

ASARCO Exploration Company Inc

EL 15/1999 - LYNCHFORD AREA

WESTERN TASMANIA

**ANNUAL REPORT FOR YEAR
ENDING OCTOBER 2002**

11 September 2002



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1. EXPLORATION PHILOSOPHY and STRATEGY

El 15/1999 was acquired by ASARCO because the area was considered prospective for :

- structurally controlled gold deposits of the Henty style
- sediment hosted gold deposits
- VHMS deposits within the Mt Read Volcanics

Following an initial review of previous exploration over the licence area, further work has been focused on the gold potential of the Harvey Creek Fault Zone, which cuts the area in a NNW direction.

2. WORK COMPLETED - year ending September 2002:

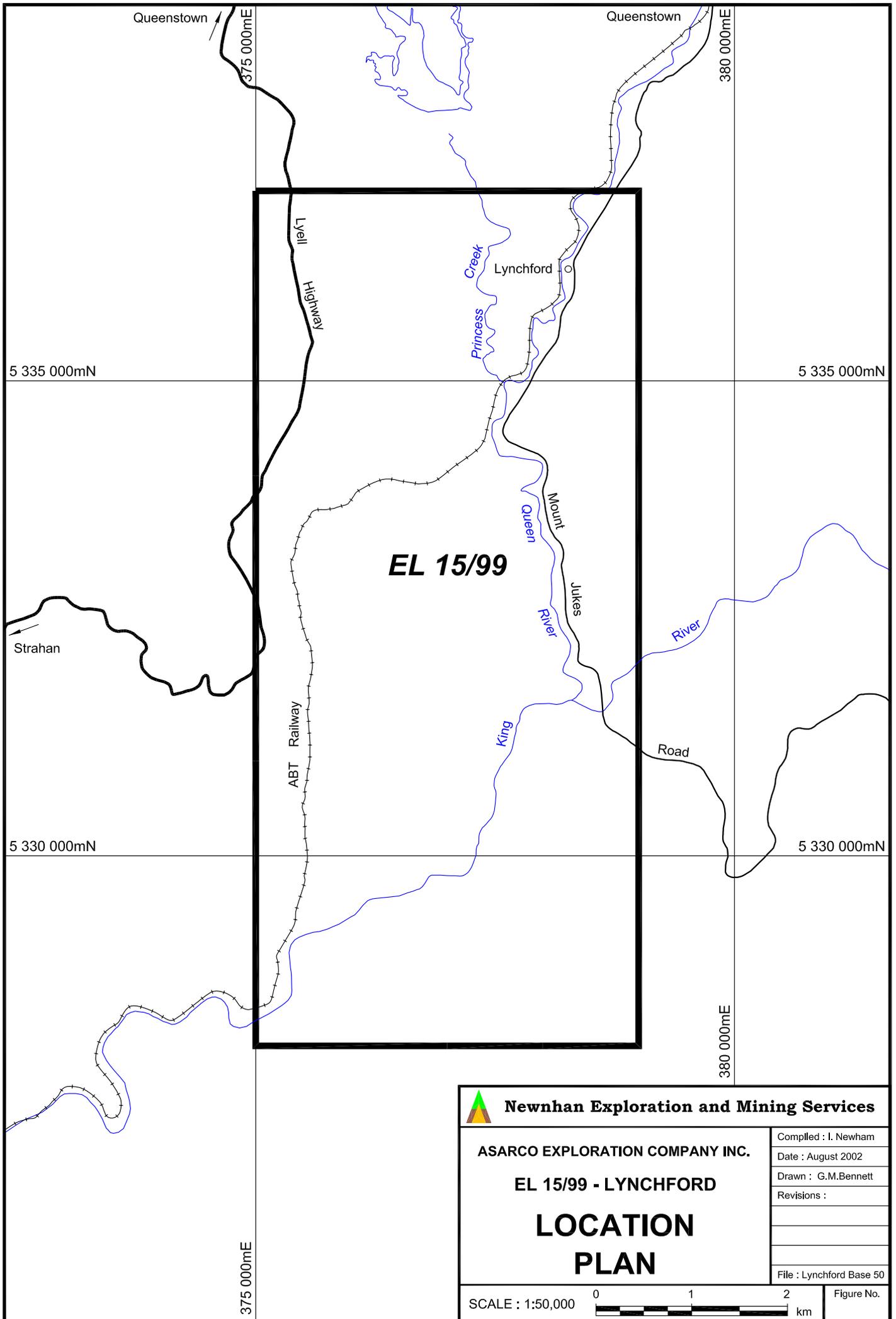
Following completion of the regional airborne EM-magnetic-radiometric surveys over EL 15/1999 by MRT, ASARCO engaged Newnham Exploration and Mining Services to undertake a review of this data in relation to its implications for further exploration of the licence area.

This review report is attached as Appendix 1.

No active field work was undertaken during the year.

3. WORK PLANNED:

The recommendations contained in the attached report are currently under review and may result in either follow-up ground investigations or high resolution airborne surveys over selected areas of EL 15/1999.



 <p>Newnhan Exploration and Mining Services</p> <p>ASARCO EXPLORATION COMPANY INC.</p> <p>EL 15/99 - LYNCHFORD</p> <p>LOCATION PLAN</p>	<p>Compiled : I. Newham</p>
	<p>Date : August 2002</p>
	<p>Drawn : G.M.Bennett</p>
	<p>Revisions :</p>
	<p>File : Lynchford Base 50</p>
<p>SCALE : 1:50,000</p>	
<p>Figure No.</p>	

Appendix:

*Report "Assessment of Recent Airborne Data
over EL 15/1999, Western Tasmania "*

ASARCO Exploration Company Inc

**ASSESSMENT OF RECENT AIRBORNE DATA
OVER EL 15/1999 - WESTERN TASMANIA**

June 2002



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1. SUMMARY:

EL 15/1999 is considered most prospective for Henty style gold deposits and its potential is reviewed in this report with the benefit of both new airborne geophysical data acquired by Mineral Resources Tasmania (MRT), and current genetic concepts relating to Henty style deposits.

The Henty gold deposit is emerging as a major high grade deposit, probably formed when magmatic hydrothermal fluids ascended along a major structure into a reactive submarine volcanic environment, forming extensive zones of sulfidic alteration accompanied by deposition of gold. Continuing movement along this structure through the Palaeozoic, resulted in recrystallisation , remobilisation and deformation of the deposit.

Key exploration features of the Henty model are the presence of large alteration and mineralised zones in Cambrian sedimentary-volcanic environments adjacent to major, long lived fault zones.

The recent MRT aeromagnetic and radiometric surveys, combined with existing high quality geological mapping, highlight a number of underexplored areas where the key features of the Henty model are present.

One such area is the Davie-Coupon area within EL 15/1999.

The MRT data suggests that a major N-W trending structure, known locally as the Harvey Creek Fault, passes through EL 15/1999.

Gold mineralisation hosted by upper Palaeozoic sediments at Woody Hill, Davie, Anomaly 24-28 and Coupon appears to be associated with this structure. The mineralisation could be interpreted as leakage along the structure from a deeper auriferous alteration zone in the underlying Mt. Read Volcanics, of a style similar to Henty.

Support for such an interpretation is derived from the extensive alteration system developed in the Mt. Read Volcanics adjacent to this major structure to the SE of EL 15/1999 in the Garfield area.

Any such target zone within EL 15/1999 would be concealed beneath post Cambrian Palaeozoic sediments, thinnest in the south (south of Coupon) and increasing in thickness to the north in the vicinity of Davie. This may explain why the geochemical leakage pattern at Coupon is more intense and extensive than at Davie.

The effectiveness of exploration within EL 15/1999 for a concealed Henty style deposit along the Harvey Creek Fault would increase going south (ie) the target beneath Davie would be comparatively deeper than at Coupon or south of Coupon.

Exploration for concealed Henty style targets can be difficult. The target is not necessarily magnetic or strongly conductive. If the target is relatively shallow, the alteration systems are chargeable. IP combined with lithochemistry and detailed mapping are probably the most effective pre-drilling techniques.

2. REVIEW OF AIRBORNE DATA

As part of the Western Tasmania Regional Minerals Program, aeromagnetic and radiometric surveys were flown by MRT over extensive areas of western and northern Tasmania between December 2000 - March 2001 to supplement existing high quality surveys.

The result is a complete coverage of the whole of western and northern Tasmania. Data lines were generally E-W at 200 metre intervals.

Selected areas were also covered with a helicopter borne Hummingbird EM system, again on 200 metre spaced E-W lines.

The aeromagnetic and radiometric surveys covered EL 15/1999, but the EM survey in this area was largely restricted to the main Mt Read Volcanic belt east of the licence area. The result was that only one very small wedge on the eastern side was covered.

The magnetic and radiometric data is good quality and for the first time provides a complete picture of the whole western half of the State.

The **radiometric** data is surprising. Western Tasmania, because of its vegetation cover and high rainfall, has traditionally been regarded as not ideally suited to airborne radiometrics. However, this new information defines stratigraphy exceedingly well and successfully highlights several previously unrecognised extensions of major structures.

