COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

RECORDS:

1964/84 (1965)

MISCELLANEOUS. CHEMICAL, PETROGRAPHIC, AND MINERAGRAPHIC INVESTIGATIONS CARRIED OUT IN THE GEOLOGICAL LABORATORY. JANUARY - JULY, 1964.

PART I

Compiled by

J.A. MacKenzie

MISCELLANEOUS CHEMICAL, PETROGRAPHIC, AND MINERAGRAPHIC INVESTIGATIONS CARRIED OUT IN THE GEOLOGICAL LABORATORY JANUARY - DECEMBER 1964

Compiled by
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Records 1964/84

INTRODUCTION

This Record is composed of reports on minor chemical, petrographic, and mineragraphic investigations carried out in the Geological Laboratory, Bureau of Mineral Resources, during the period January 1964 to December 1964. The Record is divided into two parts; the first deals with reports, covering the period January to mid-July 1964. The second part deals with reports covering the period mid-July to December 1964. In each part the reports are in chronological order.

The officers responsible for work in this Record are W.M.B. Roberts (Geologist, Class III), A.D. Haldane (Chemist, Class III), J.R. Beevers (Chemist, Class II), S.C. Goadby (Chemist, Class II), W.R. Morgan (Geologist, Class I), W. Oldershaw (Geologist, Class I), S. Baker (Chemist, Class I), E.J. Howard (Chemist, Class I), N.J. Marshall (Chemist, Class I), I.R. Pontifex (Geologist, Class I), N.W. Le Roux (Chemist, Class I).

MISCELLANEOUS CHEMICAL, PETROGRAPHIC, AND MINERAGRAPHIC INVESTIGATIONS

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Report No. 1 January 1964

SPECTROGRAPHIC ANALYSIS OF SAMPLES FROM RUM JUNGLE N.T.

by

E.J. Howard

This report gives the results obtained during week ending 20th December 1963, from the spectrographic analysis of geochemical samples from Run Jungle N.T.

The samples were submitted by P. Pritchard.

The following results are expressed in parts per million.

Area 44

Samples No.	Depth	Ni	Co	Cu	V	Mo	Pb	Remarks
320N/600E	12-43	———	———	No	Result	———	———	
320N/602E	9-27	———	———	No	Result	———	———	
320N/604E	9-30	80	30	20	50	a	20	
320N/606E	9-43	30	40	25	50	a	50	
320N/608E	6-40	25	30	25	50	a	a	
320N/610E	9-42	100	20	50	150	a	10	
320N/612E	2-40	40	20	25	100	a	10	
320N/614E	12-40	60	20	50	150	a	20	
320N/616E	12-40	100	20	25	300	a	500	
320N/618E	3-33	30	12	25	300	a	100	
320N/620E	9-40	40	20	50	200	a	200	
320N/622E	9-43	40	15	30	200	a	150	
320N/624E	12-40	30	20	25	200	1	150	
324N/600E	10-41	15	15	25	50	15	10	
324N/602E	15-40	———	———	No	Result	———	———	
324N/604E	10-40	60	40	50	100	a	a	
324N/606E	5-40	30	30	50	100	a	15	
324N/608E	10-40	40	30	50	50	a	10	
324N/610E	10-40	60	25	50	200	a	10	
324N/612E	10-40	60	20	40	200	a	20	
324N/614E	7½-40	80	30	40	300	a	100	
324N/620E	9-37	60	20	50	300	a	70	
324N/622E		60	20	50	200	a	50	
324N/624E	12-33	80	30	150	70	a	50	
328N/600E	6-40	30	20	150	100	5	300	
328N/602E	9-16	20	20	25	50	10	50	
328N/604E	-17	20	20	50	70	5	70	
328N/606E	6-40	20	20	40	70	a	50	
328N/608E	15-43	40	20	100	70	5	500	
328N/610E	3-12	30	30	40	70	5	100	
328N/612E	3-42	20	20	50	300	5	70	
328N/614E	9-43	30	20	40	300	a	200	

Sample No.	Depth	Ni	Co	Cu	V	Mo	Pb	Remarks
328N/616E	6-42	30	30	40	300	5	500	
328N/618E	6-43	40	20	25	200	a	70	
328N/620E	9-36	30	20	40	150	a	100	
328N/622E	12-30	30	20	25	150	a	50	
328N/624E	15-30	80	20	40	200	a	70	
346N/606E	9-60	150	30	50	200	a	1500	
346N/608E	18-60	80	30	40	150	5	200	
346N/610E	9-60	60	80	100	150	5	100	
352N/606E	6-60	80	20	50	300	a	50	
352N/607E	12-48	40	10	25	200	5	70	
352N/608E	6-45	30	20	40	200	5	100	
352N/609E	9-48	80	20	25	300	a	70	
352N/610E	9-38	40	20	200	300	5	70	
354N/606E	12-97	40	15	25	200	5	100	
354N/607E	9-60	80	20	100	300	7	150	
354N/608E	12-42	80	20	50	300	5	30	
354N/609E	15-45	80	60	300	300	10	70	
354N/610E	12-60	80	20	300	200	7	100	
Area 55B								
26N/1W	12-55	40	15	25	50	a	20	
26N/2W	12-60	80	30	50	10	a	20	
26N/3W	2-35	30	12	40	30	a	20	
26N/4W	6-12	60	30	70	150	7	50	
26N/5W	21-60	5-	5-	10	30	a	20	
27N/2W	30-60	80	20	[illegible]	50	5	10	
27N/3W	9-17	No Result						
27N/4W	18-50	20	5	15	20	5	10	
27N/5W	18-90	80	20	20	30	5	20	
28N/4W	0- 9	No Result						
28N/5W	6-10	No Result						
Dolerite Ridge East								
72N/160W	15-70	No Result						
72N/162W	15-40	12	15	20	30	a	50	
Area 44								
324N/616E	10-40	80	20	25	200	a	500	
324N/618E	6-42	30	20	25	200	5	70	
332N/600E	5-31	5-	5-	15	30	a	20	
332N/602E	5-29	5-	5-	10	20	a	20	
332N/604E	10-34	No Result						
332N/606E	7½-40	20	40	25	100	a	70	
332N/608E	10-40	100	80	200	100	5	10	
332N/610E	10-40	80	20	150	200	5	30	
332N/612E	10-40	60	40	150	300	7	150	

Sample No.	Depth	Ni	Co	Cu	V	Mo	Pb	Remarks
332N/614E	5-40	80	30	100	200	7	200	
332N/616E	5-36	30	40	25	100	5	100	
332N/618E	5-22	40	15	25	200	a	100	
332N/620E	7½-23	30	15	20	150	a	50	
332N/622E	7½-29	30	10	25	150	a	70	
332N/624E	10-31	80	15	50	300	5	30	
336N/600E	12-42	40	30	20	70	a	10	
336N/602E	3-25	5	5-	15	70	7	30	
336N/604E	12-42	5-	5-	10	20	a	10	Sn(30)
336N/606E	10-40	20	20	50	150	a	500	
336N/608E	6-41	30	15	20	50	5	20	
336N/610E	6-42	100	20	100	300	a	30	
336N/612E	6-42	20	15	40	200	5	100	
336N/614E	6-42	80	15	70	200	a	700	
336N/616E	6-40	100	30	50	200	a	500	
336N/618E	7½-26	30	20	20	200	a	70	
336N/620E	7½-20	40	15	15	200	a	200	
336N/622E	5-17	20	10	20	150	a	20	
336N/624E	9-36	20	12	25	100	a	30	
342N/600E	10-40	15	20	15	50	a	20	
342N/602E	10-35	10	15	15	50	a	20	
342N/604E	10-33	10	15	15	100	a	50	
342N/606E	10-35	20	12	25	200	5	150	
344N/600E	9-42	20	20	25	150	a	20	
344N/602E	3-40	15	15	40	20	5	70	
344N/604E	6-30	20	15	20	30	a	50	
344N/606E	6-44	20	10	25	200	7	100	
344N/608E	18-42	12	10	20	150	a	50	
344N/610E	12-40	30	20	50	50	a	150	
344N/612E	6-36	5	5-	50	150	a	50	
344N/614E	12-25	40	15	20	100	a	150	
344N/616E	9-41	20	15	20	100	a	150	
344N/618E	12-30	40	15	15	150	a	100	
344N/620E	9-25	30	10	20	200	a	10	
346N/599E	10-32	20	15	20	50	a	50	
348N/600E	10-34	15	20	15	50	a	200	
348N/602E	7½-37	20	20	20	20	a	2000	
348N/604E	6-40	30	30	200	150	a	700	
348N/612E	25-35	30	20	40	100	5	100	
348N/614E	10-30	30	5	25	150	10	100	
348N/616E	10-36	20	5	15	150	a	100	
348N/618E	12½-33	30	10	10	100	a	200	
348N/620E	10-25	60	20	25	150	20	50	

Sample No.	Depth	Ni	Co	Cu	V	Mo	Pb	Remarks
352N /620E	12-24	40	30	50	200	a	50	
352N/622E	12-24	60	20	70	300	5	50	
352N/624E	12-20	80	20	50	500	a	50	
Dolerite Ridge East								
64N/154E	6-42	150	80	70	200	a	a	
64N/158W	9-29	100	30	50	70	5	10	
64N/162W	30-40	40	20	70	300	a	20	
64N/166W	6-25	60	10	100	500	30	20	
64N/170W	21-35	150	80	50	200	a	a	
65N/174W	18-29	50	30	50	100	5	20	
65N/178W	24-35	20	15	50	200	5	30	
68N/158W	18-40	150	60	70	100	a	20	
68N/162W	18-36	40	15	50	200	7	30	
68N/ 166W	9-33	40	15	70	300	20	20	
68N/170W	15-49	No Result						
72N/166W	15-33	5	15	20	70	a	30	
76N/162W	10-27	5	20	20	50	10	30	
76N/166W	17½-44	40	15	50	200	10	20	
Area 44								
346N/592E	12-40	40	40	50	100	a	200	
346N/593E	-	No Result						
346N/594E	12-41	40	40	40	70	a	200	
346N/595E	12-33	60	30	50	70	a	200	
346N/596E	13-41	30	20	40	100	a	200	
346N/597E	10-30	30	30	25	50	a	200	
346N/598E	12-25	30	30	25	70	a	200	
346N/601E	12-36	15	20	25	50	a	300	
346N/607E	18-45	20	20	40	200	a	200	
346/609E	12-50	30	10	40	200	5	150	
348N/592E	12-30	30	60	25	30	a	300	
348N/593E	6-27	20	20	20	100	a	20	
348N/594E	12-40	30	20	10	30	a	20	
348N/595E	6-20	30	30	50	70	a	300	
348N/596E	6-11	20	20	20	30	a	100	
348N/597E	9-19	20	30	40	70	a	200	
348N/598E	12-28	20	30	25	50	a	700	
348N/599E	12-36	30	30	40	150	5	70	
348N/601E	6-31	40	20	40	150	a	300	
348N/603E	12-41	20	15	100	150	a	300	
348N/606E	21-60	60	20	40	200	a	500	
348N/607E	27-42	20	15	20	200	a	50	
348N/608E	18-60	20	20	40	100	a	100	

Sample No.	Depth	Ni	Co	Cu	V	Mo	Pb	Remarks
348N/609E	24-60	20	15	25	70	a	150	
348N/610E	12-60	30	20	50	150	a	100	
350N/595E	15-32	20	20	10	10	a	50	
350N/597E	12-36	20	20	15	30	a	500	
350N/599E	9-33	20	20	50	70	a	200	
350N/601E	9-30	20	30	10	50	5	200	
350N/603E	6-30	20	15	50	150	a	500	
350N/606E	15-60	30	15	20	150	a	500	
350N/607E	12-60	30	15	25	100	a	150	
350N/608E	12-60	30	15	25	150	a	30	
350N/609E	9-60	20	15	100	150	a	100	
352N/598E	12-40	30	20	25	70	a	100	
352N/599E	12-32	15	15	20	150	a	70	
352N/601E	12-32	20	30	20	50	5	200	
352N/603E	12-40	60	30	20	100	5	200	
Sediment Samples Mt Fitch								
010000		5	12	10	5	a	10	Sn(10)
010001		5	12	7	5-	a	10	
010002		5	12	5	5-	a	10	
010003		5-	10	2	5-	a	a	
010004		5-	5	2-	5-	a	a	
010005		5-	10	2	5-	a	a	
010006		5	12	10	5-	a	10	
010008		10	15	10	5-	a	20	
010009		5-	5	5	5-	a	10	
010010		5-	5	5	5	a	a	
010011		10	15	15	10	a	10	
010013		15	30	25	10	a	30	
010016		5	12	10	5-	a	10	
010018		5-	10	10	5-	a	a	
010019		5	12	15	5	a	10	
010020		5	12	10	5	a	10	
010022		5-	10	7	10	a	10	

Plate Nos. 644-669, 676-678.

Report No. 2 7th January, 1964

SPECTROGRAPHIC ANALYSIS OF GEOCHEMICAL SAMPLES FROM MCARTHUR RIVER. N.T.

by

E.J. HOWARD

Semiquantitative estimations were made of the trace metal content of geochemical samples from McArthur River N.T.

The samples were collected by Carpentaria Exploration Company.

The following results are expressed in parts per million.

HOMESTEAD

Sample No.	Ni	Co	Cu	V	Pb	Remarks
D-6-Upper	5-	10	5	5-	a	
D-6-Lower	5-	10	5	5	a	
D-16-Upper	5-	10	5	5	a	
D-16-Lower	5-	5	5	5	a	
D-26-Upper	5-	10	10	10	a	
D-26-Lower	5	15	10	30	10	
D-28-Upper	5-	10	5	10	a	
D-28-Lower	5-	10	10	30	a	
D-32-Upper	5	15	10	50	10	
D-32-Lower	5-	10	5	5-	a	
D-34-Upper	5-	10	5	5	a	
D-34-Lower	5-	12	10	30	a	
D-36-Upper	5	12	10	50	10	
D-36-Lower	5-	12	15	50	a	
D-38-Upper	5	10	10	30	a	
D-38-Lower	5-	5	15	15	a	
D-48-Upper	5-	10	10	50	a	
D-48-Lower	5-	7	10	30	a	
E-30-Lower	5	12	15	50	10	
E-30-Upper	5	10	15	30	a	
E-34-Upper	5	10	12	50	a	
E-34-Lower	5-	10	10	20	a	
E-42-Upper	5-	10	7	20	a	
E-42-Lower	5-	7	5	30	a	
F-30-Upper	5	10	10	20	a	
F-30-Lower	5-	10	12	20	a	
I-16-Upper	5	10	10	30	a	
I-16-Lower	5-	10	5	50	a	
I-80-Upper	5	12	10	30	10	

Sample No.	Ni	Co	Cu	V	Pb	Remarks
I-80-Lower	5-	7	10	20	a	
R-76-Upper	5-	7	10	10	a	
R-76-Lower	5	7	7	20	a	
S-76-Upper	5-	10	10	30	a	
S-76-Lower	5-	5	12	10	a	
A-4	5-	5-	2	7	a	
A-8	5-	10	7	20	a	
A-12	5-	5	5	5-	a	
A-16	5-	10	7	30	10	
AA-4	5-	10	5	20	10	
AA-8	5-	10	5	10	a	
AA-12	5-	10	5	20	a	
AA-16	5-	10	7	5-	a	
B-4	5-	5	2	5-	10	
B-8	5-	10	2	10	a	
B-12	5-	10	5	10	a	
B-16	5-	5-	2	5-	a	
BB-4	5-	10	5	20	a	
BB-8	5-	5	7	5-	a	
BB-12	5-	12	7	10	a	
BB-16	5-	10	5	5	a	
CC-4	5-	5	5	10	20	
CC-8	5-	10	5	10	10	
CC-12	5	12	7	10	a	
CC-16	5-	12	7	10	10	
DD-4	5-	5	5	10	a	
DD-6	5-	5	5	50	a	
DD-8	5-	5	5	5-	a	
DD-10	5	12	7	50	10	
DD-12	5-	5	5	5-	a	
DD-14	5-	12	5	20	200	
DD-16	5-	5	2	10	a	
EE-8	5-	10	5	10	a	
EE-10	5-	5	2	10	20	
EE-12	5	10	2	20	200	
EE-14	5	10	5	5	50	
EE-16	5-	12	5	5	20	
I-12	5-	10	2-	5-	a	
I-16	5-	10	5	10	20	
I-20	5-	10	5	10	a	
I-24	5-	5	5	10	a	

TEENA PROSPECT

Sample No.	Ni	Co	Cu	V	Pb	Remarks
A-8-South	5	15	10	10	30	
B-4 South	5-	10	10	5-	a	
B-8 South	5	10	20	5-	a	
C-4 South	10	15	25	10	30	
A-4 South	5	12	30	20	10	
C-4 South	5-	12	15	20	20	
D-8 South	5	20	15	20	20	
D-4 South	5	15	10	5	10	
C-8 South	5	12	10	5	10	
E-8 South	5	20	10	5	30	
F-4 South	5-	12	10	5-	10	
F-8 South	5-	12	10	5-	a	
H-12 South	5-	5-	2-	5-	10	

BOKO AREA

Sample No.	Ni	Co	Cu	V	Pb	Remarks
A-104	5	15	10	10	20	
A-108	5-	10	5	5-	a	
A-112	5	12	10	5	20	
A-116	5	10	10	10	300	
AA-104	5	12	10	5-	20	
AA-108	5	10	10	10	20	
AA-112	5	12	10	10	70	
AA-116	5	10	2	5-	200	
B-104	5	15	10	10	50	
B-108	5-	10	5	10	20	
B-112	5	12	10	5-	20	
B-116	5-	5	5	5-	a	
BB-104	5	12	5	5-	20	
BB-108	5	10	5	5-	20	
BB-112	5-	5	5	5-	a	
BB-116	5	12	5	10	20	
C-104	5	10	15	5	20	
C-108	7	12	15	10	50	
C-112	5-	10	5	5	20	
C-116	5-	10	10	5-	20	
CC-0	5	12	10	10	30	
CC-4	7	15	10	20	50	
CC-8	5-	10	5	5-	20	
D-104	5	12	10	10	70	
D-108	5-	5	5	5-	a	
D-112	5-	10	5	10	20	
D-116	5-	10	10	5-	50	

Sample No.	Ni	Co	Cu	V	Pb
DD-0	5	12	10	5	70
DD-4	5-	10	5	5-	20
DD-8	5-	10	5	5	a
E-104	5	12	10	10	30
E-108	5	10	10	10	20
E-112	5	10	10	5	20
E-116	5	10	10	5-	10
F-104	5	12	5	10	70
F-108	5-	12	10	10	20
F-112	5-	10	5	5	20
F-116	5-	10	5	5-	10
G-104	5	10	15	5-	30
G-108	5-	12	5	10	50
G-112	5-	10	10	10	20
G-116	5-	12	10	10	20
H-8	5	10	10	10	30
H-104	5-	5	5	5	20
H-108	5	12	10	10	30
H-112	5-	10	10	10	30
H-116	5-	10	5	5-	10

MITCHELL YARD

Sample No.	Ni	Co	Cu	V	Pb
A-0	5-	10	5	5	a
A-4	5-	12	10	10	a
A-8	5-	10	5	5	a
A-12	5-	5-	2-	5-	a
A-16	5-	10	5	5	a
A-20	5-	5	5	5-	a
A-24	5-	10	2	5-	a
A-28	5-	5	2-	5-	a
A-32	5-	10	5	10	a
A-36	5-	10	2	5	a
C-0	5-	5	2	5-	a
C-4	5-	5	5	5-	a
C-8	5-	5	10	5-	a

Sample No.	Ni	Co	Cu	V	Pb
C-12	5-	10	5	10	a
C-16	5-	5-	2	5-	a
C-28	5-	7	2	10	a
C-32	5-	7	5	20	a
C-36	5-	10	7	20	a
E-0	5-	10	3	10	a
E-4	5-	7	5	10	a
E-8	5-	10	3	5	a
E-12	5-	5	2-	5	a
E-16	5-	7	5	5	a
E-20	5-	5-	5	5	a
E-24	5-	5	3	5	a
E-28	5-	10	5	10	a
E-32	5-	10	20	15	a
E-36	5-	5	2	5-	a
G-0	5-	5	3	5	a
G-4	5-	5	7	5-	a
G-8	5-	7	5	5	a
G-12	5-	5	5	5-	a
G-16	5-	5	5	5	a
G-20	5-	5	5	5	a
G-24	5-	7	7	5	a
G-28	5-	12	5	10	a
G-32	5-	7	5	5	a
G-36	5-	12	7	10	a
C-20	5-	10	5	5	a
C-24	5-	5	5	5	a

Mo, Sn, Ba, P were sought but not detected in any sample.

'a' - not detected
2- - less than 2ppm.

Plate Nos. 640, 642 to 649.

Report No. 3 13th January, 1964.

SPECTROGRAPHIC ANALYSIS OF DRILL CORE SAMPLES FROM UNION REEF GOLD FIELD AND RUM JUNGLE N.T.

by

E.J. Howard

Sixteen samples from Drill Core DDH 3, Union Reef and four composite samples of drill cuttings from Rum Jungle were submitted by J.F. Ivanac for spectrographic analysis:

The following results were obtained:

Drill No.	Depth (ft)	Ni	Co	Cu	V	Mo	Pb
RD 79	0-103-5'	150	200	500	150	200	100
CD 116	95-165'	150	150	100	200	100	100
	165-215'	300	200	200	300	70	150
CD 120	20-115'	150	200	200	100	200	50
UR DDH 3	10'	10	10	20	50	a	a
	20'	10	10	20	50	5	30
	30'	10	10	5	50	5	10
	40'	10	12	10	50	5	30
	50'	10	20	20	70	a	200
	60'	12	20	20	70	a	200
	70'	12	20	25	70	a	200
	80'	10	20	25	70	a	20
	90'	10	15	20	70	5	50
	100'	10	12	15	70	a	100
	110'	12	12	10	50	a	a
	120'	15	12	5	100	a	10
	130'	10	15	5	50	a	50
	140'	15	15	10	100	a	20
	150'	20	20	50	70	a	200
	163'	15	15	5	50	a	10

Silver, gold and arsenic were sought but not detected. All results are expressed in ppm.

Lab Serial No. 1306.
Spec Plate Nos 688.689

13thJanuary, 1964
130ACT/4

REPORT No. 4

ACID INSOLUBLE RESIDUES - NATIONAL LIBRARY SITE, CANBERRA.

by

N.W. Le Roux

These are the results of an analysis carried out on five samples of core from the National Library Site, Canberra, submitted by E.J. Best.

The samples were finely ground and attacked with cold 2N NCl for a period of sixty hours. The insoluble residues were then filtered, dried at 110° and weighed.

RESULTS

Sample No.	Percent	Mean Percent
2/116	63.8 65.4	64.6
4/67	68.6 68.4	68.5
2/124	82.8 81.4	82.1
4/63	83.0 82.6	82.8
7/63	59.1 58.2	58.7

Serial Number 1414.

REPORT NO. 4A

File 170N/4
13th January, 1964

CONDUCTIVITY AND pH OF LAKE GEORGE WATERS.

by

S. Baker

Following are results for pH and Conductivity of a water sample from Lake George, taken on 7/1/64.

Conductivity (T = 25°C)	2600 micromhos/cm.
pH	8.8

Serial No.1425

Report No. 5 File No.
30th January, 1964.

THE PETROGRAPHY OF SPECIMENS FROM THE B.M.I. BOREHOLE, NEAR MUGGA QUARRY, A.C.T.

by

W.R. Morgan

The specimens are core samples of a porphyritic igneous rock obtained from a diamond drill hole put down by Blue Metal Industries, Ltd., at a site one mile south-south-east of Mugga Quarry, A.C.T. The specimens were submitted by D.E. Gardner.

R.17366. This core is from 71 to 72 feet in the drill hole. In hand specimen it is seen to have a hard, dark grey groundmass that encloses numerous large phenocrysts that measure up to 8 mm. diameter, and which consist mostly of quartz and white feldspar; some crystals of pink feldspar and a ferro -magnesian mineral can be seen.

In thin section (13016) the rock is seen to be a strongly altered micro-granodiorite porphyry. The phenocrysts consist of quartz, altered feldspar, and altered (?) hornblende. Quartz is subhedral to euhedral and is, in places, embayed. Some crystals have strongly strained zones within them. Feldspar is very strongly altered to carbonate, chlorite, and sericite; unaltered plagioclase is albite. The ferro-magnesian mineral is completely pseudomorphed by iron oxide, leucoxene, and smectite; before alteration it was probably an amphibole. It occurs as prismatic to acicular crystals that commonly show some flow-orientation around the larger phenocrysts.

The groundmass has an average grain-size of 0.02 mm., and intergrown quartz grains that enclose acicular crystals of pseudomorphed amphibole and fine iron oxide dust. A few crystals of zircon were noted.

R.17367. This sample is from between 75 feet 9 inches and 70 feet 3 inches in the drill hole. The hand specimen is very similar in appearance to R.17366, except that the matrix is slightly darker in colour. The thin section (13017) shows that the rock is mineralogically similar to R.17366, except that the plagioclase that remains unaltered is probably labradorite in composition, and that some potash feldspar is present. The phenocrysts are rimmed by concentrations of iron oxide dust. The groundmass consists of somewhat intergrown quartz grains together with some interstitial sericite and iron oxide dust.

Remarks: The specimens are both of a strongly altered, silicified extrusive or intrusive rock; neither of them are tuffs. They have a finer-grained groundmass than is usual in the Mugga Porphyry, but could represent a chilled marginal facies of the intrusion.

Report No. 6 January 31st, 1964

Estimation of Copper on Samples from Rum Jungle

by

S. Baker

Following are results for the estimation of copper on samples from Rum Jungle, submitted by P. Pritchard.

DG 27	Percent Copper
122'6" - 128'6" (Core)	13.02
1226'6" - 128'6" (fines)	12.98
DG 24	
250'11" - 251'7" Prim. sulphide zone	7.84
350' - 355' (A) Section of Core with Chrysocolla Approx. 5"	5.24
350' - 355' (B) Section of Core with Manganese and Chalcocite Approx, 10"	0.52
355-360 (A) 2' with Chrysocolla	3.50
Samples from Outcrop at Tamblyn's Shaft, Mt. Fitch	0.75

Serial No. 1258, 1378

Report No. 7 February 3rd, 1964.

Mineragraphic description and identification of ore specimens from Ban Ban and Douglas Sheets N.T.

by

I.R. Pontifex

Samples submitted by J. Barclay 27.8.63.

Field No. 145611

Locality: 5 miles N.W. of Ban Ban homestead, Pine Creek N.T.
Ore minerals identified, galena, gold, secondary iron oxides, secondary lead mineral.

Field occurrence. Barclay records that this specimen is associated with a mineralised dolerite situated about ½ mile N.E. of the Burnside Granite. He states that macroscopic lead is a rarity and that the main sulphides are pyrrhotite and minor chalcopyrite. To be of economic significance this deposit would necessarily need to contain such metals as nickel or cobalt.

Macro description. Coarsely crystalline galena is dispersed in irregular masses in massive quartz and it constitutes about 5% of the specimen. Individual masses measure up to 1" across but generally they are less than ¼" in maximum dimension. The quartz contains abundant voids, most of which are coated by secondary iron oxides, others are lined by crystalline quartz.

Micro description. Idiomorphic galena is distributed at random through the section. This mineral is altered around its grain boundaries and this has produced a corona usually about ½ MM. wide made up of colloform bands which grade imperceptively into the quartz gangue. The bands nearest the galena contain fine remnant grains of this mineral which impart an irregular corroded-looking outline to the galena. Spectrographic analysis of these bands revealed that the major element present is lead, on this basis they are considered to consist mainly of a secondary lead mineral derived from galena by processes of supergene alteration. Skeletal and cellular masses of secondary iron oxides fill voids in the quartz. The structures they form do not suggest that they represent a gossan after galena.

Minor-accessory amounts of extremely fine grained gold (observed at X600) are dispersed through the quartz and limonite matrix. No gold is associated with the galena. No minerals of Cu, Co or Ni are present in the section examined.

Spectrographic Analyses

Three samples of this specimen were analysed on the X-ray spectrograph by S. Goadby for trace amounts of Cu, Co and Ni, these were:

1. The alteration corona around galena. This was done to help identify this mineral and to investigate the possibility of a concentration of these elements on the galena in the form of a bloom.

2. A concentrate prepared from isolated mineralised patches in the quartz.

3. The polished section described above.

The results of these analyses were:

1. The alteration corona contained mainly lead with relatively less iron and minor trace amounts of copper, and nickel.

2. The concentrate contained mainly lead, major trace of copper, trace of cobalt and minor trace of nickel.

3. The polished section contained mainly lead, trace of copper, minor trace of cobalt and nickel.

It is unusual that Cu, Co or Ni occur as trace impurities in galena, therefore they must be present in the matrix of this specimen. They could not however be assigned to any specific mineral and it is impossible to estimate their significance to the economic geology of this deposit on the basis of the examination of this one specimen.

Field No. 14561●
Locality: 20 miles west of Stuart Highway on the Douglas 1 mile sheet.
Ore minerals. pyrite, marcasite, covellite, ?enargite.

Macro description. Pyrite and marcasite occur together in fine grained aggregates and in discrete crystals through milky-white massive quartz.

Micro description. Marcasite constitutes about 80% of the ore minerals, it forms irregular masses which contain abundant voids suggesting that it has been extensively leached. Pyrite forms about 10% of the ore minerals, irregular grains of this mineral are scattered generally within the core of the marcasite mass. Some pyrite grains grade imperceptively into marcasite, others form mutual boundaries with marcasite without any transgression of one with the other. Covellite makes up about 5% of the ore minerals and forms highly irregular masses and veins localised within interstices of marcasite and rarely pyrite. The maximum dimension of the covellite masses is 0.4 mms. generally however they measure about 0.2 mms. A grain of possibly enargite, surrounded by covellite was detected at 600X magnification.

Discussion. Pyrite is probably of primary origin. The relationships of the iron sulphides suggest that the marcasite is derived from pyrite by the process of supergene alteration.

Covellite is the only mineral of economic potential however its origin and therefore its significance cannot be determined from this one specimen. Usually covellite is derived from the alteration of primary copper minerals in the zone of secondary enrichment. In this section the covellite has apparently been deposited by supergene agencies but two modes of origin can be interpreted both of which have a different bearing on further investigation of copper mineralisation at this locality.

a. The covellite has completely replaced pre-existing primary copper minerals in situ. No primary copper minerals were positively identified but the possible presence of enargite supports this hypothesis.

b. The covellite has been introduced by supergene solutions derived from a primary source some distant from this locality. The almost exclusive association of covellite and supergene, leached marcasite suggests this.

No definite conclusion can be given.

File 45N/1

Report No. 8 February 6th, 1964.

Analysis of Water Samples

by

S. Baker

Following are results for the analysis of water samples, submitted by G.M. Burton.

	Bellevale No. 2 (Yass) (January 1964)	Bellevale No. 4 (Yass) (January 1964)	Lake George 5/2/64
Conductivity	649	5490	2750
pH	7.6	7.3	8.0
Cl (p.p.m.)	55 (1.55)	735 (20.73)	
SO_4 "	46 (0.96)	2083 (43.37)	
HCO_3 "	260 (4.26)	604 (9.90)	
Ca "	55 (2.74)	489 (24.40)	
Mg "	29 (2.38)	484 (39.80)	
Na "	39 (1.70)	220 (9.57)	
K "	$<$ 0.3	3	
Sr "	$<$ 0.2	5	
T.D.S. (p.p.m.)	350	4400	

figures in brackets refer to m.e./l.

Serial No. 1432, 1448

Report No. 9 18th February, 1964.

The Petrography of Specimens from the Nesbit River Mouth, Coen Area, North Queensland.

by

W.R. Morgan.

The four specimens described in this report were submitted by K.G. Lucas for petrographic examination, and were collected by C. Gibson of Clutha Development from a locality 1 mile north of the Nesbit River Mouth, 40 miles north of Coen, Cape York Peninsula.

R.16880 (Field No. LB203A) Garnetiferous quartzo-feldspathic granofels.

