RELINQUISHMENT REPORT

EL 8076

HARTS RANGE REGION, N.T.
NORTHEAST CORNER - ALICE SPRINGS [SF 53-14] 1:250,000
SOUTHEAST CORNER - ALCOOTA [SF 53-10] 1:250,000
SOUTHERN EDGE - HUCKITTA [SF 53-11] 1:250,000

TO N.T. D.M.E
FOR PERIOD TO 19/12/1995

LICENCE HOLDER:
CHAMBIGNE RESOURCES PTY LTD

REPORT COMPiled BY:
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19-11-1996
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1 SUMMARY

The 74 relinquished blocks of EL8076 essentially comprised the westernmost half of the EL, which was chiefly taken up to explore for alluvial garnet and other industrial minerals in the riverbed of the Plenty River and its associated colluvium.

Initial reconnaissance, and subsequent re-examination of the headwaters and feeders of the Plenty River, which comprised the targets within the blocks relinquished, indicated sub-economic garnet grades and low tonnages in the creeks and feeders. These commonly had shallow depths, narrow creek widths, and/or uneven and rocky creekbeds, making commercial large-scale sand recovery both difficult and commercially non-viable.

An additional factor which became apparent at the inception of planning for extraction was the higher ratio of rehabilitation that would have been required per linear kilometre of creekbed (or per ton of sand recovered), adding a proportionately higher charge to the production costs in these areas. For these reasons, these blocks were relinquished.

Creekbed sand samples were inspected visually on site for approximate garnet grade and grade distribution (estimated from about 1% in the northern feeders to local highs of 8% in the southern feeders closer to the garnetiferous source rocks), but no samples were taken for analysis for the above reasons. Initially, isolated floaters and low-lying outcrops within the relinquished portions of the EL were also examined with a view to hard-rock garnet extraction, but a consideration of the costs soon led to the abandonment of this concept. No geological mapping or photointerpretation was carried out.
2 INTRODUCTION AND TENURE

EL8076, comprising 148 graticular blocks of approximately 477km$^2$, was granted to Chambigne Resources Pty Ltd on the 20th of December, 1993. The aim of exploration was to delineate economic reserves of alluvial garnet within the riverbed of the Plenty River and its feeders, and associated colluvium.

74 blocks, comprising the western portions of the EL, and the headwaters of the Plenty River, were relinquished at the end of the second statutory year, formally notified 30 October 1995. 74 of the eastern blocks remain within EL8076, targeting solely the larger and better defined course of the eastward-flowing Plenty River.

3 LOCATION AND ACCESS

EL8076 was centred on the Plenty River, and at its western end, its feeders and colluvium. The westernmost portion of EL8076 commenced at 134° 40’, running more or less due east to 135° 28’. The precise locations of the graticular blocks comprising the original EL are shown on Appendix page 1. Appendix page 2 shows the relinquished and retained blocks, and Appendix page 3 shows the blocks remaining in EL8076.

For virtually all of its extent, the Plenty River flows eastwards, subparallel to the Plenty Highway, and located several to 10 kms to the north of it. Access to the EL from Alice Springs is thus north along the Stuart Highway, turning east onto the Plenty Highway, towards and just before the Harts Range Police Station, and continuing eastwards thereafter. A number of roads and station tracks lead north off the Plenty Highway, and cross the Plenty River, affording easy access without bush bashing. With lowered tyre pressure, a 4WD vehicle can easily drive along the riverbed.
4 GEOLOGY OF EL8076

EL8076 lies in the flood plain of the Plenty River, with little in the way of massive outcrops; numerous smaller outcrops and rock bars, however, indicate that for the most part, the riverbed lies in the mid-Proterozoic metamorphic rocks of the Harts Range Group. To the west, in the relinquished parts of the EL, some of the more northern shallow feeders cut through deeply weathered and essentially undifferentiated Lower Triassic rocks, but these have no significance in terms of the garnet genesis, and have a negative effect on the resource volumes.

Of the Harts Range Group rocks, the most significant are the Irindina Gneiss, and the Riddock Amphibolite; both are heterogeneous, and may carry from zero to 18 volume % garnet, though the average for the Gneiss is closer to 10%. From a consideration of the regional geology, petrology and topography, it is evident that the sources of most of the garnet in the river sands are the two rock units named previously. This is quite apparent in the southern portions of the feeders, which derive most of their sediment load from the Irindina Gneiss and Riddock Amphibolite. There appears to be little if any contribution of grossular-andradite garnet from the rare calc-silicate rocks that are garnetiferous, and similarly, almandine-rich garnets from the weakly garnetiferous lower grade schists to the north of the River have not contributed to the overall garnet composition or grade in the river sands.

