

COMMONWEALTH OF AUSTRALIA.

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

RECORDS:

1964/164

1964 Summary of Activities -
Mineral Resources Branch



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BUREAU OF MINERAL RESOURCES, GEOLOGY
AND GEOPHYSICS

PETROLEUM TECHNOLOGY SECTION

Review of Operations in 1964

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1. The Section's personnel during 1964 consisted of :-

Occupied Positions :

- 1 Chief Petroleum Technologist (Class 5)
- 1 Supervising Petroleum Technologist (Class 4)
- 2 Petroleum Technologists Class 3
- 2 Petroleum Technologists Class 2
- 1 Chemist Class 1
- 1 Boring Supervisor
- 2 Drillers Grade 2
- 4 Drillers Grade 1
- 4 Drill Assistants
- 1 Technical Assistant Grade 2
- 1 Clerk

Unoccupied Positions :

- 1 Drilling Superintendent

This position has been vacant since the retirement of Mr. C.L. Breaks on 18th April 1963. Numerous applications have been received and selected candidates have been interviewed.

2. Petroleum Ordinances of the Territories :-

During the year the Section dealt with various technical and scientific matters in connection with the administration of petroleum ordinances of the Northern Territory and the Territory of Papua/New Guinea. Chief Petroleum Technologist is a member of the Oil Advisory Committee appointed under these Ordinances. He has been acting as a Convenor/Secretary of the Committee since 19th October 1962.

Discussions continued on the Model Regulations to be incorporated under the relevant State and Territory Petroleum Acts. Mr. Taylor-Rogers, Chief Petroleum Technologist attended the bi-annual meeting of State Inspectors of Mines in Sydney from 26th to 28th May for discussions arising from the redrafting of the Model Regulations.

Chief Petroleum Technologist as Convenor/Secretary of the Oil Advisory Committee attended a meeting in May to consider proposed amendments to the petroleum sections of the Northern Territory (Prospecting and Mining) Ordinances.

In July 1964, Chief Petroleum Technologist and Supervising Petroleum Technologist held three discussions with officers of the Department of National Development Secretariat on the proposed uniform code of petroleum legislation in respect of the continental shelf of Australia. Extensive comments resulting from these discussions were drafted for the Secretary.

On 25th September, Chief Petroleum Technologist attended a meeting in Melbourne with the Department of Shipping and Transport to discuss marine safety regulations applicable to off-shore operations.

3. Petroleum Policy :-

Various draft minutes were prepared on Ministerial and Parliamentary questions, many of them with some petroleum policy component.

4. Petroleum Engineering :-

(a) Drilling ;

The seismic shothole drilling operations carried out by the Section were as follows:-

No. 1 Seismic Party commenced operations in the Boulia area, Queensland on 31st March. Shothole drilling by this Section was carried out using two Mayhew '1000' rigs and one Carey rig.

On 2nd September, No. 1 Party moved to the Marion Downs/Bedourie area, Queensland.

Between 1st April 1964 and 30th October 1964, the drilling units attached to No. 1 Seismic Party drilled 3360 holes giving a total of 181,215 feet. Of this amount 32,848 feet were drilled using auger technique, 17,373 feet by conventional rotary drilling with mud circulation and 130,990 feet were drilled using air or water-injected air circulation.

In addition a shallow stratigraphic test hole was drilled to 472 feet at Marion Downs Station.

The average rate of penetration for drilling by the units attached to No. 1 Seismic Party has been 109 feet per hour and the average depth of hole has been 54 feet. The party is currently in the Tobermory area.

No. 2 Seismic Party commenced operations in Bullsbrook area, Western Australia on 18th March 1964. Shot hole drilling by this Section was carried out using 2 Carey units and one Mayhew "1000" unit. Throughout April, May and until 22nd. June the party was in the Wanneroo area, W.A. and then moved to the Carnarvon area arriving on the 26th June and at 31st. October was still in that area.

