

# **YEAR4 REDUCTION REPORT OF EL28850**

## **BIRRINDUDU BASIN**

**5 March 2015 to 4 March 2016**

### **VICTORIA RIVER DOWNS PROJECT NT**

Victoria river downs	SE5204	1:250,000
Mount Sanford	5064	1:100,000
Humbert	5065	1:100,000
Victoria river downs	5165	1:100,000

**Titleholder: Australia Mining and Gemstone Co. Pty Ltd**

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**Australia Mining and Gemstone Co. Pty Ltd**  
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**28<sup>th</sup> April 2016**

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## 1. SUMMARY

The Victoria River Downs Project area is located in the Northern Territory of Australia and situated about 442 kilometres south of Darwin. The project covers 672.5 square kilometres and is made up of 5 exploration licences, EL28850 lies central of the leases, this EL's area was 131.75 square kilometres initially. After first reduction period, the EL's area is now 55.99 square kilometres. Vehicle access to the project area is via the Victoria, Buchanan and Buntine Highways, then by station tracks.

The Proterozoic Victoria River Basin (VRB) consists of a 3.5km thick stratigraphic sequence of sandstone, shale and dolomitic sediments, covering an area of 160,000sq kms, overlying the Birrindudu Basin and has the potential for sedimentary hosted zinc dominated base metal deposits similar in style to the giant McArthur River, Cannington and Century deposits. The Bullita stratigraphic succession is considered to have potential to host stratiform sedimentary, Mississippi and Irish lead-zinc styles of mineralisation. These deposits are associated with the fine grained clastic rocks (black shales) of a sedimentary package, which contains substantial dolomites and limestones, and are located near major regional structures with a halo of lead anomalism. The target size is in the order of 1-2 million tonnes at 10% combined Pb/Zn.

Age dating within these sequences suggest dates from 1,645my (Limbunya Group) to 1,610 – 1,570my (Bullita Group), which is within the age range of all major Australian SEDEX zinc deposits.

Throughout the Victoria River Basin the stratigraphy is generally flat lying or shallow dipping. However, there are a number of localised domal features adjacent to prominent faults or lineaments.

Previous base metal explorers include BHP, CRA, Rio Tinto, Anaconda, Anglo plus junior companies and diamond exploration has been undertaken by Stockdale, BHP and Ashton. These exploration programs for base metals include stream sediment sampling, Geotem and aeromagnetic surveys. Limited stratigraphic diamond drilling has been undertaken by BMR, NTGS and various exploration companies. A total of about 10 stratigraphic holes have been drilled around those lease.

In the past few years, Anglo Australian Resources NL(AAR) hold this area, AAR has reprocessed geochemical data and Geotem, gravity, aeromagnetics and Landsat images for generating new exploration target in this area. BHP previously flew Geotem over about 20 percent of the VRB project area but conducted no significant ground follow up. This data has been reviewed by Southern Geoscience geophysical consultants identifying 17 prospective Geotem conductors at the east of EL28850, AAR included stream sediment, soil, rock chip sampling programs and helicopter-supported gravity survey. This work has been successful in that the stream sediment samples have confirmed the robustness of previous anomalies identified and highlighted prospective areas of interest in the vicinity of the Victoria River Downs Homestead.

EL28850 was granted in March 2012 to Australia Mining and Gemstone Co. Pty. Ltd (AMG). AMG collated and replotted historic data in MapInfo. During 2012, AMG staff undertook a field trip to the bedrocks around No.1980 Lead occurrence. As it is covered by thick colluvium or alluvium soil in most of the lease, AMG plans to carry out surface geological mapping, regional geochemical stream sediment and soil sampling in the remained area.

## **2. LOCATION AND ACCESS**

EL28850 is located 442 kilometres south 178.5 degree of Darwin in Victoria River Downs ranges, about 255 kilometres southwest of Katherine in the Northern Territory (Figures 1).

