ARAFURA
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ABN 22 080 933 455

Report ARU-12/007

ANNUAL REPORT FOR YEAR ENDING 01/02/2012
ML 23839 (MOUNT PORTER)
NORTHERN TERRITORY, AUSTRALIA

By

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MARCH 2012

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SUMMARY

Mineral lease ML 23839, which hosts a modest gold resource at Mount Porter, was granted to Arafura Resources on 2 February 2005 for a period of twenty-five years. ML 23839 is part of Arafura's Mount Porter-Frances Creek gold project, which currently comprises six tenements. Three of these tenements, including ML 23839, are owned outright by Arafura. The mineral rights on the remaining three tenements are shared with Territory Resources Limited.

Activity on ML 23839 during the reporting period included substantial work in support of Arafura's strategy to divest its interest in Mount Porter-Frances Creek via a commercial transaction with Global Mineral Resources Limited. Unfortunately, this transaction collapsed due to volatility in global equity markets.

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INTRODUCTION

Background

Gold mineralisation was discovered in the Mount Porter region by Gold Fields Exploration Pty Ltd, a subsidiary of Renison Goldfields Consolidated Limited (RGC) in 1984. Initial positive sampling results from exposed quartz reefs at the Mount Porter North prospect (3 kilometres north of Mount Porter) led to more extensive surface rock-chip sampling along the trend of the Mount Porter Anticline to the south. This resulted in the discovery of higher grade gold mineralisation in the "10400 Zone" on the eastern slopes of Mount Porter in 1988 (Dufty, 1989).

The gold mineralisation at Mount Porter was subsequently extensively explored by RGC and their subsidiary, Pine Creek Goldfields Limited (PCG), between 1988 and 1994 during which time PCG exploited the Enterprise, Czarina, International and Gandy's Hill gold deposits ("Enterprise Gold Mine") immediately adjacent to Pine Creek. Exploration by RGC/PCG at Mount Porter included a total of 223 drill holes. The bulk of these holes were completed between 9300-11000N (local grid) in a belt which stretched from 1200 metres south of Mount Porter to 500 metres north of the peak.

Following PCG's final phase of drilling in 1993 (Eupene, 1994), PCG conducted archaeological (Mulvaney, 1993), sacred sites (AAPA), metallurgical (Capps, Mason & Till, 1994) and environmental (Anonymous, 1994) studies and prepared for mining the "10400 Zone", where Sans (1994) estimated there to be an Indicated Resource of 240,000-250,000 tonnes at a grade of 3.6-3.8 g/t Au within 70 metres of the surface, using a 1.5 g/t Au cut-off grade. But PCG's development plans were shelved later in 1994 because the anticipated financial return did not justify the development risk in the economic conditions which prevailed at the time.

Between 1995-1997, an additional 14 drill holes, some as deep as 810 metres, were completed at Mount Porter by Homestake Gold of Australia Limited (Homestake) under a farm-in arrangement with RGC. Homestake explored for major new zones of mineralisation over a one kilometre long section of the Mount Porter mineralised trend, mainly to the north of the 10400 Zone. Homestake had little success with this approach and withdrew from the project in 1998.

Arafura Resources Limited (Arafura) acquired the underlying title, ERL 116, from Iluka Resources Limited (Iluka, formerly RGC) in 2002. In late 2003, Arafura drilled seven core holes into the 10400 Zone resource (Goulevitch, 2004). This infill drilling was undertaken to confirm continuity of the highest grade gold mineralisation, as recommended by Sans (1994), who considered that the establishment of continuity of higher grade mineralisation was critical to the integrity of his resource estimate.

In early 2004, an updated resource estimate was completed by Reseval Pty Ltd (Payne, 2004). Published Identified Resources for the 10400 Zone deposit, calculated in compliance with the requirements of the Code of the Joint Ore Reserve Committee (JORC Code), now stand at:

Cut-off 0.5 g/t Au		**Cut-off 1.7 g/t Au**	
Indicated Resources	694,000 t @ 2.0 g/t Au	Indicated Resources	300,000 t @ 3.1 g/t Au
Inferred Resources	184,000 t @ 1.55 g/t Au	Inferred Resources	55,000 t @ 2.6 g/t Au
TOTAL RESOURCES	**878,000 t @ 1.9 g/t Au**	**TOTAL RESOURCES**	**355,000 t @ 3.0 g/t Au**

In 2005, a review of the geological model for the Mount Porter 10400 Zone gold deposit resulted in the identification of two small targets ("NW" and "SE") which had potential to host minor additional gold resources which could conceivably be extracted at the same time as planned open cut mining of the 10400 Zone resources. Drilling commenced in late-2006 to test these targets but the program was abandoned prematurely after drilling equipment was lost in the fourth hole of the planned 11 hole program. Importantly, the westernmost hole in this program intersected a previously unknown zone of gold mineralisation ("248 Zone") west of and deeper than the Identified Resources in the 10400 Zone (Goulevitch, 2007).

