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ANNUAL REPORT

McCARTHY'S PROJECT

E.L.'s 4931 & 4933

FOR DRIFFIELD MINING PTY LTD

BY MINING MANAGEMENT SERVICES PTY LTD

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## CONTENTS

## 1. INTRODUCTION

This report was prepared for Driffield Mining Pty Ltd by Mining Management Services Pty Ltd as part of its reporting requirements to the Northern Territory Department of Mines and Energy on Exploration Licences 4931 and 4933. The two licences have been included in the same report because their expiry dates are the same and Driffield consider the areas are part of one project centred on the abandoned McCarthy's lead mine.

## 2. LOCATION

The McCarthy's Project area is located approximately 40kms east of Pine Creek. Access is via the Kakadu Highway east of Pine Creek for a distance of approximately 32.5kms then 12kms south and east along a bush track to the old McCarthy's workings. Exploration Licence 4933 is immediately south of the access track and McCarthy's Mine.

The track continues east and then north to return to the Kakadu Highway. In the process it traverses EL 4931. The approximate positions of these roads are shown in figure 1.

## 3. TENEMENT DETAILS

Exploration Licences 4931 and 4933 were granted to North Star on the 27th June 1986. EL 4931 original consisted of four graticular blocks and EL 4933 six graticular blocks. In March 1988 an agreement was reached between Seventh State Mines NL and a number of associated and related companies and Driffield Mining Pty Ltd. This agreement resulted in Driffield obtaining the McCarthy's project, along with a number of other exploration and mining properties in the Northern Territory.

