Grants Gully, Mangana

Alluvial Gold Resource

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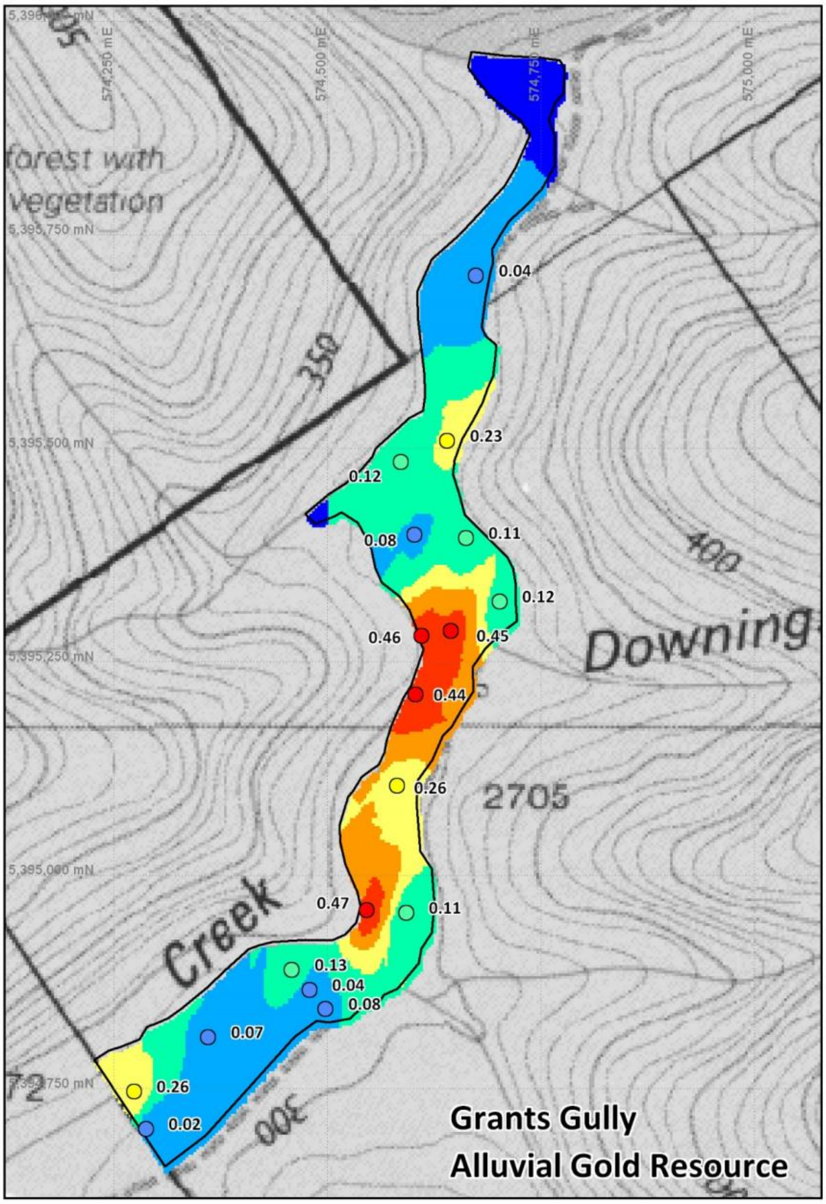
Abstract

An 18 trench alluvial gold sampling programme in Grant's Gully, Mangana, has defined a small resource.

The total resource is 108,465m3 @ 0.17g/m3 with a payable 36,997m3 @ 0.31g/t Au at a 0.2g/t Au/m3 cut-off for 369 ounces in total.



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1.0 Introduction

This report details the sampling and resource estimation of an alluvial gold deposit by Webb Mining Pty. Ltd. at Grants Gully at Mangana.

The report also discusses the potential to increase this resource in the area covered by Webb Mining Pty. Ltd. wholly owned Mining Lease 4M/2013 and Exploration Licence 11/2011.

The author was directly involved in the planning and execution of the sampling programme as well as calculating the resource. The author has 25+ years of experience in mining and exploration, predominantly for gold.

1.1 Location and Access

Grants Gully lies around 2km north-northeasterly from the township of Mangana in Tasmania's northeast. Access to Mangana is by bitumen road. Access to the gold deposit from Mangana is by a gravel road for 2km's.

1.2 Tenure and Land Use

The area covered by the alluvial gold deposit is held under Exploration Licence EL 11/2011 wholly (100%) by Webb Mining Pty. Ltd.

The land is private freehold land owned by Nigel Webb, proprietor of Webb Mining Pty. Ltd.

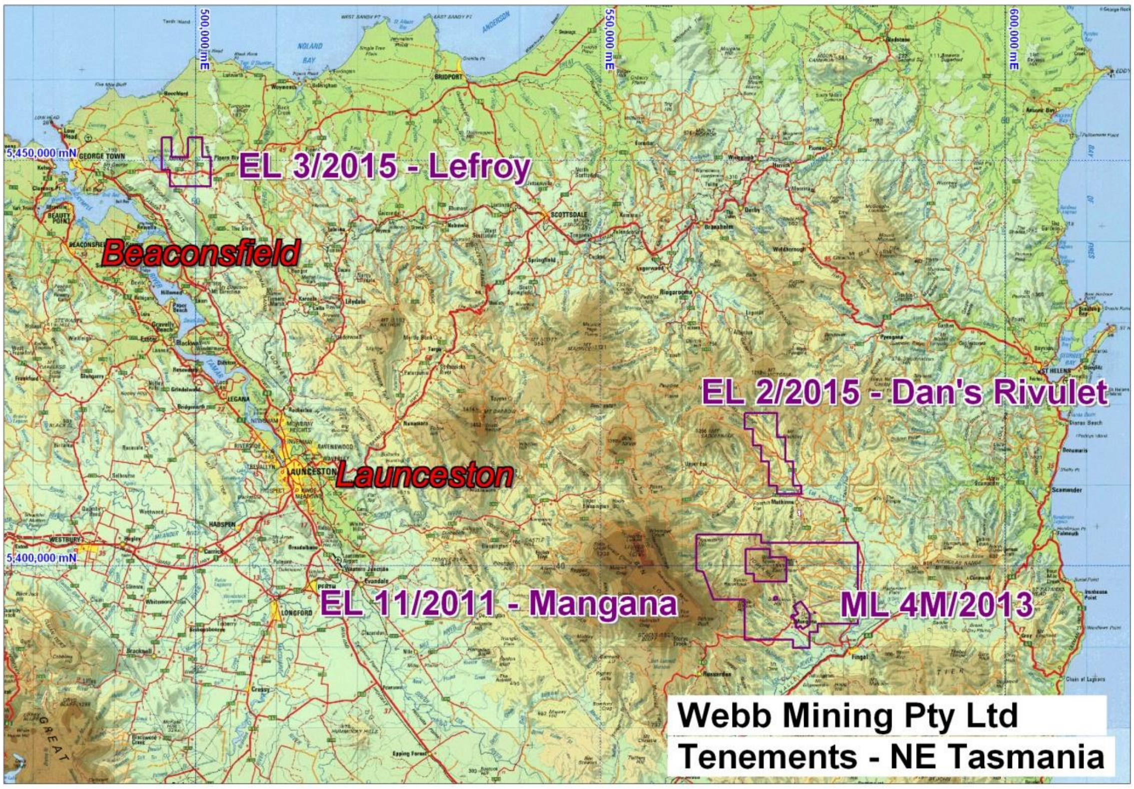

Figure 1.0: Location Mangana in Tasmania's northeastern gold province.

2.0 Geology and Geomorphology

2.1 Introduction

The geology and current geomorphology of the Mangana area show a strong relationship.

Moderately steeply sided hills rise from an essentially flat valley floor to a plateau of around 500 metres above sea level.

The hills are made of Silurian to Devonian aged slates, siltstones, sandstones of the Mathinna Beds (with occasional quartz veining), though slopes, particularly those north facing, can often have a cover of recent scree, often weathered to clay.

The plateau is Tasmania's *Great Unconformity* and marks the erosional basal surface of Permian sediments which remain in small outliers.

Valley floors are made of Quaternary alluvium in the form of pebble to sand grade alluvium which overlies Mathinna Beds bedrock.

2.2 Bedrock Geology

The Siluro-Devonian aged Mathinna Beds are a sequence of shales, siltstones and sandstones of turbidite type. These rocks were extensively folded in the Middle Devonian Tabberrabberran Orogeny on north-northwesterly oriented fold axis. It was at this time that gold bearing quartz reefs, the ultimate source of the gold in Grants Gully, were formed in these Mathinna Beds rocks.

The folding of these rocks produced a strong cleavage which is often the dominant surface recognisable within these rocks when outcropping, and which has played a role in trapping gold in berock crevasses. The cleavage surface is sub-vertical and strikes north-northwest.