In 2006, Arafura was granted a mineral lease (ML 23839) over the Mount Porter deposit and in early

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2007, in accordance with the requirements of the *NT Environmental Assessment Act 1994*, completed a Public Environmental Report (PER) in respect of mining the existing gold resource and processing off-site (MBS Environmental, 2006, 2007). The PER was formally accepted by the NT Government on 19 March 2007 and Commonwealth Government approval of the proposed open-cut development, under the provisions of the *Environmental Protection and Biodiversity Conservation Act 1999*, was issued in June 2007.

Location and access

The Mount Porter gold deposit is located 21 kilometres north of Pine Creek and 165 kilometres southeast of Darwin in the Northern Territory, Australia (Figure 1).

Access to ML 23839 from Darwin is along the Stuart Highway (225 kilometres) to Pine Creek then north along the Kakadu Highway and unsealed Frances Creek Road for 24 kilometres to a point about 6.5 kilometres past the turn-off to Mount Wells. From here a bush track leads to the prospect area some 3 kilometres distant (Figure 1).

Two mining related operations are currently active in the vicinity of Mount Porter.

Crocodile Gold Corp are conducting milling operations at the Union Reef Gold Mine, 10 kilometres SSW of Mount Porter (Figure 1). Mining operations ceased at Union Reefs in 2003 but the mill was recommissioned in late 2006 (by a previous owner, GBS Gold Australia Pty Ltd) to process ore from several deposits in the Katherine-Adelaide River area.

Territory Resources Limited are mining iron ore at Frances Creek, 4 kilometres NNE of Mount Porter. Mine products are being trucked along the old railway corridor located between Mount Porter and the Frances Creek Road to a rail siding just north of the Union Reef Mine. From there the ore is railed to Darwin for export to China. Iron ore mining was previously conducted at Frances Creek during 1968-1974.

The Enterprise Gold Mine adjacent to Pine Creek town ceased production in 1995. The Spring Hill gold deposit is ten kilometres to the west, the Union Extended Gold Mine (small past producer) is four kilometres to the west and the old McKinlay (silver, lead), Flora Belle (lead, silver) and Elizabeth (gold) mines are about eight kilometres to the WSW.

Topography and drainage

The Mount Porter area is “an erosion landscape of rugged, dissected ridges, with steep to gently undulating hills, and in the southern portion … within the granite country, of boulder fields and small rocky knolls” (Mulvaney, 1993).

Topography ranges from about 150 metres AHD along the Frances Creek Road in the eastern part of the tenement, to 292.3 metres AHD (592.3 metres local datum) at Mount Porter in the centre of the prospect area. The identified gold resource (the “10400 Zone”) is situated between the 200-275 metres AHD (present topography) on the eastern foothills of Mount Porter.

The Frances Creek Road to the east of the tenement and the access road between the Frances Creek Road and the mine site traverse the gently undulating granite country.

Ephemeral gullies drain the prospect area which is in the very upper catchments of Nellie Creek to the south (which drains east over 30-35 kilometres to the Mary River) and Watts Creek to the north (which drains north over 20-30 kilometres to the McKinlay River). The proposed initial 10400 Zone pit and associated waste dumps are likely to be constrained within the gully system which drains south to Nellie Creek. Pre-resource mineralisation is also known within both the Nellie Creek catchment and the Watts Creek catchment and these may provide additional minable resources with further exploration.

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Climate

Mount Porter is in the tropical monsoon belt of northern Australia and experiences distinct hot, humid summers ("wet season") and cool, dry winters ("dry season"). Average monthly maximum and minimum temperatures range between 30-36ºC and 12-29ºC respectively, with occasional extremes of >40ºC and <5ºC.

Average rainfall in the region is 1100-1200 millimetres which falls mainly during the period between October and March, and especially during the months of January-March when the area comes under the influence of the sub-tropical NW monsoons and associated tropical low pressure systems and monsoon trough. Peak average monthly rainfall is in February (350 millimetres).

Flora and fauna

"Open to dense eucalypt woodland with tall annual grass understorey" (Mulvaney, 1993) characterises the area of the tenement. This is typical of the "tropical eucalypt woodlands/grasslands" of Top End of the Northern Territory.

A field inspection by EcoFox Enterprises Pty Ltd in April 2004 revealed the following:

- That dominant species adjacent to the 10400 Zone pit area in the reddish soils overlaying the carbonaceous mudstone include Cooktown Ironwood *Erythrophleum chlorostachys*, Stringybark *Eucalyptus tetrodonta*, Woollybutt *E. miniata*, Bloodwood *E. latifolia, E. dicromophloia*, and Carbeen *E. clavigera*. Understorey species include *Acacia* spp., Kurrajong *Brachychiton diversifolius*, Red-flowered Kurrajong *B. paradoxum*, Grevillea *Grevillea* spp., *Hakea* sp., Sandpaper Fig *Ficus scobina*, S*esbania formosa*, Billy Goat Plum *Terminalia ferdinandiana*, *T. pterocarya*, and Melville Island Beech *Canarium australianum*;

- A range of grass species exists on the site including the common annual *Sorghum intrans*, perennial Sorghum *S. plumosum*, Black Spear Grass *Heteropogon contortus*, *Panicum* sp. *Aristida* sp. and an unidentified perennial species;

- As the reddish soils grade into the grey soils overlaying dolerite and metasediments the woodland opens out and tends to become dominated by Darwin Box *E. tectifica*. Salmon Gum *E. tintinnans* occurs on the granite country on the lower slopes to the southeast of the tenement. These species associations are common within the open eucalypt woodlands that cover most of the Top End.

