FINAL REPORT TO COMMONWEALTH OF AUSTRALIA

MINES BRANCH

NORTHERN TERRITORY ADMINISTRATION ON
PROSPECTING AUTHORITIES

2822, 2851.

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by LE NICKEL (AUSTRALIA) EXPLORATION PTY. LTD.
The prospect is located in the MacDonnell Ranges, on the northern flank of the Amadeus Basin. The complete geological succession is exposed in the area, from Basement rocks of the Arunta Complex to the Devonian Hermannsburg sandstone. Tertiary mesas are an outstanding feature of the landscape. The structure is monoclinal, with steeply dipping beds locally overturned. Nappé tectonics are represented by the Ormiston Nappé complex in the centre of the A. to P. where large portions of sedimentary formations (i.e. the Heavitree quartzite and Bitter Springs Formation) have been over-thrusted into the Arunta Complex.

The Arunta Complex, the Proterozoic and Cambrian formations were initially considered prospective. A seismic survey by Magellan...
suggests that an axis of early tectonic uplift, having reached a maximum intensity in Ordovician times, extends from Areyonga to Goyder Pass, in the Glen Helen prospect. This geological feature was observed in the field but the large scale stratigraphic pinchouts resulting from the uplift did not produce locally restricted environment where metals could have been concentrated.

No base metal showing was found in the area. All exploration work was done in Proterozoic and Cambrian terrains. The Bitter Springs, Pertatataka, Arumbera and Goyder formations were surveyed geologically and geochemically (Figures 40, 41, 42 43). Gossan sampling in the Goyder Formation did not reveal any base metal concentration. The facies of the Goyder in this area is quite similar to facies observed elsewhere in the central part of the Basin. A geochemical section across the upper part of the Arumbera sandstone did not show base metals concentrations except a very minor copper concentration associated with a manganiferous layer (Figure 43). A geochemical survey 1970 revealed slight zinc concentration in an area close to the contact between the Bitter Springs limestone and laminated argillites with siltstone and sandstone interbeds of the Pertatataka Formation (Figure 42). This stream sediment anomaly extends over more than 5 kilometres along strike. Follow up exploration work included geochemical
chip sampling, shallow auger drilling and costeaining (Figures 43 to 52). Later subsurface work indicated that this anomaly is merely reflecting the presence of very minor zinc values in the limestone, far below economic level (Figures 48 to 52). Some surface enrichment is noticeable, but to a much lesser extent than for known copper mineralization.

**Total Expenditure:** $17,870

Results of geological and geochemical surveys are displayed in the figures.

**List of Figures:**

✓ Figure 5. Map of Areas covered by Geochemical Survey

✓ Figure 7. Portion of the Hermannsburg Sheet - Geological Map with Super-imposed Results of Geochemical Survey - Glen Helen Prospect 1:100,000 scale

✓ Figure 40. Detailed Stream Sediment and Gossan Geochemical Surveys:
  Glen Helen Prospect. Copper values 1:46,000 scale

✓ Figure 41. Detailed Stream Sediment and Gossan Geochemical Surveys,
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✓ Figure 42. Detailed Stream Sediment and Gossan Geochemical Surveys,
  Glen Helen Prospect. Zinc values 1:46,000 scale
Figure 43. Geological and Geochemical section across Glen Helen Zinc Anomaly

Figure 44. Glen Helen Zinc Anomaly - Geological map

Figure 45. Glen Helen Zinc Anomaly, Shallow Auger drilling programme.

Copper values 1:5,000 (missing)

Figure 46. Glen Helen Zinc Anomaly, Shallow Auger drilling programme - Lead Values 1:5,000 scale

Figure 47. Glen Helen Zinc Anomaly, Shallow Auger drilling programme - Zinc values 1:5,000 scale

Figure 48. Glen Helen Zinc Anomaly Costeane No. 1 1:2,000 scale

Figure 49. Glen Helen Zinc Anomaly, Costeane No. 2 1:2,000 scale

Figure 50. Glen Helen Zinc Anomaly, Costeane No. 3 1:2,000 scale

Figure 51. Glen Helen Zinc Anomaly Costeane No. 4 1:2,000 scale
Location of Costean see figure 45

Geochronological section of the costean was obtained from continuous channel sampling.
An auger drilling programme was completed and two stratiform zinc anomalies delineated in the upper part of the Bitter Springs formation.

Costs for November: $2,802.
A minor zinc anomalous geochemical concentration was found over rocks of the Bitter Springs Formation during the 1970 geochemical exploration programme. The area is situated approximately 9 miles WNW of the Glen Helen Tourist Camp. Examination of aerial photographs and planning work is almost completed and a geological survey will commence in September. Geological and geochemical surveys of the Goyder Formation will also be resumed in the near future.

Costs for July were $483.49. Costs for August will be supplied with September Report.
MONTHLY REPORT - NOVEMBER, 1971.

GLEN HELEN

A. to P. 2822, 2851

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A large zinc anomaly was discovered by stream sediment sampling, soil/chip sampling and eventually auger drilling. Maximum geochemical values locally exceed 1000 parts per million. Auger drilling is still in progress and will be completed next month. No zinc minerals were noticed in outcrop, a large proportion of the area is covered by scree and alluvial, costeening will be needed to assist in defining the mineralization and improving geological information.

Expenditure for September amounted to: $683
Expenditure for October amounted to: $1823
The area of anomalous zinc content in the Bitter Springs Formation was investigated during previous geological and geochemical reconnaissance. Follow-up work is under planning and will include: shallow auger drilling of the immediate subsurface to accurately delineate the anomaly, bulldozing and eventually percussion drilling if warranted by subsurface indications. The first part of this programme is now completed, an area of 7.5 km² was covered by the auger drill on a grid of 500 metres x 25 metres. No geochemical results are presently available, but surface mapping and previous geochemical work seems to indicate that the anomaly is associated with one horizon in the limestone, at the top of the Formation. Its strike length and width are still unknown.

A geochemical section at the top of the Ambera sandstone did not reveal anomalous base metals concentrations.

Costs for September amounted to $683.
Surface geological reconnaissance was resumed in the area during the month. Special attention was paid to the lithology and sedimentology of the Goyder formation. No indication of any mineralization is visible in surface expanse. Geological and Geochemical surveys will continue in the future.