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# **ANNUAL REPORT - EL 28232**

**REPORTING PERIOD**

**29<sup>th</sup> March 2013 to 28<sup>th</sup> March 2014**

**BLUE THUNDER RESOURCES**

**PINE CREEK PROJECT**

**7<sup>th</sup> MAY 2014**

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**TARGET COMMODITY: Au**

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## LOCATION & TENURE

The Pine Creek Property (the “Property”) is located 130 km SE of Darwin in the Northern Territory, Australia. The Property is well serviced by a major sealed highway that runs from Darwin to Alice Springs, and is proximally located to the Darwin-Adelaide rail-link and the gas-pipeline from the north coast.

EL 28232 forms part of St George Mining’s (ASX-SGQ) Pine Creek Property and Blue Thunder Gold Project. The tenement adjoins the northern margin of EL 27732 covering the area of the Douglas Daly River and approaches.

Tenements are held in the name of Blue Thunder Resources Pty Ltd, a wholly owned subsidiary of St George Mining, other than for EL 27732, of which St George Mining is the Project Manager. St George completed an option agreement to acquire 80% of EL 27732 on the 1<sup>st</sup> of March 2009, from current holders, James Stewart (50%) and Geotech International (50%).

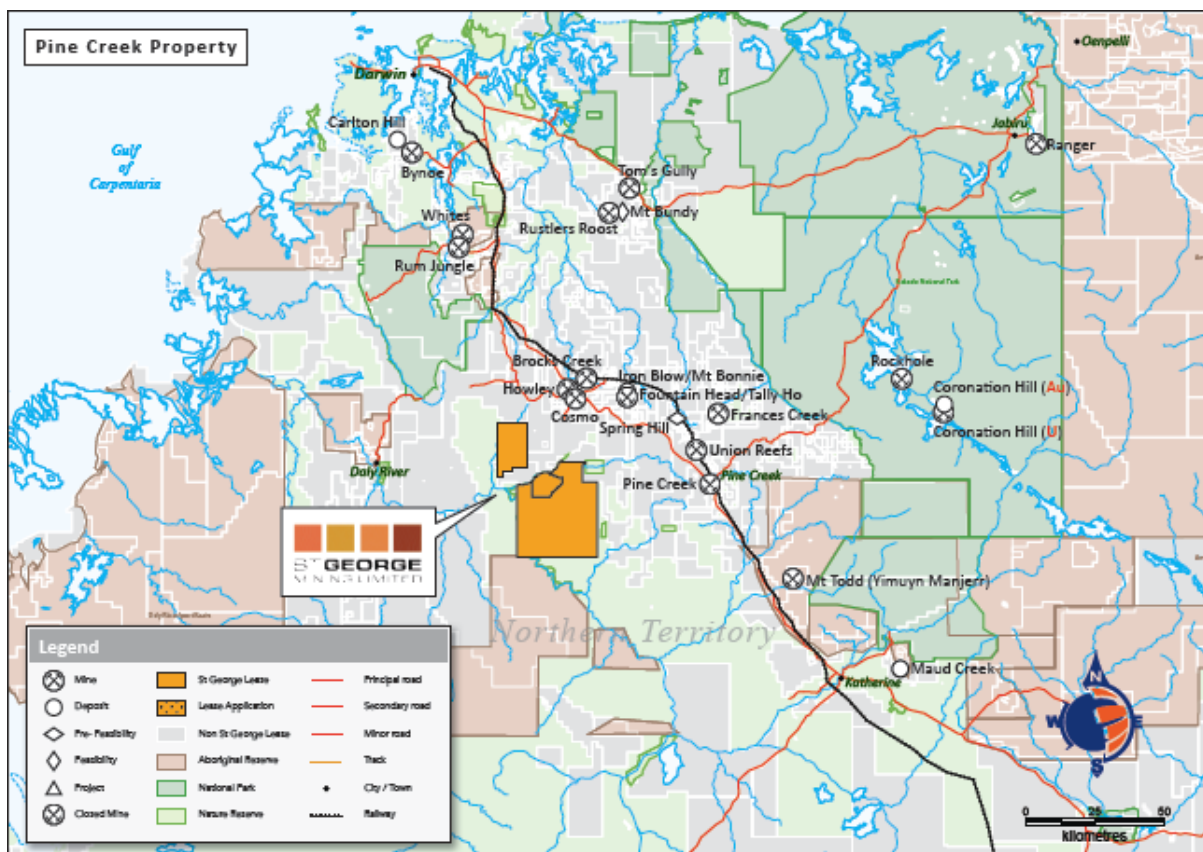


Figure 1 – St George - Pine Creek Property at Pine Creek

## GEOLOGY & MINERALISATION

The Pine Creek Property is located in the western margin of the central domain of the Pine Creek Orogen (PCO). The PCO is a major gold and uranium province within the Northern Territory of Australia and has a known gold endowment of approximately 11 MozAu.

At a regional scale, gold mineralisation in the PCO occurs in linear belts associated with regional structures at or near the greenschist facies brittle-ductile transition phase. Gold deposits within the sediments of the western area of the Central Domain of the PCO are concentrated within the sedimentary Koolpin Formation.

The region is characterized by Paleoproterozoic meta-sedimentary rocks occurring within in a geosynclinal setting over a gneissic and granitic Archean basement. This older sequence of meta-sediments is unconformably overlain by the Mesoproterozoic McArthur Basin to the east, and by the Mesoproterozoic Victoria Basin and Cambrian-Ordovician and Mesozoic sequences of the Daly and Bonaparte Gulf Basins, to the west and southwest.