The geological-lithological distribution of rocks adjacent to the relinquished portion of EL8076 can be seen on the Alice Springs and Alcoota 1:250,000 Geological maps. For a better appreciation of the distribution of petrological types, refer to the Geology of the Strangways Range Region and the Atilunga-Harts Range Special 1:100,000 geological maps. No purely geological mapping was carried out in any part of the relinquished blocks of
the EL. Written summaries of the regional geology of the areas encompassed by the EL are presented in the notes to accompany the Geology of the Strangways Range Region, and the Arltunga-Harts Range Special 1:100,000 geological maps. The previous geological summary was compiled directly from the abovementioned references, which are not presented here.

5 EXPLORATION TO 12/95

Initial reconnaissance within the relinquished blocks comprised a visual inspection of the creeks and feeders comprising the headwaters of the Plenty River, and the colluvium or “wash” on the low-lying plains which feed into the creeks during heavy rains via “sheet-flow”. These latter are predominantly sands and silts, with appreciable clay content and desiccated organic matter.

The colluvium surrounding the northern creeks and feeders comprise sediments derived in part, or locally exclusively, from non-garnetiferous Tertiary rocks, and the associated creek beds thus have low garnet grades (typically 1 to 3 volume % by visual estimate on site). The southern feeders derive their sediment load from colluvium sourced from large and continuous outcrops of Irindina Gneiss and Riddock Amphibolite, both of which are garnetiferous. Consequently, these creeks are more garnetiferous, with grades locally as high as 8%, but typically closer to 6 volume %.

Garnet grades notwithstanding, the creeks comprising the headwaters of the Plenty River are generally small, that is, they are narrow (2 to 6m) and usually quite shallow (0.5 to 1m), which in turn results in low tonnages per unit creek length. Additionally, they commonly have rocky outcrops and bars within the creekbeds, which would make effective extraction difficult, and economically even more marginal. No samples were collected during this initial reconnaissance.
Initially, hard-rock garnet extraction was also considered, and as a result, a number of the low-lying, nominally in-situ rock outcrops within the EL were examined for garnet grades. Almost invariably, the Iridinda Gneiss and Riddock Amphibolite outcrops were garnetiferous, and partly to largely decomposed. It became apparent, when blasting, crushing, sorting and garnet separation costs were assessed, that such hard-rock extraction would be at best economically marginal. When environmental considerations and rehabilitation costs were factored in, hard-rock garnet extraction became absolutely non-viable, short of doubling in the garnet price. Consequently, all further hard-rock garnet exploration was halted.

Following reconnaissance, systematic sampling, mineral separation, garnet analysis and subsequent bulk sampling of the Plenty River in the retained portions of EL8076, where grades were more consistent and tonnages per km along the riverbed orders of magnitude higher, the more garnetiferous southern feeders in the relinquished blocks were re-examined.

A preliminary time and motion study for extraction on the scale required by the current price of garnet, and the costs associated with its concentration to the required purity, indicated that extraction of garnet from the southern creeks would be marginal, with relatively high risk.

6 SYNTHESIS AND CONCLUSION

The amount of vehicular and plant traffic required to extract sands from the more garnetiferous smaller creeks in the relinquished blocks would be proportionately higher than in the larger stream beds to the east. This in turn would lead to a greater environmental impact. Additionally, when the need to preserve established small trees and large shrubs along the riverbank and in the creek bed is factored in, together with the larger rehabilitation cost per ton
of garnet extracted, even the best grade/tonnage sections of the southern creeks become non-viable.

For similar environmental reasons, the generally shallow colluvium is also non-viable. Consequently, it was decided to relinquish these western blocks in toto, as absolutely non-viable for the planned large-scale extraction of garnet.

7 EXPENDITURE 12/93 TO 12/95 - RELINQUISHED BLOCKS

The two periods of field exploration in the relinquished blocks were carried out as part of larger field efforts concentrating mainly on the wider and deeper riverbed of the Plenty River downstream of these blocks. As a consequence, the expenditures for the two years are calculated on a pro rata basis in time, excluding sample transport and processing costs, bulk sampling, metallurgical study and performance evaluation. For 1993-94, the total over the whole EL was $24,657, and for 1994-95, $6,627. For the relinquished blocks, these expenditures comprised:

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<th>Year</th>
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appendices to follow
SECOND SCHEDULE
(Plan of Area)

EL8076
148 BLOCKS
477 sq kms

LOCATION PLAN OF EL 8076 AS GRANTED
APPENDIX A
EL8076
74 BLOCKS
238 sq kms

LOCATION PLAN OF CURRENT EL 8076

APPENDIX C