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## **Lone Star Group**

*MCC's 316, 317, 340 & 341 and MLC's 362 – 375, 530 & 606 – 616*

# **MINERAL TITLES ACT COMPLIANCE REPORT**

*LICENSEE:*

**SANTEXCO PTY LTD**

A.B.N.002 910 296

*(A wholly owned subsidiary of Emmerson Resources Ltd)*

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NOVEMBER 2012**

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## 1. SUMMARY

This Report examines the historical exploration over the Lone Star Group of tenure and provides a recommendation to Emmerson Resources Ltd (Emmerson), and hence Department of Mines and Energy (DME) for the actions related to ensuring the compliance of the tenure to the Mineral Titles Act.

It is recommended that Emmerson amalgamate all 30 titles into a single title and renew the title for future detailed review of the identified anomalous zone/mineralised ore body.

The amalgamation will also help to reduce resources required for tenement administration and management for both Emmerson and DME.

The Lone Star group of leases contains several historical mine workings which have produced high grade gold in albeit limited tonnages in past years.

The Lone Star magnetic anomaly is the most significant feature of this group of leases, and is attributed to a concealed ironstone at a depth of 100m vertical, and containing a modelled (magnetic) mass of 2.5Mt. This ironstone has been extensively drilled and is shown to contain in the order of 4Mt of ironstone. This difference may be accounted for by a substantial portion of haematite in the body.

The gold mineralisation in the Lone Star mine workings has been shown to extend at shallow depths.

The structural setting of the Lone Star leases is considered to be favourable, located on the Mary Lane Shear Zone, and an east-plunging major anticline.

The potential of the Lone Star Leases is considered to be moderate to low for the discovery of large tonnage / high grade (stand alone) gold mineralisation, however the potential is moderate to high for small tonnages of open-pittable Au mineralisation.

**Shallow Potential** – The shallow potential below the mine workings at Lone Star remains open along strike to the east, although the sacred site exclusion zone discounts 120m of potential strike immediately east of this section 4620E. The shallow workings have also not been tested between 4580E and 4500E, to the west of the sacred site.

Assuming the ironstone and mineralisation continue to the west, an estimate of ironstone mass from 4500E to 4580E is in the order of 0.2 – 0.25Mt of ironstone (80m x 50m x 15m x 4). If the ironstone is

15% - 20% mineralised, which is an approximation based on the drilling of LSRC-001 to 010, there is possibly in the order of 30000t – 50000t @ 2 g/t Au (open-pittable) in situ.

**Deep Potential** – The potential for a substantial tonnage of high grade gold mineralisation is low to moderate, but given the lack of both number and width (<2m) of mineralised drill intersections observed to date, the potential is limited. Potential to test the ironstone at the level of expected supergene enrichment has some merit, but widths of mineralisation would need to increase substantially.

The drilling of the larger deep ironstone has been relatively comprehensive, and combined with the downhole magnetic data has given a relatively good control on the geometry of the body. The main ironstone has been drilled over a strike of 260m and is open at both ends, although the magnetic signature tails off at these sections, possibly indicating the limit of the strike. The body averages 30m true width, and thickens up to 60m true width to the west of 4400E. Depth to top varies from 120m in the east (possible down dip faulted? extension of the mine workings), to 200m to top at 4350E. The ironstone is sparsely mineralised in thin discontinuous high grade zones which average 10 g/t Au over true widths of 1.5 – 2m.

An estimate of ironstone mass is in the order of 4 – 4.5Mt of ironstone (260m x 140m x 30m x 4). If the ironstone has a mineralised true width of 1.5m which is an approximation based on the drilling to date, there is possibly in the order of 200000t – 220000t @ 10 g/t Au(?) in situ (260m x 140m x 1.5m x 4). This is at an average depth to the top of the ironstone of 170m.

There is also still potential for further drilling of the ironstone both along strike to the east and west and in current gaps in the drilling.

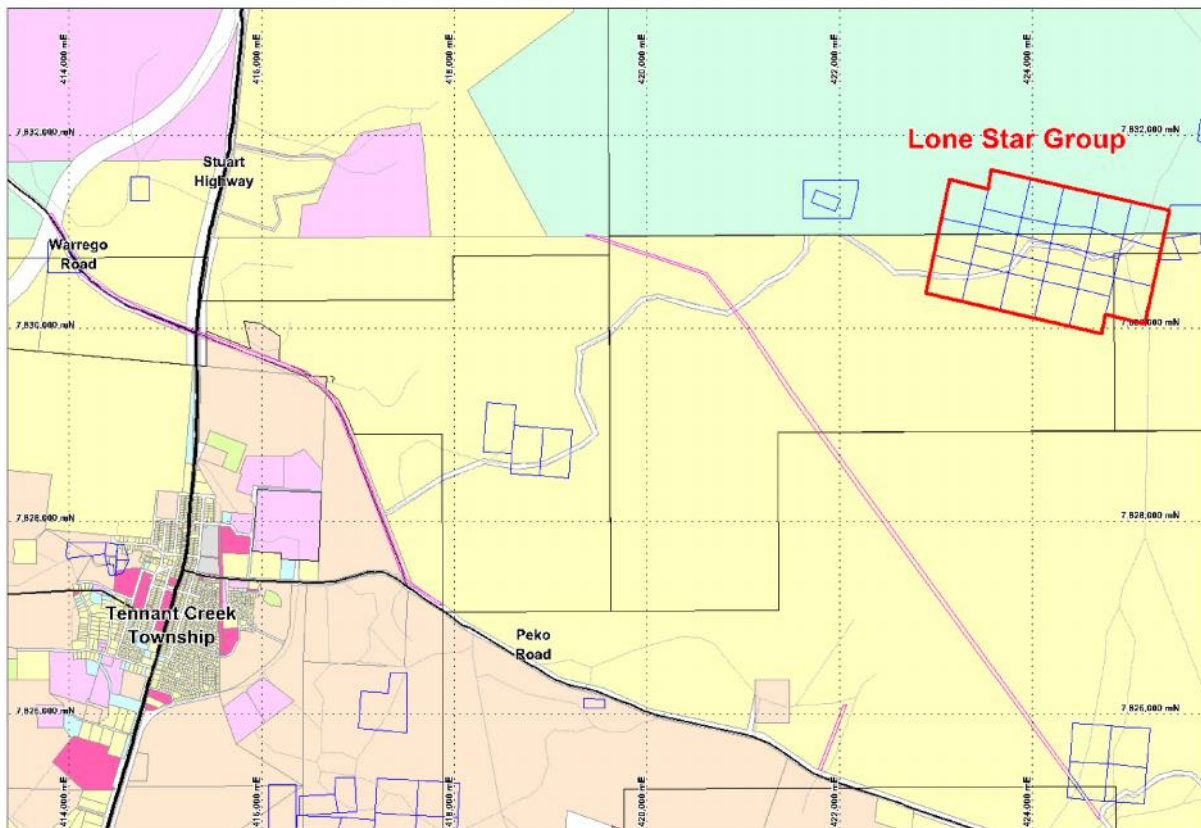
Emmerson believes a detailed re-evaluation of the Lone Star Group and its identified anomalous zone/ ore deposit is required so that the knowledge that Emmerson has gained on the distribution of economic minerals, within and immediately adjacent to, Ironstones and shear zones can be applied to the Lone Star Group and determine if the anomalous zone has been effectively tested and that the interpreted mass of the ore body has been fully evaluated.

Detailed consultation with Traditional Owners would be the first item dealt with to ensure that access to conduct the work required to evaluate in detail the anomalous zone can be completed. Should these consultations be positive then Emmerson would rank the Lone Star Group and its identified anomalous zone as a high priority.

## 2. INTRODUCTION

This report details the review of the Lone Star Group of tenements MCC's 316, 317, 340 & 341 and MLC's 362 – 375, 530 & 606 – 616 the titles cover the Lone Star, Maple Leaf, Arizona and Plain Jane historical Mines. The aim of this report is to identify, reassess and review all historical work conducted of the titles to make a determination on the prospectivity of the title, identify the presence of any anomalous zones or deposits and then make a determination on the validity of the titles and then a recommendation to the Department of Mines and Energy (DME) on the transition of the titles to comply with the Mineral Titles Act.

Figure 1 shows the location of the Lone Star Group with respect to the Tennant Creek Township and figure 2 details the tenure of the Lone Star Group.





The Lone Star Group is located approximately between 8km and 11km north east of the Tennant Creek Township. The Licence falls on the Tennant Creek (5758) 1:100,000 scale map sheet.

Access to the group area is east via Peko Road, then north along Kaczinsky Road until you reach the Lone Star Mine road which runs north east of Kaczinsky Road. The Lone Star Mine road also runs past the Gem, Explorer 109 and True Blue mines before reaching the Lone Star Group area. Further access to the area is via a series of unsealed, 4x4 and fence line tracks, which during and immediately after rain the area is generally inaccessible.

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## 4. TENURE

The tenure details of the Lone Star Group are detailed in the following table;

Tenement ID	Tenement Name	Holder	Interest	Grant Date	Effective Date	Expiry Date	Area (Ha)
MCC316	The Trump	GRE	100	25/11/1987		24/11/2010	4.1
MCC317	The Trump	GRE	100	25/11/1987		24/11/2010	5.1
MCC340	The Trump	GRE	100	9/03/1988		8/03/2011	19.9
MCC341	The Trump	GRE	100	25/11/1987		24/11/2010	16
MLC362	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	15
MLC363	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	15
MLC364	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	14
MLC365	Lone Star	San	100	5/10/1981	5/10/1981	31/12/2022	16
MLC366	Lone Star	San	100	5/10/1981	19/12/2006	31/12/2011	16
MLC367	Lone Star	San	100	5/10/1981	5/10/1981	31/12/2026	16
MLC368	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	14
MLC369	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	16
MLC370	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	14
MLC371	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	16
MLC372	Lone Star	San	100	5/10/1981	5/10/1981	31/12/2022	16
MLC373	Lone Star	San	100	5/10/1981	5/10/1981	31/12/2022	16
MLC374	Lone Star	San	100	5/10/1981	5/10/1981	31/12/2026	16
MLC375	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	16
MLC530	Lone Star	San	100	2/10/1956	1/01/2008	31/12/2012	8
MLC606	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	8
MLC607	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	7
MLC608	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	8
MLC609	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	7
MLC610	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	7
MLC611	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	7
MLC612	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	8
MLC613	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	7
MLC614	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	8
MLC615	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	8
MLC616	Lone Star	San	100	20/12/1977	1/01/2008	31/12/2012	8

Table 1: Lone Star Group Tenure Details

The Lone Star Group comprises 4 granted Mineral Claims and 26 granted Mineral Leases, refer to figure 2 and table 1, covering an area of 352 hectares.

The leases are located on –

- NT Parcel 00494, Perpetual Pastoral Lease 1142, Tennant Creek Station

- NT Parcel 03735, Aboriginal Freehold Land held by the Warumungu Aboriginal Land Trust

The Lone Star Group has three AAPA registered sacred sites within the area as displayed in figure 3 and detailed below;

- Within a radius of 75m of GDA94\_53      424300E 7830700N (Tarla 5758-007)
- Within a radius of 25m of GDA94\_53      425100E 7831100N (5758-060)
- Within a radius of 50m of GDA94\_53      423700E 7830600N (5758-064)



Figure 3: AAPA Registered Sacred Sites

## **5. GEOLOGY**

### **5.1 Regional Geology**

The reader is referred to AusIMM Monograph 14 (Geology of the Mineral Deposits of Australia and Papua New Guinea), Volume 1, pp. 829-861, to gain a good introduction to the regional geology and styles of gold-copper mineralisation of the area.

In 1995 the Northern Territory Geological Survey released a geological map and explanatory notes for the Flynn 1:100,000 sheet, which covers the area of the licenses.

The rocks of the Warramunga Formation host most of the orebodies in the region and underlie most of the Exploration Licenses.

### **5.2 Local Geology**

Normandy describes the rocks of the Lone Star Group to comprise Lower Proterozoic Warramunga Formation siltstone, sandstone and greywacke. Minor components of the formation include hematite-jasper-quartz ('hematite shale') units and quartz-magnetite-hematite ironstone. Several quartz-(rhyolite) dykes interpreted to be of volcanic origin outcrop south and south-west of the Lone Star Mine. Surface alteration includes hematite and limonite weathering with a saprolite-unweathered bedrock depth of approximately 50m, increasing to 70m – 80m in low lying areas.

The rocks have undergone large scale folding to produce shallow easterly plunging WNW trending synclines and anticlines. The folds have wavelengths of approximately 1km. An anticline axis is 800m north of the Lone Star Mine and a syncline axis a further 1km north, centred on the old Iris and Aga Khan Mines.

The Rocky Range Fault, Mary Lane Shear and Quartz Hill Fault are the major faults in the Lone Star Group Area. The faults are broadly orientated NW, outcrop as quartz ridges and displace all rock types.

Regionally the Lone Star Group are located on the Lone Star Line of ironstone bodies extending for 30km from TC8, east to the Gigantic Mine.