The project area is accessible from Darwin via the sealed Victoria River Highway and the unsealed Buchanan and Buntine Highways, and is situated on the Victoria River Downs 250,000 sheets. Station tracks provide four-wheel drive access to the project area, much of which is essentially inaccessible, except via helicopter.

The wet season normally lasts from November to March. The annual rainfall ranges from 38-51centimetres. The evaporation rate is 260 centimetres per annum. During the summer months the daily maximum temperature usually exceeds 38 degrees Celsius. In July the daily temperature range is 10-27 degrees Celsius. The six- month exploration field season usually extends from April to September.

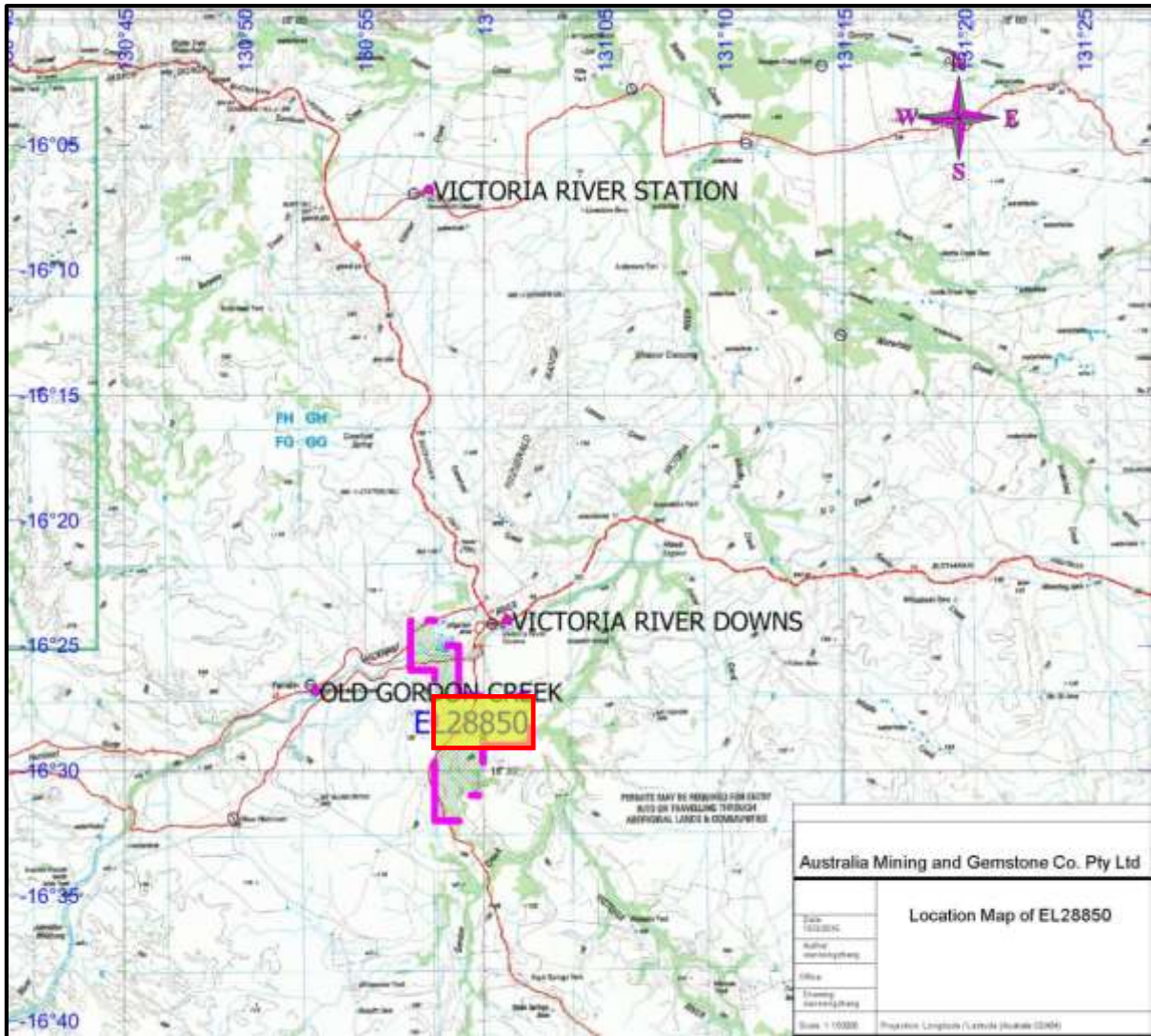


Figure 1 Location Map of EL28850

### 3. TENEMENT STATUS AND OWNERSHIP

EL28850 was granted Australia Mining and Gemstone Co. Pty Ltd on 5<sup>th</sup> March 2012 for a term of six (6) years, EL28850 comprises 40 graticular blocks (131.75 sqkm), now it is 8 graticular block(26.35 sqkm Figure 2). There are no other mining leases or mineral claims within the License area. List of Graticular blocks covering EL28850 in Table 1.

