97-4074

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**CORINNA PROJECT**

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# EXPLORATION LICENCE NO. 43/94
# CORINNA, WESTERN TASMANIA

# ANNUAL REPORT TO 4/1/97

EL43/94

Volume 1 of 3

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ANNUAL REPORT - CORINNA
EL 43/94 - GOLDSTREAM MINING/TITAN
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Prepared by: N.J. Turner Geological Services Pty Ltd
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22nd October, 1997

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## CORINNA PROJECT

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Volume 1 of 3



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## 1.0 Summary


- The Goldstream – Titan Joint Venture's primary interest in EL 43/94 is exploration for gold.
- Gold in apparently good quantities was won from streams in EL 43/94 in the late 1800's. In the same period attempts were made to hydraulically mine high level, remnant Tertiary gravels and a number of hardrock occurrences of gold were located
- Modern mineral exploration has identified copper-zinc-trace gold in iron-rich rocks at the Alpine anomaly, also a siliceous banded ironstone near the Owen-Meredith River which carries copper and gold.
- Studies reported here indicate that the widespread alluvial gold in EL 43/94 is mostly of local derivation. Previously it was thought likely that much of the gold was transported into the area by Tertiary streams.
- Reconnaissance minus 80 mesh and panned concentrate stream sediment sampling has identified four areas for detailed investigation.
- Detailed helimag has been acquired as an aid to mapping and to structural interpretation.


## 2.0 Introduction

This report outlines the nature and results of work by the Goldstream – Titan Joint Venture in Mineral Exploration Licence No 43/94 during the 1995-1996 summer field season. The work represents Stage 1 of the Joint Venture's Corinna Project which encompasses seven exploration licences covering virtually all of the Arthur Metamorphic Complex in north western Tasmania. Work for the 1996-1997 summer field season was in progress on the due date of the Annual Report (4/1/97) and will be described in the next Annual Report.

The exploration licences comprising the area of the Corinna Project (Figure 1) are EL 43/94 Corinna, EL26/95 Specimen Creek, EL 37/96 Rapid River, EL 38/96 Savage River, EL 42/96 Rocky River, EL 43/96 Pieman River and EL 46/96 Flowerdale River. In addition, an arrangement has been made with H. D. Nolan to carry out work on Consolidated Mineral Lease 7M97 which is bordered by the Joint Venture's EL 43/96.

A small exploration licence (No 44/96) held by R. Holland falls within EL 43/96. Holland's licence is for alluvial deposits and is limited to a depth of 15m. The Joint Venture has the right to explore within the licence area for deposits at depths greater than 15m. A lease shown as an excision from EL 43/94 at AMG 349000E, 5392000N in Figure 2 has been relinquished and the ground has become part of EL 43/94.

EL 43/94 was the first tenement acquired by the Goldstream – Titan Joint Venture in the Corinna district. It was taken up following a conceptual targeting exercise that focussed on Homestake style, Proterozoic, iron formation hosted, lode gold in the north west of Tasmania (Morritt, 1995). Fieldwork commenced in the tenement on 8/1/96.

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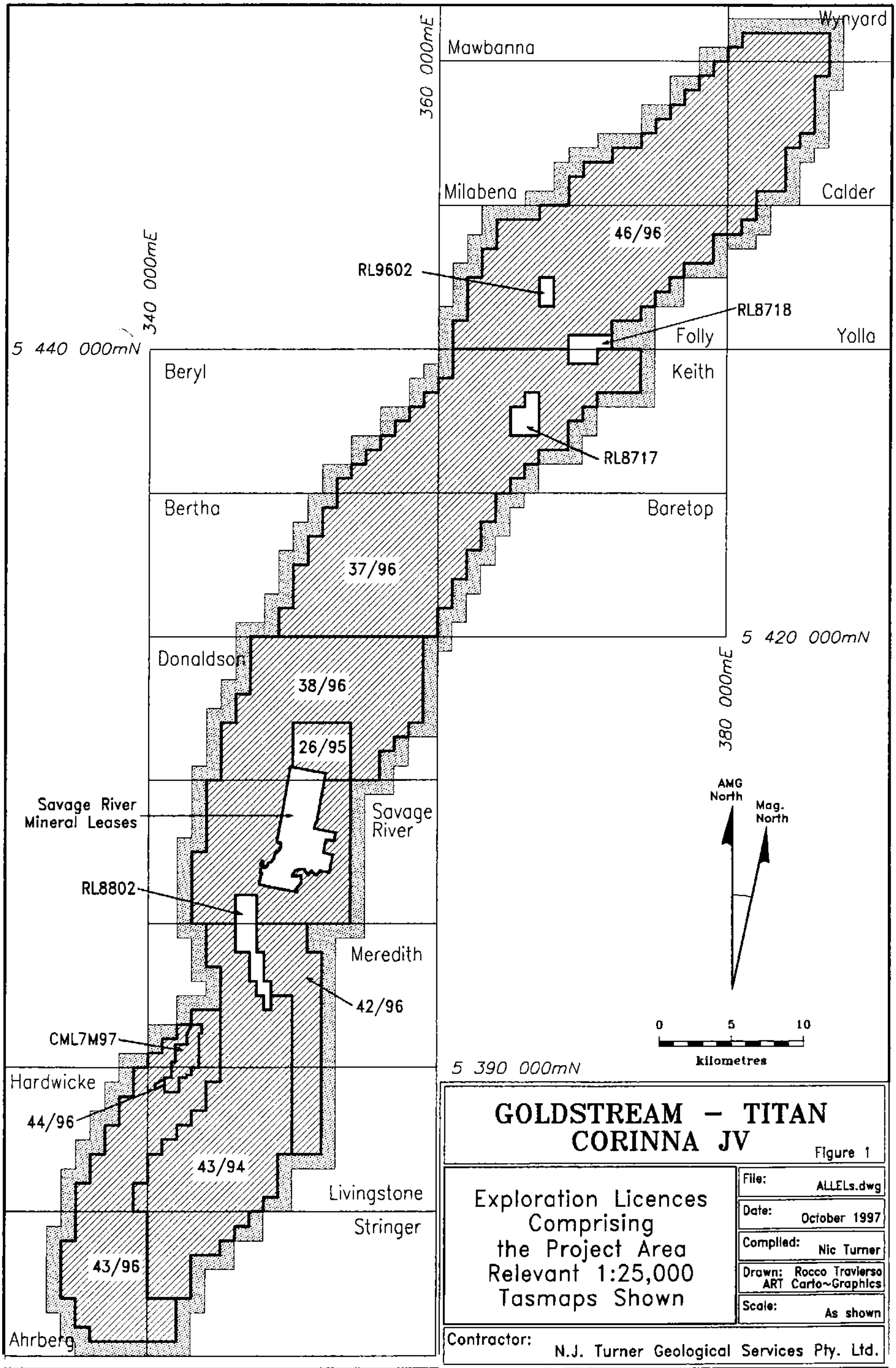


# GOLDSTREAM – TITAN CORINNA JV

Figure 1

Exploration Licences Comprising the Project Area Relevant 1:25,000 Tasmaps Shown

| | |
|---|---|
| File: | ALLELs.dwg |
| Date: | October 1997 |
| Compiled: | Nic Turner |
| Drawn: | Rocco Traviersо ART Carto~Graphics |
| Scale: | As shown |

Contractor: N.J. Turner Geological Services Pty. Ltd.

## 3.0 Tenement information

Exploration Licence No 43/94 extends NNE from a locality 6km SW of the Reece Dam on the Pieman River to a locality 7km SW of Savage River township (Plans 1-4). The licence covers an area of 127skm and falls within the Tasmap 1:25000 sheets of Stringers, Hardwicke, Livingstone and Meredith (Figure 1).

Land categories in the licence area include State Forest classified as Multiple Use Forest Land, Crown Land and Crown Land classified as Deferred Forest Land. There is a 2.5skm area of land near Reece Dam which is vested in the Hydro Electric Commission. The land is excluded from EL 43/94 though access for mineral exploration is a negotiable matter with the HEC. The Pieman River State Reserve (Plans 1-4) is excluded from EL 43/94. However, mining is permissible at depths of greater than 50m below the surface.

EL 43/94 was granted on 3/2/1995. It will remain current to 3/2/2005, providing that the licensee's performance is deemed satisfactory by the Tasmanian Minister for Mines.

## 4.0 Exploration concepts

The following ideas underpinned the Joint Venture's initial interest in EL 43/94.

1. EL 43/94 covers a greenstone belt that contains lithologies which are consistent with the possible presence of Proterozoic, iron formation hosted, lode gold. However, given that all lithologies in a greenstone belt are capable of hosting gold, the aim should be to achieve a general coverage of the rocks in EL 43/94.
2. The widespread alluvial gold in the Corinna district is mostly of local derivation. Some alluvial gold was sourced directly from bedrock. Other alluvial gold was sourced locally, but was transported for short distances in the earliest of the Tertiary streams. These streams deposited the relatively gold-enriched basal gravels at Lucy Spur, Nancy Spur and elsewhere.

## 5.0 Previous work in EL 43/94

### 5.1 GEOLOGY

The rocks in EL 43/94 and EL 42/96 (Figure 2) are a cross section of the Arthur Metamorphic Complex which is a linear greenstone belt that exceeds 100km in length and ranges up to about 10km in width (Turner et al, 1991; Calver, et al 1995). EL 43/94 and EL 42/96 are located in the widest part of the belt, where it changes trend from ENE to NNE.

In EL 43/94 the rocks comprise the Timbs Group (Pta, Pts in Figure 2) and the Oonah Formation (Po in Figure 2). The boundary between the Timbs Group and the Oonah Formation is structurally complex but appears to be transitional.

Schist and phyllite (Pts) in the Timbs Group are mostly muscovitic or chloritic though some intervals are quartzose. Respectively, these various compositional types were probably derived from muddy siltstone, (?) mafic

Figure 2

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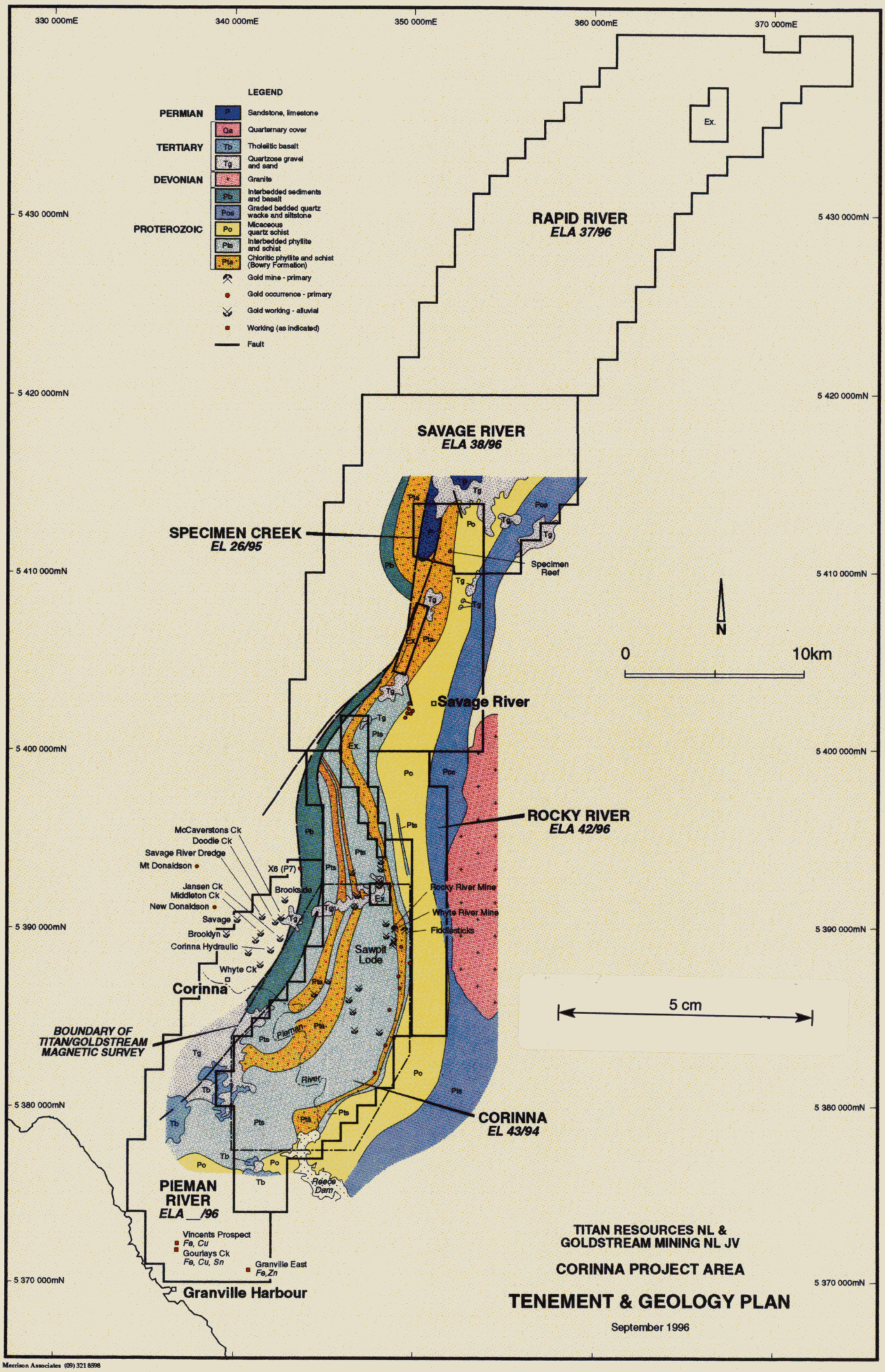


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volcaniclastic siltstone and quartzose wacke. The chloritic schist and phyllite units (Pta) comprise mostly chlorite schist and chlorite phyllite with interbands of relatively massive amphibolite after tholeiitic basalt and dolerite. Disseminated magnetite is uncommon in the western Pta unit (Nancy Formation) but is abundant in the middle unit (Lucy Formation) and the eastern unit (Bowry Formation). The Bowry Formation contains widespread lenses of interlayered chlorite schist, amphibolite and massive to banded ironstone consisting of magnetite + pyrite ± silicate. A granitoid in the Bowry Formation returned an ion probe zircon age of 777 Ma which is late Proterozoic.

The Oonah Formation comprises muscovitic schist and muscovitic phyllite interbanded with quartzose schist. This assemblage was derived from an interbanded sequence of mudstone, siltstone and turbiditic quartzose wacke.

Deformation is intense in the Arthur Metamorphic Complex with isoclinally folded compositional banding usually dipping subvertically and the second cleavage commonly dominant and also subvertical. The rocks mostly display retrograde greenschist facies metamorphism but relict amphibolite facies minerals including almandine, hornblende and glaucophane-crossite are locally preserved, particularly in the Bowry Formation. K-Ar hornblende ages give a minimum age for prograde metamorphism of about 500 Ma which is Cambrian. The Cambrian Period was an important time of metallogenesis in Tasmania.

A substantial Devonian granite intrusion outcrops a few kilometres east of EL 43/94 (Figure 2). Tin mineralisation and base metal mineralisation are associated with the granite. A small body of Devonian quartz porphyry is known in EL 43/94, at Timbs Creek.

Tertiary gravel is widespread in EL 43/94, occurring as remnant deposits on ridge tops. Thin basalt flows are commonly associated with the gravel.

## 5.2 HISTORICAL GOLD WORKINGS

### 5.2.1 Stream workings

Payable alluvial gold was discovered in the Corinna district in February, 1879 (Julen, 1984). The first discovery was at Middletons Creek, some 4km west of EL 43/94 (Figure 2). No accurate overall production figures exist for the alluvial mining at Middletons Creek, or for early alluvial mining in streams elsewhere in the Corinna district (Bottrill, 1991). The Tasmanian bank returns of the time are an inadequate record of production because it is believed that much (?most) of the gold was taken directly to Victoria for sale (Twelvetrees, 1903).

By 1881 shallow Recent gravels in Nancy Creek, Lucy Creek and the Paradise River, which are all within EL 43/94 (Plan 1), were being worked and some very coarse gold was reported. Around the same time similar gravels in streams near Browns Plains were being worked as well as gravels in streams south from the Paradise River to the Owen-Meredith River.

In 1882 McGinty and party recovered a 243 ounce (7.5kg) nugget from a depth of 5 or 6 feet in gravels in the Rocky River at a point about 1km above its junction with the Whyte River (Julen, 1981), near AMG 349250E, 5389475E. Nuggets of 140 ounces and 39 ounces were found in the Rocky River shortly afterwards. Nuggets of up to 3 ounces were occasionally found in the period to 1900, during which time a considerable amount of gold was apparently won from the Rocky River and some of its tributaries. The Rocky River has been worked on a small scale intermittently up to the present day, with suction dredging being used in recent times.

Several alluvial mining operations were carried out in the Whyte River near its junction with the Rocky River. These included working the bed of the river by bucket dredging (1901-1903) and by hydraulic mining (1932-1934). The latter method was applied in the loop of the river upstream of the junction after the riverbed was drained by diversion of the river through a tunnel under the spur at AMG 349000E, 5390000N. Neither mining operation returned gold in the quantity that was apparently derived from the Rocky River, and both were abandoned.

Upper terrace gravels with an elevation of some 18m above the bed of the Whyte River at AMG 348600E, 5389600N, downstream of the Rocky River junction, were worked hydraulically in Tarrys Mine (1936-1938) but the presence of large boulders frustrated the operation. The greater part of the gold that was recovered was derived from basal gravels rich in pebbles of magnetite and hematite (Blake, 1939).

### 5.2.2 Workings in Tertiary to Recent Gravels

In the period 1893 to 1897 several companies developed hydraulic workings in the extensive Tertiary to Recent gravels north and north east of the Corinna township (Figure 2). Hydraulic workings were also developed in Tertiary gravels capping ridges at Nancy Spur and Lucy Spur which are within EL 43/94 (Plan 1). None of these hydraulic workings was successful because the average recovered grades were too low (about 0.1 grams per cubic metre north and north east of Corinna).

At Nancy Spur and Lucy Spur the Tertiary gravels are some 15m thick. However, the greater part of the gold was found to be unevenly distributed through the basal layer of gravel whilst the much greater volume of overlying gravel contained almost no gold (Blake, 1939; Montgomery, 1894). A similar situation was encountered at Browns Plains where adits driven along the basal contact of the Tertiary gravels encountered rich patches of gold but little was found in the overlying gravels.

Gold in the basal gravel layer at Lucy Spur was reported to be waterworn to angular, of coarse grainsize and to be associated with tourmaline, rutile and chromite. It sometimes occurred as angular composite grains with quartz which suggests local derivation. One small 'auriferous leader' was exposed during sluicing.

5.2.3 Hardrock workings

The sections of the Rocky River and its tributaries which have been a source of alluvial gold flow across the Bowry Formation and adjacent rocks. At Rocky River the Bowry Formation includes two intervals containing bands of magnetite with subordinate pyrite. The more westerly of these intervals at AMG 349075E, 5390000N was investigated by the underground workings of the Rocky River Mine (1895-c1900) but no significant production of gold was achieved.

The best gold assay in published reports by the operators of the Rocky River Mine was 1oz 5dwt 8grs per ton whilst the best copper assay was 5% (Twelvetrees, 1900). The University of Tasmania returned an assay of 1.5dwt Au and 15.5dwt Ag from a grab sample of magnetite taken by Twelvetrees (1900) from a stack outside the main adit of the mine. An assay by the then Government Analyst of another sample gave 0.1% Cu, trace Au and 9dwt 19grs Ag. Small amounts of mineralisation containing Ni, Ba, Co, Mo, Pb, As and asbestos were reported from the workings.

Scattered, small prospecting adits and shafts between the Rocky River and the Owen Meredith River (Figure 2, Plan 1) also encountered patchy gold and copper mineralisation.

Good alluvial gold in a creek some 700m SSE of the Lucy Spur Tertiary gravel workings was traced to a source on the western slopes of the creek valley by sluicing (Harcourt Smith, 1897). Several adits were driven into the hillside (Plan 1) to develop a quartz porphyry intrusive carrying gold and copper. No assays or production figures for these workings have been located in the available literature. Importantly, the workings demonstrate that there is bedrock gold mineralisation in EL 43/94 outside of the Bowry Formation and adjacent rocks.

5.3 IRON ORE EXPLORATION

The belt of rocks containing magnetite-pyrite lenses which is now called the Bowry Formation (Plan 1, Figure 2) has been known since the early days of prospecting and mining in the Corinna and Savage River districts (Twelvetrees, 1903). Initially the magnetite-rich lenses were prospected for gold and copper, but later their potential as sources of iron ore became of interest.

Most interest has focussed on the larger magnetite lenses beside the Savage River (Duncan and Weatherstone, 1990), north east of EL 43/94. These have been mined for iron ore since 1967 by Pickands Mather and are currently being redeveloped by Australian Bulk Minerals. A fair amount of assessment work has also been done on the magnetite lens in Retention Licence 8802 (Figure 1) by Savage Resources, mostly under the company's previous name of Industrial and Mining Investigations. In addition IMI – Savage Resources carried out considerable work in RL 8802 on magnesite deposits in the Bowry Formation (Frost, 1982) and on overlying, surficial ochre deposits.

Magnetite lenses occur in the Bowry Formation in EL 43/94 (Reid, 1924), but only those between the Whyte River and Rocky River have attracted interest as possible sources of iron ore (Urquhart, 1966). Geological mapping and a ground magnetometer survey were carried out over these in the early 1960s and two holes were diamond drilled in the more easterly interval containing magnetite (Plan 1). A small, low grade resource was inferred (Shannon, 1988).

## 5.4 RECENT MINERAL EXPLORATION

### 5.4.1 Overview

Most parts of the Bowry Formation in EL 43/94 have attracted mineral exploration in recent times (Plan 1). However, the degree of detail has varied considerably and only one locality has been tested by diamond drilling. Outside of the area underlain by the Bowry Formation geological mapping, regional stream sediment sampling and rock chip sampling have been carried out but the overall coverage of EL 43/94 is patchy and of a reconnaissance standard. Little recent work has been done between the Whyte River and the Paradise River, west of the Bowry Formation, where there is widespread evidence of early alluvial mining and a known example of hard rock mining.

### 5.4.2 Work in the Bowry Formation

CRA – Peko (Weir, 1985) gridded the Alpine aeromagnetic anomaly which is in the Bowry Formation 4km southwest of Reece Dam (Plan 1), in an area where the Tasmanian Geological Survey had previously found massive copper-bearing pyrite outcropping in a road cut. Geological mapping, soil sampling, ground magnetics and Genie EM were used to define two drill targets.

DDH AP1 returned 12.75m averaging 0.24% Cu from an interval of metasedimentary schist and ?metaigneous schist containing semi-massive, magnetite-rich and pyrite-rich bands. A veined interval just uphole returned 8.2m averaging 0.19% Zn and 0.04% Cu. DDH AP2 intersected similar rocks and returned 27.4m averaging 0.53% Cu, again with a veined uphole interval. The latter returned 26m averaging 500ppm Zn. Outokumpu (Herrman, 1991) assayed selected samples of the copper rich interval in each hole for gold, returning a best value of 0.105gpt.

Outokumpu gridded a section of the Bowry Formation between Reece Dam and the Owen Meredith River (Herrmann, 1991). Geological mapping, rock chip sampling, soil sampling and a small amount of stream sediment sampling were carried out. A banded, siliceous ironstone in a narrow zone near the eastern contact of the Bowry Formation was found to contain chalcopyrite and gold. Best values of 0.5% Cu and 0.29gpt Au were returned from this ironstone whilst chip sampling across a 10m interval in Doctors Creek returned bulk values of 0.12% Cu and 0.045gpt Au. Massive magnetite-subordinate pyrite lenses near the western edge of the Bowry Formation returned up to 70% Fe but the copper and gold values obtained were low.

Eight profile traverses across the Bowry Formation were carried out by Fodina Minerals (Poltock, 1993) between the Owen Meredith River and the Rocky River, a distance of about 5km. These traverses involved geological mapping, rock chip sampling, B/C soil sampling and ground magnetics. The best of 17 rock chip analyses returned 0.18% Cu and 0.13gpt Au from ironstone in Bounds Creek. Copper and zinc in B/C soils defined the ironstone units with ranges of up to 344ppm Cu and 654ppm Zn. Isolated gold and arsenic soil anomalies were found east and west of the Bowry Formation with ranges of up to 0.061gpt Au and 44ppm As. No follow-up work was undertaken.

IMI – Savage Resources investigated the western part of the Bowry Formation at Rocky River by geological mapping, rock chip sampling and soil sampling (Shannon, 1988) without return of significant assay values for gold. It appears that no rock chips were collected from the eastern part of the formation or from the adjacent rocks to the east, though details of the Fiddlesticks Prospect (AMG349680E, 5389890N) are not on open file. Soil samples taken along the track which crosses the Bowry Formation returned a maximum value of 650ppm Cu over rocks just east of the eastern magnetite-rich interval.

IMI – Savage Resources selectively sampled the core (Shannon, 1985) from the two holes that had been drilled in the eastern magnetite-rich interval at Rocky River during the earlier phase of iron ore exploration. Best values of 5gpt Au and 1.2gpt Au were returned from DDH RR1 and DDH RR2 respectively but these values were not repeated in check analyses which gave a best value of 0.042gpt Au.

### 5.4.3 Work outside the Bowry Formation

Rocks west of the Bowry Formation were investigated from a large grid cut by EZ Co. (Mathison and Ferguson, 1987) which had a baseline extending some 10km north from Dennis Track to near the Whyte River. Cross lines at roughly 1km intervals extended up to 4km westward but only short distances eastward. Reconnaissance geological mapping was carried out and 270 rock chips were collected for a best value of 0.042gpt Au. The calculated background value of the rock chips was found to be slightly higher than Levinson's (1974) values.

A small number (30) of minus 80 mesh stream sediment samples collected by EZ Co. did not define any distinct base metal anomalies but interesting gold values were obtained in five of the 29 panned concentrate samples collected. No soil sampling was done but soil sampling by IMI – Savage Resources (Penny et al, 1984) on east-west lines north of the EZ Co. grid delineated a number of distinct, low order base metal and silver anomalies.

Regional stream sediment sampling has been carried out in various parts of EL 43/94 by Fodina Minerals, Aberfoyle and IMI – Savage Resources. The distribution of sample sites, methods used and results for gold are summarised in Plan 1. Overall, the stream sediment sampling results demonstrate that gold is widespread in EL 43/94.

Fodina's results in the southern part of the Lucy Formation are of interest because there appears to be a correlation with geology. Aberfoyle returned some very high gold results from streams just east of RL 8802, in ground now held by the Goldstream – Titan Joint Venture as EL 42/96. IMI – Savage Resources delineated a substantial arsenic anomaly in streams east of the

Bowry Formation at Rocky River, in an area which has also been included in EL 42/96. Soil sampling in part of this area returned higher arsenic values of 100-750ppm (Penny et al, 1984).

## 6.0 Work carried out by Goldstream and Titan

### 6.1 STREAM SEDIMENT SAMPLING

As the first stage in the exploration of EL 43/94 stream sediment samples were collected at 115 sites between Browns Plain and the Pieman River. This work provided reconnaissance coverage of the Timbs Group from its western boundary at the Lefroy Ridge Fault eastward to the Bowry Formation (Map2, Figure 2). The survey area included a substantial part of the previously poorly explored ground between the Whyte River and the Paradise River.

At each of the 115 stream sites a minus 80 mesh sample and a panned concentrate sample were collected (Appendix 1, Map 2). Each panned concentrate sample was derived from 9 litres of minus 4cm gravel collected from the top 30cm or so of the coarse active gravel in the stream bed. Care was taken to ensure that the same type of sample was collected at all sites. Crevices and other special trap sites were avoided.

The aim of the panned concentrate sampling was twofold: to obtain individual gold grains for laboratory study, and to establish the variation in the abundance of gold through the area surveyed. To preserve the gold grains for further study, the abundance was determined by counting the grains during microscope examination (Appendix 3 – separate volume) rather than by assay. Polished section and microprobe studies (Appendix 4 – separate volume) were carried out on a set of gold grains selected during the initial microscope work.

In addition to the stream sites, panned concentrate samples were collected from two sites in the Tertiary gravels at Browns Plains. Also, eight panned concentrates were collected from the Tertiary gravels in the old workings at Nancy Spur. A sample (G190A) was collected of the fines from a suction dredge in the Rocky River, close to where McGinty found his big nugget.

Minus 80 mesh stream sediment samples were selectively taken from the fine grained, muddy, waning-flood deposits which settle in the bed of the stream, often behind log jams. The field samples were submitted directly to the Analabs (Cooee) laboratory where they were dried, sieved to minus 80 mesh and pulverised to nominal minus 75 micrometres. Gold was determined by 30gm fire assay with carbon rod finish (Appendix 2). Portions of the samples were subjected to aqua regia/perchloric acid digest and copper, lead, zinc and arsenic were determined by AAS finish. Silver was determined by ICPMS finish.

### 6.2 AEROMAGNETIC SURVEY

A detailed helimag survey of EL 43/94 was carried out by UTS Geophysics as an aid to geological and structural interpretation. The flight line separation was 50m, the mean terrain clearance 40m and the sample interval 3-4m.

Specifications of the survey, the equipment used, and processing methods are summarised in Map 5 which also presents contours of total magnetic intensity. The digital survey data have already been submitted to Mineral Resources Tasmania.

## 7.0 Results

### 7.1 PANNED CONCENTRATE SAMPLES

#### *7.1.1 Gold grains recovered*

Of the 118 panned concentrate samples that were collected at the 115 stream sites, 66 contained gold grains (Appendix 3) with the majority less than 0.5mm in diameter. A total of 378 individual grains were recovered of which 128 came from three samples (G172, 174, 192A). These three samples were collected in the tailrace creek of the Lucy Spur hydraulic workings thus the gold may effectively be from Tertiary gravel.

No gold grains were recovered from the two sites in basal Tertiary gravel at Browns Plain but 10 grains were recovered from the eight samples (each 9 litres) panned from basal gravel at the Nancy Spur workings. The dredge fines from Rocky River contained 147 grains of gold.

#### *7.1.2 Travel damage to gold grains*

The amount of travel damage displayed by the gold grains is summarised in Table 1. Irrespective of grouping, relatively few grains show major travel damage whilst a substantial proportion show nil or minor travel damage. This is taken as an indication that little of the gold has been transported for long distances though more grains that are known to be from Tertiary gravels should be studied. The gold from the Lucy Spur tailrace creek shows markedly less travel damage and is perhaps closest to source.

Table 1: Travel damage displayed by alluvial gold grains

| Samples | Total Grains | Nil or Minor % | Moderate % | Major % |
|---|---|---|---|---|
| Lucy Spur G172, 174, 192A | 128 | 52 | 44 | 4 |
| Other stream Samples | 250 | 24 | 67 | 9 |
| Tertiary Nancy Spur | 10 | 30 | 60 | 10 |
| Dredge fines Rocky River | 147 | 31 | 69 | |

7.1.3 Intergrowths and inclusions in gold

A number of coarser grains (G190B) collected from the Rocky River suction dredge are composite, consisting of gold intergrown with limonite, goethite, magnetite and light grey mica. Examples of the grains are illustrated in Photos 17-22, Appendix 3, along with a similar example from the Owen Meredith River. The mineralogy of the intergrowths is consistent with derivation from local iron-rich formations which occur just upstream in each area.

Mineral inclusions identified in polished sections of the gold grains are also consistent with derivation of the gold from the local metamorphic rocks. In particular, inclusions of talc-tremolite, rutile, spinel and CaMnFe carbonate. The latter (rhodochrosite) occurs as a vein mineral in parts of the metamorphics. Quartz and goethite after pyrite are the most common inclusions and are also consistent with local derivation, though less definitive of it.

Two platinum bearing grains in the Rocky River dredge fines are oddities that could have an exotic origin in, say, the ultramafic complexes east of EL 43/94. However, the other features of the gold in the dredge sample strongly support a predominantly local source.

7.1.4 Gold fineness

Microprobe analyses of 192 gold grains (Appendix 4) showed high average fineness (mean 941) and narrow fineness ranges (728-999) in the two dredge samples, in the Lucy Spur tailrace samples, in other stream samples and in the Tertiary samples.

This is consistent with all the gold having been derived from one style of mineralisation. Furthermore, the fineness characteristics are consistent with the style of mineralisation nominated in the Joint Venture's exploration model.

7.1.5 Counts of gold grains

High counts of up to 60 gold grains per 9 litres of gravel were obtained from samples taken in the Lucy Spur tailrace creek (Plan 3). Lower counts of up to 9 grains were returned from streams around the Nancy Spur workings. The parts of the Bowry Formation that were sampled returned very low counts of less than 3 grains per 9 litres of gravel which was surprising as many of the streams show evidence of having been worked.

Heavy minerals other than gold which were notably abundant in some panned concentrates and which showed low travel damage included magnetite, pyrite, epidote, chalcopyrite, rutile and some cassiterite grains. Sample sites where pyrite, chalcopyrite, rutile or cassiterite were notable are shown in Plan 4. Relatively undamaged, crystalline rutile is present in the Nancy Creek – Lucy Spur area where gold is also more abundant. The two minerals were probably associated at source, as is indicated by the polished section study.

7.2 MINUS 80 MESH SAMPLES

Anomalous values for the various metals analysed in the minus 80 mesh samples are defined graphically in Figures 3-5. Anomalous gold values of 3-20ppb are predominant in an area of some 15skm which includes the Lucy Spur workings (Plan 3). The eastern part of this area includes the Doctors Creek – Paradise creek (-?Bounds Creek) segment of the Bowry Formation where an exceptional value of 240ppb was returned from a site in Paradise Creek.

Anomalously high minus 80 mesh gold values were also returned from several other areas including Cataract Creek and Nolan Creek. These creeks flow across the eastern part of the Bowry Formation into the section of the Rocky River that has been a significant producer of gold. Anomalous copper, zinc and silver are also present in the creeks.

Arsenic values in the minus 80 mesh samples show a fair correlation with the regional geology (Plan 3). Values are mostly elevated to 6-14ppm (Figure 4) and occasionally anomalous (14-18ppm) in streams in and near the Bowry Formation, also in streams west of the Lucy Formation. Within the Lucy Formation and in the unnamed formation between the Lucy Formation and the Bowry Formation there are a few elevated and anomalous values of arsenic.

Anomalous zinc values of 70ppm or more are mostly associated with copper values that are either elevated to 20-50ppm or are anomalous at 50ppm or more (Figure 5, Plan 3). Streams in and near the Rocky River segment of the Bowry Formation returned both anomalous zinc and anomalous copper values whilst streams in and near the Bowry Formation west of Doctors Creek returned only anomalous zinc values. There are scattered anomalous values of zinc elsewhere and a few anomalous copper values.

A few anomalous silver values of 80ppb or more were returned from the minus 80 mesh samples (Figure 4, Plan 3). The highest lead values of 20-40ppm are elevated rather than anomalous (Figure 5, Plan 4).

Figures 3,4,5 Graphical presentations of minus 80 mesh stream sediment sample analyses.

3. Counts of gold grains in panned concentrate samples; *gold (ppb) in minus 80 mesh samples.*

4. Silver (ppb) and arsenic (ppm) in minus 80 mesh samples.

5. Copper (ppm), lead (ppm) and zinc (ppm) in minus 80 mesh samples.

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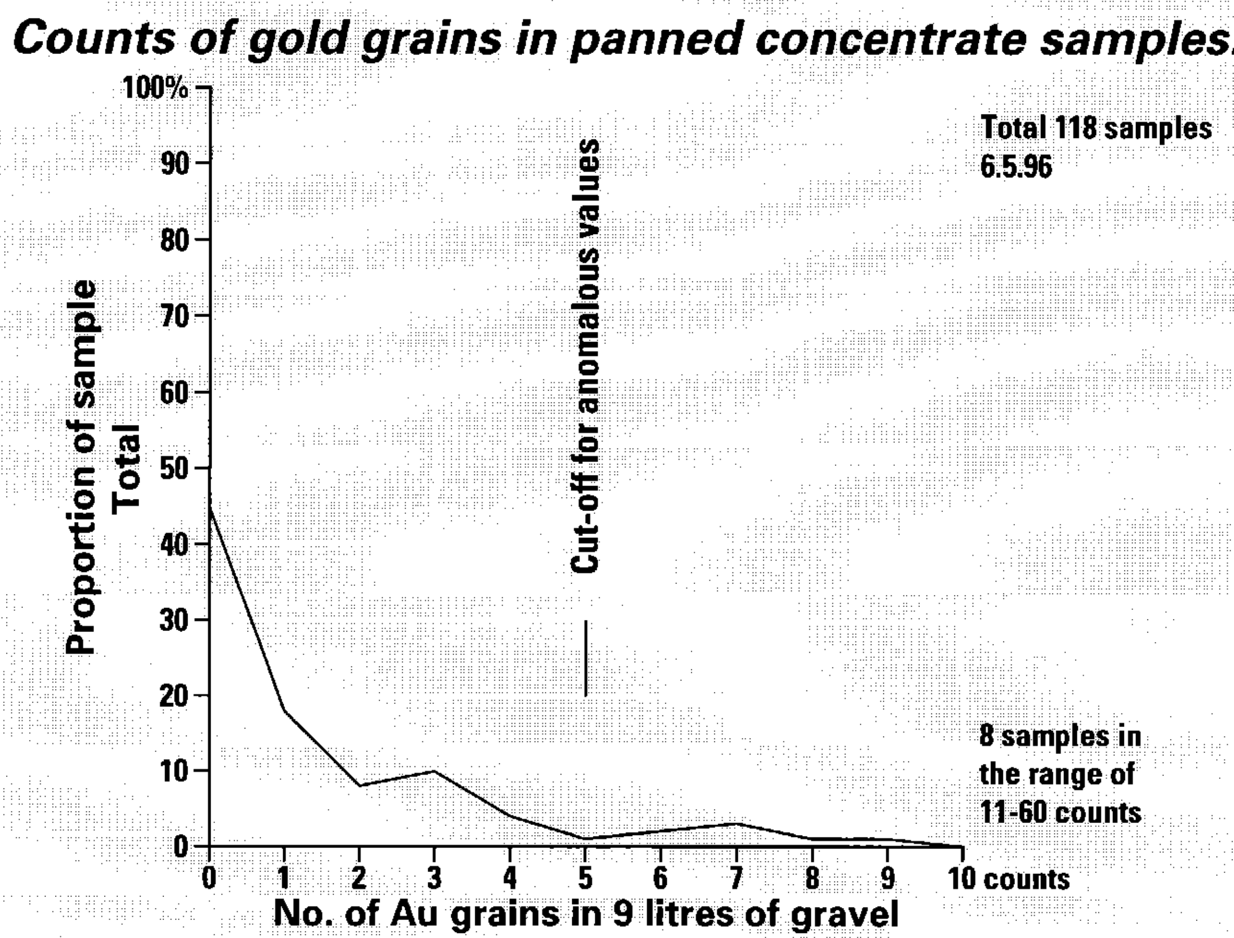


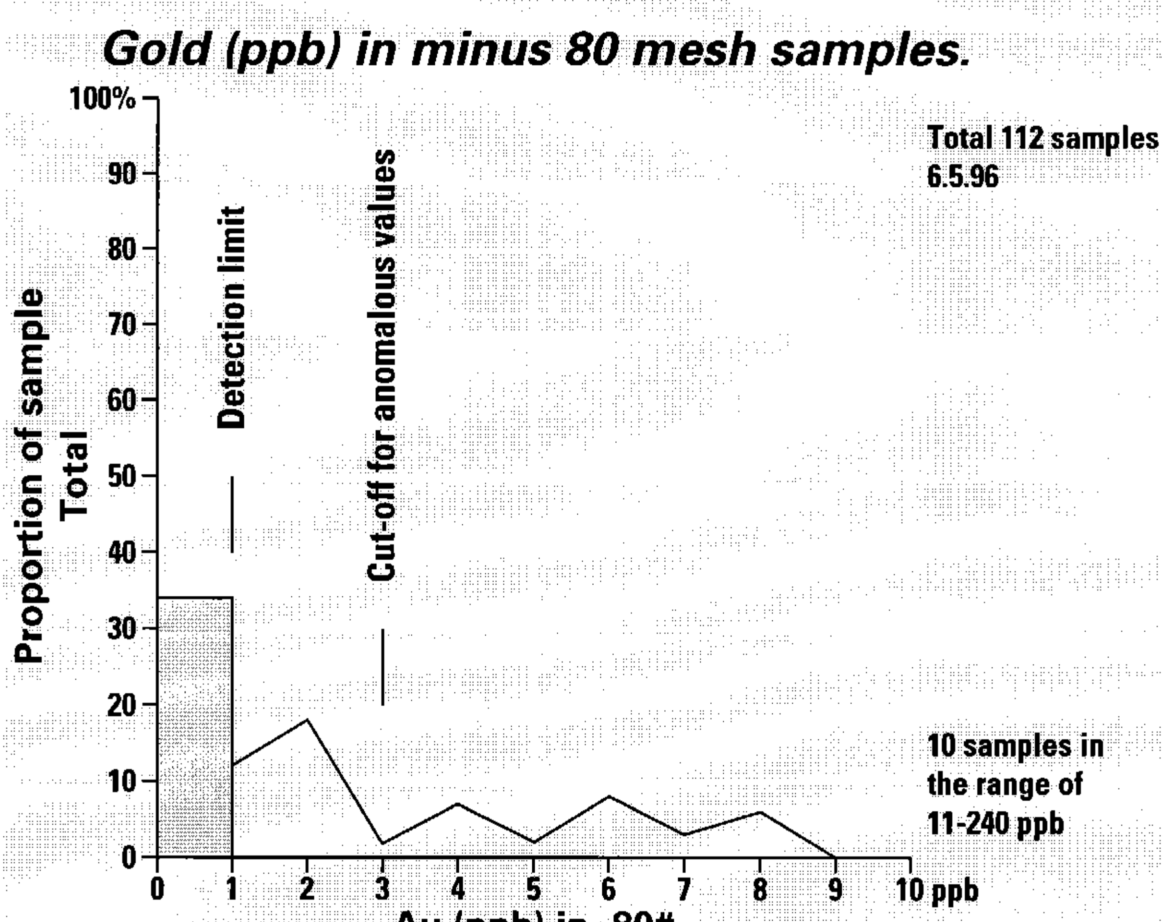
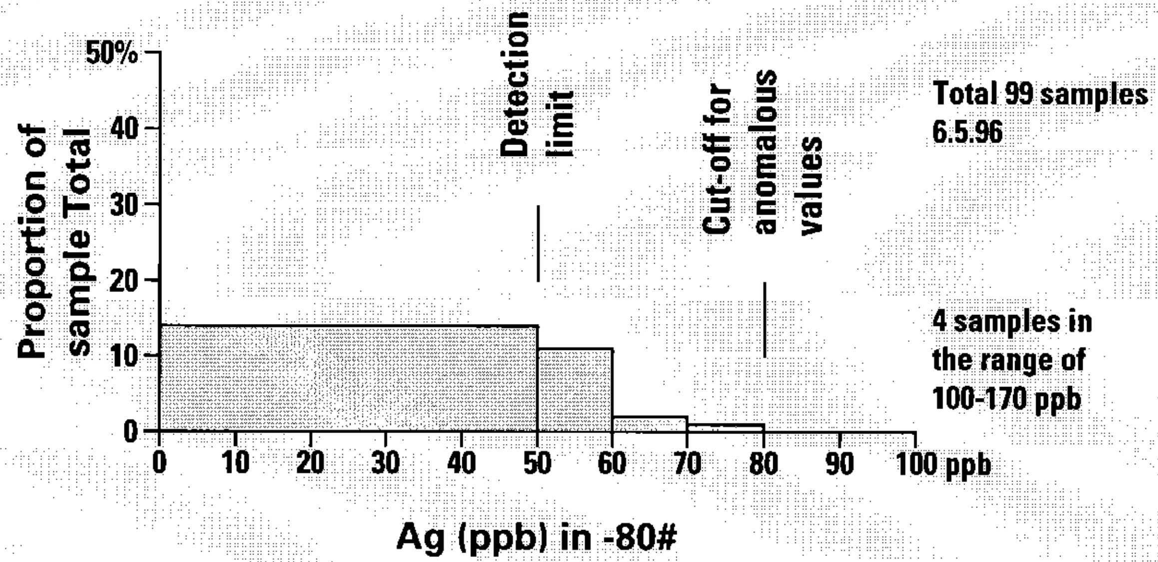




Figure 3.

