ANNUAL REPORT

FOR

EXPLORATION LICENCE NO. 5097

NORTHERN TERRITORY GOLD MINING N.L.

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JUNE 1989

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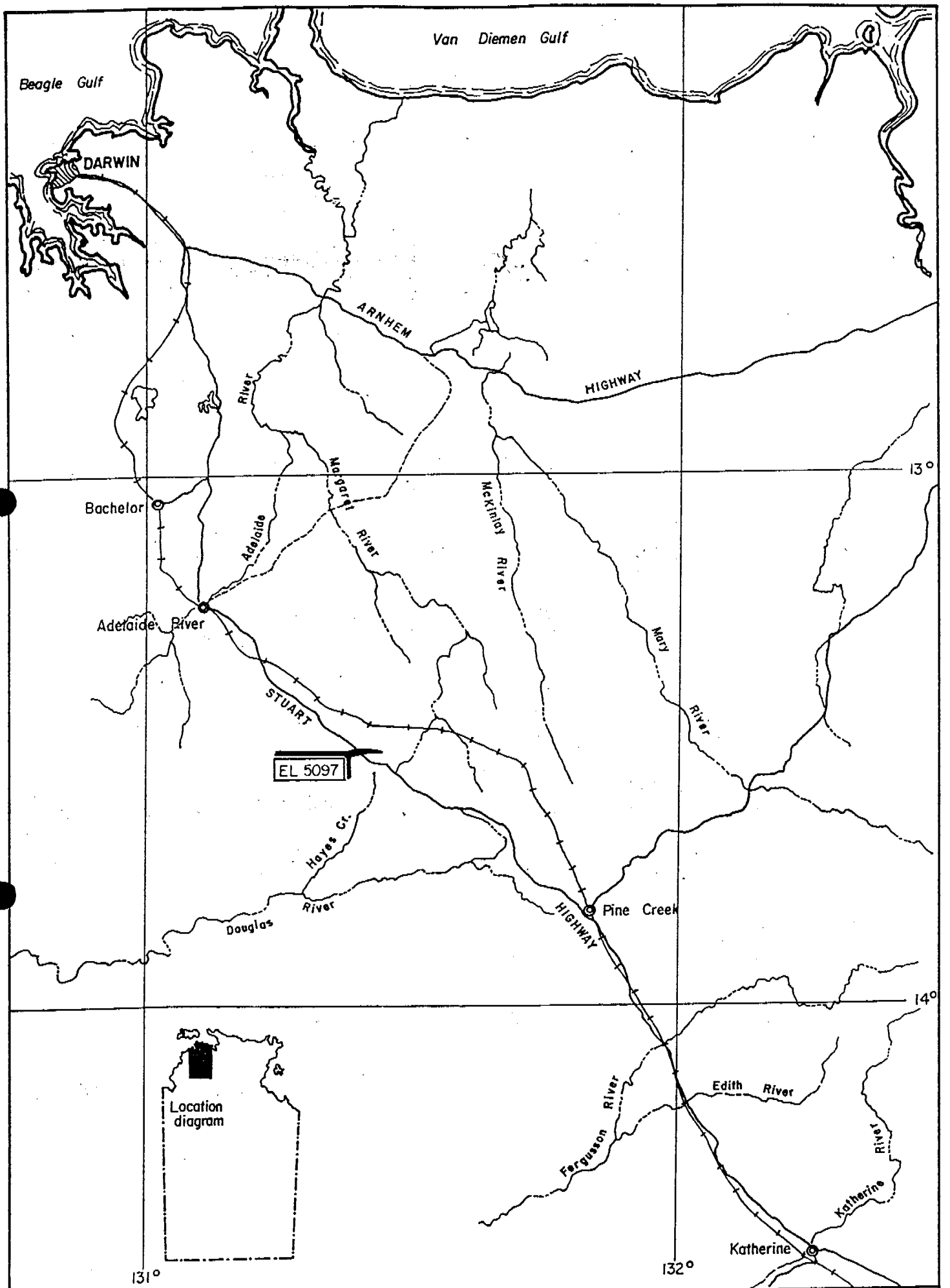

Location Map
EL 5097

1000m 0 50 100 Km

1. SUMMARY:

A structural geological approach has been applied to initial exploration of Exploration Licence 5097. This has been adopted in preference to geochemical sampling as drainage, soils and outcrop are such that only a poor quality of data would be expected from these methods.

