

*AUSTRALIAN ASIATIC GEMS PTY LTD*

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**Exploration Permit for Minerals**

**EPM 14260**

**Darkwater**

**YEAR 10**

**13 APRIL 2014 TO 12 APRIL 2015**

and

**FINAL REPORT**

**13 APRIL 2005 TO 12 APRIL 2015**

**Australian Asiatic Gems Pty Ltd**

**A C Day**

**M Kennedy**

**April 2015**

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## EXECUTIVE SUMMARY

Exploration Permit for Minerals (EPM) 14260 "Darkwater" covering 100 sub-blocks was granted to Australian Asiatic Gems Pty Ltd (AAG) on 13<sup>th</sup> April 2005. AAG is a privately-owned Queensland company exploring for gold and minerals throughout Queensland. Maranoa Resources Pty Ltd (ACN 110 759 512) ("Maranoa"), a wholly-owned subsidiary of International Base Metals Limited ("IBML"), an Australian-registered unlisted public company, was originally established to explore tenements covering a series of mafic intrusive bodies, in the Mt Tabor-Darkwater area of south-central Queensland, which may have potential for significant nickel-platinum group metals ("PGM") deposits, acquired the rights to explore the EPM on 5<sup>th</sup> December 2005. Maranoa received discouraging results from exploration on the EPM over several difficult field programs and before the Company's intended surrender in 2013, AAG acquired the EPM from Maranoa.

EPM 14260 lies to the east-north-east of Augathella and to the west-north-west of Injune, approximately about 130 km directly north of Mitchell, Central Queensland. The tenement is located within the Eddystone (SG/55-7) 1:250,000 map sheet and the Warrong (8447)1:100,000 map sheet areas.

The EPM was acquired to explore for nickel – platinum group minerals (PGM) and manganese deposits associated with a mafic-ultramafic intrusive known as the Darkwater complex. The Darkwater igneous is large (covering 10km) complex exposed as a small "window" (800m x 400m) of mafic-ultramafic rocks in the core of the Maranoa Anticline. The bulk of the complex is obscured by a veneer (up to 300m thick) of mildly-deformed sedimentary strata, mainly sandstone with subordinate shale. The presence of a large body of mafic-ultramafic rocks with associated elevated surface concentrations of nickel and copper suggests the Darkwater complex is prospective for significant nickel-copper-PGE deposits.

Maranoa exploration focussed on a Noril'sk-style nickel and PGM minerals target in accordance with the concept that the Darkwater complex was in fact intrusive, very altered and could have assimilated sufficient sulphur to fractionate out nickel and PGM minerals. In 2007 a high resolution aeromagnetic survey was completed over the EPM demonstrated that the subsurface extent of the ultramafic was considerably greater than previously known, with its volume testifying to possible massive interaction and impact of the water laden magma. Maranoa experienced difficult weather-related access conditions to the EPM over successive seasons and upon deciding to surrender the tenement, the EPM was transferred back to AAG.

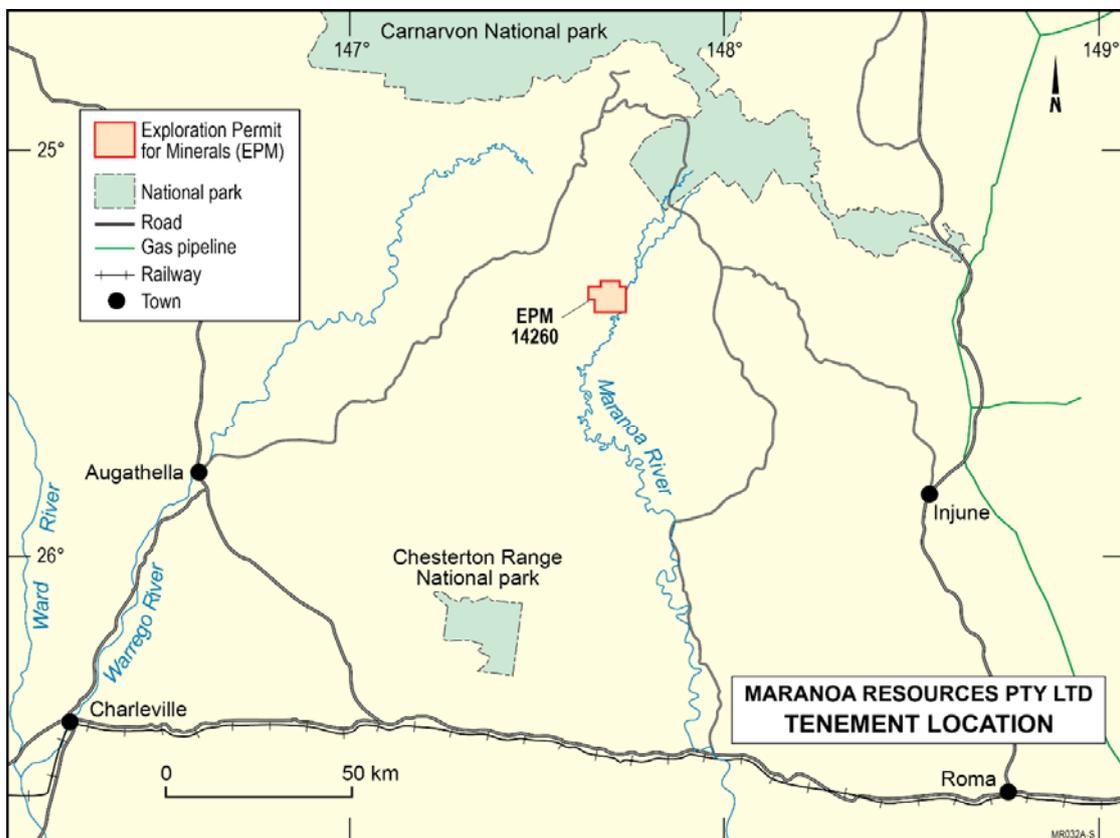
In 2014, AAG investigated the ultramafic intrusive outcrop with a seven drillhole scout RC drilling program for a total of 248 metres, to test the Darkwater complex outcrop for the presence of base metals, nickel and PGM minerals. In all seven holes it became quickly apparent that the serpentinite body was an altered basalt body, with a flat domal roof and with serpentinite concentrated towards the upper contact which had been contact metamorphosed to a very low order facies. As depth was increased the serpentine was replaced by a black fine grained basalt. Very minor sections of serpentine, talc and other pale green silicates seemed to occupy fractures/joints and were of no commercial interest.

