

RELINQUISHMENT REPORT

EL 8246

29TH DECEMBER, 1993 - 28TH DECEMBER 1995

MURCHISON RANGE 2 PROJECT

1:250,000 BONNEY WELL

NORTH STAR RESOURCES N L - LICENSEE

NEXUS MINERALS N L - OPERATOR

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SHEET
1:250,000

1. SUMMARY

The Murchison Range 2 (EL 8246) Project lies some 120kms SE of Tennant Creek.

On the secondary anniversary of EL 8246, 44 graticular blocks representing 50% of the area held under tenure were relinquished in accordance with the Northern Territory Mining Act.

This report specifically relates to exploration on the 44 surrendered blocks during the life of tenure.

Exploration over the Murchison Range 2 Project (EL 8246) has been oriented at defining Tennant Creek polymetallic mineralisation (Au - Cu - Bi) associated with ironstone bodies with a high magnetite content occurring in early Proterozoic turbiditic (arenites, greywackes, siltstone, argillaceous banded ironstone (hematite shale) sediments of the Warramunga Formation. In the Tennant Creek district mineralised bodies appear to be structurally located in WNW trending corridors. Known mineralisation in the Davenport Province, however, is related to faulting of the Warramunga Formation and Hatches Creek Group sediments.

North Star Resources NL carried out an evaluation of past exploration activities and identified no magnetic anomalies attributed to possibly ironstone bodies in concealed Warramunga sediments over the area being relinquished. On the portion of EL 8246 being retained ten magnetic anomalies (T1-T10) were identified requiring ground follow up. These targets may represent magnetite enrichment in iron layered stratigraphic units of the Warramunga Formation/Group akin to magnetite enrichment in the Tennant Creek Goldfield. North Star Resources NL carried out ground magnetic surveys of targets T7-T10

whilst Nexus Minerals NL RAB and vacuumed drilled T7 and vacuum drilled the T10 anomaly. Nexus Minerals NL (Operator) reviewed all exploration data and concluded there was no potential for Tennant Creek style mineralisation on the portion of EL 8246 being relinquished, although North Star Resources had interpreted WNW at ENE trending structures over the relinquished area.

2. LOCATION

The Murchison Range 2 Project area is located on Kurundi Pastoral lease some 120kms SE of Tennant Creek (see fig. 1).

Excellent road access exists into the Project area (see fig. 2). The main access is via the bituminised Tennant Creek - Alice Springs road for 84kms south from Tennant Creek to the intersection of the Kurundi homestead road. Thence easterly for 57kms on the formed Kurundi gravel road to Kurundi homestead. Thence 7.6kms N-NNE on the formed Kurundi-Epenarra gravel road. Thence 8kms NE on the formed 10 mile Bore gravel road to 10 mile Bore. Thence 8kms NE on the formed 10 Mile Bore - Forkyard Well gravel road to the southern boundary of EL 8246. Exploration Licence 8246 is then traversed for another 11.5kms along the 10 mile Bore - Forkyard Well gravel road to the northern boundary (see fig. 2). At approximately 12kms from 10 Mile Bore a graded access track leads west providing access to the T1 - T10 anomalies on EL 8246. This access track trends west for 3kms parallel to the 1600N base line before trending NW-NNW for 4.5kms giving access to the T1 - T6 anomalies (see fig. 3).

Exploration Licence 8246 is essentially covered by Quaternary soils (insitu and transported) and alluvium sheetwash over Proterozoic and Cambrian bedrock. The topography is generally flat with minor rises and depressions (associated with drainage). Drainage over EL 8246 is reflected in two E-NE flowing water courses (Mosquito Creek and Kurundi Creek draining the Murchison highlands to west and south (Romanoff and Sakalidis (1995)). The two drainage systems merge at Forkyard Well just to the north of the far SE sector of EL 8246 (see fig. 2) and then disperse in a flood out zone to the east.

Vegetation consists of thick spinifex with scattered small eucalyptus, turpentine bush and other acacias (Romanoff and Sakalidis (1995)). Large "Bloodwood" eucalyptus follow creek courses and may be significant to individual aboriginals (Romanoff and Sakalidis (1995)). In the vicinity of water bores the vegetation is severely denuded due to over grazing of cattle. Elsewhere vegetation reflects the climate and soil development with drainage zones showing thicker tracts of vegetation.