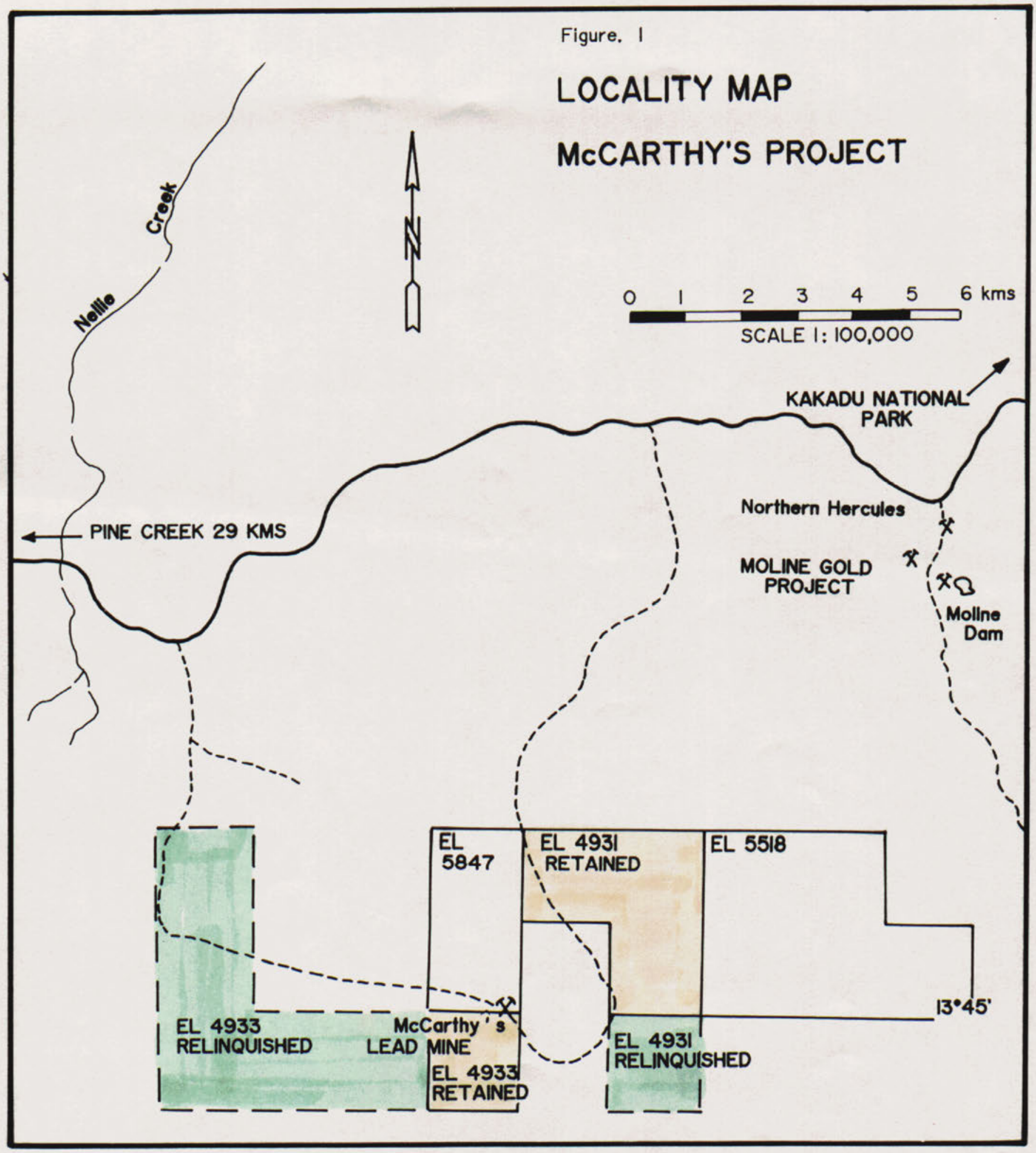


Figure. 1

LOCALITY MAP

McCARTHY'S PROJECT

The McCarthy's Project consisted of EL's 4931, 4933, 5516, 5847 totalling 17 graticular blocks and approximately 55sqr kms.

In May 1988 application was made for the partial reduction of EL 4931 from four graticular blocks to three and the reduction of EL 4933's six graticular blocks to one.

## 4. GEOLOGY

### 4.1 REGIONAL GEOLOGY

EL 4931 and EL 4933 cover a portion of the contact between the Cullen Batholith and sediments of the Finniss River Group and the South Alligator Group.

Locally the granites of the Cullen Creek Batholith consist of the more southern Allamber Springs Granite and the McCarthy's Granite. The Allamber Springs Granite is coarse grained to porphyritic, pink with biotite. The granite contains a number of younger north trending linear syenite intrusions (fig 2). McCarthy's Granite is a darker biotite/hornblende coarse grained pink - green unit.

Adjacent to the granite batholith are the sediments of the Finniss River Group (Burrell Creek Formation) and the South Alligator Group (Mount Bonnie Formation, Gerowie Tuff and the Koolpin Formations).

The disposition of these units are shown in figure 2, which has been adapted from the Northern Territory Department of Mine and Energy's Ranford Hill 1:100000 sheet.

