

1966
—
QUEENSLAND

IRRIGATION AND WATER SUPPLY COMMISSION

ANNUAL REPORT

OF THE

COMMISSIONER

OF

**IRRIGATION AND WATER SUPPLY
1965-1966**

PRESENTED TO PARLIAMENT BY COMMAND

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1914

REPORT OF THE COMMISSIONER OF THE GENERAL LAND OFFICE

ANNUAL REPORT

FOR THE YEAR 1914

PRESENTED TO THE HOUSE OF COMMONS

BY COMMAND

OF HER MAJESTY'S PARLIAMENT

LONDON: H.M.S.O.

Commissioner of Irrigation and Water Supply:

F. B. HAIGH, M.B.E., M.I.E.Aust.

Assistant Commissioners of Irrigation and Water Supply:

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Secretary:

R. ADAMSON, A.A.S.A.

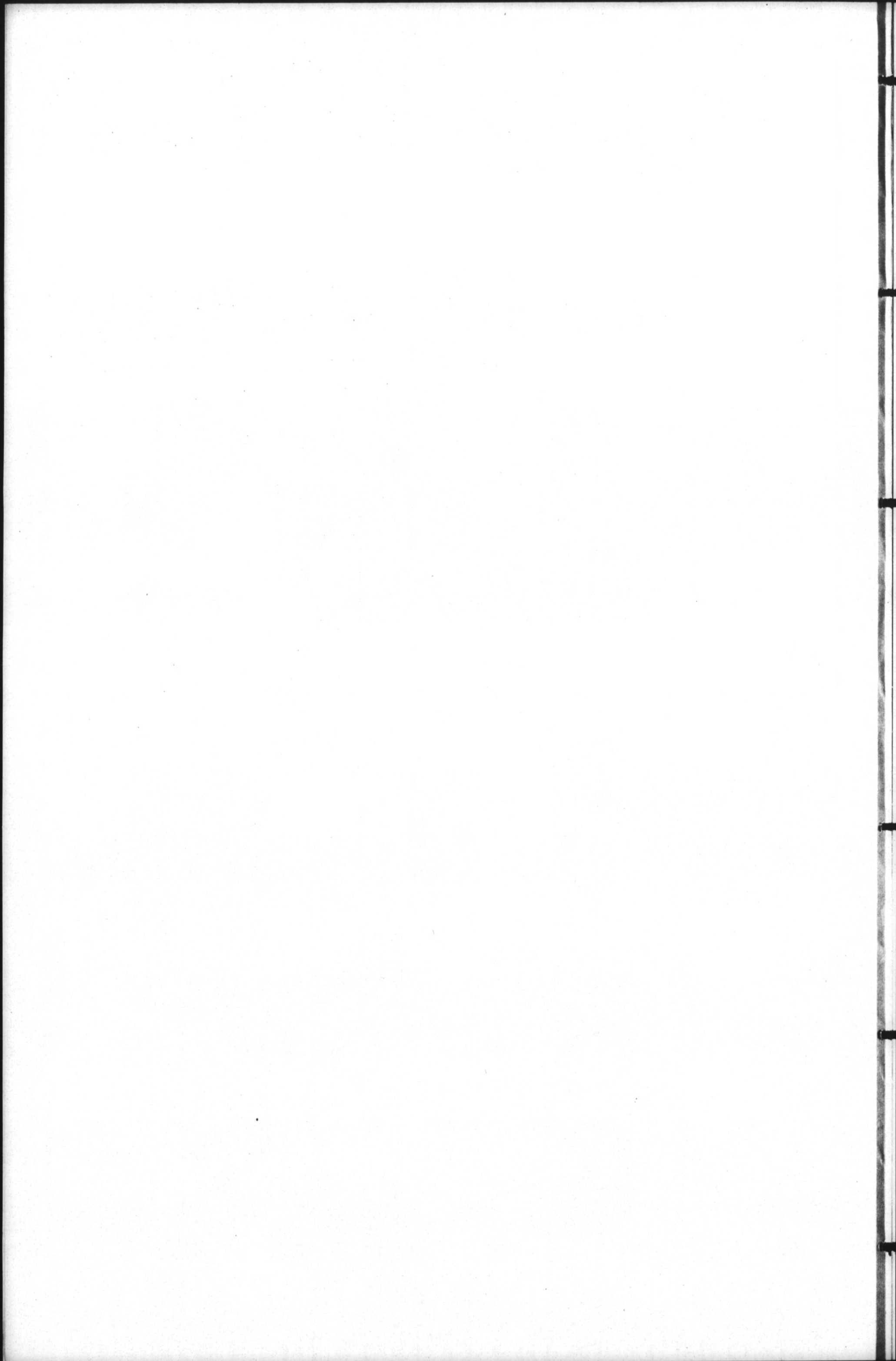
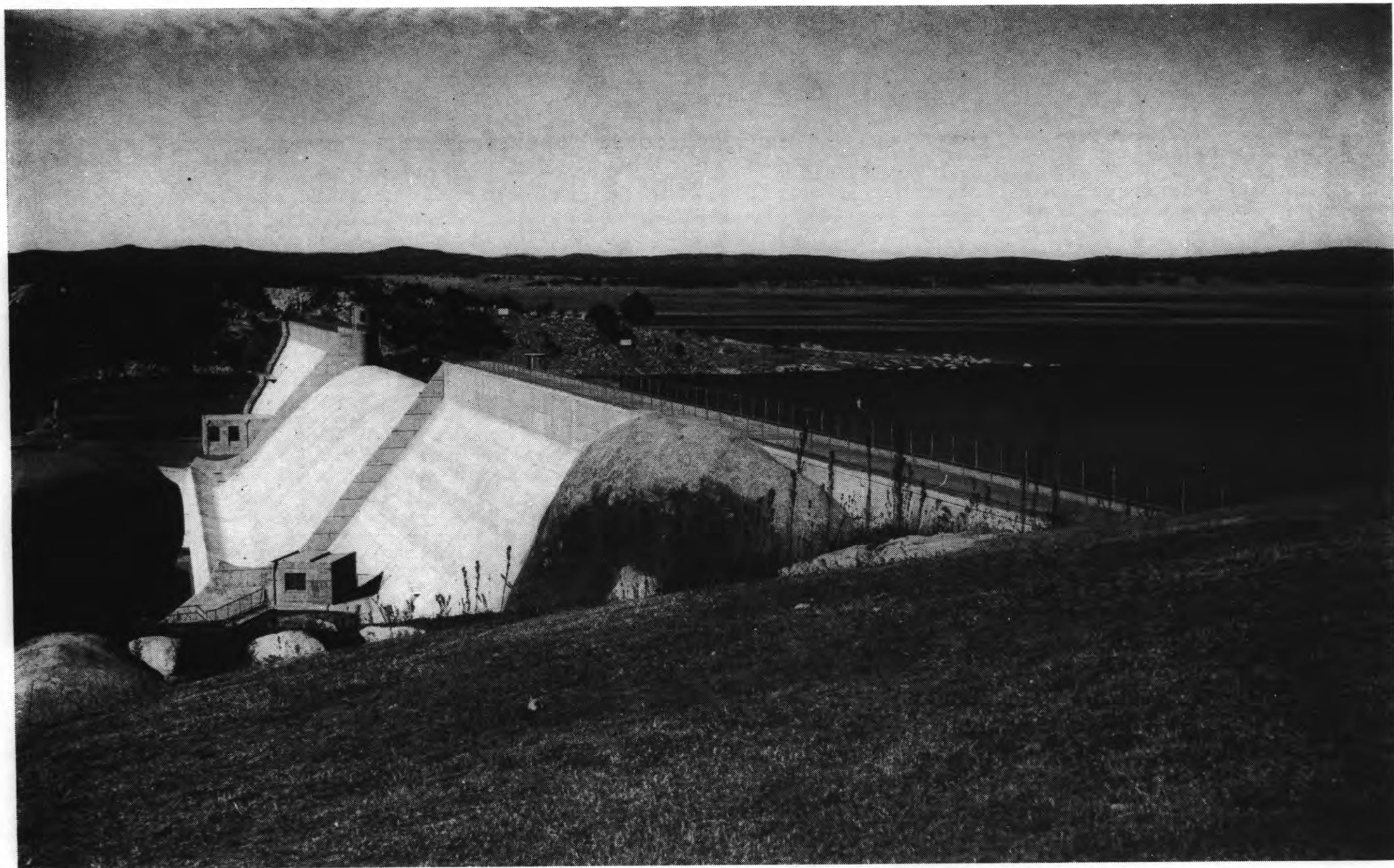


TABLE OF CONTENTS

	PAGE
LETTER	1
SUMMARY	3, 4
IRRIGATION DEVELOPMENT—	
Irrigated Areas and Crops	5
Water Conservation Works and Irrigation Areas	5
ADMINISTRATION—	
General	5
Legislation	5
District Offices	5
Staff	5, 6
Dumaresq-Barwon Border Rivers Commission	6
International Commission on Irrigation and Drainage	6
International Commission on Large Dams	6
Water Research Foundation of Australia	6
Australian Water Resources Council	6
Co-ordinating Council of the International Hydrological Decade	6, 7
Soil Conservation	7
PLANT AND EQUIPMENT	7
WATER RESOURCES INVESTIGATION—	
Measurement and Recording of Surface Water Resources	7
Investigation, Planning and Construction of Gauging Stations	7
Underground Water Supplies	8, 9
Water Quality Analyses	9
LICENSING AND CONTROL—	
Surface Water	10
Underground Water	10
RIVER IMPROVEMENT—	
River Improvement Trusts	11
INVESTIGATION DESIGN AND CONSTRUCTION OF WORKS—	
Mareeba-Dimbulah	11, 12
Coolmunda Dam	12
Leslie Dam	12
Wuruma Dam	12
Warrill Valley Irrigation Project	12
Border Rivers	12
Rural Water Supply Schemes	12, 13
Materials Testing Laboratory	13
Water Supply for Power Generation	13
Other Construction Work	13
Investigations	13
Drainage Schemes—Canelands North Queensland	13, 14
Stock Route Watering Facilities	14
Local Authorities and Other Government Departments	14
IRRIGATION AND RURAL WATER SUPPLY AREAS—	
Mareeba-Dimbulah Irrigation Area	14
Burdekin River Irrigation Area	15, 16
Dawson Valley Irrigation Area	16
St. George Irrigation Area	16, 17, 18
Mary Valley Irrigation Project	18
Warrill Valley Irrigation Project	18
Upper Condamine Irrigation Project	18
Water Advisory Boards	18
Rural Water Supply Areas	18
Bowen/Broken Rivers Area	18
Emerald Irrigation Project—Nogoa River	18
Artesian Bore Water Supply Areas	18, 19
FARM WATER SUPPLIES	19, 20
FINANCE—	
Receipts	21
Expenditure	21, 22
Programme of Works, 1965-66	23
Work for other Government Departments and Local Authorities	23
Loan Stores Suspense Account	23
Plant Account	23
Artesian Bores Working Account	23
Irrigation Projects	23
Financial Statements—	
Irrigation Areas	24
Artesian Bore Water Supply Areas	25
APPENDICES—	
Appendix A—General Statistics	26
Appendix B—Storages Completed	27
MAPS AND CHARTS—	
Queensland—Mean Annual Isohyets	
Drought Pattern Map	
Irrigation and Water Supply Projects—Investigation and Construction Programme	
Mareeba-Dimbulah Project—Channel Construction Progress Plan	
Coolmunda Dam	
Wuruma Dam	



LESLIE DAM near Warwick

1966

QUEENSLAND
IRRIGATION AND WATER SUPPLY COMMISSION

Office of the Commissioner,
Brisbane, 15th September, 1966.

ANNUAL REPORT 1965-66

THE HONOURABLE THE MINISTER FOR LOCAL GOVERNMENT AND CONSERVATION, BRISBANE

SIR,—In accordance with the provisions of Section 22 of "*The Irrigation Acts, 1922 to 1965*," I have the honour to submit for presentation to Parliament my report for the year 1965-66, being the nineteenth report since the Proclamation on 1st August, 1947, of "*The Irrigation and Water Supply Commission Act of 1946*" which reconstituted the Commission.

The continuation of serious drought conditions which prevailed over almost all the State during the year has further emphasised benefits which are derived from assured supplies of water for stock and irrigation purposes and the need for further provision of these facilities to mitigate these drought conditions.

These benefits are illustrated by the gross value of production from 281,000 acres irrigated in the State, estimated to be \$69,736,000, or about 11.1 per cent. of all rural production for the whole State. This hard core of stable output has been an important factor in minimising drought effects on the overall economy.

The need for further provision of water conservation is well illustrated by widespread demands for this work throughout the State, many of which cannot be met at once. Although the Commission staff was increased by 30 during the year, in order to expedite investigation and implementation of works, it has been necessary for the Commission to continue to obtain the assistance of the Snowy Mountains Hydro-electric Authority on some of the investigation and design work.

Substantial progress has been made during the year on investigation and recording of the State's surface and underground water resources and in the implementation of works for their conservation and utilisation. An important development during the year was the initiation of works to replenish underground water supplies in the Burdekin Delta, the first work of this kind in Australia.

A further noteworthy development was the expansion of activities in the provision of Rural Water Supply Schemes to reticulate assured supplies of water for stock and domestic purposes to intensively develop "scrub lands" in several parts of the State. These schemes will remove a substantial part of the drought hazard in these areas.

With the completion of Leslie Dam on the Condamine River catchment the total capacity of storages controlled by the Commission is now 568,100 acre-feet. A unique experience has resulted following completion of this structure whereby the whole quantity of water available has been allotted within 9 months, an indication of landholders' acceptance of the desirability of irrigation to increase and stabilise production.

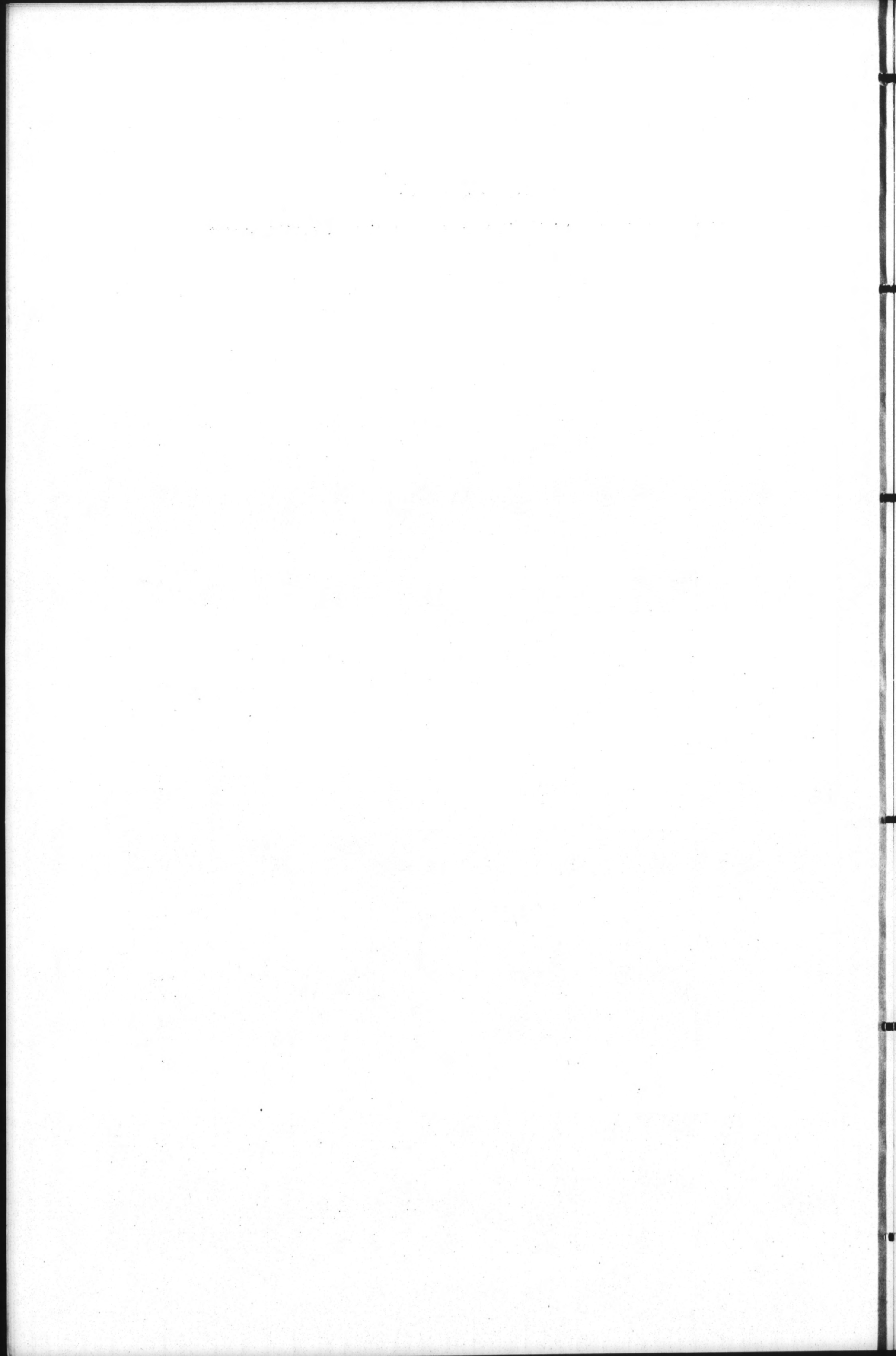
The demand for improved water supplies on individual farms continued at a high level and advances made during the year through the Farm Water Supplies Assistance Acts were a record at \$919,600, bringing the total advances under these Acts since inception to \$3,710,000.

Close co-operation with the Department of Primary Industries has continued with further joint investigation of irrigation proposals in several areas.

In conclusion I wish to record my appreciation of the loyal and competent services of the Commission staff, all of whom have been working under heavy pressure during the year and of the continued assistance of Dr. W. H. R. Nimmo as engineering consultant.

Yours faithfully,

F. B. HAIGH, Commissioner.



SUMMARY

Irrigation Development

Total area under irrigation in Queensland as at March, 1965, was 281,173 acres (an increase of 29,091 acres for the year), equivalent to 0.06 per cent. of the total State area.

Gross value of irrigated production for the year ended 31st March, 1965, was \$69,736,000 equivalent to 11.1 per cent. of State's total rural production.

Completion of Leslie Dam near Warwick increased the storages controlled and operated by the Commission to 42 weirs and 5 dams with a total storage of 568,126 acre-feet.

Coolmunda, Wuruma and Eungella Dams under construction will provide additional storage of 322,000 acre-feet.

Rural Water Supplies

The area of holdings supplied artificially with stock and domestic supplies, totalled 4,868,000 acres in 61 bore water supply areas (4,811,000 acres) and 4 Rural Water Supply Areas (100 holdings, 57,000 acres).

Four further Rural Water Supply Schemes are in progress (234 rural holdings, 106,000 acres).

Two Rural Water Supply Areas were established to replenish underground water supplies serving some 70,000 acres irrigated in the Burdekin Delta.

Administration

Commission staff at 30th June, 1966, totalled 481 (333 professional officers, 148 administrative officers), 30 more than previous year. Wages employees at 30th June, 1966, totalled 554, a decrease of 206 on previous year.

Two Regional Offices (Rockhampton and Townsville) and 15 District Offices are established throughout the State.

Amendments were made to the River Improvement Trust Acts during 1965-66.

Expenditure and Receipts

Revenue received for the year, \$657,234 was \$168,554 higher than 1964-65.

Expenditure from all Commission Votes was \$8,793,221 (including Bore Water Supply Areas \$53,413), being \$490,931 more than 1964-65.

Additional expenditure by the Commission on behalf of other Authorities or by Authorities under Commission supervision was \$1,028,963 (Stock Route Watering Facilities \$129,978; Callide Dam \$289,991 from Electricity Development funds; Rural Water Supply Boards \$334,982, River Improvement Trusts \$274,012).

Total Commission cash investment on storages, irrigation areas and irrigation projects to 30th June, 1966, was \$67,231,781.

Surplus of revenue over operation and maintenance costs for irrigation areas, excluding interest and depreciation was \$17,849.

Farm Water Supplies

Requests were received during 1965-66 for technical and/or financial assistance for improved farm water supplies from 933 landholders (318 financial) and plans prepared for irrigation installations for 5,070 acres.

Advances totalling \$1,110,953 were approved to 241 landholders. Advances expended were \$919,631.

River Improvement

River Improvement Trusts constituted increased by two to 12.

Total expenditure on works by Trusts for the year was \$274,012.

