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REPORT 1947/86

BEACH SAND INVESTIGATION  
REPORT FOR MONTH ENDING 31ST OCTOBER 1947

by

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SOUTHPORT, QUEENSLAND.

11th November, 1947.

The Chief Geologist.

BEACH SAND INVESTIGATION.

Report For Month Ending 31st. October 1947.

GENERAL.

- A. Visits were made to Army and Navy Stores in Brisbane to inspect surveying and drafting equipment which, it is hoped, will be released for us. At the same time samples were obtained from Zinc Corporation; the Geological Survey Office was visited, samples collected, and the work discussed with Mr. Morton and Mr. Connah; supplies of drafting equipment, microscope etc. were obtained at the Department of Supply & Shipping; the typewriter picked up from Chartres where it had been left for overhauling; the small theodolite left at Greenfield's; Lands Department plans left to be mounted on cloth backing; small items of equipment obtained at Taylor and Elliott's etc.
- B. Vehicles. Jeep C55124 was left at Urban Motors, Brisbane early in the month to be painted, re-covered etc. The painting was finished some time ago, but up to the 5th November, suitable material for the hood had not been procured. It is hoped that the jeep can be picked up during the week ending 15th November, and C 55127 left in its place.
- C. General Geology. Some notes have been written during week-ends on river valley terraces and benches and sea-cut benches observed in the area. These will be forwarded during the week. It is hoped that a little time can be spared later on for some field work on them. Such work could be fitted in, as convenient, with the routine work.
- D. Assistance given to Companies. The Companies which have plants in operation, and which in general have their own microscopes for examining minerals do not require much from us in the way of microscopic examination of samples. Some of them do, however, invite us to do a little mapping and levelling in connection with their boring, e.g. Associated Minerals Pty., Rutile Sands Pty., Titanium Alloy Mfg. Coy., Metal Recoveries Ltd. and Zircon Rutile Ltd. In return we obtain samples from the bores. We haven't yet the field staff to cope with this adequately. The companies which are boring, but not operating plants, occasionally ask for a determination of the composition of samples, or the identification of minerals in samples. This applied to Alluvial Gold Ltd., but they finished up their work at Cudgen before we started lab. work. It applies to Clayton who is boring for Nowman at Labrador. He has been permitted to use the Bausch and Lomb microscope, and has been given some help in the recognition of minerals. Mr. Scott-Moffatt brought some samples in for examination from the Lennox Head area. Numbers of the operating companies, viz. Zinc Corporation, Associated Minerals, Titanium Alloy Mfg. Coy., Tweed Rutile Syndicate and Zircon Rutile Ltd. have indicated that they would be interested in any chemical work which we might undertake. A photostat copy of a portion of Pool's article in the Chem. Eng. and Mining Review of February-March 1939, was sent to T.A.M. Co. some time ago in response to an enquiry concerning the determination of titanium. Mr. Derrick said that the information was of value to them.

STAFF.

General. As mentioned in sections 1 D, 3 and 4, it has not been possible to do enough field work and drafting with the small staff

here. For economy in time and petrol, the work south of Coolangatta would be best carried out by a party which could spend all or most of the week on the work without returning to Southport. That is not practicable at present. In the past I have saved time by travelling early in the morning and at night, but this becomes a bit wearing after a time, and the staff are not at all keen on it. Apart from that one cannot expect them to be continually using up their own time in travelling.

Mr. Ward started on the 27th October and spent until the end of the month on grain count work. (In October with the magnetic separator working, he is carrying out all the stages in the determination of samples, from panning to grain counting and calculating).

Messrs. Graves and Cuthbert carried out preliminary laboratory work early in the month, and all the panning, weighing and calculating on samples which were determined later in the month. Some field work and a little drafting was done towards the end of the month.

Mr. Page has attended to the receipt of samples, assigning laboratory numbers to them and acknowledging them; to general correspondence; typing reports; typing a copy of Zircon Rutile's results of grain count of their bore samples (some hundreds); maintaining files, records or correspondence, usage of stamps, petty cash expenditure; usage of petrol ration tickets etc. He has taken over the compilation of the monthly returns regarding vehicles, petty cash etc. He also assisted in some of the field work.