## *Silver (ppb) in minus 80 mesh samples.*




## *Arsenic (ppm) in minus 80 mesh samples.*

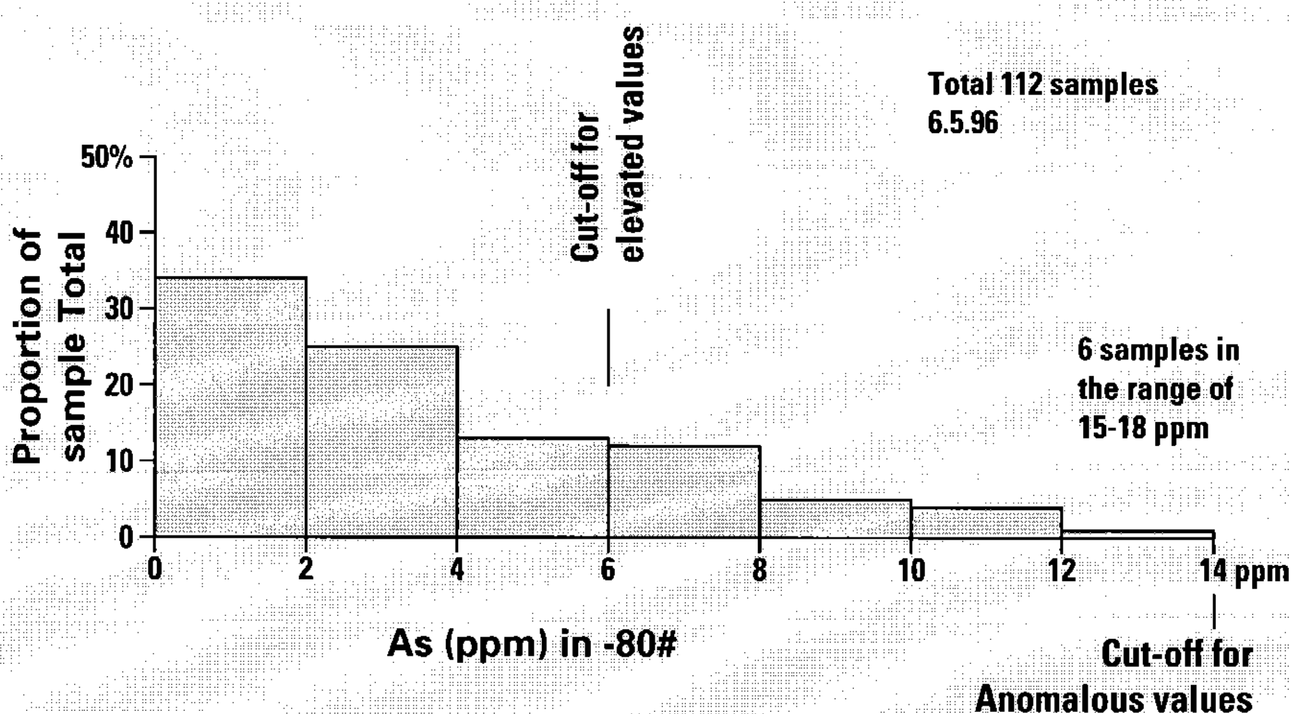



Figure 4

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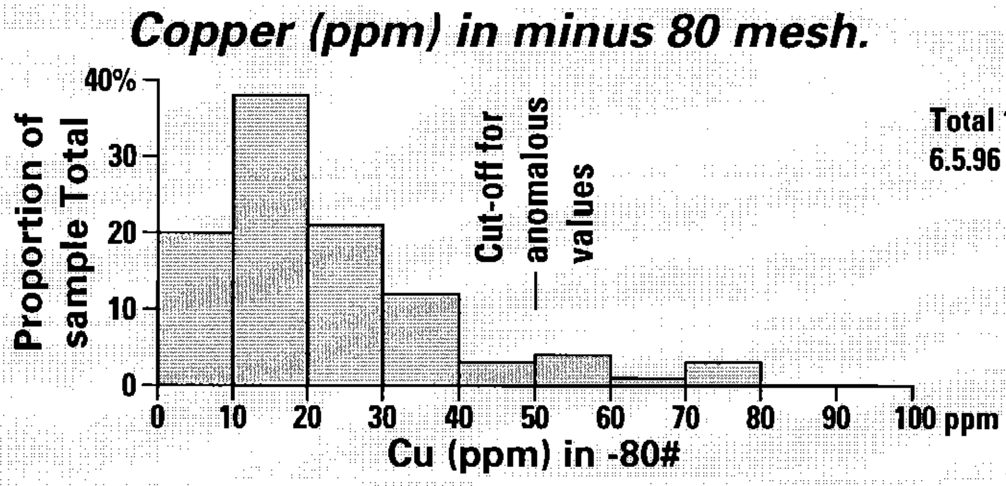


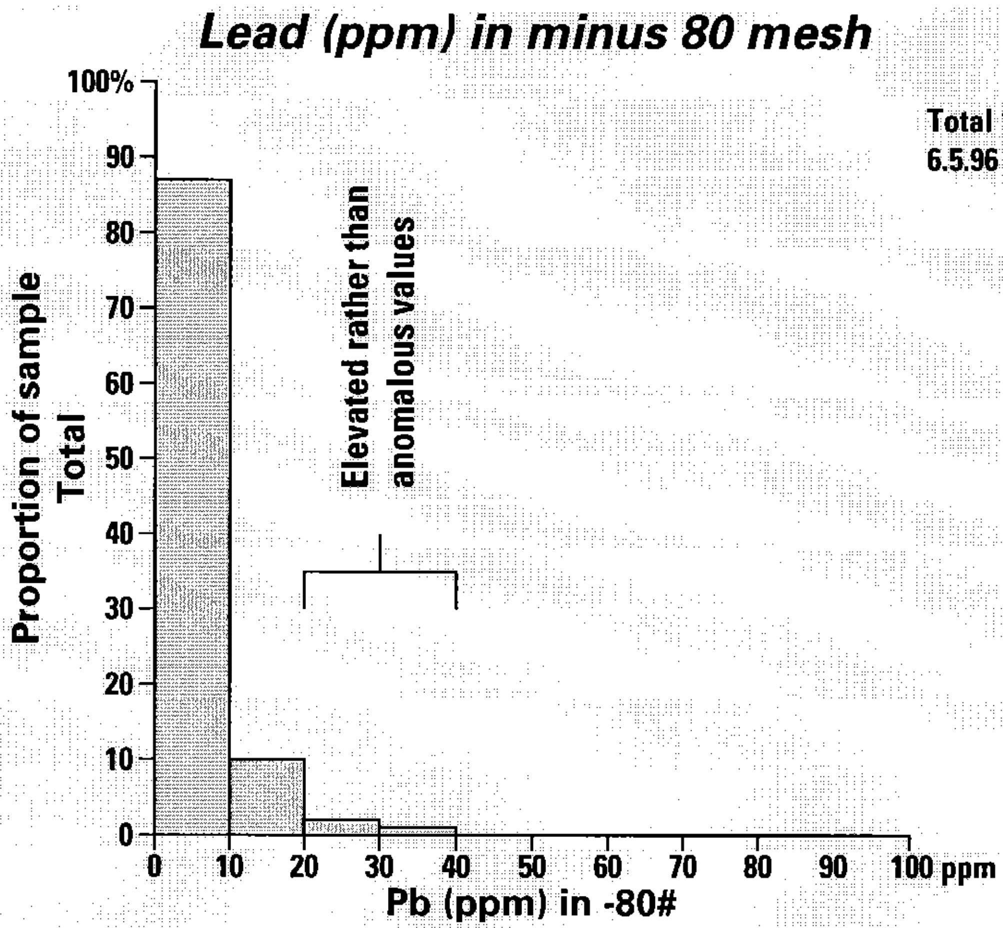


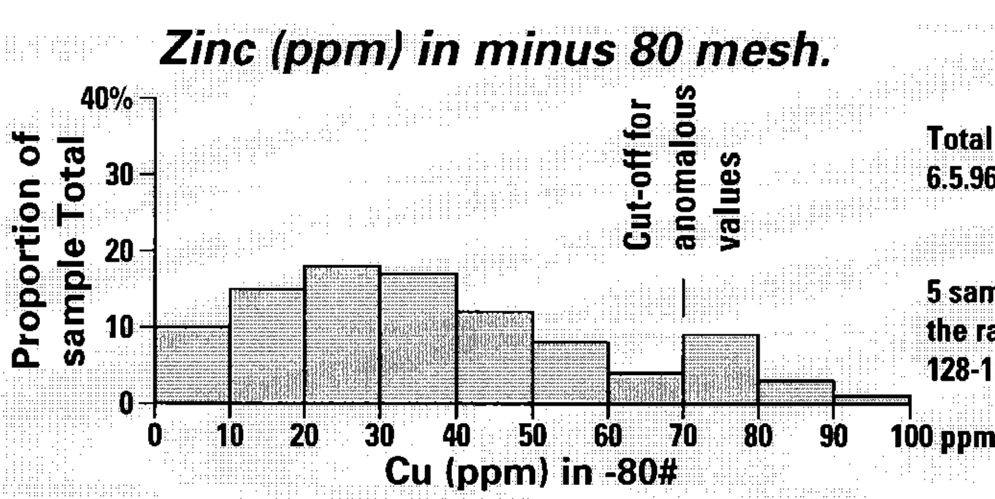


Figure 5.

## 7.3 AEROMAGNETIC DATA

The aeromagnetic data has enabled more accurate delineation of the regional boundaries of magnetic rock units such as the Lucy Formation and the Bowry Formation. Particularly in the area south west of the Pieman River where thin Tertiary cover is extensive.

Initial processing of the aeromagnetics has indicated that Hanning filtered data will be very useful in mapping at a prospect scale. Also, Hanning filtered data will be used to generate interpretive cross sections for drill hole planning.

## 8.0 Conclusions

Studies of the shapes of a substantial number of alluvial gold grains from well dispersed sites in EL 43/94 suggest that most gold in the district has not been transported very far. Intergrowths and inclusions of other minerals in the gold grains are generally consistent with local derivation from the Arthur Metamorphic Complex, particularly from the iron-rich intervals in the Complex and from quartz veins. Gold fineness characteristics are quite uniform and are consistent with an Archaean lode gold model.

Historically, hardrock gold has been found in small amounts associated with magnetite-rich intervals in the largely-mafic Bowry Formation. Modern mineral exploration by Outokumpu identified a banded siliceous ironstone in the eastern part of the Bowry Formation near Doctors Creek and the Owen Meredith River carrying up to 0.5% Cu and 0.29gpt Au in rock chips.

Stream sediment results reported here suggest that much of the segment of the Bowry Formation investigated by Outokumpu was unpromising (Plan 1 c.f. Plan 3). The segment north from Doctors Creek to Paradise Creek, and beyond, is of more interest. This segment was partly covered by Outokumpu but much of it only has coverage by the spaced profile traverses of Fodina.

At Rocky River it seems that the eastern part of the Bowry Formation has not received much attention. Stream sediment results from Cataract Creek and Nolan Creek (Plans 3, 4) suggest that the eastern part is anomalous in gold (-80#), copper, zinc and silver. North of the Whyte River there are scattered, gold-anomalous stream sediments reported by other companies but no follow-up work has been done.

CRA-Peko drilled significant copper and zinc mineralisation in the eastern part of the Bowry Formation south west of Reece Dam. Selective sampling of part of the core by Outokumpu demonstrated the presence of trace gold. The core should be tested more systematically for gold.

Outside of the Bowry Formation there are historical hardrock gold workings in a granitoid porphyry near Lucy Spur and a very small auriferous leader was exposed during sluicing at the Lucy Spur hydraulic workings. Since the gold in the Lucy Spur tailrace creek shows relatively little travel damage, it was probably derived from such local sources and underwent only a very small amount of transport in the earliest of the Tertiary streams.

Stream sediment sampling by Fodina suggests that there may be gold enrichment in the southern part of the Lucy Formation (Plan 1). This magnetite-bearing, largely-mafic formation is difficult to map with precision on the ground but is well defined by the Joint Venture's detailed aeromagnetics.

**9.0 Recommendations**

Follow-up programs of close spaced stream sediment sampling, geological mapping and rock chip sampling should be carried out in the following areas:

1. The southern part of the Lucy Formation where it can be accessed from the Heemskirk Road.
2. From the Owen-Meredith River northwards to around the old hardrock and hydraulic workings at Lucy Spur, thence to the upper reaches of Lucy Creek.
3. In the Doctors Creek – Paradise Creek – Bounds Creek segment of the Bowry Formation and adjacent rocks.
4. Along the eastern part of the Bowry Formation around Rocky River. This work should extend further east into EL 42/96 so as to include the head waters of Cataract Creek and Nolan Creek, also the arsenic anomaly reported by IMI – Savage Resources.
5. The area in the northern part of EL 42/96 where good gold values were reported by Aberfoyle. This work should extend northwards into EL 38/96 in order to include the old stream, eluvial and hardrock workings at Golden Ridge.

Hanning filtered aeromagnetic data should be generated for these various prospects.

**10.0 Environmental matters**

Minimal environmental impact was caused by the Joint Venture's work in EL 43/94. Approximately 20km of 1 metre wide walking tracks were cut to provide access for stream sampling. No cutting was undertaken in the Pieman River State Reserve.

No rehabilitation work is required.

**11.0 References**

Blake, F. 1939, *Report on the Corinna alluvial goldfields*, Tasmania Department of Mines Reports for 1939, pp26-46.

Bottrill, R.S. 1991, *Alluvial Gold*, Mineral Resources of Tasmania 11, Tasmania Department of Resources and Energy, p16.

Calver, C.R., Corbett, K.D., Everard, J.L., Goscombe, B.A., Pemberton, J., Seymour, D.B., (comp), 1995, *Geological Atlas 1:250,000 digital series. Geology of Northwest Tasmania. Tasmanian Geological Survey.*

Duncan, D.McP., Weatherstone, N., 1990, *Exploration history of the Savage River iron ore deposits*, In Glasson, K.R., Rattigan, J.H. (Eds) Geological Aspects of the discovery of some important mineral deposits in Australia, Aus. I.M.M. Monograph Series 17, pp287-292.

Frost, M.T. 1982, *The magnesite deposits at Main Creek, Savage River, Tasmania*, Economic Geology 77, 1901-1911.

Harcourt Smith, J., 1897, *Report on the mineral district between Corinna and Waratah. Report of the Secretary for Mines, Tasmania, for 1896-1897.*

Henham, R.J., 1989, *Exploration Licence 40/88, Savage River, Tasmania. Report on exploration to 4.11.1989*, Aberfoyle Resource Ltd, MRT Library, TCR 89-3026.

Herrmann, W., 1991a, *Annual report to 26.5.1991. EL 14/89, Corinna, Tasmania*, Outokumpu Exploration Aust. Pty Ltd, MRT Library TCR 91-3256.

Herrmann, W.,1991b, *Annual report to 6.4.1991, EL 56/89, Corinna South, Tasmania*, Outokumpu Exploration Aust. Pty Ltd, MRT Library TCR 91-3269.

Julen, H., 1981, *A history of gold mining on the Tasmanian west coast*, Copyright H. Julen.

Julen, H., 1984, *Corinna. The town that was*, Copyright H. Julen.

Levinson, A.A., 1980, *Introduction to Exploration Geochemistry*, Applied Publishing, Wilmette, Illinois.

Mathison, I.J., Ferguson, N., 1987, *EL 22/85, Savage River. Annual report August 1986-August 1987*, Electrolytic Zinc Co. of Australasia Ltd, MRT Library TCR 87-2734.

Montgomery, A., 1894, *Report on the Corinna goldfield. Report of the Secretary for Mines, Tasmania, for 1893-1894.*

Morritt, R.F.C., 1995, *Corinna EL 43/94. Annual report 3.2.1995-3.2.1996*, Goldstream Mining NL.

Penny, B.G., Shannon, C.H.C., Vanzino, L., 1984, *Report on field investigations within EL 4/61, West Coast, Tasmania. Summer field season 1983-1984*, Industrial and Mining Investigations Pty Ltd, MRT Library TCR 84-2262.

Poltock, R., 1993, *Annual report to May, 1993 (EL14/89, EL56/89)*, Outokumpu Exploration Aust. Pty Ltd, Fodina Minerals Pty Ltd, MRT Library TCR 93-3435.

Reid, A.M., 1924, *Preliminary report on the occurrence of iron ore at Meredith, Paradise, Rocky and Whyte Rivers*, Tasmania Department of Mines Reports for 1923-1924.

Shannon, C.H.C., 1985, *Report on field investigations within EL 4/61, West Coast, Tasmania 23.8.84-22.2.85*, Industrial and Mining Investigations Pty Ltd, MRT Library TCR 85-2380.

Shannon, C.H.C., 1988, *Relinquishment report on EL 4/61, Savage River, Tasmania*, Industrial and Mining Investigations Pty Ltd, Savage Resources Ltd MRT Library TCR 88-2776.

Turner, N.J., Brown, A.V., McClenaghan, M.P., Ir. Soetrisno, 1991, *Geological Atlas 1:50,000 Series.* Sheet 7914, Corinna, *Geological Survey of Tasmania*, Division of Mines and Mineral Resources.

Twelvetrees, W.H., 1900, *Report on mineral fields between Waratah and Corinna*, Report of the Secretary for Mines, Tasmania, for 1899-1900.

Twelvetrees, W.H., 1903, *Report on mineral fields between Waratah and Long Plains*, Tasmania Department of Mines, Old Series Report No. 207.

Urquhart, G., 1966, *Magnetite deposits of the Savage River – Rocky River region*, Geological Survey of Tasmania Bulletin 48.

Weir, D.J., 1985, *Rocky Cape EL 1/77. Progress report on the Alpine Prospect for the period 1.2.1984-31.1.1985*, CRA Exploration Pty Ltd, MRT Library TCR 85-2335.

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Goldstream - Titan Corinna Joint Venture

**EL 43/94: Annual Report to 4/1/97**

**APPENDIX 1**

STREAM SEDIMENT AND TERTIARY GRAVEL SAMPLE NUMBERS WITH AMG CO-ORDINATES OF SAMPLE SITES

**Sample Types**

1. Stream sediment panned concentrate samples were derived from 9 litres of minus 4cm, active gravel collected in the stream bed. Tertiary gravel samples also from 9 litres of minus 4cm.
2. Minus 80 mesh samples were derived from fine grained, muddy, waning-flood deposits usually collected in the stream channel. They were not sieved prior to laboratory processing.

Note: Panned concentrate samples were not assayed. They were examined by microscope and the gold grains were counted.

NOTE: Odd numbers are -80#, the following even number is a pan. con.taken at the same site.
All samples were collected in EL43/94, Corinna.

| | AMG | | | AMG | |
|---|---|---|---|---|---|
| Sample Number | Easting (m) | Northing (m) | Sample Number | Easting (m) | Northing (m) |
| G101 | 342800 | 5386850 | G149 | 345075 | 5385825 |
| G102 | 342800 | 5386850 | G150 | 345075 | 5385825 |
| G103 | 343825 | 5386225 | G151 | 345350 | 5386175 |
| G104 | 343825 | 5386225 | G152 | 345350 | 5386175 |
| G105 | 344350 | 5386025 | G153 | 345400 | 5386200 |
| G106 | 344350 | 5386025 | G154 | 345400 | 5386200 |
| G107 | 344175 | 5384625 | G155 | 345325 | 5386200 |
| G108 | 344175 | 5384625 | G156 | 345325 | 5386200 |
| G109 | 344200 | 5384600 | G157 | 345475 | 5386700 |
| G110 | 344200 | 5384600 | G158 | 345475 | 5386700 |
| G111 | 341725 | 5383850 | G159 | 345475 | 5387125 |
| G112 | 341725 | 5383850 | G160 | 345475 | 5387125 |
| G113 | 341775 | 5383800 | G161 | 345100 | 5387000 |
| G114 | 341775 | 5383800 | G162 | 345100 | 5387000 |
| G115 | 343300 | 5382325 | G163 | 346000 | 5385400 |
| G116 | 343300 | 5382325 | G164 | 346000 | 5385400 |
| G117 | 343050 | 5381650 | G165 | 346025 | 5385375 |
| G118 | 343050 | 5381650 | G166 | 346025 | 5385375 |
| G119 | 343550 | 5380875 | G167 | 346275 | 5385435 |
| G120 | 343550 | 5380875 | G168 | 346275 | 5385435 |
| G121 | 344175 | 5387900 | G169 | 344525 | 5383750 |
| G122 | 344175 | 5387900 | G170 | 344525 | 5383750 |
| G123 | 344250 | 5388025 | G171 | 347025 | 5385750 |
| G124 | 344250 | 5388025 | G172 | 347025 | 5385750 |
| G125 | 344550 | 5388500 | G173 | 346925 | 5385850 |
| G126 | 344550 | 5388500 | G174 | 346925 | 5385850 |
| G127 | 343225 | 5388675 | G175 | 346950 | 5385900 |
| G128 | 343225 | 5388675 | G176 | 346950 | 5385900 |
| G129 | 345300 | 5389025 | G177 | 347125 | 5386775 |
| G130 | 345300 | 5389025 | G178 | 347125 | 5386775 |
| G131 | 345325 | 5388950 | G179 | 347125 | 5386700 |
| G132 | 345325 | 5388950 | G180 | 347125 | 5386700 |
| G133 | 346150 | 5389500 | G181 | 346935 | 5386650 |
| G134 | 346150 | 5389500 | G182 | 346935 | 5386650 |
| G134A | 346150 | 5389500 | G183 | 346450 | 5386025 |
| G135 | 346400 | 5389575 | G184 | 346450 | 5386025 |
| G136 | 346400 | 5389575 | G184A | 346425 | 5386050 |
| G137 | 343950 | 5380900 | G185 | 346350 | 5385800 |
| G138 | 343950 | 5380900 | G186 | 346350 | 5385800 |
| G139 | 344650 | 5385600 | G187 | 346300 | 5385800 |
| G140 | 344650 | 5385600 | G188 | 346300 | 5385800 |
| G141 | 344700 | 5385700 | G189 | 346725 | 5386075 |
| G142 | 344700 | 5385700 | G190 | 346725 | 5386075 |
| G143 | 344725 | 5385775 | G191 | 346750 | 5386025 |
| G144 | 344725 | 5385775 | G192 | 346750 | 5386025 |
| G145 | 344600 | 5385575 | G192A | 346750 | 5386025 |
| G146 | 344600 | 5385575 | G193 | 344500 | 5383175 |
| G147 | 345075 | 5385900 | G194 | 344500 | 5383175 |
| G148 | 345075 | 5385900 | G194A | 344500 | 5383175 |

| | AMG | | | AMG | |
|---|---|---|---|---|---|
| Sample Number | Easting (m) | Northing (m) | Sample Number | Easting (m) | Northing (m) |
| G195 | 345425 | 5383525 | G247 | 349550 | 5388890 |
| G196 | 345425 | 5383525 | G248 | 349550 | 5388890 |
| G197 | 345000 | 5383275 | G249 | 349425 | 5389325 |
| G198 | 345000 | 5383275 | G250 | 349425 | 5389325 |
| G199 | 345600 | 5383225 | G251 | 349125 | 5389350 |
| G200 | 345600 | 5383225 | G252 | 349125 | 5389350 |
| G201 | 346075 | 5383375 | G253 | 348875 | 5387315 |
| G202 | 346075 | 5383375 | G254 | 348875 | 5387315 |
| G203 | 346400 | 5382970 | G255 | 348850 | 5387300 |
| G204 | 346400 | 5382970 | G256 | 348850 | 5387300 |
| G205 | 347250 | 5383830 | G257 | 348850 | 5387850 |
| G206 | 347250 | 5383830 | G258 | 348850 | 5387850 |
| G207 | 347200 | 5383810 | G259 | 349225 | 5387810 |
| G208 | 347200 | 5383810 | G260 | 349225 | 5387810 |
| G209 | 346975 | 5383775 | G261 | 349200 | 5387800 |
| G210 | 346975 | 5383775 | G262 | 349200 | 5387800 |
| G211 | 345675 | 5382700 | G263 | 349025 | 5388500 |
| G212 | 345675 | 5382700 | G264 | 349025 | 5388500 |
| G213 | 345725 | 5382675 | G265 | 349060 | 5388450 |
| G214 | 345725 | 5382675 | G266 | 349060 | 5388450 |
| G215 | 345400 | 5382125 | G267 | 348925 | 5389725 |
| G216 | 345400 | 5382125 | G268 | 348925 | 5389725 |
| G217 | 347850 | 5389650 | G269 | 348550 | 5389275 |
| G218 | 347850 | 5389650 | G270 | 348550 | 5389275 |
| G219 | 347100 | 5382025 | G271 | 348600 | 5389300 |
| G220 | 347100 | 5382025 | G272 | 348600 | 5389300 |
| G221 | 347030 | 5382130 | G273 | 346075 | 5381125 |
| G222 | 347030 | 5382130 | G274 | 346075 | 5381125 |
| G223 | 346300 | 5382200 | G275 | 346075 | 5381000 |
| G224 | 346300 | 5382200 | G276 | 346075 | 5381000 |
| G225 | 346300 | 5381980 | G277 | 346950 | 5381100 |
| G226 | 346300 | 5381980 | G278 | 346950 | 5381100 |
| G227 | 346050 | 5381525 | G279 | 346450 | 5380800 |
| G228 | 346050 | 5381525 | G280 | 346450 | 5380800 |
| G229 | 345475 | 5384725 | G281 | 345250 | 5380300 |
| G230 | 345475 | 5384725 | G282 | 345250 | 5380300 |
| G231 | 345450 | 5384700 | G283 | 345300 | 5380400 |
| G232 | 345450 | 5384700 | G284 | 345300 | 5380400 |
| G233 | 345300 | 5384700 | G285 | 345800 | 5380375 |
| G234 | 345300 | 5384700 | G286 | 345800 | 5380375 |
| G235 | 346910 | 5383225 | G287 | 345825 | 5380450 |
| G236 | 346910 | 5383225 | G288 | 345825 | 5380450 |
| G237 | 346575 | 5383225 | G289 | 346375 | 5380275 |
| G238 | 346575 | 5383225 | G290 | 346375 | 5380275 |
| G239 | 344300 | 5382700 | G291 | 345650 | 5389350 |
| G240 | 344300 | 5382700 | G292 | 345650 | 5389350 |
| G241 | 344800 | 5382550 | G293 | 347575 | 5388130 |
| G242 | 344800 | 5382550 | G294 | 347575 | 5388130 |
| G243 | 345050 | 5382225 | G295 | 348500 | 5383925 |
| G244 | 345050 | 5382225 | G296 | 348500 | 5383925 |
| G245 | 349425 | 5388650 | G297 | 348575 | 5383950 |
| G246 | 349425 | 5388650 | G298 | 348575 | 5383950 |

| | AMG | |
|---|---|---|
| Sample Number | Easting (m) | Northing (m) |
| G299 | 348075 | 5382050 |
| G300 | 348075 | 5382050 |
| G301 | 348100 | 5381975 |
| G302 | 348100 | 5381975 |
| G303 | 348165 | 5383000 |
| G304 | 348165 | 5383000 |
| G305 | 348175 | 5382915 |
| G306 | 348175 | 5382915 |
| G307 | 348075 | 5382930 |
| G308 | 348075 | 5382930 |
| G309 | 347750 | 5381250 |
| G310 | 347750 | 5381250 |
| G311 | 347530 | 5382385 |
| G312 | 347530 | 5382385 |
| G313 | 347610 | 5382200 |
| G314 | 347610 | 5382200 |
| G315 | 347850 | 5382200 |
| G316 | 347850 | 5382200 |
| G317 | 347800 | 5382200 |
| G318 | 347800 | 5382200 |
| G319 | NOT COLLECTED | |
| G320 | 347900 | 5392250 |
| G321 | 347560 | 5383950 |
| G322 | 347560 | 5383950 |
| G323 | 347575 | 5383875 |
| G324 | 347575 | 5383875 |
| G325 | 347375 | 5383700 |
| G326 | 347375 | 5383700 |
| G327 | NOT COLLECTED | |
| G328 | 347950 | 5393425 |
| G349 | NOT COLLECTED | |
| G350 | 347000 | 5391400 |
| G351 | NOT COLLECTED | |
| G352 | 347000 | 5391400 |
| Rocky River dredge samples | | |
| G190A | 349300 | 5389420 |
| G190B | 349300 | 5389420 |
| Tertiary gravel samples | | |
| G329 | NOT COLLECTED | |
| G330 | 347300 | 5391675 |
| G331 | NOT COLLECTED | |
| G332 | 348300 | 5391600 |
| G333 | NOT COLLECTED | |
| G334 | 345600 | 5386575 |
| G335 | NOT COLLECTED | |
| G336 | 345600 | 5386575 |
| G337 | NOT COLLECTED | |
| G338 | 345600 | 5386575 |
| G339 | NOT COLLECTED | |
| G340 | 345600 | 5386575 |

| | AMG | |
|---|---|---|
| Sample Number | Easting (m) | Northing (m) |
| G341 | NOT COLLECTED | |
| G342 | 345600 | 5386575 |
| G343 | NOT COLLECTED | |
| G344 | 345600 | 5386575 |
| G345 | NOT COLLECTED | |
| G346 | 345600 | 5386575 |
| G347 | NOT COLLECTED | |
| G348 | 345600 | 5386575 |

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**EL 43/94: Annual Report to 4/1/97**

**APPENDIX 2**

MINUS 80 MESH STREAM SEDIMENT SAMPLE NUMBERS AND ANALYTICAL DATA

**Laboratory Processing**

**Analabs**
Minus 80 mesh samples dried, sieved and pulverised to nominal minus 75 micrometres. Gold determined by 30gm fire assay, carbon rod. Cu, Pb, Zn, As by aqua regia/perchloric acid digest, AAS finish (Ag by ICPMS finish).

| Sample | Au | Au Dp1 | Cu | Pb | Zn | As | Ag |
|---|---|---|---|---|---|---|---|
| G101 | 2 | | 35 | 20 | 27 | 8.0 | <0.05 |
| G103 | | | 19 | 9 | 29 | 7.9 | <0.05 |
| G105 | 8 | | 60 | 17 | 84 | 8.6 | 0.07 |
| G107 | 1 | | 41 | 11 | 91 | 3.4 | <0.05 |
| G109 | 1 | | 11 | 4 | 4 | 0.9 | <0.05 |
| G111 | 1 | | 15 | 19 | 32 | 2.0 | <0.05 |
| G113 | | | 13 | 5 | 28 | 1.3 | <0.05 |
| G115 | | | 40 | 8 | 71 | 2.3 | 0.05 |
| G117 | 1 | | 26 | 4 | 58 | 1.4 | <0.05 |
| G119 | 1 | | 31 | 5 | 58 | 2.6 | <0.05 |
| G121 | 1 | | 11 | 7 | 24 | 11.0 | <0.05 |
| G123 | 11 | | 24 | 12 | 128 | 11.0 | 0.06 |
| G125 | <1 | | 17 | 5 | 35 | 18.0 | <0.05 |
| G127 | <1 | | 52 | 9 | 80 | 3.7 | <0.05 |
| G129 | <1 | | 27 | <3 | 38 | 13.0 | 0.06 |
| G131 | <1 | | 27 | 10 | 183 | 14.0 | 0.06 |
| G133 | <1 | | 38 | 6 | 49 | 2.8 | 0.06 |
| G135 | <1 | | 24 | 3 | 54 | 0.5 | 0.06 |
| G137 | <1 | | 11 | 3 | 21 | 0.6 | <0.05 |
| G139 | <1 | | 24 | 5 | 53 | 0.8 | <0.05 |
| G141 | <1 | | 22 | 6 | 43 | 1.7 | <0.05 |
| G143 | <1 | | 23 | 5 | 40 | 9.2 | <0.05 |
| G145 | <1 | | 15 | 3 | 37 | 4.6 | <0.05 |
| G147 | <1 | | 12 | 5 | 30 | 3.1 | <0.05 |
| G149 | 18 | 20 | 18 | 7 | 46 | 3.6 | 0.05 |
| G151 | <1 | | 10 | 4 | 27 | 3.1 | 0.17 |
| G153 | <1 | | 14 | <3 | 28 | 2.4 | <0.05 |
| G155 | <1 | | 16 | 3 | 31 | 1.7 | <0.05 |
| G157 | <1 | | 19 | 32 | 64 | 17.0 | 0.06 |
| G159 | <1 | | 10 | 3 | 19 | 1.6 | <0.05 |
| G161 | <1 | | 16 | 6 | 27 | 2.8 | <0.05 |
| G163 | 6 | | 38 | 7 | 59 | 4.3 | 0.12 |
| G165 | 2 | | 8 | 7 | 59 | 4.3 | 0.12 |
| G167 | 1 | <1 | 10 | 5 | 12 | 1.9 | <0.05 |
| G169 | 1 | 1 | 35 | 13 | 75 | 0.07 | 3.3 |
| G171 | 4 | | 5 | <3 | 4 | 0.9 | <0.05 |
| G173 | <1 | <1 | 3 | <3 | 4 | 5.1 | <0.05 |
| G175 | 6 | | 4 | <3 | 6 | 2.4 | <0.05 |
| G177 | 2 | | 3 | <3 | 4 | 0.7 | <0.05 |
| G179 | 8 | <1 | 5 | <3 | 8 | 1.5 | <0.05 |
| G181 | 4 | | 5 | <3 | 7 | 0.6 | <0.05 |
| G183 | 2 | | 16 | 5 | 33 | 2.6 | <0.05 |
| G185 | 6 | | 8 | <3 | 13 | 1.0 | <0.05 |
| G187 | 3 | | 25 | 17 | 43 | 3.0 | <0.05 |
| G189 | 2 | | 4 | <3 | 6 | 0.7 | <0.05 |
| G191 | 4 | | 6 | 4 | 10 | 1.2 | <0.05 |
| G193 | 2 | | 11 | 4 | 18 | 8.0 | <0.05 |
| G195 | 5 | | 38 | 7 | 69 | 3.8 | 0.08 |
| G197 | <1 | <1 | 22 | 5 | 49 | 1.3 | <0.05 |
| G199 | 6 | | 9 | 4 | 16 | 5.0 | 0.06 |
| G201 | 8 | | 19 | <3 | 31 | 1.5 | <0.05 |
| G203 | 6 | | 8 | <3 | 17 | 2.8 | <0.05 |
| G205 | 4 | | 20 | 4 | 32 | 1.6 | <0.05 |
| G207 | 2 | | 13 | 5 | 32 | 3.0 | <0.05 |
| G209 | 11 | | 23 | <3 | 17 | 1.7 | <0.05 |
| G211 | 6 | | 41 | <3 | 37 | 1.1 | <0.05 |
| G213 | 2 | | 15 | <3 | 23 | 0.07 | <0.05 |
| G215 | 4 | | 20 | <3 | 32 | 0.9 | <0.05 |
| G217 | 8 | 2 | 20 | 5 | 44 | 5.7 | <0.05 |

| Sample | Au | Au Dp1 | Cu | Pb | Zn | As | Ag |
|---|---|---|---|---|---|---|---|
| G219 | 2 | | 21 | <3 | 47 | 1.5 | <0.05 |
| G221 | 15 | 12 | 10 | <3 | 18 | 1.1 | <0.05 |
| G223 | <1 | | 7 | <3 | 13 | 1.0 | <0.05 |
| G225 | 2 | | 18 | 6 | 35 | 3.5 | <0.05 |
| G227 | <1 | | 20 | 7 | 55 | 3.8 | <0.05 |
| G229 | 1 | | 14 | 3 | 22 | 1.0 | <0.05 |
| G231 | 1 | | 21 | <3 | 23 | 1.2 | <0.05 |
| G233 | 4 | | 23 | 9 | 40 | 1.4 | <0.05 |
| G235 | 1 | | 8 | <3 | 11 | 1.1 | <0.05 |
| G237 | 1 | | 21 | 23 | 29 | 18.0 | <0.05 |
| G239 | 27 | | 11 | <3 | 25 | 2.5 | <0.05 |
| G241 | 2 | | 36 | 5 | 66 | 2.0 | 0.05 |
| G243 | 4 | 4 | 67 | <3 | 73 | 2.1 | <0.05 |
| G245 | 2 | | 59 | 6 | 66 | 4.6 | 0.05 |
| G247 | 10 | | 71 | 12 | 71 | 12.0 | 0.05 |
| G249 | 8 | | 73 | 22 | 179 | 9.6 | 0.10 |
| G251 | <1 | | 38 | 16 | 51 | 15.0 | <0.05 |
| G253 | 2 | | 78 | 9 | 84 | 8.5 | <0.05 |
| G255 | <1 | | 19 | 4 | 39 | 6.5 | <0.05 |
| G257 | <1 | | 7 | <3 | 10 | 0.9 | >0.05 |
| G259 | <1 | | 32 | 12 | 88 | 2.9 | <0.05 |
| G261 | <1 | | 26 | 8 | 73 | 5.8 | <0.05 |
| G263 | 2 | | 14 | <3 | 13 | 6.2 | <0.05 |
| G265 | <1 | | 20 | <3 | 20 | 3.4 | <0.05 |
| G267 | 2 | | 16 | 4 | 27 | 5.5 | <0.05 |
| G269 | <1 | | 19 | <3 | 21 | 1.8 | <0.05 |
| G271 | <1 | | 11 | <3 | 14 | 2.2 | <0.05 |
| G273 | <1 | | 20 | 4 | 49 | 5.0 | <0.05 |
| G275 | 2 | | 19 | <3 | 45 | 5.5 | <0.05 |
| G277 | 2 | | 28 | 3 | 58 | 4.9 | <0.05 |
| G279 | <1 | | 27 | 4 | 56 | 7.8 | <0.05 |
| G281 | <1 | | 39 | 5 | 76 | 7.5 | <0.05 |
| G283 | <1 | | 17 | <3 | 44 | 4.4 | <0.05 |
| G285 | 2 | | 31 | <3 | 184 | 3.1 | <0.05 |
| G287 | 2 | | 25 | 8 | 73 | 11.0 | 0.12 |
| G289 | <1 | | 20 | 8 | 74 | 8.7 | <0.05 |
| G291 | 2 | | 13 | 8 | 30 | 7.5 | <0.05 |
| G293 | <1 | | 5 | <3 | 5 | 3.8 | <0.05 |
| G295 | 4 | | 19 | 5 | 48 | 5.0 | <0.05 |
| G297 | 240 | | 14 | 8 | 32 | 7.4 | <0.05 |
| G299 | 9 | | 55 | 17 | 132 | 18.0 | |
| G301 | 8 | | 15 | 4 | 28 | 6.0 | |
| G303 | 6 | | 43 | <3 | 49 | 6.2 | |
| G305 | 8 | | 26 | 5 | 35 | 8.4 | |
| G307 | 7 | | 32 | <3 | 13 | 4.6 | |
| G309 | 20 | | 25 | 4 | 19 | 7.3 | |
| G311 | 7 | | 16 | <3 | 34 | 1.9 | |
| G313 | 17 | | 28 | 5 | 45 | 7.0 | |
| G315 | 7 | | 21 | 4 | 40 | 6.2 | |
| G317 | 6 | | 20 | 3 | 18 | 7.1 | |
| G319 | NOT COLLECTED | | | | | | |
| G321 | 8 | | 15 | <3 | 9 | 2.2 | |
| G323 | 3 | | 8 | 3 | 25 | 2.2 | |
| G325 | 6 | | 7 | <3 | 11 | 1.5 | |
| DETECTION | 1 | 1 | 2 | 3 | 2 | 0.5 | 0.05 |
| UNITS | ppb | ppb | ppm | ppm | ppm | ppm | ppm |

Stream Sediment Sampling
Fodina Minerals Pty. Ltd: Nominal 5 Kgm of active silt and sand collected from the flood level of streams. Samples split 500 gm for −80 mesh Cu and As, remainder for −16 mesh cold cyanide, static leach extraction of Au, ppb (Poltock, 1994).
Aberfoyle Resources Ltd: About 100 gm of −72 mesh fraction seived from >1 Kg of dried, minus 4 cm, active gravel collected across stream bed. Gold determined by fire assay, ppb. Cu, Pb, Zn, Ag, Ba and As also analysed (Henham, 1998).
Industrial & Mining Investigations Pty. Ltd, Savage Resources Ltd: At most stations 3 pans of gravel from a selected site were washed for a pan.con. which was assayed for contained weight of gold. At some central eastern stations pan.cons were analysed for Cu%, Ti%, W ppm, Sn ppm, Au micrograms & Nb ppm. Clay and fines from panning were analysed Cu, Pb, Zn, Ag, As, Sn, W, Ni, Ba & Mo. No panning at southern stations, only Cu, Pb & Zn analysed. (Shannon, 1985, Edyvean, 1978).
Au <3, <8 ppb.
Au 3 − 8ppb.
9.68 , 23 Au >8 ppb, values shown.
Visible Au recorded, not recorded.
Portions (approximate) of streams worked for alluvial gold (partly after Mathison, 1987).
Geological boundaries derived from Turner etal (1991), Goldstream aeromagnetics (1996), Weir (1985), Herrmann (1991), Poltock (1993) & Shannon (1988).
AP1 Diamond drill hole
EL 42/96
RL 8802
EL 36/96
EL 43/96
CML7M97
44/96
IMI/Savage Resources (Penny etal 1984)
Ground Mag. (Mines Dept. Plan 2402-43) Drilling (Hughes, 1966, unpublished Mines Dept. Logs; Shannon, 1985)
EZ Co. (Mathison 1987)
IMI/Savage Resources (Shannon 1988)
IMI/Savage Resources (Penny etal 1984)
Fodina (Poltock 1993)
CORINNA
PIEMAN RIVER
RIDGE FAULT
LEFROY
LUCY FORMATION
STATE RESERVE
Nancy Spur hydraulic workings of Frenchmans Peak Ltd. (1895)
Lucy Spur hydraulic workings of the Lucy Spur Hydraulic Gold Mining Co. (1895)
Adits with nearby crusher (1897)
Fodina (Poltock 1993)
EZ Co. (Mathison 1987)
Outokumpu (Herrmann 1991)
BOWRY FORMATION
TRANSMISSION LINE AND PYLON POSITIONS
CRA/Peko (Weir 1985)
Outokumpu (Herrmann 1991)
EL 43/94
AP1
AP2
**Note**
No portion of this map shall be copied or held in either graphic or digital format without the written consent of Goldstream Mining NL.
Map Reference
Land Information Bureau, Tasmania 1:25,000
Map Series: MEREDITH 3439; LIVINGSTONE 3438; STRINGER 3437; HARDWICKE 3238.
REFERENCE
EL 43/94 Boundary
Pieman River State Reserve
Road
Vehicular Track
Walking Track or Cut Line
River
5 cm
0 500 1000 1500 2000 metres
Scale 1:25,000
AMG North
Mag. North
11.8°
EL 43/94 CORINNA
Plan: 1
GOLDSTREAM MINING NL & TITAN RESOURCES NL Joint Venture
Previous Mineral Exploration Grids and Surveyed Lines.
Previous Stream Sediment Sampling, Old Alluvial Workings
File: 4394PL10.dwg
Date: October 1997
Compiled: Nic Turner
Drawn: Rocco Travierso ART Carto~Graphics
Scale: 1:25,000
Contractor: N.J. Turner Geological Services Pty. Ltd.
97-4074
ANNUAL REPORT - CORINNA EL 43/94 - GOLDSTREAM MINING/TITAN RESOURCES - N J TURNER - VOL 1 OF 3


276033


EL 42/96
RL 8802
EL 36/96
EL 43/96
CML7M97
44/96
EL 43/94
CORINNA
PIEMAN RIVER
LEFROY RIDGE FAULT
LUCY FORMATION
BOWRY FORMATION
STATE RESERVE
LAKE PIEMAN
WHYTE RIVER
SAVAGE RIVER
CORINNA ROAD
HEEMSKIRK ROAD
PIEMAN ROAD
BROWNS PLAINS
Nancy Spur workings
Lucy Spur workings
Reece Dam
Spillway
Donnellys Crossing
TRANSMISSION LINE AND PYLON POSITIONS
REFERENCE
EL 43/94 Boundary
Pieman River State Reserve
Road
Vehicular Track
Walking Track or Cut Line
• Sample Site
Odd Number: -80# Sample
Even Number: Panned Concentrate San
5 cm
0 500 1000 1500 200
Scale 1:25,000
**Note**
No portion of this map shall be copied or held in either graphic or digital format without the written consent of Goldstream Mining NL.
Map Reference
Land Information Bureau, Tasmania 1:25,000
Map Series: MEREDITH 3439; LIVINGSTONE 3438; STRINGER 3437; HARDWICKE 3238.
AMG North
Mag. North
11.8°
EL 43/94 CORINNA
Plan: 2
GOLDSTREAM MINING NL & TITAN RESOURCES NL Joint Venture
ACCESS; DRAINAGE; STREAM SEDIMENT SAMPLE NUMBERS AND LOCATIONS.
File: 4394PL01.dwg
Date: October 1997
Compiled: Nic Turner
Drawn: Rocco Travierso ART Carto~Graphics
Scale: 1:25,000
Contractor: N.J. Turner Geological Services Pty. Ltd.
97-4074
ANNUAL REPORT - CORINNA
EL 43/94 - GOLDSTREAM MINING/TITAN
RESOURCES - N J TURNER - VOL 1 OF 3

276034


EL 42/96
RL 8802
EL 36/96
EL 43/96
CML7M97
41/96
CORINNA
PIEMAN RIVER
FAULT
RIDGE
LEFROY
LUCY FORMATION
BOWRY FORMATION
STATE RESERVE
Nancy Spur workings
Lucy Spur workings
Reece Dam
Spillway
TRANSMISSION LINE AND PYLON POSITIONS TRACK
5 cm
EL 43/94
REFERENCE
EL 43/94 Boundary
Pieman River State Reserve
Road
Vehicular Track
Walking Track or Cut Line
Sample Location with
Au(grains), Au(ppb), As(ppm), Ag(ppb).
Second pan. con. sample and count of Au (grains)
at some locations; only pan. con. Au (grains)
at some other locations.
1,2,11,120
Au: all anomalous −80# (≥3ppb), most anomalous
pan. con. (≥5 grains) within boundary.
0 500 1000 1500 2000 metres
Scale 1:25,000
**Note**
No portion of this map shall be copied or held
in either graphic or digital format without
the written consent of Goldstream Mining NL.
Map Reference
Land Information Bureau, Tasmania 1:25,000
Map Series: MEREDITH 3439; LIVINGSTONE 3438;
STRINGER 3437; HARDWICKE 3238.
AMG North
Mag. North
11.8°
EL 43/94 CORINNA
Plan: 3
GOLDSTREAM MINING NL &
TITAN RESOURCES NL Joint Venture
Drainage;
Counts of Gold Grains
In Panned Concentrates;
With Gold,Arsenic and Silver
in Minus 80 Mesh
File: 4394PL02.dwg
Date: October 1997
Compiled: Nic Turner
Drawn: Rocco Travierso ART Carto~Graphics
Scale: 1:25,000
Contractor: N.J. Turner Geological Services Pty. Ltd.
97-4074
ANNUAL REPORT - CORINNA
EL 43/94 - GOLDSTREAM MINING/TITAN
RESOURCES - N J TURNER - VOL 1 OF 3

276035

EL 42/96
RL 8802
EL 36/96
EL 43/96
CML7M97
44/96
CORINNA
PIEMAN RIVER
LEFROY RIDGE FAULT
LUCY FORMATION
BOWRY FORMATION
STATE RESERVE
Nancy Spur workings
Lucy Spur workings
Reece Dam
Spillway
Donnellys Crossing
TRANSMISSION LINE AND PYLON POSITIONS
TRACK
EL 43/94
REFERENCE
EL 43/94 Boundary
Pieman River State Reserve
Road
Vehicular Track
Walking Track or Cut Line
−80# Stream Sediment Sample Location and Cu, Pb, Zn Geochemistry.
20,8,74
Py,Cp,Cs,Rt
Pyrite, chalcopyrite, cassiterite, rutile in panned concentrate samples.
5 cm
0 500 1000 1500 2000 metres
Scale 1:25,000
EL 43/94 CORINNA
Plan: 4
GOLDSTREAM MINING NL & TITAN RESOURCES NL Joint Venture
Drainage; Copper (ppm), Lead (ppm) and Zinc (ppm) In Minus 80 mesh;
Notable crystalline Minerals in Panned Concentrates.
File: 4394PL03.dwg
Date: October 1997
Compiled: Nic Turner
Drawn: Rocco Travierso ART Carto~Graphics
Scale: 1:25,000
Contractor: N.J. Turner Geological Services Pty. Ltd.
AMG North
Mag. North
11.8°
**Note**
No portion of this map shall be copied or held in either graphic or digital format without the written consent of Goldstream MIning NL.
Map Reference
Land Information Bureau, Tasmania 1:25,000
Map Series: MEREDITH 3439; LIVINGSTONE 3438; STRINGER 3437; HARDWICKE 3238.


