LEASE NO. 70M/51 - E.J. CORNISH - NORTH DUNDAS

(Third Report)

INTRODUCTION

Two previous reports on this lease dated 19th November, 1951, and 27th June, 1952, respectively have been submitted by D. Burger.   These investigations showed the existence of an alluvial tin-wolfram deposit and recommendations were made as to further systematic testing of the alluvials and as to the area in which the source of the tin and wolfram may be found.

The lessee spent a considerable time in the search for the primary deposit but so far no lode has been located. As a result the search was abandoned and the lessee decided to recommence the working of the alluvial.

In connection with Mr. Cornish's recent application for assistance under the Aid to Mining Act to instal a pipeline to bring water to the area, the writer received instructions to obtain additional information in the field and the show was visited again on 25th and 29th August, 1952.

PRESENT STAGE OF WORKINGS

The workings include:-
No. 1 trench, 180 ft. long, which has been dug in the stream bed and serves now as the principal means of drainage in the area.

No. 2 trench, 55 ft. long.

No. 3 trench, 50 ft. long.

During this investigation, Mr. Cornish was treating the gravels at the northern end of No. 3 trench,   Water is deviated from the stream into the trench where the gravel is washed and the concentrates accumulate in the ground sluice.

LESSEE'S PLANS AS TO FUTURE WORKING OF THE DEPOSIT

Reasons for the lessee's intention of installing a pipeline are:-
(1) By hydraulic sluicing, a considerably greater quantity of gravels can be treated than under present conditions.   For this purpose he plans, in the first instance, to clean out an old water race which runs to within 300 feet of the upstream part of the present workings.

The uppersection of the pipeline, 210 feet long, will be laid in a straight line, while the lower section, 45 feet long, will be moveable.   This will be sufficient to reach No. 3 trench. The top of the pipeline will be about 50 feet vertically above the workings. Disadvantage of this set-up are:-

(a) Only the upstream part of the deposit can be worked.

(b) Tailings will soon be a hindrance and prevent proper drainage.
A more logical plan eliminating these difficulties would be to start working the deposit on the downstream part and gradually working upstream. For this purpose, an

additional 180 feet of pipeline would be needed, bringing the total length to 435 feet. An alternative would be the digging of an extra 180 feet of race, but this would involve loss of head of approximately 15 feet.

(2)   There is a limited quantity of water in the stream flowing through the workings. Mr. Cornish states that four or five days of dry weather are sufficient to reduce the water flow to a mere trickle. The last visit to the lease was made on the first dry day after a period of heavy snow fall and rain. The water flow of the stream was certainly not excessive and was estimated to be of the order of 10 gallons per second. Therefore Mr. Cornish's statement cannot be considered to be exaggerated.

The old water race was inspected and roughly measured to a point approximately 150 feet south of the H.E.C. Transmission Line (Refer to Plan No. 1256 - 50) This section is 2040 feet long: much of its length is completely silted up and heavily overgrown. The last part of the race could not be measured as it is completely overgrown by dense cutting grass and teatree. This part is estimated to be 600 feet long bringing the total length of the race to about half a mile. Mr. Cornish estimates that the cleaning of the race will take about six weeks working single handed. The writer, however, considers that the time has been underestimated. Three months would be a more reasonable estimate.

It is his intention to continue treating the gravel under the present conditions, but will start working on the race as soon as the dry weather starts. Also, the writer understood that a second man will join the lessee in working the alluvials in the near future.

SAMPLING RESULTS AND VALUATION OF THE DEPOSITS.

During the three investigations, a total of thirteen samples were washed from the alluvials. They prove that tin and wolfram occur in the gravels over a length of at least 800 feet. The samples from the downstream part are evidently the most promising and it is on this area that the lessee will concentrate his efforts. From this area ten samples have been obtained so far. The results of these samples are shown in Table 1.

TABLE 1

No	Lbs per cubic yard				
	1 WO_3	2 Sn	3 WO_3	4 Sn	
1	0.55	1.83	0.09	0.30	
2	0.34	1.16	0.06	0.19	
3	1.06	5.36	0.18	0.89	GROUP 1
4	0.30	0.92	0.05	0.15	
Z42	15.70	10.20	2.62	1.70	
Z43	0.62	0.27	0.10	0.05	
Z46			2.47	3.47	
Z47			Nil	0.32	
Z48			Nil	0.24	GROUP 2
Z49			0.11	0.44	

3.

The samples of group 1 have been taken from a layer
not more than six inches above the bedrock, those of
group 2 over the whole depth of the gravels (average
3.3 feet) In order that the results of the two groups
may be compared, values in group 1, have been divided
by 6 in group 1, columns 1 and 2 of the table are the
actual quantities calculated for a vertical depth of
six inches, and columns 3 and 4 these values divided by
6 i.e. columns 3 and 4 give the theoretical values for
a depth of three feet. In group 2 columns 3 and 4
give the calculated values for a vertical depth of 3.3
feet.   Thus columns 3 and 4 for all samples are
comparable.   It will be seen that tin is fairly
regularly distributed over the area while wolfram is
of rather irregular distribution.

