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Dear Sir,

WEST ARM MINING LIMITED

We wish to submit our report on the boring programme carried out between Saturday, 19th May and Friday, 21st June in the West Arm Landing area of Port Darwin, Australia.

POSITION

The area under examination is marked on the accompanying plan and is covered by theClaims Dredging Claim 13B and Authority to Prospect 491 to the north of the West Arm Landing and Dredging Claim 12B to the south east of the West Arm Landing.

The West Arm Landing is at a point Latitude 12°38'20"S Longitude 130°46'45" and is on one of the many inlets in Port Darwin.

It is reached by land over 35 miles of good bitumen road, the Stuart Highway, and then 32 miles of winding gravel road, for the most part in good condition except for 3 river crossings, two of which are extremely bad.

GEOLOGY

Our enquiries at the Bureau of Mineral Resources in Darwin indicate that the area in general is a very gently dipping pre-Cambrian peneplain overlain almost conformably by Cretaceous rocks. There is no evidence of orogeny in the area - steeper dips are usually very localised and appear to be primarily infillings of local erosion channels in the peneplain surface.

The Cretaceous rocks are described as ferruginous deposits with largely laterized surface layers. The pre-Cambrian series consists chiefly of arenaceous rocks, greywackes and silt stones with minor conglomerates, schists and phyllites. South of West Arm there is a band of pegmatite intrusions up to two miles wide with many old mine workings on tin ore bearing portions of the veins.

We understand that tin ore in grain sizes up to $\frac{3}{4}$" occurs chiefly in small veins splitting from the main body of pegmatite which is not greatly mineralised.

There appear to have been no large scale workings, all the claims apparently having been worked by one or two men.

GENERAL

The boring campaign was undertaken with the intention of proving the presence or otherwise of tin ore in sufficient
quantities to warrant a detailed investigation at a later date for valuation purposes.

With this view in mind, the areas were machine bored in the DC12B area for investigation of sluicing possibilities, and hand bored in the AP491 and DC13B areas for dredging possibilities.

**EQUIPMENT**

The boring machine which was used in the sluicing areas was quite satisfactory for testing purposes, being easily towed by a Land Rover, fast in action and completely self contained. However, the recovery of spoil would not be sufficiently precise for accurate evaluation of a deposit, particularly in rapidly changing ground, or ground that did not stand as it was being bored, as casing cannot be employed.

The hand boring equipment, though not up to the standard of our Malayan plant, still proved effective enough in operation for testing purposes.

For penetrating and collecting samples of the mangrove mud, a post-hole digger was used and proved to be quite satisfactory for the operation. Where gravel was encountered, a tripod of 1½" diameter pipes was erected complete with pulley block and a ball valve sand-pump was worked by a rope fed through the pulley block and attached to the pump. The principal disadvantage of this system was the lack of penetrating power in packed or very coarse gravel. An auger was almost invariably used to verify and collect a sample of the bedrock.

**DRESSING**

In all machine boreholes, the samples were bagged, labelled, and at a later date dressed at a place convenient to the camp. Prior to the dressing, most samples were halved by coning and quartering, one half dressed in the camp and the other half retained as a check sample. These check samples were returned to Malaya for check dressing. In several cases the amount of spoil produced by the drill was so small that halving was impossible, so that no check sample of these sections are available.

The hand bores were panned to a very rough concentrate on the bore-site and this concentrate returned to the camp for final dressing and weighing, and then sent to Malaya for check dressing and assaying.

**PLANS**

Plans of the area were made at a scale of 16 chains to the inch, having been taken off the A.I.F. Army Ordinance survey plans at a scale of 1 inch to 1 mile. The positions of the borehole lines were checked by a series of prismatic compass cross-bearings.

**BORING. POSSIBLE SLUICING AREA- DREDGING CLAIM DC12B**

This comprised the valley to the east of Hang Gong Hill and three lines of holes were machine bored, the first being south of the DC12B claim and the others further north.

The position of the claim was ignored as a quite large proportion of the ground showed outcropping bedrock or laterite capping. Of the approximately 260 chains length of this claim...
shown on the plan only approximately 60 chains could have been
useful for sluicing if depths and values had been found.

The three lines, A, B and C, are marked on the
accompanying plan. Line C is approximately 15 chains south
of the claim, Line A 70 chains north of Line C, and Line B
30 chains north of Line A. In all cases, holes were drilled
at 4 chain intervals along the lines. These lines are
dealt with individually.

LINE C. The line is approximately 100 yards north of
the track leading to Johnson's Landing and King's Table and
runs across the valley on a magnetic bearing of 80°.

B.H. 1. On the east side of the valley. Not drilled
owing to bedrock outcropping <2 chains to the N.E.

B.H. 2. Bedrock at 1 foot. Trace values.

B.H. 3. Bedrock at 12 feet. The ground consisted of
grey sand and lateritic clay. The sand had obviously
been derived from the schists outcropping on both
sides of the valley. No values.

Trace values.

No values. Approximately 3 chains to the West of
B.H. 5, laterite capping made further drilling unwarranted.

LINE A. This line is located approximately 60 chains
north of the southern end of the claim and is on a
magnetic bearing of 60°.

B.H. 1E. Located 2 chains to the East of the road leading
to Delissaville. Bedrock at 4 ft. The ground consisted
of detrital gravel, a large proportion of which was
angular quartz. Overall value 0.11 lbs/cu. yd.

B.H. 2E. 0-2 ft. Quartz sand. 2-10 ft. Lateritic clay.
Bedrock at 10 ft. Overall value = 0.07 lbs/cu. yd.

B.H. 3E. 0-4 ft. Quartz sand. 4-10 ft. Lateritic clay.
Bedrock at 10 ft. Overall value = 0.11 lbs/cu. yd.

Bedrock at 8 ft. No values.
This hole was drilled within one chain to the west of
the valley creek.