Table 1 Graticular reduced blocks covering EL28850

SE52348X	SE52420D	SE52420Y	SE52492D	SE52492J
SE52420C	SE52420J	SE52420Z	SE52492E	

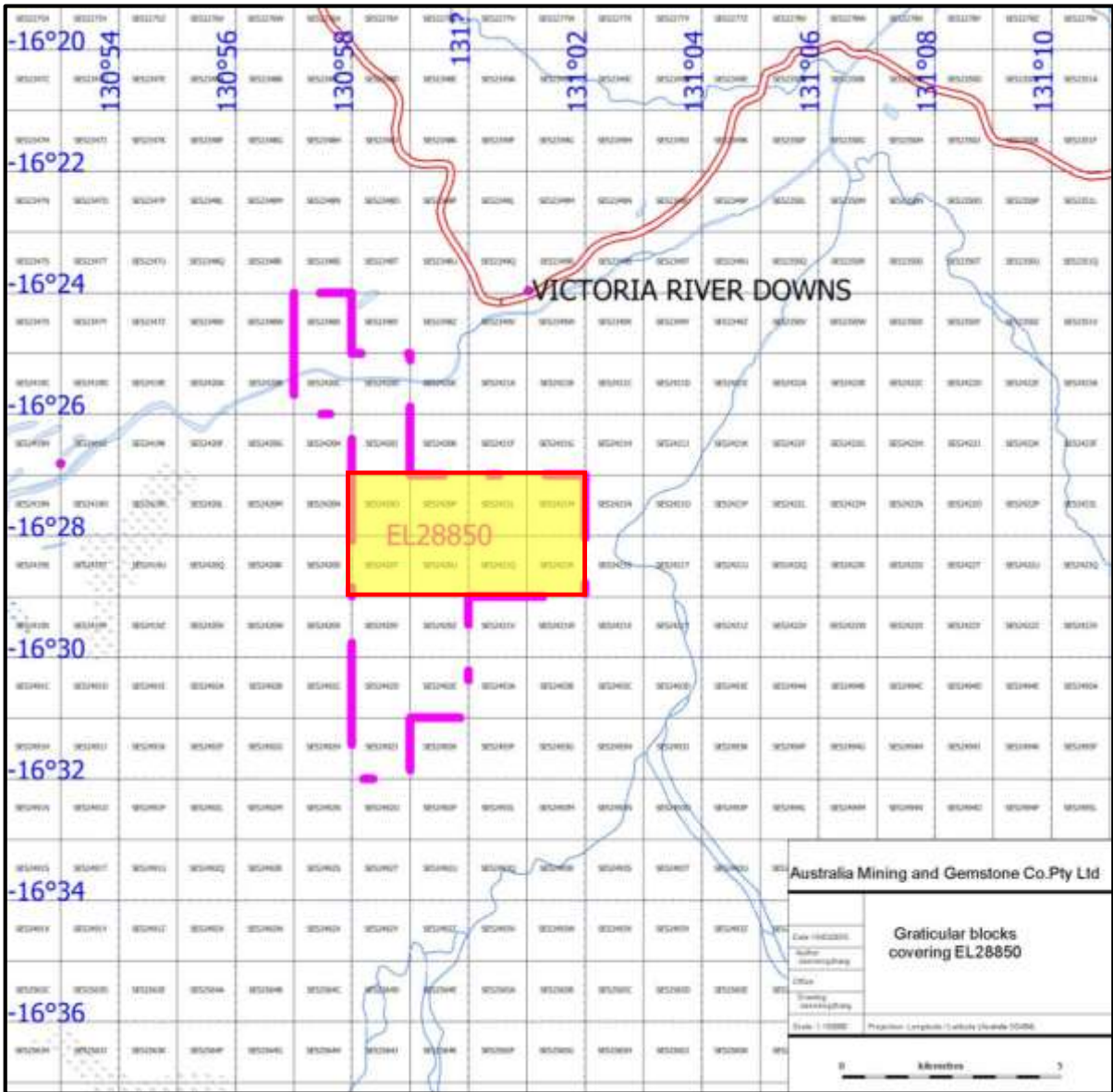


Figure 2: Graticular blocks covering EL28850 (red blocks retained)

Background land tenure under EL28850 is part of Victoria river downs station (Figure 3) , contact details being:

Heytesbury Cattle company  
 Address: PMB 19, via Katherine, Northern Territory 0852  
 Tel:+61 08 8975 0795  
[rusty.richter@heytesburycattle.com.au](mailto:rusty.richter@heytesburycattle.com.au)

The station establish access gates at some tracks, it was necessary to approach the homestead directly to make contact with the proprietors, though the proprietors were contacted by telephone.