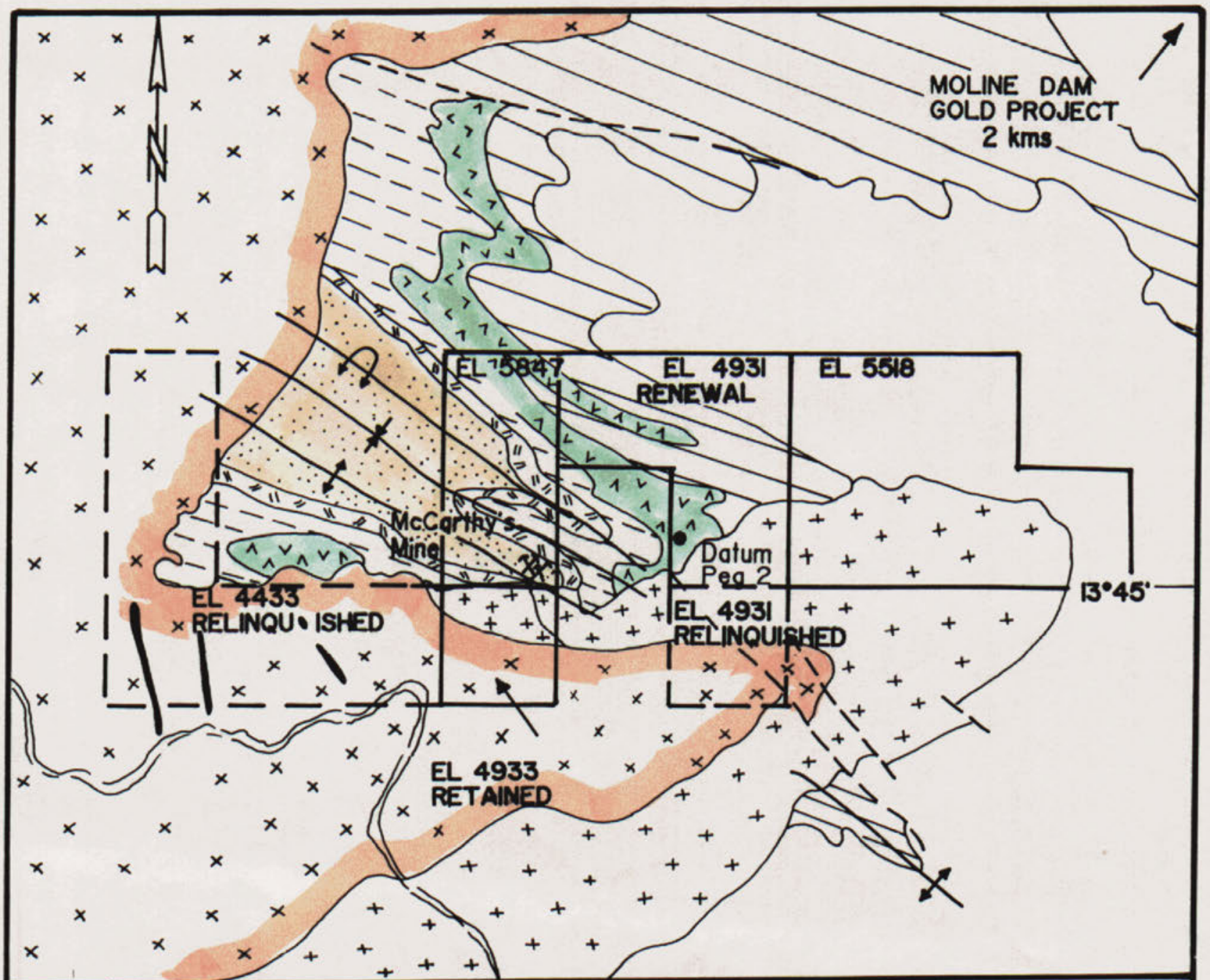


Figure. 2

# GEOLOGICAL PLAN
# McCARTHY'S PROJECT

0 1 2 3 4 kms

- Lewin Springs Syenite
- Allamber Springs Granite
- McCarthy's Granite
- Zamu Dolerite
- Burrel Creek Formation
- Mount Bonnie Formation
- Gerowie Tuff
- Koolpin Formation
- Mount Partridge Group

Adapted from Ranford Hill 1 : 100,000 Sheet

Locally the Burrell Creek Formation consists of grey - green siltstones and shales which have been altered near the granite to biotite hornfels. Its outcrop is restricted to the north-east of EL 4931.

The Mount Bonnie Formation consists of grey and grey - brown slates and phyllites which have been altered to hornfels adjacent to the batholith. It is this unit which hosts the gold mineralization at Moline and North Hercules approximately 10kms to the northeast. The structural setting at Moline is similar to McCarthy's, with the sediments tightly folded and in some cases structures overturned.

