# EXPLORATION LICENCE 5098

# ANNUAL REPORT ON EXPLORATION

## 1 SEPTEMBER 1987 TO 31 AUGUST 1988

M J Hughes and T C Bates
Norgold Limited (operator)
on behalf of the
Oceania/Norgold
"Howley" Joint Venture
16 August 1988

# EXPLORATION LICENCE 5098

(Oceania Exploration - 1:250,000 map sheet SD52-8)

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## 1 SEPTEMBER 1987 TO 31 AUGUST 1988

## NORGOLD ACTIVITY, JUNE 1988

M J Hughes and T C Bates
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## SUMMARY

Gold is the commodity sought in EL 5098. The exploration licence was geologically mapped at 1:25,000 scale and grab samples and BLEG samples taken for gold analysis. A grid, the west grid, was established to cover the Koolpin Formation (the target formation), which is confined to the northwest of the licence area. This grid was geologically mapped at 1:5,000 scale and four costeans were excavated at 200 m intervals along strike of the Koolpin Formation (115 samples).

The maximum gold value obtained in channel samples of the above costeans was 0.03 ppm Au. A small volume of gold-bearing gravel was located in the main drainage south from the Cosmopolitan Howley mine.

No further work is recommended.

# 1 INTRODUCTION

Exploration licence 5098 is within the Pine Creek 1:250,000 sheet (SD52-8) and Tipperary 1:100,000 (14/5) sheet (Fig 1). The licence was granted to Oceania Exploration on 31 July 1987 for a period of two years. EL 5098, together with the adjacent titles EL 5009 and EL 5099, was farmed out to Norgold Limited on 18 August 1987 under the terms of the Howley Joint Venture Agreement.

Norgold Limited conducted a programme of grid pegging, regional and detailed geological mapping, BLEG (Bulk Leach Extractable Gold) sampling, rock sampling and trenching, in June 1988 (geologist T Bates).

The main exploration target in the licence area is a gold deposit similar to that in the Koolpin Formation at the nearby Cosmopolitan Howley mine. Exploration concentrated on equivalent Koolpin Formation stratigraphy on the western limb of the Howley anticline.

## 2 EXPLORATION UNDERTAKEN

EL 5098 was geologically mapped by T Bates at 1:25,000 scale (Fig 2) using a photogeological base prepared by consultant G Orrige, and an interpretative geology plan was prepared at the same scale (Fig 3). Eleven rock samples (Table 1) and 35 BLEG drainage samples were collected and analysed (Fig 2). The old CRA grid in EL 4635 to the north (Swensson, 1979) was extended southwards to cover the Koolpin Formation on the west limb of the Howley anticline. The grid was then mapped geologically at 1:5,000 scale and four costeans were excavated at 200 m intervals across the prospective horizon in the northwestern part of the licence (Fig 4). These costeans have since been rehabilitated. A total of 817 m of costeaning was undertaken: 423 m of this was sampled by 115 systematic rock chip samples taken at 2-5 m intervals (Fig 5).

Samples were submitted to Amdel, Darwin for the following analyses:

| Element | Amdel Method | Detection Level |
|---|---|---|
| Au - BLEG | BLEG 2 - 5 kg sample, 24 hour cyanide leach, furnace AAS | 0.05 ppb Au |
| Au - Rock | FA1 - fire assay with lead collection, furnace AAS | 0.01 ppm Au |

# 3 RESULTS

## 3.1 EL 5098 Geology, BLEG Sampling and Alluvial Sampling

Metasedimentary rocks which include the target horizon form the western limb of the Howley anticline in the northwestern corner of the licence, where they have a northeasterly strike. These consist of metamorphosed Lower Proterozoic pelitic and volcaniclastic rocks of the Mt Partridge Group (Wildman Siltstone) and South Alligator Group (Koolpin Formation and Gerowie Tuff). Sills of Zamu Dolerite are extensively developed at several stratigraphic levels and pegmatite bodies have intruded the Koolpin Formation near its contact with the Gerowie Tuff. Wildman Siltstone forms rare outcrops in the south of the licence (eg rock sample 76518, Fig 2) but may be widely developed in this area (Fig 3).

Fine to medium-grained hornblende-biotite granite crops out over much of the northern part of EL 5098 and pegmatite bodies are present in the southern part of the licence (Figs 3, 4). The granite is probably the northern extension of the Lower-Mid Proterozoic Fenton Granite, which contains no known gold mineralization. The pegmatite consists of coarse-grained quartz-muscovite±tourmaline, and contains tin mineralization immediately north of EL 5098.

BLEG sample results are highly anomalous in gullies which drain the Cosmopolitan Howley mine area to the north (up to 106 ppb). Samples from minor gullies which only drain the licence area contain a maximum of 5.5 ppb Au, which is not considered anomalous for this area (Fig 2).

Buried stream channels were located in costeans on lines 2100N and 2300N of the western grid (Fig 5). Gravel in these costeans averages 1 m thick with 1-1.5 m of overburden, and initial results returned an average of ten colours of gold to the prospector's dish. More systematic 5 kg samples of gravel were then panned from the trenches, each sample representing a 10 m channel sample of gravel:

| Traverse | Sample | Gold Colours | Comments |
|---|---|---|---|
| 2100N | A1 | | Tourmaline |
| | A2 | 2 fine | Tourmaline |
| 2300N | A3 | 1 med-fine | |
| | A4 | 1 med, 4 fine | 1 bright red garnet |

Potential exists for an alluvial gold resources of up to 50,000 $m^3$ of unknown grade.

