EXPLORATION LICENCE 5171

FINAL REPORT

Hunter Resources Limited

September 1989

Introduction

Exploration Licence 5171 was acquired by Hunter Resouces Limited to explore for platinum group metals (PGM) in the Attutra Metagabbro, a mafic intrusion in the northeast of the Arunta Complex, Central Australia.

Location and Access

Exploration Licence 5171 is located immediately east of Jervois Mine, 380 km by road east of Alice Springs. The tenement is crossed by the Plenty Highway, and the main road to Lucy Creek Homestead. The latter road crosses the Attutra Metagabbro near its northern end, and station tracks to Unka Bore provide additional access. The country is open, and it is possible to drive directly to most outcrops.

Accommodation at the Jervois Mine is available by arrangement with the Plenty River Mining company. Fuel is sold at Jervois Homestead, 35 km to the southwest.

Title

Exploration Licence 5171 was granted to Hunter Resources on July 31, 1987. The tenement was relinguished on May 30, 1989.

Work conducted

The following work made up the PGM exploration programme for E5171:

- literature research
- reconnaissance mapping
- rock chip sampling
- stream sediment sampling
- orientation geochemical survey
- airphoto interpretation
- ground magnetic survey interpretation

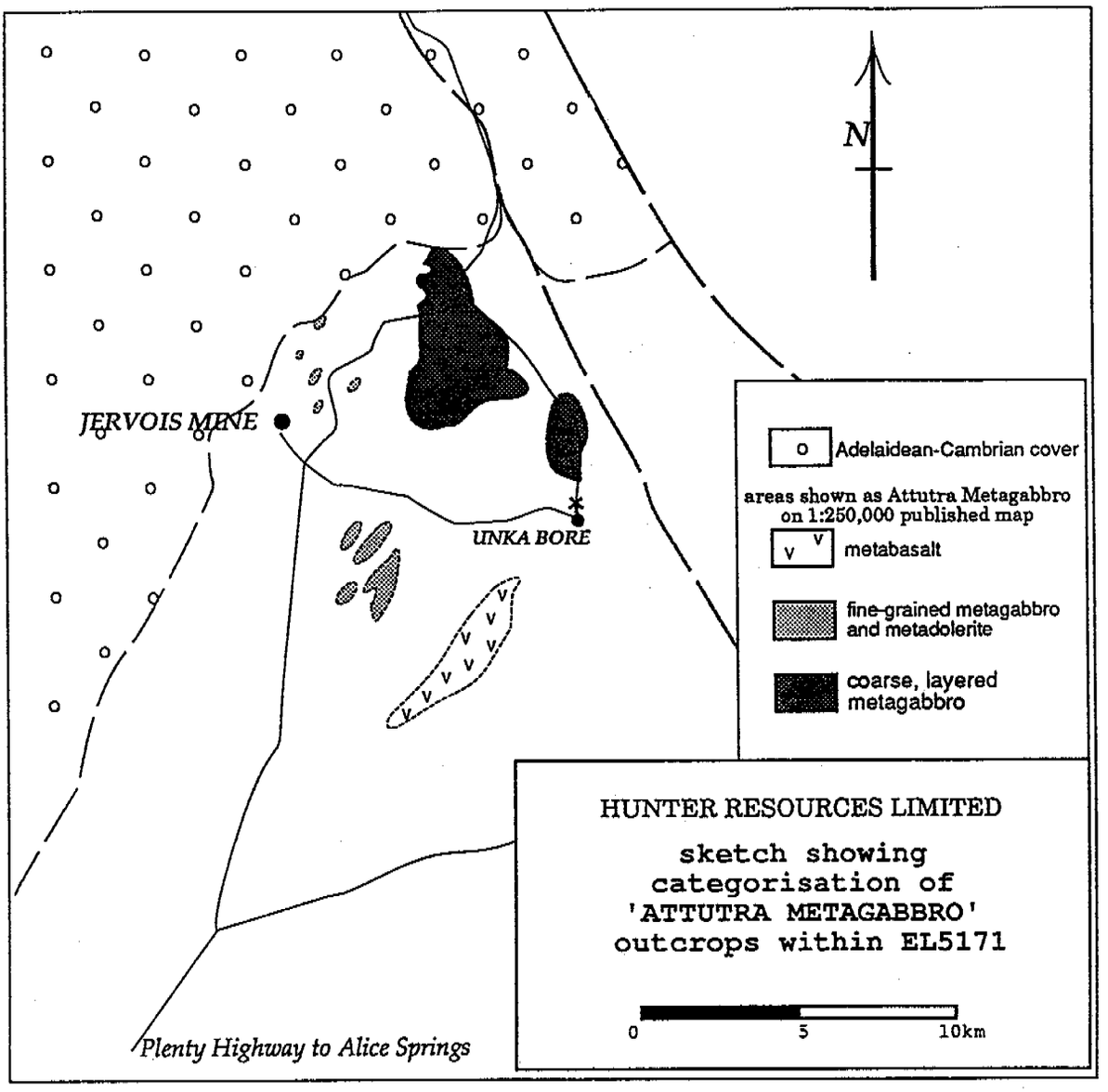

N
JERVOIS MINE
UNKA BORE
Plenty Highway to Alice Springs
Adelaidean-Cambrian cover
areas shown as Attutra Metagabbro on 1:250,000 published map
metabasalt
fine-grained metagabbro and metadolerite
coarse, layered metagabbro
HUNTER RESOURCES LIMITED
sketch showing categorisation of 'ATTUTRA METAGABBRO' outcrops within EL5171
0
5
10km

FIGURE 1

Geology and Mineralization

Geological Setting

The Attutra Metagabbro lies within the presumed Lower Proterozoic Bonya Schist, in the northeast of the exposed Arunta Complex (Figure 1). The Bonya Schist is a diverse assemblage of pelitic and semipelitic schists, banded calc-silicate rock, and metavolcanic rock, metamorphosed to lower to middle amphibolite grade. It hosts the deformed, stratabound Jervois copper-lead-zinc-silver-bismuth deposits. The metagrabbro outcrop is truncated in the north by the Adelaidean unconformity of the Jervois Range.

Attutra Metagabbro

The Attutra Metagabbro was subdivided by Freeman (1986) into a northern and southern group of outcrops, both lying within the area of E5171. The northern outcrops belong to a major differentiated mafic body. The southern ones include fine-grained metagabbro, metadolerite, amygaloidal metabasalt and various volcanogenic metasediments, calc-silicate interlayers, and amphibolitic rocks of indeterminite origin. Only the northern outcrops were considered prospective for PGM mineralization.