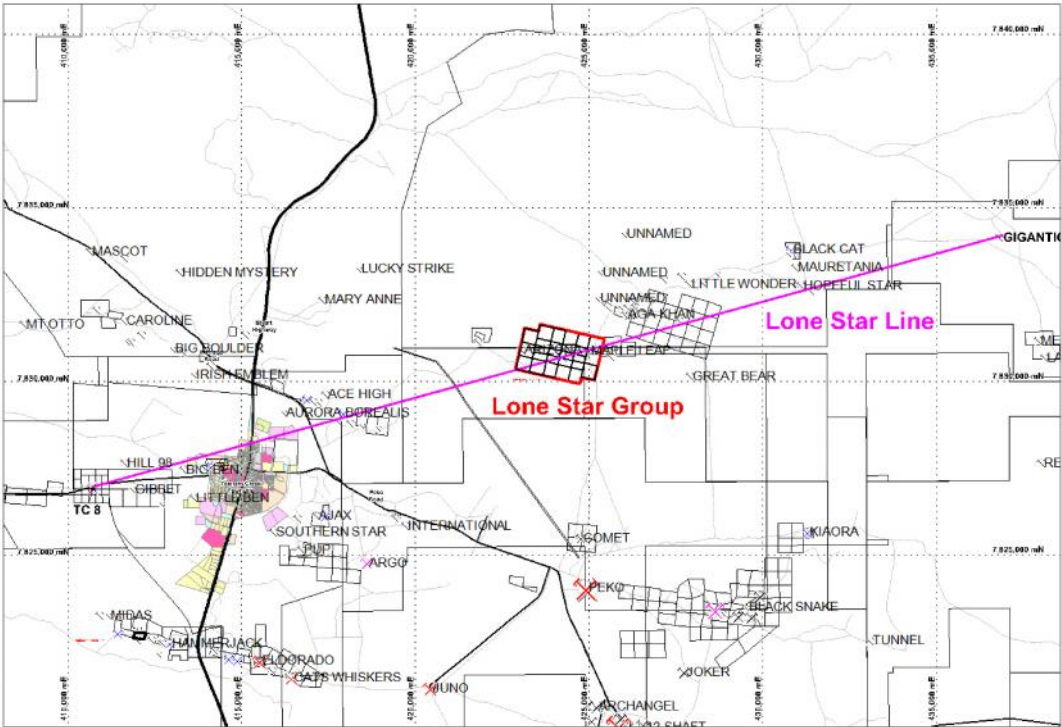


Figure 4: Lone Star Line

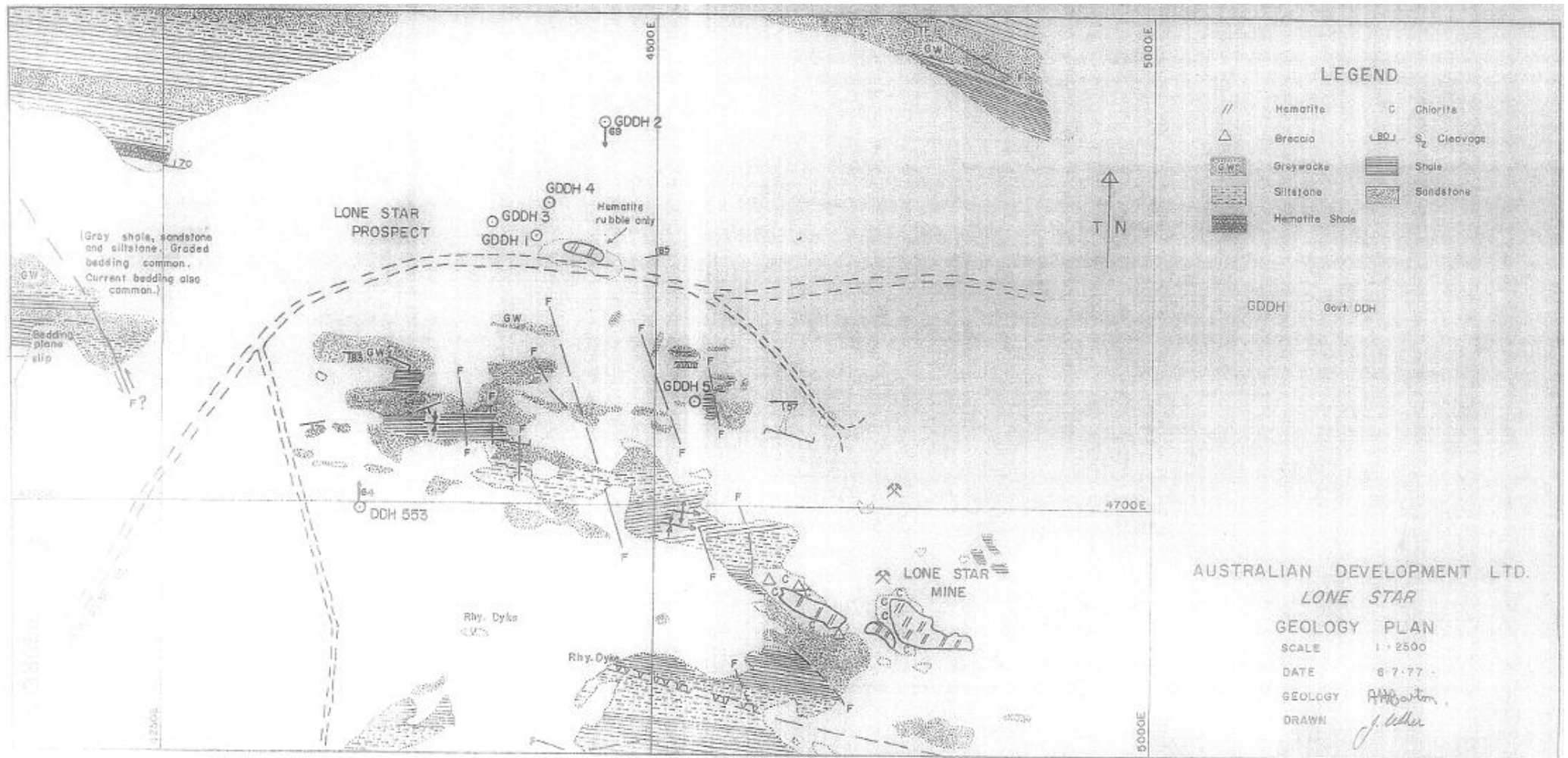


Figure 5: ADL Geology Plan (1977)



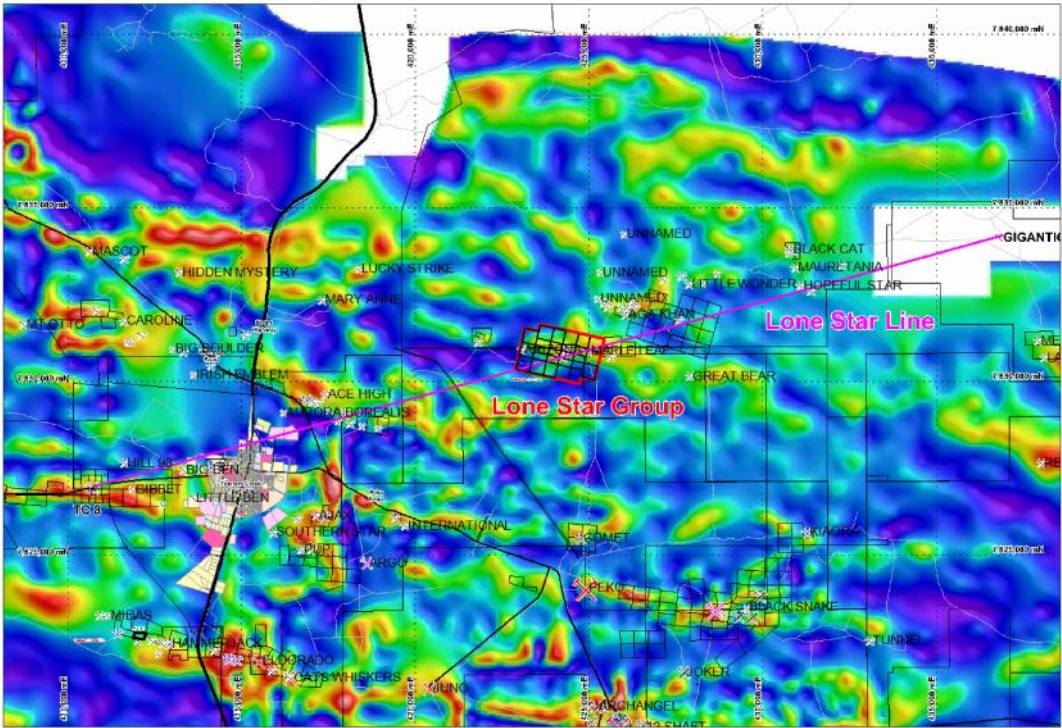


Figure 6: Lone Star Line vs. Gravity

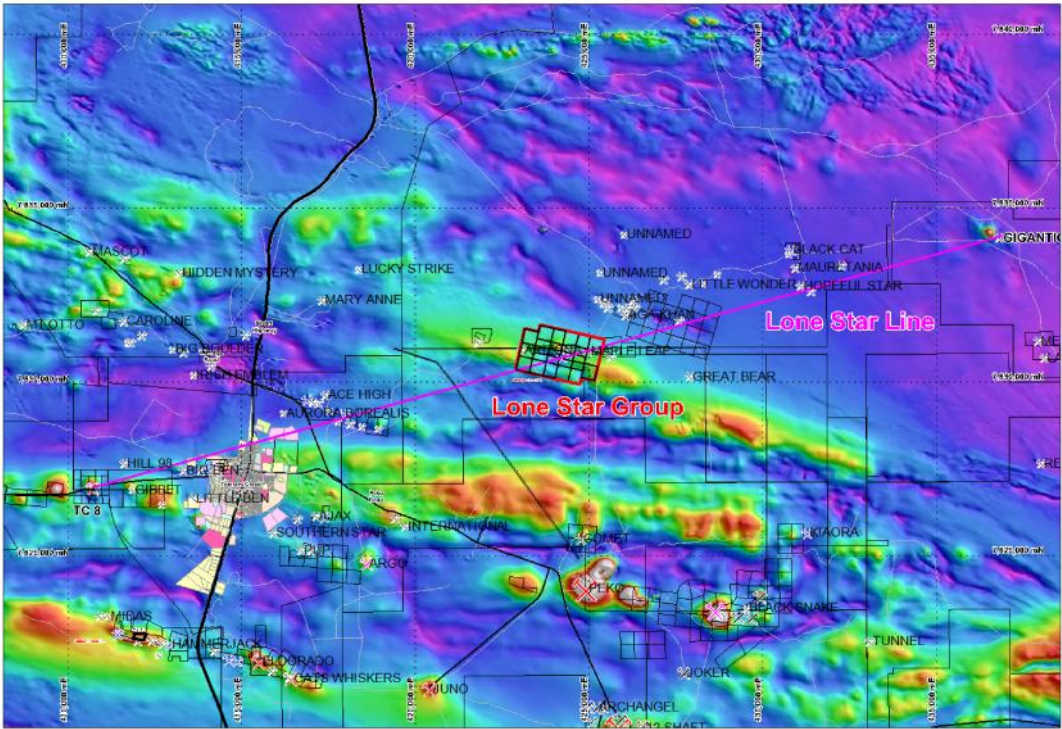


Figure 7: Lone Star Line vs. VRMI



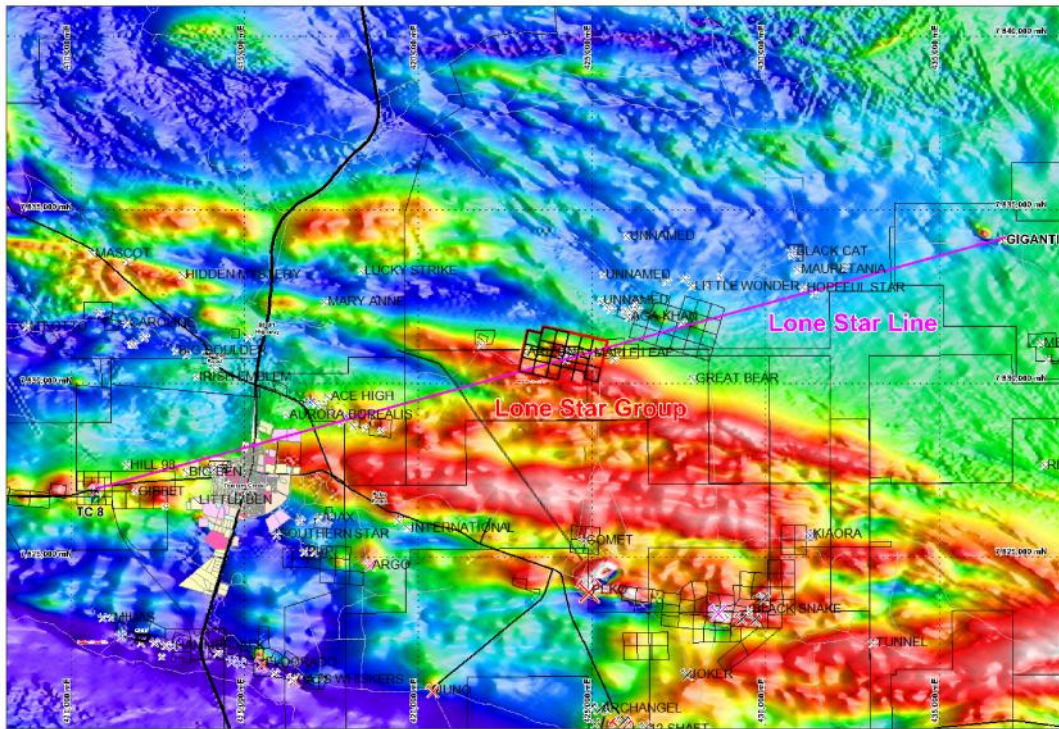


Figure 8: Lone Star Line vs. Aeromag Stitch (Spinifex 2008)

### 5.3 Mine Geology

The Lone Star Group contains a number of historical mine workings as detailed in the table below;

Mine Name	Operating Period/s	Production	Grade	Produced Metal
Arizona	1938 - 41	73.8t	13.9g/t Au	33oz Au
Lone Star	1934 - 60	9,983t	17.6g/t Au	5,665oz Au
Maple Leaf	1948 - 50			25.7oz Au
Plain Jane (Love Star)	1936 - 51	1,190.1t	17.4g/t Au	667.7oz Au
Unnamed				

Table 1: Historical Mines of the Lone Star Group

### Arizona

The *Arizona Mine* is located 1km to the WNW of *Lone Star*, and comprises 1 shallow shaft sunk on the northern side of a small quartz-haematite ironstone outcrop. The mine produced 73.8 tonnes @ 13.9g/t Au.

