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REPORT ON THE COMET - GREAT SOUTH COMET LINE

DUNDAS - TASMANIA

by

D. McKenna

the Comet file

Rep on the Comet - Great South Comet Line, Dundas (CR.T.A.E.)
3/11/58.
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INTRODUCTION

The examination of the Comet and Great South Comet Mines has been conducted intermittently over the past two and a half months. A progress geological plan is submitted on a scale of 1 inch = 400 feet (approximately). In addition are attached all available underground development, stoping and assay plans and sections of the old mines.

Reliable rock exposures are not plentiful in the area and essentially all of the surface geological information has been obtained in creek beds, on hill crests or in old road cuttings.

Additional geological mapping is required in the footwall rocks of Comet ore body and in the Kozminsky hill area. When this work is completed, the results will be submitted as an adjunct to the main report and an amended 1 inch = 400 feet (approximately) geological plan presented. It is considered that this additional work will not greatly influence the broad conclusions and recommendations outlined in this report.

The available plans of underground workings and certain assay and past production information is adequate to demonstrate the order of tonnages and grades occurring in the tested portions of the mineralised zone.

TITLE

One five acre mineral lease No. 20M/46 is held by W.J. Hodge of Zeehan and its approximate position is marked on the accompanying geological plan. The remainder of the area examined is included in S.P.L. 302.

LOCATION AND ACCESS

Comet Mine is situated 5½ miles due east of Zeehan and is 7 road miles distant. The Great South Comet Mine is 1¼ road miles south of Comet workings. The last ¾ mile of this road has very steep grades and is washed out in places. It is at present inaccessible to landrovers. The road from Zeehan to Comet Mine is in good condition.

TOPOGRAPHY

The mines are situated in a region of rugged topography. Thick rain-forest covers the hills and is relatively easy to penetrate. Secondary undergrowth on the flatter areas is very difficult to traverse.

Comet Mine is on a slight hill slope averaging 860 feet above sea level. It is separated from Great South Comet Mine by Kozminsky hill which rises an additional 540 feet. The road crossing this hill and linking the two mines has grades of 1 in 4. The Great South Comet adits penetrate a steep hill, the average grade of which is 1 in 22. The hill rises to a maximum height of 520 feet above the lowest adit.

PREVIOUS REPORTS

Montgomery, A. 1893	-	Report on the progress of the Mineral Fields of County Montague.
Montgomery, A. 1896	-	Report on the Zeehan Dundas Mineral Fields.
Reid, A.M. 1925	-	Tasmanian Geological Survey Bulletin No. 36 "The Dundas Mineral Field."
Reports of the Director of Mines	-	For 1890-91, 1894-95, 1927-29, 1948-50.
Report of the Secretary for Mines	-	For 1936.
Finucane, K.J. 1947	-	The Comet-Maestries Mine-Dundas, Tasmania. Submitted to Australian Mining & Smelting Co. Ltd.
Taylor, B.L. 1950	-	Unpublished report of the Tasmanian Mines Dept. "The Great South Comet Mine-Dundas."

GENERAL GEOLOGY

The Comet ore-body occurs in a group of rocks which, by comparison with a similar group north west of Zeehan, belong to the Carbine group, which is believed to be of Pre-Cambrian age. The rock types of the hanging wall series consits of poorly bedded grey and black slate containing numerous bands of resistant white quartzite. These rocks are tightly folded, highly cleaved and metamorphosed. The fold axes strike north and south.

The rocks on the footwall (eastern) side of the ore-body consist of poorly bedded pale green phyllites. They are in part micaceous and in places have been highly compacted to form a green argillaceous quartzite. "Sugary" pyrite occurs in two poorly defined linear zones trending south westerly towards the Comet Shear. A band of well-laminated black carbonaceous slates is apparently inter-bedded with the phyllites. The overall structure of the phyllites and black slates is an anticline striking north east. This group of rocks is also believed to be of Pre-Cambrian age on the basis of relatively high grade meta-morphism (development of sericite) and the presence of narrow bands of black and grey shales and white quartzites similar to the hanging wall series.

Two isolated occurrences of dolomite occur in the area and are believed to be derived from dolomitisation of a pre-existing serpentine. One occurs on the upstream side of the Carbine track-crossing of Dundas Rivulet and the other is on Comet Creek, immediately opposite the mouth of the southernmost Comet opencut. The Comet ore-body is quoted by previous investigators to be intimately associated with a band of dolomite.

The differences in rock type and fold trends on either side of the Comet ore zone suggest that the ore-body is emplaced in a fault channel.

One quarter of a mile west of Comet Mine the Pre-Cambrian rocks are in contact with serpentine which is believed to be a metasomatised intrusive gabbro type rock of late Cambrian age. The West Comet Mine and various indistinct gossan bodies occur in the serpentine mass.

North of Comet Mine the Pre-Cambrian group is in contact with fine grained green tuffs, coarse volcanic breccias and brown and red coloured shales of the Cambrian Dundas Group. The contact is not exposed, but it is believed to be an unconformity.

Cambrian rocks of a similar type occur as an apparent capping on Kozminsky hill. The nature of this contact with the Pre-Cambrian is also not visible, it could be unconformable or a thrust fault contact. Exposures are few in these Cambrian rocks. They are bounded to the east by white massive quartzites and grey slates of Pre-Cambrian age. Immediately west of the Dundas capping is an area of yellow clay soil grading further west into serpentine. This yellow coloured weathering product is typical of both serpentine, and Cambrian slates and tuffs, and the intervening clay area between definite serpentine to the far west and definite Dundas slates and tuffs on Kozminsky hill, could be either derived from an igneous or a sedimentary rock. The doubtful area has been shown as serpentine on the accompanying geological plan.

Cambrian rocks occur to the south of South Comet Creek and are host rocks for the Great South Comet and Kozminsky ore-bodies. The rocks consist at surface of brown, amber, red, green and steel-grey shales; tuffaceous quartzites and "Razorback" type conglomerate.

The Great South Comet mineralisation is emplaced in a fault Zone as evidenced by the fact that the conglomerate is displaced an apparent horizontal distance of 500 feet by the mineralised zone. The relative movement is west block north. In addition, the Cambrian sediments are puckered and contorted in the immediate neighbourhood of the ore shear.

The Cambrian rocks to the west of the Great South Comet ore zone are folded into a N.E. trending syncline plunging steeply N.E. towards South Comet Creek. An adjacent anticline having a similar axial trend, is situated further downstream.

A fault occurs striking 075° and roughly following the course of the creek. The relative displacement on the basis of displacement of the Cambrian-Pre-Cambrian contact is north block west.

The evidence for the existance of this fault is as follows:-

(1) Abrupt change of rock type along strike from one side of the creek to the other.

(2) The Cambrian-Pre-Cambrian contact as exposed in the road cutting 250 feet north west of adit No.1 is seen again on top of the hill 2,000 feet east of the Great South Comet shear.

(3) The "Razorback" type conglomerate appears to terminate abruptly at the creek in the vicinity of Kozminsky Mine.

The Cambrian sediments continue south over South Comet hill to at least as far as Adelaide Creek. Three short adits on the southern continuation of Great South Comet shear have been driven near creek level.

THE ORE-BODIES

(A) COMET

1. General

The Comet ore-body, as described in this report, is that section of the mineralised zone extending between the point where the zone crosses the road to Zeehan to the north, and the vicinity of Joint Shaft (near Comet Creek) to the south. This section is referred to in the older literature as the Comet-Maestries line due to the fact that both Comet and Maestries companies were at one time engaged in mining separate sections of the lode.

2. Limits, Mineralogy, Structure.

The ore zone has been exploited over an interrupted strike length of 1610 feet by a combination of open cut and underground mining.

The mineralised zone as exposed in the open cuts, consists of a series of sub parallel lenticular ferro-manganese gossan bands attaining a maximum width of 100 feet and averaging 60-70 feet. The zone strikes 330° and according to information from plans of the underground levels, dips 65°N.W.

A subsidiary gossan formation approximately 20 feet wide occurs an average distance of 200 feet east of the main zone. This band has been traced over a strike length of 1100 feet. It has not been open cut, but several shallow prospecting trenches cross it at irregular intervals.

The individual gossan bands in the main zone are variable in character; three main types occur. The most common is a friable chocolate-coloured variety which does not appear to have contained high lead/silver values. A hard brown or black cellular variety is present, the cellular box work being probably derived from galena. A botryoidal form is common.

The various types are not confined to any one band, but all three varieties may occur, intimately mixed, or independently along strike. Generally the portions of the lode containing a dominance of the chocolate coloured type have not been mined. The gossanous material extends to at least the 335 ft. level, Comet shaft.

Argentiferous galena accompanied by cerussite and traces of a yellow lead oxide are the principal ore minerals. Individual seams of galena up to 13 feet wide have been reported from the underground workings. The seams in the upper levels are generally parallel to, or crosscut through the bands of gossan, cerussite commonly occurs as a coating in underground vughs and around blocks of gossan situated in the main mass.

