COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

RECORDS:

5928/65

DEPARTMENT OF SUPPLY & SHIPPING.

MINERAL RESOURCES SURVEY BRANCH.

PRELIMINARY REPORT ON GIBSONVALE TIN FIELD, KIKOIRA, N.S.W.

Report No. 194/32. Plans Nos. 1118A & B and 1119.

I. SITUATION.

Gibsonvale tin field is situated approximately three miles southeast of the village of Kikoira on the Ungarie-Naradhan railway line, 18 miles west of Ungarie and 357 miles from Sydney.

II. HISTORY & PREVIOUS LITERATURE.

Mr. F. W. Booker of the New South Wales Geological Survey mapped, and reported on, the field in 1939. His report, dated 25/1/39, contains a considerable amount of factual information and is accompanied by a plan on a scale of 1"=5 chains.

Mr. Whalan, Inspector of Mines for this district, prepared plans of the underground workings, and these are generally kept up to date by the mine operators. The above plans and report were used extensively during the course of this examination.

According to Mr. Booker's report, the history of the area is briefly as follows. Small tin-bearing quartz reefs were discovered in 1906 by E. Connally. Some shallow surfacing was also carried out, but results were generally poor. In 1936, J. Gibson discovered rich alluvial tin ore in the area and this led to the important production that has since been achieved. The production is given in the following table, the figures being supplied by the New South Wales Mines Department:-

Production Table.

	T.	Cwt.	Qr.	Lb.	Value £.	s.	d.
1939-40	538	8	3	0	105,145.	8.	11.
1941	654	17	1	0	139,752.	14.	10.
1942	709	5	0	27	107,298.	7.	2.
1943	510	4	0	10	125,102.	7.	9.
	2412	15	1	9	535,258.	18.	8.

III. GENERAL GEOLOGY.

Mr. Booker states "Rock outcrops are few, with the result that geological boundaries can only be approximately fixed except where they are exposed in the workings. The country rock of the district is slate, probably referable to the Cobar series of Upper Silurian Age. The slate has been intruded by granite and by tin-bearing reefs." No geological mapping was carried out by the writer.

IV. ECONOMIC GEOLOGY.

The most important tin deposit is a deep lead, and the workings on it extend at intervals over a distance of 2½ miles in a northwest-southeast direction. The maximum width of the lead is 250 feet. The depth to bedrock ranges from 20 to 100 feet and the thickness of wash from 1 to 6 feet. The lead has not been worked

continuously, much of the wash being below profitable grade, which is at present regarded as 20 lb. per cubic yard.

During the present examination, the following points were investigated:-

1. Ground Overlying Wash - Eastern Half of Field.

Mr. J. Gibson, the biggest lease-holder and the original discoverer, believes that the ground overlying the wash (40 to 100 feet in depth) contains sufficient cassiterite (tinstone) to enable the whole area to be profitably dredged.

Thirty-seven samples were taken from shafts scattered widely over the area which it was proposed to dredge (chiefly the eastern half of the field). The samples were ordinarily cut in 15 foot sections, the channels being 4 to 6 inches in width and 1 inch in depth. Seventeen of these samples were panned on the field and the concentrates recovered sent for assay. The remainder of the samples were panned in the Melbourne University Ore-Dressing Laboratory under the supervision of Mr. J. G. Hart. The concentrates recovered were assayed for gold and tin. The average grade of the samples was:-

Tin oxide - Less than 0.25 lb. per cubic yard.
Gold - " " 0.25 grains per cubic yard.

The results of this reconnaissance sampling indicate that further work along these lines is not warranted and that the area is not suitable for dredging.

2. Relatively Shallow Ground - Western Half of Field.

Some attention was paid to the northwestern section of the field where the ground ranges from 17 to 40 feet in depth, in order to see whether there was a possibility of using power shovels or similar appliances for excavating the wash. In Wenham's area, near the present site of Chivers' dam and washing plant, the dumps from two shafts approximately 40 feet in depth were sampled. The results were:-

No. 13 shaft - 5.83 lb. of cassiterite per cubic yard.
" 10 " - 5.81 " " " " " " "

A costean near Chivers' washing plant is stated to have disclosed 8 feet of ground above bedrock averaging 4 lb. to the yard, the total depth being 17 to 20 feet. An attempt was made previously to work this area by means of a small Diesel shovel, but the project did not succeed. There is a dam and treatment plant close to shafts 10 and 13. It is known, however, that other shafts in the area contain only very low-grade material above the 2 to 3 feet of wash usually worked. However, it is considered some further testing by boring is warranted.

