

SOUTH AUSTRALIA.

ANNUAL REPORT

OF THE

DIRECTOR OF MINES

AND

GOVERNMENT GEOLOGIST

FOR

1925.

ADELAIDE :

BY AUTHORITY: R. E. E. ROGERS, GOVERNMENT PRINTER, NORTH TERRACE.

1926.

A

Plaint No. 79.—Heard at Adelaide, June 1st, 1925. *W. A. Hamilton v. R. Barrett.* Claim for the forfeiture of mineral lease No. 2396, situated in the hundred of Waitpinga. The decision of the Court was that the lease was liable to forfeiture. The decision of the Court was upheld by the Hon. the Minister of Mines, and the lease was forfeited in favor of the complainant.

Plaint No. 80.—Heard at Adelaide, August 13th, 1925. *B. Moulden v. Commonwealth Plaster Company.* Claim for the forfeiture of miscellaneous (gypsum) lease No. 151, situated in the hundred of Kevin. The decision of the Court was that the lease was liable to forfeiture, with an allowance of £50 costs. The features of this case were unusual. The Hon. the Minister of Mines, following the recommendation of the presiding Warden, declined to forfeit the lease, but approved costs to the plaintiff. An appeal against the Warden's decision was made by the defendant to the Supreme Court, but was dismissed.

Plaints Nos. 81, 82, 83, 84, 85.—Heard at Adelaide, August 18th, 1925. *B. Moulden v. Commonwealth Plaster Company.* These complaints were heard together, the evidence in complaint 81 being accepted for complaints 82, 83, 84, and 85, and comprised a claim for the forfeiture of miscellaneous (gypsum) leases Nos. 152, 168, 169, 175, and 188, situated in the hundred of Kevin. The decision of the Court was that these leases were liable to forfeiture, with an allowance of £5 5s. costs. On the recommendation of the presiding Warden, the Hon. the Minister of Mines declined to forfeit the leases, but approved costs to the plaintiff.

Plaint No. 86.—*F. T. Cray v. A. C. Broughton.* Claim for the forfeiture of mineral claims Nos. 11893 and 11894, situated near Olary. Consent to judgment herein was filed by the defendant, and a Warden's order to peg issued.

Plaint No. 87.—*F. T. Cray v. W. H. Trethewey.* Claim for the forfeiture of mineral claims Nos. 11768 and 11769, situated near Olary. Consent to judgment herein was filed by the defendant, and a Warden's order to peg issued.

Plaint No. 88.—*J. T. Kirkman v. F. L. MacFarlane.* Claim for the forfeiture of miscellaneous (gypsum) lease No. 189, situated in the hundred of Kevin. The plaintiff was withdrawn.

Plaint No. 89.—*J. T. Kirkman v. F. L. MacFarlane.* Claim for the forfeiture of miscellaneous (gypsum) lease No. 190, situated in the hundred of Kevin. The plaintiff was withdrawn.

Plaint No. 90.—*J. T. Kirkman v. F. L. MacFarlane.* Claim for the forfeiture of miscellaneous (gypsum) lease No. 184, situated in the hundred of Kevin. The plaintiff was withdrawn.

Plaint No. 91.—*J. T. Kirkman v. F. L. MacFarlane.* Claim for the forfeiture of miscellaneous (gypsum) lease No. 185, situated in the hundred of Kevin. The plaintiff was withdrawn.

Plaint No. 92.—*J. T. Kirkman v. H. A. Betts.* Claim for the forfeiture of miscellaneous (gypsum) lease No. 187, situated in the hundred of Kevin. The plaintiff was withdrawn.

Plaint No. 93.—*J. T. Kirkman v. H. A. Betts.* Claim for the forfeiture of miscellaneous (gypsum) lease No. 186, situated in the hundred of Kevin. The plaintiff was withdrawn.

Plaint No. 94.—*F. H. Nicholls v. A. Muston.* Claim for the forfeiture of miscellaneous (salt) lease No. 178, in the hundred of Kevin. Consent to judgment herein was filed by the defendant. The recommendation for forfeiture was approved by the Hon. the Minister of Mines, and the lease was forfeited in favor of the complainant.