### Lone Star

This is the largest mine in the area with a recorded production of 5,665ozs of gold. Most of the ore was mined by open cut methods, some was stoped from a shaft and adit level, and a little was won from alluvial placer to the south. The mine is located at the eastern end of a razorback ridge where two massive quartz-hematite lenses outcrop at the crest.

The host rocks are dominantly sandstone with interbedded siltstone and shale. The quartz-hematite lodes are enveloped in crushed and brecciated sediments and represent a zone of dilation.

The eastern lode is 40m long, and in width averages 5m to 10m with a maximum of 20m. The ore consists of friable, highly mineralised and completely replaced siltstone and mudstone. This lode bottoms on the northerly dipping Minogue Fault. Gold has been concentrated where faulting intersects a mudstone horizon.

The western quartz-hematite body is similar in size and composition to the eastern lode, but the brecciated sediment envelope consists predominantly of fine grained sandstone, and no significant mineralisation has been recorded.

### Maple Leaf

The Maple Leaf Mine is located 600m to the east of Plain Jane, and consists of a very small gossanous quartz-haematite ironstone formed in a shear zone on the steep northern limb of an east trending anticline. The only recorded production reported from the mine was 25.7oz of gold obtained from the surface outcrop, worked from 1948 to 1950.

### Plain Jane

The Plain Jane Mine is located 300m NE of Lone Star on the south-eastern flank of a line of hills. The workings include a 12.2m deep shaft, stopes, a 45.7m long adit and a small open cut.

Plain Jane consists of two major and several minor quartz-haematite(-jasper) ironstones hosted by the intersection of EW shears and NE striking cross faults. The smaller group of ironstones was the focus for the workings, which produced 1190.1 tonnes @ 17.4 g/t Au, intermittently from 1936 to 1951. Gold was mined via the connected shaft, adit and stope system, and a very small open cut on the surface ironstone. The Quartz hematite lodes are massive with outcrops occurring over 40m vertical extent from the base to the top of the hills.



Several other smaller recorded and unnamed historical mines and workings also occur within and surrounding the Lone Star Group.

## **6. EXPLORATION**

### **6.1 Target Rationale**

The Lone Star Group covers one relatively deep magnetic anomaly, which is prominent against the surrounding low-relief magnetic background. The Lone Star anomaly is located to the immediate north of the Lone Star surface workings, and west of Plain Jane. The surface ironstones and historical workings within and surrounding the leases do not have any appreciable or significant magnetic anomalies associated with them. ADL interpreted this to indicate they are all haematite-dominant bodies emplaced in structural traps above the base of oxidation.

#### GEOLOGY

As detailed above

#### MAGNETICS

The dominant magnetic signature of the Lone Star Group is the prominent, deep magnetic anomaly. The anomaly is prominent due to the low relief of the surrounding regional magnetic signature.

The Lone Star leases are located on a major WNW trending structure, the Mary Lane Shear zone, historically interpreted to represent a major north-verging thrust fault and clearly coincides with an anomalous VRMI ridge as displayed in figure 9, below. Normandy interpreted this structure as the separation between an extensive mass of magnetite-bearing Warramunga Group sediments to the south from a low relief package of magnetite-poor sediments to the north.

Several regional airborne magnetic surveys have been conducted over this part of the field, commencing in 1956 through to 1987. With ground magnetics for the leases was collected in 1975.

#### GRAVITY

The Lone Star group of deposits are located at the north-eastern margin of a WNW trending gravity high ridge which Normandy interpreted to represent a semi-regional zone of structurally thickened sediments / thrust repetition. Normandy further interpreted - This ridge to contain all of the known deposits in the south-eastern region of the field. The southern margin of a large gravity low occurs 4km to the NW of the Lone Star area, and represents the Tennant Creek Granite. It is possible that this granite has partially underplated the package of Warramunga in this region.

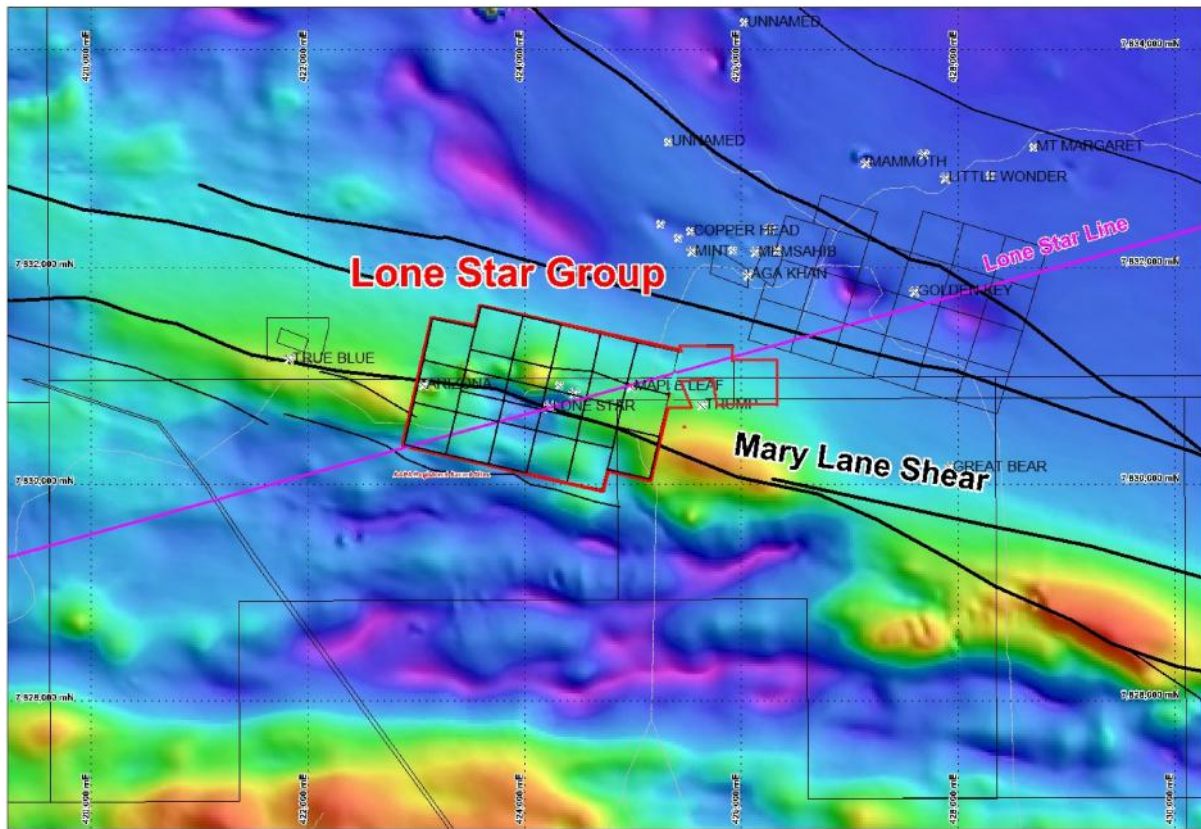


Figure 9: Mary Lane Shear vs. VRMI

Normandy interpretation was conducted from the large regional gravity data set which shows large broad anomalism and lacks the detail captured in the 2008 Emmerson ground gravity survey.

From the Emmerson 2008 ground gravity survey it can clearly be seen that the dominant gravity trends are associated with the dominant large structures of the Tennant Creek Mineral Field as in figure 10. Figure 11 displays the Mary Lane Shear, the Lone Star Group and the 2008 ground gravity on a more local scale. This figure also highlights the relationship between the historical mines and gravity.



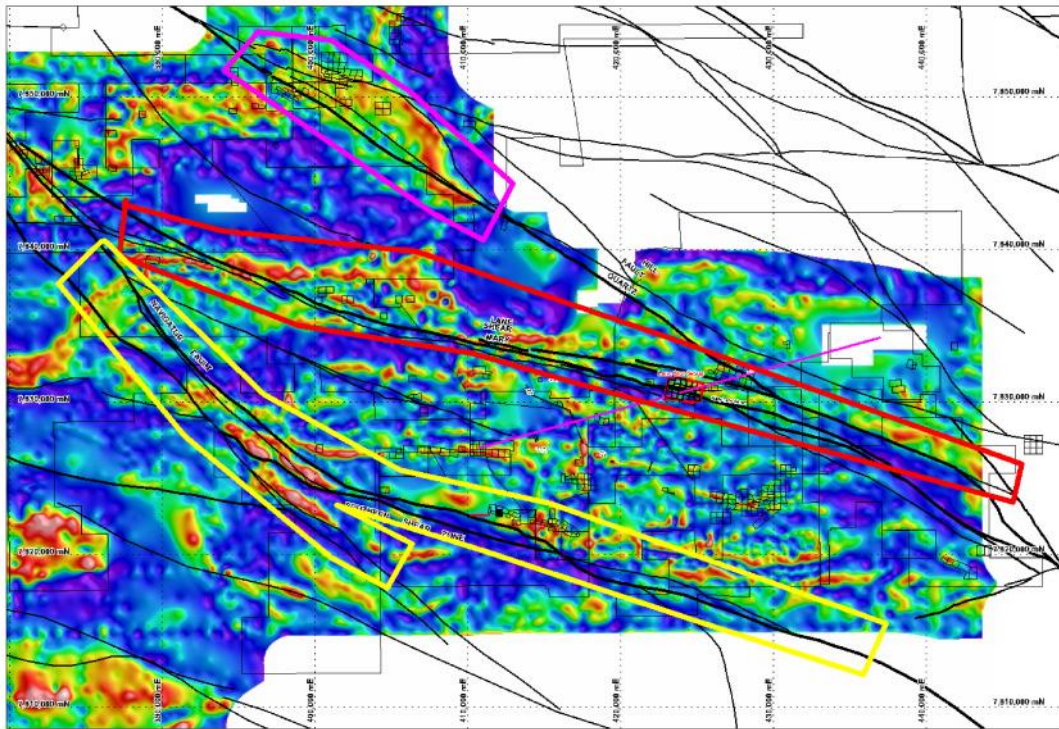


Figure 10: Regional TCMF structures and the 2008 ground gravity data

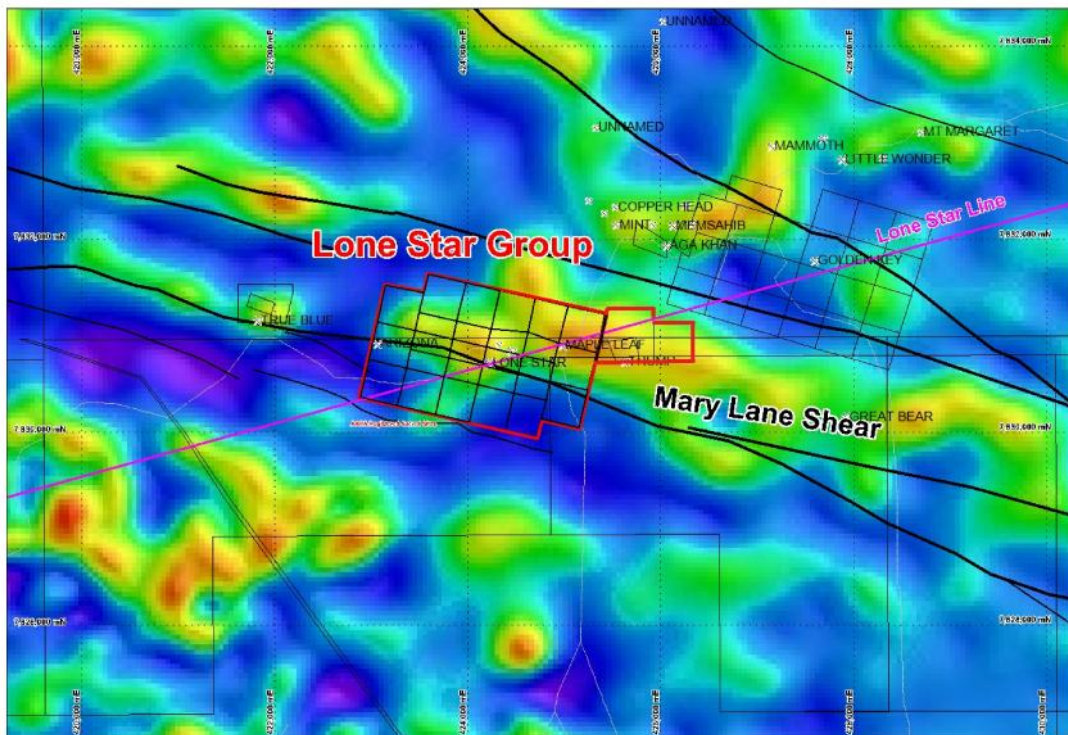


Figure 11: 2008 ground gravity, Lone Star Group and the Mary Lane Shear

## GEOCHEMISTRY

A BLEG stream sediment and soil sampling program was completed over the Lone Star Group in 1988/89. The surveys indicated anomalous Au values in the vicinity and downstream of both the Lone Star and Plain Jane mine workings.

