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Gulgong gold deposits

Mineral Resources

Gulgong is in the Mudgee District, 340km by rail from Sydney, and has a population of between 2-3 000 people.

The township is 472m above sea level and situated upon the northern end of a low range of hills which form the watershed between Wyaldra and Cooyal Creeks on the east and the Cudgegong River on the west.

Prior to 1870, the site of the Gulgong township was a sheep-run owned by the late Mr R. Rouse.

The discovery of rich alluvial gold leads in April 1870 brought a great influx of prospectors and Gulgong, Canadian and Home Rule became important gold-producing centres, supporting a population of 18-20 000 people.

The alluvial leads in the district were among the richest in the State. Within the first four years of discovery, over 300 000 ounces of gold were recovered.

The Gulgong Goldfield produced £2 175 000 of gold, most of which was won from old stream gravels as much as 60m below the surface several kilometres from Gulgong. This deep ground was discovered by tracing the ordinary shallow gold of the present-day streams at Gulgong itself to points where they dip gently under the basalt.

The richest gold deposits were found in the upper parts of the old buried water-courses.

History

Gold was first reported in the area north of Gantawang in October 1852 by Mr S. Stutchbury.

In June 1867, gold in commercial quantities was found at Two Mile Flat on the Cudgegong River, 19km west of the present village of Gulgong.

A little later the Australian Diamond Mines Company of Melbourne commenced operations close to the junction of the Wyaldra Creek and Cudgegong River, 8.8km west of Gulgong.

Hand boring plant, Home Rule Gold Mine, c1880

They reported that, “At first the ground yielded at a rate of 4 to 5 diamonds and 4dwts of gold to the load, but, afterwards fell off to 1 diamond in 2 loads”.

Mr Tom Saunders, who was employed at Surface Hill, picked up 14 ounces of nuggetty gold at Red Hill.

He reported his find as ‘payable gold’ to Sergeant O'Donnel at Two Mile Flat on Holy Thursday, April 1870. This started a small ‘rush’ of miners from Two Mile Flat to the scene of the discovery.

It was not long then until Adams' Lead was located by R. Adams and party.

By June 1870, more than 500 people were on the ground and 17 different parties reported payable gold.

The Black Lead was next discovered and attracted a further crowd of miners, increasing the population to 3 000 in January 1871.

The Happy Valley, Parramatta, Black Swan, All Nationals, Coming Event, Three Mile, Victorian, Star of the South, Rapp's Gully, Caledonian, Perseverance, Fraser and Ford's Creek leads were all found in rapid succession.

The discovery of the rich Canadian Lead in August 1871, and the Home Rule in May 1872 attracted more prospectors to the district. The population in December 1872 was estimated at 20 000.

With the large numbers of prospectors, many with experience gained at other goldfields (Kiandra, Sofala, Parkes, Forbes, etc.), it is no wonder that all the important leads were rapidly located and a period of great prosperity followed.

Reefs

While the alluvial leads were yielding their gold, many prospectors turned to the reefs which should have been the source of the alluvial gold.

Numerous reefs were located and several tons of stone were raised.

In December 1871, the Gulgong Gold Mining and Crushing Company erected a battery of 15 stampers, and in January 1872, Mr Matt of the 'O.K. Machine' had a 10 stamp battery erected at Reedy Creek.

Unfortunately, the 'reefs' were not sufficiently rich or profitable mining and though small parcels of very rich stone were occasionally struck, the average yields were small.

Ore deposits

Two main types of gold deposits occur in the Gulgong region:

1. reefs
2. deep leads

The Gulgong Gold Field Map below shows the location of all known reef deposits of the Gulgong field. The more important of these occur on a broadly north-north west trending ridge which is composed of Burranah Formation sediments that have been intruded by granite. This ridge extends from the southern part of the Gulgong field to as far north as Gulgong itself, and is believed to have been the main locus for shedding of gold into the flanking deep leads. In addition, a number of reef deposits have been discovered and worked during alluvial mining operations. These reefs, in all cases, lie concealed beneath the deep leads, e.g. the Three Mile, Happy Valley and Black leads.