## 3.2 West Grid Geology and Costean Sampling

The Koolpin Formation (the target horizon) includes two chert nodule horizons, a chert band, and iron-rich units, intruded by numerous small pegmatite bodies and minor sills of Zamu Dolerite (Fig 4). The iron-rich units occur between the nodule horizons and correlate stratigraphically with the ore horizons at the Cosmopolitan Howley mine to the north. Costeaning revealed numerous carbonaceous and hematitic siltstone horizons, interbedded with micaceous siltstone which grades into mica schist close to intrusive pegmatite bodies (Fig 5).

A maximum value of 0.03 ppm Au was recorded from the 115 systematic channel samples taken in the costeans.

## 4 EXPENDITURE

Norgold expenditure in EL 5098 from 4 May 1988 to 30 July 1988 totalled $18,308, as follows:

| | |
|---|---|
| Geologist Salaries | $3,872 |
| Field Assistants | 1,420 |
| Travel | 195 |
| Meals/Accommodation | 1,634 |
| Vehicles | 345 |
| Survey and Gridding | 2,000 |
| Costeaning | 3,566 |
| Field Living and Supplies | 550 |
| Geology, Petrology | 25 |
| Geochemistry | 2,304 |
| General Expenses | 9 |
| Sub-total | 15,920 |
| 15% Overheads | 2,388 |
| TOTAL | $18,308 |

## 5 CONCLUSIONS AND RECOMMENDATIONS

The prospective Koolpin Formation only occupies a small part of EL 5098, and there is no evidence of the tight folding and structural complexity thought to be a pre-requisite for gold mineralization of the type sought. Costeaning at 200 m intervals showed no gold values greater than 0.03 ppm Au in this formation. BLEG sampling failed to reveal other areas of interest within the licence. Anomalous gold values were detected in small volumes of gravel from the main drainage which extends southwards from the Cosmopolitan Howley mine.

No further work is recommended.

Mark Hughes.

## REFERENCE

Swensson, C, 1979, Final Report EL 1072 CRA Exploration Ltd, report CR79/27

TABLE 1

Rock Chip Samples - EL 098 - Howley Joint Venture

| Sample No | Au (ppm) | Lithology |
|---|---|---|
| 76512 | 0.03 | Iron-stained quartzose sandstone float |
| 76513 | 0.01 | Ferruginous quartz |
| 76514 | <0.01 | Veined quartzose sandstone |
| 76515 | <0.01 | Ferruginous quartz |
| 76516 | <0.01 | Ferruginous quartz |
| 76517 | <0.01 | Ferruginous quartz |
| 76518 | 0.07 | Ferruginous quartz (in Wildman Sandstone) |
| 76519 | 0.01 | Saccharoidal quartz |
| 76520 | <0.01 | Ferruginous quartz |
| 76521 | <0.01 | Quartz |
| 76522 | <0.01 | Quartz |

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

FORM 3P

REPORT AC D1579/88

ANALYSIS PPB

| Sample N° | Au |
|---|---|
| 49801 | 6·25 |
| 802 | 0·75 |
| 803 | 1·35 |
| 804 | 2·31 |
| 805 | 8·15 |
| 806 | 1·04 |
| 807 | 1·48 |
| 808 | 5·02 |
| 809 | 0·38 |
| 810 | 5·23 |
| 811 | 2·84 |
| 812 | 4·53 |
| 813 | 2·80 |
| 814 | 3·65 |
| 815 | 1·61 |
| 816 | 5·49 |
| 817 | 23 |
| 818 | 8·88 |
| 819 | 4·19 |
| 820 | 21 |
| 821 | 3·59 |
| 822 | 32 |
| 823 | 2·69 |
| 824 | 74 |
| 49825 | 106 |

BLEG 2

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AC D1579/88

ANALYSIS PPB

| Sample N° | Au | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 49826 | 5·23 | | | | | | | |
| 827 | 1·13 | | | | | | | |
| 828 | 74 | | | | | | | |
| 829 | 2·22 | | | | | | | |
| 830 | 0·97 | | | | | | | |
| 831 | 0·49 | | | | | | | |
| 832 | 0·82 | | | | | | | |
| 833 | 0·56 | | | | | | | |
| 834 | 6·55 | | | | | | | |
| 835 | 1·16 | | | | | | | |
| 836 | 3·41 | | | | | | | |
| 837 | 0·78 | | | | | | | |
| 838 | 1·70 | | | | | | | |
| 839 | 1·69 | | | | | | | |
| 840 | 0·80 | | | | | | | |
| 841 | 1·09 | | | | | | | |
| 842 | 0·85 | | | | | | | |
| 843 | 1·34 | | | | | | | |
| 844 | 0·80 | | | | | | | |
| 845 | 0·26 | | | | | | | |
| 846 | 1·05 | | | | | | | |
| 847 | 0·19 | | | | | | | |
| 848 | 0·28 | | | | | | | |
| 849 | 0·19 | | | | | | | |
| 49850 | 0·53 | | | | | | | |

BLEG 2

THE AUSTRALIAN MINERAL DEVELOPMENT LABORATORIES

REPORT AC D1579/88

ANALYSIS PPB

| Sample No° | Au | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 49851 | 0·24 | | | | | | | |
| 852 | 0·31 | | | | | | | |
| 853 | 0·76 | | | | | | | |
| 49854 | 0·39 | | | | | | | |

