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REPORT ON CORINNA ALLUVIAL GOLDFIELD

LOCATION AND ACCESS:

Corinna is an almost deserted township situated on the north bank of Pieman River, a distance of 14 miles upstream from the mouth of the river, on the west coast of Tasmania.

Access is gained by way of a motor road in a distance of 40 miles south-westerly from Waratah.

A road survey has recently been made from Zeehan to Corinna over a length of 27 miles and the first eight miles of road from Zeehan has been constructed.

HISTORY:

The gold mining history of Corinna district commenced early in the year 1879 when the creeks feeding Savage River between Brown's Plains and Corinna were prospected by H. Middleton, A. Tengdahl, G. Grove and S. Blackmore. Payable gold was discovered in the stream named after Middleton and a reward claim issued. Shortly afterwards nearly 500 men were searching the district for the precious metal, but the majority of these found their labours unremunerative.

The township of Corinna, the locality of which had previously been known as Royenrina, now began to take shape and the diggers were landed at the settlement by boats trading from Launceston via the Pieman Heads.

Among the early arrivals were Con. Curtain (afterwards Inspector of Mines); J. McCaverston; Gam. Webster; P. Lynn; Harvey Bros.; Geo. Meredith; J. Hayes; J. Crotty; J. Long; S. Hall; F. Leslie; G.Lambie; J. Davis; D. Teen and J. Brown.

The majority of the men soon drifted away and by 1885 thirty persons only were employed. During this year 1140 oz. of gold were produced in the district.

In the following few years the field languished but in 1893 a revival commenced and later developed into a boom brought about by hydraulic sluicing of the deep, high level gold-bearing gravels, which had not been attempted by the earlier miners with their more primitive methods. During this period the following companies were formed and between 1894 and 1897 carried out sluicing operations :-

Company	Manager	Lease granted in	Locality
Corinna Hydraulic Gold Mining Co. No Lia.	G. Webb	1895	Sailor Jack & Middleton Creeks
Savage River Hydraulic Gold Mining Co.No. Lia.	-Watson	1895	None Such & Brooklyn Creeks
New Donaldson Hydraulic Gold Mining Co.No. Lia.	McCormack	1897	Gutherie Creek

Company	Manager	Leases granted in	Locality
Brooklyn Hydraulic Gold Mining Co. No. Lia.	F.C.Brooks	1897	None Such Creek
Lucy Spur Hydraulic Gold Mining Co. No. Lia.	T. Dunn	1897	Lucy Spur
Brookside Lydraulic Gold Mining Co. No. Lial	G.Botterell	1895	Brookside
Frenchman's Peak Ltd.	M. Ireland	1895	Nancy Spur

These operations were generally unsuccessful owing largely to insufficient supplies of water, lack of effective head pressure, thickness of overburden and erratic distribution of the gold, which occurred chiefly in the bottom layers.

Of the companies quoted the New Donaldson Hydraulic Gold Mining Company No Liability at Gutherie Creek was the only one which did not develop its property to the production stage. This was owing to cessation of operations before completion of a race twelve miles in length, the waterfof which was to have been obtained from Donaldson River.

Before 1900 the Corinna field became almost deserted. During the years 1901-03 interest became centred in dredgeing for alluvial gold in the bed of Whyte River about the mouth of Rocky River. From this period onward little attention was devoted to alluvial mining until the advent of the Holdfast Gold Mines No. Liability in 1931. A tunnel was then constructed through a low ridge at the base of a sharp bend in Whyte River, upstream from Rocky River mouth, and the former diverted from its course to allow of sluicing in the river bed.

The gold recovered amounted to 132 oz. valued at £890 stirling and largely owing to an unreliable water scheme the project was abandoned.

The President Mining Development Company No Liability was formed in 1931 with the object of working the gravels in the vicinity of Middleton Creek and Brookside but no development was undertaken. In 1934 leases covering Middleton Creek were acquired in the name of C.T. Crabtree on behlaf of West Coast Gold Mines and 196 oxs. of gold valued at £1,384 stirling were produced, intermittently by this Syndicate and tributors.

At the present time almost the whole of the Corrima District, on north side of Pieman River is coevered by large prospecting claims in the names of various individuals. Gold Mines of Australia control those in the vicinity of Pieman and Savage Rivers and are undertaking a vigerous boring campaign in these sectors with the object of testing the ground for dredging purposes.

PREVIOUS LITERATURE:

Official literature previously published concerning Corinna district is included in the following list :-

(1)	Thureau, G.	West Coast Progress Report on Mines, 1881.
		House of Assembly Paper No.82.
		Legislative Council Paper No.77.
(2)	Thureau, G.	Report on Mt. Cleveland and Corinna Goldfields, 1884.
		Parliamentary Paper No.104.
(3)	Montgomery, A.	Report on the Corinna Goldfield,1894.
		Secretary for Mines Report for 1893-94
(4)	Smith, J.Harcourt.	Report on the Mineral District between Corinna & Waratah, 1897.
		Secretary for Mines Report, 1896-97.
(5)	Twelvetrees, W.H.	Report on the Mineral Fields between Waratah and Corinna, 1900.
		Secretary for Mines Report, 1899-1900.
(6)	J.B. Scott	Report on Brown and Little Plains, Rocky River District. Mines Dept. Typed Report, 1926.

PHYSIOGRAPHY:

The Corinna sector represents portion of an uplifted and dissected peneplain. The interstream areas now consist of plateaux rising to a general height of approximately 900 feet. The most outstanding topographical unit is that of Mt. Donaldson (1460 feet) and its northern extension Longback Range. These constitute residules which stood above the original base-levelled surface.

Preceding the uplift of the region a broad slow moving stream system meandered across the peneplain in a south westerly direction towards the sea. The system had reached the base level of erosion and had deposited its load of sediment in huge quantities along its course.

