

# **ANNUAL EXPLORATION REPORT OF EL28765**

## **BIRRINDUDU BASIN**

**22 November 2011 to 21 November 2012**

**VICTORIA RIVER DOWNS PROJECT NT**

**Victoria river downs SE5204 1:250,000**

**Victoria river downs 5165 1:100,000**

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

**Report No. 2013-001  
Australia Mining and Gemstone Co. Pty Ltd  
By Xianneng Zhang  
19<sup>th</sup> January 2013**

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## 1. SUMMARY

The Victoria River Downs Project area is located in the Northern Territory of Australia and situated about 450 kilometres south of Darwin. The project covers 672.5 square kilometres and is made up of 5 exploration licences, EL28765 lie southeastern, this EL's area is 148.26 square kilometres. Vehicle access to the project area is via the Victoria, Buchanan and Buntine Highways, thence 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 30-80 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, aeromagnetism 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 north of EL28765, 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.

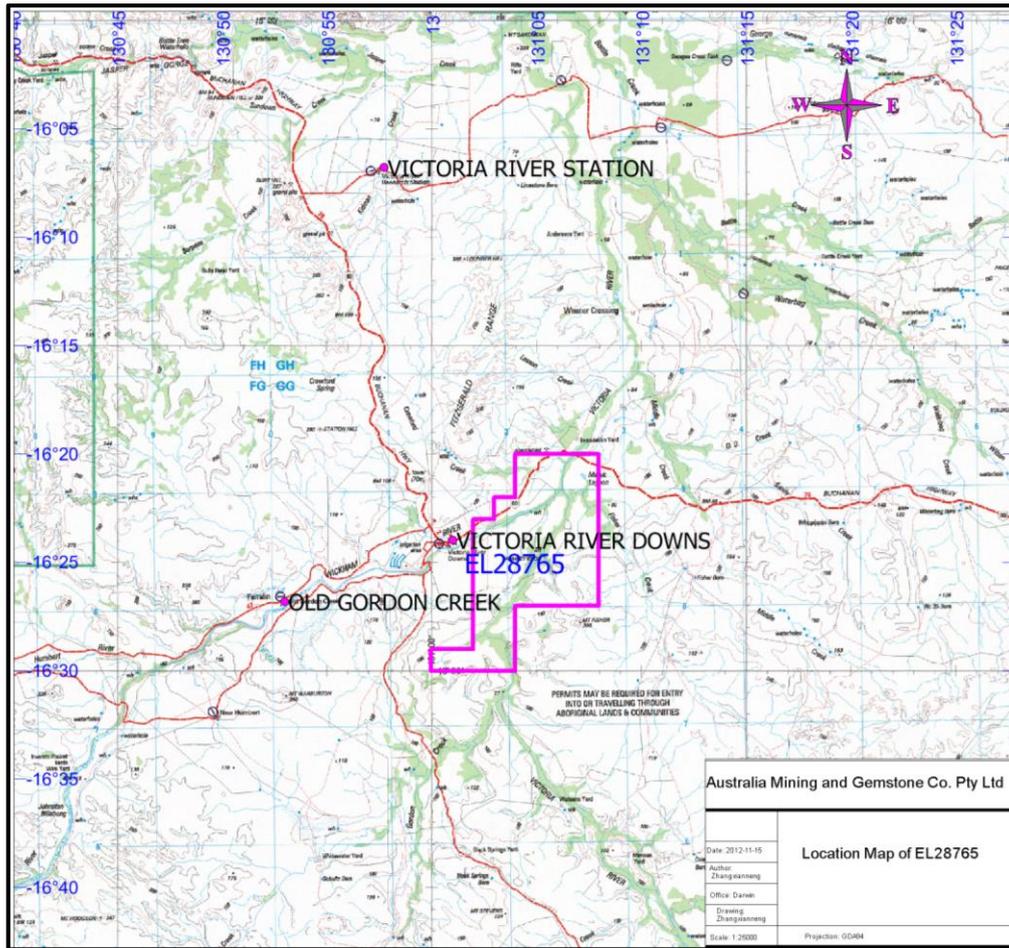
EL28765 is granted in November 2011, Australia Mining and Gemstone Co. Pty. Ltd (AMG) collate and replot history data using MapInfo, AMG is undertaking ground mapping and regional geochemical stream sediment and soil sampling in 2013.