The **aeromagnetic** data is a useful supplement to the radiometrics. Whilst it does not define stratigraphy as well as the radiometrics, it does clearly define major geological units and structural events in a manner not previously seen.

The **airborne EM** data is not yet officially available but it was restricted to the main Mt Read belt north of Macquarie Harbour and the Carboniferous granite contact aureole zones. Technical and physical problems were experienced with the system. These problems, combined with the general

ineffectiveness of airborne EM systems in rugged terrains, (the inverse cube rule for the relationship between bird height and penetration depth), suggests the usefulness of this data will be restricted to very specific targets in favourable areas.

The aeromagnetic and radiometric data, and a “collage” of regional geological mapping is best viewed at 1:100,000 scale on a single map sheet. However, these are quite large wall sized plans and not appropriate for inclusion in this report.

The airborne data does not lend itself to being enlarged to 1:50,000 and 1:25,000 scales for individual EL evaluation purposes. With 200 metre spaced flight lines, the data becomes too “grainy”.

The data is however ideal for assessing individual licence areas in their regional context, hence it has been reviewed in this report by reducing scales to 1:100,000, 1:250,000 and 1:500,000.

Experience by this writer in Tasmania is that for individual tenement evaluation, the benefits of very high resolution aeromagnetic (and probably radiometric) surveys have been greatly undervalued in the past. Thus if any aspects of the MRT regional airborne data were considered worthy of more detailed assessment (eg) the complete Harvey Creek Fault Zone, then the first and most cost effective exploration tool should be a very high resolution aeromagnetic -radiometric survey.

One of the prerequisite requirements for the formation of Henty style gold deposits is the presence of major deep seated fault zones cutting through Mt Read volcanic environments.

The MRT aeromagnetics is particularly useful in defining these structures, including:

- Henty Fault Zone
- Copper Creek Fault in Low Rocky Point area
- North Lyell and Comstock Faults in Mt Lyell area
- Harvey Creek Fault south of Queenstown

3. DEPOSIT MODEL:

EL 15/1999 is considered prospective for gold deposits.

Current geological thinking suggests that much of the gold mineralisation in western Tasmania is associated with a very large, deep seated magmatic hydrothermal event active throughout the period of Cambrian Mt Read Volcanism.

This batholithic event is thought to have altered and mineralised the overlying and evolving Cambrian volcanic-sedimentary formations by the introduction of hydrothermal fluids along major structural zones which remained active throughout the Palaeozoic, including a period of major deformation in the Devonian-Carboniferous.

The best known deposit of this type is the Henty deposit , north of Queenstown. Henty lies in a large brecciated and silicified alteration zone within rhyolitic lavas and volcanoclastics in the footwall of the Henty Fault. Gold is disseminated in quartz and pyrite lenses throughout the alteration zone which is stratigraphically transgressive. The mineralisation was probably remobilised and redeposited (at least in part) during upper Palaeozoic deformation along the Henty Fault.

A recently published paper provides a current view of the formation of the Henty deposit.

“ Geology and Host-Rock Alteration of the Henty and Mount Julia Gold Deposits, Western Tasmania” by *Tim Callaghan*,
Economic Geology, Vol 96, 2001, pp 1073-1088

That paper contained a series of schematic diagrams which neatly summarise the evolutionary development of Henty.

Additional support for this genetic concept is derived from the known gold mineralisation in deposits at Lakeside and Stirling Valley adjacent to the Henty Fault north of Henty, at Comstock near Queenstown, and Low Rocky Point south of Macquarie Harbour.

Without wanting to constrain the model too severely, there are several important features common to the known deposits:

- (a) the deposits are hosted by Cambrian volcanics and sediments accumulated in a shallow submarine environment
- (b) a large batholithic event introduced mineralised hydrothermal fluids into this overlying submarine environment along major structural zones
- (c) the ascending hydrothermal fluids interacted with the seawater environment resulting in extensive and variable alteration and metal deposition
- (d) continuing deformation of these mineralised alteration systems through to the Devonian resulted in recrystallisation, remobilisation and redeposition of the mineralisation.

The key exploration features of this model are:

- ***presence of deep seated long life structures within the Mount Read Volcanics***
- ***existence of major alteration and mineralised zones associated with these structures***

Traditionally, exploration in the Mount Read Volcanics has been strongly focused on classical VHMS deposits of the Rosebery-Que-Hellyer style. The Henty deposit was discovered in 1984 and in the ensuing 18 years, both the genetic understanding and the economic attractiveness of the deposit have slowly evolved.

As a result of a continuing aggressive exploration program, the owners of Henty are demonstrating that Henty is a very significant gold deposit and that there is excellent potential for further discovery in the major alteration systems adjacent to the regional structures south of the current mine.

4. EL 15/1999- LYNCHFORD INTERPRETATION

The MRT data relating to EL 15/1999 is presented in this report at scales of 1:50,000, 1:100,000, 1:250,000 and 1:500,000. However, as mentioned previously, the data is best viewed as a single large wall map covering the whole of western Tasmania at 1:100,000 scale.

The area is dominated by the Harvey Creek Fault, a clearly defined NNW trending regional structure, possibly a spur off the Great Lyell Fault to the east. This is analogous to the Henty area where the North and South Henty Faults are spurs off the Great Lyell Fault (or visa versa).

The Harvey Creek Fault extends from within the Mt Read Volcanics in the south, through EL 15/1999 and well to the north-west along the western margins of the Henty and Zeehan sedimentary basins, and gets lost in the vicinity of the Razorback ultramafic. It appears to not only control major periods of Palaeozoic sedimentation but also the western limit of Cambrian volcanism.

The Harvey Creek Fault was probably one of the principal, long lived, deep seated faults, which defined the western margin of the Dundas Trough.

As such, it meets one of the key criteria of the Henty gold model as outlined above.

The other key criteria of the model is the presence of major sulfidic alteration zones within a submarine volcanic environment adjacent to the structure. Unfortunately this criteria is not met, at least near surface, within EL 15/1999 which is largely underlain by post Cambrian sedimentary sequences, strongly folded and faulted along the Harvey Creek Fault.

In a gross sense, these post Cambrian sediments plunge parallel to the Harvey Creek Fault to the north-west (ie) they thicken to the NW and thin to the SE where there are in fact minor outcrops of Mt Read Volcanics. The vertical displacement component on the fault appears to be east side up.

Thus the depth to the prospective volcanic environment adjacent to the Harvey Creek Fault increases across EL 15/1999 from south to north.

However, support for the concept that the Harvey Creek Fault acted as a deep seated conduit for hydrothermal fluids associated with a deep magmatic event (the Henty Model) can be derived from the presence at surface of the Coupon, Anomaly 24-28, Davie and Woody Hill gold and gold arsenic occurrences. By analogy with the Henty Structure, these occurrences are similar to the stratigraphically shallower Stirling Valley and Lakeside deposits NE of Henty, (ie) these major structures potentially associated with significant gold deposits, are defined and characterised not by a single gold occurrence but rather a series of occurrences over a substantial strike length.

Coupon, Anomaly 24-28 and Davie are interpreted as Au-As-Fe sediment hosted geochemical leakage anomalies from more significant hydrothermal processes in the deeper underlying volcanic environment adjacent to the Harvey Creek Fault.

The depth to the more prospective Mt Read Volcanics increases south to north across EL 15/1999.