The present cycle of erosion was introduced after the subsequent rise in strand line and an entirely new drainage system formed which dissected and partly eroded the deposits of pre-existing channels.

Tha district is now drained by Pieman River, flowing westerly to the coast and by its larger tributaries the Whyte, Savage and Donaldson rivers. The latter flow in southerly directions to join the main stream. These streams are deeply entrenched in steep-walled valleys and are swift flowing along the upper reaches. In the lower parts, nearing junction with Pieman River, they assume a flat grade and move

sluggishly, Pieman River, which which is wide and deep, is tidal and navigable for 24 miles along its course. At Corinna (14 miles from coast), where the width is 450 feet and depth 40 feet, the river bank is only 15 feet above sea level.

The small creeks feeding the larger streams are in an extremely youthful stage of erosion and on the plateaux sides waterfalls are frequently present.

The upper portion of Middleton's Creek, now a tributary of Savage River, has apparently been captured in the past by a stream working back from Savage River valley, by headward erosion, through Elizabeth Range. The old valley of lower Middleton's Creek is a distinct feature on east side of Elizabeth Range extending southerly to Pieman River at Corinna.

Another river capture is indicated on Pieman River above Hell's Gates. It seems probable that the Pieman originally found its way to the coast through the low, wide valley now occupied by Delville Creek. These waters were later captured by a tributary of Donaldson River eroding its valley back through Donaldson range to the Pieman valley.

GEOLOGY:

The oldest rocks occurring within the district are the sericite schists, phyllites and quartz-sericite schists referred to Proterozoic age.

Slates, dolomites, limestones, quartzites and conglomerates of the Cambro-Ordovician period appear in a belt to the west of and probably in faulted relation with, the Proterozoic rocks.

Gravels, grits, sands and clays of Tertiary age overlie the above and these are, in turn, overlain at one point by a small flow of Tertiary basalt.

Pleistocene terrace gravels occur on the sides of the valleys high above river level.

River gravels and alluvium of Pleistocene to Recent age have been formed along the courses of the streams.

PRE-CAMBRAIN:

The rocks of this system consist of sericite schists , quartz-sericite schists and black phyllites.

These strata are considerably contorted and sheared, and are traversed throughout to an extreme degree by small veins and bunches of quartz, usually along the schist planes. The planes of schistosity appear to be generally normal to the bedding planes and the strike varies from 40° east of north to 20° west of north. The strata dip at all angles up to 85°, mostly to the east.

These rocks occupy the eastern portion of the district and consitute more than one third of the total area mapped. They are in contact with Cambro-Ordovician slates etc. along a general meridional line on the western side of the belt.

No fossils have been found in this series of rocks and their relationship to the Cambro-Ordovician rocks was not determined. They are here referred to the Proterozoic system owing to the marked schistosity and general appearance of great age which the rocks present.

CAMBRO-ORDOVICIAN:

The rocks of this system consist of Black, grey-green, dark grey and brown slates; green tuffs; black cherts; quartzites; buff coloured dolomites and blue-grey limestones. Where exposed along Croinna road the slates, tuffs and cherts of this series have some of the characteristics of the Dundas series of slates etc. as exposed elsewhere in the State, but the typical breccia horizon appears to be absent. Dolomites and limestones associated with black slates succeed these rocks to the west and the former may be correlated with similar overlying Dundas slates etc. near Smithton.

Recorded strike readings vary from 37° east of north to 25° west of north with, in most cases, steep dips to the south-east and south-west.

These strata appear to have been folded and faulted. No detailed section of the whole thickness could be obtained but the total thickness is undoubtedly great.

In the vicinity of Mt. Donaldson and Hell's Gates on Pieman River, towards the western part of the area, a different series of rocks consisting of schistose quartzites, schistose conglomerates and black phyllites occur. Although having an appearance of greater age than the series further east, the schistose rocks probably belong to the same system and may underlie the latter. Still further west a belt of slates and quartzites extend to the west coastline.

LOWER TERTIARY:

(1) Sedimentary:

The Sedimentary rocks of this system consist of conglomerates, gravels, sands and clays. The coarse gravels form the basal members and are generally composed of boulders of reef quartz, quartz-tourmaline, quartzite and chalcedony. In the vicinity of Corinna they consist of boulders of West Coast Range conglomerates, diabase, quartz, quartzite, coarse Dundas breccia and felspar porphyry. The finer gravels consist of waterworn and sub-angular pebbles of quartz. The conglomerates are composed of waterworn quartz gravels set in a hard siliceous matrix of finer material. They form part of the basal beds but are usually local and in many instances appear to be due to recent cementation of portion of the surrounding gravels and sands.

These rocks are horizontally bedded except where local current bedding is evident. Their thickness varies according to the position they occupy in the ancient valley and its tributaries in which they were deposited, and the amount of denudation which has since taken place. They are thickest in the central and southern parts of the main lead and decrease in thickness towards the north-eastern extremity. A complete and detailed section is not obtainable but in the deepest part of the main lead it probably attains a thickness of several hundreds of feet.

The Tertiary beds were mapped south-easterly from Pieman River at Corinna over a distance of two miles, but the full length in this direction was undetermined. North-east from Corinna they extend generally along either side of Corinna-Waratah road for 3½ miles. At this point a break occurs in the continuity of the lead for a distance of half a mile, over which bedrock outcrops at surface and where the originally overlying Tertiary beds have been completely denuded by the action of Hunter Creek.

The main lead then continues easterly over Little Plain before turning north laong the ridge traversing Brown's Plain (Blackguard Hill etc.) It passes out of the area in the north-eastern extremity.

A tributary lead from west side of Savage River crosses thatnstream in an easterly direction and joins the main lead in vicinity of Brookside workings.

Residuals of other former tributary leads, which do not join the main lead, are the Tertiary beds occupying Nancy and Lucy Spurs situated three to four miles east of Corinna.