On a regional scale, it can be concluded that the Darkwater serpentinite body is an unvented basalt intrusion, probably laccolithic in shape, similar to the other basalt/gabbro plugs and intrusives in the Darkwater-Mt Yanalah belt.

After the disappointing results of the 2014 drilling program AAG relinquished the EPM.

## 1. BACKGROUND

EPM 14260 was originally granted to Australian Asiatic Gems Pty Ltd (AAG) on 13<sup>th</sup> April 2005. Maranoa Resources Pty Ltd acquired the rights to explore the EPM on 5<sup>th</sup> December 2005. Maranoa Resources Pty Ltd (ACN 110 759 512) (“Maranoa”), a wholly-owned subsidiary of International Base Metals Limited (“IBML”), an Australian-registered unlisted public company, was originally established to explore tenements covering a series of mafic intrusive bodies, in the Mt Tabor-Darkwater area of south-central Queensland, which may have potential for significant nickel-platinum group metals (“PGM”) deposits. Maranoa then expanded exploration to search for base metal deposits throughout the broader region. Maranoa received discouraging results from exploration on EPM 14260 over several difficult field programs. Australia Asiatic Gems Pty Ltd sought to acquire the EPM from Maranoa before surrender of the tenement. The EPM was transferred to AAG 5<sup>th</sup> December 2013. Australia Asiatic Gems Pty Ltd is a privately-owned Queensland company exploring for gold and minerals throughout Queensland.



**Figure 1-** EPM 14260 Regional Location in Maranoa District (following reduction in April 2013).

## 2. LOCATION AND ACCESS

EPM 14260, lies to the east north east of Augathella and to the west north west of Injune and is approximately about 130 km directly north of Mitchell. The tenement is located within the Eddystone (SG/55-7) 1:250,000 map sheet and the Warrong (8447)1:100,000 map sheet areas.

Access to the area is by a dirt road leading to the Mt Owen homestead to the south west of the tenement area. Vehicle access within the EPM is limited to a few poorly maintained tracks and cross country navigation is hampered by thick scrub. The steep sandstone escarpments make ground survey work very difficult.

### 3. TENEMENT DETAILS

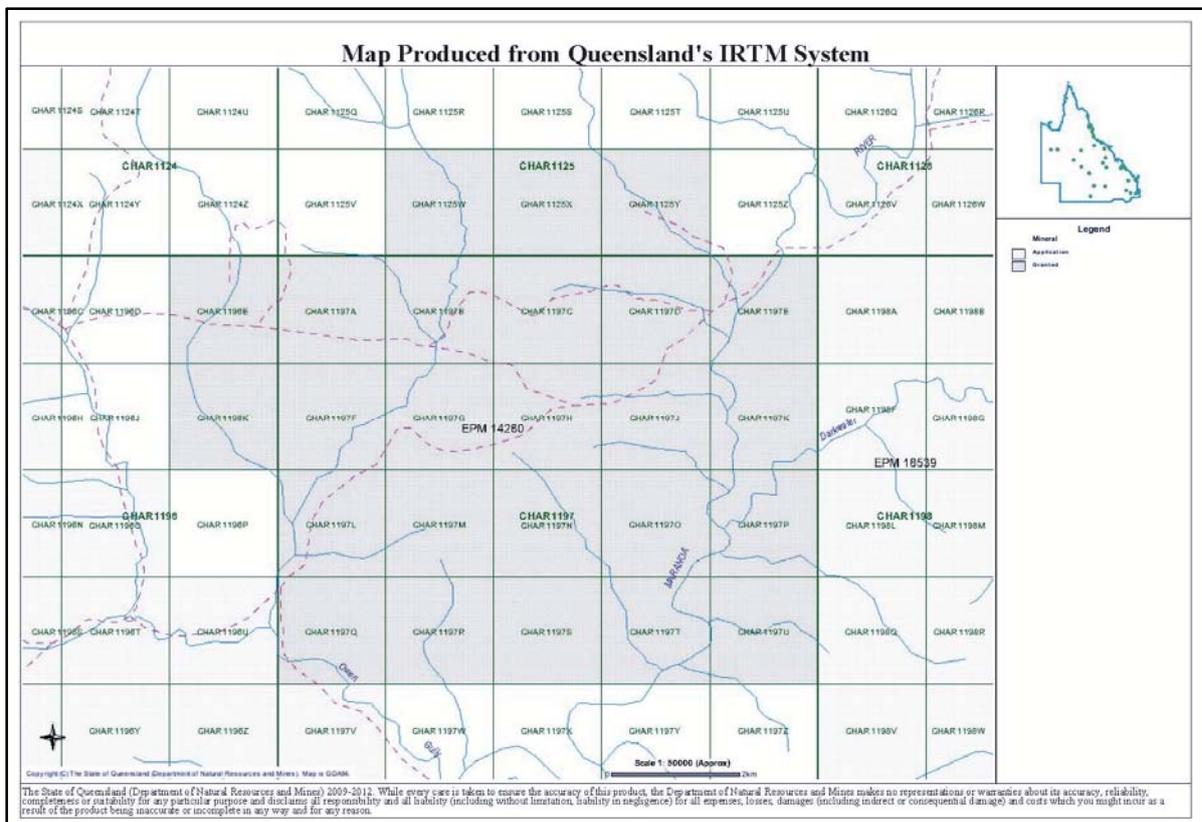
EPM 14260 was originally granted as 100 sub-blocks to Australian Asiatic Gems Pty Ltd (AAG) on 13<sup>th</sup> April 2005. Maranoa Resources Pty Ltd, (ACN 110 759 512) (“Maranoa”), a wholly-owned subsidiary of International Base Metals Limited (“IBML”), an Australian-registered unlisted public company, acquired the rights to explore the EPM on 5<sup>th</sup> December 2005. Maranoa relinquished 50 sub-blocks 17<sup>th</sup> July 2009 and an additional 25 sub-blocks 17 May 2013. EPM 14260 was renewed 11<sup>th</sup> June 2013 for an additional 2 year period with expiry 12<sup>th</sup> April 2015.

