvages of biotite (→ chlorite) are interstitial to the quartz and albite. Gas-rich, CO_2 bearing fluid inclusions are amongst earliest fluid inclusions. Grains of rutile, apatite and sphene are present. There is plastic deformation of quartz and albite, and fracturing of brittle arsenopyrite. Quartz is recrystallised, granoblastic and porphyroclastic in places. With localised fracturing and shearing, cavities and fractures are filled with granular quartz intergrown/interlocking with alkali feldspar (K-feldspar). Secondary arsenopyrite and biotite (→ chlorite) are intergrown with the secondary quartz. Carbonate forms an overprint to feldspars and quartz, and is intergrown with chlorite. Latest microfracturing is filled with carbonate and chlorite. The carbonate is rhombohedral in form and probably dolomite. Grains of xenotime and/or zircon are present in the quartz. Strain cavities about arsenopyrite are filled with biotite (→ chlorite) intergrown with quartz, alkali feldspar and a granular, high birefringent mineral.

Earliest gold occurs as euhedral inclusions within albite and quartz (together with grains of xenotime, rutile and apatite). Some gold is contained along twin places within individual albite grains, or occurs as inclusions with coarse-grained arsenopyrite. Late gold is intergrown with quartz, biotite and alkali feldspar sealing fractured arsenopyrite. Gold fills cavities defined by euhedral secondary quartz, and occurs as primary fluid inclusions within the euhedral quartz (together with gas-rich fluid inclusions). Gold is intergrown with the granular high birefringent, high relief mineral (intergrown with chlorite after biotite in the wallrock, and formed after albite in the veins). Chalcopyrite is intergrown with the carbonate and chlorite after biotite. Gold occurs as inclusions in K-feldspar that is intergrown with secondary quartz and overgrowing arsenopyrite or filling strain cavities about arsenopyrite.

6362/2422. Primary biotite is interlocking/intergrown with interstitial quartz, apatite, alkali feldspar and opaques minerals (ilmenite). Primary biotite is 5 to 10% of the rock. Abundant primary mafic minerals (pyroxene?) are replaced by pervasive secondary biotite interlocking with or enclosing euhedral to anhedral quartz. Primary feldspar is altered to sericite/illite. Secondary biotite is altered to chlorite. Carbonate is associated with illite/sericite and chlorite. Biotite veinlets are present. Biotite has also formed after primary feldspar (mainly in the form of veinlets).

6362/2419. Quartz + Fe-sulphides + albite veining with interstitial biotite. Gas-rich/filled, CO_2-rich/filled inclusions co-exist with aqueous rich, CO_2 bearing fluid inclusions. Th CO_2 → L 16°C. Secondary biotite is intergrown with recrystallised interstitial quartz. Secondary biotite is intergrown with rutile and pyrite. Grains of chalcopyrite are intergrown with the secondary biotite. A weathering assemblage replaces residual primary mafic minerals. Few primary mafic silicate minerals are present. Secondary biotite intergrown with rutile has formed after primary opaques.

6362/2416. Early albite veining is crosscut by quartz + carbonate veining. Euhedral quartz, although deformed, is part of this quartz + carbonate deposition. Arsenopyrite is associated with the albite veining. Fragments of albite are enclosed by the quartz + carbonate deposition. The carbonate is partly leached. Gas-rich CO_2 bearing/rich inclusions are present within the secondary quartz (still within the same thermal and fluid environment).

5780/74793. Quartz + albite + arsenopyrite veining. Fractures within brittle deformation of albite (relative to plastic deformation of quartz) are filled with early quartz. With shearing and fracturing of quartz, albite and arsenopyrite, early biotite is contained along shears and microfractures, the biotite merging with carbonate, the subsequence deposition dominated by carbonate. A dynamic deformation and fluid environment. There are places where the carbonate and biotite definitely appear to occupy the same paragenetic position. Early fracturing of albite (with plastic deformation of quartz) is filled with quartz seemingly of the same generation of earliest vein quartz. The transition, quartz → biotite → carbonate appears to be all from the same evolving hydrothermal fluid environment. Chlorite may be part of that transition occupying the same paragenetic position as carbonate. Primary biotite is interstitial to framework plagioclase together with quartz and opaques. Most secondary biotite is after opaques (together with rutile and arsenopyrite) and primary biotite.

6362/2408. A finer grained intrusive rock. The rock has a similar framework of plagioclase with interstitial quartz, biotite, quartz and alkali feldspar, but with more mafic silicate minerals and opaques interlocking with plagioclase. Anthophyllite and biotite (→ chlorite) have formed after the mafic silicate mineral. The alkali feldspar interlocking with interstitial quartz is microcline in some places. Interstitial quartz, alkali feldspar and biotite appear to merge with veinlets of quartz, alkali feldspar (albite) and biotite in some places. The rock appears to have a genetic relationship with quartz + alkali feldspar + biotite veinlets.