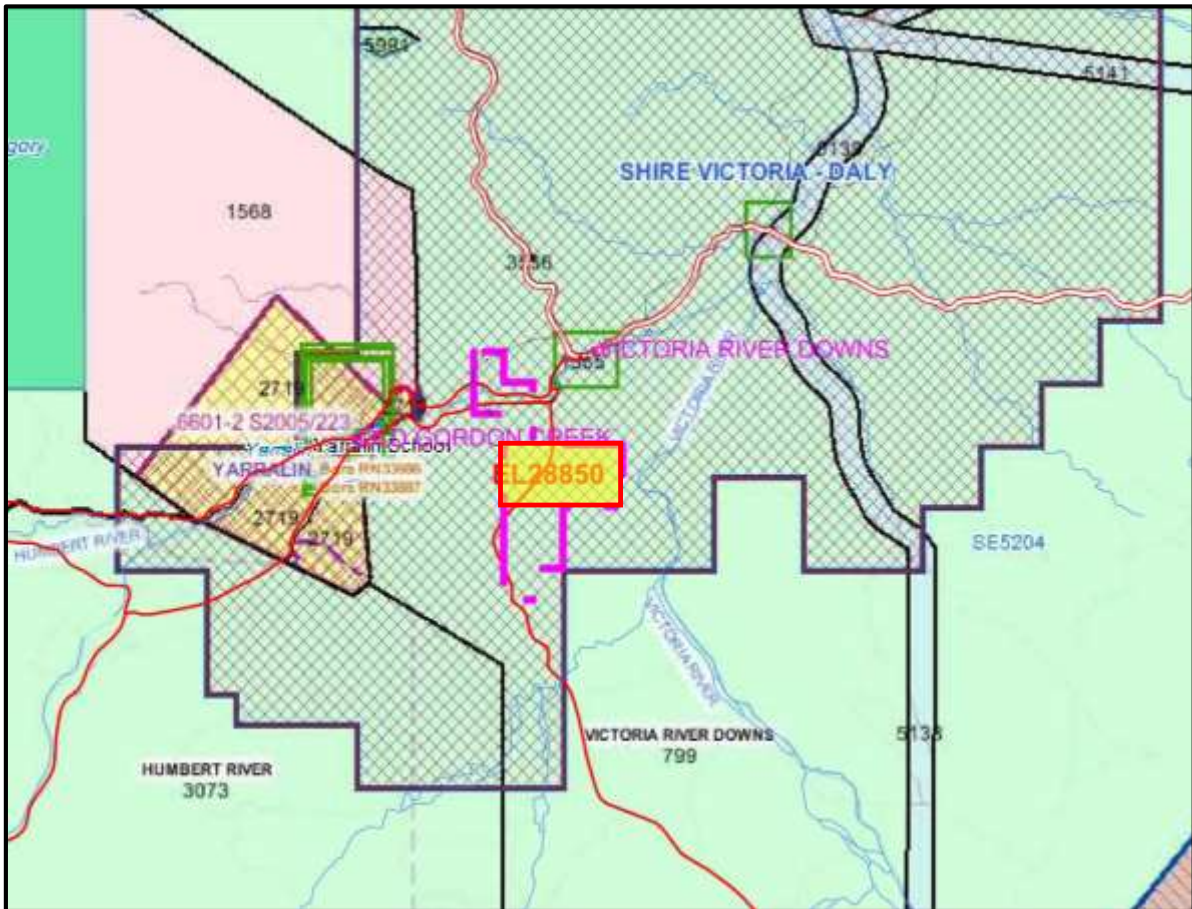


Figure 3 Landholders and Lease Numbers displayed inside EL28850

## 4. GEOLOGY

### 4.1 REGIONAL GEOLOGY

#### 4.1.1 Introduction

The project area is located in the Victoria River region, wholly within the Victoria River Basin (VRB), which overlies the basement Sturt block and consists of a 3.5km thick sequence of little deformed sedimentary rocks that cover ~160,000 sqkms.

The stratigraphic sequence from the basement Invery Metamorphics and Pine Creek volcanics upwards, consists of the Proterozoic Birrindudu and Limbunya Group sediments which form the lower Birrindudu Basin, which is overlain by the sediments of the Victoria River Basin consisting of the Wattie, Bullita, Tjunna and Avergne Groups.

The VRB is bounded to the northwest by the Fitzmaurice mobile zone, to the southwest by the

Ord Basin, to the south by the Carpentarian Birrindudu Basin, and to the southeast by Paleozoic Wiso Basin, to the Northeast by the Pine Creek geosyncline.

Birrindudu Basin was accompanied by regionally extensive north-trending growth faults. Deposition in both Birrindudu and Victoria river Basins includes several phases of intra- cratonic sag. Strata dip away from the centres of depositional basins and is attributed to basement uplift.

The major structural elements are shown on the various 1:250,000 geological plans. This data has been supplemented by lineament studies completed from aeromagnetic, Geotem, gravity and Landsat data.

The imaged Geotem has enhanced the presence of a north trending 50km long by 5km wide structural corridor, which isn't evident from mapping or other geophysical surveys. For this study this feature has been referred to as the Victoria River Trough (VRT).

This structural corridor is truncated north and south by WNW trending regional lineaments, such as the Limbunya Fault in the south and, with sub-parallel Gill and GB faults. Other major structural directions include the NW, NE and E-W lineaments.

#### 4.1.2 Regional Structure

Major anticlinal and synclinal structures with N-S orientated axial planes, have been mapped at Bullita Station and the Fitzgerald Range near Victoria River downs. These may reflect extended periods of E-W compression that may have existed during deposition and post consolidation of the stratigraphic column.

This E-W stress regime may have generated E-W orientated extensional normal faults that may have existed during sedimentation so as to generate growth fault environments.

The McArthur River and Mississippi styles of base metal mineralization are strongly influenced by structure. Thus it's essential that the major structural controls are well documented and robust geological models are generated for the evolution of the Victoria River Basin sedimentation as it has been influenced by faulting within the basement rocks.