Plaint No. 95.—*E. G. Uren v. F. W. Montague.* Claim for the forfeiture of mineral lease No. 2459, situated at Wooltana. The plaintiff was dismissed.

EXPENDITURE AND REVENUE.

The following statement of expenditure and revenue for the 11-year period, 1915-1926, is provided in order that it may be possible to see at a glance what the net cost of the Department of Mines and all its connections has been to the people of South Australia during this period. The figures quoted in the following table are inclusive of all items. The figures regarding expenditure include all salaries and departmental operations, such as boring operations, cost of running Government batteries and cyanide works, as well as all assistance granted for the encouragement of mining. The figures dealing with revenue are concerned chiefly with the sums received by way of rental and royalties on mining leases of all kinds.

It will be seen that the revenue exceeded the expenditure during four of the 11 years under review, and that the average annual cost of the Department to the State for the whole of the period is under £2,000.

Statement of Expenditure and Revenue for the 11-Year Period 1915-1926.

Financial Year.	Expenditure.	Revenue.	Excess Expenditure.	Excess Revenue.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1915-16	16,831 12 0	12,501 17 5	4,329 14 7	—
1916-17	15,561 9 6	10,832 2 7	4,729 6 11	—
1917-18	14,766 3 11	13,165 1 2	1,601 2 9	—
1918-19	11,650 15 3	11,870 0 2	—	219 4 11
1919-20	12,011 8 3	10,381 6 5	1,630 1 10	—
1920-21	14,431 8 7	18,361 5 5	—	3,929 16 10
1921-22	13,561 10 5	16,414 2 1	—	2,852 11 8
1922-23	14,715 5 1	6,718 10 2	7,996 14 11	—
1923-24	17,352 16 6	7,207 19 2	10,144 17 4	—
1924-25	13,581 0 4	17,665 5 8	—	4,084 5 4
1925-26	15,362 0 4	13,531 7 8	1,830 12 8	—
	£159,825 10 2	£138,648 17 11	£32,262 11 0	£11,085 18 9

Average annual expenditure, £14,529 11s. 10d.; average annual revenue, £12,604 8s. 10d.; excess of expenditure over revenue, £21,176 12s. 3d., or £1,925 2s. 11d. per annum.

ROYAL COMMISSION ON PLUMBISM.

Consequent upon a considerable increase in the reported cases of lead poisoning at the extensive lead-smelting works operated by the Broken Hill Associated Smelters Proprietary, Limited, at Port Pirie, a Royal Commission was appointed "to inquire into and report upon the cause or causes of the disease known as plumbism, the increase thereof amongst employees of the Broken Hill Associated Smelters Proprietary, Limited, at Port Pirie, and the best means of preventing or alleviating such disease."

The Commission, after a further investigation of the problem, which touched also upon the possibility of poisoning by carbon monoxide gas, presented a report and suggested rules for the control of the industry so far as concerns the health of the employees. This report was printed as Parliamentary Paper No. 57 of 1925. The rules drawn up by the Commission have been adopted in a regulation gazetted under the Mines and Works Inspection Act of 1920.

GEOLOGICAL INVESTIGATIONS DURING 1925.

The following schedule contains a summary of the work on which the geologists were engaged during the period under review:—

(A) INVESTIGATIONS AND REPORTS CONCERNING MINERAL DEPOSITS.

The Government Geologist made a number of visits to localities at which boring operations were in progress, and to places under consideration for carrying out exploratory work by means of drilling. Thus several inspections were made of areas at Bower, Morgan, Mannum, Kadina, and Waikerie.

The Deputy Government Geologist made inspections for the same purpose of areas near Morgan, Swan Reach, and Monteith.

The Deputy Government Geologist inspected and reported departmentally upon a proposal to make use of quartzite deposits in the Adelaide hills for building construction.

The same officer made a large number of inspections and investigations of clay deposits in connection with a bulletin on the clay resources of the State, to be published later as No. 12 of the Geological Survey Bulletins.

The Deputy Government Geologist furnished a report also on the structural features of certain quartzite beds at Sleep's Hill, near Adelaide, for the purpose of guiding future developmental operations.