In the lower levels of the mine, galena seams within a siderite gangue occur between bands of dolomite. Dolomite "boulders" are reported from the upper levels. The available literature dealing with the underground workings mentions several instances where dolomite bands have been intersected in cross cuts and have been recorded on either side of some seams of galena during driving. There is no doubt that the lode is in some way associated with dolomite. Dolomite fragments occur in the spoil at main shaft, and also at the two surface localities previously described.

3. Mine Workings

(a) Open Cuts

The ore-body is open cut over an intermittent length of 1300 feet. The northern group attains a maximum depth of 15 feet and averages approximately 10 feet deep. The southern most cut is located immediately north of Comet Creek and attains a maximum depth of 40 feet.

No mineralisation is visible in the cuts and the foregoing description of the ore characteristic have been obtained from old reports.

Finucane has sampled the accessible open cuts, but as would be expected, the assay results are low.

Table I below summarises the results of the surface sampling.

Table I

Location	%Pb	Oz.Ag	Length Feet
Hard gossan outcrop in road cutting.	< 0.1	0.44	35
Friable chocolate gossan on edge of road near Northernmost open cut.	0.15	0.7	
Northern open cuts.	Nil-5.6	0.6-2.5	
N. face of Southern most open cut.	2.2	0.7	35

Three adits, the portals of which are collapsed, are located underneath the open cuts and the ore from the deeper cuts has been presumably trammed out through the adits via short connecting rises.

(b) Underground Workings

Finucane (1947) compiled a description of the underground workings from mine managers' reports in the Zeehan-Dundas Herald and Mines Department reports. This record of development progress and grade of ore encountered contains many gaps, but the overall description is the most comprehensive summary available and is quoted verbatim below. Accompanying survey plans of the levels are included in this report.

160 ft. Level.

This corresponds with the horizon of No. 2 adit which was driven through slates and quartzites. A shear or break striking N.25° W. and dipping south west was intersected in the adit at a point corresponding generally with the northern extension of the Comet lode. The main east cross cut was driven off the adit and connected later with the Comet shaft. In the cross-cut, soft gossan and clay was intersected at 110 feet from the shaft and hard gossan occurred over the last 60 to 70 feet near the Maestries boundary. Two drives are stated by Montgomery to have been extended north from the east crosscut; one of these, located 295 feet from No. 2 adit, was driven 183 feet through nice looking gossan and then entered slate; the other was driven from the end of the cross-cut through gossanous lode material containing cerussite and a little pyromorphite. Another drive was extended southwards close to the boundary for 130 feet and intersected cerussite and canary ore at 50 feet; this shoot of ore was three feet wide and was regarded as an extension of the lode worked in Maestries section.

260 ft. Level

The gossanous formation in which the lodes occur was intersected in the main east cross-cut at approximately one hundred feet from the shaft and the lode itself at 190 feet. The principal shoot of ore mined above this horizon was about 250 feet long and extended between No. 1 and No. 4 winzes; its width varied from 3 to 16 feet and it consisted of ferruginous gossan with solid veins, slugs and small seams of galena. Of the four winzes sunk below this shoot, details are available only of No. 4 which was sunk for 17 feet on lode consisting of one to four feet of second class ore which then became poor. The winze was continued to 65 feet and showed a slight improvement from 54 to 61 feet.

From No. 4 winze south for a distance of 100 feet the lode is described in the managers' reports as being poor though widths of 3 feet of first and second class ore occurred in some places.

During the years 1901 and 1902 a new shoot of ore was developed near the south boundary of the Company's leases. It is difficult to obtain a clear picture of this from the reports but it appears to have been about 225 feet long and to have varied in width from four to 10.5 feet. Two winzes were sunk on it. The north or No. 1 Winze was 59 feet deep and showed more than 6 feet of second class ore. The south winze reached a depth of 76 feet and bottomed in dolomite but the first 46 feet contained from 3 to 5 feet of ore.

Another shoot appears to have been found on the east side of No. 2 level south drive.

The drives north east of the shaft at No. 2 level appear to have been mainly in gossan sections which contained slugs of galena and some thin seams, but nothing definite. A winze sunk to a depth of 63 feet passed through gossan containing galena and lead carbonates.

335 ft. Level

No particulars are available regarding the development of No. 3 level from the shaft to 376 feet south east of it though the three winzes described below give some idea of the size and value of the lode. From 376 to 416 feet from the shaft, corresponding with a section from 60 to 100 feet south of No. 2 winze, the lode was poor. For the next 13 feet it carried second class ore but over the remainder of the drive as far as No. 4 winze from No. 2 level it varied from 2 to 4 feet in width and was too poor to mill.

The three winzes sunk on the northern section of the No. 3 level drive are distributed over 200 feet length. The north east winze was sunk to the horizon of No. 4 level on a lode 4 to 5 feet wide consisting of pyrite and galena which was described as "good seconds"; No. 1 winze reached 52 feet depth, the lode being from 2 to 4 feet wide and consisting principally of "seconds", short sections were poor and broken. No. 2 winze reached 33 feet depth on 3 to 5 feet of seconds. It was then stopped and an intermediate drive commenced. The north drive off the main crosscut, from which the north east winze was sunk, contained a pyrite-galena ore-body from 4 to 6 feet wide. This persisted to 54 feet from the cross cut.

Records concerning the southern shoot of ore at No. 3 level are incomplete but reports of 140 feet of driving indicate that the lode was from 6 to 8 feet wide and contained some first class ore, but consisted mainly of seconds. A winze was commenced on this shoot but the ore pitched south and work was suspended. The southern end of the drive extended towards the Kozminsky hill and was in ferruginous gossan with slugs of galena. A west cross cut intersected dolomite.

The north east cross cut at No. 3 level was commenced on a cross lode which is described as being poor and broken. Later it was continued and a drive from it was extended to connect with the winze from No. 2 level. The lode consisted of gossan about 6 feet wide containing streaks of canary ore.

The north west trending drive at the northern end of No. 3 level was apparently in gossan, as a report dated January 24th, 1903, states that gossan stopes were being mined above No. 3 level over a length of 100 feet and a width of 13 feet. The location is given as 520' north west of the shaft, but should, I think, be north east.

400 ft. Level.

Development reports concerning this level are clear and concise. In sinking the shaft below No. 3 level a lode was intersected at 51'6" from the level. This was reported to be 30 feet wide and to consist of iron carbonate and galena. Its strike was N.W. and its dip S.W. In the main east cross cut it was passed through at 15 feet from the shaft. Subsequently it was driven on to the north west and intersected a cross fault; the work generally gave poor results. From 15 to 84 feet from the shaft, the main east cross cut was dolomite, no mineralisation being reported. The Comet Maestries main lode was intersected at 84 feet and the drive was then turned south along it and connected with the north east winze at 133 feet. Over this section the ore body consisted of pyrite and galena in a mangano siderite or siderite gangue and carried from 2' to 3' of second class ore which persisted for 26 feet south of the

winze, giving a total length of ore shoot of 75 feet. Driving was continued and a connection made with No. 1 winze but the lode is described as being poor except for a section six feet long where it carried 8 feet of "seconds". The drive was extended 50 feet beyond No. 1 winze but showed little improvement and was eventually abandoned owing to the hard ground. Subsequently stoping above No. 4 level was poor and the lode was mined from intermediate drives below No. 3 level.

(c) Other Prospecting

A prospecting shaft was sunk to 70 feet depth, at 360 feet south of the gossan exposed in the access road cutting. Cross cuts were extended 252 feet east and 122 feet west. From the shaft to 44 feet east there was a considerable amount of ironstone in the cross cut and from 44 feet to 252 feet it was in slate. The west cross cut showed country with bands of iron from 0 to 46 feet and sediments with iron from 46 to 122 feet. No galena was reported from this work.

Immediately south west of the S.W. corner peg of old section 2356-87M a shaft was sunk under the joint auspices of the Comet, Maestries and Kosminsky Companies. For 90 feet the shaft was in slate and then passed into cellular quartz which, according to Montgomery, resembled siliceous sinter. At 120 feet the shaft entered dolomite and a soft pug.

4. Production

The record of past production is incomplete but the following figures and estimates should indicate the order of tonnages and grades of ore which has been mined.

McIntosh Reid (1936), states "During the period 1891-1893 the Comet ore-body was worked by the Maestries Company..... Ore, containing 26% lead and silver in the ratio of 35 oz. per ton was railed ..... at the rate of 60 tons per day. When the smelting company closed their works the richer sections only of the ore-body were worked and the output was reduced to 50 tons per week of ore, consisting of lead 58% and containing 38 ozs. of silver per ton. Operations ceased in October, 1893. At that time, 9,000 tons of ore had been sold."

The Comet Company's subsequent production was 9,000 tons of lump galena assaying 65% lead and 41 ozs. silver per ton, and 12,000 tons of concentrate assaying 60% lead and 37 ozs. silver per ton.

In addition, the gossan mined as flux amounted to 90,000 tons containing 5% lead and 2.5 ozs. silver per ton.

Production figures compiled from old newspaper reports by Finucane (1947) show that the head value of crude ore milled varied from 9.7% lead in 1900 to 13.1% lead in 1897. Other years indicate a head value of 12% lead.