A more comprehensive account of the flora and fauna of Mount Porter ML 23839 is provided by Reilly, Low and Matthews (2005) who conducted and environmental survey of the landscape, flora and fauna of the Mount Porter project area for inclusion in the PER (MBS Environmental, 2006).

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TENURE

Mining/Mineral rights

Mining rights over most of the known gold mineralisation at Mount Porter are held by Arafura Resources Ltd under ML 23839 which was granted on 2 February 2005 for a term of 25 years. The lease covers an area of 366 hectares (Figure 1).

Exploration rights to immediately surrounding areas are held by Arafura under ERL 116 which was granted on 12 September 1990 and transferred to Arafura in 2002 (Figure 1).

Land tenure

Background land tenure around ML 23839 and under ERL 116 is Mary River West Pastoral Lease, PPL815 – NT portion 1630, owned by Equest Pty Limited (Gary Hamilton), C/- 9 Pall Mall Avenue, Currumbin, Queensland, 4223.

Native Title

The situation regarding Native Title on Pastoral Leases in the Northern Territory has not yet been established by court ruling. Regardless of this, until there is a definitive court ruling on the matter, the *Native Title Act 1993* allows input to land use proposals by Native Title Holders or registered Native Title Claimants.

Registered Native Title Claim DC01/6 – Mary River West – C/- Northern Land Council, is in place over NT Portion 1630 which encompasses ML 23839 and surrounding tenement ERL 116.

Prior to the grant of ML 23839, Arafura successfully negotiated a Native Title Compensation Agreement ("ancillary agreement") with the registered native title claimants and the Northern Land Council (together "the native title parties") in accordance with the "right to negotiate" provisions of the *Native Title Act 1993*. This agreement is referenced in a "tripartite agreement" between Arafura, the NT Government and the native title parties which is registered with the National Native Title Tribunal.

Native Title is not an issue with respect to exploration activities on ERL 116 as the date of grant of this title precedes introduction of the *Native Title Act 1993*.

Archaeological surveys

Current AAPA Certificate C2004/098 was issued to Arafura on 7 July 2004 for the purpose of "mining" in respect of the current area of ML 23839. There are no registered or recorded aboriginal sacred sites within the area of the application.

Current AAPA Certificate C2003/025 is held by Arafura in respect of ERL 116 for mineral exploration.

An Aboriginal archaeological survey (Mulvaney, 1993) was completed by PCG in 1993 in preparation for planned mining at that time (prior to issue of C1993/197). A similar survey was completed by Gunn (2005) for inclusion in the PER (MBS Environmental, 2006).

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GEOLOGICAL SETTING

(updated from Goulevitch 2004)

Regional geology

Stratigraphic relationships and recent geochronological data in the Pine Creek Orogen are summarised in Table 1 and an extract from the 100,000 Pine Creek Geological Series Map is included as Figure 2. Letter abbreviations in Figure 2 are referenced in Table 1 and throughout the text below.

Gold mines and prospects in the Mount Porter region occur in:

- the Mundogie Sandstone (Ppm) and Wildman Siltstone (Pps) of the Mount Partridge Group;
- the middle and upper Koolpin Formation (Psk), Gerowie Tuff (Psg) and Mount Bonnie Formation (Pso) of the South Alligator Group,;
- the Burrell Creek Formation (Pfb) of the Finniss River Group; and
- numerous semi-conformable sills of pre-orogenic Zamu Dolerite (Pdz) which intrude the Koolpin Formation and Gerowie Tuff.

All of these units are part of the Palaeoproterozoic succession of the Pine Creek Orogen which extends from Darwin to Katherine, east into Arnhem Land and west to the coast.

In the Mount Partridge Group, the Mundogie Sandstone consists of up to 500 metres of coarse pebbly feldspathic arkose and quartzitic sandstone with interbedded siltstone and shale (in places carbonaceous) and minor chert and quartz pebble conglomerate. The Wildman Siltstone is comprised of medium and thin bedded and laminated, fine grained pyritic carbonaceous sediments for the most part but with minor sandstone beds and tuffs.