### 3. FIELD WORK.

- A. Sampling Deposits (i). Samples were obtained from Companies etc, viz. Caloundra and Frazer Island samples from the Mines Department samples of an area behind Mermaid Beach from Mineral Deposits Syndicate, samples of DC 22 from Associated Minerals Pty., and samples from Zinc Corporation lease near Norries Head. Bags of sand from bores were sampled, viz., from Mr. Newman's lease at Labrador, Alluvial Gold Ltd. leases at Norries Head, and Titanium Alloy Mfg. Co. lease at Broadwater near Evans Head. The working faces of Mineral Deposits Syndicate leases west of Broadbeach were sampled. (ii) It was not possible to complete all the sampling we wished to do, viz, the working faces of areas being mined by Rutile Sands Pty. Tweed Rutile Syndicate, Titanium Alloy Mfg. Coy., Metal Recoveries Ltd., and Zircon Rutile Ltd., and further bores put down on Newman's lease at Labrador, on Titanium Alloy Mfg. Co's. lease at Broadwater, and on Zinc Corporation's lease near Norries Head. It is hoped that, eventually we will be able to sample each working face at intervals of about six weeks. By this means we should obtain accurate information about the form and composition of the deposits and the levels at which they occur. We hope also to be able to visit periodically the areas where boring is being carried out to obtain samples representative of the areas. Besides the companies mentioned above, Metal Recoveries Ltd. and Scott-Moffatt (near Lennox Head) are about to do some boring and they too should be visited regularly. Scott-Moffatt has just started up his plant near Lennox Head. (Reference: remarks in section 2 "General" re an independent field party). (iii) Some of the broad low-lying heathlands areas west of the bays in between the headlands are being bores by companies, viz., Newman at Labrador, Alluvial Gold Ltd., and Zinc Corporation near Norries Head and Titanium Alloy Mfg. Coy. near Evans Head. It may be worth our while to do some scout boring in similar areas not being tested by companies.
- B. Sampling of Plants. The plants of Mineral Deposits Syndicate at Southport and Zircon Rutile Ltd. at Byron Bay were sampled.
- C. Levelling and Mapping (1) were carried out on Mineral Deposits Syndicate lease at Broadbeach, Associated Minerals Pty. leases near North Burleigh and at Miami Beach, and the Zircon Rutile Ltd. leases at Tallow beach. (ii) If more sampling is undertaken in the future, as in the paras A (ii) and A (iii) above, extra levelling and mapping will be necessary. This work is done at the time that the sampling is done. (Such work south of Coolangatta could best be done by an independent field party as mentioned in Section 2 "General".)

4. DRAFTING.

The results of field work carried out during the month were plotted immediately upon the completion of the field work in such form that they can readily be transferred to a composite plan. The plans of the Alluvial Gold Ltd. leases near Norries Head showing boring sites were traced; also Mineral Deposits Syndicate boring charts of areas which have not yet been mined. (Some of these were started during September). A plan of Associated Mineral Pty. lease, DC 22 (Broadbeach to North Burleigh) has been done on a scale of 500 feet to the inch, showing the positions of bore lines. On this plan, the results of M.D.S. boring on their leases and on private ground west of DC 22 can be plotted. This plan may be regarded as a start on the compilation of composite plans on a scale of 500 feet to the inch. It is hoped that, during November, the area adjacent to the beach from the southern end of DC 22 to the southern end of DC 23 at Burleigh will be drawn on a scale of 500 feet to the inch. In the absence of a draftsman, it is difficult to get this work done.

5. LABORATORY WORK.

(i) Preliminary Work. Preliminary work was carried out early in the month, mainly for the purpose of developing a suitable method of getting concentrates from the samples. Our panning dishes arrived later and it was found that straight-out panning was satisfactory.

(ii) Results. By the end of the month laboratory work on the Mines Department samples from South Stradbroke Island had been completed. The determination of the mineral composition of the concentrates was done solely by grain counting the concentrate, without previously separating the ilmenite. The results on two of the samples were checked by electromagnetic separation of the ilmenite. The electromagnet was not used during the work because separation of the ilmenite from a reasonable quantity of sample took too long a time. Steps were taken to increase the efficiency of the electromagnet.

(iii) Difficulty of Grain Count without Previous Separation of Ilmenite. Some of the South Stradbroke samples were counted using a moderately bright light, but later, magnetic separation proved that quite a percentage of the rutile had been counted as ilmenite.

The samples were re-counted using a very bright light. It was then found that the count for rutile was higher than before, but still about 0.5% to 1% low (e.g. 29.0% to 29.5% determined instead of 30%). The bright illumination caused undue eye strain to the person doing the counting.

(iv) The Electromagnet Adopted for Routine Work (See diagram). By the end of the month the magnet was fitted with new pole pieces in such a way that the upper pole could be raised or lowered by turning a thumb-screw. The magnet was mounted on a wooden base. Also mounted on the base, and passing between the poles, was a horizontal brass plate or platform, along which a light gauge copper tray carrying the sample was slid. The brass platform was held to the wooden base by screws and kept above the base, approximately level with the lower pole, by spiral springs around the screws.

The height of the platform above the lower pole could be varied by turning the screws. A rectangular hole, a little larger than the rectangular surface of the lower pole of the magnet, was cut in the brass plate above the lower pole of the magnet.

The figure is missing in the hardcopy of Record 1947/86.

The magnet set up as above and working on 18 volts was able to remove the ilmenite completely from small samples of concentrate (2 or 3 grams).

However, the field strength was a bit low with the result that during the final stages of separation it was necessary to lower the upper pole inconveniently close to the sample.

(v) The Advisability of Magnetic Separation. Despite the time required, magnetic separation has been adopted as a routine method in sample determination. To obtain sufficient accuracy by grain count alone, the intensity of illumination required causes eye-strain when counting. The total time required for counting both the magnetic and non-magnetic fractions is less than the time required to count a sample of concentrate which has not been magnetically separated.

(Sgd.) D.E. GARDNER.  
Geologist.