The hand specimen is a creamish-pink rock that has the appearance of being a coarse-grained, layered arkosic grit. In some layers, however, a few large crystals, measuring up to 2 cm. long are present; these have random orientation.

In thin section (12260), the rock has a metamorphic granoblastic texture; grain-sizes range from 0.5 mm. in the fine layers to about 1.5 mm. in the coarser layers. The rock consists of slightly intergrown grains of quartz (25%), microcline (35%) and sodic plagioclase (40% - the percentages are very rough estimates). Small amounts of biotite and one or two small porphyroblasts of isotropic, colourless garnet are present. The large porphyroblasts observed in the hand specimen consist of sodic plagioclase and microcline.

R.16881 (Field No. LB203B) Metasomatized ? dolerite.

The hand specimen is a fine-to medium-grained, dark greenish-grey rock, containing very irregular quartz veins.

The thin section (12261) shows the rock to consist mostly of strongly sericitized intermediate plagioclase, recrystallized, colourless clinopyroxene, and small amounts of probable olivine. Very irregular, cavity-like veins contain quartz (showing strong straining) and epidote. A few thin veins contain prehnite. Some accessory sphene, pleochroic from pale brown to pale fox-brown, was noted.

R.16882 (Field No. LB203C). Garnetiferous quartzo-feldspathic granofels.

The hand specimen is of a pale creamish-grey, medium-grained, apparently gneissic quartzo-feldspathic rock. A few streaks of fine brown mica can be seen.

In thin section (12262) the rock is seen to have an inequigranular granoblastic texture, and to consist of roughly equal quantities of microcline, quartz, and sodic plagioclase, together with very small amounts of biotite and garnet. The biotite forms small flakes that have a rough preferred orientation which is parallel to a slight elongation shown by the quartz and feldspar grains. Over most of the rock, the grain-sizes range between 0.1 to 1.0 mm. However, a layered effect is given by some coarse bands, about 2.5 mm. thick, consisting mostly of slightly elongated, crystalloblastic grains of quartz and microcline (with small amounts of plagioclase), and in which the grain-size is about 2 mm. The bands are parallel to the mica lineation, and to the grain elongationia the coarse bands and the finer-grained material.

R.16883 (Field No. LB203D). Garnetiferous Biotite-muscovite Alkali granite.

The hand specimen is of a medium- to coarse-grained acid igneous rock that shows a slight foliation.

In thin section (12663) the rock is seen to be xenomorphic and inequigranular, the grain-sizes ranging between 0.5 mm. and 1 mm. Plagioclase (albite) is subtabular, and also forms the few phenocrysts that are present. Quartz and microcline-perthite are granular, tending to be interstitial, with quartz enclosing the potash feldspar. Muscovite and biotite form subhedral to anhedral flakes. A few idiomorphic crystals of colourless, isotropic garnet are present; these are slightly altered to iron oxide. Some opaque iron oxide is also present.

Remarks.

R.16883 appears to be an unaltered acid igneous rock. Specimens R.16880 and R.16882 are granoblastic quartzo-feldspathic rocks that could be of igneous or sedimentary origin. R.16881 is an altered basic igneous rock.

At the time of submission it was suggested that R.16880 and R.16882 are metamorphosed sediments. Evidence from petrographic work is inconclusive. However, some points are worth noting. The apparent layering in both specimens could represent relic sedimentary bedding, relic transposed bedding, or relic slip planes from a sheared sedimentary or igneous rock. In R.16882, grain elongation and mica lineation are parallel to the layering, suggesting that the layers are related to structural deformation.

Mineralogically, the two rocks are of granitic composition, suggesting that they were, originally either acid igneous rocks, or arkoses. Both specimens contain garnet, so that thin metamorphic grade is probably at least amphibiolite. The presence of garnet rises another problem: the possible relationship of these specimens to the garnetiferous granite represented by R.16883. Any solutions to this one would depend on more detailed field work and petrographic examinations in the area concerned.

Little can be said on the metasomatized dolerite. The recrystallization of the pyroxene suggests a high grade of metamorphism, or else an early anhydrous metamorphism, otherwise alteration to an amphibole would have taken place. However, it is hard to understand why the metasomatism that resulted in sericitization of plagioclase, and emplacement of quartz and prehnite veins, did not produce amphibolization of the pyroxene.

Report No. 10

File 120Q/14
19th February, 1964

MINERALOGICAL INVESTIGATIONS OF TWO HEAVY MINERAL SANDS FROM THE COEN AREA, QUEENSLAND

by

I.R. Pontifex.

The samples were submitted by K.G. Lucas on 22/10/63 for the determination of the approximate proportions of constituent minerals.

Field No. LB.86

Occurrence: A beach heavy mineral concentrated from the mouth of Breakfast Creek north of Port Stewart on the Ebagoola 4-mile Sheet. The approximate weight percentages of minerals in this sand are:

Light fraction (mainly quartz, some feldspar)	39
Ilmenite	55
Garnet (almandite)	3
Others	3

Method of Analysis: Following is a brief description of the methods of separation and analysis of this sand.

1. The heavy mineral fraction was separated from the quartz-feldspar fraction by filtering through Bromoform.
2. The heavy minerals were separated according to their magnetic susceptibilities on the Frantz isodynamic separator. The slope was set at 24° and the tilt at 12°. Three fractions were obtained.
3. Each fraction was analysed by S. Goadby on the X-Ray spectograph for Sn and Ti
4. Each fraction was checked for radioactivity.
5. The component grains of each fraction were examined microscopically in R.I. oils and in polished sections. Two X-Ray powder diffraction photographs were taken.

A summary of the results of the examination of the heavy fraction is tabulated below:

Frantz magnetic fractions at:	Approx. Wt. %	Minerals Present	X-Ray Spectrographic determinations	Radioactivity
0.2 amps	75	mainly ilmenite access. garnet	abundant Ti,Fe no Sn.	background
0.35 amps	18	mainly ilmenite 7-10% garnet access.?monazite	abundant Ti,Fe, no Sn.	background
1.3 amps	7	Mainly monazite, ilmenite,garnet zircon, access. tourmaline, rutile,?andalusite	abundant,Ti,Fe, no Sn.	300 counts per min. greater than background

Some ilmenite grains are partly coated by alteration products, presumably leucoxene. The magnetic properties of the garnet suggests that it consists mainly of the iron rich variety, almandite. The identity of the ilmenite and monazite were checked by X-Ray powder photographs.

Field No. L.B.88

Occurrence: A river heavy mineral concentrate from the Archer River crossing, 40 miles north of Coen on the Coen 4-mile sheet. Tin is reported up-stream from this locality. The approximate weight percentage of minerals in this sand are:

Light fraction (mainly quartz, some feldspar)	23
Ilmenite	65
Monazite	4
Garnet (almandite)	2
Zircon	3
Others (including cassiterite)	3

The methods of separation and analysis of this sand were identical to those described for sample L.B.86. A summary of the results of the examination is tabulated below:

Frantz magnetic fractions at:	Approx. Wt.%	Minerals percent	X-ray Spectrographic determinations	Radioactivity
0.2 amps	48	mainly ilmenite minor access. garnet.	abundant Ti,Fe trace Sn.	background
0.35 amps	35	mainly ilmenite access.garnet, olivine	abundant Ti,Fe trace Sn.	background
1.3	7	mainly monazite, minor ilmenite, tourmaline, access.zircon, ?cassiterite, rutile	essential elements Ti,Fe, trace Sn	450 counts per min.greater than background
non-magnetic fraction	9	mainly zircon, ilmenite, cassiterite, minor garnet, tourmaline, monazite	essential elements Ti,Sn. (Zr not determined)	50 counts per min greater than background

The occurrence of ilmenite and garnet in most of the fractions separated by the isodynamic separator is anomalous. It is assumed that this is the result of variations in the iron content in these minerals. No inclusions of iron oxides were observed in the ilmenite grains in polished section. Some of the ilmenite grains are partly coated by alteration products, presumably leucoxene. In the two last magnetic fractions some of the ilmenite is almost completely replaced by a secondary alteration product, part of which appears to be rutile.

Report No. 11 1876/1

21st February, 1964.

Laboratory Examination of a White Clayey Sandstone from Near Berrima, N.S.W.

by

W. Oldershaw

Mr. J. Hartwell of Campbelltown submitted samples of a white clayey sandstone for examination to determine its suitability for use as a building stone. The samples were examined under the microscope and subjected to various mechanical tests to determine the specific gravity, porosity, co-efficient of saturation and crushing strengths (see description of tests and results.)

This report refers only to the specimens submitted. The laboratory gives no undertaking that the specimens are representative of the deposits from which they were collected.

The sample (R17062) is a fine-grained equigranular clayey sandstone. It is an off-white rock with a few scattered flakes of glistening white mica and black flakes of biotite. There are a few minute specks of limonite and brown iron stains. The sample has a faint grey feathery marking, actually micro current-bedding with foresets up to one inch long. The rock darkens in colour to pale grey on wetting and the current-bedding becomes quite prominent.

Petrography

Under the microscope the sample was seen to consist of closely packed, sub-rounded and irregularly shaped grains of quartz, from 0.2 to 0.05 mm. across with a majority having a diameter of 0.1 mm. set in a sparse interstitial clay matrix of illite, sericite and kaolin which comprises 15 - 20 per cent of the rock.

The grains of quartz are closely packed and are in contact with contiguous grains. There are no rims of secondary quartz, but from the close fit of many contiguous grains and their straight margins, it is evident that there has been some solution and redistribution of silica. The quartz grains appear to have been weakly welded together, but no intricate sutured contacts were seen such as occur in the Gosford sandstones. In places the flakes of illite and sericite are intergrown with the margins of the quartz and along some grain boundaries. The clay minerals show little iron staining.

There are some crystals of zircon, rounded grains of limonite, zircon and tourmaline, irregularly shaped gr ins of limonite and flakes of mica and biotite scattered through the rock.

Physical Properties

The sample is a dense, compact, very fine-grained clayey sandstone. When dry it has a pleasing off-white colour with a faint unobtrusive grey marking. When wet the rock darkens and the marking becomes quite prominent. The sample cuts well and takes a sharp edge. It is impossible to rub grains off or break edges off by hand.

The bulk density of the rock varied little on the three samples measured. The porosity is low and ranges from only 12 to 14 per cent (see table of results.)

/2

the coefficient of saturation is quite low and varies with the orientation of the samples. Samples D1, W1, D3 and W3 were immersed in water with the bedding vertical and the rising water penetrated them faster and more thoroughly than samples D2 and W2 which were placed in water with their bedding horizontal.

The graph shows the results obtained by the Building Research Station when the porosity of some well known building stones was plotted against their coefficient of saturation and compared with their known durability. Sp 17062 lies close to the boundary separating sound stones from poor stones. However, the performance of three cubes of the sample subjected to 15 cycles of saturation in sodium sulphate solution and recrystallisated was quite remarkable. The cubes lost only 0.3 per cent of their weight and the edges of the cube were as sharp at the end of the test as at the beginning. This sulphate test is an accelerated weathering test. The results show that the stone should be quite resistant to weathering to the disruptive effects of frost action and of daily and seasonal temperature changes.

The low coefficient of saturation and the low porosity also suggests that the rock should be quite resistant to weathering, to frost action and to attack by a coastal atmosphere. The sample was not attacked by acids and appeared to contain no soluble salts. Thus it would not seem to be susceptible to rapid attack by acid, industrial or city atmospheres. The minute iron stains may spread on weathering, andthe darkening in colour when wet may be a disadvantage, but it may be possible to inhibit these changes by coating the rock with a waterproof silicone paint.

The samples have a high crushing strength when dry (more than twice the 5,000 psi recommended by the American Public Building Service) which diminishes by only 38 to 45 per cent when the rock is saturated with water.

Report No. 12 February 26th, 1964.

Estimation of Phosphate on Samples from Rum Jungle and Georgina Basin

by

S. Baker

Following are the results obtained for the estimation of phosphate on 53 core samples from DG 32, DG 33, and 2 composite phosphate samples from Rum Jungle also 4 miscellaneous samples from the Georgina Basin.

DG 32 (percent P_2O_5)				DG 33 (percent P_2O_5)	
20'-25'	6.3	165'-170'	6.6	0-15'	Less than 1.0
25'-30'	17.0	170'-175'	1.5	15'-20'	" 1.0
30'-35'	18.0	175'-180'	10.0	20'-25'	" 1.0
35'-40'	18.0	180'-185'	23.0	25'-30'	12.0
40'-45'	6.0	185'-190'	14.0	30'-35'	16.0
45'-50'	13.0	190'-195'	4.0	35'-40'	15.0
50'-55'	23.0	145'-1200'	10.0	40'-45'6"	7.0
55'-60'	25.0	200'-205'	1.3	45'6"-50'	4.7
60'-65'	10.0			50'-55'	13.0
65'-70'	4.7			55'-60'	9.0
70'-75'	18.6			60'-65'	10.0
75'-80'	17.0			65'-70'	3.0
80'-85'	less than 1.0			75'-80'	3.0
85'-90'	" 1.0			80'-85'	3.0
90'-95'	" 1.0			85'-86'	3.0
95'-100'	" 1.0			86'-90'	Less than 1.0
100'-105'	" 1.0				
105'-110'	" 1.0				
110'-115'	" 1.0				
115'-120'	" 1.0				
120'-125'	" 1.0				
125'-130'	" 1.0				
130'-135'	" 1.0				
135'-140'	3.0				
140'-145'	10.0				
145'-150'	3.0				
150'-155'	2.0				
155'-160'	2.0				
160'-165'	12.0				

	Percent P_2O_5	Loss on ignition
Composite Sample I	22.5	8.7%
" " I (ignited)	24.8	
" " II	33.8	3.0%
" " II (ignited)	34.2	

Clarke Sandstone, Bonaparte Gulf	2024 I	less than 1.0
" " " "	2C	" " 1.0
R.G.S.I. Georgina Basin		" " 1.0
R6050 Victoria River Group		" " 1.0

Serial No. 1459, 1463, 1464

27th February '64
64 NT/1

Report No. 13

PHOSPHATE DETERMINATION

by

N.W. Le Roux

These are the results of determinations carried out on samples submitted by D. Woolley, Resident Geologist, Alice Springs. The samples were selected by him after systematic testing of all water bore samples held in the Alice Springs office. The results were obtained colorimetrically.

RESULTS

BORE	INTERVAL	% P_2O_5
F 53/2 -11	301-336	0.2
F 53/7 -58	200-210	2.0
	240-250	3.5
	250-260	3.9
	329-340	0.2
	370-380	0.5
F 53/11 -60	90'	0.3
	130'	0.2
F 53/12 -66	101-107	0.1
	173-180	0.2
	334-345	0.2
	345-350	0.2

Serial Number 1433

Report No. 14 28th February, 1964

Spectrochemical Analysis of Rum Jungle Granites.

by

A.D. Haldane

The following results have been obtained for the spectrochemical analysis of outcrop samples from the Rum Jungle Granite Complex collected by M. Rhodes. All results are expressed in parts per million.

Sample No.	Ni	Co	Cu	V	Mo	Pb	Remarks
2A-14-6	5-	5-	2-	5-	a	70	
3-92-2	5	10	10	20	5	50	
4-02-1	5-	5-	2-	5-	5	20	
4-02-1A	20	15	2-	50	a	50	
5-50-22	5-	12	15	50	a	10	
5-50-10	5-	5-	2-	10	a	15	
5-52-12	5-	5-	2-	5-	a	15	
5-56-10	5-	5-	2-	5-	5	50	
5-58-2	5-	10	2-	20	a	20	
5-62-3	10	10	2-	10	5	20	
6-80-1	5-	5-	5	5-	15	100	
6-80-2	5	5-	2-	5-	a	100	
6-84-2	5-	10	15	20	a	20	
6-84-3	5-	10	5	50	a	20	
6-84-5	5-	15	2-	30	a	15	
6-86-5	5-	5-	5	5-	a	50	
7-10-13	5-	5-	2-	5-	a	50	
7-12-3	5	5-	2-	5	a	50	
7-12-13	5-	5-	2-	5-	a	70	
7-16-2	30	5-	2	5-	a	20	
7-16-16	5-	5-	2-	5-	7	50	
7-18-8	5	5-	15	5-	5	100	
7-18-9	10	15	15	10	a	20	
9-36-34	5-	5-	2-	5-	a	a	
10-66-4	5	20	25	100	a	15	
10-66-7	5-	15	20	100	5	15	
10-66-23	5-	5	10	5-	5	50	
10-68-9	5-	10	10	30	5	70	Sn (10)
7-20-11	5-	5	5	20	a	50	
9-30-12	5-	5	2	10	a	100	Sn (10)
9-36-4	10	10	15	30	5	50	
9-36-10	5-	30	2-	300	100	50	
11-70-6	5	5-	2-	5-	a	30	
11-72-22	5	5	2-	5	10	100	
11-72-23	5	5-	2	5-	20	100	
11-72-24	5-	15	2	60	a	20	

/2

Sample No.	Ni	Co	Cu	V	Mo	Pb	Remarks
11-74-35	5-	5-	2-	5	5	50	
10-68-20	5	5-	2	5-	10	20	
10-70-5	5-	5	5	5-	300	100	Sn (10)
10-70-9	10	5	2-	5	20	100	
11-70-3	5-	5-	2-	5	5	30	Sn (10)
12-20-6	5-	5	2-	20	a	20	Sn (20)
12-20-18	5-	5-	2-	5	a	150	
16-68-3	5-	5-	2	5	5	100	
11-74-36	5-	5-	2-	5-	5	70	Sn (10)
11-76-19	20	5-	2-	5-	5	100	Sn (10)
12-16-2	5	5-	2-	5-	5	100	Sn (10)
12-18-6	5-	5-	2	5-	10	70	

Beryllium and phosphorus were sought but not detected in any sample.

'5-' = less than 5.
'a' = not detected.

Plate Nos. 697,698.

REPORT N° ~~18~~ 15

167/NTS/1

Mineragraphic Investigation of three samples from Union Reef, N.T. D.D.H. 4, 190 ft. to 212 ft.

by

I.R. Pontifex

The samples were submitted by J. Shields. 21/10/63.

Field No. 195371.

Core depth. 192' 6" to 194' 7". Assayed 10 dwts. Au per ton.

Minerals identified. Hematite, hydrated iron oxide, pyrite, gold, quartz.

Macro description. Massive dark brown hydrated iron oxide contains abundant irregular leached cavities and is cut at random by veins and stringers of milky quartz.

Micro description. The iron oxide mass consists of extremely irregular corroded looking skeletal hematite which ramifies and grades imperceptibly into hydrated iron oxide. The mass contains abundant cavities which are commonly lined by finely botryoidal hematite. In some parts a ghost like quadrangular texture is evident and several cavities have well developed walls of iron oxide which are characteristic of gossanous box-works after pyrite. One hematite-hydrated iron oxide quadrangular face is striated suggesting that it is a pseudomorph after pyrite.

The quartz veins carry accessory amounts of unaltered fine pyrite euhedra, the maximum dimension of these grains is 0.08 mms. Quadrangular cavities in the quartz which measure up to 3 mms. are filled with cellular hydrated iron oxides which suggests that pre-existing relatively coarse grained pyrite has been completely replaced.

Gold occurs as fine grains and rarely as dendritic patches in the quartz and in the iron oxide mass. The maximum grain size of the gold is 0.02 mms. across.

Field No. 195372

Core depth 212'2" to 212'3"

Ore minerals identified. Galena, pyrite, arsenopyrite.

Macro description: White vein quartz contains a leached irregular mass of galena, minor amounts of secondary lead minerals and accessory pyrite cubes.

Micro description: Irregular masses of galena up to 1 cm. wide are dispersed at random through a quartz gangue. The galena is commonly associated with a wine-red vitreous mineral which crushes to an amber powder, it has at least one good cleavage and some of its crystal faces are striated. This mineral was identified as fluorite by X-ray diffraction. These two minerals are confined to the same veins in the quartz and their mutual boundaries are sharply defined.

In some places galena contains irregular zones of an amorphous material which appears to be a secondary product derived from the alteration of the lead sulphide.

Individual euhedra of arsenopyrite are dispersed through the quartz gangue in accessory abundance. These measure up to 0.7 mms. in maximum dimension. Where galena comes in contact with arsenopyrite it moulds around and enters embayments within them. Minor accessory crystals of pyrite are dispersed through the quartz gangue. In some places pyrite is intimately associated with fluorite and composite grains consisting of both minerals are completely enclosed by galena.

Field No. 195373

Core depth 212'4" to 212'6"

Ore minerals identified. Arsenopyrite, galena, pyrite.

Country rock classification. Mineralised sheared greywacke.

Macro description: White vein quartz abuts against a grey-green sheared siltstone. A cellular pocket in the quartz contains accessory amounts of fine grained galena, arsenopyrite and several cubes of pyrite. The country rock carries laths of arsenopyrite, these measure about 3 mms. long, 1 mm. wide and they are randomly orientated.

Micro description: A study of the polished section revealed no significant associations which are not evident in the hand specimen. In thin section the country rock exhibits a heterogeneous mixture of inherent quartz grains, part altered felspar grains and clumps of chlorite all of which are of siltstone size. These components are distributed through a sericitic, chloritic matrix which constitutes 80% of the rock. The quartz grains are angular and are made up of devitrified glass fragments, clear and cloudy grains and some coarsely crystalline grains. Elongate coarse componenets and sericite wisps in the matrix have a generalised common orientation which imparts a well defined foliation to the rock.

Arsenopyrite euhedra are generally associated by fine allotriomorphic granular quartz which appears to have localised in low pressure areas which presumably developed adjacent to these euhedra during deformation of the country rock. This phenomenon suggests that the arsenopyrite was in the country rock pre-shearing.

The massive white quartz is cloudy and highly strained, it has a coarse allotriomorphic granular aggregate texture. This carries arsenopyrite, galena and pyrite and possibly this was also introduced before the shearing of the country rock.

February 28th, 1964.

Lab. Serial No. 1259.

REPORT N° 16

106Q/22

Mineragraphic Investigation of pyritic sandstone from Taroom Sheet, Queensland

by

I.R. Pontifex

The sample was submitted by C. Gregory 24/10/63.

Field No. T825. Outcrop sample.

Identification. Quartz sandstone impregnated with pyrite.

Macro description. Grey, coarse grained, friable sandstone thoroughly impregnated with pyrite and possibly marcasite.

Micro description. The quartz grains have an average size of about 0.8 mms. across, they are subrounded to angular and in polished section they exhibit an apparent uniform composition. The periphery of each grain is slightly corroded. The intersticies between the grains are filled with small quartz fragments and iron sulphide.

The iron sulphide occurs in discontinuous stringers and isolated irregular veins, it is identified as pyrite however the majority of it commonly exhibits a weak but distinct anisotropism which is characteristic of marcasite. This phenomenon may be the result of its formation at lower temperatures than normal primary pyrite.

The optical properties and the mode of occurrence of this sulphide suggest that it is pyrite of supergene origin which has impregnated the sandstone after the accumulation of the quartz grains.

Pyrite in the exterior weathered crust has been completely altered to secondary iron oxides, the pyrite becomes progressively less altered as the distance from this crust increases toward the centre of the specimen.

No other opaque minerals are present.

March 2nd, 1964.

Lab serial No. 1280.

APPENDIX A

Mineragraphic Investigation of a Ferruginous Oolite from Mundubbera Sheet, Queensland

by

I.R. Pontifex

The sample was submitted by C. Gregory 24/10/63.

Field No. T686. Outcrop sample.

Minerals identified. Hydrated iron oxide, quartz, hematite, pyrite.

Approximate Fe grade. 45% Fe.

Macro description. The rock is essentially a homogeneous semi-indurated aggregate of limonite oolites. Dark brown irregular silicified bands are roughly parallel throughout, these vary in thickness from 0.5 mms. to 3 mms. Thin siliceous veins occur at random through the rock.

Micro description. The entire section consists of an aggregate of limonite oolites of both elliptical and spherical shape, these range in diameter from 0.3 mms. to 0.8 mms but generally they measure about 0.6 mms. across. Concentric layers are evident throughout the limonite which constitutes the bulk of each oolite, these however are poorly defined probably because of differential alteration of the original material and also because of the distribution of irregular but concentrically arranged leach cavities in the oolites. The outer crust of each oolite is generally not present in its entirety but where it is intact it is well defined, it consists essentially of hydrated iron oxide and attains a maximum thickness of 0.015 mms.

The leach cavities within the oolites are commonly lined by finely crystalline siliceous material and amorphous iron oxide. Interstices between the oolites are also filled with siliceous material and hydrated iron oxides, these form a weak binding cement. These components have been distributed through the aggregate after the formation of the oolites, probably by means of supergene agencies.

In the dark brown silicified bands the oolites have been thoroughly impregnated, almost completely replaced, by extremely fine crypto-crystalline silica simulating iron rich jasper.

Throughout the aggregate, exsolution-type needles of hematite occur in minor abundance in some oolites, they are about 0.003 mms. wide and extend across the diameter of the host oolite. These needles have a generalised common orientation almost perpendicular to the siliceous bands. The presence of these bodies is anomalous and their significance was not apparent.

Fine grains of pyrite, 0.002 mms. across are distributed at random through the aggregate in accessory abundance.

No other minerals are present.

Genesis. The mode of origin of this rock can not be conclusively determined from one specimen. The oolites may have been deposited originally as limonite pellets as they now exist. Oolites of this type however are not particularly common. Considering the mode of occurrence of this sample and the abundant evidence of supergene weathering in it it is thought more probable that it represents a completely oxidised oolite deposit of pre-existing iron minerals such as hematite, magnetite or chamosite. No evidence of primary oolites of this nature was observed however.

Approximate grade. The percent Fe content was not determined by any quantitative analytical technique. An approximation of this value can be estimated from the percent Fe in hydrated iron oxide and the amount of this mineral in the specimen.

Although the composition of hydrated iron oxide is variable the average percent Fe content given by Dana and Rutley is 60%.

Hydrated iron oxide makes up about 80% of the specimen.

Therefore the approximate grade of this rock is 45% Fe. Silica is the dominant impurity.

March 2nd, 1964.

Lab serial No. 1280.

Report No. 18 File 198Q/6
11th March, 1964

SPECTROGRAPHIC ANALYSIS OF STREAM SEDIMENTS FROM MOUNT GARNET, QUEENSLAND.

by

A.D. Haldane

Semiquantitative estimations were made of the trace metal content of stream sediment samples from Mount Garnet, Queensland. The samples were submitted by K.Yates. All results are expressed in parts per million.

Sample No.		Ni	Co	Cu	V	Mo	Sn	Pb	Remarks
MG/29 3/101	34	5-	5-	40	30	a	1500	150	
	66	5	5	40	70	a	20	200	
	67	5-	15	15	150	a	a	70	
	68	5-	5-	100	5-	a	100	150	
	69	5-	5-	25	5-	20	1000	300	
	70	5	5	40	5-	10	1000	30	
	71	5-	5	150	5-	10	20	300	
	72	5-	5-	50	5-	5	100	500	
	73	5-	5	40	5-	5	700	150	
	74	5-	5	40	5-	a	200	200	
	75	5-	5-	50	5-	10	100	150	
	76	5-	10	20	5-	7	1000	100	
	77	5-	5-	25	5-	7	200	150	
	78	5-	5-	15	5-	5	300	200	
	79	5-	5	50	5-	5	2000	200	
	80	5-	5	15	5-	5	20	100	
	81	5	5	100	10	7	200	300	
	82	5-	5-	15	5	5	50	200	
	83	5-	5	50	10	5	50	100	
MG6/41 4/113	84	5-	5-	50	5-	a	500	200	
	85	5	7	25	10	a	100	200	
	86	5-	10	25	10	a	50	200	
	87	5-	5-	20	5-	a	20	150	
	88	5-	5-	20	5-	a	50	200	
	89	5-	7	25	10	a	50	50	
	90	5-	5	50	10	a	a	50	
	91	5-	5	70	10	a	700	100	
	92	5-	5-	40	5-	a	20	300	
	93	5-	5-	25	5-	a	500	100	
	94	5	5-	25	5-	a	700	100	
4/115	95	5	10	40	10	a	20	10	
	96	5	10	15	10	a	50	10	
	97	5-	5	20	10	a	50	10	
1/23	98	5-	12	70	15	a	200	20	
	99	5-	10	100	15	a	200	10	
2/49	100	5-	5-	70	5-	a	300	50	
	101	5-	10	50	5	a	50	50	
	102	5	5	100	10	a	100	a	
	103	5	10	100	10	a	150	a	
6/51	104	5-	5-	10	5-	a	200	200	(Be10)
	105	5-	5-	40	5	a	400	200	

a - sought but not detected.

Plate Nos.674-675

Report No. 19

File 45ACT/1
11th March, 1964

ANALYSING OF BORE WATER

by

S.Baker

Following are results for the analysis of a sample of bore water from Hall, Belconnen No.10, taken on February 17th, 1964.

	p.p.m.	m.l./litre
Chloride (Cl)	90	2.5
Sulphate (SO_4^{--})	less than 2	-
Bicarbonate (HCO_3^{--})	610	10.0
Calcium (Ca)	72	3.6
Magnesium (Mg)	62	5.1
Sodium (Ni)	91	4.0
T.D.S.	640	
pH	7.3	
Conductivity	1030 micromhos/cm	

Serial No.1462

Report No. ~~19A~~ 20

File 120/PNG/8
11th March, 1964

SPECTROGRAPHIC ANALYSIS OF GEOCHEMICAL SAMPLES FROM WABAG - NEW GUINEA.

by

A.D.Haldane

Semiquantitative estimations were made of the trace metal content of seven (7) geochemical samples from the Wale River, Wabag, T.N.G. The samples were submitted by F.E.Dekker. All results are expressed in parts per million.

Sample No.	Ni	Co	Cu	V	Mo	Pb	Remarks
F89a	5-	20	50	200	a	30	
F89b	100	60	25	200	a	a	
F89c	20	30	50	200	a	10	
F266	5-	5	40	100	5	300	
F267	20	15	5	100	a	70	
F269	5-	15	10	200	a	50	
F273	10	10	15	50	5	300	

Bo and P were sought but not detected in any sample.

Plate No.716

REPORT No. 21.   March, 1964

SPECTROCHEMICAL ANALYSIS OF SAMPLES FROM RUM JUNGLE NORTHERN TERRITORY.

by

A. D. Haldane.

The following samples have been previously analysed spectrochemically, but no results were obtained. By using an alternative arcing procedure the following results were obtained. All results are expressed in parts per million.

Sample No.	Depth Feet.	Ni	Co	Cu	V	Mo	Pb	Remarks
5223	16	500	200	1000	30	10	a	
5229	B.O.H.	2000	1500	3000	150	10	a	
5240	2-4	500	200	500	70	7	a	
5241	0-2	1500	1000	5000	50	10	10	Be (10)
5242	2-4	2000	2000	5000	150	20	50	
5243	B.O.H.	1500	2000	5000	150	10	10	
5235	B.O.H.	2000	2000+	1000	150	20	a	
5236	"	80	150	2000	20	5	a	
5241	"	1000	1000	5000	20	20	50	Be(10)
5239	"	2000	1000	5000+	150	10	700	Be(15)
5243	0-8	1500	1000	2000	100	20	10	
5244	B.O.H.	2000	2000	500	300	100	150	
5254	"	1500	2000+	1500	10	15	a	Be(5)
5255		NO RESULT						
5256	"	1000	500	1000	10	5	a	
5261	"	700	60	500	200	5	a	
5285	"	200	100	500	10	100	a	Be(10)
5314	"	100	60	10	200	20	a	
5320		NO RESULT						
5324		NO RESULT						
5325	B.O.H.	NO RESULT						
5328	"	500	500	1500	100	100	a	Be(10)
4120	"	20	12	50	200	15	a	
4242	BULK	1000	2000	5000+	100	10	3000	Be(10)
5033	B.O.H.	1000	2000	3000	100	15	a	
5089	"	NO RESULT						
5091	"	NO RESULT						
5095	"	500	500	5000+	20	10	a	Be(10)
5097	"	700	500	1000	50	5	a	
5043	"	700	1000	2000	100	10	a	
4485	Special	20	12	5	5-	5	a	
5049	6-12	500	500	2000	5	10	a	Be(10)
5049	12-18	200	500	3000	10	10	a	Be(5)
5084	B.O.H.	500	500	1500	150	15	a	

2/...