To arrive at a crude ore figure from the concentrate given above, I have adopted a head value of 12% and a recovery of 80%. Thus 12,000 tons of concentrate assaying 60% lead, would be contributed by 75,000 tons of ore having an average head value of 12% lead.

The total recorded production is then made up as follows:-

Grade of 26% Pb and 35 ozs. Ag per ton and including a small amount of 58% Pb and 38 ozs. Ag. per ton.	9,000 tons
Lump galena assay 65% Pb and 41 ozs. Ag. per ton.	9,000 "
12,000 tons of concentrate assaying 60% Pb and 41 ozs. Ag. per ton.	75,000 "
Gossan mined as flux. assay 5% Pb. and 2.5 ozs. Ag. per ton.	90,000 "
	183,000 "

Too many unknown factors are present to attempt a calculation of overall average grade of lead per ton.

Silver is calculated to be present in the ore in the average proportion of 0.64 ozs. Ag. per 1% Pb. per ton. Thus ore containing 12% lead is estimated to contain between 7 and 8 ozs. Ag. per ton.

5. Future ore prospects beyond and below Comet Mine

Finucane (1947) recommended five diamond drill holes to be drilled to test the country 100 feet below the horizon of No. 4 level. Three holes were attempted. No. 1 reached its objective at 675 feet. No. 2 was abandoned at 466 feet because of badly caving ground. No. 3 was abandoned at 210 feet for the same reason. These figures were supplied by Electrolytic Zinc Co. but no details are given of ore intersections (if any) in bore hole No. 1.

The gossan outcrop exposed in the road cutting extends 100 feet further north. A shallow prospecting shaft is located within this length. At 1050 feet north of the roadside cutting occurs an outcrop of ferruginous and siliceous brecciated rock containing fragments of slate and some dolomitic material. This occurrence could be an extension of the Comet lode.

The country to the immediate north of the outcrop is covered by soil and scree until the gabbro/Pre-Cambrian contact is reached. Near the contact and extending in a north westerly direction is a line of gossanous rubble 700 feet long, located on a hill crest. Two shallow shafts occur on the line of gossan. Both shafts have collapsed. The gossan is similar in nature to the hard dark coloured ferromanganese types at Comet Mine.

Immediately north is a second line of gossan of a similar character, it is represented as rubble, capping a ridge to the immediate north of Carbine track. The extent, and even the trend of this occurrence is doubtful, due to the wide scattering of gossan scree. This gossan is also believed to be located in decomposed serpentine.

It is possible that these various gossan occurrences north of Comet Mine represent northern extensions of the lode channel. Strike changes in the lode could have occurred when the shear has passed from Pre-Cambrian sediments into Cambrian serpentine of a different competency.

B. GREAT SOUTH COMET

(1) General

This mine occurs approximately 2850 feet south of Joint Shaft at Comet workings, and has been developed by adits at four levels on the steep northern slope of South Comet Hill which attains a maximum height of 550 feet above creek level.

(2) Limits, Mineralogy, Structure

The known limits of the mineralised zone extend over a distance of 1700 feet between South Comet Creek and Adelaide Creek. The ore-body is contained in red and brown shales, green tuffs and conglomerates of Cambrian age and, like the Comet zone, is believed to be a mineralised fault channel having a composite sheeted structure. The ore shear strikes 335° and dips 76° to the west.

Taylor (1950) has recognised three distinct parallel ore-bodies having a combined total average width of 12 feet and separated by gangue material. The average width of the whole ore zone as measured in three places underground is 38 feet.

The chief ore-forming minerals are agentiferous galena and sphalerite accompanied by subordinate pyrite, chalcopyrite and Jamesonite, contained in a dominantly sideritic gangue. Ore shoots are relatively short and occur at apparently random intervals in any ore lode. The shoots may consist of more or less equal amounts of sphalerite and galena, but either one or the other may predominate in any shoot. J. Hodge has advised verbally that in his opinion, only shoots with payable galena have been mined, as the old treatment plants at the mine have never been equipped to satisfactorily separate galena from zinc in the concentrate. The high zinc content in the ore presents a distinct contrast to Comet lode, from which no zinc mineralisation has been recorded.

The ore shear is represented at surface by gossan, spread sporadically along the line. The gossan, unlike that at Comet, is relatively shallow.

(3) Mine Workings

The Great South Comet underground workings were surveyed by Laffer during 1945-50 and Taylor in 1950. Copies of their plans are attached. Very little mining work was done after Taylor's survey.

The ore-body was developed by means of four adits located on the northern fall of the South Comet hill.

No. 1 Adit: The portal is situated 20 feet above South Comet Creek bed and penetrates the hill for 880 feet at which point the roof is collapsed; it is not known how far past this point the drive extends. The drive is on lode (3 lode) from 180 feet from portal to the collapsed point. Two south westerly cross cuts have been driven, one is 172 feet long and is barren of lode material and the second extends through 3 lode and thence in barren country rock for about 30 feet. A rise is located 10 feet back from the collapsed portion of main drive, and connects with a winze from 2 level 3 lode.

An east cross cut has been driven opposite No. 2 W. cross cut for 44 feet, No. 2 lode was cut at 18 feet and is represented by a 9 inch wide pyrite seam. At 34 feet, No. 1 lode was intersected and driven on for 21 feet northwards and 26 feet in a southerly direction.

Six small stopes occur in the main drive on 3 lode, but the combined production from all is low. According to Mr. J. Hodge, (verbal report) the zinc content is high at this level.

No. 2 Adit: The adit is located 122 feet vertically above No. 1 adit and 280 feet south east, the drive is only 40 feet long and the exposed mineralisation is low grade.

No. 3 Adit: The portal is 230 feet vertically above No. 1 adit and 440 feet south east. At 110 feet from entrance, No. 1 lode was intersected and has been driven on to the south for 245 feet and north for 45 feet. At 315 feet from portal a cross cut leaves the main adit drive; intersects three lode, and follows it for 125 feet south at which point the drive is collapsed. No. 4 west cross cut leaves the main drive and intersects 2 lode and 3 lode. At 200 feet from portal, No. 3 west cross cut has been driven 34 feet and intersected Nos. 2 and 3 lodes. Short drives have been made to the south on the lodes from this cross cut. At 16 feet north from the collapsed section in main drive on 3 lode, a winze rise connection was made to 1 level.

A.M. Reid states that No. 3 adit level extends to 605 feet from portal. There is then at least 145 feet of drive beyond the collapsed section.

Almost the whole length of the exposed portion of the drive on 3 lode has been stoped. The stopes are numbered 7 and 8 on the accompanying plan and section.

No. 4 Adit drive: The portal of this drive is 340 feet vertically above No. 1 adit and 670 feet south east. The drive is on 3 lode for 143 feet. At 78 feet from portal a winze has been sunk for 50 feet. No stoping has been done at this adit level.

(4) Production

The bulk of the early production from stopes has come from two stopes above No. 3 level 3 lode (Stopes Nos. 7 and 8 on long section) and from 5 small stopes on 3 lode at No. 1 level. In addition, an unknown tonnage of development ore has undoubtedly contributed to the total production.

J. Hodge has advised that the bulk of production during 1949 and 1950 came from a little underhand stoping from a drive put in to bypass the fall of earth at the end of main drive 1 level, and also from small extensions to one or more of the old stopes above 1 level.

The published history of production is as follows:

During 1927 a flotation plant was constructed to float lead and zinc. The operation ceased in 1928 due to unsuccessful operation of the plant and lack of capital.

Ore treated during 1927 realised:-

Silver	1096 ozs.
Lead	121 tons
Zinc	378 tons

During 1936 Griffith and party sold:-

9.08 tons of ore containing
Silver 524.9 ozs.
Lead 5.6 tons.

During 1948 the Cuni Mining Co. transferred its operations to Great South Comet and commenced construction of an access road and concentrating mill.

During 1949 the following production is recorded:

Silver 1399.516 ozs.
Lead 18.433 tons

During 1950 the mine closed again due, I believe, to lack of finance and realised the following sales:-

From 5.358 tons of concentrate
Silver 265.757 ozs.
Lead 3.611 tons.

In addition to the four adit levels on the north flank of South Comet Hill, three small adits are situated on the southern fall of the hill, at or a little above Adelaide Creek. The portals are collapsed but judging by the size of the dumps, the adits are of the order of 30.40 feet long. Galena/sphalerite specimens in a siderite gangue occurs on the dump heaps and is similar in character to the Great South Comet type.

Production, if any, from these workings must have been very small.

(5) Reserves of ore in Great South Comet Lode

Taylor (1950) has taken a total of 26 samples which were assayed at the Mines Dept. Laboratory, Launceston. The assay values and sample numbers are tabulated in Table II below, and the sample localities are shown on the accompanying long section of Great South Comet workings.