## **2. LOCATION AND ACCESS**

EL28765 is located 450 kilometres south 177 degree of Darwin in Victoria River Downs ranges, about 240 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 EL28765**

### 3. TENEMENT STATUS AND OWNERSHIP

EL28765 was granted Australia Mining and Gemstone Co. Pty Ltd on 22<sup>th</sup> November 2011 for a term of six (6) years, EL28765 comprises 45 graticular blocks (148.26 sqkm, Figure 2). There are no other mining leases or mineral claims within the License area. List of Graticular blocks covering EL28765 in Table 1.

Table 1 Graticular blocks covering EL28765

SE52349E	SE52349P	SE52350S	SE52421E	SE52422H
SE52350A	SE52350L	SE52349X	SE52422A	SE52421N
SE52350B	SE52350M	SE52349Y	SE52422B	SE52421O
SE52350C	SE52350N	SE52349Z	SE52422C	SE52421S
SE52349K	SE52349S	SE52350V	SE52421H	SE52421T
SE52350F	SE52349T	SE52350W	SE52421J	SE52421V
SE52350G	SE52349U	SE52350X	SE52421K	SE52421W
SE52350H	SE52350Q	SE52421C	SE52422F	SE52421X
SE52349O	SE52350R	SE52421D	SE52422G	SE52421Y



Background land tenure under EL28765 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.

## **4. GEOLOGY**

### **4.1 REGIONAL GEOLOGY**

#### **4.1.1 Introduction**

The project area is located in the Victoria River region, whole 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 EL28765 area is located in the Victoria River region, outcropping is a 3.5km thick sequence of little deformed sedimentary rocks that cover ~160,000sq kms. Quaternary and Cenozoic Unconsolidated Material was covered the northwestern of EL28765 (Figure 4), Cambrian and Proterozoic sedimentary outcrop in southeastern and northern of EL (table 2).

**TABLE 2 LOCAL STRATIGRAPHIC COLUMNS**

Top

- **Cambrian**
  - Antrim plateau Volcanics (€1a), 250m thick, tholeiitic basalt and agglomerate, with minor sandstone, chert and limestone interbeds cover the whole region. Unconformably overlies the Proterozoic sequence.
- **Lower Proterozoic**