Water Resources Assessment and Utilisation

Rainfall data was obtained from 234 stations in addition to Commonwealth Bureau of Meteorology stations.

Stream flows were recorded at 271 stream gauging stations, 158 with automatic water level recorders.

Six Commission drilling plants and four contract plants were engaged in underground water supply investigations during the year in 16 individual areas. Investigation bores drilled totalled 123.

In the Great Artesian Basin area 67 new Artesian and 260 new Sub-artesian bores were completed in the year; total to date 2,966 Artesian, 11,911 Sub-artesian. Total Artesian bore flow 202 million gallons per day from 1,947 flowing bores.

Licenses issued for 3,059 existing and new bores in 6 declared areas of Sub-artesian supply.

Current waterworks licenses at 30th June, 1966, totalled 10,451 and permits for domestic supplies 1,849.

Eighty-nine Water Advisory Boards now provide assistance and advice on diversions from streams and organisation of water distribution throughout the State.

Investigation and Construction of Works

During the year investigation of water conservation, irrigation, rural water supply and drainage schemes was carried out on 31 projects.

Reports were prepared on 10 projects (Emerald Irrigation Area, Callide Valley Storages, Ross River Storage, Diversion—Warrill Creek to Warroolaba Creek, Replenishment Works—South Burdekin Delta and five Rural Water Supply Schemes). Tarampa Rural Water Supply was completed and Coreen, Roadvale, Kooingal and Proston Schemes and works to replenish underground water supplies in North Burdekin Delta were in progress.

Leslie Dam was completed during the year and construction continued on Coolmunda and Wuruma Dams and Mareeba-Dimbulah Project.

Fourteen Stock Route Water Facilities were completed, with 24 in progress.

Technical assistance was provided by the Snowy Mountains Hydro-electric Authority at Commission expense on the selection and design of stream gauge installations in North Queensland and on the investigation of four dam sites on the Burnett River Catchment and one on the Upper Brisbane River catchment.

Irrigation Areas and Projects

The area irrigated in Mareeba-Dimbulah, Burdekin River, St. George and Dawson Valley Irrigation Areas, established under the Irrigation Acts, was 28,773 acres (3,830 acres increase on 1964-65), 10.3 per cent. of all area irrigated in the State.

Production from these areas was valued at \$15,567,540, an increase of about 62 per cent. on 1964-65. The increase was due to a satisfactory tobacco crop in the Mareeba-Dimbulah area and the first harvest of sugar cane from the Burdekin River area, following the change-over from tobacco. Some 3,900 acres of sugar cane in the Burdekin River Irrigation Area yielded an average of \$354 per acre.

The Warrill Valley, Mary Valley and Upper Condamine Projects established under the Water Acts provided assured supplies to a total of 395 licensed pumps on streams supplemented from the storages on these projects. In addition to supplies for irrigation, assured supply of water to Swanbank Power Station is provided from the Warrill Valley Project and to the City of Gympie from the Mary Valley Project. Leslie Dam will provide additional supply to the City of Warwick.

Callide Dam, built to provide water for Calcip Power Station, available for storage in 1964, has not yet received any surface water inflow. Supply to the Power Station is being maintained from groundwater inflow.

Total deliveries of water to farms and other users in Irrigation Areas and Projects amounted to 190,105 acre-feet for the year, including Barron Falls Hydro-electric Station 112,433 acre-feet, Swanbank Power Station 1,255 acre-feet, City of Gympie 1,326 acre-feet and Calcip Power Station 590 acre-feet.

Acknowledgements

It is desired again to gratefully acknowledge the co-operation and assistance of Government Departments or organisations which provided assistance to the Commission, particularly the Departments of the Public Service Commissioner, Co-ordinator-General of Public Works, Primary Industries, Mines, State Electricity Commission, Land Administration Commission, Agricultural Bank, Police Department and the Snowy Mountains Hydro-electric Authority.

IRRIGATION DEVELOPMENT

IRRIGATED AREAS AND CROPS

The area irrigated in Queensland during the twelve months ended 31st March, 1965, based on information obtained from the Government Statistician was 281,173 acres, an increase of 29,091 acres since March, 1964. This represents 0.06 per cent. of the total area of the State of 426,800,000 acres.

The estimated gross value of irrigated production was some \$69,736,000, equal to 11.1 per cent. of the State's total rural production of \$627,706,000.

The accompanying table shows areas irrigated during the year under review. Sugar cane remains the largest irrigated crop, with vegetables, fodder and pastures next in importance.

AREAS UNDER IRRIGATION IN QUEENSLAND, 31st MARCH, 1965
INFORMATION OBTAINED FROM THE GOVERNMENT STATISTICIAN FOR 1964-1965

Statistical Division	Area of Crops in Acres									Total Areas Irrigated
	Sugar Cane	Vegetables	Fruit	Tobacco	Cotton	Fodder	Other	Pastures		
								Improved	Natural	
Metropolitan .. .. .	..	1,921	623	..	1	575	143	286	80	3,629
Moreton	124	21,579	2,249	931	546	24,430	5,957	9,965	985	66,766
Maryborough	38,820	5,010	2,735	717	146	8,826	1,837	4,973	655	63,719
Downs .. .. .	..	541	1,223	751	950	6,452	4,374	2,280	248	16,819
Roma .. .. .	..	13	26	..	430	2,142	945	1,089	..	4,645
South-Western .. .. .	..	7	54	..	..	28	..	208	1,520	1,817
Rockhampton	210	1,098	250	22	2,033	8,756	3,088	2,157	590	18,204
Central-Western .. .. .	..	18	26	..	..	446	1	..	..	491
Far-Western .. .. .	..	3	1	..	..	45	..	..	..	49
Mackay	13,547	160	35	..	5	314	50	18	22	14,151
Townsville	67,085	3,578	643	42	9	549	1,958	511	1,995	76,370
Cairns	770	1,074	216	11,030	3	157	332	549	40	14,171
Peninsula .. .. .	..	7	..	6	..	..	..	49	..	62
North-Western .. .. .	..	11	11	..	25	227	2	4	..	280
State Total	120,556	35,020	8,092	13,499	4,148	52,947	18,687	22,089	6,135	281,173
Percentage of Total Area Irrigated	42.88%	12.45%	2.88%	4.80%	1.47%	18.83%	6.65%	7.86%	2.18%	100%

WATER CONSERVATION WORKS AND IRRIGATION AREAS

There are 42 weirs and five dams with a total storage capacity of 568,126 acre-feet under the control of the Commission, details of which are shown in Appendix B.

A further three dams, Coolmunda and Wuruma, at present under construction by the Commission, and Eungella Dam under construction by the Co-ordinator General's Department will provide additional storage of 322,000 acre-feet.

Of the total irrigated area 28,773 acres were supplied within the four Irrigation Areas established under the Irrigation Acts—Mareeba-Dimbulah, Burdekin River, Dawson Valley and St. George. The remainder obtain supply by private diversions by individuals from surface or underground supplies, in some cases from streams supplemented by Commission storages.

These storages include Moogerah, Borumba and Leslie Dams from which water is released downstream as required to maintain flow sufficient to meet irrigation demand.

ADMINISTRATION

GENERAL

Apart from the construction and operation of water conservation and irrigation works, the Commission has responsibilities in the following fields:—

- (a) Investigation and recording of the State's water resources and planning for their efficient utilisation.
- (b) Licensing and control of diversions of surface, artesian and in "declared areas", sub-artesian waters.
- (c) Supervision of stream improvement to correct stream erosion and provide flood mitigation.
- (d) Technical and financial assistance to farmers in respect of improved water supplies for irrigation, stock and domestic purposes.
- (e) Constitution and supervision of operation of Areas and Boards for Rural Water Supply, Irrigation and Drainage.

LEGISLATION

Subject to the Minister for Local Government and Conservation, the following Acts are administered by the Commissioner of Irrigation and Water Supply:—

"The Irrigation and Water Supply Commission Acts, 1946 to 1949."

"The Water Acts, 1926 to 1964."

"The Irrigation Acts, 1922 to 1965."

"The Irrigation Areas (Land Settlement) Act of 1962."

"The Farm Water Supplies Assistance Acts, 1958 to 1965."

"The River Improvement Trust Acts, 1940 to 1965."

Legislation amending "The River Improvement Trust Acts, 1940 to 1959," was effected during the year. It provides for the division of an existing Trust into two separate Trusts when a Local Authority prefers to operate on its own.

It also provides for immediate access to private land by the Commissioner of Irrigation and Water Supply and/or a Trust in the case of an emergency and strengthens the Trusts' powers to prevent landholders from doing things which could cause damage to their own or other lands and involve a Trust in considerable repair costs.

It simplifies the rating by Local Authorities to meet precepts payable to Trusts and sets down in more detail the procedures to be followed by Trusts in borrowing money and finally it brings up to date the Ministerial Titles mentioned in the Acts.

DISTRICT OFFICES

Two Regional Offices are established at Rockhampton and Townsville, the latter being opened during the year. District Offices of the Commission are now established at Biloela, Bundaberg, Charleville, Claredale, Goondiwindi, Gympie, Longreach, Mackay, Mareeba, Rockhampton, Roma, St. George, Theodore, Toowoomba and Warwick.

STAFF

The Commission's staff at 30th June, 1966, numbered 481 (333 professional and 148 administrative officers); an increase of 16 professional and 14 administrative officers on the previous year. This expansion was due to the increasing demand on all aspects of the Commission's work.

Appointments made during the year totalled 79 and there were 49 resignations, retirements, &c.

During the year the Commission sustained the loss of two valued Senior Officers, namely Mr. A. O. Morris, Assistant Commissioner (Administration) and Dr. A. M. Fraser, Senior Engineer, Project Planning Branch, through their promotions to higher offices within other State Departments. They were

succeeded respectively by Mr. H. McL. Beal of the Main Roads Department and Mr. J. E. Morse, previously Senior Engineer in the Commission's Designs Branch.

A statement setting out particulars of staff and classifications for the years ended 30th June, 1962, to 30th June, 1966, is given in the accompanying table.

Staff	30-6-62	30-6-63	30-6-64	30-6-65	30-6-66
<i>Professional</i>					
Chief and Senior Engineers	12	11	13	14	13
Executive Engineers	6	6	7	8	11
Engineers Division I.	22	26	26	30	22
Engineers Division II.	24	30	31	28	27
Engineers Division III.	3	2	2	2	4
Surveyors	11	12	12	10	11
Other Survey Staff	3	3	2	4	2
Hydrographic Staff	20	21	22	24	28
Boring and Works Staff	47	48	51	50	52
Draftsmen and Other Staff	84	95	111	132	147
Scholarship Holders	10	8	5	15	16
Total Professional Staff	242	262	282	317	333
<i>Administration</i>					
Senior Clerical	16	16	16	16	16
Classified Clerks	10	9	18	22	24
Clerks, &c.	98	101	95	92	104
Works Clerks .. .. .	..	..	4	4	4
Total Administration Staff	124	126	133	134	148
Grand Total	366	388	415	451	481

At 30th June, 1966, staff located at Head Office numbered 319 (205 professional and 114 administrative) whilst 162 officers (128 professional and 34 administrative) were located in country centres.

The number of Commission employees on day labour work at 30th June, 1966, was 456 and Contractors had 98 wage employees engaged on work for the Commission as compared with 690 Commission employees and 70 employees of Contractors at 30th June, 1965.

DUMARESQ-BARWON BORDER RIVERS COMMISSION

The Commissioner represents Queensland on this Commission which consists of representatives of the States of New South Wales and Queensland and is charged with the responsibility of construction of works for conservation and distribution of the waters of the Dumaresq and Barwon Rivers, where they represent the boundary between the two States.

Under the existing agreement the Irrigation and Water Supply Commission continued to act as the constructing and operating authority in respect to weirs and regulators for the Border Rivers Commission.

On the recommendation of the Border Rivers Commission, agreed to by the Premiers of Queensland and New South Wales, it is intended to amend the agreement to provide for construction of storages, initially on Pike Creek in Queensland and later, if required, on the Mole River in New South Wales, as alternatives to the Dumaresq storage site at Mingoola proposed in the original agreement. Amendments to the Agreement are being drafted by officers of the two States.

INTERNATIONAL COMMISSION ON IRRIGATION AND DRAINAGE

The Irrigation and Water Supply Commission is a member of the Australian National Committee of the International Commission on Irrigation and Drainage and was represented at the meeting of the Australian Committee in South Australia in October, 1965, by the Commissioner, Mr. F. B. Haigh; Senior Irrigation Engineer, Mr. D. W. Beattie; and the District Engineer from Claredale, Mr. S. E. James.

The International Commission holds a Congress every three years and Executive Council Meetings annually. The sixth Congress was held in India during January, 1966, and was attended by the Commissioner, Mr. F. B. Haigh, as Chairman of the Australian National Committee.

INTERNATIONAL COMMISSION ON LARGE DAMS

The Irrigation and Water Supply Commission is a member of the Australian National Committee of the International Commission on Large Dams and is represented thereon by the Chief Designing Engineer, Mr. N. J. Butler.

The Committee's objective is to stimulate interest in and promote knowledge of the design, construction, maintenance and operation of large dams in Australia and to co-operate with the International Commission on Large Dams for the distribution and interchange of information concerning dams

between the national committees of the participating countries. The Australian National Committee held its fifth annual general meeting at Brisbane in October, 1965, at which 27 members and associate members were in attendance.

WATER RESEARCH FOUNDATION OF AUSTRALIA

The Irrigation and Water Supply Commission is a member of the Water Research Foundation of Australia and is represented on the Board of Trustees of the Foundation by the Commissioner, Mr. F. B. Haigh, and on the Queensland State Committee by the Officer in Charge, Rivers and Streams, Mr. K. M. Carmichael.

Since 1962 the Foundation has provided funds totalling \$22,100 for four Queensland research projects. Two projects have been completed and two more are in progress at the Civil Engineering Departments of the University College of Townsville and the University of Queensland, respectively. The Foundation recently approved a new project proposed by the Department of Primary Industries.

AUSTRALIAN WATER RESOURCES COUNCIL

The Australian Water Resources Council formed in 1962 comprises Commonwealth and State Ministers responsible for water supply. Queensland is represented on the Council by the Minister for Local Government and Conservation, the Honourable H. Richter, M.L.A., on the Standing Committee of the Council by the Commissioner, Mr. F. B. Haigh, whilst the Commission's Chief Investigation Engineer, Mr. A. I. McCutchan acted as Convener of the Council's Technical Committee on Surface Water.

The initial objectives of the Council are to prepare an assessment of the location and volume of Australia's surface and underground water supplies; to examine the adequacy of arrangements for measurement and assessment of these resources and to achieve closer co-operation between the various States and the Commonwealth in this work.

The passage of the *States Grants (Water Resources) Act, 1964* (Commonwealth) represented a major step forward in the Council's programme. Under the provisions of this Act, the Commonwealth Government undertook to provide financial assistance to the States for the installation, operation and maintenance of stream gauges and the investigation of underground water resources. Under this arrangement the total expenditure for the year amounted to \$858,686 of which the Commonwealth provided \$313,464.

The Council is currently giving attention to a variety of matters connected with the measurement and conservation of water with particular emphasis on requirements for research and education.

CO-ORDINATING COUNCIL OF THE INTERNATIONAL HYDROLOGICAL DECADE

The International Hydrological Decade is a 10-year scientific programme with two main objects—International co-operation for the advancement of basic science in hydrology;

and encouragement to each participating country to itself promote improved systems in water planning, management and research.

The Decade is an activity of the United Nations Educational Scientific and Cultural Organisation (UNESCO) which has established a Co-ordinating Council of 21 member countries to co-ordinate the Decade programme.

In order to co-ordinate and guide Australian participation, a Committee—the Australia-UNESCO Committee for the

I.H.D. (AUCIHD), has been set up, of which the Commissioner, Mr. F. B. Haigh is Deputy Chairman.

SOIL CONSERVATION

"The Soil Conservation Act of 1965," which repealed the previous Act of 1951, took effect as from 1st July, 1965. The Commissioner of Irrigation and Water Supply is a member of the Advisory and Co-ordinating Committee, constituted under the Act.

PLANT AND EQUIPMENT

VEHICLES, CONSTRUCTION PLANT AND EQUIPMENT

At 30th June, 1966, the Commission owned 240 motor vehicles including heavy vehicles for construction works.

Plant and equipment held, excluding items of a semi-permanent nature erected on construction jobs totalled 1,008, a decrease of 32 items on corresponding figures for the previous year.

WORKSHOPS AND STORES

Permanent workshops and stores depots are maintained at Rocklea and at the District Offices at Mareeba, Charleville,

Claredale, Longreach, St. George and Theodore. Temporary facilities are also established on construction projects at Leslie, Coolmunda and Wuruma Dams.

At 30th June, 1966, the total value of stock and equipment held at Rocklea and the District Offices was \$246,579 compared with \$218,034 as at the end of the previous year.

The Rocklea Depot establishment of workshops, store, hydraulic model and materials testing laboratories comprised 11 staff members and 53 wages employees, an increase of 4 staff personnel and a decrease of 30 wages employees on the previous year.

WATER RESOURCES INVESTIGATION

"The Land and Water Resources Development Acts, 1943 to 1962," require the Commissioner to—

- (a) Prepare a complete description of the natural water resources of the State, both surface and underground.
- (b) Undertake and carry on a survey of such resources.
- (c) Keep a record of all such natural water resources, surface and underground.

Such record shall ascertain, define, and record the permanent and also the periodic or intermittent surface waters of the State, as well as all available information relating to the artesian waters and those subterranean waters not classified as artesian. It shall also enable the formation, co-ordination, and implementation of plans for the conservation, replenishment, utilisation, and distribution of the waters of the State, both surface and subterranean, to the best advantage in the public interest.

MEASUREMENT AND RECORDING OF SURFACE WATER RESOURCES

The programme for the expansion of the stream gauge network planned under the financial assistance provided by the *States Grants (Water Resources) Act, 1964* (Commonwealth) has been continued. Total expenditure on installation and operation of gauges for the year 1965-66 amounted to \$508,997, of which \$238,998 was provided by the Commonwealth.

GENERAL

There was no general relief from the drought conditions experienced in the previous year and in some areas the position deteriorated alarmingly. The present drought period commenced generally with the failure of the Spring rains in 1964. The attached drought pattern map for the 18 months period November, 1964, to April, 1966, illustrates its severity throughout Queensland.

In the Gulf of Carpentaria basins and the base of Cape York Peninsula winter rains were below average but good rains fell in January causing runoff in the streams flowing northward into the Gulf. However, in the northern portion of the Peninsula below average falls were experienced and this was also the position in both areas for the remainder of the year.

In the North-East Coast basins, although winter rains were below average, the summer and autumn months produced average to heavy falls along the coastal fringe with some low level flooding in the Burdekin and Belyando Rivers. In the Central Coast region dry conditions prevailed until December and January when good general rains caused low level flooding in the Mackenzie, Isaac and Belyando Rivers.

In the South-East Coast areas some above average falls occurred in July and August. However, dry conditions prevailed until December and January when good rains were experienced resulting in low level flooding in the Brisbane and Condamine Rivers. Further moderate rains occurred in June. In the Central West good rains fell in the mid western areas but the far west received only scattered storms. Flooding occurred from January rainfall in the upper catchments of the Barcoo, Thompson, Diamantina, and Georgina Rivers.

In the South-West, except for a limited area in the Warrego catchment, there has been little real relief from the drought. In January some runoff occurred from the Warrego and Paroo catchments and Coopers Creek, the Diamantina River and Eyre Creek were in flood from rains further north. The Thargomindah area suffered one of the driest periods on record.

RAINFALL RECORDS

A total of 213 stations is now supplying daily rainfall observations to the Commission to supplement information obtained from the Commonwealth Bureau of Meteorology. In addition the Commission maintains 21 automatic recording rainfall gauges in various parts of the State, an increase of five over the previous year. One hundred and fifty stations were handed over during the year to the Commonwealth Bureau of Meteorology and thirty-six were closed down because they duplicated existing Commonwealth facilities.

STREAM FLOW

Details of stream discharges were calculated from records of stream height obtained from gauging stations situated throughout the State in conjunction with measurements of discharge at those stations.

Stream discharges were generally at very low stages throughout the year and few intermediate or high stage measurements were obtained. A notable exception was the gauging of Coopers Creek, near Windorah, in January. At 30th June, 1966, there were 271 gauging stations in operation, of which 158 were fitted with automatic recorders.

In both investigation and operation activities the use of light aircraft proved both economical and satisfactory.

INVESTIGATION, PLANNING AND CONSTRUCTION OF GAUGING STATIONS

The major portion of the Surface Water Resources Branch's expenditure was directed to the investigation, design and construction of stream flow recording and gauging stations throughout the State.