TABLE II. ASSAY RESULTS

Sample Number	Lode Number	Width Inches	Lead %	Zinc %	Antimony %	Silver %
1	1	42	3.4	12.4	Tr.	1.2
2	1	41	2.6	7.2	Tr.	0.9
3	1	59	3.0	10.6	Tr.	0.1
4	1	54	7.5	15.8	Tr.	0.5
5	1	23	1.7	4.7	Tr.	1.0
6	1	48	17.0	13.4	0.08	18.3
20	1	27/294	3.0	13.2	0.03	1.8
8	2	60	1.4	4.5	-	0.4
10	2	40	1.3	2.8	-	0.5
7	3	108	0.4	5.1	-	0.3
9	3	56	5.1	4.3	Tr.	3.5
11	3	x 31	11.7	2.2	0.03	12.9
12	3	x 30	18.1	6.4	-	13.3
13	3	x 38	3.3	1.5	-	2.6
14	3	x 33	6.9	5.0	Tr.	5.4
15	3	x 37	7.0	5.4	Tr.	7.2
16	3	x 34	8.9	3.1	0.03	8.9
17	3	x 72	8.6	5.9	Tr.	8.5
18	3	x 54	6.0	3.7	-	4.1
19	3	120	3.7	9.0	-	2.1
21	3	x 30	46.2	12.6	0.18	42.4
22	3	68	1.3	9.9	-	1.7
23	3	48	0.6	4.8	-	0.4
24	3	72	10.7	7.8	0.11	10.4
25	3	33	1.4	3.8	-	0.8
26	3	46/910 575	7.6	29.1	0.03	7.1

Explanation - x indicates sample not taken over full width of lode.

The results of only 26 assays are insufficient to attempt an ore reserve classification into various categories including possible and probable. The results of calculations using these assay results serve rather as a guide to demonstrate the order of grades of ore present in the Great South Comet Hill.

The surface area of the section along the mineralised zone between South Comet Creek and Adelaide Creek and above the creeks level is approximately 380,000 square feet. Assuming a tonnage factor of 13 cu. feet per ton Table III demonstrates the order of individual lode tonnages and grades.

TABLE III

Lode No.	Width	PB.%	Zn.%	Ag.oz per ton	Potential tonnage above & between creeks.
1	38"	5.9	11.1	4.0	92,370
2	50"	1.4	3.8	0.44	121,600
3	54+"	6.8	7.2	6.0	131,540
Totals & Averages	142+"	4.7	7.0	3.5	345,510

Assuming the average width of the ore zone in which the three lodes are contained is 38 feet, and the between lode sections are barren, then the potential tonnage of the entire zone considered as one unit is of the order of 1,100,000tons averaging 1.47% Pb, 2.2% Zn, 1.1 oz.Ag. per ton.

C. MINERALISATION OCCURRING BETWEEN COMET AND GREAT SOUTH COMET WORKINGS.

(1) Kozminsky Mine

These mine workings occur between 800 feet and 1050 feet down stream (west) of No. 1 adit Great South Comet. On the evidence outlined under "General Geology", this ore zone could represent the faulted section of Great South Comet shear.

The workings consist of one shallow shaft, three adits and one small open cut.

The only available reference to the workings is contained in Bulletin 36 by A. McIntosh Reid.

The three adits occur over a 200 feet horizontal interval and a fifteen feet vertical range. One of the adits is 300 feet long, the others are believed to be short. They are numbered K1, K2, K3 on the accompanying 400 feet = 1" geological plan.

On the shaft and adit dumps are specimens of galena, sphalerite mineralisation in a siderite gangue. The specimens are similar in megascopic character to those obtained from Great South Comet workings.

McIntosh Reid in Bulletin 36 states as follows: "Two lodes are known on the property, both course N35°W and dip S.W. at 65°. They commence at the creek where the Great South Comet ends ..... The lode has been traced nearly 20 chains, but it pinches and swells and the ore shoots are short. The eastern lode is much wider, but the proportion of marketable ore is smaller." The hill to the north of the workings where the surface gossan should trend (assuming Reid's statement is correct) is covered with dense secondary vegetation and I have not been able to find gossan outcrop along strike. Patches of gossan rubble, not in place do occur.

Reid states further " No. 3 on low level adit is a little above creek level, and about 300 feet in length. At the entrance the lode materials are poor, but as the adit advances the quality improves and some high grade Pb/Zn sulphide appears. Rich shoots are short and erratic. Near the end of the adit the lode is laterally displaced and its northward continuation is not known.

No. 2 adit exposes 18" of ore, 100 feet in length, half of it consisting of galena and sphalerite and half of quartz and mangano-siderite studded with pyrite. The quality of the higher grade ore is indicated in the following analysis:-

Lead	55.2%
Zinc	13.18%
Silver	24 oz. 16 dwt. 12 gr. per ton."

Production. No production figures are available There is a statement in the Director of Mines Report for 1926 that an option was let to the Washington Silver Lead Company. This company "picked up" the mouth of the low level tunnel and opened the tunnel to the face. They are not mentioned in reports of the following years.

(2) Adit Near Great South Comet

An adit 60 feet long is situated immediately above the road cutting about 250 feet down stream from Great South Comet No. 1 adit. The adit portal is near the contact of Pre-Cambrian graphitic slates and the Cambrian series of sediments and tuffs.

Thin seams of pyrite occur in the adit face and are sporadically distributed along the backs.

(3) Kozminsky Hill Workings

The workings consist of a shaft, one trench and an adit. The shaft is situated near the crest of Kozminsky hill and 400 feet east of the road linking Comet and Great South Comet. The shaft is collapsed but from the size of the dump is of the order of 50 feet deep. The dump rocks consist of siderite containing narrow seams of galena and sphalerite, pyrite is plentiful as narrow seams and irregular masses, chalcopyrite is present in trace quantities.

A shallow trench is situated 300 feet west of the shaft and is located in Cambrian shales and fine grained tuffs. In the trench spoil are scattered pieces of siderite gangue containing narrow seams of galena and some sphalerite.

An adit in similar country rock occurs 200-300 feet N.W. of the trench. This is said to contain a narrow seam of sphalerite, but I was unable to find it.

SUMMARY

The Comet lode is a line of proved mineralisation believed to occupy a sheeted fault zone in Pre-Cambrian phyllites and slates. Dolomite is in some way associated with the mineralisation, but surface exposures of dolomite are rare. The line of exploited lode is 1610 feet long from the northernmost open cut to the southern limit of underground driving. The vertical range of the combined workings is 400 feet.

The mineralisation is of a lead/silver type and is located in or near ferromanganese gossan to at least the 300 ft. level. The gossan includes three dominant types: botryoidal, cellular and a chocolate coloured variety. The richer ore has occurred in shoots, no apparent control of which could be seen from the surface mapping. Sampling by Finucane (1947) has indicated that the lead/silver content is low of the gossan remaining in or near the open-cuts.

The thickness of the main gossan zone at surface ranges from 35 to 100 feet. A subsidiary line of gossan occurs 200 feet to the east and has been traced for 1100 feet at surface by shallow trenches.

Comet production is of the order of 93,000 tons of ore. The mill head value varied from 9.7% Pb. in 1900 to 13.1% Pb in 1897, other years indicate a head value of about 12% lead. The silver content was of the order of 7-8 ozs. per ton of ore.

In addition, 90,000 tons of ferromanganese gossan was sold as flux and is stated to have had an average content of 5% Pb. and 2.5 ozs. Ag. per ton.

The Great South Comet Mine is an horizontal distance of 2750 feet south of Comet and is similar to Comet lode in that it is contained within a sheeted fault zone. The mineralisation is an argentiferous galena/sphalerite association containing subordinate pyrite, chalcopyrite and Jamesonite in a siderite gangue.

The tested mineralised length of lode is 1600 feet, extending between South Comet and Adelaide Creeks, it strikes 335° and dips 76° S.W. The average width of the ore zone is approximately 38 feet. Three individual lodes within the zone have been recognised by Taylor and have an aggregate width of 12 feet.

The high Pb. or Zn. values are localised in shoots within any one lode and the galena/sphalerite ratio varies from shoot to shoot, either one or the other mineral may predominate, or the two may be present in roughly equal amounts. Taylor was unable to recognise any obvious control of shoot localisation.

Ore reserve figures are based on only 26 samples and no attempt has been made to present a detailed assessment of tonnages and grade. The potential tonnage based on the available assays, above and between South Comet and Adelaide Creeks, is of the order of 1,100,000 tons bulking 1.47% Pb, 2.2% Zn, 1.1 ozs. Ag. per ton. The /combined calculation to arrive at this figure has employed a/lode width of 12 feet in an ore zone 38 feet wide. The between ore sections have been considered barren.

The mine operators in the past had trouble separating lead and zinc in their treatment processes. This fact coupled with recurring financial difficulties has caused the deposit to be worked only intermittently and on a small scale.

Kozminsky Mine occurs 900 feet down stream from Great South Comet and there is geological evidence to support the old contention that the two mines occur on different faulted sections of the same ore zone. The fault is located on or near the course of the creek.

The gossan zone of Kozminsky's Mine is said to extend 20 chains northerly from the creek, but this extension could not be identified on the ground.

Two lodes occur in the Kozminsky Mine zone and the deepest adit of three extends 300 feet along lode. The mineralisation is similar to that at Great South Comet Mine.

Mineralisation occurs on the western flank of Kozminsky Hill and is located in an apparent capping of Cambrian rocks on Pre-Cambrian quartzites and slates.

