

COMMONWEALTH OF AUSTRALIA.

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DEPARTMENT OF NATIONAL DEVELOPMENT.  
BUREAU OF MINERAL RESOURCES  
GEOLOGY AND GEOPHYSICS.

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**RECORDS.**

RECORDS 1958/118



SUMMARY OF ACTIVITIES - 1958

RESIDENT GEOLOGISTS - NORTHERN TERRITORY

by

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## SUMMARY OF ACTIVITIES - 1958

### RESIDENT GEOLOGISTS - NORTHERN TERRITORY

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#### STAFF

The geological staff are officers of the Bureau of Mineral Resources, seconded to the Northern Territory Administration and based at offices of the Mines Branch at Darwin and Alice Springs. The staff consisted of the following officers at the end of 1958:

<u>Darwin</u>	N.J. MacKay	- Senior Resident Geologist
	J. Hays	- Geologist Grade III
	W.F. McQueen	- Geologist Grade 1
<u>Alice Springs</u>	N.O. Jones	- Geologist Grade III
	T. Quinlan	- Geologist Grade II
	G.R. Ryan	- Geologist Grade I

Staff changes during the year were as follows:-

1st. January - 24th March	- N.O. Jones on recreational leave and on duty in Canberra; replaced by T. Quinlan.
24th March - 25th July	- T. Quinlan temporarily resident in Darwin.
26th Nov. - 31st December	- G.R. Ryan on recreation leave.

#### WATER SUPPLY INVESTIGATIONS

##### General

Water supply work consisted mainly of selection of bore sites for pastoralists and Government Departments concerned with the cattle industry. Discussions on water supply policy were held with pastoralists, and technical advice on maintenance and testing of bores was given. Bore sites were selected for native settlements maintained by the Department of Welfare, for farmers and other residents in the Darwin area, and for various Government Departments other than those previously mentioned.

Investigations of the water supplies at Alice Springs and Tennant Creek were continued during the year. A report on the geology of Central Australia, the availability and quality of ground water, and some of the associated problems is being prepared in Alice Springs.

Compilation of bore records and plotting of bore locations were continued, using the filing system instituted at the end of 1957. Geological maps at a scale of 4 miles to the inch were used for the plotting of bore locations. The system proved to be of considerable value in providing information about areas where bore sites were required.

## Selection of Bore Sites

A greater number of bore sites were selected during 1958 than in previous years. This was mainly because of the large programme of drought relief drilling for the Department of Lands. Work was undertaken in several new areas where little geological or hydrological information was available. Unfortunately, all requests by pastoralists for assistance in bore siting could not be handled.

The following table summarises the bore sites selected during the year:-

<u>Private Pastoralists</u>		<u>Stock Routes</u>	
Argyle Downs	5	Phillipson	5
Flora Valley	1	Wave Hill	1
Indiana	1		
Inverway	2	<u>Pastoral Scheme</u>	
Ivanhoe	3		
Kirkimbie	3	Birrindudu	1
Limbunya	3	Picton	1
Manners Creek	1		
Newry	3	<u>Native Settlements</u>	
Ord River	1		
Tobermorey	4	Bagot	1
Victoria River Downs	3	Beswick	4
Wave Hill	1	Yuendumu	6
<u>Drought Relief</u>			
Alcoota	2	Ooratippera	1
Anningie	1	Pine Hill	1
Curtain Springs	1	Umbeara	3
Derry Downs	1	Victoria Downs	3
Derwent	1	Willowra	1
Erlunda	2		
Georgina Downs	2	<u>Others</u>	
Kulgera	2		
Lilla Creek	1	Darwin area	13
Lucy Creek	2	Police Stations	5
Macdonald Downs	1	Miscellaneous	4
Mount Cavanagh	2		
Mount Doreen	5		
Napperby	4	<u>Total 108 bore sites</u>	

The results of drilling at 69 bore sites selected by the resident geologists are known: 37 bores were successful, 8 struck salt water, and 25 were dry or yielded insufficient supplies of water.

## Tennant Creek

During April and May, a Bureau of Mineral Resources Failing 750 rotary drill operated at sites selected to conform with the geophysical exploration programme which was being carried out by the Bureau of Mineral Resources. Of the total of 17 bores drilled, 14 were small-diameter (3" and 4") and 3 were large-diameter (6" and 7"). One of the small-diameter holes was subsequently enlarged to 5". All the bores were logged by J. Hayes who forwarded selected specimens to Canberra for porosity and permeability determinations. The results were most encouraging, the bore near number 13 well yielding more than 2,000 gallons an hour for 48 hours. An interim report was prepared and distributed in June. Subsequently, pumping tests on the bores were carried out by the Department of Water Use. Reports of the geophysical exploration and the pumping tests are not yet available.