Maranoa received discouraging results from exploration on EPM 14260 over several difficult field programs. Subsequently, AAG sought to acquire the EPM from Maranoa before surrender of the tenement and it was transferred 5<sup>th</sup> December 2013. After disappointing results from a drilling program in 2014, AAG voluntarily surrendered EPM 14260 16 March 2015.

The 25 sub-blocks held and covered by the Year 10 Annual Report and Final Report for the permit are:-

BIM	Block	Sub-block	No
CHAR	1125	W X Y	3
CHAR	1196	E K	2
CHAR	1197	A B C D E F G H J K L M N O P Q R S T U	20
<b>Total sub-blocks</b>			<b>25</b>

EPM 14260 is shown in Figure 2.

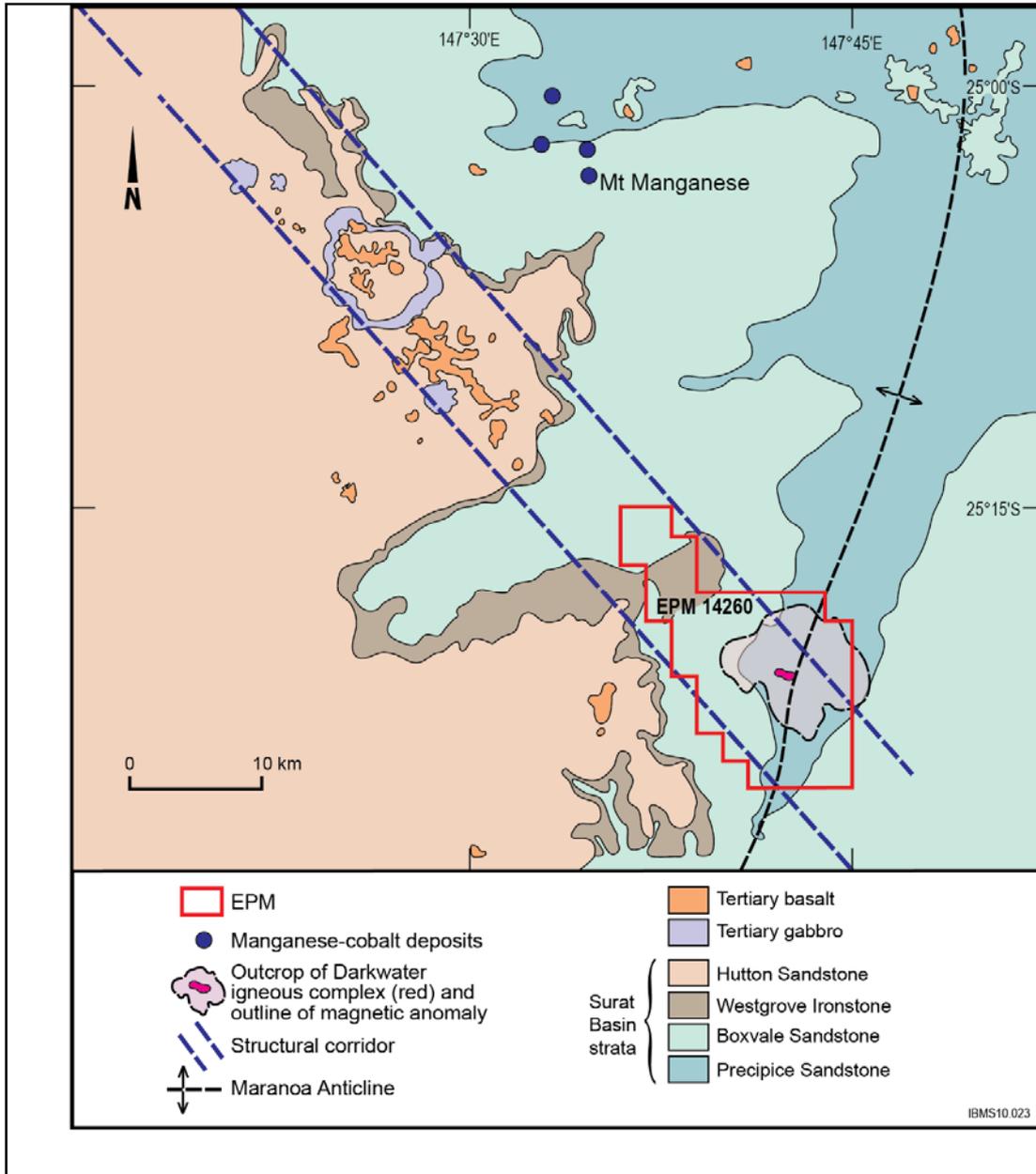


**Figure 2** EPM 14260 Block and Sub Block Identification map (IRTM figure).

#### 4 EPM 14260 GEOLOGY

EPM 14260 lies on the Nebine Ridge, a basement feature which in Permian-Triassic times, formed a basement “high” separating the Surat Basin, to the east from the Eromanga Basin to the west. Faulting along this structure has gently warped the overlying strata into the Maranoa Anticline.

The basal unit of the Surat Basin is the Jurassic Precipice Sandstone, a white coarse-grained sandstone. The Precipice is overlain in turn by the Evergreen Formation and the Hutton Sandstone. In the Maranoa area, the Evergreen Formation consists of a lower unit, the Boxvale Sandstone and an upper unit, the Westgrove Ironstone.

