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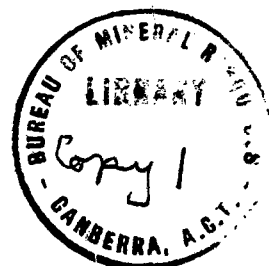
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RADIOACTIVE SURVEYS KATHERINE - DARWIN AREA, NORTHERN TERRITORY.

REPORT FOR QUARTER ENDED 30TH JUNE, 1954.

by

J.H. Lord.



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SUMMARY.

The Radioactive Section of the Bureau of Mineral Resources expanded its operations in the Katherine-Darwin Area during this quarter. The staff working in the Area has been considerably increased, but more geophysicists are required.

Regional geological mapping has commenced for the season and has disclosed one prospect showing radioactivity in the Burrundie district.

Detailed geological mapping and radiometric gridding is being done at Burrundie, Brock's Creek, A.B.C. and Adelaide River Prospects.

DARWIN OFFICE.

The new office block in Woods Street, Darwin was occupied by the Radioactive Section on 19th May. Minor work remains to be done to complete the structure.

More staff has become available during this quarter. The following were operating at or from the Darwin Office by the end of the quarter:-

J.H. Lord.	Geologist.	J.B. Nisz,	Geophysicist.
D.E. Gardner.	"	G.F. Clarke.	"
J. Rade.	"	W. Burns.	Radio Technician.
J.B. Firman.	"	P. Mayman.	Geop. Assistant.
R.A. Britten.	"	A. Parton.	" "
Miss A. Miller.	Tracer.	F. West.	" "
B.C. Thomas.	Clerk.	T. Hocking,	Clerk.
Mrs. M.B. Olle.	Typiste.		

In addition to the above, there are 3 drill foremen and 16 wages hands.

STAFF.

The size of the staff has increased during the quarter but is still insufficient to cope with all the requirements of the area, particularly with the geophysical work.

One geophysical assistant resigned, leaving only two in the area. At least two more are required urgently and one geophysicist.

The regional geological parties arrived in the area early in May. There are eight geologists under the leadership of B.P. Walpole operating in two parties at present.

Messrs. D.E. Gardner, J. Rade and R. Britten, geologists, and G.F. Clarke, geophysicists, joined the Darwin based staff.

Mr. A. Debnam, chemist, arrived at the end of June with his mobile laboratory.

By the end of the quarter it was possible to man all the drills required at present. A number of drillers in Darwin have been ~~searching for~~ ^{SEEKING} positions.

At the end of June, all payments of wages personnel and accounts was transferred from Adelaide to Darwin. An additional Clerk, Mr. T. Hocking, arrived to carry out this work.

A stores' clerk is still required, so that the Winnellie store can operate on a satisfactory basis.

HOUSING.

The rate of completion of houses is still very slow and despite original optimistic estimates by the Department of Works, only four houses were completed this quarter. There are still two to be completed as a part of the original contract.

The building of the 12 houses at Fannie Bay originally scheduled to be completed on 24th June, 1954, has commenced. Three of the houses had been commenced by the end of June.

All of the furniture which was ordered months ago for the eight houses has not yet arrived, but there is sufficient for the houses occupied.

RADIOMETRIC LABORATORY.

The radiometric laboratory operated at Winnellie until the end of June, when it was moved to its permanent location at the Woods Street office.

The demand for assaying is growing with increased drilling by the Bureau, and as the facility has become known to private operators. There is about two weeks' delay in assaying at present.

During June, 127 assays were carried out, although the laboratory did not function for one week while being moved. In many cases absorption tests were done also on the sample.

The laboratory continues to repair instruments for prospectors and companies, as well as for the Bureau. During this quarter approximately thirty instruments per month have been repaired. This is less than the number handled during the "wet" season although there are many more instruments operating in the area.

WINNELLIE STORE.

With the commencement of the field season the store has been busy with the many and varied requirements of the field parties. As recommended on numerous occasions a stores' clerk is required in order that the store can handle the necessary paper work efficiently.

All vehicles were ready for issue when required by the field parties. Most of the vehicles had been painted prior to issue.

FIELD OPERATIONS.

This quarter marked the commencement of the 1954 field season in the Northern Territory. The commencement was delayed by the late rains in April which caused much of the country

to be impassable until late May, and as a result the grass has been late in drying sufficiently to burn.

Prospectors and companies have become more active in the area this quarter. Some companies, who were not involved in any extensive work here were attracted to the new Mt. Isa field, but at the end of the quarter it appeared as if some were returning.