The Parkinson family, who are working a shaft on the east side of the road 0.7 miles north of the right-angle bend which occurs at the western end of M.L.29, stated that the ground above the wash contains considerable quantities of cassiterite. In this shaft, 1.75 feet of wash immediately above the granite bedrock has yielded an average of 20 lb. of cassiterite per cubic yard. The 13feet of ground above the wash was sampled twice and gave an average of 6 lb. of cassiterite per cubic yard. The total depth of the shaft is 40'3".

3. Origin of Cassiterite in the Lead.

It has often been assumed on the field that most of the cassiterite in the lead has been derived from the reefs (previously worked) which occur immediately north of the Giberipp and Victory Mines. This led to the conclusion that the cassiterite content of the lead would naturally fall off downstream (i.e. south and east) from here. It was found, however, that in several of the workings below this point tin-bearing veins occur. In the Victory Mine, a

2-inch vein containing 50% SnO_2 was followed down 3 to 4 inches into the granite. The cassiterite in this vein was seen by the writer and was in situ and had not been washed into a crack. Tin-bearing reefs were also noted in Anne O'Donnell's workings. In the Mulyan area, six miles south of Gibsonvale, a granitic lode 2'6" in width was found to contain 0.28% Sn. It is probable that some of the cassiterite in the Gibsonvale deep lead has been derived from similar occurrences and judging from the fact that the cassiterite is usually not very stream-worn, it appears likely that the lead has been fed more or less continuously along its length.

4. Eastern Continuation of Lead.

The future of the field depends to a very large extent upon the discovery of a continuation of the present lead to the eastward. It seems likely that in this section, the conditions of the deposition of sediments and cassiterite were different from those upstream.

From the head of the lead to its easternmost known point, the lead has occupied a well-defined channel with relatively steep sides. It is likely that during the time in which most of the cassiterite was deposited here, the rate of flow of the stream was relatively rapid and little sedimentation took place. The valley was scoured fairly clean to bedrock though some coarse material and a large proportion of the heavy cassiterite collected over a long period.

It seems likely, however, that in the area lying to the east of the present workings, the stream began to drop its load and form beds of sediments over which it subsequently flowed. So far, it has not been possible to find the same well-defined channel in this region and this suggests that the stream migrated a good deal, now taking one course and now another.

Subsequently the stream lost its capacity to carry large quantities of material in suspension. This resulted in the gradual covering of the whole area with 40 to 100 feet of clay and sand which does not carry very much cassiterite. Such cassiterite as was contained in these sediments was not concentrated, as it was in the earlier stages, by the carrying away of the lighter worthless material.

5. Geophysical Prospecting.

As indicated above, the tin-bearing wash lies on a basement of slate or granite, and is overlain by 40 to 100 feet of loosely compacted clay and sand. The cassiterite obtained has been from deposits in old stream channels eroded in the basement rocks. The Geophysical Section of this Branch considers that it would very likely be possible to contour these basement rocks and hence define stream channels in advance of boring operations. If this is the case, such work would be very desirable and fully justified by the past production and future prospects of the field.

In addition to the Gibsonvale field proper, attention should also be paid to the Mulyan area, approximately 6 miles south of Gibsonvale and to Mortensen's farm, approximately 7 miles north of Kihoira. In the Mulyan area, a granitic lode 2'6" in width was sampled and the assay result was 0.28% Sn. It has been opened up at a depth of 15 feet by a drive 20 feet in length. Quartz reefs in this vicinity also carry cassiterite and have been worked in some places. Deep Tertiary alluvial deposits occur in the vicinity of these workings and it is believed that they have not been adequately tested. Geophysical work, followed by drilling, is warranted.

