

**EXPLORATION LICENCE 8348
FRANCES CREEK**

Pine Creek 1:250,000 map sheet area, SD-52-8
Pine Creek 1:100,000 map sheet area, 5270

**ANNUAL REPORT FOR THE PERIOD ENDING
20th DECEMBER, 1997**

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1.0 SUMMARY

Work undertaken this year involved prospecting and follow up of stream sediment bleg results.

This work leaves a number of anomalies that warrant further follow up and delineation by soil sampling programs.

This area is considered prospective for gold mineralisation located in shear zones and anticlinal structures.

KEYWORDS

Vein Type Gold
Lower Proterozoic
Wildman Siltstone
Greywacke Tuff's, Siltstone
Anticlinal Coaxial Shear System
NNW Structural Grain

2.0 TENURE

Exploration Licence 8348 was granted to Corporate Developments on 21st December, 1996 for a period of six years (Figures 1 and 2).

The Licence covers an area of three blocks, being 10 sq. kms. Namely,

Union Reef Sheet 31/42, 44, 45

3.0 PREVIOUS EXPLORATION

Corporate Developments have conducted two stream bleg surveys, mapping and rock chip sampling, the latter being a follow up of anomalous results found.

Limited prospecting had been undertaken to explain these results.

4.0 REGIONAL GEOLOGY

The Frances Creek area of the Mount Wells district lies in the central position of the Paleo-proterozoic Pine Creek Geosyncline, a macroscopic structure of 66,000 sq. kms in the Katherine to Darwin region.

This province consists essentially of Early Proterozoic fluviatile and basinal sediments (with minor bimodal volcanics) that on-lapped small exposures of Archaean inliers. Ongoing sedimentation changed to flyschoid sedimentation. The regional stratigraphy is shown in Table 1 and described in Stuart-Smith et al.

During the waning stages of the deposition, igneous dykes and sills were intruded. The sediments were then folded and metamorphosed to Lower Greenschist facies grade metamorphism in the central part of the basin.

This led to the development of the Top End Orogeny (1870-1855 Ma), when syn- to post tectonic granitoid plutons and dolerite lopoliths were emplaced. Extensive granite emplacement (1850-1800 Ma) took place after the main deformation event as evident by the superposition of contact over regional metamorphic fabrics (Figure 3).

The tectonic history suggests four phases of deformation;

D1 and D2 are related to metamorphic development produced bedding and foliated regional folds.

D2 developed shallow dipping low angle shear zones in response to crustal shortening during basinal compression.

D3 and the development of F3 folds that are tight to very tight N-S trending folds and refolded S1/S2 folds.

D4, a final episode that refolded F3 folds along an E-W axis producing open folds with steep dipping axial planes.

The basin is unconformably overlain by flat Mesozoic and younger strata (Figure 3).

4.1 Stratigraphy

The Licence area is underlain by sediments of the Lower Proterozoic MUNDOGIE SANDSTONE and WILDMAN SILTSTONE that is unconformably overlain by the KOOLPIN FORMATION. Sills of theoleiite and dolerite of the Zamu Dolerite intrude these sequences (Table 1). The Licence lies towards the eastern margin of the Katherine - Pine Creek - Darwin Shear Zone Structure is dominated by open north plunging folds with younger north-east trending cross folds and faults.

The Mundogie Sandstone is a massive sandstone or feldspathic sandstone forming many of the ridges in the Licence.

The WILDMAN SILTSTONE is predominantly a pelitic unit, with sandstone lenses, up to 750m thick. It consists of two members, both cropping out in the licence. The lower member (400m) is poorly exposed being thinly bedded bleached white to grey carbon rich siltstone and shale with minor ferruginous horizons. The upper member (350m) is thinly bedded pelite, often carbon rich and sandstone that can be sericitic.

The KOOLPIN FORMATION crops out in the south west portion of the Licence. It is a distinctive iron rich sequence of pelites and arenites.

These Early Proterozoic rocks have been subjected to regional greenschist metamorphism (Map 1).

4.2 Structure

The major structural trends of the Licence area are presented on Figure 5, from a Landsat study.

Structural mapping suggests four separate deformations have occurred. The first deformation (D1) resulted in the lithology's being isoclinally folded about sub-horizontal N to NE trending fold axes (F1).

The folds are asymmetric, verge to the W, and in part may be overturned. These folds are associated with a steeply E dipping penetrative regional cleavage (S1). Cleavage bedding relationships suggest these folds are widespread in the tenement (Map 1).