The reef deposits, although rich, were patchy in value and were not able to support a permanent mining operation. In consequence, the direct contribution of the reef deposits to Gulgong gold production is quite small. However, the reefs have undoubtedly contributed much of the gold that occurs within the deep lead system.

Brief notes are here given on the more important reef deposits:

1. Red Hill

This is the site of the original discovery of gold in the vicinity of Gulgong, and has been the object of intermittent mining operations since that time. Red Hill is composed of highly altered claystones of Devonian age which have been intruded by dykes and irregular masses of granodiorite. Irregular and for the most part narrow veins of quartz, carrying free gold in places, traverse the rocks in all directions.

In addition, a more persistent vein on the south side of Red Hill, with a north-south strike and easterly dip, has been recorded. The amount of gold produced from the Red Hill mine is not known, but records indicate that it was worked at least in the periods 1871-1872 and 1900-1918. Gold values obtained were, at times, remarkably high but were not consistent enough to maintain a profitable mining operation.

2. Old Gulgong Reefs

At this deposit, which is located 5km south east of Gulgong, three reefs averaging approximately 60cm in width are localised within hornblende granodiorite. These reefs were discovered early in 1866 and were the first reefs in the district to be worked. Gold values up to 90g/t have been recorded, together with the presence of trace amounts of copper, lead, zinc and iron sulphides.

Prospecting and mining are known to have taken place from 1866-1876 and 1883-1884 and in 1889, but the amount of gold produced is not known.

The Mariner's Reef is situated 549m east of Old Gulgong Reef and was developed to a depth of 11m. The reef is from 15-91cm wide and has yielded values up to 10.89 grams per tonne. There is no recorded production.

3. Louisiana Reef

This deposit occurs 3km south-east of Gulgong and is represented by irregular bodies of quartz close to the contact of granodiorite and 'felsite' country rock.

Prospecting of this deposit took place in the period 1875-1883, but gold values appear to have been too low to support a viable mining operation.

4. Royal George Reef

At this deposit, situated 12km south of Gulgong, a series of parallel quartz veins trending north 20° are localised within slates of the Tinja Formation.

The deposit was worked during 1870-1871, and again from 1878-1879, but there has been no recorded production.

5. Salvation Hill

At this locality slates have been intruded by dykes of granodiorite and 'felsite'. The latter rock is

impregnated with pyrite and some of the oxidised material has been shown to contain gold. Prospecting at this locality took place over the period 1889-1918, but the amount of gold produced is not known.

Each of the above reefs outcrops at the surface; the following reefs were discovered as a result of deep lead mining.

6. Welcome Reef

This reef was discovered in 1871 and occurs beneath the Three Mile Alluvial Lead. It was the first of such reefs to be worked in the Gulgong region. The Welcome Reef was first intersected at a depth of 27.43m below the surface and was traced for about 91m in length. There is no record of the amount of gold produced from this deposit.

7. Parramatta Reef

The Parramatta Reef, which occurs beneath the Parramatta Lead, was also extensively tested by underground workings, but again no consistently high values were obtained.

The Happy Valley reefs occur in the vicinity of the No. 7 Happy Valley alluvial claim. These comprise a number of thin quartz veins which, although containing free gold, were too small to allow a profitable operation.

The Brillant Reef was discovered near the junction of the Parramatta and Black leads in 1896. Total production is recorded as being approximately 1 200 tonnes of ore yielding over 31.10kg of gold.

Additional reefs discovered beneath alluvial workings include the Standard Reef on the Old Standard Lead close to its junction with the Happy Valley Lead and the Never-Say-Die mine, occurring between the Parramatta and Black Leads about 1km west of Gulgong.

The majority of reefs on the Gulgong field have not yielded consistently payable values. The majority are localised either within granodiorite or within slaty sediments that have been intruded by granodiorite or felsite dykes. In consequence, it is assumed that there is a genetic relationship between the gold mineralisation and granodiorite intrusion.