The main lead attains a maximum width of 3/4 of a mile in the vicinity of Middleton and Sailor Jack Creeks. Along the north-eastern continuation in the region of Brown's Plains, it varies from half a mile to five chains in width, and in places is extremely thin.

The only organic remains found in these sediments consist of occasional pieces of wood. The field relations do not yield evidence for a precise age determination. The strata overlie Cambro-Ordovician and Pre-Cambrian sedimentary rocks and are themselves apparently overlain by basalt as being of Tertiary age.

In correlation with other districts in Tasmania where similar fresh-water sediments are overlain by basalt the sediments are regarded as of Lower Tertiary age and the basalt as closing this period.

(2) Igneous:

The only igneous rock exposed in the district is that of a small flow of basalt situated on Corinna-Waratah road at 5¾ miles from Corinna.

This is represented at surface by chocolate coloured soil and boulders of basalt extending along the road over a width of five chains, and for similar distances on either side of the road to the north and south.

This igneous rock has apparently been greatly weathered and denuded, and is now a mere remnant of the original flow, being not more than ten feet in thickness.

Tertiary gravels surround the basalt but the ~~basalt but the~~ relationship, one to the other, could not be definitely ascertained. No gravels were observed directly overlying the basalt and, in the immediate vicinity the former occur at slightly lower altitudes than the igneous rock.

Taking this evidence into consideration it seems probable that the basalt overlies the sediments and is the younger rock.

UPPER TERTIARY:

On eastern side of Whyte River, ten chains above and below the mouth of Rocky River, gravel terraces occur parallel to Whyte River and extend from river level up to a height of 60 feet above the stream.

The gravels consist of boulders and pebbles of quartz, quartzite, granite, quartz-tourmaline, gabbro amplhibolite, chloritic schists, magnetite and hematite.

These represent sediments deposited by Whyte River when flowing at a much higher level than at present. Since their deposition a positive movement of the land has taken place with relation to the sea. Increased cutting power thus given to the river enabled it to cut down through the sediments and leave them exposed high above the more recent deposits now accumulating in the river bed.

PLEISTOCENE TO RECENT:

Since the elevation of the peneplain the present streams have been engaged in cutting down their course. This process is incomplete but is now proceeding at a slower rate than formerly, especially with regard to the lower reaches.

From Pleistocene to Recent times deposits of gravel and alluvium have accumulated at different points along the stream courses. This is most pronounced in the larger streams, particularly in parts of Pieman River and in the tributary rivers towards the confluence with the former. Bore holes sunk below the floor of Lower Savage River valley, half a mile above the mouth, have revealed that the gravels and alluvium attain a thickness of 135 feet, so that the bottom of these sediments must be nearly 100 feet below sea level in that locality.

GEOLOGICAL HISTORY:

The geological history of the district is, in part, of great importance in connection with the alluvial gold deposits and that portion will be considered in detail.

(1) After the close of the Permo-Carboniferous and Triassic sedimentation, if either occurred in this district, the region became a land surface and a long period of denudation began.

The abovementioned sediments were entirely removed and a large stream system corroded its course in the underlying rocks of the Pre-Cambrian and Cambro-Ordovician systems. Stream development and denudation continued until the Lower Tertiary period.

(2) A slow subsidence of the land resulted in a thick accumulation of sediments along the stream courses and a peneplain was formed at the close of the cycle of erosion.

(3) The Lower Tertiary sedimentation was bought to a close by extrusions of basaltic lava.

(4) Contemporary with or immediately succeeding the lava flows the peneplain was elevated relative to the sea by an amount not quite equal to the depression during the Lower Tertiary sedimentation. The deformation of the peneplain was accompanied by faulting and warping.

(5) A new cycle of erosion commenced resulting in dissection of the old peneplain and formation of the present river system in channels differing from the Lower Tertiary drainage system.

The Upper Tertiary gravels were deposited with a thickness of 60 feet or more.

(6) An elevation of the land occurred which resulted in rejuvenation of streams accompanied by gorge cutting and river capture.

(7) A relative depression of the land then commenced during which Pleistocene gravels and alluvium were deposited, up to 135 feet in thickness, along the course of the larger streams. The movement continued and eventually brought about the flooding of Pieman River valley by the sea, together with the lower valleys of Donaldson, Savage and Whyte Rivers.

(8) Deposition of gravels and alluvium is still in evidence at the present time at certain localities along the course of the streams.

ECONOMIC GEOLOGY:

(1) Introduction:

The most important metallic mineral deposits in the Corinna district are those containing alluvial gold. The gold is accompanied in some localities by minor amounts of tin and osmiridium.

Secondary gold deposits of various ages from Lower Tertiary to Recent have been formed within the district. The Recent to Pleistocene ones occur along the courses of the present streams. The more recent deposits have been partly exhausted by mining, particularly along the smaller streams.

Pleistocene deposits are found only in the lower parts of the rivers and have not been exploited. Deposits of Upper Tertiary age appear to a limited extent, and occur in the form of terraces at various heights above the stream in the valley of Whyte River. These have been developed to some extent by mining.

Within the area examined those of Lower Tertiary age are generally confined to the interstream sectors. These deposits are of great thickness in places and are developed over a large extent of the area. They have been largely exploited and opened at numerous localities by mining works.

Primary mineral deposits of economic value are unkown in this district. To the east and north lenses of iron in association with pyritic veins outcrop in various localities from Savage River at Rio Tinto to headwaters of Meredith River and carry a distribution of gold in small proportion.

The Pre-Cambrian sedimentary rocks, and to a less extent, those of Cambro-Ordovician age, in this and adjoining districts are traversed by numerous small quartz veins which in some localities have proved to be gold bearing. Serpentine rocks of the Healzlewood district, 10 miles to the north-east, contain osmiridium and probably gold deposits. Tin is present at Meredith Range in close relation to the granite massif of that area, and is well known at Mt. Bischoff, twenty miles north-east of the district mapped.