2.3 Grants Gully Geomorphology

Over the bulk of its length Grants Gully maintains a north-northwesterly trend. The gully is characterised by moderately steep slopes on its northwesterly side and moderate slopes on its southeastern side.

The valley floor is sub-horizontal and the creek only drops around 15-18m over 1.4km. The creek commonly has a bedrock floor though occasionally it is choked with alluvium in the floor..

There is a higher stand surface on the northwest side of the creek from trenches 4B across to 4U, however, this surface tapers upwards towards a major side gully and is probably an alluvial fan. Similar alluvial fan type gully outwash deposits occur at the mouth of the two major gully's on the southeastern side also.

The bedrock floor of the gully is quite remarkably sub-horizontal with no evidence of the steep sides which characterise the current valley.

Locally bedrock contacts do show development of gutters and ridges with gutters up to 1.5m deep with respect to the average floor position e.g. TR1 (also TR3.5 and TR4B sect 10-20 to 1m deep).

Bedrock varies from a fresh bluey to greenish grey colour with recognisable bedforms and cleavage in some localities, to variably weathered clayey material in others. The degree of weathering of the bedrock and overlying alluvium is commonly related.

In a number of instances it was very difficult to determine the point at which wash gave way to bedrock.

The alluvial sequence is generally reasonably consistent with a relatively thin coarser (cobble to occasionally boulder grade) basal wash overlain by a relatively thicker layer of finer (pebbly) wash topped by a loamy to clayey soil.

The wash consists predominantly of Mathinna Beds shale, siltstone and sandstone, and lesser Permian sandstone and conglomerate.

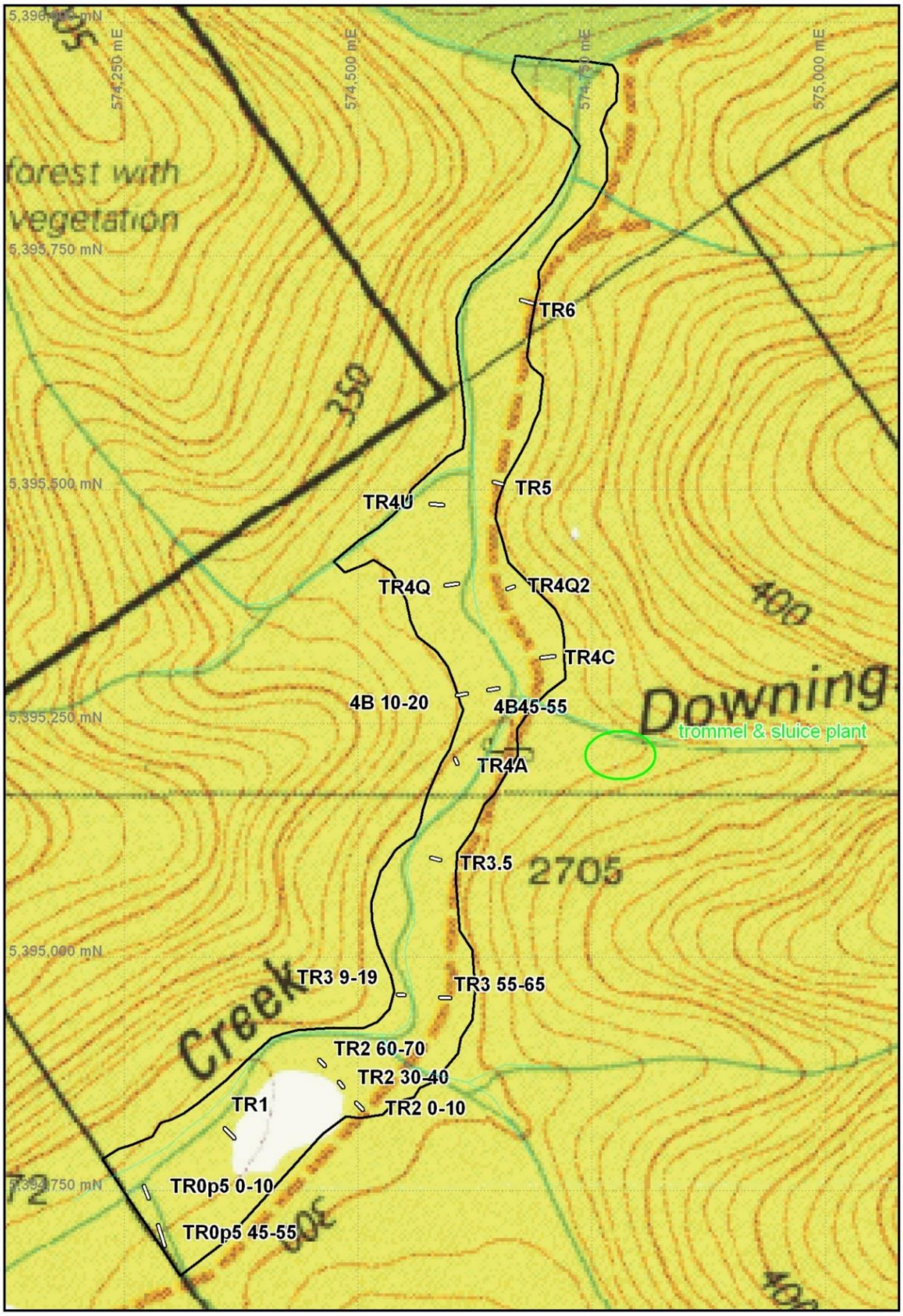

Figure 2.1: Grants Gully trench locations on topography. Solid black outline defines extent of alluvium as modelled. Mangana township lies 1km southwest of the lower left corner.

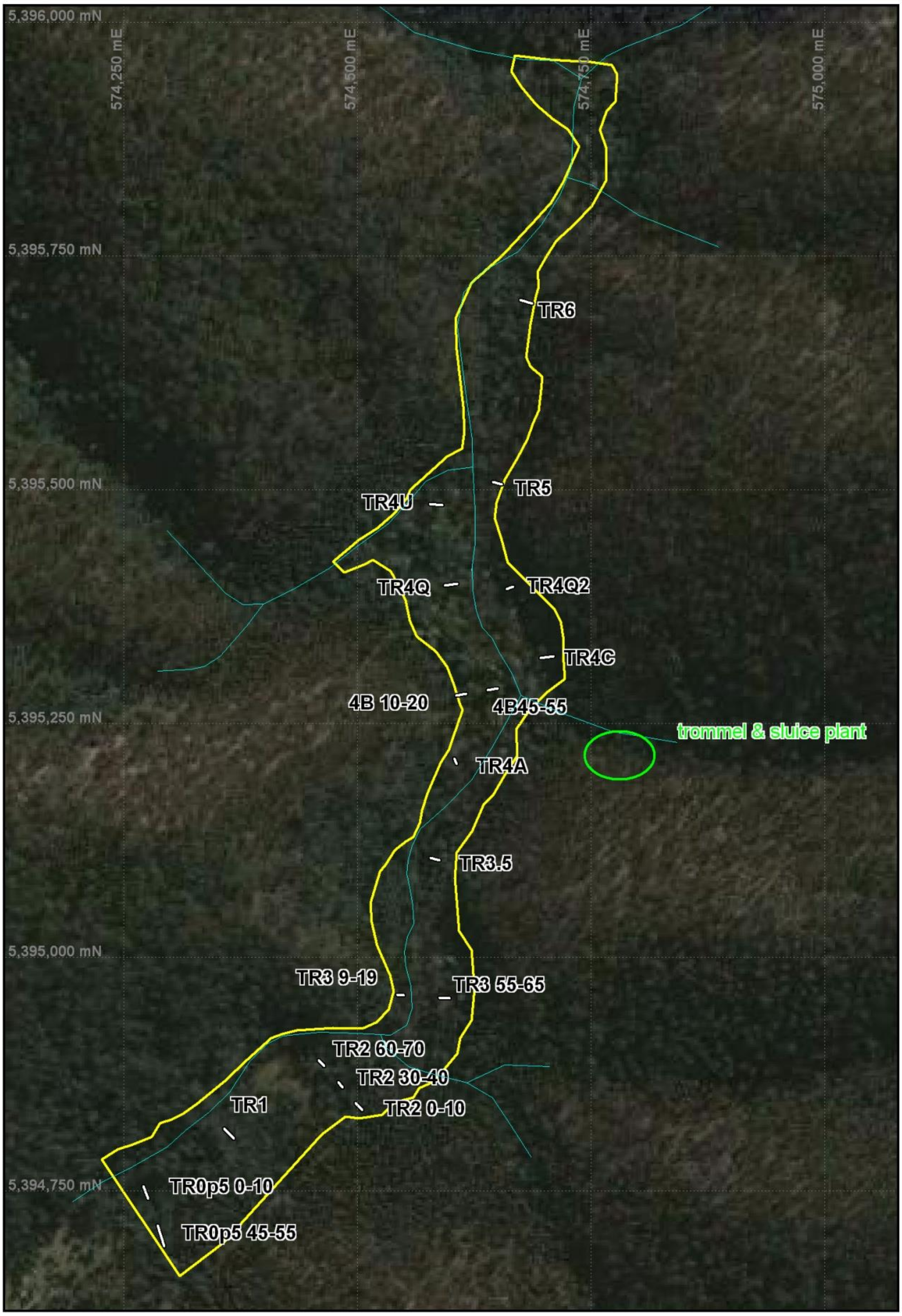

Figure 2.2: Grants Gully trench locations on airphoto. Solid black outline defines extent of alluvium as modelled.