The Attutra Metagabbro has an irregular, roughly triangular-shaped outcrop consisting of a collection of sinuous, bouldery ridges and low hills, and isolated tors. The ridges are generally oriented 090° suggesting a crude layering in this direction. This is supported by the presence of occasional short-lived magnetite or pyroxenite layers up to a few metres in thickness. Continuous well defined layering was rarely encountered.

In the northern apex, close to the Adelaidean unconformity, measurable layering strikes roughly 360° and dips vertically. Layering in the Bonya Schist is broadly north to northeast, discordant to the east-west trends of the Metagabbro.

Where marginal zones are exposed (mainly on the west and south sides), there is a very complex transitional suite of calc-silicate, fine-grained metagabbro, amphibolite, amphibole-chlorite schist, magnetite-bearing biotit gneiss, and abundant granitiod intrusives.

The most likely original form of the body is an irregular, steep-sided lopolith with concordant metasedimentary screens, which has subsequently behaved as a semi-rigid block with ductile enclaves during deformation.

Metagabbro and Pyroxenite

The dominant rock type of the Attutra Metagrabbro is a boldly outcropping, coarse to very coarse-grained, equigranular, massive metagabbro varying from leucocratic to melanocratic in rather haphazard fashion. It is generally non-magnetic, though a banded anorthositic variant at the northern extremity of outcrop does contain patches of dessiminated magnetite (sample 400825). Pyroxenitic bands and lenses are more common around the margins of the body. These are generally deformed and metamorphosed, medium to coarse-grained amphibole-chlorite schist.

Magnetite rock

Massive vanadium-bearing magnetite has been recorded previously only as isolated outcrops in the plain north of Unka Bore, where it is interpreted as occurrings as plugs (Freeman 1986) and shown on the Huckitta 1:250,000 Sheet as mineral occurrences 128 and 129 (Figure 2). These outcrops consist of hematized medium-grained magnetite rock in narrow rocky ridges mantled by wind-blown sand. There is some malachite stained at locality 129.

Apparently new occurrences found during the exploration programme lie within outcrops of metagabbro, and consist of discontinuous bands and lenses up to 3 metres thick, clearly part of the metagabbro system and not plug-like at all. They occur as clusters, several short, stacked lenses, separated along strike by magnetite-free metagabbro. Magnetite rich amphibole rock occurs locally adjacent to the bands, but no systematic differentiation or layering was observed. Outcrop generally did not reveal contacts between magnetite and the metagabbros.

Rock chip sampling was strongly biased towards magnetite-rick rocks, and a total of 15 out of 34 samples were of nearly-pure magnetite rock. Few other units within the metagabbro seemed to offer any obvious potential to accumulate PGM, except perhaps for metapyroxenite lenses, of which a number of representative samples were also collected.