It was from the disintegration of these several widely separated primary deposits of gold, tin and osmiridium that the minerals of the Lower Tertiary stream system were obtained. The later secondary deposits of Upper Tertiary to Recent may be largely attributed toaa re-distribution by the present drainage system of the Lower Tertiary deposits.

The Lower Tertiary alluvial deposits consist of conglomerates, gravels, grits, sands and clays. The boulders in the conglomerates are chiefly of white opaque quartz and the hard cementing material of fine silica and quartz sand. The gravels consist mainly of white opaque quartz, opaline quartz, chalcedony, quartzite and quartz-tourmaline boulders.

The gravels and grits are largely waterworn but sub-angular pebbles are also present in places. Distribution of the gold and other metallic minerals, where present, is not uniform and concentrations occur principally in the basal layers, which generally are gravels.

The sediments of the main lead occupy a considerable area of the watershed between Savage and Whyte Rivers while tributary leads of less extent entered from the west and east.

The greater portion of the material which formed these deposits was contributed by the ancient stream system from the north-east, north-west and south-east.

(2) <u>THE MINING PROPERTIES</u>:

(a) <u>Middleton Creek</u>: This mine is situated on Middleton Creek, ¾ mile north-north-east of Corinna. A mineral lease 53M/38 of 40 acres, in the name of C.T. Crabtree covers the southern part of the area and abandoned lease 11336/M of 40 acres (part of Special Prospecting Claim, 4,000 acres, C.T. Crabtree) the northern portion.

The Corinna-Waratah road passes ¼ mile to the east, from which a pack track deviates to the property.

The first discovery of payable gold in the district was located on the property in the year 1879 by H. Middleton. Mining was undertaken by Middleton and others on the recent gravels along the course of the stream and was continued later by Crotty, Strong, Conroy, McLean, Fitzpatrick Fogarty and others, who also worked small areas of Lower Tertiary deposits adjacent to tributaries of Middleton Creek with small hydraulic plants. Corinna Hydraulic Gold Mining Company No Liability held leases covering the property in 1895 and carried out a limited amount of hydraulic sluicing operations about that period. A syndicate known as West Coast Gold Mines, consisting of 20 members with a nominal capital of £25,000 was formed in Launceston to operate

leases held by C.T. Crabtree, with A.J. Davey as Mine Manager. Hydraulic sluicing was commenced in May, 1935, and carried on intermittently till 1938, when a tribute was granted to Davey in lower part of Middleton Creek. channel. Option to purchase the property was obtained in 1936 by the Cassowary Company which undertook boring operation at southern end of the lease, but did not exercise the option rights.

Bedrock in the greater part of the workings consistsof dolomite of Cambro-Ordovician age, but slates of this system also occur in places.

Lower Tertiary gravels and sands occur along the hill slopes on east side of Middleton Creek and to a less extent on west side.

The valley is situated towards the western edge of the main lead and these deposits have been largely denuded and re-distributed by the stream to form detrital material on the lower slopes, and recent deposits along the valley floor. The mine workings undertaken by West Coast Gold Mines are as follows:-

1. Vicinity of east and west head branches of Middleton creek in Section 11335/M. Previously worked ground in the east branch was extended from creek mouth over a length of seven to eight chains by one chain in width, in gravels up to 15 feet in thickness above dolomite bedrock. The ground is said to have yielded gold to the value of 2/6 per cubic yard.

   In Middleton Creek flat below the junction with east branch 2500 to 3000 cubic yards of fine gravels and sand was sluiced for a yield of 50 0z. of gold.

   The maximum depth obtained was 37 feet without reaching bedrock, and at this point the presence of a sink hole in dolomite is suggested.

   In west branch a face 30 feet deep was opened out on south side from older workings in Lower Tertiary gravels. The gold here is stated to be generally of large grain size and numerous small nuggets from two to five dwts. were obtained. The value of the ground was similar to that in east branch.

2. Middleton Creek flat in section 11336/M. A paddock containing 12,000 cubic yards of silt and sand, yielding 10 oz. gold, was sluiced to a maximum depth of 50 feet without reaching bedrock. A bore-hole sunk from floor of workings for a further 27 feet, passed through five feet of silt before entering gravels. The gravels continued to bottom of hole and revealed values stated to be equal to 4/- per cubic yard.

   It was found impossible with the available plant to work the deposit to a greater depth and operations in this locality ceased.

3. Five chains lower down the valley in a small creek entering from east side old workings in Lower Tertiary gravels have been extended. The deposit varies in thickness from 10 to 25 feet above soft slate bedrock. Approximately 900 cubic yards of material was treated for a yield of 15 oz. gold.

4. On the hillside, two chains south of the last mentioned workings and about 50 feet above Middleton Creek, the slope has been sluiced over an area three chains long and two chains wide.

   The deposit consists of gravels extending to a maximum depth of 15 feet and to a large extent represents a re-distribution of the main Lower Tertiary lead.

   Bedrock has not been reached and the working bottom consists of sub-angular boulders of chalcedony and quartz in a black cementing material.

5. The last operations were carried out by the tribute party on recent deposits along bed of Middleton Creek, near southern end of Section 53M/38, C.T. Crabtree, Lessee. The workings consist of a paddock approximately three chains by one and a half chains in area taken to a general depth of six feet, down the dolomite bedrock. At the upstream end a depth of 13 feet was obtained without reaching bedrock. The gravels consist of quartz and chalcedony and range in size from one up to 12 inches in diamenter.

   The work was undertaken by means of hydraulic sluicing and elevating plant, using 13 sluice heads of water under a head pressure of 180 feet. The water supply, however, was intermittent, and as no return water scheme had been provided, it was only found possible to sluice for three weeks during the operating year. During this period 10 oz. of gold was obtained in the treatment of 400 cubuc yards of material.

