EL 5139 - DOUGLAS CREEK EAST
PINE CREEK DISTRICT,NORTHERN TERRITORY
FINAL AND RELINQUISHMENT REPORT
AFTER THIRD YEAR OF TENURE

29 JANUARY 1989 - 28 JANUARY 1990

G P CURNOW

P L TYSON

APRIL 1989

DISTRIBUTION

NTDME, DARWIN

DOMINION MINING LTD, DARWIN

DOMINION MINING LTD, PERTH

APPROVED BY:

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R A VOOYS
Exploration Manager NT

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P SPINNER
Land Manager

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1. SUMMARY

This report describes the 1989 exploration program completed by Dominion Gold Operations Pty Ltd on EL 5139 (comprising one block), known as Douglas Creek East, during 1989.

The licence was granted on the 29th January 1987 and formed part of the Golden Dyke Joint Venture (GDJV) area with Geopeko. This agreement ceased on the 29th November 1988 when Dominion purchased Geopeko's interest in the joint venture.

Relinquishment of the two western blocks after the second year of tenure allowed further exploration of the southeastern block in 1989 where previously generated anomalies were located.

The work completed in 1989 consisted of a program of soil sampling, rock chip sampling and detailed mapping along traverses.

No anomalous results were obtained in either the soil samples or the rock chips.

2. INTRODUCTION

Exploration Licence 5139, DOUGLAS CREEK EAST is located on the McKinlay River 1:100,000 Sheet 5271 approximately 55 kilometres due north of the Pine Creek township. See Figure 1 for location. Access is via graded tracks from the Mt Wells tin mine for approximately 25 kilometres to the northeast.

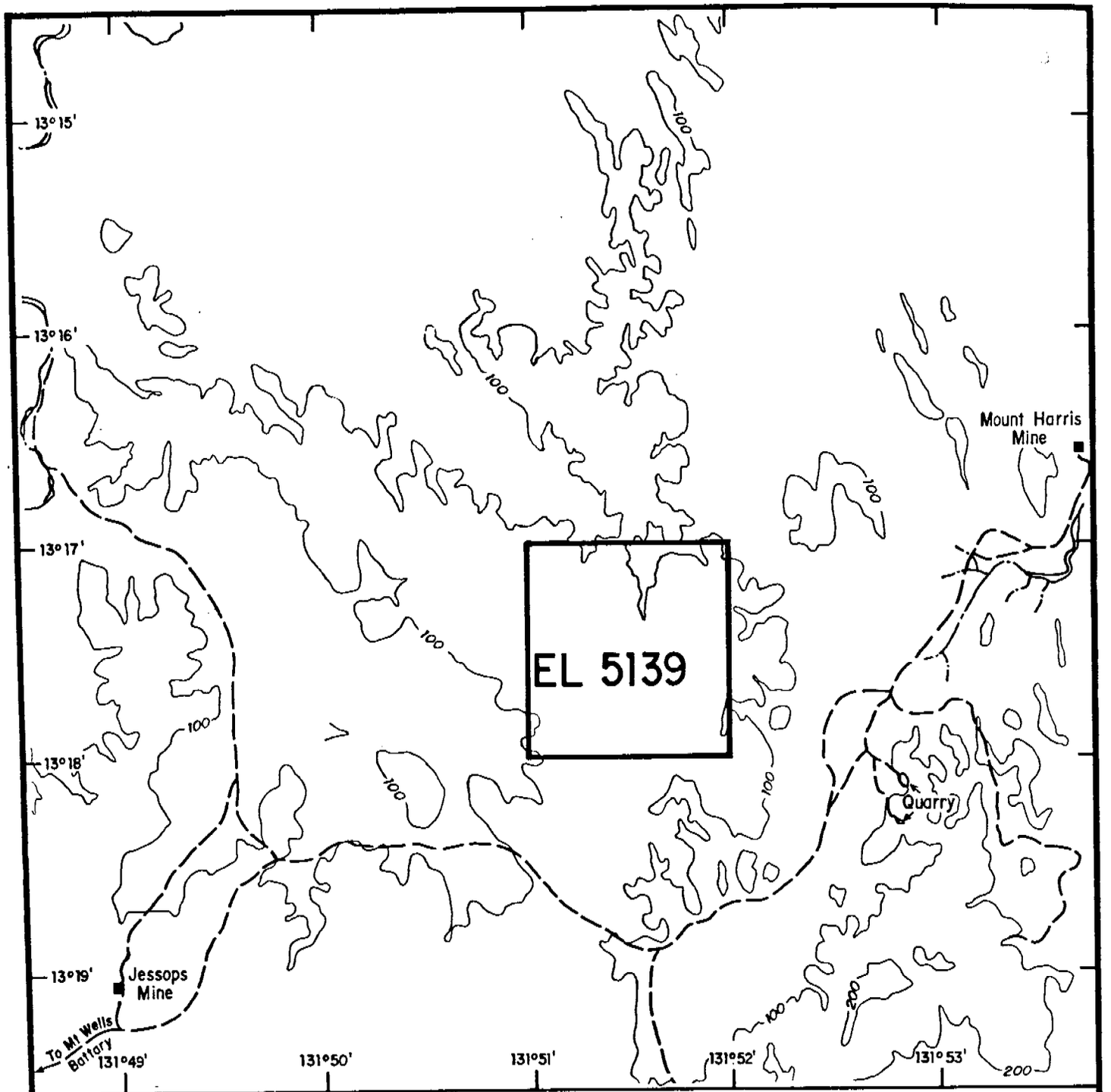
Topography comprises steep and sharply incised northwest striking ridge and valleys which reflect the local trends in geological structure and stratigraphy. Local relief is ±80 metres.