The Government Geologist accompanied Dr. Herman, on the occasion of his visit to South Australia, to inspect and report on the availability of this State's resources of lignite.

Departmental reports were furnished by the Government Geologist and Deputy Government Geologist on some supposed indications of oil and the problems of further prospecting for oil in the State.

The Government Geologist reported departmentally also on applications involving State aid to mining at Moonta and in other parts of the State.

During his visit to the Northern Territory the Government Geologist inspected and reported departmentally on the Home of Bullion Mine, near Barrow Creek, and on Ambrose's Mine, near Tennant Creek.

(B) INVESTIGATIONS CONCERNED WITH WATER SUPPLIES.

The Government Geologist was authorised by the State Government to make an investigation in the Northern Territory on behalf of the Commonwealth Department of Works and Railways with regard to underground water supplies on stock routes and elsewhere in the Northern Territory. This investigation involved field work, extending from July 2nd to October 10th. The report on this investigation, together with that on the investigation made in 1923, is being published separately by the Commonwealth Government.

The Government Geologist and Deputy Government Geologist visited an area lying beyond the occupied pastoral holdings in the north-western part of South Australia, and prepared a departmental report for the guidance of the Government in carrying out prospecting operations for water.

The Deputy Government Geologist visited and reported on a locality on Waverley Ridge, in the Mount Lofty Range, and recommended boring at a locality at which an artesian flow was subsequently obtained.

The same officer inspected and reported also on the prospects of obtaining useful supplies of underground water on pastoral leases east of Iron Knob.

The Deputy Government Geologist visited the Beltana pastoral leases, and made a supplementary report on the prospects of obtaining water supplies on these leases. This report may be regarded as a supplement to the discussion of the problems of water supply set out in Geological Survey, Bulletin No. 11. The areas mentioned in this departmental report are those at Beltana, Lyndhurst, and Murnpeowie.

Departmental reports were provided by the same officer on the prospects of obtaining water in the hundreds of Mangalo and Pascoe, and also at Parakylia Station.

(C) VARIOUS ACTIVITIES.

The Government Geologist and Deputy Government Geologist visited Melbourne as delegates from South Australia to an Interstate Geological Conference, at which were discussed many problems and methods affecting South Australia in particular and the Commonwealth as a whole.

The Deputy Government Geologist reported departmentally on the cause of development of cracks in houses in one of the suburbs of Adelaide.

The Government Geologist visited and reported on a cave recently discovered on Kangaroo Island.

The Government Geologist wrote a chapter dealing with the mining industry for a revised edition of the Handbook of Information, issued at the Government Intelligence and Tourist Bureau.

The Government Geologist reported also on various proposals regarding the alteration of legislation, the disfigurement of landscapes by quarrying, and many departmental matters connected with the mining industry.

THE INSPECTION OF MINES, WORKS, AND QUARRIES.

The Chief Inspector of Mines has furnished the following summary report on the work on which he was engaged during the year 1925 :—

Visits of inspection were made to various mines, works, and quarries during the year. In cases where advice or assistance was required reports and plans were furnished, and, in all cases, the conditions as to safe working were noted, and instructions were given to remedy anything considered unsafe.

Among the mining properties visited were the following :—The radium mine and plant at Radium Hill, Olary, and a deposit of carphosiderite near Boolcoomatta.

The workings of the Deloraine Gold Mine, and an arsenical ore property which was being worked near Callington.

A small silver-lead mine near Mount Lofty was examined and sampled, and a report furnished thereon, printed in Mining Review 42.

The Gumeracha soapstone deposit, from which regular supplies of this material are obtained, was visited, and likewise the clay pits and works of Kaolin, Limited, at Longwood.

An inspection was made of a locality where some work had formerly been done on a lode, in quest of gold near Woodvale, and the owner was advised as to any further work that might be done.

At Tarcoola and Glenloth the old gold fields were visited, and all working claims were examined—a visit being also made to the opal field at Coober Pedy, Stuart's Range, and the various workings, extending over a length of 40 miles, were examined.