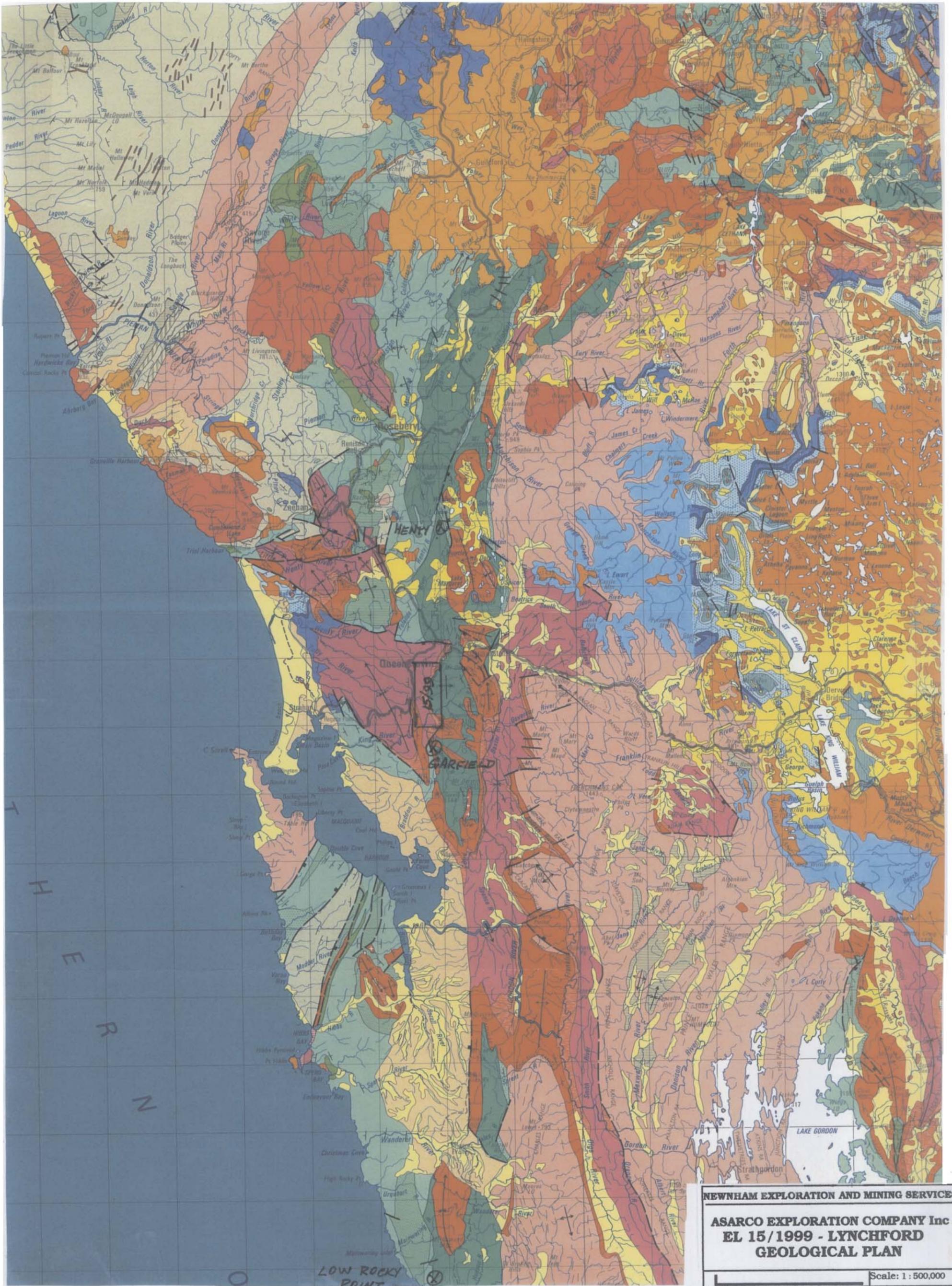
Minor outcrops of volcanics are mapped in the southern section of EL 15/1999 to the south of Coupon, but have never been mapped or sampled in detail.

On the basis of this interpretation, the depth to volcanics below Davie would be substantial (500+ metres???) but may be modest below Coupon. The deepest existing drill hole at Coupon is 200 vertical metres. Based on the Henty model, Coupon remains a very prospective area for two reasons:

- (a) the aerial extent and magnitude of the Au-As geochemical leakage anomaly, suggestive of a major alteration zone at depth
- (b) the totally decomposed nature of the Gordon Limestone adjacent

to the Harvey Creek Fault which, in this writer's experience in Tasmania, normally suggests the nearby presence of a major sulfidic environment introducing acidic ground waters into the limestone formations.

In summary, the Harvey Creek Fault is clearly defined within EL 15/1999, by the aeromagnetic and radiometric data. The fault zone is considered prospective for Henty style gold deposits, but the practical prospectivity diminishes to the north as the volcanic host target becomes deeper. The Harvey Creek Fault zone south of Coupon within EL 15/1999 has not been effectively explored.

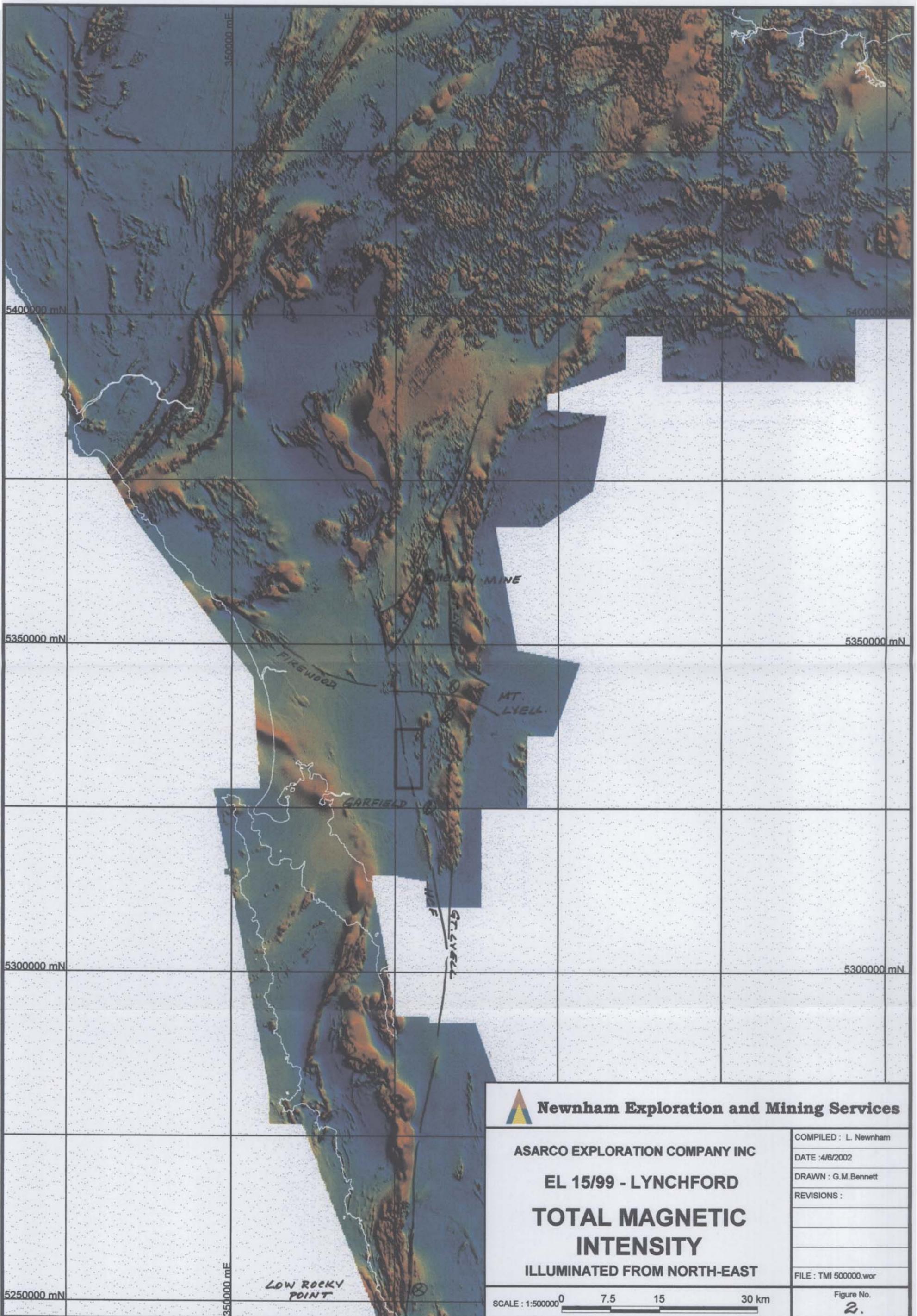


NEWHAM EXPLORATION AND MINING SERVICES

**ASARCO EXPLORATION COMPANY Inc
EL 15/1999 - LYNCHFORD
GEOLOGICAL PLAN**

Scale: 1 : 500,000
Drawn: LAN Date: Jun 2002 /.

LOW ROCKY POINT



 **Newnham Exploration and Mining Services**

ASARCO EXPLORATION COMPANY INC
EL 15/99 - LYNCHFORD
TOTAL MAGNETIC INTENSITY
ILLUMINATED FROM NORTH-EAST

COMPILED : L. Newnham
 DATE : 4/8/2002
 DRAWN : G.M. Bennett
 REVISIONS :
 FILE : TMI 500000.wor

