MIM EXPLORATION PTY LTD

TECHNICAL REPORT

No. 2553

TITLE: EXPLORATION LICENCE No. 7891
"MULE CREEK"
NORTHERN TERRITORY
PARTIAL RELINQUISHMENT REPORT
YEAR ENDED: NOVEMBER 16, 1995

HOLDER: MOUNT ISA MINES LIMITED

OPERATOR: M.I.M. EXPLORATION PTY. LTD.

1:250 000 SHEET: MOUNT YOUNG SD53-13

1:100 000 SHEET: BING BONG 6166

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INVESTIGATIONS CONDUCTED BY: BUSUTTIL, S.
McGEOUGH, M.

SUBMITTED BY: ROTHERY, E.

DATE: FEBRUARY, 1996
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<td>41752</td>
<td>QUESTEM Flight Line Diagram</td>
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<td>41152</td>
<td>Interpretation Overlay – Aeromagnetics</td>
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M. I. M. EXPLORATION PTY. LTD.

TECHNICAL REPORT No. 2553

SUMMARY

Date:  February, 1996

EL 7891, "MULE CREEK"

PARTIAL RELINQUISHMENT REPORT

YEAR ENDING NOVEMBER 15, 1995

AIM OF PROJECT

To search for HYC style base metal mineralisation.

OBJECT OF REPORT

To record the results of exploration over the areas relinquished on November 15, 1995.

LOCATION

Exploration Licence 7891, "Mule Creek" is located approximately 960 km by road south-east of Darwin and is centred about 15°45' south latitude and 136°20' east longitude.

TENURE

EL7891 was granted to Mount Isa Mines Limited on November 16, 1992 for a period of 6 years over an area of 111 blocks. The Licence was reduced to 56 blocks on November 16, 1994 and further to 28 blocks on November 15, 1995. This report covers work done on the 28 blocks relinquished on November 15, 1995.
PREVIOUS EXPLORATION

Between 1968 and 1985 six exploration licences were granted in the "Mule Creek" area to search for base metals, manganese and uranium. An oil exploration permit was also granted over the area in 1981. Most of the exploration was unsuccessful except for the location of sub economic manganese mineralisation.

WORK DONE

The EL is within the Proterozoic McArthur Basin and is mainly covered by recent sediments with sparse exposures of Tawallah Group rocks. The NTGS multi-client aeromagnetic data was reviewed and major structural elements of the Licence were identified. This interpretation was followed by an airborne QUESTEM survey which delineated two major conductivity domains. Salt flats to the north produced strong EM responses in contrast to low order responses in the southern part of the licence. No anomalous areas were identified in the relinquished areas.

POTENTIAL

The relinquished areas showed no potential for the target style mineralisation

CONCLUSION

The QUESTEM survey failed to delineate any anomalies within the relinquished areas.

RECOMMENDATION

Relinquish the areas shown on Figure 1.
1. **INTRODUCTION**

Exploration Licence No. 7891 "Mule Creek" is located approximately 960 km by road south-east of Darwin, in the McArthur Basin. The current Licence was reduced from 56 blocks to 28 blocks on November 15, 1995 and this report covers the work done on the relinquished areas from November 16, 1992.

2. **LOCATION AND ACCESS**

The relinquished areas of EL 7891, "Mule Creek", lie on the Bing Bong (6166) 1:100,000 sheet, approximately 100 km north-west from Borroloola or 960 km (by road) south-east of Darwin, Northern Territory. The areas lie between latitudes 15°35'S and 15°50'S and longitudes 136°17'E and 136°25'E (Fig. 1).

Access to EL 7891 is by the Stuart Highway from Darwin to Daly Waters, the Carpentaria Highway to Borroloola, and along the Bing Bong road for approximately 85 km to the turn-off into the Licence area.

There are numerous sand tracks within the Licence which allow four-wheel drive vehicle access. Cross-country traverses are difficult due to the low and thick nature of the scrub. The terrain is mostly flat lying and sandy with occasional black soil and paperbark swamps.

3. **TENURE**

Exploration Licence No. 7891 was applied for on 20th July 1992 and granted to Mount Isa Mines Limited on 16th November 1992 for a term of six years over an area of 111 one-minute graticular blocks. The licence was reduced to 56 blocks in November 1994 and was further reduced to 28 blocks on November 15, 1995. Details of the blocks, which comprise the latest relinquished part of the Licence, are shown on Figure 1.