The Gerowie Tuff is a micaceous tuffaceous siltstone which has been strongly altered adjacent to the McCarthy's Granite. It overlies dark grey to black shales, slates and siltstones with chert lenses, which form the Koolpin Formation. This unit outcrops in the west of EL 4931 and the north of EL 4933.

## 4.2 EXPLORATION TARGET

The McCarthy's Project area covers Mount Bonnie Formation and lower Burrell Creek Formation sediments. Locally it is these units which host the gold mineralization at Pine Creek (30kms) Union Reefs (35kms) Spring Hill (50kms) Woolwonga and numberous other occurrences within the Pine Creek Geosyncline. The Gerowie Tuff and underlying Koolpin Formation are closely associated with gold mineralization at Cosmo-Howley, Brocks Creek and the Goldern Dyke.

Structurally the McCarthy's area is similar to other significant gold areas. Like most of the above mentioned gold deposits granite batholiths are in close proximity. The Enterprise at Pine Creek is within 2kms of the Tabletop Granite, Union Reefs is within 2kms of the Allamber Springs Granite Brocks Creek is within 3kms of the Burnside Granite etc.

Many of the significantly mineralized gold deposits in the Pine Creek Geosyncline are within complexly folded sediments including overturned fold structures. The regional geological mapping indicates a tightly folded and attenuated assymetric fold pattern within EL 4931 (fig 2). This the kind of the structural setting considered favourable for the localization of gold mineralization.

Another feature of significantly gold mineralization areas in this region is an association with magnetic anomalies. Some of the gold mineralization occurs with pyrrhotite which is weakly magnetic. This is often reflected in a airborne magnetic anomaly associated with the deposits. Both EL 4931 and 4933 have strong magnetic profiles.

In summary it was concluded the geology of the McCarthy's Area was favourable to host gold mineralization on the basis of:-

* its host rocks
* its proximity to granite
* its structural complexity
* its magnetic signiture

After considering these matters Driffield Mining Pty Ltd decided to proceed with an exploration programme to evaluate the McCarthy's Projects potential gold resources.

As EL 4933 was close to the old McCarthy's Mine it was decided the areas south of McCarthy's Mine and north of the granite batholith would be evaluated for base metals. McCarthy's Mine produced approximately 500 tonnes of pyromorphite and galena concentrate between 1913 and 1930. The ore came from a narrow shear approximately .3m wide.

## 5. THE 1987/88 EXPLORATION PROGRAMME

### 5.1 EVALUATION OF PREVIOUS DATA

The data from a number of sources including:-

* the Northern Territory Department of Mines & Energy Open Files;
* the Northern Territory Department of Mines & Energy compilation sheets on the Ranford Hill 1:100000 Sheet;
* the total magnetic intensity contours for the Pine Creek Geosyncline 1:500000
* mine records from McCarthy's Ag/Pb Mine

was collected and evaluated. It was an analysis of this data which determined the exploration targets described in section 4.2.

### 5.2 FIELD EVALUATION

#### 5.2.1 EL 4933

These exploration licences are in a remote area with relatively poor access. A considerable amount of time was spent establishing tracks and locating the areas on the ground. Having established the location of the licence area it was clear that EL 4933 covered mostly granite, confirming the mapping of the Department of Mines & Energy. The lack of records of any tin-tungsten mineralization or production and the absence of heavy mineralization accumulations in creek near the granite contact indicated there was little potential for a Wolfram Hill type tungsten or tin occurrence within pegmatite veins and griesen zones in the granite and vein deposits in adjacent sediments. As a consequence of this work it was decided that the five blocks in the west and south of the licence area would be relinquished (fig

1). Further work would be concentrated on the one remaining block adjacent to the McCarthy's Mine.

5.2.2 EL 4931

Preliminary field evaluation confirmed the area as having potential for gold mineralization. It was decided to concentrate exploration on the three northern blocks of this EL.