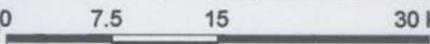
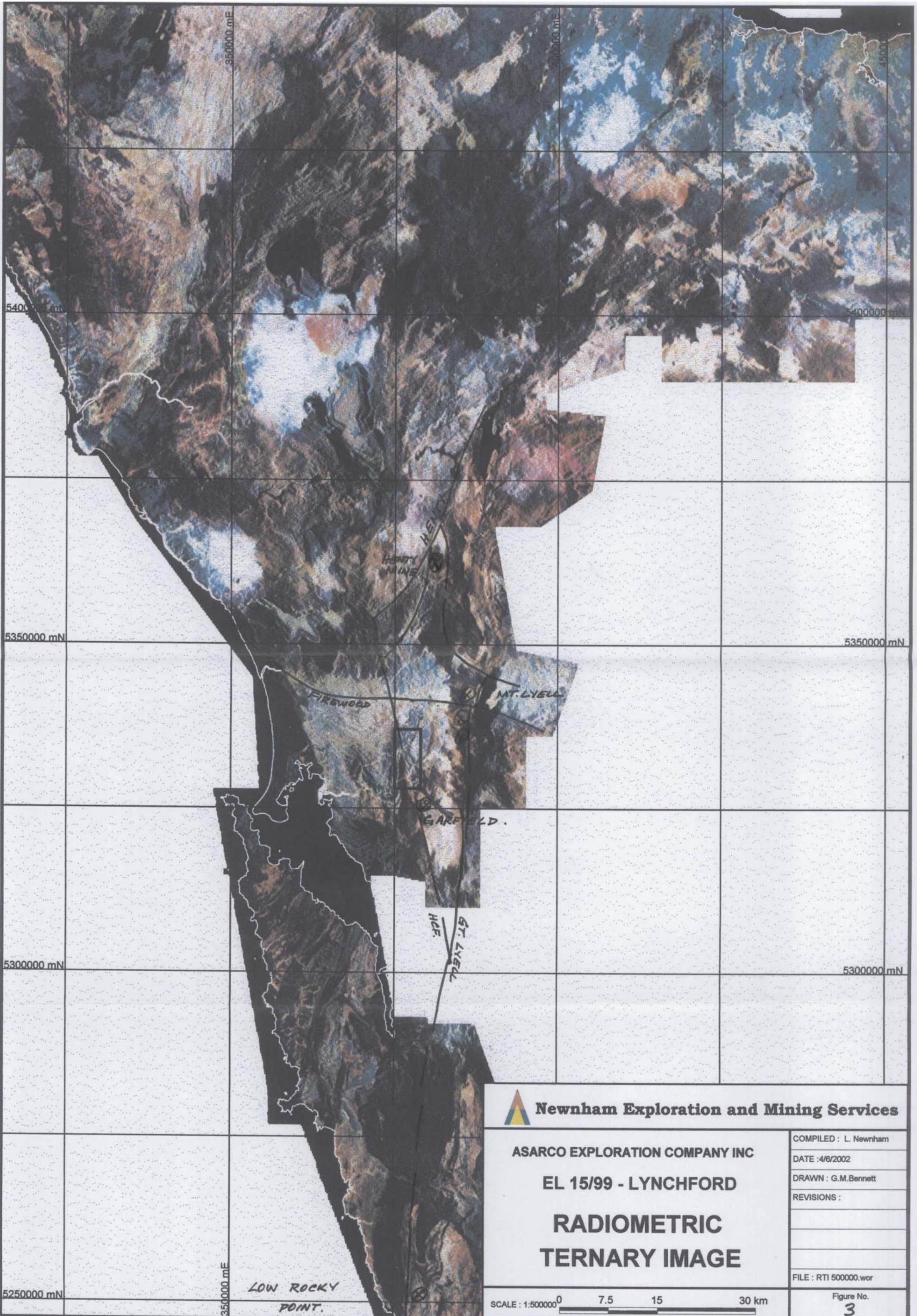
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Figure No. **2.**



Newnham Exploration and Mining Services

ASARCO EXPLORATION COMPANY INC

EL 15/99 - LYNCHFORD

**RADIOMETRIC
TERNARY IMAGE**

COMPILED : L. Newnham

DATE : 4/6/2002

DRAWN : G.M.Bennett

REVISIONS :

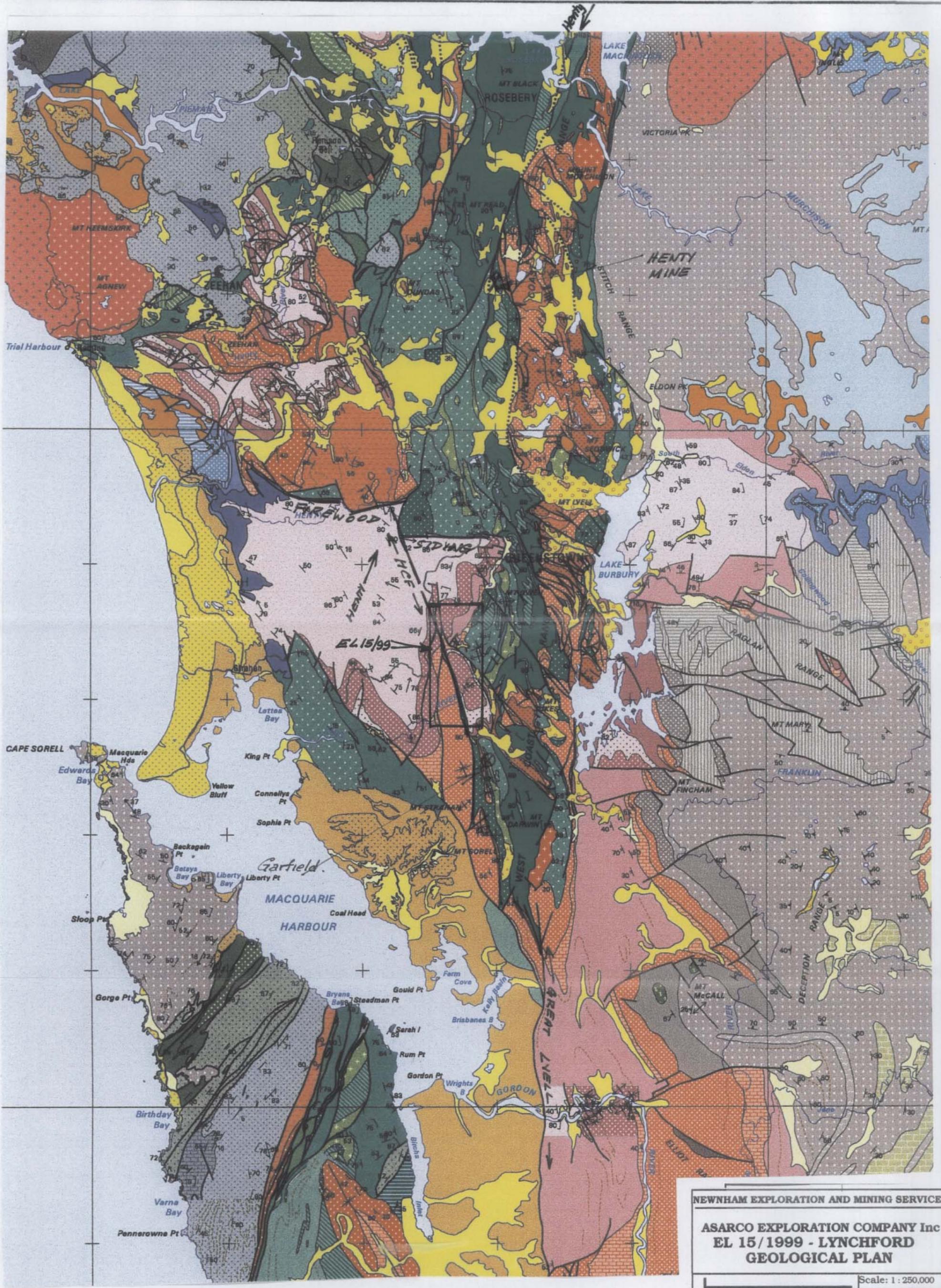
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Figure No.