6362/2414. Boudinaging of early porphyroclastic quartz veining, with resulting cavities filled with biotite (→ chlorite) and biotite concentrated along shears marginal to the plastically deformed quartz vein. Micro-veinlets of biotite extend off into the wallrock. Equally possible is that the quartz vein segments represent dilational domains formed along shears occupied by biotite. Strain shadows formed about arsenopyrite grains in the wallrock are filled with granoblastic quartz and biotite. Quartz veining and biotite veinlets and biotite along shears are probably synchronous with biotite being preferentially concentrated along controlling shears. With modification and subsequent deformation, the domains of biotite filling around vein quartz and along shears are increased.

5780/1806. Secondary biotite has formed after interstitial alkali feldspar and primary biotite, and intergrown with K-feldspar and quartz has formed after plagioclase. Relict primary plagioclase is andesine in composition. Sheared/deformed domains are replaced by granoblastic quartz, biotite and alkali feldspar dispersed with grains of arsenopyrite and pyrite. Ghosted primary mafic minerals have pyroxene and/or amphibole morphologies. Sericite/muscovite and chlorite comprise a retrograde overprint. Some green biotite is present. Primary apatite, as inclusions within all minerals, is up to 3% of the rock. Alkali feldspar (albite and K-feldspar) forms overgrowths to plagioclase.

5780/1785. Ghosted primary mafic minerals within an essentially finer grained lithology have relict amphibole morphologies. Intergrown biotite (→ chlorite), quartz and rutile have formed after the amphibole. Ghosted primary biotite is also present. Apatite and ghosted opaque minerals are dispersed about the altered primary silicate assemblage.

6547/2868. Fine grained diorite containing less than 2% interstitial primary quartz. Primary mafic silicates and opaques are replaced by aggregates of biotite intergrown with rutile and pyrite. Biotite is locally altered to chlorite and carbonate. Primary plagioclase is weakly to moderately albitised. Flecks of carbonate and illitic clay have formed after residual plagioclase (including secondary albite). Microfractures are lined with biotite (→ chlorite), locally intergrown with (type A) quartz. Albite is intergrown with the quartz. Carbonate immediately overgrows the quartz and biotite. Grains of sphalerite intergrown with pyrite occupy the same paragenetic position as biotite and carbonate. Arsenopyrite, pyrite and pyrrhotite are interlocking with the quartz. Pyrrhotite is also enclosed by and intergrown with carbonate. Chalcopyrite is intergrown with and as inclusions within sphalerite. There is weak plastic deformation of quartz and albite (wallrock and vein).

6547/2862. Secondary mineralogy comprises pervasive pyrrhotite, biotite, quartz, muscovite and albite. Biotite and muscovite define a penetrative strain fabric and fissility/schistocity. The fissility/schistocity is parallel to a ghosted primary lamination and in fact the “schistocity” is not a mineral segregation in the true sense of the term schistocity. The former lamination is defined by the distribution of Fe-sulphides, muscovite and biotite. Quartz + pyrrhotite + biotite + sphalerite veinlets lie within and at high angles to the plane of strain and ghosted lamination. A metasomatic alteration front is disconformable to the fissility/bedding, and separates pyrite from pyrrhotite, with all other silicate mineralogy remaining identical either side of the front. The front must represent a redox boundary. Sphalerite and chalcopyrite are dispersed about the replacement assemblage.

6547/2870. A biotite + muscovite + quartz + pyrrhotite altered mudstone. Ghosted attenuated Al-silicates porphyroblasts are present. Pervasive pyrrhotite is associated with grains of chalcopyrite and sphalerite. Disseminated pyrrhotite merges with veinlets of pyrrhotite (enclosing chalcopyrite) which merge with relatively voluminous quartz + pyrrhotite + biotite (→ chlorite) veins. Late-stage and most voluminous veins contained pyrite and (type A) quartz. Late fracturing is filled with euhedral to subhedral quartz intergrown with pyrite.

6547/2869. Biotite + quartz + pyrrhotite + chalcopyrite + sphalerite + arsenopyrite metamorphosed/metasomatised mudstone. Arsenopyrite is present within the wallrock replacement assemblage and in veinlets and veins containing quartz, sphalerite, chalcopyrite, pyrite and pyrrhotite. Central parts of veins are filled with voluminous sphalerite.

6547/2860. Carbonaceous mudstone interbedded with non-carbonaceous mudstone. Ghosted/attenuated ?Al-silicate porphyroblasts are present.

6547/2867. A metamorphosed/metasomatised, locally carbonaceous chert. The chert is replaced by granoblastic quartz dispersed with grains of pyrrhotite and less abundant chalcopyrite, sphalerite and arsenopyrite. The carbonaceous laminae are notable for the presence of late metasomatic carbonate.

6547/2863. A primary biotite bearing quartz diorite. Primary plagioclase is replaced by albite (complete albitisation). Aggregates of biotite (→ chlorite) and rutile have formed after mafic/opaque minerals. Veinlets of carbonate + pyrrhotite + arsenopyrite are present.

6547/2865. Tightly folded and metamorphosed/metasomatised chert and carbonaceous mudstone and silty mudstone. The chert is replaced by granoblastic quartz, whereas the carbonaceous mudstone is replaced by biotite (→ chlorite), muscovite and quartz overprinted by carbonate. Voluminous pyrrhotite and chalcopyrite are intergrown with the carbonate and more sparsely dispersed about the altered chert.