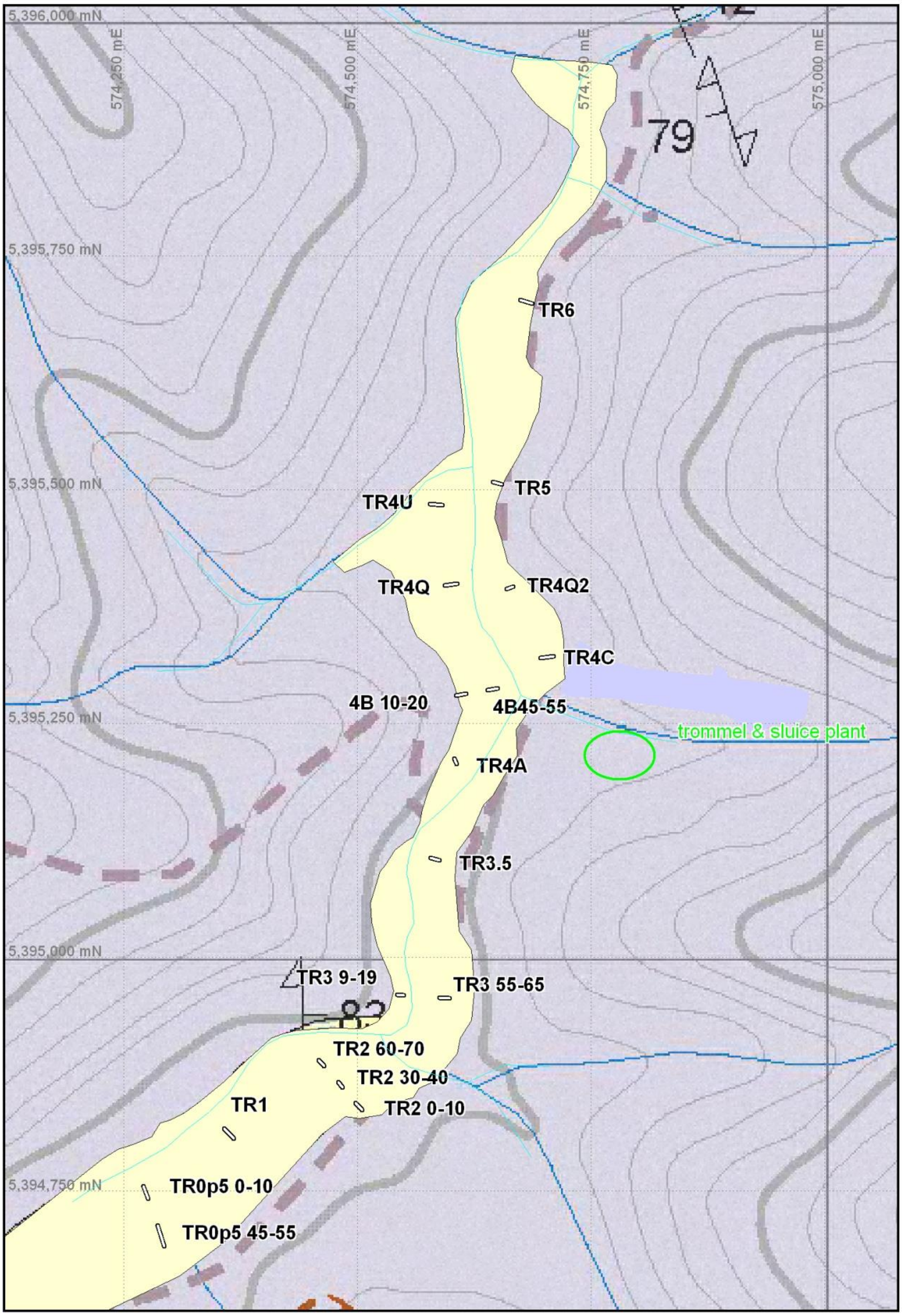

Figure 2.3: Grants Gully trench locations on geology. Pale purple is Mathinna beds, pale yellow alluvium.

The wash is well rounded but commonly disk to ellipsoidal shaped reflecting (1) the degree of erosion the wash has experienced, and (2) the commonly strongly cleaved nature of the Mathinna Beds and well bedded nature of the Permian sandstones.

The coarser basal wash is cobble (64mm to 256mm) to occasionally boulder (>256mm) grade, commonly 150-250mm with the largest boulders ~1m and rare.

The overlying finer grained wash is pebble grade (4-64mm).

The matrix to both coarser and finer wash types varies from a loose loamy material making the trench walls unstable, to a well developed clay making trench walls tight and stable. In wash with clayey matrix the clasts themselves have also turned into clay making recognition of wash type and bedrock contact difficult.

The upper layer varies from a loamy soil with rare to occasional pebble grade wash to orangey brown clay, again with or without occasional pebbles.

Figure 2.4: Grants Gully looking east from road near trench TR2 0-10m.

Figure 2.5: Grants Gully looking east from road near trench TR 3p5.

Figure 2.6: Grants Gully looking east from road near trench TR4C.

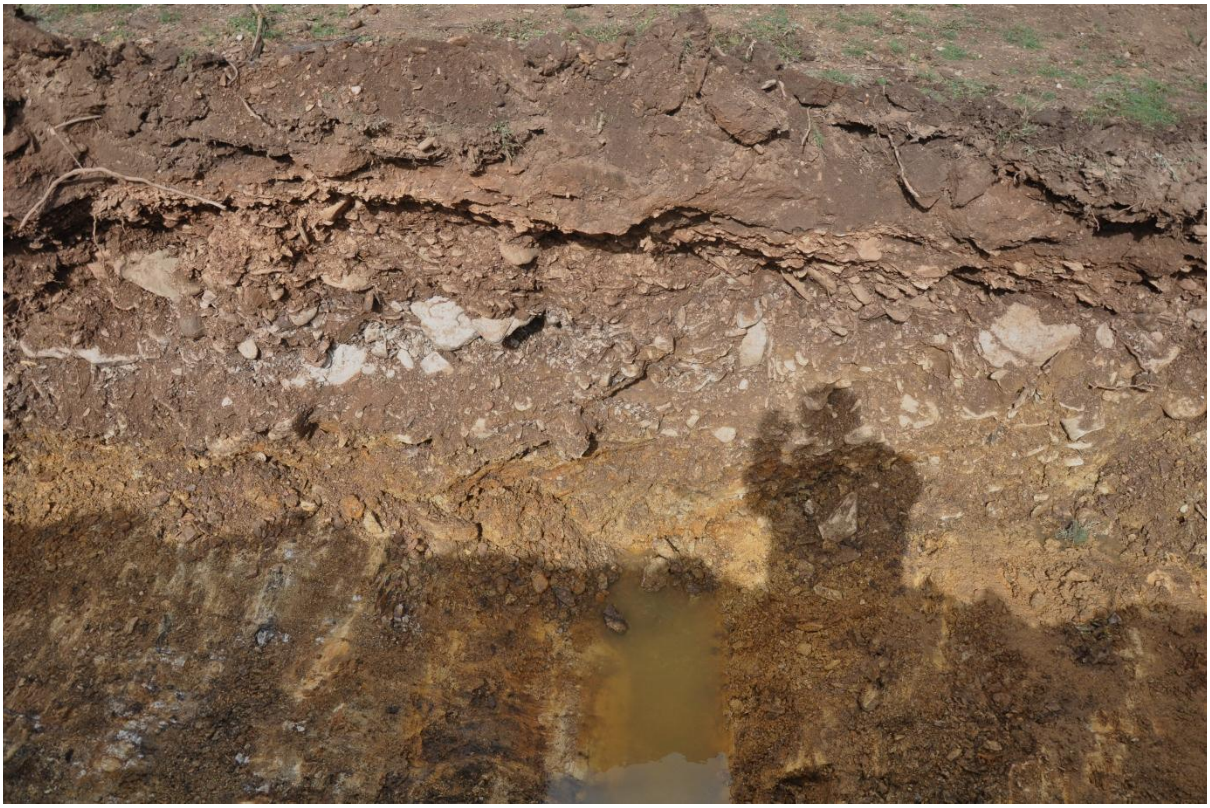

Figure 2.7: Loamy soil overlying finer wash in tunr overlying carser wash with a moderately clayey bedrock surface. Trench TR4C.