BLEG 2

amdel

Analysis code PM3/2 | Report AC D1491/88 | Page G1

Order No. MA5432 | Results in ppm

| Sample | Au |
|---|---|
| 72901 | <0.01 |
| 72902 | 0.02 |
| 72903 | 0.01 |
| 72904 | <0.01 |
| 72905 | 0.05 |
| 72906 | <0.01 |
| 72907 | <0.01 |
| 72908 | <0.01 |
| 72909 | 0.02 |
| 72910 | <0.01 |
| 72911 | <0.01 |
| 72912 | 0.02 |
| 72913 | 0.01 |
| 72914 | 0.01 |
| 72915 | 0.01 |
| 72916 | <0.01 |
| 72917 | 0.04 |
| 72918 | <0.01 |
| 72919 | 0.01 |
| 72920 | 0.01 |
| 72921 | 0.02 |
| 72922 | <0.01 |
| 72923 | 0.02 |
| 72924 | <0.01 |
| 72925 | 0.01 |
| 72926 | <0.01 |
| 72927 | <0.01 |
| 72928 | <0.01 |
| 72929 | 0.01 |
| 72930 | <0.01 |
| 72931 | <0.01 |
| 72932 | <0.01 |
| 72933 | <0.01 |
| 72934 | <0.01 |
| 72935 | <0.01 |
| 72936 | <0.01 |
| 72937 | <0.01 |
| 72938 | <0.01 |
| 72939 | <0.01 |
| 72940 | <0.01 |
| Detn limit | (0.01) |

amdel

Analysis code PM3/2 Report AC D1491/88 Page G2

Order No. MA5432 Results in ppm

| Sample | Au |
|---|---|
| 72941 | <0.01 |
| 72942 | <0.01 |
| 72943 | <0.01 |
| 72944 | <0.01 |
| 72945 | 0.02 |
| 72946 | <0.01 |
| 72947 | <0.01 |
| 72948 | <0.01 |
| 72949 | <0.01 |
| 72950 | <0.01 |
| 72951 | <0.01 |
| 72952 | <0.01 |
| 72953 | <0.01 |
| 72954 | 0.01 |
| 72955 | <0.01 |
| 72956 | <0.01 |
| 72957 | <0.01 |
| 72958 | 0.01 |
| 72959 | 0.01 |
| 72960 | <0.01 |
| 72961 | <0.01 |
| 72962 | <0.01 |
| 72963 | <0.01 |
| 72964 | 0.01 |
| 72965 | 0.02 |
| 72966 | 0.01 |
| 72967 | <0.01 |
| 72968 | 0.01 |
| 72969 | <0.01 |
| 72970 | <0.01 |
| 72971 | <0.01 |
| 72972 | <0.01 |
| 72973 | <0.01 |
| 72974 | 0.01 |
| 72975 | <0.01 |
| 72976 | <0.01 |
| 72977 | <0.01 |
| 72978 | <0.01 |
| 72979 | <0.01 |
| 72980 | <0.01 |
| Detn limit | (0.01) |

amdel

× B

Analysis code PM3/2 Report AC D1491/88 Page G3

Order No. MA5432 Results in ppm

| Sample | Au |
|---|---|
| 72981 | <0.01 |
| 72982 | <0.01 |
| 72983 | <0.01 |
| 72984 | <0.01 |
| 72985 | <0.01 |
| 72986 | <0.01 |
| 72987 | 0.01 |
| 72988 | 0.03 |
| 72989 | 0.01 |
| 72990 | 0.01 |
| 72991 | 0.03 |
| 72992 | 0.01 |
| 72993 | 0.01 |
| 72994 | <0.01 |
| 72995 | <0.01 |
| 72996 | 0.01 |
| 72997 | 0.01 |
| 72998 | 0.01 |
| 72999 | 0.01 |
| 73000 | 0.01 |
| 72807 | 0.02 |
| 72808 | 0.03 |
| 72809 | 0.01 |
| 72810 | 0.02 |
| 72811 | 0.01 |
| 72812 | <0.01 |
| 72813 | 0.02 |
| 72814 | <0.01 |
| 72815 | 0.02 |
| 72816 | 0.01 |
| 72817 | <0.01 |
| 72818 | 0.04 |
| 72819 | <0.01 |
| 72820 | <0.01 |
| 72821 | <0.01 |
| 72822 | <0.01 |
| 72823 | <0.01 |
| 72824 | <0.01 |
| 72825 | <0.01 |
| 72826 | <0.01 |
| Detn limit | (0.01) |