Major sedimentation and volcanism occurred between 2000 to 1870 Ma in an intra-cratonic basin setting formed by crustal extension of the predominantly Achaean granitic basement. This sedimentary sequence is dominated by mudstones, siltstones, greywackes, sandstones, tuffs, and limestones. The sediments and associated mafic intrusions were folded and underwent metamorphism between 1870 to 1899 Ma, when they were subsequently intruded by the Cullen batholith.

The Cullen Batholith is comprised of 23 individual plutons that are mostly comprised of highly fractionated, and sometimes metal-enriched, leuco-granites. The extent of contact margin of the granite with its host rocks vary. The contact metamorphosed margin consists of an albite + epidote + hornblende mineral assemblage. Hydrothermal fluids were concentrated at the roof and the margins of these plutons. The presence of numerous roof pendants and the distribution of the thermal aureole around these plutons suggest a high level of emplacement.

Two major phases of deformation that pre-date granitoid intrusions have been recognised in the Pine Creek Geosyncline. The earliest widely recognised structures in the Pine Creek Geosyncline are bedding-concordant fabrics and breccia zones (D1). The second phase of deformation produced the north to north-west trending folds that still dominate the district (D2). The folds vary from open and upright to overturned and isoclinal with the development of a penetrative slaty cleavage.

The South Alligator Group includes the economically important Koolpin Formation, which forms the basal unit, and is unconformably overlain by the Gerowie Tuff, which is conformable with the overlying Mount Bonney Formation. The Gerowie Tuff and overlying Mount Bonney Formation have similar siliceous (felsic) composition and may act as a stratigraphic (physical-chemical) seal for the hydrothermal mineralisation locally hosted in the underlying ferruginous and carbonaceous rocks of the preferentially mineralised Koolpin Formation.

The composition of the Cullen Batholith is not magnetic but the surrounding contact metamorphic aureoles are. The vast majority of PCO gold deposits, including all of the larger ones, lay within these contact aureoles. The magnetic response of these zones implies hydrothermal iron-enrichment associated with the contact alteration. Digenetic iron formation appears to play an important role in localizing gold mineralisation. A similar relationship between high-grade gold deposits and similar concentrations of iron (as "ironstones") exists at the Tennant Creek Goldfield (5+ MozAu), which lies to the south within the same Proterozoic terrane.