#### **Auvergne Group**

**Wondoan Hill Formation (Pco)** 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

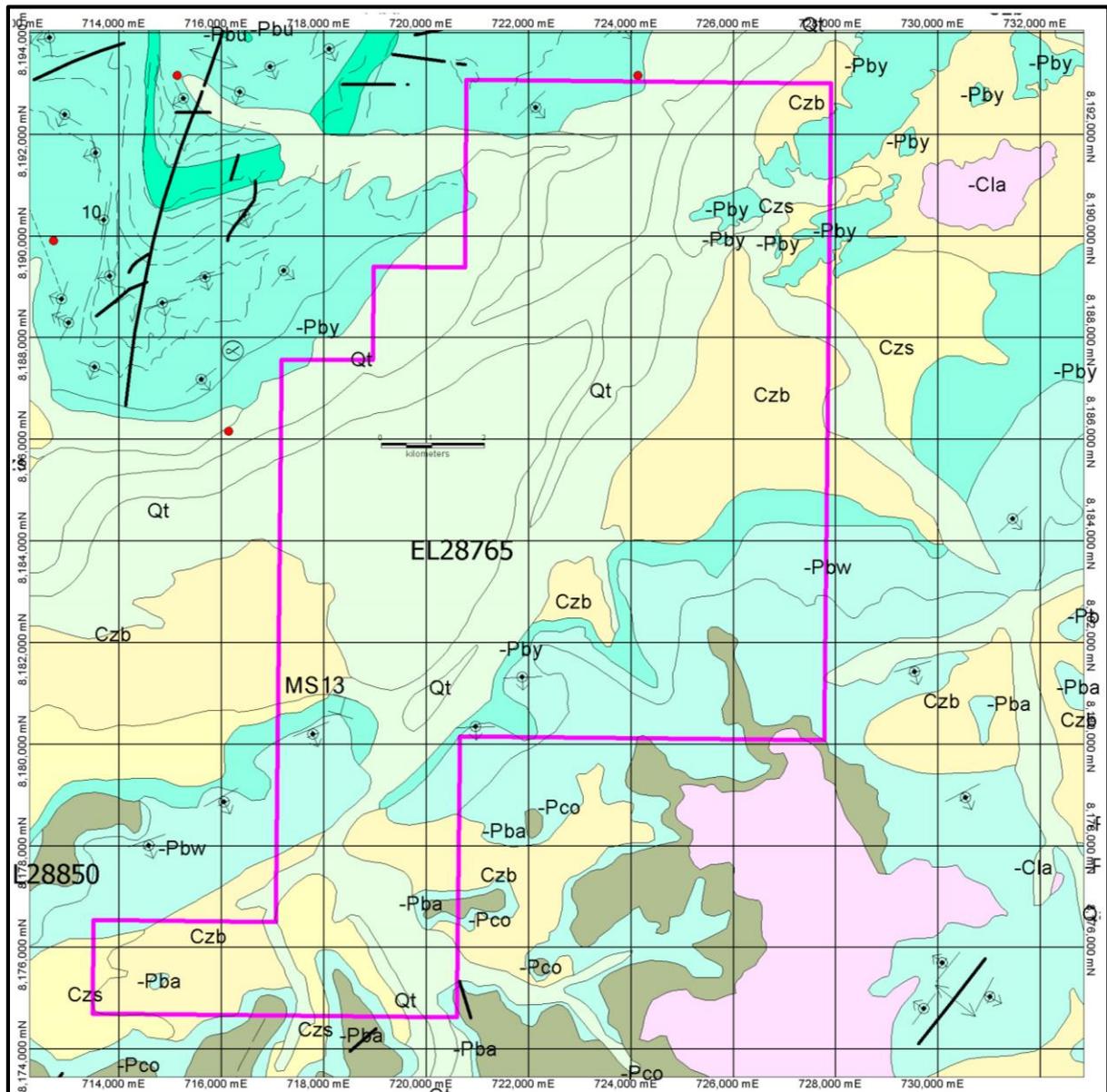
Conformably overlies the Bynoe Fm. It is a thin series of white to brown sandstone and grits that are pebbly towards the base.

**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.



**Figure 4 Geological Map of EL28765 (1:250000 geologic map)**

#### 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 250 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 (Bulita 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 EL isn't reveal faults; in the southeastern and southern of EL, there is a few hills, it was little synclinal structures with N-S and orientated axial planes.

### **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 totalling 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 22km lies EL28765 tenement southwest. Hole 99VRNTGSDD2 is located 45km to the north-northwest of the Kidman Springs homestead, about 51km to the northeast of EL28765 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 carried 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.