3. TENEMENT STATUS

Exploration Licence EL 8246 is registered in the name of North Eastern Gold Mines NL (now called North Star Resources NL). Nexus Minerals NL has entered into a joint venture involving EL 8246, 8247, 8388, 8461 and 8816 in the Tennant Creek and Kurundi districts. Nexus Minerals NL is required to meet minimum Mines Department expenditure on EL 8246 in conjunction to spending \$157,300 over a 4 year period to earn a 65% interest in EL 8246 and 8461 commencing 9th November, 1994.

Exploration Licence EL 8246 was granted on the 29th December, 1993 for six years and consists of 88 blocks totalling 292.6 sq.km. located in the NE sector of the Bonney Well 1:250,000 sheet SE 53-2, Northern Territory and lying some 120kms SE of Tennant Creek. The annual minimum expenditure has been assessed at \$32,000.

On the 29th January, 1996, EL 8246 was reduced by 44 blocks in accordance with the Northern Territory Mining Act - see fig. 2 for reduced boundaries.

A total of \$34,364 has been expended by Nexus Minerals NL over the period 29th January, 1995 - 28th January, 1996. North Star Resources NL contributed to the costs during this reporting period by way of purchasing aeromagnetic data and interpreting to assist in target selection for drilling programmes. North Star Resources NL expended \$41,048 over the period 29-12-93 to 28-12-94. Exploration expenditure by both companies is costed on a whole EL basis. Consequently it is impossible to separate costs apportioned to the area being relinquished. Field programmes reported by Rafty (1996a) relate to the portion of EL 8246 being retained. Field programmes reported by Romanoff and Sakalidis (1995) relate to

the area being retained and relinquished. Regional overviews were conducted by both companies

4. REGIONAL GEOLOGY, STRUCTURE AND MINERALISATION

The Murchison Range 2 Project (EL 8246) lies along the Northern margin of the Davenport Province in the southern sector of the Tennant Creek Inlier containing an early Proterozoic intracratonic basin which has been subject to poly deformation. The Tennant Creek Inlier forms a NNW trending belt some 700km in length centred on Tennant Creek. There are 3 distinct sub provinces as follows (after Le Messurier et al (1990), Romanoff and Sakalidis (1995) and Rafty (1996a))

1. Tennant Creek Province - Northern Sector with Warramunga Group sediments overlain by Tomkins Creek beds.
2. Tennant Creek Block - Central sector - Essentially Warramunga Group sediments.
3. Davenport Province - Southern sector with Warramunga Group sediments overlain by Hatches Creek Group sediments.

The basement rocks in the Tennant Creek district are Archaean - early Proterozoic greywacke, shale, bif, chert, felsic volcanics. Gneiss, amphibolitised sediments and mafic volcanics occur in the south west (Le Messurier et al (1990)). Unconformably overlying the basement rocks is a 6,000 thick sequence of deep water deposited ? early Proterozoic sediments. Turbiditic greywacke, siltstone, shale and lesser thin discontinuous argillaceous bif (hematite shale) and mudflow breccias with interlayered felsic volcanics. Recent mapping

of the Tennant Creek and Flynn 1:100,000 geological sheets by Donnellan et al (1995) has reassigned the sediments to the Warramunga Formation; and the felsic volcanics to the overlying Warrego Volcanics and Bernborough Formation of the Flynn Subgroup comprising a volcano - sediment succession. This is in contrast to earlier interpretations which placed the Bernborough Formation in the basal segment and the Warrego volcanics in the middle segment of the Warramunga Group (Le Messurier et al (1990)). The Warramunga Formation rocks are folded and metamorphosed to lower greenschist facies. The Churchill Heads Group consisting of volcano - sediment sequences overlies the Warramunga Formation. The lower unit is the Flynn Subgroup unconformably overlies the Warramunga Formation and are less deformed. The Tomkinson Creek Subgroup overlies the Flynn Subgroup and comprise a 6,500m thick sequence of broadly folded, largely unmetamorphosed dominantly arenaceous sediments (quartz sandstone, lesser siltstone, shale and limestone, minor conglomerate and a thin basaltic volcanic unit). Le Messurier et al (1990) estimate a total thickness of 13,750m for the Tomkinson Creek units in contrast to 6,500m estimated by Donnellan et al (1995). It is not known how the difference in estimates have arisen but it is suspected some units may have been overestimated by Le Messurier et al (1990). Overlying the Churchill Head Group is the Hatches Creek Group a 10km thick sequence of clastic sediments, felsic and mafic volcanics folded into open domes and basins mainly in the Davenport Province.