The Cosmo Howley deposit (2+ MozAu) is one of these gold deposits situated in the inner contact aureole setting of the Cullen Batholith. Cosmo Howley is situated on the sheared western limb (Pine Creek Shear) of a regional antiform, and like most of the known gold deposits in this locality is hosted by the Koolpin Formation.

The Pine Creek Property is situated on the same fold limb of this antiform but on the regional sub-parallel Fenton Shear, located further to the west. The known shear-hosted gold mineralisation within the Fenton Shear is also hosted by the folded continuation of the Koolpin Formation.

The core of this anticline forms a regional gravity high with the sediments wrapped around this body. The density of this body suggests the central cohesive body may be a concealed Archean dome, similar to those exposed elsewhere in the PCO. The competent body appears to play an important role during regional structural formation, providing a competency contrast to the more ductile sedimentary packages.

Easterly directed compression and thrusting re-orientates the flat lying sedimentary horizons to a more vertical setting along the western margin of the body, which are then deformed with the subsequent development of shearing.

Large gold systems cluster within well-defined periods of lithospheric growth including the Paleoproterozoic. Recent geochronology offers new constraints on evolution of the Pine Creek Orogen, allowing inter-regional comparisons and correlations to be made with the Tanami and Tennant Creek Regions. Previously, age dating of Paleoproterozoic gold mineralisation in the Northern Territory appears to have based on inferred genetic links between the ages of spatially related granites and the gold mineralisation (e.g. Tennant Creek). Contrasting views has also argued that the gold mineralisation in the Pine Creek area is much younger than previously thought and is of an orogenic nature. While dating is still imprecise and incomplete, it is suggested the NT gold deposits appear to be clustering around an age range of 1760 - 1700 Ma, and this represents a major orogenic gold event towards the end of the Paleoproterozoic.

This suggests a major global-scale late Paleoproterozoic gold event occurring post regional metamorphism and magmatism, and also provides a link between the formation gold deposits of the Northern Territory and the mineralising event responsible and capable of forming the similarly-aged giant Homestake gold deposit. It is an important consideration in assessing under-explored Proterozoic Orogens.

The Pine Creek lode gold deposits are spatially related to regional antiforms that are associated with thrust-ramp and thrust duplex structures. The thrusts appear to have acted as channel ways for hydrothermal fluids from deep larger structures into anticlines and other trap sites. Mineralisation is located in suitable local gold traps often associated with mafic dykes that provide local competency contrasts.

Gold occurs in all rock types except granite. The higher-grade deposits have an association with carbonaceous or iron and sulphur rich sedimentary horizons, such as the Koolpin Formation. More competent lithologies in turbidite-style sequences form vein-stockwork deposits (e.g. Enterprise and Mount Todd), whereas those with both contrasting competency and geochemistry form strata-bound vein and replacement style of deposits (e.g. Cosmo Howley).

Previous geological investigation has been able to establish the composition and relative zonation of the alteration and mineralogy of gold mineralisation hosted by the Fenton shear and within the vicinity of the Property. Investigation included the analysis of the past diamond drill core analyzed using the CSIRO hyperspectral detailed logging technology developed by the CSIRO. Closer to the centre of the gold system, there is an increase in the amount of potassium feldspar (microcline), Mg-rich chlorite, and pyrite. This reflects an increase in the amount of alkaline gold fluids and increases in crystallinity associated with higher temperatures. This provides a usual tool for focusing exploration in core zones, most likely to contain high-grade gold mineralisation.