amdel

Analysis code PM3/2 | Report AC D1491/88 | Page G6

Order No. MA5432 | Results in ppm

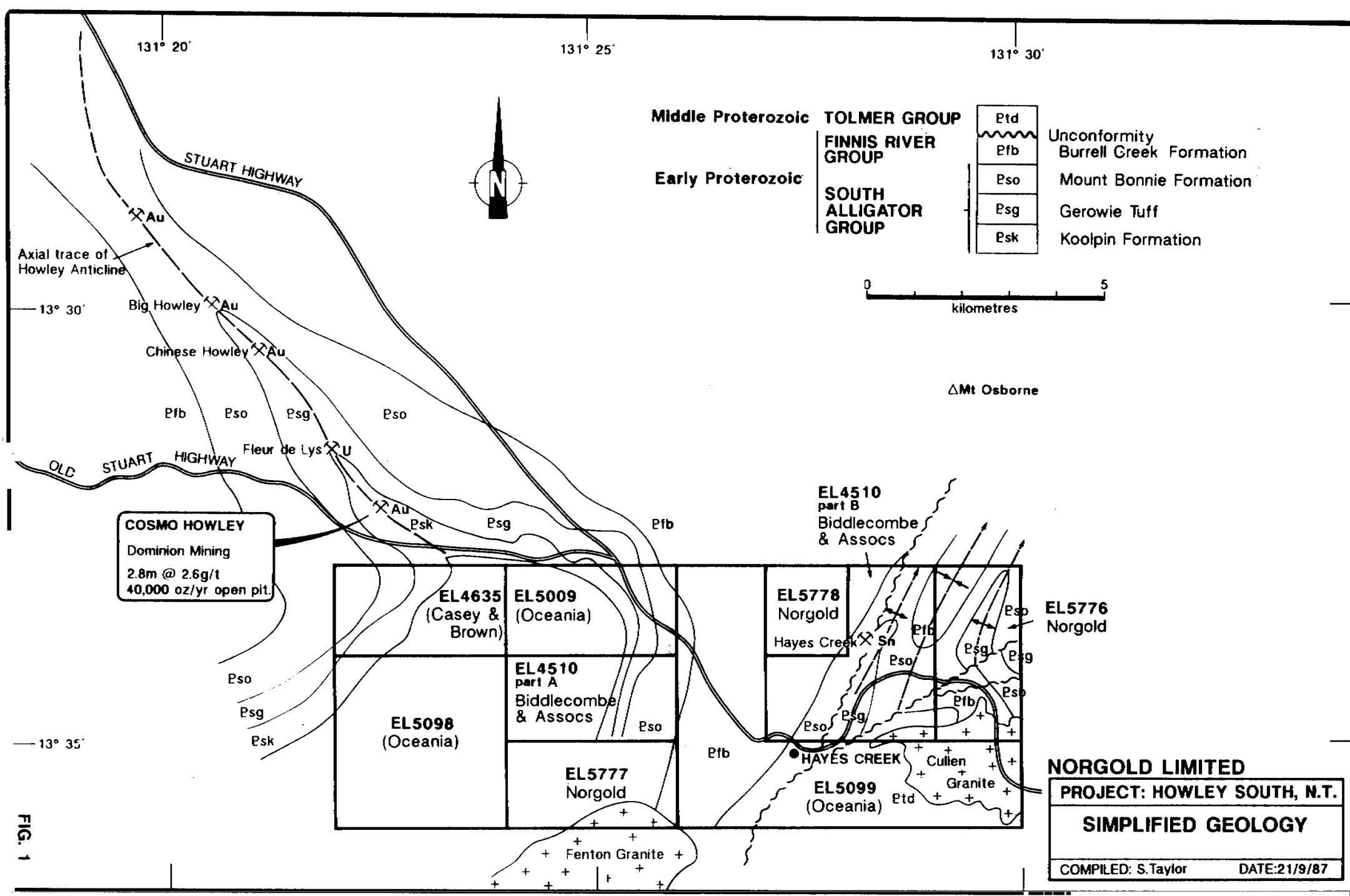
| Sample | Au |
|---|---|
| 76752 | 0.01 |
| 76753 | 0.01 |
| 76754 | <0.01 |
| 76755 | <0.01 |
| 76756 | 0.01 |
| 76757 | 0.01 |
| 76758 | <0.01 |
| 76759 | 0.01 |
| 76760 | 0.01 |
| 76761 | 0.01 |
| 76762 | 0.01 |
| 76763 | <0.01 |
| 76764 | <0.01 |
| 76765 | 0.06 |
| 76766 | 0.01 |
| 76767 | 0.01 |
| 76768 | <0.01 |
| 76769 | <0.01 |
| 76770 | <0.01 |
| 76771 | <0.01 |
| 46401 | 0.01 |
| 46402 | <0.01 |
| 46403 | <0.01 |
| 46404 | <0.01 |
| 46405 | <0.01 |
| 46406 | <0.01 |
| 46407 | <0.01 |
| 46408 | <0.01 |
| 46409 | <0.01 |
| 46410 | <0.01 |
| 46411 | <0.01 |
| 46412 | <0.01 |
| 46413 | 0.01 |
| 46414 | <0.01 |
| 46415 | 0.01 |
| 46416 | <0.01 |
| 46417 | <0.01 |
| 46418 | <0.01 |
| 46419 | 0.01 |
| 46420 | 0.01 |
| Detn limit | (0.01) |