## AIRBORNE SURVEY SPECIFICATIONS

| | |
|---|---|
| Flight Line Direction: | 090 - 270 degrees |
| Flight Line Separation: | 50 metres |
| Tie Line Direction: | 000 - 180 degrees |
| Tie Line Separation: | 500 metres |
| Mean Terrain Clearance: | 40 metres |
| Sample Interval: | 3-4 metres |
| Navigation: | Differential GPS |
| Survey Flown: | May 1996 |

## AIRBORNE SURVEY EQUIPMENT

| | |
|---|---|
| Acquisition: | UTS Geophysics |
| Aircraft: | AS350B Helicopter |
| Magnetometer: | Scintrex Cesium Vapour CS-2 |
| Resolution: | 0.001 nT |
| Sensitivity: | 0.001 nT |
| Recording Interval: | 0.1 sec |
| Compensation: | RMS AADC II Compensator |

## PROCESSING DETAILS

Diurnal variations have been removed from the data. Tie line levelling processes have been applied. Enhanced microlevelling processes have been applied. The magnetic regional gradient has been removed by subtraction of the IGRF 1995 model computed at the date of the survey.

| | |
|---|---|
| Grid cell size: | 10mE x 10mN |
| 1st contour interval: | 2nT |
| 2nd contour interval: | 5nT |
| 3rd contour interval: | 10nT |
| 4th contour interval: | 50nT |
| 5th contour interval: | 100nT |
| 6th contour interval: | 250nT |
| 7th contour interval: | 500nT |

PRELIMINAR
UTS GEOPHYSIC

97-4074
ANNUAL REPORT - CORINNA
EL 43/94 - GOLDSTREAM MINING/TITAN
RESOURCES - N J TURNER - VOL 1 OF 3

Grid North

Universal Transverse Mercator Projection
Central Meridian 147
AMG zone 55

0 200 400 600 800 1000 1200 1400 1600 1800 2000 metres

Scale 1: 25000

UTS Geophysics

5 cm

Plan 5

GOLDSTREAM MINING N.L.

CORINNA (TAS)

DETAILED HELI-MAG SURVEY

CONTOUR MAP OF

TOTAL MAGNETIC INTENSITY

| | |
|---|---|
| DRAWN: UTS GEOPHYSICS | SCALE: 1: 25000 |
| DATE: 10 JUNE 1996 | JOB: A101 - AREA 01 |

276037

Appendix 4 of Turner, N.J. 1997. Exploration Licence No 43/94, Corinna, Tasmania. Annual Report 4/1/97. Goldstream Mining NL and Titan Resources NL. Volume 3 of 3 of the annual report.

**Consultant's Report**

**to**

**Goldstream Mining N.L.**



# A PETROGRAPHIC AND GEOCHEMICAL INVESTIGATION OF GOLD: ARTHUR MOBILE BELT,WESTERN TASMANIA



**(confidential)**

**September 1996**

Dr Paul A. Kitto , Centre for Ore Deposit and Exploration Studies
Geology Department, University of Tasmania, GPO Box 252-79, Hobart, Australia 7001
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276039

**Consultant's Report**

**to**

**Goldstream Mining N.L.**

# A PETROGRAPHIC AND GEOCHEMICAL INVESTIGATION OF GOLD: ARTHUR MOBILE BELT, WESTERN TASMANIA

**(confidential)**

**September 1996**

Dr Paul A. Kitto , Centre for Ore Deposit and Exploration Studies
Geology Department, University of Tasmania, GPO Box 252-79, Hobart, Australia 7001
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276040

## SUMMARY


Eleven epoxy probe mounts containing a total of 192 gold grains from the Whyte River - Pieman River area, Arthur Mobile Belt, western Tasmania were examined petrographical (size, sphericity, angularity, mineral inclusions, presence of vugs) and analysed for their gold fineness from core to rim (1000 x Au/[Au + A]) to document the characteristic nature of the gold and potential origins for mineralisation.

The eleven probe mounts contained gold specimens that had been previously classified on their physical properties (e.g., colour, travel damage, crystallinity, mineral intergrowths, and etched nature). No single physical characteristic was successful in pigeon holing the gold grains relative to gold fineness but it is interpreted that in most cased only minor travel damage has occurred and therefore the samples are proximal to source (1-2 km; Rose, 1987). The gold specimens typically contained high and consistent average fineness, and narrow fineness ranges (Mean = 941; Range = 728 to 999) comparable with hypogene depth classes of Fisher (1945), and similar to values for Archaean (including Witwatersrand), Slate Belt and Plutonic classes of Morrison (1991). An increase in gold fineness from core to rim typically corresponded with minor colour variations (darker) on the immediate rim of the grains, associated with increased Ag-poor rims. This increase in gold fineness from core to rim is more or less associated with increased sphericity and rounded and most probably resulted from supergene enrichment in an oxidising environment. However, it was equally noted that almost half of all gold grains decreased in gold fineness from core to rim and this was inferred as a primary depositional feature associated with falling temperatures during mineralisation.

Mineral inclusions associated with, and entrapped within, gold grains ranged from: quartz, goethite, rutile, carbonates, spinel, chalcopyrite, galena, talc/tremolite, feldspar? and platinum. Quartz inclusions were by far the most frequent followed by goethite after pyrite (± pyrrhotite). The associated decrease in gold fineness for grains containing galena, relative to grains containing chalcopyrite, support an interpretation for declining temperatures during mineralisation.

The source of gold mineralisation remains equivocal. The abundance of quartz inclusions, and the nature of associated mineral inclusions, may indicate that gold deposition occurred either in sulphide-rich quartz veins, during silica replacement of carbonate (Carlin-style; Bottrill, 1992), or in quartz-rich host rocks related to felsic intrusives. The presence of goethite after pyrite (± pyrrhotite) containing gold inclusions along primary growth zones indicates that gold deposition was coeval with sulphide deposition. A metamorphic origin for gold mineralisation is equally supported by mineral inclusions of talc/tremolite, rutile, spinel and K-feldspar (?). The detection of two platinum grains associated with gold might also indicate the presence of a minor basic to ultrabasic source for gold mineralisation.

## INTRODUCTION AND BACKGROUND

Native gold and silver in nature forms a continuous alloy between these two end members due to their almost identical atomic radii. Electrum is the term used to refer to alloys of a specific compositional range (i.e., between 20 & 80 wt.% gold; Boyle, 1979). Historically, however, the purity of gold has been expressed in terms of fineness (1000 x Au/[Au + A]). For the purpose of this report the Au-Ag alloy will be described in terms of the gold fineness characteristics; and the term electrum will not be used.

More recent investigations of gold mineralisation associated with the Arthur Mobile Belt in the Corinna district, western Tasmania, have been reported by Khin Zaw (1990), Khin Zaw et al. (1992), Bottrill (1991), Bottrill et al. (1992). Studies of alluvial gold grains together with silicification of associated Precambrian limestones have led to a suggestion of Carlin-style gold mineralisation in this region of western Tasmania (Bottrill et al., 1992).

In this investigation a detailed examination was made of panned gold concentrates from the Corinna district. Observation of grain size, sphericity, angularity, mineral inclusions and composition (Au, Ag, & Hg; fineness) were documented to identify the gold signature for the district and make comparisons with previous gold studies to determine the origin of gold mineralisation.

## METHOD

Eleven samples containing a total of 192 gold grains were provided by Mr Hugh Nolan and mounted in epoxy resin discs at the University of Tasmania by Mr Simon Stephens. The mounted alluvial gold grains were carefully polished with 2.5μm aluminium paste allowing petrographic description, electron microprobe analysis and photographing.

Analyses were determined using a CAMECA-SX electron microprobe at the Central Science Laboratory, University of Tasmania under the supervision of Ms Alicia Verbeeten. The experimental conditions for gold analysis (Au, Ag & Hg) were set using the AgAuHg Label which uses an accelerating voltage of 20kv, and samples were standardised against the available silver standard.

## GOLD FINENESS SIGNATURES

Appendix I provides a detailed summary of the results obtained from petrographic descriptions of each gold grain (size visible on polished surface; sphericity; angularity; mineral inclusions; presence of vugs) in the epoxy resin mounts together with microprobe results (Ag, Au, and Hg) and calculations of gold fineness from core to rim within each grain are also summarised. Comments regarding the original grain classifications, field numbers, mean gold fineness, ranges in gold fineness for each epoxy probe mount, and the range in variations of gold fineness from rim to core are also included.

The following section systematically discusses the results presented in Appendix I.

### *G353 EPOXY PROBE MOUNT*

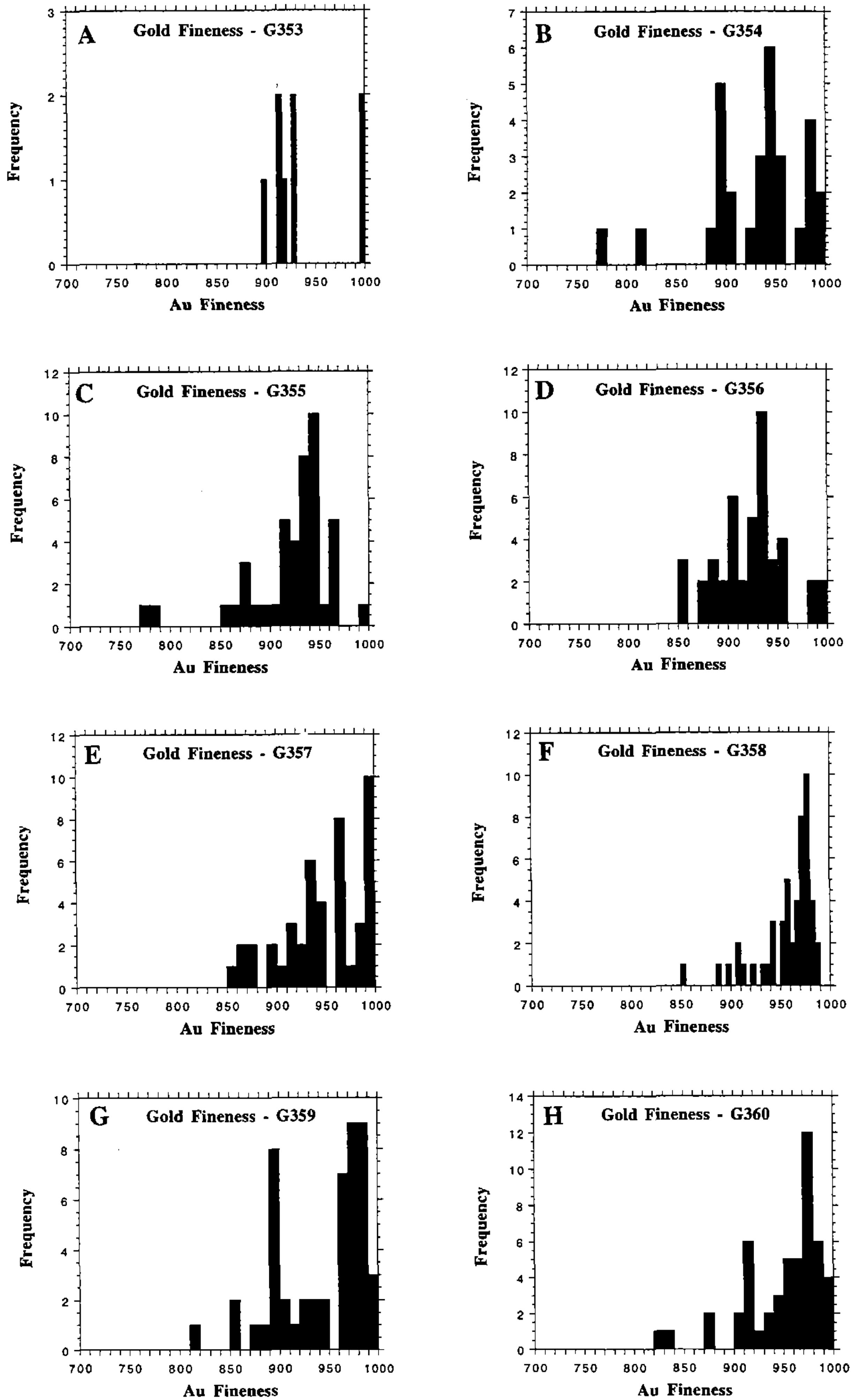
Probe mount G353 contains those **four grains** (Field no's: G154, G302, G206, G150) originally classified as **Pale in Colour** (Plate 1). The grains ranged in size (visibly exposed) from 450 to 100 µm, were subangular, and ranged in sphericity from low to high. The four grains presented do not have vugs nor do they contain inclusions of other minerals. Silver contents of the gold grains are typically less than 10 wt.% and mercury contents are minimal (<0.4 wt.%). Gold fineness ranged from 898 to 999 (Fig. 1A) with a mean of 939. G353-G4 is anomalous in this data set in having extreme gold fineness (996-999). This same grain also has a higher sphericity relative to the remaining grains. Variations in gold fineness from core to rim are minimal with the exception of G353-G3 which actually decreases in fineness (-20).

### *G354 EPOXY PROBE MOUNT*

Probe mount G354 contained **fifteen grains** (Field no's: G158, G148, G172, G174, G318, G294, G176, G328) originally classified as **Rich in Colour** (Plate 2). The grains ranged in size (visibly exposed) from 1500 to 200 µm, exhibited low to medium sphericity with the exception of G354-G11, and were all sub- to well-rounded but for G354-G9 and G354-G13 (same Field no's - G318). The only gold grain to have a vuggy appearance was G354-G14 which coincidently had the lowest gold fineness. Mineral inclusions within grains are many and varied (quartz, chalcopyrite, galena, Ti oxide, goethite after pyrite with minor hematite in fractures, K-spar?). In G354-G9 and G13 goethite pseudomorphs pyrite and gold occurs along primary growth zones. A lower gold fineness (~890) is associated with goethite. Silver contents of all gold grains are typically less than 12 wt.% (excluding G354-G14) and mercury contents minimal (<0.65 wt.%). Gold fineness ranged from 776 to 999 (Fig. 1B) with a mean of 931. The frequency histogram is positively skewed to higher gold fineness values (Fig. 1B). The highest gold fineness (999) occurs in G354-G10 associated with a possible feldspar inclusion. Gold fineness is higher in those grains containing chalcopyrite inclusions relative to grains with galena inclusions. Variations in gold fineness from core to rim are minimal with exception of G354-G5 (+49) and G354-G14 (-38).

### *G355 EPOXY PROBE MOUNT*

Probe mount G355 contained **twenty two grains** (Field no's: G172, G174) originally classified as **Medium Colour** with **Nil Travel Damage** (Plate 3). The grains ranged in size (visibly exposed) from 500 to 100 µm, exhibited low to high sphericity, and were typically angular to subrounded. Vuggy appearances were typically present but mineral inclusions rarely observed (quartz, Ti-oxide, chalcopyrite). Silver contents of all gold grains are typically less than 15 wt.% (excluding G355-G15) and mercury contents minimal (<0.64 wt.%). Gold fineness ranged from 777 to 999 (Fig. 1C) with a mean of 922. The frequency histogram has a positively skewed distribution to higher gold fineness values (Fig. 1C). Variations in gold fineness from core to rim are minimal with exception of G355-G9 (+21) and G355-G18 (+38) which had increases in gold fineness from core to rim, and samples G355-G11 (-30) and G355-G13 (-22) which had decreases in gold fineness from core to rim. Variations in gold fineness are apparent in a number of grains, based on variations in colour change, but in G355-G15 and G355-G16 such changes


A Gold Fineness - G353
B Gold Fineness - G354
C Gold Fineness - G355
D Gold Fineness - G356
E Gold Fineness - G357
F Gold Fineness - G358
G Gold Fineness - G359
H Gold Fineness - G360
Frequency
Au Fineness
700
750
800
850
900
950
1000

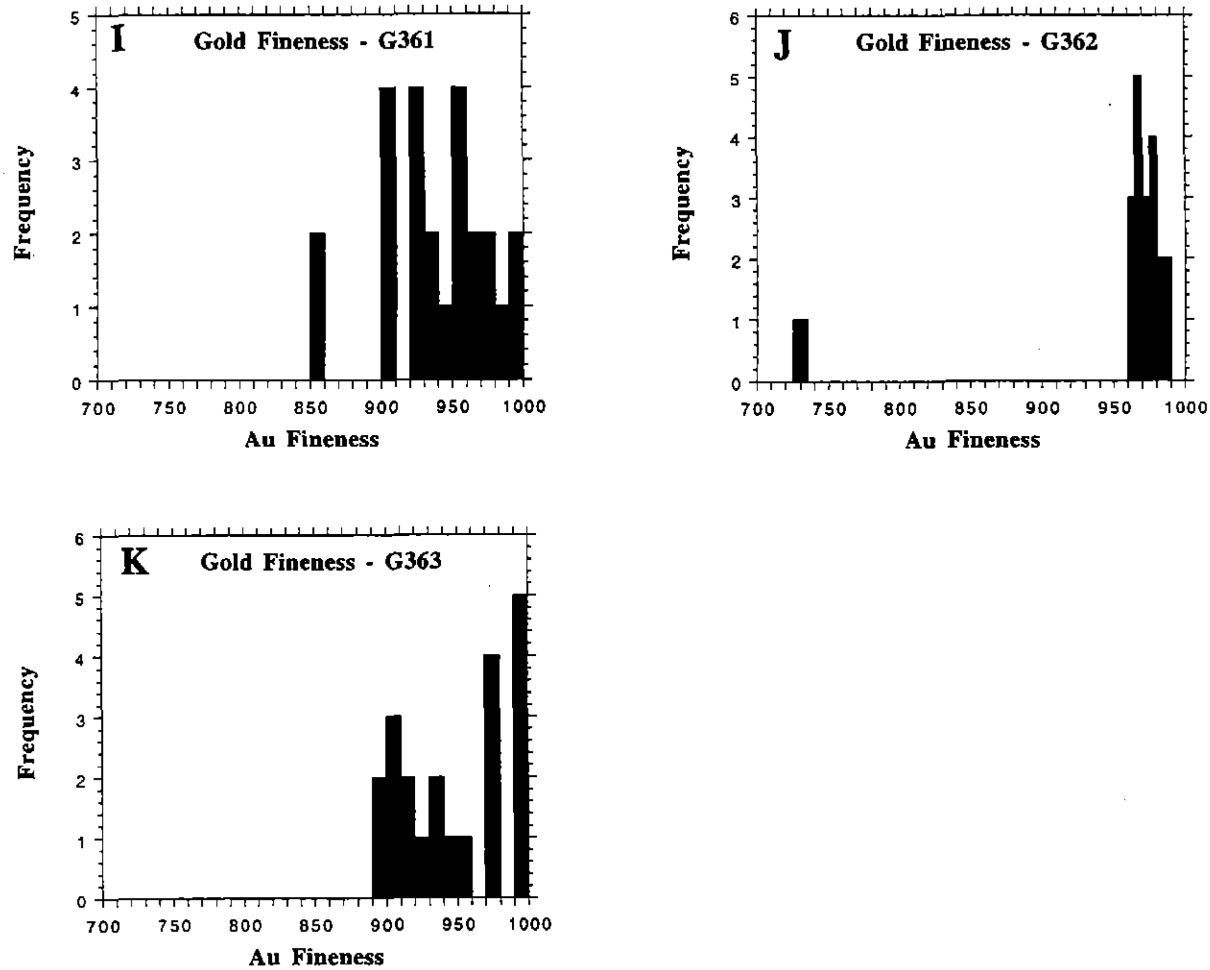



**Figure 1.** Histograms of gold fineness for the epoxy probe mount classifications (see Appendix 1 for detailed classifications).

appeared random. The only notable difference between panned concentrates G172 and G174 would be visible variability in colour (correlating with changes in gold fineness).

### *G356 EPOXY PROBE MOUNT*

Probe mount G356 contained **twenty two grains** (Field no's: G172, G174) originally classified as **Medium Colour** with **Minor Travel Damage** (Plate 4). The grains ranged in size (visibly exposed) from 550 to 50 µm, exhibited low to high sphericity, and were typically subangular to well rounded. Highest sphericity and smallest grain size correlates well with highest gold fineness (G356-G7 & G356-G15). Vuggy appearances were typical but mineral inclusions rare (quartz, Fe+Mg carbonate?). Silver contents of all gold grains are typically less than 15 wt.% and mercury contents minimal (<0.9 wt.%). Gold fineness ranged from 852 to 997 (Fig. 1D) with a mean of 923. The frequency histogram has a normal bell shape distribution in gold fineness about the mean value (Fig. 1D). Variations in gold fineness from core to rim are highly changeable, ranging from +71 (G356-G5) to -37 (G356-G4) with an average increase of +3.2. It is interesting to note, however, that more than half of the grains decrease in gold fineness from core to rim. The only notable difference between panned concentrates G172 and G174 would be visible variability in colour as noted in epoxy mount G355 (correlating with changes in gold fineness).

### *G357 EPOXY PROBE MOUNT*

Probe mount G357 contained **twenty two grains** (Field no's: G172, G174) originally classified as **Medium Colour** with **Medium Travel Damage** (Plate 5). The grains ranged in size (visibly exposed) from 1500 to 200 µm, exhibited low to medium sphericity, and were typically subangular to subrounded. Vuggy appearances were most apparent as were mineral inclusions (quartz, goethite, spinel, Ti-oxide, galena, Ca-carbonate, chalcopyrite). Gold fineness was lower in galena bearing gold grains than in chalcopyrite bearing gold grains (similar to G354). Silver contents of all gold grains are typically less than 14.5 wt.% and mercury contents minimal (<0.6 wt.%). Gold fineness ranged from 857 to 999 (Fig. 1E) with a mean of 946. The frequency histogram shows a positively skewed distribution in gold fineness to higher values (Fig. 1E). Variations in gold fineness from core to rim are highly changeable, ranging from +92 (G357-G14) to -43 (G357-G7) with an average increase of +12.4. The average increase in gold fineness for the epoxy probe mount G357 was the second largest of the eleven probe mounts investigated but even out of the 22 grains in G357 six grains decreased in gold fineness from core to rim and three grains showed no variation. The only notable difference between panned concentrates G172 and G174 were in the nature of inclusion types found within the gold grains. G172 was dominated by quartz inclusions and G174 was dominated by base metal inclusions (galena & chalcopyrite). A similar trend is noted for epoxy probe mounts G355 and G356 but the general lack of inclusions in these probe mounts requires caution in drawing such a conclusion.

### *G358 EPOXY PROBE MOUNT*

Probe mount G358 contained **twenty five grains** (Field no's: G190A) originally classified as **Medium Colour** with **Minor Travel Damage** and

**80% crystallinity** (Plate 6). The grains ranged in size (visibly exposed) from 1000 to 400 µm, exhibited very low to high sphericity, and were typically angular to subrounded. Vuggy appearances were most apparent and the extreme nature of this phenomenon resulted in a brain-rock appearance. Mineral inclusions were minor (Fe-Mn-Mg-rich carbonate, Platinum) but the nature of the inclusions may be important for interpreting the genetic origins for the gold. Silver contents of all gold grains are typically less than 10.5 wt.% and mercury contents minimal (<0.5 wt.%). Gold fineness ranged from 850 to 986 (Fig. 1F) with a mean of 957, the highest mean gold fineness value obtained for all epoxy probe mounts investigated. The frequency histogram exhibits a strong positively skewed distribution in gold fineness to higher values (Fig. 1F). Variations in gold fineness from core to rim are unusual in that only minor increases in gold fineness from core to rim occurred (+4 in G358-G25 to -101 in G358-G19) with an average decrease of -7.2.

### *G359 EPOXY PROBE MOUNT*

Probe mount G359 contained **twenty five grains** (Field no's: G190A) originally classified as **Medium Colour** with **Moderate Travel Damage** and **50% crystallinity** (Plate 7). The grains ranged in size (visibly exposed) from 1200 to 250 µm, exhibited low to medium sphericity, and were typically subangular to rounded. Vuggy appearances were most apparent but not as extreme as visible in G358. Mineral inclusions were minor (quartz, goethite) and in G359-G5 goethite pseudomorphs pyrite with gold aligned along primary growth zones. Silver contents of most gold grains are typically less than 12.5 wt.% but reach a maximum in G359-G24 at 18.3 wt.%. Mercury contents are minimal (<0.6 wt.%). Gold fineness ranged from 819 to 999 (Fig. 1G) with a mean of 944. The frequency histogram exhibits a strong positively skewed distribution in gold fineness to higher values but a secondary high is present at 890 (Fig. 1G). Similar secondary highs were not present in corresponding pan concentrates G358 (Fig. 1F) but were noted in G360 (Fig. 1H). Variations in gold fineness from core to rim are highly variable, ranging from +81 (G359-G2) to -74 (G357-G24) with an average increase of +1.7.

### *G360 EPOXY PROBE MOUNT*

Probe mount G360 contained **twenty five grains** (Field no's: G190A) originally classified as **Medium-rich Colour** with **Moderate Travel Damage** and **nil crystallinity** (Plate 8). The grains ranged in size (visibly exposed) from 1500 to 350 µm, exhibited low to high sphericity, and were typically subangular to well rounded. Vuggy appearances were apparent but not as extreme as seen in G358 and G359. Mineral inclusions were minor (quartz, Ti-oxide, goethite). Silver contents of most gold grains are typically less than 13 wt.% but reach a maximum in G360-G19 at 17.46 wt.%. Mercury contents were minimal (<0.5 wt.%). Gold fineness ranged from 829 to 998 (Fig. 1H) with a mean of 950. The frequency histogram exhibits a strong positively skewed distribution in gold fineness to higher values (Fig. 1H). Variations in gold fineness from core to rim are highly variable, ranging from +87 (G360-G2) to -5 (G360-G19) with an average increase of +13.3. This increase is the largest average increase of all the epoxy probe mounts studied but still nine grains had a decrease in gold fineness from core to rim, and one sample was unchanged. In most grains that showed an increase in gold fineness from core to rim a corresponding colour change was also visible.

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## *G361 EPOXY PROBE MOUNT*

Probe mount G361 contained **twelve grains** (Field no's: G312, G314, G316, G318) originally classified as **Medium Colour** with **Minor-Major Travel Damage** (Plate 9). The grains ranged in size (visibly exposed) from 550 to 100 µm, exhibited low to high sphericity, and were typically angular to subrounded. Vuggy appearances were apparent for most grain as were mineral inclusions (quartz, Ca-Mn-Fe-rich carbonate, Ca-carbonate, goethite, Si-Al-Fe-K-rich feldspar?). Silver contents of most gold grains are typically less than 10 wt.% but reach a maximum in G361-G7 at 15.01 wt.%. Mercury contents were minimal (<0.45 wt.%). Gold fineness ranged from 852 to 998 (Fig. 1i) with a mean of 938. The frequency histogram exhibits a normal bell shaped distribution (Fig. 1i). Variations in gold fineness from core to rim are variable, ranging from +38 (G361-G2) to -7 (G361-G6) with an average increase of +6.3.

## *G362 EPOXY PROBE MOUNT*

Probe mount G362 contained **ten grains** (Field no's: G190A, G190B) originally classified as **Gold Intergrown With Other Minerals** (Plate 10). The grains ranged in size (visibly exposed) from 3400 to 450 µm, exhibited low to high sphericity, and were typically angular to subrounded. Gold was typically intergrown with goethite which exhibited a spongy laminated texture in a number of samples (G362-G3, G362-G4, G362-G10) suggestive of pyrrhotite replacement. In goethite dominated examples gold constituted less than 35% of the intergrowth. Other minerals intergrown with gold included talc/tremolite (G362-G1, G362-G7, G362-G8), and quartz. Silver contents of most gold grains are typically less than 3.8 wt.% but reached a maximum in G362-G1 at 27.39 wt.%. Mercury contents were minimal (<0.25 wt.%). Gold fineness ranged from 728 to 986 (Fig. 1J) with a mean of 948. The frequency histogram exhibits bimodal distribution with one sample having a gold fineness of 728 and the remainder of values near 970 (Fig. 1J). Variations in gold fineness from core to rim are minimal, ranging from +3 to -1 with an average increase of +0.33. Panned concentrate samples G190A and G190B appeared inseparable in terms of their observed and measured properties. The only exception was G362-G1 from panned concentrate G190B which had a gold fineness of 728, the lowest of any samples measured in this study.

## *G363 EPOXY PROBE MOUNT*

Probe mount G363 contained **ten grains** (Field no's: G334, G340, G346, G348) originally classified as **Etched Surfaces** (Plate 11). The grains ranged in size (visibly exposed) from 1400 to 400 µm, exhibited low to medium sphericity, and were typically very angular to rounded. Gold was typically vuggy and inclusion free but quartz was present in two samples (G363-G5, G363-G6) and goethite in one other (G363-G10). Silver contents of most gold grains are typically less than 11 wt.% and mercury contents were minimal (<0.75 wt.%). Gold fineness ranged from 893 to 966 (Fig. 1K) with a mean of 948. The frequency histogram of gold fineness for G363 exhibits a positively skewed distribution (Fig. 1K). Variations in gold fineness from core to rim are variable, ranging from +46 to -7 with an average increase of +9.1. Largest variations in fineness from core to rim were noted in those two gold grains with quartz inclusions (G363-G5, G363-G6), however, Ag-poor rims regions (darker) were optically visible in many of the grains.

## GOLD FINENESS

Gold fineness values result from a complex function of temperature, redox state, activity of the ligands, pH, and total Au/Ag content of the system in question (Boyle, 1979; Morrison et al., 1991; Huston et al., 1992; Gammons and Williams-Jones, 1995). As a result the fineness of gold deposited in various geological environments under differing physico-chemical conditions will be different. In figure 2 Morrison et al.(1991) has summarised the six major classes of gold-silver forming environments together with their overall averages and ranges of fineness values, after Fisher (1945). They note that Archaean (including Witwatersrand), Slate Belt and Plutonic classes are characterised by high and consistent average fineness and narrow fineness ranges. There would appear to be no clear subdivision within these classes according to deposit style or inferred genesis. The Porphyry, Volcanogenic and Epithermal classes have variable average deposit fineness and a wide total range in fineness values. Within these three classes, higher fineness is typical of deposits in andesitic rather than rhyolitic volcanic settings; and deposits with Cu-Au rather than Cu-Mo or Pb-Zn element associations.

In major gold-silver forming environments the dominant transportation mechanism for gold and silver takes place in the form of $AgCl_2^-$ for silver and $Au(HS)_2^-$ for gold. The solubility of gold and silver in hydrothermal fluids for all the classes of gold-silver deposits decreases with a fall in temperature, except for the fluids responsible for acid-sulphate type epithermal deposits (Morrison et al., 1991). In addition to cooling some gold-forming environments are characterised by the predominance of one or more processes of ore deposition. In Archaean greenstone-hosted deposits, dilute $CO_2$ rich fluids precipitate gold by reaction with iron-rich wallrocks resulting in sulphidation of the associated wallrocks (Neall & Phillips, 1987). In Slate Belt environments ore-forming fluids are generated by metamorphic dewatering and consist of $CO_2$ bearing chloride brines. Gold deposition results when the ore fluids are reduced by carbonaceous wallrock reactions, or by mixing with methane bearing fluids derived from the rocks. Similarly, cooling and an increase in fluid pH due to wall rock reactions, as seen in the Otago schist belt (Paterson, 1986), may play a role in gold deposition, as might sulphidation reactions associated with pyritic shales (Cox et al., 1983). In the plutonic environment mantle-lower crust interaction, metamorphic dewatering, and melting may be important (Bohlke & Kistler, 1986; Bohlke, 1989). Gold precipitation mechanisms include cooling, wall rock interaction (sulphidation) and reduction by fluid mixing.

Whereas cooling affects chloro and bisulphide complexes of gold and silver in the same manner by decreasing their solubility, changes in pH, $fO2$, salinity and activity of reduced sulphur have different effects on the stability of chloro and bisulphide complexes (Morrison, 1991). For example, at a fixed temperature an increase in pH and a drop in oxidation levels causes a fall in the solubility of gold and silver chloro-complexes. However, for bisulphide complexes the effect of changes in pH , redox and reduced sulphur depends on the initial pH and oxidation state of the fluid.

In summary, of the six major classes of gold-silver forming environments the Archaean (including Witwatersrand), Slate Belt and Plutonic classes are

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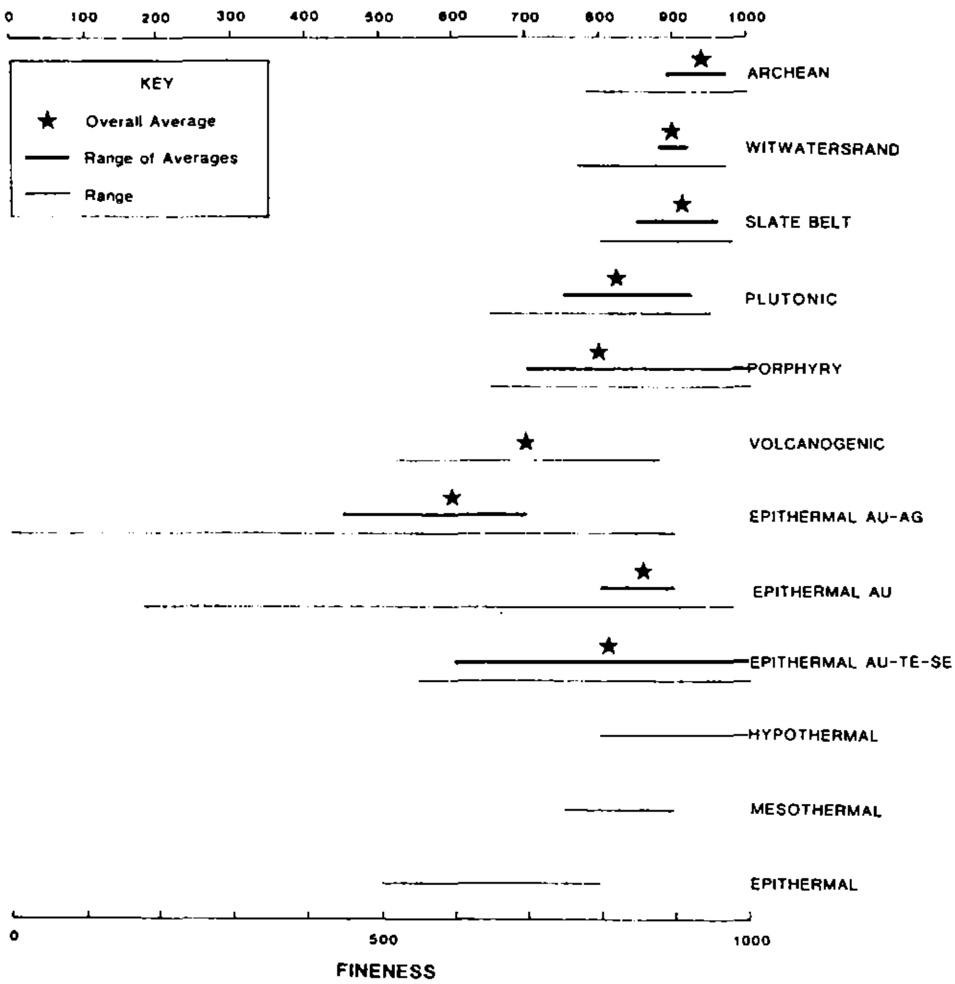


**Figure 2.** Overall average, range of averages and range of fineness for major deposit classes. Hypothermal, Mesothermal and Epithermal ranges from Fisher (1945) included for comparison. From Morrison et al. (1991).

characterised by high and consistent average fineness and narrow fineness range comparable to the hypogene depth classes used by Fisher (1945). Au/Ag ratios can not be explained by transport mechanisms alone and therefore Au/Ag ratios in the source rock and mechanisms of deposition must be considered.

Four possible explanations for consistency in gold fineness values are possible:

1. a common origin for all styles of mineralisation
2. a common source for gold and silver bearing fluids without modification
3. a mechanism for homogenising the fineness values through post-mineralisation deformation and metamorphism
4. a mechanism of supergene enrichment

## INTERPRETATION OF GOLD FINENESS IN PANNED CONCENTRATES

A summary of gold fineness variations is graphically presented in figure 3 which compares gold fineness for each of the epoxy probe mounts. A tabulation of the mean, range and variations from core to rim of fineness are also summarised in Table 1.

It is immediately apparent from the results that with few exceptions all gold samples from the Whyte River - Pieman River area have characteristically high and consistent average fineness, and narrow fineness ranges comparable to the hypogene depth classes used by Fisher (1945), and similar to the values for the Archaean (including Witwatersrand), Slate Belt and Plutonic classes of Morrison (1991). The data is also comparable to the findings reported by Zaw (1990), Zaw et al (1992) and Bottrill et al.(1992) from the Corinna region.

The original classification of gold samples into the various epoxy probe mount types based on their physical properties has not been a complete success. For example, minor variations in gold fineness have been noted from lowest average gold fineness in those samples with least travel damage (G355, mean = 922) to highest average gold fineness in those samples with maximum visible crystallinity (G358, mean = 957). Original classifications of samples by colour alone was not diagnostic in identifying highest gold fineness (c/f. G353, mean = 939; G354, mean = 931). In individual gold grains, however, colour variations have been noted and correspond with Ag-poor rims on grain boundaries. Classification of samples by the degree of travel damage was moderately more successful than other techniques but not completely (c/f. G355, mean = 922; G356, mean = 923; G361, mean = 938; G359, mean = 944; G360, mean = 950).

The nature of mineral inclusions associated with and entrapped within individual gold grains was many and varied. The most common inclusions being quartz. Goethite after pyrite or pyrrhotite has also been identified. In a number of samples goethite has pseudomorphed original pyrite grains and contains gold inclusions enclosed along pyrite growth zones. Where goethite has replaced pyrrhotite, laminated intergrowths after secondary marcasite are apparent. Minor inclusions of rutile, carbonate, spinel, chalcopyrite, galena, talc/tremolite, platinum, and feldspar? have also been identified.