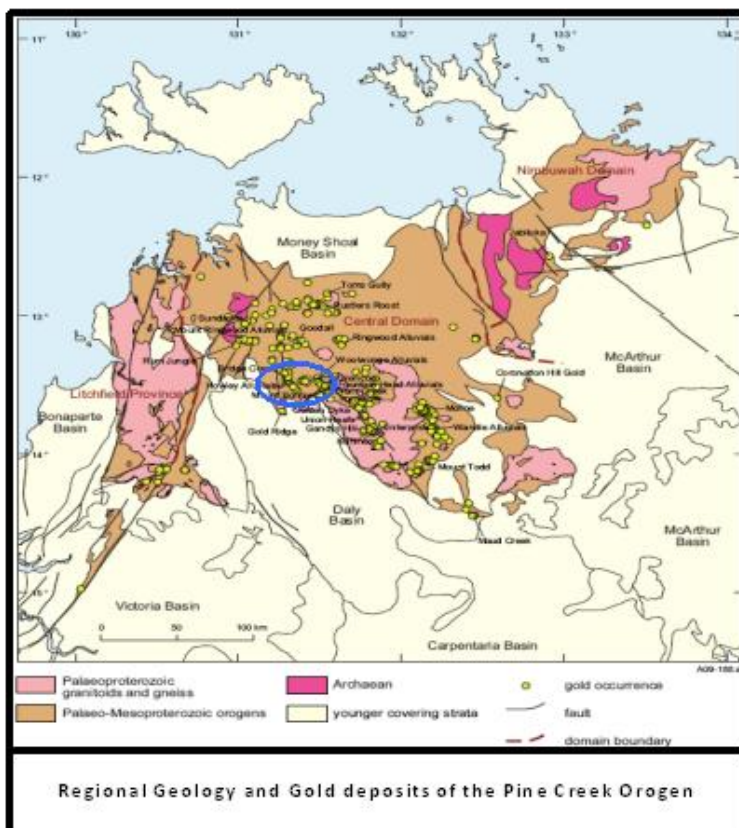


Figure 2 – Regional geology and gold deposits of the PCO with blue ellipse showing approximate area of the Blue Thunder tenements

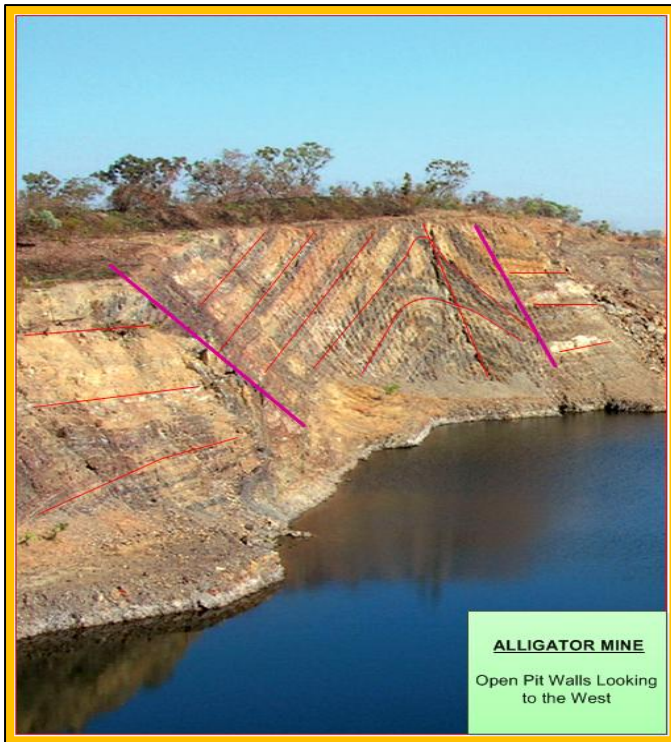


Figure 3 – The consistent structural pattern that acts a local control on gold mineralisation is visible throughout Pine Creek in mineralised and non-mineralised rocks. The thrust related antiforms have steep and narrow eastern limbs truncated by shearing, while the hinge zones and western fold limbs are open and gently dipping. Most of the gold mineralisation is contained within the fold hinge and the moderately dipping western limb.