No. 2 party has met with more difficult drilling and moving conditions than No. 1 party. Repairs to both vehicles and drilling rigs have been heavy; staffing problems have also been encountered. Drilling rigs attached to No. 2 Seismic Party from 18th March 1964 to 30th September 1964 drilled a total of 1878 holes for a total of 124,523 feet. Of this total 114,016 feet were drilled by conventional rotary drilling with mud circulation and only 10,507 feet was drilled by air.

The average rate of penetration was 96 feet per hour and the average depth of hole has been 66 feet.

It is interesting to note that in the Bullsbrook area, one Carey rig drilled 1439 feet of $3\frac{7}{8}$ " hole in $6\frac{1}{2}$ hours, an average of 221 feet/hour, using 10 sacks of bentonite and conventional circulation. At the end of October the No. 2 party was operating in the Gascoyne Junction area, W.A.

Contract stratigraphic drilling involving three holes in the Georgina Basin, N.T. (B.M.R. No. 11 - Cattle Creek; B.M.R. No. 12 - Cockroach and B.M.R. No. 13-Sandover) commenced in July, 1963. At the end of November, 1963, B.M.R. No. 11 - Cattle Creek had reached a final depth of 1501 $\frac{1}{2}$ feet and had been logged and left in condition for conversion to a water well. Full details of this operation are given in B.M.R. Record No. 1964/45 prepared jointly by this Section and the Geological Branch. Mr. M. D. Bell, Petroleum Technologist Cl. 2 acted as well site engineer throughout the operation.

On completion of B.M.R. No. 11 - Cattle Creek, it had been planned to suspend operation until after the "wet" and start at B.M.R. No. 12 - Cockroach in April 1964. However due to bad road conditions and lack of water at the B.M.R. No. 11 site, it was decided to move to B.M.R. No. 13 - Sandover as soon as possible.

B.M.R. No. 13 - Sandover was spudded in on 15th January 1964 and reached final depth of 3330 feet on 6th July 1964. Difficulties were experienced with lost circulation and several major shut downs for repairs occurred. The well was logged and plugged back to 3012' in order to test the interval 2952' and 2975' from which samples had shown signs of oil and gas while drilling.

The interval was tested but the results were inconclusive as the tail pipe failed during the test; it could not be recovered and the well was plugged and abandoned on 21st. July 1964. Full details of this operation are given in B.M.R. Record No. 1964/127 prepared jointly by this Section and the Geological Branch. Mr. D. McKay, Petroleum Technologist Cl. 2 was well site engineer from 5th January until 11th February when he was replaced by Mr. M.D. Bell who was at the site until recalled on 6th April; since then no permanent well site engineer has been employed. Periodic visits have been made by officers of the Section when required.

B.M.R. No. 12 - Cockroach was spudded in on 15th August and on the 31st. October was drilling at 3350 feet. After initial problems connected with verticality, drilling at this location has proceeded without incident.

Petroleum Engineering

(b) Laboratory.

The analysis of cores or samples from sidewall cores, conventional plugs cut from cores, whole cores and outcrop samples was carried out continuously throughout the year. Routine analyses consisted of tests for water saturation, oil saturation, core water salinity, acid solubility, porosity, permeability and bulk and grain densities.

During the last twelve months, 1225 individual core pieces and 187 outcrop pieces have been analysed for all or most of the above mentioned properties.

Mr. B. McKay has been continuously employed on 'whole core analysis' and in the design, building and use of several pieces of apparatus connected with more advanced petrophysics such as capillary pressure, irreducible connate water, saturation, fluid flow in porous media and the reliability of the theoretical Klintenberg equation.

During the year two new permeameters were received, one for fluid flow, and one for gas (nitrogen) flow.

Testing of bentonites continued intermittently and samples from four different areas were fully tested in the natural state and also after treatment. Approximately 120 slurries were tested for rheological and wall building properties.

During the early part of the year the final modifications to the gas chromatograph were completed and tested. Preparation of analytical columns and carrier testing was carried out including the isolation of interfering impurities in carrier gases.