Granitoids

The Attutra Metagabbro is riddled with bodies of medium-grained granitoid, with distinctive bouldery outcrop resembling the gabbros themselves. They consist of equigranular quartz and feldspar, with an indeterminate, often oxidised dark mineral. Many bodies are obviously cross-cutting, few are larger than several tens of metres across, and none form any part of the igneous layering. They are especially abundant around the margins of the Metagabbro.

Structure and Metamorphism

Observations of the Jervois Mine (Freeman 1986) show two major folding events, an early, layer-parallel isoclinal one, and later more open upright folding. The precise timing of the emplacement of the Metagabbro is not clear, but it does not have the character of a concordant sill emplaced into layers of the metasediments. Its massive wedge-like form suggests a timing after the initial folding. Confused layering, complex schistose margins, and amphibolite grade metamorphic mineralogy, points to substantial deformation, by at least one major tectonic evernt. Internally, the metagabbro is widely unfoliated, doubtless due to the resitive nature of its main lithology.

Exploration Results and Recommendations

Sample descriptions and results are listed in Table 1. Sample locations are shown on Figure 2. The values of both platinum and palladium are mildly to moderately elevated in the magnetite-rich seams, and had these been more extensive, further work would have been justified.

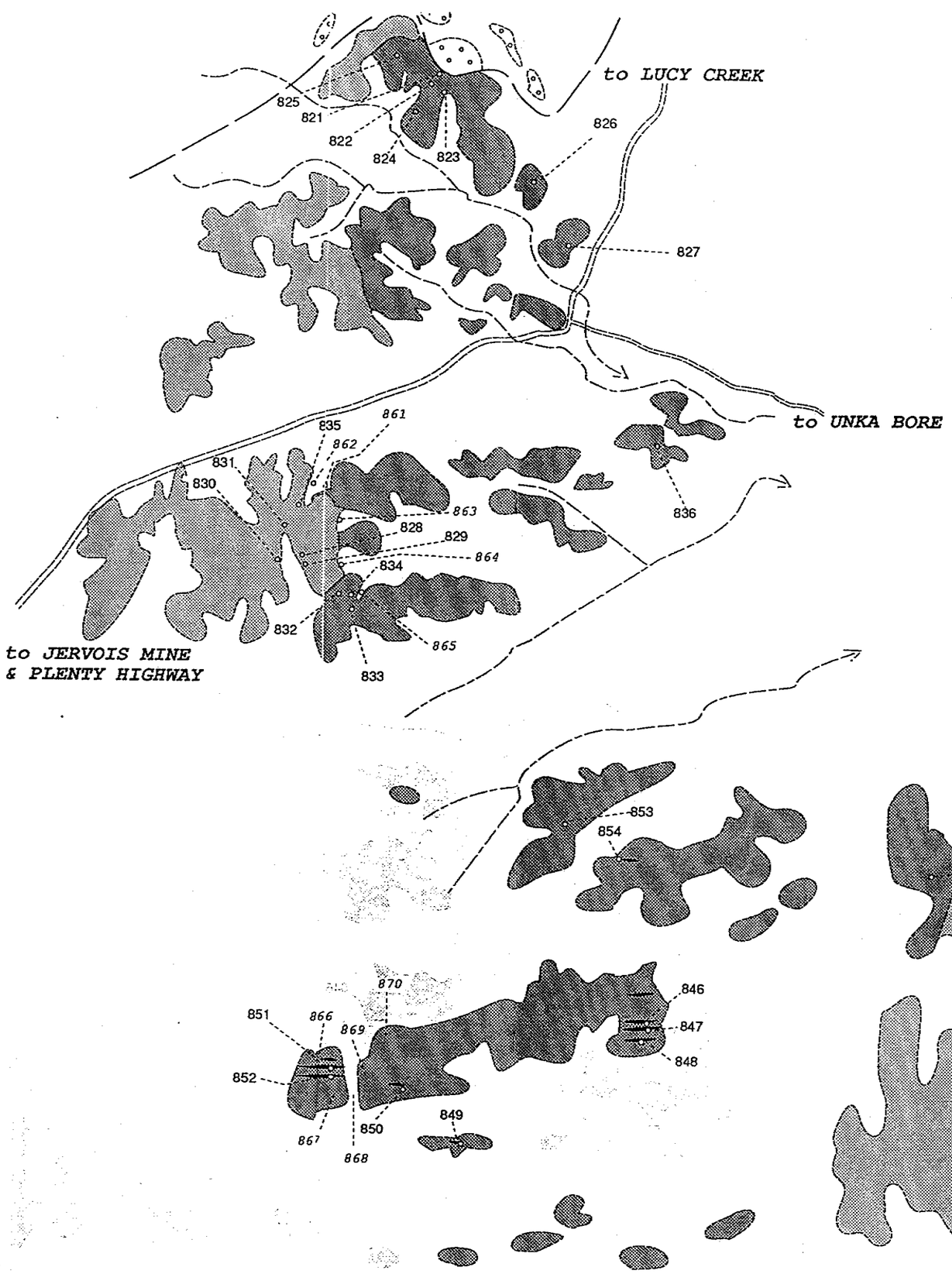
Considering that quite large samples (2 to 5 kg) were taken from fairly restricted lenses of cumulate phases such as magnetite rock and metapyroxenite, the likelihood of large bodies of ore grade platiniferous rock being present seems small. The grades required to render these small bodies commercial in platinum would have reflected more sttrongly in the samples taken, and as such, no further work is warranted.