In the South Alligator Group, the Koolpin Formation consists of sulphidic carbonaceous siltstones and mudstones, ferruginous chert, iron formation, carbonates and phyllitic mudstones. Aeromagnetic patterns indicate the presence of pyrrhotite where it is the major sulphide phase in the Koolpin Formation. The Koolpin Formation varies in thickness from less than 100 metres to over 500 metres but its precise thickness in any area is difficult to determine because of the inclusion of sills of pre-tectonic Zamu Dolerite. These can vary in thickness from a few metres to a few hundred metres.

The Burrell Creek Formation in the Finniss River Group is up to 1,500 metres thick and consists dominantly of greywacke, siltstone and mudstone.

The Mount Bonnie Formation is a transitional unit which contains interbedded units of both Koolpin facies and Burrell Creek facies rocks. Its thickness is variable but generally ranges from 200-700 metres. The base of the Mount Bonnie Formation (formerly the Kapalga Formation, Crick *et al*., 1978) is defined as the base of the lower of two major greywacke-mudstone units each generally 20-50 metres thick, which represents the first recognisable input of Burrell Creek facies into the upper part of the South Alligator Group. The two thick greywacke-mudstone units are separated by 30-60 metres of laminated siltstone, shale, chert and tuff (Goulevitch, 1980).

The Gerowie Tuff, the only time marker in the South Alligator Group sequence, is up to 400 metres thick and is comprised of tuff, tuffaceous chert and tuffaceous siltstones with lesser amounts of interbedded Koolpin-facies sediments, i.e. laminated chert and carbonaceous siltstone. Bands of tuff, tuffaceous chert and tuffaceous siltstone continue through the Mount Bonnie Formation and, in places, continue into the lower Burrell Creek Formation. Beds of similar tuffaceous chert have been noted in drill core from the hanging wall sequence of Wildman Siltstone at Tom's Gully. This is much lower in the sequence than is normally the case for Gerowie Tuff input.

A sometimes angular and other times conformable contact separates the Wildman Siltstone and Koolpin Formation (Stuart-Smith *et al.,* 1993) and recent geochronological studies suggest this probably marks a major depositional hiatus between about 2030-2020 Ma and 1870-1865 Ma

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(Worden *et al.,* 2008; Table 1).

The boundaries between the Koolpin Formation, Gerowie Tuff, Mount Bonnie Formation and Burrell Creek Formation are conformable.

Sills and dykes of Zamu Dolerite intruded the South Alligator Group prior to the onset of regional tectonism.

The sediments, volcanics and dolerite sills are moderately to tightly folded about axial planes which strike to the south-south-east, south and south-south-west and dip vertically or steeply either side of vertical. The fold axes plunge northerly or southerly in different parts of the inlier generally at shallow angles. This accounts for the attenuated outcrop pattern. The dominant fold structure in the Mount Porter area is the Mount Porter Anticline which plunges gently to the NNW over a distance of 8 kilometres from the intrusive contact of the Allamber Springs Granite (see below).

Regional lower greenschist grade metamorphism accompanied the folding event during a major episode of deformation between 1865-1847 Ma with peak metamorphism at about 1855 Ma (Worden *et al.*, 2008).

The folded metasediment sequences and metadolerite sills of the Pine Creek Orogen were subsequently intruded by late Palaeoproterozoic granite batholiths and plutons at about 1830-1815 Ma. These intrusions generated aureoles of contact metamorphism, 0.5-2 kilometres wide, in the adjacent metasediments and metadolerites and this overprinted the effects of earlier regional metamorphism. In the Mount Porter area the Allamber Springs Granite (Pgca), a component of the Cullen Batholith (Pgc), is the local expression of this phase of plutonism. This intrusion cuts across the southern part of ERL 116 within a few hundred metres of the 10400 Zone.

Subsequently, an extensive array of north-east and north-west trending dolerite dykes intruded during extensional deformation. These crop out only rarely but are clearly evident on aeromagnetic images because of their magnetic character and continuity over distances up to 100 kilometres.

Mesoproterozoic sandstones, possibly Cambrian carbonate-rich rocks and Cretaceous sandstones and gravel (Czg) probably all covered the Pine Creek Orogen area at later times but these have since been almost entirely removed by erosion, at least around Mount Porter.

GOLD MINERALISATION MODELS IN THE PINE CREEK OROGEN

Goulevitch (1997) has summarised the styles of gold mineralisation in the Pine Creek Orogen and provides a detailed list of references to geological accounts for the various deposits which are mentioned below.