Because of insufficient Commission staff the assistance of the Snowy Mountains Hydro-electric Authority was obtained and during the year that Authority completed designs for 46 stations in the Gulf of Carpentaria basins. Commission staff carried out 43 investigations and completed 27 designs including 10 in the Lake Eyre Division.

A total of 31 installations was constructed during the financial year in the Gulf of Carpentaria, North-East Coast and Murray-Darling Divisions.

Seven Cadet Hydrographers passed a Course in Hydrography organised by the Snowy Mountains Hydro-electric Authority.

The computation, printing, and recording of daily stream discharges using electronic computers is being introduced. Hydrologic studies using electronic computers have been performed for projects on the Barron, Herbert, Ross, Fitzroy, Boyne, Burnett, Kolan, Brisbane, and Balonne Rivers.

Basic information on bores in the area has been assembled and the construction of 34 water level observation points with a total depth of 1,360 feet was completed.

Underground Water Level Measurements

The programme of measurement of water levels in Commission observation wells and selected private bores in various areas throughout the State was continued. These provide information on fluctuations of water levels caused by seasonal conditions and use of supplies which is essential for assessment of safe yield of water from the respective underground sources.

Underground Water Data Collection

Collection of data on private bores including bore details, strata, water levels, and water quality was continued.

Artesian Basin

Recording of data from private drilling of new artesian and sub-artesian bores within the Artesian Basin area was continued.

This is being supplemented by information obtained by oil research activities including seismic surveys, deep well drilling, and gamma ray logging of existing water bores.

This information is improving the reliability of advice, on likely supplies and quality, given to landholders and drillers on prospects of obtaining artesian and sub-artesian supplies within the Basin.

In the drilling of new artesian bores the Commission provides advice on and supervises pressure cementing of bores to prevent deterioration of bore casing by contact with corrosive strata; exclude saline water; and prevent loss of water by transference from high pressure to low pressure aquifers.

A few bores were drilled by rotary rigs which proved valuable during the drought because of the rapidity with which bores can be constructed. High cost of transport of this equipment precludes its use for single bores but if several bores are constructed in the one locality, lower costs can be achieved than with percussion plants.

During the year arrangements were made by landholders to convert to water bores 20 wells put down for oil search purposes.

Because flow from the Basin as a whole is diminishing, as seen in the graph, and losses from bore drains are high, the Commission does not permit the use of bore drains to

distribute supplies from new bores. The flow from new bores must be reticulated by pipelines and controlled by valves to storage tanks and troughing. In cases where the mechanical condition of the bore prevents its control, the Commission assists the landholder by carrying out tests and advising on methods by which the bore can be reconditioned.

The re-measurement of bore flows and pressures was continued, the aim being to measure each bore within the State at least once every 5 years. During the year 471 re-measurements were carried out. To 30th June, 1966, a total of 2,966 artesian bores had been drilled, of which 1,019 had ceased to flow. The total flow from the basin was estimated to be some 202 million gallons daily, actual controlled flow only being included where the flow is limited by control works on the borehead. The above daily flow is 3 million gallons per day higher than the estimated flow given in the 1964-65 report. This difference results from corrections to the previous estimate arising from actual measurements during the year and is not an indication of an increased flow.

Particulars of artesian bores drilled and the estimated flow of artesian water since 1884 are shown in the accompanying graph.

WATER QUALITY ANALYSES

The analyses of surface and underground water, both artesian and sub-artesian, was continued during the year, a total of 2,746 samples having been processed.

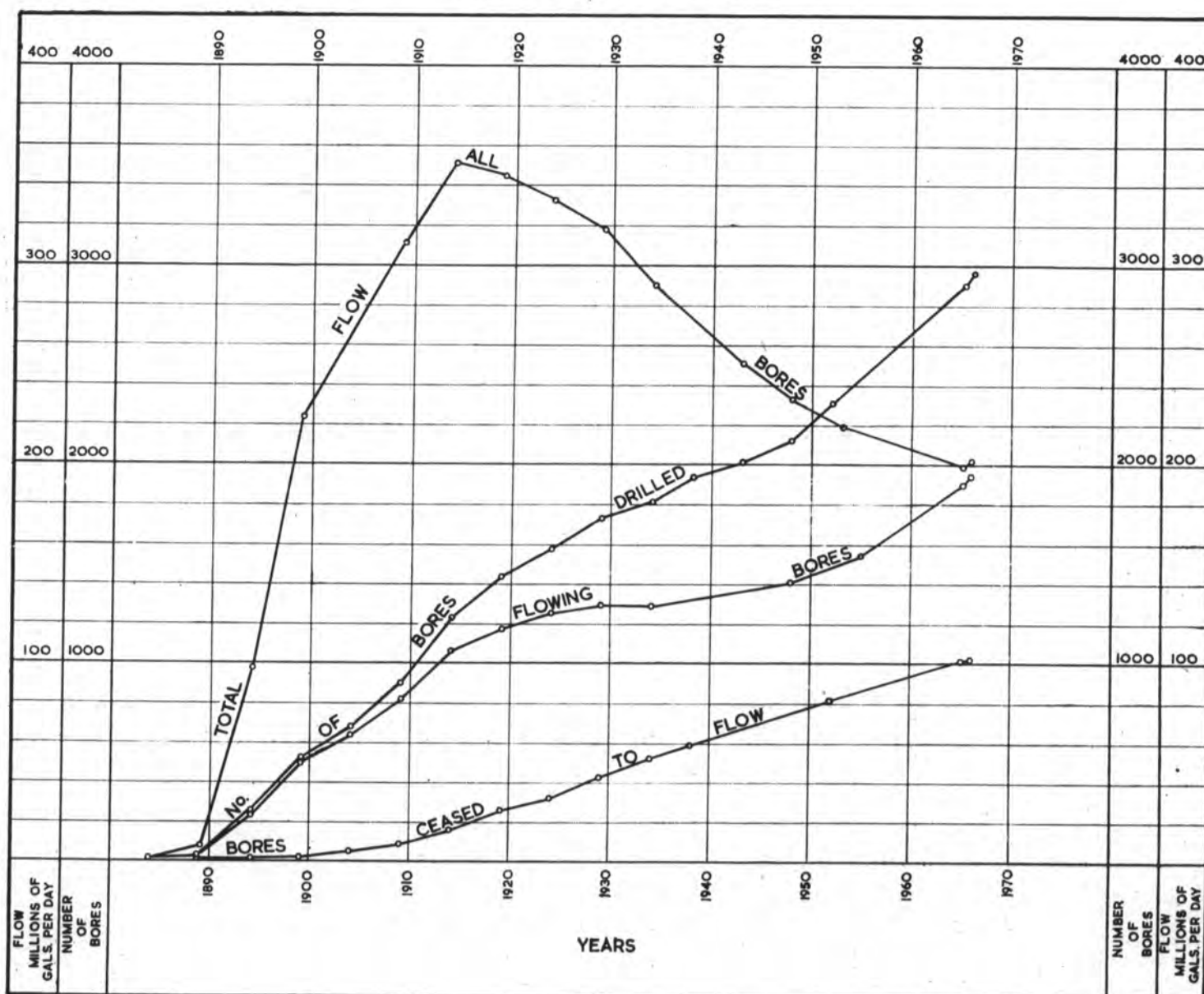
These comprised—

Surface Water	717
Underground Water—	
In Declared Areas	973
In Undeclared Areas	1,056
	2,029
Total	2,746

Initial quality determinations are made by Commission staff, in the field, in Regional Offices and some District Offices.

Detailed analyses and determination of suitability for domestic use are made by the Government Chemical Laboratory and determination of suitability for stock and irrigation use by the Department of Primary Industries or Bureau of Sugar Experiment Stations.

**QUEENSLAND
IRRIGATION & WATER SUPPLY COMMISSION
ARTESIAN BORES**



LICENSING AND CONTROL

SURFACE WATER

Waterworks Licenses

The total number of waterworks licenses in existence as at 30th June, 1966, was 10,451 and permits to divert water from streams for domestic purposes numbered 1,849.

The following is a table of statistics relating to applications for waterworks licenses and permits under Sections 9 and 4 of the Water Acts during the year 1965-66, and the purposes for which they were issued:—

WATERWORKS LICENSES 1965-66

APPLICATIONS

	Waterworks Licenses	Permits Under Section 9 of the Water Acts	Permits Under Section 4 of the Water Acts
Being Processed—			
30-6-65	567	16	..
Applications received	1,338	162	6
Granted	1,205	157	6
Refused	30	..	..
Cancelled	173	6	..
Being Processed—			
30-6-66	497	15	..

LICENSES ISSUED

	Issued	Cancelled	Operative as at 30-6-1966
Pumps	904	327	8,495
Dams and Weirs ..	254	30	1,526
Diversion Channels ..	22	4	114
Miscellaneous ..	25	27	316
Total	1,205	388	10,451

PERMITS ISSUED

	Issued	Cancelled	Operative as at 30-6-1966
Section 9	157	10	1,781
Section 4	6	..	68

Sand and Gravel Removals

Sand and gravel permits issued during the year 1965-66 numbered 294, an increase of 15 on the previous year. Material removed from watercourses increased by 110,000 cubic yards to 703,000 cubic yards.

An amount of \$31,980 was received in royalties and permit fees, an increase of \$6,402 on the previous year. From the total receipts an amount of \$1,558 was refunded as rebates on material used on Government and Local Authority works.

Water Advisory Boards

Currently there are 82 Water Advisory Boards operating in Queensland, excluding those in the four Irrigation Areas. Two existing Boards were dissolved during the year whilst five new Boards were constituted mainly in the south-east corner of the State.

The function of Boards is the local control of diversion from streams for irrigation, including recommendations for the imposing of restrictions on pumping where necessary according to prevailing conditions and advice in the organisation of water distribution in Irrigation Areas. In dealing with these matters Boards continued to render valued assistance to their respective communities and to the Commission throughout the year.

Restriction on Pumping for Irrigation

Good general rains in July and August, 1965, resulted in the easing of restrictions imposed on most streams in the southern and central parts of Queensland. Prior to this, restrictions were placed on some 3,500 pumps, equivalent to more than half of all licensed irrigation pumps on unregulated streams within the State.

However, in the absence of good follow-up rains it became necessary again to impose restrictions on most streams mainly in the south-eastern part of the State and on most of the coastal strips. The restrictions were effective until December when further rains fell. This rain gave these areas temporary relief only and unless there are good rains early in the latter half of 1966 it will again become necessary to impose restrictions on most streams within the State with the advent of warmer weather.

UNDERGROUND WATER

Under the provisions of the Water Acts, licenses must be obtained from the Commission for sinking of artesian bores, i.e. from which water will flow to the surface, and use of water from them. Virtually all artesian water being used in Queensland is derived from the Great Artesian Basin. Licenses for drilling and use of sub-artesian water (that which requires pumping) are also required in areas proclaimed as areas of Sub-artesian Supplies.

There are six areas of sub-artesian supplies proclaimed to date, Artesian Basin, Parish of Northcote, Bowen Shire, Pioneer Valley, Sarina Shire, and Monto Shire.

Great Artesian Basin

In addition to artesian bores in this Basin used entirely for stock, domestic and town supply, there are a large number of relatively deep sub-artesian bores used for stock and domestic supplies. A recent development is the exploitation, mainly for irrigation of shallow groundwater supplies in alluvial materials along the Condamine River and tributaries on the Darling Downs.

There were 59 licenses issued for new artesian bores and 330 for new sub-artesian bores tapping artesian aquifers in the Artesian Basin.

Details of these bores drilled and under construction are as follows:—

	During 1965-66	Total as at 30-6-1966
Completed artesian bores	67	2,966
Completed sub-artesian bores	260	11,911
Bores in Progress—		
Artesian—15 .. ..	..	..
Sub-artesian—23	38	..
Total	365	14,877

Total Depths of Bores Completed	In 1965-66	Total to 30-6-1966
	Feet	Feet
Artesian	92,383	4,141,424
Sub-artesian	139,674	5,136,473
Bores in progress .. ..	..	26,361
Total	232,057	9,304,258

Shallow and Non-artesian Supplies

Within the proclaimed sub-artesian areas licenses for existing and new bores were issued during the year as follows:—

	For 1965-66
Artesian Basin (Darling Downs)	1,497
Parish of Northcote	9
Bowen Shire	401
Pioneer Valley	486
Sarina Shire	16
Monto Shire	650
Total	3,059

Drillers Licenses

The number of drillers licenses issued during the year was 359, an increase of 50 over the previous year. The increase is due to the additional sub-artesian areas recently proclaimed.

RIVER IMPROVEMENT

RIVER IMPROVEMENT TRUSTS

There are at present 12 River Improvement Trusts constituted under "The River Improvement Trust Acts, 1940 to 1965." These are the Burdekin, Herbert, Don, Upper Pioneer, Pioneer, Condamine, Bremer, Wambo Shire, Jondaryan Shire, Glengallan Shire, Millmerran Shire, and Clifton Shire River Improvement Trusts.

The Millmerran Shire River Improvement Trust was constituted on 5th August, 1965, basically to improve the channel of the Condamine River where it runs through that Shire. The River Improvement Area consists of that part of the Shire on the Condamine River catchment. To date no work has been carried out by this Trust but work will commence within the coming year.

The Clifton Shire River Improvement Trust was constituted on 20th January, 1966, following an application by Clifton Shire Council to withdraw from the Condamine River Improvement Trust, of which it was formerly a member. The Condamine River Improvement Trust now consists of the Shires of Allora and Rosenthal.

Trusts comprise a Government representative as Chairman and two members nominated by each Local Authority within the Trust Area.

The responsibility of the Trusts is to carry out and maintain works to improve stream channels, to increase their flood carrying capacity, to prevent or repair bank erosion and to mitigate flooding.

Trusts are virtually autonomous bodies employing their own engineering and administrative staff as required but they are subject to the requirement that all plans of proposed works shall be submitted to the Commissioner of Irrigation and Water Supply for approval. Commission officers are at present Chairmen of seven of the Trusts.

Finance for new Trust work is derived from debenture loans and government subsidy generally equivalent to 33½ per cent. of the capital cost of the works. Maintenance, administrative and debt service costs are financed by annual precept levied on the Local Authorities within the Trust Area.

The work being carried out by the Trusts varies greatly due to the different nature of the streams being treated, the North Queensland streams being much larger owing to the higher runoff. Activities of the northern Trusts have been comparatively quiet during the past year as there has not been flooding of any magnitude in those streams during the period.

In general these Trusts have been engaged on river bank erosion repair and the prevention of further erosion by the placing of stone spalls, although the Pioneer River Improvement Trust has recently completed a levee bank in the City of Mackay to prevent the intrusion of flood water into a large part of that City.

In Southern Queensland during the past year the Trusts have been engaged on the prevention of flooding, erosion and siltation in streams by the removal of undesirable timber, mainly willows, from within the bed and banks of various streams in their areas.

Amending Legislation was enacted during the year, and provides power, *inter alia*, for the division of a Trust into two separate Trusts, if desired; to enlarge the powers of Trusts in regard to access to private land in emergencies; to give greater control over landholders in certain circumstances; to simplify the method of rating for Local Authorities; and to amplify the borrowing powers of Trusts generally.

Expenditure by each of the Trusts from both their Loan and Revenue Funds for 1965-66 is set out in the accompanying table.

RIVER IMPROVEMENT TRUSTS—1965-66

Trust	Loan Fund Expenditure	General Fund Expenditure	Rateable Value of Area	1965-66 Precept	1965-66 Rating (cents per dollar)	Loan Indebtedness 30-6-1966
	\$	\$	\$	\$		\$
Herbert River ..	Nil	4,858.40	890,370	5,800.00	0.65	49,628.36
Burdekin River ..	520.32	21,052.37	5,480,543	20,450.00	0.37	212,281.42
Don River ..	555.73	5,955.63	265,480	4,094.73	1.54	38,501.30
Pioneer River ..	59,527.00	18,437.00	9,960,248	7,558.00	0.08	152,934.00
Upper Pioneer River	5,688.79	10,563.63	2,406,694	10,800.00	0.45	115,754.31
Condamine River ..	30,029.44	23,196.74	4,580,358	5,390.00	0.12	121,131.20
Wambo Shire ..	59,378.02	13,928.99	17,593,562	10,000.00	0.06	142,365.41
Jondaryan Shire ..	735.20	3,029.52	11,516,244	2,652.00	0.02	19,056.86
Glengallan Shire ..	12,020.86	3,446.58	4,449,998	3,000.00	0.07	26,026.10
Bremer River ..	Nil	1,087.60	5,440,238	1,100.00	0.02	7,461.67
Clifton Shire ..	Nil	Nil	4,016,860	Nil	Nil	Nil
Millmerran Shire ..	Nil	Nil	3,406,800	Nil	Nil	Nil
Total ..	\$168,455.36	\$105,556.46	..	..	..	\$885,140.63

INVESTIGATION, DESIGN AND CONSTRUCTION OF WORKS

The continued drought has further increased the demand for water conservation works throughout the State, particularly on streams where the unregulated supply has been inadequate to meet irrigation, stock, and domestic requirements. This has resulted in increased activities during the year in the investigation of these works both in relation to surface and underground water resources.

Notwithstanding the limited funds available significant progress has been made on construction works including the completion of Leslie Dam, the continuation of work on the Mareeba-Dimbulah Irrigation Project, on Coolmunda and Wuruma Dams, and on reticulation works in the several rural water supply areas.

Notable new works commenced included construction of works to artificially replenish underground water supplies in the Burdekin Delta and the construction of two rural water supply schemes to provide stock and domestic supplies to landholders.

Details of progress on individual works are as follows:—

MAREEBA-DIMBULAH IRRIGATION PROJECT

Investigation surveys have been continued for the extension of the West Barron Main Channel system and boundary surveys of new tobacco farms for the East Barron are still in progress.

The Department of Primary Industries continued work on detailed soil surveys, and field work covering a further 15,000 acres was completed. Land use reports covering some 159,000 acres have been submitted.

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To date approximately 185.6 miles of Main and Distribution Channels have been completed as follows:—

	Miles	Miles
Main Channels—		
West Barron ..	28.8	
Walsh Bluff ..	7.6	
South Walsh ..	34.0	
Mareeba ..	10.8	
East Barron ..	11.1	
North Walsh ..	1.2	
Atherton Creek ..	4.4	
		97.9
Distribution Channels ..		87.7
Total ..		185.6

Experimental work and commercial trials of irrigated production on soils not suitable for tobacco continued and is being expanded. This work is aimed at utilisation of water available from Tinaroo Falls Dam, surplus to ultimate requirements for tobacco.

Results obtained from beef fattening on irrigated pastures continued to show promise. During the year the two commercial size farms were further developed. On one of these 200 acres of tropical pastures were sufficiently established for leasing for stock-fattening purposes during the coming year. On the second farm an area of 200 acres was sown to tropical pastures of various species and reasonable strikes were obtained.

Employees on the project numbered 123 at 30th June, 1966, a reduction of 37 on the previous year.

Expenditure for the financial year 1965-66 amounted to \$759,999 bringing the nett capital cost of the project to \$31,573,632, of which \$12,659,752 has been expended on Tinaroo Falls Dam and \$18,913,880 on irrigation and other works.

COOLMUNDA DAM

Work continued on the construction of Coolmunda Dam, an earth, gravel, and rockfill embankment with a concrete spillway, situated on Macintyre Brook, at its junction with Bracker Creek approximately 12 miles upstream from Inglewood.

The dam will have a storage capacity of 61,000 acre-feet and will provide an assured supply of irrigation water in Macintyre Brook to enable irrigation of 8,500 acres along the Brook from the dam site to its junction with the Dumaresq River, a distance of 48 miles.

The construction under contract by the Cementation Company (Australia) Ltd. at a cost of \$450,000, of an impermeable cut-off 2,862 feet long through the underground gravels by a special machine digging a 2-foot wide trench up to 50 feet deep to bed-rock and backfilling with an impermeable material was completed.

Stream flow has been diverted through the spillway structure and construction of the embankment by the Commission's day labour forces will continue in 1966-67. An 8-foot high section of the embankment in the bed of the Brook was completed to facilitate construction of that section of the impermeable cut-off.

The concrete spillway and dissipator works on the left bank of the Brook were about 90 per cent. completed at the end of the year. Construction is being carried out under Contract by Dillingham Constructions Pty. Ltd. for a tender price of \$1,624,962 and is expected to be completed in September 1966. The structural design included a photo-elastic analysis of the area of the piers accommodating the prestressed anchorage for the radial gates, which analysis was made by the Snowy Mountains Hydro-electric Authority.