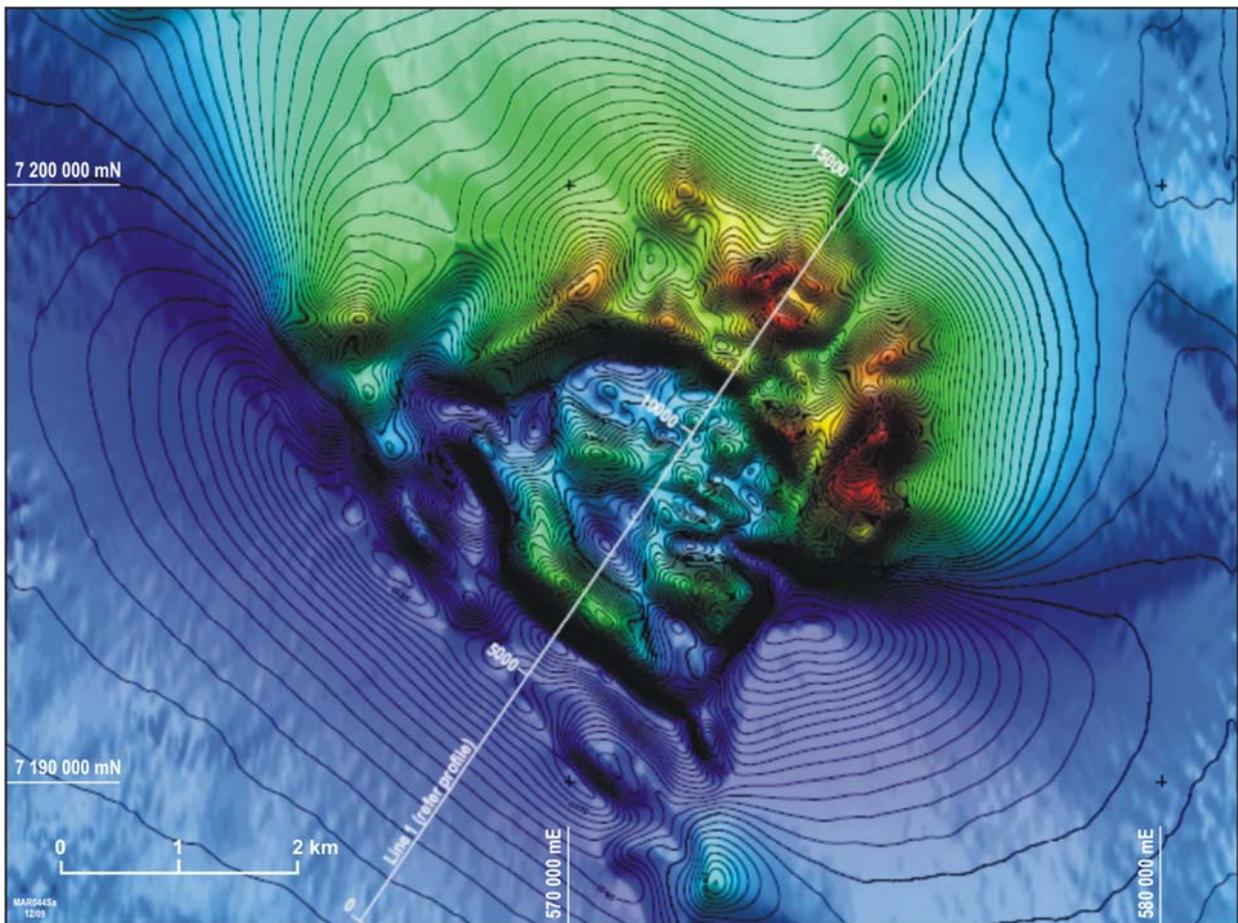


**Figure 3** Maranoa geology showing interpreted outline of Darkwater Igneous complex with outcrop in red

The intrusives in the region appear to be structurally controlled within N to NE trending anticlinal crests. The Darkwater igneous complex is exposed as a small “window” (800m x 400m) of mafic-ultramafic rocks in the core of the Maranoa Anticline. The bulk of the complex is obscured by a veneer (up to 300m thick) of mildly-deformed sedimentary strata, mainly sandstone with subordinate shale. The age of the ultramafic suite is thought to be of lower Palaeozoic age.

Geological mapping by Maranoa has shown no evidence of alteration in any outcrops or sand-covered areas in or around the magnetic features. The only rocks displaying possible alteration are in the immediate vicinity of the known outcrop of mafic and ultramafic rocks. Along the northwestern contact with the overlying rocks are some fine grained skarn rocks with minor carbonate. Upslope from this zone is a small outcropping knob about 20-30 metres in extent of very white quartz sandstone. The sandstone is composed almost entirely of quartz grains with silica cement, probably authigenic quartz. There are no remnant clays or feldspars although there are rare very small grains of a dark detrital mineral.

A high-resolution aeromagnetic survey flown by Maranoa in 2007 has defined a near-circular magnetic feature covering an area of approximately 10 km by 10 km which is mainly buried beneath the Jurassic sandstones.