Sample No.	Depth Feet	Ni	Co	Cu	V.	Mo	Pb	Remarks
5085	B.O.H.	1000	1000	5000	200	20	a	
4532	6-20	500	150	500	300	50	a	
4530	BULK	500	300	50	1000	a	a	Bc(10)
4568	"		NO RESULT					
429N/119E/5019	B.O.H.		NO RESULT					
427N/119-5E	"		NO RESULT					
5021	B.O.H.	1000	500	1500	150	10	a	Bc(Ø)
5022	10-40		NO RESULT					
5043	8-90		NO RESULT					
5044	12-48	200	100	500	50	15	a	Bc(10)
5078	B.O.H.	1500	500	3000	50	20	a	Bc(10)
5079	"		NO RESULT					
5090	"		NO RESULT					
5098	"	300	300	5000	5	5	a	Bc(20)
5104	"		NO RESULT					
5108	"		NO RESULT					
5122	"	500	100	5000+	10	20	a	
5122	10-40		NO RESULT					
5123	6-36		NO RESULT					
5127	B.O.H.	500	[illegible]00	3000	20	10	a	
5127	4-40		NO RESULT					
5128	B.O.H.		NO RESULT					
5021 (No.2)	B.O.H.		NO RESULT					
5128	6-29		NO RESULT					
5129	8-36		NO RESULT					
5409	B.O.H.	100	30	3000	50	a	500	
5434	6-14	500	200	1000	50	10	3000	Bc(10)
5435	6-34	700	200	1000	100	15	5000	Bc(10)
5436	20-28	700	200	5000+	500	20	2000	
5450	8-28	1000	200	3000	100	5	a	Bc(10)
5453	14-28	30	60	100	50	5-	a	
5459	30-40	1000	700	1000	10	20	3000	Bc(10)
5488	16-28	50	30	70	50	5-	a	
5490	10-22	20	60	50	50	10	a	
5537	4-20	200	100	20	50	5-	a	
5538	12-28	10	30	15	200	5-	a	
5539	16-28	12	30	20	20	5	a	Bc(30)
5561	6-12	12	30	10	20	5	a	
5563	10-28	30	30	5	10	5	a	Bc(30)
4661	6-35	700	150	200	50	10	a	Bc(20)
5133	8-28	200	100	2000	100	5-	a	
5137	8-22	300	80	2000	10	10	a	Bc(10)
5147	10-28	1000	500	5000	10	20	a	Bc(20)
5150	6-28	1000	500	5000	50	20	a	
5149	4-28	300	200	700	10	5	a	Bc(10)

3....

Sample No.	Depth feet	Ni	Co	Cu	V	Mo	Pb	Remarks
5151	2-28	700	1000	5000+	200	300	a	
5153	4-22	1000	1000	5000	10	50	a	Be(20)
5155	4-18	500	200	5000	5	10	a	Be(20)
5154	6-28	300	300	1500	10	15	a	
5156	4-28	300	100	1500	10	10	a	
5157	8-22	100	200	1000	10	20	a	Be(10)
5158	8-22		NO RESULT					
5600	10-24	20	60	50	500	5	a	
5650	8-28	30	15	10	20	5	a	Be(20)
5657	2-10	30	20	10	20	5	a	Be(10)
R55 B's								
30N/6W	Bulk	300	100	500	20	10	a	Be(20)
30N/10W	"		NO RESULT					
42N/4W	B.O.H.	200	30	15	10	5	a	
44N/00	Bulk		NO RESULT					
44N/2W	"	500	200	50	300	15	a	
44N/4W	"	300	60	70	150	10	a	
5169	6-22	300	500	5000	50	20	a	
MOUNT FITCH								
5182	14-16	150	100	1000	200	20	a	
5192	6-28	100	500	500	20	50	a	
5195	B.O.H.	30	15	25	15	10	a	Be(10)
RUM JUNGLE								
5199	8-10	60	30	100	5	10	a	Be(10)
5787	12-28	200	60	1000	5	20	a	Be(10)
5789	2-10	300	200	1000	50	15	a	Be(10)
5796	4-10		NO RESULT					
5797	19-16	200	100	100	10	10	a	Be(10)
5804	4-16	100	60	200	10	10	a	
5870	14-18	200	500	1500	20	15	a	Be(10)
5811	14-28	300	500	1000	200	30	a	Be(10)
5812	8-12	20	20	70	10	5	a	
5814	20-28	200	100	700	20	15	a	Be(5)
5816	12-14	150	20	50	50	5	a	Be(5)
5824	8-18	300	500	1000	50	20	a	Be(10)
5825	6-28	500	150	500	70	50	a	
5831	10-28	300	60	100	50	50	a	
5832	12-28	150	100	500	50	20	a	Be(20)
5835	6-10	20	20	50	20	5	a	
5844	18-28	150	40	40	10	10	a	Be(10)
5853	18-28	150	100	200	10	10	a	
5899	2-4	30	15	70	100	5	a	
5902	2-10	20	12	25	100	5	a	

Sample No.	Depth (feet)	Ni	Co	Cu	V	Mo	Pb	Remarks
5912	6-16	20	30	50	100	5	a	
5990	4-12	20	30	50	100	10	a	
7094	10-28	20	12	15	20	5-	a	
7192	16-22	30	12	10	200	5	a	
7249	14-16	5-	20	50	500	20	a	
7251	4-16	20	15	25	200	7	a	
7252	14-16	5	12	50	500	15	a	
7257	12-16	40	100	50	5	5-	a	
7265	8-16	10	5	10	300	10	a	
7268	10-16	5-	10	10	300	10	a	
7269	14-16	15	30	15	100	5	a	
7270	10-16	20	30	25	500	15	a	
7271	14-16	150	30	20	5-	5-	a	Be(10)
7279	4-12	60	10	25	50	5	a	
7283	10-16		NO RESULT					
7286	12-16	10	5	15	70	5	a	
7298	4-16	25	60	5	50	5	a	
7304	14-16	100	200	20	50	5-	a	
7307	8-16	10	5-	10	70	5	a	
7325	14-16	12	12	10	100	5	a	
7338	4-16	10	5-	10	50	5-	a	
7340	8-16	5-	5-	10	20	5-	a	
7341	12-16	5-	5	10	40	5	a	
7355	14-16	15	5	10	50	5-	a	
7356	12-16	30	20	15	100	7	a	
320N/600E	12-43		NO RESULT					
320N/602E	9-27	60	30	5	5-	5-	a	
324N/602E	15-40	60	15	10	5	5-	a	Be(5)
27N/3W	9-17	12	15	20	10	5-	a	
28N/4W	0-9	20	15	25	40	5	a	
28N/5W	6-10	30	60	25	100	10	a	
72N/160W	15-70	15	30	20	50	5-	a	
332N/604E	10-34	5-	5-	10	50	5-	a	
68N/170E	5-49	15	12	15	50	5-	a	

Phosphorus was sought but not detected in any sample.

5- = less than 5. 5000+ = greater than 5000

a . = not detected B.O.H. = bottom of hole.

Plate Nos. 699 - 711.

REPORT No. 22

File
18.March, 1964

SPECTROGRAPHIC ANALYSIS OF SAMPLESFROM TENNANT CREEK NORTHERN TERRITORY.

by

A.D.Haldane

Semiquantitative estimations were made of the trace metal content of geochemical samples of auger cuttings from Golden Forty area, Tennant Creek, Northern Territory. All results are expressed in parts per million.

Co-ords.	Depth feet	Ni	Co	Cu	V	Mo	Pb	Remarks
2W/4s	0-6	5	12	200	50	15	5	Tr.Bi
	12-18	5	12	50	50	5	5	
	18-24	5-	15	100	100	10	5	Tr.Bi
2W/4.5s	0-6	5-	20	200	100	10	5	
	6-12	5-	10	25	20	10	a	
	12-18	5-	5	25	50	5	a	
	18-24	5-	5	50	50	5	a	
	24-30	5	10	25	50	5	a	
	30-36	5	5	20	50	5	a	
2W/5s	0-6	5-	10	25	50	5	5	
	6-12	5-	10	50	20	5	5	
	12-18	5-	10	70	20	5	5	
	18-24	5-	12	70	50	10	10	
	24-30	5-	12	50	50	5	5	
	30-36	5-	10	100	50	5	a	
	36-42	5-	5	50	20	5	a	
2W/5.5s	0-6	5-	5	50	20	5	20	
	6-12	5-	10	100	20	5	20	
2W/6.5s	0-6	5-	20	100	20	15	500	TrBi
	6-12	5-	20	50	20	10	700	
	12-18	5	20	50	20	5	1000	
	18-24	5-	15	150	20	10	700	TrBi
	24-30	5-	10	25	50	5	500	
	30-36	5-	15	50	50	5	700	
	36-42	5	20	70	50	5	1000	Be(5)
2W/7s	0-6	5-	10	50	50	5	50	
	6-12	5-	5	20	50	5	200	
	12-18	5	5	15	50	5	500	
	18-24	5	12	70	150	10	2000	
	24-30	5	20	50	100	10	5000	
	30-36	5	12	50	150	10	1500	
	36-42	10	12	70	100	10	1500	
	42-48	10	10	100	150	10	1500	

2...

Co-ords.	Depth feet.	Ni	Co	Cu	V	Mo	Pb	Remarks.
2W/8s	0-6	5	10	100	150	10	700	
	6-12	5	12	200	150	10	1000	
	12-18	5	12	200	200	10	1000	
	18-24	5	12	100	200	12	1000	
	24-30	5	12	100	100	12	1000	
	30-36	5	12	70	200	10	1000	
6W/4s	2-6	10	10	70	200	10	20	
	6-12	5	10	50	100	10	a	
	12-18	5-	10	70	150	5	a	
6W/5s	0-6	10	10	70	200	10	a	
	6-12	10	10	50	100	10	a	
	12-18	10	10	50	150	10	a	
	18-24	10	10	100	150	5	a	
6W/5.5s	0-6	5	10	100	200	10	20	
	6-12	10	10	70	100	10	a	
	12-18	10	10	70	50	5	a	
	18-24	10	10	70	100	5	a	
	24-30	10	5	100	150	5	a	
	30-36	5	10	50	200	5	a	
	36-42	5-	10	15	50	5	a	
6W/6s	0-6	5	15	50	50	10	a	
	6-12	5	15	50	100	5	a	
	12-15	5-	15	50	100	5	a	
6W/6.5s	0.6	12	12	30	100	5	a	
	6-12	10	10	15	100	5	a	
	12-18	5	5	20	100	5	a	
	18-24	5	10	20	100	5	a	
6W/7s	0-6(A)	10	12	25	150	10	20	
	0-6(B)	5	12	25	100	5	a	
	6-12	10	10	15	100	5	a	
	12-18	5-	10	20	50	5	a	
6W/7.5s	6-12	5	5	50	100	5	a	
	12-18	5	5	50	100	5	a	
	18-24	5-	5	20	50	5	a	
	24-30	5-	5	15	100	5	a	
6W/8s	2-6	5	12	20	50	5	30	
	6-12	5	5	15	50	5	50	
	12-18	5-	5	25	100	5	70	
	18-24	5-	5	20	100	5	70	

Sn and P were sought but not detected in any sample.

a = not detected. tr = detected at trace level.

Plate Nos.725 - 727.

Report No. 23.

File
19th March, 1964

SPECTROGRAPHIC ANALYSIS OF GEOCHEMICAL SAMPLES FROM RUM JUNGLE, NORTHERN TERRITORY.

by

A.D.Haldane.

Semiquantitative estimations were made of the trace metal contents of geochemical samples from R.D.H. R142, Mount Fitch, Rum Jungle, N.T. The samples were submitted by P.Pritchard. All results are expressed in parts per million.

R.142

Depth (Feet).	Ni	Co	Cu	V	Mo	Pb	Remarks
0-5	500	200	5000+	5	20	100	(Be.10)
5-10	200	200	5000+	5-	20	30	(Be.10)
10-15	1000	500	5000+	150	50	a	(P present)
15-20	500	200	5000+	10	50	30	(Be.5)
20-25	200	150	5000+	5-	20	5-	(Be.10)
25-30	400	400	5000+	25	50	70	(P Present)
30-35	200	200	5000+	10	30	50	(Be.10/(P Present)
35-40	700	700	5000+	200	200	a	(Sn.20) P/present)
40-45	700	400	5000+	20	100	a	(Sn.10)
45-50	400	150	5000+	5	20	20	(P Present)
50-55	400	100	5000+	10	15	30	(P present)
55-60	400	100	5000+	10	50	70	(P present)
60-65	400	100	5000+	10	20	a	
65-70	200	50	4000	100	5	a	
70 -75	200	80	2000	100	5	5	
75-80	400	100	2000	400	10	a	
80-85	200	40	1000	100	a	5	
85-90	200	60	1000	100	a	a	
90-95	400	60	4000	50	a	a	
95-100	200	100	5000+	5-	a	5	(Be.5)
100-105	200	100	5000+	5-	a	5	(Be.5)
105-110	500	200	5000+	100	5	a	
110-115	200	500	4000	20	5	5	
115-120	100	80	4000	20	5	5	
120-125	100	60	5000+	20	20	5	
125-130	100	150	2000	10	a	a	(Be.10)
130-135	400	100	4000	50	5	a	
135-140	400	100	4000	50	15	a	
140-145	100	150	5000	20	20	a	
145-150	100	80	2000	50	10	a	
150-155	100	100	200	50	10	a	
155-160	100	100	700	70	15	a	
160-165	60	150	1000	10	5	a	(Be.10
165-170	80	60	50	50	5	a	
170-175	60	100	500	20	10	a	
175-180	100	80	50	30	10	a	
180-185	100	80	500	30	10	a	(Be.5)
185-190	80	100	700	50	5	a	
190-195	60	80	5000 +	30	10	a	

Plate Nos.716-717

Report No. 24

File No.
19th March, 1964

ANALYSIS OF TWO WATER SAMPLES FROM THE CAPTAIN'S FLAT AREA, NEW SOUTH WALES.

by

S. Baker.

About ten water samples taken during the geochemical survey of Captain's Flat in 1961-62, showed an anomalous zinc content.

During February, 1964, after a two to three month period of little rain, two water samples from the Foxlow and Gourlay-Hickey anomalies were collected for analysis. The Foxlow sample shows an unusual chemical composition, not only in the presence of zinc, but also because of its exceptionally low pH value and high sulphate to chloride ratio.

	Foxlow.	Gourlay-Hickey
Conductivity (micro ohms/cm	1790	300
pH	2.9	6.2
Sulphate (SO_4) p.p.m.	940	79
Chloride (Cl) "	25	18
Calcium (Ca) "	18	11
Magnesium (Mg) "	136	13
Sodium (Na) "	173	91
Zinc (Zn) "	13	0.2
Ratio $\frac{SO_4}{Cl}$	37.6	4.4

Report No. ~~24A~~ ~~25~~. 24A

File.
19thMarch.1964

X-RAY DIFFRACTION ANALYSIS OF THREE MINERAL SAMPLES FROM THE CHARTERS TOWERS AREA OF QUEENSLAND.

by

S.C. Goadby.

Three mineral samples were submitted by A.G.L.PAINE for identification by X-Ray powder diffraction.

1. 2A.3.99CT. : thin vein of ? sphalerite in pale grey siliceous metavolcanic rock.

   The material is sphalerite.

2. IR.3.99CT : white earthy material. The material is magnesite.

3. 16.3 99CT. : three small floaters in creek. The material is barytes.

Laboratory reference - 1472.

REPORT No 25

File 106/Q/4
63/292

8B

March 26, 1964.

ESTIMATION OF PHOSPHATE

By

S. Baker

Following are results for the determination of Phosphate on samples bubmitted by A.R. Jensen and R. Bryan.

FIELD NO.		PER CENT P 205
T166	Mundubberra, Run 2, Photo Pt. 166	1.0
155/19	Port Campbell No. 1 Well 5018'-5020'	less than 1.0
155/21	Port Campbell No. 1 Well 5223'-5225'	" 1.0
161/7	Port Campbell No. 2 Well 1923'-1925'	" 1.0
161/13	" " " " 7685'-7687'	" 1.0

Serial No. 1448, 1490.

Report No. 26.　　　　File No. 64NT/1

Spectrographic Analysis of Samples from Rum Jungle

by

A.D. Haldane

Semiquantitative estimations were made of the trace metal content of cores samples from D.G.9, D.G.24, D.G.27, D.G.30, and D.G. 31, from Rum Jungle, N.T. The samples were submitted by P. Pritchard.

All results are expressed in parts per million.

D.G.9 "Geolsec" area, Rum Jungle.

depth	Ni	Co	Cu	V	Mo	P	Remarks
- 19'10"	10	5-	5	5-	5-	p	
19'10" - 22'	12	5-	5-	5-	5-	p	
22' - 24'3"	60	5-	5-	5-	5-	p	
24'3" - 26'	60	10	5-	5-	5-	p	
26' - 29'	100	5-	5	5-	5-	p	
29' - 33'6"	80	5	5-	5-	5-	p	
33'6" - 35'	30	12	15	5	5-	p	
35' - 40'	60	12	15	5	10	p	
40' - 45'	60	5	5-	5-	10	p	
45' - 50'	60	5	5-	5	5-	p	
50' - 55'	100	5-	5-	5-	5-	p	
55' - 57'	80	5-	5-	5-	5-	p	
57' - 62'	80	5	5-	5	5-	p	
62' - 67'	60	5	5-	10	5	p	
67' - 69'2"	60	5	5-	5	5-	p	
69'2" - 74'	60	5	5-	5-	5-	p	
74' - 77'3"	40	5	5-	10	5-	p	
77'3" - 80'	30	5-	5-	20	5-	p	
80' - 85'	30	5-	5-	20	5-	p	
85' - 90'	40	5	5-	20	5-	p	
90' - 93'	60	5	5-	20	5-	p	
93' - 98'	100	10	5-	20	5-	p	
98' - 103'	100	10	5-	20	5-	p	
103' - 105'7"	20	10	5-	20	5-	p	
105'7" - 110'	100	10	5-	50	5-	p	
110' - 115'	40	5-	5-	50	5-	p	
115' - 120'	60	5-	5-	20	5-	p	
120' - 122'10"	60	5-	5-	50	5-	p	

depth	Ni	Co	Cu	V	Mo	P	Remarks
122'10" - 124'2"	40	5-	5-	100	5-	p	
124'2" - 128'	40	5	5-	100	5-	p	
128' - 129'	60	5-	5-	70	5-	p	
129' - 134'	60	5-	5-	100	5-	p	
134' - 139'	30	5-	5-	50	5-	p	
139' - 141'	30	5-	5-	100	5-	p	
141' - 145'	60	5-	5	5-	5-	a	
145' - 150'	80	5-	5	5-	5-	a	
150' - 155'	60	5	5	5-	5-	a	
155' - 159'5"	100	5	5	5	5-	p	
159'5" - 165'	100	5	10	40	5-	p	
165' - 170'	60	5	10	70	5-	p	
170' - 174'6"	80	5-	5-	50	5-	p	
174'6" - 180'	5	5-	5-	50	5-	p	
180' - 185'	5-	5-	15	50	10	p	
185' - 190'	5	10	15	40	10	p	
190' - 195'	5-	5	10	50	5-	p	
195' - 200'	5-	5-	10	50	5	p	
200' - 205'	5-	5-	10	100	5-	p	
205' - 210'	5-	5-	10	50	5	p	
210' - 215'	5-	10	5-	20	5-	p	
215' - 220'	5	10	5-	50	5-	p	
220' - 225'	5	12	5-	20	5-	p	
225' - 227'9"	5	5-	5-	5	5-	p	
227'9" - 232'	100	5	5	20	5-	p	
232' - 237'11"	80	5-	5-	50	5-	p	
237'11" - 240'	5-	5-	5	100	5-	a	
240' - 245'	5-	5-	5	100	5-	p	
245' - 250'	10	5-	5-	150	5-	a	
250' - 255'	5	5-	5-	100	5-	p	
255' - 260'	10	5-	5-	100	5-	p	
260' - 265'	5	5-	5-	70	5-	p	
265' - 270'	60	10	5-	50	5-	a	
270' - 275'	5-	10	5-	40	5-	p	
275' - 280'	5-	5-	5-	100	5-	p	
280' - 285'	5-	5-	5	100	5-	a	
285' - 290'	5-	5-	5	70	5-	a	
290' - 293'3"	60	5-	5-	10	5-	a	
293'3" - 295'	60	10	5-	10	5-	a	
295' - 300'	60	5	5-	40	5-	a	
300' - 305'	60	10	5-	40	5-	a	
305' - 310'	30	5-	5	20	5-	a	

depth	Ni	Co	Cu	V	Mo	P	Remarks
310' - 315'	60	5	5-	40	5-	a	
315' - 320'	60	10	5-	20	5-	a	
320' - 325'	60	10	5-	20	a	a	
325' - 330'	60	10	5-	10	a	a	
330' - 335'	60	10	5-	10	a	a	
335' - 340'	100	12	5-	10	10	a	
340' - 345'	100	10	5-	10	15	a	
345' - 351'	80	10	5-	20	20	a	
351' - 355'	10	5	5-	50	5	a	
355' - 359'	12	5	5	100	10	a	
359' - 360'9"	60	5	5	10	5-	a	
360'9" - 363'6"	5-	5-	5-	10	10	a	
363'6" - 364'2"	12	5-	5-	50	50	a	
364'2" - 365'6"	5	5-	5-	70	20	p	
365'6" - 370'	60	10	5-	20	5	a	
370' - 375'	30	10	5-	10	10	a	
375' - 380'	40	10	5-	20	10	a	
380' - 385'	20	5	5-	20	5	a	
385' - 390'	30	10	5-	50	5	a	
390' - 395'	200	12	5	5-	5	a	
395' - 396'3"	100	12	5-	5-	10	a	
396'3" - 397'3"		No Result					
397'3" - 400'	60	15	5-	50	10	a	
400' - 401'9"	30	20	5-	20	50	p	
401'9" - 405'	30	15	5-	20	5-	p	
405' - 410'	40	15	5-	30	a	a	
410' - 414'8"	5	12	5-	50	10	p	
414'8" - 419'	60	15	5-	20	5-	p	
419' - 422'6"	80	15	5-	5	a	a	

<u>D.G. 24, Mt. Fitch, Rum Jungle.</u>

depth	Ni	Co	Cu	V	Mo	P	Remarks
150' - 155' (clay)	2000	500	1000	20	10	a	(Pb50) (Be10)
150' - 155' (core)	500	200	1000	5-	10	a	(Pb50)
155' - 160' (clay)		No Result					
155' - 160' (core)	1000	400	2000	5	10	a	(Pb50)
160' - 165' (clay)	1000	500	2000	5	50	a	(Pb50)
160' - 165' (core	200	150	1500	5-	5	a	
165' - 170'	400	150	700	5-	5	a	
170' - 175' (clay	500	500	1000	5-	10	a	(Be10) (Pb10)
170' - 175' (core)	200	100	500	5-	5	a	
175' - 180'	400	150	700	5-	5	a	
180' - 185'	1000	200	700	5-	10	a	

depth	Ni	Co	Cu	V	Mo	P	Remarks
185' - 190'	400	100	700	5-	10	a	
190' - 195'	400	200	700	5-	10	a	
195' - 200'	400	200	700	5-	5	a	
200' - 205' (clay)	100	1000	2000	5-	5	a	
200' - 205' (core)	500	200	1000	5-	5	a	
205' - 210' (clay)	1000	500	3000	5-	5	a	
205' - 210' (core)	150	100	700	5-	5	a	
210' - 221'6" (A)	700	500	5000+	5-	10	a	Manganiferous sec.
210' - 221'6" (B)	400	150	700	5-	5	a	(Pb5)
221'6" - 225'	1000	150	500	5-	5	a	
225' - 230'	400	150	700	5-	5	a	(Pb10)
230' - 235'	200	100	500	5-	a	a	
235' - 240'	500	150	500	5-	10	a	
240' - 245'	400	100	700	5-	a	a	
245' - 250'11"	20	15	100	5-	a	a	
251'7" - 255'	50	60	100	5-	a	a	
255' - 260'	30	20	100	5-	a	a	
260' - 265'	200	60	500	5-	a	a	
271' - 273'	400	200	1000	5-	10	a	
330' - 331'	400	200	1500	5-	10	a	
348'7" - 350'	2000+	2000	5000+	5	10	a	(Pb10)
350' - 355'(C)	2000+	2000+	5000+	10	5	a	(Pb 5)
355' - 360'(B)	2000+	2000+	5000+	10	10	a	
360' - 361'	200	100	2000	100	10	a	
361' - 374' (core)	1000	500	5000	100	5	a	
361' - 374' (clay)	1000	2000+	5000+	100	5	a	
378' - 382'	500	2000	5000+	20	10	a	
382' - 409'6"	500	2000	5000+	100	10	a	
409'6" - 415' (core)	200	150	5000+	20	10	a	(Pb 5)
409'6" - 415' (clay)	400	200	2000	20	5	a	
415' - 423'6" (core)	30	60	200	50	10	a	(Pb 5)
415' - 423'6" (clay)	60	100	500	50	5	a	
423'6" - 425'6"	10	15	200	20	10	a	
423'6" - 430' (core)	200	100	1500	50	5	a	(Pb 5)
423'6" - 430' (clay)	200	200	4000	50	5	a	

<u>D.G. 27</u>.

depth	Ni	Co	Cu	V	Mo	P	Remarks
85' - 92'6"	2000	2000+	5000+	50	10	a	(Pb10, Be10)
122'6" - 128'6"	2000	500	5000+	50	50	a	(Pb10, Be20)

depth		Ni	Co	Cu	V	Mo	Pb	Remarks
D.G. 30.								
585'	- 590'	100	60	700	5-	5-	a	
590'	- 595'	1000	2000	5000+	150	5	100	
595'	- 600'	700	2000	5000+	100	5	100	
600'	- 605'	200	150	1500	50	10	50	
605'	- 610'	150	80	200	5-	10	10	
610'	- 615'	200	200	5000	5-	5-	10	
615'	- 620'	700	1000	1500	5-	5-	10	
620'	- 625'	200	200	500	5-	5-	a	
D.G. 31.								
65'	- 70'	200	200	500	700	20	10	(Sn10)
70'	- 75'	150	150	1000	500	5	10	(Sn10)
75'	- 80'	400	500	5000+	150	20	10	
80'	- 85'	500	500	5000+	200	5	10	(Sn10)
115'	- 120'	100	100	50	100	150	5	
120'	- 125'	150	60	10	200	150	5	
720'	- 725'	30	100	100	5-	5-	a	

p = Present but value not estimated

a = sought but not dedected

plate Nos. 712 - 716 and 723 - 725 and 729

REPORT No 27

SPECTROCHEMICAL ANALYSIS OF GEOCHEMICAL SAMPLES FROM DUCHESS QUEENSLAND

BY

A.D. HALDANE

Semiquantitative estimations were made of the trace metal content of samples from the Labour Victory mine and the Maraposa Valley.

The samples were submitted by A.L. Mather.

All results are expressed in parts per million.

Sample No.	Ni	Co	Zn	Cu	V	Mo	Sn	Pb
Labour Victory								
011047	15	30	100	200	200	10	a	10
011048	15	30		100	200	10	a	5
011049	15	30	100	200	200	10	a	5
011032	5-	5-	100	500	200	10	a	5
011033	10	30		70	200	5	a	5
011034	5	30		100	150	a	a	5
011035	5-	30		70	200	a	a	10
011036	5	30		100	200	a	a	10
011037	5	30		70	100	5	a	5
011038	10	30		70	150	5	a	5
011039	10	30		70	150	5	a	5
011040	10	30		70	150	5	a	5
011041	10	30		100	200	5	a	5
011042	10	25		100	150	5	a	5
011043	10	30		100	150	5	a	5
011044	5	20		70	200	5	a	10
011045	10	30		70	150	5	a	5
011046	10	30		100	150	5	a	5
Maraposa Valley								
011030	5	40	100	500	500	15	a	a
011031	5	40	500	200	200	20	a	a
011025	5	40	1000	300	300	50	a	a
011026	5	40	500	500	300	20	a	a
011027	5	40	700	500	70	30	a	a
011028	5	60	500	400	200	10	a	a
011029	5	60	700	500	300	20	a	a

P was sought but not detected in any sample

Zn detection limit 100 ppm.

Plate Nos. 516-517 730, 731.

REPORT Nº 28

Examination of proposed aggregate for the Tindal Airstrip N.T.

by

W. Oldershaw

Sp 149869 R17562 TS 13794

The specimen is a granular grey rock composed of small black crystals of augite, 2 mm. long, set in a white matrix (stained green in places) comprising 50-60 percent of the rock. The weathered surface has been stained red and the mafic minerals leached out.

Under the microscope the rock is seen to consist of corroded crystals of augite and euhedral crystals of feldspar set in a matrix of graphically intergrown quartz and orthoclase.

The augite exhibits well marked exsolution lamellae herringbone pattern. Some crystals have been altered to fibrous hornblende and chlorite along their margins and some have rims of granular and massive hornblende.

The feldspar phenocrysts consist of highly altered euhedral crystals of andesine. Most of them now consist of aggregates of sericite flakes, zoisite and limonite dust.

The matrix of the rock is a distinctive graphic intergrowth of quartz and orthoclase. In places the intergrowths comprise coronas surrounding cores of euhedral quartz and orthoclase. There are interstitial patches of sericite and penninite. Apatite and ilmenite are accessory.

The rock is a highly altered porphyritic quartz - hornblende - augite - microdiorite (a markfieldite or a micro-mangerite).

This rock would normally be suitable for concrete aggregate for it is coarsely crystalline and contains no unstable minerals. Its high content of lime would tend to neutralise any high alkali cement. However, the rock is very altered and may contain too many soft flaky minerals, chlorite and sericite, which reduce the strength of the rock and in addition could produce a "dirty" aggregate on crushing and weaken the cement bond. Because of the presence of the deleterious minerals it is recommended that the aggregate be subjected to routine laboratory testing before use in concrete.

Sp 149897 R 17563 TS 13795

The specimen consists of fragments of white chert set in a matrix of red chert. The rock is hard (hardness 7), glassy and has a prominent conchoidal fracture along which it tends to flake off.

Under the microscope the rock is seen to consist of fragments of microcrystalline silica, some crowded with limonite dust, set in a matrix of microcrystalline silica. There are few patches of coarsely crystalline quartz and of chalcedony.

The rock would be a hard, compact, uniform aggregate, but tends to be flaky. The smooth conchoidal fracture surfaces afford little grip to any matrix, especially bitumen. The chert would probably react with a high alkali cement; it is recommended that it be subjected to routine laboratory tests in concrete, especially for expansive reaction with alkali cements.

REPORT N° 29.

10th April, 1964.
198PNG/1

Mineragraphic investigation of a specimen from No.3 level Mount Victor Gold Mine, Kainantu area, New Guinea

by

I.R. Pontifex

Sample submitted by R.G. Horne, 14th February, 1964.

Field No. RH48.

Ore minerals identified. Magnetite, pyrite, chalcopyrite, enargite, tennantite, hematite, chalcocite, covellite.

Assay recorded by Horne. Au 1.86 dwt/ton.
Ag 2.32 dwt/ton.

Cu ore grade. 0.1% Cu (X-ray spectrograph determination).

Conclusions. The Mount Victor lode is a magmatic-segregation type ore body derived from the hanging wall rock, the Elendora porphyry. (Dow 1963).

In this specimen magnetite is the host rock for a related group of epigenetic hydrothermal sulphides. Pyrite is the most abundant sulphide, it carries inclusions of tennantite and enargite and was introduced into the magnetite before the associated chalcopyrite.

No gold or silver minerals were detected.

The mode of occurrence of the Au and Ag found by assay was not conclusively determined. The presence of tennantite in pyrite may be important in this regard since this mineral commonly contains significant amounts of Ag and Au; also pyrite may contain sub microscopic Au in solid solution or in colloidal form.

The relationships and associations of hematite, chalcocite and covellite indicate the incipient stages of supergene oxidation of the ore at the locality of this specimen.