B.H. 5E. 0-3 ft. Grey sand, clayey.
Bedrock at 3 ft. No values.

B.H. 6E. Not sampled as bedrock was overlain by only
6 inches of grey sand.

Line A was extended into the valley to the west of Hang
Gong Hill as a check on the possibility of an alluvial tin
ore deposit. Trace values were found in B.H. 6W and Nil'Y
values in B.H. 3W. The overall values of B.H. 4W and B.H. 5W were
0.20 lbs/cu. yd. and 0.05 lbs/cu. yd. respectively. The
shallowness of the ground, 9 feet to bedrock at the deepest
hole, did not warrant further time being spent in the area.
LINE B. This line was located just north of the junction of the two creeks which run either side of the Hang Gong Hill. The valley at this point narrows considerably, and the line permitted only three holes in the alluvial flat. The magnetic bearing of the line was 62°.

B.H. 1. Located 2 chains east of the road to Delissaville. Lateritic capping was within 1 chain of the hole.
0-3 ft. Quartz sand, clayey.
Bedrock at 3 ft. Trace value.

4½ to 7 ft. Laterite and lateritic mud.
Bedrock at 7 ft. Trace value.

B.H. 3. 0-4 Lateritic sand.
Bedrock at 4 ft. No value.

POSSIBLE DREDGING AREAS AUTHORITY TO PROSPECT 491 AND DREDGING CLAIM 13E

As before, the boundaries of these claims were ignored in order to get a more complete overall picture of the area. Four lines, K, L East, M and X East were completed on the east bank of the river and three lines L West, P and X West on the west bank. Line K was not extended to the west bank as this is entirely composed of outcropping schist, Line P corresponded to the westward extension of Line M.

Two additional holes, L North and M South were bored to test the possibility of deposition of tin ore by Johnson's Creek.

With the exception of B.H.'s 1 to 4 on Line K, which were machine bored, all the holes in these lines were hand bored.

Considerable difficulty was experienced in cutting some of the lines through the mangrove, particularly where they approached either the main river or minor creeks within the mud flats. In these areas the tangled mangrove roots could only be penetrated at the cost of a considerable amount of time, and it was for this reason that Lines M and X West were abandoned after boring only two holes.

Boreholes K5 and M1 were the only holes in this area which yielded free gravel and contained values. K5 give free gravel from 14 ft to 22 ft with a value of 0.44 lbs/cu. yd. and M1 gravel from 19 ft. 6 ins to 27 ft. with a value of 0.04 lbs/cu. yd.

Borehole M South, 16 chains due south of M 1, yielded a small amount of gravel contained within the bottom 2 ft of mud, but gave only a trace value. No other hole produced any gravel at all, the mangrove mud being deposited directly on to the bedrock.

LINE X EAST. Three holes were bored, 1E, 2E and 3E, at distances of 7, 10 and 18 chains into the mangroves on a magnetic bearing of 270°. BH 3E was within 4 chains of the river.

BH 1E. 0-3 ft. Mixed lateritic gravel to mangrove mud.
3-11 ft. Mixed lateritic and quartz gravel embedded in a tough lateritic clay.
Bedrock at 11 ft. Trace value.
BH 2E. 0-9 ft. Mangrove mud.
4-10 ft. Lateritic clay and decomposed schist.
Bedrock at 10 1/2 feet. No values.

BH 3E. 0-20 ft. Mangrove mud.
Bedrock at 20 ft. No values.

LINE X WEST Only two holes, BH 1W and BH 2W were put down here. The first hole, 10 chains into the mangroves, reached bedrock at 7 ft., and as it was all mangrove mud, it was not sampled. The second bore, a further 10 chains in struck bedrock at 12 ft., again with all mangrove mud. This material was grab sampled, but yielded no values. These two holes were basically probing holes to test presence of otherwise of gravel and as none was encountered and the area further east was covered by the thickly tangled mangrove roots mentioned earlier, the line was abandoned.

LINE M. Three holes were sunk in this area, M1, M2, M3 and 13 chains respectively into the mangroves on a magnetic bearing of 270°, and M South, 16 chains due south of M 1.

21 1/2-27. Coarse gravel and mud.
Bedrock at 27 ft. The overall value of this hole was 0.04 lbs/cu. yd.

M2. Mangrove mud. Bedrock at 10 ft. The auger was sunk to 16 1/2 feet for proving purposes, when further penetration became extremely difficult. A sample of the bedrock at this depth has been retained. No values.

M South. 0-7 ft. Mangrove mud. 7-9 ft. Mangrove mud, and gravel mixed.
Bedrock at 9 ft. Trace value.

LINE P. This line was put in to test the area opposite Line M and was run out due east and due west from the narrow neck of land separating the main river from another inlet to the west. Outcropping schist was observed at the tip of the neck, but a proving bore 4 1/2 ft deep was put down.

B.H. 1E. Located 5 chains to the east and within approximately 1 1/2 chains of the river.
0-5 ft. Mangrove mud. 5 1/2-8 ft. Lateritic pebbles in a schist clay.
Bedrock at 8 ft. No values.
From 2 to 3 1/2 chains west of the tip, hard, massive outcrops of laterite were found running in a N-S direction.

B.H. 1W. Located 5 chains west of the top
0-1 1/2 ft. Mangrove mud.
1 1/2-3 ft. Laterite pebbled and schist clay.
Bedrock at 3 ft. No values.

B.H. 2W. Located 10 chains west of the tip and within 2 chains of the river.
0-10 1/2 ft. Mangrove mud.
Bedrock at 10 1/2 ft. No values.

LINE L. On the east bank, the line was cut into the mangroves on a magnetic bearing of 270°. 3 1/2-4 chains into the mangroves, laterite outcrop was observed, the hole was put down at 6 chains and was within 2 chains of the river.
0-5 ft. Mangrove mud.
5-6 ft. Mangrove mud and gravel mixed.
6-7 ft. Gravel and decomposed schist.
Bedrock at 7 ft. No values.