On Mortensen's farm, ten bores were put down to depths of 40 to 100 feet in wash overlying granite in an area of approximately 12 acres. All of these bores are reported to have revealed 1 to 2 feet of wash, carrying approximately 7 lb. of cassiterite per cubic yard. On one bore site, a shaft has been sunk to a depth of 83 feet. Ten cubic yards of wash were extracted and treated for a recovery of 12 lb. of cassiterite concentrates (50% Sn) per cubic yard. There are no criteria which can be used in selecting sites for these bores

and it is possible that any channel occurring on the property has been missed by the bores.

6. Individual Mines.

(a) The Gibcrimp Mine (M.L.17).

This mine has been the richest on the field. Production figures as supplied by the management are as follows:-

Year	Wash C.yd.	Cons. Tons	Grade lb./c.y.
1942	Not recorded	274 10 0 23	Prob. high
1943	8,594	177 2	46.3
to April 30th, 1944	2,490	43 7 2 13	39.0
1943 and 1944	11,084	220 9 2 13	Av. 44.5

Down the lead from the present workings a drive has been extended for 320 feet. This has proved wash averaging, according to the Manager, approximately 28 lb. of cassiterite per cubic yard. The average thickness of the wash is 2'3". The width of the lead in this area is unknown, but may range from 120 to 200 feet. The maximum amount of wash in this section would be 5,000 cubic yards. An additional 400 feet length of lead lies to the east of this. This could contain an additional 5,000 cubic yards. There are also several small pillars left in the present workings. There is a possibility that some wash could be obtained from a parallel lead to the north of No. 2 shaft. The Manager, Mr. C. Griffiths, considers that there is probably two years life ahead of the mine. (16,000 cubic yards at the 1943 rate of output). On the present indications, it appears that this would be the outside limit.

The mine is well managed and the output per man shift is approximately 1 cubic yard.

The wash is treated on the lease. It is put through a trommel whence it goes into a race approximately 20 feet in length. The concentrates from this race are streamed in a second box. Final concentrates usually assay 72 to 74% Sn. 13,000 cubic yards of tailings from this plant were re-treated and returned 3.95 lb. of cassiterite concentrates per cubic yard. Costs are reported by the Manager to be in the vicinity of 40/- per cubic yard.

(b) Duff's Victory Mine (P.M.L.29).

This mine has been one of the most productive on the field and has been well managed. The figures in the following table of production were supplied by the Manager, Mr. Binney.

Year	Cubic Yards	Bags of Concentrates	Approx.Av. Grade lb/ c.yd.
From 21/9/39 to 30/12/39	2,469	494	23.64
1940	5,396	1,127	24.82
1941	5,868	1,893	36.06
1942	8,097	2,727	39.93
1943	5,347	1,239	27.8
To March 1944	1,032	193	22.1
	28,169	7,673	32.4

NOTE: Approximately 18.75 bags = 1 ton of concentrates, hence total production = approx. 409 tons of concentrates. There are approximately 620 yards of 20 lb. wash at grass waiting for treatment.

This is a close approximation to the actual production, but the exact figures could only be obtained from sales records.

The owner, Mr. Duff, is Shire Engineer, at Wyalong, New South Wales. He equipped the mine with a 12 h.p. steam engine, 2 centrifugual pumps, 2 gravel races and a streaming race, plus accessory piping, etc. A 5,000 cubic yard dam was also put down on the property. Total costs appear to have been kept in the vicinity of 30/- per cubic yard, although they have risen over the past year. Treatment costs were stated by the Manager to be 3/6 per cubic yard. The output per man shift was 1.46 cubic yards for the six months ending 30/6/43, but had fallen to 1.12 yards for the six months ending 30/12/43.

There is still some 30 lb. wash in pillars in the mine, but their total yardage is small. The Manager reports that four bores sunk to test the main ground remaining on the lease, gave results varying from a trace to 40 lb. per cubic yard. In general, the results were lower than the average grade of the ground previously worked.

There is a stack of tailings on the lease, which probably contains 30,000 cubic yards. Panning of this reveals that it contains a considerable amount of fine tin and some coarser pieces. It was not systematically sampled. However, judging from results obtained by re-treating the Giberipp sands (3.95 lb. per cubic yard), it appears likely that this sand would contain from 2 to 4 lb. of cassiterite per cubic yard.

(c) Gibson's Mine.