Over 70 samples of gases were analysed, many of these in duplicate to check on equipment reliability. Samples were also prepared and analysed by other organisations to check our equipment's performance. The routine analysis of water samples and the testing of oil samples was continued.

(c) Reports, Articles, Statistics, etc.

The Section collects, collates and prepares for publication and dissemination the following:

- (1) Petroleum Tenement Map and Key - twice a year.
- (2) Petroleum Newsletter - quarterly
- (3) Rig Activity, wells and footage drilled - monthly.
- (4) Breakdown of exploration activity and expenditure - annually

- (5) List of drilling contractors, service companies and consultants - as required, usually twice a year.
 - (6) Articles on petroleum in Australia for various publications in Australia and overseas - quarterly for the Australian Mineral Industry Review"
"Australia in Facts and Figures", News and Information Bureau, Encyclopædia Britannica year book, etc.
- (d) Conferences, Meetings, Courses etc:

Chief Petroleum Technologist attended the following :

- (i) Bi-annual meeting of State Inspectors of Mines in Sydney from 26th to 28th May for discussion on Petroleum Regulations.
- (2) During July, three discussions with officers of the Secretariat on proposed uniform code of petroleum legislation in respect of the continental shelf of Australia. Mr. M.C. Konecki also took part in the discussions.

Mr. M. C. Konecki, Supervising Petroleum Technologist attended the annual conference of the Australian Petroleum Exploration Association in Melbourne in March, 1964.

Mr. J.M. Henry, Petroleum Technologist Class 3 attended the Schlumberger Log Interpretation Course in Brisbane from the 10th to 14th February 1964.

- (e) Visitors, Interviews, etc.

From the beginning of November 1963 to the end of September 1964 some 146 visitors representing local and overseas companies interested in or participating in petroleum exploration were interviewed by officers of the Section. It is estimated that some 160 to 175 professional man-hours were involved in the visits and discussions.

- (f) Visits to Field Operations:

Officers of the Section made the following visits to field operations:

Chief Petroleum Technologist -

Exoil-Mereenie No.1 - 26th February 1964
Moonie field - 25th & 26th March 1964.

J. M. Henry, Petroleum Technologist Class 3.

B.M.R. No. 12 Cockroach - 25 August to 3 Sept. 1964.

P. Duff. Petroleum Technologist Class 3 -

Exoil-Mereenie No. 1 - 26th Feb. 1964 to 4 March 1964.
B.M.R. No. 13 13th June 1964 to 17th June, 1964
and 3rd. July 1964 to 17th July, 1964.

M. D. Bell, Petroleum Technologist Class 2.

B.M.R. No. 13 9th February 1964 to 6th April 1964.

B. McKay, Petroleum Technologist Class 2.

B.M.R. No. 13 7th January 1964 to 11th February 1964.

(H. S. TAYLOR-ROGERS)
Chief Petroleum Technologist

MINING ENGINEERING SECTION 1964

1. The following reports were prepared concerning:

(a) The Gold Mines Development Assistance Act

- (i) Approval of Moonlight Wiluna Gold Mine Ltd as a producer.
- (ii) Approval of development programmes and supplementary development programmes for 1963/64 for Lake View and Star Ltd, Great Boulder Gold Mine Ltd, North Kalbarri (1912) Ltd, and Hill 50 Gold Mine Ltd and Golden Plateau No Liability for 1964/65.
- (iii) Completion of development programme for 1963/64 of all producers listed in (ii).

(b) Export of iron ore

- (i) Hamersley Iron Pty Ltd.
- (ii) Mount Newman Iron Ore Co. Ltd (3 reports).

(c) Export of manganese ore.

- (i) Northern Minerals Syndicate. M.C. 269 Woodie Woodie.
- (ii) Bell Brothers Pty Ltd. M.C.'s 487, (Woodie Woodie) 244, 245 and 256 (Ant Hill).

(d) Run Jungle Intermediate copper prospect.