Deep leads

An extensive deep lead system of Middle Miocene age has been preserved in the Gulgong field. The position of the main or Gulgong-Cooyal deep lead is similar to that of the present location of Wyaldra Creek. The pattern of distribution suggests that in Miocene times a prominent north-north west trending ridge composed of sediments intruded by granite formed a topographic high, the erosion of which shed gold, both to the east and west, as well as to the north within a series of tributaries that eventually joined the main river channel.

Typical cross-sections of deep leads from the Gulgong gold field indicate steep sided valleys that have been incised within a bedrock of sediments and intrusive rocks. The valleys have filled with sand and gravel, and in place by basaltic lava flows. The depth of the deep lead system varies according to their location in the field. They are at their shallowest in the vicinity of Gulgong itself. A number of leads outcrop at the surface, but with increasing distance downstream they eventually reach depths in excess of 76m. With increasing depth and inflow of water these leads become more difficult to work and it can be assumed that considerable volumes of gold-bearing alluvial at depths of in excess of 61m still remain on the Gulgong field.

A feature of much of the Gulgong deep lead system is that the gold-bearing gravels are covered by Tertiary basalt. It was the presence of basalt their location to be traced by magnetic methods in areas not previously subject to underground mining operations or boring.

The Main or Gulgong-Cooyal Deep Lead

The position of the main deep lead channel into which the various tributary leads flow must be regarded as approximate only, since it has been definitely determined only in the vicinity of Home Rule, as a result of the sinking by the Department of Mines in 1901-1902 of two lines of bores as well as by an earlier shaft, the David Buchanan Shaft, together with a further series of bores and shafts sunk to the north of Gulgong near the postulated junction of the main lead with the tributary Black Lead. In addition, geophysical work has helped to define the main lead in the vicinity of the Caledonian lead system.

Assessment of the economic potential of the main lead was affected by strong flows of underground water, as well as by inadequate drill sampling techniques. However, overall results were not encouraging, and it has been assumed that the main lead system is unlikely to contain payable gold values. In no case has the junction of the tributary leads with the main lead channel been exposed in underground workings.

Western Group of Leads

The following leads to the west and south-west of Gulgong have been worked: Adams, Moonlight, Caledonian (and tributaries), Three Mile (and associated leads), Perseverance, Louisa, Beryl, Scabby Gully and Tallawang.

Adams

This was the first lead to be worked on the Gulgong field and rises on the western slope of Red Hill. The depths of sinking range from near surface at Red Hill to 45m at the Eureka shaft. The wash dirt averaged 38cm in thickness and ranged up to 91m wide. Gold values are reported to have averaged 18.6c/load. A number of nuggets were found including one of 0.17kg. In the lower portions of the lead, basaltic lava overlies the gravels and gold values tended to decline.

Moonlight Lead

This lead was discovered in 1871. Sinking ranged from 42-60m with basalt present from 12-30m thick. Overall gold values have been low, and there has been no record of any significant production.

The Caledonian Lead and Tributaries (Grecian Bend, Victorian, Red Gate and Little Caledonian)

The total length of this lead from its junction with the main lead system is some 3.6km. Basalt cover rock comes in just below the junction between the Victorian and Grecian Bend leads. The depth of sinking of the Caledonian lead and its tributaries ranged from less than 3m to 40m in the deepest shaft. Wash dirt ranged from 3-30m in width and varied from 15-25cm in thickness. Although values obtained in specific areas were as high as 93g/load, the average yield for the whole lead has been estimated at 7.7g/load. The major period of activity was 1871-1876.

Three Mile Lead and associated leads (Magpie, Springfield, Rapp's Gully, Ford's Creek and Sovereign Leads)

This lead system is situated to the south of Gulgong, the Three Mile Lead taking its rise from the prominent north-south ridge in the vicinity of the Gulgong Reef mine. All of these leads were discovered in the early years of the Gulgong field, and were worked more or less continuously for about 10 years. The Three Mile lead itself was characterised by the presence of gold nuggets. These were recovered from wash that averaged 25cm in thickness and varied from 6-21m in width. The Three Mile lead was worked over a length of approximately 2.4km, the maximum depth of sinking being 40m.