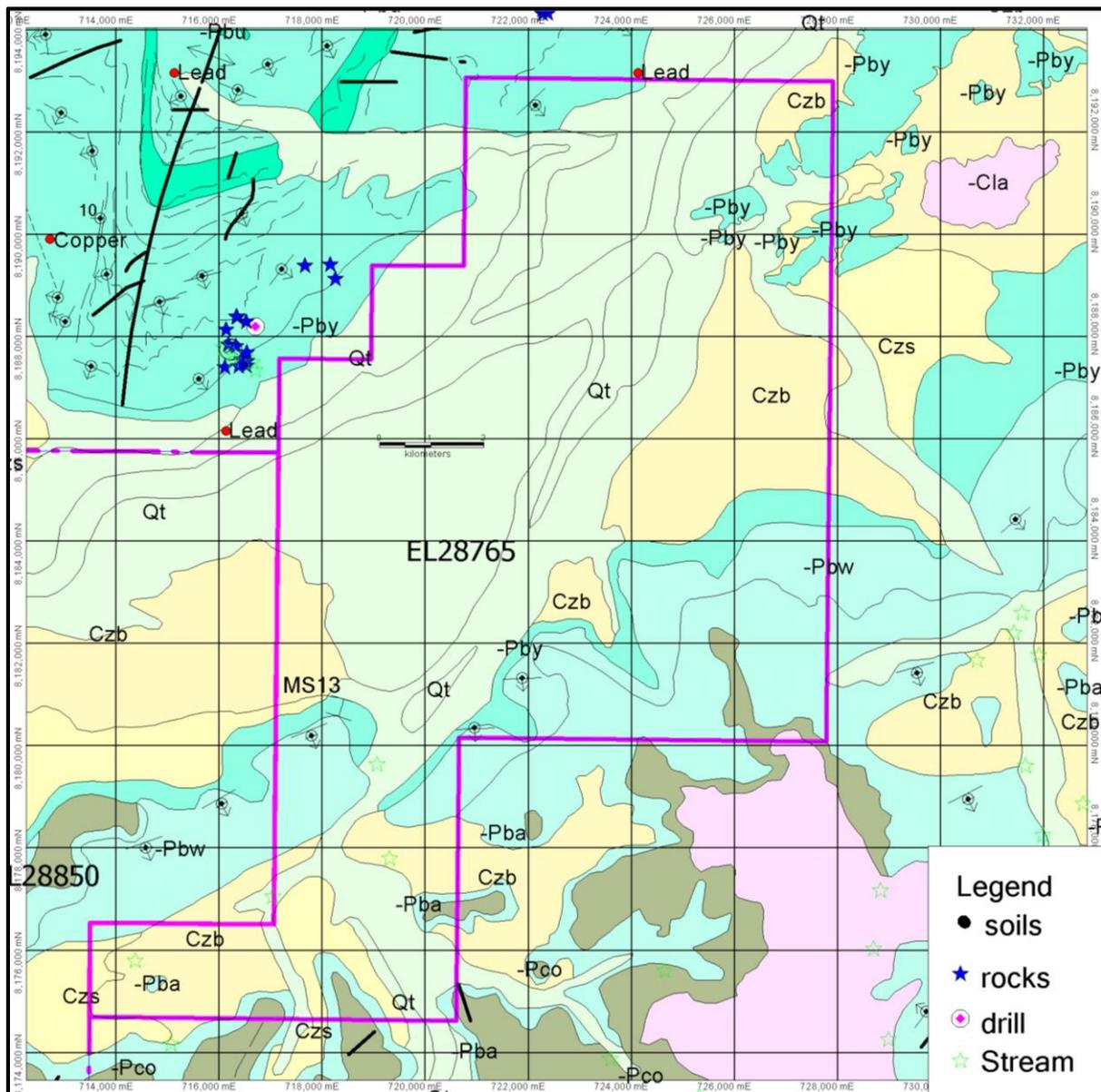
In 2011-2012 Australia Mining and Gemstone Co. Pty. Ltd exploration consisted of historic data compilation including tenure, datasets, open file reports and geo-referencing of relevant maps. This enabled an informed review of the tenements prospectively in regards to Pb Zn Cu and Ag.

### 6. EXPLORATION DURING YEAR 1

During Year one, all available historical data was compiled into one database (displayed in Figure 5). On 20<sup>th</sup> – 26<sup>th</sup> August 2012, AMG staff along station track enter northern of EL (photo 1).



Photo1 flat or gentle dip bedding (northwest of EL28765, Wickham river)



**Figure 5 Compilation of historical data on EL28765**

## **7. PLANNED EXPLORATION FOR YEAR 2**

Exploration was planned to target Pb Zn Cu and Ag mineralization, programme include soil survey in bedrock outcrops of EL28765 and mapping over EL28765.

A cost for the total proposal at least \$22,000.

## 8. EXPENDITURE

Expenditure (as supplied by Australia Mining and Gemstone Co. Pty Ltd) consisted of:

Table 3 Expenditure on EL28765

Expense	\$
Office Studies	\$3,000.00
field reconnaissance	\$7,000.00
Consultants	\$3,000.00
General research, work plan	\$4,000.00
<b>TOTAL</b>	<b>\$17,000.00</b>

## 9. CONCLUSION AND RECOMMENDATIONS

The exploration target is sedimenthosted stratiform Pb–Zn–Ag deposits, however throughout analysis history exploration date and superficial traversing the EL28765 property, this lease area absence black siltstones and major regional basinal faults, in other words, no metalliferous brines source. AMG geologist think if there can't found deep faults after mapping or soil survey next year, probably there be no potential in the lease.

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