   In advance of the face testing by pits has porved the gravels to extend to 15 feet from surface in payable ground. The gold in this locality is of fine grain size and is associated with abundant ilmenite.

To the south of Section 53M/38 a comparatively flat area of alluvium extends south-westerly towards Corinna along a previous course of Middleton Creek. The northern portion of this belt was partly tested by Cassoway Company in 1936 by five bore-holes. The depths ranged from 30 to 54 feet. Gold was obtained in each hole but further details are not available. During the same period another hole was sunk near Corinna-Waratah road to the south east in Tertiary gravels. Gold was not proved to be present at this site.

Records of production from Middleton Creek workings prior to the advent of West Coast Gold Mines are not recorded. From 1935 to 1938 the above syndicate and the tribute party produced the following gold:-

Year	Gold oz.	Value Value	Material handled in cubic yards.
1935	73.01	515	5,500
1936	67.95	481	5,000 (for 55 oz.)
1937	11.75	83	
1938	43.30	305	
Total:	196.01	£1,384	

C.T. Crabtree holds water rights amounting to four sluice heads on Timb's Creek. The water is conducted by race from a dam on Timb's Creek and passes through a tunnel under Corinna-Waratah road to the bed of Hunter Creek. A storage dam was constructed on Hunter Creek but later collapsed and is not now in use. The water is again picked up at a lower point on Hunter Creek and conveyed by race to a dam on the hillside overlooking Middleton Creek. From there it is reticulated along the eastern hillslope and delivered and totally inadequate for continuous sluicing on any considerable scale, where hydraulic elevation of tailings is necessary.

(3) Sailor Jack and White Creeks:

Numerous old gold workings occur in the vicinity of the branches of Sailor Hack Creek and White Creek. These streams are tributaries of Whyte River situated on eastern side of the watershed about half a mile east of Middleton Creek. The workings occur towards the eastern boundary of the main lead and are confined to the valleys on south-eastern side of Corinna-Waratah road, between two and three miles from Corinna.

The work of the early miners, among whom were H. Middleton; Jansen Bros., P. Lynn; Olsen and Lawson, was at first confined to the gold bearing gravels along the creek beds. Later, when limited quantities of water were conveyed by races from adjoining creeks, operations were extended by them to the Lower Tertiary deposits adjacent to the streams. About the years 1895-1897 Corinna Hydraulic Gold Mining Company No Liability constructed the race (22W/38) now held by C.T. Crabtree and carried out hydraulic sluicing operations. The early workings were extended and some large faces opened out in the lead gravels, mainly about the head branches of Sailor Jack Creek now covered by abandoned mineral leases 1887/93M and 1888/93M.

The deposits consist of compact sands and fine gravels underlain in places by coarse gravels with boulders up to 12 inches in diameter. The boulders are generally composed of opaque quartz, opaline quartz, and chalcedony. The sands and fine gravels are largely cemented and in some localities the coarse gravels give place to hard siliceous conglomerates.

The working bottom consists of a layer of cemented dark coloured, carbonaceous sands, and bedrock is nowhere visible in the mine openings. Cambro-Ordovician slates and dolomite outcrop in the creeks below the south-eastern periphery of the lead.

The largest face occurs in the middle head branch of Sailor Jack Creek. This extends across a width of two chains and attains a maximum depth of 40 feet in gravels. In the eastern branch faces ranging up to 30 feet in height have been worked, while in west branch and down the main stream extensive workings occur with faces from 10 to 20 feet high.

A limited amount of mining was also undertaken in Jansen and Jarman creeks and other tributaries of Sailor Jack Creek.

In White Creek the workings are generally small and shallow near the road but in the lower reaches the openings are more extensive.

No production figures of these old workings are in existence.

(4) Brookside Mine:

The old Brookside workings are contained in abandoned mineral section 10836/M of 5 acres in extent.

The mine is accessible in a distance of 1½ miles by pack track, which leaves Corinna-Waratah road at 4½ miles from Corinna.

Prior to 1895 the claim was worked by Brooks and Lincoln but in that year was acquired by Brookside Hydraulic Gold Mining Company No Liability.

The deposit consists of Lower Tertiary clays and gravels and represents portion of a tributary lead from the west. The mine occurs near the junction with the main lead and is situated at the outer edge of the deposit some distance from the porbable gutter of the ancient stream.

The working face extends from Brookside Creek over a length of three to four chains and to a height of 25 feet. Bedrock, in the form of Cambro-Ordovician slates and dark grey limestones, is exposed over the floor of the workings.

It is reported that the gold obtained was coarse in grain side and unevenly distributed through the deposit.

(5) McCaverston Creek:

McCaverston Creek is a small tributary of Savage River. It rises below Waratah-Corinna road on south side of Brookside track, and flows westerly across the main Lower Tertiary lead to the western edge of those deposits at ¼ mile from the river. In that locality and for about 10 chains upstream McCaverston's old workings occur in the banks on either side of the stream. The gravels of the ancient lead have been sluiced along a narrow belt to a maximum depth of 15 feet and at the lower end expose the underlying slates of Cambro-Ordovician age.

(6) Gutherie, Brooklyn and None Such Creeks

These streams enter Savage River from the west and assist in the drainage of the eastern slopes of Mt. Donaldson and Longback Range.

Extensive deposits of high level gravelsaare reported to occur in this locality. They were not examined but have been indicated in a general manner on the accompanying sketch map. These deposits probably represent remnants of a Lower Tertiary lead and may junction with the tributary lead which crosses Savage River to the west of Brookside mine. Between the years 1895 and 1897 three companies were formed to treat these gold bearing gravels by hydraulic sluicing.