Several intrusive phases have occurred in the Proterozoic affecting the stratigraphic succession in the Tennant Creek district. Early - mid Proterozoic granite intrusives (Tennant Creek Granite, Cabbage gum granite, Hill of Leaders Granite, unnamed granite); feldspar quartz - feldspar porphyry intrusives; and dolerite dykes intrude the basement and the Warramunga Formation. A mid Proterozoic phase of felsic and mafic sills are intruded into

the lower Tomkinson Creek Group. Middle - late Proterozoic granitoid intrusives (Elkedra Granite, Devil's Marbles Granite, Warrego Granite) and minor lamprophyre dykes also occur

In the Davenport Province, Cambrian sediments of the Georgina Basin onlap unconformably on the northern margin of the province. The Cambrian sediments comprise the basal Andagera Formation - a flat lying, gentle dipping middle Cambrian conglomerate and sandstone (Wyche and Simons (1987)). Overlying is the middle Cambrian Gum Ridge Formation consisting of flat lying to gently dipping chert and laminated to thin bedded siltstone and fine grained sandstone and dolostone (Wyche and Simons (1987)). The Cambrian sediments usually unconformably overlie Warramunga Group sediments or nonconformably on deeply weathered granite (Wyche and Simons (1987)).

Minor Devonian sediments of the Wiso Basin onlap unconformably on the NW margin of the Davenport Province and comprise the Lake Surprise marine sandstone overlying the Warramunga Group. A minor Proterozoic flat lying clayey sandy, conglomeratic, pebbly sandstone occurs in low mesas east of the Murchison Range.

Exploration Licence EL 8246 is largely covered by Quaternary soil cover with isolated outcrop of granite, Warramunga siltstones and Cambrian Gum Ridge Formation (low rounded hills of chert, chert breccia and ferricretes) in the NW sector (Romanoff and Sakalidis (1995)). North Star Resources NL interpreted the strong regional magnetic signature from aeromagnetic surveys to the Warramunga Group sediment in a NW - SE trending belt (Romanoff and Sakalidis (1995)).

Various authors concede the Warramunga Group was laid down in an unstable deep water marine environment due to down warping of a pull apart basin or ensialic basin. The sediments were deposited in proximal to distal fan settings (Romanoff and Sakalidis (1995)). The Warramunga Group was folded about east-west axis with a strongly developed, steeply northerly dipping axial plane slaty cleavage (Goulevitch (1993)). Folds plunge shallowly east and west (Le Messurier et al (1990)). In the Davenport Province the Hatches Creek Group reflect the proposed downwarping with the centre of the province receiving less sediment than adjacent parts (Le Messurier (1990)).

Faulting and folding is ubiquitous throughout the Tennant Creek Inlier. In the Tennant Creek Block and Province tight E - W isoclinal folding with a shallow plunge to the E and W as well as near vertical axial plane slaty cleavage; quartz filled NW trending sinistral faults; and mineralised narrow (50m wide) high angle sinistral thrust fault shears trending WNW have significantly affected the Warramunga Group sediments. The Tomkins Creek Beds have open upright N trending folds and NNE - N faults with east block down.

The Hatches Creek Group has also been deformed involving two (NW and NE trending) folding periods, associated reverses faulting and thrusting and greenschist metamorphism (Le Messurier et al (1990)). In the Davenport province the Warramunga Group sediments are moderately to tightly isoclinally folded before deposition of the Hatches Creek Group sediments in a similar manner to the folding affecting the Tennant Creek Block and Province. Faulting of the Warramunga Group sediments before deposition of the Hatches Creek Group is not recognised. Wyche and Simons (1987) related many of the faults (some quartz filled) to the folding of the Hatches Creek Group and granite intrusion. These faults are steep or vertical at the surface with some changing to low angle thrusts at depth.