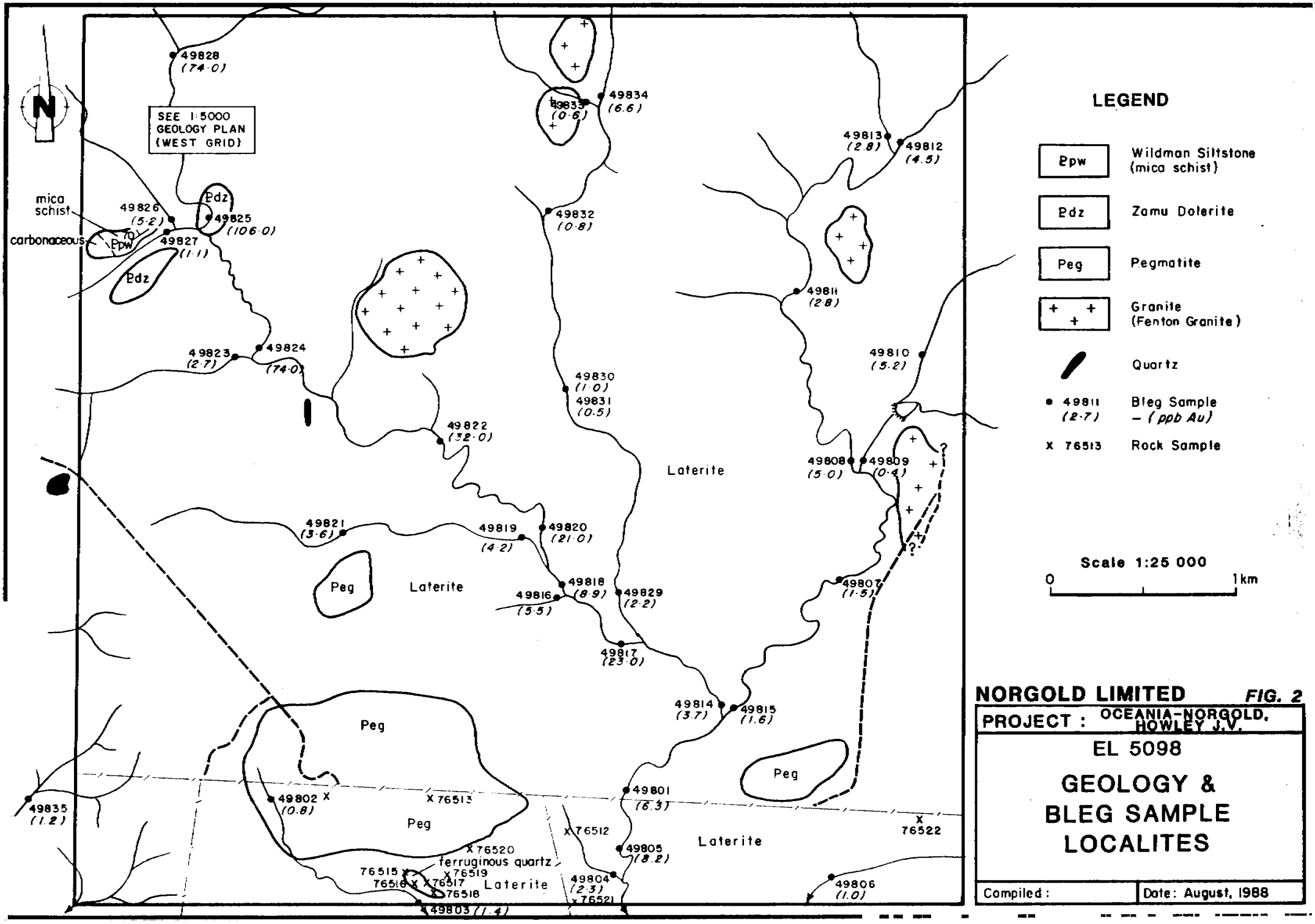
amdel

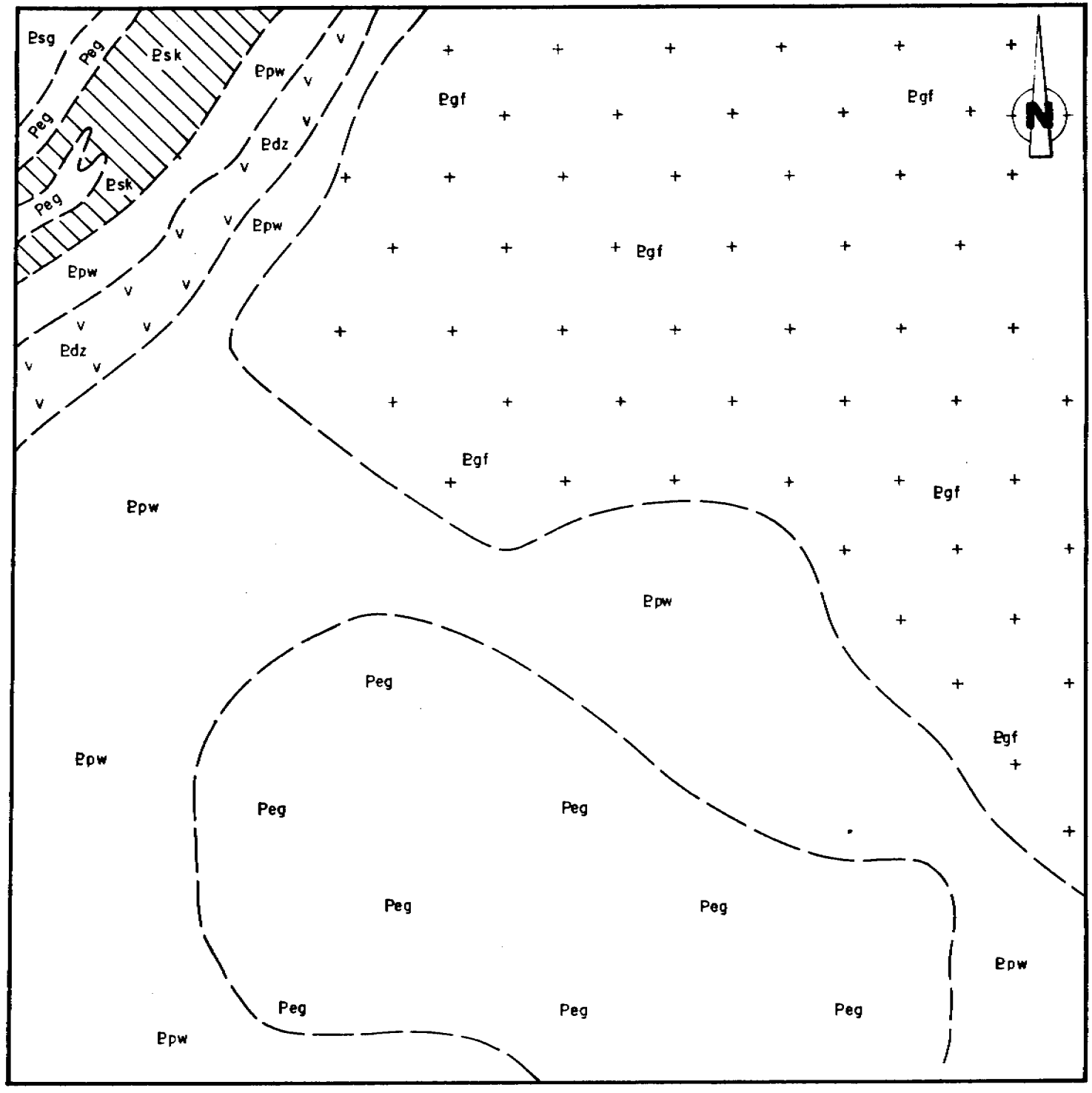
Analysis code PM3/2 | Report AC D1491/88 | Page G7