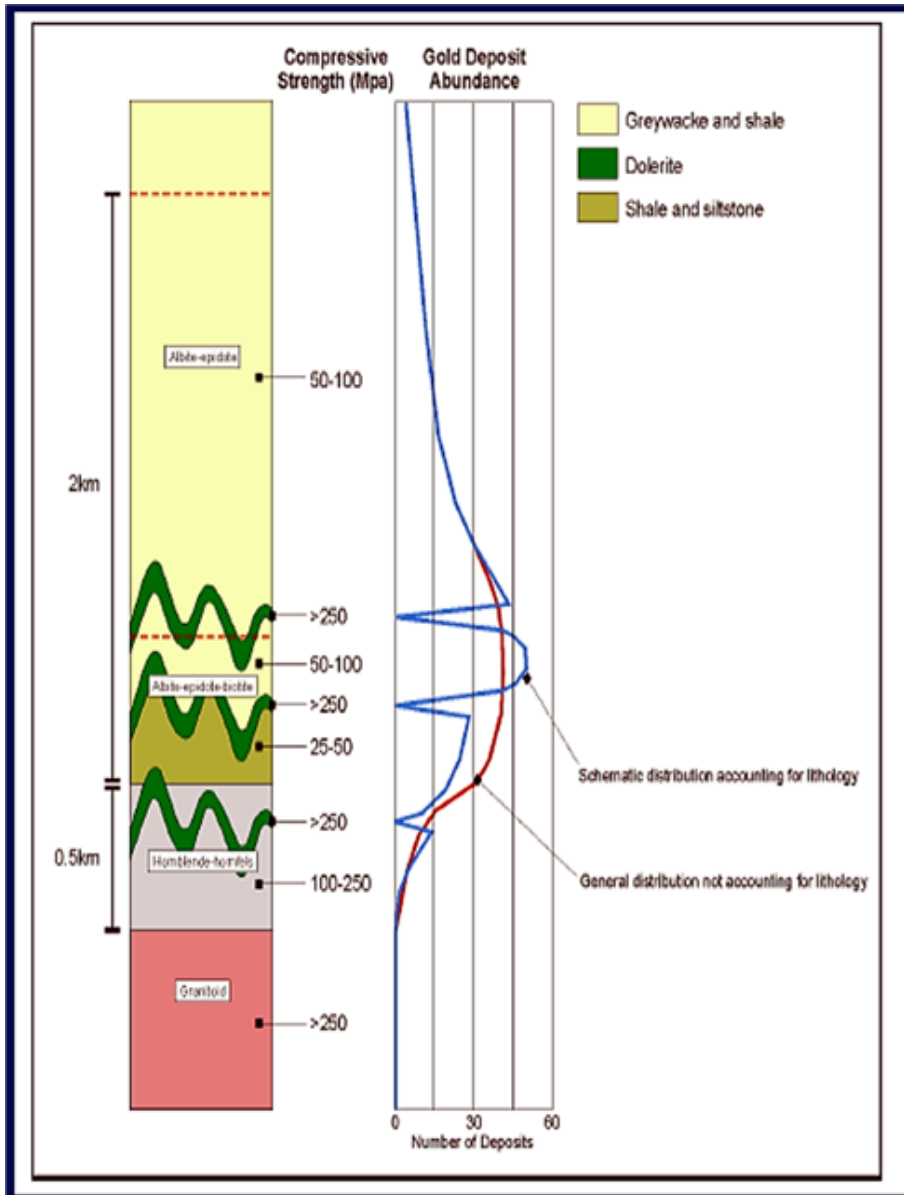


Figure 4 – Stylized image of marginal granite setting. The most fractured area occurs outboard of the hornfelsed (contact metamorphic zone) shown in grey on the graphic.