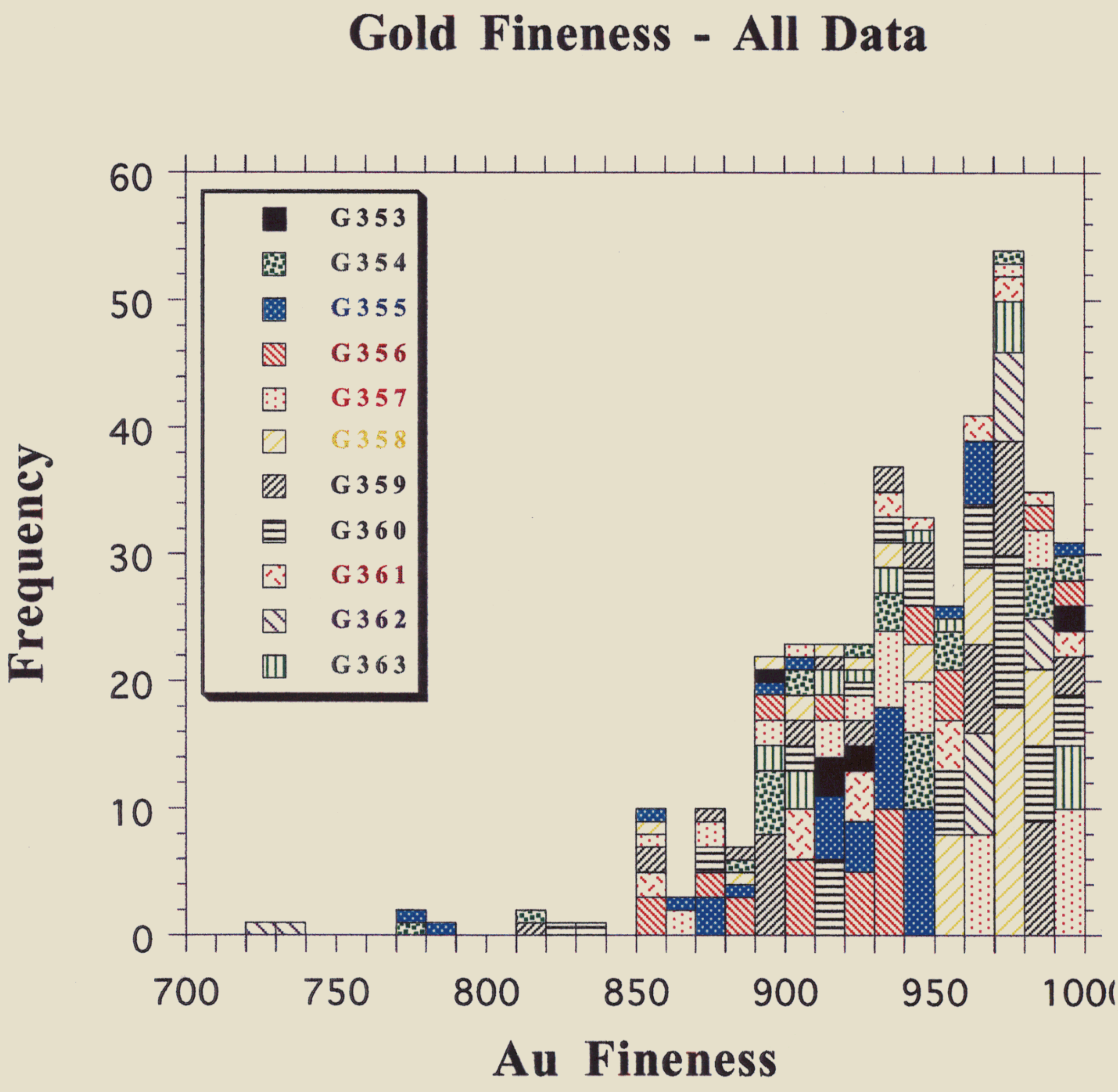


**Figure 3.** Histogram of gold fineness for all gold grains.

TABLE 1: FINENESS VARIATION

| SAMPLE NO. | MEAN | RANGE | RIM TO CORE RANGE | RIM TO CORE AV. VARIATION |
|---|---|---|---|---|
| G353 (4 grains) | 939 (n=7) | 898 to 999 | 3 to -20 (n=3) | -6.0 |
| G354 (15 grains) | 931 (n=30) | 776 to 999 | +49 to -38 (n=15) | -0.3 |
| G355 (22 grains) | 922 (n=44) | 777 to 999 | +38 to -30 (n=22) | -0.5 |
| G356 (22 grains) | 923 (n=44) | 852 to 997 | 71 to -37 (n=22) | 3.2 |
| G357 (22 grains) | 946 (n=43) | 857 to 999 | +92 to -43 (n=20) | 12.4 |
| G358 (25 grains) | 957 (n=49) | 850 to 986 | 4 to -101 (n=24) | -7.2 |
| G359 (25 grains) | 944 (n=50) | 819 to 999 | +81 to -74 (n=25) | 1.7 |
| G360 (25 grains) | 950 (n=48) | 829 to 998 | 87 to -5 (n=23) | 13.3 |
| G361 (12 grains) | 938 (n=24) | 852 to 998 | +38 to -7 (n=7) | 6.3 |
| G362 (10 grains) | 948 (n=20) | 728 to 986 | +3 to -1 (n=9) | 0.3 |
| G363 (10 grains) | 948 (n=21) | 893 to 996 | 46 to -7 (n=10) | 9.1 |
| **AVERAGE** | **941** (n=387) | **728 to 999** | **92 to -101** | **3.3** |

The nature of mineral inclusions could be useful in the interpretation of the source for and genesis of gold mineralisation in the region. The abundance of quartz inclusions would tend to indicate that either gold deposition occurred within quartz veins, silica replacement, or quartz-rich host-rocks. It would appear less probable that quartz was picked up during travel damage as most grains exhibit only nil-minor evidence for reworking. The presence of goethite after pyrite (± pyrrhotite) with gold inclusions along primary growth zones indicates that some gold deposition was coeval with sulphide deposition. Such conclusions are supported by the occurrence of minor chalcopyrite and galena inclusions within gold grains. The fact that higher gold fineness is associated with chalcopyrite rather than galena could most likely indicate a temperate constraint on gold and sulphide deposition. The existence of a range of carbonate inclusions in gold could be associated with carbonate replacement mineralisation as muted for the silica flour deposit at Corinna (Zaw, 1990). Bottrill et al. (1992) for example has hypothesised that gold deposition in the area might be associated with Carlin-style mineralisation (i.e., disseminated gold in limestone). The existence of a minor number of talc/tremolite inclusions in gold could be further evidence for carbonate replacement mineralisation, or equally support a metamorphic origin for gold mineralisation. Rutile, minor spinel and possible K-feldspar inclusions could similarly be associated with metamorphic events, or hypothetical felsic intrusives. Finally, the detection of two pure platinum grains within gold could be indicative of basic to ultrabasic sources for gold mineralisation.

The variation in gold fineness within most grains from core to rim is typically minimal with minor exceptions. It was noted that in all epoxy probe mounts that there was almost an equal proportion of gold grains that increased in fineness from core to rim as there were gold grains that decreased in fineness from core to rim. Increases in gold fineness are typically associated with changes in colour to darker coloured rims and greater sphericity and roundness. The logical conclusion being that increases in gold fineness from core to rim are associated with minor travel damage and supergene enrichment, where in oxidising environments silver is more mobile and has been removed from the rim of the grains. Rose (1987) in describing Alaskan gold placer deposits made an empirical observation that for each kilometre of transport from the source region actually caused an increase of fineness by five points. Applying this interpretation to the majority of the gold grains analysed in the Whyte River-Pieman River area would indicate that most grains have travelled less than 1-2 km from the source. Decreases in gold fineness from core to rim, on the other hand, are thought to be a primary feature associated with gold deposition in the region and may reflect a decrease in temperature during gold deposition.

## CONCLUSIONS

The characteristically high and consistent average gold fineness, and narrow fineness ranges for gold specimens from the Whyte River - Pieman River regions are comparable to the hypogene depth class of Fisher (1945) and corresponds to similar values for the Archaean (including Witwatersrand), Slate Belt and Plutonic classes of Morrison (1991). The systematic decrease in gold fineness from core to rim in almost half of all gold grains might indicate that gold deposition was controlled by falling temperatures. This interpretation is supported by decreases in gold fineness for grains containing galena inclusions relative to chalcopyrite inclusions. However, the presence of goethite after pyrite (± pyrrhotite), together with other sulphides, suggests that gold precipitation was associated with sulphidation reactions. The presence of carbonate inclusions too could indicate that cooling together with an increase in pH due to carbonate wall-rock reactions may have played a role in gold deposition. Based on fluid inclusion studies for silica flour replacement of dolomites by Zaw (1990) the potential fluids responsible for gold mineralisation may have been at ~300°C and $CO_2$ ± $CH_4$ bearing weakly-moderately saline brines. Such fluids could either have been associated with plutonism or metamorphism and the final conclusions are still equivocal. The presence of quartz, rutile, minor spinel and possibly K-feldspar inclusions in gold grains neither supports nor detracts from both models. In fact, it may be that two sources for gold mineralisation exist in this region! The occurrence of two platinum grains could also be indicative of a third gold source associated with basic to ultrabasic rocks.

Finally, minor increases in gold fineness from core to rim in a large number of gold grains together with evidence for minor travel damage suggests that supergene processes have occurred and that travel distances were minimal, perhaps less than 1-2 km from source.

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## REFERENCES


Bohlke, J. K., 1989. Comparison of metasomatic reactions between a common CO2-rich vein fluid and diverse wall rocks: Intensive variables, mass transfers, and Au mineralisation at Alleghany, Califomnia. Econ. Geol., v84: 291-327.

Bohlke, J. K.; Kistler, R. W., 1986. Rb-Sr, K-Ar and stable isotope evidence for the ages and sources of fluid components of gold-bearing quartz veins in the northernSierra Nevada foothills metamorphic belt, California. Econ. Geol., v81: 296-322.

Bottrill, R. S., 1991. Alluvial gold. Miner. Res. Geol. Surv. Tasm. v11.

Bottrill, R. S.; Huston, D. L.; Taheri, J.; Khin Zaw. 1991. Gold in Tasmania. Bull. Geol. Surv. Tasm. v70: 24-46.

Boyle, R. W., 1979. The geochemistry of gold and its deposits. Geol. Surv. Can. Bull., 280 pp.

Cox, S. F.; Wall, V. J.; Etheridge, M. A.; Sun, S. S.; Potter, T. F., 1983. Gold-quartz mineralisation in Slate Belts. The Castlemain-Chewton example. 7th Aust. Geol. Conv. Abstr., pp. 260-261.

Fisher, N. H., 1945. The fineness of gold with special reference to the Morobe goldfields, New Guinea. Econ Geol., v40: 449-495; 537-563.

Gammons, C. H.; Williams-Jones, A. E., 1995. Hydrothermal geochemistry of electrum: thermodynamic constraints. Econ. Geol., v90: 420-432.

Huston, D. L.,; Bottrill, R. S.; Creelman, R. A.; Zaw, K.; Ramsden, T. R.; Rand, S. W.;Gemmell, J. B.; Jablonski, W.; Sie, S. H.; Large, R. R., 1992. Geologic and geochemical controls on the mineralogy and grain size of gold-bearing phases, eastern Australian volcanogenic-hosted massive sulphide deposits. Econ. Geol., v87: 542-563.

Khin Zaw, 1990. An investigation on the fluid inclusion characteristics and gold geochemistry of silica flour deposit, westem Tasmania. Unpubl. CODES Report to Aberfoyle Resources Ltd.

Khin Zaw; Turner, N. J.; Large, R. R.; Nolan, H.; Mernagh, T., 1992. Geology and genesis of silica flour and gold in the Corinna district, western Tasmania. Bull. Geol. Surv. Tasm. v70: 96.

Morrison, G. W.; Rose, W. J.; Jaireth, S., 1991. Geological and geochemical controls on the silver content (fineness) of gold in gold-silver deposits. Ore Geology Reviews, v6: 333-364.

Neall, F. B.; Phillips, G. N., 1987. Fluid-wall rock interaction in an Archean hydrothermal deposit: A thermodynamic model for the Hunt Mine, Kambalda. Econ. Geol., v82: 1678-1694.

Paterson, C. J., 1986. Controls on gold and tungsten mineralisation in metamorphic hydrothermal systems, Otago, New Zealand, in: J. D. Keppie, R. W. Boyle and S. J. Haynes (Editors), Turbidite Hosted Gold Deposits. Geol. Assoc. Can., Spec. Pap., v32: 25-39.

Rose, W. J., 1987. The silver content of gold: A method for distinguishing North Queensland ore deposits of differing genesis. Unpubl. M.Sc thesis, James Cook Univ. North Queensland. 116p.

## PLATES

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**Plate 1.** G353 - Classification: Pale colour (x25; reflected light).

**Plate 2.** G354 - Classification: Rich colour (x25; reflected light).

**Plate 3.** G355 - Classification: Medium colour, nil travel damage (x25; reflected light).

**Plate 4.** G356 - Classification: Medium colour, minor travel damage (x25; reflected light).

**Plate 5.** G357 - Classification: Medium colour, medium travel damage (x25; reflected light).

**Plate 6.** G358 - Classification: Medium colour, minor travel damage, 80% crystallinity (x25; reflected light).

**Plate 7.** G359 - Classification: Medium colour, moderate travel damage, 50% crystallinity (x25; reflected light).

**Plate 8.** G360 - Classification: Medium colour, moderate travel damage, nil crystallinity (x25; reflected light).

**Plate 9.** G361 - Classification: Medium colour, minor-major travel damage (x25; reflected light).

**Plate 10.** G362 - Classification: Gold intergrown with other minerals (x25; reflected light).

**Plate 11.** G363 - Classification: Gold with etched surfaces (x25; reflected light).

PLATE 1 276057

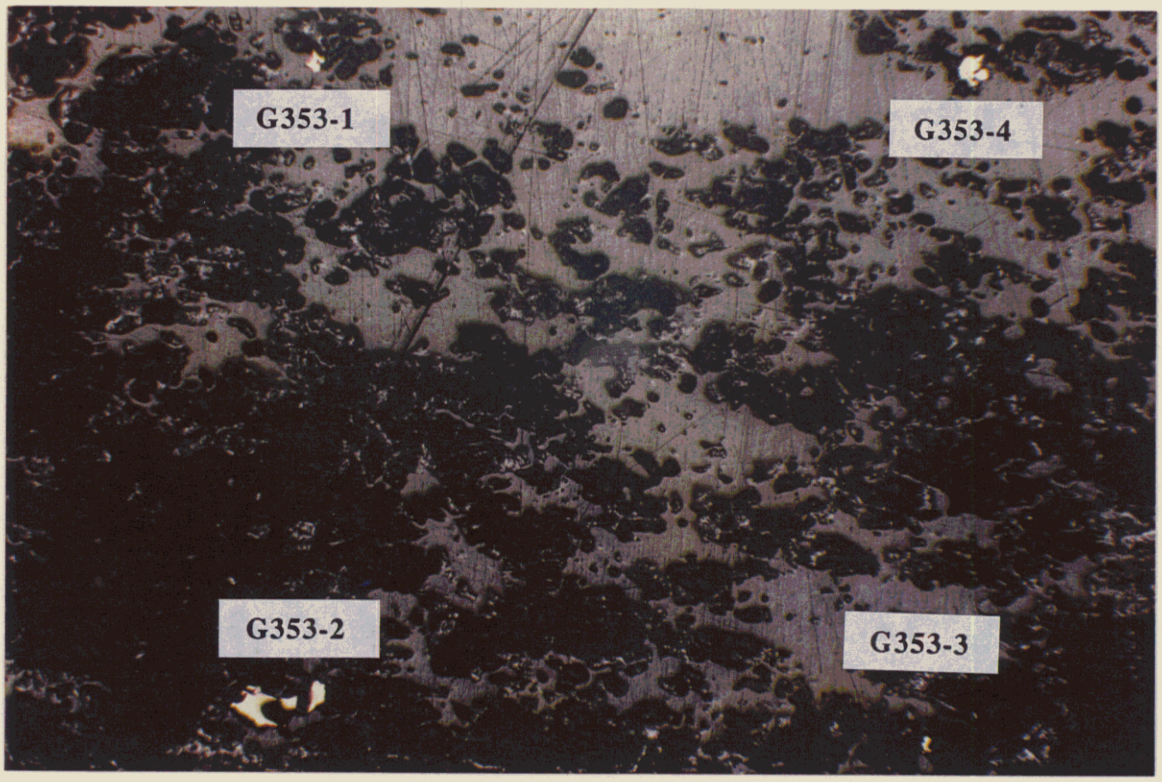


PLATE 2

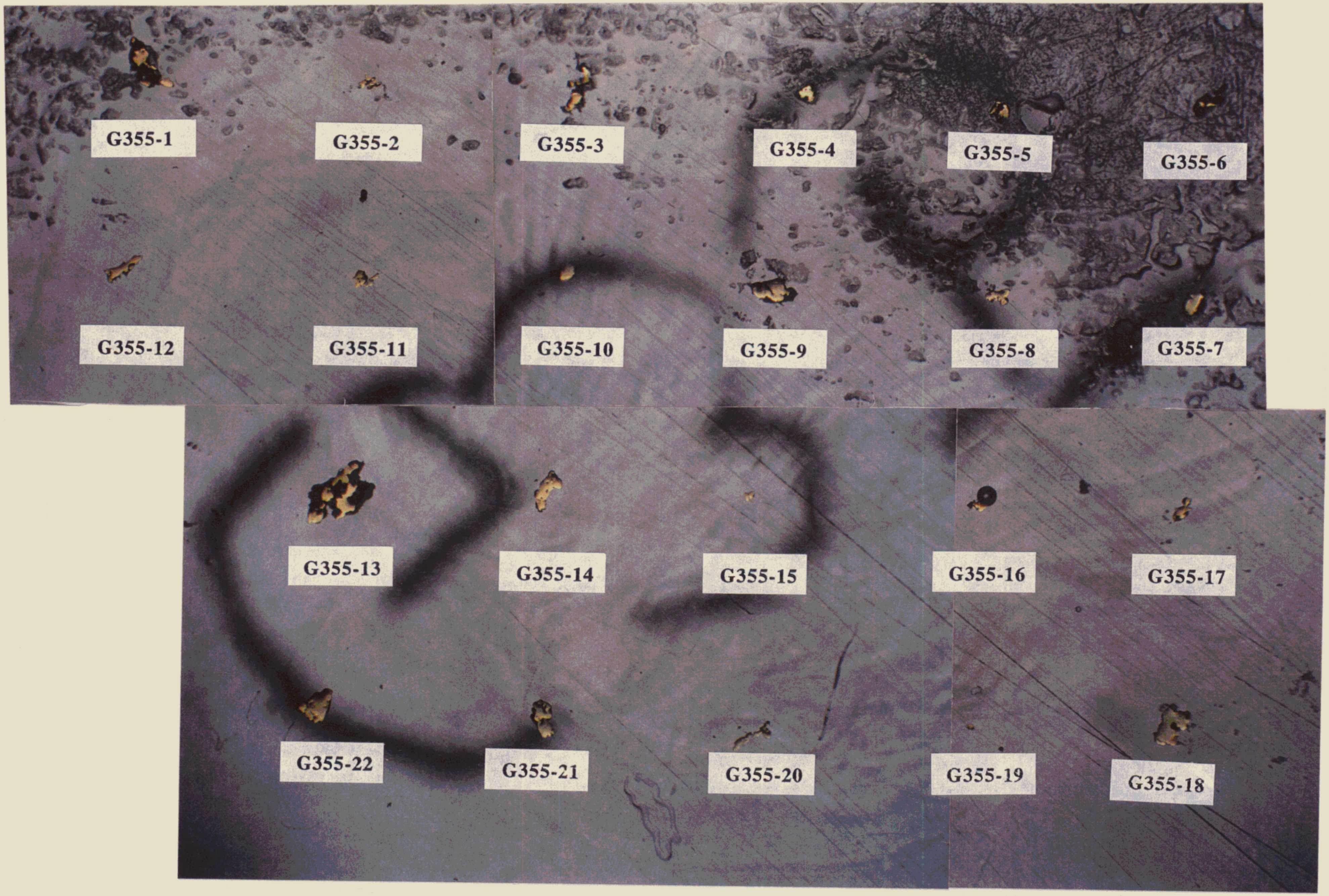


PLATE 3



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# PLATE 4

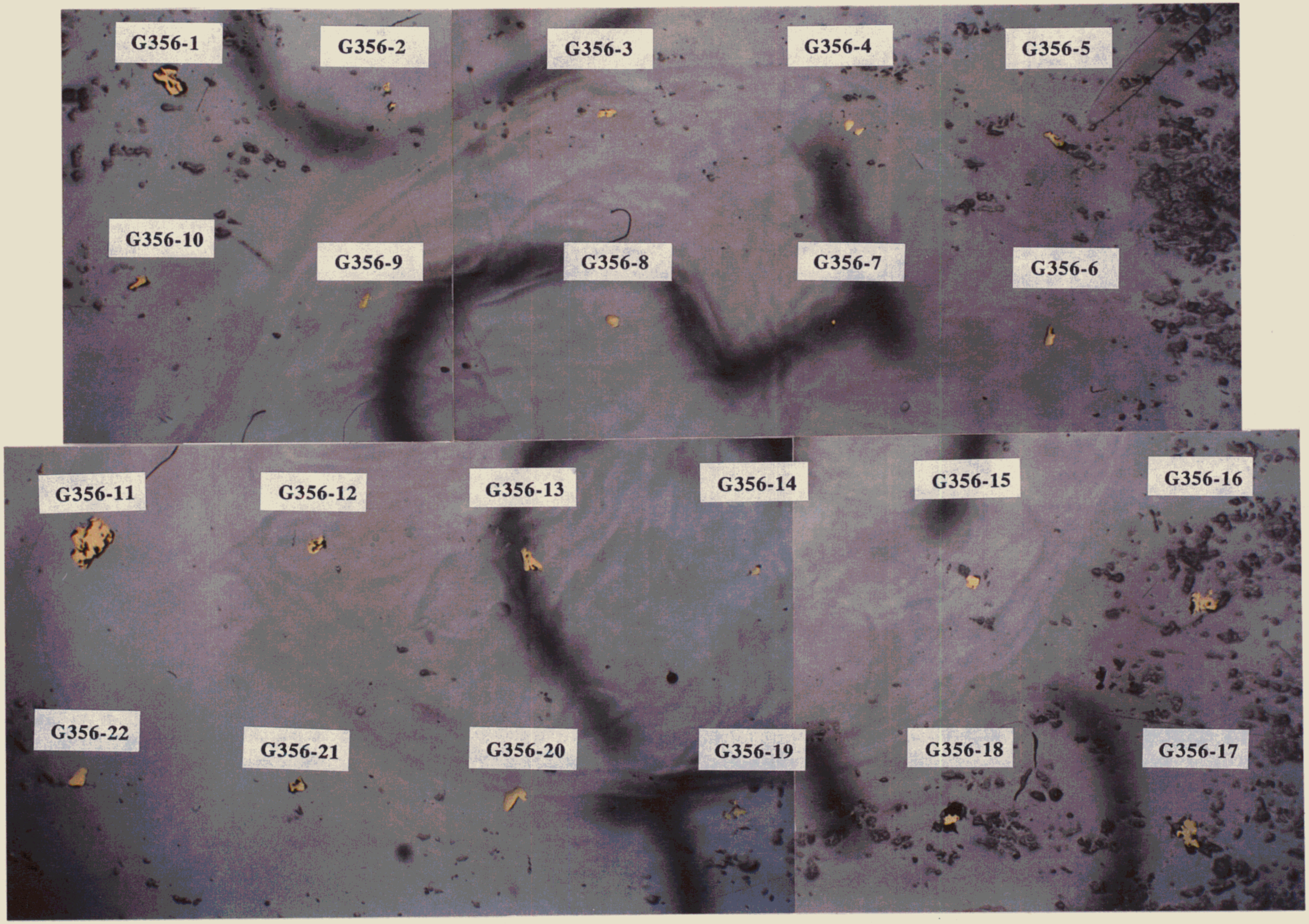


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PLATE 5

PLATE 6

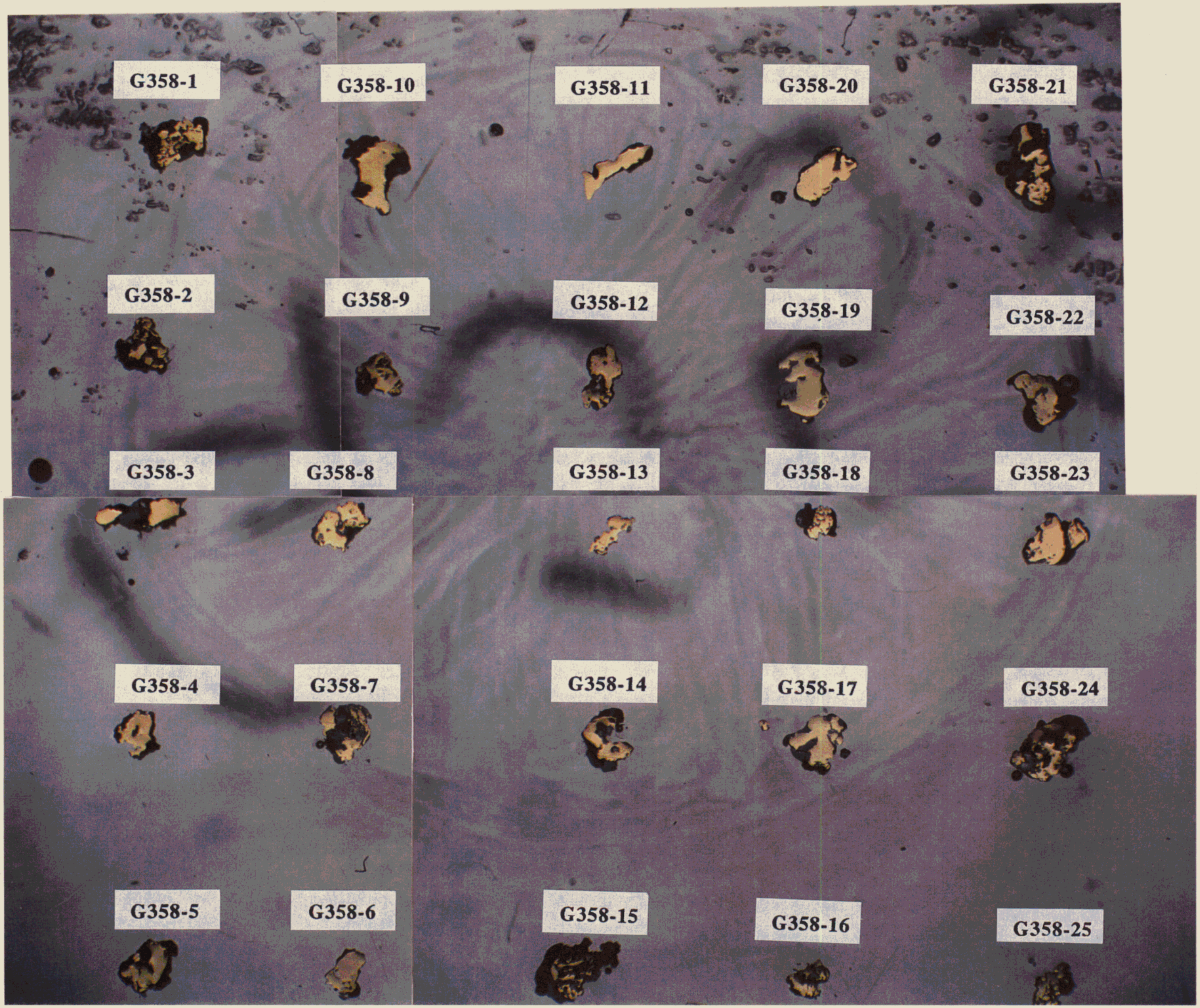
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PLATE 7

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PLATE 8


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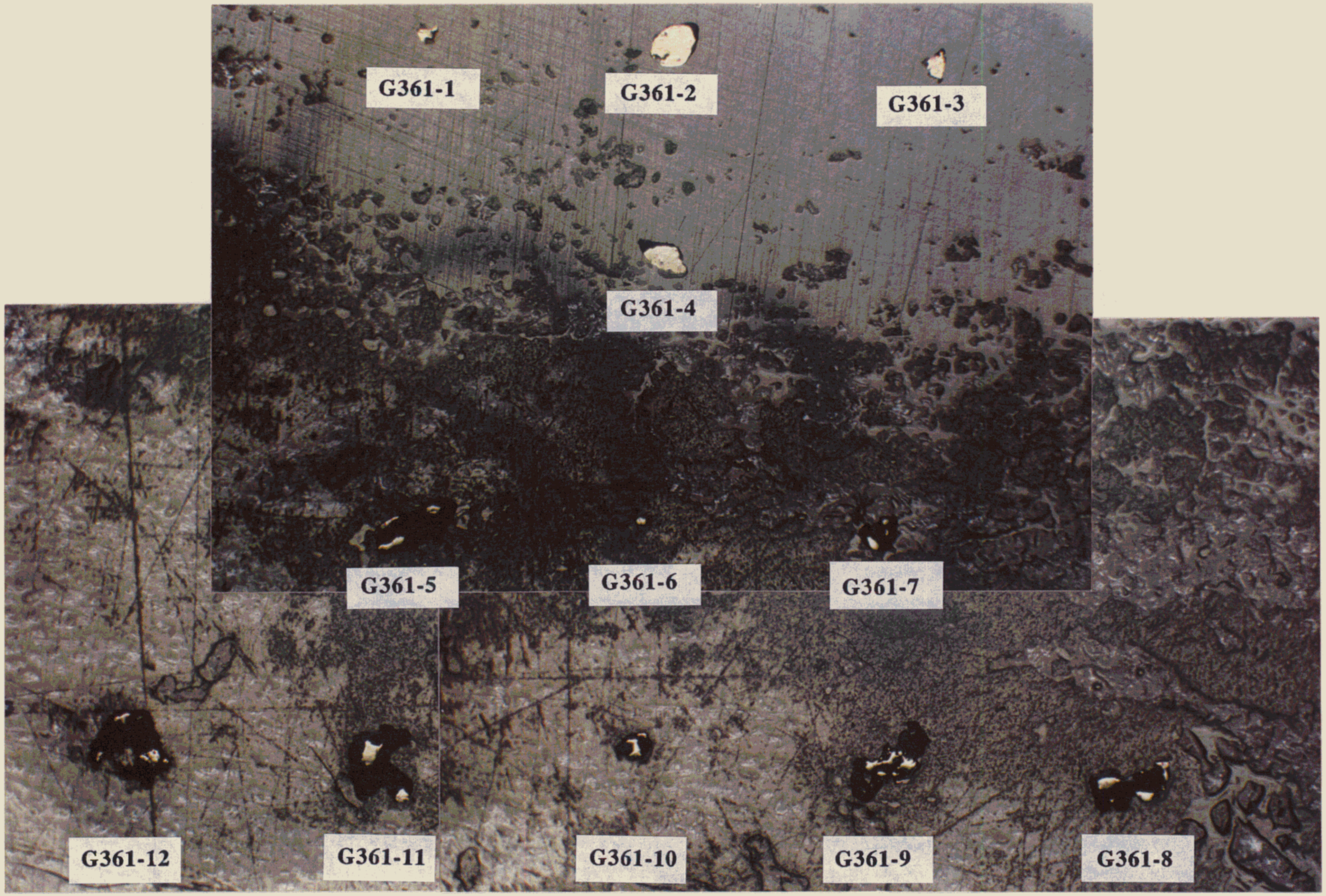


PLATE 9

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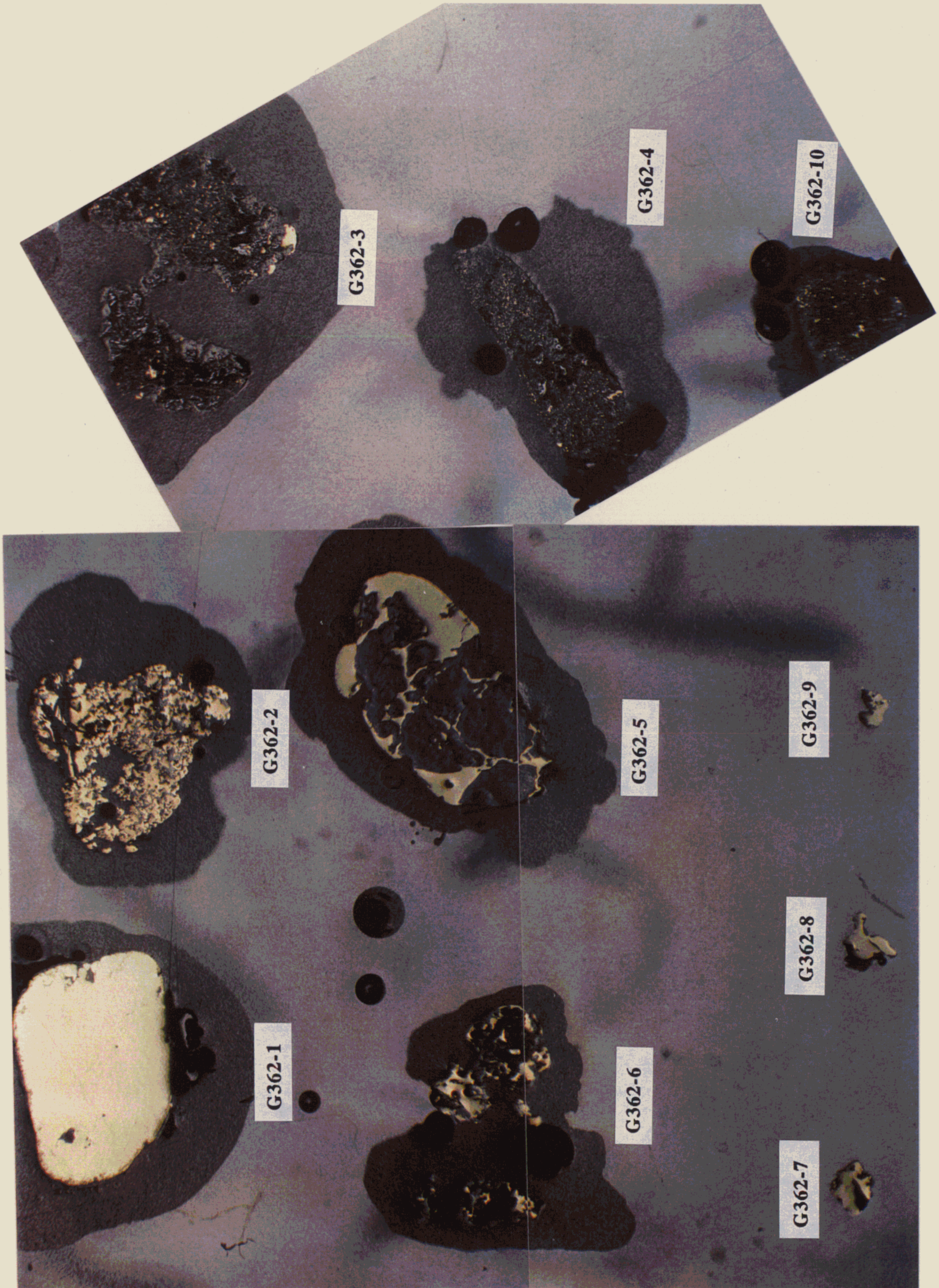
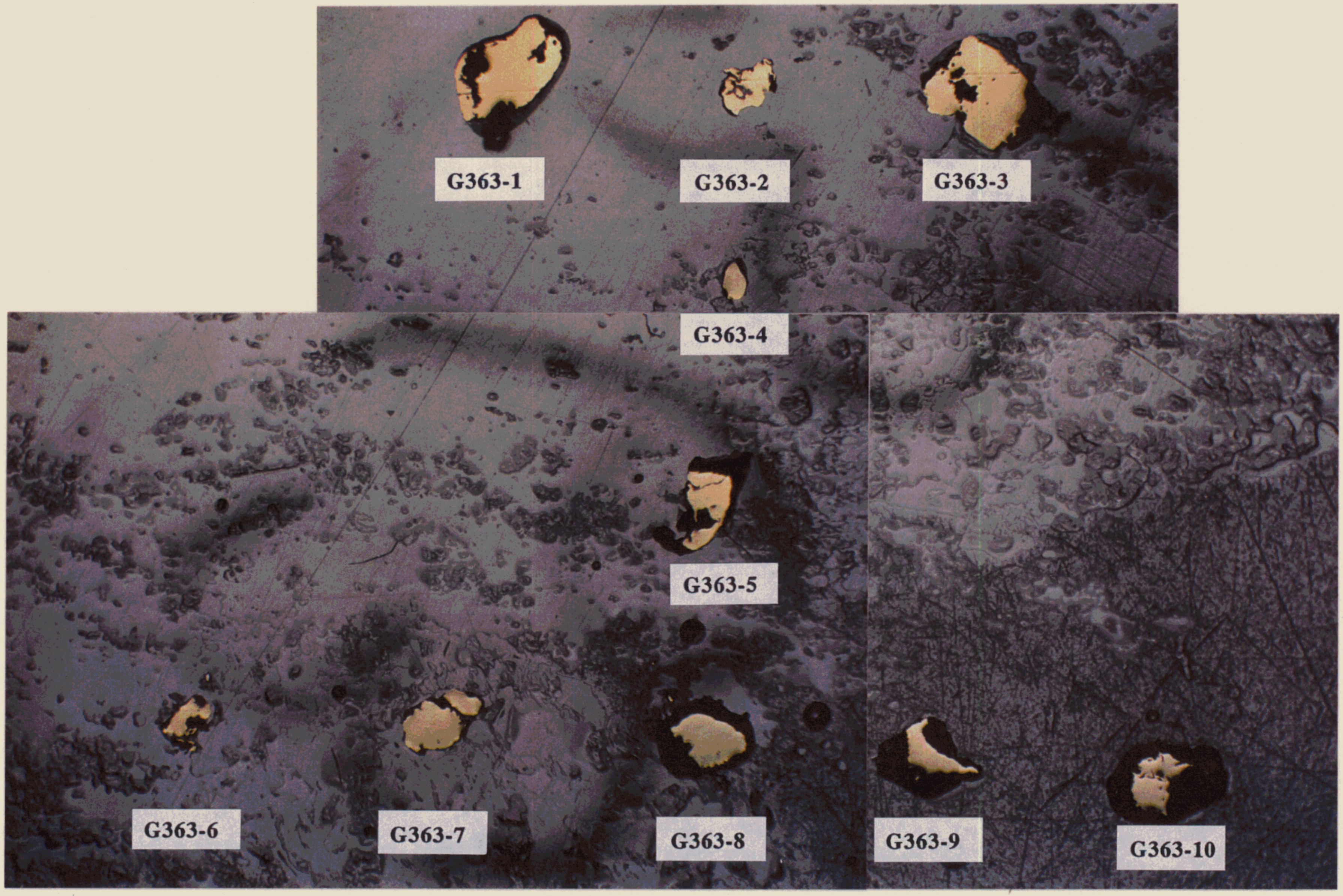
PLATE 10

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G363-7
G363-8
G363-9
G363-10

| No. | Mount | Grain | Field # | Size (μm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | **ORIGINAL CLASSIF.: Pale Colour** |
| 1 | G353 | G1C | G154 | 100 | medium | subangular | 8.86 | 91.27 | 0.08 | 912 | | |
| 2 | G353 | G2C | G302 | 450x300 | low | subangular | 7.46 | 94.16 | 0.23 | 927 | | |
| 3 | G353 | G2R | G302 | | | | 7.43 | 93.30 | 0.35 | 926 | -1 | |
| 4 | G353 | G3C | G206 | 100x50 | low | subangular | 8.33 | 92.80 | 0.06 | 918 | | |
| 5 | G353 | G3R | G206 | | | | 10.14 | 89.70 | 0.13 | 898 | -20 | |
| 6 | G353 | G4C | G150 | 200 | spherical | subangular | 0.41 | 101.11 | 0.23 | 996 | | |
| 7 | G353 | G4R | G150 | | | | 0.07 | 100.12 | 0.00 | 999 | 3 | |
| | | | | | | | | | **Mean =** | **939** | | |
| | | | | | | | | | **Range= 898 to 999** | | | |
| | | | | | | | | | **Rim to core = +3 to -20 (av. = -6.0)** | | | |
| | | | | | | | | | | | | **ORIGINAL CLASSIF.: Rich Colour** |
| 8 | G354 | G1C | G158 | 450x300 | medium | well rounded | 5.47 | 95.18 | 0.24 | 946 | | quartz inclusions & Ag-rich chalcopyrite inclusions |
| 9 | G354 | G1R | G158 | | | | 5.61 | 95.31 | 0.27 | 944 | -2 | |
| 10 | G354 | G2C | G158 | 500x250 | low | well rounded | 5.41 | 93.67 | 0.33 | 945 | | |
| 11 | G354 | G2R | G158 | | | | 6.56 | 93.22 | 0.57 | 934 | -11 | |
| 12 | G354 | G3C | G158 | 500x250 | medium | subangular | 5.29 | 95.80 | 0.03 | 948 | | quartz inclusions & chalcopyrite inclusions |
| 13 | G354 | G3R | G158 | | | | 5.44 | 95.76 | 0.04 | 946 | -2 | |
| 14 | G354 | G4C | G148 | 300x250 | medium | well rounded | 9.37 | 90.72 | 0.17 | 906 | | galena inclusions (± chalcopyrite) |
| 15 | G354 | G4R | G148 | | | | 9.27 | 91.04 | 0.18 | 908 | 2 | |
| 16 | G354 | G5C | G172 | 350x200 | low | rounded | 7.16 | 93.43 | 0.16 | 929 | | quartz inclusions & minor Fe-oxide (goethite) |
| 17 | G354 | G5R | G172 | | | | 2.23 | 98.56 | 0.07 | 978 | 49 | |
| 18 | G354 | G6C | G172 | 200x100 | low | subrounded | 4.99 | 95.95 | 0.19 | 951 | | |
| 19 | G354 | G6R | G172 | | | | 5.23 | 95.40 | 0.16 | 948 | -3 | |
| 20 | G354 | G7C | G174 | 250x100 | low | subrounded | 1.69 | 97.98 | 0.00 | 983 | | |
| 21 | G354 | G7R | G174 | | | | 1.45 | 98.54 | 0.13 | 985 | 2 | |
| 22 | G354 | G8C | G174 | 250x200 | medium | well rounded | 4.85 | 96.34 | 0.03 | 952 | | |
| 23 | G354 | G8R | G174 | | | | 4.73 | 95.57 | 0.06 | 953 | 2 | |
| 24 | G354 | G9C | G318 | 1500 | low | subangular | 11.10 | 90.34 | 0.22 | 891 | | Goethite after pyrite with hematite fractures. Au inclusions along grain rims. |
| 25 | G354 | G9C2 | G318 | | | | 11.66 | 88.45 | 0.10 | 884 | -7 | |
| 26 | G354 | G10C | G294 | 450x250 | low | rounded | 0.06 | 99.58 | 0.16 | 999 | | feldspar inclusion? (Al, Si, K ± Fe) |
| 27 | G354 | G10R | G294 | | | | 0.06 | 100.48 | 0.17 | 999 | 0 | |
| 28 | G354 | G11C | G176 | 325 | high | rounded | 6.64 | 94.94 | 0.07 | 935 | | |
| 29 | G354 | G11R | G176 | | | | 6.83 | 94.35 | 0.17 | 933 | -2 | |
| 30 | G354 | G12C | G174 | 325x225 | low | subrounded | 1.95 | 98.47 | 0.08 | 981 | | |
| 31 | G354 | G12R | G174 | | | | 1.75 | 98.09 | 0.15 | 983 | 2 | |
| 32 | G354 | G13C | G318 | 1250x400 | low | angular | 10.52 | 89.99 | 0.12 | 895 | | goethite after pyrite; gold has Ag-poor rims (darker) where contacting goethite |
| 33 | G354 | G13R | G318 | | | | 10.14 | 89.20 | 0.01 | 898 | 3 | |
| 34 | G354 | G14C | G328 | 800x300 | low | well rounded | 18.65 | 81.69 | 0.05 | 814 | | quartz inclusion; gold has Ag-poor zones (darker); vuggy |
| 35 | G354 | G14R | G328 | | | | 22.80 | 78.77 | 0.19 | 776 | -38 | |
| 36 | G354 | G15C | G328 | 200x100 | low | well rounded | 10.82 | 89.86 | 0.65 | 893 | | quartz & Ti-oxide inclusions |
| 37 | G354 | G15R | G328 | | | | 10.60 | 89.80 | 0.64 | 894 | 1 | |