The structural approach (combining geophysical data, aerial photography and regional geology) has generated two probable targets for further exploration. Unfortunately the definition of these targets is largely abstract.In the context of the regional picture, similar structural targets however have shown to be of a low economic significance.Further exploration cannot be recommended at this stage.

2. INTRODUCTION:

This report details current investigations within the exploration licence 5097, Northern Territory. The licence is six blocks in total, covering an area of approximately 19.5 km^2. The licence has been considered as marginally prospective with units of both the South Alligator and Finniss River Group present. The area has also been the target of repeated base metals / tin mineralisation exploration and is within close proximity to other known gold occurrences (i.e. Cosmopolitan Howley).

Exploration conducted by Northern Territory Gold Mining NL for the period ending June 1989 has involved extensive interpretative studies from aeromagnetic data and aerial photography.

3. TENURE:

Exploration licence was granted to Peter Jonathon Leach for a period of three years from 12th May,1988. The licence was transferred to Northern Territory Gold Mining N.L. on the 21st June1988.

3. PREVIOUS EXPLORATION:

Since 1977, active exploration has been conducted (in part) across the licence area. There has been an overlap of the central

blocks of the current licence with that of the previous licence 1072, and later licence 1338.

Previous exploration has been undertaken by Geopeko during 1978 was centered on the eastern part of the licence, Eupene (1979), and C.R.A. Exploration (Swensson (1979) and Wills (1977)) toward the north and east. Both companies were expressly involved in base metal searches and as a consequence none of the prospecting has been targeted at gold mineralisation.

The area has been previously mapped as part of the B.M.R. regional 1:100,000 scale mapping programme (1984).

4. LOCATION:

Exploration licence 5097 is situated approximately 130 kilometres SE of Darwin. Locally the licence is positioned approximately 5km east of Cosmo Howley Mine, and 10km south of Brocks Creek area. Access to the area is readily gained with the Stuart Highway passing through the south west corner of the licence (see fig 1).

5. PHYSIOGRAPHY:

Much of the licence covers flat ground with the development of central elevated plateau. A valley system has developed central to the area draining into slight rolling hills in the south western corner.

The area is largely covered in soils with alluvial gravels deposited in the valley. Climatic variation of the region is restricted to two seasonal variations of the "Wet" season when rainfall may be as high as 1000 mm through to the "Dry" season when virtually no rainfall is recorded. Temperature variation annually is minimal from a minimum of 20^{o}C to a maximum of 30^{o}C.

Vegetation of the area is primarily small shrubby trees to tall eucalyptus with a thick ground cover of spear grass up to one metre tall.

6. REGIONAL GEOLOGY:

Regionally the goldfield is situated within the Pine Creek Geosyncline (a macroscopic structure of some 40,000 km^2), in the Katherine and Darwin region of the Northern Territory. The regional geology was mapped in detail by Walpole et. al. (1968)

and later Needham et. al. (1980). A good outline of the history of the syncline has been written by Eupene and Nicholson (1984) and may be summarised as follows:

Approximately 2400-2100 mya, arkose, pelitic, carbonate and iron rich sediments were deposited upon a crystalline Archaean basement. This sequence suffered deformation and amphi0olite facies metamorphism through to 2000 mya. Uplift and erosion of these sediments led to the carbonaceous mudstones, limestones and tuff beds as fluviatile sediments and turbidites with a final flysh sequence of greywacke and shales. Near the end of deposition, igneous dykes and sills were intruded, followed by further deformation and lower greenschist facies metamorphism. The metamorphism is dated at approximately 1800 mya. Extensive granitic intrusions occurred as a post metamorphic event.