A program of detailed rock chip sampling was completed on the leases in 1995, comprising 114 samples collected from ironstone (+/- mine workings), altered sediment 'envelopes', haematite-altered shear zones and haematite shale units.

The samples returned peak values of 0.19 ppm Au, 410 ppm Cu and 410 ppm Bi, and generally the sheared and altered sediment 'envelope' to the ironstones were more anomalous than the ironstones proper. Plain Jane samples returned values to 4.5 g/t Au, 640 ppm Cu and 0.2% Bi from sheared, haematite-rich and brecciated mudstone, on the ironstone margins at the 20foot underground level.

In 1995, a program of grid based geochemical vacuum drilling was also completed, with the objective of defining anomalous geochemistry possibly related to concealed oxidised ironstones and/or shear hosted mineralisation. Drilling was undertaken on a 200m x 50m local grid, and a total of 228 holes (1,571m) were completed (drilling did not cover areas with inaccessible topographic relief). Drilling returned bedrock geochemical values to 221 ppb Au, 195 ppm Cu and 80 ppm Bi, defining a robust anomaly related to quartz-haematite impregnated sediments in the NW corner of the lease block. A broad low order anomaly peaking at 28 ppb Au was also outlined to the east of the Lone Star Mine.

### **6.2 Historical Exploration**

The Lone Star and Plain Jane Mines were discovered in 1935 and 1936 respectively. In 1937 the AGGSNA conducted magnetic surveys within the Tennant Creek field including the Lone Star area. Results defined a prominent anomaly 200m NW of the Lone Star Mine.

Between 1951 and 1954 the Northern Territory Geological Survey (NTGS) drilled three (3) diamond holes testing areas down plunge of the Lone Star open cut workings. Patchy Au-Cu mineralisation was returned in two holes in ironstone.

Between 1962 and 1965 a further four (4) holes (LSDH001 – 004; Holes were renamed from original DDH to LSDH) were drilled to test the AGGSNA magnetic anomaly. Results defined an ironstone hosting patchy Cu mineralisation with the best result LSDH001 with 1.8m @ 6.2%Cu from 157m.

One further diamond hole (LSDH-005) and 57 wagon holes (short auger) were drilled by the NTGS between 1967 and 1969 in the area between Lone Star and the buried ironstone body to the Northwest. Two wagon drillholes intersected the northern edge of the Lone Star ironstone body which contained low grade secondary copper mineralisation, and several other holes intersected anomalous geochemical values.

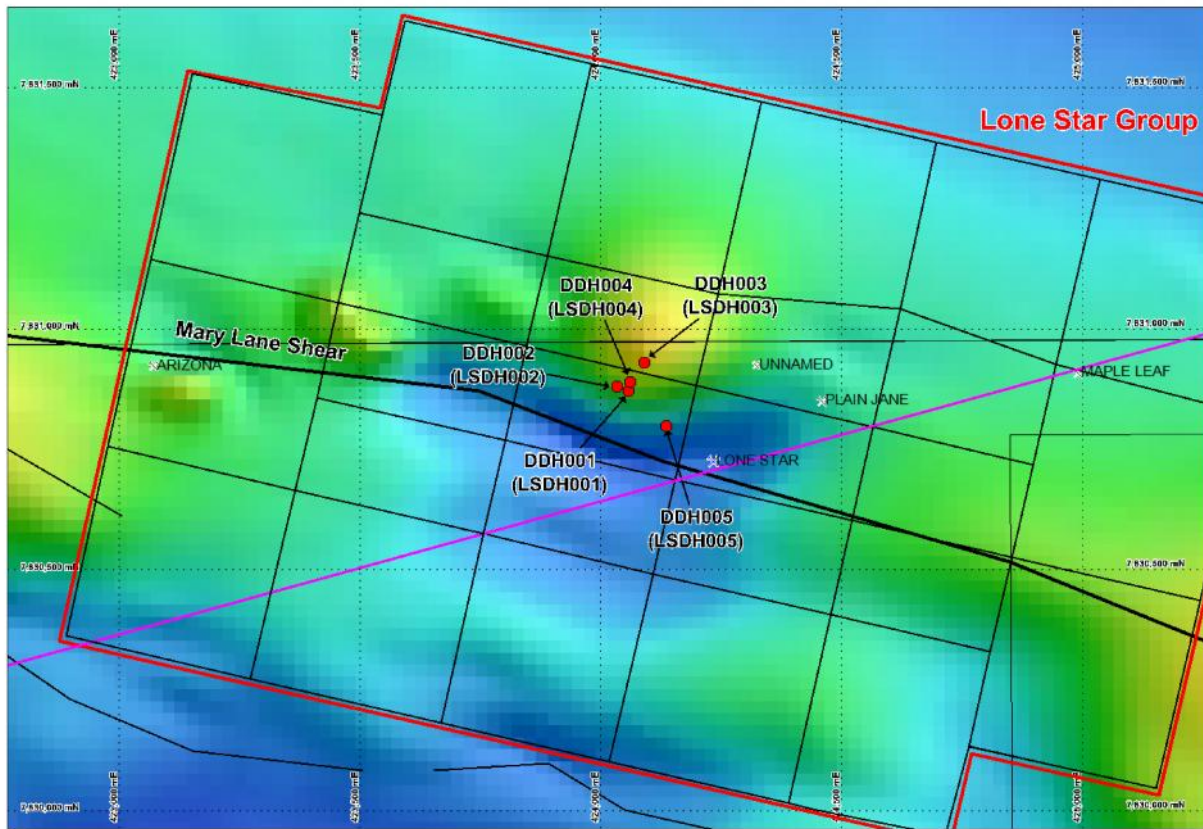


Figure 12: LSDH hole locations vs. VRMI

Hole ID	From (m)	To (m)	Lithology
LSDH-001	0	140	SL/GW
LSDH-001	140	145	SLcq
LSDH-001	145	180.1	MHcqt
LSDH-001	180.1	197.6	SL/GW
LSDH-002	0	198.1	SLGWq
LSDH-003	0	97.54	SL
LSDH-003	97.54	103.6299	SLcq
LSDH-003	103.6299	128.3	SL
LSDH-003	128.3	131	HMccp
LSDH-003	131	138.6799	GWcq
LSDH-003	138.6799	199.1	HMcj dq
LSDH-004	0	135.6	SL/GW



LSDH-004	135.6	199.6	Mtcq
LSDH-005	0	137.2	SSSLc

Table 2: LSDH lithological logging

ADL interpreted the 5 DDH holes intersected ‘...black and dark green chlorite alteration, grey talc-magnetite, minor dolomite, quartz magnetite-hematite, jasper-quartz, massive hematite-magnetite and some chalcopyrite. These alteration types were mostly between 140m – 200m vertical depth, but some alteration occurs up to 76m. The most common alteration type was dark green and black chlorite.....The above alteration types indicate that the government drilling intersected the top of the magnetite body only.....’, ADL also stated that the drilling indicated a plunging body to the north west.

In 1972 and 1973 Nobelex (exploring for ADL) and Inter Copper NL (Inter Copper) conducted ground gridding followed by ground magnetics over the Lone Star area, again defining the Lone Star magnetic anomaly (a compact circular anomaly with an amplitude of 400nT), there was also a small contour depression to the north most likely associated with a small outcropping ironstone. The grid origin is the Lone Star Trig and was conducted on a 100m x 50m grid and was levelled with respect to mean sea level. The grid was run for ground magnetics using a Geomatics Proton Magnetometer G816. In 1976 a further diamond hole (LSDH-553; again renamed from the original DDH to LSDH) was completed at the Lone Star Mine by Nobelex-Inter Copper with the best result being 14m @ 0.37% from 226m, 21m @ 0.68% from 243m and 34m @ 0.59% Cu from 294m.

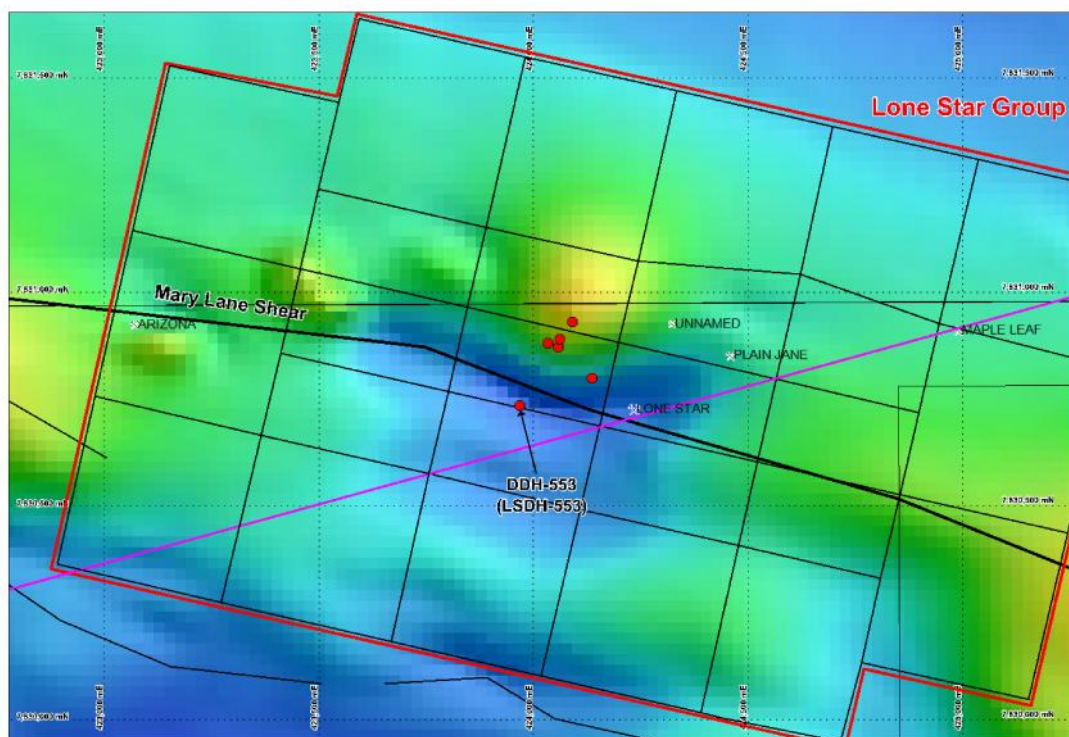


Figure 13: Location of LSDH553

Hole ID	From (m)	To (m)	Lithology
LSDH-553	0	225.4499	SLGW
LSDH-553	225.4499	240	MHcq
LSDH-553	240	263.6499	SLcmt
LSDH-553	263.6499	383	cmthq
LSDH-553	383	408.1	SL

Table 3: LSDH lithological Logs

ADL interpreted LSDH-553, refer to figure 14 '*....intersected hydrothermal alteration between 225m and 347.5m. The main alteration types intersected (excluding the chlorite zones) were quartz-magnetite-hematite with some chalcopryrite between 227m and 255m, and grey talc-magnetite between 259m and 346m. Some alteration zones, especially the lower grey talc-magnetite zones, were re-intersected because faulting had displaced the body. These faults were probably the 160° – 340° set which were mapped at surface....*'

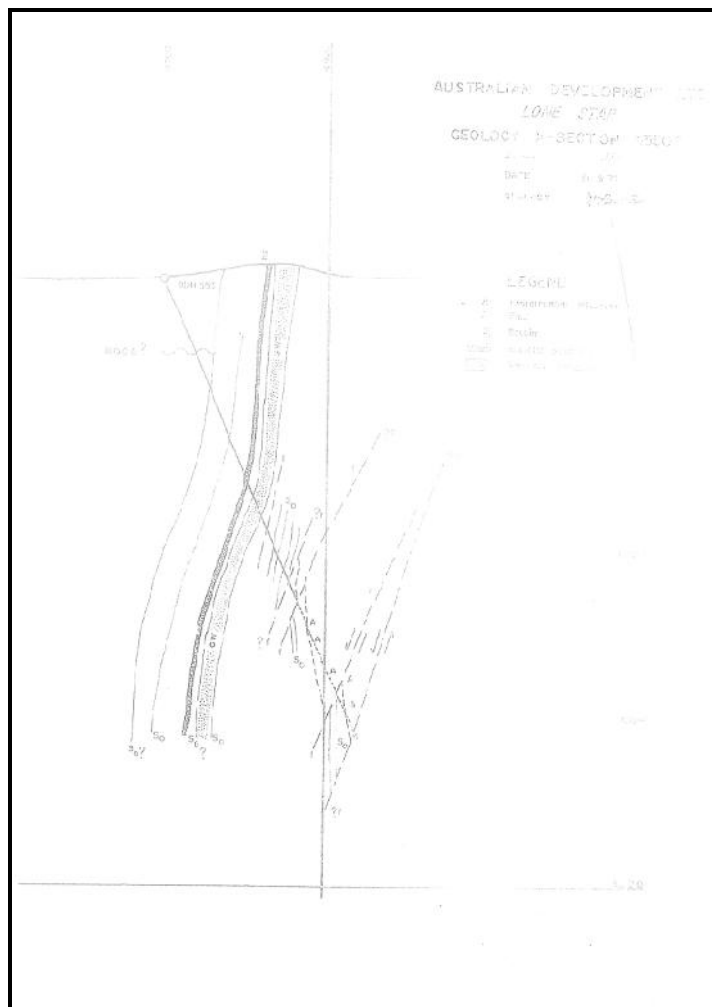


Figure 14: LSDH-553 Cross Section (ADL)

