PARTIAL RELINQUISHED REPORT ON
EL 26955 MT MACHLAN PINE CREEK
NORTHERN TERRITORY

TENEMENT HOLDER: ELEMENT 92 PTY LTD

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Element 92 Pty Ltd (Thundelarra Exploration Ltd)
**SUMMARY**

EL 26955 “Mt McLachlan” is located about 220 km south of Darwin and is being explored by Thundelarra Exploration Limited/Element 92 Pty Ltd since its grant. In order to meet NT Mining Act requirements, 20 blocks of EL 26955 were surrendered in 2011, and following report is lodged to satisfy NT Mining Act requirements. It was granted to Element 92 Pty Ltd on 19 May 2009, and originally comprised of 39 blocks (127 km²).

The tenement covers a small section of the Pine Creek Shear Zone which runs north-westerly through the Palaeoproterozoic metasediments between Allamber Springs Granite, to the east, and the McMinns Bluff Granite and Tabletop Granite, to the west. The Pine Creek Shear Zone has been a major locus for the passage of gold-bearing fluids and hosts majority of gold occurrences in the Pine Creek Orogen. The fault zone trends NNW and consists of a number of sub-parallel faults, over a 5 km corridor, with apparent sinistral movement of up to 2 km. The Mt McLachlan tenement area is located in the southern part of the Pine Creek Orogen which is dominated by mudstones, siltstones, greywackes, sandstones and tuffaceous rocks which have been assigned to the Mount Bonnie and Burrell Creek formations.

A desk top study of the project area was undertaken. For this purpose, data obtained during previous exploration programs were examined together with data collected by NT Geological Survey/Australian Geological Survey Organisation. Mapping conducted by the Government organisations has provided geological and structural setting of the project area in regional context which is important in evaluating mineral potential of the project area. A number of field visits were undertaken for ground-truthing and assessing the mineral potential of the project area. In addition 5 rock chip samples were taken which have not been assayed yet. During ground-truthing and appraisal of historical exploration data revealed that area relinquished did not have any potential for gold or base metals mineralisation.
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1.0 INTRODUCTION

EL 26955 “Mt McLachlan” is located about 220 km south of Darwin and is being explored by Thundelarra Exploration Limited/Element 92 Pty Ltd since its grant. Project area has been explored for gold, uranium and base metals mineralisation. This report has been prepared to satisfy NT Mining Act requirements over the relinquished area.

2.0 LOCATION AND ACCESS

EL 26955 is approximately 3 km SW of Pine Creek township which is situated about 220 km south of Darwin (Figure 1). From Darwin, Project area can be approached by Stuart Highway, a main road which runs north to south connecting Darwin with Adelaide. It runs through the northern part of EL 26955. About 2 km south of Pine Creek, Jindare road takes off from Stuart Highway and provide access through the southern part of the project area (Figure 1). Northern part of the tenement can also be accessed by Pinq Que Road. Within the project area access is possible through station tracks. Stuart Highway is all weather road and provide access all year around, whereas access within the project area may be restricted during wet season.

3.0 TENEMENT DETAILS

The tenement was applied for on 18 September 2008 and was granted to Element 92 Pty Ltd on 19 May 2009. It originally comprised of 39 blocks (127 km²) located within Pine Creek (1:100000) and Pine Creek (1:250 000) sheets area. Before grant EL, 26955 was affected by Native Title Claim which expired on 31 March 2009. To meet NT Mining Act requirements, 20 blocks (SD521510Q, SD521510R, SD521510V, SD521510W, SD521582B, SD521582F, SD521582G, SD521582L, SD521582M, SD511582N, SD521582O, SD521582R, SD521582S, SD521582V, SD521582W, SD521582X, SD521654B, SD521654C, SD521654G and SD521654L) of EL 26955 were surrendered in 2011, and following report is lodged to satisfy NT Mining Act requirements. Figure 1 shows relinquished part of the EL 26955.
Figure 1: Location of Project Area
4.0 GEOLOGICAL SETTING

Regional geology is outlined in many publications, notably Ahmad et al. (1993), Needham and Stuart-Smith (1984) and Needham et al. (1988). The tenements are within the Pine Creek Orogen, a folded sequence of Palaeoproterozoic pelitic and psammitic sediments, with interlayered cherty tuff units. These rocks have been intruded by the late-orogenic Palaeoproterozoic granites, causing wide spread contact/thermal aureole which contains most of the gold mineralisation (Bajwah, 1994) in the Orogen. An important tectonic feature – the Pine Creek Shear zone runs through the project area, which is known to host gold mineralisation in the area.