On the West, owing to difficult going, the line wound considerably, and was then surveyed with compass and chain. This showed it to be 11 chains into the mangroves on a magnetic bearing of 73°10' and was within 3 chains of the river.

0-17 ft. Mangrove mud and clay.
Bedrock at 17 ft. No values.

L. NORTH. Approximately 33 chains north of Line L on the east bank, a further hole was put in to test the southern bank of Johnson's Creek. It was sited approximately 4-5 chains east of the main river and 1½-2 chains south of Johnson's Creek.

0-5 ft. Mangrove mud
5-6 ft. Mangrove mud and gravel mixed
6-8 ft. Coarse gravel. Trace values.
Bedrock at 8 ft.

LINE K. On the east bank and almost opposite the West Arm Landing, this line consisted of four machine bored holes and one hand bored hole, the latter 4 chains from the river.

B.H. 1. Located 4 chains to the landward (east) side of the mangroves.
0-3 ft. Grey sand, 3-4 ft. Lateritic clay.
4-5 ft. Decomposed schist and lateritic mud.
Bedrock at 5 ft. No values.

B.H. 2. Located on edge of mangroves.
0-2 ft. Grey sand.
Bedrock at 2 ft. Trace values.

B.H. 3. Located 4 chains into the mangroves.
0-3 ft. Grey sand.
3-9 ft. Lateritic clay.
Bedrock at 9 ft. Trace values.

B.H. 4. 0-7 ft. Mangrove mud.
Bedrock at 7 ft. No values.

B.H. 5. Hand bored 16 chains into mangroves, 4 chains from river.
0-14 ft. Mangrove mud.
14-17 ft. Gravel and free sand.
17-22 ft. Gravel and sand, micaceous clay.
Bedrock at 22 ft. The overall value of this hole was 0.44 lbs/cu. yd.

As previously mentioned, Line K was not extended to the western side of the river as schist was outcropping in the bank.

SUMMARY OF BORING

Although the original intention of covering as large an area as possible in the time available has been achieved, the footage drilled both by machine and by hand has been very small but is entirely due to the shallowness of the
alluvium in all cases and the time taken to cut lines into the
mangroves. Approximately 5 miles of road were also cut to reach
boring sites.

A summary of boring is as follows:

<table>
<thead>
<tr>
<th>Hand Boring</th>
<th>Bedrock Depth</th>
<th>Machine Boring</th>
<th>Bedrock Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line X East</td>
<td>42$\frac{1}{2}$</td>
<td>Line A</td>
<td>63$\frac{1}{2}$</td>
</tr>
<tr>
<td>West</td>
<td>20</td>
<td>B</td>
<td>14</td>
</tr>
<tr>
<td>Line M</td>
<td>48</td>
<td>C</td>
<td>26</td>
</tr>
<tr>
<td>Line P</td>
<td>21$\frac{1}{2}$</td>
<td>P</td>
<td>4$\frac{3}{4}$</td>
</tr>
<tr>
<td>Line L East</td>
<td>7</td>
<td>K</td>
<td>23</td>
</tr>
<tr>
<td>West</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North</td>
<td>8</td>
<td></td>
<td>133</td>
</tr>
<tr>
<td>Line K</td>
<td>22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>186</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In addition, a further 200 ft. was machine drilled in proving
bedrock.

The average depths are as follows:

Hand boring. 15 holes average depth 12.4 ft.
Machine Boring. 22 holes, average depth 5.9 ft.

CONCLUSIONS

We consider that sufficient boring has been carried out
for the purpose of this preliminary prospecting scheme.

We were unable to establish any hopes of the locations of
workable alluvial deposits of tin ore.

The alluvium appears to be shallow throughout the mangrove
swamp and over much of the area consists almost entirely of
surface mud lying direct on the bedrock. Gravel beds were located
in a few places but tin ore values contained in them were
negligible.

Outside the mangrove swamp areas, the land has very gentle
slopes indicating mature weathering with very shallow depths of
detrital material containing negligible values as indicated both
by the shallow bores and large areas where bedrock outcrops
at surface.

We recommend that no further prospecting for alluvial
deposits be carried out in this area.

ACKNOWLEDGMENT

Throughout the campaign, Mr. A.H. Montague, the boring
contractor, materially assisted the writer by providing all
transport and camp facilities, assisting in the surveying and
cutting boring lines and access roads.

Yours faithfully,
VALLENTINE & DUNNE LTD.

HPC/AJA
The Secretary,
Tableland Tin Dredging N.L.,
2 Greenknowe Avenue,
Potts Point.

Dear Sir,

BYNOL HARBOUR AND WEST ARM.

We refer to our letter to you of the 17th September, 1957 and are now pleased to make available to you further reports and plans in connection with boring carried out on the abovementioned areas pre-war. One copy of each of the following is enclosed:

1. One photostat print of Plan No. AM-201 (6169A).
2. " " " AM-158 (6169B).
3. " " " AM-189 (6169C).
4. " " " AM-183 (6169D).
7. Mr. T.J.B. Donnelly's letter dated 29.9.37 (E.P.O.207).

Yours faithfully,
A.O. (AUSTRALIA) PTY. LIMITED.

Director.
ANGLO-MALAYAN DEVELOPMENT LIMITED

C/- Post Office,
Darwin, N.T.

2nd September, 1937.

The Manager,
Anglo-Malayan Development Ltd.

Dear Sir,

Prospecting - Northern Territory.

I enclose herewith my progress report for the period 16th Aug. to 31st Aug. giving details of the work done on E.F.L. 206 Byrne Harbour.

To date only a small amount of field concentrates has been obtained. I have not been satisfied with it, and as the mineral recovered has been of too fine a grade to use the usual tests I have had an assay done in the Mines Department here. Their assay certificate is enclosed.