Lead/zinc mineralisation similar to Great South Comet type is visible on the dump of a shallow shaft and in spoil from a nearby trench.

If the Comet, Great South Comet and intermediate ore occurrences are considered to be part of one large mineralised linear zone, disrupted in places by faulting, then the vertical range of proved mineralisation is 1050 feet (from bottom level of Comet Mine to the top of South Comet Hill) and the horizontal extent is 6,000 feet (from Northern-most open cut at Comet to Adelaide Creek).

Ore prospects to the north of Comet Mine are indefinite. Gossanous material of the same type as Comet extends intermittently to 4,000 feet north of Comet Mine. The last 1300 feet occurs in weathered serpentine. The area generally is covered by scree on the hill slopes and by soil in the flatter areas.

Ore prospects south of Adelaide Creek are unknown. There are no recorded workings other than the short south adit No. 7.

CONCLUSIONS AND RECOMMENDATIONS

A potential linear zone of lead, zinc and silver mineralisation exists between and beyond the existing Comet and Great South Comet Mines. The line is at least 10,000 feet long and known mineralisation extends over a vertical range of 1050 feet. The zone is probably dislocated by faulting and strike changes could be due to different degrees of shearing competency of the rocks traversed. The line passes from north to south through Cambrian intrusive serpentine; Pre-Cambrian phyllites quartzites and slates; and into Cambrian shales and tuffs.

The possibility of exploiting the area by large scale mining will depend primarily upon the establishment of continuity of the mineralised zone between Comet and Great South Comet Mines or outlining extensions to the north of Comet or south of Adelaide Creek.

It is recommended that preliminary geophysical testing be undertaken to test the zone between Carbine track to the north and Adelaide Creek southwards. The recommended eastern and western limits are shown on the accompanying 400 feet = 1 inch (approx.) geological plan.

Insufficient assay evidence is available to indicate whether or not the grade potential of the line as a whole is high or low. The Comet Mine production figures indicate a favourable grade of lead and silver. The indicated bulk grade potential of silver, lead and zinc in Great South Comet mine is low. The ultimate decision on grades of ore will be determined only by drilling.

If geophysical results prove encouraging, it is further recommended that Great South Comet Mine be systematically sampled, thus making possible a more accurate grade assessment than that available at present. Adits Nos. 1 and 2 have not been worked for about eight years, and the higher levels, for a considerably longer period. It is expected that very little work would be required to make the workings safe for sampling. At least one adit of Kozminsky Mine also should be relatively easy to enter. Comet Mine underground workings are badly collapsed and flooded and are beyond economic restoration.

3rd November, 1958. D. McKenna, Geologist.

B

Carbine track

Soil change

Dundas

Dolomite

Old tramway, present day road

Rivulet

ML 20M/46
W.J. Hodge

Prospecting shaft

Northern open cut

open cut

open cut

open cut

Comet shaft

Southern open cut

Dolomite

Air shaft

Joint shaft

Creek

Comet

Road

Access

WEST COMET MINE

Adit

Trench
Pb, siderite

Shaft

KOZMINSKY HILL

AMG
370923mE
5361880mN

Creek

SOUTH COMET CREEK FAULT

No 1 adit

No 2 adit

No 3 adit

No 4 adit

KOZMINSKY MINE

Adit

Shaft

South Comet

SOUTH COMET SHEAR

SOUTH COMET HILL

No 6 Adit

No 5 Adit

No 7 Adit

ADELAIDE CREEK WORKINGS

Ck

Adelaide

B'

T N

Dolomite

Serpentine

Fine grained green tuffs

Apple-green coloured, well laminated shales containing occasional narrow tuff bands.

Brown to red coloured shales containing occasional narrow tuff bands

Grey and black laminated shales

"Razorback" type conglomerate

Tuffaceous quartzite

Black and grey coloured shales and slates, poorly bedded and containing occasional narrow intercalations of quartzites

Grey and white massive quartzite

Apple-green coloured phyllite and argillaceous quartzite - micaceous in part

Black, well laminated slate

Lines of ferromanganese gossan – believed to be in place

Impregnations of pyrite – generally disseminated – veining rare

Geological boundaries, indicated

Adit portal

Shaft

Area recommended for geophysical testing

Mineral lease

392021

AMG REFERENCE POINTS ADDED

5 cm

58 - 250

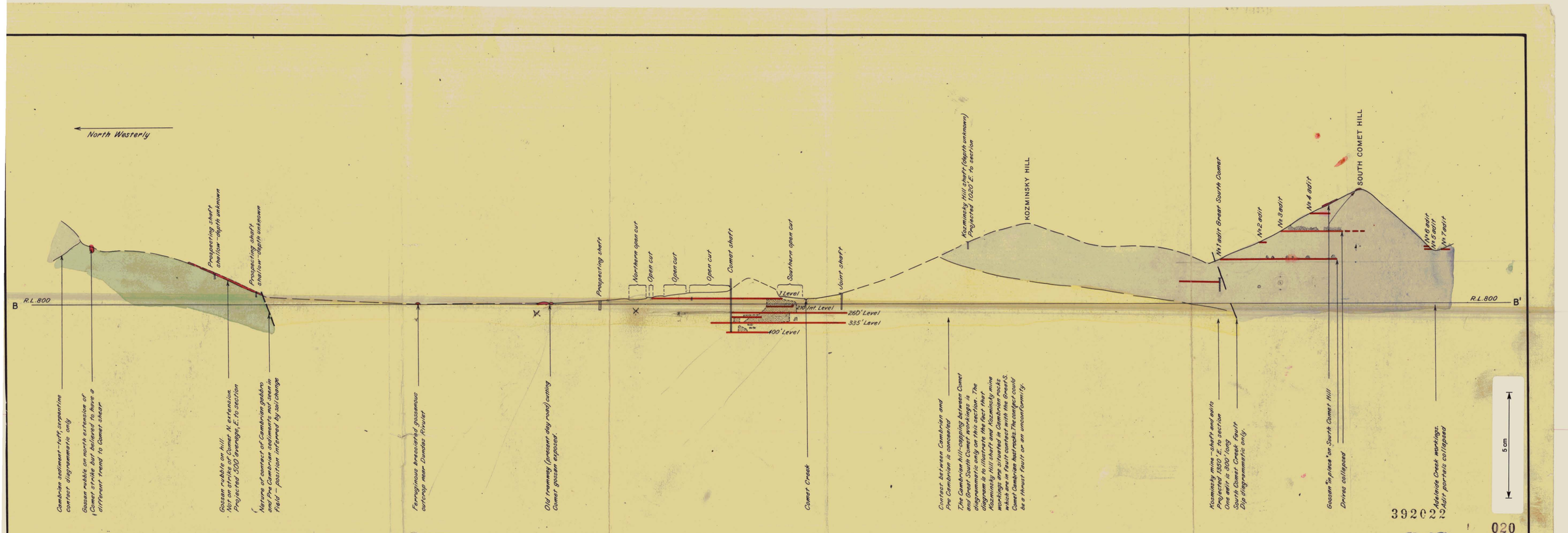
019

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED.

PRELIMINARY GEOLOGICAL MAP

COMET – GREAT SOUTH COMET LINE

Date: October, 1958	Geologist: D. McKenna	P.R.P/7/100
Scale: 400 feet to 1 inch approximately		Plan No T 484



Reference

- Underground and adit drives within the ore zone
- Significant gossan outcrops on or near the line of lode
- Stoping outline

Legend

- CAMBRIAN — Serpentine and Gabbro
- CAMBRIAN — Brown to red coloured shales and green tuffs, conglomerates
- PRE CAMBRIAN — Black and grey coloured shales and slates with bands of white quartzite