Gold mineralisation in the Davenport Province has been recorded as being associated with fault related quartz veins cutting Warramunga Group and Hatches Creek Group sediments (Wyche and Simons (1987)). Grades assayed from 3 - 15g Au/t in narrow discontinuous quartz veins. Base metal mineralisation (Cu, Pb, Zn and Bi) has not been recorded for Warramunga Group sediments although extensive company sponsored exploration programmes have tried to find Tennant Creek style Au - Cu - Bi mineralisation in the Warramunga Group sediments. Copper and lead mineralisation has been recorded from quartz veins in mafic - intermediate volcanic - igneous rocks from the Hatches Creek Group. Wyche and Simons (1987) believe the mineralisation is scavenged from the mafic rocks and deposited into the quartz veins. The style of mineralisation so far detected in the Davenport Province is not in accordance with typical Tennant Creek style of mineralisation described by Rafty (1996b) as follows:

“The mineralisation characteristics of the Tennant Creek Inlier - in particular in the Tennant Creek district have a distinct spatial relationship to lithology, stratigraphy and structure. Large (1975) and Large and Wedekind (1987) attribute the following elements as being critical in the formation of economic mineralisation.

- A. Development of “ironstones” as lenticular, ellipsoidal or pipelike bodies composed of magnetite - hematite cutting across sedimentary structures. Approximately 650 ironstone bodies occur within the Warramunga Group sediments, over 100 of which have been mined for gold (Williams (1987)). Most ironstones do not occur beneath the base of oxidation (100m) and <20m thick and are a few hundred metres in strike, comprised of hematite (martite) and quartz with minor jasper, magnetite, goethite and clay minerals. Mineralised

ironstones generally occur below the base of oxidation composed of magnetite, chlorite and lesser quartz, hematite, pyrite, talc, dolomite, calcite, muscovite and jasper.

- B Ironstone mineral zonation is common to many mineralised ironstones. Essentially the core is comprised of massive magnetite with chlorite and/or minor quartz. Enveloping zones include the following (after Large and Wedekind (1987)):

- I Quartz - Magnetite
- II Hematite - Magnetite
- III Quartz - Hematite
- IV Talc - Magnetite
- V Dolomite - Jasper
- VI Dolomite - Calcite
- VII Dolomite - Talc - Chlorite
- VIII Chlorite - Hematite

- C. Metal zonation has been recognised in many mineralised ironstones with vertical and limited horizontal zonation patterns. Gold zones occur at the base of the magnetite body followed above by bismuth and then copper. Overlapping patterns are common. Gold is generally associated with the magnetite - chlorite core (with the exception of the Gecko K44 pod) and is concentrated toward the footwall of the ironstone or at its margins in distinct pods associated with chlorite and muscovite (Wedekind et al (1989)). Not all ironstones have complete zonation patterns due to various factors including erosion.

- D. The mineralised magnetite-hematite bodies are located

- I Close to thin beds of argillaceous banded iron formation and hematite rich shales (Nobles Nob, Juno, Eldorado, TC8).

- II Within the sediments adjacent to contacts of rhyolitic porphyries (Peko, Warrego, Golden Forty).
 - III Within soft sediment slump structures (mudflow conglomerates, breccia conglomerates) (Gecko and Orlando).
- E Linear structural control is evident throughout the Tennant Creek Goldfield delineating specific corridors of ironstone formation. These corridors represent the location of deep seated structures that may have controlled the regional movement of hydrothermal fluids at the time of mineralisation. The major structural corridors are:-
- I The Juno Line (290° strike) includes Nobles Nob, Juno, Eldorado, and Mt Samuel.
 - II The Peko Line (285° strike) includes Golden Forty, Peko, Argo and TC8.
 - III The Lone Star Line (250° strike - curving) includes Gigantic, Lone Star, Burnt Shirt, TC8 and Explorer 50.
 - IV Warrego Line (295° strike) includes Warrego, White Devil, Red Bluff and Ivanhoe.
 - V Gecko Line (285° strike) includes Orlando and Gecko. The Lone Star corridor may be a major fault zone (Large and Wedekind (1987)) offsetting the Peko and Juno Lines from the Warrego Line.
- F. Ironstone bodies within regional linear zones are aligned 270° - 280° parallel to the dominant cleavage and associated fold axis (usually in the domal position of second order anticlinal folds).