The tenement covers a small section of the Pine Creek Shear Zone which runs north-westerly through the Palaeoproterozoic metasediments between Allamber Springs Granite, to the east, and the McMinns Bluff Granite and Tabletop Granite, to the west (Fig. 2). The Pine Creek Shear Zone has been a major locus for the passage of gold-bearing fluids and hosts majority of gold occurrences in the Pine Creek Orogen. The fault zone trends NNW and consists of a number of sub-parallel faults, over a 5 km corridor, with apparent sinistral movement of up to 2 km (Vieru, 2010). It postdates the granite intrusions and, where not seen in outcrop, the Pine Creek Shear Zone is defined by linear magnetic features given by the contact metamorphic rocks formed during the granitic intrusions.

The Mt McLachlan tenement area is located in the southern part of the Pine Creek Orogen which is dominated by mudstones, siltstones, greywackes, sandstones and tuffaceous rocks which have been assigned to the Mount Bonnie and Burrell Creek formations. This sequence was folded and metamorphosed up to the amphibolite facies from 1870 to 1899Ma. Transitional igneous rocks, including pre-tectonic dolerite sills and syn- to post-tectonic granitoid plutons and dolerite sills and dykes, intrude the orogenic sequence. Detailed geology of the Pine Creek Geosyncline has been discussed by Nicholson, Ormsby, and Farrar (1994).

Two major phases of deformation that pre-date granitoid intrusions have been recognised in the Pine Creek Orogen. The earliest widely recognised structures in the Pine Creek deformation produced the dominant north to north-west trending folds. The folds vary from open and upright to overturned and isoclinal, and were accompanied by the development of a penetrative slaty cleavage.

The bulk of the gold resources of the Orogen occur in quartz-sulphide stock-works and in sheeted vein systems. Many of these deposits are located along the sheared hinge lines of anticlinal folds, particularly in interbedded greywackes and siltstones of
Figure 2: Geological setting of the project area
the Mount Bonnie and Burrell Creek formations. The prime examples included Union Reefs, Fountain Head, Spring Hill, Woolwonga Mines and Yam Creek. Presently identified gold resources and reserves along this major structure are estimated to more than 130,000 kg (4,000,000 ounces). The Enterprise ore body at Pine Creek provides a model for proposed exploration in the Pine Creek area. This deposit occurs at the boundary of the Mount Bonnie Formation and the Burrell Creek Formation, the principal host rocks being greywackes, siltstone, shale, mudstone, chert and tuff. The main structure is the Enterprise anticline, a simple, upright, moderately tight fold which plunges gently to the south. Extensive fracturing and shearing occur throughout the deposit, frequently concentrated around the anticlinal axis.

Most ore grade mineralisation occurs within 50 metres of the fold axis, and the ore body extends for approximately 1,000 metres along the axis of the fold. Mineralisation consists of quartz-sulphide veining with pervasive alteration of the host rocks. Common sulphides are pyrite-arsenopyrite and pyrrhotite, with lesser sphalerite, galena and chalcopyrite. Most rock alteration consists of the silica-potash feldspar-chlorite-biotite assemblages. Vein types include saddles, spurs and stockworks in the hinge zone, ladder and sheeted veins restricted to the west fold limb, and late-stage vuggy quartz veins and beccias which are relatively rich in sphalerite and galena.

Greenschist facies metamorphism appears to be broadly synchronous with this deformation. Pine Creek Goldfields commenced mining the Enterprise deposit in 1885 and, by July 1993, had produced approximately 20 tonnes of gold.

5.0 PREVIOUS EXPLORATION HISTORY

The project area has seen the exploration activity since 1880’s when Pine Creek goldfield was discovered. Since then area has attracted considerable interest from gold explorer. Sytematic mapping of the area commenced in 1960’s with the production of first edition Pine Creek (1:250,000) map and explanatory notes. Most of the exploration activity within the area was directed to the new gold discoveries between the Union Reefs and Enterprise gold mines.

The Copperfield copper mine, located within the MLN21 (which is excised from the EL), has produced 3,450 tons of ore grading greater than 25% Cu. Most of the ore was obtained from the 30 metres thick oxidation zone. The working consisted of at least 15 shafts, the deepest being 40 metres (down to primary ore) and an open cut
30 x 2 x 4 metres in dimension. The second phase of production was associated with the southern extension of the lode which was 1.5 metres wide. Several hundred tonnes of copper ore graded 12-26% Cu was raised from a 50 metre shaft. United Uranium NL (1967) has estimated a possible 90,000 tons of ore remaining, with a grading of 6.1% Cu and 185 g/t Ag. The Enterprise No 2 copper prospect is located about 2.5 kilometres southwest of the Pine Creek township on the northern part of the MLN95 which is excised from the current tenure. The prospect lies within hornfelsed arenites of the Burrell Creek Formation in the contact aureole of the Tabletop Granite.