This event produced strong layer parallel or sub-parallel S1 axial plane schistosity or planar fabric. An example of an overturned, shallow plunging (8') anticline is found on the north bank of the Frances Creek 500m downstream from the road bend at 13' 33.4, 131 52.15".

F1 folds are deformed by two later shearing events. D2 shear zones trend NNE and are steeply E dipping and layer parallel. They are up to 100m wide, being defined by a schistose foliation (S2). The S2 foliation contain a dominant near vertical mineral lineation perpendicular to boudin necks observed in quartz veins. A shallow plunging (18') anticlinal fold is found in this direction. These shear zones appear to be retrograde shear zones associated with exhumation.

This foliation was disrupted by a third structural episode. D3 shear zones are up to 500m wide, produced a dominant shallow dipping (30') low angle cleavage with well developed N-DS foliation (S3) defined by CS fabrics and a sub horizontal mineral lineation (L2). These features indicate dextral movement of a wrench shear system and are better developed to the west of the Licence eg. the Mount Wells to Mount Ringwood shear.

Throughout the general area are faults that cut the stratigraphy at oblique angles; particularly the 120' set being stronger than the 030' set. Both these directions manifest themselves in the drainage pattern. These faults form conjugate sets which were mainly brittle in character forming extensional faults and fractures, and propagating quartz veining. Shear features of rock failure are common, particularly feather fractures, step like breaks, imbricated fractures and slickensides. These features are observed on the quartz reefs that trend dominantly either at 160' or 120'. They indicate the importance of the strike slip or coaxial movement.

Slickensides can be found on the bedding planes plunging 12'N. Tight upright F2 folds with axes trending NNW-SSE are common on Map 1. The iron ore open pits are on the limbs of a NNW plunging anticlinal structure with parasitic folds. Fold closures are difficult to find and have been often sheared out. Their asymmetric character indicates the direction and sense of movement. The principle stress acted from the ENE towards WNW and reflects the granitoid intrusion and represent "Z" drag fold structures associated with shearing along west fold limbs. The dolerites can occupy the fold hinge zones of the F2 folds because the dolerite and sandstone contact can be followed around the fold closure.

A younger east - west trending set minor folds is widely evident on the Map. They are either steeply (67') west plunging open folds or shallow east plunging (13') Z folds. This direction is parallel to a late direction of shearing. The evolving stress field that led to four deformations and pre-, syn- and post-granitoid intrusion is reflected in the multiple phases of vein quartz. They are

- 1: compression F1 which created pre-quartz mineralisation primary tensile fractures.
- 2: compression of the WSW - ENE directions (F2), which produced shear structures as reverse and strike - slip faults, tensile fractures and en echelon folds and faults.
- 3: basement uplift or basement fault activity causing tensile openings of existing structures to form conjugate faults.
- 4: late east - west fractures with associated minor shearing and faulting.

Full evaluation of understanding the geology of this area will be ongoing with additional work.

5.0 EXPLORATION MODELS

The Licence areas is prospective for:-

1. Touheys style mesothermal gold mineralisation, where gold is emplaced in dilatational structural traps within siltstones, in part carbon rich, or ferruginous sediments.
2. McKeddie's style epigenetic disseminated and stockwork gold mineralisation in and associated with the Zamu Dolerite in the fold axes.
3. Mt. Porter style gold mineralisation hosted in iron rich sediments in an anticlinal structure. The Mt. Porter prospect lies 5km west of the Licence.

6.0 FIELDWORK COMPLETED

Field work in 1997 consisted of testing the various BLEG anomalies discovered in the previous BLEG sampling.

One anomaly in the northern block of EL 8348 west of Ochre Hill has a peak 10.4 PPB supported by an adjacent 3.8 PPB.

The location is a broad mature west to east drainage with a black soil plain with small scoured water holes. These are not very useful as sample points as only the off floater of Zamu dolerite was found.

At location 1 upstream of the general anomaly area a local scour adjacent to dolerite yielded 3 VVF colours of gold.

The strike ridges on the contact of the Zamu dolerite adjacent to BLEG samples 3.8 PPB and 2.24 PPB was prospected in detail. Several thin quartz sulphide veins in carbonaceous siltstone were collected and dollied for gold with negative results.

A ground search in the area of BLEG 7.64 found several promising looking veins systems. Loaming and dollying on and adjacent to the quartz veins were negative.