A barytes property at Oladdie, upon which a treatment plant was in operation, was examined, and a report was written thereon, which was published in Mining Review 42.

The Mount Malvern Mine, formerly worked for silver-lead, having been re-opened, visits of examination were made and the plant and the underground workings were inspected.

The immense gypsum deposits of Lake MacDonnell, not far from Penong, are now being utilised on a large scale; two companies having built large treatment plants for the production of plaster. The lake workings, where the raw material is obtained, and the works at Cape Thevenard, where it is manufactured into plaster, were visited, a description of the operations being published in Mining Review 43. The workings at the Lake MacDonnell salt leases were also inspected.

A visit was made to Moonta in connection with the Government boring work being carried on at the Hamley Mine, and the workings of the Wild Dog Mine, the Moonta Prospecting Syndicate, and the Moonta Copper Recovery Company were inspected. At the first-named mine preparations were being made for sinking a further lift of the main shaft to open up a new level.

A considerable industry is established in the south-east part of the State, near Mount Gambier, in the production of building stone obtained from the beds of polyzoal limestone in the vicinity. The various quarries were inspected and were found to be in good order as regards workings and plant.

A steady production of first-class barytes is maintained from the Adelaide Barytes Syndicate's mine near Noarlunga, the various workings of which were visited and examined.

Inspections were likewise made of the two large slate quarries at Mintaro and at Willunga.

The sand and gravel workings on the Torrens, near Gilles Plains, were visited. Here a large deposit is being worked, the material being put through a cleaning and crushing plant, yielding clean stone and sand very suitable for building purposes.

Visits of inspection were also made to the cement works and various quarries and brickworks.

On the whole, the provisions of the Mines and Works Inspection Act and regulations are fairly well observed.

As a number of the quarries are working quartzite beds for the production of road metal and screenings, it is very essential, for the health of the employees, that the dust from the stone should be suppressed or removed, and a steady improvement is being effected in this regard, chiefly by the use of water-sprays.

Fatal Accidents.—Two fatalities occurred in the conduct of quarrying operations for the year.

The first was at the large limestone quarry of the Adelaide Cement Company at Klein Point. Large pockets of clay, the filling of old solution cavities, occur in the limestone, and while an employee was working at one of these a fall of clay took place, resulting in his death.

The other fatality was at the limestone quarry at Reynella, worked by the South Australian Portland Cement Company, where an employee was killed by a fall of rock from the face.

The third fatal accident of the year occurred at the lead smelting works at Port Pirie, and was caused by an electric shock received by an employee engaged in electrical work.

The Inspector of Mines and Quarries has supplied the following summary of his work during the year 1925 :—

From January to March a systematic inspection was made of the more important quarries, including those supplying materials for roads, cement manufacture, and brickmaking.

The Cleve Silver Mine, on the West Coast, and the Crusader Silver-Lead Mine, at Baratta, were examined and sampled. Reports and plans were furnished the mine owners, the particulars being published in Mining Review No. 41.

For the same Review an article was compiled describing the plant of the Broken Hill Associated Smelters, Port Pirie, and outlining the treatment processes.

The period April-July was occupied as a member of the Royal Commission on Plumbism appointed to inquire into the cause of lead poisoning amongst the Smelter employees at Port Pirie, and the best means of preventing or alleviating the disease.

Following the Commission's report in July, special attention was given to the supervision of operations at the Smelters, including the alterations required to conform with the special regulations for the prevention of lead and gas poisoning adopted on the Commission's recommendation. Though the programme of alterations is still incomplete, there has been a material improvement in dust suppression, and in the latter half of the year there was a marked reduction in the incidence of lead poisoning amongst the employees.

Inspections were also made of the Fertilisers' works at Birkenhead and Wallaroo, where leady material in the form of zinc concentrates is being roasted to recover the sulphur for acid making. At both works the alterations necessary to meet the requirements of the new regulations were commenced. These operations are now being regularly supervised.

Several visits were paid to the Moonta district, and the working properties examined. Departmental reports were furnished on the Moonta Prospecting Syndicate and Wild Dog properties in connection with an application for special assistance to mining in that district.