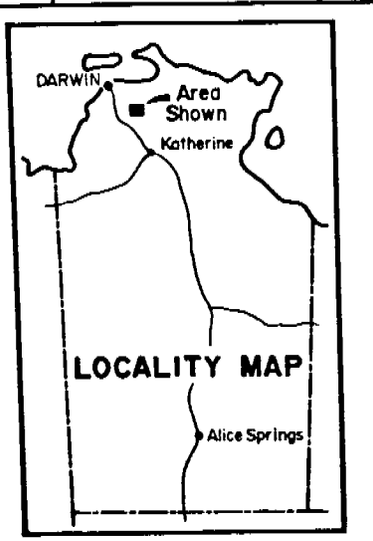
EL 5139 originally comprised three blocks granted for a period of three years from 29 January 1987 to Dominion Gold Operations Pty Ltd (DGO). The 2 western blocks were relinquished on 28 February 1989.

The area was subject to the Golden Dyke Joint Venture agreement between DGO and Peko Wallsend Operations Pty Ltd. This agreement ceased on the 29th November 1988 when Dominion purchased Peko's equity in the GDJV.

Previous investigation within the licence consisted of geological mapping at 1:100 000 scale, a program of semi-detailed regional stream sediment sampling, minor rock chip and float sampling by the GDJV who evaluated the potential of the Middle Koolpin Formation for strata bound gold and base metal mineralization.

This is a report of Dominion's 1989 exploration program.





N

CONTOURS IN METRES

0 1 2 3km

1:50000

EL 5139 — DOUGLAS CREEK EAST

DOMINION MINING LIMITED

PROJECT G.D.J.V.				STATE N.T.	
Orig. R.A.V.	date 2/88	Drawn S.J.F	date 4/90	Scale 1:50000	
Checked		Figure No. 1	Plate No.	Plan No 2A-T32	

3. GEOLOGY

3.1 Regional Geology

The geology of the Pine Creek - McKinlay River region is described by two BMR 1:100,000 geology sheets as compiled by Needham, et al (1979) and Stuart - Smith, Wallace, et al (1980).

EL 5139 Douglas Creek lies within a Lower Proterozoic sequence deposited by a shallow water regime in a geosynclinal basin environment. Following intrusion by conformable dolerite sills, a major period of deformation and regional metamorphism related to batholithic intrusion caused a series of tight, upright to overturned NW trending anticlinoria. See Figure 2.

The Lower Proterozoic stratigraphy of EL 5139 is discussed briefly below.

(a) Mt. Partridge Group (MPG)

Only the Wildman Siltstone member (Ppw) of the Mt. Partridge Group occurs within EL 5139. Ppw is a fluviatile sequence whose lithology ranges through phyllitic mudstone, siltstone to minor coarse-grained sandstones.