The tectonic history has been detailed by Johnston (1984) in an unpublished Phd thesis and suggests four phases of deformation have occurred. D_1 and D_2 are related to the metamorphic development with D_2 developing low angle shear zones as a response to overthrusting and crustal shortening during basinal compression. D_3 resulted in the development of F_3 folds which are tight to isoclinal N-S trending folds seen to dominate the syncline. A final folding episode, D_4 refolded F_3 folds along an E-W axis.

The chronostratigraphy of the synclinal sediments is shown in figure 2 with a regional geology map in figure 3.

7. LOCAL GEOLOGY - LITHOLOGY:

Sediments from both the South Alligator and Finnis River groups have been recognised within the licence area (see fig 4).

The Koolpin facies sediments are reported to be of a similar nature to those exposed at Brocks Creek, Golden Dyke and Cosmo-Howley. They are inferred to be of a thinner part of the sequence within the southwest corner of the licence and may be correlated with those seen at Brocks Creek. The lower boundary of the upper "Golden Dyke" sediments as exposed at Golden Dyke and Cosmo Howley has not been identified.

Further exposure of the upper South Alligator Group sediments is also seen in the SW corner of the licence. These are the siliceous, banded cherts and tuffs of the Gerowie Tuff beds, (with minor carbonaceous siltstones) and the incoming overlying greywackes and coarser sediments of the Mt. Bonnie Formation.

The Mt. Bonnie Formation is presumed to be a transition zone from the low energy Koolpin facies muds to the high energy turbidite sediments of the Burrell Creek (Finniss River Group).

The Burrell Creek sediments make up a large proportion of the rocks within the licence area, and these are in turn covered with a thick cap of soils and quaternary gravels.

Outside the area to the south, sils of Zamu dolerite intrude Koolpin facies sediments. Eupene (1978) also reported numerous amphibolite units and an isolated gabbroic ferrodiorite occurrences in the South. To the east of the licence a suite of quartz, muscovite tourmaline cassiterite pegmatite veins are observed and may well be associated with near-by granite emplacement.

8. STRUCTURE

The poor outcrop of Burrell Creek sediments over much of the area has hindered definition of major structural elements in the field.

regionally there exists an east-west flexure folding the numerous north-south trending folds. This axis of this flexure (which may be by D_4 deformation after Johnston (1984), passes close to the field area.

There is a high density of faulting with numerous occurrences of disruption to the antiformal structures. This may well be related to the east-west flexure.

The fault mesh developed appears to have two preferred orientations of ENE (subparallel to the E-W structural fold) and WSW,sub perpendicular to the E-W structural fold.

The major NNE trending Hayes Creek fault is immediately east of the area and may show some dip slip component with the south-east side down thrown. The strike slip component (if any) has not been ascertained, however, there is strong indication for aeromagnetic data that there has been warping of the N-S folds to form the E-W flexure with macroscopic drag fold development suggesting sinistral strike slip.

9. MINERALISATION:

Gold mineralisation has been found (and successfully mined) through-out the Pine Creek region in two dominant styles;

Epigenetic gold hosted quartz veining and stratabound (? epigenetic) disseminated gold horizons.

The quartz vein style of mineralisation has been recognised in numerous deposits and occurs in a variety of attitudes of both conformable to, and discordant with, bedding and cleavage.

Pyrite arsenopyrite and rare galena, chalcopyrite development has been reported to be associated with the gold mineralisation (Goulevitch & Holden 1988).