Production records for the years prior to 1943 were not obtainable. The Accountant supplied the following figures of production during 1943:-

	Wash C.yd.	Concs. Tons.	Grade lb/c.yd.
Mine	7,222	84.09	26.3
Tailing Retreatment	2,188	2.16	2.2

The mine has been running at a loss since September, 1943. (The owner states that it has been running at a loss for the past two years). The number of men employed during this period averaged 50, each man working approximately 240 shifts per year. Hence, with an output of 7,222 cubic yards, the output per man shift averaged 0.60 cubic yards. On Duff's mine with similar widths, the average was 1.29 cubic yards.

It is doubtful whether Gibson's mine has any reserves at the present time. The mine has been producing at a loss since September, 1943. On the other hand, it is very likely that the lease still contains 4,000 to 10,000 cubic yards averaging a little above 20 lb. to the yard.

(d) Anne O'Donnell's Mine. (P.M.L.38 and adjoining lease to eastward).

The following figures were supplied by Miss O'Donnell:-

Year	Cubic Yards	Concs. T.	Cwt.	Qr.	Lb.	Value £.	s.	d.
1941	Not recorded	28	7	0	13	6,011.	6.	0.
1942	5050	49	5	0	5	11,323.	16.	0.
1943	5080	47	1	0	11	11,282.	10.	2.
	10,130	124	13	1	1	£28,617.	12.	2.

This gives an average grade for 1942 and 1943 of 21.5 lb. of cassiterite per cubic yard. Six men were employed in recent operations. A small quantity of high-grade ore, approximately 35 to 40 lb., is known to be left in the old workings on P.M.L.38, but it is thought that it does not exceed 1,000 cubic yards. Work is now being concentrated on new shafts at the eastern end of the field. Wash averaging 20 to 25 lb. per cubic yard is being mined, but very little ore has been blocked out.

Miss O'Donnell has recently acquired a boring plant with which she is testing the lease.

(e) Matuschka's Mine (P.M.L.10).

The approximate total production to date as supplied by Mr. Matuschka is:-

Wash C.yd.	Concentrates Tons	Grade lb/c.y.
4,000	35.7	20

Mr. Matuschka believes that he has two years of life ahead in the mine. This would represent approximately 2,000 tons of wash. It seems likely that this is the case as ore has been proved on the downstream side of the lease where it adjoins Duff's mine. The grade (19.6 lb. for the last 1,000 cubic yards trented) is somewhat marginal and would show little profit if wages men were employed. Most of the work is carried out by the owner and his brother.

(f) Other Mines.

The mines described above have been the main producers on the field. In addition, up to 12 men work as tributers on P.M.L.10 (Matuschka) and on P.M.L.37 (Honning). They pay 10/- tribute. Their output is usually over one cubic yard per man shift so that they are likely to mine 3,000 cubic yards per annum. The grade in this section varies from 20 to 30 lb. per cubic yard, which gives them an approximate productive capacity of 35 tons of cassiterite concentrates per year.

V. SUMMARY.

Ore remaining in the leases at present being worked is, for the most part, undeveloped and, therefore, accurate estimates cannot be made. However, as profitable wash is strictly limited to a well defined channel, which has been followed for over two miles, it is clear that ore remaining in particular leases is very unlikely to exceed certain maximum figures as indicated in the description of individual mines. These calculations show that the present ore position is, on the whole, unsatisfactory and, considered in conjunction with other factors, will lead to a drop in output during 1944

as compared with 1943 (510 tons of concentrates were produced during 1943). It is believed that production for 1944 will not exceed 300 tons of concentrates.

The material above the wash in the eastern half of the field was sampled in shafts, but the results proved that the grade (less than 0.25 lb. per cubic yard) was too low for profitable dredging.

CANBERRA, A.C.T.
9th October, 1944.

