

COMMONWEALTH OF AUSTRALIA.

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BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.

RECORDS.

1956/30



SUMMARY OF ACTIVITIES OF RESIDENT GEOLOGISTS
IN THE NORTHERN TERRITORY FOR 1955

by

N.J. MacKay

CANBERRA.

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STAFF

The geological staff consisted of officers of the Bureau of Mineral Resources, seconded to the Northern Territory Administration and based at offices of the Mines Branch in Darwin and Alice Springs. The resident staff at the commencement of 1955 consisted of the following officers:

H.B. Owen (Senior Resident Geologist)	- Darwin
N.O. Jones (Resident Geologist)	- Alice Springs
D.E. Catley (Resident Geologist)	- Alice Springs

Staff changes and movements during the year were as follows:-

24th January - H.B. Owen proceeded on leave prior to resignation

14th March - N.J. MacKay commenced duty in Darwin as Senior Resident Geologist

15th August - W.F. McQueen commenced duty in Darwin as Resident Geologist

14th October - D.E. Catley proceeded on leave

16th December - N.O. Jones proceeded on leave

J.B. Firman of the Darwin Uranium Group relieved N.O. Jones while he was absent on leave.

WATER SUPPLY

Water supply work consisted mainly of selection of bore sites for pastoralists and Government Departments concerned with the cattle industry of the Northern Territory. All available information on bores was catalogued and the positions of bores and bore sites were plotted on aerial mosaics and basemaps in the Darwin and Alice Springs offices.

(a) Cattle Stations

At the request of pastoralists and the Department of Lands, sites for private bores, drought relief bores, poison relief bores and pastoral scheme bores were selected by the resident geologists. It has been very difficult to obtain the results of many of the private bores from the pastoralists.

During the year a total of 61 bore sites were chosen on the following cattle stations:

Atnarpa	Stirling
Marqua	Erlunda
Tarlton Downs	Lillia Creek
Manner's Creek	Palmer Valley
Harper Springs	Nutwood Downs
Willowra	Owen Springs
Lucy Creek	Yambah
Allambi	Auvergne
Elkedra	Limbunya
Woodgreen	Camfield

Information available on the drilling of 20 of these bore sites shows that 12 bores were successful and 8 bores yielded little or no water.

In the Victoria River District bores were drilled on 13 sites selected by H.B. Owen in 1954, on Wave Hill, Waterloo and Ord River stations. Nine bores struck good supplies of water and four bores were unsuccessful. It is considered that two of the dry bores should intersect water supplies if they are deepened. This recommendation was forwarded to the stations concerned.

(b) Stock Routes

Bore sites were selected or approved on four stock routes for the Animal Industry Branch.

On Phillipson Stock Route a bore site for number 3 Bore was selected. Subsequent drilling on this site struck a good supply of water.

On South Barkly Stock Route two bore sites chosen by Animal Industry Branch were inspected and approved.

A site for number 50 bore on Wave Hill Stock Route was selected; drilling on this site yielded a flow of 2,400 gph. of good water.

Three bores were sited on Auvergne Stock Route. Drilling of the first hole struck a flow of 450 gph. which is sufficient for this area. The second hole has not been completed.

(c) Native Settlements

Geological work relating to water supply problems was carried out on four native settlements for the Department of Welfare.

Three bore sites were selected at Jay Creek Native Settlement but drilling did not find any adequate water supply for domestic purposes. A short report on the water problems of this area was written by N.O. Jones who also investigated and reported on a proposed Mexican dam site.

At Amoonguna Native Settlement four bores were drilled on sites chosen by N.O. Jones. Two bores were successful and two were failures. A fifth bore was being drilled at the end of the year.

A bore site was selected at Haast's Bluff Native Settlement. Drilling on this site struck a supply of 1500 gph., but the sulphate content of the water was very high. Two bore sites for stock water were chosen in the area west of the settlement.

A geological reconnaissance of Hooker Creek Native Settlement was carried out and two bore sites for stock water were selected.

(d) Towns.

The Alice Springs water supply was discussed with the Principal Engineer, Department of Works, and advice given on testing the Todd River basin for changes in salinity of the water supply. An inspection was made of Wigley's dam site on the Todd River, 5 miles north of Alice Springs.