3

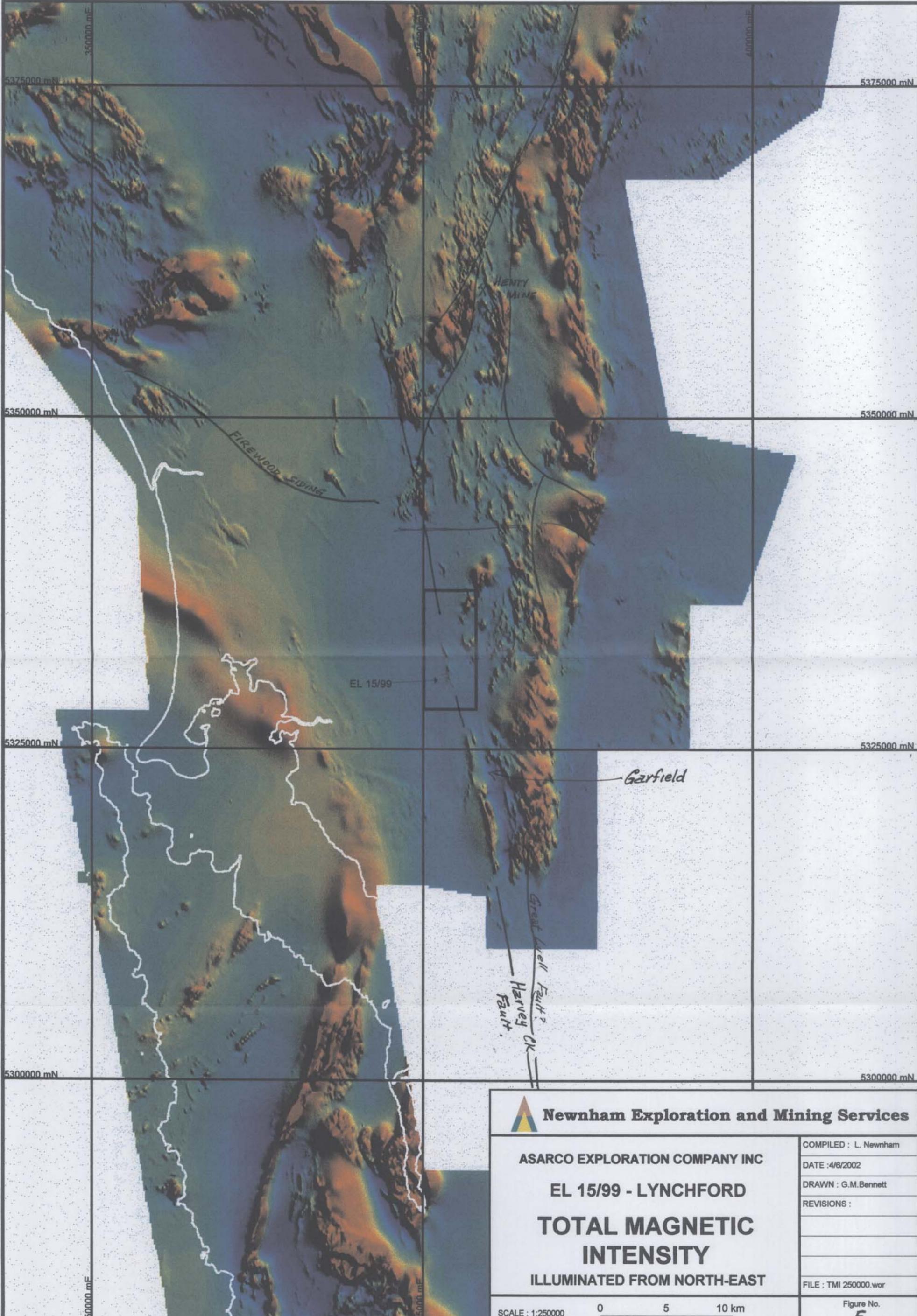
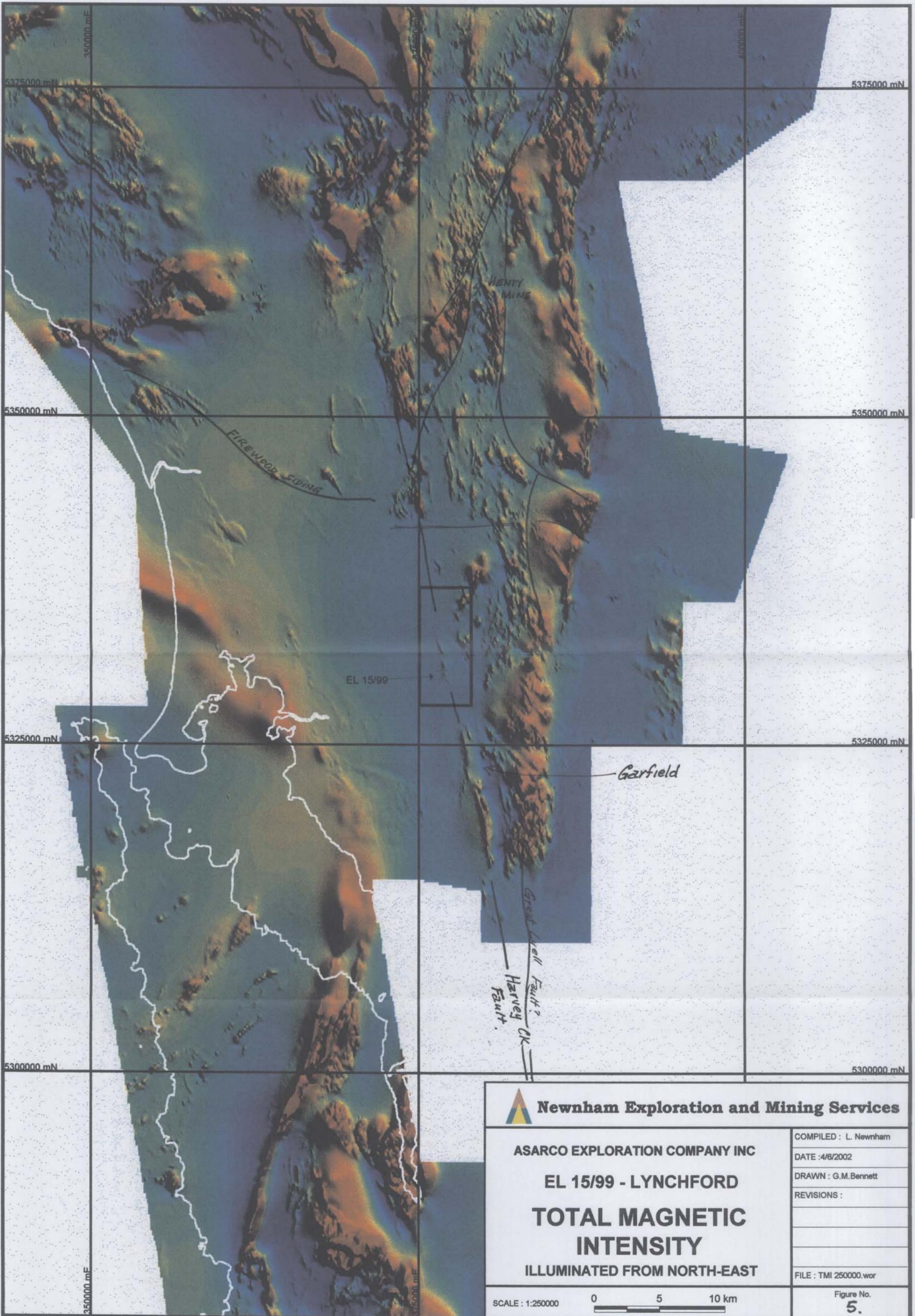
*LOW ROCKY
POINT.*



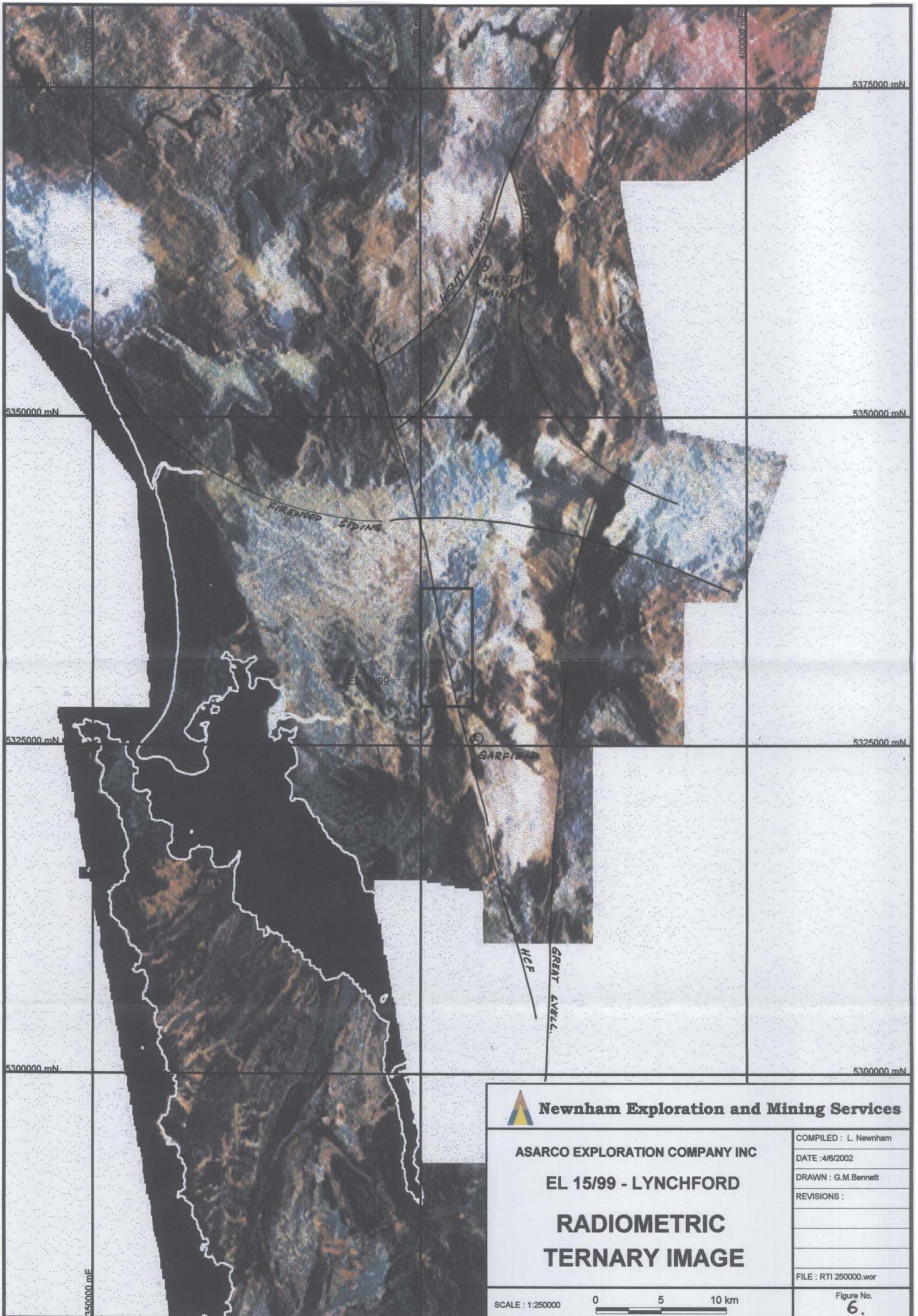
NEWHAM EXPLORATION AND MINING SERVICES

**ASARCO EXPLORATION COMPANY Inc
EL 15/1999 - LYNCHFORD
GEOLOGICAL PLAN**

Scale: 1 : 250,000
Drawn: LAN Date: Jun 2002 4.