39202 020

58 - 250

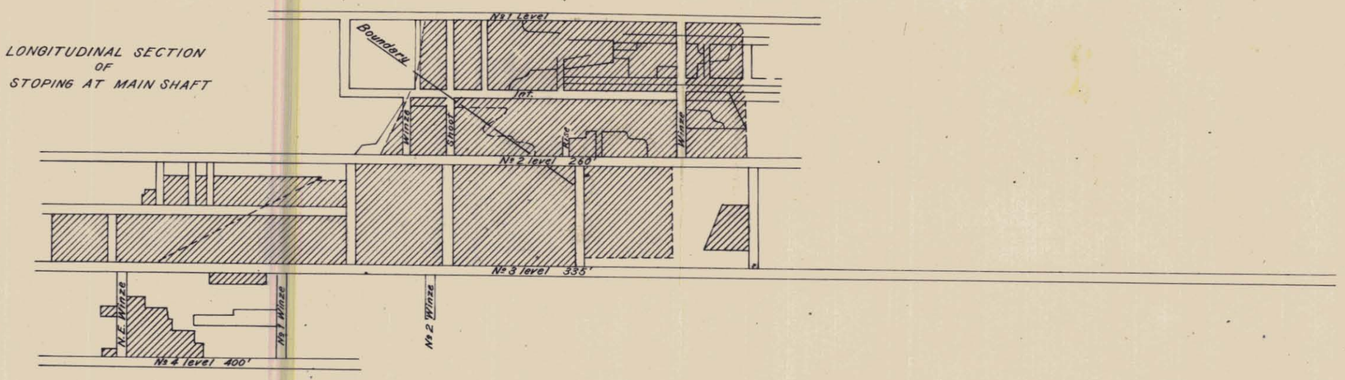
RIO TINTO AUSTRALIAN EXPLORATION PTY LIMITED

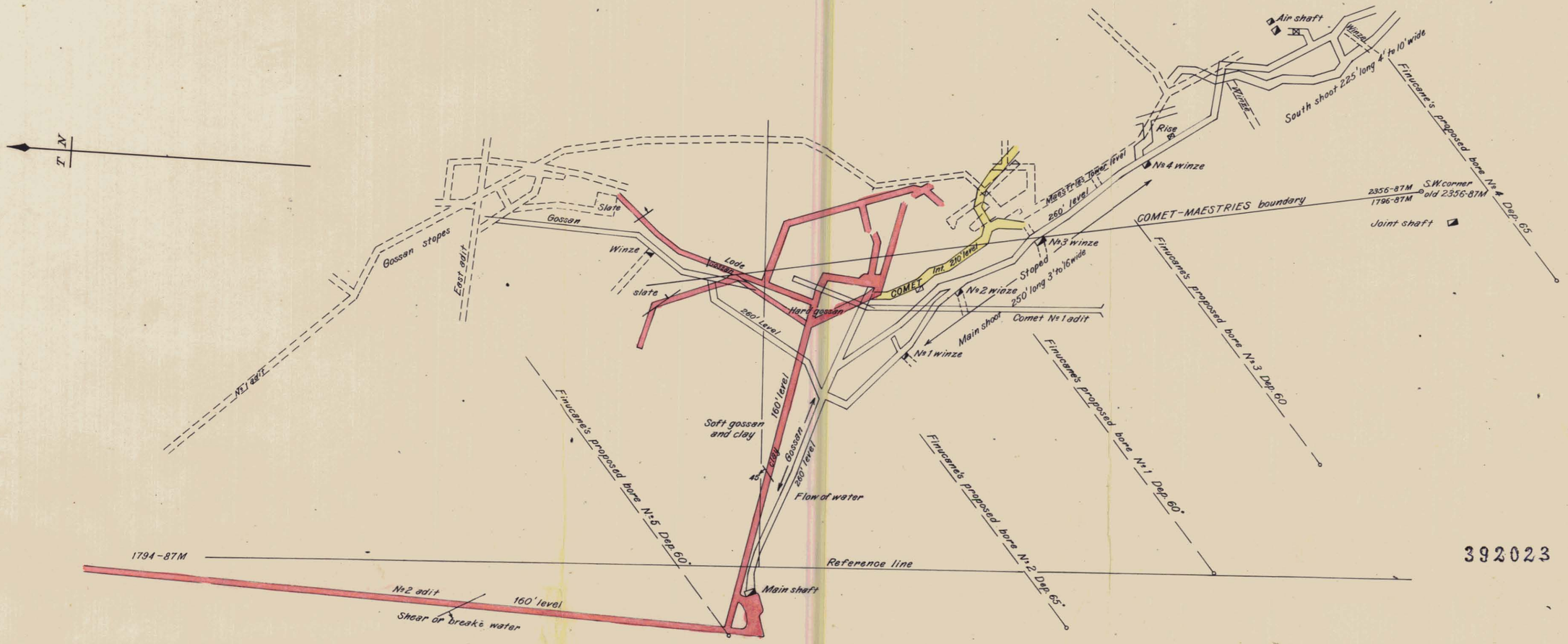
LONGITUDINAL SECTION

COMET — GREAT SOUTH COMET LINE

Date: October, 1958	Geologist: D. McKenna	P.R.P./7/100
Scale: 400 feet to 1 inch approximately		Plan No T485