### 4.1.3 Alternative Structural Models

Given the strong development of the NW (315 degree) trending lineaments, this fault orientation could be indicative of a Southeast – Northwest compression direction, which would generate normal faults and potentially growth faults in this orientation. This model fits the gross geometry of the stratigraphy with the oldest rock types outcropping in the Southwest and Younging towards the northeast i.e. a general northeast block down sense of displacement.

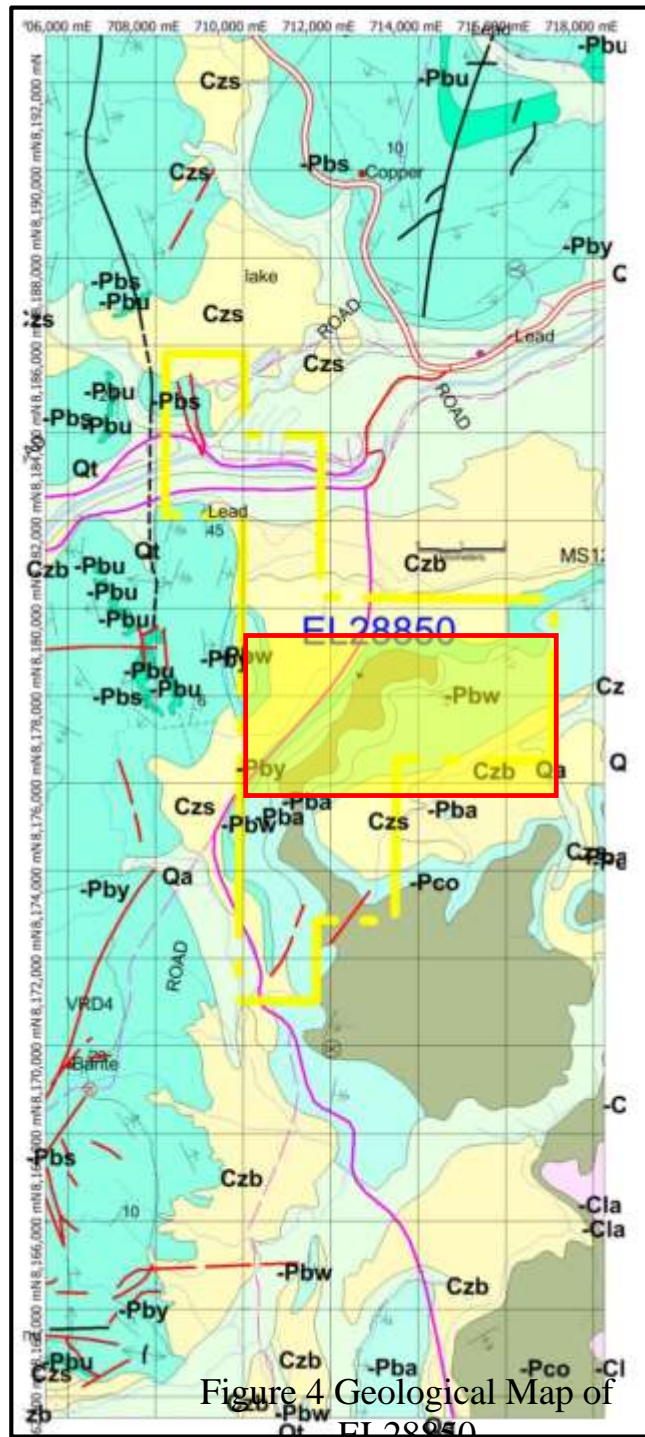
## 4.2 LOCAL GEOLOGY

### 4.2.1 Stratigraphy

The EL28850 area is located in the Victoria River region, outcropping is a 3.5km thick sequence of little deformed sedimentary rocks that cover ~160,000sqkms. Quaternary and Cenozoic Unconsolidated Material was covered the most area of EL28850 (Figurec 4), Proterozoic sedimentary outcrop in southeastern and northern of EL (table 2).