**Figure 4** - EPM 14260 Magnetic image of the Darkwater igneous complex

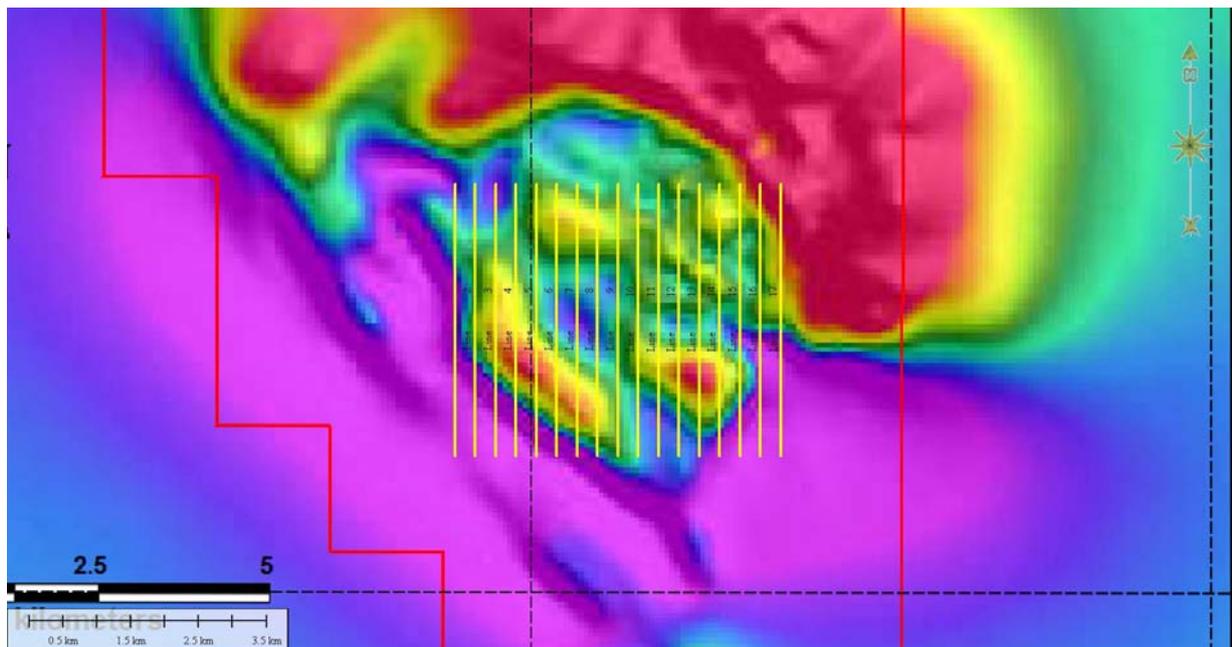
The only past mining activity has been by early prospectors, searching for asbestos. Minor small pits and two costeans were dug over the outcropping ultramafic inlier along tremolite filled shear zones.

## 5. PREVIOUS EXPLORATION

Exploration by previous companies to have held title over the ground have focussed on the area of ultramafic intrusive outcrop. Small pits by early prospectors, searching for asbestos, were dug on a tremolite filled shear in the ultramafics. There is evidence in the field of drilling (two very shallow diamond drill holes) but results appear not to have been reported. Details have been published in previous Annual Reports submitted to QDEX.

In August 2011, a ground Electro-magnetic (EM) survey by Outer-Rim Exploration Services with inloop (moving loop) survey geometry using the CSIRO Landtem SQUID (Superconducting Quantum Interference Device) sensor with a reduced transmittal loop of 100m (due to the terrain) was contracted. Because of the terrain, consideration was given to surveying using a helicopter survey method such as the VTEM system. This option was rejected due to the possible large time constants expected for a nickel sulphide deposit and possible large depth of burial.