A contract was awarded to Evans Deakin and Co. Pty. Ltd. for the construction of a prestressed concrete bridge over the spillway at a cost of \$53,910 for completion in December 1966. A further contract for \$34,409 has been let to the Bundaberg Foundry Company Ltd. for steel bulkhead gate units which will be utilised to enable erection and maintenance of spillway gates. The quarrying and supplying of rock for the embankment is being undertaken by J. A. Graham, Brisbane, under contract at a cost of \$144,000.

A contract has also been let to Bundaberg Foundry Company Ltd. at a price of \$841,000 for the manufacture and installation of seven steel automatically controlled radial spillway gates, each 42 feet long by 36 feet 6 inches high. These gates will hold water above the spillway crest and open automatically to pass flood waters downstream once the reservoir is filled.

Expenditure for the year on the project amounted to \$1,730,129 bringing total expenditure as at 30th June 1966, to \$3,276,549.

LESLIE DAM

Construction of Leslie Dam on Sandy Creek, a tributary of the Condamine River, approximately nine miles from Warwick, by the Commission's day labour forces was completed in December 1965. The dam is a mass concrete gravity structure with a full storage capacity of 38,500 acre-feet. Provision has been made in the design for the addition of 20-foot high steel gates on the spillway crest which would increase the capacity of the reservoir to 87,000 acre-feet if required.

A special feature of the design was the use of 131 post-tensioning cables in the spillway section of the dam to overcome foundation deficiencies in this area. A low dam of rolled earth-fill with protective rock facing was also required to fill a saddle on the right bank side of the reservoir. Road works to replace roads inundated by the storage were carried out on behalf of the Commission by the Rosenthal Shire Council.

The project is a dual purpose scheme which will provide an assured supply of irrigation water in the Condamine River, between Sandy Creek and Cecil Plains and will augment the existing water supply to the City of Warwick. The installation of pumping equipment and the construction of pipelines and auxiliary works for this purpose are the responsibility of the Council.

The dam and reservoir area has already become a popular recreation facility for residents of the Darling Downs and provision of public facilities is being made for this purpose.

The National Fitness Council has purchased an area of land and surplus buildings from the Commission with the intention of establishing a camp at the site similar to those conducted elsewhere by the Council.

Total expenditure on the project to 30th June, 1966, amounted to \$4,751,873.

WURUMA DAM

Wuruma Dam will form a major storage on the Nogo River, a tributary of the Burnett River, at a site approximately 30 miles from Eidsvold. It will be a mass concrete gravity structure with a maximum height of 142 feet above present stream bed level, a total length of 1,050 feet and will impound some 157,000 acre-feet of water. Its storage will provide an assured supply of water for irrigation by private diversion along the Burnett River downstream almost to Bundaberg. Construction is being carried out by the Commission's day labour forces, the estimated cost being \$4,514,000.

Hydraulic model testing for the spillway was completed by the Snowy Mountains Hydro-electric Authority and detailed design of its structure is approaching completion.

During the year construction of the access road from Abercorn to the dam site was completed by the Eidsvold Shire Council and the establishment of township facilities, which include accommodation for married and single staff and other employees, a canteen, Post Office, store, and electricity supplies, is nearing completion. Simultaneously most of the works buildings have been erected and are now in use.

Transfer of plant and equipment from Leslie Dam was completed and erection of the cableway, crushing plant, sand treatment and the concrete batching and mixing plant is in progress.

Dam foundations in the river bed have been uncovered and investigation of sub-surface conditions by diamond drilling and other methods is continuing.

One hundred and forty men were employed on the dam at the close of the financial year and expenditure for the year amounted to \$1,041,805, bringing the total expenditure to date to \$1,841,842.

WARRILL VALLEY IRRIGATION PROJECT

Arrangements are in hand for works for the proposed diversion of water from the supplemented Warrill Creek into Warroolaba Creek. The proposed works comprise an inlet structure on Warrill Creek, 1,300 linear feet of 27-inch diameter reinforced concrete pipeline and 1,900 linear feet of earth channel to Warroolaba Creek.

BORDER RIVERS

In conjunction with the Water Conservation and Irrigation Commission, New South Wales, a joint study was commenced on behalf of the Border Rivers Commission of proposals for equalisation of flows in the various branches of the Balonne-Culgoa Rivers system. Preliminary surveys were completed in the Narran and Donnegri areas.

RURAL WATER SUPPLY SCHEMES

Investigations and designs for a number of reticulated stock and domestic schemes were undertaken during the year. The drought conditions experienced throughout Southern Queensland have increased interest in works of this nature.

These schemes may attract a Government subsidy of 50 per cent. of the capital cost and the balance is obtained by way of Government guaranteed loans raised by the Board in each area.

Progress with individual schemes is as follows:—

(a) Tarampa Area

Construction of water supply works near Lowood involving a bore and pumping equipment, two 30,000 gallons capacity concrete reservoirs, some 20 miles of pipelines to serve 54 consumers (area 4,200 acres) was completed. The amount expended at 30th June, 1966, was \$72,424 with further accounts still to be met.

(b) Coreen Area

This area was constituted in September 1965 and construction of the works including bores and pumping equipment, three 30,000 gallons and one 20,000 gallons capacity concrete reservoirs, some 30 miles of pipeline to serve 35 consumers occupying 40,668 acres about 9 miles west of Biloela, was nearing completion at the end of the year. Estimated cost of the scheme is \$140,000.

(c) Proston Area

This Area in the Proston-Hivesville Districts was constituted during the year. Construction of the works which include three pumping stations, four concrete reservoirs, one of 250,000, one of 150,000 and two of 30,000 gallons capacities, approximately 80 miles of pipelines to serve 160 consumers (area 50,200 acres) and estimated to cost \$380,000 was commenced and will be completed during the coming year.

In addition, work has commenced on Proston Weir, a mass concrete gravity structure of 300 acre-feet capacity on the Stuart River, to provide supply for the Rural Water Supply scheme. It will also provide for some improvement of stock water supplies and for limited irrigation downstream along the Stuart River.

The structure will incorporate a 5-foot high water inflated "Fabridam" to provide a moveable crest which will automatically adjust itself to permit flood flows to pass downstream without causing excessive increase in the water level and to minimise siltation in the storage.

(d) Roadvale Area

This area near Boonah was constituted in March 1966. Preparation of final plans and specifications for construction were nearing completion at the end of the year. Construction of the works in the Roadvale district, which include a pumping station, three 30,000 gallons capacity concrete reservoirs and some 23 miles of pipelines to serve 84 consumers (area 7,400 acres) will be completed in the coming year. Estimated cost is \$102,500.

(e) Kooingal Area

This area near Biloela was constituted in May 1966. Preparation of final plans and specifications for this scheme in the Parish of Kooingal were nearing completion at the 30th June. Construction of works, which include a bore and pumping equipment, reservoirs and some five miles of pipelines to serve nine consumers (area 7,900 acres), will be undertaken during the coming year. Estimated cost is \$37,200.

(f) Merlwood Area

Notice of intention to constitute this scheme, near Murgon, was advertised in October 1965, but following requests to expand the area to almost double its original size it had to be completely re-investigated. The report on objections following this re-examination was nearing completion at the close of the year.

(g) Ridglands

Detailed investigations for this proposal, near Rockhampton, were completed and a report on its establishment will be submitted early in the coming year.

Requests have also been received for investigation of 12 other schemes which will be undertaken in 1966-67.

MATERIALS TESTING LABORATORY

Testing of soils and concrete was carried out in conjunction with engineering investigations and construction control on Commission projects, farm advisory work and for the Co-ordinator-General's Department.

WATER SUPPLY FOR POWER GENERATION**Callide and Moura Coalfields**

Investigations were continued into the availability and cost of water supply for possible power stations at Moura and Callide. After a preliminary assessment of alternative sources, investigations into the use of water from the Dawson Valley were made and the financial aspects determined sufficiently to enable the planning of power development in this area by the State Electricity Commission to proceed.

Blair Athol and Blackwater Coalfields

Investigations were continued into the cost of supplying cooling water for power generation at Blair Athol and Blackwater coalfields.

These investigations have been based on supplies being obtained from the proposed Maraboon Dam on the Nogoa River near Emerald and have progressed to the stage where preliminary costs have been determined and submitted to the State Electricity Commission for planning purposes.

Mackenzie River

Water supplies required for mining activities associated with the development of coal resources at Blackwater will be obtained from the Mackenzie River at 341M (Bedford Crossing) and proposals for a small weir at this site have been submitted by the mining company.

The Commission has commenced preliminary studies at this site to determine the technical and economic feasibility of constructing a larger storage to serve possible irrigation and power station development.

Aerial mapping of the proposed storage site is in progress with the assistance of the Snowy Mountains Hydro-electric Authority.

BUNDABERG-CHILDERS DISTRICT

Investigation of water conservation and irrigation works to serve cane areas not adequately served by existing underground supplies was continued.

Studies of proposals for supply to areas north of the Burnett River have been completed and a report is now in course of preparation. Studies of proposals for supply to areas south of the Burnett River are in progress.

The engineering investigations have included examination of potential storage sites—three on the lower Burnett River, one each on the Kolan and Gregory Rivers and one on Gin Gin Creek—involving surveys, aerial mapping and dam site foundation exploration and have been carried out with the assistance of the Survey Office, the Snowy Mountains Hydro-electric Authority and a private aerial survey firm.

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Concurrently, investigation has been in progress on other aspects relating to the irrigation works and the area to be served, including suitability of soils, potential production under irrigation and overall economics of the scheme on a joint basis by the Department of Primary Industries, the Bureau of Sugar Experiment Stations and the Commission.

ST. GEORGE IRRIGATION AREA

Investigations were continued to determine the technical and economic feasibility of constructing a weir on the Balonne River above St. George in order to augment the supply for the existing irrigation area and to provide for an extension of this development.

Preliminary contour surveys of the area were completed, also further foundation drilling at the weir site and along Thuraggi Lagoon watercourse for the main distribution channel and channel structures.

The soil survey undertaken by the Department of Primary Industries in the area of the proposed extension was completed.

UPPER BRISBANE RIVER

Survey, geological and engineering investigations were commenced in the Upper Brisbane River area to determine the most suitable dam site for regulating flows along the Upper Brisbane River.

Aerial mapping of three possible storage sites in the area is being carried out with the assistance of the Snowy Mountains Hydro-electric Authority and a private aerial survey firm.

Foundation drilling was completed at one possible dam site located at 7.7M on Cooyar Creek and drilling was commenced at another site located at 175M on the Brisbane River near Linville.

LOWER LOCKYER CREEK

Surveys and engineering investigations were continued in the Lower Lockyer Creek area for the provision of off-stream storages, mainly at Lake Clarendon and Atkinson's Lagoon. Preliminary foundation investigations were completed at the Atkinson's Lagoon embankment site.

Engineering studies, including preliminary designs of storage proposals, are nearing completion.

UPPER CONDAMINE DIVERSION

Engineering investigations were continued into the proposals for diverting flows from the Condamine River proper into the North Branch of the Condamine River.

CALLANDON CREEK

Minor surveys were completed during the year in connection with studies to determine the practicability of limited diversion from the Macintyre River into Callandoon Creek to increase stock watering facilities.

BARKER-BARAMBAH CREEKS

Aerial photography of possible dam sites and storage areas at 25.6M and 97.7M on Barambah Creek and 1M on Barker Creek was completed. Planning for aerial mapping of the areas by the Snowy Mountains Hydro-electric Authority is in progress.

EMERALD IRRIGATION AREA—NOGOA RIVER

Site and storage surveys were carried out for a proposed weir at 428M on the Nogoa River. This weir would supply water to two pilot farms in the area, and could be a source of supply pending the construction of the proposed Maraboon Dam.

WAMBO SHIRE RIVER IMPROVEMENT TRUST

Aerial mapping of an area near Pirrinuan for the design of flood mitigation works by the Trust was completed by a private firm. Copies of plans were issued to all interested Departments.

DRAINAGE SCHEMES—CANELANDS, NORTH QUEENSLAND

Investigations and preliminary designs were completed for an overall drainage scheme for sugar cane lands in the Babinda Swamp Area and a report on works required and proposals for constitution of a Drainage Area and a Drainage Board was in preparation at the close of the year. Designs for a further outlet from the swamp to the Russell River were prepared and the works installed by a group of settlers. The two outlets now constructed have already provided marked drainage relief.

Investigations by consulting engineers of the drainage proposals at Ripple Creek, near Ingham, were nearing completion at the close of the year.

Investigations were continued into proposals for drainage of Eubenangee Swamp and the Rusty Creek area near Babinda, two areas near Mossman and the Valdora-Yandina area.

Applications for investigation for drainage have been received from four other groups of landholders in the coastal region north of Ingham.

STOCK ROUTE WATERING FACILITIES

Investigation and construction of Main Stock Route Watering Facilities during the year is summarised as follows:—

Facilities completed	14
Additional construction on existing facilities ..	16
Facilities under construction at 30th June, 1966 ..	19
Contracts let	5
Investigations in progress	11
Investigations carried out	30
Deferred	6

IRRIGATION AND RURAL WATER SUPPLY AREAS

MAREEBA-DIMBULAH IRRIGATION AREA

In common with much of North Queensland, rainfall within the Irrigation area was only slightly better than half the average. Stream flows and runoff were low. At the end of the year most of the tributaries of the Barron River had ceased to flow.

Tinaroo Falls Dam, overflowing at the beginning of the year fell to 262,400 acre-feet on 5th March, 1966, and rose to 265,600 acre-feet on 12th March and fell slowly to a level of 225,700 acre-feet (68 per cent. capacity) at the end of the year.

Following the implementation of the Tobacco Stabilisation Plan and the attachment of quotas to individual farmers, the area planted to tobacco decreased by some 1,431 acres on the previous year to 9,310 acres. However, the success of the plan was indicated when 99.8 per cent. of the quota leaf offered sold at an average price of 113.1 cents per pound. Some 11,477,688 pounds of leaf sold for \$12,981,908.

The completion of the siphon across Gorge Creek and of the relift pumping stations serving the Paddy's Green Area south of Gorge Creek by the end of the year will enable

The Commission acts as constructing authority and consultant to the Stock Routes Co-ordinating Board and carries out general investigations and surveys for the establishment of stock route watering facilities and also acts in a supervisory capacity during their construction.

Expenditure under the Main Stock Routes Loan Vote during the year was \$129,978 and under the Stock Route Investigation Vote, \$7,963.

LOCAL AUTHORITIES AND OTHER GOVERNMENT DEPARTMENTS

At the request of five Local Authorities and two other Government Departments, the Commission is acting as Consultant in the preparation of plans and specifications and as supervisor of construction for 12 artesian and sub-artesian bores in the Great Artesian Basin area for town water supplies and Research Stations.

the temporary pumping installations to be dispensed with and permit a further 54 existing tobacco farms to be supplied during the coming year.

Land Settlement

As tobacco quotas were not available no new farms were opened during the year. The total new farm openings in the area remains at 66.

Production

During the year three further farms took supply from the channel system. The total number of farms served in this area was 579 made up as follows:—

Supplied from Channel system	224	(195 producing tobacco)
Supplied from regulated streams	348	(324 producing tobacco)
Supplied from unregulated streams	7	(7 producing tobacco)
	579	(526 producing tobacco)

Details of crop planting and estimated value of production from irrigated crops within the area are as follows:—

Crop	Area of Planting				Estimated Value
	Channel Supplied Farm	Regulated Stream Supplied Farm	Unregulated Stream Supplied Farm	Total Farm	
	(Acres)	(Acres)	(Acres)	(Acres)	\$
Tobacco	3,944	5,273	93	9,310	12,981,908
Maize	144	68	..	212	8,640
Peanuts	172	..	..	172	30,960
Vegetables	351	35	..	386	30,880
Seed Crops—					
Grasses and Legumes	450	48	..	498	50,200
Beans	307	98	..	405	30,700
Peas	20	..	..	20	2,000
Pastures (for beef fattening)	822	..	..	822	25,320
Horticultural Crops	5	33	..	38	38,000
Total	6,215	5,555	93	11,863	\$13,198,608

In addition to the above irrigated crops, farms served by the channel system produced some 2,395 acres of grass seed, maize and peanuts without irrigation. The estimated value of production of these crops is \$191,740.

The above figures do not include any allowance for experimental cropping undertaken on the Parada or Walkamin Regional Experimental Stations.

Water Releases and Use

Details of water releases are as follows:—

	Acre-feet	Acre-feet
Tinaroo Falls Dam—		
Release into channel system—		
For irrigation from channel	28,579	
For irrigation from streams	24,591	
		53,170
Released into Barron River—		
For irrigation	6,330	
For hydro-electric power station at Kuranda	112,433	
		118,763
Collins Weir—Released into channel system for irrigation	910	910
		172,843

Total releases for irrigation of 60,410 acre-feet were 35 per cent. of all releases.

Deliveries to 195 tobacco farms served direct by the channel system were 9,074 acre-feet, an average of 2.3 acre-feet per acre irrigated and 46.5 acre-feet per farm. Deliveries to farms through the channel system totalled 14,669 acre-feet for the year.

Urban Development

Urban development in the towns of Mareeba and Dimbulah is continuing at a reasonably high level as indicated by the value of building permits issued by the Shire of Mareeba in the accompanying table.

BUILDING PERMITS—MAREEBA SHIRE

	1963-64	1964-65	1965-66
Number	254	226	159
Value	\$990,082	\$745,788	\$403,646

Tinaroo Falls Dam continued to attract many visitors with its recreation facilities, particularly for power boating, sailing and water ski-ing.

BURDEKIN RIVER IRRIGATION AREA

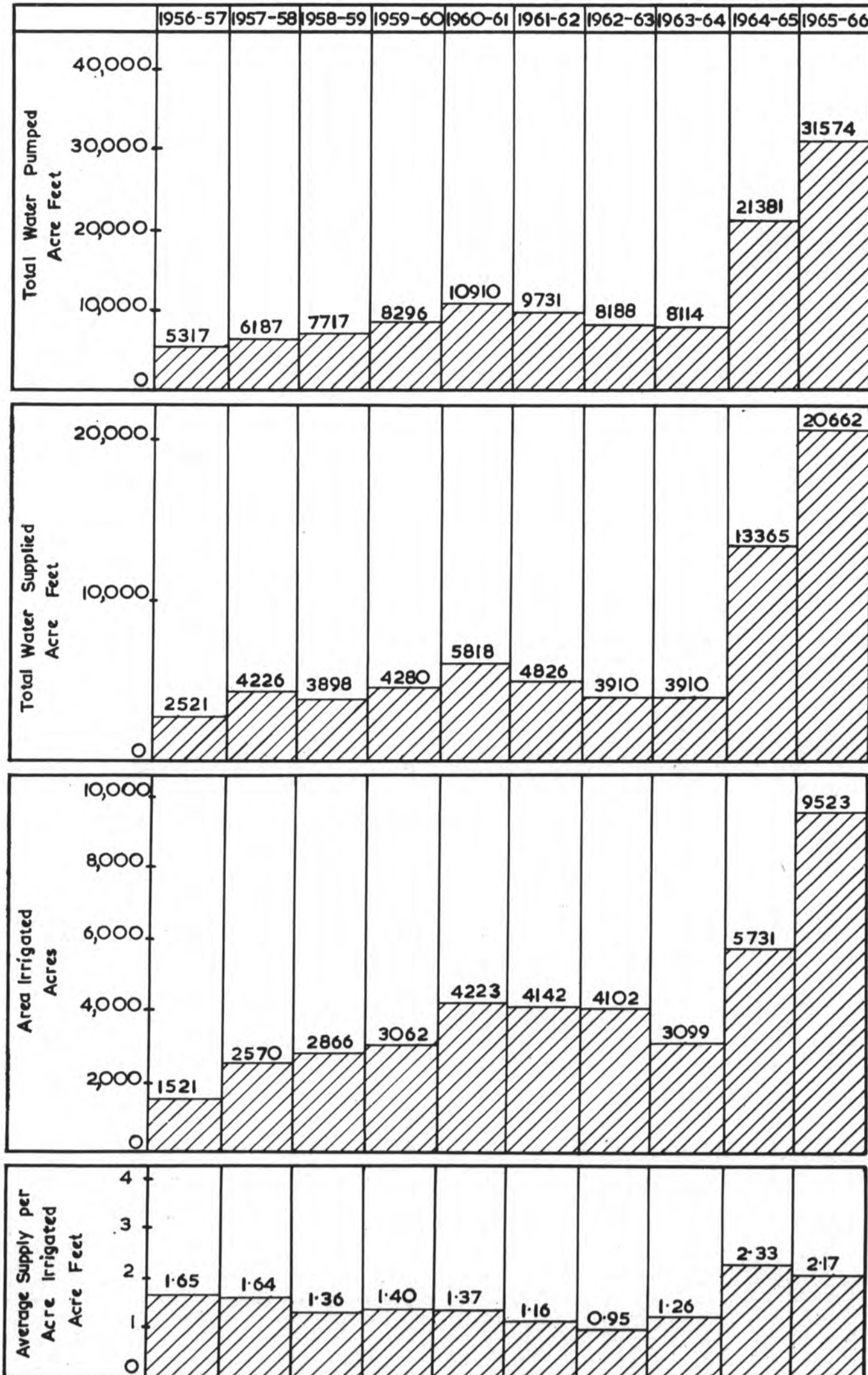
Comprising the three sections of Clare, Millaroo and Dalbeg, the Burdekin River Irrigation Area is now in its second year of sugar cane production. The first year's harvest yielded 177,937 tons of sugar cane from 3,896 acres for an average yield of 45.7 tons per acre.