(e) Work done by Cove Mining and Industrial Limited on Special Mineral Leases Nos. 2, 3 and 4, N.T.

(f) The results of the section's work on survey and sampling of tailings dumps in New South Wales and Tasmania. These were issued as Records Nos. 64/58 and 64/59.

2. Liaison with other Government Departments was maintained concerning the development of the Run Jungle Intermediate Copper prospect, Frances Creek iron ore deposits, Cove bauxite deposits and silicosis legislation for the Northern Territory.

3. Tailings dumps were surveyed in Queensland and the Northampton area of Western Australia.

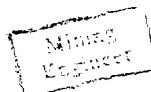
4. The following notes refer to work done by A.M.D.L. on projects supplied by the section:

1. Laboratory study of Induced Radioactivity Sorter for manganese. Project was held up by lack of suitable samples - these have now been sent to A.M.D.L. The question of sorting on a basis of silica content is also being investigated, but indications are that in the case of Mn ores selectivity will not be very good. In Progress.
2. Hatches Creek - separation of chalcophyllite from bismuthinite in gravity concentrate from the Pioneer Mill. The order has been placed but no progress reports received. In Progress.

2.

3. Upgrading of Western Australian Manganese Ores - Progress report No. 6 31/7/64 advised that test work on samples from Peak Hill and Woodie Woodie was complete and preparation of a final report was in progress. This has not yet been received. Results shown in the progress reports were not at all encouraging. Completed - Awaiting Final Report.
4. Investigation into Production of Refined Bismuth - Project completed, but final report not yet received. Completed - Awaiting Final Report.

SF Meas
5/11/64



MINERAL ECONOMICS SECTION - REPORT ON ACTIVITIES, 1964

The activities of the Mineral Economics Section continued to be circumscribed during 1964 by organizational and staffing difficulties. Of the seven professional positions in the Section, one was vacant for the whole of the year, a second became vacant in June and a third in mid-November. Without taking into account additional staff losses owing to temporary transfers (partly offset by the loan of an officer from the Operations Branch), the professional strength was at only 75 per cent of capacity over the year. In these circumstances the Section was hard pressed to maintain its ad hoc activities and produce its publications and was only able to do so as a result of the provision of some non-professional staff for routine work and editing, and outside contracts for sub-editing and proof-reading.

Attempts at recruitment of professional staff during the year were unsuccessful, largely because the vacancies which existed or occurred early in the year were at Class 1 level. Experience has indicated that it is unlikely that recruitment in any numbers will be possible at this level. Although the chances of recruitment at the Class 2 level - if positions existed - might be better, it should be noted that the Class 1 officer who left in June had by the end of October been promoted to a position (not requiring professional qualifications) within the Class 3 range in another Department.

These factors, together with the steadily increasing volume of ad hoc work resulting from the growth of the mineral industry meant that little was possible in the way of field work associated with a continuing programme of commodity studies. The field work undertaken was concerned with beach sands (Mr. Ward) and industrial minerals (Dr. Kalix). Discussions were also held with C.S.I.R.O. in Melbourne, and visits paid to State Mines Departments in Sydney, Melbourne, Adelaide and Perth.

A major project during the early part of the year was the provision of assistance to the Committee of Economic Enquiry. Mr. Livingstone was made available to the Committee as an independent consultant on a part-time basis during April, May and June. Mr. Ross was also made available for a period to assist in the preparation of background material for the Committee. The Committee and officers of its Secretariat were also afforded assistance at other times during the year.

International commodity problems occupied a considerable amount of the time of senior officers of the Section. These concerned lead and zinc, tin and tungsten. A meeting of the International Lead and Zinc Study Group was held in October, and Mr. Morgan prepared the brief for this; he was also chairman of the sub-committee on long-term problems of production. Mr. Livingstone and Mr. Ward took part in inter-Departmental discussions and consultations with industry in connection with the International Tin Council and the United Nations Ad Hoc Committee on Tungsten. An analysis of the probable future position in tin in Australia and a study of the long-term position in tungsten were undertaken as part of this work.