The main copper-bearing quartz vein strikes north-northeast and outcrops discontinuously over a strike length of 330 metres. Where the shaft is located, the vein is about 0.5 metres thick and dips 60° to the west. Malachite is the main copper mineral present, commonly staining the joint surfaces of vein quartz. The mineralisation at depth is largely in the form of veinlets and disseminations of chalcopyrite within the granoblastic quartz veins, however stockwork veinlets exist in the brecciated wallrock.

The prospect was investigated during 1974-75 by the Northern Geological Survey which conducted geological mapping and a diamond drilling program of 5 holes totalling 402 metres. The best drillhole intersected by Newton (1975) was 0.5 metres (35.5-36 m) grading 1.6% Cu from a quartz vein which contained veinlets of chalcopyrite along with minor chalcocite and bornite in DDH 1. Results indicate that there is no significant mineralisation at depth. A second quartz vein is exposed about 100 metres west of the shaft and appears to outcrop again in the creek, where it contains malachite and minor cuprite, chalcocite and koechlinite. The failure to intersect significant grades in the main copper lode at depth in the drilling program severely downgrades any economic potential for copper-bearing quartz veins in the area. Arnhem Land Mining Ltd conducted systematic reconnaissance geochemical and ground radiometric surveys over the Allamber Springs Granite, which is adjacent to the north-eastern portion of the exploration licence. The results of the stream sediment sampling indicated that several drainages contained anomalously high values of leachable uranium (CR1998/0128).

Greenbushes Tin Ltd carried out stream sediment sampling targeting acid intrusives for cassiterite, tantalite and tungsten mineralisation over granitic plutons. The work included evaluation of previous exploration, which included replotting previous geological and geochemical data and airphotographic studies for potential accumulation of alluvial/elluvial deposits. Anomalous Ta, Sn and W stream sediment samples were returned from the program which may be the result of “skarn/greisen-
type" mineralisation. Enterprise Gold Mines NL and Circular Quay Holdings Pty Ltd conducted gold exploration targeting extensions of gold mineralisation along the Enterprise Gold Mine. A number of areas of low order anomalous gold were detected, the most notable being in the vicinity of the old Copperfield Workings along the Jindare Road south of Pine Creek where rock chip samples assayed up to 6.94ppm gold which were obtained from gossanous outcrop adjacent to the workings.

Nineteen water bore holes, totalling 874 metres, were completed for the first program assaying for gold, copper, lead, zinc and silver. During the second program, 15 holes totalling 810 metres were completed with disappointing results. The maximum gold recorded was 0.34g/t gold in bore W28 from 24-27 metres.

Geonorth and Apple Management conducted exploration activities on the north-north western portion of exploration licence. Rock chip sampling was the main exploration activity. The sampling delineated anomalous results approximately 3 square kilometres in size and open in all directions.

Union Reefs Gold NL conducted a desktop study on the eastern portion of the tenement in 1989. A reconnaissance RAB drilling program was planned to obtain bedrock geological information which would indicate the presence of any significant gold mineralisation beneath the soil cover. Other target areas include the presence if a discrete southerly plunging anticlinal structure within the Mt Bonnie sediments adjacent to the Allamber Springs Granite contact.

Rockquartz Mining NL conducted rock chip sampling which yielded 0.11 g/t Au from a large outcropping quartz vein in the vicinity of an anticlinal structure. Trenching was recommended along the anticlinal axis due to extensive soil coverage. Soil samples taken from colluvium were found to be unreliable as an exploration technique with all assays returning very low gold values.

Geonorth Pty Ltd indicated that favourable anticlinal structures and stratigraphy are present on the eastern part of the tenement where the Mt Bonnie /Burrell Creek formation crop out. Exploration activities included photogeology, geological mapping, gridding and sampling of rock chips and soil, concentrated mainly over the Mt Bonnie Formation in the central part of the area, including the Anomaly One Prospect.

At the Anomaly One Prospect, rock chip sampling returned high gold values (up to 7.7 g/t Au) in small quartz-sulphide veins associated within more extensive gold-anomalous zones (0.28 to 1.41 g/t Au) characterized by chloritic alteration, quartz-sulphide stockworks and pyritic disseminations in shales and greywackes of the Mt Bonnie Formation. Acacia Resources Ltd conducted geological mapping, gridding,
stream sediment and soil sampling on the western area of the exploration licence. Grid based residual soil sampling was undertaken. The results were inconclusive with thick alluvial cover hindering sample collection in some areas. A number of narrow low NW trending zones are indicated based on low level Au values of 4-16 ppb Au. Anomalous stream sediment samples ranged from 8-177 ppb. Acacia Resources Ltd conducted gridding over the outcropping Burrell Creek Formation to the north of the exploration licence. The surveyed grid was orientated at 331.5o (magnetic) north. A soil program (composed of 207 samples) was completed. A weakly anomalous gold anomaly was delineated striking north-westerly with the area subsequently relinquished.