- G. Some mineralised ironstones are located within E - W faults/shear zones (Ivanhoe, Argo, White Devil).

The above listed characteristics of the mineralised ironstones has led most workers to postulate a replacement process to explain the formation of the mineralised ironstones during D2 deformation. An alternate model is presented by Goulevitch (1993) whereby the ironstones are modified banded iron formations (bif) which were laid down as an integral part of the sedimentary sequence and then subsequently modified and deformed. The mineralisation is associated with the syngenetic deposition of the bif from hydrothermal fluids

Regardless of the acceptance of either model there appears to be distinct stratigraphic control as follows (Large and Wedekind (1987)):

- I Hematite - Shale horizon
- II Pyroclastic/sediment contacts
- III Intraformational sediment breccia conglomerate horizons".

The Tennant Creek style of mineralisation described in Rafty (1996b) indicates WNW trending structural control is a dominant characteristic with structural control reflected in anticline and syncline development. Romanoff and Sakalidis (1995) have interpreted W - WNW trending structures as well as NE trending structures from aeromagnetic responses over the northern margin of the Davenport Province (see fig. 3). Most of the structures transect or subparallel bedrock lithologies buried beneath Cainozoic cover. Wyche and Simons (1987) had mapped many of these structures as faults to the west and south in the Murchison and Davenport Ranges.

5. EXPLORATION ON THE RELINQUISHED AREA OF EL 8246

The following programmes were carried out over the first two years on tenure covering the relinquished portion on EL 8246

5.1 North Star Resources NL 1993 - 1994

North Star Resources carried out a thorough review of past geophysical surveys, drilling and surface sampling. Exploration activities include the following and are reported by Romanoff and Sakalidis (1995):-

- A. Historical research and appraisal of previous exploration data.
- B. Reprocessing of AGSO aeromagnetic digital and digitised contour data; and reprocessing of detailed digitised contour data.
- C. Analysis of reprocessed aeromagnetic imagery resulting in a structural interpretation (see fig. 3).
- D. Identification of 10 Anomalies (T1-T10) over the retained areas.

5.2 Nexus Minerals NL 1994 - 1995

Upon entering the Joint Venture Nexus Minerals conducted a review of the North Star Resources exploration activities and carried out regional reviews of literature.

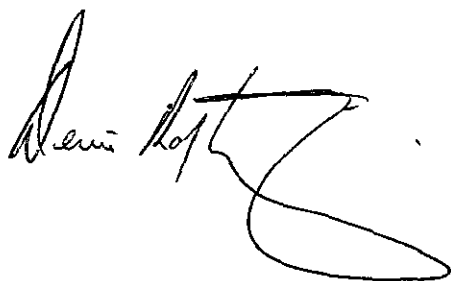
Nexus Minerals engaged Magdata Consultant to review the geophysical characteristics of the area to be relinquished. To this end North Star Resources

purchased BMR 1:250,000 digitised coloured aeromagnetic contours (fig. 4) and imagery at 1:100,000 from GeoPeko.

It was concluded by Nexus that no magnetic anomalies occur over the area to be relinquished to indicate possible ironstone bodies hosting Tennant Creek style of mineralisation. Over the area to be retained 10 magnetic anomalies identified by North Star contain potential for Tennant Creek style of mineralisation. Nexus Minerals RAB and vacuum drilled anomaly T8 and vacuum drilled anomaly T10. The results of these programs are reported in Rafty (1996a).

6. CONCLUSION

The area of EL 8246 relinquished contains no magnetic anomalies to indicate concealed ironstone bodies akin to the Tennant Creek style of mineralisation. North Star Resources NL had interpreted ENE and WNW trending regional structures transecting the area relinquished. No magnetic anomalies were interpreted to be associated with these structures over the relinquished area.

A handwritten signature in black ink, appearing to read "David Hoyle", followed by a large, stylized flourish or loop.