Rare massive hematitic ironstone lenses can also be found in several locations.

(b) South Alligator Group (SAG)

This overlies the MPG, and is dominantly pelitic with chemical sediments and volcanic tuffs indicating a restricted shallow water environment. Within EL 5139, from base, the **South Alligator Group** has been subdivided as follows:

b.1 Lower Koolpin Formation (Psk1)

This unit is defined as purple-grey to grey-brown mudstones with occasional hematitic laminae. Minor chert horizons and laminated Siliceous iron formation (Sif) are also present.Throughout the EL, the top of this unit is defined as underlying the first thick Sif horizon, while the base of the member overlies a thick dolerite sill. In much of the tenement the Lower Koolpin Formation is not apparent.

b.2 **Middle Koolpin Formation (Psk2)**

The dominant lithologies of this member are strongly ferruginous mudstones, Sif, chert nodular horizons, silicic opaline Sif and massive limonitic ironstones.

b.3 **Upper Koolpin Formation (Psk3)**

The base of this member is defined as ferruginous mudstones with recrystallised chert and sugary quartz bands. Overlying this bed is a bleached, grey-white, sericitic mudstone/slate unit, originally a black, cherty carbonaceous mudstone.

b.4 **Gerowie Tuff (Psg)**

The Gerowie Tuff is characterised by siliceous mudstone, cherty volcanic and lithic tuffs with minor carbonaceous mudstones and dark greywackes.

b.5 **Mt. Bonnie Formation (Pso)**

Overlying the volcanic sediments, the base of the Mt Bonnie Formation is defined by a "tombstone" greywacke. Within the isolated outcrops, dominant lithologies are greywacke, phyllitic shales, siltstone and minor lithic tuffs, thus indicating a return to deeper water flysch deposition.

(c) **Zamu Dolerite (Pdz)**

At the completion of sedimentation there occurred intrusion by the Zamu Dolerite as generally conformable sills. Major dolerite sills have been mapped at three stratigraphic horizons:-

(i) between the Wildman Siltstone and Koolpin Formation,
(ii) between the Middle and Upper Koolpin Formation members, and
(iii) at the Koolpin Formation and Gerowie Tuff contact.

Structural trends within EL 5139 define tight NW trending synclines where S_0 may be completely overprinted by a strong S_1 cleavage. In some locations, especially slaty mudstones, a definite S_2 cleavage may be seen which may be the product of secondary deformation.