Although washing of one single dish at a
time is a quick method of obtaining a rough idea of
the distribution of the useful minerals as in the
present case, the results are not suitable for
evaluation for the following reasons:-

(1) The patchy nature of the deposit.

(2) The presence of coarse gravel and boulders. Only
the finer material is washed in the dish and when
evaluating the deposit the volume of boulders must be
taken into account. In the present case, it is estimated
that the alluvial contains from 20 to 50 per cent of
very coarse gravel and small boulders. Therefore,
systematic testing by pits is considered the only way of
obtaining reliable results.   Unfortunately the lessee
has not carried out this suggestion. However, to arrive
at a reasonable evaluation, the following facts have
been examined:-
(a) Volume of gravel treated so far by the lessee.
(b) Minerals produced.

With regard to the first point, a survey
was made of the trenches. Results are compiled in
Table 2 showing the amount of gravel treated per trench.

TABLE 2

Trench	Cu. yards	Working Days	Cu. yds per day
No. 1	168	51	3.3
No. 2	47	10	4.7
No. 3	52	20	2.6
Total	267	81	Average 3.3

Average depth
of gravel =
3.3 feet

As Mr. Cornish had no recollection of how long he
worked on No. 1 trench, the average of Nos. 2 and
3 trenches were used to estimate the number of working
days for No. 1. trench.

4.

Treating an average of 3.3 cu. yards per day appear to the writer quite reasonable for one man working under the conditions obtaining at present.

Production figures compiled in Table 3 were obtained from accounts of sales supplied by the lessee. It appears that the concentrates have been subjected to a magnetic treatment resulting in a magnetic and a non-magnetic product.   The first forms the wolfram concentrate, the second the tin concentrate.   These concentrates have been assayed by the buyers and, by calculation, the approximate metal contents of the original mixed concentrates have been deduced.

TABLE 3

DATE	Concentrate (lbs)			Assay		Gross Value (£)	Nett Value (£)	Content of original parcel	
	Wolf.	Tin	Tot.	$WO_3\%$	$Sn\%$			$WO_3\%$	$Sn\%$
18.10.51	+	64	64		23.8	5.19.2	4. 9. 5		23.8
14.12.51	+	132	132		23.0	11.17.7	11. 3.10		23.0
19. 2.52	68	74	142	46.6	37.2	47. 2.3	44. 2. 7	22.3	19.3
21. 2.52	132	107	239	36.1	69.2	88. 3.6	83.10. 9	20.0	32.2
6. 5.52	50	11	61	47.2	65.3	34. 5.8	26.15. 1	38.7	11.8
1. 8.52	61	53	114	46.5	67.8	44.16.3	40. 4. 3	24.9	31.1
Total	311	441	752			232.4.5	210. 5.11		
Average								17.5	25.1

+   No data available on wolfram content.

5.

From Tables 2 and 3 the following data
have been calculated.

TABLE 4

(a) One cubic yard of gravel contains 2.81 lbs.
of mixed concentrates of gross value £0.17.4
(b) Gross earnings per man day based on 3.3 cu.
yards per day £2.17.2

As for the actual evaluation of the deposit,
a rectangular area 40 x 60 yards is considered in
which the present workings are situated.   It is
reasonable to expect in this area conditions similar
to those in the trenches.   Using the average depth
of gravel 1.1 yard as found for the trenches, the
cubic content of this area is 2640 cubic yards.
Subtracting from this the volume of 267 cubic yards
already removed, the quantity remaining is 2373 cubic
yards containing 6668 lbs of mixed concentrates of
gross value £2149.6.8.

CONCLUSIONS

(1)   There is a small alluvial tin-wolfram deposit
which is expected to yield approximately three
tons of mixed concentrates.   This figure should be
considered as conservative, as only the immediate
surroundings of the present workings have been taken
into account in calculating the reserves.   It is
highly probable that tin and wolfram will be found
outside this specified area, but how far the economic
minerals extend can only be determined by extensive
testing.

(2)   The deposit will provide a reasonable living
for two men for at least twelve months.   The
total gross earnings of £232.4.5 over nine months
cannot be called a large income, but, if one considers
that the lessee has worked only an estimated 81 days
at irregular intervals, it becomes clear that a good
income can be expected.

(3)   In view of the conclusion that the investigated
portion of the deposit has an estimated life of
only twelve months, systematic prospecting of further
portions by means of pits should proceed concurrently
with the normal working of the deposit.

(Signed)

D. Burger

A. M. Aust. I.M.M.

GEOLOGIST

The Director of Mines,
HOBART

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17th September, 1952