APPENDIX 1

276067

| No. | Mount | Grain | Field # | Size (μm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Mean =** 931
**Range=** 776 to 999
**Rim to core =** +49 to -38 (av. = -0.3)

**ORIGINAL CLASSIF.: Medium Colour; Nil Travel Damage**

| No. | Mount | Grain | Field # | Size (μm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38 | G355 | G1C | G172 | 350x200 | very low | very angular | 3.92 | 97.55 | 0.14 | 961 | | vuggy |
| 39 | G355 | G1R | G172 | | | | 3.66 | 97.91 | 0.07 | 964 | 3 | |
| 40 | G355 | G2C | G172 | 200x70 | low | subrounded | 4.95 | 96.24 | 0.29 | 951 | | vuggy |
| 41 | G355 | G2R | G172 | | | | 5.18 | 95.88 | 0.00 | 949 | -2 | |
| 42 | G355 | G3C | G172 | 250x100 | low | angular | 5.70 | 95.34 | 0.17 | 944 | | |
| 43 | G355 | G3R | G172 | | | | 5.58 | 95.77 | 0.09 | 945 | 1 | |
| 44 | G355 | G4C | G172 | 200 | high | subrounded | 8.33 | 92.94 | 0.15 | 918 | | vuggy |
| 45 | G355 | G4R | G172 | | | | 8.02 | 93.08 | 0.19 | 921 | 3 | |
| 46 | G355 | G5C | G172 | 200 | high | subangular | 5.84 | 94.49 | 0.14 | 942 | | vuggy |
| 47 | G355 | G5R | G172 | | | | 6.16 | 95.54 | 0.05 | 939 | -3 | |
| 48 | G355 | G6C | G172 | 200x60 | low | subangular | 3.26 | 98.15 | 0.25 | 968 | | vuggy |
| 49 | G355 | G6R | G172 | | | | 3.61 | 96.87 | 0.06 | 964 | -4 | |
| 50 | G355 | G7C | G172 | 350x50 | low | subangular | 12.51 | 88.28 | 0.00 | 876 | | |
| 51 | G355 | G7R | G172 | | | | 12.90 | 89.03 | 0.12 | 873 | -3 | |
| 52 | G355 | G8C | G172 | 300x100 | low | angular | 5.64 | 95.58 | 0.25 | 944 | | Ti-oxide? inclusion; vuggy |
| 53 | G355 | G8R | G172 | | | | 5.73 | 95.33 | 0.18 | 943 | -1 | |
| 54 | G355 | G9C | G172 | 450x200 | low | subangular | 14.79 | 87.57 | 0.00 | 856 | | vuggy |
| 55 | G355 | G9R | G172 | | | | 12.61 | 89.55 | 0.00 | 877 | 21 | |
| 56 | G355 | G10C | G172 | 200x150 | med | subangular | 8.03 | 92.57 | 0.27 | 920 | | |
| 57 | G355 | G10R | G172 | | | | 8.24 | 93.29 | 0.34 | 919 | -1 | |
| 58 | G355 | G11C | G172 | 200 | high | subangular | 5.54 | 95.65 | 0.12 | 945 | | vuggy |
| 59 | G355 | G11R | G172 | | | | 8.68 | 93.44 | 0.01 | 915 | -30 | |
| 60 | G355 | G12C | G172 | 500x100 | very low | subrounded | 5.28 | 96.36 | 0.04 | 948 | | vuggy |
| 61 | G355 | G12R | G172 | | | | 5.28 | 95.38 | 0.11 | 948 | 0 | |
| 62 | G355 | G13C | G174 | 400x200 | low | subangular | 11.71 | 89.14 | 0.18 | 884 | | vuggy |
| 63 | G355 | G13R | G174 | | | | 14.03 | 87.55 | 0.04 | 862 | -22 | |
| 64 | G355 | G14C | G174 | 450x150 | low | subrounded | 6.28 | 95.61 | 0.38 | 938 | | |
| 65 | G355 | G14R | G174 | | | | 5.89 | 93.11 | 0.43 | 941 | 3 | |
| 66 | G355 | G15C | G174 | 100 | high | subangular | 22.20 | 78.85 | 0.38 | 780 | | gold has Ag-poor zones (darker); vuggy |
| 67 | G355 | G15R | G174 | | | | 22.62 | 78.67 | 0.51 | 777 | -3 | |
| 68 | G355 | G16C | G174 | 200x100 | low | subrounded | 7.26 | 94.34 | 0.00 | 929 | | mottled Ag-poor zones throughout (darker) |
| 69 | G355 | G16R | G174 | | | | 7.97 | 93.68 | 0.00 | 922 | -7 | |
| 70 | G355 | G17C | G174 | 350x150 | low | subangular | 6.77 | 94.43 | 0.09 | 933 | | |
| 71 | G355 | G17R | G174 | | | | 6.67 | 93.43 | 0.00 | 933 | 0 | |
| 72 | G355 | G18C | G174 | 450x300 | medium | subangular | 3.94 | 98.41 | 0.12 | 961 | | gold has Ag-poor rims (darker); vuggy |
| 73 | G355 | G18R | G174 | | | | 0.12 | 101.87 | 0.09 | 999 | 38 | |
| 74 | G355 | G19C | G174 | 100x70 | low | well rounded | 9.03 | 92.29 | 0.00 | 911 | | gold has Ag-poor rims (darker); vuggy |
| 75 | G355 | G19R | G174 | | | | 8.75 | 91.72 | 0.00 | 913 | 2 | |
| 76 | G355 | G20C | G174 | 200x100 | low | angular | 6.47 | 94.73 | 0.26 | 936 | | quartz inclusions; vuggy |

| No. | Mount | Grain | Field # | Size (μm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 77 | G355 | G20R | G174 | | | | 6.36 | 93.55 | 0.38 | 936 | 0 | |
| 78 | G355 | G21C | G174 | 500x200 | low | rounded | 9.83 | 90.20 | 0.64 | 902 | | vuggy |
| 79 | G355 | G21R | G174 | | | | 10.15 | 89.59 | 0.60 | 898 | -4 | |
| 80 | G355 | G22C | G174 | 450x300 | low | subrounded | 6.52 | 95.30 | 0.00 | 936 | | chalcopyrite inclusion; vuggy |
| 81 | G355 | G22R | G174 | | | | 6.53 | 94.79 | 0.19 | 936 | 0 | |
| | | | | | | | | | **Mean =** | **922** | | |
| | | | | | | | | | **Range= 777 to 999** | | | |
| | | | | | | | | | **Rim to core = +38 to -30 (av. = -0.5)** | | | |
| | | | | | | | | | | | | **ORIGINAL CLASSIF.: Medium Colour; Minor Travel Damage** |
| 82 | G356 | G1C | G172 | 400x200 | low | subrounded | 7.50 | 92.80 | 0.25 | 925 | | quartz inclusion; vuggy |
| 83 | G356 | G1R | G172 | | | | 7.74 | 93.85 | 0.15 | 924 | -1 | |
| 84 | G356 | G2C | G172 | 100x50 | low | subangular | 11.22 | 89.46 | 0.48 | 889 | | quartz inclusion; vuggy |
| 85 | G356 | G2R | G172 | | | | 9.98 | 91.93 | 0.08 | 902 | 13 | |
| 86 | G356 | G3C | G172 | 200x100 | low | subangular | 9.76 | 91.43 | 0.44 | 904 | | minor vugs |
| 87 | G356 | G3R | G172 | | | | 10.07 | 90.48 | 0.37 | 900 | -4 | |
| 88 | G356 | G4C | G172 | 100 | high | rounded | 8.91 | 93.96 | 0.15 | 913 | | |
| 89 | G356 | G4R | G172 | | | | 12.67 | 89.28 | 0.13 | 876 | -37 | |
| 90 | G356 | G5C | G172 | 300x100 | low | subrounded | 12.77 | 89.79 | 0.24 | 876 | | vuggy |
| 91 | G356 | G5R | G172 | | | | 5.61 | 96.09 | 0.04 | 945 | 71 | |
| 92 | G356 | G6C | G172 | 250x100 | low | rounded | 5.46 | 92.65 | 0.12 | 944 | | |
| 93 | G356 | G6R | G172 | | | | 5.66 | 96.30 | 0.22 | 945 | 1 | |
| 94 | G356 | G7 | G172 | 50 | high | subangular | 0.34 | 99.94 | 0.09 | 997 | | too small to analyse 2 points |
| 95 | G356 | G8C | G172 | 150 | high | well rounded | 10.92 | 88.75 | 0.15 | 890 | | |
| 96 | G356 | G8R | G172 | | | | 11.87 | 89.07 | 0.11 | 882 | -8 | |
| 97 | G356 | G9C | G172 | 200x100 | low | subangular | 9.41 | 90.93 | 0.09 | 906 | | vuggy |
| 98 | G356 | G9R | G172 | | | | 9.73 | 91.61 | 0.17 | 904 | -2 | |
| 99 | G356 | G10C | G172 | 250x100 | low | well rounded | 4.25 | 97.31 | 0.07 | 958 | | |
| 100 | G356 | G10R | G172 | | | | 4.36 | 97.67 | 0.12 | 957 | -1 | |
| 101 | G356 | G11C | G174 | 550x400 | med | subrounded | 15.07 | 86.53 | 0.22 | 852 | | Fe+Mg-rich inclusion? Gold has Ag-poor rims (darker); vuggy |
| 102 | G356 | G11R | G174 | | | | 0.24 | 102.14 | 0.18 | 998 | 46 | |
| 103 | G356 | G12C | G174 | 250x150 | low | subangular | 14.82 | 86.82 | 0.10 | 854 | | very vuggy |
| 104 | G356 | G12R | G174 | | | | 15.09 | 86.99 | 0.19 | 852 | -2 | |
| 105 | G356 | G13C | G174 | 350x150 | low | subrounded | 6.44 | 94.78 | 0.11 | 936 | | quartz inclusion; Ag-poor zones throughout (darker); vuggy |
| 106 | G356 | G13R | G174 | | | | 6.69 | 94.92 | 0.00 | 934 | -2 | |
| 107 | G356 | G14C | G174 | 100x60 | low | angular | 11.25 | 90.04 | 0.15 | 889 | | |
| 108 | G356 | G14R | G174 | | | | 10.80 | 91.19 | 0.17 | 894 | 5 | |
| 109 | G356 | G15C | G174 | 150 | high | rounded | 1.09 | 100.24 | 0.12 | 989 | | |
| 110 | G356 | G15R | G174 | | | | 1.31 | 100.59 | 0.00 | 987 | -2 | |
| 111 | G356 | G16C | G174 | 300x250 | med | subangular | 4.89 | 97.21 | 0.23 | 952 | | vuggy |
| 112 | G356 | G16R | G174 | | | | 5.00 | 96.54 | 0.27 | 951 | -1 | |
| 113 | G356 | G17C | G174 | 350x200 | low | angular | 7.00 | 93.26 | 0.78 | 930 | | vuggy |
| 114 | G356 | G17R | G174 | | | | 6.84 | 93.15 | 0.86 | 932 | 2 | |
| 115 | G356 | G18C | G174 | 200x150 | med | subrounded | 6.66 | 93.87 | 0.63 | 934 | | |

| No. | Mount | Grain | Field # | Size (µm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 116 | G356 | G18R | G174 | | | | 6.64 | 94.44 | 0.58 | 934 | 0 | |
| 117 | G356 | G19C | G174 | 300x250 | med | angular | 9.17 | 92.24 | 0.13 | 910 | | vuggy |
| 118 | G356 | G19R | G174 | | | | 9.56 | 90.74 | 0.27 | 905 | -5 | |
| 119 | G356 | G20C | G174 | 350x150 | low | subrounded | 6.45 | 93.59 | 0.57 | 936 | | |
| 120 | G356 | G20R | G174 | | | | 6.61 | 94.88 | 0.32 | 935 | -1 | |
| 121 | G356 | G21C | G174 | 200x150 | med | subangular | 6.86 | 95.30 | 0.01 | 933 | | vuggy |
| 122 | G356 | G21R | G174 | | | | 6.82 | 94.41 | 0.16 | 933 | 0 | |
| 123 | G356 | G22C | G174 | 200x250 | med | well rounded | 7.24 | 95.35 | 0.23 | 929 | | |
| 124 | G356 | G22R | G174 | | | | 7.26 | 93.62 | 0.25 | 928 | -1 | |
| 125 | G356 | G22R A | G174 | | | | 7.21 | 95.05 | 0.34 | 929 | 0 | |
| | | | | | | | | | Mean = | 923 | | |
| | | | | | | | | | Range= 852 to 997 | | | |
| | | | | | | | | | Rim to core = +71 to -37 (av. = + 3.2) | | | |
| | | | | | | | | | | | | **ORIGINAL CLASSIF.: Medium Colour; Medium Travel Damage** |
| 126 | G357 | G1C | G172 | 600x350 | low | subrounded | 0.55 | 101.69 | 0.04 | 995 | | quartz inclusion; Ag-poor zone in middle (darker); vuggy |
| 127 | G357 | G1R | G172 | | | | 0.17 | 96.81 | 0.25 | 998 | 3 | |
| 128 | G357 | G2C | G172 | 450x150 | low | angular | 3.25 | 94.58 | 0.26 | 967 | | goethite inclusion; vuggy |
| 129 | G357 | G2R | G172 | | | | 3.24 | 93.89 | 0.09 | 967 | 0 | |
| 130 | G357 | G3C | G172 | 300x250 | med | subangular | 8.27 | 90.87 | 0.12 | 917 | | quartz inclusion; vuggy |
| 131 | G357 | G3R | G172 | | | | 9.08 | 92.50 | 0.20 | 911 | -6 | |
| 132 | G357 | G4C | G172 | 700x200 | low | rounded | 13.52 | 87.56 | 0.19 | 866 | | quartz inclusion; minor vugs |
| 133 | G357 | G4R | G172 | | | | 12.43 | 87.23 | 0.00 | 875 | 9 | |
| 134 | G357 | G5C | G172 | 500x300 | low | rounded | 5.46 | 94.97 | 0.09 | 946 | | spinel inclusion; Ag-poor rim (darker); minor vugs |
| 135 | G357 | G6C | G172 | 750x300 | low | subrounded | 6.29 | 94.47 | 0.56 | 938 | | quartz inclusion; Ag-poor rim (darker); minor vugs |
| 136 | G357 | G6R | G172 | | | | 0.05 | 100.47 | 0.11 | 999 | 61 | |
| 137 | G357 | G7C | G172 | 250x200 | med | wellrounded | 10.08 | 91.22 | 0.20 | 900 | | |
| 138 | G357 | G7R | G172 | | | | 14.44 | 86.83 | 0.30 | 857 | -43 | |
| 139 | G357 | G8C | G172 | 650x250 | low | rounded | 3.76 | 95.71 | 0.19 | 962 | | minor vugs |
| 140 | G357 | G8R | G172 | | | | 3.82 | 96.29 | 0.00 | 962 | 0 | |
| 141 | G357 | G9C | G172 | 250 | high | angular | 7.11 | 89.46 | 0.00 | 926 | | Ti-oxide inclusions (lots); vuggy |
| 142 | G357 | G10C | G172 | 650x500 | med | subrounded | 3.26 | 98.49 | 0.13 | 968 | | quartz inclusions (lots); vuggy |
| 143 | G357 | G10R | G172 | | | | 3.15 | 97.67 | 0.27 | 969 | 1 | |
| 144 | G357 | G11C | G174 | 1200x500 | low | rounded | 13.48 | 87.40 | 0.10 | 866 | | galena, goethite & Ca-carbonate inclusions; some Ag-poor zones (darker); vuggy |
| 145 | G357 | G11R | G174 | | | | 12.35 | 88.89 | 0.05 | 878 | 12 | |
| 146 | G357 | G12C | G174 | 500x150 | low | well rounded | 7.00 | 93.87 | 0.07 | 931 | | chalcopyrite inclusion |
| 147 | G357 | G12R | G174 | | | | 7.05 | 93.64 | 0.04 | 930 | -1 | |
| 148 | G357 | G13C | G174 | 450x200 | low | rounded | 0.36 | 99.81 | 0.16 | 996 | | |
| 149 | G357 | G13R | G174 | | | | 0.34 | 100.12 | 0.19 | 997 | 1 | |
| 150 | G357 | G14C | G174 | 400x200 | low | subrounded | 10.21 | 90.05 | 0.10 | 898 | | minor Ag-poor zones on rim (darker) |
| 151 | G357 | G14C A | G174 | | | | 10.41 | 90.43 | 0.05 | 897 | | |
| 152 | G357 | G14R | G174 | | | | 1.12 | 99.92 | 0.00 | 989 | 92 | |
| 153 | G357 | G15C | G174 | 300x200 | med | subangular | 7.16 | 93.91 | 0.16 | 929 | | Ti-oxide - lots intergrown; extensive Ag-poor zones (darker); vuggy-brain rock |
| 154 | G357 | G15R | G174 | | | | 0.31 | 101.72 | 0.08 | 997 | 68 | |

| No. | Mount | Grain | Field # | Size (µm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 155 | G357 | G16C | G174 | 700x300 | low | subrounded | 0.55 | 100.48 | 0.16 | 995 | | vuggy |
| 156 | G357 | G16R | G174 | | | | 0.14 | 98.23 | 0.00 | 999 | 4 | |
| 157 | G357 | G17C | G174 | 900x500 | med | subrounded | 6.72 | 93.44 | 0.00 | 933 | | chalcopyrite & quartz inclusions; very vuggy |
| 158 | G357 | G17R | G174 | | | | 6.87 | 93.34 | 0.31 | 931 | -2 | |
| 159 | G357 | G18C | G174 | 200x150 | med | rounded | 3.82 | 97.64 | 0.14 | 962 | | |
| 160 | G357 | G18R | G174 | | | | 4.04 | 96.59 | 0.15 | 960 | -2 | |
| 161 | G357 | G19C | G174 | 550x300 | low | subrounded | 2.51 | 97.87 | 0.24 | 975 | | |
| 162 | G357 | G19R | G174 | | | | 0.32 | 99.96 | 0.10 | 997 | 22 | |
| 163 | G357 | G20C | G174 | 300x150 | low | rounded | 8.60 | 92.66 | 0.33 | 915 | | Ag-poor zones on rim areas (darker); vuggy |
| 164 | G357 | G20R | G174 | | | | 5.53 | 95.55 | 0.34 | 945 | 30 | |
| 165 | G357 | G21C | G174 | 400x250 | low | rounded | 4.80 | 89.05 | 0.12 | 949 | | vuggy |
| 166 | G357 | G21R | G174 | | | | 5.28 | 95.80 | 0.01 | 948 | -1 | |
| 167 | G357 | G22C | G174 | 1500x300 | very low | subrounded | 2.03 | 99.34 | 0.10 | 980 | | |
| 168 | G357 | G22R | G174 | | | | 2.04 | 99.28 | 0.14 | 980 | 0 | |

**Mean = 946**

**Range= 857 to 999**

**Rim to core = +92 to -43 (av. = +12.4)**

**ORIGINAL CLASSIF.: Medium Colour; Minor Travel Damage; 80% Crystal.**

| No. | Mount | Grain | Field # | Size (µm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 169 | G358 | G1C | G190A | 600x400 | low | subrounded | 5.80 | 96.37 | 0.00 | 943 | | vuggy-brain rockl |
| 170 | G358 | G1R | G190A | | | | 6.05 | 97.87 | 0.09 | 942 | -1 | |
| 171 | G358 | G2C | G190A | 500x400 | med | subangular | 2.08 | 100.24 | 0.17 | 980 | | vuggy-brain rockl |
| 172 | G358 | G2R | G190A | | | | 2.15 | 99.33 | 0.02 | 979 | -1 | |
| 173 | G358 | G3C | G190A | 1000x300 | very low | subrounded | 4.42 | 97.88 | 0.18 | 957 | | |
| 174 | G358 | G3R | G190A | | | | 6.06 | 95.30 | 0.17 | 940 | -17 | |
| 175 | G358 | G4C | G190A | 500x400 | med | angular | 3.56 | 98.12 | 0.14 | 965 | | Pt inclusion; minor vugs |
| 176 | G358 | G4R | G190A | | | | 3.47 | 98.67 | 0.01 | 966 | 1 | |
| 177 | G358 | G5C | G190A | 600x450 | low | angular | 3.01 | 98.44 | 0.10 | 970 | | vuggy |
| 178 | G358 | G5R | G190A | | | | 2.98 | 98.61 | 0.09 | 971 | 1 | |
| 179 | G358 | G6C | G190A | 550x350 | low | subrounded | 3.11 | 98.91 | 0.00 | 969 | | minor vugs |
| 180 | G358 | G6R | G190A | | | | 3.19 | 99.10 | 0.00 | 969 | 0 | |
| 181 | G358 | G7C | G190A | 700 | high | angular | 3.02 | 99.18 | 0.00 | 970 | | Pt inclusion; vuggy-brain rockl |
| 182 | G358 | G7R | G190A | | | | 3.02 | 98.84 | 0.00 | 970 | 0 | |
| 183 | G358 | G8C | G190A | 600x400 | low | angular | 1.42 | 100.81 | 0.02 | 986 | | vuggy |
| 184 | G358 | G8R | G190A | | | | 1.37 | 99.81 | 0.00 | 986 | 0 | |
| 185 | G358 | G9C | G190A | 600x300 | low | subangular | 2.16 | 100.46 | 0.14 | 979 | | |
| 186 | G358 | G9R | G190A | | | | 2.21 | 100.60 | 0.06 | 979 | 0 | |
| 187 | G358 | G10C | G190A | 850x300 | low | angular | 9.50 | 93.10 | 0.16 | 907 | | |
| 188 | G358 | G10R | G190A | | | | 10.37 | 91.81 | 0.41 | 898 | -9 | |
| 189 | G358 | G11C | G190A | 1000x200 | very low | subangular | 8.85 | 92.83 | 0.29 | 913 | | |
| 190 | G358 | G11R | G190A | | | | 9.38 | 92.45 | 0.32 | 908 | -5 | |
| 191 | G358 | G12C | G190A | 800x300 | low | angular | 2.14 | 100.98 | 0.02 | 979 | | vuggy |
| 192 | G358 | G12R | G190A | | | | 2.10 | 100.58 | 0.00 | 980 | 1 | |
| 193 | G358 | G13C | G190A | 600x200 | low | angular | 2.18 | 99.65 | 0.00 | 979 | | quartz inclusion; vuggy |

| No. | Mount | Grain | Field # | Size (μm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 194 | G358 | G14C | G190A | 600x400 | med | angular | 2.89 | 99.70 | 0.00 | 972 | | vuggy |
| 195 | G358 | G14R | G190A | | | | 2.78 | 98.35 | 0.04 | 972 | 0 | |
| 196 | G358 | G15C | G190A | 550 | high | angular | 4.48 | 97.68 | 0.16 | 956 | | vuggy-brain rockl |
| 197 | G358 | G15R | G190A | | | | 4.58 | 97.46 | 0.00 | 955 | -1 | |
| 198 | G358 | G16C | G190A | 450x350 | med | angular | 4.50 | 96.70 | 0.30 | 956 | | Fe-Mn-Mg-rich carbonate inclusion; vuggy |
| 199 | G358 | G16R | G190A | | | | 4.76 | 96.94 | 0.00 | 953 | -3 | |
| 200 | G358 | G17C | G190A | 650 | high | angular | 7.81 | 94.36 | 0.38 | 924 | | vuggy |
| 201 | G358 | G17R | G190A | | | | 11.37 | 90.68 | 0.46 | 889 | -35 | |
| 202 | G358 | G18C | G190A | 400x300 | med | subangular | 3.75 | 98.56 | 0.23 | 963 | | vuggy-brain rockl |
| 203 | G358 | G18R | G190A | | | | 3.76 | 97.56 | 0.09 | 963 | 0 | |
| 204 | G358 | G19C | G190A | 800x400 | low | subangular | 4.95 | 96.50 | 0.07 | 951 | | vuggy |
| 205 | G358 | G19R | G190A | | | | 15.26 | 86.19 | 0.25 | 850 | -101 | |
| 206 | G358 | G20C | G190A | 750x350 | low | rounded | 2.09 | 100.59 | 0.18 | 980 | | minor vugs |
| 207 | G358 | G20R | G190A | | | | 2.21 | 99.11 | 0.00 | 978 | -2 | |
| 208 | G358 | G21C | G190A | 1000x300 | very low | subangular | 4.42 | 97.78 | 0.21 | 957 | | vuggy-brain rockl |
| 209 | G358 | G21R | G190A | | | | 4.81 | 96.74 | 0.00 | 953 | -4 | |
| 210 | G358 | G22C | G190A | 700x350 | low | rounded | 2.89 | 99.28 | 0.02 | 972 | | vuggy-brain rockl |
| 211 | G358 | G22R | G190A | | | | 3.03 | 98.71 | 0.10 | 970 | -2 | |
| 212 | G358 | G23C | G190A | 800x500 | low | subrounded | 2.32 | 100.23 | 0.12 | 977 | | vuggy |
| 213 | G358 | G23R | G190A | | | | 2.27 | 99.97 | 0.02 | 978 | 1 | |
| 214 | G358 | G24C | G190A | 850x600 | med | subangular | 2.22 | 99.72 | 0.04 | 978 | | very vuggy-brain rockl |
| 215 | G358 | G24R | G190A | | | | 2.13 | 99.25 | 0.00 | 979 | 1 | |
| 216 | G358 | G25C | G190A | 600x350 | low | angular | 6.45 | 95.67 | 0.00 | 937 | | vuggy-brain rockl |
| 217 | G358 | G25R | G190A | | | | 6.85 | 95.44 | 0.08 | 933 | 4 | |
| | | | | | | | | | Mean = | 957 | | |
| | | | | | | | | | Range= 850 to 986 | | | |
| | | | | | | | | | Rim to core = +4 to -101 (av. = -7.2) | | | |
| | | | | | | | | | | | | **ORIGINAL CLASSIF.: Medium Colour; Moderate Travel Damage; 50% Crystal.** |
| 218 | G359 | G1C | G190A | 900x800 | med | subrounded | 9.65 | 90.70 | 0.30 | 904 | | vuggy |
| 219 | G359 | G1R | G190A | | | | 10.17 | 90.59 | 0.27 | 899 | -5 | |
| 220 | G359 | G2C | G190A | 700x200 | low | rounded | 9.37 | 91.54 | 0.12 | 907 | | quartz inclusion; Ag-poor zones around vugs and rim (darker) |
| 221 | G359 | G2R | G190A | | | | 1.17 | 100.45 | 0.00 | 988 | 81 | |
| 222 | G359 | G3C | G190A | 450x400 | med | subangular | 10.36 | 90.30 | 0.08 | 897 | | minor vugs |
| 223 | G359 | G3R | G190A | | | | 10.28 | 88.70 | 0.00 | 896 | -1 | |
| 224 | G359 | G4C | G190A | 550x500 | med | subrounded | 3.25 | 98.35 | 0.04 | 968 | | minor vugs |
| 225 | G359 | G4R | G190A | | | | 3.30 | 99.01 | 0.00 | 968 | 0 | |
| 226 | G359 | G5C | G190A | 250x150 | low | subrounded | 0.33 | 98.10 | 0.00 | 997 | | goethite with hematite after pyrite with Au inclusions on margins |
| 227 | G359 | G5R | G190A | | | | 0.03 | 101.82 | 0.09 | 999 | 2 | |
| 228 | G359 | G6C | G190A | 550x400 | low | subangular | 2.07 | 99.65 | 0.13 | 980 | | vuggy |
| 229 | G359 | G6R | G190A | | | | 2.09 | 97.69 | 0.00 | 979 | -1 | |
| 230 | G359 | G7C | G190A | 700x250 | low | subangular | 2.14 | 99.61 | 0.05 | 979 | | vuggy |
| 231 | G359 | G7R | G190A | | | | 2.00 | 99.65 | 0.20 | 980 | 1 | |
| 232 | G359 | G8C | G190A | 600x300 | low | subangular | 1.58 | 100.48 | 0.00 | 984 | | vuggy |

| No. | Mount | Grain | Field # | Size (µm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 233 | G359 | G8R | G190A | | | | 1.59 | 100.20 | 0.00 | 984 | 0 | |
| 234 | G359 | G9C | G190A | 1000x400 | low | subrounded | 3.09 | 98.07 | 0.08 | 969 | | vuggy |
| 235 | G359 | G9R | G190A | | | | 2.73 | 98.37 | 0.31 | 973 | 4 | |
| 236 | G359 | G10C | G190A | 900x300 | low | subrounded | 1.39 | 99.40 | 0.07 | 986 | | quartz inclusion; vuggy |
| 237 | G359 | G10R | G190A | | | | 1.62 | 98.97 | 0.13 | 984 | -2 | |
| 238 | G359 | G11C | G190A | 350x200 | low | subrounded | 2.11 | 98.48 | 0.03 | 979 | | vuggy |
| 239 | G359 | G11R | G190A | | | | 2.20 | 98.77 | 0.03 | 978 | -1 | |
| 240 | G359 | G12C | G190A | 600x300 | low | subangular | 14.83 | 85.92 | 0.04 | 853 | | |
| 241 | G359 | G12R | G190A | | | | 14.50 | 87.44 | 0.00 | 858 | 5 | |
| 242 | G359 | G13C | G190A | 750x250 | low | subangular | 3.30 | 98.57 | 0.06 | 968 | | vuggy |
| 243 | G359 | G13R | G190A | | | | 3.40 | 97.76 | 0.08 | 966 | -2 | |
| 244 | G359 | G14C | G190A | 700x400 | low | angular | 1.74 | 99.76 | 0.07 | 983 | | vuggy |
| 245 | G359 | G14R | G190A | | | | 1.63 | 100.80 | 0.00 | 984 | 1 | |
| 246 | G359 | G15C | G190A | 900x250 | very low | subangular | 10.23 | 91.28 | 0.00 | 899 | | quartz inclusion; Ag-poor zones on rim (darker); vuggy |
| 247 | G359 | G15R | G190A | | | | 12.12 | 89.78 | 0.21 | 881 | -18 | |
| 248 | G359 | G16C | G190A | 500x400 | med | subangular | 10.53 | 90.93 | 0.19 | 896 | | Ag-poor zones on rim (darker); minor vugs |
| 249 | G359 | G16R | G190A | | | | 10.63 | 90.47 | 0.04 | 895 | -1 | |
| 250 | G359 | G17C | G190A | 700x400 | low | subrounded | 6.89 | 94.20 | 0.18 | 932 | | vuggy |
| 251 | G359 | G17R | G190A | | | | 6.81 | 94.57 | 0.03 | 933 | 1 | |
| 252 | G359 | G18C | G190A | 600x300 | low | subrounded | 2.93 | 98.23 | 0.08 | 971 | | very vuggy |
| 253 | G359 | G18R | G190A | | | | 2.72 | 99.25 | 0.11 | 973 | 2 | |
| 254 | G359 | G19C | G190A | 600x450 | med | subrounded | 7.83 | 92.95 | 0.17 | 922 | | vuggy |
| 255 | G359 | G19R | G190A | | | | 8.29 | 93.53 | 0.09 | 919 | -3 | |
| 256 | G359 | G20C | G190A | 700x250 | low | rounded | 3.28 | 98.09 | 0.00 | 968 | | minor vugs |
| 257 | G359 | G20R | G190A | | | | 3.09 | 98.24 | 0.01 | 969 | 1 | |
| 258 | G359 | G21C | G190A | 700x250 | low | subrounded | 5.42 | 95.73 | 0.02 | 946 | | vuggy-brain rockl |
| 259 | G359 | G21R | G190A | | | | 5.55 | 96.08 | 0.00 | 945 | -1 | |
| 260 | G359 | G22C | G190A | 900x400 | low | rounded | 7.35 | 94.81 | 0.00 | 928 | | vuggy |
| 261 | G359 | G22R | G190A | | | | 0.16 | 100.97 | 0.00 | 998 | 70 | |
| 262 | G359 | G23C | G190A | 1200x350 | low | rounded | 3.05 | 97.82 | 0.27 | 970 | | quartz inclusion; vuggy |
| 263 | G359 | G23R | G190A | | | | 3.01 | 97.38 | 0.02 | 970 | 0 | |
| 264 | G359 | G24C | G190A | 700x200 | low | subrounded | 10.61 | 90.72 | 0.15 | 895 | | vuggy |
| 265 | G359 | G24R | G190A | | | | 18.30 | 82.86 | 0.09 | 819 | -74 | |
| 266 | G359 | G25C | G190A | 700x300 | low | subrounded | 10.63 | 90.93 | 0.40 | 895 | | |
| 267 | G359 | G25R | G190A | | | | 12.17 | 88.71 | 0.56 | 879 | -16 | |

**Mean = 944**
**Range= 819 to 999**
**Rim to core = +81 to -74 (av. = +1.7)**

**ORIGINAL CLASSIF.: Med-rich Colour; Moderate Travel Damage; Nil Crystal**

| No. | Mount | Grain | Field # | Size (µm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 268 | G360 | G1C | G190A | 1000x500 | low | subrounded | 6.54 | 96.23 | 0.19 | 936 | | |
| 269 | G360 | G1R | G190A | | | | 6.50 | 96.18 | 0.05 | 937 | 1 | |
| 270 | G360 | G2C | G190A | 800x300 | low | rounded | 9.32 | 91.69 | 0.33 | 908 | | Ag-poor rims (darker); minor vugs |
| 271 | G360 | G2R | G190A | | | | 0.56 | 102.44 | 0.05 | 995 | 87 | |

| No. | Mount | Grain | Field # | Size (µm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 272 | G360 | G3C | G190A | 300 | high | rounded | 2.72 | 98.79 | 0.27 | 973 | | |
| 273 | G360 | G4C | G190A | 450x300 | med | rounded | 5.66 | 95.58 | 0.11 | 944 | | |
| 274 | G360 | G5C | G190A | 1000x550 | low | rounded | 12.94 | 89.28 | 0.00 | 873 | | quartz & Ti-oxide inclusions; minor Ag-poor rims (darker); vuggy |
| 275 | G360 | G5R | G190A | | | | 12.82 | 89.07 | 0.30 | 874 | 1 | |
| 276 | G360 | G6C | G190A | 550x600 | high | rounded | 1.36 | 100.51 | 0.20 | 987 | | vuggy |
| 277 | G360 | G6R | G190A | | | | 1.17 | 99.40 | 0.14 | 988 | 1 | |
| 278 | G360 | G7C | G190A | 400x300 | low | subangular | 2.69 | 100.01 | 0.12 | 974 | | vuggy |
| 279 | G360 | G7R | G190A | | | | 2.72 | 95.95 | 0.19 | 972 | -2 | |
| 280 | G360 | G8C | G190A | 400x300 | med | well rounded | 3.85 | 98.41 | 0.34 | 962 | | Ag-poor zone around central vug (darker) |
| 281 | G360 | G8R | G190A | | | | 4.04 | 98.06 | 0.37 | 960 | -2 | |
| 282 | G360 | G9C | G190A | 350 | high | rounded | 8.53 | 93.76 | 0.00 | 917 | | goethite |
| 283 | G360 | G9R | G190A | | | | 8.60 | 93.18 | 0.06 | 916 | -1 | |
| 284 | G360 | G10C | G190A | 500x250 | low | subangular | 8.44 | 93.59 | 0.22 | 917 | | quartz inclusion (+ Al-oxide - polish?); minor vugs |
| 285 | G360 | G10R | G190A | | | | 8.39 | 93.82 | 0.00 | 918 | 1 | |
| 286 | G360 | G11C | G190A | 700x550 | med | rounded | 2.62 | 99.94 | 0.00 | 974 | | |
| 287 | G360 | G11R | G190A | | | | 2.79 | 99.54 | 0.21 | 973 | -1 | |
| 288 | G360 | G12C | G190A | 600x350 | low | rounded | 3.19 | 99.30 | 0.00 | 969 | | vuggy |
| 289 | G360 | G12R | G190A | | | | 2.65 | 99.60 | 0.08 | 974 | 5 | |
| 290 | G360 | G13C | G190A | 500x400 | med | subrounded | 2.23 | 99.63 | 0.00 | 978 | | vuggy |
| 291 | G360 | G13R | G190A | | | | 1.86 | 99.45 | 0.00 | 982 | 4 | |
| 292 | G360 | G14C | G190A | 550x400 | med | subangular | 8.53 | 94.16 | 0.00 | 917 | | |
| 293 | G360 | G14R | G190A | | | | 8.60 | 92.24 | 0.18 | 915 | -2 | |
| 294 | G360 | G15C | G190A | 900x400 | low | rounded | 5.93 | 96.58 | 0.18 | 942 | | Ti-oxide inclusion; vuggy |
| 295 | G360 | G15R | G190A | | | | 5.39 | 95.99 | 0.11 | 947 | 5 | |
| 296 | G360 | G16C | G190A | 500x300 | med | well rounded | 4.84 | 97.59 | 0.07 | 953 | | quartz inclusions; Ag-poor rims (darker) |
| 297 | G360 | G16R | G190A | | | | 0.17 | 102.34 | 0.02 | 998 | 45 | |
| 298 | G360 | G17C | G190A | 600x450 | med | well rounded | 9.88 | 92.71 | 0.00 | 904 | | minor Ag-poor rims (darker) |
| 299 | G360 | G17R | G190A | | | | 3.56 | 99.14 | 0.14 | 965 | 61 | |
| 300 | G360 | G18C | G190A | 1500x350 | very low | subangular | 8.15 | 93.94 | 0.08 | 920 | | Ag-poor rims (darker); minor vugs |
| 301 | G360 | G18R | G190A | | | | 0.20 | 102.86 | 0.14 | 998 | 78 | |
| 302 | G360 | G19C | G190A | 450x350 | med | well rounded | 17.00 | 85.47 | 0.11 | 834 | | Ag-poor rims in areas (darker) |
| 303 | G360 | G19R | G190A | | | | 17.46 | 84.86 | 0.04 | 829 | -5 | |
| 304 | G360 | G20C | G190A | 850x300 | low | rounded | 2.21 | 99.13 | 0.18 | 978 | | minor vugs |
| 305 | G360 | G20R | G190A | | | | 2.36 | 100.97 | 0.21 | 977 | -1 | |
| 306 | G360 | G21C | G190A | 650 | high | subrounded | 2.74 | 99.47 | 0.31 | 973 | | |
| 307 | G360 | G21R | G190A | | | | 0.37 | 102.33 | 0.00 | 996 | 23 | |
| 308 | G360 | G22C | G190A | 700x400 | low | subangular | 2.15 | 99.43 | 0.03 | 979 | | minor vugs |
| 309 | G360 | G22R | G190A | | | | 1.35 | 100.77 | 0.08 | 987 | 8 | |
| 310 | G360 | G23C | G190A | 750x350 | low | subrounded | 1.55 | 100.67 | 0.29 | 985 | | minor vugs |
| 311 | G360 | G23R | G190A | | | | 1.67 | 100.80 | 0.47 | 984 | -1 | |
| 312 | G360 | G24C | G190A | 500x400 | med | rounded | 4.05 | 97.43 | 0.03 | 960 | | |
| 313 | G360 | G24R | G190A | | | | 4.27 | 97.64 | 0.35 | 958 | -2 | |
| 314 | G360 | G25C | G190A | 600x550 | med | well rounded | 4.36 | 99.86 | 0.01 | 958 | | minor vugs |
| 315 | G360 | G25R | G190A | | | | 4.30 | 97.67 | 0.10 | 958 | 0 | |

| No. | Mount | Grain | Field # | Size (µm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Mean = 950**
**Range= 829 to 998**
**Rim to core = +87 to -5 (av. = +13.3)**

**ORIGINAL CLASSIF.: Medium Colour; Minor-Major Travel Damage**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 316 | G361 | G1C | G312 | 200x50 | low | angular | 6.44 | 95.06 | 0.39 | 937 | | |
| 317 | G361 | G1R | G312 | | | | 6.50 | 94.70 | 0.34 | 936 | -1 | |
| 318 | G361 | G2C | G312 | 450 | high | subrounded | 4.52 | 95.05 | 0.39 | 955 | | quartz inclusions; Ag-poor rims (darker) |
| 319 | G361 | G2R | G312 | | | | 0.69 | 100.74 | 0.01 | 993 | 38 | |
| 320 | G361 | G3C | G312 | 250x200 | med | angular | 2.68 | 99.21 | 0.00 | 974 | | Ca-Mn-Fe-rich carbonate (+Al-oxide - polish?) |
| 321 | G361 | G3R | G312 | | | | 2.69 | 99.53 | 0.00 | 974 | 0 | |
| 322 | G361 | G4C | G314 | 500x300 | low | angular | 1.30 | 99.70 | 0.06 | 987 | | |
| 323 | G361 | G4R | G314 | | | | 0.24 | 101.68 | 0.26 | 998 | 11 | |
| 324 | G361 | G5C | G316 | 300x100 | low | subangular | 3.96 | 97.39 | 0.20 | 961 | | Si-Al-Fe±K-rich inclusions; Ca-carbonate inclusion; vuggy |
| 325 | G361 | G5C2 | G316 | | | | 3.93 | 95.64 | 0.31 | 961 | | |
| 326 | G361 | G6C | G316 | 100 | high | subangular | 4.58 | 97.30 | 0.25 | 955 | | goethite ± Ag inclusions on fractures; vuggy |
| 327 | G361 | G6R | G316 | | | | 5.28 | 95.72 | 0.37 | 948 | -7 | |
| 328 | G361 | G7C | G316 | 150 | high | subangular | 14.72 | 85.93 | 0.27 | 854 | | vuggy |
| 329 | G361 | G7C2 | G316 | | | | 15.01 | 86.10 | 0.22 | 852 | | |
| 330 | G361 | G8C | G318 | 250x100 | low | subrounded | 4.66 | 96.53 | 0.08 | 954 | | goethite after Fe-Si-Al-K-rich inclusion; vuggy |
| 331 | G361 | G8C2 | G318 | | | | 4.80 | 95.88 | 0.08 | 952 | | |
| 332 | G361 | G9C | G318 | 550x300 | low | angular | 9.72 | 90.51 | 0.17 | 903 | | Si-Al-rich inclusion (± minor Ag); very vuggy |
| 333 | G361 | G9R | G318 | | | | 9.51 | 91.46 | 0.42 | 906 | 3 | |
| 334 | G361 | G10C | G318 | 200x100 | med | subrounded | 7.31 | 94.02 | 0.07 | 928 | | |
| 335 | G361 | G10R | G318 | | | | 7.35 | 94.15 | 0.21 | 928 | 0 | |
| 336 | G361 | G11C | G318 | 200x250 | med | angular | 7.49 | 93.88 | 0.20 | 926 | | quartz inclusion; vuggy |
| 337 | G361 | G11C2 | G318 | | | | 7.15 | 93.48 | 0.10 | 929 | | |
| 338 | G361 | G12C | G318 | 200 | high | subrounded | 9.65 | 90.60 | 0.35 | 904 | | goethite inclusion; vuggy |
| 339 | G361 | G12C2 | G318 | | | | 9.56 | 91.14 | 0.18 | 905 | | |