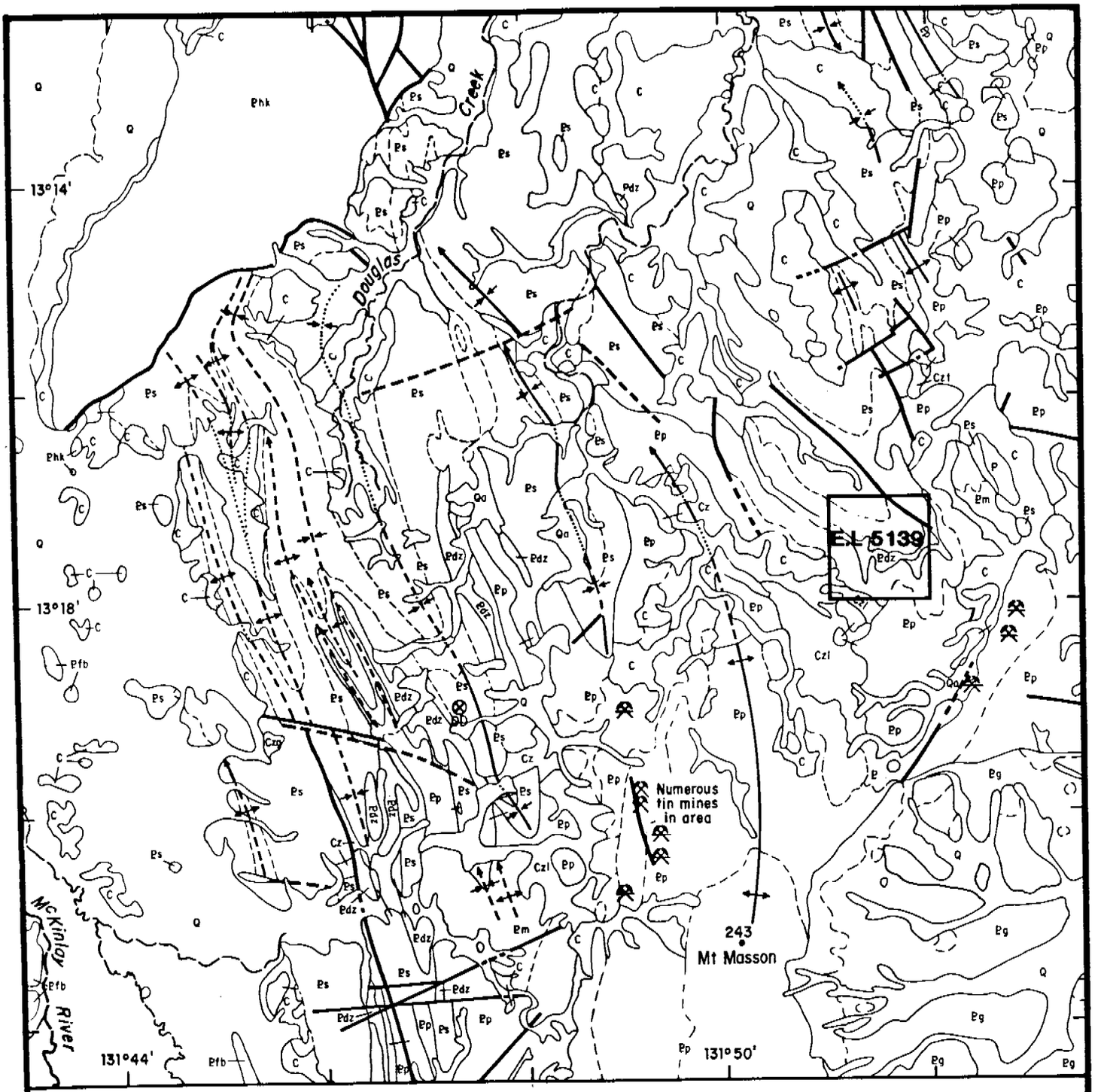
3.2 **Prospect Geology**

The geological setting of EL 5139 is a broad northwest plunging syncline. Gerowie Tuff forms the core of the syncline with Koolpin Formation and Wildman Siltstone forming ridges parallel to the fold axis.

Lithologies within the Wildman Silstone include mudstones, phyllites, siltstones and a coarse grained sandstone unit with quartz stockwork. This sandstone unit defines a tight fold closure within the southwest block.

Koolpin Formation lithologies include mudstones, siltstones, Sif, and chert nodular horizons. Parasitic folding, shearing and quartz reefs have been observed in the fold nose area.

Lithic and volcanic tuffs, black cherts, mudstones and minor greywackes are the dominant lithologies of the Gerowie Tuff within the central syclinal zone.



LEGEND

C-Q	CAINOZOIC AND QUATERNARY SEDIMENTS
Phk	KATHERINE RIVER GROUP
Pg	CULLEN BATHOLITH
Pdz	ZAMU DOLERITE
Pfb	FINNISS RIVER GROUP
Ps	SOUTH ALLIGATOR GROUP
Pp	MOUNT PARTRIDGE GROUP
Pn	NAMOONA GROUP

- Geological Boundry
- Anticline
- Syncline
- Overturned Anticline
- Overturned Syncline
- Fault
- River, Creek
- Mine (abandoned)
- Drillhole, DD-diamond

N

0 1 2 3 4 5

1:100 000

REGIONAL GEOLOGY FOR E.L 5139

DOMINION MINING LIMITED

PROJECT G.D.J.V.			STATE N.T.
Orig R.A.V. date 2/88	Drawn S.J.F date 4/90	Scale 1:100 000	
Checked	Figure No. 2 Plate No.	Plan No 2A-G63	

4. PREVIOUS WORK

Previous work by Geopeko consisted of a regional stream sediment sampling program undertaken in 1977. The samples taken were minus 20 mesh and some anomalies were noted. Data on this work is limited as no specific reports could be found.

Preliminary exploration in 1987 by GDJV consisted of minor rock chip sampling, photogeological mapping and brief regional scale field mapping.

