BAUXITE IN TASMANIA.

The occurrence of bauxite in Tasmania has been established beyond the initial stages of identification and, although the average material is not regarded as high grade, proved and potential resources indicate a substantial volume of ferruginous bauxite commercially suitable for the production of aluminium.

Initial stages of identification were succeeded by investigations to fix a minimum economic quantity of commercial ore and to establish deposits in localities beyond the extremities of any proved area, for the purpose of rapid development should industrial requirements demand accessions to proved volumes.

Deposits at Ouse, Campbell Town, Swansea and St. Leonards have comprised the major set-up for a survey of known bauxites. The Ouse deposits offered the best advantages for immediate development and this locality was selected for the purpose of fixing the initial objective of a minimum economic quantity of commercial ore.

OUSE.

A total of 1,206 feet of shafting has been completed and the intersected bauxite has been channel sampled in lengths of up to five feet and in the proportion of approximately one pound weight of sample per foot of channel.

An occurrence on the Gladfield Estate was selected for the laying down of a systematic grid of shafts at intervals of approximately 200 feet. The bauxite occurs as a lenticular crust over an area of about 220,000 square yards and with a thickness range of up to approximately 19 feet. The surface gradient is a little less than 6 degrees. The overburden is generally less than 3 feet and rarely in excess of 6 feet. The calculated volume in the inner area of this deposit is 500,000 tons of an average value per foot of sample of 41.2 per cent of available alumina and 3.2 per cent of free silica. The outer area represents fringes of the deposit and, although the fringes may provide a slightly less average grade than the inner area, selective production from the fringes should provide an additional 100,000 tons of commercial ore. Three other deposits on the Gladfield Estate are of less dimensions than the major area and the available bauxite has been assessed at 75,000 tons, making a total of 675,000 tons of proved and probable bauxite on this estate.

From 44 analyses of Ouse bauxite, the average content of titanium dioxide is set at 2.17 per cent.

Developments on the Gladfield Estate readily fixed the initial objective of a proved minimum economic quantity of commercial bauxite, amenable to low-cost surface mining.

Without the proved grade and volume attracting industrial exploitation, substantial expenditure has not been merited in close shafting and developing other deposits, but the survey has been extended to other localities and prospecting has been done to indicate possibilities and to prepare for systematic development should the proved grade attract an establishment of the aluminium industry and should the initial requirements of a possible industry demand the fixation of a greater proved volume.

Appended assay tabulations show many variations from commercial to non-commercial material but the complete results are submitted to illustrate the strata penetrations, to indicate definition of commercial bauxite in the proved area, and to illustrate the results of prospecting work and the existence of grade bauxite that will merit systematic development to finally prove quantities additional to the minimum economic quantity already indicated.

Deposits of bauxite, collectively of material volume, also occur on Lachlan Vale, Lentwardine, Glen Dhu, Lawrenny, Kenmere, Cleveland and other estates. The report of the Extension Officer is attached and his summary of the position at Ouse is that the aggregate importance of the unexplored deposits is at present indeterminate but they are sufficiently widespread to encourage the belief that the potentialities of the district are not less than the originally claimed 2,000,000 tons.

CAMPBELL TOWN.

Bauxitic crusts occur in extensive tracts of country in the Campbell Town district. Shafting and general prospecting have revealed wide variations in mineral constituents. Spots of bauxite attractively high in alumina and desirably low in silica have been traced in the formations but the extent of the commercial ore appears patchy. It is unlikely that the aggregate volume of grade ore would be great but selective methods and beneficiation may enable quantities of ore to be produced for despatch to a treatment plant within the State. The attached report covers details of exploratory work and assay results. Extensive developmental work is necessary to isolate patches or blocks of grade ore for quantity evaluation and pending acceptance of the established grade for industrial exploitation substantial expenditure on developmental work has not been merited.

SWANSEA AND ST. LEONARDS.

Deposits of bauxite at Swansea and St. Leonards have been definitely identified but investigations have been limited to the searching of outcrops and some prospect shafting to determine ore types and possible grades. The indicated grade of bauxite is not higher than that of the proved bauxite at Ouse. The areal extent of the deposits and the prospect assays merit developmental work to isolate blocks of commercial ore, but expenditure hereon is undesirable until available grades of proved ore are accepted for the commercial production of aluminium.

SWANSEA -

Samples of bauxite from outcrops and prospecting shafts returned the following results :-

Available Alumina.	Free Silica.
42.4 per cent.	6.1 per cent.
40.0 " "	1.7 " "
42.9 " "	1.6 " "
36.9 " "	3.7 " "
35.6 " "	5.9 " "
37.4 " "	3.4 " "
33.8 " "	4.0 " "
35.9 " "	3.5 " "

The investigating officer has recorded the following observations upon the situation and extent of the deposits :-

" It is anticipated that further work will "
"establish the existence of ore of a reasonable grade," "but until sufficient shafting is carried out there " "will be no certainty that the deposits, as a whole, " "can provide a useful thickness of solid ore. "

" As far as surface indications are concerned "
"only one major outcrop gives promise of providing " "a large bulk of solid bauxite. This outcrop is " "situated on "Riversdale" (Woburn) estate and is " "located just east of the Bicheno road at a distance " "of 1.2 miles from the Campbell Town road junction. " "This deposit has a probable area of nineteen acres " "and has a good showing of solid ore on its eastern " "edge. Assuming an average thickness of bauxite of " "10 feet over the whole area, the upper limit of " "production would be in the vicinity of half a " "million tons, but from conditions found to prevail " "in similar deposits elsewhere, it is considered " "unlikely that this figure would be realised. "