The stratabound style of deposit appears primarily within the Koolpin facies rocks and has been successfully mined with the Cosmo Howley mine in the west and Golden Dyke Mine to the east. Recognition of a similar horizon at Brocks Creek (Goulevitch & Holden (1988) to the north gives the horizon extensive lateral continuity. Within Cosmo Howley it appears as successively stacked series of mineralised packets along shears subparallel to the hinge of the Howley Anticline. Remobilisation of gold into these shears has elevated the grade in close proximity to the shears.

Tin mineralisation has also been reported to the east and south-east but seems restricted to veins parallel to bedding Eupene (1978).

10. RESULTS AND DISCUSSION:

Most of the licence area is covered by massive greywackes and lesser siltstones of the Burrell Creek sediments, with exposure of the underlying South Alligator Group to the southwest.

It appears that economic mineralisation may occur in any of the above sediments and that the definition of favourable structures is the more important element. The area of the licence seems particularly amenable to structurally controlled mineralisation as it lies within the area of flexure of the originally N-S trending folds and is bounded by the Hayes Creek shear (trending approx. 070^0) to the east and by the informally named Howley-emerald springs fault (trending approximately 290^0), to the south.

The targets that have been delineated are those which are structurally complex often at the intersection of two major faults or of a fold with a shear structure.

Two such structures can be isolated within the field area.(see figure 4).

Unfortunately extensions of these features into surrounding licences which have been selectively sampled but have so far failed to produce a result.

The association of folds with shearing has proved to highly prospective.(Goulevitch & Holden (1988) also Scriven & Orridge (1989)).

11. CONCLUSIONS & RECOMMENDATIONS:

The broad cover of overlying Burrell Creek soils have restricted any first pass geochemical sampling to transported soils or in-situ C-horizon derived solely for the Burrell Creek sediments. It was decided that a geophysical rather than geochemical approach be adopted for first pass work.

Following the results of the structural work, the two broad targets were presented for further consideration.(see figure 4). At this stage the targets have been selected solely on their structural associations and similarities to known deposits. Extensive follow-up is now required to test the targets.

Such follow-up work will require extensive sampling of bedrock at high financial commitment. At this stage, such commitment would be based solely on the various speculations from the geophysical and air photo interpretation.

It is recommended that no further work be conducted at this stage and that the company should withdraw from the area.

EXPENDITURE:

Aeromagnetic Data Acquisition	6000.00
Geologist	1,000.00
Vehicle & Fuel	400.00
Literature, Search and acquisition	1,300.00
Overheads	1,305.00
TOTAL EXPENDITURE	**10,005.00**