7. REFERENCES

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
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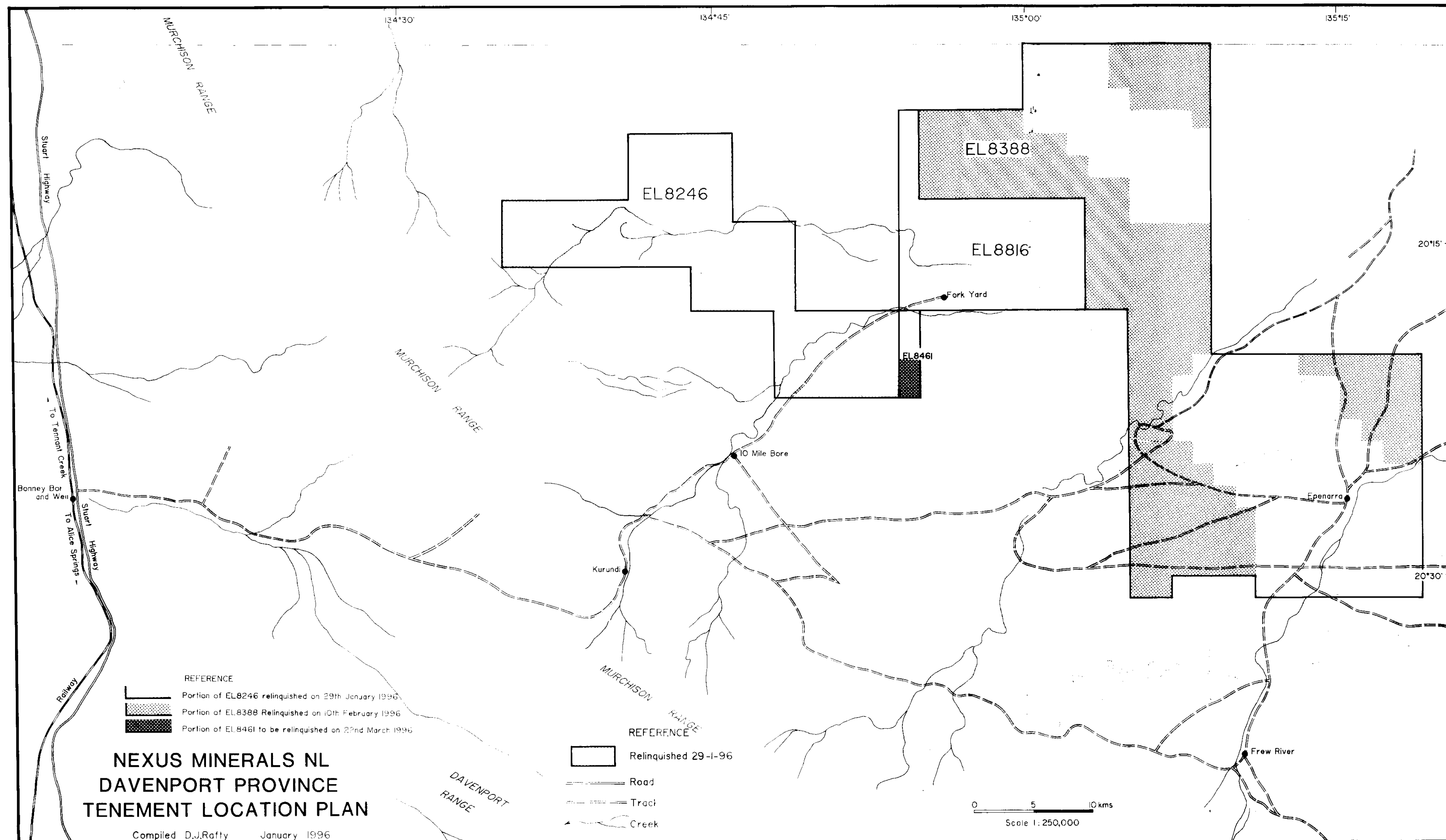
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 TENNANT CREEK PROJECT
 REGIONAL GEOLOGY
 AND TENEMENTS