The 1988 exploration program consisted of reconnaissance evaluation entailing geological mapping at 1:10 000 scale using enlarged aerial photography for control of the mapping and regional stream sediment/rock chip sampling programs. Five anomalous results were obtained from four sites. Two of these samples came from drainages where the possible source of mineralization lies outside the licence boundary. The other three anomalies lie within the retained block which covers a synclinal closure where gossanous outcrops and quartz reefs have been located.

In 1988 three different size fractions were tested during the stream sediment sampling program, and they were:

- Minus 80 mesh (Method 334 Au See Section 5)
- Pan concentrate (Method 300, Analabs)
- Minus 6mm Bulk Cyanide Leach (BCL)

340 (Au) Cyanide extractable; Bottle roll; Solvent extraction; Aas finish.
Detection limit for Au 0.2 ppb.
Assaying done by Analabs Perth.

5. 1989 WORK PROGRAM

The 1989 exploration program consisted of intense sampling in areas that had previously shown anomalies.

The nature of the work undertaken was bulk soil sampling at 25m intervals and rock chip sampling. The soils were bulk samples because previous exploration by Geopeko and GDJV showed anomalies only in the coarse fractions (-#20 soil and -6mm BCL). Assay techniques, used during 1989, included:

101 (As)	Perchloric Acid digestion; AAS finish Detection limit for As>100ppm
114 (As)	Perchloric Acid digestion; Hydride generation; AAS finish Detection limit for As 1-100ppm
334(Au)	30 gram sample, Aqua Regia; carbon rod finish Detection limit for Au 1-100ppb
336(Au)	50 gram sample, Aqua Regia; carbon rod finish Detection limit for Au 1-100ppb

The soil samples were assayed using method 336 for gold, and both 101 and 114 for arsenic, while 334, 101 and 114 were used for the rock chip samples. All assaying was done by Analabs in Darwin.

Sample locations are shown on Plate 2 with 1989 assay results reported in Table 1.

6. RESULTS

6.1 Geochemistry

A total of 63 soil samples (Nos. 175549 - 611) and 14 rock chip samples (Nos. 283001-014) were collected along traverse lines within EL 5139 in 1989.

Assay results are listed in Table 1 and 2 and shown on Plate 2. Population distrubtions in soils for both gold and arsenic are shown in Figures 3 and 4 respectively.

These show a mean distribution with no significant deviations over a population of 63 samples. Although this is not a large enough population to be completely reliable, it still indicates that the values received are background with no anomalies present.