Towards the end of the year the critical supply position in copper gave rise to consultations between the industry and Departmental representatives and inter-Departmental meetings, all of which were attended by Mr. Livingstone. Mr. Ward was a member of an inter-Departmental committee examining the economy of King Island and Mr. Ross was a member of an inter-Departmental committee discussing export controls and COCOM safeguards relating to lithium minerals and monazite.

Several aspects of taxation in the mining industry were examined during the year. Mr. Livingstone was a member of an inter-Departmental committee examining Sections 77A and 77AA of the Income Tax Act, which provide for 100 per cent deductibility from assessable income of moneys paid as share calls to companies prospecting for petroleum or mining and prospecting for certain other minerals respectively; both Sections were retained as part of the Act for a further three years to June 1967. In mid-November proposals for a tax holiday for new mines and the extension of Section 23 (p) and 23A concessions to lead and zinc (put forward by the Export Development Council), and for a more precise definition of mining operations for taxation purposes (suggested by Dr. S.A. Dunn) were being studied. Other minor questions on mineral taxations were dealt with.

The Section continued to prepare periodic estimates of export income and to advise Departments and industry on mineral export trends and prospects generally. Particular attention was paid to developments in exports of beach sands and aluminium, alumina and bauxite, and developments towards exports of iron ore, in the context of the continuing study of mineral exports in general.

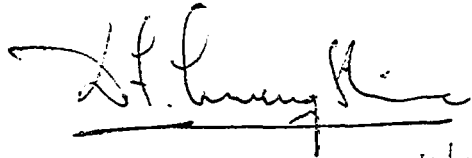
Throughout the year the Section advised the Joint Intelligence Branch of Department of Defence on the selection and grading of key points, and maintained liaison with the Planning Branch of Department of Supply with regard to the assessment of resources, production and consumption of strategic raw materials.

Numerous visitors were interviewed, the more important topics being bauxite, iron ore, phosphate, potash (There were many enquiries about these four minerals), asbestos, tungsten, tin, nickel, copper, salt, the rarer metals, abrasives, gypsum, magnesite and other refractories, salt, and other industrial minerals. Visitors also discussed taxation, mineral development policy, export policy, costs and investment opportunities in the industry. There were a number of visitors on a less official basis during the ANZAAS meeting.

As well as interviewing and assisting visitors to the office the Section dealt with numerous enquiries from mining companies and mineral dealers and from private individuals. The volume of enquiries was again higher than in the previous year and covered the whole range of mineral products, markets and other aspects of the industry. There were also many enquiries from other Government Departments, over and above those in connection with the various inter-Departmental committees referred to previously.

During the year the 1963 Annual Review of the Australian Mineral Industry, covering the period to June 1964, was prepared, and publication was expected in December. Three issues of the Quarterly Review - Vol. 16 Nos. 3 and 4 and Vol. 17 No. 1 - were published, and Vol. 17 No. 2 was in preparation in November; these contained articles on developments towards iron ore exports, the trend in mineral exports in general, the tin position in Australia in the late 1960's and the production and use of refractories in Australia. Towards the end of the year work was resumed on the statistical volume in the series on the Mineral Resources of Australia. No Summary Reports were prepared during the year; those on copper, limestone and minor non-metals are still outstanding. As well as checking articles and press statements by the Minister, the Section prepared articles on the mineral industry and beach sands mining for the Eighth Commonwealth Mining and Metallurgical Congress and provided material for other articles.

The Section's draft programme for 1965 necessarily reflects the fact that organisational and staffing difficulties are likely to persist, at least in the early part of the year. The programme has been planned on the basis that the volume of ad hoc work, plus the publications programme, will virtually take up all the Section's capacity. The use of non-professional staff will materially assist the publications programme, but any professional time thus released will almost certainly be fully pre-empted by the growth of general business; commodity studies will have to take priority over basic investigations if any work in these specialized areas can be undertaken.



11/11/64