 Newnham Exploration and Mining Services	
ASARCO EXPLORATION COMPANY INC EL 15/99 - LYNCHFORD TOTAL MAGNETIC INTENSITY ILLUMINATED FROM NORTH-EAST	
SCALE : 1:250000 0 5 10 km	COMPILED : L. Newnham DATE : 4/6/2002 DRAWN : G.M. Bennett REVISIONS : FILE : TMI 250000.wor Figure No. 5.



 **Newnham Exploration and Mining Services**

ASARCO EXPLORATION COMPANY INC
EL 15/99 - LYNCHFORD
RADIOMETRIC
TERNARY IMAGE

COMPILED : L. Newnham
DATE : 4/8/2002
DRAWN : G.M.Bennett
REVISIONS :
FILE : RTI 250000.wor

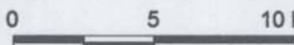
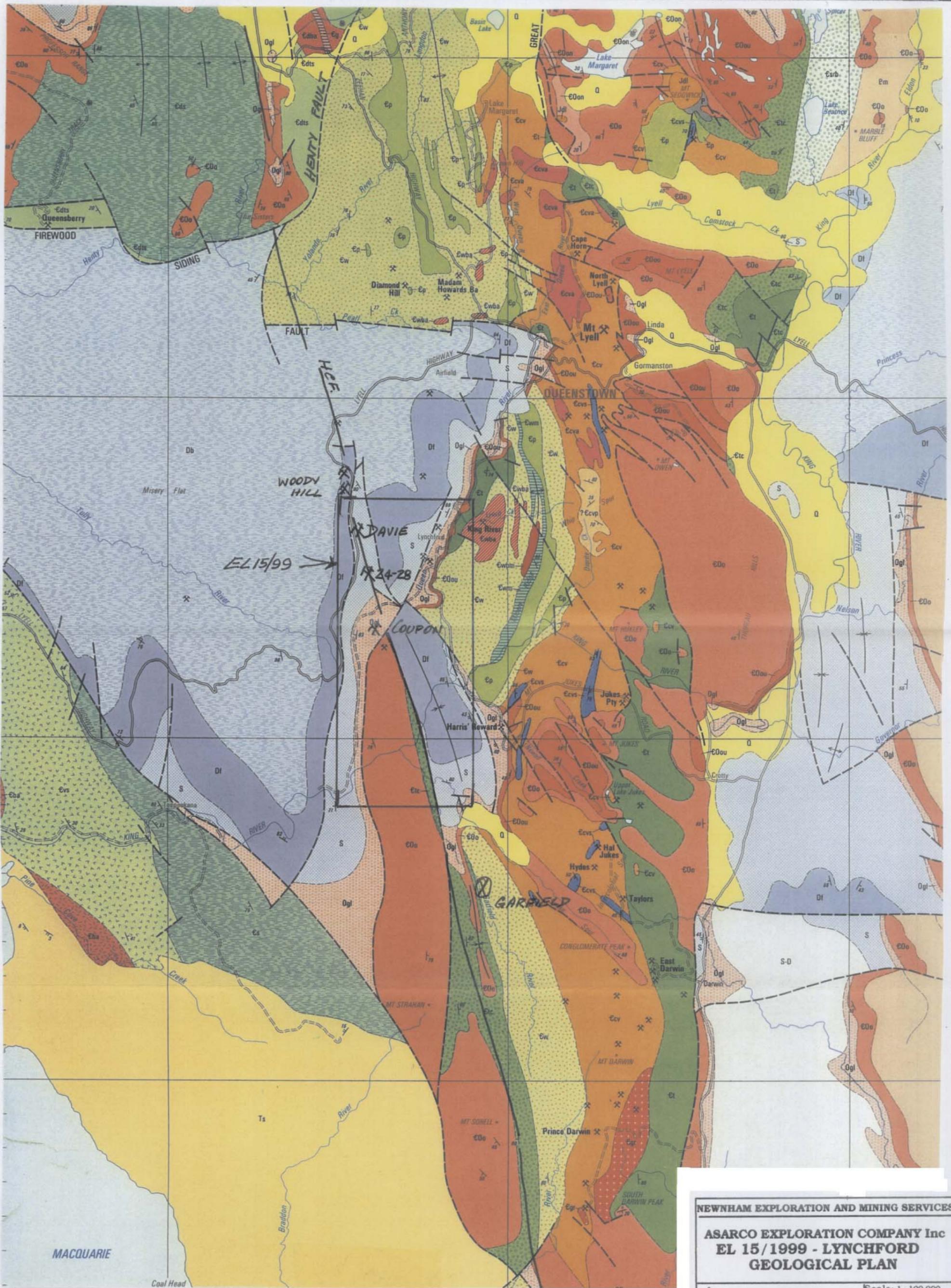
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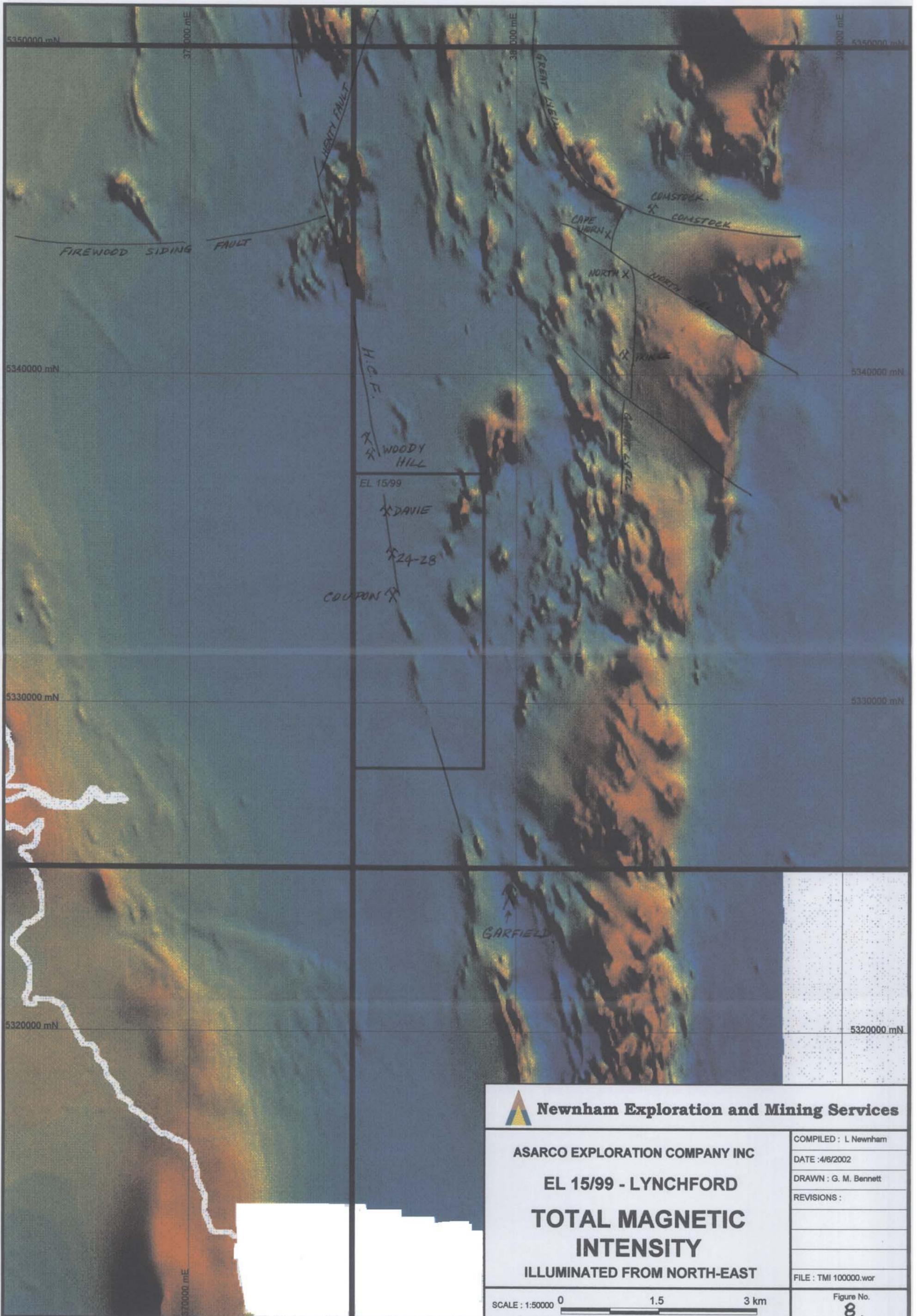
Figure No.
6.