However, the general nature of the quartz and the heavy grass cover of the line of the search leaves the possibility that the actual vein or veins shedding the gold were not located.

The source of the 10.4 PPB BLEG is probably a concentration formed over the deeply weathered dolerite from elevated background levels in the dolerite because despite a diligent search of the dolerite no significant quartz float or in areas of outcrop, alteration were found.

At the anomaly on the southern block of EL 8348 east of the old Frances Creek iron mine, a diligent search of the areas surrounding BLEG 12.1 PPB, 5.32 PPB, and 9.44 PPB did not manage to locate any veins worth sampling.

Several small stringers of greasy grey quartz were found and dollied with negative results.

The creek adjacent to BLEG 5.09 when panned shows fine flaky gold and evidence of old workings; once again prospecting was hampered by the grass which was greener and lushier than usual.

Most of the gullies in the area of BLEG 5.09 show evidence of workings. The area has as yet not been fully prospected.

To the south west the area of BLEG 6.09 was visited and appears from the pattern of old workings related to the Watts Creek trend of workings. The creeks in the area have abundant quartz float and gravel.

The question of the source of the 9.44 PPB, 12.1 PPB and 5.32 PPB anomaly should be left until later in the dry season as it is evident that a strong gold anomaly not associated with elevated background gold is probably present and has not as yet been located.