This assay reveals that no tin-ore is present in the material tested to date, iron oxide (hematite), ferruginous quartz and some tourmaline only being present. In the circumstances, I will not follow the programme which has been outlined in my progress report, but will transfer operations to the area on the Charlotte River which has been reported upon favourably by Stait. From information I have received privately, I am not unduly optimistic regarding both the area itself and the efficiency of the methods used in previous inspections made here.

As soon as further concentrates are obtained, another assay will be put through locally. If it shows similar results to the assay under discussion, I shall cease operations and return the men and tools to Darwin.

I have not cabled the assay results to you as I have no code or cipher, and ordinary messages through the post office here are not treated confidentially.

Yours faithfully,

Sgd: T.J.B. DONELLY.

Encl.: Report

Assay Certificate

9 Bore sheets

Plan

Letter.
COPY

ANGLO-AIYAN DEVELOPMENT LTD.

C/- Post Office,
Darwin, N.T.

1st September, 1937.

The Manager,
Anglo-Aiyan Development Ltd.

Dear Sir,

Prospecting — E.P.L. 206, Bynes Harbour, N.T.
Progress Report for Period 16th to 31st August, 1937.

I sent 5 men and stores out to Bynes Harbour by motorboat on Thursday, 12th August, to establish camp.

Having finally succeeded in chartering a lugger, the boring tools and the 4 sections of the pontoon were put aboard and I left Darwin with the rest of the men on the morning of Tuesday, 17th August. Arriving at Bynes Harbour late in the same day, I found that the preliminary party had been unable to locate a water supply, to a well as previously used having dried up. They had been without water for two days. The following day, Wednesday, after the tools and pontoon had been unloaded from the lugger, I located fresh water 7½ miles from camp, at the head of the Charlotte River.

On Thursday, the sections of the pontoon were brought together and the wall timbers, deckings, corner ballards, etc., completed, the pontoon then being ready for use.

On Friday, 26th August, we commenced decantation work and the cutting of renticles. The dense and tangled masses of mangroves fringing all these salt tidal rivers render decantation work here comparatively slow.

From Saturday, 21st August, to Monday, 30th August, boring and surveying were carried on as rapidly as the tides and general conditions would permit. 10 bores being completed. On 2 days during this period, work had to be suspended whilst the launch was absent getting water at the head of the Charlotte. As the river is shallow there with many rock-bases, the launch must go up at high tide, the week’s supply of water is hurriedly carried back a ½ mile to the boat, and we return to the camp while the water is still high.

The attached plan shows the 7 lines of bores I propose to put down in E.P.L. 206, across the Charlotte River bed. For convenience sake, the inlet from the junction of the Katherine and Charlotte Rivers to the main Harbour is referred to as the Charlotte River.

After a careful study of the terrain, I concluded that this method of boring is the most suitable for this particular area. Further details of the lines of bores will be forwarded when further decantation work has revealed the accuracy or otherwise of the various reaches of the river as shown on the plans supplied to us.

I am at present working with 1 gang only. To put on another 1 or 2 gangs would necessitate hiring extra launches etc., and owing to the existing conditions, would double or treble expenses without getting a corresponding amount of work done.
Approximately another month will be required to complete the boring E.F.L. 206 on the Charlotte, if it seems desirable to finish the programme outlined. In the event of unpayable depths and values being encountered on this E.F.L., it may be considered unnecessary to commence boring operations on E.F.L. 207 on the main harbour. I would appreciate your opinion on this matter. Boring on E.F.L. 207 will be almost entirely slow and expensive pontoon boring, and unless payable depths and values are proved in E.F.L. 206, I do not consider further prospecting at Bynoe Harbour would be justified.

Enclosed please find 9 bore sheets. The values and depths to date have not been satisfactory but may improve.

Under separate cover I am forwarding a sample of the concentrates obtained, for assay. Concentrates containing mineral of this degree of fineness are most difficult to clean. I am not satisfied with these concentrates, and as the mineral obtained is too fine to permit the usual tests, I am having an assay done at the Mines Department here tomorrow.

I also forward a small sample of Tourmaline which occurs, in some cases to excess, in the material here. I would like to obtain a confirmation from Dr. Duncan of Bussang regarding it.

Near the camp site is an outcrop of granitic rock (pegmatite) carrying mineral. It much resembles Tourmaline but seems heavier. There may be Cassiterite or Columbite associated with it. A mineral determination assay of it is being done here and you will be advised of the result.

Enclosed please find a copy of a letter from the District Naval Officer requesting information as to the results obtained by us. I would suggest that no information be given until the results of prospecting have been fully considered by you.

Yours faithfully,
Sgd: T.J.S. DAVID.

incl.
Dear Sir,

Result of baring operations - Byne Harbour - E.P.L, 206.

This area cannot be considered as a tin-dragging proposition, as the tin oxide content of the detritus is negligible and the depths unsuitable.

The following are the tabulated results:

<table>
<thead>
<tr>
<th>Values proved</th>
<th>Traces, only, of tin oxides.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of boxes put down</td>
<td>23 boxes.</td>
</tr>
<tr>
<td>Average depth</td>
<td>11 feet.</td>
</tr>
</tbody>
</table>

**GEODETICAL.**

Byne Harbour is situated 50 miles around the coast to the West of Darwin, in the Northern Territory of Australia.

**TOPOGRAPHICAL.**

The Harbour lays approximately East-West, is 10 miles in length, and varies in width from 1 to 3 miles.

The rivers Katherine, Charlotte, Annie and Leviathan, which have their sources in the stanniferous hilly country in the interior, flow into the Eastern end of the Harbour. The country slopes gradually down from the hills to the coast, until the rivers and creeks with their flanking sandflats, near the Harbour, pass through undulating country with high ridges.

The area examined consisted of portion of the Charlotte River bed and the sandbanks therein contained and the adjacent sandflats.