LONGITUDINAL SECTION
OF
STOPING AT MAIN SHAFT





392023

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

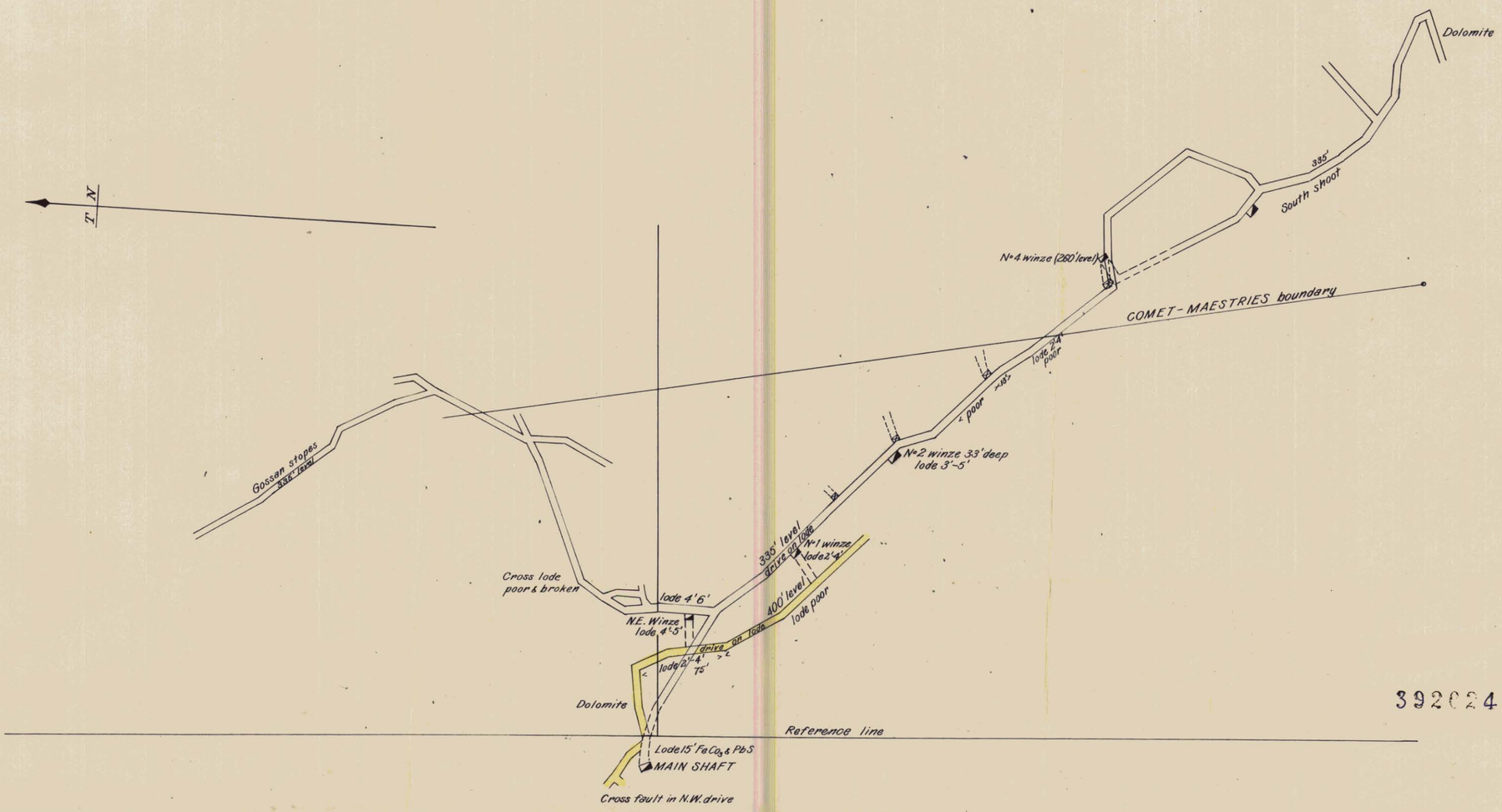
PLAN OF 160FT, 210FT, 260FT LEVELS & LONGITUDINAL STOPE SECTION

COMET · MINE

021

Date: October, 1958	Authority: P.R.P/7/100
Scale: 80 feet to 1 inch	Plan No T486

58-250



392024

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

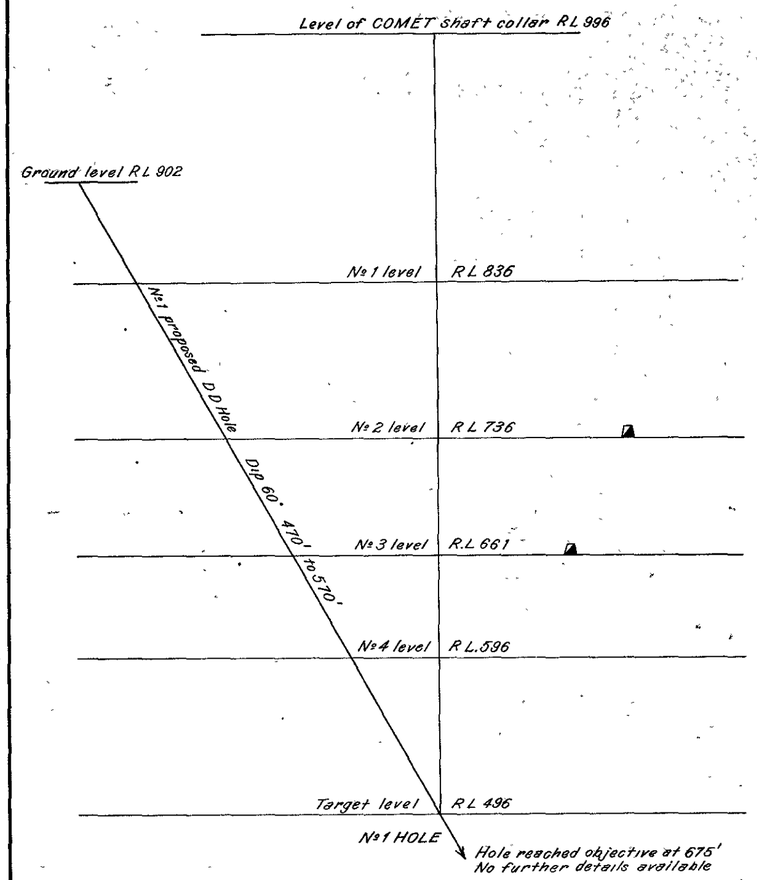
PLAN OF 335 FT. AND 400 FT. LEVELS

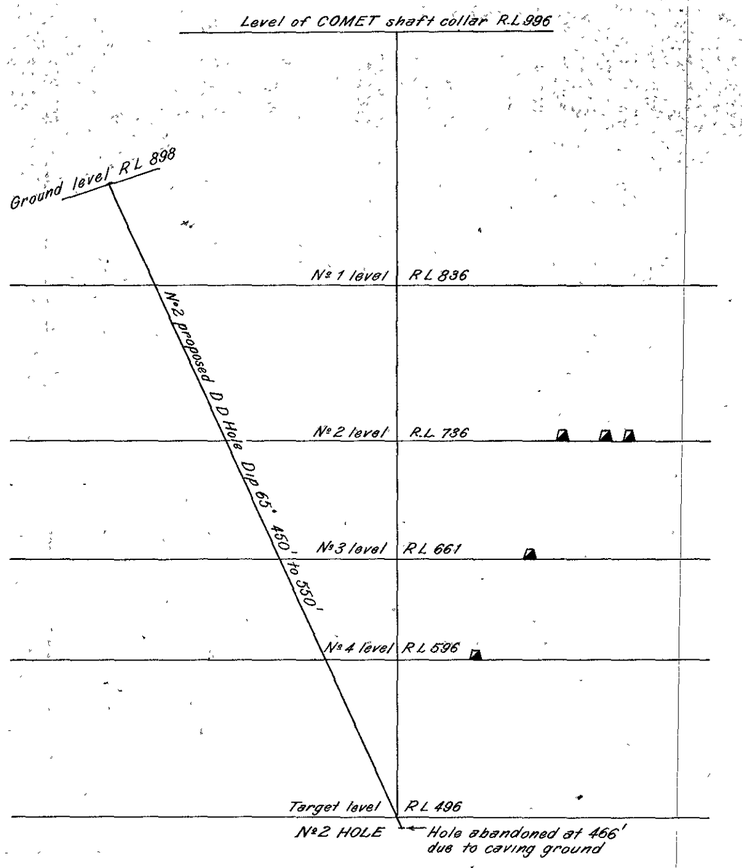
COMET MINE

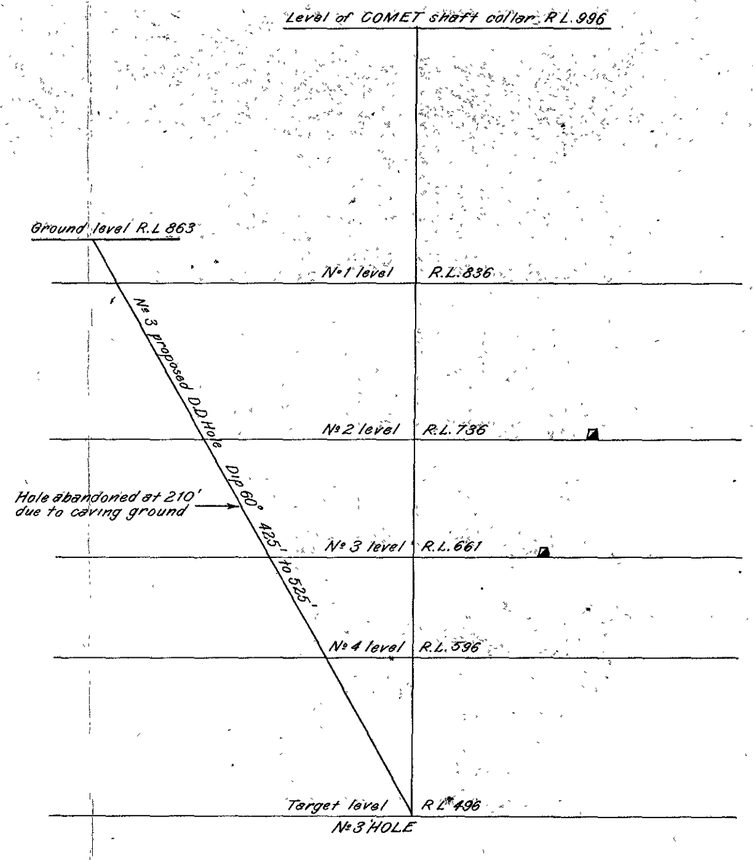
4259

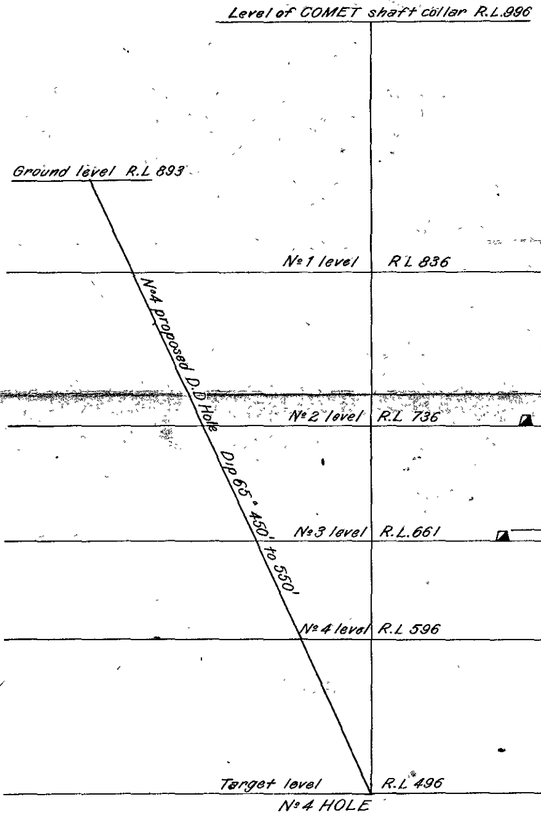
Date: October, 1958	Authority: P.R.P/7/100
Scale: 80 feet to 1 inch	Plan Nº T 487

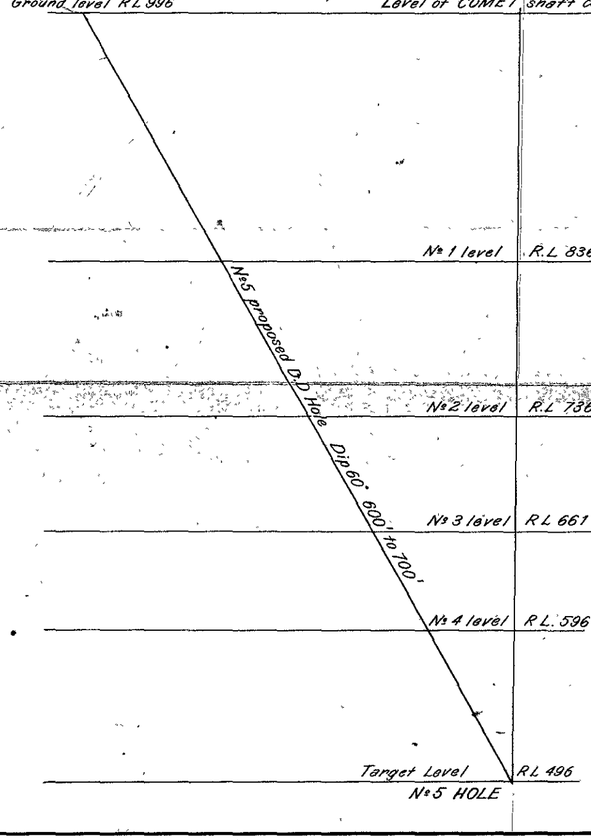
58-250











392025

Note. The actual depth of each bore will depend on the position of the lode intersection and the formations encountered and it would be advisable to penetrate through the dolomite band with which the lode is associated.

5 cm

RIO TINTO AUSTRALIAN EXPLORATION PTY LIMITED

DRILLING PROGRAMME PROPOSED BY FINUCANE (1947)

COMET MINE

4260

Date: October, 1958	Authority: P.R.P./7/100:
Scale: 80 feet to 1 inch	Plan No T488

1800N

1600N

1400N

1200N

600E

800E

A

A'

B

B'

C

C'

D

D'

E

E'

No 1 ADIT

No 2 ADIT

No 3 ADIT

No 4 ADIT

No 1 stope

No 2 stope

No 3 stope

No 4 stope

No 5 stope

No 6 stope

No 7 stope

No 8 stope

No 1 XCUT W.