During the year, assignments were granted to a further two of the irrigated farms in the area, bringing the total assigned area to 7,176 acres. In addition, assignments have

been granted to a further three farms within the area, which are not currently served by the channel system.

Rainfall in the area during the year was greatly below average and this factor, combined with the increased water requirements for production of sugar cane, resulted in a demand for irrigation water greatly in excess of that previously supplied. Natural flow in the Burdekin River ceased during May, when releases from the Gorge and Blue Valley weirs were commenced. If no rain falls, it is anticipated that supply to the irrigated farms will not be continued beyond early August.

BURDEKIN RIVER IRRIGATION AREA
WATER USE 1956-57 TO 1965-66



Production

The total area from which crops were harvested was 5,707 acres of which 3,896 acres produced sugar cane.

Of the 177,937 tons of cane harvested from farms in the area, 147,014 tons were accepted into the No. 1 pool and the balance, 30,923 tons into the No. 2 pool. The average sugar content (C.C.S.) of 14.46 compares favourably with the established areas in the Burdekin Delta.

The estimated yield of sugar cane from the area during the 1966 season is in excess of 180,000 tons.

Following the granting of tobacco quotas to a number of farms in the Dalbeg and Millaroo areas, tobacco production increased from 15 acres to 65 acres. Of the 69,436 pounds of leaf offered for sale, some 88.3 per cent. was sold at an average price of 103 cents per pound.

Areas of crops harvested and estimated values of production for the year in the three sections are set out in table below.

Crop	Clare		Millaroo		Dalbeg		Total	
	Area	Value	Area	Value	Area	Value	Area	Value
	Acres	\$	Acres	\$	Acres	\$	Acres	\$
Sugar Cane	1,687	590,588	1,312	475,067	897	315,624	3,896	1,381,279
Tobacco .. .. .	..	..	19	20,210	46	43,297	65	63,507
Beans, Fresh	35	26,700	13	13,000	..	..	48	39,700
Beans, Seed	194	32,742	55	6,337	..	..	249	39,079
Other Seed Crops	30	3,150	68	8,190	..	..	98	11,340
Maize	344	34,779	584	51,664	20	1,100	948	87,543
Cucumber	54	32,600	17	7,401	..	..	71	40,001
Miscellaneous	152	23,080	152	31,815	28	8,230	332	63,125
Totals	2,496	743,639	2,220	613,684	991	368,251	5,707	1,725,574

Water Use

An analysis of total water pumped and supplied, areas irrigated, and average supply per acre irrigated since 1955-56, is shown in the graph on page 15. The quantities pumped and supplied during the year increased by 48 per cent. and 55 per cent. respectively on the previous year because of the greater area of cane being watered and the dry conditions prevailing throughout the year. Average water use on the 9,523 acres irrigated during the year was 2.17 acre feet per acre.

Construction

Construction of additional channels, drains, roads, &c., required to serve the additional areas granted to farms allotted cane assignments was completed during the year.

Minor improvements to the channel system were also completed to meet increased demands.

Town Water Supplies

The Commission continued to operate the town water supply systems in the townships of Claredale, Millaroo, and Dalbeg. A new bore and pumping unit has been installed for the Claredale township and a bore constructed to provide an improved supply to Millaroo.

DAWSON VALLEY IRRIGATION AREA

Comprising the two developed sections of Theodore and Gibber Gonyah, this area again experienced below average rainfall and little runoff into the Dawson River occurred. Because of dry conditions and poor river flows, it was necessary to limit supplies of water to the individual farmer between the 9th August, 1965, and the 8th December, 1965, when the river again ran.

At the close of the year the weirs serving the area contained just under 90 per cent. of total available capacity.

Despite the limitation of supply, which prevailed in the early part of the year, water use increased considerably over the previous year.

Land Settlement

Four of the 61 farms in the two sections changed ownership during the year.

Production

Cotton plantings were increased by some 80 acres over the previous year. Because of the dry conditions, dry plantings remained relatively low at 50 acres, while the irrigated plantings increased only slightly from 1,026 acres to 1,070 acres. Yields from the irrigated plantings in the Theodore section increased significantly, averaging 1,912 pounds of seed cotton per acre, although the acreage planted decreased from 928 acres to 618 acres. In the Gibber Gonyah section, the acreage of cotton planted increased from 321 acres to 452 acres, although the average yield decreased to 1,908 pounds of seed cotton per acre. One farmer in the Gibber Gonyah area obtained an average yield of 2,700 pounds of seed cotton per acre from an area of 198 acres.

On the information available to the Commission, it is estimated that the values of produce from irrigated and associated dry farms during the year are as shown in the following table.

Commodity	Estimated Value
	\$
Cotton	221,953
Sorghum	34,272
Wheat	60,508
Lucerne (Hay)	40,000
Cream	24,910
Milk	10,240
Safflower	2,500
Miscellaneous	16,552
Total	\$410,935

The foregoing figures do not include any allowance for livestock production which could not be estimated with reasonable accuracy. The poor returns from grain crops on associated dry areas, because of the prevailing dry conditions, is readily discernible from the above table.

Water Use

A total volume of 9,506 acre-feet was pumped to supply 6,660 acre-feet to farms. The average supply per farm was 109 acre-feet and the 4,250 acres irrigated received an average of 1.56 acre-feet of irrigation water.

An analysis of total water pumped and supplied, areas irrigated and average supply per acre irrigated since 1954-55, is shown in the graph on page 17.

Construction

Construction of a new outfall drain to the Dawson River in the Gibber Gonyah section was completed during the year. New suction pumps were fitted to the Theodore Pumping Station, following the collapse of one of the suction pipes. Minor works to improve the operation of the channel and drainage systems were also completed.

Theodore Town Water Supply

The Commission continued to operate the Theodore Town Water Supply System. During the year a further thirteen services were connected bringing the total to 194. Minor works were also undertaken to improve and extend the system.

Consumption from the town water supply system was 18.37 million gallons, the highest on record.

ST. GEORGE IRRIGATION AREA

Rainfall in this area was much better than in the previous year, although still below average.

At the start of the year only 1,950 acre-feet remained in the storage and irrigators were operating on a limited quota of water. However, following good rains on the Darling Downs during July, the storage filled at the beginning of August, 1965, following which limitations on supply were lifted. Although the storage fell to 3,200 acre-feet at the end of November, it was not necessary to impose further limitations and after refilling in December, the weir has continued to overflow for the last six months of the year.

Water use increased by a further 7.7 per cent. on 1964-65. Irrigation development on the farms also increased during the year.

Fat lambs and fodder production continues to be the dominant form of production in the area with the fat lambs produced comparing more than favourably with those from elsewhere in both quality and price. The purchase of several of the farms by graziers, working them in conjunction with dry properties distant from the irrigation area, has resulted in much more effort being put into fodder conservation and it seems likely that this trend will be maintained. Cotton plantings reduced from 495 acres in 1964-65 to 240 acres in the current year but are expected to build up in the coming years.

Land Settlement

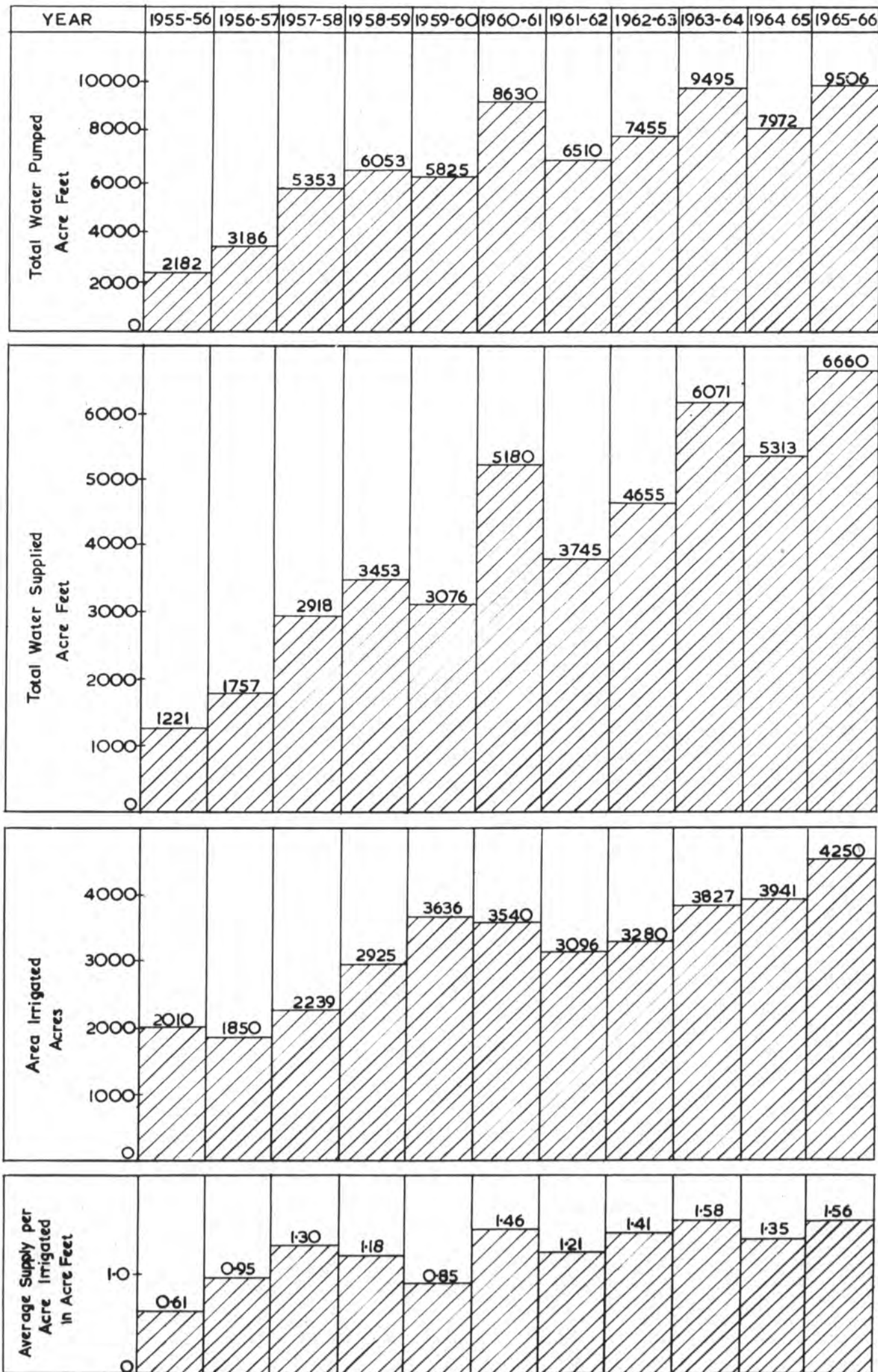
Nineteen farms are served by the existing works. Three farms changed ownership during the year.

Production

Because of the number of properties which changed hands, it has been difficult to obtain production data for the past year. However, such information, as is available, suggests that returns from wool and fat lambs are generally similar to the previous year while hay production increased considerably because of the dry conditions. Grain production fell because of the dry conditions which applied at the beginning of the year and the consequent necessity to restrict plantings of wheat.

DAWSON VALLEY IRRIGATION AREA

WATER USE 1955-56 TO 1965-66



Production information available to the Commission is shown in the following table.

Commodity	Estimated Value
	\$
Sheep and Lambs ..	76,969
Wool	44,955
Hay	66,919
Grains	5,295
Cotton	19,800
Fat Cattle	14,830
Miscellaneous	3,663
Total	\$232,431

Water Use

A total volume of 17,890 acre-feet was pumped to supply 12,846 acre-feet to farms, an average supply for the 6,688 acres irrigated of 1.92 acre-feet. Supplies to farms varied from a minimum of 299 acre-feet to a maximum of 1,324 acre-feet, averaging 676 acre-feet per farm.

Demonstration Farm

The demonstration farm was sold to the Farm Manager on the 9th February, 1966, it being considered that the farm had served its purpose in demonstrating the advantages to be gained by full employment and by adoption of recognised irrigation methods and techniques. Despite the sale during the year, gross production from the farm to the date of sale was greater than in the previous year, a total production of \$19,879 being realised.

Quality of the fat lambs sold from the farm again proved to be high, a total of 995 lambs being sold at an average price of \$9.95 after deduction of cartage and selling charges. Fifty head of cattle, fattened for a period of three months, proved to be a most successful venture, being sold at an average price of almost \$107.

MARY VALLEY IRRIGATION PROJECT

Borumba Dam continued to provide regulated flows in Yabba Creek and the Mary River. Prior to the close of the year the Dam overflowed and at 30th June, was storing a total of 34,000 acre-feet. A total of 5,250 acre-feet was released from the Dam for irrigation and the Gympie City Water Supply.

At 30th June, 1966, 132 licensed pumps were operating along the supplemented sections of Yabba Creek and the Mary River. These diverted some 1,308 acre-feet during the year. In addition 1,326 acre-feet were diverted by Gympie City Council for city water supply.

WARRILL VALLEY IRRIGATION PROJECT

At the end of the year Moogerah Dam was storing 56,200 acre-feet, equal to 75 per cent. of its total capacity.

The generally dry conditions which prevailed in this area throughout the year caused a fairly high level of water use and resulted in the number of licensed pumps on streams regulated from Moogerah Dam increasing from 175 at the end of the previous year, to 225. These pumps are licensed to divert 4,365 acre-feet from streams regulated from the Dam.

Supply to the Swanbank Power Station from the Bremer River, near Churchill, commenced in April, and to the end of the year some 1,255 acre-feet had been diverted to this station.

A total of 19,454 acre-feet was released from the Dam during the year while the volume actually diverted by private pumping installations under license and to the Swanbank Power Station was 7,951 acre-feet.

UPPER CONDAMINE IRRIGATION PROJECT

Following its completion in December 1965, Leslie Dam on Sandy Creek has maintained regulated supplies of water in the Condamine River down to Cecil Plains.

At the end of the year, Leslie Dam was storing 13,500 acre-feet, equal to 35 per cent. of its total capacity. Applications for allocations by way of licensed pumps on the regulated section of the Condamine River have been such that as at 30th June, the entire available yield from the Dam has been or will be allocated and it will also be necessary to limit the amount of water which individual irrigators may divert from the regulated stream. At the close of the year, licenses had been issued for 38 pumps, which are licensed to divert 3,565 acre-feet.

WATER ADVISORY BOARDS

Seven Water Advisory Boards continued to function within the irrigation areas and assisted the Commission with advice on water distribution, weir operation and stream control.

RURAL WATER SUPPLY AREAS

The Tarampa Water Supply Area was constituted in May 1965, and commenced operations in January 1966.

In addition the three areas of Back Creek, Grevillea, and Brigooda also continued to operate successfully to supply stock and domestic water to benefited properties throughout the year.

Details of numbers of holdings, benefited area, basis of rating and capital indebtedness of the four schemes operating at the end of the year are set out in the accompanying table.

Scheme	Number of Holdings	Benefited Area	Basis of Rating	Capital Indebtedness at 30-6-66
		Acres		\$
Grevillea	27	21,900	Carrying Capacity Water Supplied { Unimproved Capital Value	20,827.77
Brigooda	11	3,900		Nil
Back Creek	8	27,250		7,633.02
Tarampa	54	4,200		36,464.36

BOWEN-BROKEN RIVERS AREA

Works required for the irrigation trial being undertaken jointly by a private company, the Department of Primary Industries and the Commission on lands riparian to the Bowen River, were nearing completion at the end of the year. These works included the construction of a pumping station, pipelines, and the preparation of some 200 acres for irrigation.

This prepared area, consisting of some 30 acres of levee soils and 150 acres of black earths, was cropped with lucerne, maize, grain sorghum and green manure crop. To date the levee soils are producing good crops but some problems have been encountered in the handling of the black earths.

The purpose of this trial is to indicate to existing landholders the benefits of irrigation by private diversion when water becomes available from Eungella Dam on the Broken River. The trial will also provide basic data for any major irrigation project envisaged in that area.

EMERALD IRRIGATION PROJECT—NOGOA RIVER

Following the release at the beginning of the year of the report by the Commonwealth Bureau of Agricultural Economics on this scheme which indicated that the scheme was not economic, an overall re-assessment was undertaken jointly by the Commission and the Department of Primary Industries.

The re-appraisal was concentrated on the agricultural aspects of the scheme, suitable farm sizes, cropping enterprises, &c., and a report on this was nearing completion at the end of the year.

Emerald Pilot Farms

The development of the two pilot farms is proceeding. A farm manager for Farm I was appointed early in the year and the manager for Farm II was recently appointed, and took up duties in July 1966. Development carried out during the year included the installation of pumping stations and rising mains, clearing of some 300 acres, purchase of farm machinery, construction of two houses, and the fencing of Farm I. Ninety acres on Farm I were prepared for irrigation and planted to 60 acres of cotton and 30 acres of winter grain. Cotton harvesting has been completed and a yield of some 2,400 pounds of seed cotton per acre obtained.

ARTESIAN BORE WATER SUPPLY AREAS

Bore Water Supply Areas are constituted under the Water Acts for the purpose of supplying water to several properties from an artesian or sub-artesian bore. The construction or acquisition of a bore and distribution system within an Area is financed by a Treasury Loan, and rates, calculated on the basis of area benefited, are levied annually to cover loan repayments and normal maintenance of the bore and distribution system.

To date there have been 74 Areas constituted but 13 of these have been abolished due to diminution of supply from the bore to such an extent that only one property

benefits from the supply. In those cases, the bore has been sold to the landholder on whose property the bore is located and the money thus obtained has been paid into Consolidated Revenue.

Of the 61 Bore Water Supply Areas operating in the State at 30th June, 1966, 55 are administered by the Commissioner and six by Boards elected by the ratepayers within the Areas.

The diminution of bore water flows is causing quite a problem within Bore Water Supply Areas. As the bore drains dry back, terminal properties are faced with the problem of providing alternative water supplies for their stock. Preliminary investigations are now being carried out to see whether it would be economically feasible to install high pressure pumps on the bores and reticulate the water by pipelines.

FARM WATER SUPPLIES

The Farm Advisory Service is provided under the authority of "The Farm Water Supplies Assistance Acts, 1958 to 1965". The year 1965-66 was the eighth year of operation under the provisions of those Acts.

The purposes of the Acts are to—

- (a) Improve the standard of stock and domestic water supply installations on individual holdings; and
- (b) Encourage greater development of individual irrigation schemes by—
 - (i) Modern methods of water conservation and water harvesting;
 - (ii) Development and utilisation of sub-surface supplies where such supplies are known to exist; and
 - (iii) Ensuring that such development is soundly planned, technically and economically.
- (c) Provide greater stability of production and avoid losses in time of drought, together with generally increasing production.

To achieve these purposes, the Acts authorise the provision of technical or technical and financial assistance to landowners for the investigation, design and installation of approved works of farm water supply. All projects for which finance is provided under the Farm Water Supplies Assistance Acts are carried out with appropriate Commission advice and for the payment of a small charge, the Commission will advise on the construction of works designed by its staff but for which the landowners do not require financial assistance under the Acts. In those cases when landowners wish to obtain an advance under the provisions of the Acts, agricultural suitability of the scheme is investigated by the Department of Primary Industries or by the Bureau of Sugar Experiment Stations in the case of caneland projects and the final approval of an advance is made by the Agricultural Bank Board after investigation of the financial position and prospects of the applicant.