**GEOLYNICAL.**

The terrain to the East of, and adjacent to the Harbour, is a low rise of miscellaneous schist, vertically bedded and striking North and South. The schist is intersected by many outcropping dykes of correnctoric ironstone and ironstone conglomerate, ferruginous sandstone, greisens, pegmatite, quartz and albite-pegmatite. Outcrops of these rocks occur on the shores of Byne Harbour and in the banks and bed of the Charlotte River.

Apparently the process of denudation on this area has been extremely slow, resulting in shallow deposits of alluvium. In places the bed of the Charlotte River is swept bare of detritus by the swift tides, leaving a clean rock bottom.

The tides here have a maximum rise and fall of up to 26 feet, and reach a speed of 3 miles per hour.

**GENERAL.**

The boxes put down have shown that the tin-ore content of the alluvium here is negligible. The values to be obtained by panning of the surface material of the sandbars may be due to very recent denudation of ore-bearing rock. These values are not maintained throughout the deposits.

Attached herewith please find a tracing showing the bore positions and other information.

Yours faithfully,

Sgd. T. J. B. DONELLY,
Field Engineer.
TJBD/3.

The Manager,
Anglo-Malayan Development Ltd.,
Kuala Lumpur.

Dear Sir,

Results of Boring — Bryce Harbour — E.P.L. 207.

This area cannot be considered as a possible dredging area. The tin-oxide content of the alluvium is negligible, and the depths unsuitable.

EXTRACT OF OPERATIONS.

In all, 14 scout bores were put down at irregular intervals on this E.P.L.

<table>
<thead>
<tr>
<th>No. of Scout Bores</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value of ground</td>
<td>Traces, only, of tin-oxide.</td>
</tr>
<tr>
<td>Average depth of material</td>
<td>9 feet</td>
</tr>
</tbody>
</table>

In the circumstances, no full detailed report will be given. The country included in this area is similar geologically to that in E.P.L. 206.

The majority of the bores were put down from a pontoon. This pontoon was constructed from baeslage and decking of bush timber, and 16 44-gallon petrol drums. Once towed into position and heavily anchored at all 4 corners, it served the purpose well, holding its position in up to 5 fathoms of fast-moving water.

Two extra bores were put down, apart from the original suggested programme. Bore 13 was located on a big sandbank which is exposed at low tides at the junction of the Annie and Liewathin Rivers with the main Harbour. Although a promising looking deposit of alluvium, the values obtained were poor. The site selected for Bore 14 was on a stretch of open flat country near the western peg of the lease. Ironstone occurred at a depth of 1 foot.

I attach herewith logs of the 14 scout bores and a tracing showing the bore sites, etc.

Yours faithfully,

Sgd: T.J.B. DONELLY.
ANGLO-ORIENTAL (MALAYA) LIMITED

2 - 8 Jawa Street,
P.O. Box No. 140,
Kuala Lumpur,
Selangor, P.K.S.

111/AGP.

No. E.766/37.

25th November, 1937.

London Tin Corporation Ltd.,
55-61 Moorgate,
LONDON, E.C.2.

Dear Sirs,

ANGLO-MALAYA DEVELOPMENT LIMITED.

We have pleasure in submitting herewith a report on
the examination carried out on areas covered by Exclusive Prospecting
Licences Nos. 205, 206 and 207 recently approved to the above Company
in the vicinity of West Arm and Bynce Harbour, Port Darwin, Australia.
Each Licence covered an area of approximately 5 square miles, and was
located to cover such areas as were considered to offer fair prospects
of occurrences of alluvial deposits of tin-ore, consequent on denudation
of the surrounding mineralised country.

E.P.L. 205 - PLAN No. AN-152. (See org. No. 6169.B.)

This Licence covered an area astride the Southern section
of West Arm which flows directly into Port Darwin.

The depth of water at its junction with the main harbour
is 9 fathoms while the maximum rise and fall of tides is 28 feet in the
November Spring tides and the minimum 16 feet. The tide is very swift,
attaining a speed of 3 miles per hour.

Many sand banks and rock bars exist in the bed of this
creek.

GEOLOGY.

The country hereabouts is mainly schist with intrusions
of greisen and pegmatite. Ironstone and sandstone also occur in the
vicinity.
HISTORY.

Numerous indications of previous prospecting and fossicking were to be seen around this area which we understand was fairly actively mined by small parties during the period 1903-1907. No instances were reported, however, of stanniferous formations occurring below a depth of 65 feet.

We understand that the Ting Gong Mine produced 138 tons of tin concentrates from an area 2 acres in extent, while it appears that altogether only 520 tons of tin-ore were won from the West Arm and Bynoe Harbour areas.

PROSPECTING.

Examination revealed outcrops of ironstone occurring in the vicinity of this area; it was not considered therefore that an alluvial deposit of any extent would be discovered. Boring by Bank drills confirmed this assumption as fourteen bores reached an average depth of only 11.5 feet of material consisting of silt, sand, and gravels overlying a bottom of schist. Traces only of tin-ore were recovered whilst the schist bedrock also proved to be barren. Tantalite was discovered on this area, but gave no indication of the existence of a deposit of any reasonable extent.

E.P.L. 206 - PLAN No. AM-183 (see fig. No. 6169-D.)

This area lies along the junction of the Katherine and Charlotte Rivers with Bynoe Harbour. A total of 23 bores were drilled to an average depth of 11 feet in sandbanks and mud flats but failed to produce a trace of mineral value. Bedrock proved to be schist while the material sampled consisted of silt with some gravels on bottom.

The high ground bordering the river flats shows numerous outcrops of ironstone, quartz, etc. and resembled geologically the West Arm area.

E.P.L. 207 - PLAN No. AM-189.