C. J. SULLIVAN,
Geologist.

PLAN OF GIBSONVALE TINFIELD

PLATE I. (Sheet I)

5 0 5 10 Chs

— Reference —

Recent — Alluvium.
Tertiary — Deep Leads
Ordovician — Andalusite Slates
Igneous — Granite

● Bores. ■ Shafts, Tanks, Contours

Datum - Sea Level

NOTE All work in black & General geological mapping taken directly from Mr F.W. Booker's plan.
Additional information from Mr Booker's Report not previously shown on plan:-
Wash - Thickness & grade thus:- 3', 20lb (Bixenholes)
Wash in shafts thus:- 19', 12lb.
The following information has been added by C.J. Sullivan:-
Notched out Ground:- 3 [illegible]
Grade determined by workings:- 32 lb
Sampling of shafts:- Sampling confirmed to material above wash except where otherwise noted

Depth feet	SnO_2 lb/c.y	Au gr/c.y
15-30	0·8	0·08

Dump samples:- 5·83 lb/c.y
Possible amount & grade of wash remaining:- 5000 c.y. 20 lb.
R.L of bedrock partly based on Mr Booker's survey:- 923'
All results for Tin in terms of lb per c.y. of cassiterite concentrates (70-72% Sn.). Samples panned & concentrates assayed

PML 36

PML 8

Open cuts & shallow holes

KANTARA TIN MINING SYND.

PML 35 CASSIM & PTY.

ML 29

ML 3 GIBCRIPP MINE

23

VICTORY MINE

PML 9

PML 17

SUCCESS MINE

PML 31

PML 15

GIBSON'S NO. 2 MINE

PML 16

PML 38

ANNE O'DONNELL'S PARADOX MINE

No values

PML 28 MOONEY'S MINE GIBSON

PML 25

too low grade for dredging

BYRNES & KEMP

24

PML

This area considered

PML 26

J. P. MOONEY Gibson

A.I. & J.R. O'DONNELL.

PML 22

J. BYRNE & PTY. Gibson

PILON & PTY.

1'9", 12lb Samples 37-40

Depth feet	SnO_2 lb/c.y	Au gr/c.y
32-37	0·08	0·22
37-74	0·03	0·22
74-82	0·03	0·30
82-94	1·15	0·30

Depth feet	SnO_2 lb/c.y	Au gr/c.y
0-15	Tr	Not
15-30	Nil	determined
30-45	0·1	
45-60	Nil	
60-74	0·8	Bedrock 74'

Depth feet	SnO_2 lb/c.y	Au gr/c.y
0-15	Tr	Not determined
15-30	Nil	
30-45	Tr	
45-60	0·2	Bedrock 79'
60-74	Timber 66-76	

Depth feet	SnO_2 lb/c.y	Au gr/c.y
0-15	Tr	

Depth feet	SnO_2 lb/c.y	Au gr/c.y
22-42	0·02	0·32
42-62	0·02	0·32
62-77	0·15	0·32
77-79	0·58	Nil

Depth feet	SnO_2 lb/c.y
59-95'	0·48

Wash 15"-18"

118A

PLATE I.
(Sheet II)

For Reference see Plate 1, (Sheet I)

PLAN OF GIBSONVALE TINFIELD N.S.W.

0 5 10 CHS.

BLACKFELLOW MINE

6 Bores Smith & Orellman

ML 24

GILBERT'S MINE

ML 25

22

29

WENHAM'S MINE

Bacon & Pty

ML 27 OAKENFULL'S MINE

34

Depth feet	SnO_2 lb/c'y	Au gr/c.y.
6-16	0·46	0·22
16-27	0·13	Nil
27-29	10·4	Nil

Wash

Elderidge & Pty

Depth feet	SnO_2 lb/c.y.	Au gr/c.y.
19-28	Tr.	Not recorded
28-41	Tr.	
41-44	5·5	

Wash

Parkinson Family Shaft

Samples 13-16

Depth feet	SnO_2 lb/c.y	Au gr/c.y
18-25	8·03	Au present Amount not recorded
25-35 6"	0·5	
Wash 35·6-37·3	34·0	

PML 14

PML 37

PML 36

HENNING'S MINE

PML 18

Kelder & Pty

Depth feet	SnO_2 lb/c.y.	Au gr/c.y.
15·30	0·0	0·38
30-40	0·04	Tr.