TABLE 1 EL 5139 - SOIL SAMPLES 1989: As + Au

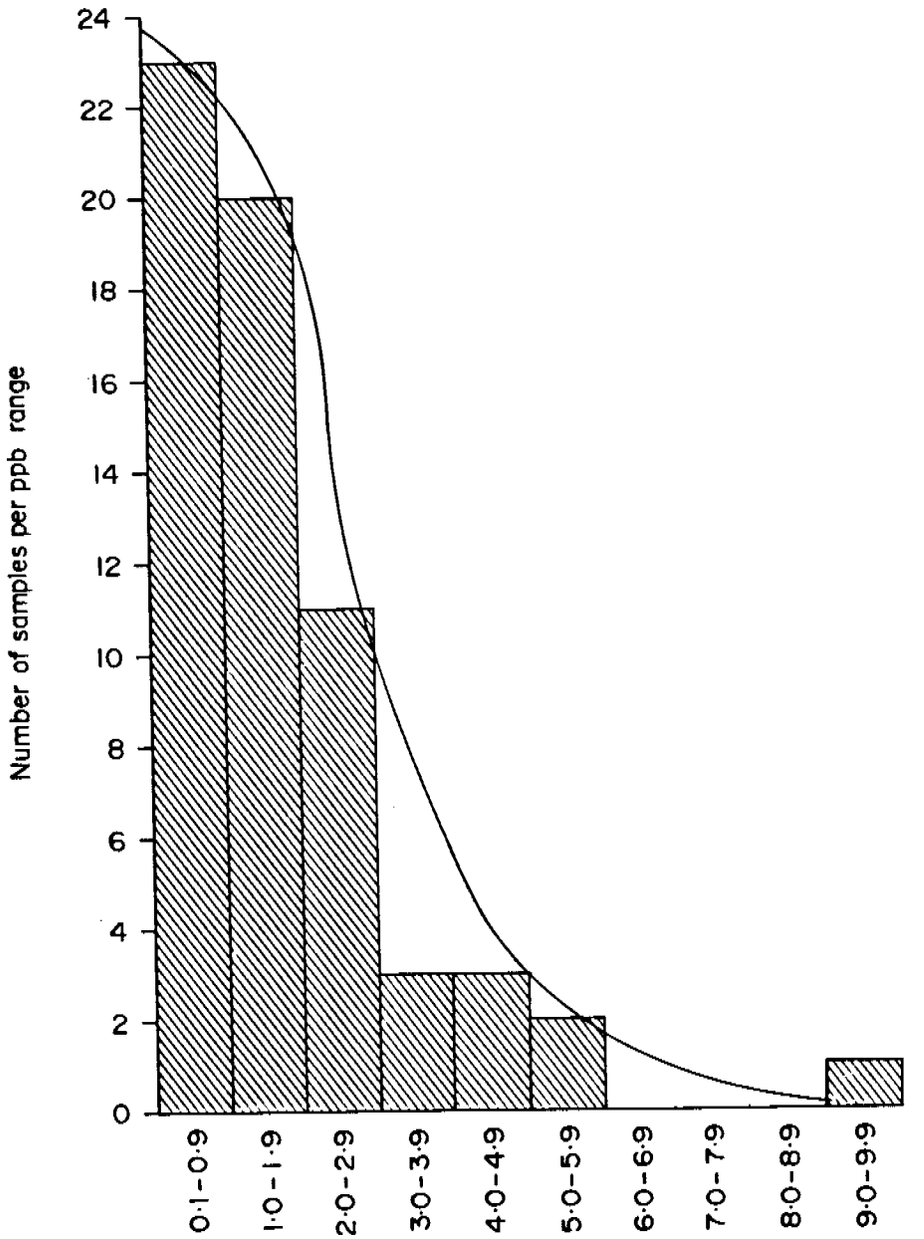
SAMPLE NO.	As ppm	Au ppm	
175549	120	0.001	
175550	120	0.001	
175551	180	0.001	
175552	180	0.001	
175553	140	0.002	
175554	92	0.002	
175555	72	0.001	
155556	84	0.002	
155557	160	0.002	
155558	130	0.005	
155559	130	0.003	
155560	170	0.001	
155561	97	<0.001	
155562	310	<0.001	
155563	360	<0.001	
155564	180	<0.001	
155565	150	<0.001	
155566	84	<0.001	
155567	38	0.001	
155568	43	0.001	
155569	56	0.002	
155570	80	0.002	
155571	130	0.001	
155572	130	0.002	
155573	33	0.001	
175574	32	<0.001	
175575	24	<0.001	
175576	22	<0.001	
175577	17	<0.001	
175578	16	<0.001	
175579	32	0.001	

TABLE 1 EL 5139 - SOIL SAMPLES 1989: As + Au (Cont'd)

SAMPLE NO.	As ppm	Au ppm	
175580	120	0.001	
175581	110	<0.001	
175582	60	0.002	
175583	130	<0.001	
175584	67	0.001	
175585	82	0.003	
175586	130	0.009	
175587	110	0.004	
175588	30	0.001	
175589	44	0.001	
175590	56	<0.001	
175591	130	0.001	
175592	110	<0.001	
175593	69	0.001	
175594	100	<0.001	
175595	100	<0.001	
175596	260	<0.001	
175597	140	<0.001	
175598	33	0.001	
175599	32	<0.001	
175600	25	<0.001	
1755601	26	<0.001	
1755602	36	0.003	
1755603	63	<0.001	
1755604	90	0.004	
175605	180	0.001	
175606	67	0.002	
175607	130	0.002	
175608	100	0.005	
175609	130	0.004	
175610	80	0.002	
175611	110	0.001	

TABLE 2 EL 5139 - ROCK CHIP SAMPLES: As + Au

SAMPLE NO.	As ppm	Au ppm	
283001	1100	0.010	
283002	120	0.002	
283003	110	0.004	
283004	130	0.002	
283005	90	0.016	
283006	69	0.005	
283007	48	0.001	
283008	370	0.001	
283009	800	0.001	
283010	280	0.001	
283011	120	0.001	
283012	1200	0.002	
283013	67	0.002	
283014	160	0.005	