Prior to mining at Rustler's Roost between 1994 and 1998, gold mineralisation in the Pine Creek Orogen was generally categorised into one of the following three dominant geological models:

1. Sheeted and stockwork quartz-sulphide vein systems mainly along major anticlinal hinge lines in the Mount Bonnie Formation, and to a lesser extent in the underlying Gerowie Tuff and overlying Burrell Creek Formation. Mineralisation is preferentially associated with a strong carbonaceous or sulphide component in the host sequence (Woolwonga, Moline) or located where there are marked competency differences between successive layers such as greywacke and shale (Enterprise, Union Reef, Goodall, Mount Todd, Alligator and Faded Lily at Brocks Creek, Chinese Howley, Big Howley, Spring Hill, Yam Creek, Fountain Head, Mount Tymn, Mount Porter North). A dominant linear auriferous quartz-vein structure sub-parallel to the axial plane of the associated anticline has been identified in some deposits (Enterprise, Woolwonga). Bedding conformable quartz reefs are a feature of most deposits of this style and these often thicken and develop to saddle reefs where they pass over fold hinges (Enterprise, Union Reef, Fountain Head, Mt Tymn,

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Mount Porter North);

2. Sediment-hosted stratiform gold mineralisation and quartz-sulphide-vein-hosted stratabound gold mineralisation associated with cherty iron formation and carbonaceous mudstone mainly in the Koolpin Formation (Cosmo-Howley, Golden Dyke, Mount Porter, West Koolpin/Taipan at Quest 29) but also to a lesser extent in the Gerowie Tuff (Zapopan) and Mount Bonnie Formation (Northern Hercules, ?Beef Bucket at Rustler's Roost).

3. Auriferous stratiform, massive to banded, sulphide-silicate-carbonate mineralisation in the Mount Bonnie Formation (Mt Bonnie, Iron Blow, Moline).

As a result of the detailed geological investigations undertaken during mining at Rustler's Roost, and given the physical extent of the resources identified there, sediment-hosted stratiform gold mineralisation associated with cherty dolomitic and sulphidic shale in the Mount Bonnie Formation needs to be added to this list. This model displays elements of the first and second models listed above given that:

- the vast bulk of the mineralisation at Rustler's Roost is situated astride a major anticline (the Dolly Pot Anticline);
- sheeted quartz-sulphide veins host some of the gold mineralisation (in the Backhoe deposit); and
- the gold mineralisation at Rustler's Roost occurs in stacked sediment packages and thus displays both strong stratiform and strong stratabound character.

The Rustler's Roost model could be considered as a link between models 1 and 2 above.

Gold mineralisation models of lesser importance in the Pine Creek Orogen include:

1. Sediment-hosted, isolated, single quartz veins or reefs which generally transgress stratigraphy (BHS, Marrakai, Bandicoot, William, Great Northern, Great Western). Veins are generally only a metre or two thick and are very often banded or laminated. The Tom's Gully reef may be regarded as a near-bedding-conformable example of this model. Reefs of this style may be expressions of reverse faults;
2. Sheeted or stockwork quartz-feldspar-sulphide veins hosted by sills of Zamu Dolerite within the Koolpin Formation and Gerowie Tuff (Chinese Howley South, Margaret Diggings, Quest 29, Maureen);
3. Sediment-hosted, transgressive, linear arsenical ferruginous quartz-breccia reefs which pass across granite boundaries into low-grade linear sericite alteration zones of considerable length (Golden Honcho, Bonrook). This is the only Pine Creek Orogen model in which gold mineralisation demonstrably post-dates granite intrusion.

Most gold mineralisation in the region occurs mostly above the middle of the Koolpin Formation in the South Alligator Group, and in the lower part of the Burrell Creek Formation of the Finniss River Group. Tom's Gully and Golden Honcho are two of the very few exceptions to this generalisation. The Tom's Gully vein occurs in strongly carbonaceous pyritic sediments of the Wildman Siltstone of the Mount Partridge Group. The Golden Honcho reef system at Frances Creek transgresses the contact between the Allamber Springs Granite and the Mundogie Sandstone, also of the Mount Partridge Group.

Of prime importance in understanding the mineralisation at Mount Porter is the Cosmo-Howley/Golden Dyke style of gold mineralisation which is hosted by silicate-sulphide facies cherty iron formations in the middle and upper levels of the Koolpin Formation. Golden Dyke and adjacent smaller deposits produced 25,000 ounces of gold from a stratiform lens of cherty iron formation on the western side of the Golden Dyke Dome. Cosmo Howley produced 369,000 ounces of gold from similarly hosted stratiform mineralisation on the limbs and the crest of the Cosmo Anticline in zones complicated by, strong axial plane faulting.

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The syn-orogenic granites (*eg.* Cullen Batholith, Mount Bundey Granite, Mount Goyder Syenite) are regarded by many geologists to be the driving force for gold mineralisation in the Pine Creek Orogen. Mineralisation is thus generally considered to be pre- or syn-intrusion. There is reasonable evidence to interpret that the bulk of the anticline-associated vein-type deposits were deposited during structural re-activation of regional fold structures during granite intrusion, though this has not been established unequivocally. Only the Golden Honcho and Bonrook reefs demonstrably overprint granite intrusion.