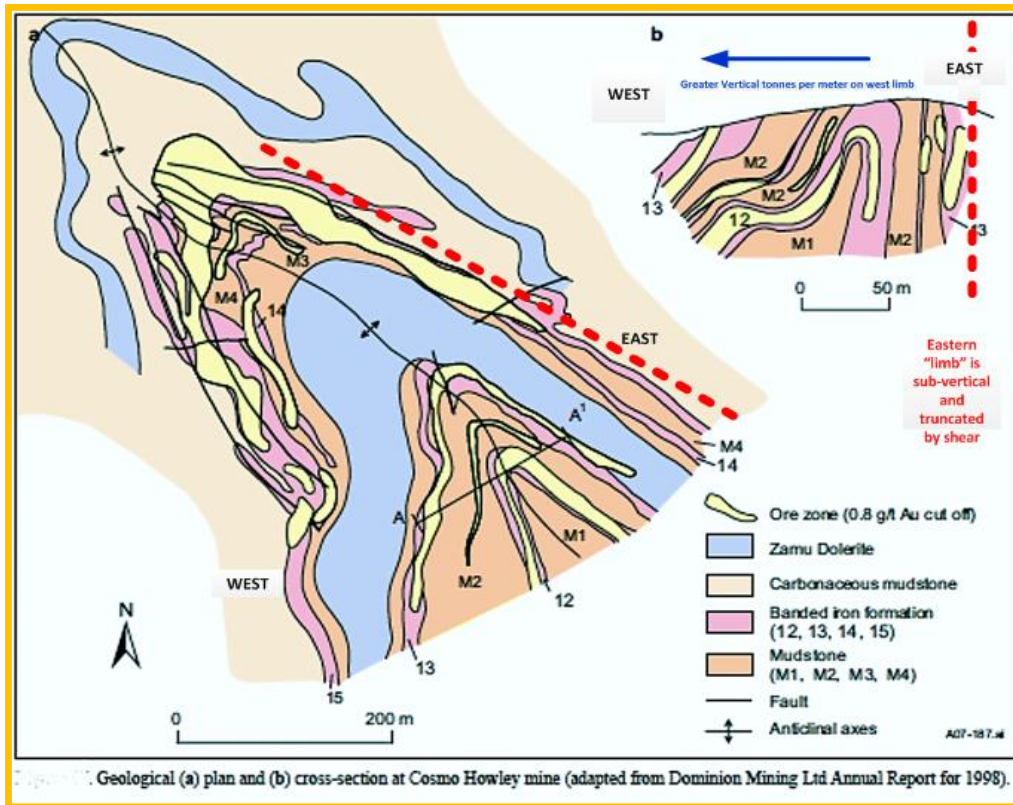


Figure 5 - In gold deposits within the Pine Creek area, such as Cosmo Howley, gold mineralisation is concentrated within the upright hinge zones of the thrust-related anti-forms and the more gently dipping western fold limbs.

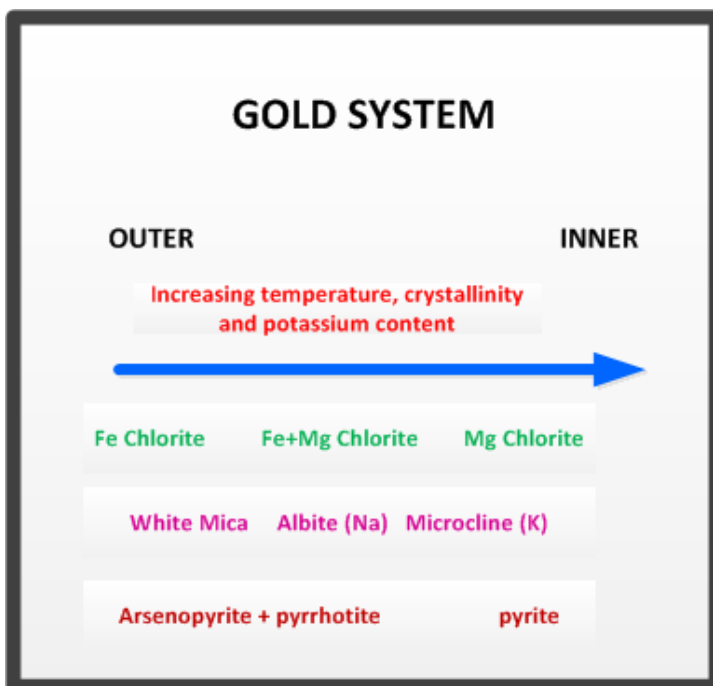


Figure 6 - Previous geological investigation has been able to establish the composition and relative zonation of the alteration and mineralogy of gold mineralisation within the Fenton shear and hosted by the Koolpin Formation.