From 1978 - 94 ADL (Nobelex) entered into a Joint Venture with Homestake Australia Ltd. Based on the encouraging intersections of ironstone, alteration and Cu mineralisation, to

further drill the Lone Star prospect, 10 diamond (LSDH-554, 555, 581, 582, 584, 587, 588, 590 – 592) and 23 RC drill holes (LSRC001 – 023). The drilling defined at least two smaller ironstone bodies with associated alteration of the surrounding sediments. Patchy copper and gold were intersected throughout and on the margins of the ironstone bodies, the 2 tables below details the significant results;

Work Completed	Significant Results
LSRC-002	3m @ 2.47g/t Au from 22m 3m @ 3.12g/t Au from 35m 1m @ 1.10g/t Au from 51m
LSRC-003	2m @ 1.54g/t Au from 23m
LSRC-004	2m @ 9.31g/t Au from 75m 2m @ 2.41g/t Au from 85m
LSRC-005	2m @ 1.37g/t Au from 46m 6m @ 1.74g/t u from 56m
LSRC-006	1m @ 1.79g/t Au from 54m 1m @ 1.05g/t Au from 64m
LSRC-007	2m @ 1.49g/t Au from 39m 4m @ 1.33g/t Au from 45m 6m @ 2.17g/t Au from 56m
LSRC-008	1m @ 1.07g/t Au from 58m 2m @ 1.76g/t Au from 61m
LSRC-009	1m @ 1.94g/t Au from 50m 1m @ 1.24g/t Au from 54m
LSRC-010	2m @ 1.10 g/t Au from 35m
LSRC-011	1m @ 0.24 g/t Au from 22m
LSRC-012	1m @ 2.92 g/t Au from 96m
LSRC-015	2m @ 30g/t Au from 198m



LSRC-020	3m @ 4.65 g/t Au from 183m
LSRC-021	N.S.R. Intersected 21m of ironstone
LSRC-022	120m of Ironstone; 1m @ 2.17g/t Au from 204m & several +1% Cu results.
LSRC-023	125m of ironstone, 1m @ 1.27 g/t Au from 161m downhole
10 Diamond Holes (3,841m)	DDH-590 1m @ 12.7g/t Au from 156m 1m @ 11.5g/t Au from 217m DDH-592 1m @ 10.7g/t Au form 488m

Table 4: ADL 1978 drilling Significant Results

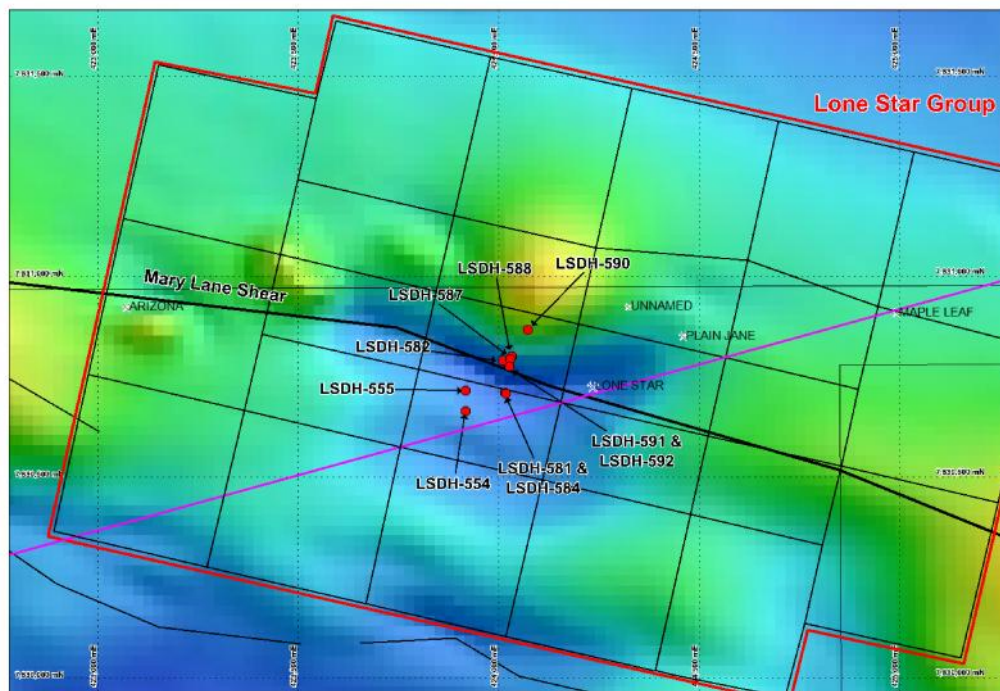


Figure 15: ADL 1978 drilling locations

The RC drilling was proposed with two aims;

1. To test the north-dipping extension to the mine workings at shallow 'open-pittable' depths, twelve holes (LSRC-001 – 012) were completed to the north of, and beneath the mine workings. All holes intersected significant widths of ironstone (to 22m downhole), however mineralisation was of a low tenor, and it was concluded at

the time that no further work was warranted on the shallow target. No collar information for LSRC-011 & 012 could be located.

2. To test the deeper concealed ironstone a further nine holes (LSRC015 – 023) were completed;

Downhole magnetic probing of LSRC-010 – 012 indicated that they had passed beneath the ironstone body, which severely restricts the potential immediately below the mine workings proper. Importantly it should be noted that the Lone Star Hill Sacred Site (Tarla) was registered after this drilling was completed, and the exclusion zone encompasses holes LSRC-001, 002, 003, 009 and 010. The remaining collars in this program are immediately north of the exclusion zone, and are drilled to the south beneath the Sacred Site. The registration of this site now precludes any further evaluation of this shallow potential. The ironstone and mineralisation are still open to the east of section 4620E (local) but the exclusion zone discounts 120m of potential strike immediately east of this section.

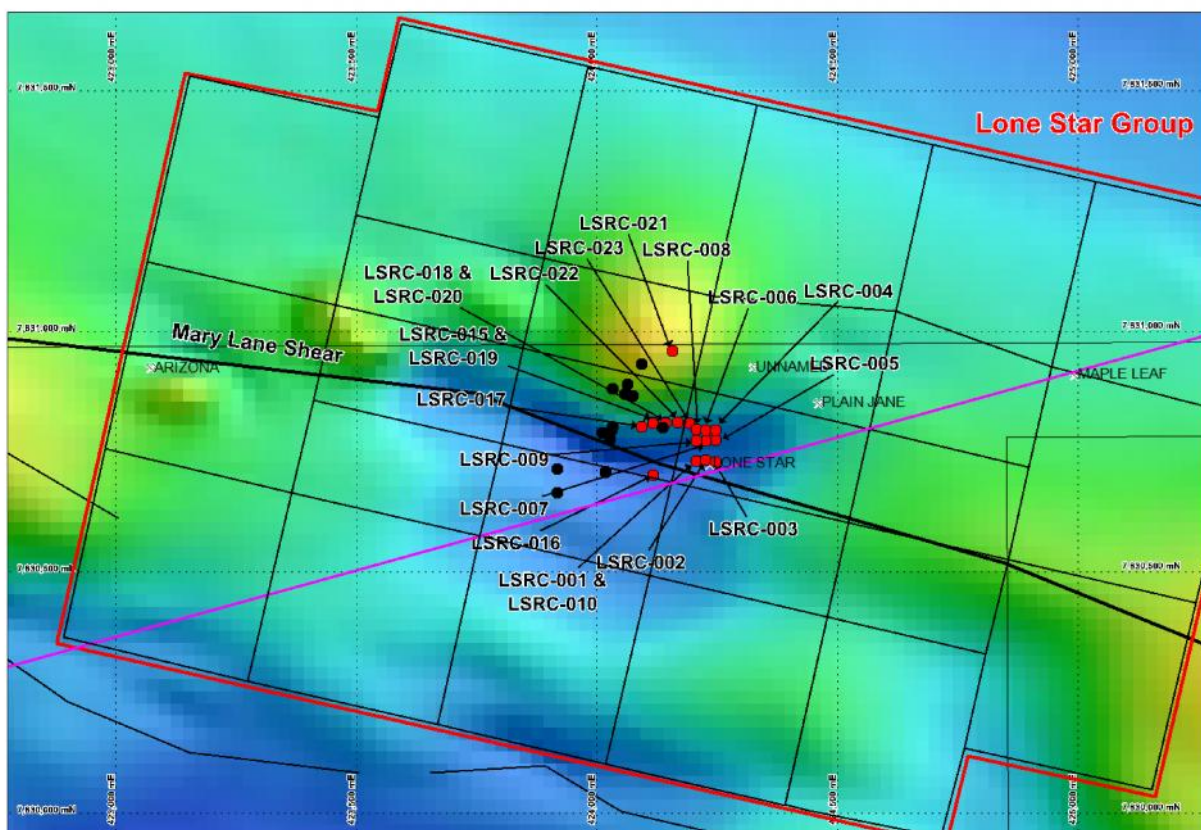


Figure 16: LSRC drilling locations

Interpretation of downhole magnetics for LSRC-020, indicated additional potential for more ironstone to the east, therefore another three holes (LSRC-021 – 023) were drilled to the

east of LSRC-020. All holes returned encouraging intersections of ironstone and alteration, however assay results were negligible.

Interpretation of downhole magnetic probing continued to indicate that a mass of (untested) ironstone existed to the east of LSRC-023. Despite this conclusion, it was considered that no further work was warranted, given the lack of substantial widths of Au mineralisation.

Significant results are detailed in the table above;

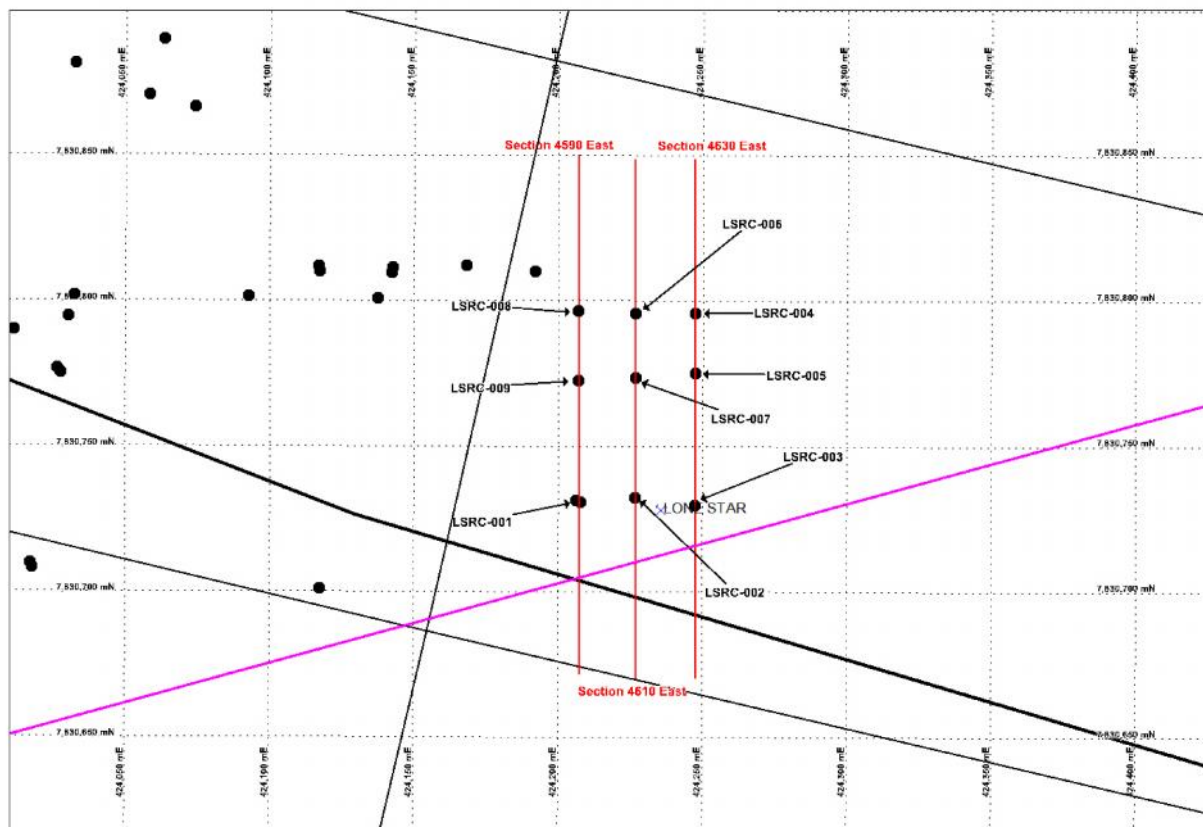
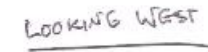


Figure 17: LSRC cross-section locations




$$> 0.5\% \text{Ca}$$

LEGEND

FIG. 1.  $\gamma$  vs.  $\beta$  for  $\beta = 0.25$  and  $\beta = 0.50$ .

LHS: Cu 2.4mm

RHS δ/ppm

Collected by AU, 18 August 1991.