NEWHAM EXPLORATION AND MINING SERVICES

**ASARCO EXPLORATION COMPANY Inc
EL 15/1999 - LYNCHFORD
GEOLOGICAL PLAN**

Scale: 1 : 100,000
Drawn: LAN Date: Jun 2002 7



 **Newnham Exploration and Mining Services**

ASARCO EXPLORATION COMPANY INC

EL 15/99 - LYNCHFORD

TOTAL MAGNETIC INTENSITY

ILLUMINATED FROM NORTH-EAST

COMPILED : L Newnham

DATE : 4/6/2002

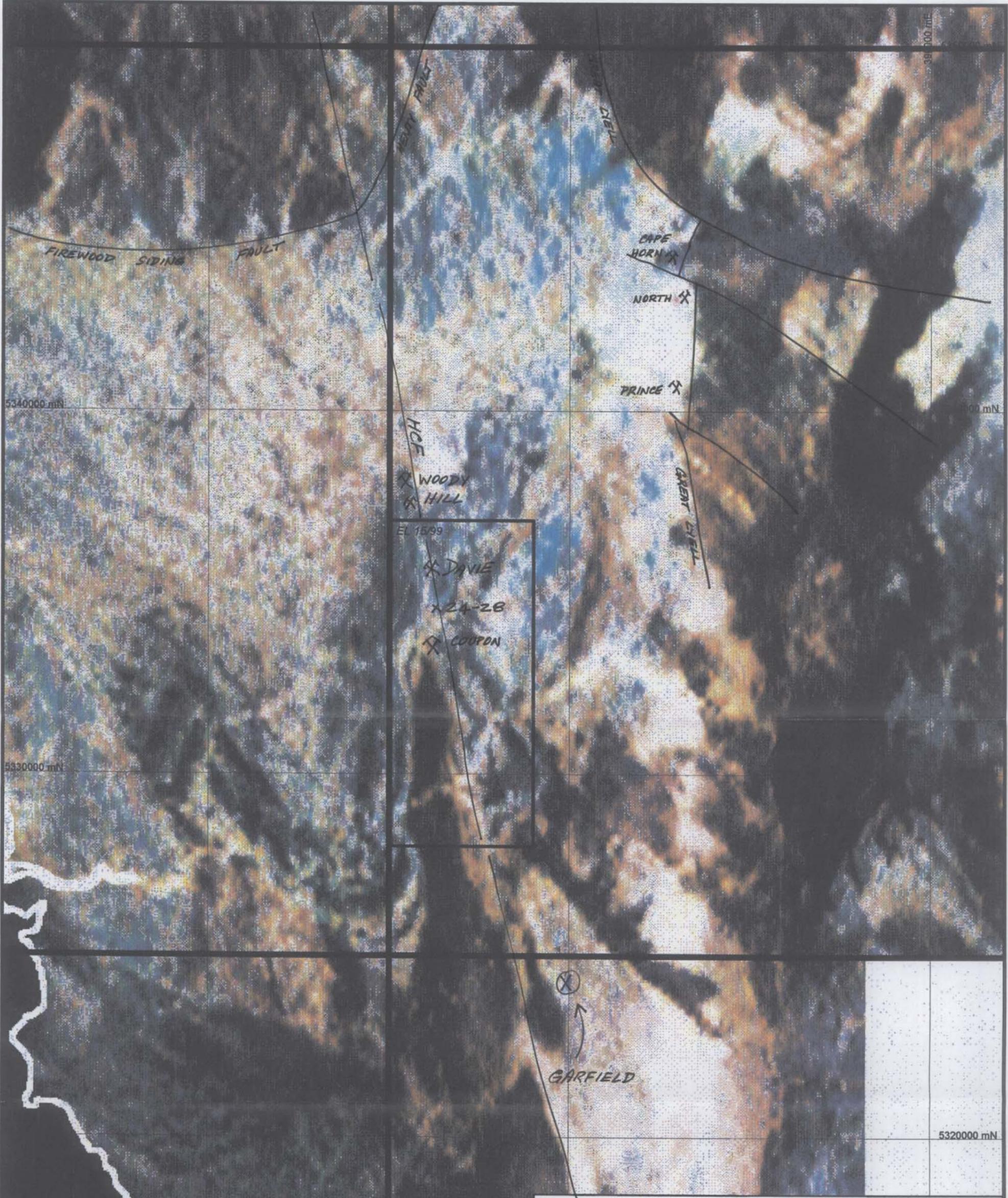
DRAWN : G. M. Bennett

REVISIONS :

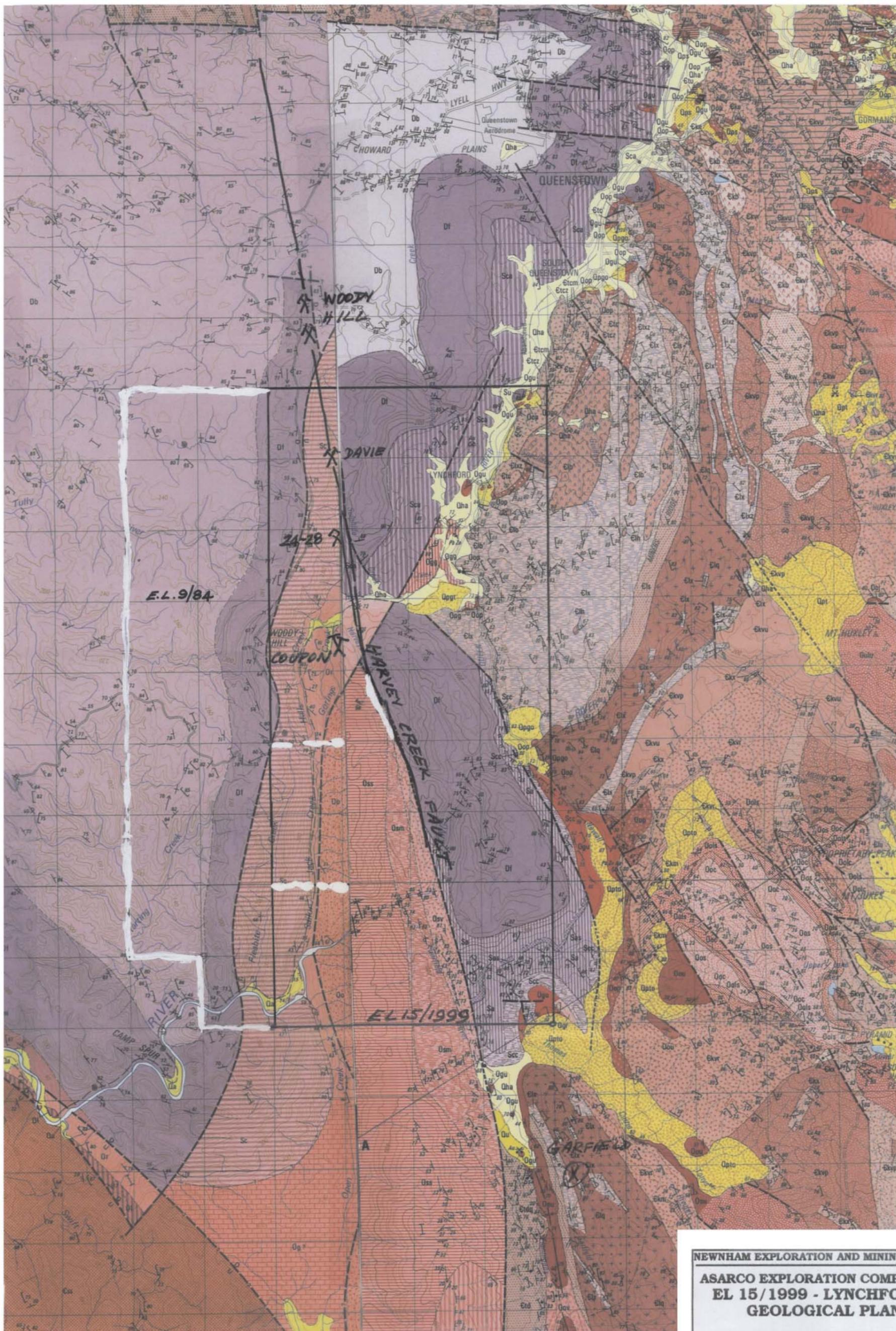
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Figure No.
8.