The Magpie, Springfield and Rapp's Gully leads to the south of the Three Mile lead, were worked over a considerable length, but for the most part values were low with occasional rich values being obtained. The width of wash ranged from 6-18m, with an average thickness of 23cm. The depth of sinking averaged 21m. The yield of gold from the Magpie, Springfield and Rapp's Gully leads was estimated to be approximately 3.9g/load. Similar conditions were encountered in the Ford's Creek and Sovereign leads to the west.

Perseverance and Fraser Leads

These leads occur to the west-south-west of Gulgong on the northern side of the main lead channel. Data indicates that the wash dirt was up to 15m wide and averaged 22cm in thickness. Gold values ranged from 6-62g/load for the Perseverance lead, averaging approximately 23g/load and 18.6g/load for the Perseverance and Fraser loads respectively. The depth of sinking reached 38m.

The junction of the combined Perseverance/Fraser leads with the main lead has not been determined, although considerable boring was carried out by the Digger Prince Mining Company in 1923, in an attempt to locate it. Small leads to the west of Fraser's lead include the Louisa lead and the Beryl or Diamonds Field lead, the latter being situated close to the junction of the Wyaldra Creek and the Cudgegong River.

The Scabby Gully lead is located 8km north west of Gulgong. In 1899 it yielded rich gold values over a short period of time.

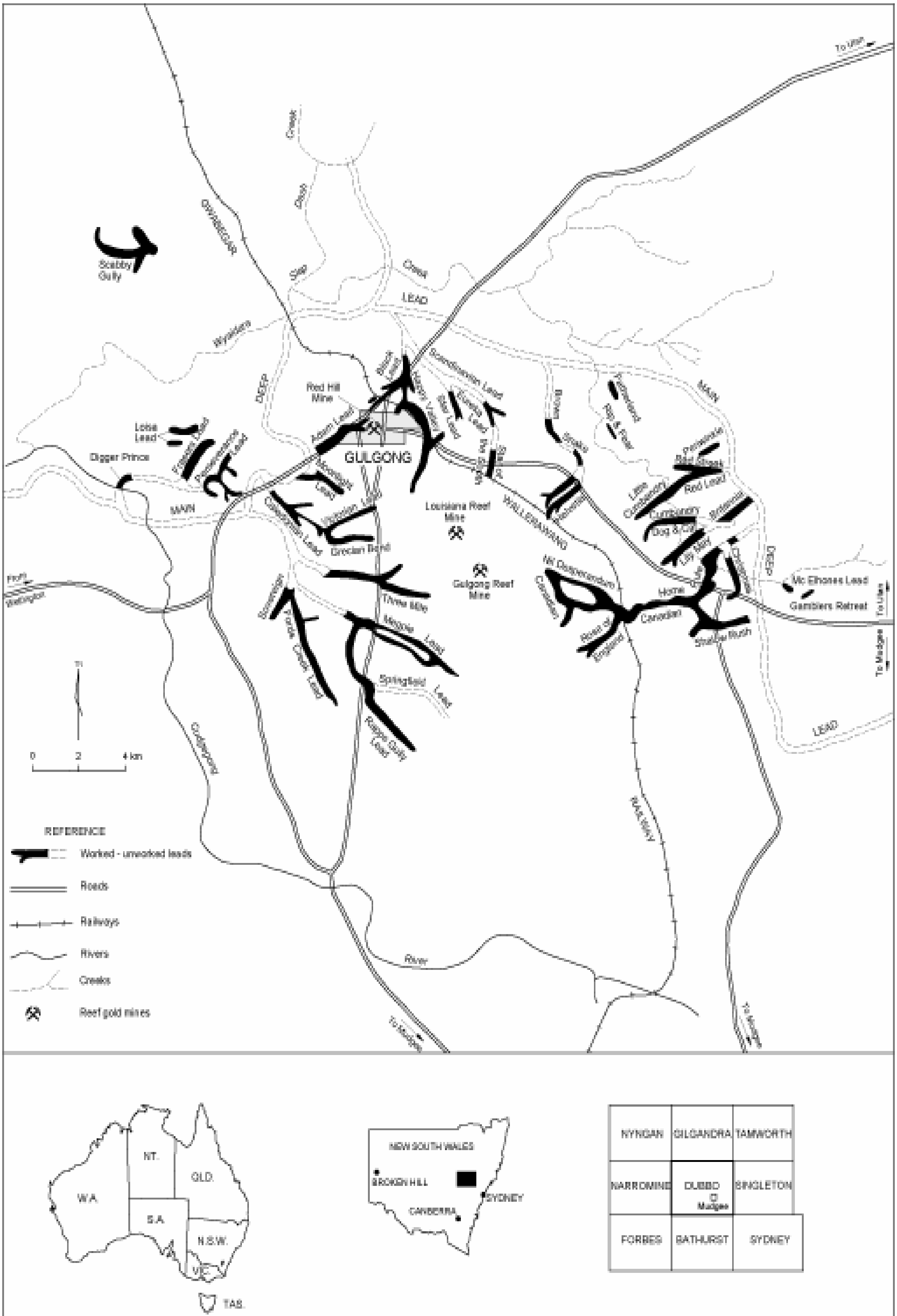
Leads to the North, North-East and East of Gulgong Black Lead and Tributaries