An average of thirty Authorities to Prospect have been held during this period, but only four companies have been engaged on developmental work.

The regional geological parties of the Bureau commenced mapping early in May, and the detailed geological and geophysical parties have commenced operations as staff became available.

A.B.C. Prospect.

Although geophysicists operated on the A.B.C. reservation from the end of March using landrovers, it was not possible to move in drilling equipment until the end of April. Drilling commenced on 7th May and by the end of June 21 holes had been completed using two drills.

The first objective of the drilling was to define the attitude of the mineralisation. When this stage is completed it is intended to try to solve the structure of the occurrence, with deeper holes, and also to prospect other minor anomalies and some soil-covered areas with short vertical holes.

More detailed geological mapping is being planned with additional costeaning and bulldozing.

The carborne scintillometer is traversing the volcanics within the reservation and any anomalies found will be gridded in detail. The geophysicists are probing all holes drilled.

Although it is early to draw any definite conclusions the following tentative conclusions are made:-

- a) the uranium mineralisation has so far been revealed only as a surface feature.
- b) the uranium mineralisation is closely associated with irregular silicified hematitic bands, which show characteristics of an acid volcanic or altered tuff.
- c) the prospect may be disturbed by post-mineralisation faulting.

Although the size of the lode at present being drilled may prove to be disappointing, the area is worthy of extensive detailed investigation.

Edith River Prospect.

The bore hole F.1 at Deposit F was completed in April when drilling stopped at 230 feet. Due to the shortage of drillers the rig was moved to the A.B.C. Prospect, but it is intended to do further drilling at this Prospect, commencing in July.

In bore F.1 a silicified zone was intersected at an inclined depth (45°) of 172 feet. The zone was not as well

defined as it appears at the surface. The probing of the hole did not show any noteworthy radioactivity and the sludge assays in the vicinity of the silicified zone were:-

Depth (feet).	Assay % eU_3O_8 .
170 - 175	.007
175 - 180	.005
180 - 185	.005
185 - 190	.005
190 - 195	.008
195 - 200	.007

The hole A1 at Deposit A, which was completed last quarter, was probed, and showed three slight anomalies at 63, 135 and 204 feet, where the counts were 400, 550 and 1100 counts per minute respectively (background approximately 100 counts per minute.) The only results of note in the sludge samples were:-

Depth (feet)	Assay % eU_3O_8 .
200 - 205	.023
205 - 210	.026
210 - 215	.010

Although these results are not encouraging it is considered that another two or three holes should be drilled to intersect the shears below the zone of oxidation. It cannot be suggested that there is a good chance that the primary zone will show uranium ore, but drilling will show the nature of these shears at depth and will influence future company policy in the Edith and Cullen River districts.

Adelaide River Prospect.

Although radioactivity was found $1\frac{1}{2}$ miles south of Adelaide River by Mr. J. Lennox on 13th March, it was not examined by the Bureau until early in April. Later rich torbernite ore was found.

This Prospect was the most important find reported during this quarter. An option has been given to Uranium Development and Prospecting N.L. who are actively developing the find under the geological supervision of Mr. R. Sprigg. The company is investigating the area with two shafts and an adit as well as a diamond drill. Costeening and prospecting over the five square miles of the Authority to Prospect are being actively pursued.

The original find is on a shear-zone in a decomposed micaceous sandstone of the Brock's Creek Group, and the uranium mineral is torbernite, which is persisting with depth. On the strike of this shear a boulder was uprooted, about which the company reported as follows on its examination:-

"Mineragraphic investigation of highly radioactive ore from the Adelaide River find has demonstrated the presence of pitchblende gossan at a depth of only a foot or so. The specimen examined is from a mass originally weighing many pounds, which occurred just south of the main open cut.

Microscopic examination has shown it to be a completely weathered and leached limonitic gossan, consisting of highly radioactive gummite and torbernite, along with a little quartz and iron ore minerals. Gummite is the immediate breakdown product of the richest of all uranium ores, uraninite or pitchblende. The mineragrapher has also reported that the original form of the pitchblende is preserved in outline by its degradation products, and that the extreme degree of solution leaching characteristic of these tropical areas is abundantly demonstrated by comparison of chemical analyses of material from deeper layers of the specimen (thirteen percent U3O8) with that of the cellular crust (point nine per cent.)"

(Signed: Reg. C. Sprigg.)