Savage River Hydraulic Gold Mining Company No Liability leased four sections (16/95 to 19/95) of 10 acres each between Brooklyn and None Such creeks and operated with water conveyed by race (water rights 16W/94 and 25W/95) from the source in Gutherie and other creeks in the vicinity.

Brooklyn Hydraulic Gold Mining Company No Liability held lease No. 8/96 of 10 acres in extent, situated westaand adjoining Section No.19/95 of the Savage River Company, at None Such Creek. Water supplies were obtained by way of a race (water right 14W/95) from a creek flowing south to Pieman River from Mt. Donaldson.

The limited amount of sluicing operations carried out by these two companies proved the claims to be unprofitable. under the conditions prevailing.

New Donaldson Hydraulic Gold Mining Company No Liability acquired Lease 78/95 of 10 acres near the head of Gutherie Creek and proceeded to construct a water race (now 21W/38 - G.T. Crabtree) of about 12 miles in length with a capacity of 54 sluiceheads of water. After completing nine miles of race on the slopes of Lmgback Range to within three miles of the proposed source at Donaldson River, operations were suspended and the property was not worked.

(7) Nancy Spur:

Nancy Spur is an east-west trending ridge constituting the watershed between Frenchman Creek, flowing to White River in the north, and Nancy Creek a west flowing tributary of Pieman River to the south. The area is accessible from Corinna in boats up Pieman River for 3½ miles to the mouth of Nancy Creek. From the landing a pack-track now overgrown, can be followed with difficulty for a distance of two miles to the top of Nancy Spur and headwaters of Frenchman's Creek.

Schistose quartzites and phillites of Pre-Cambrian age are exposed for 1½ miles along the track. These rocks are overlain on the ridge, at 650 feet above sea level, by Lower Tertiary gravels having a maximum thickness of approximately 40 feet. The gravel deposits extend to the east in a narrow belt for about ½ mile and probably represent a dissected remnant of an ancient tributary lead, previously joining the main lead near Corinna.

Preceeding 1894 the stream gravels in the upper parts of Frenchman and Nancy creeks had been worked for gold by the early miners. During 1894 C. McLean and another were sluicing the lead gravels and had opened a face 40 feet in length to a depth of 12 feet. It was reported that the party obtained 7 oz. gold in three weeks but difficulties arose owing to inadequate water supplies and operations ceased.

In that year also and in 1895 a Launceston syndicate (Frenchman's Peak Ltd.) prospected the area and acquired nine mineral leases (91/94 to 95/94 and 79/95 to 82/95) of 10 acres each covering the deposit. Frenchman's Peak Gold Mining Company was then formed in England to operate the mine by hydraulic sluicing methods under the management of M. Ireland. A head race (5W/98) of eight miles in length was constructed from dam on a branch of Lucy Creek and, after tunnels had been driven in the gravels and dump shafts sunk, sluicing commenced. This work was of short duration as gold returns proved disappointing and towards the end of 1895 the mine was permanently closed.

In his published account of "Pioneering on North-East Coast and West Coast of Tasmania from 1876 to 1913" Mark Ireland, the mine manager, attributes the failure of the Company to the fact that the greater part of the gold

was distributed unevenly through the basal layers and that the overburden wasaalmost valueless. A contributing factor was the lack of the necessary head pressure for removal of the deposit on a large enough scale.

(8) Lucy Spur:

This ridge is situated to the south-east of the head waters of Lucy Creek which flows westerly to Pieman River.

Originally a track extending south-easterly connected the workings at Nancy Spur with those at Lucy Spur in a distance of 1½ miles, but this is now overgrown and not accessible.

Lower Tertiary gravels overlie Pre-Cambrian schists on Lucy Spur at a height of 730 feet above sealevel. Before being dissected this deposit was probably continuous with that on Nancy Spur and composed either a branch or part of the same tributary lead. The gravels, which vary in size from small pebbles to large boulders, are cemented in parts and in some localities occur in the form of hard conglomerates particularly in the lower layers. The greater part of the gold is contained in the basal wash where it is usually of coarse grain size and associated with quantities of black sand in the form of chromite, tourmaline, and rutile.

Lucy Spur Hydraulic Gold Mining Company No Liability was formed in 1894 to work that portion of the deposit covered by two 10 acre leases numbered 4/96 and 5/96. Two adits were driven on the north-east side of the spur and another on the south west side with the object of testing the basal gravels below some previously worked faces. These works proved the gravels to be thickest under the ridge top and suggested a westerly sloping gutter in that locality.

A water race (1W/1901 and 27G/W) of 35 sluice heads capacity and 14 miles in length was constructed with intake of Rocky River. This included a tunnel 11 chains long and a syphon of similar length, together with ¼ mile of fluming.

The company commenced mining operations early in 1895 and an appreciable amount of sluicing was undertaken in the following months resulting in the opening up of a large face. Unsatisfactory results, however, were obtained and work ceased before the close of the year.

In 1894 A. Montgomery, then Government Geologist, sampled the gravels in two faces in the older workings (6 to 20 feet deep) and an adit on north east side of the spur with the following results:-

Locality	Sample	Gold in grains per cubic yard.
Southern Face	Over full depth of face	3.86
Northern face	Different parts of face	63.71
Adit	18" of basal wash	43.20

Of the faces sampled, almost the whole of the gold was contained in the bottom 18 inches of gravel.

(9) Brown and Little Plains:

These plains form portion of the watershed dividing Whyte and Savage Rivers and consist of a north-east south-west trending plateau of undulating button grass coutry in the north-east quarter of the district, ranging in height gtom 700 to 950 feet above sea level. The area is traversed throughout the length of Corinna-Waratah road extending between the 6 and 9½ mile points from Corinna.