## PREVIOUS EXPLORATION

Little modern exploration had been conducted in this area and the Fenton shear was not seriously explored for gold until the initiation of a regional exploration by Homestake Gold of Australia (Homestake) in the 1990's. At that time Homestake was one of the largest gold companies in the world and owned the name-sake giant Homestake deposit (~57 MozAu) in Lead, South Dakota.

HGAL had noted the similarities between the style of mineralisation, alteration, stratigraphic setting and age of mineralisation of the Cosmo Howley deposit, and that of their Homestake deposit (~57 MozAu). The deposit style and host rocks of Cosmo Howley and the Homestake deposit are independently noted as being similar with respect to their character and stratigraphic succession. Homestake initiated a regional exploration program to test for undercover “Homestake-style” gold deposits.

The regional diamond and RC drilling program intersected material gold levels in two drill holes during this drilling programme: FEND 14 and FEND 18 (currently on Blue Thunder’s EL 27732) before the exploration program was prematurely terminated because of worsening gold prices and change in corporate strategy. These holes are located within tenements currently owned by St George Mining (ASX-SGQ).

FEND 14 intersected 17 metres @ 0.74 ppmAu (from 610 - 627m and with no cut-off) within a 150 meter-thick zone of pyrrhotite-rich, iron-rich, chlorite and chert sediments with a felsic hanging wall unit. Despite the modest grade, the hole confirmed the presence of a broad gold-bearing iron-formation, and validated the exploration model with the presence of “Homestake-style” gold mineralisation.

FEND 18 was drilled 1200 m SSE of FEND 14 and intersected 20 m @ 1.74 ppmAu within a broad zone of continuous stratabound mineralisation (no cut-off) from 423 to 443 m. The FEND 18 intersection was approximately 200 m above the intersection made in FEND 14. FEND 18 was significant in that it confirmed not only the consistency of broad zones of gold mineralisation initially identified in FEND 14, but also encountered various high-grade gold intersections, confirming the strength of the system.

Despite Homestake’s premature withdrawal, the exploration program was successful in demonstrating the previous unexplored Fenton Shear hosted gold mineralisation and that the gold mineralisation was similar in nature and probably in age to that found at Cosmo Howley providing some proof of concept for the HGAL “Homestake Gold” exploration model.

HOLE ID	NORTHING	EASTING	DIP (degrees)	AZM (degrees)	DEPTH (m)	FROM (m)	TO (m)	WIDTH (m)	GRADE (ppmAu)
FEND 14	8472737	746928	-68	264	650	610	627	17	0.74

**Table 1 - Drill Intersections FEND 14 (not on SHELL tenements) with no cut-off, this was the first hole in the regional HGAL drill program to encounter consistent lengths of low grade gold mineralisation.**

High grade intersections were present in FEND 18 within the broad intersection of 20 m @ 1.74 ppmAu between 423 to 443 m (no cut-off), and these are presented in the table below:

HOLE ID	NORTHING	EASTING	DIP (degrees)	AZM (degrees)	DEPTH (m)	FROM (m)	TO (m)	WIDTH (m)	GRADE (ppmAu)
FEND 18	8471548	747190	-68	264	649	423	425	2	2.24
						431	433	2	4.89
					inc.	431	432	1	8.68
						438	444	5	3.48
					inc.	441	442	1	8.32
						463	464	1	1.81

Table 2 –Drill Intersections FEND 18 at a 1 ppmAu cut-off. This was the first hole to confirm extensive and higher grade gold mineralisation was present in the unexplored Fenton Shear, thus providing “proof of concept”.

The presence of gold mineralisation hosted by iron-rich sediments within the under explored Fenton shear zone has been established by the previous Homestake exploration. These broad and occasionally high grade intersections by Homestake within the target Koolpin Formation are highly encouraging and provided direct evidence that the previously unexplored Fenton Shear has the potential to contain significant gold mineralisation.