**TABLE 2 Local stratigraphic columns**

Top
<b>Lower Proterozoic Auvergne Group</b>
<i>Wondoan Hill Formation (Pco)</i>
145m thick
Unconformably overlies the Bullita Group. Consists of quartz sandstone and glauconitic sandstone, with minor claystone and siltstone.



## **Bullita Group**

### **Battle Creek Formation (Pba)** 80m thick

Conformably overlies the Weaner Sandstone.

Consists of greenish to purple siltstone with dark brown coarse-grained glauconitic dolomite. At the middle of the formation is a series of red brown stromatolitic dolomite and at the top is brown yellow sandstone.

### **Weaner Sandstone (Pbw)** 3-15m thick

Conformably overlies the Bynoe Fm. It is a thin series of white to brown sandstone and grits that are pebbly towards the base.

### **Bynoe Formation (Pby)** 190-243m thick.

The basal part contains green and purplish micaceous siltstones and shales with few sandstone and dolomite interbeds.

The rest of the Fm consists of thinly bedded sandstone and slightly micaceous siltstone.

### **Skull Creek Formation (Pbs)** 162-229m thick,

Predominantly dolomitic with silty upper and lower parts. The lower contact is defined by a 3m thick stromatolitic horizon. It contains pyrobitumen and disseminated pyrite. The formation has undergone varying degrees of dolomitisation.

## **4.2.2 Metamorphics**

Muscovite quartz schist, acid volcanics. Basement in the Birrindudu Basin.

The project is targeting sedex-style zinc-lead deposits in the Victoria River Basin. The Basin has strong similarities to the MacArthur and Nicholson Basins which host the giant MacArthur River and Century SEDEX-style zinc deposits. The project, located 200 km east of Kununurra (WA) and 240 km southwest of Katherine (NT), covers a sequence of Proterozoic sediments dominated by dolomitic carbonates and other fine-grained sediments. The sediments are generally flat lying with an overall very shallow south-easterly dip. The Mount Sanford Formation (Wattie Group) and the Timber Creek Formation (Bullita Group) are considered the most prospective for SEDEX style of mineralisation targeted by former lease (Anglo Australian Resources NL), particularly adjacent to interpreted growth faults.

## **4.2.3 Structure**

The fault main direction is north-northwest and north-northeast, another little fault is east-west toward, there is syncline at southeast of the ELs.

## **5. PREVIOUS EXPLORATION**

Little advanced exploration has been carried out in the Victoria River Basin. Most of the work has consisted of early stage exploration consisting of stream sediment sampling and rock chip sampling. Large areas of stream sediment anomalism have had limited follow up. BHP completed a Geotem survey but no on ground follow-up.

The most extensive base metal exploration was completed by Hooker Mining / Australasian Minerals during the period 1969 -1972. Exploration included very detailed stream sediment sampling, VLFEM and IP follow-up at the Colt Prospect and Area 2. Exploration reports detail the mapping and geochemical sampling of 18 prospects in the Victoria River Basin area, which were either domal, monoclonal or fault structures, though several were flat basinal sag structures.

The areal extent of outcropping mineralization is never greater than several square kms and is often related to faults and joints. The most common occurrence of base metals is in the coarse grained dolomites, particularly just above or below the Supplejack dolomite Member of the Skull Creek Formation and in the thick dolomite of the Lower Marker within the Timber Creek Formation. Near the Depot Creek-Wickham River intersection, within the Lower Marker sequence are 10cm thick bands of 30-40% galena. At Charlies Prospect (Area 4-T146), widespread disseminated galena, sphalerite and pyrite occur just above the Supplejack Dolomite Member of the Skull Creek Formation. This mineralization is 1-2m thick, and can be traced laterally for 300m. Fairly extensive disseminated pyrite, chalcopyrite and galena mineralization has been found at Area 14 within the Battle Creek Formation.