Bedrock consists of Pre-Cambrian schists. The rocks are overlain along a median ridge by waterworn and sub-angular gravels and sands of Lower Tertiary age. The gravels vary in thickness from one to 50 feet and the belt varies from a few chains to ½ a mile in width. Coarse gravels near the base of the deposit have been largely cemented and occur as hard conglomerates. The deposit represents a highly denuded remnant of the ancient main lead. Where not overlain by the lead gravels the schists are covered at surface by angular quartz detritus, up to two feet in thickness, resulting from the disintegration of innumerable veins and bunches of quartz which traverse the rocks.

Shallow recent gravels along the courses of numerous streams, notably Donnelly, Chinaman, 8 Mile, Goodall, Brown and Hunter Creeks, which take their rise in the belt of Lower Tertiary gravels, have been worked to a limited extent in the past for gold and tin.

Owing to the scarcity of water for sluicing in the high ground along the ridge on which the lead gravels are found little attempt has been made to test or exploit these deposits. It would be possible to obtain water supplies from a distance of approximately 20 miles but it is doubtful if sufficient head pressure could be gained to effectively treat the gravels and conglomerates in an economic manner.

At the head of 8 Mile Creek, on the west side of Blackguard Hill and immediately west of old Section 11463/M, an adit was cut prior to 1894 by one Harvey. It was driven south-easterly for an unkown distance in schists below a roof of cemented gravels and conglomerates with the apparent object of testing the lead and finding the old gutter. The base of the deposit slopes to the east and this suggests that the latter lies under the hill in that direction. Montgomery in 1894 reported that rich patches of gold were obtained from this adit.

Several old adits also occur in similar conglomerates on old Section 1813/93M at the head of Brown Creek. These are driven in schists and the basal members of the lead for a considerable distance on either side of the creek.

Old workings carried out by A. Findlay are situated to the east of Brown Plain on a small spur between head waters of Graham Creek and a branch of Goodhall Creek in abandoned Section 11463/M. This deposit forms an easterly extension, or a branch, of the main lead and consists of the usual gravels and conglomerates having an approximate thickness of eight feet. Several small and shallow paddocks have been worked and over 50 oz. of gold obtained. The gold values are reported to be erratically distributed and confined to a small area.

Only storm water is available for sluicing. The concentration of a dam on Section 2992/W at head of 8 Mile Creek was contemplated and a race cut to the site, but the scheme was not completed.

(10) Tarry's Mine:

This mine is situated on eastern bank of Whyte River about the confluence of Rocky River. The area is held under mineral lease by W.C. Hart - Section 11693/M - 24 acres, and A.M. Hart - Section 11726/M - 20 acres. Access is gained by way of a well constructed pack track which deviates south easterly from Corinna-Waratah road at Brown Plain (7½ miles from Corinna) and finishes at a wire cage over Whyte River. From the latter a foot track continues down east bank of the river to the mine.

One of the early mining ventures in this locality consisted of dredging gravels along the course of Whyte River for gold, osmiridium, and tin. This was undertaken by Whyte River Gold Dredging Company No Liability from 1901 to 1903. The plant was constructed in Launceston at a cost of £5000 and was fitted with 25 buckets of 3½ cubic feet capacity and three grabs. The buckets worked at the rate of 12 to 14 per minute, equivalent to 100 tons per hour for 12 buckets when operated at the latter rate. No difficulty was experienced in dredging the gravels to a depth of 20 feet or cutting into the schist bedrock, but the removal of logs continually interrupted the work. In the early stages the dredge sank but was soon refloated and moved to another position. During 1901 39 oz. of gold were recovered together with unrecorded quantities of tin and osmiridium. Dredging continued intermittently with low returns to the early part of 1903, when work finally ceased.

In 1932 leases covering the bed of Whyte River in the same vicinity were taken up by Holdfast Gold Mines No Liability with the object of sluicing the stream gravels for gold and osmiridium. To divert the river a tunnel was driven through the hill at base of the large bend in the stream almost surrounding the western part of Section 11693/M. For water supply a race was cut for several miles from intake on Rocky River. The river was turned through the tunnel and hydraulic plant erected. In 1933 the river bed was worked at several points but with little success. Sluicing was also carried out on adjacent terrace gravels, during 1933 and 1934 with disappointing results. Recorded production figures are as follows:-

Year	Gold (fine)	Value Stg.	Osmiridium
1933	28 oz.	£181	3.8
1934	103.89 oz.	£709	2 (incomplete)
Totals:	131.89	£890	5.8

In 1936 Tasmanian Gold Developments, with W.C. Hart as Manager, erected a small portable pumping plant to test terrace gravels on sections 11693/M and 11726/M. The greater portion of the work was accomplished on the latter lease. The deposit consists of Whyte River gravels of Upper Tertiary age extending from river level

in two terraces to heights of approximately 20 to 60 feet reppectively up the hillside. Small workings completed by "Taranki" many years ago occur on the lower terrace.

Tarry's mine (Tasmanian Gold Development) is situated on the Upper terrace and consists of two working faces. The gravels are made up of small pebbles and large boulders of quartz, quartzite, granite, quartz-tourmaline, gabbro amplhibolite, chloritic schist, magnetite, and hematite. They have been worked to schist bedrock and vary in thickness from 10 to 20 feet as exposed in the northern and southern faces respectively. The base of the deposit dips easterly and it is apparently in that direction that the old gutter lies. The upper two feet of the deposit consists of small pebbles, grits, and sands of a general white colour which contains only a little gold. The lower members are generally composed of coarse gravels, but numerous small pebbles of magnetite and hematite occur. Iron oxide leachings from the latter have stained this portion of the deposit a general brown colour. The greater part of the gold recovered was reported to be concentrated in the basal gravels in close relation to the iron pebbles.