Order No. MA5432 | Results in ppm

| Sample | Au |
|---|---|
| 46421 | <0.01 |
| 46422 | <0.01 |
| 46423 | 0.02 |
| 46424 | 0.01 |
| 46425 | 0.01 |
| 46426 | 0.01 |
| 46427 | 0.02 |
| 46428 | 0.01 |
| 46429 | 0.05 |
| 46430 | <0.01 |
| 46431 | <0.01 |
| 46432 | <0.01 |
| 46433 | <0.01 |
| 46434 | <0.01 |
| 46435 | 0.01 |
| 46436 | 0.01 |
| 46437 | 0.01 |
| 76506 | 0.03 |
| 76507 | 0.01 |
| 76508 | 0.30 |
| 76509 | 0.12 |
| 76510 | 0.20 |
| 76511 | 0.42 |
| Detn limit | (0.01) |


131° 20'
131° 25'
131° 30'
13° 30'
13° 35'
N
STUART HIGHWAY
OLD STUART HIGHWAY
Axial trace of Howley Anticline
Au
Big Howley
Chinese Howley
Fleur de Lys
U
Middle Proterozoic
TOLMER GROUP
Ptd
Unconformity
FINNIS RIVER GROUP
Pfb
Burrell Creek Formation
Early Proterozoic
Pso
Mount Bonnie Formation
SOUTH ALLIGATOR GROUP
Psg
Gerowie Tuff
Psk
Koolpin Formation
0
5
kilometres
△Mt Osborne
COSMO HOWLEY
Dominion Mining
2.8m @ 2.6g/t
40,000 oz/yr open pit.
EL4635
(Casey & Brown)
EL5009
(Oceania)
EL4510
part A
Biddlecombe & Assocs
EL5098
(Oceania)
EL5777
Norgold
EL4510
part B
Biddlecombe & Assocs
EL5778
Norgold
Hayes Creek
Sn
EL5776
Norgold
HAYES CREEK
EL5099
(Oceania)
Cullen
Granite
Fenton Granite
NORGOLD LIMITED
PROJECT: HOWLEY SOUTH, N.T.
SIMPLIFIED GEOLOGY
COMPILED: S.Taylor
DATE:21/9/87
FIG. 1


SEE 1:5000 GEOLOGY PLAN (WEST GRID)
mica schist
carbonaceous
Ppw
Pdz
Peg
Laterite
49828 (74·0)
49826 (5·2)
49825 (106·0)
49827 (1·1)
49823 (2·7)
49824 (74·0)
49822 (32·0)
49821 (3·6)
49819 (4·2)
49820 (21·0)
49818 (8·9)
49816 (5·5)
49829 (2·2)
49817 (23·0)
49830 (1·0)
49831 (0·5)
49832 (0·8)
49833 (0·6)
49834 (6·6)
49813 (2·8)
49812 (4·5)
49811 (2·8)
49810 (5·2)
49808 (5·0)
49809 (0·4)
49807 (1·5)
49814 (3·7)
49815 (1·6)
49801 (6·3)
49805 (8·2)
49804 (2·3)
49806 (1·0)
49803 (1·4)
49802 (0·8)
49835 (1·2)
X 76513
X 76512
X 76522
X 76520
ferruginous quartz
X 76519
X 76517
X 76518
76515
76516
X 76521
LEGEND
Ppw Wildman Siltstone (mica schist)
Pdz Zamu Dolerite
Peg Pegmatite
Granite (Fenton Granite)
Quartz
49811 (2·7) Bleg Sample – (ppb Au)
X 76513 Rock Sample
Scale 1:25 000
0 1km
NORGOLD LIMITED
FIG. 2
PROJECT : OCEANIA-NORGOLD, HOWLEY J.V.
EL 5098
GEOLOGY & BLEG SAMPLE LOCALITES
Compiled :
Date : August, 1988




## LEGEND

- Psg — Gerowie Tuff
- Psk — Koolpin Formation
- Ppw — Wildman Siltstone

INTRUSIVE ROCKS

- Peg — Pegmatite
- Pgf — Granite (Fenton Granite)
- Pdz — Dolerite (Zamu Dolerite)

Scale 1:25 000

0 1 km

NOTE - LATERITE covers much of the central and eastern area of E.L. 5098. Good outcrop is restricted to the N.W. corner of the E.L. (SEE GEOLOGY, WEST GRID (1:5000)