One of the most prolific gold-producing leads of the district was the Black lead discovered in June 1870, shortly after Adams lead had been located. It rises on the northern slopes of Red Hill and trends north-north easterly. The Parramatta and Black Swan tributary leads junction with the Black Hill, while lower down the Black lead is joined by the Happy Valley lead, and subsequently the Cosmopolitan.

Wash dirt in the Black lead averaged 91m wide and 30cm thick. The total area worked is estimated at 388ha. The lead was worked extensively for several years after its discovery, and then decreasingly until 1890. As previously noted the Brillant and Parramatta Reefs were worked beneath the alluvium of the Black and tributary Parramatta leads. The Brillant Reef yielded some 31kg of gold.

It is clear that the Black lead was a prolific producer of gold. In its upper portions large tonnages of wash yielded up to 9kg of gold per load. However, as it was followed downstream a gradually increasing thickness of basalt and increasing width of the river channel resulted in a sharply decreased yield.

The tributary Happy Valley lead contained wash up to 49m wide and averaging 45cm thick. Two large nuggets weighing 2.799kg and 1.773kg were



SIMPLIFIED MAP OF THE GULGONG GOLDFIELD

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recovered from this deposit. Locally, exceptionally rich values were obtained.

The Star and Star of the South, Eureka and Scandinavian lead systems occur immediately to the east of the Happy Valley lead. These latter leads were the subject of intensive prospecting operations in the 1880s and 1890s.

The Eureka and Scandinavian leads appear to have contained values far too low for profitable operation.

Helvetia and Brown Snake

Both these leads were discovered in 1871. The Brown Snake was abandoned early, however, a parallel lead was located in 1896 and yielded values ranging from 5-15g/load.

Canadian Leads

The Canadian lead and its tributaries, Nil Desperandum, Rose of England and Rose of Australia, head on the eastern side of the main Gulgong range, and flow in an easterly direction before joining the main deep lead channel.

In its lower part, the Canadian lead is known as the Home Rule. The Canadian lead and its tributary appear to have been discovered in 1871, and excellent results were obtained by early prospectors.

Total recorded production from the Canadian-Home Rule lead system is given as 746kg at an average grade of 9.3g/load in the upper Canadian, and from 7-93g/load for other parts of the lead system. Locally cavernous limestone forms the basement of the lead system.

Nuggets up to 2.2kg were found in the west which ranged up to 170m in thickness.

To the north of the Canadian-Home Rule system a number of parallel leads have been worked. These include the Cumbandry, Dog and Cat, Lily May, Britannia, Little Cumbandry, Red, Red Streak and Perrywinkle. In all cases these leads have been worked in their upper portions, but have not been traced down to their assumed junction with the main north-south trending main lead channel.

Exploration

Little systematic exploration to test the grade and location of the Gulgong deep leads has been carried out in recent years, and it is clear that a considerable area of untested ground remains.

Testing would need to be undertaken initially using refined geophysical methods, including magnetic and seismic, to trade the location of the leads followed by systematic drilling using techniques designed to give an accurate indication of the gold content of the alluvial gravels.

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