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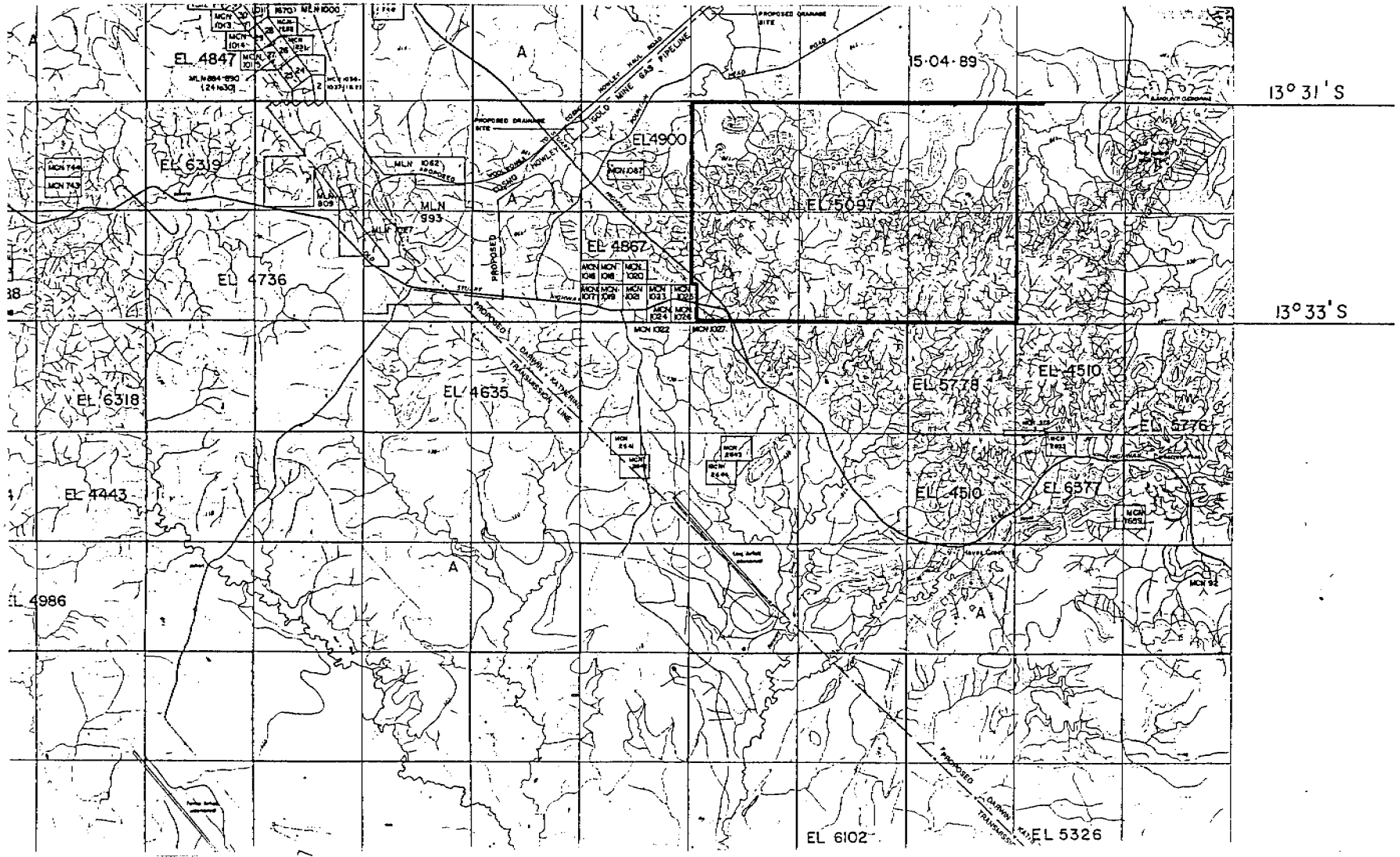


NORTHERN TERRITORY GOLD MINING N.L.