ATTUTRA ROCK CHIP ASSAYS

SAMPLE NO	DESCRIPTION	Pt/ppb	Pd/ppb	Au/ppb	Cu/ppm	Ni/ppm	Cr/ppm
400821	weakly magnetic metapyroxenite	<5	<1	<1	48	191	129
400822	small magnetite-rich lens	<5	<1	12	22	315	365
400823	magnetite-rich schistose metapyroxenite	<5	<1	2	41	224	118
400824	metapyroxenite	<5	<1	47	53	32	43
400825	anorthositic gabbro with magnetite	<5	1	104	150	25	13
400826	schistose magnetic pyroxenite	<5	<1	20	50	215	46
400827	" " " " "	<5	<1	15	130	113	82
400828	magnetite rich biotite gneiss	<5	<1	<1	4	78	83
400829	"	<5	<1	58	87	74	74
400830	"	<5	<1	<1	131	48	41
400831	"	<5	1	<1	19	68	96
400832	pyroxenite	10	4	<1	2900	82	96
400833	magnetite rock	<5	1	<1	30	53	78
400834	pyroxenite	<5	1	10	323	154	22
400835	quartz from small pit	<5	<1	<1	16	10	152
400836	pyroxenite adjacent to an anorthositic gabbro	<5	1	1	74	21	22
400837	massive coarse hematised magnetite	13	24	<1	31	255	43
400838	"	9	35	<1	63	29	67
400839	"	37	35	<1	74	351	317
400840	"	7	50	<1	39	297	44
400841	massive magnetite with malachite	27	203	5	2400	189	57
400842	"	16	74	<1	1600	294	74
400843	gabbro-pyroxenite with magnetite	17	68	<1	1400	289	70
400844	massive magnetite	28	215	<1	244	183	52
400845	fine grained magnetic pyroxenite	<5	5	<1	122	25	53
400846	massive magnetite rock	9	3	4	24	597	927
400847	"	11	22	5	13	607	1030
400848	"	5	<1	<1	17	603	683
400849	small magnetite lens	5	<1	64	24	713	1158
400850	magnetite rich pyroxenite	<5	2	<1	51	47	54
400851	massive magnetite rock	6	<1	<1	7	702	1820
400852	" "	5	<1	<1	6	49	738
400853	schistose metapyroxenite	<5	<1	<1	350	327	111
400854	" "	<5	<1	<1	63	330	228
400855							

TABLE 1

Cr by perchloric acid digestion only



ADELAIDEAN COVER
(Georgina Basin)

BONYA SCHIST - mixed metsediments with numerous felsic intrusives

ATTUTRA METAGABBRO

magnetite-rock; local lenses and bands

metagabbro, minor metapyroxenite, leucogabbro, numerous granodiorite bodies

836 — rock chip sample loc.

863 — drainage sample loc. (minor gullies only)

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OUTCROP SKETCH PLAN OF THE ATTUTRA METAGABBRO

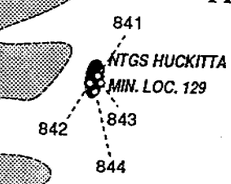
adapted from N. T. Geological Survey field compilation sheets

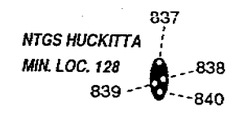
SCALE 1:25,000 approx.

John Martyn & Associates Pty Limited, Sydney, May 1988

ADOBE ILLUSTRATOR ™

FIGURE 2





References

Freeman, M.J., Huckitta 1:250,000 Geological map series explanatory notes, N.T. Geological Survey, 1986.

John Martyn & Associates Pty Ltd, Attrutra, E.L. 5171, N.T.: Report on Field Visit for Hunter Resources Ltd, 1988.