The demand for services offered has been maintained at approximately the same level as in preceding years. The backlog in applications awaiting investigation has been reduced to 399 as compared with 533 at 30th June, 1965. This has been mainly caused by a decrease of 80 in the number of applications received in 1965-66 below those received in 1964-65. Part of the overhauling of the backlog as well as handling applications lodged during 1965-66, can be attributed to the number of applications submitted which have been surveyed and designed by equipment firms, thus relieving Commission staff of lengthy investigations.

The following table summarises the work during the year of the Farm Advisory Service, excluding those instances of advice on underground water projects where such projects did not include financial assistance or additional technical assistance with regard to equipping the bore:—

Period	Number of Applications		
	For Technical Assistance only	For Technical and Financial Assistance	Total
Brought forward from 1964-65	460		
Less internal adjustment ..	88		
Deferred at 30th June, 1965*	372	161	533
Received 1965-66	64	41	105
	615	318	933
Total	1,051	520	1,571
Finalised 1965-66	727	363	1,090
Deferred by Applicants at 30th June, 1966	75	7	82
Outstanding at 30th June, 1966 ..	249	150	399
Total	1,051	520	1,571

*These figures have been adjusted from those shown in 1964-65 report.

The overall details of the 61 areas now in operation are summarised as follows:—

Original cost of works	\$791,876
Areas in which loans not yet redeemed	9
Amount of loans unredeemed	\$180,732
Annual interest and redemption	\$10,969
Area benefited	4,810,734 acres
Annual rate assessment	\$55,987
Average assessment per acre	1.16 cents
Number of flowing bores	60
Total flow	25,211,000 g.p.d.
Length of drains	2,567 miles
Average use of water per mile of drain	9,820 g.p.d.

These figures differ from those in the previous report which related to the 74 areas originally constituted.

During the year there were 769 applications for advice on various aspects of groundwater supplies. Of these, 153 related to projects for which farm water supplies assistance, either technical or financial was given and are included in the total of 933 applications received, recorded above.

Of the 769 groundwater applications received and 99 carried over from 1964-65, 707 were completed during the year.

The following statistics are for the year 1965-66:—

Analysis of Applications for Financial Assistance

Approved by Agricultural Bank Board	241
Approved under the Agricultural Bank (Loans) Acts and War Service Land Settlement Scheme	10
Withdrawn because mortgagee would not cede priority	7
Not approved by Bank Board and not proceeded with	35
Withdrawn by Applicant	70
Deferred by Applicant	7
Active applications outstanding at 30th June, 1966	150
Total	520

	\$
Unexpended approvals brought forward at 1st July, 1965	614,109
Amount approved for advances 1965-66	1,110,953
Amount reinstated	23,466
Sub-Total	1,748,528
Less Cancellations 1965-66	207,443
Total	1,541,085
Amount paid out in 1965-66	919,631
Unexpended approvals carried forward to 1966-67	621,454

STATISTICS FOR PROJECTS FOR WHICH FINAL PLANS WERE PREPARED 1965-66

IRRIGATION SYSTEMS

No.	Total Area	Total Cost	Average cost per acre
94	Acres 5,069**	\$ 450,910	Portable and Semi-portable Sprinkler Systems 129 Surface Systems* 44

* Land preparation only.

** Includes 2,379 acres designed for surface irrigation.

IRRIGATION STORAGES

No.	Total Earthworks	Total Storage	Total Cost	Average Cost per acre foot
18	Cu. yd. 142,210	Acre feet 1,210	\$ 52,600	\$ 43.46

STOCK WATER SUPPLY STORAGES

No.	Total Earthworks	Total Storage	Total Cost	Average Cost	
				Million gals.	Acre foot
	Cu. yd.	Million gals.	\$	\$	\$
42	386,890	202.80	134,800	664.69	179

STOCK AND DOMESTIC WATER SUPPLY INSTALLATIONS

No.	Total Daily Capacity	Total Cost	Average Cost
7	22,700 gallons	\$ 21,250	\$ 3,036

Additional to these are bores and wells constructed, for which no plans are required.

\$
 Amount received for Plans and Specifications 15,440
 Amount received for Supervision Charges . . . 988

The total number of applications for technical assistance and for technical and financial assistance was approximately 7.9 per cent. less than those of 1964-65.

Due to the further application of the specification requiring proper construction (compaction of the material at optimum moisture content), instances of farm dam failure have been considerably reduced. Further investigation into construction methods is being carried out and from results it is expected to further reduce farm dam failures.

During the year 1965-66 the amount of finance (\$919,631) made available to landowners for water supply improvements, was approximately 25 per cent. of the overall total of \$3,709,966 made available to landowners in the eight years of operation of the Farm Water Supplies Assistance Acts.

FINANCE

Details of receipts and expenditure and financial statements of the Commission for the financial year 1965-66, are set out as follows:—

RECEIPTS

During 1965-66, receipts of the Commission from all sources, amounted to \$7,525,515, as compared with \$7,255,160 for 1964-65, and \$6,083,630 for 1963-64.

	1963-64	1964-65	1965-66
	\$	\$	\$
Consolidated Revenue Fund—			
Water and Drainage Charges, Land Rents, &c.—			
Mareeba-Dimbulah Irrigation Area	201,740	203,134	210,291
Burdekin River Irrigation Area	26,986	51,700	82,026
Dawson Valley Irrigation Area	89,336	74,080	81,204
St. George Irrigation Area	42,694	55,810	60,647
Warrill Valley Irrigation Project	6,190	12,202	30,177
Mary Valley Irrigation Project	3,430	18,270	20,581
Upper Condamine Irrigation Project .. .. .	..	..	3,870
Callide Dam Project .. .. .	..	..	80,000
Farm Advisory Service—Plan Fees and Supervision	16,840	19,692	17,474
Sand and Gravel Royalties	25,942	25,538	30,422
Head Office Administration Fees	16,976	14,032	17,271
General	13,354	14,222	23,271
	\$ 443,488	488,680	657,234
Trust Fund—			
Artesian Bores Working Account	45,628	54,514	52,123
Irrigation and Water Supply Construction Fund	5,327,888	5,685,146	5,675,085
Water Resources Investigation Fund .. .. .	..	705,436	859,066
Burdekin River Irrigation Area	*1,188	1,008	448
	\$ 5,374,704	6,446,104	6,586,722
* Net refunds during year			
Loan Fund—			
Mareeba-Dimbulah Irrigation Area	79,276	83,824	48,076
Burdekin River Irrigation Area	180	750	3,246
Dawson Valley Irrigation Area	660	2,930	20
St. George Irrigation Area	1,406	940	12,001
Borumba Dam	4,252	4,270	17
Moogerah Dam	870	12,586	5,260
Leslie Dam	2,846	22,980	9,941
Coolmunda Dam	12	2,904	16,559
Wuruma Dam .. .. .	..	32	766
Commonwealth Government—Water Facilities Channel Country Stock Routes	278	..	..
Rocklea Sale of Land, &c. .. .. .	..	..	11,804
Sale of Plant and Plant Hire Earnings	167,656	183,056	169,365
Other	8,002	1,024	4,084
North Qld. Development and Main Stock Routes (Lands Department) .. .. .	..	5,080	420
	\$ 265,438	320,376	281,559
Total	\$ 6,083,630	7,255,160	7,525,515

Loan Fund contributed an amount of \$5,517,236 towards the receipts shown in the Irrigation and Water Supply Construction Trust Fund. The balance was deducted from Plant Hire Earnings to meet expenditure on Plant Maintenance.

The receipts shown in the Water Resources Investigation Trust Fund were provided from:

Irrigation and Water Supply Commission—

	\$	\$
Consolidated Revenue Fund	100,000	
Loan Fund	407,764	
		507,764
Department of Mines		36,534
Commonwealth Government Grants—Advances		313,464
Sales of Assets		1,304
		\$859,066

Receipts in Loan Fund were derived from Plant Hire, sales of Plant, Stores and other assets and payments for improvements on properties opened for selection.

EXPENDITURE

Expenditure on works and services carried out by the Commission, is provided for in the Revenue, Loan and Trust Funds.

The Loan Fund Appropriations are allocated for credit to the "Irrigation and Water Supply Construction Trust Fund" and the "Water Resources Investigation Trust Fund." The expenditure as authorised by the Works Programme is controlled in detail through these Funds.

The Water Resources Investigation Trust Fund, commenced in 1964-65, is also financed by grants from the Commonwealth for the "Measurement and Investigation of Water Resources", under *States Grants (Water Resources) Act, 1964* (Commonwealth). With respect to the investigation of Underground Water, this Fund is also operated on by the Department of Mines. In the applicable section of the following statement, expenditure by the Department of Mines has been excluded.

The Farm Water Supplies Assistance Trust Fund, within the Commission's votes, controls expenditure incurred by the Agricultural Bank, on Advances to Settlers, interest, redemption and management charges in connection with "*The Farm Water Supplies Assistance Acts, 1958 to 1965.*" This fund is financed by Borrowers repayments, and Loan Funds provided in the Estimates of the Treasury (Agricultural Bank).

The Construction of Callide Dam was financed from the "Electricity Development Trust Fund," and the dam which is now completed and in operation, is owned and controlled by this Commission.

The Commission also acts as Constructing Authority for the Stock Routes Co-ordinating Board, funds being provided from the Department of Lands—Loan Fund.

The expenditure from Commission votes, and from the abovementioned funds on the works stated, for 1965-66 year amounted to \$9,213,189, compared with \$10,738,884 for 1964-65 and \$9,426,416 for 1963-64. The virtual completion of Callide Dam in 1964-65, is the main factor in the reduced total expenditure as compared with 1964-65.

EXPENDITURE—continued

	1963-64	1964-65	1965-66
Revenue Fund—			
Salaries	\$ 555,874	\$ 507,726	\$ 534,601
Operation and Maintenance of Irrigation Areas, Weirs, &c.—			
Mareeba/Dimbulah Irrigation Area	90,672	98,662	113,347
Burdekin River Irrigation Area	66,692	77,312	122,241
Dawson Valley Irrigation Area	44,724	46,656	53,715
St. George Irrigation Area	33,430	43,960	39,087
St. George Demonstration Farm	11,924	10,666	12,183
Warrill Valley Irrigation Project	4,090	5,434	8,987
Mary Valley Irrigation Project	1,082	3,530	6,877
Upper Condamine Irrigation Project .. .. .	..	..	541
Callide Dam .. .. .	..	..	2,038
Weirs, Depots, &c.	6,528	7,378	10,082
Services to Settlers	76,950	86,154	91,886
Surface Water and Artesian Bore Measurement, Licensing and Investigation, &c.	53,094	*24,786	*33,512
Contribution to Water Resources Investigation Trust Fund .. .. .	..	100,000	100,000
Fares, Printing, Equipment, &c.	68,686	76,550	81,237
Total Revenue Fund Expenditure	\$ 1,013,746	1,088,814	1,210,334
Trust Fund—			
Irrigation and Water Supply Construction Fund—			
Salaries	694,856	659,096	720,160
Mareeba-Dimbulah Irrigation Area Development Works	1,089,950	882,448	759,999
Burdekin River Irrigation Area Development Works	40,990	229,876	29,300
Dawson Valley Irrigation Area Development Works	25,842	41,622	22,608
St. George Irrigation Area Development Works	14,108	18,664	30,477
St. George Demonstration Farm	8,760	6,056	3,758
Moogerah Dam Construction	27,658	17,820	2,283
Warrill Valley Irrigation Project	84,336	141,654	20,185
Borumba Dam Construction	1,004,994	102,002	22,612
Leslie Dam Construction	1,343,988	1,240,454	395,650
Coolmunda Dam Construction	228,992	1,119,274	1,730,129
Wuruma Dam Construction .. .. .	..	527,784	1,041,805
Proston Weir .. .. .	..	..	41,081
Construction of Minor Works and Investigations, &c.	380,946	169,818	239,736
Emerald and Bowen River Pilot Farms .. .. .	..	86,030	113,364
Contribution to Dumaresq-Barwon Border Rivers Commission	20,000	28,000	40,000
Plant Purchases	139,998	159,960	180,000
Fares, Printing, &c.	118,052	119,412	146,520
Provided by Loan Fund	\$ 5,223,470	5,549,970	5,539,667
Plant Maintenance—Provided from Plant Hire Earnings	107,888	125,624	157,849
Total Construction Fund Expenditure	\$ 5,331,358	5,675,594	5,697,516
Water Resources Investigation Fund—			
Capital Expenditure—Measurement of Discharge of Rivers	†80,000	238,948	329,998
Operational Expenditure—Measurement of Discharge of Rivers	†100,000	135,986	178,998
Underground Water Resources Investigations	†154,000	282,996	301,822
.. .. .	\$..	657,930	810,818
Artesian Bores Working Account	\$ 55,212	49,988	53,413
Farm Water Supplies Assistance Fund—			
Advances to Farmers	623,356	783,612	919,631
Interest and Redemption of Advances, &c.	105,544	148,802	191,269
.. .. .	\$ 728,900	932,414	1,110,900
Settlers' Water Conservation Fund .. .. .	\$ ..	..	10,248
Total Trust Fund Expenditure	\$ 6,115,470	7,315,926	7,682,895
‡Loan Fund—			
Stores Suspense Account Operations	Cr. 11,252	Cr. 36,796	46,512
Special Suspense Account Operations	8,826	34,346	Cr. 46,520
Total Loan Fund Expenditure	Cr. 2,426	Cr. 2,450	Cr. 8
Total Expenditure from Commission's Votes (excluding Revenue Fund contribution to Water Resources Investigation Fund \$100,000 and Mines Department Expenditure \$47,867)	\$ 7,126,790	8,302,290	8,793,221
Expenditure Incurred Votes other Government Departments—			
Loan Fund—Department of Public Lands Water Facilities—Main Stock Routes	139,656	96,864	129,978
Trust Fund—Electricity Development Fund—Callide Dam	2,159,970	2,339,730	289,990
.. .. .	2,299,626	2,436,594	419,968
Total Expenditure—All Funds	\$ 9,426,416	10,738,884	9,213,189

* Surface Water Measurement now included in Water Resources Investigation Trust Fund.

† Expenditure previously included in other Funds. Figures shown are estimates for comparison only.

‡ Loan Fund also provided the following amounts :—

	1963-64	1964-65	1965-66
	\$	\$	\$
Credited to: Irrigation and Water Supply Construction Trust Fund	5,220,000	5,559,522	5,517,236
Credited to: Water Resources Investigation Trust Fund .. .. .	..	316,478	407,764
Total	\$ 5,220,000	5,876,000	5,925,000

PROGRAMME OF WORKS, 1965-66

The Works Programme for 1965-66, as authorised by the Co-ordinator-General of Public Works of Queensland, under "The State Development and Public Works Organisation Acts, 1938 to 1964," provided for an expenditure of \$6,193,736 by this Commission. Expenditure during the year against the programme amounted to \$6,350,485, the excess being met by the provision of \$159,000 by the Treasury as unforeseen expenditure. Of this unforeseen expenditure, \$10,000 was provided by the Commonwealth.

Details of expenditure on the Works Programme are given under expenditure from "The Construction Trust Fund" and "The Water Resources Investigation Trust Fund", in the foregoing table and comprise all items shown excepting the amount of \$157,849 charged against Plant Maintenance.

WORK FOR OTHER GOVERNMENT DEPARTMENTS AND LOCAL AUTHORITIES, &c.

The Commission, in addition, provides services to other Government Departments, to Local Authorities, and to farmers on a repayment basis, and acts as Constructing Authority on behalf of the Dumaresq-Barwon Border Rivers Commission, the North Burdekin and the South Burdekin Water Boards (recharge of underground supplies), and the Tarampa, Coreen and Proston Rural Water Supply Boards.

Expenditure incurred on these services amounted to \$426,602 during 1965-66 compared with \$65,702 for the previous year.

The major portion of this expenditure, \$334,982, was incurred on behalf of the Water Boards.

A notable feature of the past two years was the contribution of \$20,000 by the Landholders and Mill Owners of the general Bundaberg Area, to expedite investigations of water conservation and irrigation facilities in that area, and the provision of finance by the Farleigh Co-operative Sugar Milling Association, the Mackay City Council, and the Colonial Sugar Refining Co. (Macknade Mill), to expedite surface and Underground Water and Drainage investigations.

LOAN STORES SUSPENSE ACCOUNT

Transactions covering the purchase and issue of Stores and the control of Workshop and General Equipment and Operations at Rocklea and District Depots are dealt with through the Loan Stores Suspense Account.

The following table shows the balances in the various Stores and Workshop, &c. Equipment Accounts as at 30th June, 1966, as compared with 30th June, 1965.

Place	Stores Including Recoverable Overhead Costs		Workshop and General Tools and Equipment	
	30-6-65	30-6-66	30-6-65	30-6-66
Rocklea	\$ 83,878	\$ 89,416	\$ 29,458	\$ 32,727
Claredale	11,374	7,155	7,418	9,185
Charleville	5,292	6,197	1,346	990
Theodore	6,490	7,692	1,848	3,172
Longreach	17,238	25,109	1,148	1,573
St. George	4,930	6,109	1,250	4,612
Goondiwindi	502	502	..	..
Field Casing Stock, &c.	24,034	28,771	..	..
Stock Realisation Account	24	..	..	..
Boring Plant Equipment (less hire credits) .. .. .	..	..	19,050	18,309
Diamond Drilling Equipment .. .. .	..	..	2,754	5,060
	153,762	170,951	64,272	75,628
Workshop Operation Accounts, Overheads, &c. .. .. .	..	..	Cr. \$10,698	\$7,268

PLANT ACCOUNT

On major projects, plant purchased for and used on construction works is charged to and treated in the project accounts. All other plant is controlled at Head Office, transactions relating thereto being processed through the Construction Trust Fund.

The following are the net expenditure and earnings in respect of Head Office Plant which had, at 30th June, 1966, a net value of \$390,109.

	1964-65		1965-66	
	Allocation	Expenditure	Allocation	Expenditure
Purchase of Plant	\$ 160,000	\$ 159,960	\$ 180,000	\$ 180,000
Maintenance of Plant	126,000	125,624	160,000	157,849

	1964-65	1965-66
	\$	\$
Plant Hire Earnings	289,186	309,520
Sales of Plant	19,492	17,694

The cost of total plant purchases including those charged against jobs, during the year was \$266,304.

ARTESIAN BORES WORKING ACCOUNT

The Artesian Bores Working Account, is a Trust Account established at the Treasury to record transactions in respect of Artesian Bore Water Supply Areas administered by the Commission.

**REVENUE ACCOUNTS
YEAR ENDED 30TH JUNE, 1966**

	Warrill Valley Irrigation Project	Mary Valley Irrigation Project	Upper Condamine Irrigation Project	Callide Dam Project
Management, Operation and Maintenance	\$ 11,269	\$ 9,452	\$ 1,375	\$ 2,039
Revenue—Water Sales, &c.	35,337	19,644	8,100	80,000
Net Revenue A/c. Surplus	\$ 24,068	10,192	6,725	77,961

PROFIT AND LOSS ACCOUNTS

Accumulated Surplus—1st July, 1965	\$ 8,567	13,351	Dr. 13	..
Balance brought down from Revenue A/c.	24,068	10,192	6,725	77,961
Accumulated Surplus—30th June, 1966	\$ 32,635	23,543	6,712	77,961

The following is a summary of the transactions in the account during 1965-66:—

Balance, 1st July, 1965	Cr. 10,840.20
Collections, 1965-66	Cr. 52,123.32
	Cr. 62,963.52
Expenditure, 1965-66	53,413.05
Balance, 30th June, 1966	Cr. 9,550.47

Collections were obtained by means of assessments on property occupiers within the areas, and by sundry sales of water. Assessments are based on the amount required to finance the operation of each Bore Water Supply Area during the financial year. In view of the drought, the collections were most satisfactory.

The Revenue Accounts and Balance Sheets of the respective Bore Water Supply Areas are given on page 25.

IRRIGATION AREAS

Four Irrigation Areas have been established and are in operation. Separate accounts are kept for each area and are set out on page 24.

The relief granted to settlers on the Burdekin River Irrigation Area in 1962-63 by cancelling Water Right and Drainage Charges, and granting a reduced charge for irrigation water used, was extended to cover 1965-66. This relief has again adversely affected the Area's Revenue and contributed to the deficit incurred.

IRRIGATION PROJECTS

Three Irrigation Projects have been established under the Water Acts in the Warrill Valley, Mary Valley, and Upper Condamine regions following completion of Moogerah, Borumba and Leslie Dams. The Callide Dam is also completed and supplying cooling water to the Calcap Power Station.