GEOLOGY OF THE MOUNT PORTER DEPOSIT

(Goulevitch, 2004; partially after Eupene, 1994, and Majoribanks, 1994)

The metasedimentary rocks present in the Mount Porter project area belong to the Koolpin Formation of the South Alligator Group. For the most part the Koolpin Formation at Mount Porter is characterised by pyrrhotitic and pyritic carbonaceous shales and siltstones but in the Middle Koolpin Formation, sulphidic laminated chloritic/carbonaceous "shales", with prominently developed “chert” nodules, are ubiquitously present. (In most parts of the Pine Creek Orogen the “chert” nodules are actually comprised of microcrystalline silica but in more weakly metamorphosed areas, such as at Rustler’s Roost near Mount Bundey, the nodules are cryptocrystalline and chalcedonic in character. Chert is thus believed to be a pre-cursor for the microcrystalline silica and, for this reason, the term “chert” is applied to all the bedded nodular silica in the Koolpin-facies rocks of the South Alligator Group whether they be in the Koolpin Formation, Gerowie Tuff or Mount Bonnie Formation.

These chloritic chert-shale units in the South Alligator Group appear to be laterally continuous over considerable distances and are widely regarded to be “silicate facies” banded iron formations (BIF), though that has not been unequivocally established. According to Eupene (1994), over the 13 kilometres which separates exposures of Koolpin Formation at the Cosmo Howley and Golden Dyke gold mines, there is good correlation of nine identifiable sub-units of the Middle Koolpin Formation, including five separate iron formation horizons. This subdivision is believed to be useful at least as far east as the Horseshoe Anticline, 10 kilometres west-north-west of Mount Porter and 20 kilometres from Golden Dyke, but a lesser number of sub-units appears to be present at Mount Porter.

Due to perceived structural complexity, a lack of surface exposures and only a limited amount of drill core, the Koolpin Formation stratigraphy at Mount Porter has not yet been fully defined though it does appear that up to three BIF horizons separated by carbonaceous mudstone units may be present in the middle of the Koolpin Formation. These are overlain by a thick sequence of sulphidic (predominantly pyrrhotitic) carbonaceous mudstone. Distinct thick dolomitic marble units are present towards the base of the Koolpin Formation and some dolomitic marble bands, 10-20 centimetres thick, are interbedded with bands of nodular chert in the intervening sequence.

A subdivision of the Koolpin Formation and interleaved sills of Zamu Dolerite at Mount Porter away from the complex structural development in the 10400 Zone is shown in Table 2 as well as thicknesses of the individual units. This demonstrates considerable thickness variations of units over a distance of 1.5 kilometres along the Mount Porter Anticline.

The mineralised Middle Koolpin Formation (informally referred to in this report as “Unit I”) at Mount Porter, is interpreted to extend from the top of the uppermost dolomitic marble layer or band to the base of the massive sulphidic carbonaceous mudstone unit which constitutes the basal unit of the Upper Koolpin Formation. Unit I appears to be more than 45 metres thick on the crest of the Mount Porter Anticline in the 10400 Zone but possibly thinner on the limbs. Eupene (1994) subdivided the nodular cherty iron formations in Unit I into two sub-units separated by an intervening carbonaceous mudstone horizon 3-10 metres thick. He also recognised a biotite hornfels sub-unit below the lower nodular chert sub-unit. This sub-division was not supported by the 2003 drilling in which more carbonaceous zones occurred in different stratigraphic positions in different holes and chert nodules generally occurred sporadically within this zone. Consequently, until more lateral consistency can be established in the stratigraphy of the Middle Koolpin Formation, the entire unit, including variably garnetiferous/carbonaceous biotite hornfels at depth, is referred to as Unit I.

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An overlying massive sulphidic carbonaceous mudstone unit comprises the bulk of the Upper Koolpin Formation at Mount Porter and this is informally referred to in this report as "Unit C". The upper two dolerite sills, Du and Dm (see below) divide Unit C into three sub-units, C1, C2 and C3.

The Lower Koolpin Formation ("Unit Kl") has not been identified in the 10400 Zone drilling but it has been drilled elsewhere at Mount Porter including in holes MPDH225, 226, 228, 229 and 230 drilled by Homestake. In MPDH225 the unit includes interbedded marble, chloritic cherty (nodular) iron formation and biotite-cordierite-garnet metasiltstone/hornfels and it is in excess of 88 metres thick, of which up to 10 metres occurs above the lower dolerite sill (see below).

Three semi-conformable dolerite sills (metadolerite/amphibolite) have been identified within the Koolpin Formation at Mount Porter. The thickest of these ("Dm", 70-90 metres true thickness) intrudes Unit C about 5-30 metres above the top of Unit I. A thinner dolerite sill ("Du", 10-25 metres true thickness) occurs higher in Unit C and another thin dolerite sill (20-30 metres true thickness) occurs below the uppermost dolomitic marble layer in the Lower Koolpin Formation. Du and Dl may not be as persistent laterally as Dm (Dl does not appear to be present in MPDH226 drilled a few hundred metres east of the 10400 Zone).