The results of this investigation considered together with the field geology derive several implications which may be significant to future mineral search in this area. These are discussed at the end of this report.

Field occurrence. The lode geology of the Mount Victor prospect is recorded by Dow (1959) and Dow and Plane (1963). The observations made by these authors are from the oxidised zone of the lode and apparently no information from the primary zone was available at the time of their investigation.

The prospect consists of a ferruginous quartz lode on a contact between Mount Victor Granodiorite (foot wall) and Elendora Porphyry (hanging wall). The lode is oxidised and consists of iron stained friable quartz, it includes large masses of limonite up to 15 ft. across, these contain magnetite and hematite.

The limonite masses have resulted from the oxidation of pre-existing primary magnetite and pyrite. Secondary enrichment has played a large part in concentrating the gold which occurs free and ranges in fineness from 800 to 830 fine.

The oxidised lode contains 60,000 tons of ore of about 6 dwts Au/ton. The lode grades downwards into propylitised andesite porphyry which contains over 50% pyrite which carries about 0.5 dwt Au/ton.

Macro description

Abundant irregular veins and patches of pyrite are distributed at random through massive finely granular magnetite. The maximum thickness of these veins is 5 mms. Accessory amounts of pale green talc are associated with the sulphide veins and some small patches of talc occur alone in the magnetite.

Micro description.

Eighty percent of the specimen is magnetite which occurs in a fine grained granular aggregate containing abundant interstitial voids. The outside boundary of the magnetite grains consists of a narrow corona of hematite (observed at X450) and an irregular network of hematite through the magnetite aggregate is an expression of these coronas surrounding the composite grains.

Pyrite has been introduced into the magnetite, partly filling voids and cutting at random through the host mineral; it commonly encloses magnetite grains. The pyrite carries minor accessory inclusions of two minerals, these are roughly elliptical and measure up to 0.13 mms. in maximum dimension but their average is 0.015 mms. Generally these inclusions are completely enclosed in pyrite but some are localised at the periphery of the pyrite masses; in places they are associated with chalcopyrite.

One mineral is pinkish brown (in oil much darker), it has a distinct reflective pleochroism and a strong anisotropism exhibiting shades of grey, violet and yellow. The other mineral has a bluish grey-green color and is isotropic.

A positive identification of these inclusions is difficult because of their small size, however their optical properties and rare association with chalcopyrite suggest that they are enargite and tennantite respectively.

Irregular masses of chalcopyrite up to 0.15 mms across are associated with pyrite, these also occur independently, partly filling voids in magnetite. The texture relationships in this ore indicate that chalcopyrite was introduced into the magnetite after pyrite. Commonly chalcopyrite grades imperceptively into irregular alteration coronas of chalcocite and covellite. Some grains are completely unaltered, some are wholly replaced by the secondary copper sulphides.

<u>Implications</u>. Since this is apparently the first time copper mineralisation has been detected in the Mount Victor lode it is suggested that additional specimens from the ore are microscopically examined (if possible from a greater depth than No.3 level) to help establish the abundance, distribution and relationships of the copper minerals. Also specimens of the Elendora porphyry parent rock should be examined for Cu, Au and Ag minerals with the aim of investigating the genesis of the ore.

According to Dow (1963) the Elendora porphyry (and its equivalent) is the source rock for other Au and Cu mineralisation in the Kainantu mineral province, accordingly, studies of these occurrences could be conducted.

The mineralogical correlation between each prospect may establish significant facts regarding the composition, origin and possible extensions of the known prospects which could form the basis of geochemical or other prospecting in this area.

<u>References;</u> DOW, D.B. "Geological Report Mount Victor Prospect, E.P.L.37. Kainantu, T.N.G." B.M.R. Record 1959/27.

DOW, D.B. and PLANE, M.D. "The Geology of the Kainantu Gold Fields". B.M.R. Record 1963/64.

REPORT No 30

10th April, 1964.
106Q/19

Mineragraphic investigation of heavy mineral bands in a sandstone from the Springsure area, Queensland.

by

I.R. Pontifex

Sample submitted by R.G. Mollan for the identification of opaque mineral grains.

Location. Springsure 1:250,000 sheet, $1\frac{3}{4}$ miles S.W. of "Treswell".

Field No. SP 343/2

Opaque minerals identified. Hematite, limonite, pyrite, ?gold.

Macro description. Buff, light brown, dirty silty sandstone contains irregular dark mineral bands measuring up to 5 mms. thick. These bands are parallel to the bedding.

Micro description. Opague grains are disseminated throughout the silt-sand matrix of this rock but they are relatively concentrated in bands evident in the land specimen. These grains consist of leached remnant cores of detrital hematite which are surrounded and cut by irregular zones of limonite. The limonite has derived from the pre-existing hematite grains probably by the process of supergene oxidation and generally it has almost completely replaced the original iron oxide.

During this alteration process some of the limonite has migrated from the iron oxide grains along adjacent intergranular boundaries within the sediment matrix. It is possible that the iron oxide grains originally consisted of magnetite and that the hematite and limonite are subsequent oxidation products of this mineral. No remnant grains of magnetite were observed however. Grains of pyrite up to 0.03 mms. across are disseminated through the matrix in minor accessory abundance.

Several extremely fine grains of possible gold were observed at 800 x magnification. These were too small for a positive identification.

Lab. reference. 1293.

REPORT N° 31

File 120Q/4
April 14, 1964.

Mineralogical and Chemical investigation of silica sand from 15 miles north of Cooktown, Queensland.

by

I. R. Pontifex.

Three samples were submitted by K.G. Lucas for determination of mineralogical impurities pertaining to glass sand. The properties pertaining to a fracking sand were also considered. Location, 15 miles north of Cooktown: wind blown (blowout) dunes.

Field Nos. LB 195, LB 196, LB 197.

CONCLUSIONS. The Chemical analysis revealed greater than 99% SiO_2 in each sample. The x-ray spectrograph found less than 0.036% Fe in each. Mineralogically the sand contains greater than 97.5% quartz grains of an average diameter of 0.175 mms.

Assuming the samples are representative this sand has the attributes of a high quality glass sand. It is too fine grained for use as a fracking sand.

GLASS SAND REQUIREMENTS. The mineralogical specifications of a glass sand given by Bates in "Geology of the Industrial Rocks and Minerals" (1960) are as follows:-

For optical glass 99% silica
For container glass 95% silica
Maximum iron impurity 0.06%
Maximum Cr & Co impurity, approx. 0.0002%
Maximum Al content (in felspar) 4%
Grainsize: between 30 mesh (0.5 mms) and 150 mesh (0.104 mms)

The grains should be clear, i.e., no coating or inclusions.

ANALYTICAL RESULTS.

1. Mineralogy. All three samples have essentially the same composition. They are white but contain minor accessory amounts of dark grains. The sand is well sorted, the grains are sub-rounded to angular and have an average maximum dimension of 0.175 mms.

Under the binocular microscope about 90% of the grains appear clear, in thin section however, up to 80% of these are found to carry minor accessory amounts of opaque, dust and needle like inclusions. The inclusions are mainly iron oxides and minor rutile.

The binocular microscope examination reveals 10% cloudy grains and these simulate grains of felspar. In this section the majority are found to be crypto-crystalline quartz probably detrital grains of chert or fine grained quartzite. The sample contains less than 2% K felspar and no plagioclase. Some of the cloudy grains have an excess of opaque inclusions. The cloudiness is an inherent characteristis of these grains: but some also have a superficial coating of clay.

The mineralogical composition of each sample is given in the following table.

Constituent	LB 195	LB 196	LB 197
Wt% quartz grains (assume 2% felspar)	97.88	97.79	97.81
Wt% K felspar grains	less than 2%	less than 2%	less than 2%
Wt% Magnetic impurities	0.12	0.21	0.19
Magnetic impurities	Magnetic, tourmaline, garnet, pyrite, ilmenite, pyroxene, epidote, zircon.		
Wt% 30 mesh 150 mesh	99.81	99.65	99.75
Wt% 150 mesh	0.19	0.35	0.25
Wt% heavy minerals 150 mesh	0.07	0.09	0.11

2. Chemistry

The samples were analysed for total percent SiO_2 by Dr. R. Beevers. Two samples of each specimen were analysed. The results are:

	LB195	LB 196	LB 197
% SiO2	99.59	99.66	99.23
% SiO_2	99.60	-	99.20

An analysis for Fe, Co, Cr, and K impurities in unseparated material of each sample was carried out by S. Goodby by X-ray spectrograph. The results are:

	LB 195	LB 196	LB 197
% Fe	0.015	0.035	0.035
% Co	——	not detected	———
% Cr	faint trace	faint trace	faint trace
% K	0.015	0.038	0.031

METHODS OF ANALYSIS AND COMMENTS

1. The iron bearing grains were separated by passing the sample through a Frantz separator which was set to remove grains of minimum magnetic susceptibility. The magnetic fraction was assumed to contain most of the Fe contamination of the sand. Minerals in the magnetic fraction were identified under a binocular microscope.

2. Thin sections were made of the non-magnetic fraction of each sample. Almost every grain examined was quartz, no plagioclase was detected, about 5% of the sample appeared to be detrital chert, less than 2% orthoclase was present. Most of the quartz grains contained microscopically fine opaque inclusions.

3. To check the K felspar content the non-magnetic fraction was mixed with a bromoform-acetone solution designed to float K felspar and sink quartz. Less than 2% of the total of each specimen floated.

4. The thin sections were coated with sodium-cobalti-nitrate which stains K felspar. Less than 2% of the grains in the sections were stained.

5. Each sand was sieved by a 30 mesh sieve (0.5 mms) and a 150 meshsieve (0.104 mms) to determine the percent of undesirable coarse and fine grains. A relative abundance of dark, heavy grains appeared in the fine fraction.

6. The fine fraction ($<$ 150 mesh) was separated by heavy liquids to determine the percent of heavy mineral impurities which could be separated by sieving. The heavy mineral assemblage is essentially the same as that found in the magnetic fraction from the Frantz separator.

The relative proportion of heavies obtained by magnetic separation and by sieving indicate that the majority of heavy mineral grain impurities occur in the undesirable fines and that they can be removed by sieving.

7. The samples analysed by the X-ray spectrograph were powdered to ensure the detection of the maximum amount of impuritisv In particular it was necessary to release the opaque inclusions in the quartz grains since no accurate estimation of these can be given from the mineralogical examination.

The estimation of K content was done to check the possible presence of K felspar previously undetected in the mineralogical examination.

PROPERTIES REGARDING FRACKING SAND.

One of the most essential properties of a sand for fracking or proping in oil reservoirs is that the grain size is of 20 to 60 mesh size. (i.e. 0.35 mms to 0.251 mms) but it is even more desirable if the sand is of 20 to 40 mesh size.

All the grains in each sample under investigation pass the 60 mesh sieve which renders them too fine for use as a fracking sand.

Laboratory Reference 1248.

REPORT N°32 File 120 EO/14

Mineragraphic investigation of mineralised Bitter Springs Limestone, east of Orange Creek Station, Rodinga N.T.

by

I. R. Pontifex

Sample submitted by P. Cook for identification of opaque minerals. Location. Eight miles east of Orange Creek homestead. Field No. HY 301.

CONCLUSIONS AND GENESIS This rock is a crystalline limestone containing roughly parallel bands of botryoidal limonite (with minor manganese hydroxide) and disseminated grains of psilomelane. The psilomelane contains detectable amounts of Cu.

The origin of these minerals is difficult to interpret from this one specimen however the mode of occurrence of the limonite suggests that it was deposited by supergene agencies probably introduced after the crystallisation of the limestone.

The distribution of the Mn mineral grains suggests that they may be inherent components of the limestone, however some supergene deposition of the Mn hydroxide has taken place contemporaneous with that of the Fe hydroxides.

Psilomelane is most commonly found as a secondary product of supergene origin and replacement deposits in calcareous or dolomitic rocks formed by meteoric waters may be of large extent. (Dana)

In this specimen probably both the Fe and Mn derived from a common supergene origin and the Fe and Mn minerals have been separately removed and concentrated during weathering.

MACRO DESCRIPTION Medium grained marble contains irregular parallel layers up to 1 cm. wide of rust brown botryoidal limonite. On the weathered surface individual nodules exhibit irregular colloform banding and commonly the external crust has a shiny irridescent tarnished appearance. Discrete angular grains of a manganese mineral measuring up to 2 mms. across are dispersed through the marble separate from the limonite.

MICRO DESCRIPTION Thin section: the non opaque matrix consists entirely of an allotriomorphic granular aggregate of calcite. Small blebs of quartz border part of the periphery of some limonite concretions. Some of the limonite concretions are fractured and the fractures have been filled with crystalline calcite.

Polished section: the limonite macro layers seen in the hand specimen consist of intricately colloform-banded limonite. Individual bands of limonite are generally about 0.005 mms. wide. The outermost band of each limonite concretion, adjacent to the calcite matrix consists of psilomelane. This outer band measures up to 0.15 mms. wide, the inner side of it follows the colloform limonite banding, the outer side is irregular and fine acicular needles of psilomelane project at random from it into the calcite. Rarely bands of psilomelane occur in the limonite concretions, some bands have the optical properties of Fe and Mn hydroxides and these probably consist of an admixture of both minerals. Such a mixed product is termed ferrian.

The dark manganese mineral grains in the marble consist entirely of psilomelane which exhibits a very fine felted ice flower texture.

Minor accessory amounts of fine brassy grains measuring about 0.005 mms. across are disseminated through the limonite layers. This mineral was too fine to positively identify however it is probably pyrite.

SPECTROGRAPHIC ANALYSIS. An x-ray spectrographic analysis was carried out by S. Goodby for Ba, Cu and Co on two different fractions of the rock, these were:-

1. the limonite bands,
2. psilomelane grains.

The analysis for Ba was done to confirm the identification of psilomelane. (This mineral contains up to 16% Ba). The Ba content in the limonite fraction was within background detection limits. In the psilomelane grains, Ba is present in abundance relative to background.

The analysis for Cu revealed only background quantities in the limonite bands, in psilomelane Cu is present in slightly greater amounts than detected in background but it is not an essential element of this mineral.

No Cu minerals were observed in this rock which would account for this relatively high Cu content. It is common however that hydrous manganese oxides contain admixtures of various elements including Cu and Co and this is considered to be the mode of occurrence of the Cu detected in this specimen.

The analysis for Co revealed only background amounts in both fractions.

Lab. Reference 1479
April 14, 1964.

Report No. 33.

File No.

17/4/64

Spectrochemical Analysis of Samples from Tennant Creek, N.T.

by

A.D. Haldane

The following results have been obtained for the semiquantitative spectrochemical analysis of samples from Nobles Nob, Peko, and Orlando Mines. The samples were submitted by A.L. Mather.

All results are expressed in parts per million.

Sample No. Nobles Nob	Ni	Co	Cu	V	Mo	Sn	Pb	Remarks	
011001	5	40	200	20	300	a	a	Zn 500	
011002	300	30	100	5-	200	a	a	Zn 100	
011003	300	30	70	10	15	a	50	Zn 100	
011004	300	30	30	20	15	a	a	Zn 100	
011005	30	20	50	150	5	a	5	Zn 100	
011006	60	15	5	50	5	a	5	Zn 100	
011007	80	7	100	50	5	a	5	Zn 100	
011008	30	20	7	150	5	a	5	Zn 100	
Peko Cores									
011009	12	200	1500	20	10	a	a	Zn 300	
011010	20	20	20	100	5	a	5		
011011	40	30	15	100	5	a	10		
011012	60	20	25	50	10	a	10		
Orlando									
011013	12	15	5-	150	5	a	a		
011014	5-	300	5000+	20	5	a	50	Zn 500	Bi
011015	5-	150	5000	5	5	a	1500	Zn 5000	
011016	70	100	500	5-	5	a	1000	Zn 700	
011017	10	12	100	150	5	5	50	Zn 100	
011018	10	500	5000+	200	70	a	100	Zn 700	
011019	30	40	200	150	5	a	100	Zn 100	
011020	30	40	200	150	5	a	a		
011021	30	100	4000	150	10	a	a	Zn 400	
011022	100	80	1500	100	10	a	10	Zn 200	
011023	60	2000+	5000++	20	10	a	500	Zn 300	
011024	30	200	2000	30	5	a	a	Zn 300	

P was sought but not detected in any sample.

Plate Nos. 728, 729, 746

REPORT N° 34 20/4/64

SPECTROCHEMICAL ANALYSIS OF GEOCHEMICAL SAMPLES FROM TENNANT CREEK N.T.

BY

A.D. HALDANE

Semiquantitative estimations were made of the trace metal content of geochemical samples from Golden 40 prospect Tennant Creek N.T.

The samples were submitted by A.L. Mather as part of an orientation survey.

All results are expressed in parts per million.

Sample No.	Depth (ft.)	Ni	Co	Cu	V	Mo	Pb	Remarks
6W/00s	52 BOH	5-	5	20	20	5	5	
/0.5s	52 BOH	5-	5	10	30	5-	a	
/1.0s	52 BOH	5-	5-	10	10	5-	5	
/1.5s	52 BOH	5-	5-	15	30	5-	5	
/2.0s	40 BOH	5-	5	5	30	5-	5	(Sn 5)
2.5s	28 "	5-	5	5-	50	5	a	
3.0s	46 "	5-	5	15	50	5-	a	
3.5s	18 "	5-	5-	15	20	5-	a	
4.0s	16 "	5-	5-	15	50	5-	a	
4.5s	12 "	5-	5-	10	50	5-	a	
5.0s	22 "	5	5	80	50	5-	a	
5.5s	0 - 4	5	10	20	50	5-	5	
5.5s	40 BOH	5	12	80	10	5-	a	
6.0s	16 "	5-	5	15	20	5-	a	
6.5s	22 "	5	5-	15	20	5-	a	
7.0s	16 "	5	5-	15	30	5-	a	
7.5s	28 "	5-	5	20	30	5-	5	
8.0s	22 "	5-	5-	10	40	5-	100	
8.5s	34 "	5-	5-	10	50	5-	100	
9.0s	40 "	5	5-	15	50	5-	70	
9.5s	52 "	5	5-	20	50	5-	50	
10.0s	20 "	5	5-	15	40	2	50	
10.5s	44 "	5-	5-	15	40	2	50	
11.0s	34 "	5	5-	20	30	2	50	
11.5s	40 "	5	15	25	25	10	100	
12.0s	40 "	5	5	20	30	15	50	(Zn 100)
2W/ 00	52 "	5-	5	10	50	5	5	
1.0s	16 "	5-	5	10	50	5	5	
1.5s	10 "	5	5	10	20	7	a	
2.0s	22 "	5-	5	20	30	7	a	
2.5s	22 "	5-	5	70	50	5	5	
3.0s	40 "	5-	5	50	50	7	5	
3.5s	46 "	5-	5	100	30	5	5	
4.0s	52 "	5	10	70	50	7	5	

Sample No.	Depth (Ft.)	Ni	Co	Cu	V	Mo	Pb	Remarks
2W/4.5s	39 BOH	5-	5	50	50	10	5	
5.0s	34 "	5-	12	100	50	5	5	
5.5s	16 "	10	12	100	30	10	20	
6.0s	22 "	10	150	500	10	10	5000	(Zn 100)
6.5s	52 "	5-	30	100	30	5	1000	
7.0s	40 "	5-	10	70	20	5	700	
7.5s	52 "	5	12	25	20	2	1000	
8.0s	46 "	5-	12	50	50	5	1000	
8.5s	51 "	5-	10	50	20	2	700	
9.0s	52 "	5	12	25	30	2	700	
9.5s	52 "	5	5-	25	30	2	300	
10.0s	46 "	5	5	25	50	2	100	
11.5s	44 "	5-	5	25	50	2	100	

P and Bi sought but not detected.

Plate Nos. 736, 737.

REPORT No 35

20/4/64

SPECTROCHEMICAL ANALYSIS OF GEOCHEMICAL SAMPLES FROM TENNANT CREEK N.T.

BY

A.D. HALDANE

Semiquantitative estimations were made of the trace metal content of 10 auger samples from Mary Lane Prospect, Tennant Creek. The samples were submitted by A.L. Mather.

All results are expressed in parts per million.

Grid Reff.	Ni	Co	Cu	V	Mo	Pb
149E/10s	10	15	30	100	5	10
149.5E/9.5s	5	20	50	50	5	a
149.5E/10s	5-	10	100	50	5	700
149.5E/10.5s	5-	10	100	50	5	50
150E/9.5s	5	15	50	50	5	20
150E/10.5s	5-	5	50	20	5	a
150.5E/9.5s	5-	5	50	50	5	a
150.5E/10.5s(1)	5-	5	10	20	5	a
150.5E/10.5s(2)	5-	5	10	5-	5	a
151E/10s	5	15	25	20	5	a

Zn, Bi, P were sought but not detected in any sample.

Plate No. 744

REPORT N° 36 — 20/4/64

SPECTROCHEMICAL ANALYSIS OF GEOCHEMICAL SAMPLES FROM FENTON PROSPECT N.T.

BY A.D. HALDANE

Semiquantitative estimations were made of the trace metal content of soil samples from United Uranium, Fenton Prospect.

The samples were submitted by A.L. Mather.

All results are expressed in parts per million.

Grid Reff	Sample No.	Ni	Co	Zn	Cu	V	Mo	Sn	Pb	Remarks
400s/ 00	F10	10	12	100	100	200	10	a	20	
120E	11	10	60	100	100	20	10	a	5	
120W	12	10	15	100	200	200	10	a	5	
800s/ 00	13	12	15	100	150	200	12	a	70	
120W	14	10	20	100	100	200	10	a	20	
1200s/125W	15	20	40	100.	200	200	10	a	20	
160E	16	30	60		150	150	5	a	20	
1600s/ 00	17	5	12	100	150	200	20	a	40	
210W	18	5	15	100	100	100	10	a	20	
165E	19	40	60		150	200	5	a	100	
2000s/ 00	20	5	12	100	150	500	10	a	50	
270W	21	5	30	100	100	200	10	a	20	
210E	22	10	60		100	100	10	a	20	
2400s/ 00	23	30	60		200	400	10	a	5-	
220E	25	12	60	100	70	100	5	a	5	
2800s/ 00	26	5	10		100	150	10	a	10	
186W	27	5	12		10	20	5	10	5	
160E	28	10	20		50	50	5	a	10	
3200s/ 00	29	10	20		100	150	10	10	10	
3600s/ 00	30	12	40		1000	200	10	70	5	
180E	31	5	12		25	50	5-	100	5	
4000s/ 00	32	10	30		15	100	5	700	5	
240W	33	5	10		50	20	5	50	5	
165E	34	5-	10		25	20	5	20	10	
4300s/ 00	35	5	10		50	20	5	10	5	
180W	36	5-	5-		15	5	5-	40	5	
4000s/130E	37	5-	5		15	5	5-	5-	5	
4800s/180E	38	10	12		15	20	5-	10	5	
150W	39	5-	5-		15	5-	5-	70	5-	
360W	40	5-	5		25	10	5-	50	5-	
5200s/ 00	41	5-	5		10	10	5-	50	5	
220E	42	5-	15		10	20	5-	20	5-	
5600s/ 00	43	5-	5		10	20	5-	50	5-	
185E	44	5-	5-		5-	20	5-	5	5-	
315W	45	5	5		50	20	5-	50	5-	

Grid Reff	Sample No.	Ni	Co	Zn	Cu	V	Mo	Sn	Pb	Remarks
6000s/ 00	F46	5	5		10	20	5-	70	5-	
210E	47	5	10		5-	20	5-	a	5-	
6400s/ 00	48	5	10		10	20	5-	50	5-	
1200s/ 00	52	30	60		100	50	5-	a	20	
4800s/ 00	53	5	12		15	20	5-	50	5-	
8000s/ 00	54	60	60		70	150	10	100	5	(Be 10)
210W	55	12	15		15	50	10	70	5	
400N/ 00	56	5	15		70	40	10	10	50	
100E	57	12	30		100	40	10	10	70	
70W	58	10	20		100	50	15	10	20	
800N/ 00	59	10	15		70	50	10	5	10	
250E	60	10	30		50	15	5	10	20	
125W	61	12	30		100	150	10	10	20	
1200N/ 00	62	12	150		50	50	5	5	a	
300W	63	60	30		400	400	15	10	10	
2000N/ 00	64	5-	12		50	200	15	10	50	
170E	65	10	12		70	100	10	5	50	
200W	66	5-	10		10	20	10	5	a	
2400N/ 00	67	12	15		100	200	10	5	100	
200E	68	80	80		50	150	5	10	50	
150W	69	10	30		50	150	5	5	50	
2800N/ 00	70	20	30		100	150	10	10	100	
130W	71	12	20		100	200	10	10	100	
250W	72	60	60		50	200	5	10	100	
3000N/ 00	73	5	15		50	20	5	5	50	
3600N/ 00	74	10	12		70	200	15	5	50	
4000N/ 00	75	10	15		100	200	10	5	70	
120W	76	5-	40		50	200	10	a	200	
150E	77	12	30		50	100	5	a	100	
5200N/120W	79	12	30		100	200	15	a	10	
180E	80	10	30		70	20	10	a	5	
5600N/ 00	81	12	20		100	300	15	a	20	
7200N/ 00	82	20	30		200	300	15	a	20	
100W	83	30	30		200	400	20	a	70	
120E	84	15	20		100	200	10	a	20	
7600N/ 00	85	15	30		100	200	10	a	100	
100W	86	20	30		100	200	10	a	100	
130E	87	20	60		100	100	5	a	1000	
8800N/ 00	88	5-	15		200	400	20	a	50	
140W	89	5	20		70	400	15	a	200	
150E	90	10	15		100	200	10	a	10	
9200N/ 00	91	10	30		100	200	15	a	20	
180W	92	10	60		100	300	10	a	10	

Grid Reff	Sample No.	Ni	Co	Zn	Cu	V	Mo	Sn	Pb	Remarks
12[illegible]	F93	5	12		100	100	5	a	50	
9600N/ 00	94	12	12		300	300	30	a	100	
[illegible]	95	5–	12		100	300	20	a	150	
150E	96	10	40		100	100	10	a	20	
10000N/ 00	97	12	20		300	300	20	a	100	
100W	98	5–	30		70	300	10	a	200	
110E	99	10	20		100	100	5	a	100	
12400N/ 00	100	5	20		70	500	15	a	10	
110W	101	5	15		50	300	10	a	10	
180E	102	20	30		100	100	10	a	5	

a = Sought but not detected

Plate Nos. 732 – 735

Report No 37 68 20/4/64

SPECTROCHEMICAL ANALYSIS OF GEOCHEMICAL SAMPLES FROM NEW GUINEA

BY

A.D. HALDANE

Semiquantitative estimations were made of the trace metal content of geochemical samples submitted by A. Mather, from Port Moresby - Rigo.

All results are expressed in parts per million.

Sample No.	Ni	Co	Cu	V	Mo	Sn	Pb	Remarks
Rock Samples								
010006	P	P	P	P	P	P	a	Manganese ore
010007	100	100	100	500	5-	a	5	
010008	5	60	200	20	10	a	5	
010009	150	100	50	500	5-	a	5	
010010	30	60	70	500	5-	a	a	
010011	5-	150	100	1000	5-	a	a	
010012	5	100	10	500	5-	a	a	
010013	5-	30	15	200	5	a	10	
010014	5-	30	15	300	5	a	10	
Gossan Samples								
010015	P	P	P	P	P	P	a	Manganese ore
010016	5-	60	500	20	10	a	a	
010017	5-	5	500	5-	20	a	a	
010001	5	12	1000	200	10	a	5	
010003	5-	10	200	5-	100	a	a	
010054	5-	5-	5000+	200	500	a	5000+	(Zn 500) Bi present
010075	5-	5-	1500	5-	200	a	5000+	(Zn 500)
Mineralised Rock Samples								
010018	5-	5	5000+	100	10	a	20	(Zn 200)
010019	5-	150	5000+	5-	500	a	1000	
010020	5-	150	5000+	5-	100	300	5000+	(Zn 5000+)
010021	5	15	5000+	500	5-	a	10	(Zn 200)
010022	40	60	5000+	200	5	a	10	(Zn 1000)
010023	5-	5-	5000+	100	5	a	5	
010053	5-	5-	5000+	5-	1000	700	1000	(Zn 1%+)
Soil Samples								
010061	20	30	300	150	5	a	a	(Zn 100)
010062	20	60	150	150	5	a	a	
010063	30	60	300	200	5	a	a	
010064	30	20	100	150	5	a	5	
010065	60	30	500	150	5	a	5	
010066	20	30	1500	100	20	10	100	(Zn 500)
010067	5	20	1000	100	5	a	50	(Zn 700)
010002	5-	5	1500	20	150	500	1000	(Zn 200)
010068	10	30	70	150	5	a	5	

P = Present but value not estimated
a = Sought but not detected
Plate Nos. 730-732

REPORT No 38 69 20/4/64

SPECTROCHEMICAL ANALYSIS OF GEOCHEMICAL SAMPLES FROM ASTROLABE, NEW GUINEA

BY

A.D. HALDANE

Semiquantitative estimations were made of the trace metal content of 27 samples from Astrolabe, New Guinea. The samples were submitted by A.L. Mather.

All results are expressed in parts per million.

Sample No.	Ni	Co	Cu	V	Mo	Pb	Remarks
010005	60	60	150	200	5-	a	
010055	150	80	150	500	5-	a	
010056	30	30	100	100	5	5	
010057	40	60	200	300	5	5	
010058	30	40	150	300	5	100	(Sn 150)
010059	30	20	70	150	5-	5	
010060	20	30	100	200	5	5	(Sn 5)
010069S	20	30	500	300	5	20	
010071S	40	40	70	150	5	5	(Sn 15)
010072S	150	80	150	300	5-	5	
010073S	200	80	200	400	5-	a	
010074S	80	80	300	400	5	a	
010076	15	30	50	500	5-	5	
010078	20	40	70	300	5-	a	
010080	10	30	50	300	5-	a	
010083	60	60	70	400	5-	a	
010086	30	80	70	600	5-	a	(Sn 5)
010089	60	40	40	500	5-	a	
010090	10	40	70	500	5-	a	
010092	10	20	40	200	5-	5	
010094	15	20	60	100	5	5	
010095	30	50	70	400	5-	a	
010096	30	40	70	300	5-	a	
010097	60	50	70	150	5-	a	
010098	15	40	70	300	5-	a	
010099	15	25	50	500	5-	a	
010100	15	12	100	150	5-	a	

Bi, P, Zn were sought but not detected in any sample.

Plate Nos. 744, 745

REPORT N° 39

File 198/Q5.
22/4/64

MINERAGRAPHIC INVESTIGATIONS OF THREE DUMP SPECIMENS FROM MOUNT GARNET MINE. N.Q'LD.

by

I.R. Pontifex.

Samples submitted by K.Yates for identification of the ore minerals and to check for the presence of galena.
Locality - Dump of Mount Garnet (Copper) Mine, one quarterof a mile south of Mount Garnet. N.Q.

Conclusions:

The ore minerals in this suite of specimens are chalcopyrite, sphalerite, pyrrhotite, pyrite and magnetite. In each specimen the sphalerite, chalcopyrite and pyrrhotite exhibit exsolution characteristics which indicate that these minerals derived from a common hydrothermal solid-solution and crystallised at about 400°C.

Pyrite, present in two of the specimens, was introduced earlier in the paragenesis than the above mentioned sulphide complex.

Brecciated quartz-magnetite is host-rock to the sulphide minerals in one specimen, a calc-silicate rock is host to the sulphides in another.

No galena was observed in any specimen.

Field No.1

Ore minerals and approximate proportions. Magnetite 40%; sphalerite 40%; pyrrhotite 1%; chalcopyrite 0.5%; pyrite 1%.

Micro description: Throughout the section magnetite occurs in highly irregular masses which contain abundant voids and fractures, most of which are filled with quartz.

Spaces within the quartz-magnetite have been filled by irregular masses of sphalerite with the result that the entire rock consists of a complex intergrowth of quartz-magnetite and sphalerite. Accessory amounts of pyrite grains up to 0.05 mms. across are associated with the quartz within the magnetite.