The operational position of these Projects is set out hereunder:—

IRRIGATION AREAS ACCOUNTS FOR YEAR ENDED 30TH JUNE, 1966
REVENUE ACCOUNTS

	Mareeba-Dimbulah Irrigation Area		Burdekin River Irrigation Area		Dawson Valley Irrigation Area		St. George Irrigation Area	
	\$	\$	\$	\$	\$	\$	\$	\$
IRRIGATION OPERATIONS—								
Administration and Management ..	25,905		22,926		5,641		1,747	
Operation	44,494		98,981		34,765		29,458	
Maintenance	63,523		22,849		12,875		7,587	
	133,922		144,756		53,281		38,792	
Revenue Water Sales, &c.	166,523		64,783		26,360		31,438	
Surplus or Deficit		32,601		79,973		26,921		7,354
DRAINAGE OPERATIONS—								
Administration and Management ..					1,898		630	
Maintenance	251		3,655		4,248		7,102	
	251		3,655		6,146		7,732	
Revenue Rates, &c.			232		1,398		3,341	
Surplus or Deficit		251		3,423		4,748		4,391
TOWN WATER SUPPLY—								
Administration and Management ..					1,672		..	
Operation and Maintenance ..	2,329		2,911		2,285		..	
	2,329		2,911		3,957		..	
Revenue Rates, &c.	818		1,067		5,018		..	
Surplus or Deficit		1,511		1,844		1,061	..	
FARM RENTS		52,404		16,132		39,856		3,916
MISCELLANEOUS—								
Surplus or Deficit		1,115		1,165		1,209		1,224
Net Revenue A/c. Surplus or Deficit \$		84,358		67,943		8,039		6,605

PROFIT AND LOSS ACCOUNTS

	\$	\$	\$	\$
Accumulated Surplus or Deficit—1st July, 1965	326,379	422,165	190,162	90,474
Adjustments 1964-65	915	569	98	942
Balance brought down from Revenue A/c.	84,358	67,943	8,039	6,605
Accumulated Surplus or Deficit—30th June, 1966 \$	411,652	490,677	182,025	98,021

IRRIGATION AREAS ACCOUNTS FOR YEAR ENDED 30TH JUNE, 1966
BALANCE SHEETS

	Mareeba-Dimbulah Irrigation Area	Burdekin River Irrigation Area	Dawson Valley Irrigation Area	St. George Irrigation Area
	\$	\$	\$	\$
LIABILITIES—				
EXPENDITURE (NET)—				
Consolidated Revenue Fund	314,131	797,278	216,724	177,322
Loan Fund	2,447,024	1,024,444	1,625,073	325,179
Trust and Special Funds—				
Irrigation and Water Supply Construction Fund	28,216,312	451,373	1,223,002	1,563,566
Burdekin River Authority Fund .. .. .	..	3,860,433	..	..
Post-war Reconstruction and Development Fund	250,000	195,834	..	28
PROFIT AND LOSS ACCOUNTS	411,652	..	..	..
	\$ 31,639,119	6,329,362	3,064,799	2,066,095
ASSETS—				
INVESTIGATION AND CONSTRUCTION OF WORKS—				
Tinaroo Falls Dam	12,659,752	..	..	..
Area Works, Weirs, &c.	18,913,880	5,701,123	2,864,939	1,915,030
DEMONSTRATION FARMS .. .. .	..	35,314	..	..
SUNDRY DEBTORS—				
Water and other charges	34,927	101,124	13,965	3,510
Improvement Agreements, &c.	23,309	1,201	1,406	44,100
General	36	Cr. 3,363	246	2,594
SELECTIONS IMPROVEMENT ACCOUNT .. .. .	..	..	2,146	..
CASH IN TRANSIT	7,215	3,286	72	2,840
PROFIT AND LOSS ACCOUNTS .. .. .	..	490,677	182,025	98,021
	\$ 31,639,119	6,329,362	3,064,799	2,066,095

IRRIGATION AND WATER SUPPLY COMMISSION
ARTESIAN BORE WATER SUPPLY AREAS

REVENUE ACCOUNT FOR THE YEAR ENDED 30TH JUNE, 1966

BALANCE SHEET AS AT 30TH JUNE, 1966

REVENUE			EXPENDITURE				Name of Area	LIABILITIES				ASSETS				
Balance at 1st July 1965	Water Rates and Interest	Total	Loan Repayments	Adminis-tration	Mainten-ance, &c.	Balance at 30th June, 1966		Total	Treasury Loan	Sundry Creditors	Revenue Account	Total	Bore Account	Outstanding Rates	Trust Account	Total
\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
742	60	802	..	75	..	727	802	Alva .. .. .	..	..	727	727	..	..	727	727
Dr. 81	20	101	..	38	..	63	101	Ardoch .. .. .	..	..	63	63	Cr. 4	..	67	63
394	681	1,075	..	28	..	62	90	Blythedale .. .. .	..	..	62	62	..	..	62	62
196	2,731	2,927	502	55	101	417	1,075	Borah .. .. .	..	..	417	6,774	..	87	330	6,774
Dr. 4,462	5,532	1,070	1,654	84	974	215	2,927	Charlton	6,357	..	215	22,190	6,357	288	73	22,190
431	1,981	1,981	..	113	1,413	Dr. 456	1,070	Chesterfield	21,975	..	Dr. 456	Dr. 456	..	190	Cr. 646	Cr. 456
497	10	507	..	99	1,802	80	1,981	Chippeway .. .. .	..	..	80	80	..	196	Cr. 116	80
359	1,016	1,375	..	18	..	489	507	Coongoola .. .. .	..	..	489	489	..	..	Cr. 489	489
..	149	149	..	89	1,015	271	1,375	Cypress Downs .. .. .	..	..	271	271	..	10	261	271
16	504	520	..	64	5	80	149	Dillalah No. 1 .. .. .	..	..	80	80	..	..	80	80
383	1,667	2,050	888	85	444	Dr. 9	520	Dillalah No. 2 .. .. .	..	..	Dr. 9	Dr. 9	..	215	Cr. 224	Cr. 9
211	20	231	..	95	776	291	2,050	Eugun	1,759	..	291	2,050	1,759	64	227	2,050
Dr. 173	3,613	3,500	1,359	18	..	213	231	Fairlight .. .. .	..	..	213	213	..	..	213	213
576	..	576	..	135	2,603	Dr. 597	3,500	Fernlee	18,233	..	Dr. 597	17,636	18,233	806	Cr. 1,403	17,636
Dr. 50	134	84	..	17	*559	..	576	Hillsborough .. .. .	..	..	..	..	..	..	..	..
556	3,693	4,249	..	35	25	24	84	Hopeland .. .. .	..	..	24	24	..	43	Cr. 19	24
103	..	103	..	101	3,295	853	4,249	Ingie .. .. .	..	..	853	853	..	544	Cr. 309	853
2,044	281	2,325	742	18	..	85	103	Juanbong .. .. .	..	..	85	85	..	..	85	85
120	1,948	2,068	..	101	42	1,440	2,325	Kulki	16,747	..	1,440	18,187	16,747	24	1,416	18,187
209	..	209	..	93	835	1,140	2,068	Maroungle .. .. .	..	..	1,140	1,140	..	611	529	1,140
487	..	487	..	35	24	150	209	Merridew .. .. .	..	..	150	150	..	..	150	150
1,040	1,010	2,050	..	38	..	449	487	Minetta .. .. .	..	..	449	449	..	..	449	449
820	30	850	..	75	2,338	Dr. 363	2,050	Mona .. .. .	..	..	Dr. 363	Dr. 363	..	2	Cr. 365	Cr. 363
43	..	43	..	101	390	359	850	Mooro .. .. .	..	..	359	359	..	2	Cr. 361	359
1,095	268	1,363	..	..	..	43	43	Murweh .. .. .	..	..	43	43	..	..	43	43
850	1,259	2,109	..	149	897	317	1,363	Myall Plains .. .. .	..	..	317	317	..	43	Cr. 274	317
39	80	119	..	85	2,355	Dr. 331	2,109	Neabul .. .. .	..	..	Dr. 331	Dr. 331	..	46	Cr. 285	Cr. 331
847	6,263	7,110	4,683	57	..	62	119	Nelia Ponds .. .. .	..	..	62	62	..	..	62	62
Dr. 1,307	3,237	1,930	..	135	1,039	1,253	7,110	Noondoo	65,434	..	1,253	66,687	65,434	351	902	66,687
621	707	1,328	..	89	1,264	577	1,930	North Yancho .. .. .	..	..	577	577	..	343	234	577
2,015	2,263	4,278	..	205	770	353	1,328	Oakhampton .. .. .	..	..	353	353	..	434†	Cr. 81	353
221	766	987	..	95	1,252	Dr. 2,931	4,278	Pigurra .. .. .	..	40	2,931	2,971	1,429†	447	1,095	2,971
24	350	374	324	79	1,325	Dr. 417	987	Powrunna .. .. .	..	..	Dr. 417	Dr. 417	..	337	Cr. 754	Cr. 417
1,335	2,268	3,603	..	28	..	22	374	Stamfordham	2,277	..	22	2,299	2,277	..	22	2,299
631	2,832	3,463	..	93	3,185	325	3,603	Thomby .. .. .	..	..	325	325	..	9	316	325
1,284	178	1,462	..	325	2,717	421	3,463	Weengallon 1 .. .. .	..	..	421	421	..	2	419	421
18	856	874	..	135	560	767	1,462	Weengallon 2 .. .. .	..	..	767	767	Cr. 44	811	767	
Dr. 334	2,006	1,672	817	175	278	421	874	Weengallon 3 .. .. .	..	..	421	421	..	28	393	421
940	947	1,887	..	115	302	438	1,672	Wellshot	1,541	..	438	1,979	1,541	339	99	1,979
956	100	1,056	..	81	1,673	133	1,887	Whyenbah .. .. .	..	..	133	133	..	1	132	133
1,962	241	2,203	..	79	212	765	1,056	Whynot .. .. .	..	..	765	765	..	..	765	765
133	2,420	2,553	..	75	1,251	877	2,203	Wierbo'la .. .. .	..	..	877	877	..	..	877	877
192	457	649	..	135	1,453	965	2,553	Wild Horse Plains .. .. .	..	..	965	965	..	350	615	965
821	691	1,512	..	79	95	475	649	Winbin .. .. .	..	..	475	475	..	64	411	475
			..	89	1,066	357	1,512	Woolerina .. .. .	..	..	357	357	..	66	291	357
\$17,019	\$52,935	\$69,954	\$10,969	\$3,913	\$38,335	\$16,737	\$69,954		\$134,323	\$40	\$16,737	\$151,100	\$136,186	\$5,364	\$9,550	\$151,100

* Distribution of Surplus Revenue.

† Plant purchased from Revenue.

Appendix A

GENERAL STATISTICS 1965-66

Area of State of Queensland—667,000 square miles.
426,800,000 acres. (As recorded in Queensland Year Book.)

Average Annual Rainfall (1926-1955)—Over whole State.
Range 5.04 inches (Roseberth) to 177.25 inches (Tully).
Average 23.14 inches.

Rainfall	Area	Percentage of State
	Sq. miles	
Under 10 inches	99,500	14.90
10-20 inches	248,400	37.19
20-30 inches	173,800	26.02
30-40 inches	64,200	9.61
40-60 inches	61,300	9.18
60-80 inches	17,500	2.62
80-100 inches	1,700	0.25
100-130 inches	900	0.13
130-160 inches	400	0.06
Over 160 inches	300	0.04
Total	*668,000	100.00

* Mainland area.

Agricultural Lands, 1964-65—

Total Area 3,873,293 acres
Estimated Value of Production .. \$270,639,000

Irrigated Lands, 1964-65—

Total Area 281,173 acres
(a) South Queensland .. 157,395 acres
(b) Central Queensland .. 18,744 acres
(c) North Queensland .. 105,034 acres
Estimated Value of Production .. \$69,736,000

Crops Irrigated—

	Acres
Sugar Cane	120,556
Vegetables	35,020
Fruit	8,092
Tobacco	13,499
Cotton	4,148
Fodder	52,947
Pasture-Improved	22,089
Pasture-Natural	6,135
Others	18,687
Total	281,173

Storages—

	No.	Capacity (acre feet)
Constructed	47	568,126

Stream Gauging Stations—

Number of daily recording stations	113*
Automatic recorders	158
Total	271

* Includes Commonwealth Flood Warning Gauges, from which daily records are received.

Waterworks Licenses—

Pumps	8,495
Dams and Weirs	1,526
Diversions	114
Miscellaneous	316
Total—all waterworks	10,451

Great Artesian Basin—

Total area of basin	640,000 square miles
Area in State of Queensland	434,000 square miles
Number of artesian bores at 30th June, 1966—	
Flowing	1,947
Non-flowing	1,019
Total	2,966

Total number of bores—Artesian and Sub-artesian registered 14,877

Bore Water Supply Areas—

	No.
Areas administered by the Commissioner	55
Areas administered by Local Boards	6
	61

Total benefited area of Bore Water Boards 1965-66— 4,810,734 acres

Total length of drains served .. 2,567 miles

Estimated total flow at 30th June, 1966 .. 25,211,000 g.p.d.

Stock Route Water Facilities—

Completed under the direct supervision of the Irrigation and Water Supply Commission at 30th June, 1966	570
Under construction at 30th June, 1966	19
Tenders called and contracts let at 30th June, 1966	5
Under investigation at 30th June, 1966	11

WATER DELIVERIES—IRRIGATION AREAS AND PROJECTS

YEAR ENDING 30TH JUNE, 1966

Irrigation Area or Project	Deliveries	
	To	Quantity
		Acre-feet
Mareeba-Dimbulah ..	{ Hydro	112,433
	{ Irrigation	25,859
Burdekin	Irrigation	20,662
Dawson Valley ..	{ Irrigation	6,660
	{ Theodore Town	68
St. George	{ Irrigation	12,846
	{ St. George Town	402
Warrill Valley ..	{ Irrigation	6,696
	{ Swanbank	1,255
Mary Valley	{ Irrigation	1,308
	{ Gympie City	1,326
Callide	Calcap Power Station ..	590
	Total	190,105

Appendix B
STORAGES COMPLETED

Basin Name and Number	Stream	Name of Storage	Location		Type	R.L. Crest and F.S.L. (S.D.)	Crest Height above Original Bed	Length between Banks	Total Length	Storage Capacity	Date Completed	Remarks
			Stream Mileage	Nearest Town								
Mitchell River I. 8	Sandy Creek	Sandy Creek	Miles	Dimbulah	Timber Crib	Feet	Feet	Feet	Feet	Ac. feet		
Mitchell River I. 8	Walsh River	Bruce	143-45	Dimbulah	Mass Concrete	1,492-00	22	653	760	790	1949	
Mitchell River I. 8	Walsh River	Leafgold	135-14	Dimbulah	Mass Concrete	1,431-00	16	490	712	320	1952	
Mitchell River I. 8	Eureka Creek	Solanum	8-48	Dimbulah	Mass Concrete	1,520-00	20	370	410	280	1951	
Mitchell River I. 8	Walsh River	Collins	167-2	Dimbulah	Mass Concrete	1,790-00	30	440	677	800	1953	
Barron River II. 4	Barron River	Tinaroo Falls Dam	63-0	Atherton	Mass Concrete	2,200-34	136		1,750	330,000	1958	
Barron River II. 4	Emerald Creek	Emerald	5-15	Mareeba	Timber Crib	1,353-20	14	190	243	44	1947	
Barron River II. 4	Granite Creek	Granite Creek	5-42	Mareeba	Mass Concrete	1,385-00	22	285	328	198	1948	
Barron River II. 4	Tinaroo Creek	Dulbil	3-48	Mareeba	Mass Concrete	1,342-00	23	228	239	220	1950	
Burdekin River II. 8	Burdekin River	Gorge	79-2	Dalbeg	Mass Concrete	200-00	20	1,284	1,284	7,670	1953	
Burdekin River II. 8	Burdekin River	Blue Valley	72-0	Dalbeg	Mass Concrete	158-40	3			2,550	1963	Raises height of commandable storage of existing pool
Pioneer River II. 9	Pioneer River	Marian	20-0	Marian	Mass Concrete	105-00	20	670	925	3,100	1952	Reconstructed 1956
Fitzroy River II. 10	Eight Mile Creek	Bajool	22-96	Bajool	Earth and Rock	17-67	8	1,132	1,132	100	1933	Combined causeway and weir. Raised to present level 1955
Fitzroy River II. 10	Dawson River	Moura	93-4	Moura	Timber Piled	339-69	20	540	630	5,100	1946	Combined bridge and weir
Fitzroy River II. 10	Dawson River	Theodore	142-00	Theodore	Timber Piled	436-19	15	238	275	3,860	1930	
Fitzroy River II. 10	Dawson River	Orange Creek	168-2	Cracow	Timber Piled	491-16	19	220	297	5,500	1932	
Fitzroy River II. 10	Dawson River	Binda	157-8	Theodore	Timber Piled	470-55	22	240	324	920	1953	
Fitzroy River II. 10	Callide Creek	Callide Dam	49-8	Biloela	Earth and Rockfill	680-00	83		6,950	37,800	1965	Constructed to Stage I
Fitzroy River II. 10	Nogoa River	Selma	415-5	Emerald	Mass Concrete	560-00	20	120	612	950	1952	Piled foundations
Burnett River II. 12	Monal Creek	Mungungo	10-06	Mungungo	Mass Concrete	834-00	14	170	225	135	1951	
Burnett River II. 12	Burnett River	Mundubbera	149-25	Mundubbera	Mass Concrete	360-00	23	722	817	4,000	1951	
Burnett River II. 12	Barker Creek	Nanango	53-25	Nanango	Mass Concrete	1,138-00	11	225	271	125	1951	
Burnett River II. 12	Three Moon Creek	Mulgildie	22-29	Mulgildie	Timber Piled	662-00	12	68	132	270	1952	Commandable Storage 195Ac. feet
Burnett River II. 12	Barambah Creek	Silverleaf	74-8	Murgon	Timber Piled	864-00	14	102	288	510	1953	
Mary River II. 14	Yabba Creek	Imbil	6-8	Imbil	Mass Concrete	252-00	4	76	102	37	1954	
Mary River II. 14	Yabba Creek	Borumba Dam	19-3	Imbil	Rockfill with Concrete face	434-00	102	1,010	1,125	34,500	1964	
Brisbane River II. 16	Warrill Creek	Aratula	37-26	Aratula	Mass Concrete	320-00	10	107	140	44	1945	
Brisbane River II. 16	Warrill Creek	Churchbank	2-00	Churchbank	Mass Concrete	127-00	11	184	268	155	1947	
Brisbane River II. 16	Reynolds Creek	Moogerah Dam	9-53	Kalbar	Double Curvature Concrete Arch	508-40	105	715	715	75,000	1961	
Brisbane River II. 16	Lockyer Creek	Wilson	38-09	Gatton College	Mass Concrete	271-36	13	156	156	190	1941	Capacity to Jordan Weir
Brisbane River II. 16	Lockyer Creek	Brightview	22-64	Brightview	Mass Concrete	195-89	25	110	212	310	1943	
Brisbane River II. 16	Lockyer Creek	Jordan	40-51	Gatton	Mass Concrete	285-59	17	275	335	370	1945	
Brisbane River II. 16	Lockyer Creek	O'Reilly	0-9	Lowood	Mass Concrete	102-00	27	90	216	470	1948	
Hilliards Creek II. 17	Hilliards Creek	Hilliards Creek	2-7	Cleveland	Timber Piled	15-75	11	174	216	26½	1948	
Balonne-Condamine R. III. 1	Condamine River	Cecil Plains	553-7	Cecil Plains	Mass Concrete	1,150-50	12	133	304	840	1947	
Balonne-Condamine R. III. 1	Balonne River	Jack Taylor	142-65	St. George	Mass Concrete	637-00	25	600	845	8,220	1953	Combined bridge and weir with Crest gates added 1959
Balonne-Condamine R. III. 1	Condamine River	Leslie	5-25	Warwick	Mass Concrete	1530-00	76	1,228	1,308	38,200	1965	Constructed to Stage I.
Border Streams III. 2	Macintyre Brook	Ben Dor	11-6	Yelarbon	Mass Concrete	821-00	18	239	536	595	1954	
Border Streams III. 2	Macintyre Brook	Whetstone	23-9	Inglewood	Timber Piled	861-70	17	174	270	410	1951	
Border Streams III. 2	Macintyre Brook	Greenup	45-6	Inglewood	Timber Piled	974-00	14	160	787	300	1958	
Border Streams III. 2	Dumaresq River	Bonshaw	78-7	Texas	Timber Piled	965-5	7-5	376	570	500	1958	
Border Streams III. 2	Dumaresq River	Cunningham	42-17	Texas	Timber Piled	833-00	13	192	480	440	1954	
Border Streams III. 2	Dumaresq River	Glenarvon	35-42	Yelarbon	Steel sheet piling	810-00	9	185	320	286	1959	
Border Streams III. 2	Barwon River	Mungindi	3-0	Mungindi	Timber Piled						1936	Constructed by N.S.W.
Border Streams III. 2	Macintyre River	Goondiwindi	167-04	Goondiwindi	Timber Crib	685-95	6-5	287	298	1,350	1942	
Border Streams III. 2	Barwon River	Boomi	71-75	Boomi, N.S.W.	Steel sheet piling	602-00	13	83	150		1960	
Barcoo River IV. 1	Alice River	Charles Lloyd Jones	43-0	Barcardine	Mass Concrete	824-00	10	122	266	340	1953	