The area examined under this Licence lies astride Bynoe Harbour. Here again similar geological conditions to those obtaining at E.P.L.'s 205 and 206 were encountered. Fourteen bores were drilled in an average depth of 9 feet only of detrites which proved to be barren of values.
The material recovered from the bores consisted of silt with quartz and ironstone gravels while in all cases the bores bottomed on schist bedrock which also proved to be barren of values.

Having due regard to the results of these examinations and the history of mining previously carried on in these districts, it was decided to abandon the prospects and to incur no further expenditure in the examination of adjoining territory.

For reference with this report, a print of each of the following plans is appended hereto:

- Location Plan
- E.P.L. 205 Boring Plan
- E.P.L. 206
- E.P.L. 207
- 6 Descriptive Photographs

See Dwg No. 6169/A/B/C/D.

In conclusion, we wish to record our appreciation of the kindly assistance and advice which our Representative, Mr. T.J.O. Donnelly, received from Mr. N.C. Bell, the Administrator of the Mines Department, Northern Territory, as well as from Government Officials in general.

Yours faithfully,

[Signature]

Sgd: Secretary.

Encl.
A.O. (AUSTRALIA) PTY. LIMITED

66 Pitt Street, Sydney.

17th September, 1957.

The Secretary,
Tableland Tin Dredging N.L.,
2 Greenknowe Avenue,
POTTS POINT.

Dear Sir,

BYNOE HARBOUR AND WEST ARM.

With reference to our letter of the 27th August we now have pleasure in attaching a copy of each of the following reports on prospecting carried out pre-war by Anglo-Malayan Development Ltd. on the abovementioned areas:

1. Progress Report by Mr. T.J.B. Donnelly for the period ending 15th June, 1937.

2. Copy of Mr. T.J.B. Donnelly's report on his examination on the Western Arm of the Area. (E.P.L.205).

3. Copy of Progress Report by Mr. T.J.B. Donnelly for the period 16th July, 1937 to 31st July, 1937.


5. Copy of Progress Report dated 16th September, 1937, by Mr. T.J.B. Donnelly for the period 1st September, 1937 to 15th September, 1937.

Our Malayan Office have been unable to locate a copy of the boring plan but they have communicated with London Tin Corporation Limited in the matter, and should this or any further data be available we will let you know.

Yours faithfully,

A.O. (AUSTRALIA) PTY. LIMITED.

Director.
The Manager,
Anglo-Malayan Dev. Ltd.,
Kuala Lumpur.

Dear Sir,

**Prospecting in the Northern Territory**

**Progress report for half-monthly period ending 15.6.37.**

Immediately after my arrival in Darwin on Saturday, May 29th I began making the necessary arrangements. On Tuesday June 1st, I applied for Exclusive Prospecting Licenses for 3 blocks of 5 square miles each - 1 block on West Arm, and 2 on Bynoe Harbour.

I judged it advisable to tie up all available land with dredging possibilities, as there is a good deal of interest being taken in mining here at present. My applications were filed just in time, for on June 3rd the Mines Department here received an application by telegram from a man named Frank Fraser of Ingham, Queensland, for Prospecting Licences over the ground I had previously secured at Bynoe Harbour. This man Fraser is an agent, but so far I have not been able to find out for whom he is acting.

The three leases totalling 15 square miles applied for by me, were approved by the Administrator and were granted to the Company by Government Gazette on June 8th.

On June 5th I engaged two men to accompany me, and ordered the necessary supplies.

On Sunday June 6th we proceeded by motor-boat from Darwin across the Harbour to West Arm. We landed at Hang Gong's landing, and then carried our gear 1½ miles inland towards the Hang Gong mine, to the nearest permanent water. (See attached plan). I remained one week - from June 6th to June 13th; inspecting and prospecting this area. The lease having been pegged in accordance with regulations, daily trips were made to many parts of the lease. Test holes were sunk in likely stretches of flat country and many spots in creek beds, creek banks and amongst the mangroves, were tested by dish washing.

A complete detailed report of work done at West Arm, and the conclusions arrived at, will be forwarded at a later date.

This trip to West Arm was primarily to peg and thus secure the lease, and to make a preliminary survey of the country.

I returned to Darwin from West Arm by motor-boat on Sunday June 13th. I am now engaged in obtaining stores and transport for the trip around the coast to Bynoe Harbour. I expect to leave Darwin on Saturday next, June 19th. The same procedure will be followed as at West Arm - the leases will be pegged and a preliminary survey made of the country. I have until the 8th of July to peg these leases.

**Tantalite.** The known tantalite deposits of this area have all been taken up and are being worked. The largest deposit is near the Finniss River, south of Bynoe Harbour. It is held by a Mrs. Murphy and has lately been inspected by Mr. Kennedy and Professor Clayton, representatives of the big tantalite mining company at Wagina, West Australia.
There are Japanese and German tantalite-buyers in Darwin at present. They are anxious to obtain supplies, and are paying up to twelve shillings (12/-) per pound for good quality tantalite.

The Mount Isa Mines Company are doing exploratory work on a big low-grade gold proposition here at Brook's Creek. About 30 men are working there.

I have twice interviewed the Administrator, Mr. Abbot. He has kindly offered to give any assistance necessary.

I understand that the man Fraser I previously mentioned is now endeavouring to obtain blocks adjoining those I have taken up at Bynoe Harbour.

As workmen's compensation insurance is compulsory here in Australia, I have taken out a policy covering the men under my employment. One of my men is an old prospector who knows the country well. His knowledge had been of great use. He received 18/- per day for a 5½ day week. The other two men I will need at Bynoe Harbour, will receive 16/- per day. These wages are in addition to food, which amounts to approximately £1.5.0. per week.

Reliable men are not easy to obtain, as there is plenty of work offering at present in Darwin.

Further reports will be forwarded in due course.

Yours faithfully,

Sgd. T.J.B. Donnelly.
ANGLO-MALAYAN DEVELOPMENT LIMITED

PROSPECTING WEST ARM, NORTHERN TERRITORY.