On the western side of the exploration licence, Acacia Resources Ltd carried out exploration targeting large tonnage low grade gold resources. Ten line kilometres of 200 x 50 spaced lines were gridded on the regional grid. The regional grid was orientated north south on a surveyed baseline at 331.5o (magnetic) north. Some 490 soil samples were taken and analysed for Au, Pb, Zn and As. Geological traversing has confirmed that these areas of anomalous gold in soil are coincident with quartz veining within the Burrell Creek metasediments.

In 1997, Acacia Resources Ltd completed a soil sampling program which included 391 samples. Anomalous gold results, up to 650 ppb Au were spread well over the area with higher results in clusters rather than spot highs. The results have been contoured on 10 ppb Au and 100 ppb Au contours and show a north westerly anomalous trend. Exploration was followed up in 1998, with a vacuum drilling program totalling 1,103 metres drilled and 277 residual samples taken. Drill holes were on average 4 metres deep. The vacuum soil results confirmed the broader lower level 10-50 ppb Au anomaly defined in the previous year and constrained the halo of higher results to width between 25 and 75 metres. The best results included are 915, 295, 170, 165 and 125 ppb Au. The proposed costean program to follow up the encouraging soil and vacuum results was abandoned due to transported cover, which was between 2 and 3 metres thick. Three costeans were proposed and each one was only partially completed with no assays submitted for analysis. In 1999, 7 RC drill holes, totalling 293 metres were completed over the gold anomaly. A blanket of up to 5 metres of quartz rich gravel was intersected in every hole drilled. This gravel layer assayed up to 100 ppb Au. The indication is that the anomalous gold results defined in earlier soil sampling are alluvial in origin.
Peel Investments Pty Ltd used a new method of delineating fold axes using various imageries. The field work which followed the application of this technique was successful in delineating previously unknown low grade gold mineralisation. This gold mineralisation has been named the Peel Gold Prospect which was subsequently explored by Explore Min Pty Ltd in 1998. Soil sampling on the Peel Gold Prospect revealed moderate gold, silver and arsenic anomalism in soil coincident with an area of patchy quartz reef. RC drilling of the anomalies did not intercept any significant mineralisation and results were disappointing. Explore Min Pty Ltd conducted a first pass soil sample program on the East Copperfield, located on the south-western portion of the exploration area. The results highlighted three areas of gold anomalism in soil that warrant further investigation.

Anglogold Australasia Ltd completed a gridding program on the eastern side of the exploration licence designed for an extensive soil sampling program. Regional magnetic/radiometric survey was also flown. Three hundred and fifty two soil samples were collected and assayed for Au, Pb, Cu, Zn and As. A peak of 33 ppb Au was returned from the program.

In April 2007, Kastellco Geological Consultancy was commissioned by Davos Resources Pty Ltd to carry out a follow-up exploration program based on the geochemical/structural target delineated during 2006 work program.

In June 2007, Arnhem Exploration and Rural Services were commissioned to carry out a soil and rock chip program over several areas within EL26955. Samples were taken at 100m spaces along specific lines using a handheld GPS to establish site location. Over 1546 sites were sampled and 44 duplicate samples were also taken. Based on the assay results several Pb and Zn anomalies have been delineated within the EL.

6.0 Exploration Activity during the Period under Review

A desk top study of the project area was undertaken. For this purpose, data obtained during previous exploration programs were examined together with data collected by NT Geological Survey/Australian Geological Survey Organisation. Mapping conducted by the Government organisations has provided geological and structural
setting of the project area in regional context which is important in evaluating mineral potential of the project area. A number of field visits were undertaken for ground-truthing and assessing the mineral potential of the project area. In addition, 5 rock chip samples were taken which have not been assayed yet.

Within EL 26955, Tabletop Granite intrudes rocks of the Burrell Creek and Mt Bonnie formations with contact areoles of several km wide, which host a number of gold deposits. In addition Pine Creek Shear zone runs NNW and is an important structure for localisation of gold mineralisation. During ground-truthing and appraisal of historical exploration data revealed that area relinquished did not have any potential for gold or base metals mineralisation.

7.0 REFERENCES