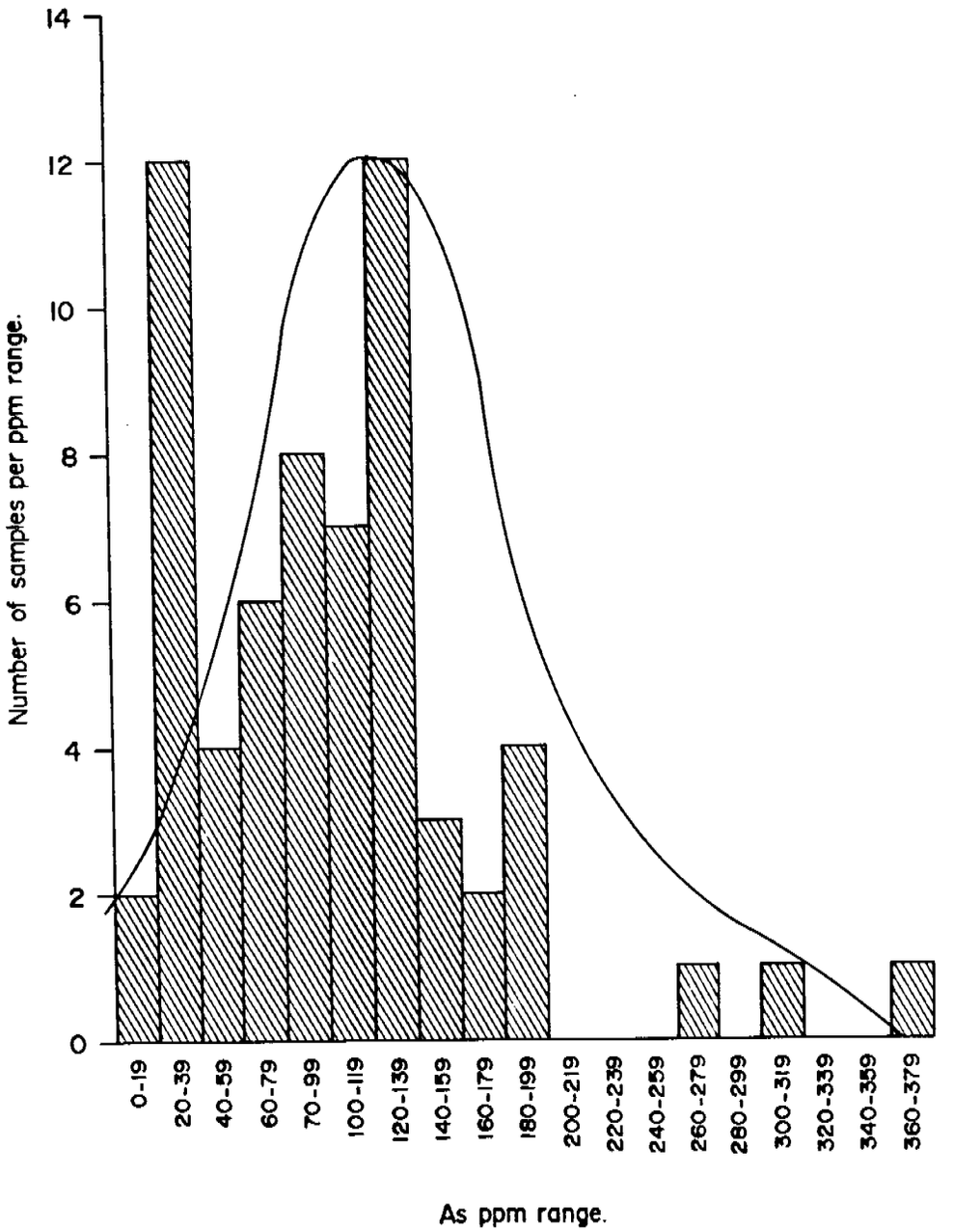


Soil Samples

Population Distribution of Gold

PROJECT	EL. 5139 DOUGLAS CREEK EAST				STATE N.T
Orig. P.T	date 12/89	Drawn SJF	date	Scale	
Checked		Figure No 3	Plate No	Plan No 2M-M1	

DOMINION GOLD MINES N.L.



