ELR 116 Mount Porter, Northern Territory

Annual Report for period ending 11 September, 2015

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SUMMARY

The Mount Porter gold resource is a key asset and major focus of attention for future Gold production for Ark Mines. The Arafura Mount Porter-Frances Creek Project was farmed into by Ark Mines in March 2013. This Project currently comprises a number of exploration / mining titles, covering an area of approximately 67 km^2. Three of these licenses, including ELR 116, are owned outright by Arafura. The mineral rights on the remaining licenses are shared with Territory Resources Limited, or with its wholly owned subsidiary, Frances Creek Pty Ltd.

To date, Arks activities in the Mount Porter region have been directed at preparing for the commercial exploitation of the Mount Porter gold resource. Ark has been focusing on the Mt Porter resource. Ark has undertaken revised metallurgical test work, optimization work on Mt Porter. This work has led Ark to decide on Mining the Mt Porter Gold Pit. Ark has negotiated an agreement to treat the ore at the local Gold plant at Pine Creek owned and Operated by Newmarket Gold (formerly Crocodile Gold) Ark has commenced a Mining Management Plan for Mt Porter and anticipates commencement of Mining upon completion of the MMP.

INTRODUCTION

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 kilometers 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 kilometer 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, ELR 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 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 kilometers north of Pine Creek and 165 kilometer's southeast of Darwin in the Northern Territory, Australia (Figure 1).

Access to ELR 116 and ML 23839 from Darwin is along the Stuart Highway (225 kilometers) to Pine Creek then north along the Kakadu Highway and unsealed Frances Creek Road for 24 kilometer's to a point about 6.5 kilometer's past the turn-off to Mount Wells. From here a bush track leads to the prospect area some 3 kilometer's distant .

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 center of the prospect area. The identified gold resource 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 mineable resources with further exploration.

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) characterised 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.

TENURE

Mining/Mineral rights

Exploration rights to areas immediately surrounding Mount Porter are held by Arafura Resources Ltd and farmed out to Ark Mines Limited under ELR 116 which was granted on 12 September 1990 and transferred to Arafura in 2002

Mining rights over most of the known gold mineralisation at Mount Porter are held by Arafura and assigned under contract to Ark Mines 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

Land tenure

Background land tenure under ELR 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

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

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 ELR 116 as the date of grant of this title precedes introduction of the *Native Title Act 1993*.

Archaeological surveys

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

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).

GEOLOGICAL SETTING

(updated from Goulevitch 2004)

Regional geology

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

- the Mundogie Sandstone (Ppm)
- 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 (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 .

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 ELR 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 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.

The syn-orogenic granites (*e.g.* 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 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.

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 . 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 . 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.

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 ELR 116 over the succeeding decade. ELR 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.

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 2) 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 was not intersected in any earlier holes drilled into the western side of the Mount Porter deposit.

WORK COMPLETED BY ARK DURING 2014- 15

Developing the Metallurgy, permits and commerciality of Mt Porter

- ✓ Mt. Porter Mining Lease 22389 is in good standing
- ✓ Extensive and independent metallurgical testing completed
  - Expected gold recoveries - 73% - 76% in the fresh 92% in the oxide
- ✓ Mt. Porter Whittle analysis & pit optimisation completed (summary below)
  - Supports cash flow positive mining case for 'Union Reefs' mill
  - Mill located approx. 10km from Mt. Porter
- ✓ Binding Heads of Agreement signed with 'Union Reefs' mill owner/operator
  - Contemplates mining/processing during 2016
  - Contemplates up to 550k tonnes and circa. 27,000 gold ounces
  - Potential for recoveries to be increased to between 75% and 76%
  - Definitive processing agreement being negotiated
- ✓ Mt. Porter Mining Management Plan now being prepared
- ✓ Public Environmental Report prepared
- ✓ Statutory environmental approvals secured until end of 2017
- ✓ Native title agreements and approvals obtained and in place

SUMMARY OF PROPOSED ACTIVITIES

The proposed action is to establish a mining operation within the Mt Porter mineral lease. This will require development of an open cut pit to access the ore body. Ore will be extracted through blasting and excavation. The excavated material will be placed in stockpiles before being loaded onto trucks and transported to the Union Reef CIL plant which is located some 10 kilometres south west of Mt Porter.

A more detailed explanation of the sequential mining process is described below:

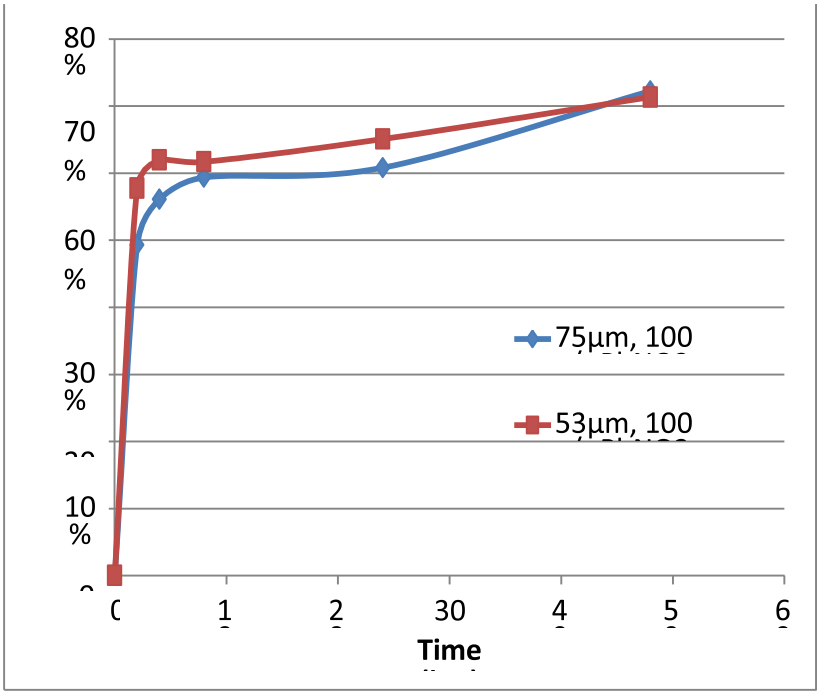
1. **Removal of Vegetation:** Any vegetation that needs to be cleared for the purposes of mining at the site, where practicable will be stockpiled for use in later rehabilitation. Clearing will be kept to the minimum required to conduct the mining project.
2. **Remove and Stockpile Topsoil:** The top 200 millimetres will be removed using scrapers or other efficient earth moving machinery and placed in low stockpiles for later re-use.
3. **Remove and Stockpile Overburden:** Waste includes both the overburden layer and the non mineralised material around the ore body. Waste will be placed in a purpose built waste landform adjacent to the pit as displayed in Figure 3. Approximately 2.4 million tonnes of waste is anticipated to require removal.
4. **Mining:** Extraction will be carried out using an excavator and a fleet of trucks. Blasting will generally be required to fracture the ore and waste rock sufficiently to allow excavation. Ore will be loaded onto haulage trucks and taken to a ROM stockpile at the base of the hill. The resultant pit will be about 4 hectares in area and 115 metres deep to allow production of 574,000 tonnes of ore and 2,400,000 tonnes of waste rock. It is estimated that the total volume of the pit will be one million bank cubic metres. A total of 24 hectares of land is expected to be disturbed by the operation.
5. **Transport:** Road trains will be used to transport ore to the nearby Union Reef CIL processing plant. Transport will occur on dedicated haul roads and existing public roads.
6. **Disposal of Wastes:** Waste rock will be stockpiled adjacent to the pit in a purpose built waste rock stockpile. A total of 2,400,000 tonnes of waste rock is anticipated. The waste rock stockpiles will be shaped to blend with the topography and revegetated. PAF material will be stored and then re trucked back into the Pit and then covered by oxide material.
7. **Rehabilitation:** Rehabilitation will be undertaken with waste rock material deposited in the waste rock stockpile. Topsoil will be replaced over the waste rock stockpile as part of the rehabilitation process.

METALURGY

Ark undertook a revised study on the metallurgical recoveries of the Mt Porter Ore during this reporting year.

Arafura had undertaken Metallurgical test work for the Mt Porter Ore in 2006, however Ark decided to undertake further work as there was a gap in the process between the previous test work and the actual Union Reef plant process. Ark engaged IMO from Perth to undertake extensive test on core taken from the core sample repository in Darwin. The core used was in very good condition due to be stored in a sealed container. IMO have indicated the core samples used were essentially un oxidised and were representative of the insitu ore.

Leach tests conducted on the material with no other pre-beneficiation yielded a maximum of 73% gold recovery, which is better than expected. This recovery was achieved with the addition of $PbNO_3$ and oxygen with a maintained NaCN concentration of 300 ppm. Additionally, at the conclusion of testing (48 hours), leaching still appeared to be occurring as evidenced by the absence of a plateau in the recovery curve.



The potential for separate recovery of gravity recoverable gold is indicated. A gravity circuit also offers benefit in terms of reduced elution costs and carbon attrition gold loss.

The Crocodile Gold metallurgists have indicated that the recoveries based on the test work will actually reconcile through the Union Reef plant at 76% recovery, as the plant uses oxygen sparging and an acacia reactor, which have proven to increase recoveries on this type of ore.

MINING

The deposit is to be mined within an eight month period in the dry season between April and November 2016. A total of 570,000 tons of ore will be mined and hauled to Union reef along a well formed Haul Road. This haul road was built by Territory Iron and runs directly past Mt Porter to the rail heading at Union Reef. (refer to the photo below)

Haul road running directly past Mt Porter

Mining activity will be concentrated between the 215 to 280 metres AHD levels on the eastern slopes of Mt Porter.

Development of the project will principally involve:

- An eight month mining operation of recoverable mineral resources using standard opencut methods over an eight month period in the dry season (April to November).
- Temporarily stockpiling ore on site before transporting it off-site using road-trains along existing transport corridors.
- Progressive rehabilitation of areas disturbed by mining operations.
- Decommissioning of the site upon completion of operations.

CONCLUSION AND RECOMMENDATIONS

At prices of Aus $1500/oz for gold Ark will continue to Pursue a Mine Management Plan with the intention of Mine commencement 2016. Ark will upon commencement of Mining and cash flows will look to further investigating ELR116 for potential similar deposits.

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