Figure 2.8: More clayey topsoil overlying coarse wash with a moderately clayey bedrock surface. Trench TR5.

2.4 Resource Geology

The viable resource defined by the work described below occurs in the basal coarse grained wash and on and in cracks and depressions in the bedrock surface. Sampling focused on taking the lowermost 0.5m of wash and uppermost bedrock. Whilst in many instances this broadly corresponded with the top of the coarse wash in others it didn't. Hence the upper contact of the resource is more correctly defined by height rather than geology.

The lower contact is defined at the depth of bedrock at which all potential gold bearing cracks and depressions have been removed.

Some potentially gold bearing alluvium occurs upstream of the defined resource but in more discrete separate and small areas.

Downstream the resource is marked by a change in freehold title.

2.5 Gold Geology

Gold grains are predominantly flat and <2mm in diameter. In addition 6 coarser "pickers" to 5mm with sub-rounded margins were collected. One piece had attached quartz vein material.

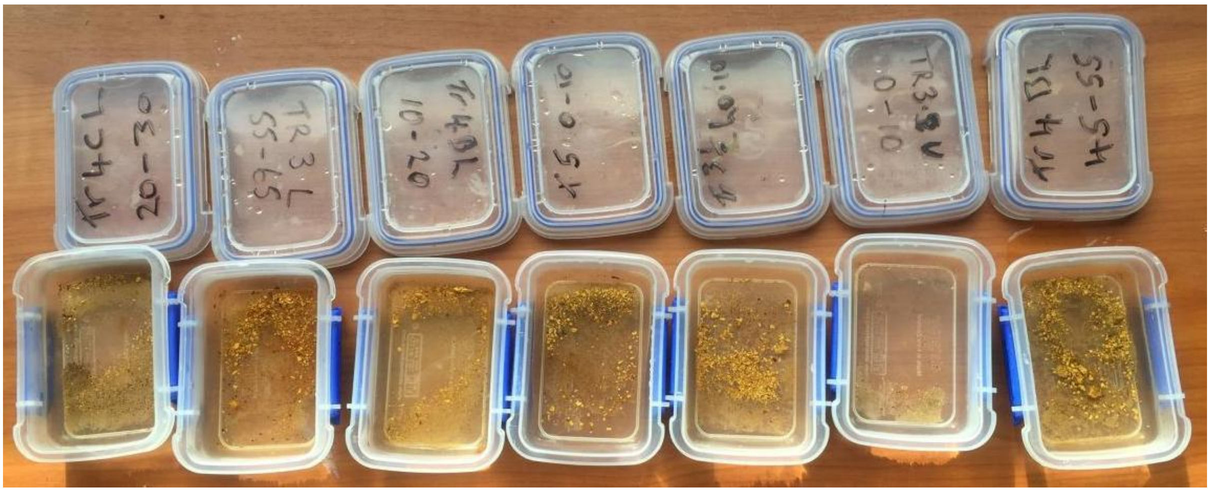

Figure 2.9: Gold from a number of trenches.

3.0 Previous Exploration and Alluvial Gold Working

3.1 Introduction

3.2 Historical Alluvial Gold Working

The Mangana goldfield produced a significant portion of its total gold endowment from alluvial workings. Significant producers were Majors Gully, Sailors Gully and Sharkeys Gully.

Surprisingly there is no evidence of alluvial gold workings in Grants Gully. Twelvetrees (1913) refers to the fact that the land was granted as private freehold before the onset of gold mining thus stopping any alluvial gold working.

Much of the evidence of historical working can be seen as circular shafts which open out in the bottom half metre or so in 360 degrees. These shafts are located 2-3m's from one another indicating that the horizontal workings at the base of this shaft extend out a 1-1.5m's or so. The diggers of these shafts were clearly targeting the basal wash and bedrock contact.

3.3 Modern Alluvial Gold Exploration

Modern exploration for alluvial gold in the Mangana area commenced with some trenching by Tasminex (Charlton, 1980) along Richardsons Creek but which included a trench across the mouth of Grants Gully which had better results (over 0.5m) of 0.3 and 0.253 g/m3.

Alex White mined Majors Gully in the 1990's. Reporting is poor and it is suspected that as much as 10,000 ounces may have been won though 5,000 is commonly cited.

4.0 Sampling Methodology and Results

4.1 Introduction

The sampling programme was carried out (intermittently) in the months of March and April, 2015.

The work utilised a 20 tonne excavator, a 25 tonne articulated mine truck (moxy), an on-site alluvial test plant and a gemini table at the Sailors Gully mine site's mill around 2km's south of Grant's Gully. The work was carried out by the author and variably by four Webb Mining Pty. Ltd. employees Bill Parker (excavator/truck), Jamie Pross (test plant operator), Steve Parker (gemini table and final wash up) and Paul Stevenson (fitter/leading hand).

Following a small preliminary programme of test pitting a total of 194m's of trenches were dug in 18 discrete nominally 10m long trenches.

4.2 Preliminary Test Pits

Initially a small programme of smaller test pits were dug to bedrock with a 20 tonne excavator at a number of the planned trench sites in order to (1) map and measure the nature and thickness of the alluvial strata and the nature and depth of bedrock, and (2) provide some information about the distribution of alluvial gold.

Approximately 10kg samples were collected by hand, sieved through 10mm mesh and the finer fraction then washed on the gemini tables. Samples were collected according to geology with a separate sample for upper soil, finer wash, coarser wash and a separate sample of basal wash/ upper bedrock.

This work showed;

- The bedrock surface lies at a depth 1-3m's, maximum 4m (where tested) evenly across the valley floor.
- The alluvial sequence is generally characterised by a relatively thinner layer of coarse wash at the base overlain by a relatively thicker layer of finer shingly wash topped by a relatively thin layer at the surface ranging from loamy soil to clay.
- There is variable clay development.
- Gold is predominantly found in the coarser wash and coarse wash/bedrock contact.

4.3 Sampling Plant

The sampling plant was situated in a small gully on the southeast side of the valley.

Material dumped at a single stockpile site by the moxy was fed onto a 100mm vibrating screen by a front-end loader. The -100mm fraction then passed through a ~1.5m diameter trammel with 10mm mesh outside screen. The -10mm fraction then fed onto a 20m long sluice box arrangement with containing mesh, miners moss, carpet and ridged black plastic.

Water for the operation was recirculated out of a number of small dams with only the final wash-up from the sluice box using fresh water pumped from Grants Creek.

Figure 4.1: Alluvial treatment plant in Grants Gully with loader feeding screen leading into sluice.

Figure 4.2; Steve Parker operating gemini table at sailors Gully mine/mill site.

4.4 Trenching Methodology

Trenches were dug with a 20 tonne excavator. Where possible the 1.7m mud bucket was used throughout though in many instances the smaller toothed bucket and very occasionally the ripper were used particularly on the bedrock base and in tighter more clayey ground.

Considerable attention was paid to scraping and removing the upper part of the bedrock itself to ensure that no cracks or depressions where gold is likely to have preferentially accumulated were left behind. All trenches were finished with the smooth edged mud bucket.

Trenches were hand measured by 8m and 60m tape. Each trench was mapped at 1:10 scale.

Trench locations were surveyed and recorded (and pegged) using hand held GPS (+/- 4m accuracy). Trenches along the same line were also located with respect to each other with a common datum pegged surveyed by hand-held GPS. The positional accuracy of the data used in this resource estimate by more accurate surveying of these pegs.

Upon completion of the above work all trenches were filled back in with topsoil replaced last.