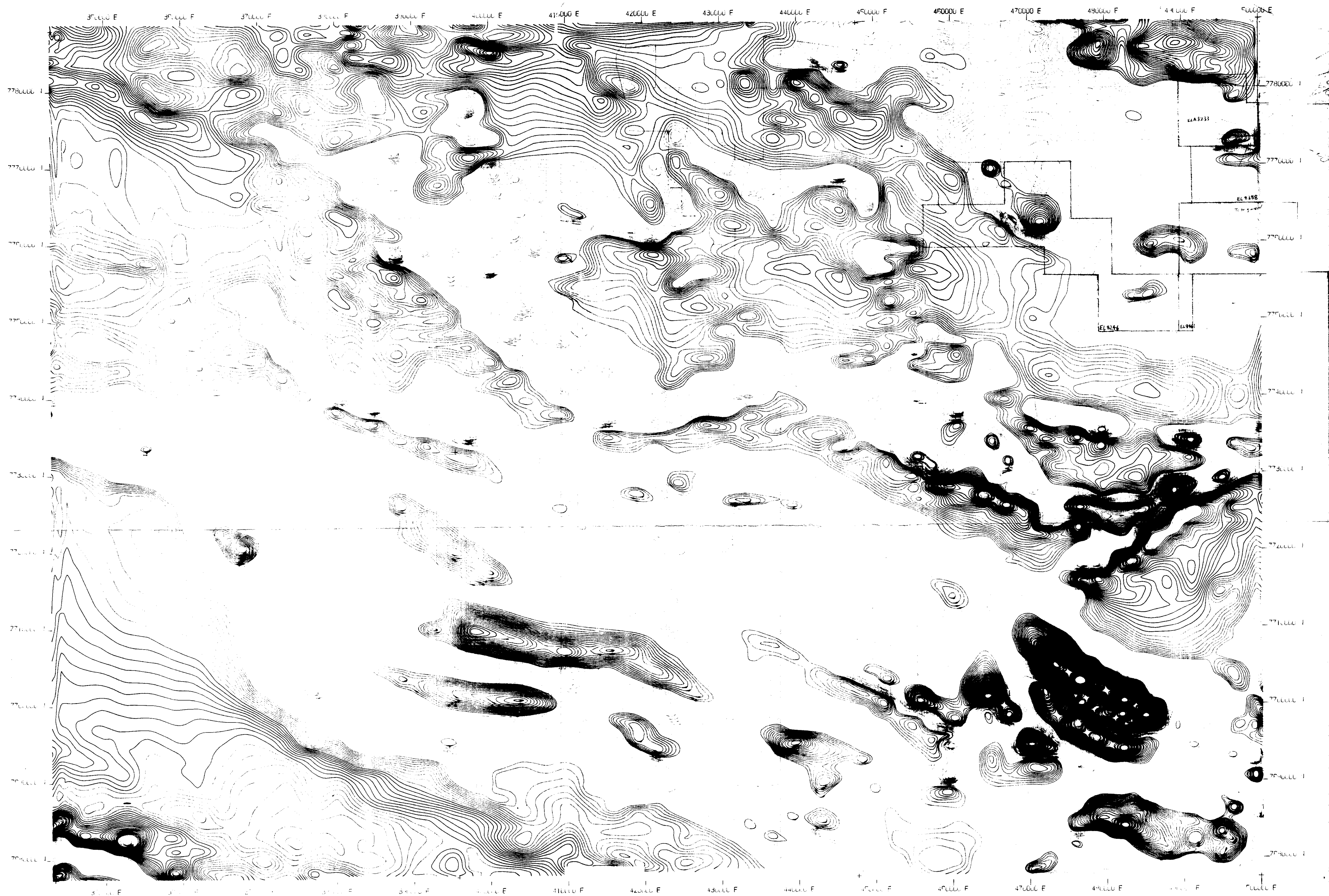
- REFERENCE
-  Hatches Creek Group
 -  Black Eye Member
 -  Interpreted Black Eye Member
 -  Warramunga Group
 -  Old gold mine
 -  Nexus tenement
 -  Geological Structure / Shear
 -  Magnetic Target

0 10 20 km



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FIGURE 2



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KEY
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Scale 1:25000
1000 Meters

BLACK	5000-5500m	10m
BROWN	5500-6000m	10m
GREEN	6000-6500m	10m
BROWN	6500-7000m	10m
YELLOW	7000-7500m	10m
RED	7500-8000m	10m
BURGUNDY	8000-8500m	10m