4. **PREVIOUS EXPLORATION**

The western half of "Mule Creek" was held under AP1973 by Australis Mining Co Pty Ltd in 1968 (Table 1). The Licence was operated by Placer Prospecting Pty Ltd. Eleven auger holes were drilled and samples panned to define areas of heavy mineral accumulations. Results were disappointing and the AP was relinquished in 1969.

APs 2169 and 2170 were held by US Steel Int. (NY) Inc in 1969. Target mineralisation was base metals, uranium and manganese. Limited helicopter supported reconnaissance geological mapping and rock and stream sediment sampling were conducted in the present tenement. The APs were relinquished in 1971 due to poor results.
EL 1425 was explored for manganese by Australia and New Zealand Exploration. Several shallow auger holes were drilled in the present tenement area and although ferruginous manganiferous siltstone and laminated silty argillite with abundant manganese were intersected, an economic deposit was considered unlikely. The Licence was surrendered in 1977.

BHP Minerals Co held two tenement areas, ELs 4678 and 4746, which covered the south-west portion of EL 7891 "Mule Creek". An HYC type base metal deposit was their target. Extensive airborne geophysics (aeromagnetics and radiometrics) were flown to define ground anomalies. EM-37 soundings and limited gravity surveys over these targets were completed. Limited reconnaissance work was conducted in the present tenement area with disappointing results. Both Licences were surrendered by late 1986.

OP 198, held by Amoco Productions Co. in 1981, was taken out to explore for hydrocarbons. Much of the work consisted of geophysics, geochemistry and drilling of favourable hydrocarbon hosts through the southern McArthur Basin. Little work was done over the area of EL 7891 due to the extensive alluvial cover. The Licence was relinquished in 1985 after no significant results were achieved.

**TABLE 1**

**OPEN FILE COMPANY REPORTS COVERING [EL7891 "MULE CREEK"]**

<table>
<thead>
<tr>
<th>TENEMENT NUMBER</th>
<th>GRANTED</th>
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<th>CR NUMBER</th>
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<td>01-07-68</td>
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<td>01-02-69</td>
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<td>23-12-76</td>
<td>Aust. and N. Z. Expl. Co.</td>
<td>78/011</td>
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<td>EL4678</td>
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<td>BHP Minerals Ltd</td>
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<td>PR85/015 A-F</td>
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5. **REGIONAL GEOLOGY**

EL 7891 "Mule Creek" is located within Carpentarian rocks of Lower Middle Proterozoic age and lies on the Mt. Young 1:250 000 sheet area (SD 53-15). The Licence is extensively covered by sand, ferruginous cemented detritus and alluvium. The sequence of interest is the McArthur Group which forms part of a thick platform-cover sequence deposited within the McArthur Basin. It unconformably overlies the Tawallah Group and is overlain by the Nathan and Roper Groups. Many base metal deposits within the North Australian Craton are hosted by the McArthur Group or its equivalents. This, coupled with major lineaments which traverse the Licence, suggested the areas could be prospective for the target mineralisation.

6. **WORK DONE BY M.I.M. EXPLORATION PTY. LTD.**

6.1 **Review of NTGS Aeromagnetics**

A review of the NTGS multi-client aeromagnetic data over the tenement was undertaken. The interpretation was carried out to identify major structures in the area, with the aim of focusing further ground and possibly airborne geophysical surveys.

A major north-west structure, called the Gulf Fault, was identified in the southern half of the tenement. Its trend is approximately parallel to other major structures within the McArthur Basin (e.g. The Calvert Fault). The fault was mainly defined by the truncation of an interpreted shallow volcanic unit (see Drawing No. 41152).

6.2 **QUESTEM Survey**

In June 1994 an airborne QUESTEM survey was undertaken over the tenement area. The survey incorporated a considerable area of salt flats and tidal creeks which formed a very conductive overburden. In the southern half of the tenement, away from the salt flats, lower amplitude EM responses dominated. This response indicated a predominantly resistive country rock. Results obtained over the relinquished areas are shown on Drawing No. 41784. Located data in digital form is included as Appendix 1.

A reconnaissance field visit was carried out in order to investigate QUESTEM anomalies on the ground and also look for any previously unmapped Proterozoic outcrops. This exercise was unsuccessful.
7. CONCLUSIONS

The QUESTEM survey failed to delineate any anomalies within the relinquished areas.

8. RECOMMENDATIONS

Relinquish the areas shown on Figure 1.

D.M. Crabb
Geologist
9. REFERENCES


APPENDICES
APPENDIX 1

LOCATED QUESTEM DATA
DRAWINGS