Investigations were made into Tennant Creek water supply. Reports were written on possible dam sites and possible sources of underground water in the Tennant Creek area. N.O. Jones examined the Cabbage Gum Basin and reported that it appeared to be the only possible ground water source for an adequate supply of fresh water within 20 miles of Tennant Creek township.

METALLIFEROUS INVESTIGATIONS

(a) General

The following mining areas were inspected during the year:

Winnecke Goldfield
Arltunga Goldfield
Hatches Creek
Hart's Range
Jervois Range
Mt. Doreen
Tennant Creek Goldfield

N.J. MacKay accompanied the Chief Mineral Economist, Bureau of Mineral Resources, on a tour of inspection of mining areas in the Northern Territory. The areas visited were Rum Jungle, Adelaide River, South Alligator River, Sleisbeck, Northern Hercules, Maranboy tinfield, Mucketty manganese deposit, Tennant Creek Goldfield, Mosquito Creek, Hatches Creek and Hart's Range mica field.

N.J. MacKay also accompanied the Parliamentary Mining Committee when it visited Maranboy tinfield, Mucketty manganese deposit and Tennant Creek goldfield.

Old mines in the Coronet Hill-Mt. Diamond area and Hidden Valley area were examined and an underground inspection was made of Northern Hercules mine. A copper prospect on Ringwood Station was examined and sampled but did not appear to be promising. Occurrences of copper minerals in the Tennant Creek area were plotted on a geological map of the area.

Assistance was given to the mining community both in the field and the office whenever it was requested.

(b) Manganese

A geological examination of Manganese deposits in the Mucketty and Renner Springs areas was carried out by N.O. Jones. Work was concentrated on the main deposit at Mucketty which was sampled and mapped in detail. The manganese deposits have been formed by replacement of siltstone, sandstone and limestone beds which dip at 20 to 30 degrees to the north-east. The total strike length of the Mucketty deposit is 2000 yards and the manganese deposit forms a prominent scarp trending north-west.

Ore reserves at Mucketty, expressed as tons per foot down the dip of the beds, have been calculated as:

High grade ore (over 75% MnO_2).....	40 tons per foot.
Good grade ore (60 - 75% MnO_2).....	850 tons per foot.
Medium grade ore (35 - 60% MnO_2).....	7600 tons per foot.

Total ore (over 35% MnO_2).....	8490 tons per foot.
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No estimation of total ore reserves can be made until the depth to which replacement has occurred is known. Only a small portion of the exposed ore is of economic grade. This ore is being mined by a small open cut and sold to Territory Enterprises Proprietary Limited for use in the uranium treatment plant at Rum Jungle.

Sites were recommended for diamond drilling to determine the depth and grade of ore beneath the surface. Diamond drilling of the deposit will be carried out in 1956 by the Bureau of Mineral Resources.

(c) Tin

N.J. MacKay accompanied a party of Rio Tinto Mining personnel on an examination of Maranboy and Yeuralba tinfields. Geological maps and reports showing estimated grades of extracted ore were made available to the party. Rio Tinto's interests were mainly confined to establishing whether the main lode at Maranboy warrants large scale exploration. This company did not show any subsequent interest in this area.

Cores from two diamond drill holes put down at Maranboy by Red Terror Gold Mining No Liability were logged by the Darwin office. One hole was diamond drilled by the Bureau of Mineral Resources at O'Sullivan's Hill in the Yeuralba area. The core was logged and samples forwarded by the Darwin office to Tasmania to be assayed for tin content.

(d) Uranium

N.J. MacKay accompanied the Chief Geologist, Bureau of Mineral Resources, on an inspection of the South Alligator and Sleisbeck uranium prospects and of the three Bureau of Mineral Resources field parties working in the Katherine-Darwin region.

An inspection of four freehold blocks in the Rum Jungle area was carried out in the company of a representative of the owner of the Blocks. The owner has claimed compensation for the loss of the mineral rights of the blocks but no uranium mineralisation has been discovered on the four blocks of land.

(e) Black Beach Sands

Black sand deposits on the north coast of Melville Island were examined and two areas of possible economic interest were discovered. Assay results of samples taken from these two areas revealed that the rutile content of the sands was too low for economic exploitation. It is considered that further testing of the two beaches below water level is warranted and the interested company hopes to be able to test the deposits in 1956.