**Mean = 938**
**Range= 852 to 998**
**Rim to core = +38 to -7 (av. = +6.3)**

**ORIGINAL CLASSIF.: Gold Intergrown Other Minerals**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 340 | G362 | G1C | G190B | 2600x2000 | med | rounded | 27.39 | 73.37 | 0.02 | 728 | | rim of goethite (± Si, Al, P) corroding margins and intergrown with Ag-poor gold (darker) |
| 341 | G362 | G1R | G190B | | | | 27.10 | 73.67 | 0.12 | 731 | 3 | |
| 342 | G362 | G2C | G190B | 2000 | high | subrounded | 3.67 | 97.36 | 0.14 | 964 | | talc/tremolite matrix; quartz & goethite (± Si, Al, P) inclusions; spongy-brain rock!; 50% Au |
| 343 | G362 | G2R | G190B | | | | 3.63 | 97.20 | 0.00 | 964 | 0 | |
| 344 | G362 | G2RR | G190B | | | | 3.76 | 98.12 | 0.00 | 963 | | |
| 345 | G362 | G3C | G190B | 3000x2200 | low | subrounded | 3.23 | 98.74 | 0.25 | 968 | | solid goethite phase & spongy goethite (± Si, Al, P) after pyrrhotite; 5% Au |
| 346 | G362 | G3R | G190B | | | | 2.83 | 93.93 | 0.18 | 971 | 3 | |
| 347 | G362 | G4R | G190B | 3000x800 | low | rounded | 3.20 | 97.37 | 0.12 | 968 | | solid goethite phase & spongy goethite (± Si, Al, P) after pyrrhotite; 5% Au |
| 348 | G362 | G4C | G190B | | | | 3.19 | 97.57 | 0.07 | 968 | 0 | |
| 349 | G362 | G5C | G190B | 3400x1800 | med | rounded | 2.84 | 98.17 | 0.06 | 972 | | 30% Au in goethite fractures; minor quartz inclusions |

| No. | Mount | Grain | Field # | Size (µm) | Sphericity | Angularity | Ag | Au | Hg | Fineness | R-C | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 350 | G362 | G5R | G190B | | | | 2.89 | 98.17 | 0.00 | 971 | -1 | |
| 351 | G362 | G6C | G190B | 1600x1000 | low | subrounded | 2.49 | 96.98 | 0.01 | 975 | | 35% Au in goethite fractures; minor quartz inclusions |
| 352 | G362 | G6R | G190B | | | | 2.47 | 95.42 | 0.10 | 975 | 0 | |
| 353 | G362 | G7R | G190A | 650 | high | angular | 1.53 | 97.21 | 0.00 | 984 | | talc/tremolite inclusions; vuggy |
| 354 | G362 | G8C | G190A | 700x300 | low | angular | 2.18 | 98.11 | 0.06 | 978 | | talc/tremolite inclusions |
| 355 | G362 | G8R | G190A | | | | 2.30 | 99.32 | 0.00 | 977 | -1 | |
| 356 | G362 | G9C | G190A | 450x300 | med | subrounded | 1.39 | 99.31 | 0.00 | 986 | | goethite (±Al-oxide - polish?); vuggy |
| 357 | G362 | G9R | G190A | | | | 1.48 | 98.15 | 0.00 | 985 | -1 | |
| 358 | G362 | G10C | G190B | 2000x1500 | med | rounded | 3.25 | 97.29 | 0.02 | 968 | | spongy goethite after pyrrhotite (±Al-oxide - polish?); 10% Au |
| 359 | G362 | G10R | G190B | | | | 3.16 | 96.98 | 0.25 | 968 | 0 | |
| | | | | | | | | | Mean = | 948 | | |
| | | | | | | | | | Range= 726 to 986 | | | |
| | | | | | | | | | Rim to core = +3 to -1 (av. = +0.33) | | | |
| | | | | | | | | | | | | ORIGINAL CLASSIF.: Etched Surfaces |
| 360 | G363 | G1C | G334 | 1400x800 | low | rounded | 2.48 | 98.12 | 0.24 | 975 | | vuggy |
| 361 | G363 | G1R | G334 | | | | 2.11 | 97.52 | 0.39 | 979 | 4 | |
| 362 | G363 | G2C | G334 | 650x450 | low | angular | 9.50 | 91.55 | 0.39 | 906 | | Ag-poor rims to vugs |
| 363 | G363 | G2R | G334 | | | | 9.17 | 92.38 | 0.08 | 910 | 4 | |
| 364 | G363 | G3C | G334 | 1000x900 | med | angular | 2.46 | 97.83 | 0.48 | 975 | | vuggy |
| 365 | G363 | G3R | G334 | | | | 2.24 | 97.65 | 0.75 | 978 | 3 | |
| 366 | G363 | G4C | G340 | 400x250 | low | rounded | 10.24 | 90.68 | 0.36 | 899 | | |
| 367 | G363 | G4R | G340 | | | | 10.77 | 89.89 | 0.43 | 893 | -6 | |
| 368 | G363 | G5C | G346 | 900x500 | low | angular | 5.48 | 95.93 | 0.31 | 946 | | quartz inclusions in cracks; Ag-poor rims; vuggy |
| 369 | G363 | G5R | G346 | | | | 0.79 | 100.60 | 0.00 | 992 | 46 | |
| 370 | G363 | G6C | G348 | 500x300 | low | very angular | 4.37 | 96.39 | 0.22 | 957 | | quartz inclusions in cracks; vuggy |
| 371 | G363 | G6R | G348 | | | | 0.36 | 97.26 | 0.00 | 996 | 39 | |
| 372 | G363 | G7 | G348 | 900x600 | med | subangular | 1.06 | 99.92 | 0.00 | 990 | | Ag-poor zone (darker) in core |
| 373 | G363 | G7C | G348 | | | | 7.72 | 94.40 | 0.27 | 924 | | |
| 374 | G363 | G7R | G348 | | | | 8.35 | 91.67 | 0.10 | 917 | -7 | |
| 375 | G363 | G8C | G348 | 900x500 | med | angular | 9.60 | 92.11 | 0.22 | 906 | | Ag-poor rim regions (darker) |
| 376 | G363 | G8R | G348 | | | | 9.36 | 90.90 | 0.19 | 907 | 1 | |
| 377 | G363 | G9C | G348 | 1000x300 | low | angular | 6.21 | 95.09 | 0.24 | 939 | | Ag-poor rim region on single side (darker) |
| 378 | G363 | G9R | G348 | | | | 6.37 | 94.57 | 0.00 | 937 | 2 | |
| 379 | G363 | G10C | G348 | 700x450 | med | very angular | 1.00 | 99.86 | 0.12 | 990 | | spongy texture; vuggy |
| 380 | G363 | G10R | G348 | | | | 0.49 | 101.09 | 0.00 | 995 | 5 | |
| | | | | | | | | | Mean = | 948 | | |
| | | | | | | | | | Range= 893 to 996 | | | |
| | | | | | | | | | Rim to core = +46 to -7 (av. = +9.1) | | | |



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Appendix 3 of Turner, N.J. 1997. Exploration Licence No 43/94, Corinna, Tasmania. Annual Report 4/1/97. Goldstream Mining NL and Titan Resources NL. Volume 2 of 3 of the annual report.



# MICROSCOPIC EXAMINATION OF GOLD PARTICLES IN PANNED CONCENTRATE SAMPLES

by

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March 1996



This appendix was assembled by N. J. Turner Geological Services Pty Ltd from material provided by H. D. Nolan. August 1997.

# *CONTENTS*

## 1.0 Introduction

This examination of panned concentrate field samples was undertaken for the purpose of identifying and describing the physical properties of alluvial gold particles. Examination was undertaken using an Olympus 10-40x zoom stereo microscope.

The aim of the examination has been to identify those gold particles having physical characteristics consistent with local primary derivation. Low levels of travel damage, often combined with distinct or complete crystallinity, are thought to generally reflect short transportation and thus, to mostly indicate fairly local derivation of the gold. Colour of the surface of the grains correlates with travel damage with rich colours generally corresponding to major travel damage and pale colours to lower levels of travel damage.

Tertiary gravels, often mildly auriferous, cover a significant proportion of the exploration tenement. Apart from gold, these gravels host an extensive suite of generally well rounded mineral grains. The most common minerals are spinel, chromite, ilmenite, corundum, rutile, cassiterite, zircon, garnet, topaz and tourmaline. The component of this Tertiary gravel heavy mineral suite (TGHMS) is commented upon by sample.

Representative gold grains were separated from the panned concentrates and mounted on double sided tape. Photographs of a subset of the mounted grains are presented in section 3 of this appendix.

The tape-mounted grains were transferred directly to epoxy resin mounts for polished thin section description and electron microprobe work by Paul Kitto, University of Tasmania (see Appendix 4). Probe mount numbers and corresponding field sample numbers are listed in section 4 of this appendix.

See Appendix 1 of Turner (1997) for the AMG co-ordinates of the sites at which the panned concentrate samples were collected.

## 2.0 Sample descriptions

Sample descriptions take the following format;

Brief description of dominant and any anomalous mineralisation in the panned concentrate.

Total number of gold grains observed.

A dissection of the total grain count according to physical characteristics.

The following scales are used in this report for describing the physical characteristics of gold grains.

| CRYSTALLINTY | TRAVEL DAMAGE | COLOUR |
|---|---|---|
| complete | nil | pale |
| distinct | minor | medium |
| remnant | moderate | rich |
| nil | major | |

| PANNED CONCENTRATE | GOLD GRAINS | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|
| **G102**<br>Predominantly hematite & iron pyrite. Minor TGHMS. | nil | | | |
| **G104**<br>Hematite, minor magnetite, epidote & mica. Minor TGHMS | nil | | | |
| **G106**<br>As per sample G104 | nil | | | |
| **G108**<br>Hematite, magnetite, epidote & mica. Minor TGHMS | nil | | | |
| **G110**<br>Magnetite & hematite dominant, epidote Moderate TGHMS | 1 | nil | major | medium |
| **G112**<br>Hematite, magnetite, epidote. Minor TGHMS | nil | | | |
| **G114**<br>Hematite, mica, magnetite, epidote. Minor TGHMS | nil | | | |
| **G116**<br>As per sample G114 | nil | | | |
| **G118**<br>As per sample G114 | nil | | | |
| **G120**<br>Hematite, mica, magnetite, epidote. Moderate TGHMS | 1 | nil | major | medium |
| **G122**<br>As per sample G120 | 2 | distinct | minor | medium |

| PANNED CONCENTRATE | GOLD GRAINS | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|
| **G122A**<br>Hematite, mica, magnetite, epidote, minor iron pyrite. Moderate TGHMS | nil | | | |
| **G124**<br>Hematite, mica, magnetite, epidote. Dominant TGHMS | nil | | | |
| **G126**<br>Hematite, magnetite, epidote. Very minor TGHMS | nil | | | |
| **G128**<br>As per sample G126 | nil | | | |
| **G130**<br>As per sample G126 | nil | | | |
| **G132**<br>Hematite, magnetite, epidote. Fine crystalline cassiterite. Minor fine chalcopyrite. Strong TGHMS | 1 | distinct | minor | medium |
| **G134**<br>Hematite, magnetite, epidote. Very minor fine chalcopyrite. Strong TGHMS | 1 | nil | moderate | medium |
| **G134A**<br>As per sample G134 | nil | | | |
| **G136**<br>Hematite, magnetite, epidote. Minor TGHMS | nil | | | |
| **G138**<br>Hematite, magnetite, epidote. High cassiterite. Strong TGHMS | 26 / 4<br>2<br>20 | distinct<br>remnant<br>nil | minor<br>moderate<br>moderate | medium<br>medium<br>medium |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G140** | | | | | |
| Hematite, magnetite, epidote, mica. Moderate TGHMS | nil | | | | |
| **G142** | | | | | |
| Hematite, magnetite, epidote. High fine rutile. Moderate TGHMS | 7 | 3 | distinct | minor | medium |
| | | 4 | nil | moderate | medium |
| **G144** | | | | | |
| As per sample G142 | 1 | | nil | major | medium |
| **G146** | | | | | |
| Hematite, magnetite, epidote. Strong TGHMS | 3 | | distinct | minor | medium |
| **G148** | | | | | |
| Hematite, magnetite, epidote. Abundant rutile. Moderate TGHMS | 6 | 2 | distinct | minor | medium |
| | | 3 | remnant | moderate | medium |
| | | 1 | nil | major | rich |
| **G150** | | | | | |
| Hematite, epidote. Very minor fine chalcopyrite. Negligible TGHMS | 1 | | distinct | minor | pale |
| **G152** | | | | | |
| Hematite, magnetite, epidote. High rutile. Moderate TGHMS | 3 | 1 | complete | nil | medium |
| | | 1 | distinct | minor | medium |
| | | 1 | remnant | moderate | medium |
| **G152A** | | | | | |
| Hematite, magnetite, epidote. Moderate TGHMS | 1 | | nil | major | medium |
| **G154** | | | | | |
| Hematite, magnetite, epidote. Very minor fine chalcopyrite. Moderate TGHMS | 9 | 1 | complete | nil | pale |
| | | 5 | distinct | minor | medium |
| | | 3 | remnant | moderate | medium |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G156** | | | | | |
| Hematite, magnetite, epidote. Minor TGHMS | 4 | | remnant | moderate | medium |
| **G158** | | | | | |
| Hematite, epidote. Iron pyrite. Minor chalcopyrite. Strong TGHMS | 6 | 1 | distinct | minor | medium |
| | | 2 | remnant | moderate | medium |
| | | 3 | nil | major | rich |
| **G160** | | | | | |
| Epidote, hematite. High fine cassiterite. Minor TGHMS | 4 | | nil | moderate | medium |
| **G162** | | | | | |
| Epidote, hematite, magnetite, minor mica-hematite composite. Minor TGHMS | 5 | 2 | remnant | minor | medium |
| | | 3 | nil | moderate | medium |
| **G164** | | | | | |
| Hematite, magnetite, minor epidote & mica -hematite composite. Minor TGHMS | 7 | 2 | distinct | minor | medium |
| | | 3 | remnant | moderate | medium |
| | | 2 | nil | moderate | medium |
| **G166** | | | | | |
| Hematite, magnetite, minor epidote. High crystalline rutile. Strong TGHMS | 8 | 2 | remnant | moderate | medium |
| | | 6 | nil | moderate | medium |
| **G168** | | | | | |
| Hematite, magnetite, minor epidote. High crystalline rutile. Moderate TGHMS | 12 | 8 | remnant | moderate | medium |
| | | 4 | nil | moderate | medium |
| **G170** | | | | | |
| Hematite, magnetite, minor epidote. Minor TGHMS | nil | | | | |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G172** | | | | | |
| Hematite, magnetite, | 44 | 15 | complete | nil | medium |
| minor epidote. High | | 11 | distinct | minor | medium |
| crystalline rutile. | | 10 | remnant | moderate | medium |
| Minor TGHMS | | 6 | nil | moderate | medium |
| | | 2 | nil | major | rich |
| **G174** | | | | | |
| Hematite, magnetite, | 60 | 12 | complete | nil | medium |
| minor epidote. High | | 15 | distinct | minor | medium |
| crystalline rutile. | | 14 | remnant | moderate | medium |
| Moderate TGHMS | | 16 | nil | moderate | medium |
| | | 3 | nil | major | rich |
| **G176** | | | | | |
| Hematite, magnetite. | 2 | 1 | remnant | moderate | medium |
| High iron pyrite & | | 1 | nil | major | rich |
| rutile. | | | | | |
| Moderate TGHMS | | | | | |
| **G176A** | | | | | |
| A well travelled | nil | | | | |
| pebble of hematite | | | | | |
| & iron pyrite. | | | | | |
| **G178** | | | | | |
| Minor mica & | 24 | 6 | remnant | moderate | medium |
| hematite. | | 18 | nil | moderate | medium |
| Dominant TGHMS | | | | | |
| **G180** | | | | | |
| Hematite, magnetite, | 3 | | remnant | moderate | medium |
| minor epidote. | | | | | |
| Minor TGHMS | | | | | |
| **G182** | | | | | |
| Negligible local | 4 | | nil | moderate | medium |
| mineral component. | | | | | |
| Dominant TGHMS | | | | | |
| **G184** | | | | | |
| Magnetite, hematite. | nil | | | | |
| Very minor TGHMS | | | | | |
| **G184A** | | | | | |
| Hematite, magnetite, | nil | | | | |
| minor epidote. | | | | | |
| Minor TGHMS | | | | | |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G186** | | | | | |
| Hematite, magnetite, minor epidote. Minor TGHMS | 3 | | distinct | minor | medium |
| **G188** | | | | | |
| Hematite, magnetite, minor epidote. High fine iron pyrite. Moderate TGHMS | 4 | 2 | remnant | moderate | medium |
| | | 2 | nil | major | medium |
| **G190** | | | | | |
| Magnetite, minor hematite & epidote. Strong TGHMS | 3 | | remnant | moderate | medium |

G190A, G190B, G190C, ARE FROM MATERIAL OBTAINED BY SUCTION DREDGING IN THE ROCKY RIVER.

**G190A**

A 93 gramme sample of relatively fine-grained heavy mineral concentrate containing small particles of gold. These particles were separated from the concentrate and examined by microscope. A total of 147 particles were recovered and these were divided into three groups.

46 particles - Having crystalline form to 80%+ of the particle surface. Travel damage minor to negligible. Colour medium.

70 particles - Having crystalline form to approximately 50% of the particle surface. Travel damage moderate. Colour medium.

31 particles - Having no crystalline form, however not substantially rounded, flattened or polished. Colour medium to rich.

| PANNED CONCENTRATE | GOLD GRAINS | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|

**G190B**

Seven particles of gold in ironstone ranging in size from 2mm to 8mm.

All display substantial rounding from travel damage on exposed ironstone and gold surfaces. Protected surfaces display crystalline gold.

Fracture of one particle confirms the ironstone as the host rock. The fractured faces display crystalline gold richly disseminated throughout the particle.

In each particle, with the exception of one, the gold is hosted in either limonite or geothite. In the exception, the gold is disseminated throughout mica rich limonite. The light grey coloured mica being an equal gold host to the limonite.

The less weathered particles respond readily to a magnet, which suggests a magnetite host.

**G190C**

A reasonably well rounded rock from the bed of the Rocky River.

Massive iron pyrite with sufficient disseminated magnetite for the sample to respond to a magnet. Minor mica & quartz.

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G192** | | | | | |
| Minor hematite, | 7 | 5 | distinct | minor | medium |
| magnetite, epidote. | | 2 | remnant | moderate | medium |
| Dominant TGHMS | | | | | |
| **G192A** | | | | | |
| Hematite, magnetite, | 24 | 6 | complete | nil | medium |
| minor epidote. | | 8 | distinct | minor | medium |
| Moderate TGHMS | | 6 | remnant | moderate | medium |
| | | 4 | nil | moderate | medium |
| **G194** | | | | | |
| Hematite, magnetite, | nil | | | | |
| epidote. | | | | | |
| Negligible TGHMS | | | | | |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G194A** | | | | | |
| Hematite, magnetite, epidote.<br>Negligible TGHMS | 1 | | remnant | moderate | medium |
| **G196** | | | | | |
| As per sample G194A | nil | | | | |
| **G198** | | | | | |
| As per sample G194A | nil | | | | |
| **G200** | | | | | |
| As per sample G194A | 1 | | remnant | moderate | medium |
| **G202** | | | | | |
| As per sample G194A | 1 | | remnant | moderate | medium |
| **G204** | | | | | |
| As per sample G194A | 2 | | nil | moderate | medium |
| **G206** | | | | | |
| Hematite, magnetite, moderate epidote.<br>Negligible TGHMS | 3 | 1<br>2 | complete<br>remnant | nil<br>moderate | pale<br>medium |
| **G208** | | | | | |
| Hematite, magnetite, minor epidote.<br>Negligible TGHMS | 1 | | remnant | moderate | medium |
| **G210** | | | | | |
| Hematite, magnetite, moderate epidote.<br>Negligible TGHMS | 6 | 2<br>4 | distinct<br>remnant | minor<br>moderate | medium<br>medium |
| **G212** | | | | | |
| Hematite, magnetite, minor epidote.<br>Negligible TGHMS | 1 | | remnant | moderate | medium |
| **G214** | | | | | |
| As per sample G212 | nil | | | | |
| **G216** | | | | | |
| As per sample G212 | nil | | | | |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G218** | | | | | |
| Hematite, magnetite, composite mica-hematite, minor epidote. Negligible TGHMS | 1 | | distinct | minor | medium |
| **G220** | | | | | |
| As per sample G218 | 2 | | nil | major | medium |
| **G222** | | | | | |
| As per sample G218 | 3 | | remnant | moderate | medium |
| **G224** | | | | | |
| Hematite, magnetite, Mica-hematite composite, epidote. Negligible TGHMS | 1 | | distinct | minor | medium |
| **G226** | | | | | |
| As per sample G224 | 3 | 2 | distinct | minor | medium |
| | | 1 | remnant | minor | medium |
| **G228** | | | | | |
| Hematite, magnetite, epidote. Negligible TGHMS | 1 | | distinct | minor | medium |
| **G230** | | | | | |
| Hematite, magnetite, | 11 | 2 | distinct | minor | medium |
| minor epidote. | | 7 | remnant | moderate | medium |
| Strong TGHMS | | 2 | nil | moderate | medium |
| **G232** | | | | | |
| Hematite, magnetite, | 16 | 4 | distinct | minor | medium |
| epidote. | | 11 | remnant | moderate | medium |
| Moderate TGHMS | | 1 | nil | major | medium |
| **G234** | | | | | |
| Hematite, high epidote, minor magnetite. Minor TGHMS | 3 | | remnant | moderate | medium |
| **G236** | | | | | |
| Hematite, epidote, minor magnetite. Minor TGHMS | nil | | | | |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G238**<br>Hematite, magnetite, minor epidote.<br>Negligible TGHMS | 2 | | distinct | minor | medium |
| **G240**<br>As per sample G238 | 2 | 1 | distinct | minor | medium |
| | | 1 | remnant | moderate | medium |
| **G242**<br>Hematite, magnetite, epidote.<br>Negligible TGHMS | nil | | | | |
| **G244**<br>As per sample G242 | nil | | | | |
| **G246**<br>Magnetite, hematite, epidote. Hematite rich mica. Minor chalco-pyrite.<br>Negligible TGHMS | nil | | | | |
| **G 248**<br>Magnetite, hematite. Minor epidote, iron-pyrite, chalcopyrite.<br>Negligible TGHMS | nil | | | | |
| **G250**<br>Magnetite, hematite, epidote. Minor chalco-pyrite.<br>Negligible TGHMS | 1 | | remnant | moderate | medium |
| **G252**<br>Hematite, magnetite, epidote.<br>Negligible TGHMS | nil | | | | |
| **G254**<br>Strong iron & chalco-pyrite. Magnetite, epidote. Minor hematite.<br>Negligible TGHMS | nil | | | | |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL-LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G256**<br>Hematite, magnetite, epidote.<br>Minor TGHMS | nil | | | | |
| **G258**<br>Hematite. Minor magnetite & epidote. Very minor ironpyrite & chalcopyrite.<br>Moderate TGHMS | nil | | | | |
| **G260**<br>Strong magnetite & epidote. Hematite.<br>Moderate TGHMS | nil | | | | |
| **G262**<br>Hematite, magnetite, epidote.<br>Minor TGHMS | nil | | | | |
| **G264**<br>Hematite, magnetite. Minor epidote & iron-pyrite.<br>Minor TGHMS | 4 | 1 | remnant | minor | medium |
| | | 2 | remnant | moderate | medium |
| | | 1 | nil | moderate | medium |
| **G266**<br>Hematite. Minor magnetite & epidote.<br>Minor TGHMS | nil | | | | |
| **G268**<br>Hematite, magnetite, epidote. Very minor ironpyrite & chalco-pyrite.<br>Minor TGHMS | 1 | | distinct | minor | medium |
| **G270**<br>Hematite, magnetite, epidote.<br>Negligible TGHMS | nil | | | | |
| **G272**<br>Hematite, magnetite. Minor epidote.<br>Negligible TGHMS | nil | | | | |

| PANNED CONCENTRATE | GOLD GRAINS | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|
| **G274**<br>As per sample G272 | nil | | | |
| **G276**<br>As per sample G272 | 2 | remnant | moderate | medium |
| **G278**<br>Hematite, magnetite, epidote. Very minor ironpyrite.<br>Negligible TGHMS | 2 | distinct | minor | medium |
| **G280**<br>As per sample G278 | nil | | | |
| **G282**<br>Hematite, magnetite. Strong epidote.<br>Negligible TGHMS | nil | | | |
| **G284**<br>Hematite, magnetite, epidote.<br>Negligible TGHMS | nil | | | |
| **G286**<br>As per ample G284 | nil | | | |
| **G288**<br>Hematite, magnetite, epidote. Strong iron-pyrite. Possibly minor fine chalcopyrite.<br>Negligible TGHMS | nil | | | |
| **G290**<br>Hematite, magnetite. Minor epidote, iron-pyrite, chalcopyrite.<br>Minor TGHMS | 1 | nil | major | medium |
| **G292**<br>Hematite, magnetite, minor epidote.<br>Negligible TGHMS | nil | | | |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G294** Minor hematite, magnetite, epidote. Dominant TGHMS | 3 | 2 | remnant | moderate | medium |
| | | 1 | nil | major | rich |
| **G296** Hematite, magnetite, epidote. Negligible TGHMS | nil | | | | |
| **G298** Hematite, magnetite, minor epidote. Negligible TGHMS | nil | | | | |
| **G300** Hematite, magnetite. Minor epidote, iron-pyrite, chalcopyrite. Negligible TGHMS | nil | | | | |
| **G302** Magnetite, chalco-pyrite, ironpyrite. Minor hematite & epidote. Negligible TGHMS | 1 | | complete | nil | pale |
| **G304** Hematite, magnetite, epidote. Negligible TGHMS | nil | | | | |
| **G306** Hematite, magnetite, epidote. Very minor ironpyrite, chalco-pyrite. Negligible TGHMS | nil | | | | |
| **G308** Hematite, magnetite, epidote. Negligible TGHMS | nil | | | | |
| **G310** Very minor hematite, magnetite. Moderate TGHMS | nil | | | | |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G312** | | | | | |
| Hematite, magnetite, | 3 | 2 | remnant | moderate | medium |
| epidote. | | 1 | nil | major | medium |
| Negligible TGHMS | | | | | |
| **G314** | | | | | |
| Hematite, magnetite. | 1 | | remnant | moderate | medium |
| Minor epidote. | | | | | |
| Negligible TGHMS | | | | | |
| **G316** | | | | | |
| Hemate, magnetite, | 3 | 1 | distinct | minor | medium |
| epidote. | | 2 | remnant | moderate | medium |
| Negligible TGHMS | | | | | |
| **G318** | | | | | |
| Hematite, magnetite. | 7 | 2 | distinct | minor | medium |
| Minor epidote & | | 3 | remnant | moderate | medium |
| ironpyrite. | | 2 | nil | major | rich |
| Negligible TGHMS | | | | | |
| **G320** | | | | | |
| Magnetite, hematite. | 2 | 1 | distinct | minor | medium |
| Very minor epidote. | | 1 | nil | moderate | medium |
| Strong ironpyrite & | | | | | |
| chalcopyrite. | | | | | |
| Strong TGHMS. | | | | | |
| **G322** | | | | | |
| Hematite, magnetite. | 1 | | nil | major | medium |
| Minor epidote. | | | | | |
| Very minor TGHMS | | | | | |
| **G324** | | | | | |
| Hematite, magnetite, | nil | | | | |
| epidote. | | | | | |
| Very minor TGHMS | | | | | |
| **G326** | | | | | |
| As per sample G324 | nil | | | | |
| **G328** | | | | | |
| Negligible hematite, | 3 | | nil | major | rich |
| magnetite, epidote. | | | | | |
| Moderate marcasite/ | | | | | |
| iron pyrite ? One | | | | | |
| particle osmiridium. | | | | | |
| Dominant TGHMS | | | | | |

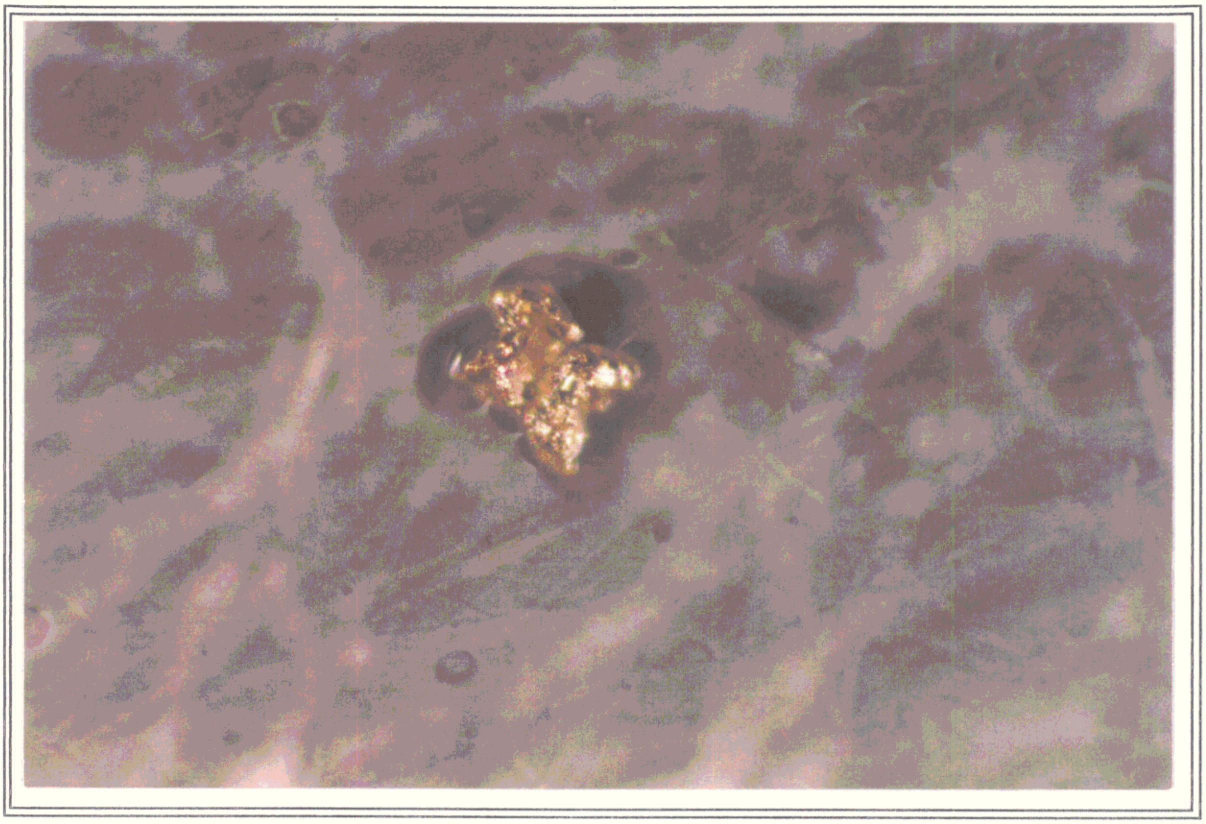
| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G330**<br>Negligible hematite, magnetite. Moderate epidote.<br>Strong marcasite/ iron pyrite.<br>Dominant TGHMS | nil | | | | |
| **G332**<br>Negligible hematite, magnetite. Moderate epidote.<br>Strong TGHMS | nil | | | | |
| **G334**<br>Magnetite. Minor hematite, epidote.<br>Moderate marcasite/ iron pyrite? and rutile.<br>The shape of the pale coloured particles is consistent with having travelled some distance however the particle surfaces display a clean undamaged etched appearance.<br>Minor TGHMS | 3 | 1<br>2 | remnant<br>nil | moderate<br>nil? | medium<br>pale |
| **G336**<br>Negligible hematite, magnetite, epidote.<br>Dominant TGHMS | nil | | | | |
| **G338**<br>Negligible hematite, magnetite, epidote.<br>Negligible TGHMS | nil | | | | |
| **G340**<br>Minor hematite & magnetite. Moderate marcasite/iron pyrite.<br>Moderate TGHMS | 1 | | remnant<br>(etched grain surface) | moderate | medium |

| PANNED CONCENTRATE | GOLD GRAINS | | CRYSTAL -LINITY | TRAVEL DAMAGE | COLOUR |
|---|---|---|---|---|---|
| **G342** | | | | | |
| Very minor hematite & magnetite. Moderate marcasite/iron pyrite. Moderate TGHMS | nil | | | | |
| **G344** | | | | | |
| Negligible hematite & magnetite. Moderate rutile. Strong marcasite/iron pyrite. Moderate TGHMS | nil | | | | |
| **G346** | | | | | |
| As per sample G344 | 1 | | nil | major | medium |
| | | | (etched grain surface) | | |
| **G348** | | | | | |
| As per sample G344 | 5 | 1 | remnant | minor | pale |
| | | 2 | nil | moderate | pale |
| | | 2 | nil | moderate | medium |
| | | | (all grain surfaces etched) | | |
| **G350** | | | | | |
| Minor hematite & magnetite. Minor iron pyrite. Strong TGHMS | nil | | | | |
| **G352** | | | | | |
| Minor hematite & magnetite. Strong TGHMS | nil | | | | |

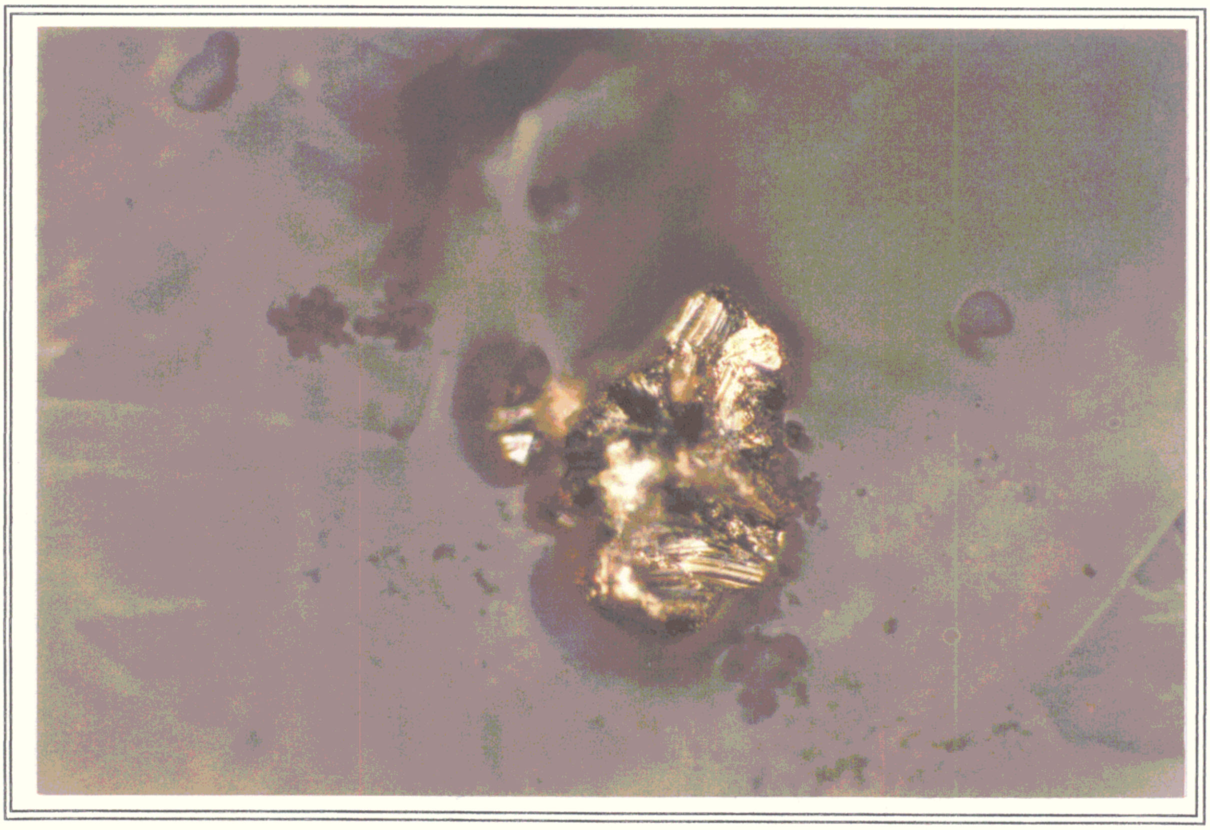
### 3.0 Photographs

| Photo | Field No. | Probe No. | Magnification | Area |
|---|---|---|---|---|
| Nil travel damage, complete crystallinity, pale colour | | | | |
| 1 | G154 | G353 (1) | x100x4.5 | Nancy Creek |
| 2 | G206 | G353 (3) | x200x4.5 | Lucy Spur |
| Nil travel damage, complete crystalinity, medium colour | | | | |
| 3 | G172 | G355 (1-12) | x100x4.5 | Lucy Spur |
| 4 | G174 | G355 (13-20) | x100x4.5 | Lucy Spur |
| 5 | G172 | G355 (1-12) | x100x4.5 | Lucy Spur |
| 6 | G174 | G355 (20) | x100x4.5 | Lucy Spur |
| Minor travel damage, medium colour | | | | |
| 7 | G174 | G356 (11) | x50x4.5 | Lucy Spur |
| 8 | G172 | G356 (1-10) | x50x4.5 | Lucy Spur |
| Moderate travel damage, medium colour | | | | |
| 9 | G174 | G357 (11-22) | x50x4.5 | Lucy Spur |
| 10 | G172 | G357 (1-10) | x50x4.5 | Lucy Spur |
| 11 | G174 | G357 (11-22) | x50x4.5 | Lucy Spur |
| 12 | G174 | G357 (11-22) | x50x4.5 | Lucy Spur |
| Major travel damage, rich colour | | | | |
| 13 | G158 | G354 (1) | x50x4.5 | Nancy Spur |
| 14 | G174 | G354 (8) | x50x4.5 | Lucy Spur |
| 15 | G148 | G354 (4) | x25x4.5 | Nancy Creek |
| 16 | G172 | G354 (5) | x50x4.5 | Lucy Spur |
| Gold intergrown with other minerals | | | | |
| 17 | G318 | G354 (9) | x50x4.5 | Owen Meredith River |
| 18 | G190B | G362 (?1) | x12x4.5 | Rocky River |
| 19 | G190B | G362 (2) | x12x4.5 | Rocky River |
| 20 | G190B | G362 (2) | x25x4.5 | Rocky River |
| 21 | G190B | G362 (5) | x12x4.5 | Rocky River |
| 22 | G190B | G362 (5) | x25x4.5 | Rocky River |
| Grains from base of Tertiary gravel - etched surfaces | | | | |
| 23 | G334 | G363 (3) | x25x4.5 | Nancy Spur Workings |
| 24 | G346 | G363 (5) | x50x4.5 | Nancy Spur Workings |
| 25 | G334 | G363 (1,2) | x25x4.5 | Nancy Spur Workings |
| 26 | G348 | G363 (6-10) | x50x4.5 | Nancy Spur Workings |

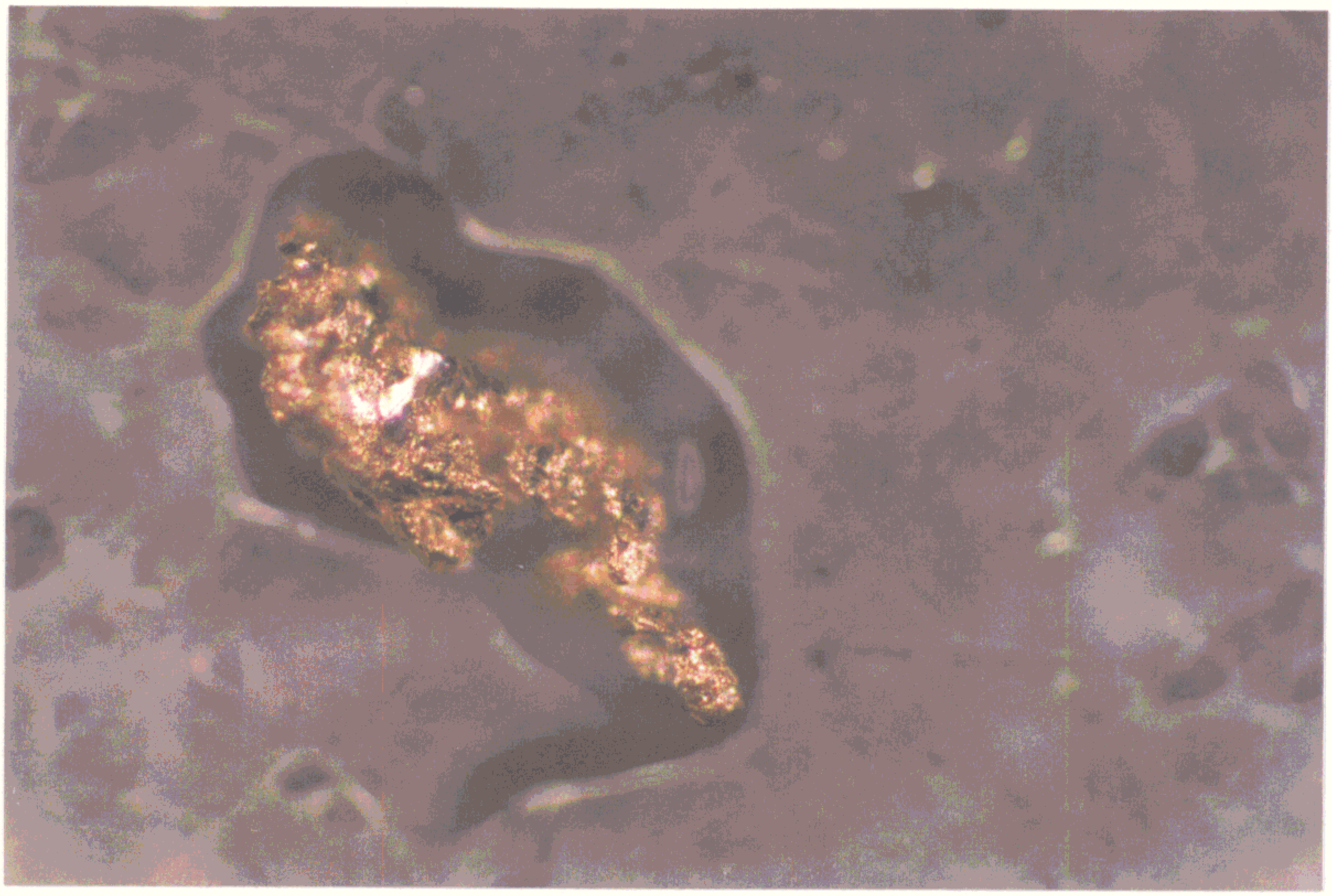
1. Grain colour has not been accurately or consistently rendered in the photographs. In particular, numbers 3-6 are too dark. However, a general impression is still given of the pale, medium and rich colour groupings by the other photographs.
2. The grains were mounted on double sided tape which provides the fibrous backdrop in the photographs.
3. The grains are back-to-front relative to the probe mount photographs in Kitto (1996).
4. Magnification is given as microscope magnification (eg. x50) and printing magnification (x4.5). The latter is an average value.
5. The photographs were taken by R.S. Bottrill, Mineral Resources, Tasmania.
6. See Appendix 1 of Turner (1997) for the AMG co-ordinates of the sample sites.
7. For some grains photographed here the equivalent grain in Kitto's (1996) photographs is not known, only the group of grains containing the equivalent grain. eg the grain in photograph 11 occurs in probe group 357 (11-22).