" Another area of similar size on Riversdale extends eastwards towards the Grange road " "from a point about 20 chains north of the junction " "of the Campbell Town and Bicheno roads. Solid " "material is exposed at the surface only on the north-" "eastern tip of this area and, pending shaft sinking," "its potential productivity is quite indeterminate. "

" Between these two areas, minor outcrops of" "solid ore occur as remnants along a diabase ridge. " "These would perhaps provide useful ore in small " "quantities, but even in aggregate they are " "insufficient to affect the general position. "

" The principal outcrop on "The Springs" " "estate is on the north-eastern side of the old " "disused road from Swansea to Campbell Town at " "a distance of 1.6 miles south-easterly from the " "State School on the present main road. "

" The formation has a surface extent of " "about 9 acres strewn with bauxite boulders, but " "there is no solid ore outcropping. A small quarry, " "now partially filled in, provided blocks of bauxite " "for house building purposes, but inspection of " "the buildings on which the stone was used gives the " "impression that solid bauxite was not " "plentiful in the quarry. "

" There are several small patches of the " "bauxitic formation on this estate but there is " "little evidence of solid ore at the surface, and " "failing satisfactory results from prospecting of " "the larger areas, they are not likely to be of any " "great importance. "

" All outcrops in the district have low " "angles of dip and the removal of overburden would " "not be a serious problem. The bauxite obviously " "belongs to the same type of formation as that " "found in other parts of Tasmania and its potential " "utility will remain speculative until a reasonable " "amount of test shafting has been completed. It " "should be realised, however, that the probable " "upper limit of production is less than 2,000,000 "

"tons and that, unless the deposits open up more "
"favourably than surface evidence indicates, the "
"total output capacity may be less than 1,000,000 "
"tons. "

ST. LEONARDS -

In geological associations and in superficial physical characteristics, the bauxite resembles that occurring at Ouse, but shafting and sampling are necessary to determine grades and quantities. A factor of disadvantage is the probability of heavy overburden but systematic development is necessary before grades, quantities and mining economics can be discussed.

The investigating officer has recorded the following observations :-

" There is an occurrence of bauxite about "
"one mile north-easterly from St. Leonards "
"Township. The outcrop is most conveniently "
"reached by the Launceston-Scottsdale highway "
"being situated along a valley side "
"approximately 30 chains south of that road "
"at a distance of five and a quarter miles "
"from Launceston. "

" The trend of the valley is from north- "
"west to south-east with the bauxite outcropp- "
"ing along the south-western flank and being "
"exposed also across the head, or north- "
"western end of the valley. Across the "
"valley in a north-easterly direction, remnants "
"of bauxite mark the termination of the "
"formation against the diabase bed rock. "

" The actual outcrop is continuous for "
"about half a mile, but the extent of the "
"formation is indeterminate because the "
"bauxite passes under sub-basaltic sands and "
"clays, and its degree of persistence under "
"this cover to the north and west is unknown. "

" The bauxite has a probable average dip "
"of about 5 degrees in an easterly or south- "
"easterly direction. This dip would tend to "
"reduce the rate of increase in the thickness "
"of overburden, but not sufficiently to prevent "
"the handling of overburden from becoming "
"a serious problem in the extraction of ore. "
"To determine the available tonnage of bauxite, "
"under a reasonable thickness of overburden, it "
"would be necessary to put down a number of "
"shafts or bores away from the outcrop. The "
"extraction of bauxite by methods of underground "
"mining would be difficult on account of the "
"nature of the sub-basaltic sediments which would"
"form a dangerous roof to the workings, "
"particularly under wet conditions. "

" Shafting would also be necessary to "
"determine the average thickness of commercial "
"ore and to establish its grade. Assay results "
"are at present available from only three "
"samples. These were of surface material and "
"were collected by Mr. A. Pearson in the presence"
"of Mr. W. St. C. Manson, Chief Chemist and "
"Metallurgist of the Mines Department. Not "
"being representative samples, they should be "
"regarded as an indication only of the "
"probable grade. The results were :- "

		Alumina.	Silica.	Remarks.
"				"
"	No. 1	45.42	5.99	Pisolitic. "
"	No. 2	43.67	2.53	Pisolitic. "
"	No. 3	37.32	7.66	Ochreous. "

The present position in regard to Bauxite in Tasmania is represented by the following factors :-

OUSE -

1. A proved minimum economic volume of commercial ore.
2. Deposits of bauxite exterior to the proved area upon which developmental work is necessary but which are sufficiently widespread to encourage the opinion that the aggregate potentialities are not less than 2,000,000 tons.
3. Ready accessibility.
4. Low-cost mining for a considerable period.
5. Coal of a suitable quality in the district.
6. Hydro-Electric Power and a transmission line across the area, and
7. An abundant supply of water from a river system in the locality of the deposits.

CAMPBELL TOWN, SWANSEA AND ST. LEONARDS -

Prospecting and other investigational work has indicated that bauxite suitable for the production of aluminium occurs over extensive tracts of country distant from the Ouse deposits. Collectively, these deposits may yield a large quantity of ore, but developmental work is necessary to determine grades and volumes and to isolate blocks of commercial bauxite. Expenditure in this direction has been deferred for the reasons outlined.

(Sgd.) W. H. Williams.

DIRECTOR OF MINES.

Department of Mines,
HOBART.

15th December, 1942.