4.5 Trenches and Results

The full set of trench results is shown in table 1.

including a 100m vibrating screen feeding a trommel with 10mm mesh in turn feeding a sluice box

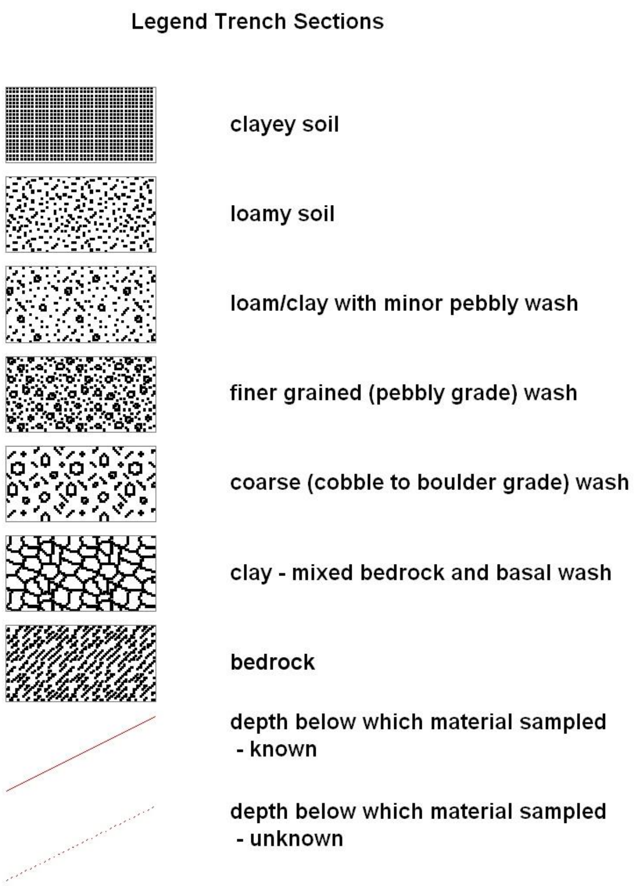

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Figure 4.3: Legend for following trench section maps