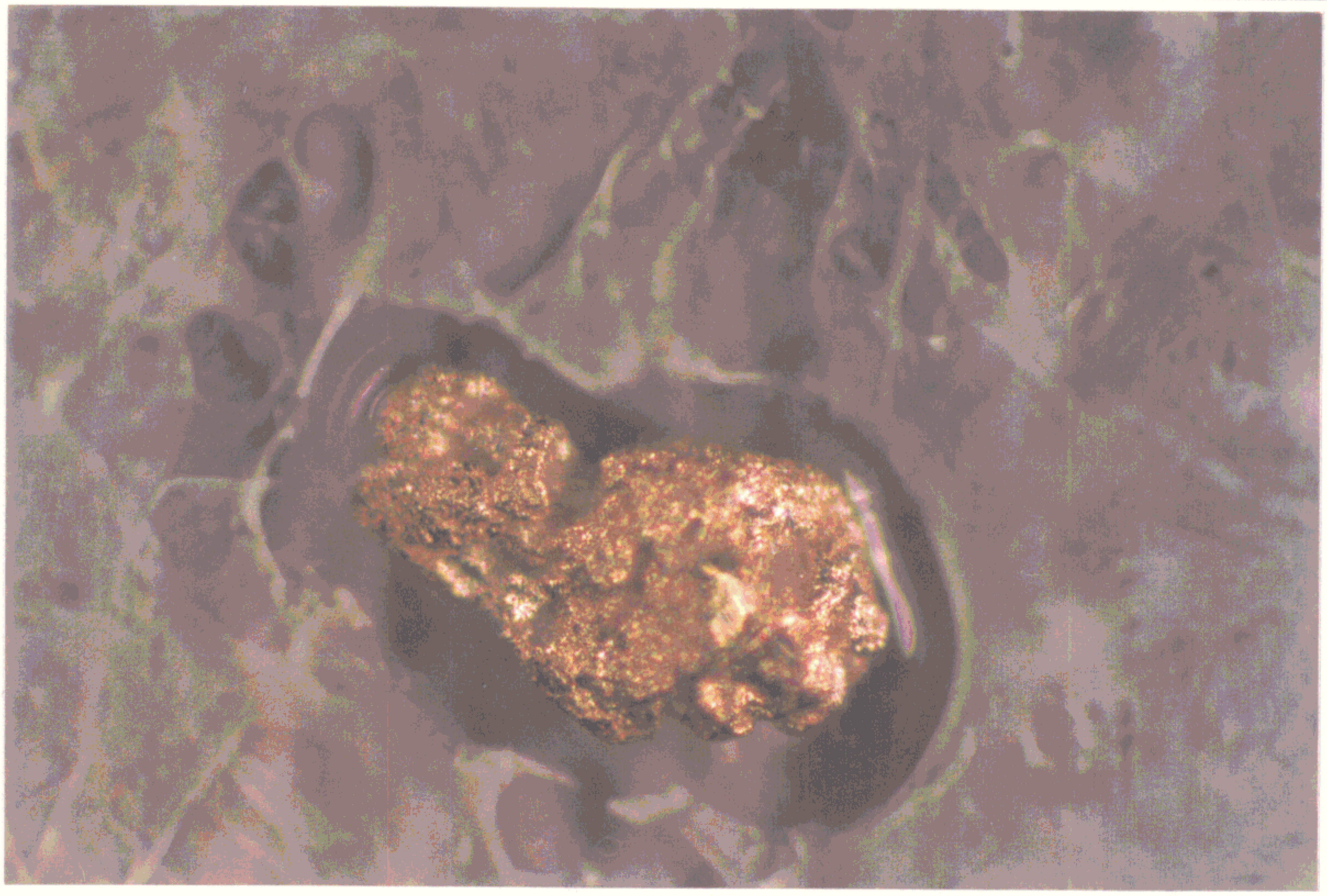
1. Nil travel damage, complete crystallinity, pale colour. Magnification x100x4.5



2. Nil travel damage, complete crystallinity, pale colour. Magnification x200x4.5

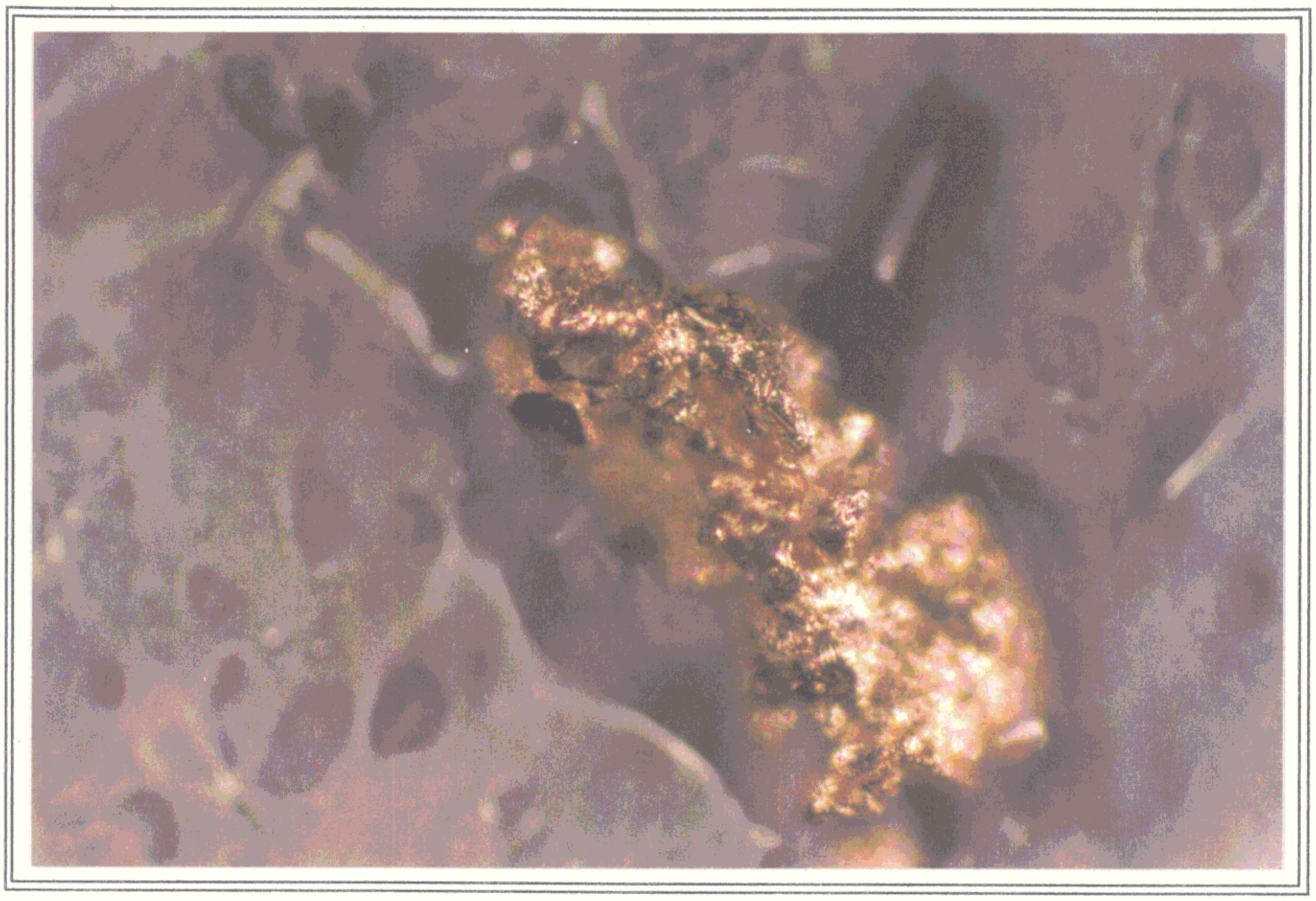


**3.** Nil travel damage, complete crystallinity, medium colour. Magnification x100x4.5

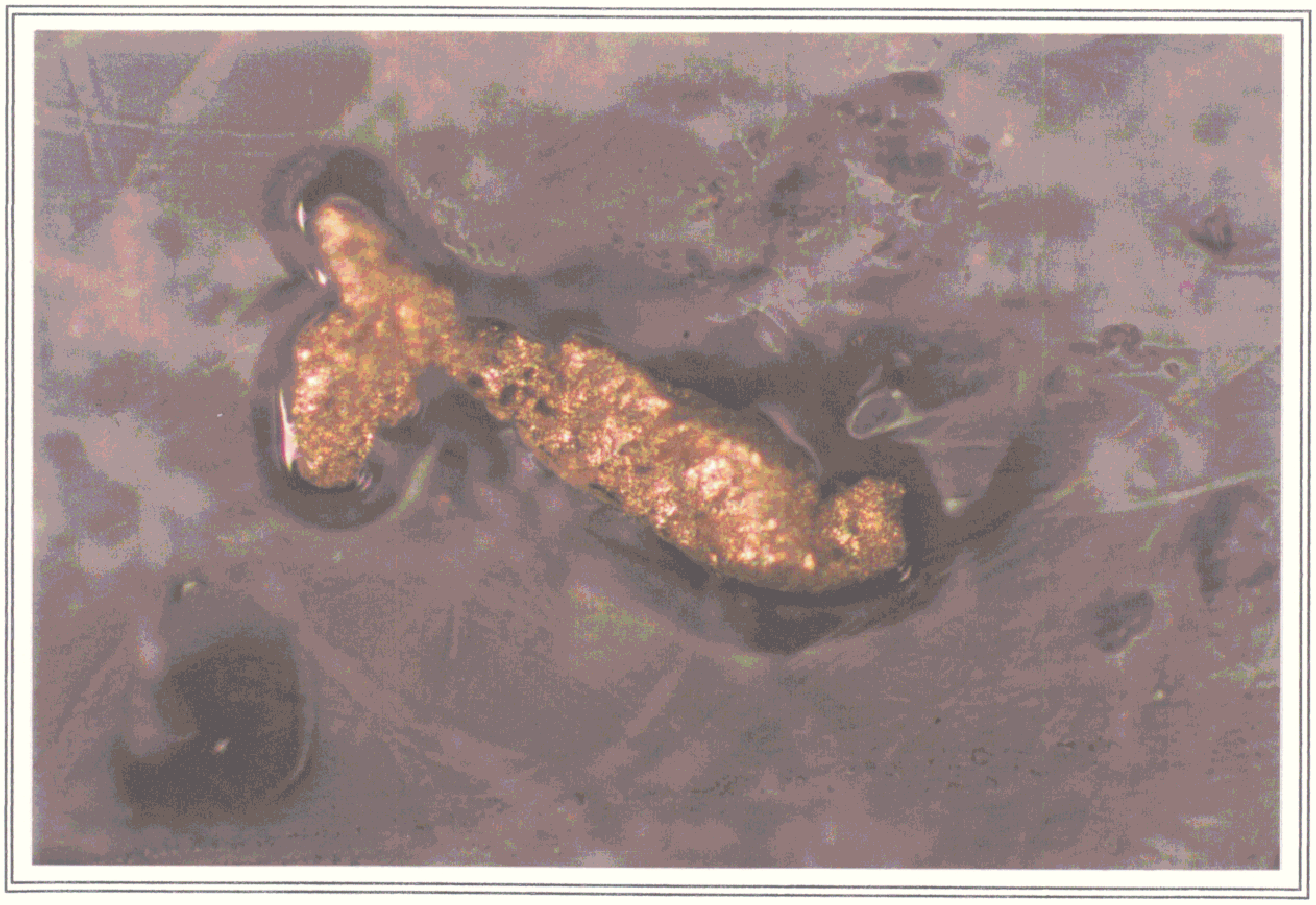


**4.** Nil travel damage, complete crystallinity, medium colour. Magnification x100x4.5

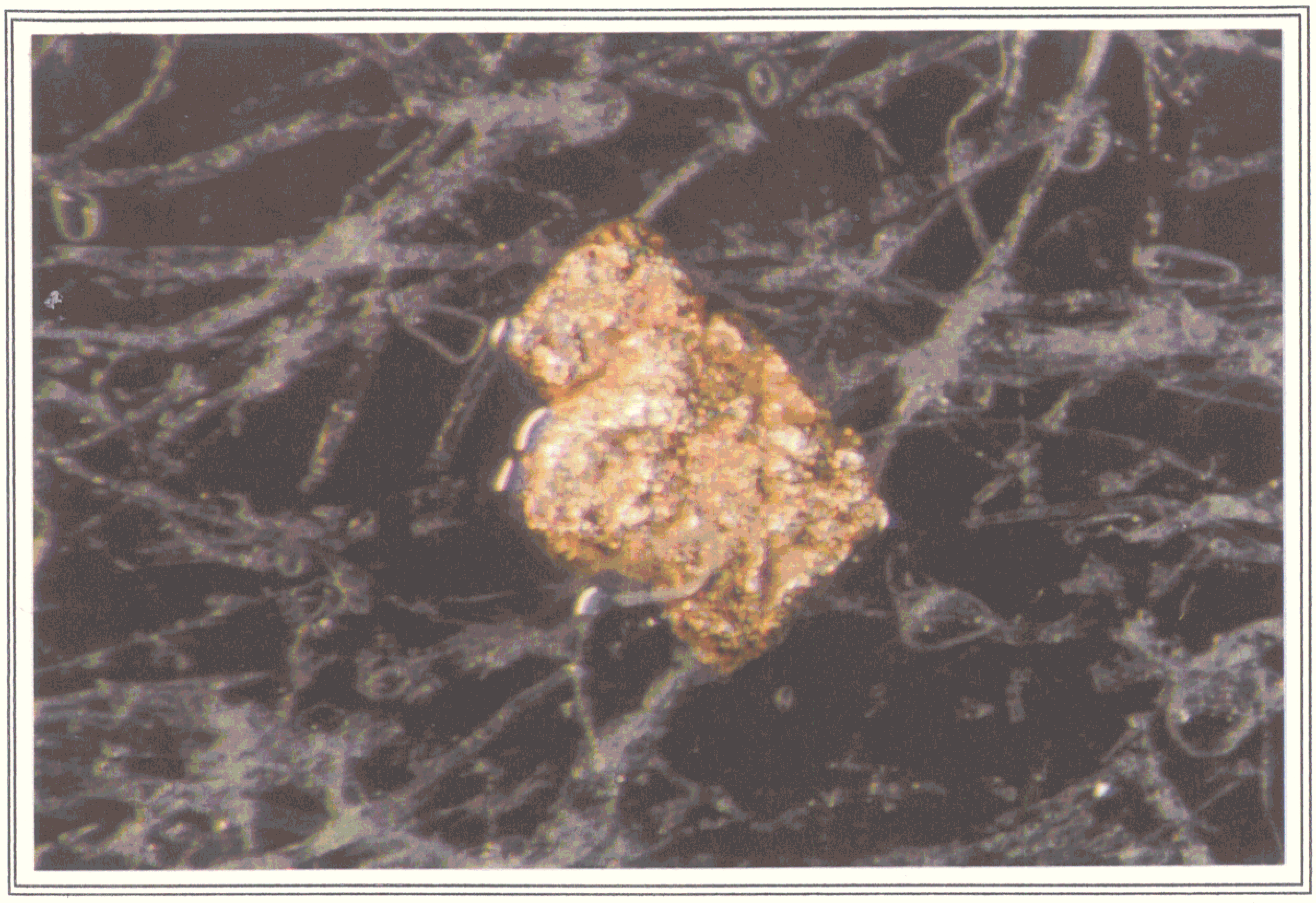
276099



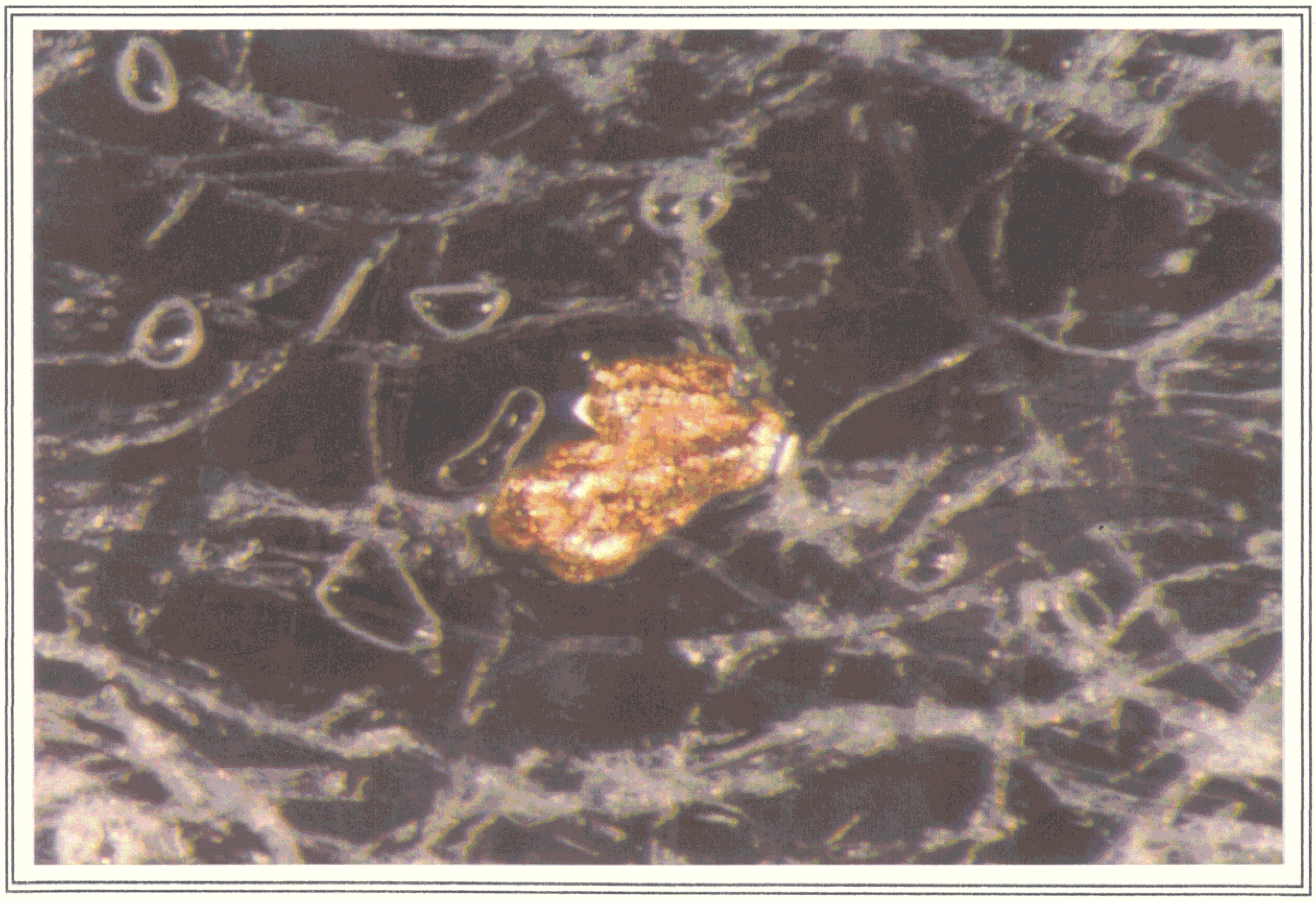
5. Nil travel damage, complete crystallinity, medium colour. Magnification x100x4.5



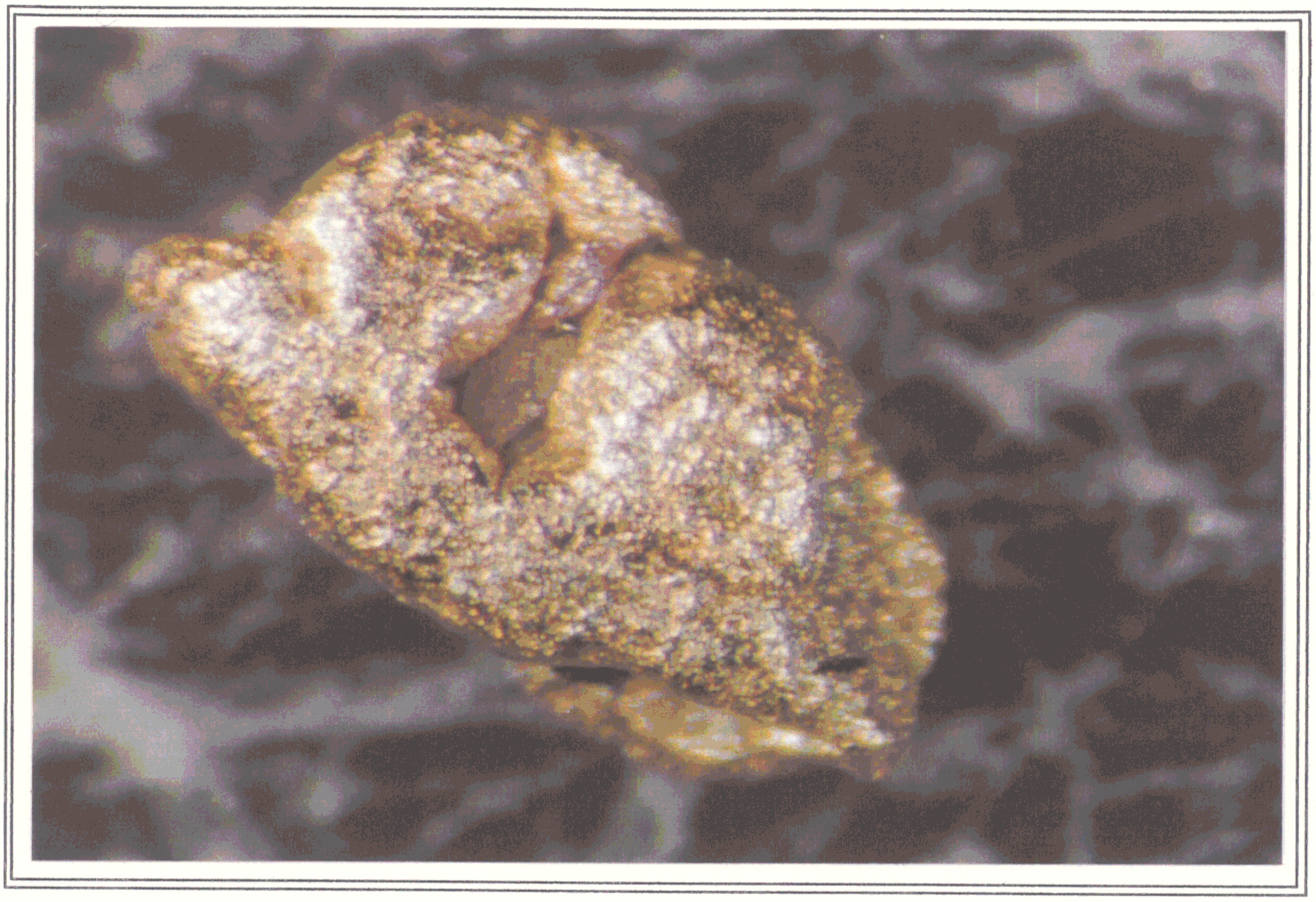
6. Nil travel damage, complete crystallinity, medium colour. Magnification x100x4.5



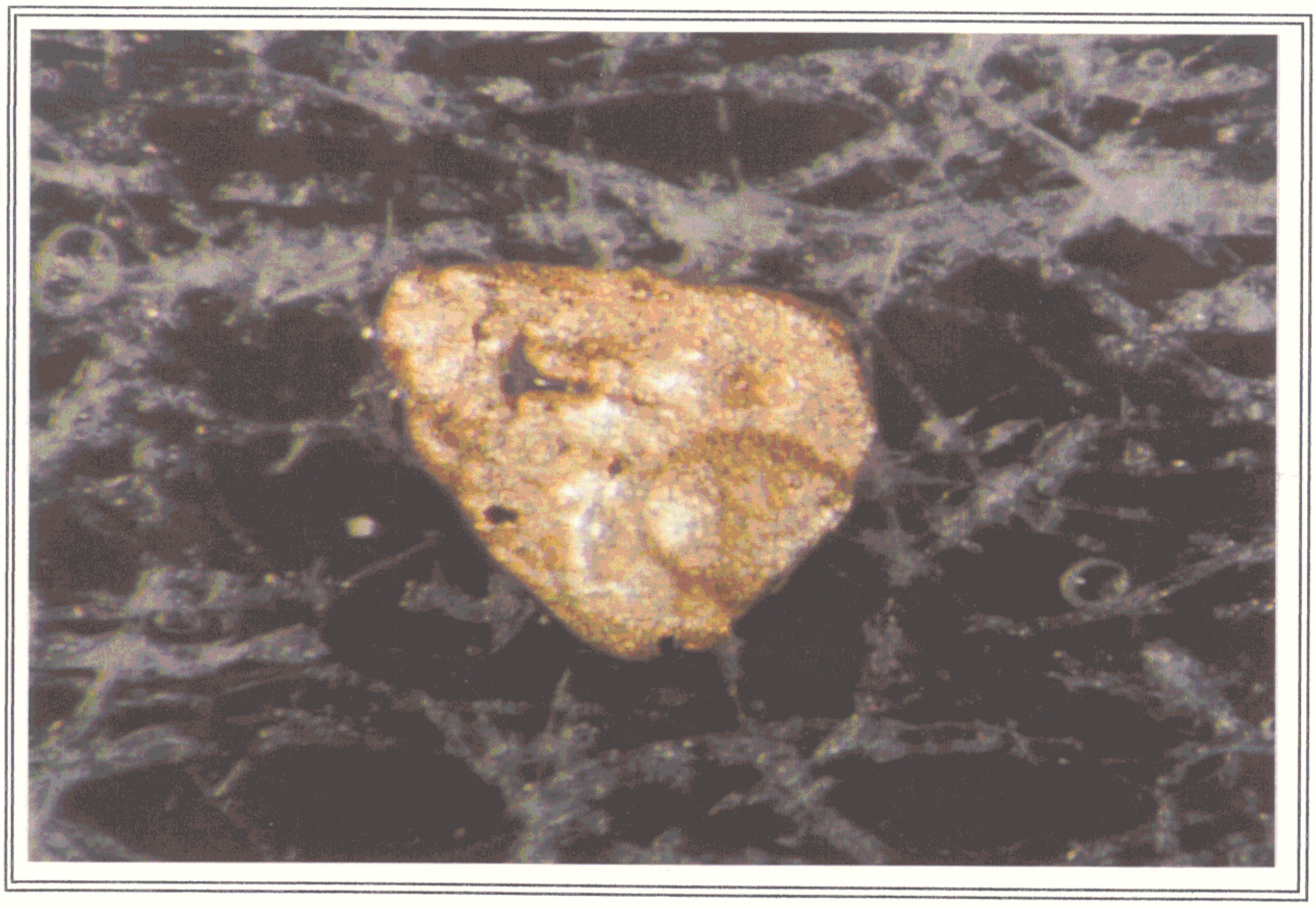
7. Minor travel damage, medium colour. Magnification x50x4.5



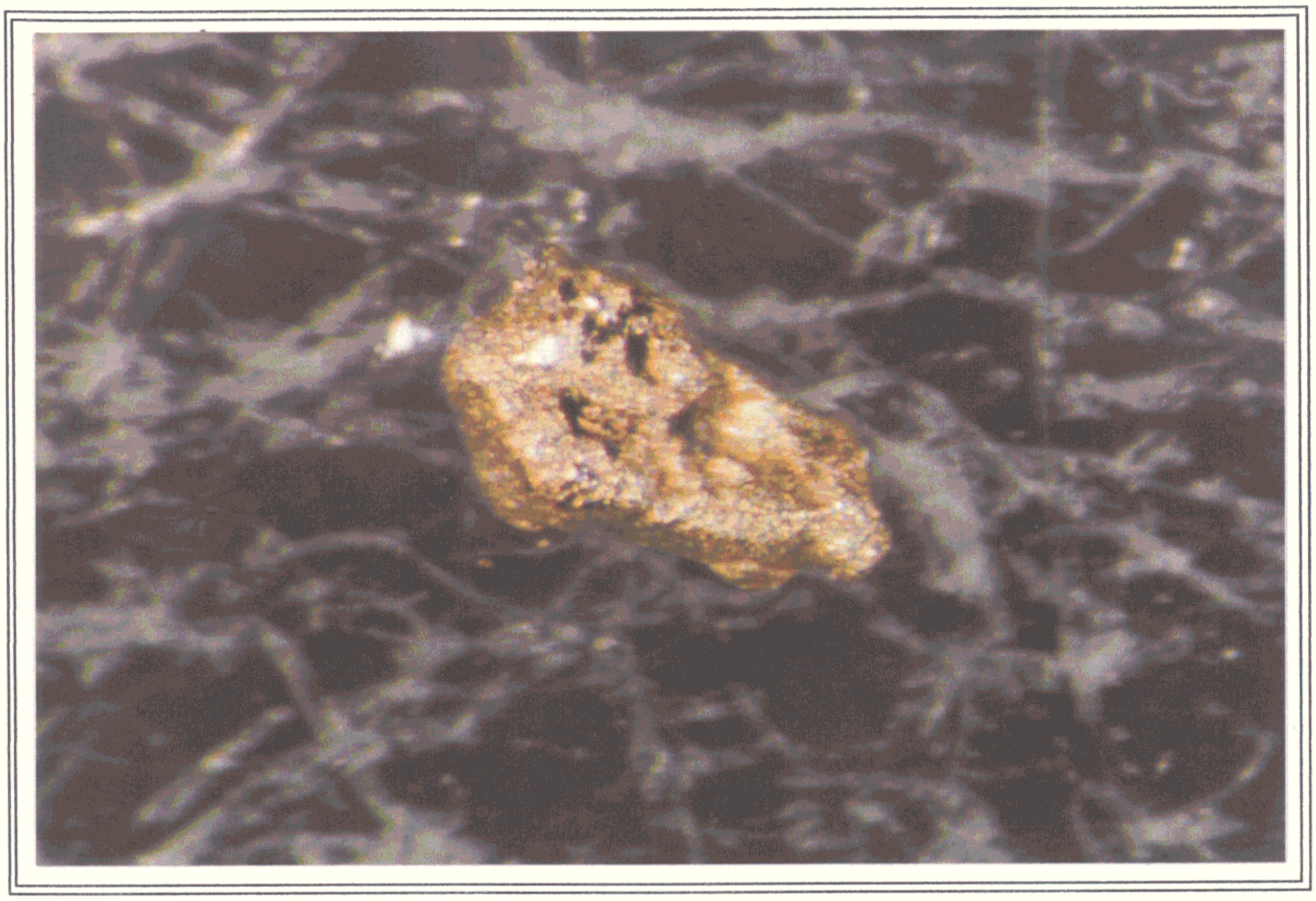
8. Minor travel damage, medium colour. Magnification x50x4.5



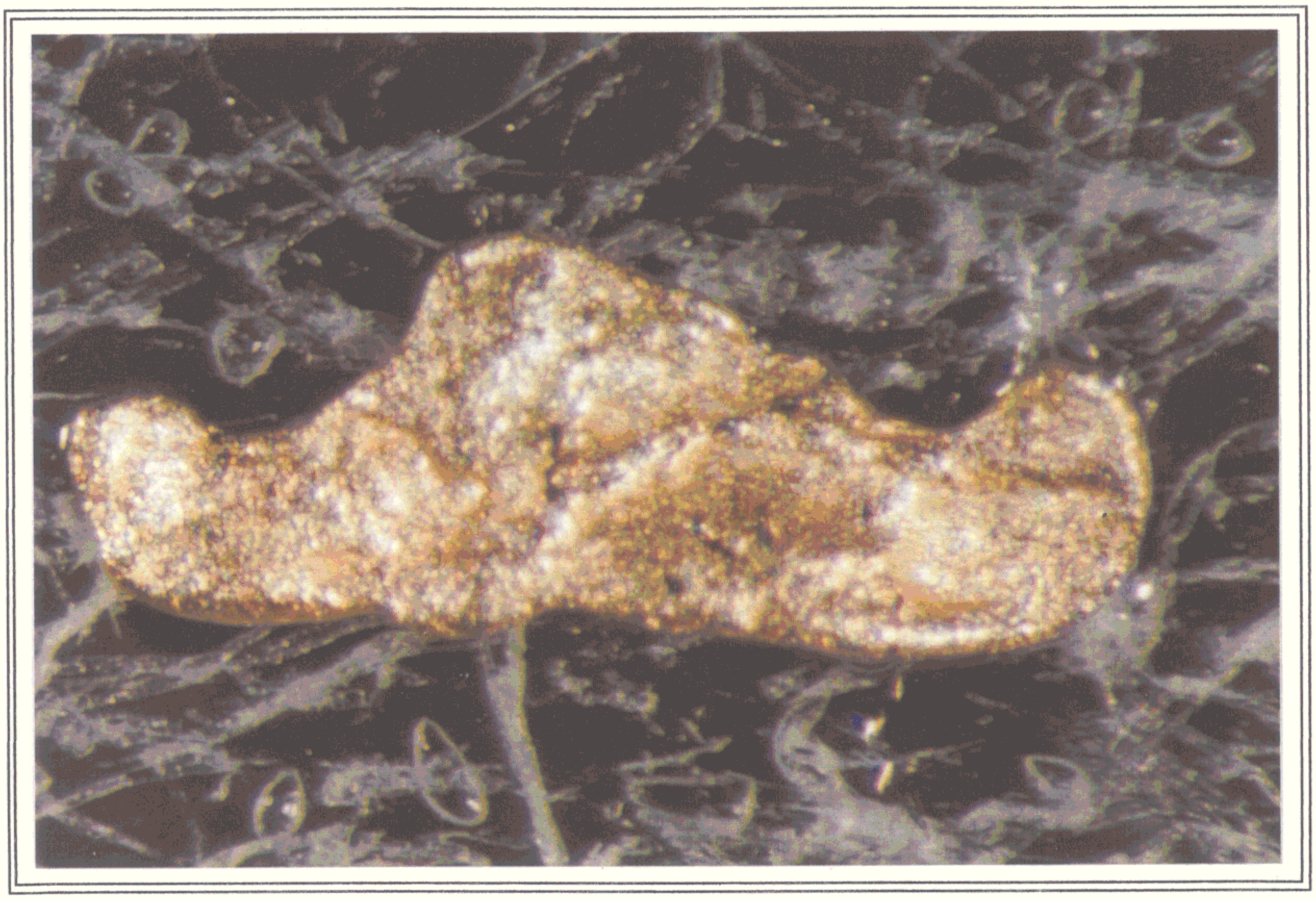
**9.** Moderate travel damage, medium colour. Magnification x50x4.5



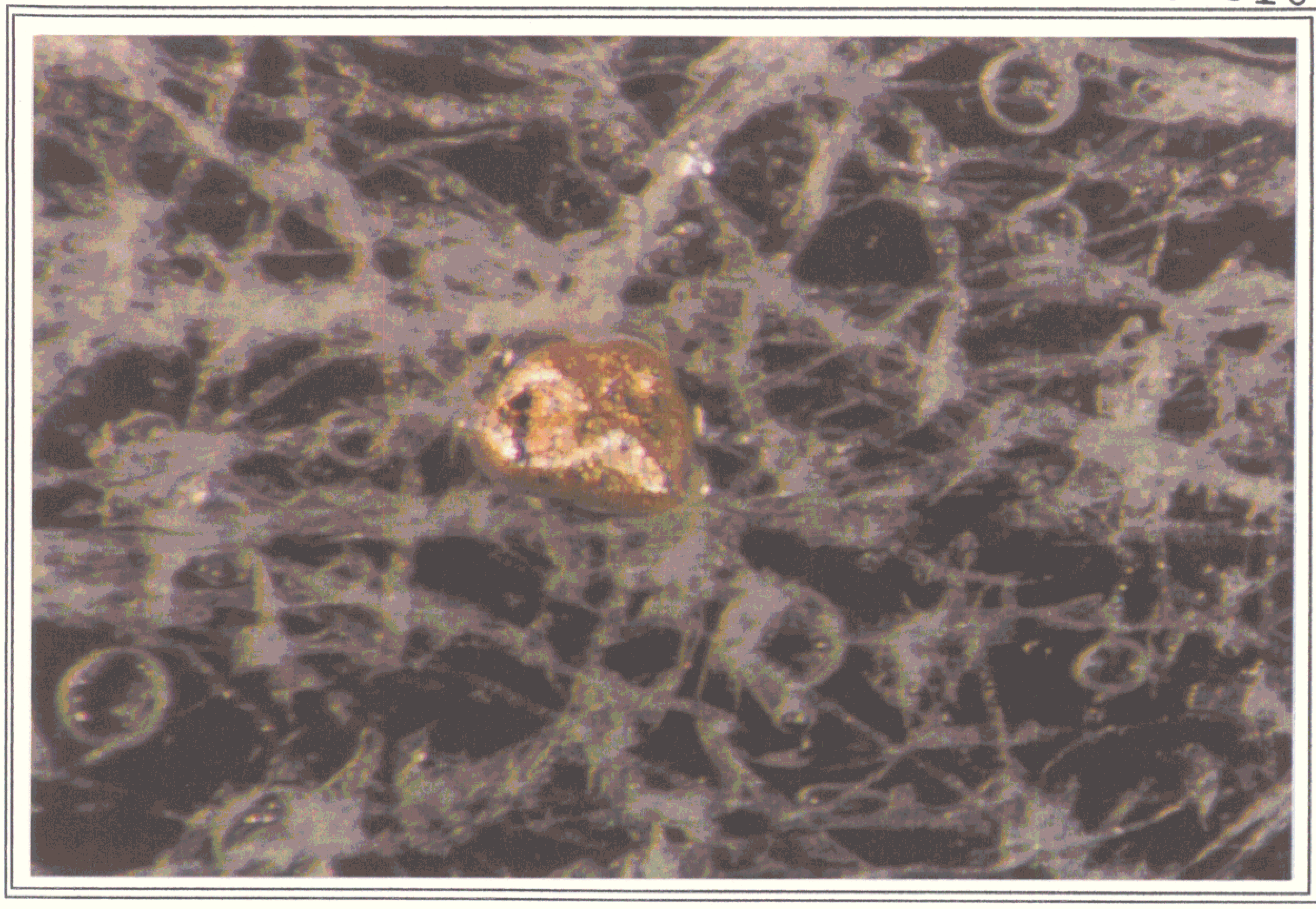
**10.** Moderate travel damage, medium colour. Magnification x50x4.5



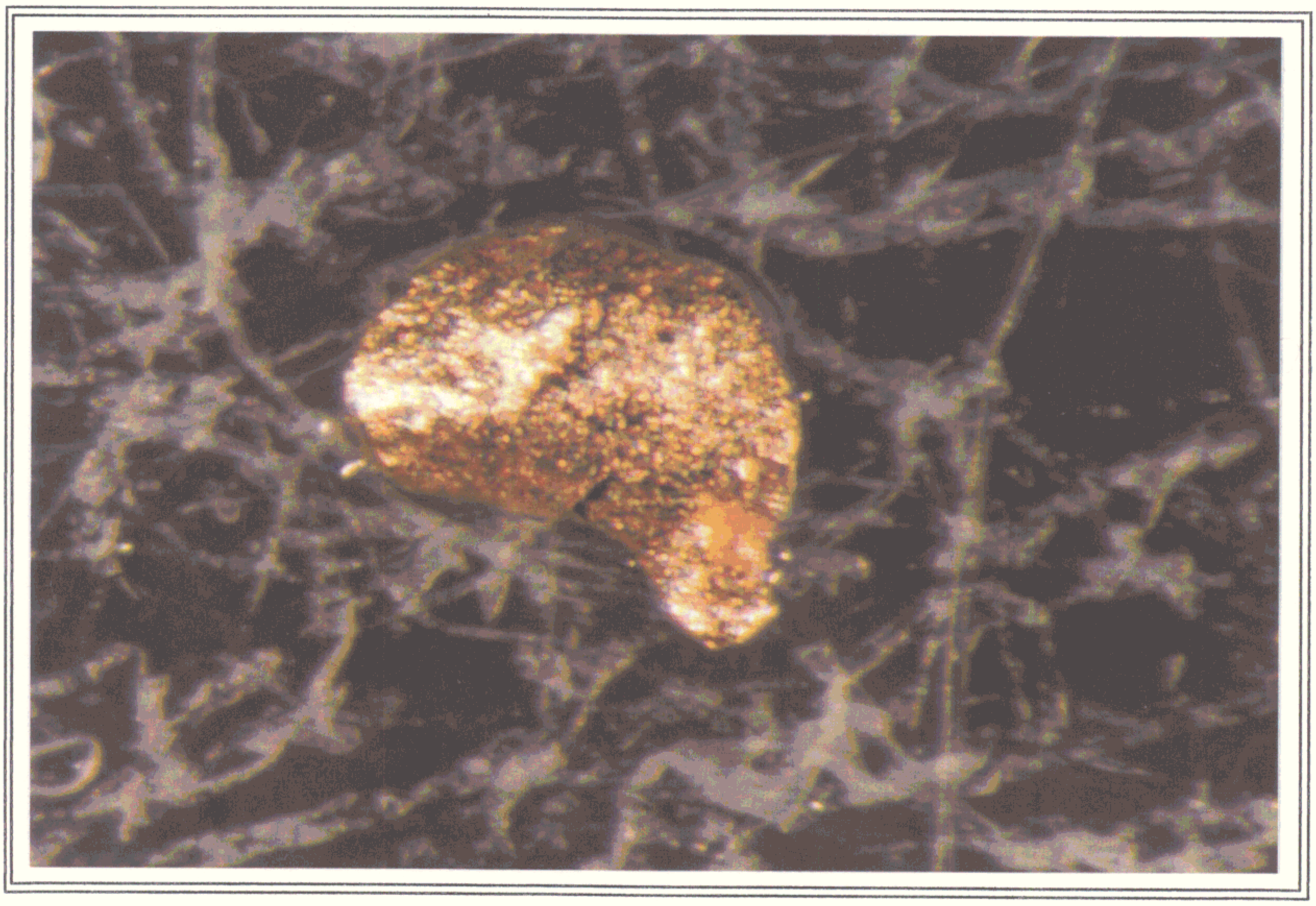
**11.** Moderate travel damage, medium colour. Magnification x50x4.5