## 5.3 GRID ESTABLISHMENT

An exploration grid was established at EL 4933 with its origin at the intersection of the access road and the turnoff to the McCarthy's Mine. A baseline was established bearing 270 degrees magnetic from the origin (1000m n Om w). Crosslines were established at 100mw, 400mw and 700w. The crosslines were pegged at 100m spacing until they reached the granite to the south (fig 3).

A surveyed traverse was made to the south then north - east to establish a datum peg in EL 4931. From the datum peg (1000m n 10000m e) line 10000me was pegged at 200m intervals bearing 041 degrees magnetic until the granite was reached. At 2000mn a crossline was run bearing 311 degrees magnetic and line 8500e established (fig 4). Line 8500e was pegged at 200m intervals.

## 5.4 ROCK CHIP SAMPLING

5.4.1 EL 4933

Approximately 4kgms of rock chips were collected from each rid location. The samples were geologically logged and dispatched to Analabs in Darwin for assay for As, Au, Pb and Zn. The results are set out in table 1.

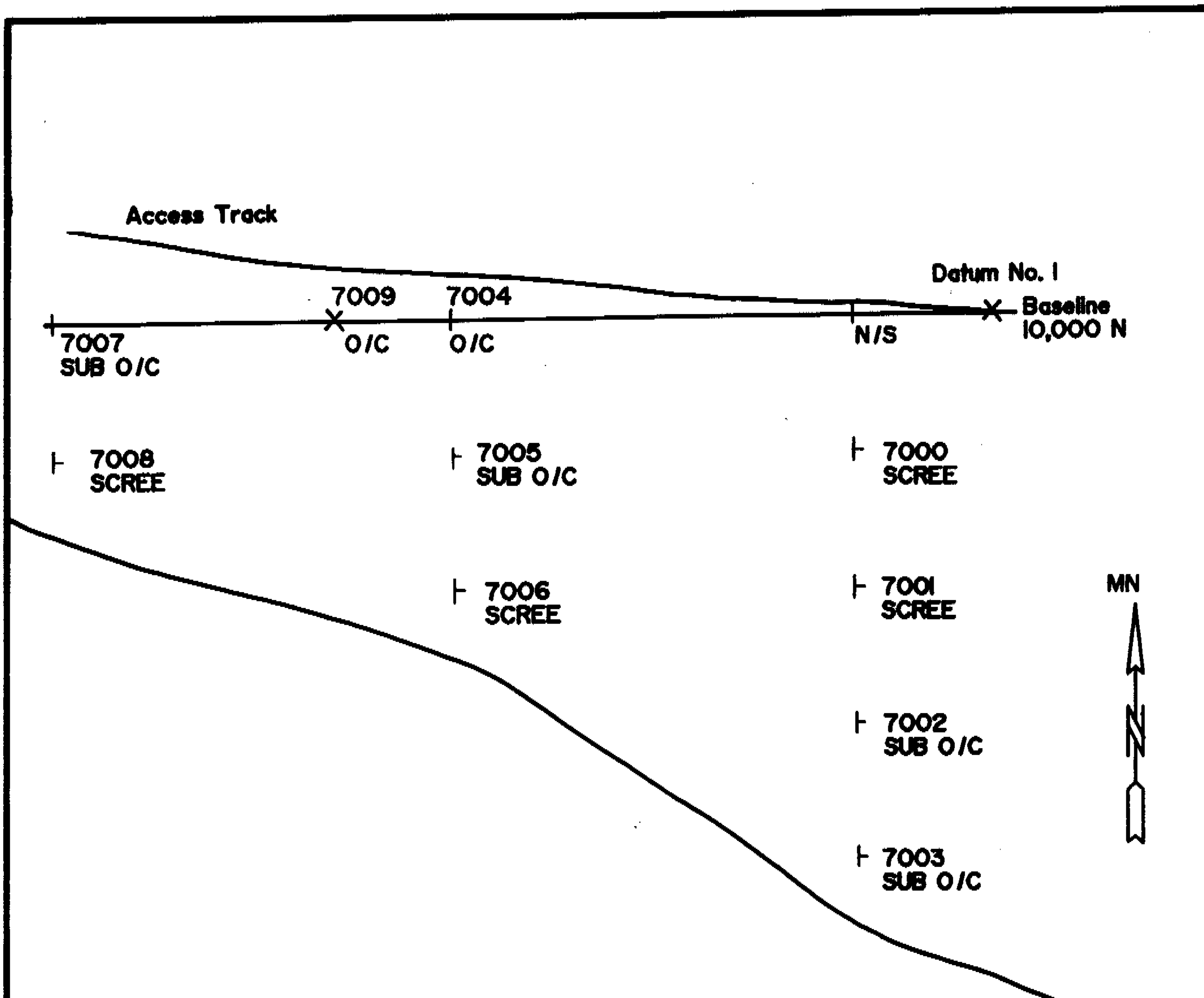


Figure. 3A

EL 4933 ROCK CHIP SAMPLE LOCATION

0 100 200 300m

Figure. 4

# EL 4931

## ROCK CHIP SAMPLING ASSAY RESULTS

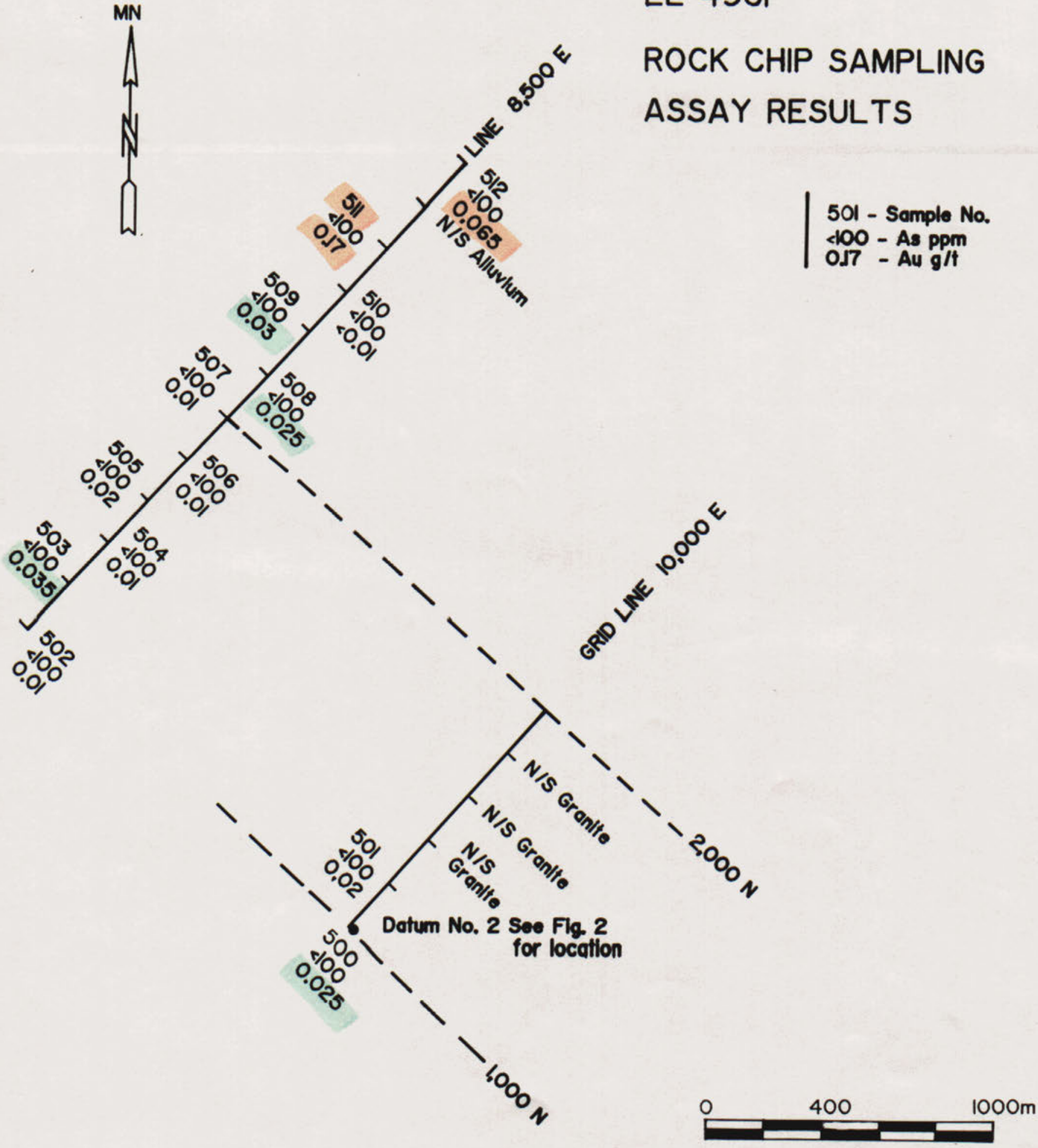

TABLE 1. EL 4933 ROCK CHIP SAMPLING RESULTS

| Sample No. | Co-Ordinates n | w | As ppm | Au g/t | Pb ppm | Zn | Rock Description |
|---|---|---|---|---|---|---|---|
| N/S | 1000 | 100 | | | | | no outcrop |
| 7000 | 900 | 100 | 4 | LT.01 | 85 | 30 | blue/grey vesicular tuffaceous rock no Fe/Q |
| 7001 | 800 | 100 | 50 | LT.01 | 285 | 285 | Fe rich red/brown griesen muscovite present |
| 7002 | 700 | 100 | 360 | LT.01 | 235 | 155 | blue/grey tuff qtz veined strongly Fe |
| 7003 | 600 | 100 | 68 | LT.01 | 480 | 325 | blue/grey fine grained shale Qtz/musc/felds/ griesen milky qtz to 3cms |
| End of line 100W granite contact at 560N. | | | | | | | |
| 7004 | 1000 | 400 | 63 | LT.01 | 25 | 380 | blue/grey Fe tuff/shale 10mm amphib needles |
| 7005 | 900 | 400 | 36 | .009 | 40 | 85 | blue/grey shale felsic/ mica alteration amphib needles |
| 7006 | 800 | 400 | 46 | LT.01 | LT5 | 35 | blue/grey shale felsic/ mica alteration amphib needles |
| 7007 | 1000 | 700 | 65 | 1.12 | 65 | 780 | blue/grey silicious shale vesicular no Fe/q |
| 7008 | 900 | 700 | 80 | .016 | 10 | 55 | blue/grey Fe Qtz veined tuffaceous shale |
| 7009 | 1000 | 516 | 160 | .018 | 235 | 135 | grey silic, shale Fe on joints boxwork - gossanous, qtz veining |

The results of the rock chip sampling programme were considered very encouraging. Sample 7007 with a result of 1.12g/t Au warrants further investigation. The base metal analysis results were variable and more sampling is required to establish background levels.

### 5.4.2. EL 4933

A rock chip sampling programme was implemented over the exploration grid described in section 5.3. Samples were processed by AAL in Pine Creek for As and Au. The location of samples is shown in fig 4 and table 2 summarizes the results.