NORMANDY GOLD PTY LIMITED

LONE STAR

SECTION 4630 EAST

INFLUENCE 10 Metres

SCALE

1:500

DRAWN

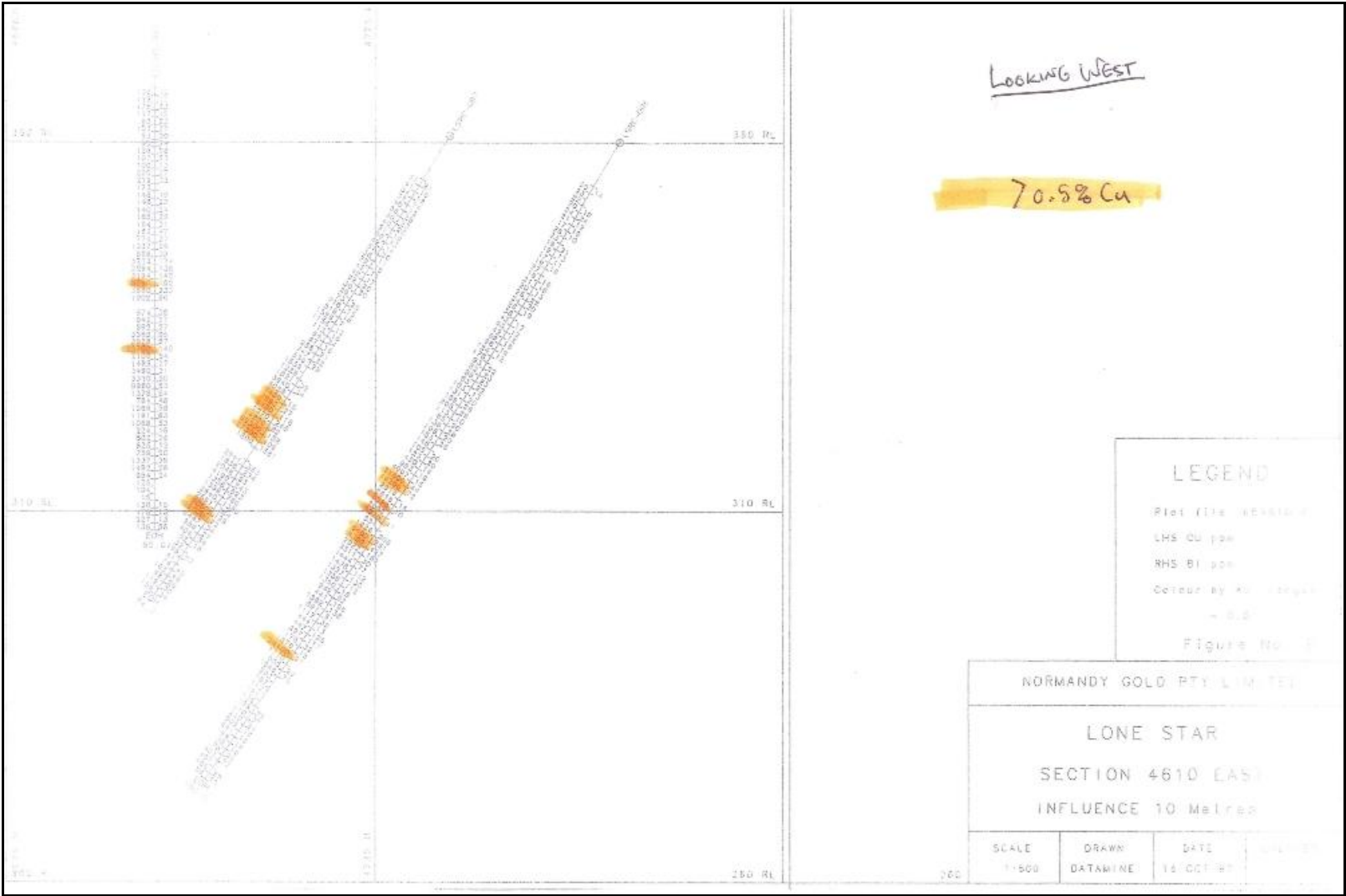
DATE/TIME

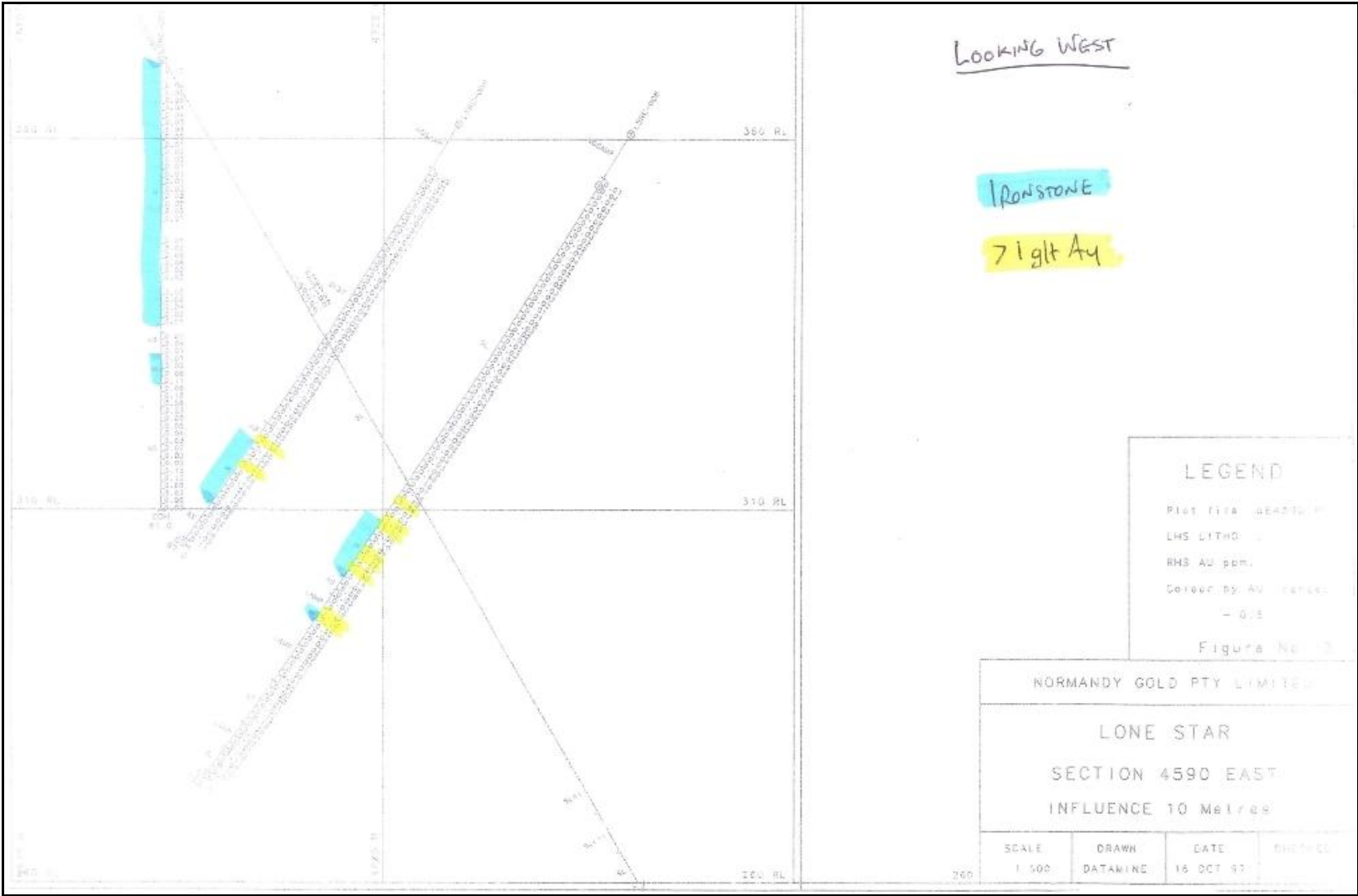
DATE \_\_\_\_\_

16 OCT 1983

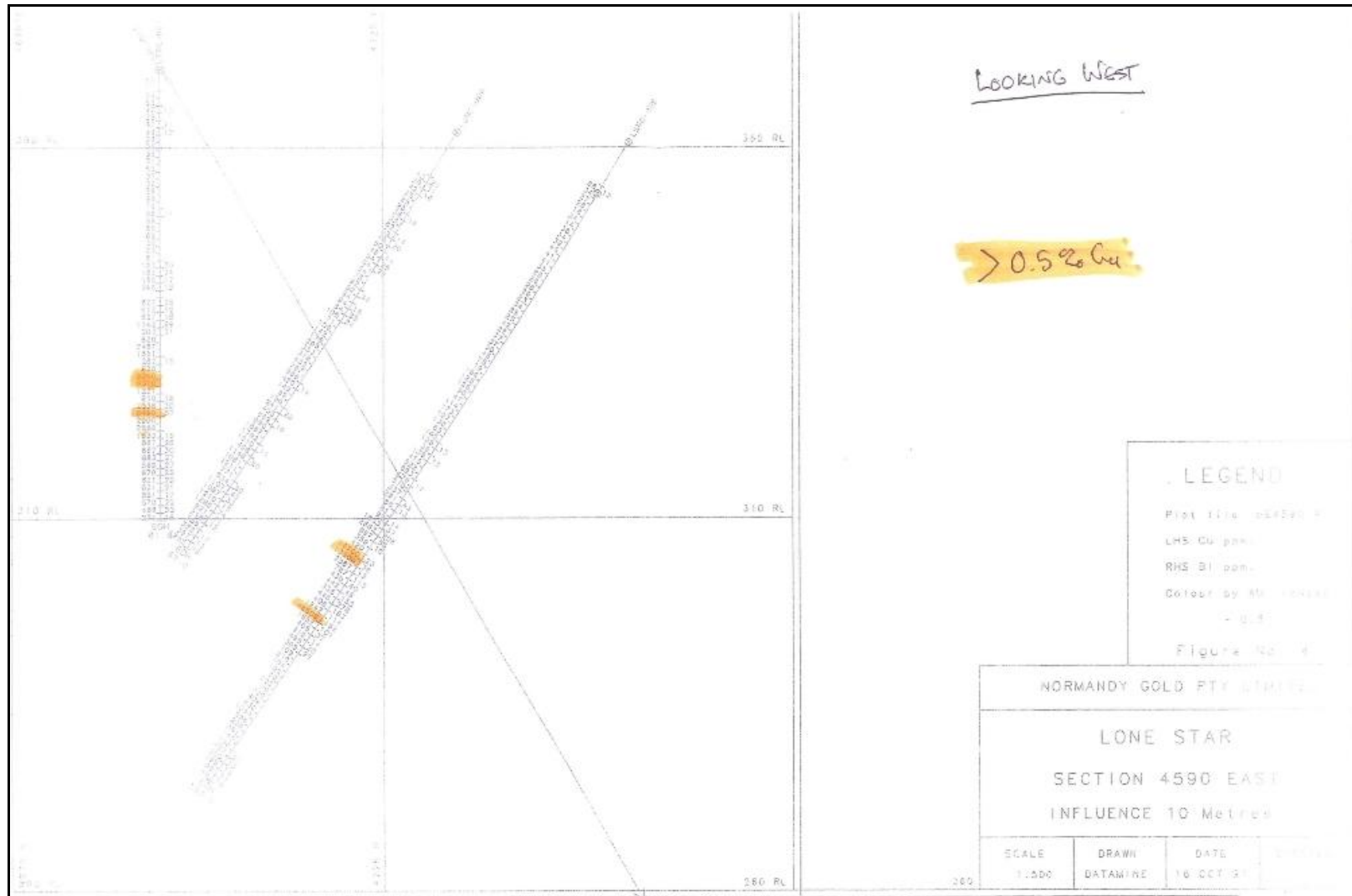












This was followed by a BLEG soil and BLEG soil-stream geochemical programme conducted over the Lone Star area. A total of 114 samples were taken. The highest gold values were recorded in the vicinity and downstream of both the Lone Star and Plain Jane Mines, result are displayed in the table below;

Work Completed	Significant Results
BLEG geochemistry, mapping	BLEG geochemical anomalies to 10.61ppb Au

Table 5: BLEB significant Results

In 1994 a re-appraisal of the Lone Star area was undertaken and resulted in a change of focus from deep magnetic targets to shallow oxide bodies. Work conducted following this included rock chip sampling, vacuum drilling and follow-up RAB and RC drilling at the Plain Jane and Arizona mines.

Rock chipping was conducted over areas not accessible with vacuum drilling. A total of 67 rock chips were taken. Results returned were subdued and peak values included 4.5g/t Au, 640ppm Cu and 2130ppm Bi at Plain Jane. Generally, bounding hematite altered sediments were more anomalous than massive ironstone. Significant results are detailed in the table below.

Vacuum drilling over the Lone Star area was conducted in late 1995. A total of 228 vertical holes for 1,571m were completed. Bedrock assay results showed a broad lower order anomaly was defined east and along strike of the Lone Star Mine, results up to 28ppb Au, 30ppm Cu and 1.8ppm Bi, as detailed in the table below.

A reinterpretation of the available magnetic data (1975) was undertaken in 1995 (Weis). The task was made difficult due to the limited quality of the data, which was considered to be inadequate for detailed structural or lithological mapping, but sufficient to enable targeting of the magnetic anomalies, and review the regional structural and stratigraphic setting of the leases.