PROGRESS REPORT FOR HALF MONTHLY PERIOD FROM 16.7.37 TO 31.7.37.

The launch having returned from Darwin on 19th July with a new magnet, boring commenced on July 20th on line 1. We continued boring all this period, the pontoon proving very satisfactory. Boring operations are dependent upon the tides, all bores in the creek bed being put down at low tide. The pontoon, upon arrival at a bore-site, is securely anchored at all four corners to prevent any movement when the casing is down.

As shown by the bore-sheets previously forwarded, and those enclosed, the results obtained to date have been far from satisfactory both in the depths of wash encountered and the values obtained. The high values in Bores C6 and A4 are concentrations of the ore in shallow depths of wash as a result of the rush of the tides in the narrow creeks.

Bores A7, A8 and A9 occur in high ground with ironstone outcrops. As the ground is not dredgeable the bores will not be put down.

Further inspection of the mangrove flats fringing the main Arm revealed outcrops of concretionary ironstone and ironstone conglomerate in various places. In view of the boring already done over the mangrove flats, I am of the opinion that only a shallow depth of mangrove mud and wash exists here and that further boring of these flats is unwarranted.

Bores will be put down at G4 and on line 1. Should these bores prove unsatisfactory, I shall cease operations here and make the necessary arrangements for the commencement of prospecting at Bynoe Harbour.

TANTALITE DEPOSIT ON OUR AREA. During the time that the launch was unavailable for boring, prospecting continued on this tantalite area. One test pit showed values of 2 lb. 15 ozs. Tantalite to the cubic yard. The other pits showed traces only. As the deposit is of small extent, no further attention will be paid to it.

GENERAL STRIKE. From 16th to 21st July, all work in Darwin was at a standstill owing to a general strike by Union Members. I was able to keep our men at work, thus avoiding loss of time.

WELSH & TIE LEASES. I note in your letter of the 17th instant that you are in agreement with me that the abovementioned leases are too small to be of any interest to our Company.

Yours faithfully,

Sgd. T.J.B. Donnelly.

The Manager,
Anglo-Malayan Development Ltd.

Dear Sir,

**Prospecting - Bynoe Harbour**

**Progress Report for period 1.9.37 - 15.9.37**

As stated in my last report, forwarded to you on Friday, 3rd Sept., an assay was done at the Mines Dept. on September 1st on the concentrates obtained from boring operations on lines M and K, E.P.L. 206, Bynoe Harbour.

These concentrates had not been satisfactory, but as the tin-ore of this country is blackish, the mineral obtained was, for the moment, considered and weighed up as tin. The results of the assay you already know.

In the circumstances I did not complete the boring of lines M and K, boring operations being recommenced on line 1, which is inside the area reported on by Staite.

The work was pushed ahead as rapidly as possible, 13 bores being completed.

In view of the shallow depths, and the almost total lack of tin-ore in the alluvium here, no further prospecting will be done on this E.P.L.

I demarcated the bore-sites and put down an extra line of bores, line I, on a big sand bank which is exposed at low tide in the Charlotte. Two of these bores were over 20 feet in depth, but the values were very poor.

Numerous outcrops of schist, etc. occur in the bed and banks of the river above the position of line I, rendering the area unsuitable as a dredging proposition.

Your cable of the 7th instant was received by me on my return to Darwin yesterday. Your suggestion could not therefore be put into operation. As the enclosed boresheets and plans show, I have tested this area thoroughly. The only material suitable for dredging purposes on this E.P.L. lies in the creek-bed itself, and on the adjacent mud-flats. The boring programme I have carried out here, has revealed the depths, and the values contained in this alluvium, and was adopted after a careful study of the area to be investigated. The high ground on the area is studded with numerous outcrops of ironstone conglomerate, sandstone, pegmatite, quartz etc., and a shallow depth of material is everywhere evident. There may be, of course, small deposits of mineral-bearing alluvium which could perhaps be worked profitably by small parties or syndicates, but is is open to doubt as to whether a deposit exists which would be of sufficient size to interest us. The high ground was therefore not bored, with the exception of bores M 1 and M 8, which were put down in high country outside the mangrove flats. Please note the depths of material found.

Two men have had attacks of malaria. Five others have been suffering from ptomaine poisoning as a result of eating tinned salmon which became tainted. A loss of efficiency on their part for some days resulted.

I understand that a Southern Company have taken up dredging leases on an area known as Walker's Creek, west of the Finniss River. To date no prospecting has been done, so it may be purely a speculative move on their part. I am obtaining further details now, which will be forwarded at a later date. I understand that the creek drains proven tin-bearing country, but that the detrital deposits available are not of great extent. At the conclusion of operations at Bynoe Harbour, an inspection of ... can be made quietly, if you so desire.
SITUATION. West Arm is a salt-water tidal river or inlet draining directly into Darwin Harbour. It is situated seven (7) miles south-west across the harbour from the town of Darwin.

AREA HELD. An area of five (5) square miles on West Arm is held by the Company under Exclusive Prospecting Licence No. 205, approved by the Administrator on June 8th, 1937.

TOPOGRAPHICAL. The river is approximately five (5) miles long and the general direction of its course is North and South. At the junction with the main harbour, it has a width of half a mile, at high water. It follows a winding course and quickly narrows. Two miles from the mouth, the width of the river is 200 yards. One mile North of Hang Gong's Landing, the width is 70 yards. At the Landing, the width is 25 yards. From the Landing southwards the river is a very narrow channel winding amongst dense mangroves.

The depth of water in the Arm at the junction with the main harbour is 9 fathoms (54 feet). Two miles up the river, the depth is 2 fathoms (12 feet). From there to the Landing, the depth varies between 1 and 3 fathoms. (These figures are obtained from official Naval charts, the soundings having been taken at maximum low water. To them is to be added the tide rise and fall).