The sphalerite contains minor accessory amounts of fine exsolution blob like bodies of chalcopyrite and pyrrhotite The chalcopyrite bodies have a maximum size of 0.05 mms. across but generally they measure about 0.001 mms. Some of these are distributed along the crystallographic axes of the sphalerite, however, the majority have an apparent random distribution which produces an emulsion texture through the host. Narrow veins of chalcopyrite border the periphery of some sphalerite grains

The pyrrhotite bodies are less wide spread than the chalcopyrite, these are commonly elliptical and measure up to 0.03 mms. across. Pyrrhotite rarely borders sphalerite grains. Several composite grains of pyrrhotite and chalcopyrite are also enclosed by sphalerite.

Field No.2

The ore minerals in this specimen consist mainly of irregular veins and stringers of pyrrhotite (5%) and intimately related chalcopyrite (1%); these veins are associated with a grey-green calc silicate rock. Several veins of sphalerite 0.02 mms. wide carry extremely fine exsolution bodies of chalcopyrite and pyrrhotite.

One grain of pyrite in quartz is fractured along its cleavage planes, these fractures are partly filled by pyrrhotite.

The sulphide minerals almost exclusively follow the intergranular boundaries of the crystalline silicate matrix but they do not enter voids within or replace the components of the host-rock. These relationships suggest that the ore minerals were present during the crystallisation of the host rock.

(continued on p. 72)

 See p 72.

Field No. K.30.

Locality: Salt lake north of Migura Well, Kulgera Sheet, N.T.

The composition of this sample is summarised in the following table. The methods of analysis which produced these results are described later in this report.

Radicals detected in the flame photometer; mainly Na, also K, Ca, Mg, Sr.

Radicals detected chemically, abundant Cl, minor SO_4, less than 1 ppm. B.

Component fractions	Wt%	Composition and minerals found by x-ray and petrologically	Probable mineral equivalents in salt crust specimens.
Fraction soluble in H_2O	70.45	NaCl halite.	halite.
Fraction insoluble in H_2O, soluble in HCl	4.11	$CaSO_4$ anhydrite	anhydrite or gypsum
Fraction insoluble in H_2O, insoluble in HCl	25.50	sand, clay, limonite.	-

The K, Mg and Sr probably from admixtures with the halite and gypsum.

Methods of Analysis.

1. The samples were analysed in the flame photometer by S.Baker for the elements, Na, K, Ca, Mg and Sr.
2. N.Le Roux chemically analysed the samplew semi-quantitatively for the Cl and SO_4 radical and quantitativesy for the B content.
3. A mineralogical examination of the evaporite components was conducted on the basis of the selective solubility of evaporite minerals in H_2O and HCl.
4. The fraction soluble in H_2O and the fraction soluble in HCl but insoluble in H_2O were separated from their respective solvents by filtration and subsequent evaporation.
5. The composition of a random sample of each residue was determined from an x-ray powder diffraction pattern photograph.
6. A random sample of each residue was examined petrologically to determine the possible presence of more than one mineral in that fraction.

Laboratory Serial No. 1026A.

Field No.3

This rock consists of chalcopyrite (45%), pyrrhotite (35%), sphalerite (5%), alteration products (5%).

The ore minerals are leached; sphalerite shows the most extensive alteration and is commonly accompanied by limonite; chalcopyrite is selectively leached along crystallographic axial planes.

Chalcopyrite and pyrrhotite occur in irregular masses with mutual interlocking boundaries. Some pyrrhotite is localised along the periphery of chalcopyrite masses, commonly adjacent to sphalerite.

Sphalerite shows an almost exclusive association with chalcopyrite although some small blebs are disseminated through pyrrhotite. Irregular bleb like masses of sphalerite up to 0.5 mms. across occur as inclusions in chalcopyrite and vein like masses border the periphery of some chalcopyrite grains. Some of the sphalerite contains minor amounts of disseminated extremely fine exsolution blebs of chalcopyrite.

File. 120NT/20.
27th April, 1964.

EXAMINATION OF EVAPORITES IN SALT LAKE CRUST FROM THE KULGERA 1:250,000 SHEET, NORTHERN TERRITORY.

REPORT No 40

by

Samples submitted by A.T.Wells for the determination of various evaporite components.

Field No.K.8

Locality : Pulcura Well, Kulgera Sheet, Northern Territory.

The composition of this sample is summarised in the following table. The methods of analysis which produced these results are described later in this report.

Radicals detected in the flame photometer; mainly Na, also K, Ca, Mg, Sr.

Radicals detected chemically; abundant SO_4, minor Cl, less than 1 ppm. B.

Component fractions.	Wt%	Composition and minerals found by X-ray and petrologically.	Probable mineral equivalents in salt crust specimen.
Fraction soluble in H_2O	48.12	Na_2SO_4 (90%) Thenardite NaCl (10%) Halite	Thenardite or mirabilite. Halite. Halite.
Fraction insoluble in H_2O, soluble in HCl	1.46	$CaSO_4$ Anhydrite	Anhydrite or gypsum.
Fraction insoluble in H_2O, insoluble in HCl.	50.41	Quartz-sand, clay, limonite.	-

The K, Mg and Sr detected by the flame photometer, probably form admixtures with the evaporite minerals since trace amounts of these elements can substitute for Na and Ca.

Continued on p. 71.

REPORT N° 41. 12th May, 1964.

Spectrographic Analysis of Samples from Rum Jungle, N.T.

by

A.D. Haldane

This report gives the results from analysis of core samples from D.D.H. A2, A3 and D690 Area 55. The samples were submitted by P. Pritchard.

All results are expressed in parts per million.

D.D.H. A2		Ni	Co	Zn	Cu	V	Mo	Pb	Remarks
107'6"	- 109'6"	150	30	200	150	150	10	1500	
318'	- 320'	500	500	1500	300	500	a	2000	
151'	- 153'6"	1000	2000	1500	5000+	500	15	5000	
150'	- 151'	700	60	500	5000+	20	10	5000	(PTr)
148'	- 150'	100	60	1000	150	500	a	5000	(PTr)
129'	- 131'	300	60	500	1000	300	10	5000	(PTr)
127'	- 129'	300	60	200	1000	400	10	1000	
124'	- 127'	100	20	1000	700	100	a	2000	(Sn, 20)
123'	- 124'	300	60	2000	1500	50	10	5000	
105'6"	- 107'6"	500	150	500	1500	50	20	5000	
102'6"	- 105'6"	200	60	500	2000	150	15	5000	(Sn, 30)
100'6"	- 102'6"	150	30	100	1000	500	10	2000	
98'6"	- 100'6"	60	12	100	5000+	700	5	5000	
96'6"	- 98'6"	100	30	100	5000	500	15	5000+	
94'6"	- 96'6"	30	15	a	5000+	700	a	5000+	(PTr)
92'6"	- 94'6"	60	30	a	5000+	1000	10	5000+	(PTr)
84'	- 86'6"	100	100	a	700	500	a	5000+	(PTr)
82'6"	- 84'	150	60	a	200	500	15	5000	(PTr)
80'	- 82'6"	30	30	a	500	700	50	5000+	(PTr)
77'6"	- 80'	30	30	a	200	700	70	5000	(PTr)
75'	- 77'6"	12	20	a	150	500	80	5000+	(PTr)
72'6"	- 75'	15	20	a	200	500	80	5000+	(PTr)
70'	- 72'6"	15	20	a	200	500	100	5000+	(PTr)

D.D.H. A2		Ni	Co	Zn	Cu	V	Mo	Pb	Remarks
67'	- 70'	5	10	a	150	500	70	5000+	(PTr)
63'	- 67'	5-	5	a	70	500	15	5000+	(PTr)
60'	- 63'	5-	5-	a	70	400	5	1000	(PTr)
57'	- 60'	5-	5-	a	70	500	15	2000	(PTr)
50'	- 53'	5-	5	a	70	500	50	500	(PTr)
48'	- 50'	5-	5-	a	70	700	70	700	(PTr)
40'	- 48'	5-	5-	a	50	500	70	1000	(PTr)
34'	- 40'	5-	5	a	50	500	100	500	(PTr)
30'	- 34'	12	12	a	100	500	150	1000	(PTr)
26'	- 30'	12	15	a	100	700	70	1000	(PTr)
24'	- 26'	60	30	100	200	300	100	2000	(PTr)
22'	- 24'	60	60	200	400	300	20	2000	(PTr)
20'	- 22'	20	20	a	100	500	20	700	(PTr)
D.D.H. A3									
46'3"	- 47'9"	5-	15	a	1000	500	10	5000	
69'	- 72'	40	20	a	5000+	700	20	5000+	
68'	- 72'	20	20	a	2000	500	15	5000+	
72'	- 83'	40	20	a	5000+	600	15	5000+	
149'6"	- 152'	2000	500	3000	5000	1000	300	5000+	
218'	- 220'	1000	1500	3000	1000	300	a	5000	
222'	- 225'	700	1000	3000	70	500	a	100	
225'	- 229'	700	1000	3000	500	500	a	5000+	
229'	- 230'	500	500	1000	200	500	20	3000	
250'6"	- 255'	300	200	700	300	300	a	5000	
260'	- 264'	700	1000	a	2000	600	5	5000+	
307'	- 310'	400	1000	a	100	500	5	1000	
310'	- 312'6"	500	200	a	100	500	a	100	
312'6"	- 315'6"	700	300	a	70	700	10	500	
315'6"	- 318'	600	500	700	100	500	a	200	
324'6"	- 328'	1000	1000	1000	100	500	70	3000	
365'	- 368'	2000	700	a	100	300	5	1000	
361'	- 363'	200	150	a	1000	100	50	150	
335'	- 340'	100	150	a	1000	10	30	1000	(Sn, 200)
331'6"	- 335'	300	150	a	70	400	15	1000	
328'	- 331'6"	700	500	a	100	400	a	1000	
214'6"	- 219'	1000	1000	3000	1000	400	5	5000	
368'	- 373'6"	60	100	a	500	50	5	200	
373'6"	- 378'	60	200	a	500	20	10	200	
378'	- 386'	80	150	a	150	50	20	70	
10'	- 12'	20	20	a	1000	1000	100	5000+	
12'	- 14'	15	20	a	500	500	5	5000+	
14'	- 16'	15	30	a	1000	500	20	5000+	
16'	- 18'	10	15	a	700	700	10	5000+	
205'	- 210'	400	1000	3000	1000	300	50	1000	

D.D.H. A3	Ni	Co	Zn	Cu	V	Mo	Pb	Remarks
18' - 20'	12	20	a	300	500	5	5000+	
20' - 22'	5	10	a	500	500	70	5000+	
22' - 24'	10	10	a	700	500	5	5000+	
24' - 26'	5	10	a	700	700	20	5000+	
26' - 28'	5	10	a	700	700	50	5000+	
28' - 30'	5	10	a	700	500	10	5000+	
30' - 33'6"	5	10	a	700	500	10	5000+	
33'6" - 38'	10	12	a	1000	500	5	5000+	(Sn, 10)
38' - 43'9"	10	12	a	1000	500	20	5000+	
43' - 46'3"	10	15	a	1500	500	10	5000+	
121'6" - 126'6"	2000	2000+	3000	5000+	500	50	5000++	
131'6" - 134'	2000	2000+	5000	5000+	500	20	5000++	
219' - 222'	700	2000	2000	700	300	a	5000	
176' - 181'	700	500	5000	200	300	10	1000	
181' - 185'	300	500	2000	100	300	a	700	
185' - 190'	300	500	2000	100	300	a	200	
190' - 195'	300	300	2000	200	300	a	100	
195' - 200'	300	300	1000	100	400	a	500	
200' - 203'	300	300	1500	150	300	a	1000	
203' - 205'	300	500	1500	200	500	a	3000	
205' - 210'	200	700	1500	150	400	a	1500	
210' - 214'6"	700	700	2000	500	500	a	5000	
112' - 116'	700	500	3000	3000	200	150	5000	
116' - 117'	500	1000	3000	5000	300	100	5000+	
117' - 121'6"	700	500	4000	5000+	500	50	5000+	
126'6" - 131'6"	700	1000	4000	5000+	400	70	5000+	
135' - 139'6"	2000	2000+	5000	5000+	300	30	5000+	
139'6" - 144'	2000	2000	5000	5000+	500	30	5000+	
146' - 149'6"	700	500	2000	5000	500	70	5000+	
230' - 233'	150	200	1500	200	300	15	2000	
233' - 235'	150	200	1000	100	300	30	2000	
235' - 237'	200	300	1000	100	300	a	500	
237' - 240'6"	200	300	1000	100	500	a	150	
240'6" - 242'	300	500	1000	200	500	10	1000	
242' - 246'6"	500	1000	1000	300	400	15	5000	
246'6" - 250'6"	1000	1000	500	1000	400	15	5000+	
108' - 109'6"	300	200	700	4000	500	150	5000+	
D690								
80' - 82'6"	20	15	100	700	500	15	1000	
22'6" - 25'	100	30	100	300	200	10	1000	
110' - 112'6"	30	30	100	5000	500	20	500	
97'6" - 100'	30	20	100	150	700	50	1000	

Be was sought but not detected in any sample

plate Nos. 751 and 752, 756 - 758

REPORT No 42

19th May, 1964.

Spectrographic Analysis of Samples from Rum Jungle, N.T.

by

A.D. Haldane

This report gives the results from analysis of core samples from C.D. 155, 158, 162, 163, 165, 168, 169, 172, 173 and 174. The samples were submitted by P. Pritchard.

All results are expressed in parts per million.

C.D. 155	Ni	Co	Zn	Cu	V	Mo	Pb	Remarks
20' - 25'	300	150	a	700	500	a	1000	
25' - 30'	200	150	a	800	1000	a	1000	
30' - 35'	300	150	a	800	500	a	1000	
35' - 40'	200	300	a	1000	1000	5	2000	
40' - 45'	150	100	a	1000	300	5	300	
45' - 50'	300	500	a	1500	300	10	200	
50' - 55'	200	200	a	1000	200	7	200	
55' - 60'	200	200	a	1000	200	7	100	
60' - 65'	400	100	a	700	200	10	200	
65' - 70'	300	200	a	1500	200	7	200	
70' - 75'	500	500	a	2000	300	7	500	
75' - 80'	500	300	a	2000	500	10	700	
80' - 85'	200	100	a	1000	200	7	100	
85' - 90'	500	300	a	2000	300	5	100	
90' - 95'	300	300	a	1500	200	5	200	
95' - 100'	400	500	a	3000	300	5	200	
100' - 105'	500	500	a	5000	200	5	700	
105' - 110'	500	700	a	5000+	300	7	500	
110' - 115'	400	1000	a	5000	200	5	700	
115' - 120'	500	1000	a	5000+	200	7	1000	
120' - 125'	500	1000	a	5000+	200	10	2000	
125' - 130'	1000	2000	a	5000+	200	10	2000	
C.D. 158								
15' - 20'	100	60	a	700	10	20	500	(Sn, 30)
20' - 25'	100	60	a	700	20	20	500	
25' - 30'	100	60	a	1000	5-	5	700	
30' - 35'	500	1000	a	1500	5	15	5000+	
35' - 40'	500	1000	a	3000	5	10	5000	
40' - 45'	500	1000	500	5000	10	15	5000	(Be, 10)

C.D. 158		Ni	Co	Zn	Cu	V	Mo	Pb	Remarks
50'	- 55'	1000	1000	1500	5000+	20	10	1500	(Be, 20)
55'	- 60'	2000	2000	2000	5000	30	10	1000	(Be, 20)
60'	- 65'	2000	2000	2000	5000	20	10	700	(Be, 20)
65'	- 70'	1000	1000	2000	5000	5-	5	700	(Be, 20)
70'	- 75'	2000	1500	700	5000	40	15	700	(Be, 10)
80'	- 85'	700	500	700	1000	10	15	50	
85'	- 90'	400	400	200	1000	10	10	50	
95'	- 100'	500	300	300	1000	50	10	70	
100'	- 105'	1000	1000	1000	2000	20	10	100	
C.D. 162									
55'	- 60'	150	80	a	700	700	15	5000+	
60'	- 65'	80	100	a	500	1000	20	5000+	
65'	- 70'	80	80	a	400	1000	20	5000+	(Sn, 20)
70'	- 75'	100	100	a	1000	500	15	5000+	
75'	- 80'	150	150	a	1500	700	70	5000+	
80'	- 85'	300	200	a	1500	700	20	5000+	
15'	- 20'	200	100	a	1000	700	15	5000+	
20'	- 25'	80	60	a	1500	1000	15	5000+	
30'	- 35'	30	20	a	1000	500	10	5000+	
35'	- 40'	60	60	a	700	500	20	5000+	
40'	- 45'	60	100	a	700	700	15	5000+	
50'	- 55'	30	150	a	700	700	20	5000+	
85'	- 90'	500	150	a	1500	700	15	5000+	
90'	- 95'	300	150	700	1500	500	15	5000+	
95'	- 100'	300	150	700	1500	500	15	5000+	
100'	- 105'	500	150	200	1500	400	10	5000+	
105'	- 110'	400	200	300	1500	500	15	5000+	
110'	- 115'	400	150	500	1500	400	5	5000+	
115'	- 120'	500	200	500	3000	500	20	5000+	
120'	- 125'	500	200	700	3000	500	20	5000+	
125'	- 130'	700	300	2000	5000	500	30	5000+	
130'	- 135'	2000+	700	2000	5000+	700	20	5000+	
135'	- 140'	2000+	700	1500	5000	500	20	5000+	
145'	- 150'	1000	700	1000	1500	500	15	5000+	
150'	- 155'	2000+	2000+	4000	700	500	15	5000+	
155'	- 160'	2000	2000	1500	1000	700	30	5000+	
160'	- 165'	2000	2000	700	1000	500	20	5000+	
165'	- 170'	2000+	2000+	1000	1000	500	50	5000+	
170'	- 175'	2000	1000	1000	1000	400	15	2000	
170'	- 175'	2000+	1000	1000	1500	400	15	5000	
175'	- 180'	2000	1000	1%	1500	400	15	4000	
180'	- 185'	2000+	1500	1%	700	500	20	5000	

C.D. 162		Ni	Co	Zn	Cu	V.	Mo	Pb	Remarks
185'	- 190'	2000+	1000	500	500	500	70	1500	
190'	- 195'	1500	700	1000	500	500	15	5000+	
195'	- 200'	2000	1500	1500	5000	700	200	5000	
200'	- 205'	2000	700	1000	1500	400	500	5000	
205'	- 210'	2000	500	100	1500	500	50	5000	
210'	- 215'	2000	1000	200	4000	400	400	3000	
215'	- 220'	2000+	2000	500	5000+	500	30	2000	
220'	- 225'	2000	1500	1000	5000+	200	300	1000	
C.D. 163									
35'	- 40'	1000	1000	a	500	500	a	100	(Sn, 20)
40'	- 45'	700	400	a	500	100	300	50	
50'	- 55'	1000	1000	a	700	200	20	20	
55'	- 60'	700	500	a	1000	50	15	a	
60'	- 65'	1000	1000	200	1500	200	10	a	
65'	- 70'	700	1000	a	1000	150	10	a	
70'	- 75'	500	500	a	700	200	20	20	
C.D. 165									
165'	- 170'	300	500	a	5000	500	20	5000+	(Sn, 20)
210'	- 215'	600	500	a	5000+	500	10	5000	(Sn, 10)
215'	- 220'	500	500	a	4000	500	10	2000	(Sn, 10)
220'	- 225'	500	300	a	1500	500	10	2000	(Sn, 10)
225'	- 230'	500	300	a	1000	500	10	1000	(Sn, 20)
230'	- 235'	400	300	a	2000	500	15	1000	(Sn, 10)
235'	- 240'	400	500	a	1000	500	5	500	(Sn, 10)
240'	- 245'	1000	2000	a	700	500	5	2000	(Sn, 10)
245'	- 250'	1000	2000	a	500	1000	10	1000	(Sn, 15)
C.D. 168									
20'	- 25'	30	60	a	1500	700	20	5000+	
50'	- 55'	200	150	500	2000	700	20	5000+	
55'	- 60'	150	100	500	1500	1000	20	5000+	
60'	- 65'	30	60	a	1000	500	20	5000+	(Sn, 10)
65'	- 70'	60	100	a	1500	500	30	5000+	
70'	- 75'	150	100	500	1500	500	10	5000+	
75'	- 80'	500	200	1000	2000	500	10	5000+	
80'	- 85'	1000	200	700	1500	300	10	5000+	
85'	- 90'	500	500	500	2000	500	50	5000+	
90'	- 95'	500	500	700	5000	500	15	5000+	
95'	- 100'	1000	1000	1000	5000	700	50	5000+	
100'	- 105'	500	1000	500	4000	300	30	5000+	
105'	- 110'	500	500	500	2000	500	20	5000+	
110'	- 115'	1000	2000	500	3000	400	20	5000+	

C.D. 168		Ni	Co	Zn	Cu	V	Mo	Pb	Remarks
120'	- 125'	2000	2000	700	5000+	500	20	5000+	
125'	- 130'	2000	2000	700	4000	500	20	5000+	
130'	- 135'	1000	2000	700	3000	500	10	5000+	
135'	- 140'	1000	2000	700	2000	400	15	5000+	
140'	- 145'	1000	2000	500	3000	300	15	5000+	
145'	- 150'	1000	1500	700	4000	400	10	5000+	
150'	- 155'	1000	1500	500	4000	500	15	5000+	
155'	- 160'	1000	1000	500	4000	300	10	5000+	
160'	- 168'	1000	1000	400	5000	700	10	5000+	
170'	- 175'	1000	2000	500	5000	400	10	5000+	
175'	- 180'	2000	2000	700	5000+	400	10	5000+	
180'	- 185'	2000	2000	700	5000	500	70	5000+	
C.D. 169									
15'	- 20'	15	10	a	50	2000+	10	70	
20'	- 25'	20	12	a	25	2000+	10	100	
25'	- 30'	30	12	a	50	2000+	10	70	
30'	- 35'	100	20	a	100	2000+	70	100	
40'	- 45'	100	12	a	70	400	15	100	
45'	- 50'	30	15	a	15	200	10	50	
50'	- 55'	30	10	a	20	300	10	50	
55'	- 60'	30	10	a	10	300	10	20	
60'	- 65'	15	5	a	10	300	10	20	
70'	- 75'	20	10	a	10	150	10	200	
75'	- 80'	20	5	a	15	150	10	a	
80'	- 85'	20	5	a	10	100	5	a	
90'	- 95'	30	10	a	10	150	20	50	
95'	- 100'	30	10	a	5	200	50	a	
100'	- 105'	60	5	a	15	20	10	a	
105'	- 110'	60	10	a	25	15	10	a	
110'	- 115'	100	20	a	20	100	20	a	(Sn, 15)
115'	- 120'	100	20	a	15	150	5	a	(Sn, 10)
125'	- 130'	150	30	a	25	20	10	a	
130'	- 135'	200	20	a	25	20	10	a	
135'	- 140'	200	30	a	15	50	10	a	
140'	- 145'	200	40	a	15	100	15	a	
145'	- 150'	150	30	a	15	150	10	a	
150'	- 155'	150	60	a	15	150	10	a	(Sn, 10)
155'	- 160'	150	60	a	10	200	10	a	(Sn, 5)
160'	- 165'	100	60	a	5	200	5	a	(Sn, 10)
85'	- 90'	20	10	a	10	200	5	a	(Sn, 5)
165'	- 170'	100	30	a	10	100	10	a	(Sn, 10)
170'	- 172'	100	30	a	10	150	5	a	(Sn, 10)

C.D. 172	Ni	Co	Zn	Cu	V	Mo	Pb	Remarks
50' - 55'	100	50	a	200	50	5	100	
55' - 60'	200	100	a	500	500	a	100	
60' - 75'	200	100	a	700	500	a	100	
65' - 70'	200	60	a	700	300	15	100	
70' - 75'	150	60	a	300	300	a	100	
75' - 80'	150	80	a	200	500	a	50	
80' - 85'	200	100	a	200	500	a	50	
85' - 90'	400	200	a	300	300	10	a	
90' - 95'	500	200	a	100	200	15	a	
95' - 100'	500	200	a	200	200	15	a	
100' - 105'	300	200	a	1000	200	10	a	
C.D. 173								
30' - 35'	200	60	a	50	500	a	10	(Sn, 10, PTr)
35' - 40'	150	100	a	20	200	a	10	(Sn, 10, PTr)
40' - 45'	100	60	a	70	400	5	5	(PTr)
45' - 50'	200	100	a	70	400	20	a	
50' - 55'	150	30	a	25	100	5	a	
55' - 60'	200	30	a	20	100	10	a	
60' - 65'	150	30	a	25	150	10	a	
65' - 69'	20	12	a	5	5	a	a	
C.D. 174								
10' - 15'	150	50	a	300	500	20	100	
15' - 20'	100	30	a	200	300	15	10	
20' - 25'	150	400	a	200	200	25	20	
25' - 30'	200	200	a	100	100	15	20	
30' - 35'	300	150	a	50	50	5	20	

Plate Nos. 758 - 762 and 764 - 766

REPORT No 43 May, 1964.

Spectrochemical Analysis of Samples from
Rum Jungle, N.T.

by

A.D. Haldane

Semiquantitative estimations were made of the trace metal content of core samples from Area 55 Rum Jungle. The samples were submitted by P. Pritchard.

All results are expressed in parts per million.

D.D.H. A1	Ni	Co	Cu	V	Mo	Pb	Remarks
264' - 265'	2000	1500	50	10	5	a	(Zn2000, Sn5)
257'6" - 264'(1)	300	200	100	300	a	50	(Zn200)
257'6" - 264'(2)	500	500	100	500	100	70	(Zn200)
255' - 256'	800	500	50	200	5	a	(Zn300)
225' - 227'6"	150	80	200	300	150	3000	(Zn100)
223' - 225'	200	80	500	500	a	2000	(Zn300, Sn10)
220'6" - 223'	300	80	70	300	15	50	(Zn100)
217'6" - 220'6"	300	150	200	300	5	1000	(Zn200, Sn20)
214' - 217'6"	500	200	100	500	15	100	(Zn200)
210' - 212'6"	2000	1000	100	500	150	50	(Zn100)
185' - 188'	300	100	70	500	a	1000	(Zn100, Sn10)
180'6" - 185'	1500	500	300	300	20	3000	(Zn1000, Sn10,PTr)
162' - 166'6"(1)	20	20	1000	700	a	5000+	(Zn100, Sn20,PTr)
162' - 166'6"(2)	30	30	1500	700	a	5000+	(Zn200, Sn20,PTr)
158' - 162'	30	150	700	700	a	5000+	(Zn200, Sn20,PTr)
154' - 158'	60	30	1000	700	a	5000+	(Zn200, Sn10)
151'6" - 154'	200	300	1500	700	20	5000+	(Zn400, Sn50)
149' - 151'6"	60	100	1500	1000	a	5000+	(Zn400, Sn70)
146' - 149'	250	150	2000	1000	a	5000+	(Zn200, Sn50)
144' - 146'6"	100	15	5000+	1000	a	5000+	(Sn200, Sn50)
116' - 118'6"	100	30	500	500	10	5000+	(Zn100, Sn10)
87' - 88'	150	20	700	500	5	5000	(Zn200, Sn5)
85' - 87'	300	30	2000	500	5	5000	(Zn200, Sn5)
82'6" - 85'	300	60	2000	300	5	5000+	(Zn500)
371'6" - 373'	500	500	5000+	100	10	200	(Zn500, Sn10)
369' - 370'6"	200	100	5000	50	200	1000	(Zn100)
366'6" - 369'	200	100	5000+	100	5	700	(Sn10)
362'6" - 364'	500	300	5000+	300	5-	1000	
359'6" - 362'6"	300	150	3000	100	200	700	
357' - 359'6"	200	60	4000	5	10	700	

D.D.H. A1	Ni	Co	Cu	V	Mo	Pb	Remarks
354'6" - 357'	1000	150	4000	5	10	700	
353' - 354'6"	500	200	5000+	5-	10	700	
345' - 348'	300	150	5000+	5-	15	1500	
342'4" - 345'(1)	300	150	5000+	5-	15	1000	
339'2" - 342'4"	200	200	5000+	5-	15	600	
338'6" - 340'6"	200	150	5000+	5-	10	100	
336'6" - 338'6"	100	60	5000+	5-	10	500	
335'6" - 339'2"(1)	200	200	5000	5-	15	2000	
335'6" - 339'2"(2)	200	100	5000+	5-	20	200	
334'4" - 336'6"	200	60	1000	5-	30	500	
333' - 335'6"	150	80	1500	5-	20	1000	
331'6" - 333'	200	150	1500	5-	10	700	
329' - 331'6"	200	60	1500	5-	20	700	
324' - 326'	300	300	5000+	5-	15	600	
320'6" - 322'	400	200	3000	100	15	2000	
310' - 312'	200	80	1000	5-	10	200	
72' - 74'	500	100	1500	700	200	5000	
34' - 37'	200	60	1000	2000	150	5000+	
374'6" - 375'6"	500	500	5000+	150	15	100	(Zn500)
371' - 374'6"	700	1000	5000+	5-	15	200	(Zn500)
370'6" - 371'6"	300	500	5000+	50	5	700	(Zn1000, Sn10)
364' - 366'6"	200	150	5000+	150	5	200	(Zn100, Sn10)
351' - 353'	300	200	5000+	5-	20	700	
348' - 351'	300	200	5000	5-	15	1000	
342'4" - 345'(2)	300	300	5000+	5-	15	1000	
332' - 334'4"	300	100	5000	5-	15	3000	(Zn100)
329' - 332'	200	80	4000	5-	20	2000	(Zn100)
326' - 329'	200	80	4000	5-	15	700	
327' - 329'	200	60	2000	5-	10	700	
325' - 327'	300	100	5000+	5-	15	500	
323' - 325'	300	100	5000+	5-	10	300	
322' - 324'	200	300	5000+	5	15	700	
321' - 323'	400	300	1500	5-	20	1500	
318'6" - 320'6"	500	200	2000	5-	10	1500	
316'6" - 318'6"	300	150	1000	50	20	5000+	(Zn100)
314'6" - 316'6"	500	1000	5000+	30	40	1500	(Zn200)
312' - 314'6"	300	400	2000	20	10	1500	(Zn100)
308' - 310'6"	150	100	5000	5-	10	1000	
301' - 304'	700	300	5000+	100	100	3000	(Zn500)
283'6" - 286'	400	300	70	300	100	5000	(Zn100)
298' - 301'	200	200	3000	300	15	150	(Zn300, Sn10)
281' - 283'6"	500	200	70	500	150	5000+	(Zn100, Sn10)

3.

D.D.H. A1	Ni	Co	Cu	V	Mo	Pb	Remarks
76' - 78'	300	100	2000	300	10	5000	(Zn500)
74' - 76'	150	30	1000	150	15	5000	(Zn100)
70' - 72'	200	30	1000	200	20	5000	(Zn100)
67'6" - 70'	1000	150	5000	400	100	5000+	(Zn700)
65' - 67'6"	150	60	1500	150	150	5000	(Zn200)
37' - 39'	100	60	1000	1000	50	5000+	(Zn100)

Be was sought but not detected in any sample
Plate Nos. 749 - 751 and 753

REPORT N° 44

May, 1964.

Estimation of lead on Core Samples from Area 55,
Rum Jungle

by

S. Baker

Following are results for the determination of lead on core samples from Area 55.

D.D.H. A1	per cent lead
82'6" - 85'	0.20
85' - 87'	0.20
87' - 88'	0.29
116' - 118'6"	0.39
144' - 146'6"	0.77
146' - 149'	0.56
149' - 151'6"	0.16
151' - 154'	0.18
154' - 158'	1.2
158' - 162'	2.4
162' - 166' (1)	1.0
162' - 166' (2)	5.0

D.D.H. A2	per cent lead
63' - 67'	0.29
67' - 70'	0.35
70' - 72'6"	0.54
72'6" - 75'	0.50
75' - 77'6"	0.33
77'6" - 80'	0.33
80' - 82'6"	0.39
82'6" - 84'	0.62
84' - 86'6"	0.25
92' - 94'6"	0.93
94'6" - 96'	1.1

Report No. 45 May, 1964.

Estimation of Copper on Samples from Rum Jungle

by

S. Baker

Following are results for the estimation of copper on samples from Rum Jungle, submitted by P. Pritchard.