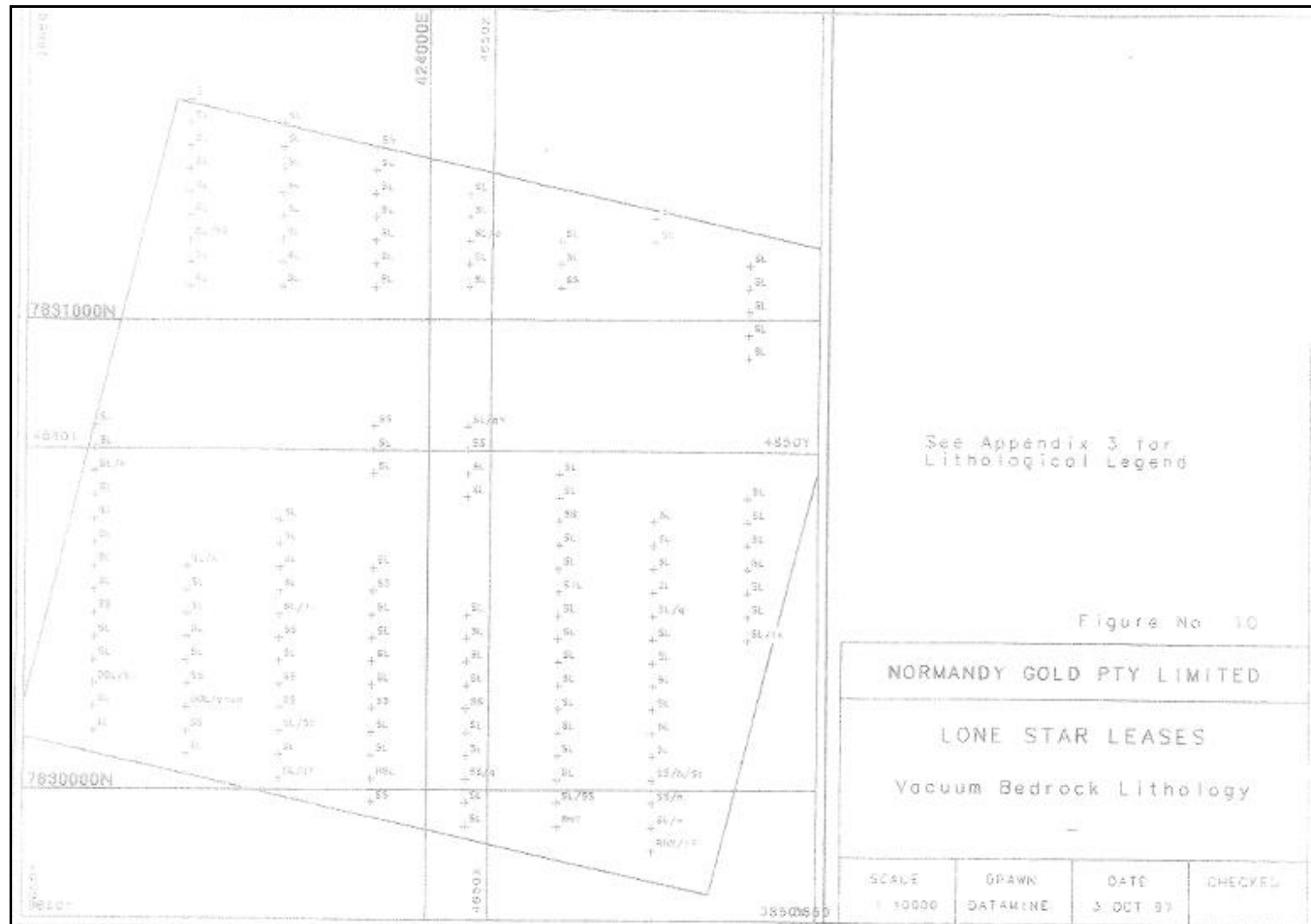
Weis felt that the initial modelling of this data in 1976 (Geoex), and again in the late 1980's (Farrar) was sufficient, given that the drilling at Lone Star had intersected large ironstones causative of the anomalies, and no further modelling was completed at this stage. The original modelling (confirmed by drilling) indicated the following:

***Ironstone body of dimensions 200m (strike) x 30-50m (width), striking EW and at a depth to top of 150 to 180m. (Farrar – 2.4Mt @ 250m vertical depth to centre of magnetic mass).***

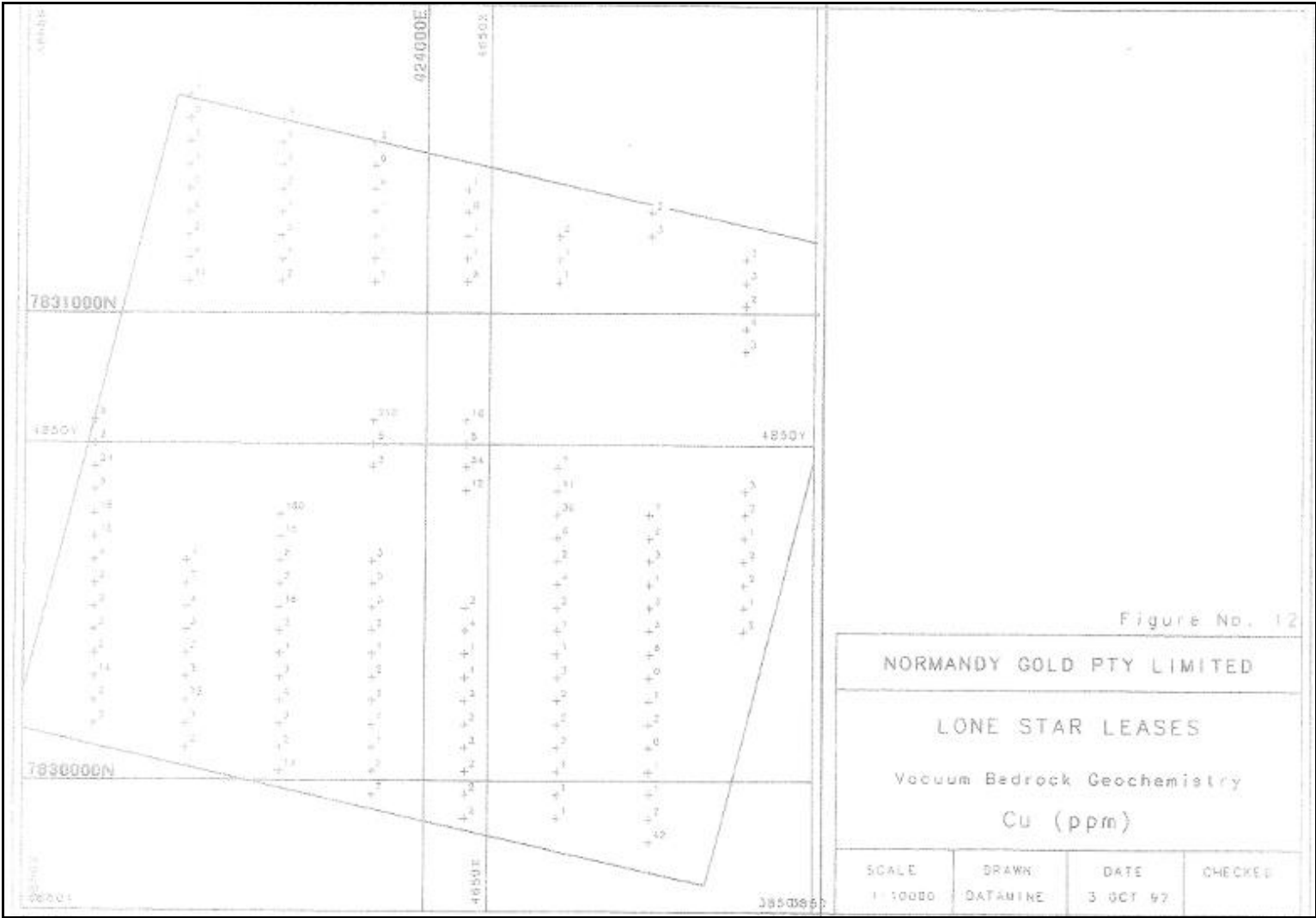
It was recommended that high resolution magnetics be flown over the leases to enable detailed interpretation of local structure and stratigraphy, this was not undertaken. In addition, it was recommended that a TDEM survey be undertaken to evaluate the characteristics of the known ironstones, and possibly indicate further shallow resistive bodies. This was also not undertaken.











Downhole magnetic probing of drillholes was completed through the late 1980's to the early 1990's, and results were reinterpreted in 1995, with the aim of determining the potential for further drilling. Ten holes were probed at Lone Star. Interpretation of the data at Lone Star indicated that all holes probed were targeted on the eastern portion of the magnetic feature (most of the historical drilling, pre-1985 was completed on the western section of the anomaly).

In 1996 RAB and RC drilling was conducted at Plain Jane. A total of 207m of RAB in three (3) holes (PJRB-001 – 003) and 300m of RC in two (2) holes (PJRC-001 – 002) were completed, targeting extensions to the near surface workings associated with the Plain Jane Mineralised Structure. The 3 RAB holes were collared on the hill hosting the mine, and drilled to the south, they intersected quartz-hematite-chlorite and quartz specular hematite ironstone and strongly hematized sericite-altered siltstone. To evaluate the down dip potential of the mineralisation encountered in the RAB holes the two RC holes were drilled from the mine adit and drilled to the north beneath the RAB holes. The holes were collared approximately 45m below the RAB holes. Neither RC hole intersected the ironstone evident in the RAB drilling. A chlorite-altered siltstone was intersected at the target position, possibly representing a “feeder” shear zone below the ironstone, results are summarised in the table below;

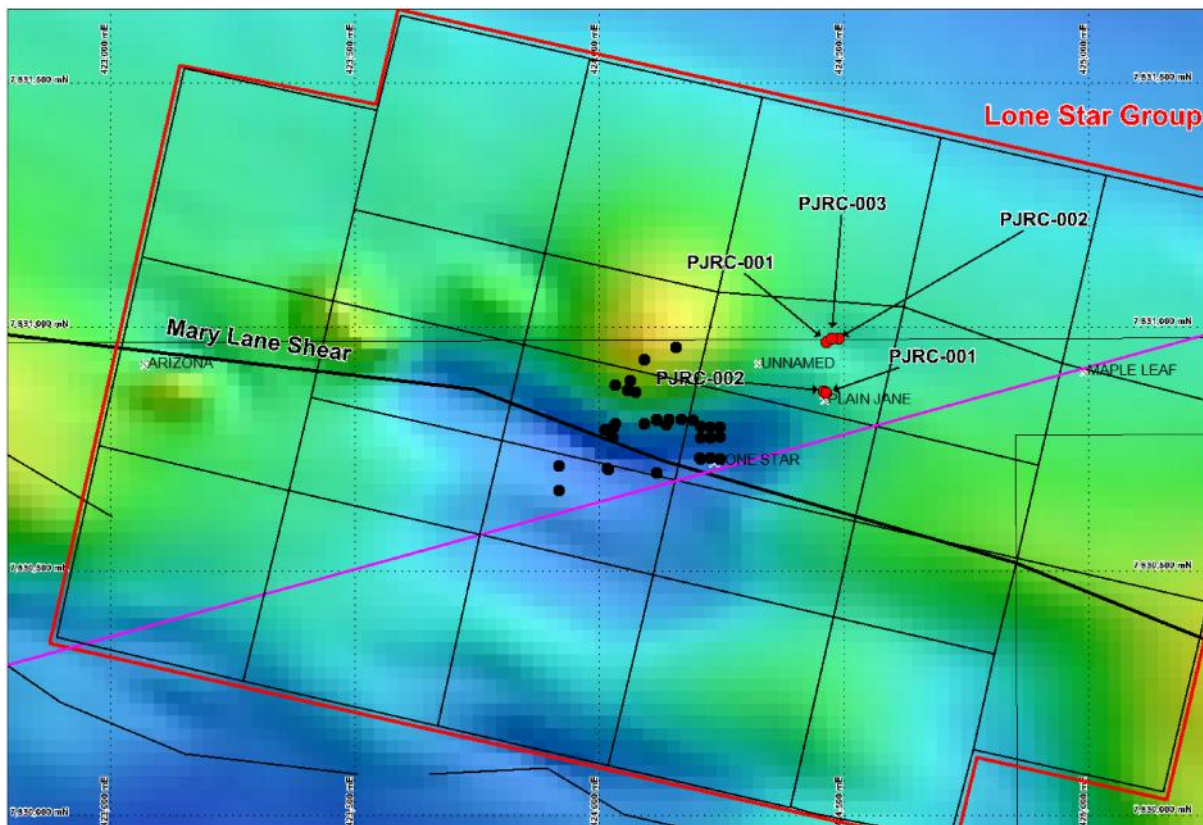


Figure 25: Plain Jane RC drilling locations



Work Completed	Significant Results
Rock Chipping (67 samples)	4.5g/t Au, 640ppm Cu and 2130ppm Bi at Plain Jane
140 Vacuum Drillholes (909m)	Bedrock anomaly @ 28ppb Au, 30ppm Cu and 1.8ppm Bi
5 RAB/RC Drillholes (507m) at Plain Jane	<p>PJRB-001</p> <p>2m @ 2.22g/t Au and 9230ppm Bi from 24m</p> <p>PJRB-002</p> <p>9m @ 1.60g/t Au from 18m</p> <p>PJRB-003</p> <p>3m @ 1.35g/t Au from 60m</p> <p>6m @ 2.30g/t Au from 72m</p> <p>PJRC-001</p> <p>3m @ 0.14g/t Au from 78m</p>

Table 6: Rock Chipping and 1995/96 Drilling Significant Results

Also during 1996, a program of RAB drilling was undertaken to investigate the anomalous vacuum geochemistry outlined at the Arizona mine area and the north west portion of the Lone Star Group and also to test extensions to the surface workings.

A 221 ppb Au anomaly with supporting Cu and Bi geochemistry located 200m to the north of the Arizona Mine was tested with 6 RAB holes (LSRB-001 – 006). Drilling intersected dominantly Warramunga sediments and minor porphyry. Drillhole LSRB-004 intersected a concealed quartz-haematite ironstone in chloritic sediments from 39 to 42m downhole. This drillhole returned results anomalous results including: 10m @ 0.04 g/t Au from 36m, and 18m @ 0.1% Cu, 167 ppm Bi from 36m downhole. Drillholes LSRB-002 and 003 intersected sediments strongly anomalous in Mn and Fe.