The EM survey was mobilised on 22<sup>nd</sup> October 2011 and stood down on 5<sup>th</sup> December following flooding rains. During this time only a couple of survey grid lines were recorded due to a series of problems caused by the rugged terrain, equipment failures requiring replacement parts, and finally flooding of the Maranoa River and tributaries which resulted in evacuation. A number of options were canvassed following the failure of the EM survey in 2011, in order to continue exploration over the tenement. Another attempt of an EM survey commenced 26<sup>th</sup> November 2012. A 300m square transmitter loop was initially used with 150m station spacing along south-north survey lines. The rationale being that the geometry would connect well with deep flat lying strongly conducting bodies and that these would be clearly delineated in the data. In the case of steeply dipping conductors, the survey geometry would also be reasonably coupled and would be unbiased relative to the strike or dip of such a conductor. After considerable effort, the eastern third of the survey area (Figure 6) was covered with some lines having incomplete or intermitted data due to the ruggedness of the terrain and the moving loop configuration. The survey geometry was changed to the use of large fixed transmitter loops, with the survey points inside the loop to cover the central part of the survey area. Unfortunately the detection of steep conductors is compromised with this survey geometry, particularly near the centre of the transmitter loop.



**Figure 6 – EPM 14260 EM Survey grid over Magnetic (TMI) imagery**

A halt in surveying on 14th December 2012 was brought about by large and uncontrolled bushfires in the area causing the crew to be demobilised prematurely before the Christmas period break. The crew re-mobilised on 20<sup>th</sup> February and the survey was completed by 25<sup>th</sup> March 2013.

The results of the EM survey by Maranoa did not define any clear targets for drilling. The primary target for the ground EM survey was for the delineation of strongly conducting zones due to massive nickel sulphides. However, the survey results show that in the centre of the magnetic complex, at the northern end of the survey area in a magnetic low there are at least two EM responses that may be due to zones of disseminated sulphides. Maranoa considered that it is likely that the responses are some sort of geological noise rather than a true exploration target and considered surrender of the permit. Australian Asiatic Gems Pty Ltd (AAG) sought to acquire EPM 14260 from Maranoa with the tenement transferred to AAG on 5<sup>th</sup> December 2013. AAG reviewed all previous exploration on the tenement and the EM survey results. The results of the EM survey by Maranoa suggested the presence of possible disseminated sulphides that could be of interest for further exploration.

## **6. EPM 14260 FINAL EXPLORATION ACTIVITIES – YEAR 10**

In 2014 AAG investigated the ultramafic intrusive outcrop with a seven drillhole scout RC drilling program for a total of 248 metres, with the aim to better understand mineralisation in the area.

### **6.1 Background to 2014 Drilling Program**

#### **Geology**

The Darkwater complex is a serpentinised ultramafic intrusive measuring 800m EW by 400m NS displaying hydrothermal minerals such as asbesiform tremolite in old pits and rare apple green secondary nickel minerals on fractures. The Eddystone sheet was mapped in 1964 by BMR geologists and the Darkwater complex was noted as “gabbro and ultramafic plutonic rocks” of Lower Palaeozoic age surrounded by a halo of “ferruginous and calcareous sediments” postulated as being pre-Jurassic.

Significantly the complex lies on the axis of the Maranoa Anticline, as an “eye”, an inlier within a vast stretch of Precipice Sandstone (Figure 2 and 7). This position, along with little field evidence to the contrary, suggested to the field party at that time that the occurrence was part of a basement high related to the Nebine Ridge with Jurassic sediments draped over it.

However it is this Company’s contention that the ultramafic complex is, in fact, intruding the sandstones and is related to the Mt Tabor-Mt Yanalah-Mt Hopeless complex of stocks and lopoliths of olivine gabbro with related extrusive basalts clustered on a SE-NW structural corridor. These bodies were designated a Tertiary age by the BMR team. It should be noted that the gravity image of Queensland defines a very prominent NW break at depth below this area that extends along many kilometres of strike length, and is postulated by the author to extend to the upper mantle. This feature would alone account for the “solitary” occurrence of these intrusives in an otherwise mundane sedimentary terrain.

This being the case, it is our theory that the Darkwater ultramafic body was injected as molten magma into the aquifers of the Great Artesian Basin resulting in considerable hot water production and convection, confined within a large “thermos flask” containment.

Such hydrothermal activity and magnesium metasomatism was responsible for:-

- Serpentinisation of the original magma, as it did not vent as the Mt Tabor cluster did;
- Mild low temperature contact metamorphism of the enclosing sandstones (the halo of “ferruginous and calcareous sediments”) which can be observed immediately in contact with the outcrop extremities of the body; and
- Production of observed associated secondary alteration minerals, such as tremolite.

This activity was also responsible for the mobilisation of nickel ions, presumably in association with absorbed sulphur from the pyritic sandstones that occur in the Precipice Sandstone sequence. On weathering this manifests as garnierite-type secondary minerals as found in fractures of the serpentine host.

As substantiation of this theory, it should be noted that since 1964 considerable oil and gas exploration has been conducted in the region, and seismic traverses have failed to substantiate any evidence of high level basement, while oil exploration drill holes in the general area have intersected considerable thicknesses of Mesozoic and pre-Mesozoic sediments.