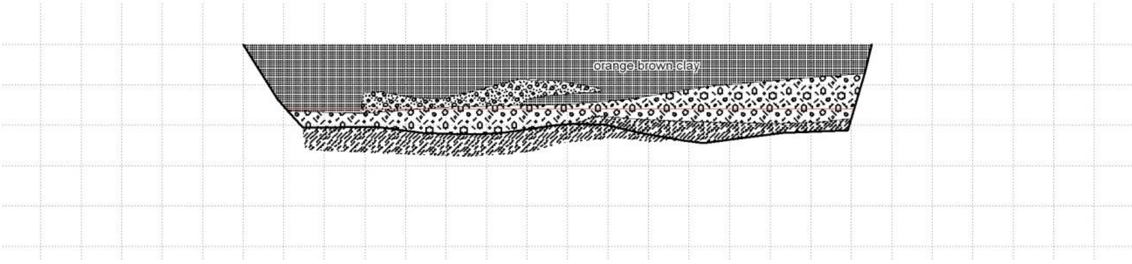

Figure 4.4: TR0p5 sect 0m to 10m

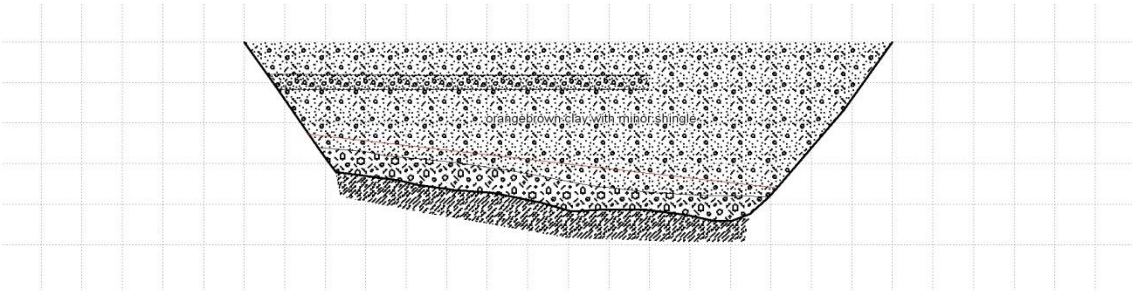

Figure 4.5: TR0p5 sect 0m to 10m

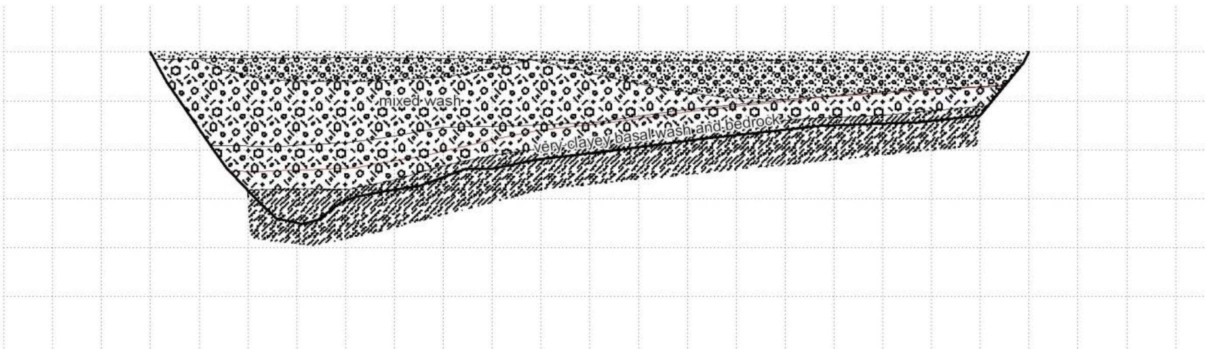

Figure 4.6: TR1 sect 15m to 25m

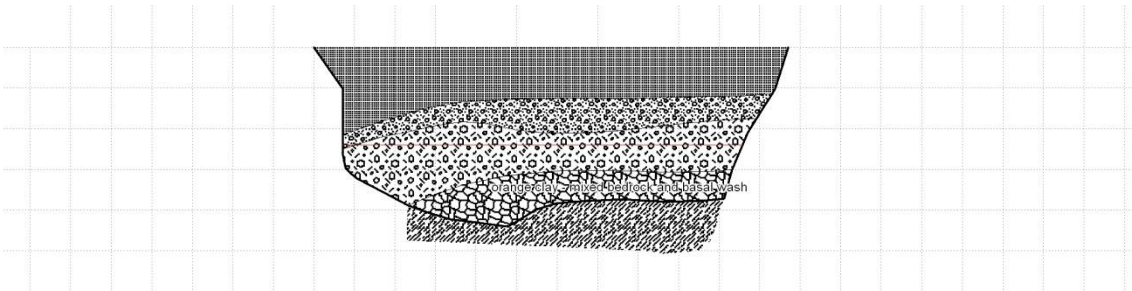

Figure 4.7: TR2 sect 0m to 10m

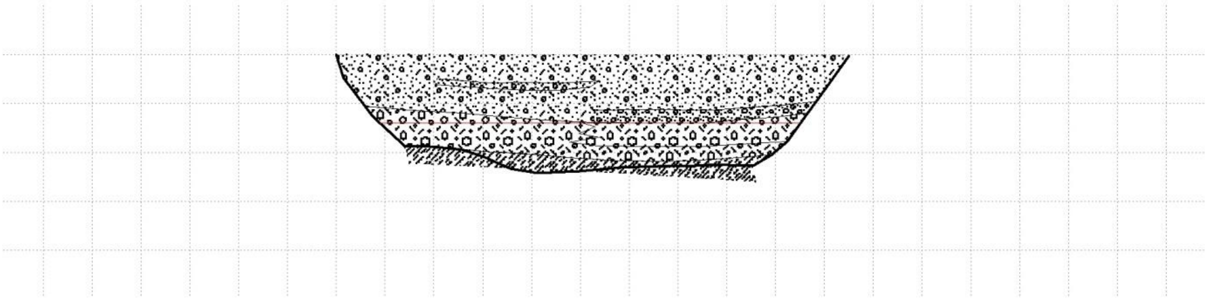

Figure 4.8: TR2 sect 30m to 40m

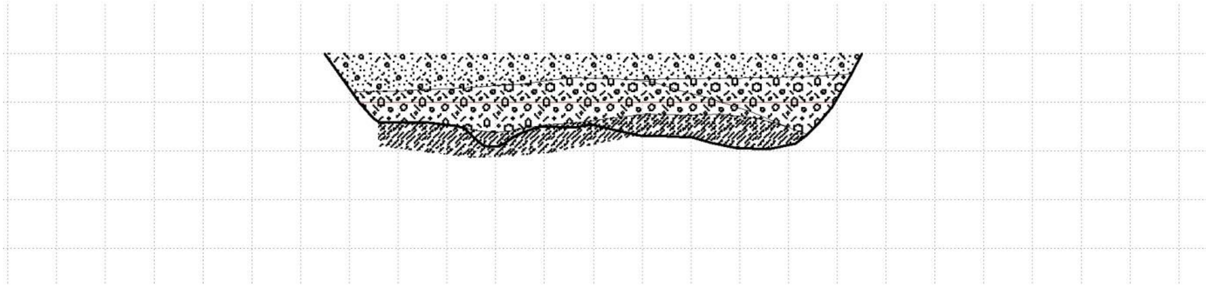

Figure 4.9: TR2 sect 60m to 70m

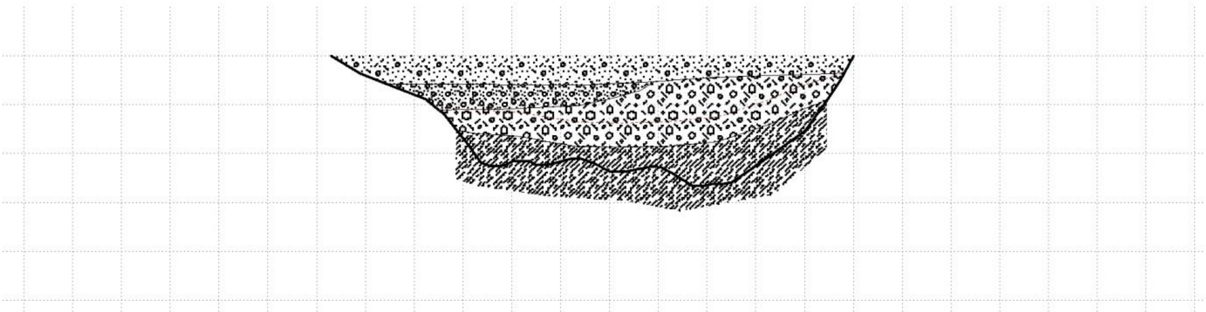

Figure 4.10: TR3 sect 9m to 19m

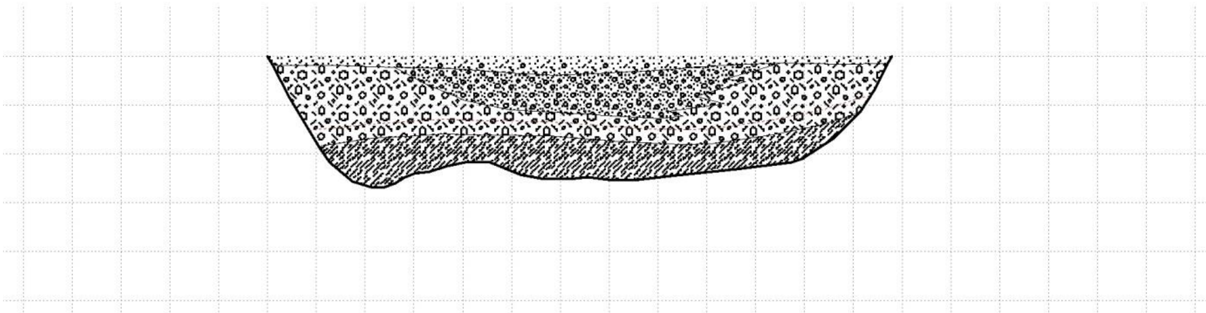

Figure 4.11: TR3 sect 55m to 65m

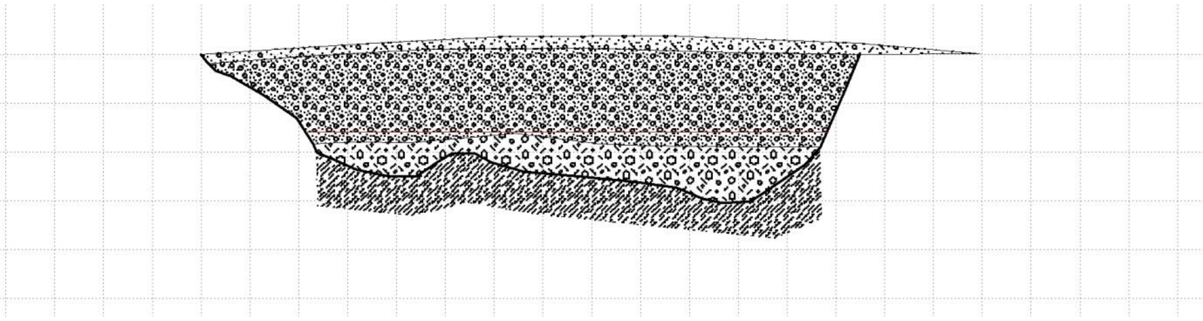

Figure 4.12: TR3p5 sect 0m to 10m

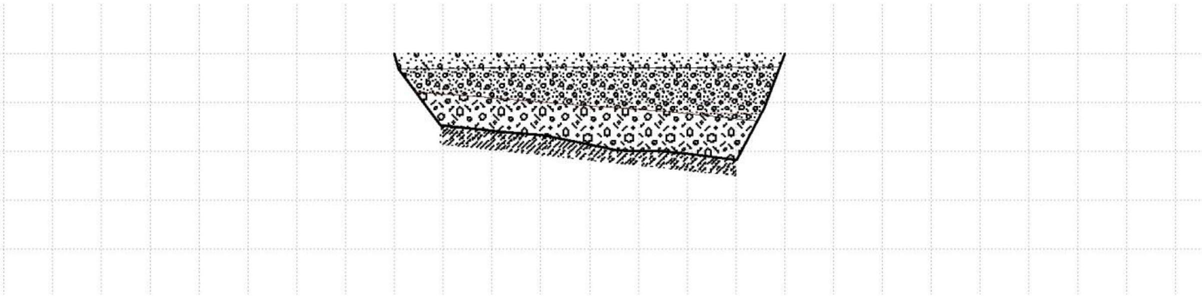

Figure 4.13: TR4A sect 15m to 25m

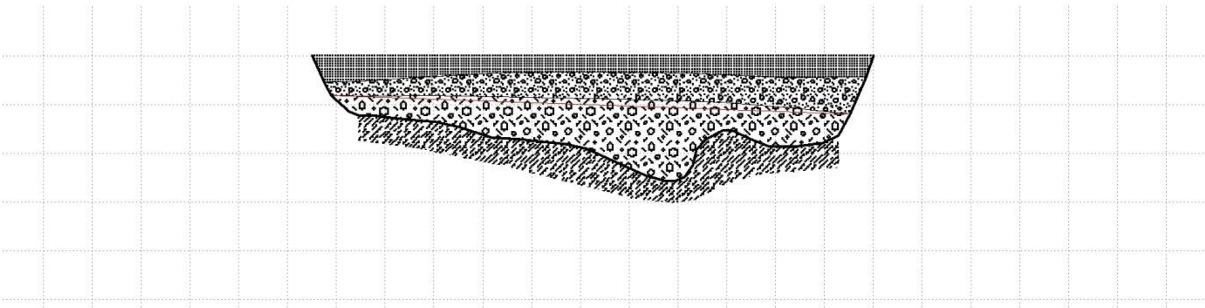

Figure 4.14: TR4B sect 0m to 10m

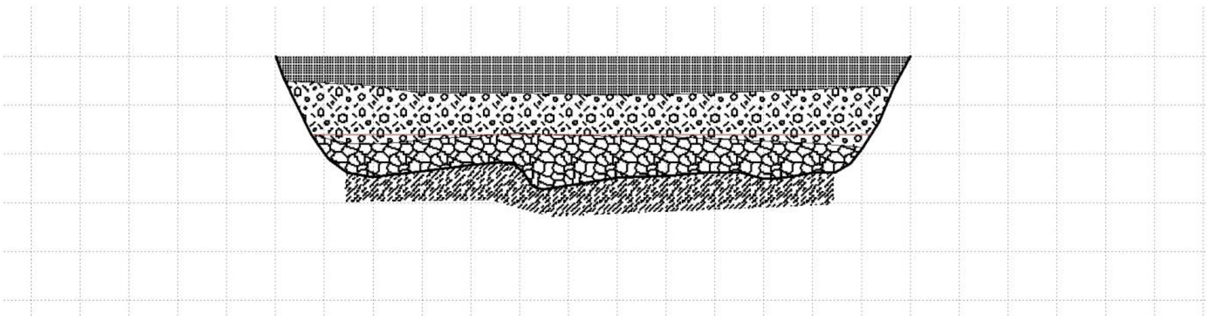

Figure 4.15: TR4B sect 45m to 55m

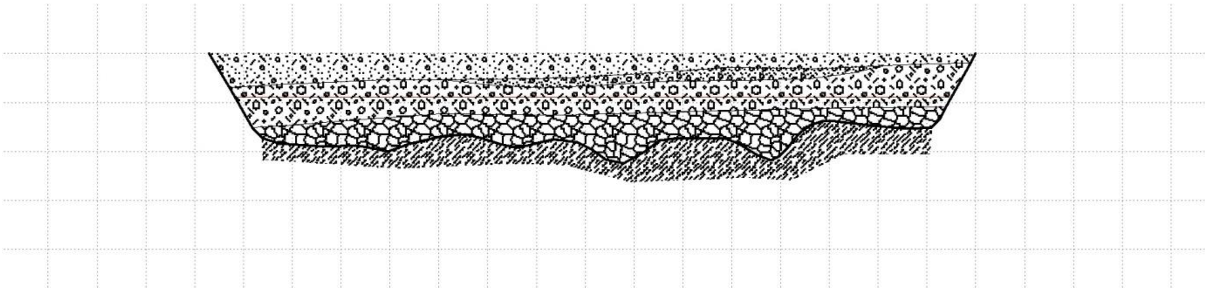

Figure 4.16: TR4C sect 0m to 10m

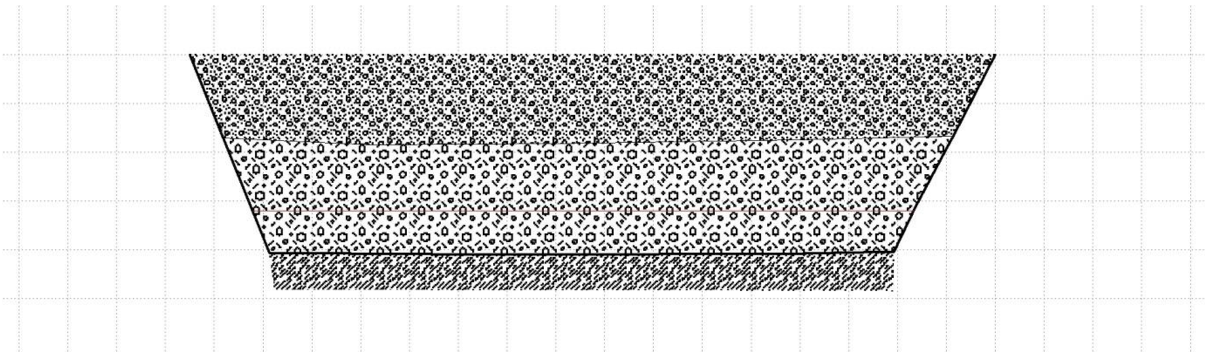

Figure 4.17: TR4Q sect 0m to 10m

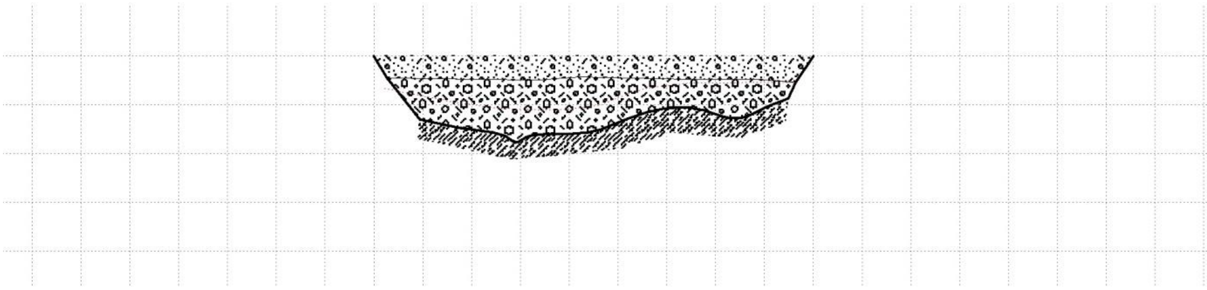

Figure 4.18: TR4Q2 sect 0m to 10m

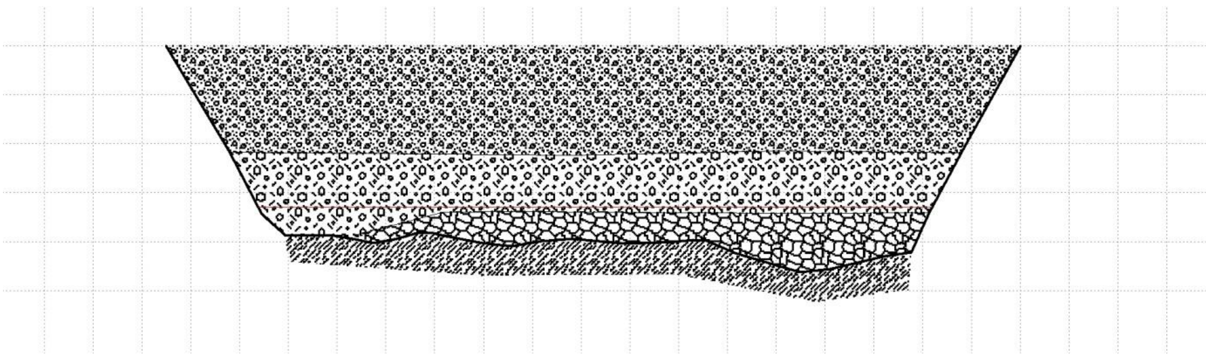

Figure 4.19: TR4U sect 0m to 10m

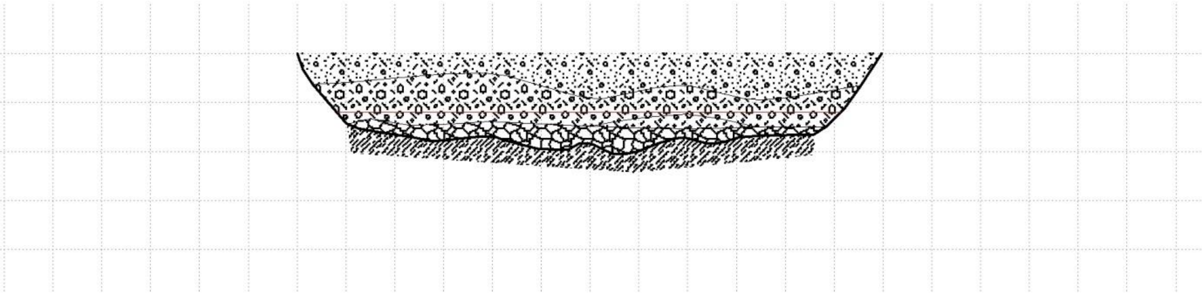

Figure 4.20: TR5 sect 0m to 10m

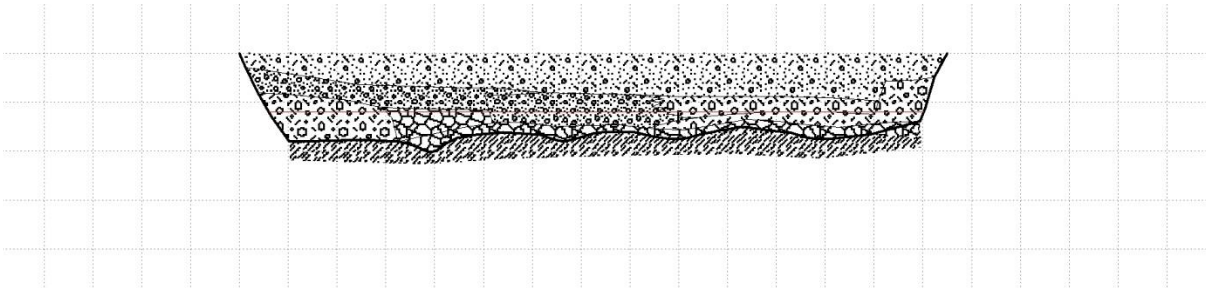

Figure 4.21: TR6 sect 0m to 10m

5.0 Resource Estimation

5.1 Introduction

Alluvial deposits are difficult orebody types to calculate resources for. Grade can be quite variable, there is a requirement to bulk sample material and the distribution of the gold is controlled by a palaeo-river whose geometry and topography only really becomes clear as mining progresses.

For this reason it is only reasonable to justify classification as an Inferred Resource under the JORC framework.

5.2 Sample Data Quality

Sample quality was mostly impacted in the actual digging and removal of the material in the trench.