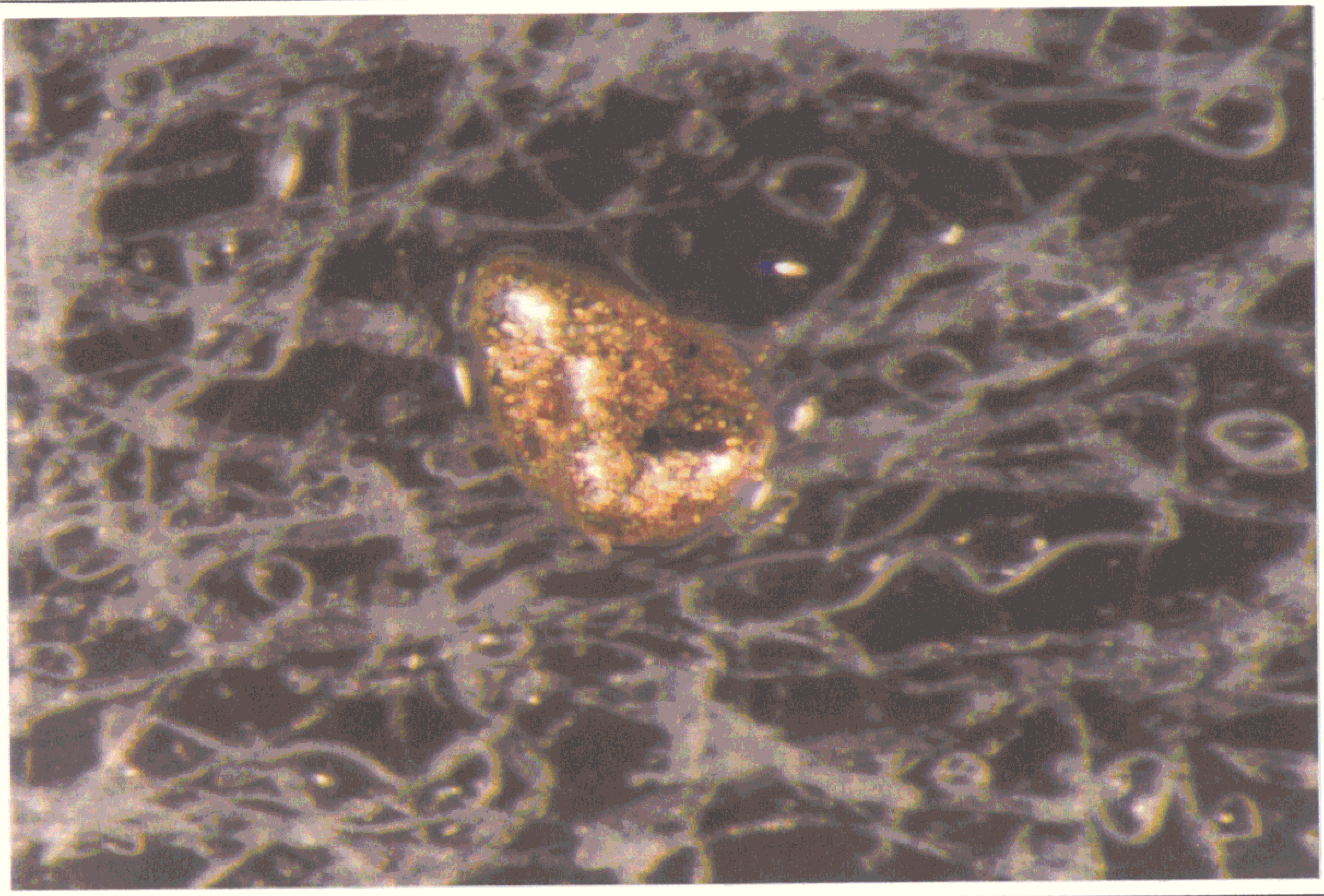
**12.** Moderate travel damage, medium colour. Magnification x50x4.5



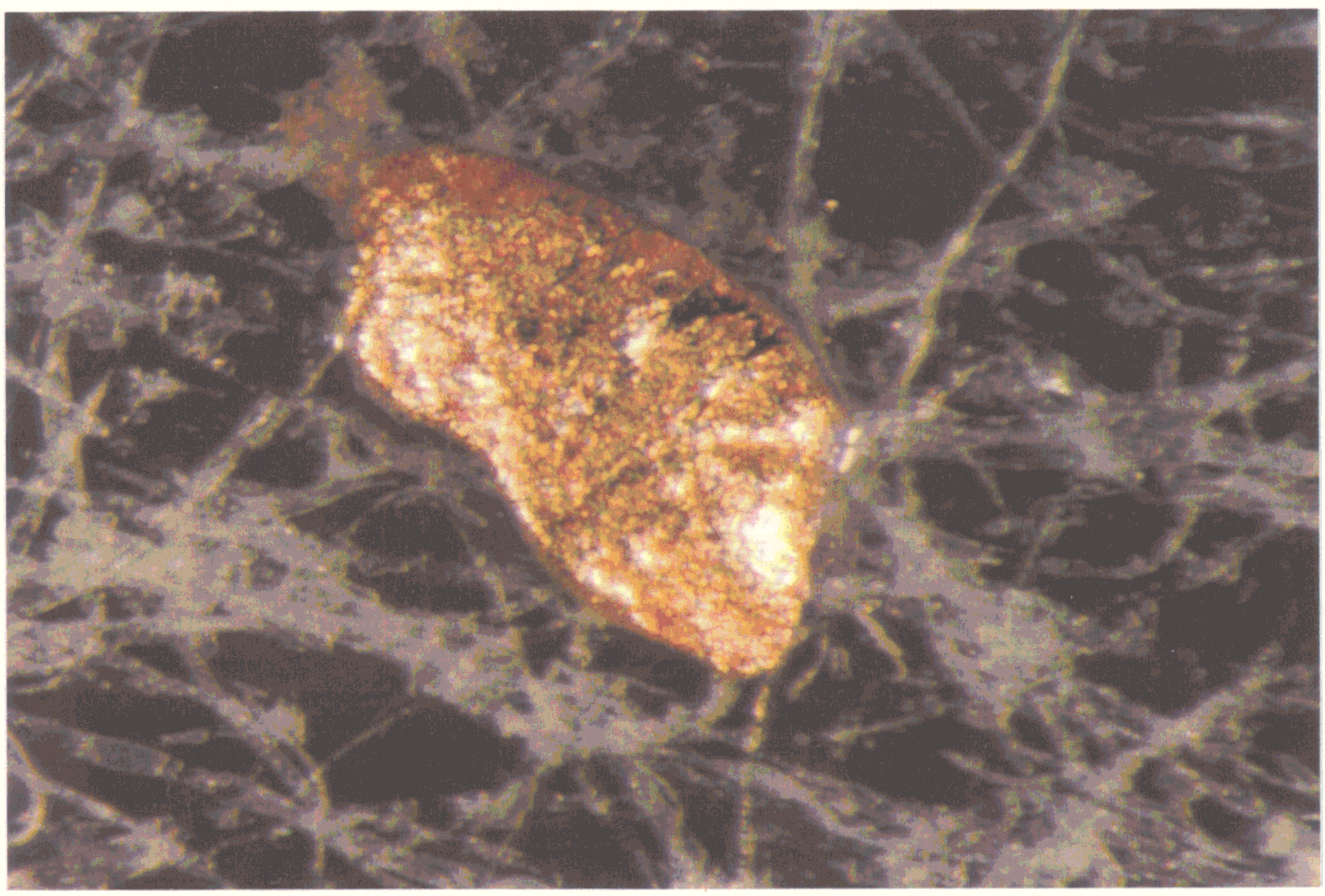
**13.** Major travel damage, rich colour. Magnification x50x4.5



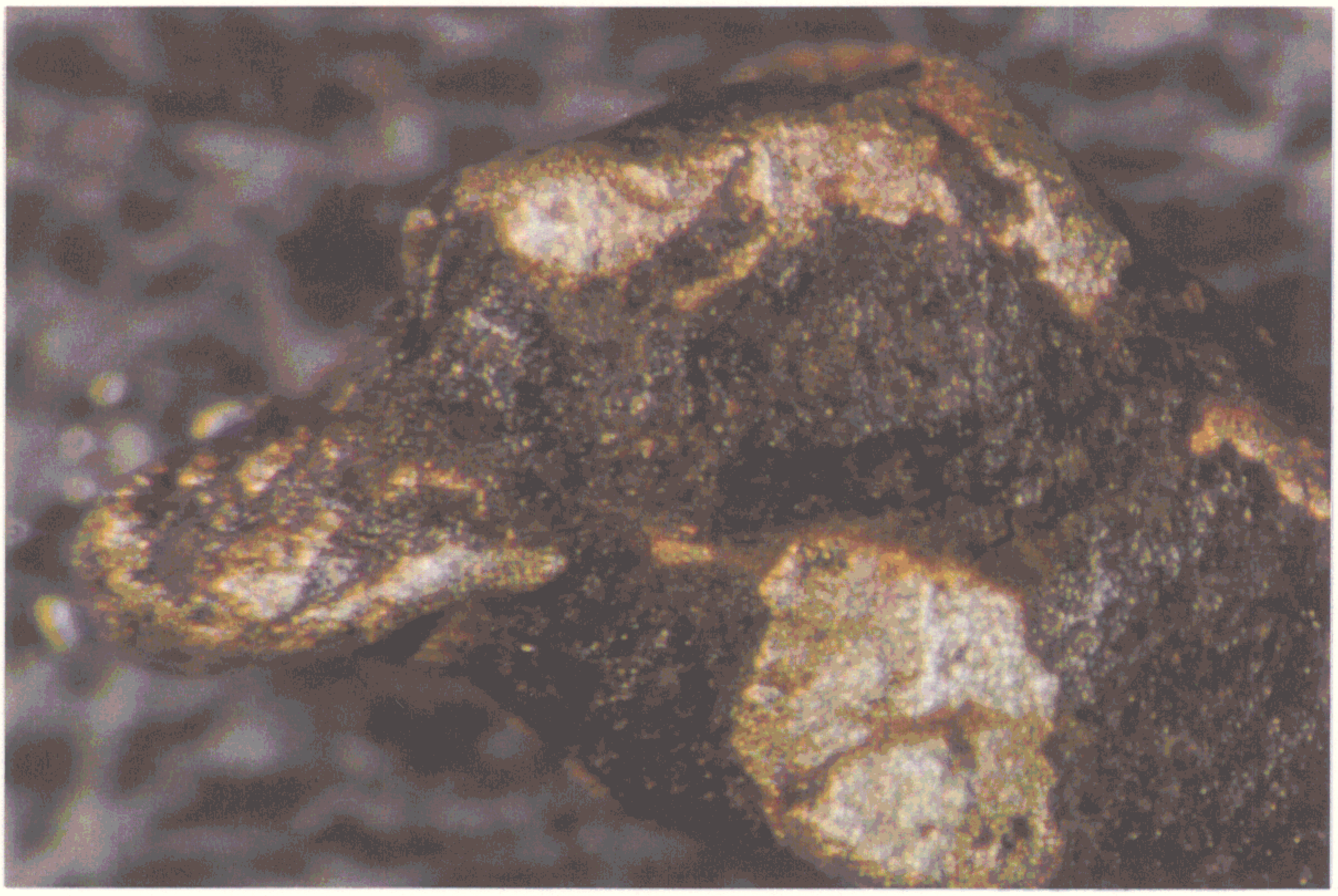
**14.** Major travel damage, rich colour. Magnification x50x4.5



**15.** Major travel damage, rich colour. Magnification x25x4.5

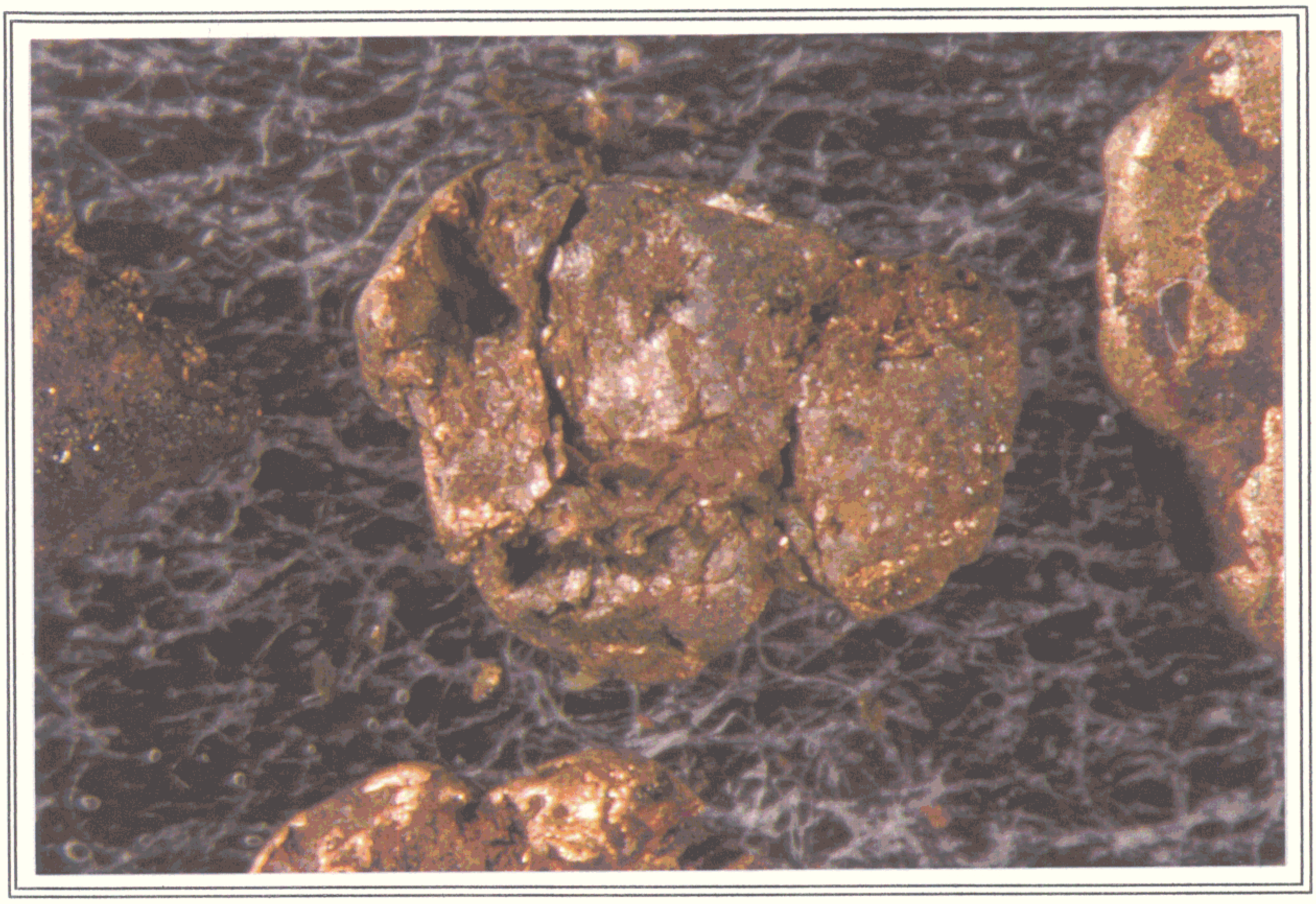


**16.** Major travel damage, rich colour. Magnification x50x4.5

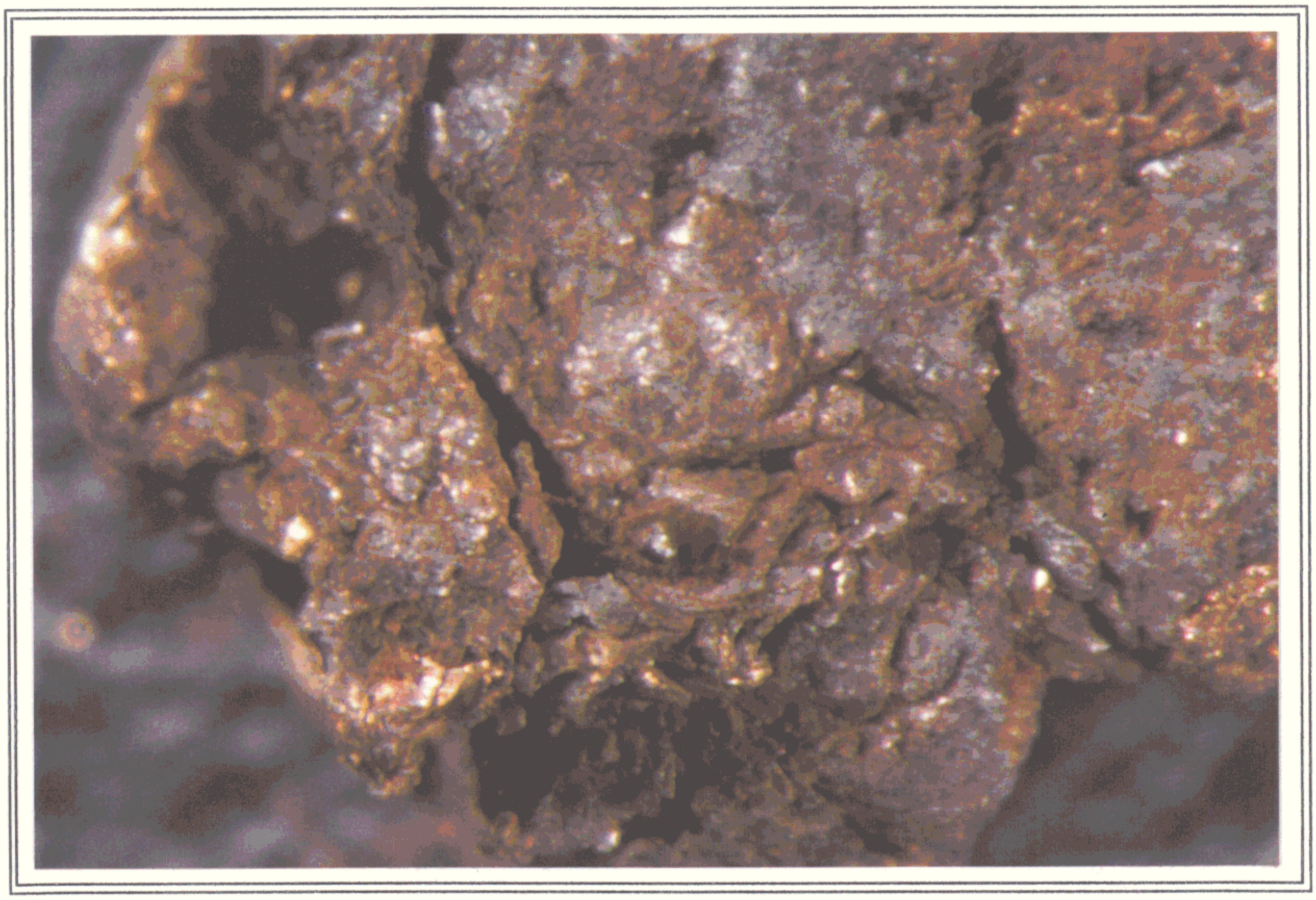


**17.** Gold intergrown with goethite. The gold is of pale colour beneath a rich coloured skin (see fracture at lower right). Collected 150m down stream of iron formation in Owen Meredith River. Magnification x50x4.5

**18.** Gold with goethite. Collected near iron formations in Rocky River. Magnification x12x4.5

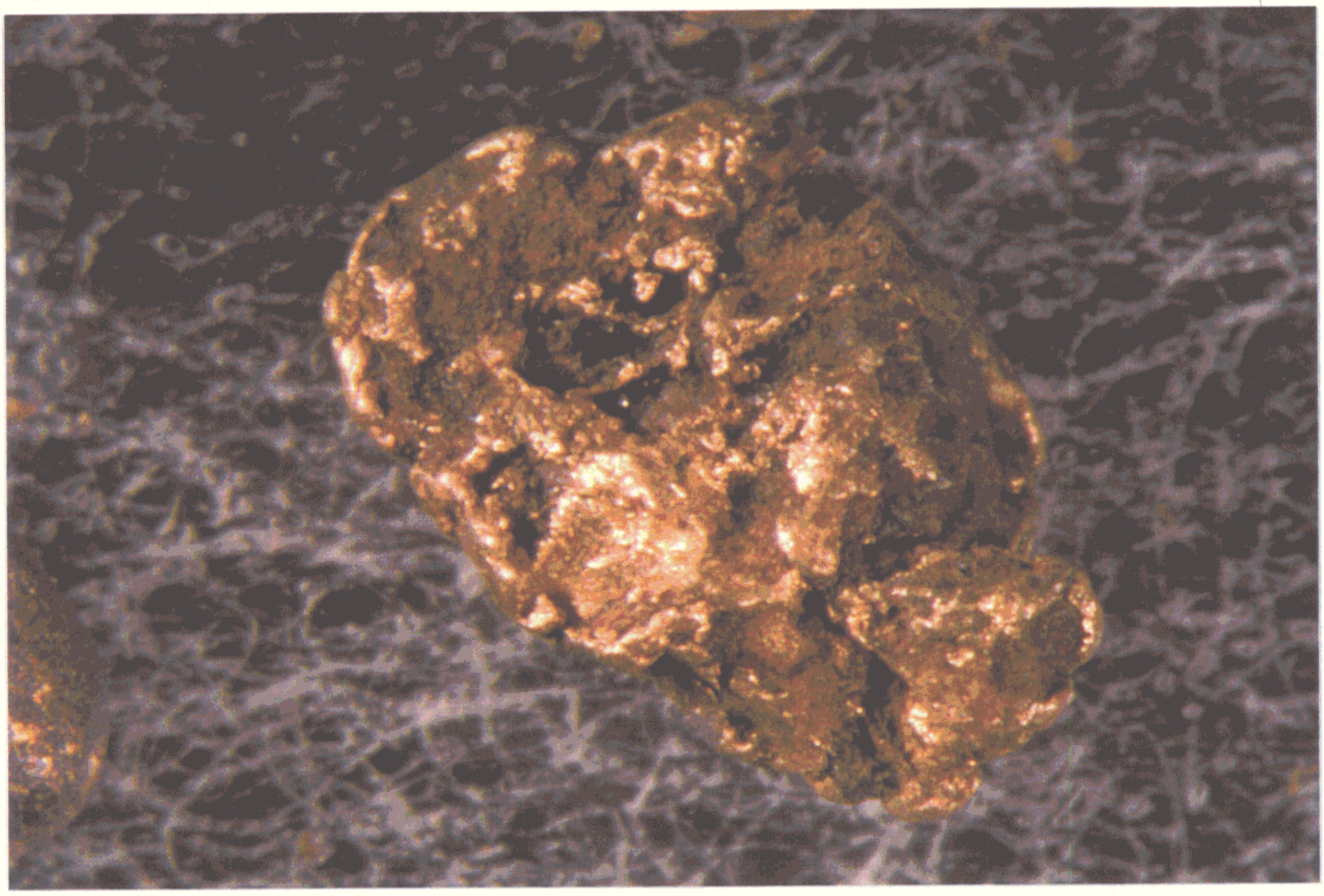


**19.** Gold subordinate to goethite. Same site as 18. Magnification x12x4.5

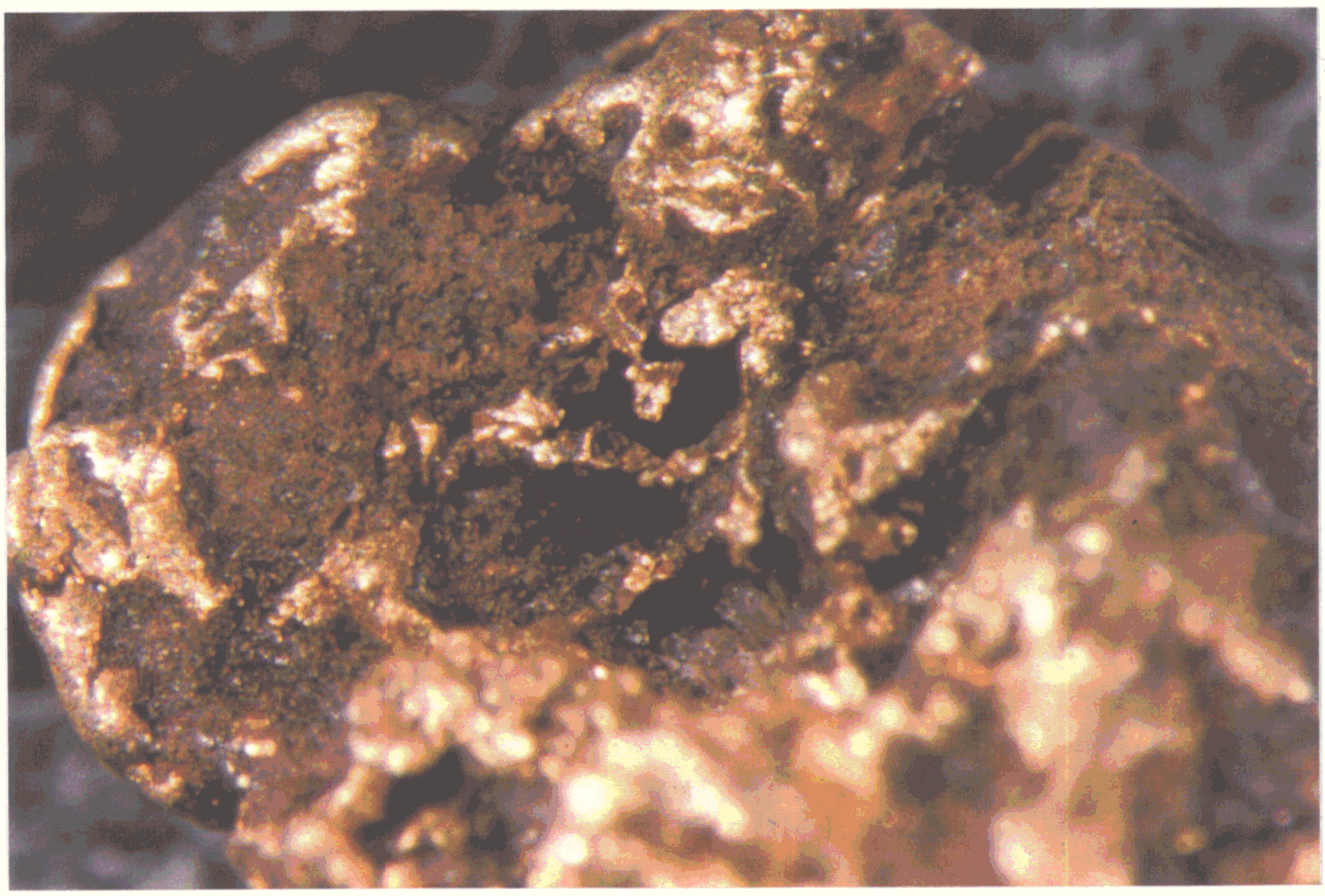


**20.** Enlargement of 19. Magnification x25x4.5

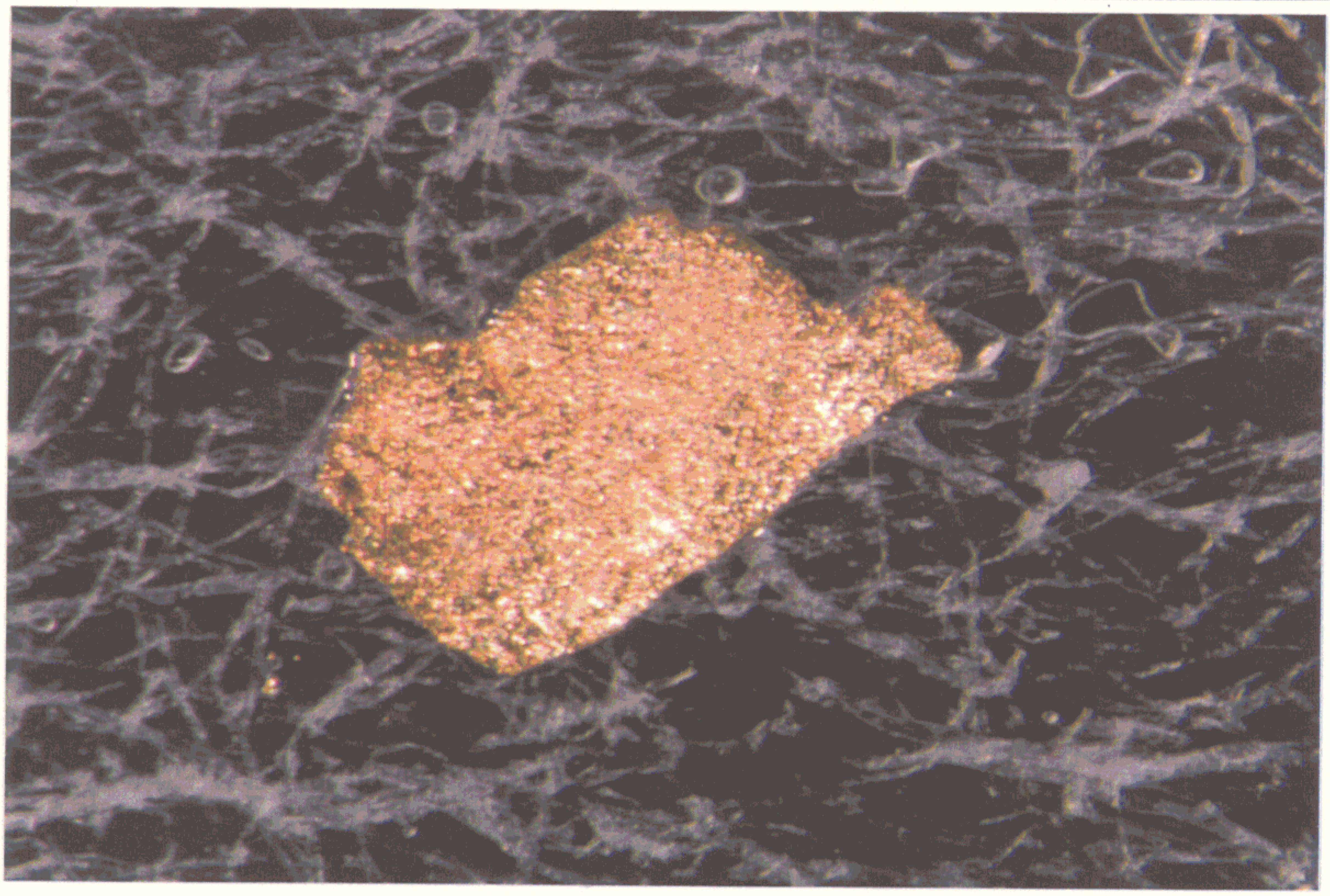
276107



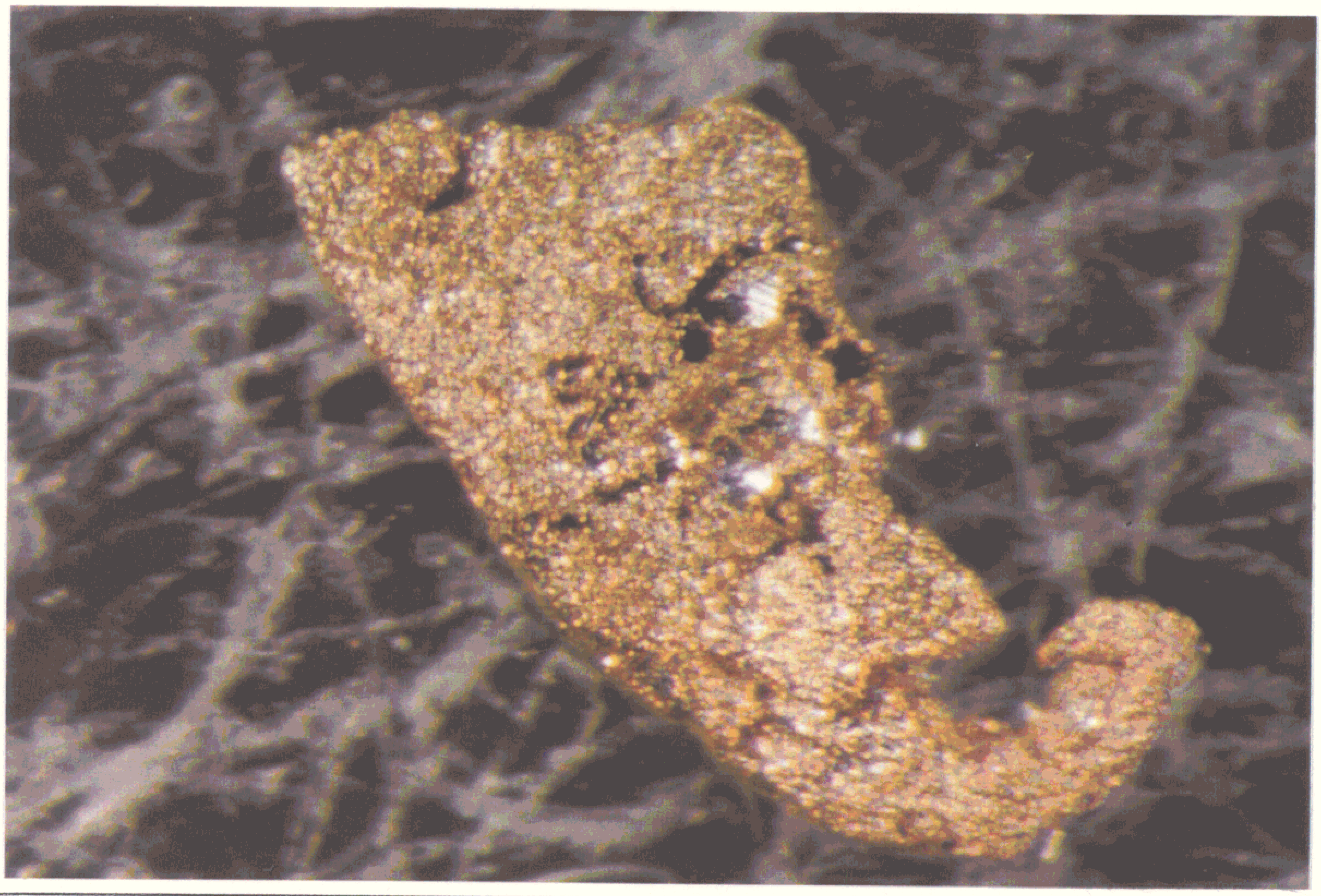
**21.** Gold with limonite and goethite. Same site as 18. Magnification x12x4.5



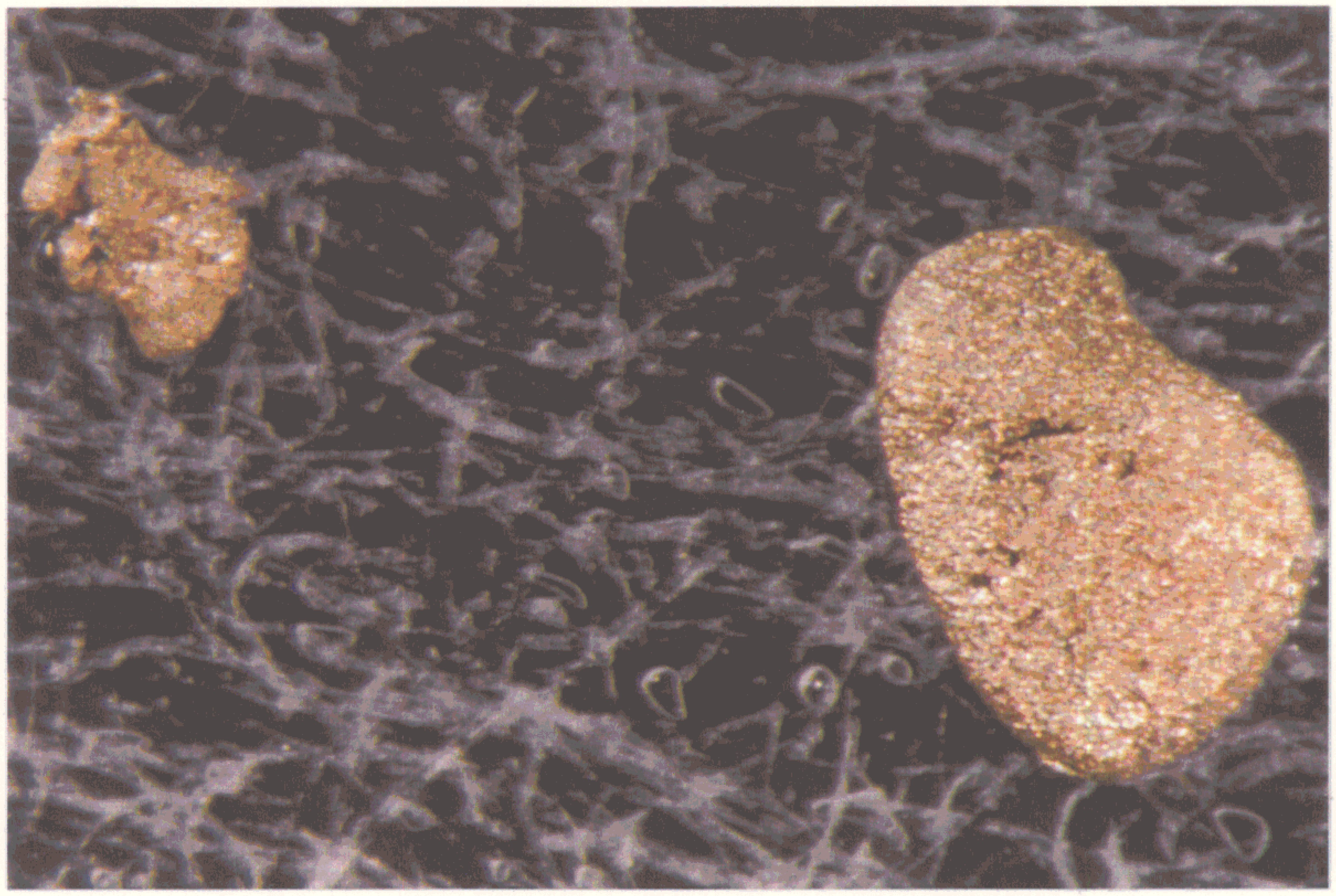
**22.** Enlargement of 21. Magnification x25x4.5



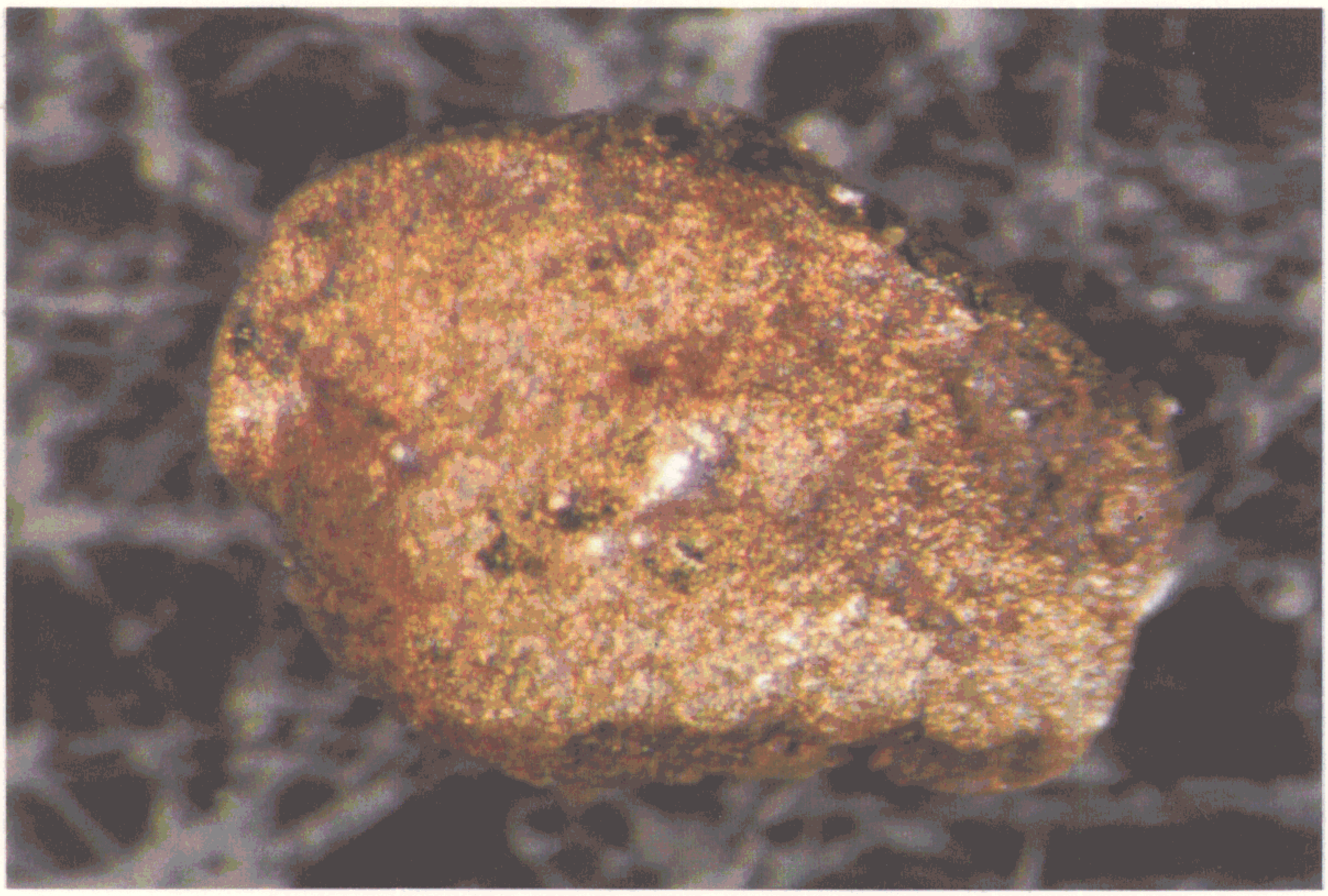
**23.** Detrital gold from the lowermost few centimetres of Tertiary gravel in the old Frenchmans Peak Ltd. Workings at ~~Lucy~~ Nancy Spur. The surface of the grain is distinctively etched (?by groundwater). Magnification x25x4.5



**24.** As for 23. Magnification x50x4.5



**25.** As for 23. Magnification x25x4.5



**24.** As for 23. Magnification x50x4.5

### 4.0 Field numbers & probe mount numbers (Kitto, 1996)

| Field Number | Probe Number | Area |
|---|---|---|
| Nil travel damage, pale colour | | |
| G154 | G353 (1) | Nancy Creek |
| G302 | G353 (2) | Owen Meredith River |
| G206 | G353 (3) | Lucy Spur |
| G150 | G353 (4) | Nancy Creek |
| Major travel damage, rich colour | | |
| G158 | G354 (1-3) | Nancy Spur |
| G148 | G354 (4) | Nancy Creek |
| G172 | G354 (5,6) | Lucy Spur |
| G174 | G354 (7,8,12) | Lucy Spur |
| G318 | G354 (9) | Owen Meredith River |
| G294 | G354 (10) | Lucy Spur North |
| G176 | G354 (11) | Lucy Spur |
| G318 | G354 (13) | Owen Meredith River |
| G328 | G354 (14-16) | Timbs Creek |
| Nil travel damage, medium colour | | |
| G172 | G355 (1-12) | Lucy Spur |
| G174 | G355 (13-22) | Lucy Spur |
| Minor travel damage, medium colour | | |
| G172 | G356 (1-10) | Lucy Spur |
| G174 | G356 (11-22) | Lucy Spur |
| Moderate travel damage, medium colour | | |
| G172 | G357 (1-10) | Lucy Spur |
| G174 | G357 (11-22) | Lucy Spur |
| Minor travel damage, 80% crystallinity, medium colour | | |
| G190A | G358 (1-25) | Rocky River |
| Moderate travel damage, 50% crystallinity, medium colour | | |
| G190A | G359 (1-25) | Rocky River |
| Moderate travel damage, nil crystallinity, medium-rich colour | | |
| G190A | G360 (1-25) | Rocky River |
| Minor-major travel damage, medium colour | | |
| G312 | G361 (1-3) | Owen Meredith River |
| G314 | G361 (4) | Doctors Creek |
| G316 | G361 (5-7) | Finlay Creek |
| G318 | G361 (8-12) | Owen Meredith River |
| Gold intergrown with other minerals | | |
| G190B | G362 (1-6,10) | Rocky River |
| G190A | G362 (7-9) | Rocky River |
| Grains from base of Tertiary gravel - etched surfaces | | |
| G334 | G363 (1-3) | Nancy Spur workings |
| G340 | G363 (4) | Nancy Spur workings |
| G346 | G363 (5) | Nancy Spur workings |
| G348 | G363 (6-10) | Nancy Spur workings |

See Appendix 1 of Turner (1997) for the AMG co-ordinates of the sample sites.

## 5.0 References

276111

Kitto, P.A. 1996. *A petrographic and geochemical investigation of gold: Arthur Mobile Belt, western Tasmania.* Appendix 4 in Turner, N. J. 1997. Exploration Licence No 43/94, Corinna, Tasmania. Annual Report 1995-1996. Goldstream Mining NL and Titan Resources NL.

Turner, N. J. 1997. Exploration Licence No 43/94, Corinna, Tasmania. Annual Report 1995-1996. Goldstream Mining NL and Titan Resources NL.