### **Past Exploration**

Although there is no record of any previous exploration tenures on the Darkwater complex, there has been limited historical activity on the site.

The MinesOnlineMaps website shows no record of old Authorities to Prospect in the area and there are no reports in the QDEX Open File system of the DNRM. The only mention of historical work is of abandoned pits noted on the Eddystone sheet as "Prospect: little production – asbestos-amphibolite". The age of these workings is open to conjecture.

However at the locality two large trenches have been excavated by a small-sized dozer - local hearsay maintains them being dug in the late 1960s, presumably on the heels of the first publication of BMR's mapping. These costeans do get to fresh rock in places and confirm a suite of altered ultramafic rocks of varying compositions and textures, in contrast to the bulk of the exhumed complex which is non- outcropping and sand covered. It is in these trenches that the garnierite-bearing fractures have been exposed.

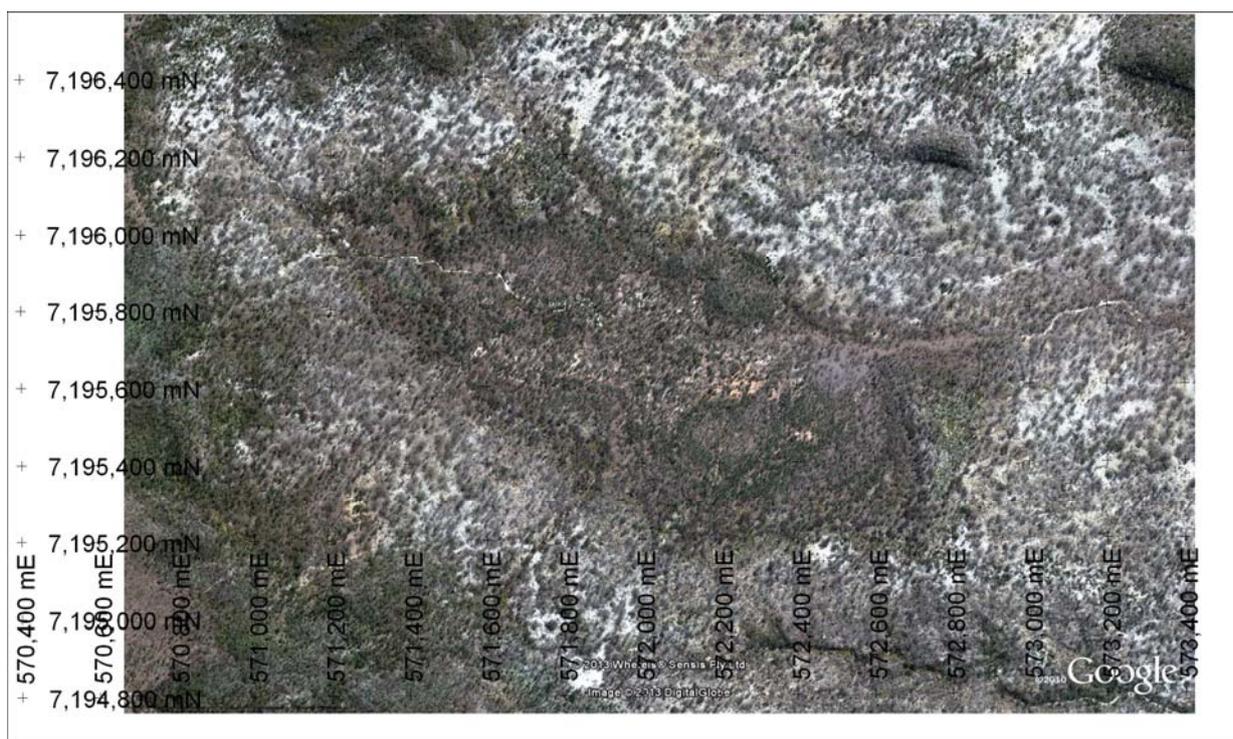
These limited exposures accord with rare rock floaters from nearby composed of very hard, perhaps better expressed as more "tenacious", altered ultramafics containing dark green phenocrysts resembling nephrite.

More importantly, and of greater pertinence to this Company's exploration effort, is the fact that 2 diamond drill holes were drilled in 1970 during the nickel boom by a local landholder. He has reported to the author that a significant intersection was made in the second hole, but the programme was abandoned when at the time the nickel boom subsided.

My associate has reported to me that at a depth of 50 feet a very hard ("tenacious") rock was intersected over a 6 feet interval which took several hours to drill. When retrieved, the core was a solid stick of translucent green material which he identified as nephrite, a mineral that could legitimately have been formed in the hydrothermal cell within the intrusion under magnesium metasomatic conditions. Another comment of significance was that when he tried to break the core to fit in the core box, it proved to be a very difficult task, succeeding only with a large sledge hammer and a great degree of brute force – again another indication of the "tenacity" of the mineral, a well-recognised characteristic property of jade-like minerals.

The whereabouts of the core is a total mystery, apparently being taken off site by the supervising geologist. However the steel collar pipe of the hole is clearly visible projecting above ground level, its position easily located when one knows where to look within the topographic low of the serpentinite inlier.

The author has known the person responsible for this hole for many years as a very competent prospector and field manager who has held positions in exploration camps for a number of reputable companies, and has no reason to doubt his veracity.