In attempting to test the deposit with a small hydraulic plant a six horsepower petrol engine was used to operate a 3" pump of 1½ sluice head capacity and great difficulty was experienced in dealing with large boulders dislodged from the face. The boulders were stacked in front of the face and eventually left no working space so that the gutter, in which payable concentrations of gold probably exist, was not reached before work ceased. The recorded production is as follows:-

Year	Gold oz.	Value £	Osmiridium oz.
1936	9.5	66	
1937	3	21	0.75
1938	1.75	12	
Totals:	14.25	£99	0.75

(11) Dredging Area:

Several areas occur along Savage, Pieman, and Whyte Rivers, in which conditions may be favourable for the recovery of gold, osmiridium, and tin by means of dredges.

The deposits consist of gravels, sands, and alluvium of Pleistocene to Recent age and are found along the bed of the streams and the adjacent floor plains.

Alluvial flats are present along the course of Savage River in three areas of approximately 1½ miles in length and separated from each other by rock bound gorges. The lower area commenced from the confluence with Pieman River and extends upstream through old mineral section 11661/M to 11665/M.

In 1933 Austral Malay Tin Ltd. sunk three bore-holes with a power drill in the flat on eastern side of river, to the north of Middleton Creek. The holes were spaced along a north-south line at intervals of 18 chains.

The company's engineer reported that the holes were abandoned before reaching bedrock.

Details of the bores are as follows:-

NO. 1 BORE:

Value: Gold - Trace

Depth in feet	Material passed through
0 - 92	Soft clay overburden.
92 - 94	Loose wash, mainly quartz pebbles about 2" diamenter; some light black sand; two fine colours gold.
94 - 115	Coarse sand with occasional quartz pebble. No black sand and no gold.
115 - 130	Loose wash consisting of slate pebbles and slime. Some fine black sand. Two fine colours gold.
130 - 135	Loose wash and a few boulders of slate and quartz. Some heavy black sand containing fine colours of gold and about 20 colours of osmiridium.

NO. 2 BORE

Value: Gold - Trace

Depth in feet	Material passed through
0 - 47	Soft clay overburden
47 - 78	Fine sand and pebbles of quartz and sandstone. Two colours of gold.
78 - 92	In decomposed schist. This is not bottom but is formed of blocks of schist.
92 - 125	Alternate bands of fine sand and mud with quartz and serpentine pebbles. Fine colours of gold. No heavy black sand.

NO. 3 BORE

Value: - Gold - Trace

Depth in feet	Material passed through
0 - 35	Soft clay
35 - 45	Soft sandy clay and slurry
45 - 50	Wash - quartz, slate and limestone. Closely packed. Fair quantity of heavy black sand. Three fine colours gold.
50 -100	Fine rising sand
100 -102	Decomposed schist - false bottom
102 -110	Fine sand with occasional pebble of quartz or slate.

It was considered that it would serve no useful purpose to sink the holes further as the ground tested had not proved payable. Even with the possibility of gold concentration in the basal layers the deposit extended to an unworkable depth for economic dredging.

The middle area extends upstream from abandoned mineral section 11666/M to northern boundary of 11607/M. Bedrock consists of Cambro-Ordovician slates. Austral Malay Tin Limited put down several bore-holes with hand operated plant in 1933 and proved the thickness of the deposit to vary from 50 to 75 feet. Further details of the boring are not available.

Upper area commences about 30 chains above the middle area and continues upstream for about 1½ miles. The bedrock in this locality consists of dolomite on eastern side of river and slates on the west. The mutual contact of these rocks is not visible. Gold Mines of Australia is now carrying out a hand boring campaign along the flats on either side of the stream to test the alluvial deposit from a dredging aspect.

In Pieman River valley wide alluvial flats extend along the course of the stream from Corinna to half a mile above Whyte River mouth and should prove suitable deposits for testing by boring. More extensive areas occur further downstream below the junction with Savage River but these would in all probability have a thickness exceeding 100 feet and, therefore, be too deep for effective dredging.

The recent gravels etc. lying in the bed of the river are now being tested by power boring plant operated from a punt. This work is being undertaken by Gold Mines of Australia between Nancy Creek and Meredith River and the results will be awaited with much interest.

CONCLUSIONS:

The geological mapping of the Corinna district has illustrated that extensive potential gold bearing deposits exist in the region.

The largest deposits are those constituting a system of ancient river leads situated for the greater part at high levels. In the past it has not been generally recognised that these represent filled valleys. In such valleys it is usually found that the gold concentration occur along a more or less central gutter forming the course of the stream before its valleys was occupied by sediments. The principal mining so far attempted has been established towards the outer edges of these deposits. Where workings have approached the central part of the main lead near the point where the gutter might be expected to exist, as at the head of Sailor Jack Creek, they have not reached bedrock.

In any future plan for prospecting the first essential should be a systematic boring campaign with lines of holes extending at right angles to the course of the leads. One of the best localities for testing appears to be across the main lead near the junction with the subsidiary lead, to the south east of Brookside mine. Other lines of bores spaced at intervals across the lead further to the south-west would define the general direction of the gutter.

If, and when, gold concantrations of economic value are proved to exist it will be of the utmost importance to obtain large perennial supplies of water with sufficient head pressure to exploit the deposits in a continuous manner by hydraulic sluicing. With the possible exception of Brown Plain, Lucy Spur and Nancy Spur deposits, this would probably be made possible by the conveyance of water in races for distances in excess of 20 miles from Healzewood, Savage or Donaldson Rivers. The completion of the partly constructed race from Donaldson River along Longback Range would enable subsidiary leads on west side of Savage River to be operated. Alternatively the water could be syphoned across that valley to the east side for working main lead.

It has also been indicated that in several localities gravels and alluvium occurring along the coarses of the present rivers are potentially gold bearing and that the areas are now being investigated and the deposits tested by a well-known company with a view to dredging.

F. BLAKE
ACTING GOVERNMENT GEOLOGIST.

Mines Department,
HOBART.

26th June, 1939.