## EXPLORATION ACTIVITY - 2014

EL 28232 is contiguous with the northern boundary of EL 27732 and covers the area of the Douglas Daly River and approaches. It is the most northern part of the Fenton Shear before it is intersected by a major NE-SW cross structure. The Douglas Baly River appears to be a subsequent watercourse to this cross structure.

While the project is optimally sited and has demonstrated occurrences of gold mineralisation, the comparatively lower gold prices, and the continued decline in the investment markets for gold, resulted in a comprehensive strategic and economic exploration review of Blue Thunder’s commitment to this property.

The predictive exploration model derived during the previous period was the geological basis for this review. The critical outcomes from this review were:

The recognition that the magnetic stratigraphy of the Koolpin Formation was secondary in nature, with the magnetite placement being the result of Fe-rich and acid metamorphic fluids depositing magnetite is the same low pressure diastrophic zones that were optimal sites for the precipitation for the later gold mineralisation.

The recognition that the original flat lying magnetic stratigraphy had been re-orientated into a subvertical orientation by thrust folding up against a competent body, possibly a concealed Archean dome. Exploration focus should be restricted to the sheared upright northerly trending and magnetic stratigraphy that approximates the Fenton shear zone trend.

The recognition that the presence of greenstones in the form of intrusive dolerite bodies provide an important physio-chemical component of the gold forming process. A negative criterion is the absence of extensive greenstone volcanism, present in voluminous amounts in the highly gold endowed Proterozoic Birimian terrane. The restriction to intrusive greenstones may at Pine Creek may be a reflection of the absence large underlying tectonic and magmatic processes.

The recognition that the attenuation and sheared, subvertically-orientated, eastern limb of the thrust folded stratigraphy could be seen consistently in the regional structural profile; however, this was not the optimal target when it came to local occurrences of mineralisation. Gold mineralisation appeared to be concentrated in the fold hinge. All previous exploration had focused on the eastern limb where two historical drill holes had encountered gold mineralisation. The deep diamond hole PCDD01 was drilled into this zone and did not encounter the favourable Koolpin stratigraphy or any gold mineralisation. The gold system in this area appeared to be constrained by the tight subvertical lithology.

The recognition from the detailed analysis of the HyLogger examination of all previous drilling that while the hole FEND-18 intersected good thicknesses of low grade gold mineralisation, it was located in peripheral position to the central and focused position of the gold system. This was on the basis of the apparent degree of alteration, and especially the low Mg chlorite/ Fe chlorite ratio. Conversely the lower grade gold mineralisation in FEND 14 was contradictory with the mineralogy that indicated that this drill hole was actually more centrally located to the gold system. There is a marked increase in the Mg chlorite/ Fe chlorite ratios.

The conclusion that the priority exploration area at the Pine Creek project was around the northern end of the tenement, where FEND14 was situated. There was a good correlation with anomalous sections of the historic Homestake Gold Australia (HGAL) soil geochemistry, and anomalous geochemistry on the northern portion of the tenement.

## FINDINGS

- The exploration work completed to date and the incorporation of the latest exploration technologies and concepts strongly support the case for further exploration work to be focused in the northern portion of the tenement, which appears to be a more central part of the gold system.
- However, the area remains prospective for gold mineralisation and forms part of a strong gold prospect largely situated on EL 27732.
- This is an area where historical, partial-leach soil geochemistry recognised the presence of gold anomalies. Conceptually, this is consistent and the project scale of a large fold hinge and the lower-angle dip of the western limb.
- The structural deformation associated with the shear zone in the area allows geochemical leakage from the underlying mineral system. Exploration work needs to focus to the west of the drillhole FEND14 around the top and western side of the magnetic feature.
- Higher quality ground or airborne magnetic and gravity surveys provide useful tools to identify local “iron stones” which may provide areas of competency contrast with favourable iron contacts and act as good gold precipitation sites. The thicker fold images will present as thick areas of the magnetic domain.

## CONCLUSION

- Pine Creek project is a gold project of interest but with economic restrictions related to the +350 m depth to mineralisation indicated by the initial drilling. It is important to determine the plunge of the folding to determine where the target unit may be at comparatively shallow depths.

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