C.D. 162	Per Cent Copper
125' - 130'	0.45
130' - 135'	0.55
135' - 140'	0.65
195' - 200'	0.27
210' - 215'	0.45
215' - 220'	1.24

C.D. 168	Per Cent Copper
90' - 95'	0.40
95' - 100'	0.46
100' - 105'	0.28
120' - 125'	0.62
125' - 130'	0.52
145' - 150'	0.52
150' - 155'	0.48
155' - 160'	0.50
160' - 168'	0.57
170' - 175'	0.47
175' - 180'	0.47
180' - 185'	0.70

REPORT N°46

May, 1964.

Estimation of Copper on Core Samples from Area 55, Rum Jungle

by

S. Baker

Following are results for the determination of copper on core samples as AI from Area 55, Rum Jungle.

			per cent Copper
301'	-	304'6"	0.78
308'	-	310'6"	0.28
312'	-	314'6"	0.41
314'6"	-	316'6"	0.42
316'6"	-	318'6"	0.31
318'6"	-	320'6"	0.23
321'	-	323'	0.56
322'	-	324'	0.87
323'	-	325'	0.94
325'	-	327'	1.1
326'	-	329'	0.70
327'	-	329'	0.22
329'	-	332'	0.29
332'	-	334'4"	0.34
342'4"	-	345'(2)	1.5
348'	-	351'	0.29
351'	-	353'	0.60
364'	-	366'6"	0.94
370'6"	-	371'6"	0.72
373'	-	374'6"	0.65
374'6"	-	375'6"	0.87

REPORT N° 47 May, 1964.

Estimation of Copper and Lead on Core Samples D.G.17, 24, 25, 30 and 31 from Rum Jungle.

by

S. Baker

Following are results for the determination of Copper and Lead on Core Samples from Rum Jungle, N.T. Note D.G.17 has been assayed previously for Pb by X-ray fluorescence analysis and those results are unreliable and should be discarded.

D.G.17		per cent Lead			per cent Lead
3'	- 7'	1.9	91'	- 95½'	2.1
7'	- 9'	0.37	100'	- 103'	0.56
9'	- 13'	0.39	103'	- 103½'	1.4
13'	- 16'	0.58	103'4"	- 109'	0.54
17'	- 21'	1.2	116'	- 121'	1.4
21½'	- 26'	2.2	121'	- 127'	1.2
26'	- 31'	2.2			
31'	- 36'	0.75			
41'	- 46'	0.73			
46'	- 50'	0.48			
50'	- 54½'	0.52			
54½'	- 57'	0.79			
57'	- 62'	2.3			
62'	- 64'	7.0			
64'	- 66'	3.5			
66½'	- 67½'	3.5			
67'	- 71'	1.8			
71½'	- 76½'	0.68			
76'	- 80'	1.0			
80'6"	- 84'6"	0.68			
84½'	- 87¾'	1.6			
87¾'	- 91'	2.3			

D.G. 24	Recovery	per cent Copper	
348'7" - 349'6"	9"	0.52	
349'6" - 353'	11"	0.8	
353' - 354'6"	1"	0.40	
354'6" - 356' (1)	8½"	0.81	black siliceous rock
354'6" - 356' (2)	4½"	8.1	brown siliceous rock
356' - 357'4"	1"	0.73	
357'4" - 358'4"	12"	0.95	

D.G.25	Recovery	per cent Copper	
36'3" - 37'		0.20	
37' - 39'4"		0.20	
39'4" - 41'		0.12	
41' - 42'5"		0.35	
42'5" - 43'		0.30	
43' - 44'6"		0.15	
44'6" - 47'4"		0.1	
65'6" - 70' (1)	15"	0.74	brown clay
65'6" - 70' (2)	14"	0.70	black clay
65'6" - 70' (3)	2"	0.45	brown clay
141' - 144'		0.25	
D.G. 30			
75' - 80'		0.68	
80' - 85'		0.91	
655' - 660'		4.2	
D.G. 31			
590' - 595'		1.7	
595' - 600'		1.2	
610' - 615'		0.50	

Report No. 48 May, 1964

Analysis of Water Samples from the A.C.T.

by

S. Baker

Following are results for the analysis of Water Samples from the A.C.T., submitted by J.M. Burton.

Field No.	Sugerloaf W1 L5	Sugerloaf BA X3	Springfield W1 L7	Narrangullen BA X4	Narrangullen BB X5
Conductivity	400	1250	2130	2000	2080
pH	6.5	7.3	7.3	7.2	7.2
Cl p.p.m.	31 (0.87)	12 (0.34)	247 (6.96)	135 (3.80)	135 (3.80)
NO3			not detected		
SO4 p.p.m.	64 (1.33)	148 (3.08)	32 (0.66)	280 (5.83)	284 (5.91)
HCO_3 p.p.m.	37 (0.60)	470 (7.70)	543 (8.90)	397 (6.50)	390 (6.40)
Ca p.p.m.	14 (0.70)	126 (6.29)	136 (6.79)	162 (8.08)	162 (8.08)
Mg p.p.m.	8 (0.66)	21 (1.73)	79 (6.50)	28 (2.30)	30 (2.47)
Na p.p.m.	33 (1.43)	72 (3.13)	75 (3.26)	130 (5.65)	130 (5.65)
K	less than 3	less than 3	less than 3	4	5
T.D.S.(180°C)	180	610	855	960	950

Field No.	Narrangullen BC. L14	Greendale	Butmaroo Creek L3	Murrumbateman I X6	Iurallo Creek L31
Conductivity	3850	810	714	264	1120
pH	7.3	7.6	7.3	7.1	7.4
Cl p.p.m.	405 (11.4)	50 (1.41)	112 (3.16)	40 (1.13)	225 (6.34)
SO4 p.p.m.	756 (15.7)	8 (0.17)	3 (0.06)	less than 3	43 (0.89)
HCO_3 p.p.m.	488 (8.00)	460 (7.54)	276 (4.52)	104 (1.70)	287 (4.70)
Ca p.p.m.	333 (16.6)	56 (2.79)	38 (1.89)	6 (0.30)	52 (2.59)
Mg p.p.m.	94 (7.73)	45 (3.70)	35 (2.88)	5 (0.41)	53 (4.36)
Na p.p.m.	248 (10.8)	64 (2.78)	70 (3.05)	49 (2.13)	116 (5.05)
K p.p.m.	7	less than 3	less than 3	less than 3	less than 3
T.D.S.(180°C)	2100	460	405	160	640

	Conductivity (T = 25°C)
Paddy's River 23/2/64	100
Mountain Creek 6/3/64	265
Mullion Creek 6/3/64	88
Lake George 6/4/64	3100

Results in brackets refer to m. equ./litre.

Serial No. 1504 - 1505 - 1506

Report No. 49.

File No. 153NT/4

May, 1964.

Spectrographic Analysis of Samples from Tennant Creek

by

A.D. Haldane

This report gives the results from analysis of geochemical samples from Explorer 13 prospect. The samples were submitted by P.G. Dunn.

All results are expressed in parts per million.

Ex 13 Hole 1 (foot)	Ni	Co	Cu	V	Mo	Pb	Remarks
258 - 268	20	25	5	150	5	70	
268 - 278	30	20	5-	150	5	50	
278 - 288	25	20	10	100	5	50	
288 - 298	20	25	5-	150	7	10	
298 - 308	30	20	15	100	5	20	
308 - 318	20	20	20	50	5	20	
318 - 328	30	20	10	70	7	10	
328 - 338	25	25	5	50	5	10	
338 - 348	30	20	10	100	5	20	
348 - 358	40	20	10	50	7	10	
358 - 368	60	25	15	100	7	20	
368 - 378	15	20	5	50	5	20	
378 - 388	60	20	20	30	5	20	
388 - 398	30	20	15	50	5	10	
398 - 408	60	20	15	50	7	20	
408 - 418	60	20	15	50	5	20	
418 - 428	40	20	10	50	7	20	
428 - 438	80	20	25	20	7	10	
438 - 448	60	15	25	50	7	10	
448 - 458	60	15	50	50	5	100	
458 - 468	30	15	10	100	5	20	
468 - 478	60	20	25	100	5	20	
478 - 488	80	20	25	50	5	10	
488 - 498	80	15	25	100	5	10	
498 - 508	40	20	10	150	5	10	
508 - 518	150	20	20	150	10	20	
518 - 528	200	30	70	100	10	20	

Ex 13 Hole 1 (foot)	Ni	Co	Cu	V	Mo	Pb	Remarks
528 - 538	100	20	15	150	5	10	
538 - 548	150	20	70	100	10	10	
548 - 558	150	30	700	100	5	5	
558 - 568	40	20	15	150	5	5	
568 - 578	60	20	15	150	5	10	
578 - 588	60	20	10	150	5	10	
588 - 598	30	25	70	150	5	20	Tr Bi
598 - 608	40	20	10	150	5	10	
608 - 618	100	20	25	100	10	10	
618 - 628	100	20	20	100	5	10	
628 - 638	60	25	10	150	5	10	
638 - 648	100	20	25	100	7	5	
648 - 658	60	15	15	150	5	20	
658 - 668	80	15	20	100	5	30	
668 - 678	20	20	5	100	5	10	
678 - 688	60	20	10	100	7	5	
688 - 698	40	20	15	150	5	10	
698 - 708	40	20	10	100	5	10	
708 - 718	60	15	10	150	5	5	
718 - 728	30	20	15	100	5	5	
728 - 738	60	15	15	100	10	5	
738 - 748	60	15	50	20	5	10	
748 - 758	20	15	10	50	5	5	
758 - 768	60	15	15	50	5	5-	
768 - 778	80	15	25	50	5	5	
778 - 788	30	15	10	150	5	5	
788 - 798	30	20	10	100	15	5	
798 - 808	15	15	10	100	5	5-	
808 - 818	100	12	100	20	5	5	
818 - 828	15	15	5-	50	5	5	
828 - 838	12	12	5	50	5	5	
838 - 848	12	15	5-	100	5-	5-	
848 - 858	20	15	50	100	5	5	
858 - 868	15	15	5-	100	5	5	
868 - 878	15	15	5-	70	5	5-	
878 - 888	10	15	5-	50	5	5	
888 - 898	15	15	5-	50	5	5-	
898 - 908	20	12	10	20	5	10	
908 - 918	20	15	5-	50	5	5-	
918 - 928	12	20	70	70	5	5-	
928 - 938	15	30	15	50	5	5-	
938 - 948	20	40	3000	20	50	5-	Tr Bi

Ex 13 Hole 1 (feet)	Ni	Co	Cu	V	Mo	Pb	Remarks
948 - 958	25	30	50	20	50	5	
958 - 968	20	30	15	50	15	5-	Tr Bi
968 - 978	30	30	15	10	20	5-	
978 - 988	10	25	7	20	5	a	
988 - 998	30	60	25	10	10	a	
998 - 1008	50	150	500	5-	5	a	
1008 - 1018	80	60	50	5-	5	a	
1018 - 1028	30	30	20	5-	20	a	
1028 - 1038	10	30	2	5-	5	a	
1038 - 1048	10	20	5	20	5	a	
1048 - 1058	12	80	3000	20	10	50	(Zn 100) Bi
1058 - 1068	20	20	10	5-	10	a	
1068 - 1078	5	30	500	5-	1000	20	(Zn 300) Bi
1078 - 1088	10	40	25	5	300	60	(Zn 200) Bi
1088 - 1098	20	40	5000+	5	500	700	(Zn 200) Bi
1098 - 1108	20	40	100	5	10	a	
1108 - 1118	12	15	10	10	5	a	
1118 - 1128	15	12	10	40	5	a	
1128 - 1138	12	12	5	40	5-	a	
1138 - 1148	15	12	15	50	5	a	
1148 - 1158	15	12	5	30	5	a	
1158 - 1168	20	15	5	50	5-	a	
1168 - 1178	20	12	15	50	5	a	
1178 - 1188	20	15	15	30	5	a	
1188 - 1198	15	15	10	50	5	a	
1198 - 1208	20	12	10	50	5	a	
1208 - 1218	30	15	25	50	5	a	
1218 - 1228	60	20	30	70	10	10	
1228 - 1238	30	20	10	150	10	a	
1238 - 1248	30	20	10	100	10	5	
1248 - 1258	40	20	10	100	5	a	
1258 - 1268	50	20	10	150	5	a	
1268 - 1278	15	15	5	150	5	a	
1278 - 1288	40	25	10	150	5	a	
1288 - 1298	60	15	15	100	7	a	
1298 - 1308	30	20	5	150	5	a	
1308 - 1318	30	20	10	100	5	a	
1318 - 1328	30	15	20	50	10	a	
1328 - 1338	20	15	7	50	5	a	
1338 - 1348	60	20	15	70	5	a	
1348 - 1358	50	15	10	150	5	a	
1358 - 1368	20	20	5	150	5	a	

Ex 13 Hole 1 (feet)	Ni	Co	Cu	V	Mo	Pb.	Remarks
1368 - 1378	30	15	10	100	5	5	
1378 - 1388	40	20	5-	150	5-	a	
1388 - 1398	30	20	7	150	5-	5	
1398 - 1408	60	20	15	100	5	a	
1408 - 1418	30	15	10	100	5	a	
1418 - 1428	25	15	5	70	5	a	
1428 - 1438	30	15	10	50	5	a	
1438 - 1448	30	20	5	50	5	a	
1448 - 1458	60	15	15	100	7	5	
1458 - 1468	30	20	10	150	5	a	
1468 - 1478	60	20	15	100	7	a	
1478 - 1488	30	20	20	100	5	a	
1488 - 1498	30	15	10	150	5	a	
1498 - 1508	30	15	5-	70	5	a	
1508 - 1518	30	15	20	50	7	10	
1518 - 1528	60	15	15	100	5	a	
1528 - 1538	20	15	5	100	5	a	
1538 - 1548	30	15	5	150	5	10	
1548 - 1558	25	15	10	150	5	10	
1558 - 1568	25	15	5-	150	5	10	
1568 - 1578	20	15	5-	70	5	20	
1578 - 1588	40	40	10	100	5	10	

Phosphorus was sought but not detected in any sample

a - not detected

Plate No. 739 - 744

REPORT N° 50

206PNG/8

May, 1964.

Olivine Basalt from the April, 1964, Eruption of Manam Volcano, New Guinea

by

W.R. Morgan

The specimen, R.17706, was collected by C.D. Branch from the snout of an advancing lava flow in the south-east avalanche valley of Manam Valley.

Thin section shows the lava to be seriate porphyritic, the phenocrysts ranging in size from 2.5 mm. down to the average groundmass grain-size of 0.015 mm. The phenocrysts form about 20 to 25% of the rock, and consist of plagioclase, augite, and olivine.

Plagioclase phenocrysts form tabular to sub-tabular crystals that show slight zoning on their margins. Many occur as parallel and interpenetrant growths. Their composition is about An 85, zoned to labradorite. Augite forms pale green, euhedral prismatic crystals. Olivine occurs as colourless, prismatic crystals with rounded margins; many olivine crystals are surrounded by a very thin rim of pale green granular clinopyroxene grains.

Groundmass crystals have random orientation, and are formed to tabular, commonly pellucid crystals of plagioclase, prismatic augite and probable hypersthene, together with octahedral black iron oxide. All the crystals are enclosed in a dark brown, somewhat altered glass that forms about 25% of the rock.

A few cognate xenoliths are present. Some consist of clusters of slightly intergrown grains of augite; others are similar, but also contain granular olivine. Another is formed of anhedral olivine grains sub-ophitically enclosing small laths of plagioclase. The diameters of these inclusions are about 1 to 1.5 mm. and the average size of the grains within them is about 0.3 mm.

A very rough estimate of the percentage of minerals present is : plagioclase: 40, augite and (?) hypersthene : 25, glass: 25, olivine: 5, black iron oxide: 5.

The specimen is a porphyritic olivine basalt which, generally speaking, is typical of Manam Volcano. The main difference between this sample and specimens from the 1957 eruption is the presence of phenocrystic hypersthene in the latter.

REPORT N° 51

June, 1964.

Spectrographic Analysis of Samples from Rum Jungle N.T.

by

A.D. Haldane

This report gives the results from analysis of samples from C.D. 174, C.D. 176, D.D.H. 726, D.D.H. 59A3, D. 582, D. 708 and D. 729.

C.D. 174	Ni	Co	Cu	V	Mo	Pb	Remarks
35' - 40'	300	100	50	50	5	50	
40' - 45'	100	40	50	10	5	20	
45' - 50'	500	100	100	20	5	10	
50' - 55'	300	80	100	50	50	10	
55' - 58'	200	30	50	5	70	a	
C.D. 176							
135' - 140'	2000	500	1000	400	100	10	
115' - 120'	300	200	100	150	20	100	
110' - 115'	300	200	200	20	20	70	
105' - 110'	400	200	100	50	50	100	
100' - 105'	500	150	200	150	15	50	
95' - 100'	300	150	200	50	20	20	
85' - 90'	200	150	200	50	10	200	(Zn, 200)
80' - 85'	400	200	200	100	10	100	(Zn, 200)
75' - 80'	300	200	100	20	10	50	
65' - 70'	400	150	100	150	10	20	
55' - 60'	300	150	100	200	10	15	
45' - 50'	500	200	100	300	10	5	
D.D.H. 726							
255' - 270'	2000	2000	2000	50	30	700	(Zn, 500)
250'6" - 255'	700	500	2000	200	5	500	(Zn, 100)
250' - 255'	2000	1000	1500	20	10	200	(Zn, 1000)
244' - 248'	2000+	2000+	5000+	200	10	2000	(Zn, 1000)
240' - 244'	1000	500	1500	200	a	1000	
219' - 222'	1000	1000	100	200	500	100	
216' - 219'	2000	2000	2000	20	50	200	(Zn, 500)
14'6" - 19'	15	12	500	500	a	2000	(Sn, 20)
36'6" - 37'6"	60	10	100	20	5	500	
51' - 52'	60	10	100	5-	10	700	

D.D.H. 726	Ni	Co	Cu	V	Mo	Pb	Remarks
55' - 57'	60	10	100	5	10	1000	
70' - 72'	60	20	500	5-	10	700	
72' - 75'	60	5	50	5-	10	100	
79' - 83'	60	10	100	5-	10	200	
99'9" - 101'	30	12	500	700	a	300	(Sn, 100)
108' - 113'	30	12	300	1000	a	100	(Sn, 70)
157' - 159'	200	150	500	500	10	70	(Sn, 20)
160'6" - 164'6"	100	30	200	1000	a	100	(Sn, 20)
178' - 181'6"	100	80	100	500	a	50	(Sn, 20)
181'6" - 186'	200'	100	70	700	a	50	(Sn, 10)
190' - 195'	200	100	700	700	a	100	
195' - 198'	400	100	100	500	a	100	(Sn, 10)
205'6" - 209'	500	200	500	700	a	500	(Sn, 10)
23' - 26'9"	300	50	2000	1000	100	5000	(Zn, 500, Sn, 10)
29' - 33'9"	100	12	100	50	10	500	
39'6" - 44'	60	12	100	50	10	1000	
47' - 51'	60	5	100	5-	10	100	
52' - 55'	60	5	150	5-	10	500	
57' - 60'6"	60	15	100	5	10	100	
60'6" - 64'	60	12	200	50	10	1000	
64' - 66'6"	50	5	100	5-	10	200	
66'6" - 70'	60	12	100	5-	10	200	
87' - 91'6"	80	15	700	100	10	1000	
91'6" - 95'6"	100	10	200	200	10	100	
95'6" - 99'9"	80	60	1000	500	5	2000	(Sn, 20)
75' - 79'	60	10	100	10	5	200	
101' - 105'	100	100	500	1000	a	1000	(Sn, 100)
105' - 108'	200	200	1500	700	a	100	(Sn, 50)
108' - 113'	20	15	300	700	a	100	(Sn, 70)
117' - 119'	150	60	500	500	a	100	(Sn, 50)
119' - 125'6"	100	30	400	500	a	100	(Sn, 20)
129'6" - 131'6"	60	30	400	1000	a	200	(Sn, 20)
131'6" - 136'	100	60	300	700	a	100	(Sn, 10)
136' - 138'	100	100	500	700	a	100	(Sn, 20)
138' - 140'	200	100	500	500	a	150	(Sn, 20)
140' - 143'6"	200	60	500	700	a	200	(Sn, 20)
143'6" - 147'6"	300	100	500	700	a	200	(Sn, 20)
159' - 160'6"	150	60	300	1000	a	200	(Sn, 20)
152'6" - 157'	200	100	400	1000	a	100	(Sn, 20)
173'6" - 178'	200	100	2000	500	a	100	(Sn, 10)
186' - 190'	300	150	100	700	a	150	
198' - 200'	400	200	100	500	a	50	
200' - 201'6"	300	150	100	1000	a	100	(Sn, 10)

D.D.H. 726	Ni	Co	Cu	V	Mo	Pb	Remarks
209' - 213'	1000	400	500	500	10	200	
213' - 216'	1000	500	1000	200	15	100	(Zn, 200)
222' - 226'	1000	500	1000	100	20	1000	(Zn, 500)
229'6" - 234'6"	500	400	1500	200	a	100	
248' - 250'6"	1000	1000	5000+	200	15	1000	(Zn, 5000, Sn, 20)
D.D.H. 59 A3							
264' - 265'	400	1000	100	500	a	100	
265' - 269'6"	500	2000	70	500	50	200	
269'6" - 274'	400	1000	100	500	20	100	
274' - 278'6"	400	1000	100	500	20	1000	
290'6" - 295'	700	1000	100	700	50	5000	(Zn, 1000)
295' - 297'	1000	1000	100	700	a	5000+	(Zn, 2000)
297' - 298'6"	500	500	70	700	15	1000	(Sn, 10)
298'6" - 301'	700	500	150	700	10	2000	(Sn, 10)
121'6" - 126'6"	1000	500	5000+	300	50	5000+	(Zn, 3000)
152' - 155'6"	1000	700	5000+	500	20	5000+	(Zn, 3000)
155'6" - 159'	1000	700	5000	500	80	5000+	(Zn, 3000)
159' - 162'	1000	1000	2000	300	10	5000+	(Zn, 5000)
255' - 260'	700	1000	100	300	5	700	(Zn, 1000)
278'6" - 282'	700	2000	300	300	5	5000	(Zn, 5000)
282' - 286'	1000	2000	100	300	50	2000	(Zn, 700)
286' - 290'6"	1000	2000	100	500	100	1000	
301' - 304'6"	700	2000	500	500	10	2000	(Sn, 10)
304'6" - 307'	500	1500	200	500	50	1500	(Sn, 10)
320' - 324'6"	500	700	200	500	50	2000	(Zn, 5000, Sn, 5)
363' - 364'	100	100	3000	50	5	100	
D. 582							
110' - 112'6"	200	100	100	100	20	a	(Sn, 10)
112'6" - 115'	200	20	70	150	10	5	
125' - 128'	700	200	500	500	a	a	
D. 708							
230' - 232'	200	200	20	1000	a	50	(Sn, 50)
232' - 234'6"	400	200	50	1000	a	50	(Sn, 10)
234'6" - 236'6"	400	200	50	500	a	50	(Sn, 10)
236'6" - 238'6"	400	200	50	500	a	50	(Sn, 10)
238' - 241'	300	200	100	500	a	50	
241' - 244'	200	200	100	1000	a	50	(Sn, 5)
244' - 246'	400	200	500	700	a	50	(Sn, 5)
246' - 247'6"	150	100	200	700	a	50	
247'6" - 249'6"	200	150	200	1000	a	50	(Sn, 5)
249'6" - 251'6"	300	150	200	700	a	100	(Sn, 5)

D. 708		Ni	Co	Cu	V	Mo	Pb	Remarks
251'	- 253'	500	300	1500	700	a	100	(Sn, 5)
253'	- 254'6"	400	400	700	1000	a	100	(Sn, 5)
254'	- 256'6"	300	200	500	1000	a	100	(Sn, 5)
256'6"	- 258'6"	300	200	400	700	a	100	(Sn, 5)
258'6"	- 262'	500	200	500	700	a	70	(Sn, 5)
262'	- 264'	300	200	500	700	a	100	
264'	- 265'6"	200	150	200	700	a	100	
265'6"	- 267'6"	500	400	400	500	a	100	
267'6"	- 269'6"	1000	500	500	500	a	70	(Sn, 5)
271'6"	- 273'6"	700	500	500	500	a	100	
273'6"	- 276'6"	400	200	500	500	a	200	
276'6"	- 280'	600	300	5000	500	a	200	
202'6"	- 205'	300	500	700	1000	a	100	(Sn, 20)
205'	- 207'	300	500	500	1000	a	100	(Sn, 20)
218'	- 220'6"	200	200	50	1000	a	50	(Sn, 20)
222'6"	- 224'6"	200	200	70	1000	a	70	(Sn, 20)
224'6"	- 226'	300	200	25	1000	a	100	(Sn, 20)
207'	- 209'	200	150	700	1000	a	70	(Sn, 20)
209'	- 212'	200	500	70	1000	a	70	(Sn, 50)
212'	- 213'6"	150	200	15	1000	a	50	(Sn, 50)
213'6"	- 215'6"	150	150	25	1000	a	50	(Sn, 70)
215'6"	- 218'	200	150	25	1000	a	50	(Sn, 50)
58'	- 61'6"	100	30	1000	300	20	5000	(Sn, 10)
61'6"	- 64'	150	60	1000	300	20	5000+	
64'	- 66'	60	15	700	300	20	5000+	
66'	- 68'	100	15	1000	300	20	5000+	(Sn, 10)
68'	- 71'	60	15	500	300	10	5000	(Sn, 10)
71'	- 74'	100	20	700	300	10	5000	
74'	- 77'	60	15	500	150	10	5000	
77'	- 83'	150	60	500	5-	10	200	
83'	- 86'	150	12	500	5-	10	200	
86'	- 90'	100	10	200	5-	5	50	
90'	- 92'	150	10	200	5-	7	50	
92'	- 95'	200	200	1000	5-	10	50	
95'	- 98'	100	20	700	5-	7	70	
98'	- 101'	60	12	200	150	10	200	
101'	- 103'	150	12	200	5-	10	200	
103'	- 105'	150	60	1000	5-	15	100	
105'	- 107'	150	20	500	5-	10	50	
107'	- 110'	200	20	300	5-	10	50	
110'	- 112'	200	100	1000	5-	10	10	
112'	- 116'	200	60	700	100	15	200	

D. 708	Ni	Co	Cu	V	Mo	Pb	Remarks
116' - 119'	150	60	500	700	5-	200	
119' - 120'6"	200	30	400	500	10	100	
120'6" - 122'	200	30	400	200	10	50	
122' - 126'	60	60	150	700	15	500	(Sn, 10)
126' - 129'	200	20	200	700	5	100	(Sn, 10)
129' - 132'	500	20	500	20	10	50	
132' - 136'	300	60	1000	300	10	50	(Sn, 20)
136' - 140'	30	20	50	300	5	50	(Sn, 50)
140' - 143'6"	500	100	1000	1000	5	70	(Sn, 50)
143'6" - 146'6"	200	20	1000	500	5	50	(Sn, 50)
146' - 149'	500	150	1000	500	5	100	(Sn, 50)
149'6" - 151'	2000	1000	500	500	15	100	(Zn, 1000, Sn, 50)
151' - 154'	500	200	500	1000	10	100	(Sn, 100)
154' - 156'6"	200	60	700	1000	10	100	(Sn, 70)
156'6" - 159'	500	100	500	1000	15	150	(Sn, 50)
159' - 161'	200	60	200	1000	5	100	(Sn, 70)
161' - 163'	150	30	100	1000	5	50	(Sn, 70)
163' - 165'	200	60	200	1000	5	50	(Sn, 70)
165' - 167'	500	150	500	700	7	50	(Sn, 50)
167' - 169'	300	200	500	1000	10	50	
169' - 172'	300	200	500	1000	10	70	(Sn, 5)
172' - 173'	400	300	1000	1000	10	70	(Sn, 5)
173' - 175'	200	200	1000	1000	a	20	(Sn, 5-)
175' - 177'6"	200	200	1500	700	a	50	(Sn, 5)
177'6" - 180'	300	150	300	1000	a	50	(Sn, 5)
180' - 182'6"	60	60	500	1000	a	50	(Sn, 50)
182'6" - 185'	200	200	1000	1000	a	70	(Sn, 20)
185' - 187'6"	100	100	1000	1000	a	50	(Sn, 50)
187'6" - 190'	30	20	50	1000	a	50	(Sn, 20)
190' - 192'6"	30	30	100	1000	a	50	(Sn, 20)
192'6" - 195'	20	60	100	1000	a	70	(Sn, 20)
195' - 197'	30	60	100	1500	a	70	(Sn, 20)
197' - 200'	30	60	150	1000	a	50	(Sn, 20)
200' - 202'6"	60	150	200	1000	a	70	(Sn, 20)
220'6" - 222'6"	500	300	200	500	a	20	(Sn, 50)
226' - 228'	100	150	5	700	5	20	(Sn, 50)
228' - 230'	200	200	100	500	a	200	(Sn, 50)
280' - 282'6"	400	150	5000+	500	5	100	(Sn, 5)
282'6" - 284'6"	500	100	500	200	5	50	

D. 729	Ni	Co	Cu	V	Mo	Pb	Remarks
32'6" - 35'	100	200	100	200	5	50	

Be and P were sought but not detected in any sample

Plate Nos. 767 - 770 and 772 - 776.

REPORT N° 52

June, 1964.

Spectrographic Analysis of Samples from Tennant Creek, N.T.

by

A.D. Haldane

This report gives the results from analysis of geochemical samples from the Aeromagnetic Ridge Orientation Survey. The samples were submitted by I. Pontifex.

All results are expressed in parts per million.

Grid Co-ords.		Ni	Co	Cu	V	Mo	Pb	Remarks
21N/00E	0 - 10'	5-	10	15	200	10	5	
	10'- 16'	5-	12	5	100	a	5	
	A 16'- 22'	5-	12	5	200	5	5	
	B 16'- 22'	5-	12	15	200	5	5	
00N/32E	0 - 7'	5-	15	15	100	5	10	
	7'- 16'	5-	10	10	100	5	a	
	A 16'- 28'	5-	10	5	150	5	a	
	B 16'-28'	5-	10	10	150	5	a	
28N/28E	1'- 2'	5-	12	25	100	5	10	
	2'- 12'	5-	15	25	200	5	10	
	12'- 24'	5-	12	15	200	15	a	
	24'- 30'	5-	5	5-	100	7	a	
	A 30'- 34'	5-	5	10	200	7	a	
	B 30'- 34'	5-	10	5	150	7	a	
15N/60E	0 - 10'	5-	12	15	100	7	a	
	10'- 16'	5-	12	15	150	10	a	
	16'- 20'	5-	12	10	200	10	a	
	20'- 26'	5-	30	5-	200	5	a	
	A 26'- 28'	5-	10	5-	200	5	a	
	B 26'- 28'	5-	10	25	200	5	a	
4 N/16E	0 - 6'	5-	12	25	150	5	a	
	6'- 14'	5	10	5	200	5	a	
	A 14'- 22'	5-	5	5	100	5	a	
	B 14'- 22'	5-	5	15	100	5	a	
21N/36E	0 - 16'	5	15	20	150	5	a	
	16'- 18'	5	12	10	200	7	a	
	18'- 22'	5	12	10	150	7	a	
	22'- 32'	5	10	5-	150	5	a	
	32'- 34'	5	10	5	150	5	a	
	A 34'- 38'	5	10	5	200	5	a	
	B 34'- 38'	5	10	20	150	5	a	

Grid Co-ords.		Ni	Co	Cu	V	Mo	Pb	Remarks
39N/28E	0 – 2'	5	12	25	100	10	a	
	20'– 14'	5	12	25	100	7	a	
	14'– 28'	5	12	15	150	7	a	
	28'– 32'	5	10	5–	150	5	a	
	A 32'– 34'	5	10	5–	150	5	a	
	B 32'– 34'	5	10	10	150	5	a	
28N/48E	0 – 2'	5	12	25	100	7	a	
	2'– 16'	5	12	15	100	5	a	
	16'– 20'	5	15	25	200	5	a	
	20'– 26'	5	12	5–	100	5	a	
	A 26'– 28'	5	10	5–	150	5	a	
	B 26'– 28'	5–	12	15	150	7	a	
38N/56E	0 – 2'	5	12	15	100	7	a	
	2'– 12'	5	12	15	150	5	a	
	12'–16'	5	12	20	300	10	a	
	16'– 20'	5	15	10	200	5	a	
	20'– 22'	5	12	10	200	5	a	
	A 22'– 24'	5–	12	5–	100	5	15	
	B 22'– 24'	5–	12	15	200	5	15	

Zn, Sn, Be, P and Bi were sought but were not detected in any samples.