PML 19

12

PML 10 MATUSCHKA'S MINE

ML 29

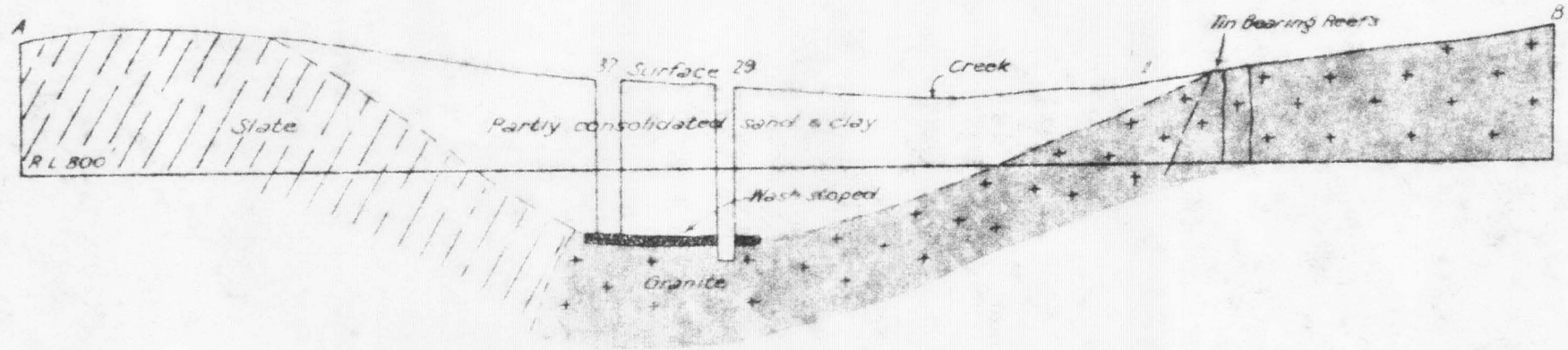
23 VICTORY MINE

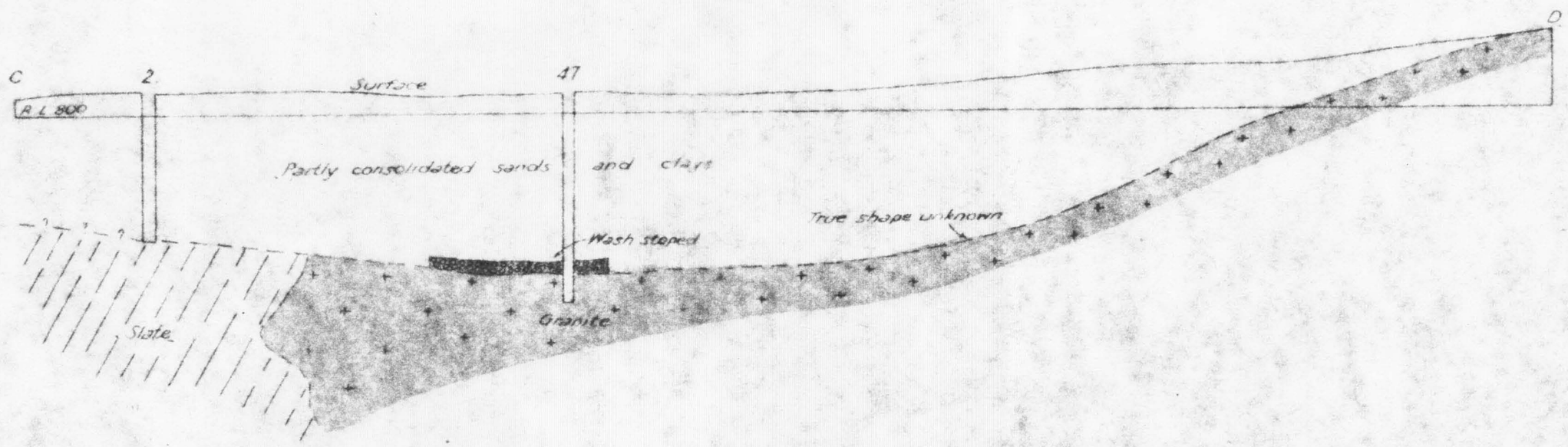
1118 B.

PLATE 2.

GIBSONVALE
SECTIONS THROUGH LEAD

Hor Scale 1" = 5 chs
Vert " 1" = 40 ft
V/H = 8.25





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