**NORGOLD LIMITED** *FIG. 3*

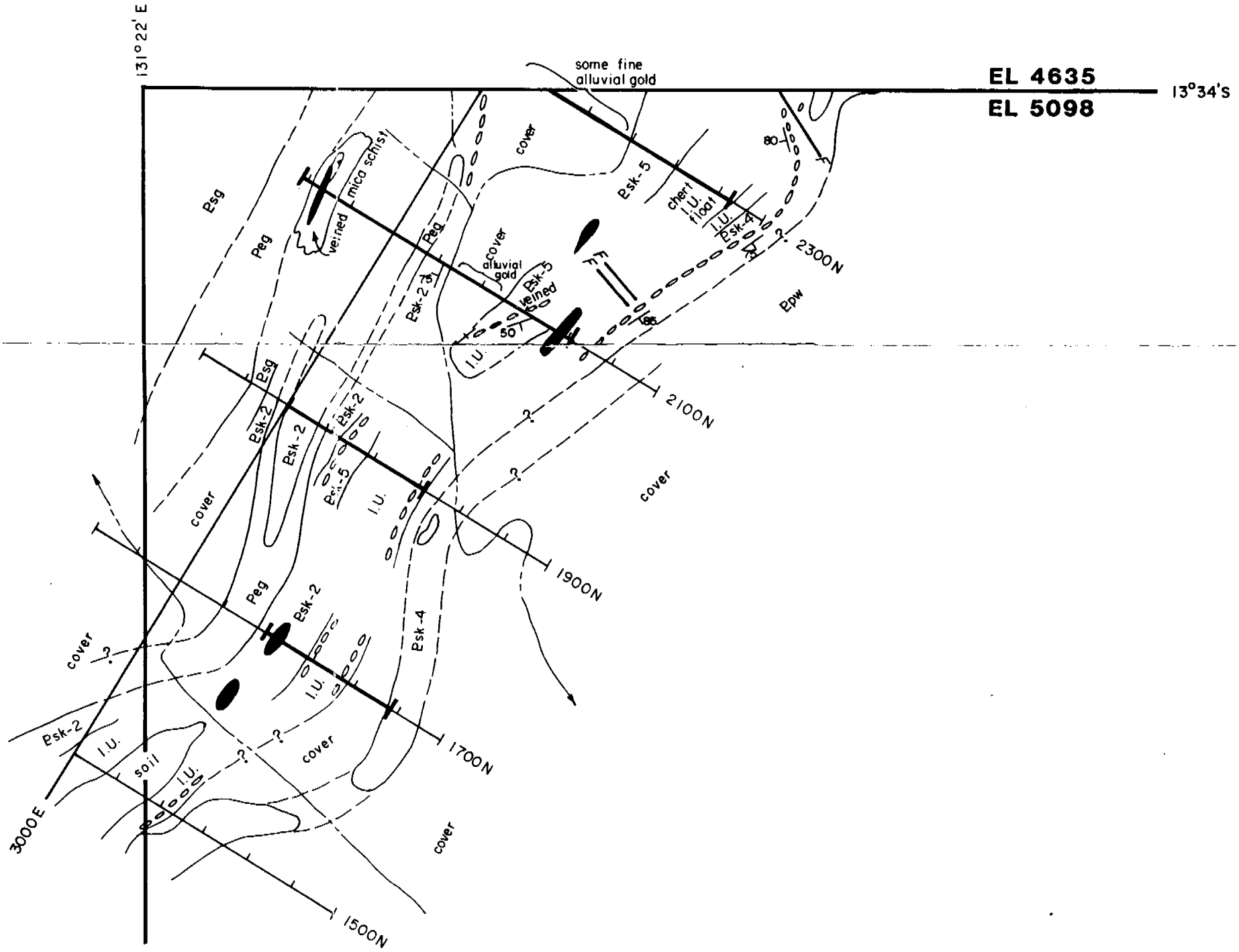
PROJECT : OCEANIA-NORGOLD, HOWLEY J.V.

# EL 5098
## HAYES CREEK

# INTERPRETATIVE GEOLOGY

Compiled :

Date: August, 1988




## LEGEND

| | | | |
|---|---|---|---|
| | ZAMU DOLERITE | Pdz | Dolerite |
| SOUTH ALLIGATOR GROUP | GEROWIE TUFF | Psg | Chert / tuff |
| | | Psg | Chert / shale |
| | KOOLPIN FM. | Psk-1 | Quartzite |
| | | Psk-2 | Graphitic hematitic siltstone |
| | | Psk-3 | Chert nodule beds |
| | | Psk-4 | Chert |
| | | Psk-5 | Phyllite |
| MOUNT PARTRIDGE GROUP | WILDMAN SILTSTONE | Ppw | Schist / phyllite, slightly graphitic |
| | | Peg | Pegmatite |
| | | I.U. | Iron rich unit in Koolpin Fm. |
| | | | Quartz |
| | | | Dip |
| | | | Costean |

LOWER PROTEROZOIC

Scale 1:5000

0 100 200 300

METRES

**NORGOLD LIMITED**

PROJECT: OCEANIA-NORGOLD, HOWLEY J.V.

EL 5098

HAYES CREEK

# GEOLOGY - WEST GRID

## STH. EXTENSION OF CRA GRID

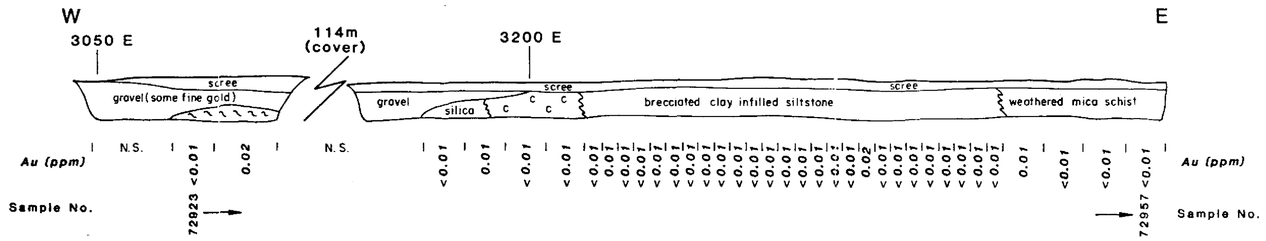
Compiled:

Date: August 1988

*FIG. 4*

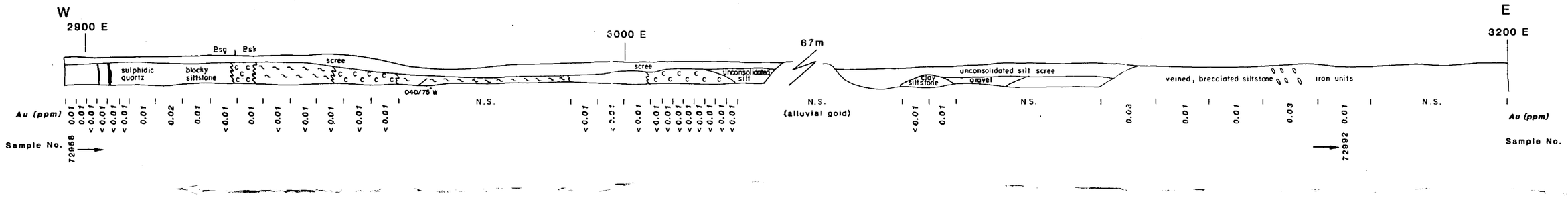
## SECTION 2300 N

125m Long, 105m Sampled, 36 Samples.



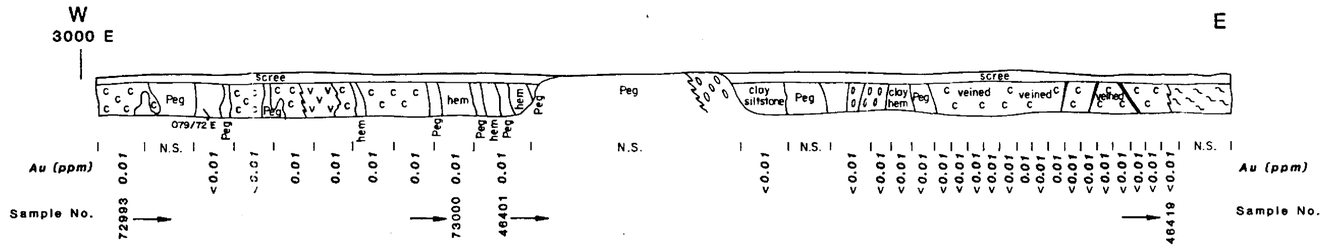

## SECTION 2100 N

304m Long, 153m Sampled, 34 samples.



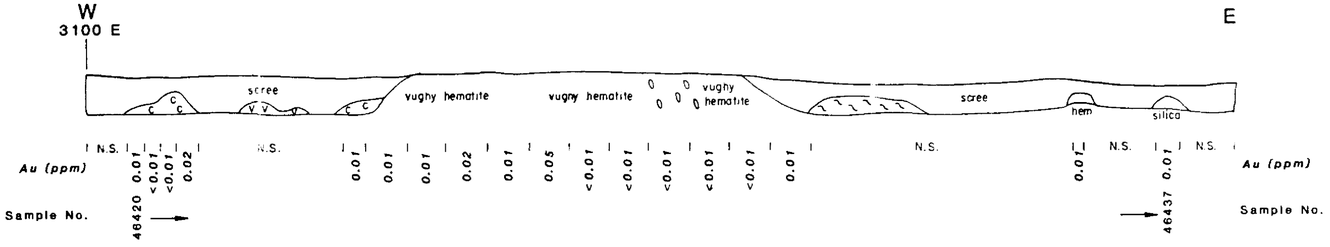

## SECTION 1900 N

141m Long, 94m Sampled, 27 Samples.




## SECTION 1700 N

143m Long, 71m Sampled, 18 Samples.




## LEGEND

| | | | |
|---|---|---|---|
| | Peg | PEGMATITE (Quartz-muscovite± tourmaline, cassiterite) | |
| ZAMU DOLERITE (Pdz) | V V V V V V | DOLERITE (Mainly altered to amphibolite or weathered to clay) | |
| SOUTH ALLIGATOR GROUP | GEROWIE TUFF (Psg) | T T T T T | Undifferentiated siltstone, minor phyllite, tuff and chert |
| | KOOLPIN FM. (Psk) | | SILTSTONE (Massive, blocky siltstone to well cleaved siltstone) |
| | | | PHYLLITE, MICA SCHIST (Crenulated phyllite, muscovite schist, rare knotted phyllite (andalusite?)) |
| | | C C C C C C | GRAPHITIC SILTSTONE (Often friable, clay rich and pronounced cleavage) |
| | | | CHERT NODULE BEDS (Chert nodules in silicified siltstone?) |
| | | Hem | MASSIVE HEMATITE (Porous, hard or friable hematite) |
| | | chert | CHERT (Massive± specular hematite in vughs, occasionally saccharoidal) |
| MOUNT PARTRIDGE GROUP | WILDMAN SILTSTONE | Epw | Undifferentiated phyllite, mica schist (muscovite), knotted phyllite |

Quartz vein — clay: Clay infill on joints & bedding

053/45W: Strike & dip — silica: Silica infill on joints & bedding

76510: Special rock chip sample — N.S.: No sample

72923 0.01: Au (ppm), Sample No.

VERTICAL SCALE 1:100

0 2 4 6 8 10 metres

0 10 20 30 40 50 metres

HORIZONTAL SCALE 1:500

**NORGOLD LIMITED**

PROJECT: OCEANIA-NORGOLD, HOWLEY J.V.

EL 5098

HAYES CREEK

# COSTEAN GEOLOGY & SAMPLE RESULTS WEST GRID

Compiled. | Date: August 38

FIG. 5