Sample transport and processing was essentially clean with care taken in all steps of the process. The mats, carpet, miners moss and mesh in the slice were carefully cleaned after each sample.

Processing of the concentrate on the gemini table was also carried out with care.

Sample quality in the trench was affected by;

(1) The presence of water with digging under water difficult.

(2) The nature of bedrock surface with undulating hard surfaces difficult to ensure all possible gold bearing fractures are dug.

(3) The depth of trench with collapsing walls in deep trenches an issue.

(4) The nature of the wash with wash ranging from tight and clayey to free.

5.3 Estimation Methodology

Sample volumes were estimated by two means. Initially it had been planned to just use accurate trench measurements to calculate bank cubic metre's. This proved satisfactory in many instances, however, the walls in a few trenches collapsed whilst digging leading to a loss of control over volume excavated and taken as gold bearing wash and thus the introduction of potential error.

Trenches were mapped whilst being sampled and the depth at which sampling commenced measured. From this a sectional area was calculated which with average width gives bank cubic metre volume.

The sectional area/average length is the average height of sample taken. Whilst the targeted depth was the basal 0.5m to 0.7m the average depth dug was 0.84m.

A total of 18 trenches were excavated with a total measured in-ground volume of material taken for sampling as gold bearing wash of 358.5m3 (as determined from bcm measurements). This was compared with

Individual gram/m3 grades have been calculated for each trench using the bcm measurements i..e. sectional area (as shown on section) x average width = bulk cubic metre volume in-situ.

During sampling the loader operator feeding the screen with sample material dumped was asked to try and maintain consistency in filling the bucket and to count the buckets per sample.