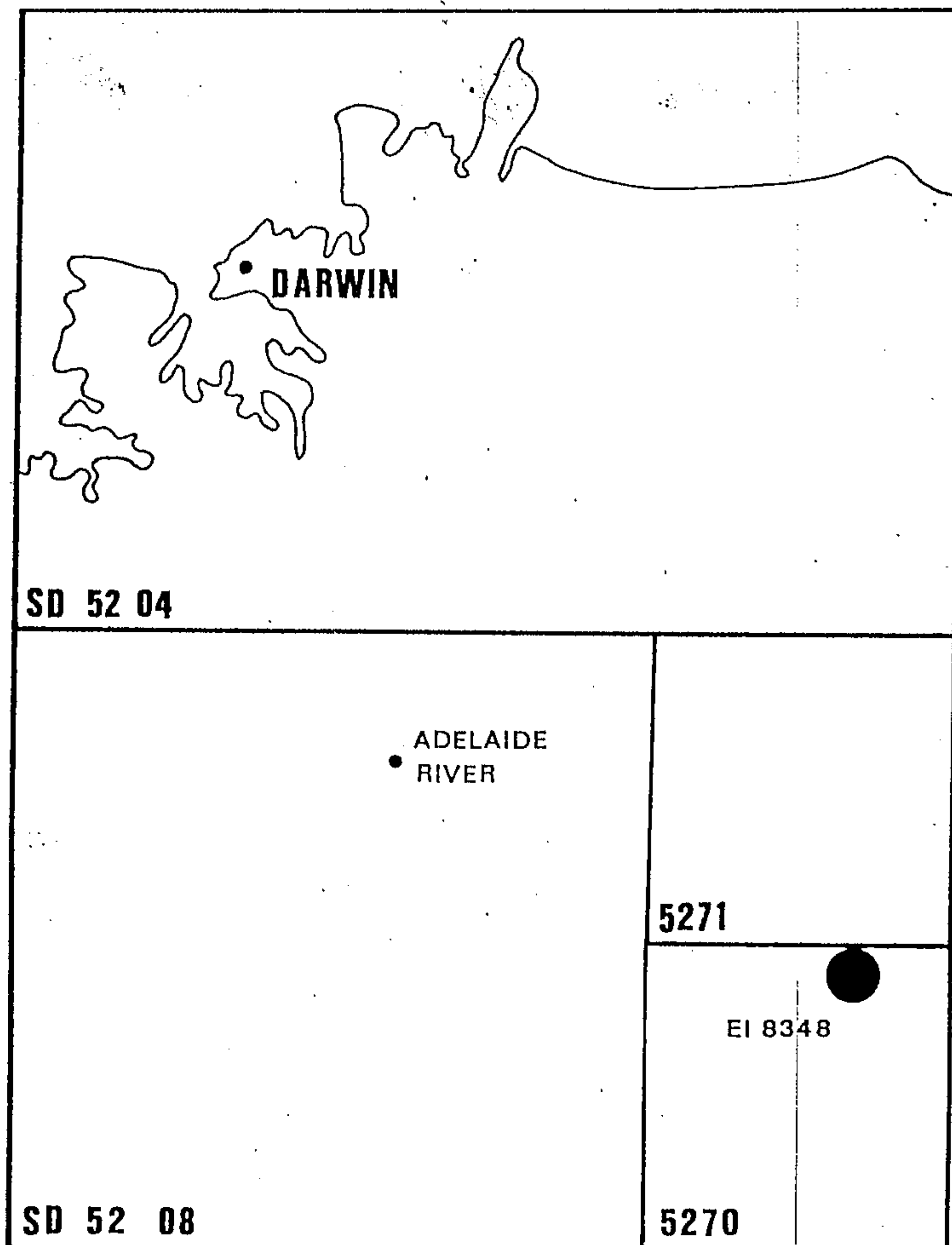
7.0 PROPOSED PROGRAMME

Follow up unexplained BLEGS and implement an exploration programmes for any areas of continuing interest.

Proposed programme cost is \$3,250-.

8.0 EXPENDITURE

Prospecting	\$2,475
Geological Advice	\$1,330
Accommodation & Consumables	\$1,260
Administration & Reporting	\$ 875
Publications, Printing, etc.	<u>\$ 85</u>
Total	<u>\$6,025</u>