Plate Nos. 781 – 783.

REPORT No 53

5th June, 1964.

COPPER ASSAYS

by

J. R. Beevers

The following are copper assays on Samples from the Rum Jungle area, Northern Territory, submitted by P. Pritchard.

Sample No.	% Cu
A1 324' - 326'	1.42
A1 335'6" - 339'2" (1)	0.19
A1 335'6" - 339'2" (2)	0.63
A1 336'6" - 338'6"	0.22
A1 338'6" - 340'6"	1.44
A1 339'2" - 342'4"	1.37
A1 342'4" - 345'	0.52
A1 345' - 348'	0.80
A1 353' - 354'6"	0.38
A1 354'6" - 357'	0.26
A1 357' - 359'6"	0.26
A1 362'6" - 364'	0.83
A1 366'6" - 369'	1.54
A1 369' - 370'6"	0.32
A1 371'6" - 373'	0.43
DDH 59A3 69' - 72'	0.43
DDH 59A3 72' - 83'	0.37
DDH 59A3 109' - 112'	0.44
DDH 58A3 112' - 116'	0.43
DDH 59A3 116' - 117'	0.47
DDH 59A3 117' - 121'6"	0.71
DDH 59A3 121'6" - 126'6"	0.72
DDH 59A3 126'6" - 131'6"	0.99
DDH 59A3 131'6" - 134'	0.85
DDH 59A3 134' - 135'	0.68
DDH 59A3 135' - 139'6"	0.76
DDH 59A3 139'6" - 144'	0.61
DDH 59A3 146' - 149'6"	0.46
DDH 59A3 149'6" - 152'	0.58
DDH 59A3 152' - 155'6"	0.58
DDH 59A3 155'6" - 159'	0.57
CD 155 100' - 105'	0.27
CD 155 105' - 110'	0.46
CD 155 110' - 115'	0.30
CD 155 115' - 120'	0.55
CD 155 120' - 125'	0.49
CD 155 125' - 130'	0.67
CD 158 40' - 45'	0.43
CD 158 50' - 55'	0.78
CD 158 55' - 60'	0.61
CD 158 60' - 65'	0.37
CD 158 65' - 70'	0.41
CD 158 70' - 75'	0.17
CD 162 220 - 225'	0.51
CD 165 165 - 170'	0.27
CD 165 210'- 215'	0.33
CD 165 215'- 220'	0.24
DDH 726 237'6"- 240'	0.74
DDH 726 244'- 248'	0.49
DDH 726 248'- 250'6	0.54
D 582 276'6"- 280'	0.32

REPORT N° 54 June, 1964.

Spectrographic Analysis of Samples from Ooratippra, N.T.

by

A.D. Haldane

This report gives the results of analysis of dark grey and black shale from the stratigraphic hole B.M.R. 13 being drilled at Ooratippra. The Samples were submitted by D. Woolley.

All results are expressed in parts per million.

B.M.R. 13	Ni	Co	Cu	V	Pb	Remarks
250' - 260'	10	20	25	150	a	
270' - 280'	12	20	5-	500	a	
280' - 290'	12	20	10	300	a	
440' - 450'	5	12	10	100	a	
470' - 480'	15	30	25	300	10	
520' - 530'	15	20	20	300	5	
560' - 570'	15	20	15	50	10	(Mo, 50)
570' - 580'	5	12	15	50	a	
600' - 610'	5	12	15	50	10	
620' - 630'	10	20	100	200	a	
1010' - 1020'	10	30	50	300	5	
1030' - 1040'	20	60	50	300	5	
1055' - 1060'	15	15	10	300	a	
1140' - 1150'	20	30	10	50	5	
1610' - 1620'	5	20	20	200	10	
1620' - 1630'	5	12	15	50	50	(Mo, 50)

Sn, Zn and P were sought but not detected in any sample

Plate No. 789

REPORT N°55.

June, 1964.

Spectrographic Analysis of Samples from Kalgoorlie, W.A.

by

A.D. Haldane

This report gives the results from analysis of samples from N.C.G.F. Kalgoorlie. The samples were submitted by N. Le Roux.

All results are expressed in parts per million.

Sample No.	Ni	Co	Cu	V	Mo	Pb	Remarks
I 011019	12	5-	50	300	15	20	
H 011038	30	12	15	200	5	5	
1 Lake View & Star	5	30	30	200	20	a	
2 Gold Mines Kal.	12	30	30	200	7	a	
011009	12	12	15	50	5-	10	
011018	100	40	25	150	5	10	
011020	30	10	25	100	5-	10	
011021	30	10	25	100	5-	15	
011022	60	12	30	100	5	20	
011023	40	10	50	100	10	10	
011024	30	5	50	100	5	a	
011025	5-	12	15	20	5	a	
011026	15	10	20	200	5	5	
011027	100	15	30	200	10	5	(Zn, 100)
011028	200	30	25	100	a	5	
011029	30	12	25	200	10	a	(Zn, 100)
011030	20	10	10	100	5	a	
011031	100	12	15	100	5	a	
011032	20	5	10	200	5-	20	
011033	100	12	20	100	5	a	(Zn, 100)
011034	60	5	25	200	5	5	(Zn, 100
011035	30	5	15	200	10	5	
011036	20	10	20	100	10	10	
011037	12	5	15	100	5	10	
011039	12	5	15	100	5-	5	
011040	60	12	20	100	5-	5	
011041	60	10	25	200	10	a	(Zn, 200)
011042	100	10	15	100	5-	a	(Zn, 100)

Sample No.	Ni	Co	Cu	V	Mo	Pb	Remarks
011043	80	10	25	300	10	100	
011044	60	10	25	200	10	20	
011045	100	12	20	300	10	20	
011046	300	20	50	200	15	5	
011047	30	10	25	150	5	5	
011048	15	5-	20	200	10	a	
Great Boulder	10	60	100	500	15	a	
North Kalgoorlie	15	60	100	500	20	100	
011063 18' - 21'	500	60	50	700	10	a	
011064 6' - 9'	500	100	100	500	10	a	
011065 12' - 15'	150	10	25	400	10	a	
011066 21' - 24'	15	5	20	150	5	a	
011067 15'6"-17'6"	15	5-	15	300	7	a	
011068 12' - 13'6"	12	5-	25	200	7	a	
011069 9' - 11'	30	5	50	500	15	a	
011070 3' - 6'	30	12	75	300	5	a	
011071 3' - 6'	20	10	75	400	5	10	
011072 3' - 5'6"	30	12	50	400	5	10	
011073 9' - 11'	60	12	50	200	5	10	
011074 15' - 18'	10	12	20	500	5	a	
011075 6' - 9'	20	5	50	300	a	a	
011076 6' - 9'	10	5-	50	300	10	20	
011077 6' - 9'	30	5	75	200	10	20	
011078 3' - 6'	5	5-	15	100	10	10	
011079 3' - 6'	2000	150	75	200	5	a	
011080 12' - 15'	1000	60	25	300	5	a	
011081 6' - 9'	1000	100	75	200	5	a	
011082 3' - 6'	400	60	100	400	10	a	
011083 12' - 15'	100	30	50	300	10	a	
011084 6' - 9'	100	15	25	150	5	a	
011085 9' - 12'	100	30	25	300	5	a	
011086 7'6"- 9'	10	10	50	100	10	10	
011087 3' - 6'	30	12	70	300	10	10	
011088 3' - 6'	60	20	70	300	5	10	
011089 3' - 6'	80	15	50	500	a	a	
011090 9' - 12'	30	20	50	300	5	a	
011091 3' - 6'	100	12	50	500	5	a	
011092 0' - 3'	200	15	100	400	a	20	
011093 0' - 4'	1000	100	70	400	a	a	

Sample No.		Ni	Co	Cu	V	Mo	Pb	Remarks
011094	6' - 9'	500	100	100	400	a	a	
011095	3' - 5'	1000	200	50	200	a	a	
011096	3' - 5'	200	20	70	500	a	a	
011097	7' - 9'	300	30	50	500	15	a	
011098	6' - 9'	200	15	50	300	10	10	
011099	9' - 11'	400	20	70	500	10	a	
011000	0' - 3'	60	15	50	400	a	10	
011001	3' - 6'	150	30	50	400	a	10	
011002	6' - 9'	100	20	50	500	a	10	
011003	9' - 12'	150	12	50	500	a	a	
011004	12' - 15'	60	12	50	500	10	a	
011005	15' - 18'	60	12	50	400	10	a	
011006	18' - 21'	60	10	50	400	5	a	
011007	22' - 6"	60	10	50	400	10	a	
011100	3' - 6"	60	12	50	400	10	10	
011101	4' 6" - 7'6"	15	5	25	200	10	10	(Sn, 50)
011102	3' - 6'	30	15	75	200	10	10	(Sn, 20)
011103	4' 6" - 7'6"	30	15	50	300	10	10	(Sn, 50)
011104	3' - 6'	20	20	100	500	5	a	(Sn, 200)
011105	1' 5" - 1'8"	5	20	50	300	7	a	
011106		60	25	50	300	5	10	(Sn, 200)
011107	6' - 9'	100	10	50	300	10	10	(Sn, 5)
011108	3' - 6'	100	20	200	500	5	20	(Sn, 5)
011109	1' 6" - 4'6"	500	60	75	200	a	5	
011110		700	100	100	200	a	5	
011111	6' - 9'	700	100	100	300	10	a	
011112	6' - 9'	700	100	50	200	5	a	(Sn, 20)
011113	2' - 5'	15	10	15	300	5	5	(Sn, 20)
011114	1' 6" - 4'6"	15	10	50	400	10	5	
011115	5'6" - 8'	100	12	50	200	10	5	
011116	6' - 9'	150	20	50	200	5	10	
011117	6' - 7'6"	100	20	50	300	5	5	
011050	6' - 9'	100	15	25	500	10	a	
011051	6' - 9'	30	5	25	500	15	a	
011052	1' 5" - 1'8"	60	10	50	500	10	a	
011053	9' - 1'2"	60	12	50	200	10	5	
011008	0' - 3'	100	20	100	200	5	5	
011010	6' - 9'	12	10	10	200	5	20	
011011	9' - 12'	10	5	25	200	5	70	
011012	12' - 15'	5	5	25	200	7	70	

Sample No.		Ni	Co	Cu	V	Mo	Pb	Remarks
011013	15' - 18'	5	5	15	200	7	100	
011014	18' - 21'	5-	5-	5	200	7	70	
011015	21' - 24'	5-	5-	5	150	7	100	
011016	24' - 27'	5-	5	50	100	7	100	
011017	27' - 30'	5	5	100	100	7	100	
011054	3' - 6'	30	12	25	500	10	20	
011055	0' - 3'	30	12	100	500	5	20	
011056	12' - 15'	100	30	100	500	5	5	
011057	15' - 18'	60	15	75	500	5	a	
011058	27' - 30'	20	5-	15	400	10	a	
011059	15' - 18'	60	5-	50	500	10	a	
011060	9' - 10'3"	100	5-	50	500	10	a	
011061	3' - 4'3"	100	15	75	400	10	a	
011062	12' - 15'	1000	100	100	500	10	a	

Be and P were sought but not detected in any sample

Plate Nos. 768, 769, 771, 773, 783 - 786.

110.

REPORT No 56 JUNE 26 1964

MINERAGRAPHIC DESCRIPTION AND DETERMINATION OF ORE MINERALS IN A MINERALISED DOLERITE FROM BAN BAN SHEET, N.T.

by

I.R. Pontifex

Samples submitted by J. Barclay

Field No. 145613

Locality. 4 miles N.W. of Ban Ban homestead, Pine Creek, N.T.

Ore minerals identified, pyrrhotite, pyrite, chalcopyrite.

Rock type. Pyroxenite.

Field occurrence. This specimen is associated withan extensive mineralised dolerite situated about ½ mile N.E. of the Burnside Granite. Macroscopic lead is a rarity in this rock, the main sulphides are pyrrhotite and minor chalcopyrite. To be of economic potential this rock would necessarily need to contain such metals as nickel or cobalt.

Macro description. This is a dense massive grey-green rock with a light brown pitted weathered surface. The rock is fractured and epigenetic quartz fills between breccia fragments and along veins. Irregular pyrrhotite grains make up 3-5% of the rock, some of these are associated with quartz and some with a dark green material filling fractures.

Thin section description. The finely crystalline matrix consists predominantly of pyroxene. It contains localised patches of coarsely crystalline pyroxene and is cut by veins of pyroxene and prehnite. The opaque minerals are commonly associated with this vein material.

Augite makes up 85% of the section. Throughout the rock small patches of chlorite, amphibole and calcite are intimately related with the augite, and these are alteration products derived from it. Accessory amounts of fine euhedral sphene have a sporadic distribution through the rock.

Veins up to 0.5 mms. wide filled with prehnite, augite and rarely quartz cut the pyroxene matrix.

On a mineralogical basis this rock is classified as a pyroxenite.

Polished section description. Isolated pyrrhotite grains ranging up to 2 mms. across are randomly distributed through the section. Pyrrhotite makes up about 5% of the section.

Minor pyrite is associated with pyrrhotite generally in areas of the section adjacent to epigenetic quartz veins. One grain of pyrrhotite is intruded by a pyrite bleb 0.35 mms. across and the periphery of the same grain has a alteration corona of pyrite which is physically continuous with the pyrrhotite core. In other parts of the section isolated anhedral pyrite grains occur adjacent to pyrrhotite grains near quartz.

Minor accessory grains of chalcopyrite up to 0.03 mms. across occur near pyrite and quartz; generally these are isolated, however one grain of pyrrhotite is partly enclosed by a narrow border of chalcopyrite.

Pyrite and chalcopyrite make up less than 0.5% of the section.

X-ray spectrographic analysis. A semi quantitative X-ray spectrochemical analysis for Co, Ni, Cu, Pb and Zn by S. Goadby proved these elements were present only in trace quantities.

Conclusions. This specimen is a pyroxinite containing about 5% pyrrhotite and less than 0.5% pyrite and chalcopyrite. The pyrrhotite is an inherent mineral of the pyroxinite, formed in cavities of the host rock during the final stages of crystallisation together with prehnite and vein pyroxene.

The pyrite and chalcopyrite were introduced after the pyrrhotite, possibly these minerals are genetically related to epigenetic quartz which was formed later than the pyroxinite.

Spectrographic analysis for Co, Ni, Cu, Pb and Zn indicate that the amounts present have no economic significance.

Since this rock represents an extensive mineralised dolerite the analysis of one grab sample is not considered adequate to assess the economic potential of the entire rock unit. Depending on field indications of possibly significant mineralisation it is suggested that further samples should be analysed spectrographically and that any which contain important amounts of economic elements could be examined mineralogically.

PHOSPHATE ANALYSIS OF SAMPLES FROM THE LAKE AMADEUS AND FREW RIVER AREAS OF THE NORTHERN TERRITORY.

by

S.C.Goadby.

A series of samples were submitted by J.Barrie for quantitative P_2O_5 determination.

I. S1 samples from Johnny Creek headwater.

	Depth (inches)	% P_2O_5
1.	0 - 18	0.3
2.	18 - 23	2.6
3.	23 - 36	0.7
4.	36 - 48	2.0
5.	48 - 60	0.9
6.	60 - 65	4.6
7.	65 - 73	0.4
8.	73 - 75	4.2
9.	75 - 90	0.9
10.	90 - 93	2.7
11.	93 - 105	2.2
12.	14' - 14'6"	0.5
13.	23' - 23'6"	0.3
14.	37'6"- 37'9"	0.3
15.	92'6"- 93'	8.5
16.	102'6"- 103'6"	0.4
17.	103'6"- 104'4"	0.85
18.	104'4"- 104'10"	0.5
19.	104'6"- 104'9"	1.2
20.	104'10- 105'2"	0.8
21.	105'2"- 105'6"	5.4
22.	105'6"- 106'2"	1.0
23.	106'2"- 108'2"	0.6
24.	108'2"- 108'5"	1.8

II. S2 samples from Carmichael Crag.

Samples	
1	7.5
3	8.2
4	0.3
5	4.3
6	0.1
7	8.0
14	5.2
15	9.8
16	14.0

III. S3/4. sample from S.Flank of George Gill Range. P_2O_5 = 13.7%

IV. S4. samples from Indindie Bore area.

Sample	% P_2O_5
1	3.3
2	0.5
3	8.2
4	2.3

V. Sample from B.M.R. 13, Frew River area, unwashed cutting 2955 - 2960'

(a) Before extraction with toluene - 2.1 % P_2O_5

(b) After extraction with toluene - 1.8 % "

Lab.Reference 1534 & 1537.
30th June, 1964.

REPORT N° 58

June, 1964.

Analysis of Lava Flow from Manam Volcano, T.P.N.G.

by

S. Baker

Following are the results for the analysis of a new lava flow on Manam, submitted by G.A. Taylor.

	Percent
SiO_2	51.10
Al_2O_3	16.65
Fe_2O_3	4.98
FeO	4.00
CaO	10.60
MgO	6.80
Na_2O	4.25
K_2O	0.88
MnO	0.16
TiO_2	0.58
P_2O_5	0.19
H_2O (110°C)	Nil
Loss on ignition	Nill
Total	100.19

Serial No. 1514

REPORT N° 59

IDENTIFICATION OF A METAL SPECIMEN FROM PILA PILA, T.P.N.G.

by

I.R. Pontifex

Sample submitted by C.D. Branch 22/5/64.

Location ½ mile N. of Pila Pila between road and coast
1:250,000 Sheet, SB56-2 Gazelle Peninsula.

Field No. P.P.1.

Field Description. Silvery metal with iridescent tornish.
Possibly slag from time of Japanese occupation.

Laboratory Identification. An X-ray diffraction pattern and a scan on the X-ray spectorgraph by S. Goadby indicated that this metal is a ferro-silicon alloy.

Rabaul File 3-5-1
Lab. Ref. 1520
25th June, 1964.

REPORT N°60 July, 1964.

Identification of fibrous material from Lake Stinear Antarctica

by

I.R. Pontifex

The Sample was submitted by J. Mc Leod.

Specimen No. D63482

Locality. Lake Stinear, Antarctica.

Identification. Siliceous sponge spicules.

The fibrous material is made up of siliceous capillary type bodies which measure up to 8 cms. long about 0.025 mms. wide and have an inner cavity diameter of about 0.005 mms. Most of the spicules are broken however, some were present as complete entities of which at least three different types were recognised, these are :

(a) Straight or slightly curved and tapered to a point at each end. These are classified as monoaxons.

(b) Spicules with 4 axes. One main tube gives rise to 3 divergent, relatively shorter rays. These are tetraxons.

(c) From one end of some monoaxons, 2 or 3 divergent barb like hooks curve back toward their base. The inner cavity follows these structures accordingly; these are also classified as tetraxons.

Fragments of other micro-organism hard parts are contained within the fibrous mat.

An X-ray diffraction photo indicated that the material was amorphous and various chemical tests proved that it was silica.

The structure and composition of these "fibres" indicates that they are spicules (or megascleres) which constituted the main skeletal framework of an original sponge, probably of the class Demospongia. (Moore Lalicker and Fisher).

REPORT No 61

ANALYSIS OF A SAMPLE OF SUSPECTED BADDELEYITE FROM CAIRNS, QUEENSLAND.

by

W.M.B. Roberts

The sample, a fine-grained, homogenous, fairly friable material, thought to be baddeleyite was submitted for examination by K.X. Croese, of Cairns. Patches of hydrated iron oxide were observed in some of the large fragments; other than these, microscopic examination showed it to be composed entirely of one mineral.

X-ray spectrochemical analysis showed no zirconium or alumina in the sample, and a full silicate analysis by the same method gave the composition of the material as 99.7% SiO_2 and about 0.2% Fe.

. . . .

Mineragraphic investigation of a specimen from New Guinea submitted to Green and Co. Pty. Ltd. Rabaul.

REPORT No 62

by

I.R. Pontifex

Sample submitted by Green and Co. Ltd., Rabaul.

Locality. Not given.

Ore minerals identified. Pyrite, hematite, magnetite.

This specimen consists of massive, brecciated white vein quartz which carries minor amounts of pyrite and accessory hematite. In polished section the pyrite is observed to be weakly anisotropic suggesting that it is slightly altered to marcasite. The hematite generally surrounds fine skeletal cores of magnetite indicating that the hematite is derived by oxidation of the pre-existing magnetite.

REPORT Nº 63

July, 1964.

120/NT/1

Mineralogical identification of minerals in mica schists

from Mulga Park Station, Ayers Rock Sheet, N.T.

by

I.R. Pontifex

The samples were submitted by D. Forman.

Field No. AR143a

Locality. South of Kelly Hills, Mulga Park Station; Ayers Rock 1:250,000 Sheet, N.T.

Rock type, almandine-lepidolite schist.

This rock is a mica quartz schist which contains randomly dispersed, hard, dark green knots which measure up to 1 cm. across.

Several of the knots were isolated for investigation, their mineral components were crushed, examined microscopically and analysed by means of X-ray diffraction.

The microscopic examination indicated that the knots are essentially garnet, and more specifically, the iron rich variety almandine. This mineral contains minor amounts of fine magnetite inclusions. Fragments of the schist adhering to the garnet were identified as lepidolite and quartz. The X-ray diffraction pattern confirmed the identification of garnet.

The clear pale green color of this mineral is unusual for almandine, accordingly the mineral was analysed on the X-ray spectrograph by S. Goadby to determine the possible presence of anomalous elements. This study revealed that iron and manganese are abundant, these are to be expected in garnet since these elements readily substitute for each other in this mineral. The only other elements which were present is slightly greater than background values are barium and strontium.

Field No. A.R. 143b

Locality. South of Kelly Hills, Mulga Park Station; Ayers Rock Sheet, N.T.

Rock type, Tourmaline-hematite-mica schist.

This rock is a mica schist containing ruby red needle-like crystals and small augens of a metallic mineral.

The red crystals were identified microscopically and by X-ray diffraction as tourmaline. The color of the crystals indicates that they are the variety rubellite.

The metallic mineral was identified as hematite.

Field No.A.R.142

Locality. South of Kelly Hills.

This is a mineralised amphibolite which was submitted for gold assay.

The specimen is too small for a gold assay. The sample however, was analysed by A.D. Haldane on the optical emission spectrograph; no gold could be detected, although the optical spectrograph would not be sensitive enough to detect the lower concentrations of gold that could still be economic.

REPORT No 64 July, 1964.

Mineragraphic Investigation of two garnet gneisses from islands near Fold Island, Antarctica

by

I.R. Pontifex

Samples submitted by D. Trail.

Field No. 11501

Location. Large island about 3 miles south of south coast of Fold Island, Kempland.

Petrology. This rock has been described at A.M.D.L. (Report MP942-62 May 1963) as a biotite-orthoclase-quartz-plagioclase-hypersthene-garnet rock. "Opaques are commonly associated with ferromagnesian minerals".

Mineragraphy. The ore minerals identified were chalcopyrite, pyrite, ilmenite, sphalerite, marcasite.

The section examined consists mainly of a coarse massive aggregate of garnet, the component grains are extensively brecciated. Fine grains of pyrite which measure up to 0.1 mm. across are disseminated through the section, these make up about 2% of the rock. Generally pyrite occurs between garnet grains and in fractures within these grains apparently associated with ferromagnesian minerals. Some of the pyrite grades imperceptively into marcasite. Rarely extremely fine isolated blebs of pyrite are distributed along crystallographic planes of the garnet.

Chalcopyrite makes up less than 1% of the section, this mineral is generally associated with pyrite. Some discrete chalcopyrite grains occur in fine cracks within garnet and some are present as exsolution type inclusions in this mineral.

Ilmenite and sphalerite together form about 3% of the section, these occur as irregular grains throughout the brecciated aggregate, associated with ferromagnesian minerals and as fine needle like inclusions in garnet. In the irregular grains ilmenite occurs both as broad lamellae and as irregular inclusions in the sphalerite host. This mineral also occurs as discrete grains. These ilmenite-sphalerite grains are commonly associated with pyrite and chalcopyrite.

The inclusions of ilmenite and sphalerite in garnet are observed as fine needles up to 0.25 mms. long and 0.008 mms. wide, these are oriented along crystallographic planes of the host. Ilmenite is the most abundant of these two minerals in this form. Both ilmenite and sphalerite are rarely associated with needles of pyrite and chalcopyrite which have a similar occurrence in the same host garnets.

Mineral genesis. The spatial relationships of the ore minerals indicate that they are genetically related. The localisation of ore minerals along garnet crystallographic planes indicates that they were present during the formation of the garnet.

The same minerals localised in fractures, associated with ferromagnesian minerals between garnet fragments, suggests that brecciation occurred after the crystallization of the garnet and during this event the ferromagnesians were mobilised and this facilitated a redistribution of these on ore minerals.

Spectrographic analysis. The specimen was analysed by S. Goadby on the X-ray spectrograph. Values of greater than back ground were found for the following elements :

Fe, Mn, Cu, Zn, Ni, Rb, Ba.

Iron is present in relatively great abundance, the amounts of the other elements in the rock however are probably less than about 0·1%.

The Fe is accounted for in garnet, ferro-magnesian minerals and the ore minerals. Mn is probably derived from the garnet. Cu and Zn are presumably derived from chalcopyrite and sphalerite respectively. The origin of the Ni, Rb and Ba is unaccounted for by the mineralogical investigation at this stage.

Field No. 11509

Location. East coast of a small square island, 3 miles south of Fold Island.

Petrology. The specimen is a brecciated massive aggregate of garnet with pyroxene, apatite, quartz and felspar. (A.M.D.L. report MP942-62, May 1963).

Mineragraphy. The ore minerals identified were, ilmenite, sphalerite, pyrite.

Irregular grains of ilmenite are disseminated through the section, these measure up to 1mm. across and occur in fractures between garnet grains. They constitute about 2% of the rock. Minor accessory grains of sphalerite are associated with some ilmenite. Minor accessory ilmenite bleb and needle like inclusions up to 0.03 mms. long and 0.003 mms. wide occur in garnet, these are commonly distributed along crystallographic planes of garnet.

Spectrographic analysis. An X-ray spectrographic analysis of this specimen by S. Goadby revealed that the following elements are present in amounts greater than background values, Fe, Mn, Rb, and to a lesser extent Cu and Zn. With the exception of Fe, these elements are present in quantities less than about 0.1%. On a mineralogical basis Fe is readily accounted for, Mn is probably derived from the garnet and Zn from sphalerite. Although no copper minerals were identified, the mineralogy of specimen 11501 suggests that minor accessory amounts of copper sulphide may be expected in this specimen. The Rb is not accounted for.

File 167/NTS/1/4

REPORT N° 65

July, 1964.

Mineralogical Investigation of eight mineralised specimens from Union Reefs, Pine Creek, N.T.

by

I.R. Pontifex

The samples were submitted by J. Shields. They include :

2 specimens of core from D.D.H. 7
3 " " " " D.D.H. 8
1 " " " " D.D.H. 9
1 " " " " D.D.H. 10
1 specimen of mineralised dolerite from 120N, 23W.

Conclusions

The drill core specimens consist of strongly sheared and foliated greywackes and chlorite schists. These rocks have been intruded, commonly along foliation planes, by a quartz-carbonate gangue which carries accessory amounts of pyrite, marcasite, chalcopyrite, and arsenopyrite. These minerals have a common hydrothermal origin. Iron oxide grains appear to be inherent components of the greywacke country rock.

The author was not informed of any field relationships between the ore mineralisation and the mineralised dolerite outcrop. On a mineralogical basis however, it appears that this dolerite could be the source rock of the sulphide mineralisation in this area.

Descriptions

D.D.H. No. 7: 596' to 596'6"

Field No. 195393

Rock type : sheared sericite greywacke.

Ore minerals present : pyrite.

Marco. This is a grey-green medium grained sheared rock cut by massive white quartz which carries pyrite, irregular patches of chlorite and a carbonate mineral. The core is broken along slickensided foliation planes.

Thin section. The rock consists of a heterogeneous mixture of sub-angular grains of stressed quartz, chert, weathered felspar and opaque minerals, generally of silt size. Several zircon grains are also present. These components are distributed through a chlorite-sericite matrix which constitutes 70% of the rock. The chlorite and sericite flakes in the matrix have a generalised common orientation which imparts a foliation to the rock.

Thin veins of epigenetic quartz cut the rock at random, these are commonly associated with fine clumps of chlorite.

Polished section. Massive epigenetic quartz carries irregular masses of pyrite up to 10 mms. across, made up of an aggregate of sub-hedral pyrite grains. The quartz also carries irregular inclusions of chlorite schist, some shred like bodies of this material have a common orientation, and were probably aligned during the introduction of the quartz.

D.D.H. No. 7: 636'6" to 637'

Field No. 195394

Rock type : sheared greywacke.

Ore minerals present : pyrite, marcasite, arsenopyrite, hematite, chalcopyrite.

Marco. This is a sheared grey-green chloritic rock cut by irregular roughly parallel veins of white quartz and calcite. The veins carry accessory pyrite.

Thin section. A heterogeneous mixture of silt size angular and sub-angular fragments of various types of quartz and minor amounts of felspar are dispersed through a fine grained matrix of similar composition with the addition of some sericite and chlorite. Shred like sericite stringers have a generalised parallel orientation. Isolated patches of coarsely crystalline carbonate throughout the matrix may be part of the original sediment or may have been introduced into the greywacke with the other vein material.

All the components are stressed. Elongate areas of quartz have crystallised adjacent to, and on the same sides of several opaque grains, obviously having been localised in strain free areas on their low pressure sides Quartz of this type almost surrounds some opaque grains indicating a rotation of the stress directions during the deformation of this rock.

Minor quartz veins cut the section.

Polished section: Pyrite makes up about 3% of the section, it occurs in irregular masses up to 2 mms. across associated with epigenetic quartz. Some of the pyrite grades imperceptively into marcasite.

Anhedral arsenopyrite (2% of the section) and hematite (1% of the section) are disseminated through the greywacke. These two minerals are apparently unrelated to the quartz vein.

Narrow veins of clear quartz (1 mm. wide) cut the massive white quartz. These narrow veins have the relationships of a second generation quartz and they carry accessory amounts of chalcopyrite.

D.D.H. No. 9; 369'8"

Field No. 195395

Rock type : quartz and dolomite intruding chlorite schist.

Ore minerals present : pyrite, marcasite, chalcopyrite, arsenopyrite, sphalorite, ilmanite.

Marco. A coarsely crystalline dolomite and quartz rock cuts a dark green massive chlorite schist.

Thin section. The intrusive material consists of a coarsely crystalline granular aggregate of dolomite and quartz containing veins which are filled with coarsely crystalline apherulitic chlorite. The adjacent rock is a silicified chlorite schist.

Polished section. The intrusive material carries accessory amounts of pyrite, marcasite, arsenopyrite, chalcopyrite and ilmanite. Pyrite occurs in irregular patches and commonly grades imperceptively into marcasite. Near the contact of dolomite and the schist anhydral pyrite exhibits a folded lamellae texture suggesting that this mineral was deformed as the result of flow stresses which were active during introduction of the host vein.

Isolated grains of chalcopyrite 0.16 mms. long and 0.08 mms. wide are disseminated through the dolomite together with small grains of pyrite and arsenopyrite. Anhedral arsenopyrite grains occour at the contact of quartz and schist and fine grains of this mineral are disseminated through the schist.

Fine grains of sphalerite are disseminated through both vein and gangue material. These make up less than 1% of the section.

D.D.H. No. 10; 349'

Field No. 195396

Rock type : white quartz.

This specimen consists of a coarse allotriomorphic granular aggregate of quartz. Rare thin veins of sericite and chlorite occur along quartz grain contacts.