Appendix 3:

Report Metadata Form

(Bibliographic Data Sheet)

Northern Territory Department of Business, Industry & Resource Development

REPORT METADATA FORM

(MINERAL EXPLORATION)

PART A (DME USE ONLY)					
Report Number	Date Received				
Collation	___ pp.	___ figs	___ logs	___ maps	___ apps.
Media	___ CDs	___ 1.5”	___ Exab.	___ DLT	___ vols.

PART B			
Tenure Number(s)	SEL23658	Company Report Number	31421
Report Date	April 2004	Anniversary Date	03/04/2003
Group Project Name	Tanami Central		
Report Title	1st Annual Report for SEL23658 (Lennards) for the period		
03/04/2003 to 02/04/2004			

Author(s)	Walter, M.	Lowe, G.
Corporate Author(s)	Newmont Tanami Pty Ltd	

Maps 1 : 250 000	SF52-03					
Maps 1 : 100 000	4957					

Tectonic Units			
❑ Amadeus Basin	❑ Carpentaria Basin	❑ McArthur Basin	❑ Pine Creek Inlier
❑ Arafura Basin	❑ Daly Basin	❑ Money Shoal Basin	❑ Simpson Basin
❑ Arnhem Inlier	❑ Dunmarra Basin	❑ Murphy Inlier	❑ South Nicholson Basin
❑ Arunta Inlier	❑ Eromanga Basin	❑ Musgrave Block	❑ Tennant Creek Inlier
❑ Birrindudu Basin	❑ Fitzmaurice Mobile Zone	❑ Ngalia Basin	❑ Victoria Basin
❑ Bonaparte Basin	❑ Georgina Basin	❑ Ord Basin	❑ Warburton Basin
❑ Browse Basin	✓ Granites-Tanami Inlier	❑ Pedirka Basin	❑ Wiso Basin
Other structural units			

Stratigraphic Names			
Billabong Complex	MacFarlanes Peak Group	Tanami Group	Pargee Sandstone
Gardiner Sandstone	Antrim Plateau Basalts	Mt Charles Formation	Inningarra Granite

AMF Thesaurus Terms - General			
✓ Geological mapping	❑ Regional Geology	❑ Stratigraphy	✓ Structural Geology
❑ Metallogenesis	❑ Remote sensing	❑ Imagery	❑ Landsat
✓ Petrology	❑ Lithology	❑ Literature reviews	❑ Metamorphism
❑ Lineaments	❑ Photogeology	✓ Reconnaissance	❑ Indicator minerals
Other terms ...			

AMF Thesaurus Terms - Target Minerals			
✓ Gold	❑ Silver	❑ Tin	❑ Diamonds
❑ Lead	❑ Copper	❑ Platinum Group Minerals	❑ Industrial Minerals

❑ Zinc	❑ Uranium	❑ Bauxite	

AMF Thesaurus Terms - Mining			
❑ Environmental impact surveys	❑ Feasibility studies	❑ Geostatistics	❑ Metallurgy
❑ Ore reserves	❑ Resource assessment	❑ Mineral resources	❑ Mining geology
❑ Mine design	❑ Mine drainage	❑ Mine evaluation	❑ Pits

AMF Thesaurus Terms - Geophysical Surveys			
❑ Aerial magnetic surveys	❑ Aerial radioactivity surveys	❑ Aerial EM surveys	❑ Ground EM surveys
❑ Gravity surveys	❑ Geophysical anomalies	❑ Gravity anomalies	❑ Bouger anomaly maps
❑ Sirotem surveys	❑ Ground magnetic surveys	❑ IP surveys	❑ Resistivity surveys
❑ Seismic surveys	❑ Magnetic anomalies	❑ Geophysical interpretation	❑ Geophysical logs
Other terms ...			

AMF Thesaurus Terms - Geochemical Exploration – Surface sampling			
✓ Geochemical sampling	❑ Stream sediment sampling	❑ Rock chip sampling	❑ Bulk sampling
✓ Soil sampling	❑ Heavy mineral sampling	❑ Geochemical anomalies	❑ Assaying
❑ Isotope geochemistry	❑ Whole rock analysis	❑ X ray diffraction	✓ Sample location maps
Other terms ...	Lag sampling		

AMF Thesaurus Terms - Geochemical Exploration - Drill sampling			
❑ Diamond drilling	✓ RAB drilling	❑ Percussion drilling	❑ Aircore drilling
❑ RC drilling	❑ Rotary drilling	❑ Vacuum drilling	❑ Auger drilling
❑ Drill core	❑ Drill cuttings	✓ Drill hole logs	❑ Drill core analysis

Other terms ...			

Drilling Type	**No. of holes**	**Hole name(s)**
Diamond		
Percussion		
Vacuum		
RAB	75	PRB1836-1910
Auger		
Air		
RC		
Rotary		
Other ...		

Mine / Deposit / Prospects		**Location - AMG**	**Location - Datum**
Mines			
Deposits			
Prospects	East Ptilotus		
Other …			