**Figure 7. Project site – an inlier of serpentinite surrounded by Precipice Sandstone**

### **Recent Exploration**

Australian Asiatic Gems Pty Ltd (AAG) applied for EPM 14260, along with EPM14261 surrounding manganese occurrences to the NNW in 2003, being granted in April 2005. The Permits were joint ventured with International Base Metals Limited (IBML) sometime after and have been actively worked on since that time through its subsidiary Maranoa Resources Pty Ltd. The target of its efforts was Noril'sk-style nickel and PGM minerals in accordance with the concept that the Darkwater complex was in fact, intrusive very altered and could have assimilated sufficient sulphur to fractionate out nickel and PGM minerals. Comprehensive annual reports have been lodged with DNRM on a regular basis.

IBML withdrew from the arrangement last year (2013) making all technical data available to AAG, and it is AAG's intention to continue exploration of the property to confirm the drillhole intersection and to follow up geophysical anomalies not yet tested and explained.

In 2007 a high resolution aeromagnetic survey was completed over EPM14260 which demonstrated that the subsurface extent of the ultramafic was considerably greater than previously known, with its volume testifying to the possible massive interaction and impact of the water laden magma. Although the available information did not allow Maranoa to interpret the style of intrusive complex, the presence of a large (10 km across) body of mafic-ultramafic rocks with associated elevated surface concentrations of nickel and copper in its view supported the prospectivity of the Darkwater complex for significant nickel-copper-PGE deposits.

## 6.1 2014 Drilling Program Results

AAG investigated the ultramafic intrusive outcrop with a seven drillhole scout RC drilling program for a total of 248 metres. A summary of the drilling program drillholes is given in Table 1.

**Table 1. EPM 14260 Darkwater 2014 Drillholes**

Hole ID	MGA-Zone55 East (GDA94)	MGA-Zone55 North (GDA94)	Azimuth	Dip	Total Depth (metres)	Comment
MO1	571822	7195871	0	90	44	2.5 m North of old hole
MO2	571823	7195869	0	90	42	0.5 m East of old hole
MO3	571828	7195847	355	60	42	
MO4	571171	7195478	355	60	30	
MO5	571183	7195492	355	60	30	
MO6	572425	7195519	340	60	30	
MO7	572422	7195541	333	60	30	

Confirmation of the supposed 1970 nephrite intersection in the second hole was the priority of the drilling programme conducted on 13-18 October 2014. The first holes were sited as close as possible to the existing historic hole to confirm the reported intersection of supposedly 2 metres of nephrite, and were drilled to greater than 15 metres depth so as to match the reported 50 feet intersection.

The first hole MO1 was collared 2.5 metres north of the steel collar pipe and was completed at 44 metres. No minerals, especially green potential gem minerals, were intersected.

Hole MO2 was collared 0.5 metres east of the original hole, again with no intersection of minerals of consequence.

Hole MO3 was drilled at 60° from the south and beneath the collars of the above holes to test a possible vertical host structures that may have been missed by the 2 previous vertical holes. The same result, no green alteration minerals of significance, was determined in this hole.

This revelation weighed heavily on the future of continued drilling and on the project as a whole. It was obvious that historical fact was, in fact, a fallacy so the search for the supposed nephrite was abandoned.

Since drill pads had been prepared between the old trenches, it was decided to test for base metal sulphides below ultramafic outcrops that demonstrated secondary nickel and copper minerals in apparently linear outcrops with near E-W strikes. These were 30° inclined holes in two short near N-S traverses. No sulphides of consequence were intercepted.

### **Geology of Drilled Intercepts**

In all seven holes it became quickly apparent that the serpentinite body was an altered basalt body, with a flat domal roof and with serpentinite concentrated towards the upper contact which had been contact metamorphosed to a very low order facies. As depth was increased the serpentine was replaced by a black fine grained basalt pervasively invaded by haematite alteration. Very minor sections of serpentine, talc and other pale green silicates seemed to occupy fractures/joints and were of no commercial interest.

The haematitic alteration gradually faded at greater depth (>20 metres) until a host of black fine grained basalt predominated. This tended to be magnetic to varying degrees, in contrast to the upper sections which were not so due to magnetite destruction.

So on a regional scale, it can be concluded that the Darkwater serpentinite body is an unvented basalt intrusion, probably laccolithic in shape, similar to the other basalt/gabbro plugs and intrusives in the Darkwater-Mt Yanalah belt.

Because of its flat cupola contact, a thin shell of metasomatic alteration was developed, and was preserved to a large degree because of minimum exposure by exhumation from the surrounding Precipice Sandstone. As such its potential to host Norilsk-type nickel sulphide bodies is considered non-existent.

## **7. CONCLUSIONS**

The failure to intersect the supposed nephrite occurrence reported from a historical drill hole prematurely aborted the drilling programme with only 248 metres drilled in total.

Although minimal, the metreage achieved was sufficient to explain the geologic setting of the Darkwater exposure and place it in context of its neighbouring basalt occurrences.

As a result of the disappointing results, it was decided to relinquish the Permit.

Adrian Day  
Geologist & Director  
Brisbane February 2015

## **8. REFERENCES**

- DAVEN P, EPM 14260 Darkwater Year 7 Annual Report for the period 13 April 2011 to 12 April 2012  
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