EXPLORATION LICENCE 8348, FRANCES CREEK

Tenure Location Map

Nominal Scale

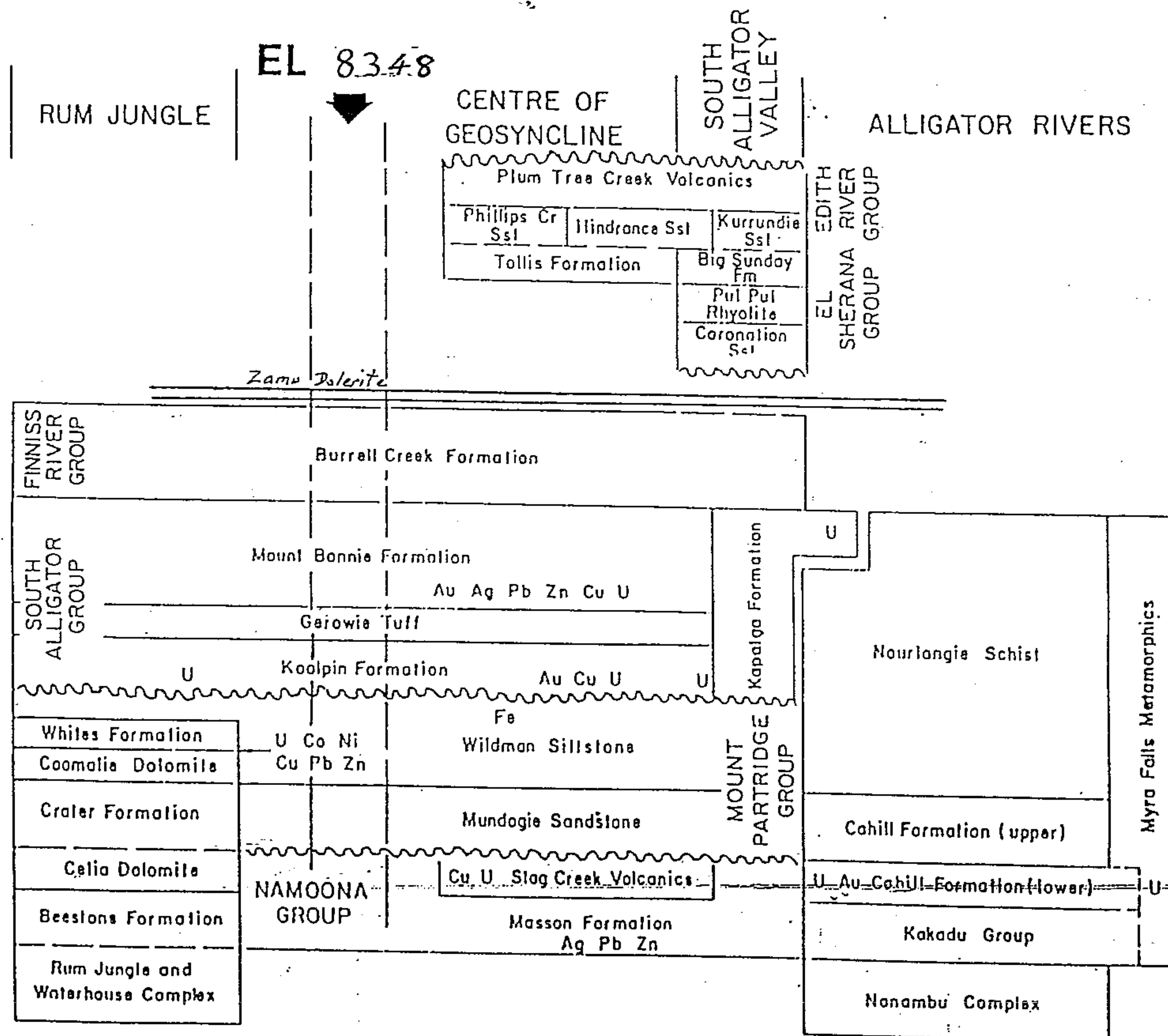
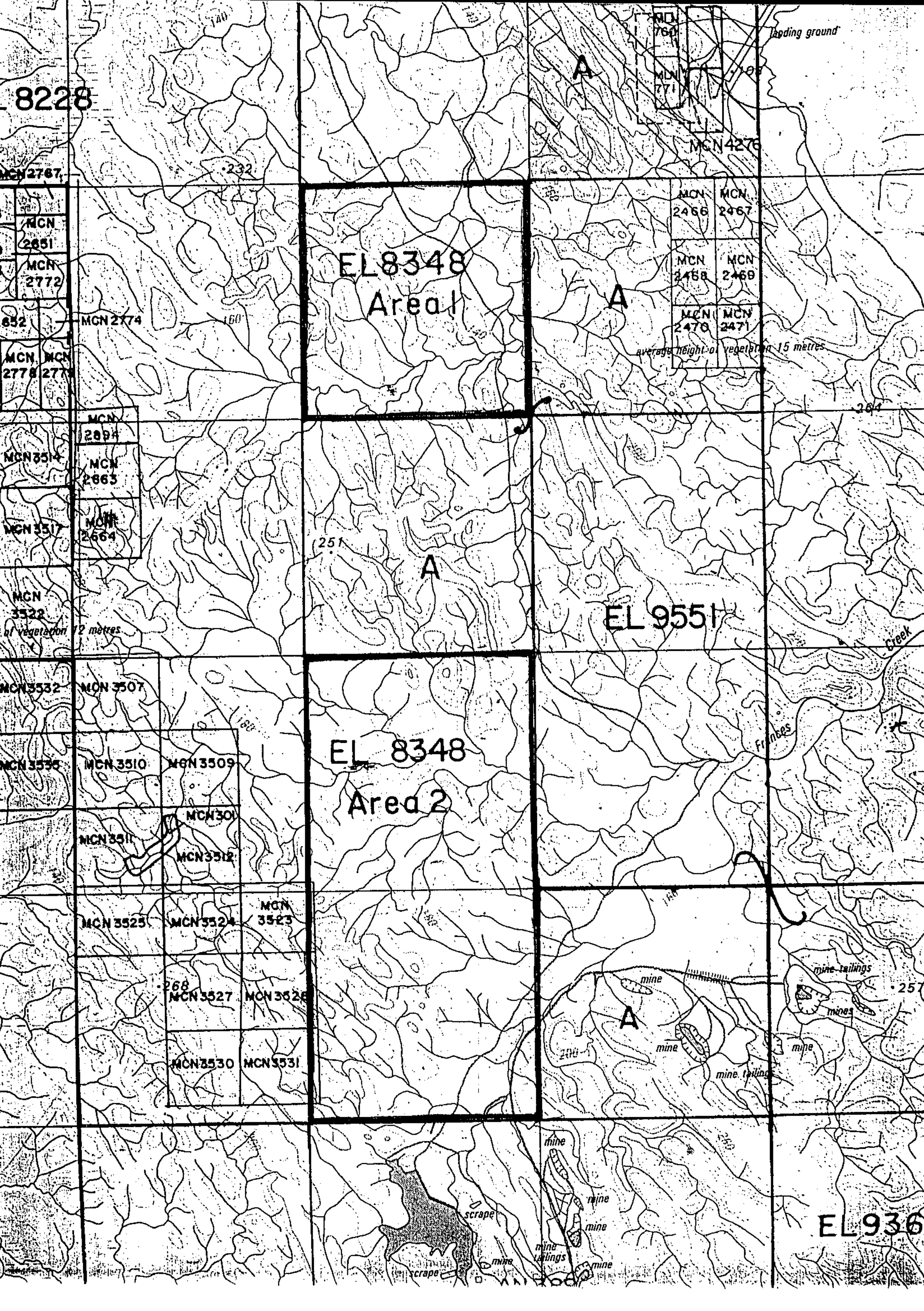