### Alice Springs

The resident geologists continued to work with the Department of Works and Water Use Branch in the investigations of the Alice Springs alluvial basins. Measurements of standing water levels in selected observation bores were continued in the Town and Farm Area basins throughout the year.

Six test drill holes in the Farm Area basin were supervised for the Water Use Branch, and bore data was collected on new private bores drilled in the basins. Advice was given on several proposed bore sites in the Town and Farm Areas.

### Darwin

Thirteen bore sites were selected on farms in the Night-cliff and Berrimah areas. Nine of these were at the request of the Water Use Branch for the Primary Producers Board. Most of the sites were selected on rocks of the Darwin Formation, and all the successful bores struck good supplies of water in conglomerate at the base of this formation.

## METALLIFEROUS INVESTIGATIONS

### Mount Harris Tinfield

The Ban Ban East 1-mile sheet was remapped at photoscale, particular attention being directed to the tinfield between Mount Harris, Mount George, and Mount Masson. All quartz-hematite lodes in the tinfield were mapped on aerial photographs enlarged to a scale of approximately 4 inches to 1 mile. The lodes were dollied and panned, and samples taken of those containing cassiterite.

A photoscale map, accompanied by notes on the geology of the area, is being prepared for submission to the <sup>East</sup> Chief Geologist, Canberra, as a replacement of the existing Ban Ban sheet. Preparations of the map will be followed by a detailed report and plans of the tinfield.

### Hatches Creek

The compilation of the plans and comprehensive report on the Hatches Creek Wolfram field was completed by G.R. Ryan. The edited report will be distributed at the end of the year.

### Tennant Creek

G.R. Ryan was attached to the Bureau of Mineral Resources geological party at Tennant Creek from 21st May to 25th October. He worked on the detailed mapping of the Tennant Creek 1-mile sheet and gave advice to the local mining industry when requested.

During July, G.R. Ryan carried out a survey of the Eldorado Mine at the request of the Director of Mines to assess its future potential as a gold producer. Critical areas of the mine were examined, and recommendations for exploration and development were made in his report on the mine.

### Maranboy Tinfield

Diamond drilling started on the Anaconda lease on 28th March, on a programme under an agreement by the Bureau of Mineral Resources with United Uranium N.L.

No.1 hole was completed at 361 feet on 25th May, No.2 at 397 feet on 5th June, No.3 at 500 feet on 1st August, No.4 at 517 feet on 9th August, and No.5 at 704 feet on 25th October. Logs, plans, and sections of the drill holes were compiled and forwarded to Canberra.

Assay results of intersections of tin ore were as follows:-

<u>Drill Hole</u>	<u>Intersection</u>	<u>% Tin</u>
No.2	292' - 294'	2.18
No.3	450'10" - 467'11"	1.51
No.4	482'11" - 491'6"	1.47

A further six holes are to be drilled, three on Anaconda lease and three on Osman lease. Drilling of No.6 hole on the Anaconda lease started in December.

#### Cosmopolitan Howley Mine

Diamond drill hole No.2B was completed in March at 341 feet. Assay results from drill hole No.1 showed a maximum gold content of 2.7 dwts. per ton over a core length of 5 feet and an average of 0.75 dwts. per ton over a true width of 60 feet. Results from drill hole No.2B were as follows:

<u>Intersection</u>	<u>Assay</u>
269' - 294'	3.61 dwts Gold per ton.
325' - 341'	8.58 dwts.Gold per ton.

These were sufficiently high to justify further drilling. The drill hole was deepened to 382 feet in November, and the drill core split and sent for gold assay.

#### General

A brief inspection was made by J.Hays of an occurrence of galena, cerussite, and fluorspar near the homestead on Ban Ban station.

Exploratory adits were sited on several leases in the Mount Harris area for prospectors likely to qualify for financial assistance.

G.R. Ryan attended the regional meeting of the Institute of Mining and Metallurgy at Mount Isa in August. He also inspected the mine workings at Mount Isa and Lary Kathleen Mines.

Specimens of various minerals were identified for local prospectors.

#### GENERAL INVESTIGATIONS

##### C.S.I.R.O. Survey, Alice Springs District.

The descriptions of the geology of the various land systems in the district were completed in June by T.Quinlan. They were forwarded to C.S.I.R.O., Canberra. He also compiled 4-mile geological maps of the district. These maps will be reduced by C.S.I.R.O. to a map on a scale of 16 miles to the inch.

A summary report on the geology and ground-water supplies of the district is being prepared for inclusion in the C.S.I.R.O. report.