D.D.H. No. 8; 524'

Field No. 195397

Rock type : chloritic slate intruded by quartz.

Ore minerals : pyrite

Thin section. The rock is made up of a heterogeneous complex of allotriomorphic granular quartz and chloritic, sericitic schistose slate.

Polished section. The quartz veins in the schist carry minor accessory amounts of pyrite grains which measure up to 0.05 mms. across.

D.D.H. No. 8; 536'3"

Field No. 195398

Rock type : quartz intruding silicified chlorite schist

Ore minerals : pyrite, marcasite

Marco. White quartz veins 2 mms. wide occur along the foliation plane of a dark green silicified chlorite schist.

The quartz carries shreds of chlorite and minor patches of pyrite.

Thin section. The vein intruding the schist consists essentially of a coarse allotriomorphic granular aggregate of quartz. The vein carries irregular patches of dolomite and accessory opaque minerals. The schist is made up of interfingering lenses and shreds of fine chlorite and sericite.

Polished section. The patches of pyrite are made up of an aggregate of brecciated subhedral pyrite grains. Some of these merge imperceptively into marcasite. Rarely marcasite occurs as discrete grains.

D.D.H. No. 8, 538'9"

Field No. 195399

Rock type : Quartz and calcite aggregate

Ore Minerals present : pyrite, marcasite, chalcopyrite

Thin section. This specimen consists of a coarsely crystalline aggregate of quartz and calcite which carries accessory amounts of opaque minerals. The opaque minerals show no preferential association with quartz or calcite.

Polished section. Massive white vein quartz carries irregular patches of pyrite and stringers of chlorite. Pyrite occurs in small aggregates of subhedral brecciated grains. Rarely minor accessory amounts of chalcopyrite accompany the pyrite. Some of the pyrite grades into marcasite.

Outcrop specimen.

Field No, not given

Location Union Reefs. 120N, 23W.

Rock type : albite-dolerite

Ore Minerals : chalcopyrite, pyrite, magnetite chalcocite

Macro. Dark green medium grained crystalline rock cut by a vein 5 mm. wide containing pink felspar. Accessory pyrite is disseminated through the rock.

Thin section. This specimen is a crystalline aggregate of biotite, albite, chlorite, pyroxene and accessory tremolite, calcite, apatite and quartz. Albite and biotite are the most abundant minerals. The albite is cloudy, severely strained and contains abundant inclusions of pyroxene, biotite and chlorite. Biotite laths range in size up to 1.5 mms. long. Invariably biotite surrounds pyroxene grains and it is itself altered to chlorite. Much of the biotite forms pseudomorphs after pyroxene. These relationships indicate that extensive metasomatic alteration of the original pyroxene and biotite has taken place.

The pyroxene, biotite, chlorite, tremolite, calcite combination suggests that the rock is a metamorphosed dolerite. The abundance of albite however is anomalous for a dolerite and it seems that the rock has been contaminated by albite, possibly during its introduction or during a phase of the metasomatic, alteration. These two events may have been contemporaneous.

Polished section. Accessory amounts of subhedral pyrite and irregular grains of chalcopyrite and magnetite are disseminated through the section. Pyrite makes up about 2% of the rock, chalcopyrite about 1%. Near the weathered surface chalcopyrite grains are replaced around their peripheries by narrow alteration rims of chalcocite. The ore minerals show no preferential associations.

REPORT No 66

July, 1964.

Analysis of Core Samples from Rum Jungle

by

S. Baker

Following are results for the analysis of Core Samples from Rum Jungle, submitted by P. Pritchard.

All results are expressed in percent.

D.D. 726		Ni	Co	Zn	Cu	Pb
216'	- 219'	0.15	0.04	0.50		0.1
244'	- 248'	0.16	0.06	0.50		0.50
D.G. 17						
84'6"	- 87'9"	1.20	0.80	0.32		1.80
87'9"	- 91'	0.50	0.19	0.07		2.50
91'	- 95'6"	0.50	0.40	0.07		2.30
95'6"	- 100'	1.20	0.85	0.05		0.22
100'	- 103'	0.75	0.85	0.05		0.70
D.D.H. 59A1						
34'	- 37'			0.14	0.08	0.92
37'	- 39'			0.006	0.08	0.72
65'	- 67'6"			0.62	0.08	0.24
67'6"	- 70'			0.05	0.24	0.86
70'	- 72'			0.01	0.07	0.27
72'	- 74'			0.02	0.11	0.36
74'	- 76'			0.02	0.13	0.60
76'	- 78'			0.06	0.40	0.36
144'	- 146'6"			0.006	1.32	0.68
281'	- 283'6"			0.03	0.02	0.80
283'6"	- 286'			0.02	0.02	0.50
329'	- 331'6"			0.01	0.26	0.10
331'6"	- 333'			0.006	0.16	0.10
333'	- 335'6"			0.005	0.11	0.10
333'4"	- 336'6"			0.004	0.05	0.10
359'	- 362'6"			0.03	0.40	0.10

20th July, 1964.
97/NT/1

REPORT No 67

ARSENIC DETERMINATIONS

by

N.W. Le Roux

These are the results of arsenic determinations carried out on samples submitted by S. Yeaman. The results were obtained by the Gutzeit method.

RESULTS

Sample		As p.p.m.
0060216		15
0060217A		25
0060217B		25
0060217C		10
0060217D		5
0060218A		30
0060218B		15
0060218C		20
0060219A		3
0060219B	less than	3
0060219C		3
0060231	less than	3

Serial No. 1553

REPORT No 68

21st July, 1964
120/NT/14

ANALYSIS OF WATER SAMPLES FROM RANKEN AREA

by

N.W. Le Roux

These are the results of the analysis of bore water samples submitted by M.A. Randall.

me/l

Sample No.	55/305	55/410	56/312	56/375	57/312	57/365
Cl^-	1.61	0.42	6.08	0.50	2.54	1.01
HCO_3^-	4.05	3.49	3.68	4.32	2.57	3.41
$SiO_3^=$	0.26	0.45	0.32	0.47	0.32	0.55
$SO_4^=$	1.84	1.17	5.30	0.70	6.89	1.68
F^-	0.08	0.06	0.05	0.04	0.04	0.04
NO_3^-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
BO_2^-	0.012	0.023	< 0.012	< 0.012	< 0.012	< 0.012
Ca^{++}	2.49	2.04	3.35	2.32	4.72	3.02
Mg^{++}	3.41	2.88	3.70	3.08	3.77	2.68
Na^+	2.37	0.70	8.78	0.83	3.91	1.24

P.P.M

TDS (180°C)	420	242	927	297	769	352
CONDUCTIVITY	768	514	1543	563	1153	640
pH	7.3	8.0	7.3	7.8	7.5	8.0
Cl^-	57.6	14.9	216.0	17.8	90.2	35.8
HCO_3^-	247	213	225	264	157	208
$SiO_3^=$	10	17	12	18	12	21
$SO_4^=$	88.1	56.0	254.5	33.4	331.0	80.6
F^-	1.6	1.1	0.9	0.7	0.8	0.7
NO_3^-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
B	0.5	1.0	<0.5	<0.5	<0.5	<0.5
Ca^{++}	49.9	40.9	67.2	46.6	94.6	60.6
Mg^{++}	41.5	35.0	45.0	37.4	45.8	32.6
Na^+	54.5	16.0	202.0	19.0	90.0	28.5

Serial No. 1565

REPORT N°69

X-RAY SPECTROCHEMICAL ANALYSIS OF AUGER DRILL SAMPLES

FROM THE MOUNT FITCH AREA OF RUM JUNGLE

by

S.C. Goadby

A series of samples from auger drill holes in Mount Fitch Prospect, N.T., were submitted by P. Pritchard for copper assay.

	Hole No.	Depth ft.	Copper %
1.	5020	BOH	0.15
2.	A5231	"	0.12
3.	A1375	6-20	0.25
4.	A5200	BOH	0.63
5.	A5012	"	0.28
6.	A7387	9-30	0.13
7.	5017	BOH	0.17
8.	A7380	9-26	0.35
9.	A5274	BOH	0.49
10.	A5008	5-12½	0.25
11.	A5093	BOH	0.34
12.	A5316	"	0.16
13.	A5144	12-28	0.35
14.	A5272	BOH	0.14
15.	A5275	"	2.70
16.	A7383	12-18	0.18
17.	A5216	6-38	0.90
18.	A5321	BOH	0.20
19.	A5159	4-10	0.16
20.	A5012	2½-5	0.42
21.	A5040	BOH	0.59
22.	A5096	"	0.61
23.	A5128	"	0.45
24.	A5205	"	0.43
25.	A5124	10-40	0.62
26.	5104	BOH	0.98
27.	5011	"	0.38
28.	A5153	4-22	0.41
29.	A5151	2-28	0.79
30.	A5120	BOH	0.79

	Hole No.	Depth ft.	Copper %
31.	A5085	BOH	0.69
32.	A5089	"	0.49
33.	A5182	14-16	0.10
34.	5043	8-90	0.82
35.	A5200	8-40	0.59
36.	A5156	4-28	0.10
37.	A5128	6-28	0.40
38.	A5149	4-28	0.79
39.	A5328	BOH	0.35
40.	A5154	6-28	0.41
41.	A5126	8-26	0.20
42.	A5131	10-28	0.31
43.	5229	BOH 40	0.45
44.	A5106	BOH	0.63
45.	A5095	"	0.87
46.	A5108(445N:117E)	"	0.05
47.	A5108(432N:118E)	"	0.61
48.	A5032	"	0.27
49.	A4000	6-8	0.13
50.	"	8-10	0.08
51.	"	10-18	0.06
52.	"	18-28	0.06
53.	"	28-38	0.10
54.	"	6-38	0.09
55.	A4005	8-10	0.08
56.	"	10-12	0.08
57.	"	12-20	0.10
58.	"	20-26	0.07
59.	"	26-36	0.08
60.	"	36-46	0.08
61.	"	46-56	0.10
62.	"	8-56	0.09
63.	A4010	14-16	0.06
64.	"	16-18	0.06
65.	"	18-28	0.05
66.	"	28-38	0.05
67.	"	38-48	0.05
68.	"	BOH	0.05
69.	"	14-48	0.06

	Hole No.	Depth ft.	Copper %
70.	4015	8–10	0.10
71.	"	10–12	0.09
72.	"	12–22	0.06
73.	5008	BOH	0.39
74.	5011	7½–40	0.58
75.	5042	16–66	0.30
76.	5077	BOH	0.35
77.	5082	"	0.35
78.	5083	"	0.44
79.	5086	"	0.77
80.	5088	"	0.35
81.	5097	"	0.23
82.	"	6–60	0.37
83.	5103	BOH	0.13
84.	5120	2–40	0.34
85.	5122	BOH	1.27
86.	5123	"	0.44
87.	5125	6–40	2.00
88.	A5126	BOH	0.63
89.	5129	8–36	0.31
90.	5134	14–28	0.19
91.	5136	14–20	0.33
92.	5205	Comp.	0.43
93.	A5221	8–40	0.37
94.	5301	BOH	0.30
95.	5330	"	0.11
96.	5756	8–26	0.70
97.	5022	10–40	0.31
98.	5043	BOH	0.27
99.	5033	"	0.50
100.	5078	"	0.37
101.	5100	"	0.11
102.	5106	6–40	0.65
103.	5126	BOH	0.05
104.	5121	12–40	1.26
105.	5021	BOH	0.29
106.	5122	10–40	1.28
107.	5123	6–36	0.91
108.	5125	BOH	0.72
109.	5127	4–40	0.51
110.	"	BOH	0.31

	Hole No.	Depth ft.	Copper %
111.	5137	8–22	0.37
112.	5049	BOH	0.26
113.	5150	6–28	0.30
114.	5157	8–22	0.28
115.	5158	8–22	0.41
116.	5155	4–8	0.21
117.	5169	6–22	0.32
118.	5241	0–2	0.22
119.	5243	0–8	0.16
120.	5243	BOH	0.34
121.	5108	8–40	0.09
122.	5121	BOH	1.38
123.	5021	"	0.62
124.	5035	"	0.14
125.	5086	12–20	0.79
126.	5090	BOH	1.72
127.	4015	22–30	0.06
128.	"	30–38	0.07
129.	"	38–46	0.08
130.	"	46	0.08
131.	"	10–46	0.08
132.	4020	8–10	0.14
133.	"	10–14	0.37
134.	"	14–18	0.34
135.	"	18–28	0.22
136.	"	28–36	0.22
137.	"	36–46	0.32
138.	"	46–52	3.31
139.	"	52–60	6.10
140.	"	BOH	5.50
141.	4030	10–12	0.34
142.	"	12–14	0.52
143.	"	14–24	2.56
144.	"	24–32	2.36
145.	"	32–42	1.77
146.	"	10–52	2.02
147.	4035	6–8	0.34
148.	"	8–10	0.23
149.	"	10–20	0.10
150.	"	20–30	0.18
151.	4025	6–8	0.44
152.	"	8–12	2.68
153.	"	12	4.61

	Hole No.	Depth ft.	Copper %
154.	4025	20-30	3.41
155.	"	0-42	3.99
156.	"	42-54	3.98
157.	A4025	54-64	3.17
158.	"	BOH	3.47
159.	A4041	4-6	0.61
160.	"	6-8	0.94
161.	"	16-26	0.69
162.	"	26-36	0.78
163.	"	36-46	1.89
164.	"	46-56	1.94
165.	"	56-62	1.84
166.	"	68-74	1.93
167.	"	4-74	1.77
168.	"	74	1.52
169.	A4035	6-52	0.31
170.	"	30-40	0.27
171.	"	40-52	0.37
172.	A4045	4-6	0.57
173.	"	6-8	0.40
174.	"	8-12	0.95
175.	A4045	4-16	0.87
176.	"	12-16	1.25
177.	"	16	0.97
178.	A4050	10-20	0.81
179.	"	10-26	0.77
180.	"	20-26	0.77
181.	"	26	0.48
182.	A4055	8-10	0.71
183.	"	10-20	1.85
184.	"	20-30	2.29
185.	"	8-42	2.19
186.	A4060	8-10	2.45
187.	"	10-12	2.44
188.	"	12-22	2.76
189.	"	22-30	2.44
190.	"	8-38	2.63
191.	"	38	2.14
192.	A4065	8-10	0.80
193.	"	8-14	0.90
194.	"	14	0.65

	Hole No.	Depth ft.	Copper %
195.	A4070	4-10	0.14
196.	"	4-16	0.22
197.	"	10-12	0.21
198.	"	12-16	0.30
199.	"	BOH	0.30
200.	4075	?	0.34
201.	4080	8-10	0.12
202.	"	10-18	0.12
203.	"	18	0.12
204.	4081	6-8	0.09
205.	"	BOH	0.14
206.	4082	52	1.15
207.	4083	6-18	0.64
208.	"	14-16	0.41
209.	"	16-18	0.56
210.	"	6-8	0.50
211.	4084	6-8	0.09
212.	"	8-10	0.16
213.	"	10-12	0.24
214.	"	12-22	0.63
215.	"	12-32	0.57
216.	"	32	1.08
217.	"	22-32	0.75
218.	4086	10-20	0.88
219.	4085	6-8	0.07
220.	"	8-14	0.06
221.	"	14-22	0.08
222.	4086	20-30	1.31
223.	"	30-40	1.43
224.	"	40-48	0.96
225.	"	48-54	0.94
226.	"	54	0.60
227.	"	10-54	1.26
228.	4087	4-8	3.23
229.	"	4-12	3.39
230.	"	8-12	3.53
231.	"	12	2.79

	Hole No.	Depth ft.	Copper %
232.	4088	10–14	1.58
233.	"	14–24	2.71
234.	"	24–32	2.07
235.	"	10–48	3.97
236.	"	32–40	1.28
237.	"	40–48	1.83
238.	"	48	2.59
239.	4089	12–16	0.23
240.	"	16–26	0.21
241.	"	26–34	0.25
242.	"	18–42	0.33
243.	"	34–42	1.64
244.	"	42	2.12
245.	4090	12–20	0.06
246.	"	12–28	0.05
247.	"	20–28	0.06
248.	"	28	0.05
249.	4091	16–24	0.06
250.	"	24–32	0.06
251.	"	32–42	0.06
252.	"	16–52	0.11
253.	"	42–52	0.14
254.	4092	8–14	0.65
255.	"	16–24	0.15
256.	"	16–42	0.26
257.	"	24–32	0.13
258.	"	32–42	0.43
259.	"	42	1.07
260.	4093	18–28	0.22
261.	"	28–38	0.38
262.	"	38–48	0.72
263.	"	18–48	0.59
264.	"	48	0.48
265.	4094	4–8	0.05
266.	"	4–12	0.05
267.	"	8–12	0.05
268.	"	12	0.05

REPORT N° 70

PETROGRAPHIC DESCRIPTION OF THREE BASALT SPECIMENS FROM DAMSITE A, LOWER WARANGOI RIVER, NEW BRITAIN

by

W. Oldershaw

The following petrographic descriptions are of there basalt specimens from the Warangoi River which were submitted by Dr. E.K. Carter.

R. 17701 TS. 14001 FN. CA.

Porphyritic Vesicular Augite Basalt

The specimen is a porous granular rock composed of white crystals of feldspar and olive green crystals of augite set in a dark grey vesicular matrix. There is no shearing or foliation, and the rock has a rough irregular fracture. The rock has a bulk specific gravity of 2.57 which compared to the specific gravity of 2.73 of solid basalt shows it to have a porosity of 6 percent. This porosity is high for a basalt and is due to the vesicular matrix.

Under the microscope, the rock is seen to consist of phenocrysts of plagioclase and augite 1 to 2 mm. across, comprising 60 percent of the rock, set in a matrix of small laths of plagioclase and grains of magnetite with interstitial brown basaltic glass.

The phenocrysts of plagioclase consist of euhedral crystals of labradorite, most of which are well zoned and show growth lines. Some phenocrysts consist of two interpenetrant euhedral crystals in the form of a cross. Many of the crystals are strongly zoned from cores of labradorite to margins of oligoclase. The growth lines are marked by inclusions of dust and basalt glass along the old crystal faces. The laths of plagioclase in the groundmass consist of euhedral crystals of labradorite-andesine about 0.1 mm. long.

The mafic minerals, augite and magnetite, occur in groups. The augite consists of fresh, roughly prismatic crystals, some of which are slightly leached and corroded around their margins.

The matrix of the rock consists of minute laths of fresh plagioclase, minute octahedra of magnetite which comprise about 6 percent of the matrix, and interstitial brown basaltic glass which comprises about 10 percent of the matrix.

The specimen is a porous granular rock with numerous vesicles. The vesicles are empty and unlined. There is no foliation or shearing. The rock is fresh and shows no sign of weathering or alteration. The rock has a specific gravity of 2.57 which is less than the specific gravity of 2.73 for solid basalts and is due to the vesicles which comprise 6 percent of the rock. These vesicles would greatly reduce its strength. Ten percent of the matrix consists of basaltic glass, but this is not known to be deletrious.

R. 17702 TS. 14002 F. CB

Porphyritic Vesicular Augite Basalt

The specimen is a porous crystalline rock with a few crystals of white feldspar and olive-green augite, 1-2 mm. across, set in a dark grey vesicular groundmass. There is no shearing or foliation and the rock has a rough hackly fracture. The rock has a bulk specific gravity of 2.57. This is less than the specific gravity of most basalts (2.73) and is due to the vesicles which comprise 6 percent of the rock.

Under the microscope the rock is seen to consist of euhedral crystals of plagioclase, comprising 60 percent of the rock, and groups of roughly prismatic crystals of augite set in a very fine-grained matrix of minute laths of plagioclase, octahedra of magnetite and sparse interstitial basaltic glass.

The phenocrysts of feldspar consist of euhedral, strongly zoned crystals of plagioclase with bytownite-labradorite cores and oligoclase margins. The crystals contain bands of inclusions of dust, gas vugs and pods of basaltic glass along the growth lines marking old crystal faces.

The mafic minerals - augite, magnetite and a little olivine - occur in groups. The augite shows little alteration and litt corrosion.

The matrix of the rock is finer-grained and darker than in specimen R. 17701 and consists of minute laths of plagioclase and octahedra of magnetite set in a sparse brown basaltic glass.

Most of the numerous vesicles in this rock are lined with a thin layer (0.1 mm. thick) of a pale brown, non-pleochroic, highly birefrigent colloform mineral, parts of which show a layered structure and parts show an aggregate structure.

Some of the smaller vesicles are full of this mineral. It appears to be one of the montmorillonite group of clay minerals and was probably formed by deuteric alteration of the basaltic glass in the matrix around the vesicles.

The specimen is a porous vesicular rock. There is no foliation or shearing. The rock is fresh and shows no signs of weathering and only a little alteration. The numerous vesicles in the rock account for its high porosity of 6 percent and would tend to reduce its strength. The basaltic glass around some of the vesicles has been altered to montmorillonite. This is one of the "swelling clays", but as it only forms a thin lining to the larger vesicles and fills a few of the smaller vesicles, it comprises about one percent of the rock and its effect would be quite small.

R. 17703 TS. 14003 FN. CC

Augite Basalt

The specimen is a compact crystalline black rock with a few crystals of grey feldspar, black augite, and small pods of brown clay minerals scattered through it. The sample has a rough hackly fracture. No shear planes, joints or foliation were found. The sample has a specific gravity of 2.67 and a porosity of 1 percent. The sample is not weathered or stained.

Under the microscope, the rock is seen to consist of euhedral and subhedral phenocrysts of plagioclase, which form 60 percent of the rock, and a few prisms of augite and a few grains of magnetite set in a fine-grained matrix of minute laths and prisms of plagioclase and octahedra of magnetite.

The phenocrysts of plagioclase are strongly zoned and consist of bytownite-labradorite with oligoclase margins. The cores of the phenocrysts are crowded with inclusions of groundmass, part altered to clay, magnetite and dust, but the marginal zones are clear. Some of the growth lines are marked by bands of inclusions. Some grains are cut by parallel cracks, a few of which are filled with a brown clay.

The mafic minerals - augite and magnetite, occur in clots. The augite forms euhedral to subhedral prisms and shows no alteration.

The matrix of the rock consists of minute laths and prisms of plagioclase (0.05 mm. long) and octahedra of magnetite. The magnetite comprises 10 percent of the matrix. There are a few small vesicles comprising 1 percent of the rock which contain a brown, banded colloform, highly birefrigent mineral which is probably nontronite, one of the montmorillonite groups of clay minerals. The matrix in a few places has been altered to irregularly shaped masses of brown montmorillonite. There are a few veinlets filled with brown clay.

The rock is a hard compact augite basalt. It contains few vesicles and there is no foliation or shearing. The rock is not weathered and the minerals show no alteration. In a few places, comprising less than 1 percent of the rock, the glassy part of the matrix has broken down into one of the montmorillonitic group of clays.

REPORT N° 71

Copper Assays

by

J.R. Beevers

The following are assays for copper on samples submitted by P. Pritchard from the Rum Jungle area, N.T.

Sample			% Cu
R. 134	20'	25'	1.6
"	20'	25' B	.67
"	20'	30'	.51
"	30'	35'	.23
"	35'	40'	.47
"	40'	45'	.39
"	45'	50'	.33
"	50'	55'	.37
"	55'	60'	.26
"	60'	65'	.23
"	65'	70'	.22
"	70'	75'	.22
"	75'	80'	.42
"	80'	85'	.20
"	85'	90'	.13
"	90'	95'	.11
"	90'	100'	.46
"	100'	105'	.51
"	105'	110'	1.80
"	115'	120'	.79
R. 136	0'	5'	.68
"	0'	5' B	.56
"	5'	10'	.35
"	10'	15'	.55
"	10'	15' B	.61
"	20'	25'	.72
"	25'	30'	.63
"	30'	35'	.51
"	35'	40'	.67
"	40'	45'	.56
"	45'	50'	.54
"	50'	55'	.51
"	55'	60'	.55
"	60'	65'	.78

Sample			% Cu
R. 136	65'	- 70'	.72
"	70'	- 75'	.68
"	75'	- 80'	.46
"	90'	- 95'	.47
"	95'	- 100'	.53
R. 138	0'	- 5'	.69
"	5'	- 10'	.75
"	15'	- 20'	.66
"	20'	- 25'	.73
"	25'	- 30'	.50
"	30'	- 35'	.68
"	35'	- 40'	.74
"	40'	- 45'	.68
R. 140	0'	- 5'	.45
"	5'	- 10'	.58
"	10'	- 15'	.87
"	15'	- 20'	.93
"	20'	- 25'	.45
"	25'	- 30'	.48
"	30'	- 35'	.37
"	35'	- 40'	.93
"	45'	- 50'	1.14
"	50'	- 55'	.89
"	55'	- 60'	.38
"	60'	- 65'	.30
"	65'	- 70'	.17
"	70'	- 75'	.84
"	75'	- 80'	.57
"	80'	- 85'	.59
"	85'	- 90'	.34
"	90'	- 95'	.37
"	95'	- 100'	2.4
"	100'	- 105'	.94
"	105'	- 110'	.64
"	110'	- 115'	.65
"	115'	- 120'	.64
"	120'	- 125'	.51
R. 165	75'	- 80'	.32
"	80'	- 85'	.28
"	90'	- 95'	.37
"	95'	- 100'	.72
"	105'	- 110'	.92
"	110'	- 115'	.41

Sample			% Cu
R. 167	0' –	5'	.26
"	5' –	10'	.46
"	5' –	10' B	.28
"	5' –	10' C	.22
"	10' –	15'	.36
"	15' –	20'	.33
"	20' –	25'	.34
"	25' –	30'	.20
"	30' –	35'	.70
"	35' –	40'	.17
"	40' –	45'	.49
"	45' –	50'	.37
"	50' –	55'	1.03
"	55' –	60'	.99
"	60' –	65'	.50
"	65' –	70'	.22
"	70' –	75'	1.3
"	75' –	80'	.24
"	80' –	85'	.17
"	85' –	90'	.68
"	90' –	95'	.22
"	95' –	100'	.27

Report No. 72

Estimation of Copper on Core Samples from Rum Jungle.

by

S. Baker

Following are results for the estimation of copper on core samples from Rum Jungle:-

D.D.H. DG17 Area 55, Rum Jungle

Interval	Core	Recovery %	Copper %	
3'- 7'	42"	88	0.2	
7'-21'6"	126"	72	less than 0.1	
21'6"-26'	48"	89	0.2	
26' -31'	54"	90	0.3	
31' -36'	46"	77	0.3	
36' -41'	48"	80	no sample	
41' -46'	31"	52	0.3	
46' -50')	60"	59	0.4	
50' -54'6")			0.7	
54'6"-57'	14"	48	0.5	
57' -62'	50"	83	0.6	
62' -64' }	45"	83	1.0	
64' -66'6" }			0.5	
66'6"-67'6" }	53"	98	0.5	
67'6"-71' }			0.3	
71'6"-76'6"	37"	62	0.4	
76'6"-80'6"	32"	67	0.8	
80'6"-84'6"	48"	89	0.4	
84'6"-87'9"	31"	80	0.6	
87'9"-91"	29"	74	4.2	abundant sulphides
91' -95'6"	48"	89	4.2	abundant sulphides
95'6"-100'	37"	69	7.4	abundant sulphides
100' -103'	27"	75	10.0	abundant sulphides
103' -103'6")	57"	79	0.6	
103'6-109')			0.2	
109' -112'6"	38"	90	0.2	trace of sulphides
112'6"-116'	32"	76	1.0	abundant sulphides
116' -121'	27	45	0.4	abundant sulphides
121' -127'	35"	58	0.8	abundant sulphides
127' -128' }	31"	65	1.5	abundant sulphides
128' -131' }			1.2	trace of sulphides

Note: Core recovered from the intervals 100'-103' and 103'-109' were logged as 57" and 27" respectively as the first recovery is obviously incorrect and the second somewhat lower than average the core figures have been transposed in the above table.

D.G. 24 Mount Fitch, Rum Jungle

Interval	Core	Recovery %	Copper %	
210' -221'6"	96"	70	<0.1	Mn rich section 0.6
250'11"-255'	34"	72	1.9	8" x 7.8, Rem nil
348'7" -350'	12"	71	0.5	
350' -355'	26½"	44	1.4	4½"x 5.2, Rem 0.7
355' -360'	36"	60	2.5	24"x 3.5, Rem 0.6
361' -374'	101"	64	0.4	
404'6" -409'6"	8"	13	0.3	
409'6" -415'	43½"	66	0.2	core fragments 0.7

D.D.H.'s DG 27, DG 30, DG 31, Mount Fitch, Rum Jungle

Interval	Core	Recovery %	Copper %	
DG 27				
85' -92'6"	42"	47	0.5	clay 1.5
122'6"-128'6"	not recorded in log		13.0	clay 13.0
DG 30				
590' -595'	21" approx.	70	1.3	cavity 591'-593'6"
595' -600'	43" approx.	72	0.9	
DG 31				
75' - 80'	78" (75'-85')	67	0.4	
80' - 85'			0.6	

R.D.H. R 142, Mount Fitch, Rum Jungle

Depth	Copper %	Depth	Copper %
0- 5'	1.2	95' -100'	0.6
5'-10'	1.9	100' -105'	0.3
10'-15'	2.1	105' -110'	0.6
15'-20'	1.8	110' -115'	0.2
20'-25'	2.0		
25'-30'	3.3	120' -125'	0.5
30'-35'	2.8		
35'-40'	4.7	130' -135'	0.5
40'-45'	2.3	135' -140'	0.5
45'-50'	5.9	140' -145'	0.6
50'-55'	4.9		
55'-60'	4.0	190' -195'	0.9
60'-65'	1.4		

Report No. 73 July, 1964.

Andesite from Borehole TAV. 1, Rabaul, New Britain.

by

W.R. Morgan

The specimen, R.16888, was submitted by C.B. Branch for petrological examination. The hand specimen is a pinkish-grey, fine-grained sparsely porphyritic lava that is cut by parallel, white veins, 5 to 10 mm. apart, and about 1 to 2 mm. thick. In a zone about 0.5 mm. thick either side of the veins, the lava is oxidized.

In thin section, the phenocrysts are seen to range up to 2mm. long, and to form about 5% of the rock. Plagioclase phenocrysts are tabular and, in places, clustered; they have a composition of about An_{35-40}. Pale green augite, and rather less common colourless hypersthene, phenocrysts form slightly embayed and rounded prismatic crystals that are, in places, intergrown with magnetite; some pyroxene crystals are slightly altered to hydrated iron oxide particularly where they are close to the veins noted in hand specimen.

The groundmass is holocrystalline, and consists mostly of flow-oriented to sub-variolitic, fairly sodic plagioclase microlites that measure 0.02 mm. long by 0.006 mm. wide. Some granular pyroxene grains, 0.003 mm. diameter, and small amounts of octahedral magnetite, are present.

The veins are composed of granular to elongated crystals of a zeolite, possibly phillipsite.

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REPORT NO. 74

9th January, 1964.

Dolerite from Loloki Copper Smelter, T.P.N.G.

by

W.R. Morgan

The sample (R.17289) was submitted for petrographic examination by B.P. Walpole. In hand specimen, it is seen to be a dark greenish-grey, medium-grained dolerite whose constituent crystals show a fairly well-defined preferred orientation. The rock is cut by thin, irregular veins.

The thin section (12849) shows the rock to be a strongly altered dolerite. Plagioclase laths measure about 2 mm. long and 0.6 mm. wide, and are flow-oriented. In many places the plagioclase is strongly altered to kaolin, together with some chlorite and quartz. Augite grains measure about 1.3 mm. in diameter, and mostly form colourless prismatic crystals; some, however, fill interstices between plagioclase laths. In some places, augite is partly replaced by actinolite and chlorite. Probable olivine is represented by a few chlorite pseudomorphs. Grains of an opaque mineral were shown by polished section to be magnetic containing exsolved lamellae of ilmenite on octahedral planes. Magnetite crystals have fretted margins.

A rough estimate of the percentages of minerals present is : - plagioclase (and its alteration products) : 70; augite (together with actinolite and chlorite): 20-25; magnetite: 5-10. The pseudomorphed (?) olivine is present in accessory quantities only.

The rock is cut by thin veins containing fine, granular epidote.