GENERAL INVESTIGATIONS

(a) Gidgee Poison Survey

The survey of the Gidgee Poison area was made by C.S.I.R.O. and Animal Industry Branch officers accompanied by N.O. Jones who carried out geological mapping in the Topermory-Marqua-Tarlton Downs area. It was found that the poison weed is almost entirely confined to carbonate rocks, mainly dolomites.

(b) Aggregate Material

At the request of the Department of Works, a search for a quarry site for producing 200,000 tons of aggregate material for use in the construction of the new runway at Darwin was carried out. It was necessary for the quarry to be near the railway line and as close to Darwin as possible.

The selected site is near the Darwin River, half a mile from the railway line and 42 miles by rail from Darwin. The quarry will be worked by No. 5 Airfield Construction Squadron, R.A.A.F. on the north-western side of a prominent ridge which consists of interbedded quartzite, shale and sericite schist. These sedimentary beds strike 065 degrees and dip at 60 to 65 degrees to the north.

The quartzite will be used as the aggregate material and the soft shale and sericite schist will be discarded. An inclined diamond drill hole, 143 feet in length, was put down into the deposit to determine the ratio of quartzite to shale and schist. The drilling showed that, apart from various narrow bands of shale and schist, only one thick band of soft material will be encountered in the centre of the quarry. This band is approximately 35 feet thick.

During quarrying operations of a sedimentary deposit of this nature, care will have to be taken during stripping out of the bands of shale and schist from the quartzite beds and drainage will have to be carefully controlled during the wet season.

(c) Limestone Deposits

A search for limestone deposits suitable for use in the manufacture of cement in Darwin revealed that the known deposits of large tonnage, nearest to Darwin, occur at Batchelor. Samples were taken from these limestone deposits for the Company interested in the construction of a cement works in Darwin.

Four miles north of Darwin, between East Point and Nightcliff, a shell deposit forming a raised beach was examined. The silica content of the deposit appears to be low and a good supply of lime may be obtainable here. A plan for testing the beach was submitted to the interested company.

(d) Building Stone

Following a request by the Bishop of Darwin, several areas in Darwin were examined as possible quarry sites to provide facing stone for the New Catholic Cathedral. It was decided to open up an old quarry near Doctor's Gully in the Larrakeyah area. The rocks at the quarry are Cretaceous in age and consist of kaolinised, leached shales overlain by hard Porcellanite. The Porcellanite is seven feet thick and will have to be removed prior to quarrying of the underlying shale.

OFFICE

(a) General

Mineral specimens were on display at the Alice Springs and Darwin offices. Geological maps and reports on various areas in the Northern Territory were available to the general public. Many inquiries for information about mining areas were handled by the resident geologists and mineral specimens brought in by prospectors were examined and identified.

(b) Petroleum

N.J. MacKay attended all meetings of the Petroleum Advisory Board during the year. Eleven applications for petroleum permits were dealt with and recommendations were made to His Honour the Administrator by the Board. A map was prepared which showed the known occurrences of sedimentary and unfavourable rocks within the areas of the permits.

(c) Black Beach Sands

An examination was made of plans of two beaches, Rinamatta and Bowen Bay, at the south-western end of Bathurst Island which were tested by Dowsett Engineering (Australia) Proprietary Limited in 1954. An assessment of the available information showed that the company has proved approximately 670,000 tons of heavy mineral bearing sand containing 40,000 tons of heavy minerals and averaging just under 1% rutile. Further testing of the large area of sand dunes behind the beach at Bowen Bay should increase the available tonnage by a considerable amount.

The beaches are not a high grade proposition and the reserves proved to date are not large, but it is likely that the company will commence mining the two beaches in 1956.

(d) Mineral Map

Compilation of the new mineral map of the Katherine-Darwin region was completed and provisional copies distributed to the Director of Mines and the Darwin Uranium Group. The compilation was forwarded to the map-compilation section of the Bureau of Mineral Resources, Canberra, for correction and re-drafting. When this is completed, copies will be available at Darwin for the general public.

(e) Regional Maps

Compilation of 4 mile regional maps of the Northern Territory was carried out during the year at both the Darwin and Alice Springs offices. These maps will be used in the compilation of the geological map of the Northern Territory which is being handled by the Bureau of Mineral Resources map-compilation section in Canberra.

(f) Geological Library

Geological plans and aerial mosaics held in the Darwin office were listed and classified during the year. Classification and indexing of all reports and publications held by the Darwin office and the Mines Branch were commenced late in the year.