TENEMENT MAP

HAYES CREEK EL 5097

FIGURE 1

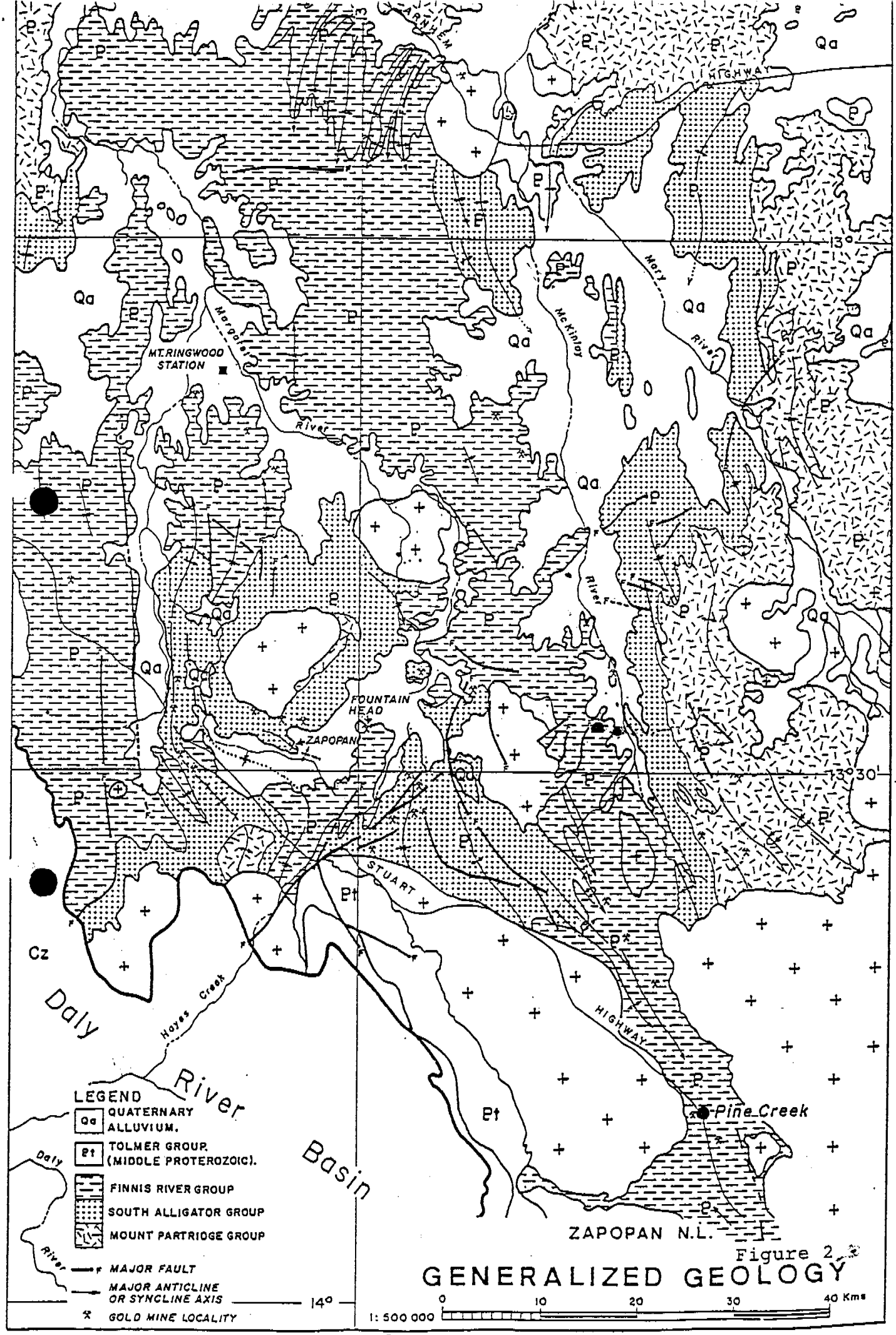
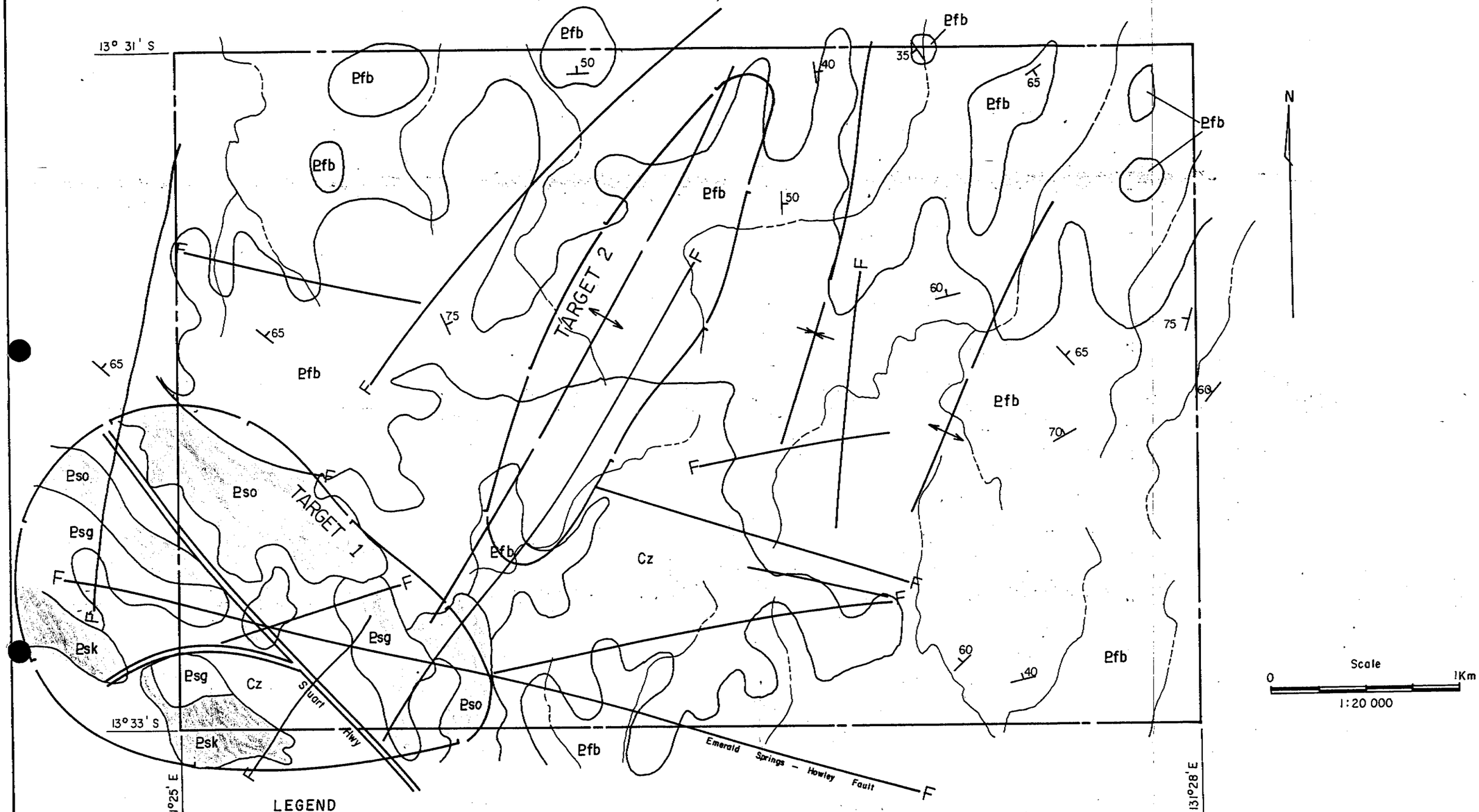