A total of 273 loader buckets equated to the 358.5m3 giving a LCM of 1.31. Individual gram/m3 grades have been also calculated for each trench from these bucket count loose cubic metre volumes.

It was considered preferable in the first instance to use bulk cubic metre volumes, however, in those instances where the discrepancy between the expected bcm volume measured in the trench and the volume as determined by bucket count is in excess of 30% it is considered more accurate to utilise bucket count. It is recognised there is some circularity in these calculations making them approximations.

Trenches in which this is considered necessary are;

- TR2 30-40m, TR2 60-70m and TR 4A 5-15m where the actual lcm was significantly less than that expected from the bcm measurements (i.e. -46%, -37% and -50% respectively), and
- TR4Q 50-60m, TR3 9-19m and TR0p5 0-10m where the actual lcm was significantly more than that expected from the bcm measurements (i.e. +37%, +36% and +43% respectively).

The most accurate results are thus considered to be the combined bcm and lcm data in the far right column in table 5.1.

Table 5.1 Trench sampling data

Trench	**Grams_Au**	**Buckets**	**sectional_area m2**	**Mean_length m**	**Mean_width m**	**calculated_mean_height m**	**BCM_calc**	**LCM_vol**	**% diff LCM & BCM**	**Au g/m3_by_BCM**	**Au g/m3_by_LCM**	**Au g/m3 combined BCM LCM**
TR0p5 0-10 L	3.8	16	7.7	14.5	1.9	0.53	14.63	20.96	43	0.26	0.18	**0.26**
TR0p5 45-55 L	0.4	16	10.4	11	1.9	0.95	19.76	20.96	6	0.02	0.02	**0.02**
TR1 15-25 L	1.5	16	9.7	15	1.8	0.65	17.46	20.96	20	0.09	0.07	**0.07**
TR2 0-10 L	3.1	30	18.8	10	2.6	1.88	48.88	39.3	-20	0.06	0.08	**0.08**
TR2 30-40 L	0.62	7	6.5	8	2.6	0.81	16.9	9.17	-46	0.04	0.07	**0.04**
TR2 60-70 L	1.93	7	6.05	9	2.4	0.67	14.52	9.17	-37	0.13	0.21	**0.13**
TR3 9-19 L	9.04	20	8	7	2.4	1.14	19.2	26.2	36	0.47	0.35	**0.47**
TR3 55-65 L	3.1	22	10.8	10.5	2.4	1.03	25.92	28.82	11	0.12	0.11	**0.11**
TR3.5 0-10 L	4.8	14	9.3	10	2.1	0.93	19.53	18.34	-6	0.25	0.26	**0.26**
TR4A 5-15 L	6.9	6	5.1	6.5	3.1	0.78	15.81	7.86	-50	0.44	0.88	**0.44**
TR4B 10-20 L	4.8	8	7.7	10.5	1.9	0.73	14.63	10.48	-28	0.33	0.46	**0.46**
TR4B 45-55 L	8.8	15	8.93	11	2.1	0.81	18.753	19.65	5	0.47	0.45	**0.45**
TR4C 20-30 L	2.7	17	12.7	14	2.1	0.91	26.67	22.27	-16	0.10	0.12	**0.12**
TR4Q 50-60	2.1	28	11.6	13	2.3	0.89	26.68	36.68	37	0.08	0.06	**0.08**
TR4Q2 0-10 L	1	7	4.1	7.5	2.2	0.55	9.02	9.17	2	0.11	0.11	**0.11**
TR4U 20-30 L	3.4	22	10.7	13.5	2.3	0.79	24.61	28.82	17	0.14	0.12	**0.12**
TR5 0-10 L	3	10	5.6	10	2.1	0.56	11.76	13.1	11	0.26	0.23	**0.23**
TR6 10-20 L	0.6	12	6.56	13	2.1	0.5	13.776	15.72	14	0.04	0.04	**0.04**
		sum 273				mean 0.84	**sum 358.5**			**mean 0.19**	**mean 0.21**	**mean 0.19**

6.0 Estimated Resource

A resource was estimated using SURPAC software.

Each trench was represented by a single assay. No consideration was given to depth variation across the resource in this first pass estimation and the average depth of 0.84m was used and is recognised in being an approximation. The estimation method used was ID2

Better modelling would attempt model the distribution of the wash and would also require better resolution in sampling between wash types.

Table 6.1: Grants Gully Alluvial Gold Resource

Cut-off Au g/m3	Volume m3	Au g/m3	Au ounces
0	108,465	0.17	593
0.1	75,154	0.22	532
0.2	36,997	0.31	369
0.3	19,231	0.37	229
0.4	7,030	0.43	97

The total resource is 108,465m3 @ 0.17g/m3 with a payable 36,997m3 @ 0.31g/t Au at a 0.2g/t Au/m3 cut-off for 369 ounces in total.

Figure 6.1 shows the higher grade portion to lie in the middle of the valley and closer to the northwest bank.

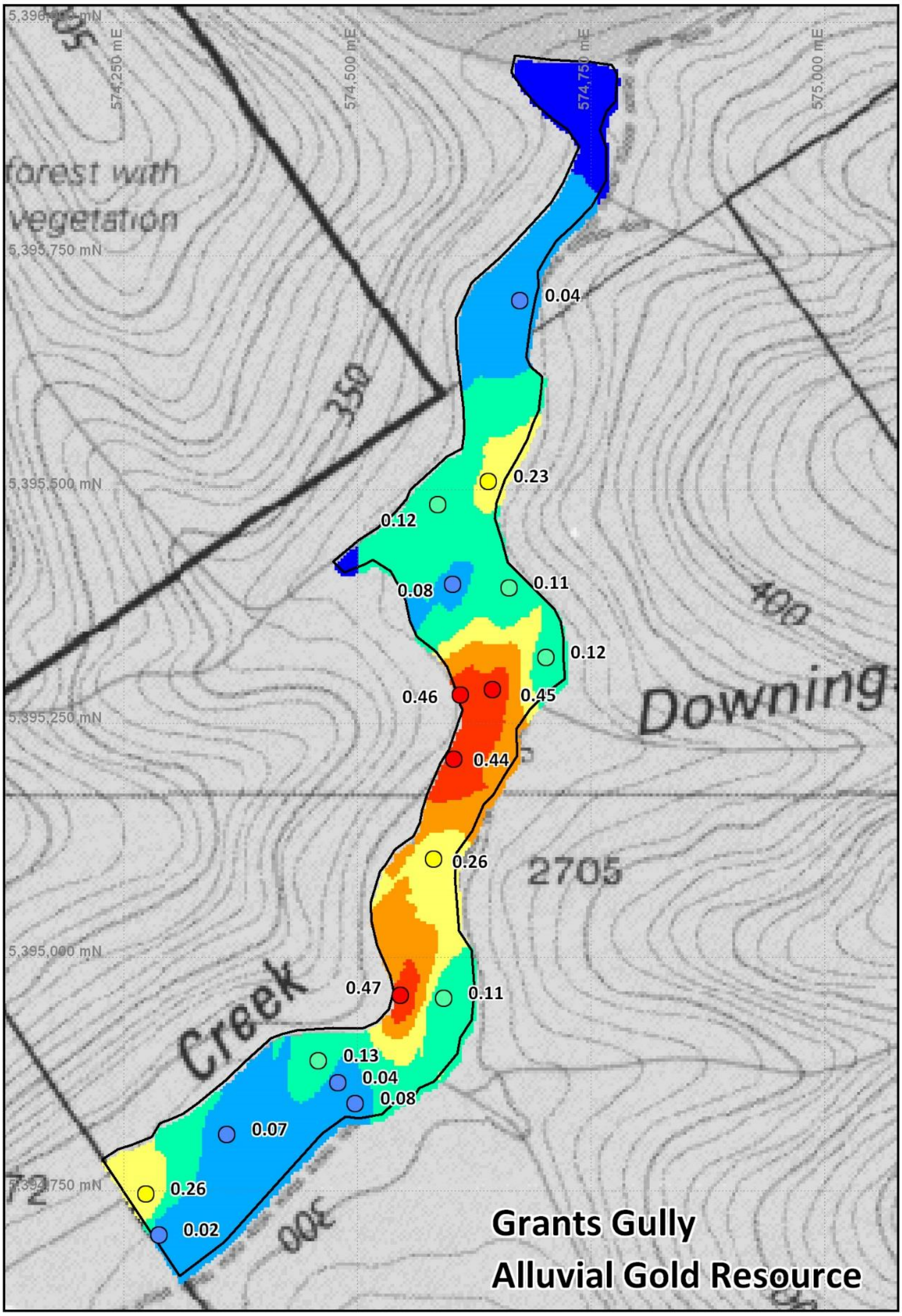

Figure 6.1: Grants Gully alluvial gold resource showing Au g/m3 grades on ID2 model image.