No 2 XCUT W.

No 3 XCUT W.

No 4 XCUT W

No 1 XCUT E.

Portion

16°

18°

27°

23°

9°

23°

24°

12°

S7

S8

S9

S10

S20

S26

No 1 lode

No 2 lode

No 3 lode

Winze

Rise

392026

5 cm

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

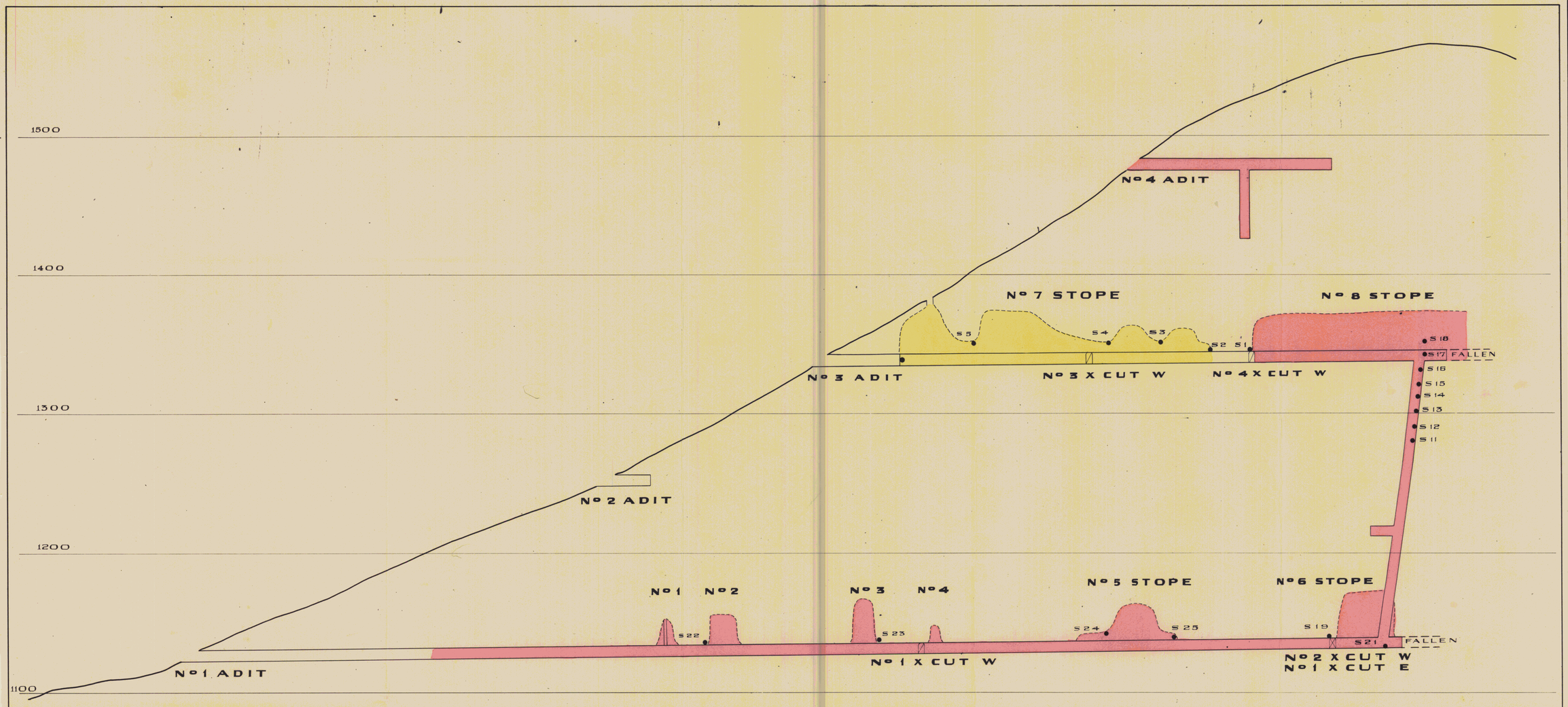
PLAN OF Nos 1,2,3,4 ADIT LEVELS (AFTER TAYLOR, 1950)

GREAT SOUTH COMET MINE

4262

Date: October, 1958	Authority: P.R.P./7/100
Scale: 40 feet to 1 inch	Plan No T489.

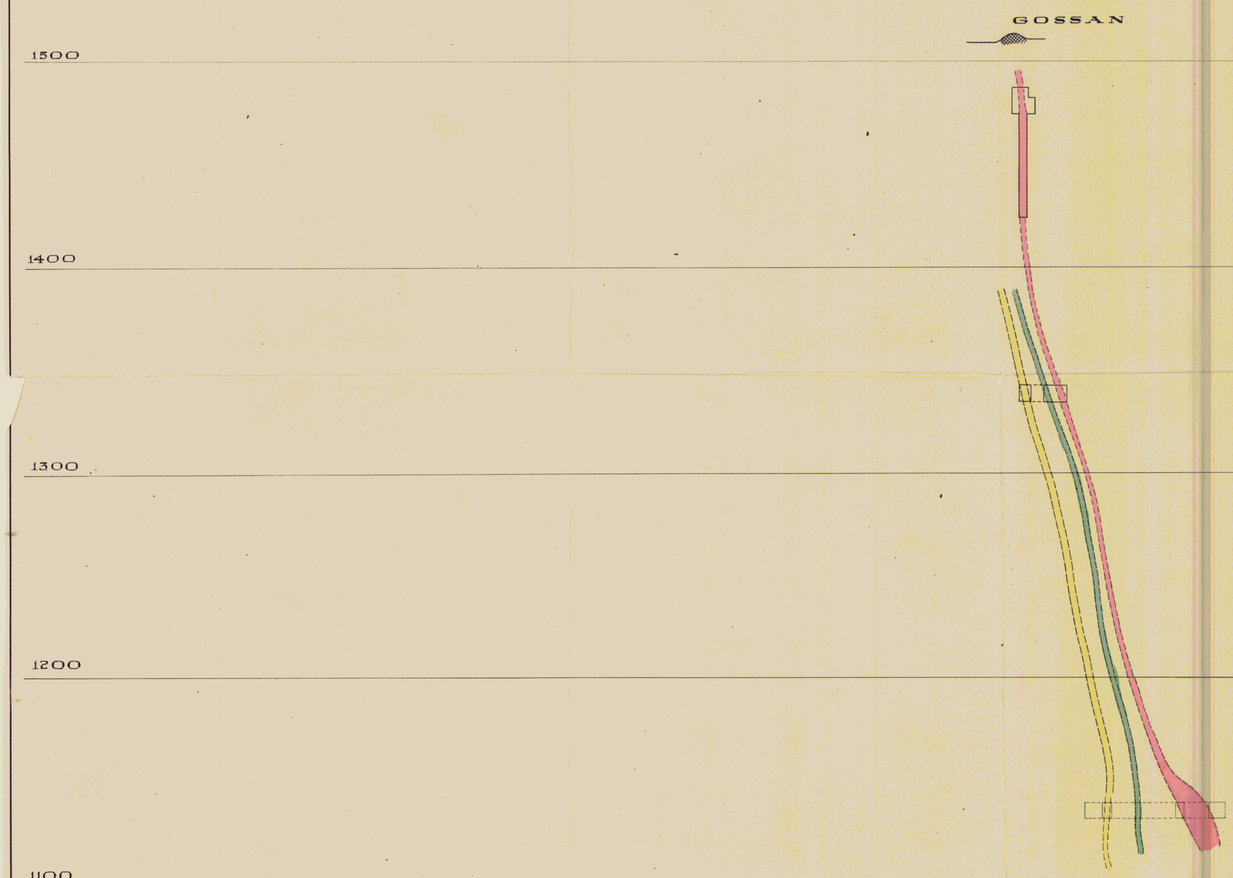
58-250



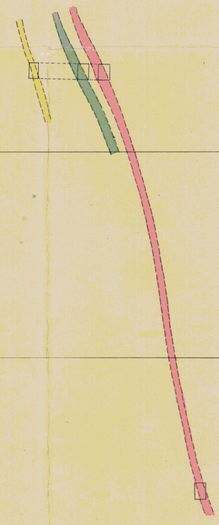
LONGITUDINAL SECTION PROJECTED ON TO AA' - LOOKING EAST

CROSS SECTIONS

CC' AND DD' PROJECTED ONTO EE'



BB'



No 1 Lode
No 2 Lode
No 3 Lode

5 cm

RIO TINTO AUSTRALIAN EXPLORATION PTY. LIMITED

LONGITUDINAL & CROSS SECTIONS
(After Taylor - 1950)

GREAT SOUTH COMET MINE

DATE: OCTOBER, 1958 | SCALE: 1 INCH = 40 FEET

AUTHORITY: PRP/7/100

GEOLOGIST: D. McKenna | DRAFTSMAN: D. Lawford | PLAN No T.490

392027

4261

58 - 250