A massive barite vein outcrops at Location C199, measuring 1.5m thick and 800m long. Manganese nodules and stains have been reported around Battle Creek within the Battle Creek Formation.

Four percussion holes were drilled targeting IP anomalies corresponding to geochem anomalism at the Colt and Area 2 prospects totaling 500m. Localised disseminated galena was

intersected. These holes were drilled more than 35 years ago. While no detailed collar locations are available the two prospects are interpreted to occur in the following locations. The Colt prospect is reasonably well defined by a sketch map and is located 2.7km NE of the VRD homestead near a fence in the vicinity of weakly altered dolomite and lead stream sediment anomalies (approx. 716,500E 8,187,700N).

Reports on the Area 2 prospect give no specific location. However we can interpret that this prospect occurs in the vicinity of a very strong and extensive, north east trending lead in stream sediment anomaly located 11 – 17 km north east of the VRD homestead. Stream sediment and soil sampling in this area by Anglo Australian Resources confirmed the lead anomalism but did not find the drill collars.

The Northern Territory Geological Survey in 1999 completed two stratigraphic diamond drill holes located within the Victoria River Basin (99VRNTGSDD1 and 99VRNTGSDD2). Hole 99VRNTGSDD1 is located 17km south- southwest of the Victoria River Downs homestead and about 4 km lies EL28850 tenement southwest. Hole 99VRNTGSDD2 is located 45km to the north-northwest of the Kidman Springs homestead, about 60 km to the northeast of EL28850 tenements. The drilling intersected live oil and bitumen as well as epigenetic galena and pyrite within the Skull Creek Formation and the Timber Creek Formation. Assay values up to 1630ppm Pb were obtained. (Dunster and Cutovinos 2002)

Previous exploration in the area located large areas of anomalous Lead and Zinc stream sediment geochemistry. Values of up to 9000ppm Pb, 740ppm Zn and 500ppm Cu have been recorded. In 2007, former lease holder carry out reconnaissance program, stream sediment, rock chip and reconnaissance soil sampling. Stream sediment sampling confirmed previous lead anomalism with assays up to 5700ppm Pb and 130ppm Zn associated with the Skull Creek Formation and the Bynoe Formation within the Bullita Group. Highly anomalous levels of lead (up to 3300ppm Pb) and zinc (up to 1100ppm Zn) were returned from rock chips of dolomitic sediments. Anomalous levels (up to 500ppm) of lead were also returned from wide-spaced reconnaissance soil traverses. The values and the extent of anomalism (up to 12 x 3km in dimension) are encouraging, as the deposit models guiding the exploration suggest lead anomalism may be the surface expression of an alteration halo of a base metal mineralised system at depth.







Photo1 cataclastic in interformational strata (gentle dip carbonatite bedding)

## **7. EXPLORATION DURING YEAR 2**

During second year, AMG continued to collate all historic data of the EL. AMG paid attention to the Kurinelli goldfield in Davenport range of Barkly region. As the lease is covered by shallow topsoil and approximate flat attitude strata, there is no useful tectonic activated. AMG surrendered the northern and southern area of this tenement.

## **8. EXPLORATION DURING YEAR 3**

During third year, the EL did not undertake field work, as AMG geologists carried out two copper exploration projects with Panda Mining Pty Ltd in Flinders Range of South Australia.

## **9. EXPLORATION DURING YEAR 4**

Work done during Year 4 included:

- a) All data review and
- b) Some geological survey



## 10. CONCLUSION AND RECOMMENDATIONS

The exploration target is sediment hosted stratiform Pb–Zn–Ag deposits, however throughout analysis historic exploration data and superficial traversing the EL28850 property, this lease area has gentle dips of bedrock outcrop at hills. It has an absence of black siltstones and major regional basinal faults, in other words, no metalliferous brines and hydrothermal source were observed. The geologists hope to find some large faults by surface geological mapping or soil survey next year, if not, probably there will be no potential in the lease.

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