The maximum rise and fall of the tide in Darwin Harbour and West Arm is 28 feet in the November Spring tides, the minimum being 16 feet. An average figure for the year would be 18 feet. The tide is swift, attaining a speed of 2 to 3 miles an hour. At low tide, the Arm is not navigable, the bottom being exposed in many places. Many mud and sand-banks, and rocky bars, exist in the bed of the river.

To the south, and on both sides of West Arm are low ridges and hills intersected by many small creeks.

GEOLOGICAL.

The country to the south of and adjacent to the Arm is a low rise of schist, micaceous, vertically-bedded, and striking North and South. The schist is intersected by many out-cropping dykes of ferruginous claystone, concretionary ironstone and ironstone conglomerate, ferruginous sandstone and quartzose sandstone, kaolin, greisen, pegmatite and quartz.

The tin ore occurs in this area in the granitic dykes traversing the micaceous and argillaceous schists, ferruginous claystones and sandstones, etc. In some cases, these dykes were lenticular formations composed of greisen, kaolin, and small quartz veins. The greisen carried the majority of the cassiterite, the quartz being valueless. As shafts were sunk on these bodies, it was found that the greisen, and with it the tin-ore, gradually cut out. The kaolin persisted, but its tin content, which was never very high, also diminished.

These dykes are irregular in size and thickness and are not generally consistent in the direction of strike.

PREVIOUS MINING ACTIVITIES. Numerous old shafts, open-cuts and costeens exist on this area, which was extensively mined during the period 1903-1909. Grant's, Johnston's, Bell's Moana and the Hang Gong were the biggest producers. These mines obtained the ore mostly by open-cut and shallow-shafting methods, no instance being on record of tin-ore occurring on this field below a depth of 65 feet.
Diamond-drilling to 150 feet proved the lodes did not exist at depth.

The Hang Gong produced 168 tons of tin concentrates from an area 2 acres in extent, and not more than 300 yards from the lode from which it presumably was shed.

Altogether only 520 tons of tin concentrates were won from the West Arm and Bynoe Harbour fields.

PROSPECTING DONE TO DATE. The West Arm tin-field is in the high country which forms the watershed of the Arm proper. A number of small creeks and watercourses drain this country and empty into the Arm, therefore it is reasonable to suppose that any country rock or lode matter which has been denuded, may have been carried, together with any mineral content, by the forces of gravity and water action, towards or into West Arm itself.

With this view in mind, I proceeded to the area. Having pegged the required country, I commenced sampling and testing by means of dish-washing. The wash in the banks, and where possible, in the beds, of most of the creeks emptying into the Arm, was found to carry tin-ore, with an average value of .40 lbs cassiterite to the cubic yard.

Two test-pits were put down in the flat high country which extends from near the old Hang Gong Mine down towards the head of the Arm. Our lease takes in portion of this stretch. One pit was sunk in the 400 yard area which had to be left vacant, according to the Mining Regulations, between the Hang Gong Mineral Lease and our Prospecting Area. This pit yielded the following results:

| Tin content of ground | .35 lbs per cubic yard. |
| Depth of wash         | 4 feet.               |
| Bedrock               | Micaceous Schist.     |
| Nature of material    | 2 ft. silt, 2 ft. tight wash. |

Another pit was put down inside our Southern lease boundary. At this spot, the ground was rising gradually to the North to a low ridge. The results were as follows:

| Tin content of ground | .40 lbs per cubic yard. |
| Depth of Wash         | 4½ feet.               |
| Bedrock               | Micaceous Schist.      |
| Nature of material    | 2 ft. silt, 2½ ft. tight wash. |

Various other spots amongst the mangroves fringing the small creeks and the main Arm, were tested. The majority showed traces of tin-ore, the values ranging from traces only, to .50 lb per cubic yard.

RECOMMENDATIONS. After a close inspection of the area in question, I consider that further investigation of the Southern end of this Prospecting Area is unwarranted.

All this country is high, being up to about 60 feet above sea level, and consists of low ridges, intersected by numerous small creeks and shallow watercourses, and occasional small area of flat ground. In some cases the ground rises abruptly from the creek banks.

Numerous dykes and reefs of claystone, ironstone, quartz, etc., outcrops in this area, rendering dredging impossible.
Demudation on a large scale has not, apparently, taken place here. The prospecting of the creek banks and the alluvial flats revealed only a shallow layer of silt and wash. Although tin-ore is widely distributed throughout the alluvium, it is apparently only in small quantities.

In view of the shallow depth of wash, the comparatively small tin content, the difficulties of the terrain, and the problem of water supply, I consider that this section of the area held, could not be economically worked.

From the small creek on which Messrs. Welsh and Tye have mineral leases, northwards, the Arm commences to widen out, and is flanked by mangrove mud-flats of varying width. These flats, and the main channel itself, would seem to require investigation, in the circumstances.

FUTURE PROSPECTING. I am now making the necessary arrangements for the transport of the boring tools to West Arm and obtaining more men, etc. Boring shall commence on the Northern section of this area as soon as the essential demarcation work is finished.

NAVAL CONTROL OF WATERS. I find that the waters held by the Company in this area at West Arm are under the control of the Commonwealth Naval Board, for Defence purposes. Some little difficulty may be experienced in this regard if it is considered advisable to commence mining operations here.

PLAN OF AREA. I attach herewith a plan of this area showing the particular section referred to.

Yours faithfully,

Sgd. T.J.B. Donnelly,
Field Engineer.
ANGLO-MALAYAN DEVELOPMENT LTD
BYNOE HARBOUR
PLAN SHOWING RESULTS OF BORES PUT DOWN
BY MR. T. J. B. DONELLY
(LATE 1937)
IN E.P.L. NO. 207
SCALE 10 CHANS. TO AN INCH

[Map diagram with various symbols and annotations]