The special duties enumerated interfered to a considerable extent with routine inspection work, but, as far as practicable, in association with the Chief Inspector of Mines, a regular supervision was maintained of the larger quarries and crushing plants. These, including the Broken Hill Proprietary Company's loading and crushing plants at Whyalla, and the extensive mining operations at Iron Knob, where the Iron Monarch quarry face has been developed until it is now over 2,000ft. in length.

Investigations were made and reports supplied respecting fatal accidents at the Broken Hill Associated Smelters, Port Pirie, and the South Australian Portland Cement Company's quarries, Reynella.

There was generally a reasonable compliance with the requirements of the Mines and Works Inspection Act and Regulations, excepting that at a number of the stone crushing plants the equipment for dust suppression is not effective. As a result of departmental influence at several plants improved appliances and more efficient water sprays have been installed, resulting, in these cases, in a substantial improvement in working conditions for the employees.

STATE BATTERIES AND CYANIDE WORKS.

The following report on the operations of the State batteries and cyanide works has been furnished by the General Manager:—

During the year ended December 31st, 1925, work has proceeded as usual at the Government batteries and cyanide works. This work consists of the treatment of ore by battery, the treatment of tailings by the cyanide process, and the testing and assaying of small parcels for the prospector not included as parcels.

In the period referred to 40 parcels of ore were treated, the total weight being 604 tons 12cwt. for a return of 927ozs. 9dwts. 3grs. of gold bullion, valued at £3,300 1s. 3d.

In the course of the year 404 assays and pan tests of small parcels of ore of a few pounds weight and ore and tailings under treatment were made. The total weight of tailings treated by the cyanide process amounted to 1,085 tons. Of the total bullion recovered, 726ozs. 12dwts. 1gr., valued at £2,545 10s., were recovered by amalgamation, and 166ozs. 4dwts., valued at £664 16s., were recovered by the cyanide process. The average value per ton of ore treated for the 12 months was £5 9s. 3d.

The work carried out at State batteries and cyanide works during the year has, in addition to the testing of small parcels for the prospector, enabled a return to be made to the prospector of £2,778 7s. 9d. as proceeds on the treatment of the various parcels of ore.

The total value of gold bullion recovered to date at State batteries and cyanide works is £106,469 2s. 6d.

GOVERNMENT DRILLING OPERATIONS.

The work of diamond drilling was carried out continuously throughout the period of review in the Kadina district, prospecting for the downward and longitudinal extensions of the lode worked at Stirling West shaft. Altogether 955ft. of boring were completed by this drill, which was kept working for one shift only. The results of these boring operations are summarised in Mining Reviews Nos. 42 and 43.

Boring for lignite was carried out with rotary drills of the calyx type at Bower, Tailem Bend, Monteith, Swan Reach, Mannum, and Morgan.

At Bower 2,408ft. were drilled in boreholes numbered 7 to 12 of that series.

At Tailem Bend 266ft. 6in. were drilled in one borehole.

At Monteith 363ft. 3in. were drilled in two boreholes.

At Swan Reach 412ft. were drilled in three boreholes.

At Mannum 655ft. were bored in three boreholes, being numbers 2, 3, and 4 of that series.

At Morgan 968ft. were bored in two boreholes, being numbers 2 and 3 of that series.

In addition to this work, a borehole was drilled to a depth of 100ft. at Port Pirie to ascertain the nature of the foundations for a structure that was to be built by the Railways Commissioners.

At Waikerie 924ft. were drilled in eight boreholes for the Irrigation Commission, for the purpose of conveying seepage water from the soil to the porous limestone which exists at a depth of about 130ft. below the surface.

The total amount of boring completed by the several drills, at all the localities mentioned, was 7,051ft. 9in. during the year 1925.

THE MINERAL PRODUCTION OF SOUTH AUSTRALIA TO THE END OF 1925.