### Search for Phosphate Deposits

W.F. McQueen visited the islands within Ashmore Reef, 500 miles west of Darwin, and carried out qualitative tests for phosphate. Samples were taken down to ground-water level to a maximum depth of 8 feet. Quantitative tests carried out in Darwin indicated that the top 2 feet of the shelly material of which the islands are composed contain not more than 5%  $P_2O_5$ , and the  $P_2O_5$  content of the underlying material ranges from traces to 3%. A rough estimate of quantities available would be 250,000 tons of 5%  $P_2O_5$  and 1,000,000 tons with traces of  $P_2O_5$ . A report was prepared and distributed.

### Miscellaneous

W.F. McQueen investigated several sites for a municipal swimming pool at Darwin, supervised diamond drilling at Larrakeyah Quarry, and conducted a plane table and geological survey at Manton Dam. The Manton Dam survey was done at the request of the Department of Works who propose to raise the present dam 5 feet to increase the storage capacity of the reservoir.

Diamond drill cores from the proposed site for the new power house at Darwin were logged, and the general geology of the area was investigated for the Department of Works.

The proposed dam site at Jay Creek Native Settlement was examined by N.O. Jones. He discussed the suitability of the site with officers of the Department of Works.

During May, N. MacKay, accompanied by E. Irving, of the Australian National University, collected 77 orientated rock specimens in the Victoria River District. The specimens will be examined and tested for palaeomagnetism at the University.

### OFFICE

The libraries of technical reports at Darwin and Alice Springs were enlarged and kept up to date. Constant use of the libraries and bore records was made by mining companies, drillers, and the general public.

New filing systems for correspondence and technical information at Darwin and Alice Springs were introduced and were in operation by mid-March. All maps, plans, and mosaics at Darwin were rechecked, and a comprehensive index prepared.

N.J. MacKay attended meetings of the Oil Advisory Board. He completed the report on his visit to Canada and the U.S.A. last year.

Mineral specimens from the Darwin office were used as part of the Mines Branch exhibit at the Annual Darwin Show. The Katherine-Darwin geological map and the mineral map of the Northern Territory were also displayed.

Assistance and information were given to the public, mining and oil companies, and Government departments, on geology, mineral deposits, mineral identification, and water supply.

REPORTS

Reports written and completed during 1958 are listed below:

<u>B.M.R. Record No.</u>	<u>Titles</u>	<u>Author</u>
1958/1	Report on groundwater prospects Yuendumu Native Reserve.	T. Quinlan.
1958/6	Report on Water Supply, Beswick Station, Northern Territory.	W.F. McQueen.
1958/12	Preliminary Report on the Mount Harris Tinfield. N.T.	J. Hays
1958/21	Preliminary Report on the Groundwater Resources of the Cabbage Gum Basin, Tennant Creek. N.T.	J. Hays
	The Geology of an area near Fanny Bay Beach, Darwin, N.T.	W.F. McQueen.
	Summary of Activities of Resident Geologists in the N.T. for 1957.	N.J. MacKay
With 1958/1	Supplementary Report on Groundwater Prospects on Yuendumu Native Reserve, N.T.	T. Quinlan
1958/23	Report on Visit to Canada and U.S.A. in 1957.	N.J. MacKay
1958/61	Interim Report on the Groundwater Resources of the Cabbage Gum Basin, Tennant Creek, N.T.	J. Hays
1958/51	The Groundwater Problem at Yuendumu Native Settlement, N.T.	N.O. Jones, & T. Quinlan.
1958/50	Report on the Selection of a Bore-site for the Police Station at Hatches Creek, N.T.	G.R. Ryan
	Report on Diamond Drilling at Cosmopolitan Howley Mine, Brocks Creek, N.T.	W.F. McQueen.
1958/76	A Geological Examination of Eldorado Mine Tennant Creek, N.T.	G.R. Ryan.
1958/77	Report on the Search for Phosphates in the N.T.	W.F. McQueen
	Administrative Review of the Department.	N.J. MacKay
	Groundwater Prospects - Proposed Police Station, Kulgera, N.T.	N.O. Jones
	Geology and Mineral Deposits of the Hatches Creek Wolfram Field, N.T.	G.R. Ryan.
1958/118	Summary of Activities of Resident Geologists in the N.T. for 1958	N.J. MacKay
1958/107	Notes on the geology and mineral deposits of Reynolds Range area, N.T.	G.R. Ryan.



Reports in Progress at the end of 1958 are as follows:-

<u>Title</u>	<u>Author</u>
Geological Report on Manton Dam, N.T.	W.F. McQueen
Final Report on the Mount Harris Tinfield, N.T.	J. Hays.
The Groundwater Resources of Central Australia.	N.O. Jones & T. Quinlan.
Summary Report on the Geology and Groundwater Supplies in the Alice Springs District, N.T. (for C.S.I.R.O.)	T. Quinlan.