Soil Samples

Population Distribution of Arsenic

DOMINION GOLD MINES N.L.	PROJECT	EL. 5139 DOUGLAS CREEK EAST			STATE N.T
	Orig. P.T	date 12/88	Drawn S.F	date	Scale
	Checked		Figure No 4	Plate No.	Plan No 2M-M2

7. CONCLUSIONS & RECOMMENDATIONS

Exploration within EL 5139 consisted of a reconnaissance stream sediment sampling program, geological mapping and rock chip sampling in 1987 & 1988. Work in 1989 consisted of a soil sampling program, rock chip sampling and mapping in areas previously found to be anomalous.

The results indicate no significant anomalous zones and no repeat of the previously generated GDJV and Geopeko results. There is no potential for a significant hard rock resource.

No further evaluation is warranted and it is recommended that EL 5139 be relinquished.

8. EXPENDITURE

Exploration expenditure during year three of tenure for EL 5139, totalled $15,704 as at 31 March 1990, and is as follows:-

Direct

Assays	$1019
Geophysics	$ 264
Sub Total	$1283

Indirect

Consultant Fees	$1250
Vehicles and Fuels	$ 960
Travel and Accommodation	$ 912
Field Consumables & Equipment	$ 190
Salaries and Wages	$4578
Drafting	$ 138
Camp Supplies and Rental	$4145
Sub-Total	$12373
Administration	$2048
TOTAL	$15704

9. BIBLIOGRAPHY, REFERENCES

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Stuart-Smith, P.G., Needham, R.S., Wallace, D.A., & Bagus, L. (1985) Pine Creek 1:100,000 Sheet 5270 Explanatory Notes.

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Aerial Photography, 1:25,000
Flown by Airesearch for Dominion Gold Operations Pty. Ltd (1988)
Am513, Run 1 No's 198-199

DOMINION MINING LIMITED

PROJECT: EL 5139 DOUGLAS CREEK

PROSPECT: N.T.

SURFACE GEOLOGY
CR90/269

0 50 100 150 200
metres

ORIGINATOR:	P. Tyson	SCALE:	1:2500
Date:	12/89	DRAWN: S.J.F	Date: 12/89
REVISION:	Date:	PLATE NO:	1
REVISION:	Date:	PLAN NO:	2M-G3

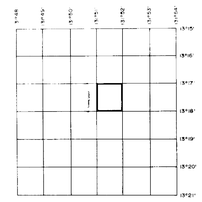
Legend

- survey station and traverse line
- outcrop
- quartz vein dip and strike
- bedding
- cleavage

Abbreviations

abund	abundant
anast	anastamosing
b	bedding
bx	breccia
c	carbonaceous
ch	chert
fe	ferruginous
go	gossanous
h	highly
he	hematite
la	laminated
mass	massive
mr	minor
nod	nodules
Q	Quartz
Scr	scree
sh	shear
Sif	siliceous iron formation
Sil	siliceous
Smd	Mudstone
Ssl	Siltstone
Su	Sulphides
Vdl	Dolerite
vn	vein
//	parallel

McKinlay River Graticular Reference 32/58



DOMINION MINING LIMITED

PROJECT: EL 5139 DOUGLAS CREEK

PROSPECT: N.T.

SAMPLE LOCATIONS AND ASSAY RESULTS.

0 50 100 150 200 metres

ORIGINATOR: P. Tyson		SCALE: 1:2500	
Date: Dec. 89		DRAWN: S.J.F	Date: Dec. 89
REVISION: G.C	Date: 4/90	PLATE No:	2
REVISION:	Date:	PLAN No:	2M-C2

CR90/269

LEGEND

- Survey station and traverse line.
- As ppm assay result. Au ppm assay result. Rock chip sample location and number. 283003
- Soil sample location and number. As ppm assay result. Au ppm assay result.
- X25(0-04) 1988 Rock chip sample location and number. 252025. Au ppm assay result.
- (I-68) Geopeko sample location Au ppm assay result.
- 64 - I-8 / - 0.001 / - 0.007 Stream sample location and number. 147564. BCL ppb Au assay result. -80 # ppm Au assay result. PC ppm Au assay result.

McKinlay River Graticular Reference 32/58