At the Arizona Mine the 3 RAB holes (AZRB-001 – 003) were completed to 60m depth, and all holes intersected haematite-quartz with enveloping talc-haematite-dolomite alteration. Results were disappointing, and no further work was proposed:

Work Completed	Significant Results
3 RAB Drillholes (180m) at Arizona	AZRB-001

	6m @ 0.24g/t Au from 18m
	AZRB-002
	3m @ 0.17g/t Au from 36m
	AZRB-003
	15m @ 0.10g/t Au from 23m

Table 7: RAB drilling significant results

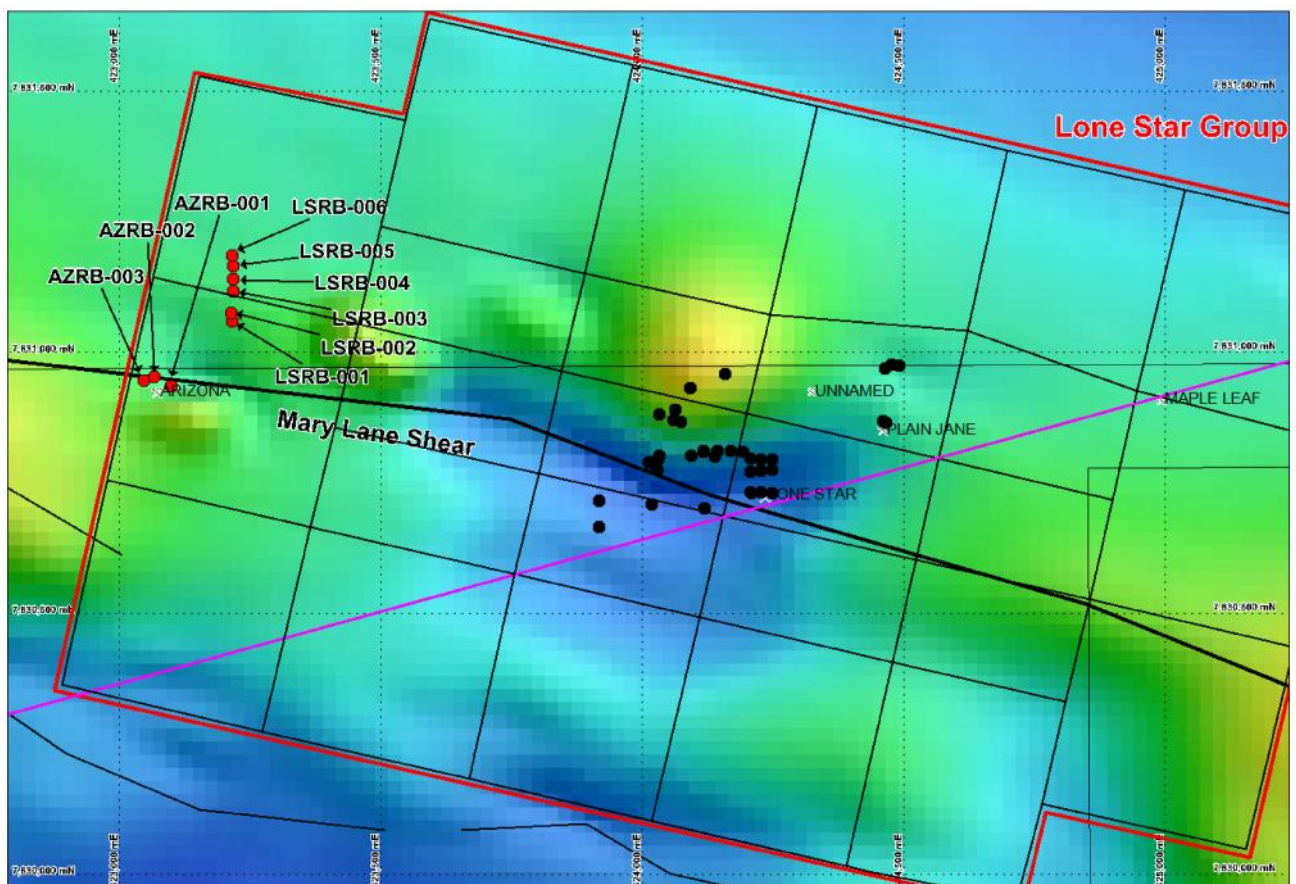


Figure 26: Arizona drilling locations

During the 2000 rationalisation review all historical data was revisited to gauge the potential remaining at Lone Star, with the following points of note extracted directly from the report:

*Shallow – The shallow potential below the mine workings at Lone Star remains open to the east from section 4620E, although the sacred site exclusion zone discounts 120m of*

*potential strike immediately east of this section. The shallow workings have also not been tested between 4580E and 4500E, to the west of the sacred site.*

*Assuming the ironstone and mineralisation continue to the west, an estimate of ironstone mass from 4500E to 4580E is in the order of 0.2 – 0.25Mt of ironstone (80m x 50m x 15m x 4). If the ironstone is 15% - 20% mineralised, which is an approximation based on the drilling of LSRC-001 to 010, there is possibly in the order of 30000t – 50000t @ 2 g/t Au in situ.*

### **3,000oz Au**

*Deep - The drilling of the larger deep ironstone has been relatively comprehensive, and combined with the downhole magnetic data has given a relatively good control on the geometry of the body. The main ironstone has been drilled from section 4580E to 4320E, and is open at both ends, although the magnetic signature tails off at these sections, possibly indicating the limit of the strike. The body averages 30m true width from 4580E to 4400E, where it thickens substantially to 60m true width to the west of 4400E (structural thickening due to sinistral strike-slip movement?). Depth to top varies from 120m in the east (possible down dip faulted? extension of the mine workings), to 200m to top at 4350E, westerly plunge. The body dips from steeply south through vertical to steeply north, and has a down dip extent of 150m. Several smaller satellite bodies are sub-parallel to the main body, and the main body appears to have been possibly faulted to the south at 4320E, although this is only interpretation due to lack of drilling.*

*The ironstone is sparsely mineralised in thin discontinuous high grade zones which average 10 g/t Au over true widths of 1.5 – 2m.*

*Assuming the ironstone is continuous from 4320E to 4580E, an estimate of ironstone mass is in the order of 4 – 4.5Mt of ironstone (260m x 140m x 30m x 4). If the ironstone has a mineralised true width of 1.5m which is an approximation based on the drilling to date, there is possibly in the order of 200000t – 220000t @ 10 g/t Au(?) in situ (260m x 140m x 1.5m x 4). This is at an average depth to the top of the ironstone of 170m.*

### **70,000oz Au**

*There is still potential for further drilling of the ironstone both along strike and in gaps:*

- to the west of section 4280E (shallow and deep);*
- 4380E to 4280E, above 300m vertical depth;*
- 4460E to 4480E, down dip below 200m vertical depth;*
- to the east of 4520E, below 200m vertical depth, although the ironstone does appear to pinch out at this depth on section 4500E.*

*The potential for a substantial tonnage of high grade gold mineralisation is moderate, but given the lack of both number and width (<2m) of mineralised drill intersections observed*

*to date, the potential is limited. Potential to test the ironstone at the level of expected supergene enrichment has some merit, but widths of mineralisation would need to increase substantially.*

## 7. CONCLUSIONS

A detailed prospectivity and tenement rationalisation commenced in April 2000 and reported in November 2002, the results of this rationalisation are stated in the below table;

PROSPECT	TENEMENT	ENVIRONMENTAL LIABILITY (Y/N) (Minor-Moderate- Major)	RESOURCE POTENTIAL (Y/N) (Size, Depth, Grade)	EXPLORATION POTENTIAL (Y/N) (Minor- Moderate-High)	RANK (1 - 10)	Gold	Copper	RECOMMENDATIONS (Sell/Retain/Surrender/JV)	ILUA/ ALRA/ OTHER	COMMENTS
Lone Star	ML C362- 375, ML C530, ML C606-616	Major  Approx\$60,000 in 2002\$\$	Shallow: 30K - 50Kt @ 2 g/t Au, <80m depth, 1.5 - 2m true width - 2000 – 3200 oz Au  Deep:200K - 220Kt @ 10g/t Au, >170m depth, 1.5 - 3m true width - 65,000 - 70,000 oz Au	Yes High	6	X	X	Downgraded due to aboriginal matters and depth	60% ILUA 40% ALRA	Data Assessment Required

Table 8: Lone Star 2000 Rationalisation Review Ranking

The Lone Star group of leases contains several historical mine workings which have produced high grade gold in albeit limited tonnages in past years.

The Lone Star magnetic anomaly is the most significant feature of this group of leases, and is attributed to a concealed ironstone at a depth of 100m vertical, and containing a modelled (magnetic) mass of 2.5Mt. This ironstone has been extensively

drilled and is shown to contain in the order of 4Mt of ironstone. This difference may be accounted for by a substantial portion of haematite in the body. The gold mineralisation in the Lone Star mine workings has been shown to extend at shallow depths.

The structural setting of the Lone Star leases is considered to be favourable, located on the Mary Lane Shear Zone, and an east-plunging major anticline.

The potential of the Lone Star Leases is considered to be moderate to low for the discovery of large tonnage / high grade (stand alone) gold mineralisation, however the potential is moderate to high for small tonnages of open-pittable Au mineralisation.

**Shallow Potential** – The shallow potential below the mine workings at Lone Star remains open along strike to the east, although the sacred site exclusion zone discounts 120m of potential strike immediately east of this section 4620E. The shallow workings have also not been tested between 4580E and 4500E, to the west of the sacred site.

Assuming the ironstone and mineralisation continue to the west, an estimate of ironstone mass from 4500E to 4580E is in the order of 0.2 – 0.25Mt of ironstone (80m x 50m x 15m x 4). If the ironstone is

15% - 20% mineralised, which is an approximation based on the drilling of LSRC-001 to 010, there is possibly in the order of 30000t – 50000t @ 2 g/t Au (open-pittable) in situ.

**Deep Potential** – The potential for a substantial tonnage of high grade gold mineralisation is low to moderate, but given the lack of both number and width (<2m) of mineralised drill intersections observed to date, the potential is limited. Potential to test the ironstone at the level of expected supergene enrichment has some merit, but widths of mineralisation would need to increase substantially.

The drilling of the larger deep ironstone has been relatively comprehensive, and combined with the downhole magnetic data has given a relatively good control on the geometry of the body. The main ironstone has been drilled over a strike of 260m and is open at both ends, although the magnetic signature tails off at these sections, possibly indicating the limit of the strike. The body averages 30m true width, and thickens up to 60m true width to the west of 4400E. Depth to top varies from 120m in the east (possible down dip faulted? extension of the mine workings), to 200m to top at 4350E. The ironstone is sparsely mineralised in thin discontinuous high grade zones which average 10 g/t Au over true widths of 1.5 – 2m.

An estimate of ironstone mass is in the order of 4 – 4.5Mt of ironstone (260m x 140m x 30m x 4). If the ironstone has a mineralised true width of 1.5m which is an approximation based on the drilling to date, there is possibly in the order of 200000t – 220000t @ 10 g/t Au(?) in situ (260m x 140m x 1.5m x 4). This is at an average depth to the top of the ironstone of 170m.

There is also still potential for further drilling of the ironstone both along strike to the east and west and in current gaps in the drilling.

The 2000 rationalisation review rated the Lone Star Prospect 6/10 and recommended the leases be sold.

Emmerson believes a detailed re-evaluation of the Lone Star Group and its identified anomalous zone/ ore deposit is required so that the knowledge that Emmerson has gained on the distribution of economic minerals, within and immediately adjacent to, Ironstones and shear zones can be applied to the Lone Star Group and determine if the anomalous zone has been effectively tested and that the interpreted mass of the ore body has been fully evaluated.

Detailed consultation with Traditional Owners would be the first item dealt with to ensure that access to conduct the work required to evaluate in detail the anomalous zone can be completed. Should these consultations be positive then Emmerson would rank the Lone Star Group and its identified anomalous zone as a high priority.

## **8. MTA COMPLIANCE RECOMMENDATION**

It is recommended that all 30 titles be amalgamated into a single title and renew the title for future exploration activities to further explore the identified anomalous zone / ore deposit to determine its potential to host an economic deposit, as detailed above.

Any planned future activities will commence following detailed consultation with Traditional Owners in regards to access to appropriate sites to conduct exploration with the aim of protecting any areas of cultural sensitivity. Following these consultations, and should they be positive for access, then a prioritised ranking of the Lone Star Group prospectivity and the availability of resources to complete the planned future works will be conducted. Emmerson will be required to conduct a number of highly detailed desktop activities prior to any on ground exploration, and these will consist of, but are not limited to the following;

- Complete the compilation of drilling data; Early DDH drilling has structural and magnetic susceptibility data available in hard copy, but yet to be data entered for validation and upload
- Validation of the completed drilling data compilation
- Loading validated drilling data into Emmerson DataShed digital drilling database
- Import drilling data into 3D software for 3D geological and structural analysis and interpretation
- Re-model existing geophysical data where possible
- Compare and analyse the geological 3D interpretation with the new Geophysical models
- Generate targets for further geophysical surveys and/or drill testing



On ground exploration may consist of, but is not limited to the following;

- Further geophysical surveys such as HeliTEM and Induced Polarisation (IP)
- Drill testing by RC and/or DDH

## **9. REFERENCES**

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