TABLE 2. EL 4931 ROCK CHIP SAMPLE RESULTS

| Sample No. | Co-Ordinates N | Co-Ordinates E | Analysis Results As ppm | | Analysis Results Au g/t |
|---|---|---|---|---|---|
| 500 | 1000 | 10000 | <100 | | .025 |
| 501 | 1200 | 10000 | <100 | | .020 |
| | 1400 | 10000 | N/S | granite | |
| | 1600 | 10000 | N/S | granite | |
| | 1800 | 10000 | N/S | granite | |
| | 2000 | 10000 | N/S | granite | |
| 502 | | | | | |
| 503 | 1200 | 8500 | <100 | | .035 |
| 504 | 1400 | 8500 | <100 | | .010 |
| 505 | 1600 | 8500 | <100 | | .020 |
| 506 | 1800 | 8500 | <100 | | .010 |
| 507 | 2000 | 8500 | <100 | | .010 |
| 508 | 2200 | 8500 | <100 | | .025 |
| 509 | 2400 | 8500 | <100 | | .030 |
| 510 | 2600 | 8500 | <100 | | <.010 |
| 511 | 2800 | 8500 | <100 | | .170 |
| | 3000 | 8500 | N/S creek slit and alluvium | | |
| 512 | 3200 | 8500 | <100 | | .065 |

5.4.3 <u>ROCK CHIP SAMPLING McCARTHY'S MINE</u>

A number of lead zinc deposits in the Pine Creek Geosyncline have associated gold mineralization. Flora Belle and McKinley mines are examples.

A number of samples were collected from the McCarthy's dump to determine whether there was any Au associated with the Pb mineralization at this mine. It was thought that if Au could be found to be associated with the mineralization at McCarthy's, EL 4933 immediately south would be worthy of further investigation. The results are tabulated in table 3.

TABLE 3 McCARTHY'S MINE ROCK CHIP SAMPLING

| Sample No | As | Au | Pb | Zn | Ag | Rock Description |
|---|---|---|---|---|---|---|
| 7011 | | LT.01 | | | | Fe stained felsic muscovite tuff pyromorphite, cherty lenses, boxwood |
| 7013 | | LT.01 | | | | Pyromorphite, blue/grey qtz felsic |
| 7015 | | .01 | | | | Blue/grey shale with pyromorphite Fe stained some galena |

At the time of writing this report Analabs had reported only the gold assay results. These indicate there is no significant gold mineralization associated with the Pb mineralization at McCarthy's. When assays for additional elements become available they will be dispatched to the Northern Territory Department of Mines & Energy as soon as possible.

## 6. ESTIMATED EXPENDITURE

The following is an estimate of expenditure on EL's 4931 and 4933 in 1987/88. Driffield Mining Pty Ltd only took responsibility for the expenditure in April 1988. At this stage there is no record of North Star or Seventh States NL's expenditure on this licence prior to the purchase by Driffield Mining. It is only possible to estimate this expenditure.

| ITEM | ESTIMATED EXPENDITURE |
|---|---|
| Legal | 2,000 |
| Leasing | 100 |
| Leasing Administration | 400 |
| Office Services | 2,800 |
| Communication | 300 |
| Geological Salaries & Wages | 13,500 |
| Accountancy | 1,000 |
| Insurance | 150 |
| Field Assistants Salaries & Wages | 2,900 |
| Office Staff Salaries & Wages | 1,000 |
| Drafting | 350 |
| Assaying | 500 |
| Field Consumables | 350 |
| Vehicles | 1,800 |
| Surveying | 1,000 |
| Fuel & Oil | 550 |
| Report | 250 |
| Technical Information | 150 |
| Accommodation & messing | 1,500 |
| Travel & Airfares | 850 |
| Total Estimate | 31,450 |

If any additional information is required please do not hesitate to contact this office.

## 7. CONCLUSIONS

EL 4931 has been the subject of a geological investigation, field evaluation and a rock chip sampling survey. This work located a single sample assaying 1.12g/t Au. The sample is open to the west and north and further work is planned to immediately follow up this result.

The rock chip sampling results from EL 4933 processed by AAL in Pine Creek were available and they indicate further sampling is required. The assay of 0.17g/t Au from sample No. 511 is considered very significant on such a widely spaced grid.