Thin (0.5-3 metres thick) fine grained felsic and/or mafic dykes also intrude the mineralised sequence at Mount Porter. These appear to post-date most of the structural development of the area. Some are definitely cut by auriferous massive sulphide veins but generally these dykes are not otherwise mineralised. Most of the felsic dykes in the 10400 Zone appear to be constrained within a 3-5 metre wide zone which extends roughly along 10160E at the surface. This zone dips very steeply to the east at the surface and less steeply to the east at depth.

The primary structure through the Mount Porter prospect is the Mount Porter Anticline, which is a prominent and persistent NNW plunging regional structure (Figure 2). The Mount Porter Anticline appears to have many features which characterise other major fold structures in the Pine Creek Orogen:

- Steeply dipping to slightly overturned but generally regular limbs;
- Complex axial zones, commonly with at least two separate antiform folds;
- Thickening of incompetent units, especially carbonaceous shale, in the axial zone, and disruption of competent units;
- Complex fault zones, frequently intruded by late basic or lamprophyric dykes and/or associated quartz veining and stockworks;
- Evidence of massive brecciation and mineralisation.

At the 10400N Zone, most of the mineralisation intersected to date occurs in a complex multiply hinged fold zone on, and immediately to the west of, the main axis of the Mount Porter Anticline (Figures 3 and 4). This zone is bounded by at least three major faults – a NE trending structure to the southeast (F1), an ESE trending structure to the north at about 10500N (F2) and a major NS trending fault and shear zone to the west on about 10100E (F5). Another major structure (F3), parallel to F2, occurs further to the north at about 10700N.

The Mount Porter Anticline and mineralised metasediment sequence are intruded to the southeast by the Allamber Springs Granite which is a phase of the Cullen Batholith. The NE trending granite contact traverses the southeast portion of the tenement and, on the basis of a drill intersection 500 metres east of the 10400 Zone (MPDH226), dips to the NW at about 40-45º.

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Table 1

Stratigraphic Relationships in the Pine Creek Orogen

From Pine Creek & Batchelor 1:100 000 Geological Series Map, BMR/NTGS, 1985, and other sources. Letter abbreviations relate to Figure 2.

*Age dates from Worden *et al.,* 2008.

RECENT/CAINOZOIC

Alluvium and Colluvium (Qa)

Laterite

MESOZOIC

Petrel and Bathurst Island Formation

Mullaman Beds

Unconformity

CAMBRIAN

Daly River Group

Unconformity

MESOPROTEROZOIC

Katherine River Group, Tolmer Group

Unconformity

PALAEOPROTEROZOIC

Cullen Batholith (Pgc) (1835-1775 Ma)

Mount Bundey Granite, Mount Goyder Syenite

*Major period of deformation and regional metamorphism – 1865-1847 Ma**

PALAEOPROTEROZOIC

Zamu Dolerite (Pdz)

Finniss River Group (1865-1857 Ma*)

Burrell Creek Formation (Pfb)/Welltree Metamorphics?

South Alligator Group

Mt Bonnie Formation (Pso)

Gerowie Tuff (Psg) **(1867-1858 Ma*)**

Koolpin Formation (Psk)

*Unconformity **(major hiatus*)***

Mount Partridge Group

Wildman Siltstone (Ppw) **(2030-2020 Ma*)**

Mundogie Sandstone (Ppm)

Mount Deane Volcanic member

Acacia Gap Quartzite Member

Whites Formation

Coomalie Dolostone

Crater Formation

Unconformity

Namoona Group (/Manton) (2030-2020 Ma*)

Masson Formation (Pnm)

Celia Dolostone

Beestons Formation

Unconformity, deformation and high grade metamorphism

ARCHAEAN

Rum Jungle and Waterhouse Complexes **(2545-2520 Ma*)**

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Table 2 - True thicknesses (m) of sub-units of Koolpin Formation and Zamu Dolerite sills at Mount Porter in Homestake's core holes.

GRID NORTH	10150	10470	10475	10600	10640 E A'cline	10680	10710	10880	11100	11500	11500
MPDH/ UNIT	**229**	**232**	**235/6**	**225**	**226**	**233**	**230**	**228**	**237**	**231**	**227**
C3						>63.8			>72.9 **F**	>63	
Du						>8.5 **F**		>5	**F** >18.6	24	35.8
C2				>36		**F** >12.1 **F**		6	>17.1 **F**	23	>47.3
Dm				94	>53	**F** >13	>75	65-70	**F** >34 **A'cline** >6.8	>49 **F**	>74.5
C1				28.7	6.9	5.7	12.2	4	0.5 **A'cline** 2.0	**F** >1	>10.7
I	>40			>23.5 **F**	53.2	38.7	55-65	53	29.4 **A'cline** 44.7	54	
Klu	6.3			**F** >10.9 **A'cline** 21.2 **S'cline** 24.4	>16- >36.7	>11.1	>2	>1.5	?>7.9	NIL	
Dl	NI			20.4 **A'cline** 33						>6.6 ?Dm	
Kll				>78 **A'cline** >34							

PREVIOUS INVESTIGATIONS

The Mount Porter gold deposit was discovered on the eastern flanks of Mount Porter (292 metres, AHD) in 1988 by Gold Fields Exploration Pty Ltd, a subsidiary of Renison Goldfields Consolidated Limited (RGC) (Dufty, 1989). Initial positive outcrop samples led to more intensive exploration under ELs 4752 and 6530, and ERL 116 over the succeeding decade. ERL 116 remains to this time.