The sources of the minerals produced within the State during 1925 are shown in the tabular statement published with this report. When the value of these products is added to that recorded since the foundation of South Australia, and the principal mineral products are segregated from the annual totals, it will be found that the most important contributions are made by the following :—

	Value of Total Production, 1840-1925. •£
Copper	33,024,835
Iron	4,731,621
Salt	1,925,878
Gold	1,616,165
Gypsum	404,272
Silver and lead	380,386
Limestone	373,621
Phosphate rock	129,118
Manganese	92,330
Opal	81,495
Other minerals	391,961
Total to end of 1925	£43,151,682

The principal output from any one district is that from the Wallaroo and Moonta field, which produced 335,311 tons of copper, valued at £20,429,372, between the time of its discovery in 1860 and the end of 1925.

The total production from Iron Knob, since the deposits were first opened up in 1899 to the end of 1925, is 4,611,013 tons, of which 1,023,943 tons were consumed as flux at Port Pirie, and 3,587,070 tons were shipped to New South Wales for smelting into iron and steel.

SOUTH AUSTRALIA.—GEOGRAPHICAL DISTRIBUTION OF MINERAL PRODUCTION FOR THE YEAR 1925.

Division and County.	Value of Mineral Production for 1925.	Details of Production.
I. Central—	£	
Adelaide	27,510	Gold, £786; barytes, £4,101; soapstone, £250; clay, £7,252; limestone, £14,552; ochre, £10; flint pebbles, £21; felspar, £38; silver-lead, £420; silica, £80.
Carnarvon	13,990	Salt, £13,990.
Eyre	1,281	Barytes, £1,281.
Fergusson	147,869	Gypsum, £34,960; limestone, £27,667; salt, £85,242.
Gawler	1,035	Limestone, £857; salt, £178.
Hindmarsh	2,025	Clay, £2,025.
Light	1,401	Phosphate rock, £1,142; gold, £67; barytes, £192.
Sturt	1,261	Arsenic ore, £600; clay, £661.
Total	£196,372	
II. Lower North—		
Burra	375	Magnesite, £375.
Daly	66,199	Copper, £35,878; gypsum, £61; salt, £30,260.
Kimberley	—	—
Stanley	—	—
Victoria	—	—
Total	£66,574	

GEOGRAPHICAL DISTRIBUTION OF MINERAL PRODUCTION FOR THE YEAR 1925—Contd.

Division and County.	Value of Mineral Production for 1925.	Details of Production.
III. Upper North—		
Blachford	—	—
Dalhousie	450	Barytes, £450.
Derby	991	Silver-lead, £991.
Frome	443	Magnesite, £443.
Granville	—	—
Hanson	—	—
Herbert	60	Magnesite, £60.
Lytton	—	—
Newcastle	—	—
Taunton	—	—
Total	£1,944	
IV. South-Eastern—		
Buckingham	—	—
Cardwell	—	—
Grey	333	Pebbles, flint, £333.
MacDonnell	—	—
Robe	—	—
Total	£333	
V. Western—		
Bosanquet	—	—
Buxton	—	—
Dufferin	—	—
Flinders	912	Talc, £912.
Hopetoun	—	—
Jervois	—	—
Kintore	32,231	Gypsum, £26,815; salt, £5,416.
Le Hunte	—	—
Manchester	701,207	Ironstone, £674,649; salt, £26,532; clay, £26.
Musgrave	—	—
Robinson	—	—
Way	—	—
York	—	—
Total	£734,350	
VI. Murray-Mallee—		
Albert	17	Gypsum, £17.
Alfred	741	Gypsum, £741.
Buccleuch	324	Gypsum, £324.
Chandos	—	—
Hamley	—	—
Russell	324	Gypsum, £324.
Young	—	—
Total	£1,406	
Outside Counties—		
Northern	757	Ochre, £757.
North-Eastern	479	Radio-active ores, £172; gold, £63; silver-lead, £244.
North-Western	26,256	Gold, £2,619; ochre, £120; opal, £9,070; salt, £14,447.
Western	—	—
Total for the State	£1,028,471	

In conclusion, I desire to record my appreciation of the loyal and generous assistance given to me at all times by all officers of the department.

I have, &c.,

L. KEITH WARD,

Director of Mines, Government Geologist, and Secretary to the Minister of Mines.

To the Honorable the Minister of Mines.