Figure 2

GENERALIZED GEOLOGY

Group	Formation	Member	Lithologies	Thickness (m)
Finniss River	Burrell Creek		Greywacke, siltstone, mudstone, rare chert, iron formation and conglomerate	>3000
South Alligator	Mount Bonnie	Upper	Mudstone, siltstone, chert, iron formation	100-250
		Lower	Greywacke, mudstone, siltstone, chert, carbonaceous mudstone, rare conglomerate	50-150
	Gerowie Tuff		Chert, mudstone siltstone	200-400
	Koolpin	Upper	Carbonaceous mudstone, mudstone, siltstone	50-150
		Middle	Iron formation, mudstone, carbonaceous mudstone, siltstone	30-100
		Lower	Carbonaceous mudstone, mudstone, siltstone, limestone	0-250
Mount Partridge	Wildman Siltstone		Mudstone, phyllite, siltstone, carbonaceous mudstone, sandstone	200-400
	Mundogie Sandstone		quartzite, arkose, pebble conglomerate, mudstone, siltstone	>500



LEGEND

Cz	Ceezed
Pfb	Burrell Creek Formation
Pso	Mount Bonnie Formation
Psg	Gerowie Tuff
Psk	Koolpin Formation

F — Fault

Anticline

Syncline

65 — Bedding So strike and dip

Drainage

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GEOLOGY

HAYES CREEK EL 5097

FIGURE 4