Approximately 150 feet to the east of the original "find" across the strike there is a bed of brown argillaceous sandstone which gave counts up to 16 times background on the surface and assayed 0.098 % eU₃O₈. This bed is being investigated with an adit and could produce good results at depth.

The Bureau is making a radiometric grid of the Prospect and it would appear that there is a possibility of extensions along the strike.

Brock's Creek Prospect.

The Brock's Creek Uranium Co. N.L. have applied for drilling to be done on their Fleur de Lys lease and detailed geological mapping has been done in the vicinity of the Prospect. As a result of a new discovery on the 1st July, this mapping is being continued and radiometric gridding extended from the original find to the new one.

The company has continued the incline shaft to 68 feet in leached shales containing copper mineralisation and some uranium. The vertical shaft has been deepened to 80 feet in country rock.

Burrundie Prospect.

A Bureau of Mineral Resources' regional party led by B.P. Walpole located a prospect $3\frac{1}{2}$ miles on a bearing of 242 degrees from the Burrundie siding on the 20th May, 1954.

A temporary reservation of 35 square miles was granted by the Mines' Branch, while the regional geologists checked the regional structure. The area was then reduced to one square mile in order that detailed work could be done on the Prospect.

The Prospect is on a razor-back ridge of rocks belonging to the Brock's Creek group. The radioactivity up to four times background, is in a highly leached limonitic gossan, probably along the strike shear, in carbonaceous slates.

The area is being examined and mapped in detail before deciding the type of developmental work to be undertaken.

Regional Geology.

The regional parties, under the leadership of B.P. Walpole, commenced mapping on 10th May, 1954 and have made good progress. The Table Top 1 - mile sheet has been completed and the Burnside, Burrundie and Tipperary sheets are nearing completion.

Particular attention is being paid to the nomenclature of the Pre-Cambrian succession and the sub-division of the Lower Proterozoic rocks. A considerable area of granite, which does not correlate with the Cullen Granite, has been mapped near the Fenton and Long Airstrips.

Survey hands attached to the parties have been trained and carry out prospecting in conjunction with the regional mapping.

The tentative nomenclature of the succession within the area mapped is as follows:-

Age.	Unit.	Description.
Tertiary to Recent.		Alluvium, laterite etc.
Lower Cretaceous.	Mullaman Group. NONCONFORMITY.	Sandstone, conglomerate etc.
Cambrian.	Daly River Group. Douglas limestone.	Flaggy limestone - fossiliferous.
	Stray Creek sandstone.	Mainly arenaceous beds - laminated flaggy sandstone and shale, friable quartz sandstone.
	Edna Creek Sandstone. NONCONFORMITY.	Pink coloured siliceous and friable quartz sandstone - (probably corresponds to "Buldiva Quartzite.")
Upper Proterozoic.	George Creek Formation. NONCONFORMITY.	Maroon to grey-purple med. grained sandstone, greywacke, micaceous sandstone, fine grained sandstone and maroon shale.
	Granite intrusion. <u>Cullen Granite.</u>	Coarse porphyritic Hornblende Granite.
	<u>Prices Springs Granite.</u> NONCONFORMITY.	Biotite Granite (contaminated.)
Lower Proterozoic.	<u>Burrells Creek Beds.</u> CONFORMITY.	Sandstone, greywacke, micaceous greywacke, greywacke siltstone, shale, conglomerate, shale, conglomerate siltstone and carbonaceous slates.
	<u>Brock's Creek Beds.</u>	Require further definition. Main units are carbonaceous slates, diorite, limestone, sandstone, greywacke and SILTSTONE.

Miscellaneous Operations.

The car-borne scintillometer commenced operations on the A.B.C. Reservation late in May. The work has concentrated on traversing the volcanics shown on the regional map.

Mr. A. Debnam, with a mobile chemical laboratory arrived late in June to carry out geobotanical and geochemical work in the Darwin-Katherine area. At first he will carry out experiments on known uranium areas on the flora to ascertain if uranium can be traced by this method. Mr. W. Bateman, forestry officer, will be assisting him in this work.

During the quarter numerous areas have been inspected for the Director of Mines, Darwin, by the resident staff.

A monthly conference of party leaders and resident staff has been held to discuss present and future operations. These conferences are proving beneficial to all concerned.

During May a meeting was arranged by the Senior Geologist for all geologists, geophysicists and interested persons in this area. Over thirty attended and monthly meetings of this "society" are now held.

July, 1954.

J.H. Lord.