TABLE 1

STRATIGRAPHY OF THE PINE CREEK GEOSYNCLINE

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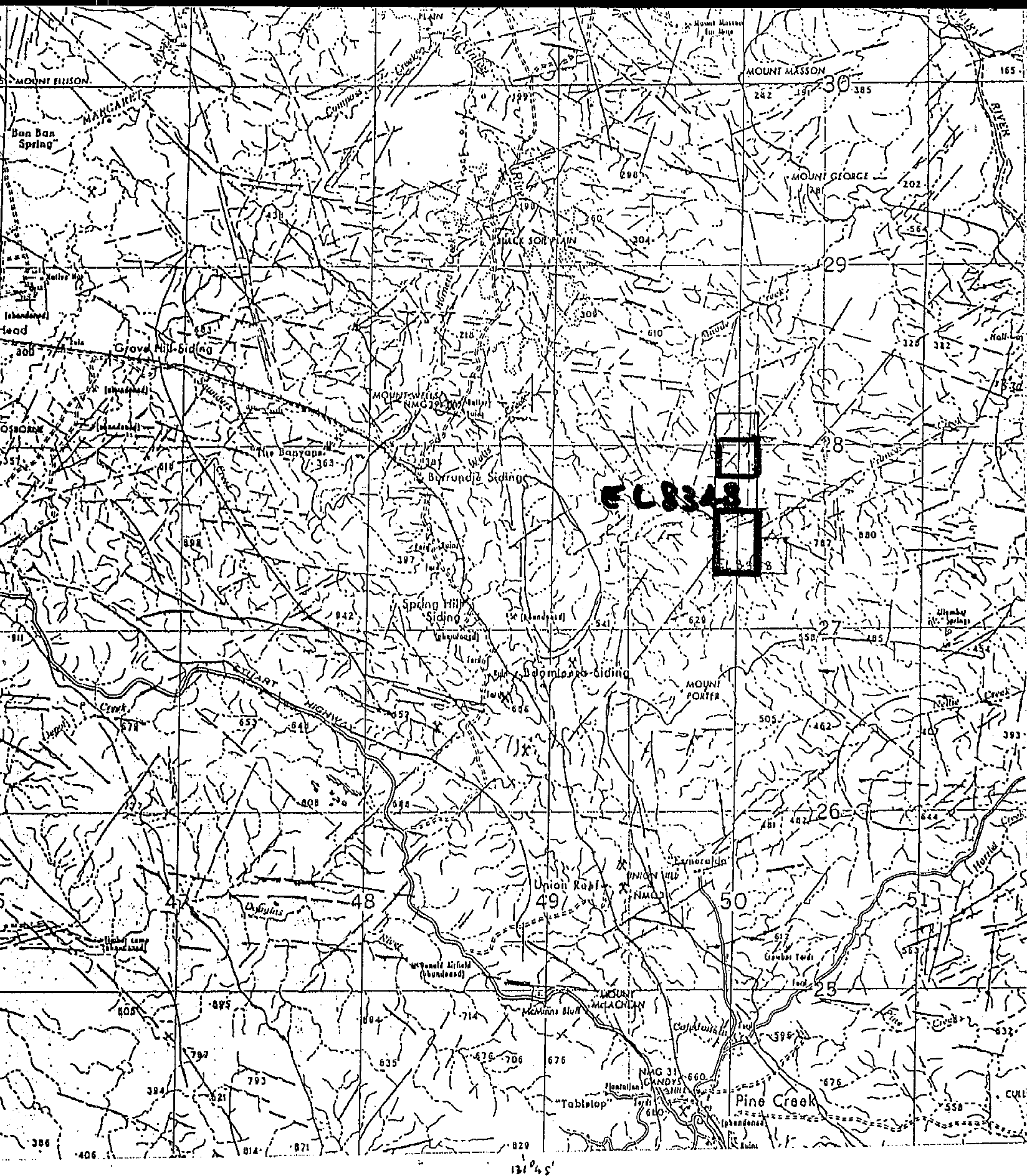


EL 8348
Area 1

EL 9551

EL 8348
Area 2

EL 936



LANDSAT INTERPRETATION

Mt WELLS - FRANCES CREEK

SCALE 1:250,000