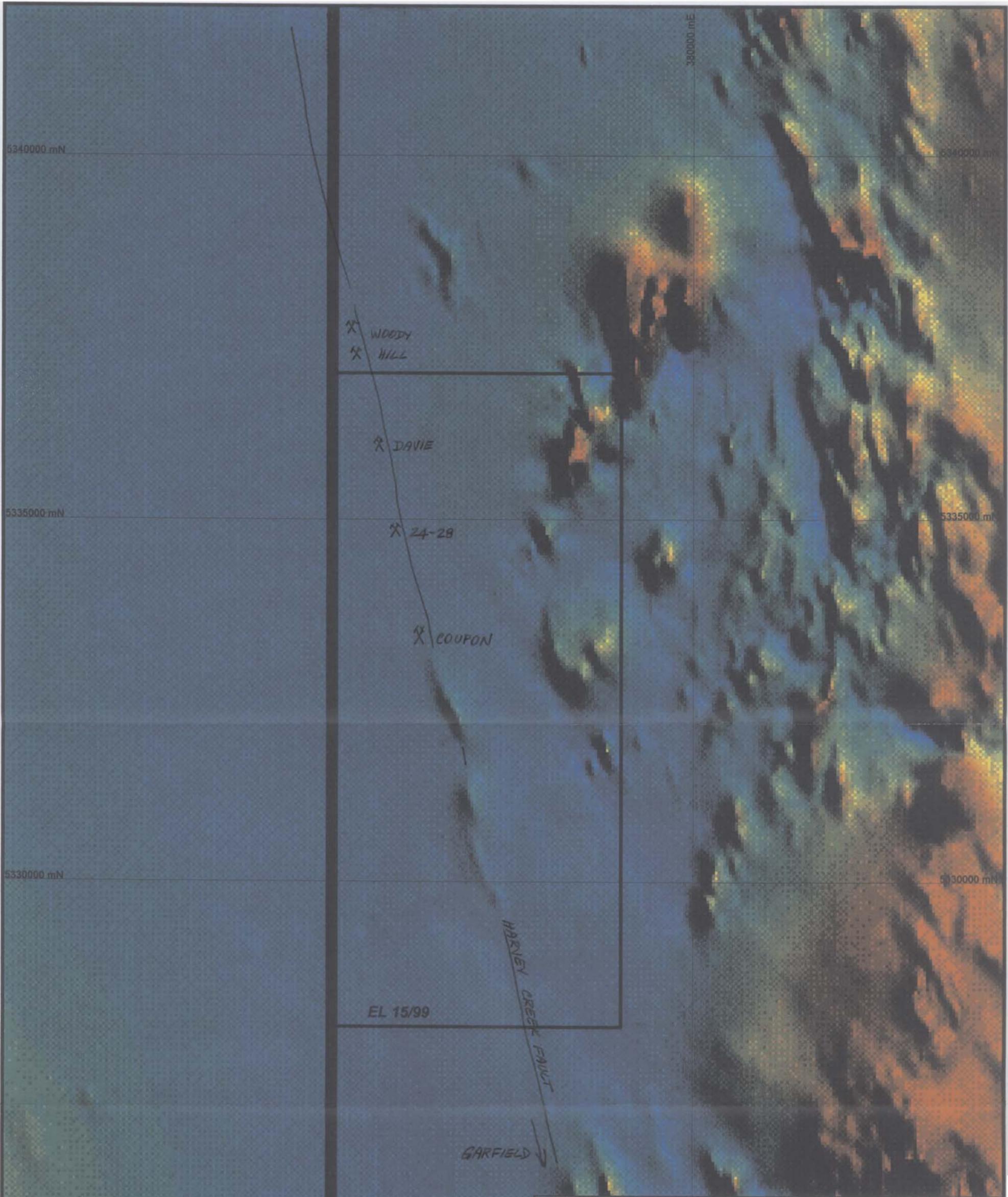


 Newnham Exploration and Mining Services	
ASARCO EXPLORATION COMPANY INC EL 15/99 - LYNCHFORD RADIOMETRIC TERNARY IMAGE	COMPILED : L. Newnham DATE : 4/6/2002 DRAWN : G. M. Bennett REVISIONS : FILE : RTI 100000.wor
SCALE : 1:100000 0 2.5 5 km	Figure No. 9.



NEWHAM EXPLORATION AND MINING SERVICES
 ASARCO EXPLORATION COMPANY Inc
 EL 15/1999 - LYNCHFORD
 GEOLOGICAL PLAN

Scale: 1 : 50,000
 Drawn: LAN Date: Jun 2002 10.



Newnham Exploration and Mining Services

ASARCO EXPLORATION COMPANY INC

EL 15/99 - LYNCHFORD

TOTAL MAGNETIC INTENSITY

ILLUMINATED FROM NORTH-EAST

COMPILED : L Newnham

DATE : 4/6/2002

DRAWN : G. M. Bennett

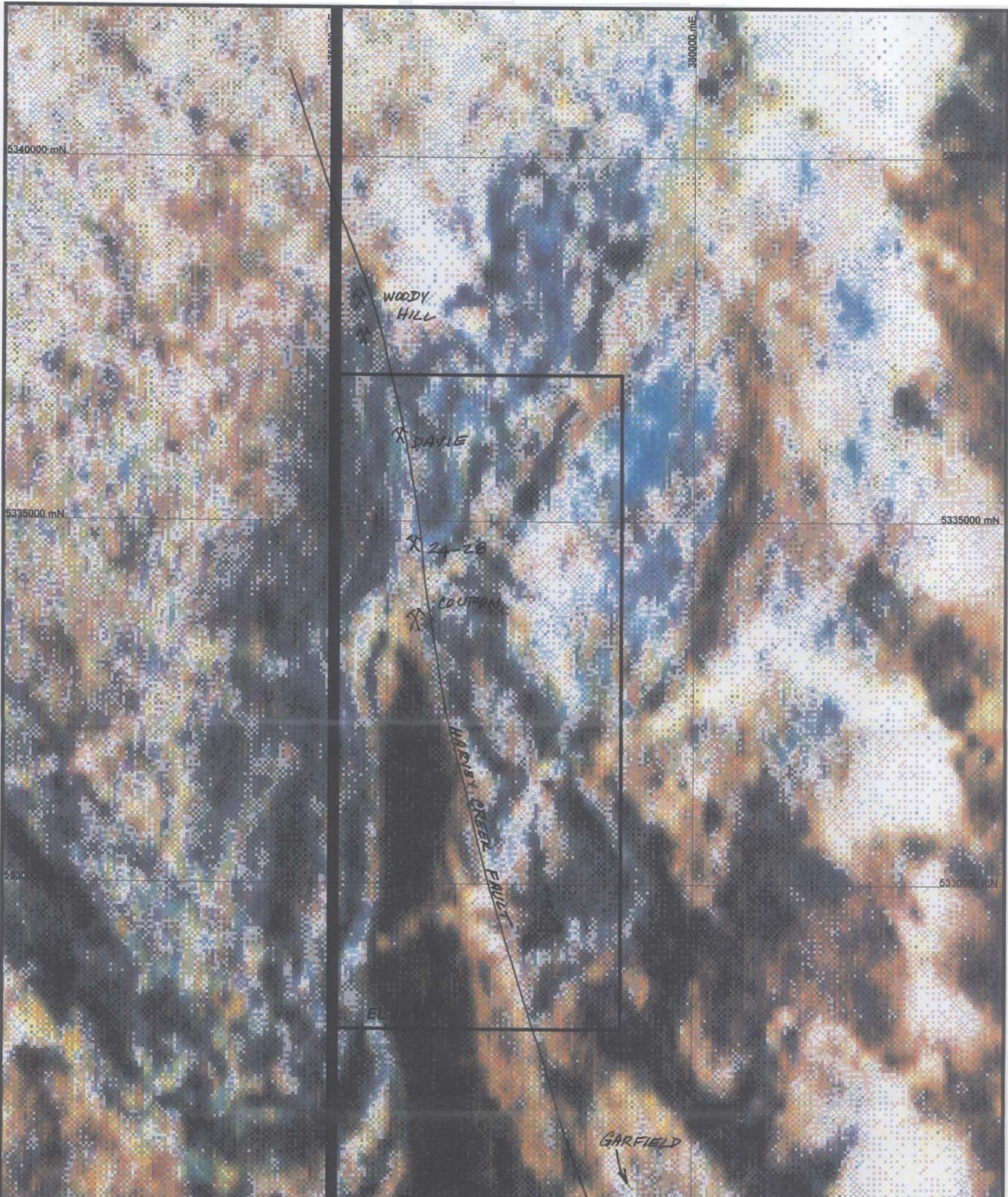
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FILE : TMI 50000.wor

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Figure No.

11.



Newnham Exploration and Mining Services

ASARCO EXPLORATION COMPANY INC

EL 15/99 - LYNCHFORD

**RADIOMETRIC
TERNARY IMAGE**

COMPILED : L Newnham

DATE : 4/6/2002

DRAWN : G. M. Bennett

REVISIONS :

FILE : RTI 50000.wor

SCALE : 1:50000 0 1.5 3 km

Figure No.
12.