RGC's exploration to the end of 1993 included a total of 223 drill holes (Eupene, 1994). The bulk of these holes were completed between 9300-11000N (local grid) in a belt which stretched from 1,200 metres S of Mt Porter to 500 metres N of the peak.

The final phase of exploration (46 holes) by RGC in 1993-1994 was conducted by their subsidiary, Pine Creek Goldfields Limited, who at the time operated the Enterprise Mine in Pine Creek, 20 kilometres to the south (Eupene, 1994; Majoribanks, 1994). This drilling was concentrated between 10250-10550N ("10400 Zone") where the earlier drilling had identified a coherent zone of relatively high grade (3-4 g/t Au) gold mineralisation at shallow depths (less than 70 metres from the surface). It was after this phase of exploration that the currently identified mineral resources were estimated for the "10400 Zone".

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PCG completed ore body modelling of Mount Porter early in 1994 (Sans, 1994). The estimated global resources were:-

Cut-off 1.5 g/t Au
240,000-250,000 t @ 3.6-3.8 g/t Au
Cut-off 1.7 g/t Au
215,000 t @ 3.9 g/t Au
Cut-off 2.0 g/t Au
176,000 t @ 4.4 g/t Au.

PCG conducted archaeological, sacred sites, metallurgical and environmental studies and in 1993-94 prepared for mining the "10400 Zone" (Agnew, 1994). But plans were shelved in 1994 because the anticipated financial return of about $1 million did not justify the development risk in the economic conditions which prevailed at the time.

Between 1995 and 1997, an additional 14 drill holes, some as deep as 810 metres (600 metres vertical), were completed by Homestake Gold of Australia Limited (Homestake) under a farm-in arrangement with RGC. Homestake explored for new major zones of mineralisation over a kilometre long section of the Mount Porter mineralised trend, mainly to the north of the 10400 Zone (Stewart, 1996, 1997). Homestake had little success with this approach and withdrew from the project in 1998.

In 2003, Arafura Resources completed a program of 7 inclined HQ core holes (MPDH241-247) totalling 417.5 metres into the 10400 Zone (Goulevitch, 2004) to confirm the continuity of the highest grade gold mineralisation, as recommended by Sans (1994). Results from this program and all earlier investigations were utilised to construct a more reliable geological model as a basis for a new estimate of identified mineral resources by Payne (2004).

A program of 4 inclined RC holes (MPRC248-251) totalling 320.8 metres into two targets ("NW" and "SE" targets – Figure 3) on the margins of the 10400 Zone at Mount Porter was completed by Arafura in 2006 (Goulevitch, 2007). The westernmost hole of the program, MPRC248, intersected a previously unknown zone of gold mineralisation over a 13 metre interval (13 metres @ 3.53 g/t Au) some 20 metres west of and 30 metres deeper than the Identified Resources in the 10400 Zone. This zone (the "248 Zone" – Figure 5) was not intersected in any earlier holes drilled into the western side of the Mount Porter deposit.

In an effort to generate new geological and alteration-related exploration targets over the Mount Porter-Frances Creek Project tenements (ML 23839, ERL 116, EL 23237, AN 389, and parts of EL 22270 and EL 10137), Arafura commissioned Hyvista Corporation to acquire an airborne hyperspectral (HyMap) survey in 2010 (Figure 6).

WORK COMPLETED DURING 2011-12

Corporate

Following a decision to accelerate the development of its rare earths business interests, Arafura has in recent years been active in communicating a desire to divest its interest in the Mount Porter Project. In the last twelve months, the Company made some progress in executing its divestment strategy:

- In January 2011, Arafura executed a contract of sale for its Mount Porter-Frances Creek gold assets, including ML 23839, with Global Mineral Resources Limited (Global);
- In a prospectus lodged with Australian Securities & Investments Commission (ASIC) in June 2011, Global sought to raise $5-6 million via an initial public offering (IPO). The proceeds from the capital raising were aimed at funding the first two years of exploration;
- In September 2011 Global lodged a supplementary prospectus with ASIC which extended the closing date of the IPO to December 2011.However due to volatility in global equity markets during the second half of 2011 (primarily associated with the European Debt Crisis), Global was unable to generate sufficient interest in its IPO to list on the Australian Securities Exchange (ASX), a Condition Precedent of the agreement with Arafura;

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- Consequently, Global withdrew its IPO prospectus on 18 November 2011, and the contract of sale between Global and Arafura lapsed shortly thereafter.

Arafura remains committed to executing its gold portfolio divestment strategy through active engagement with suitable gold development partners.

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