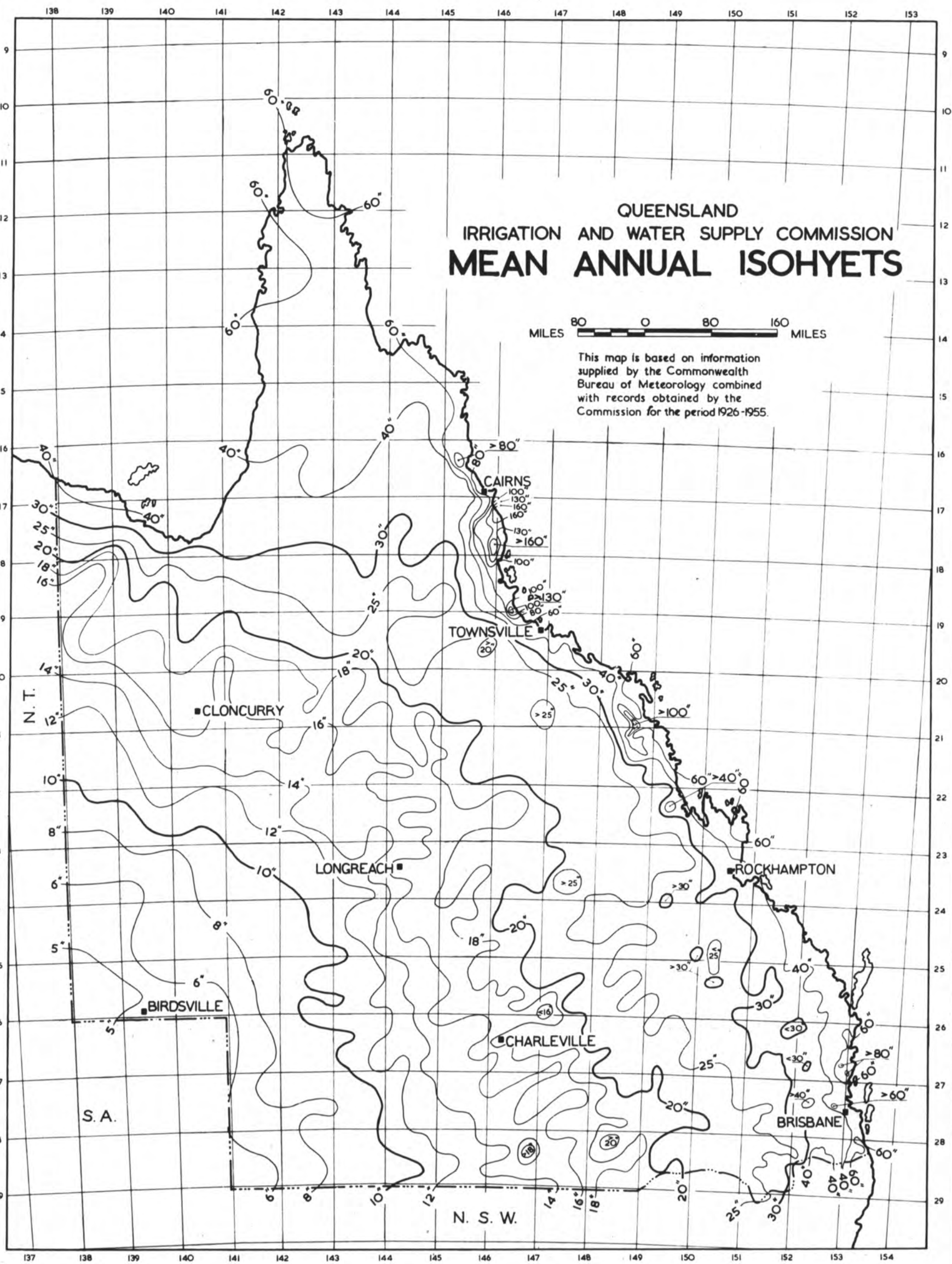
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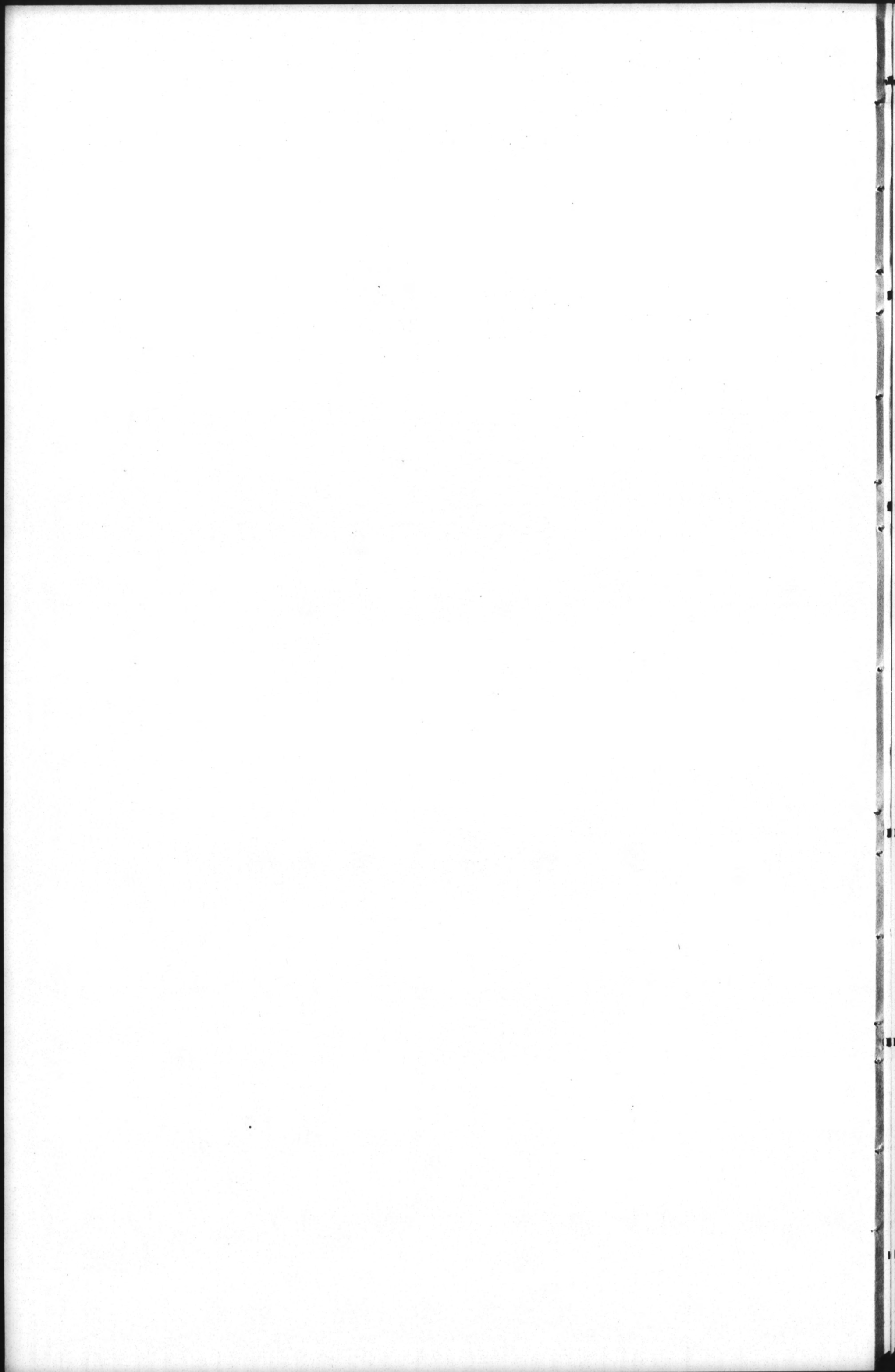
3

QUEENSLAND
IRRIGATION AND WATER SUPPLY COMMISSION
MEAN ANNUAL ISOHYETS

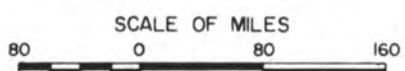
MILES 80 0 80 160 MILES

This map is based on information supplied by the Commonwealth Bureau of Meteorology combined with records obtained by the Commission for the period 1926-1955.



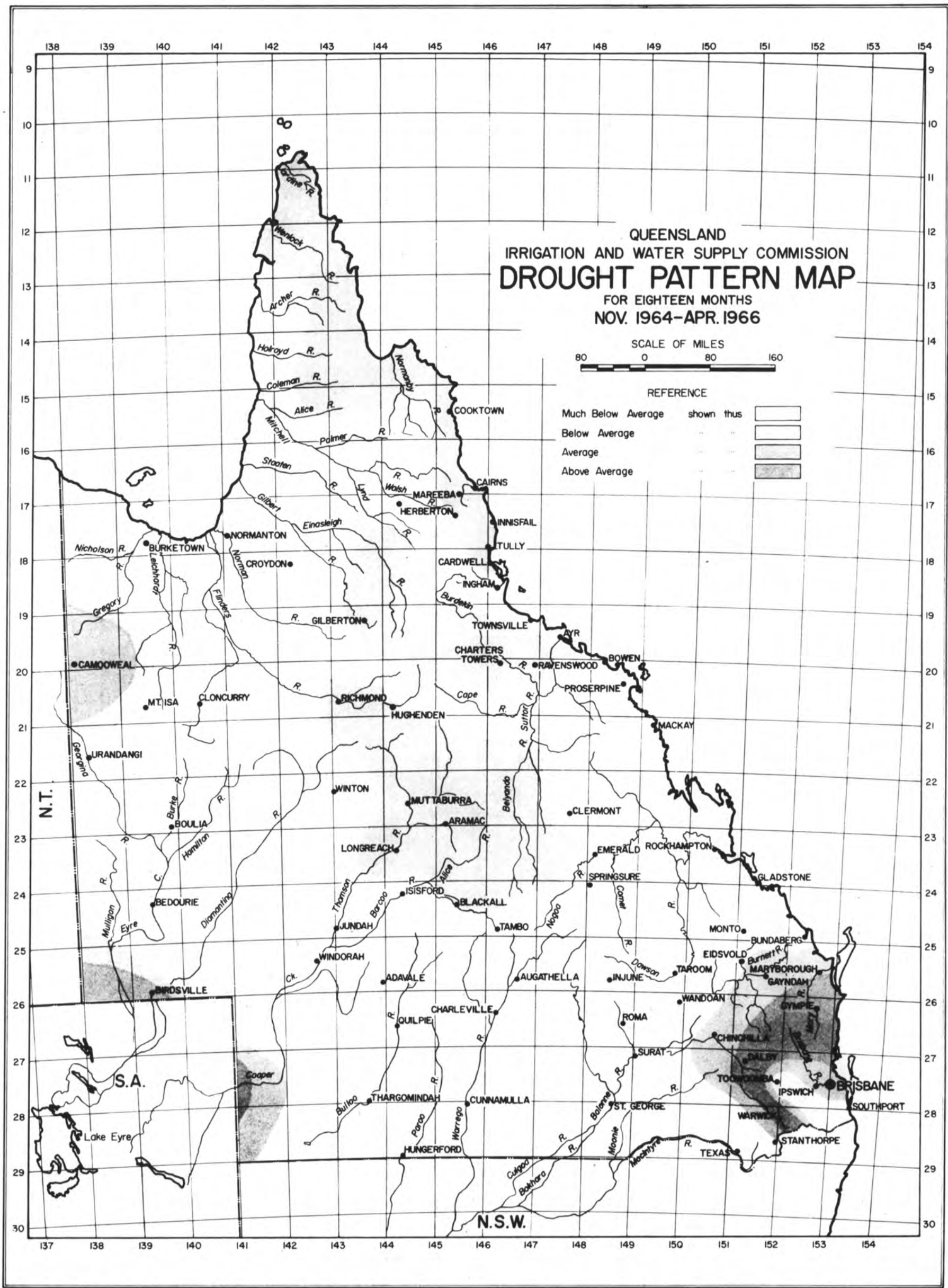


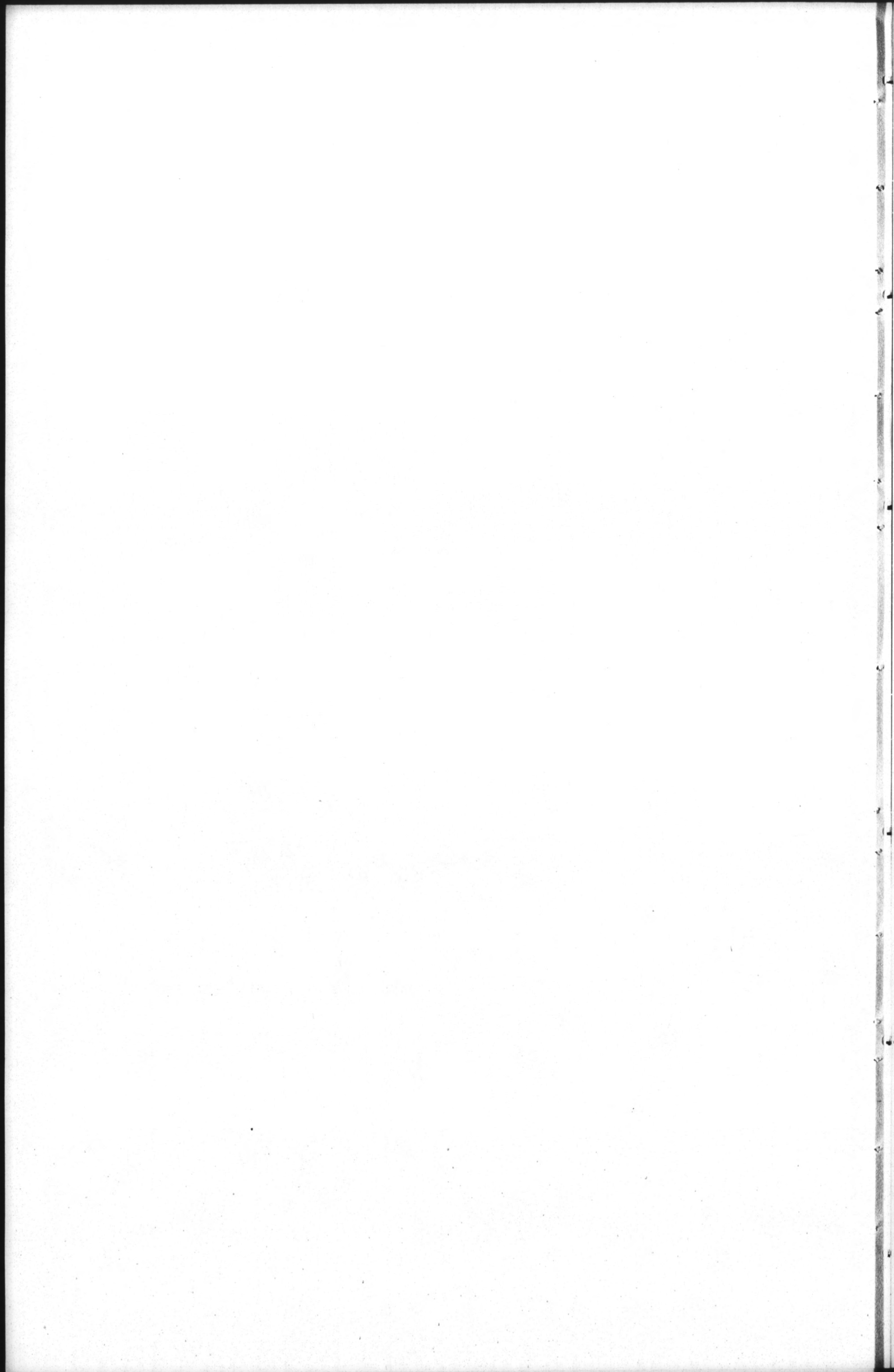
QUEENSLAND
IRRIGATION AND WATER SUPPLY COMMISSION
DROUGHT PATTERN MAP
FOR EIGHTEEN MONTHS
NOV. 1964-APR. 1966

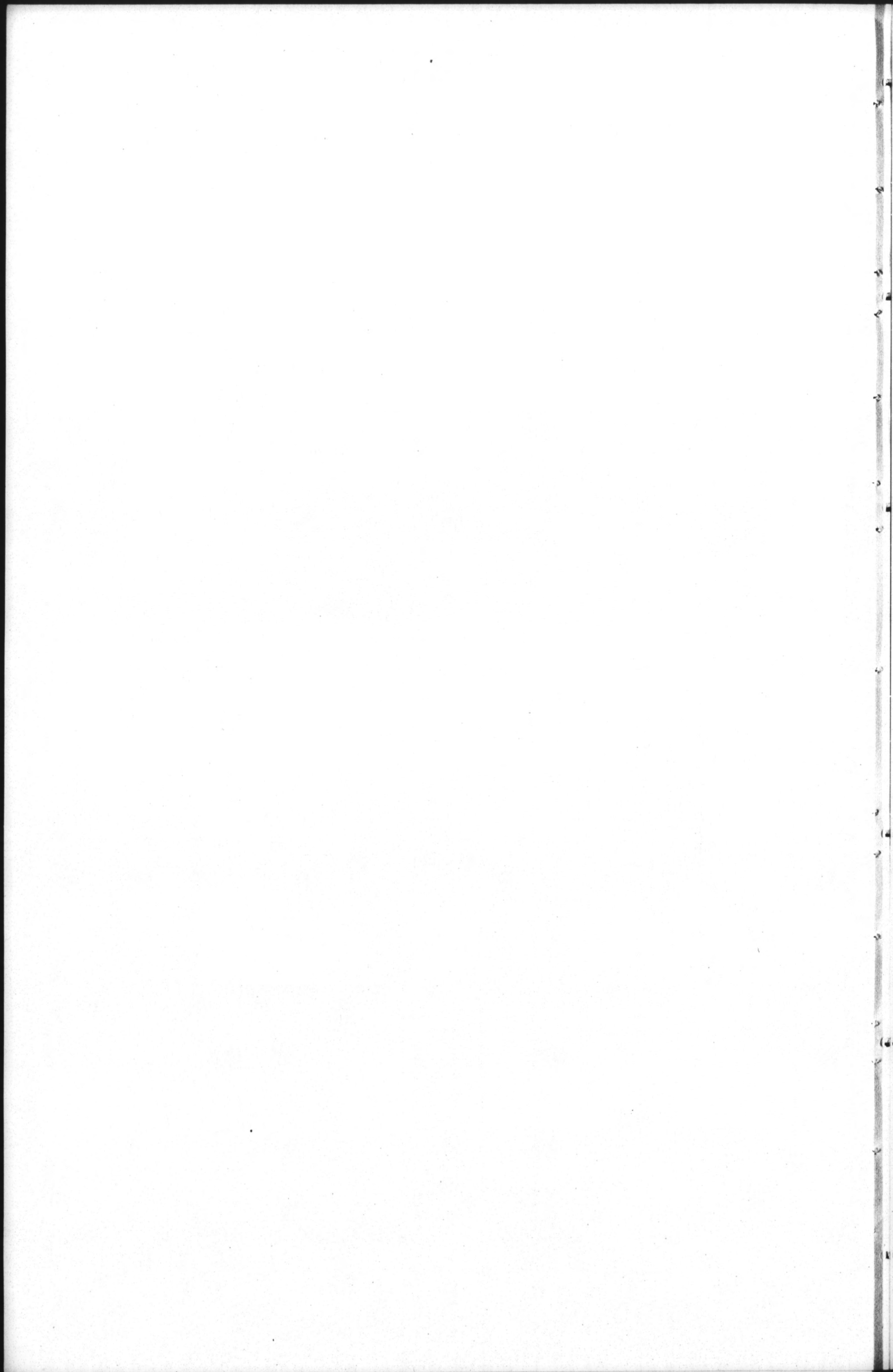


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Much Below Average	shown thus	
Below Average	"	
Average	"	
Above Average	"	














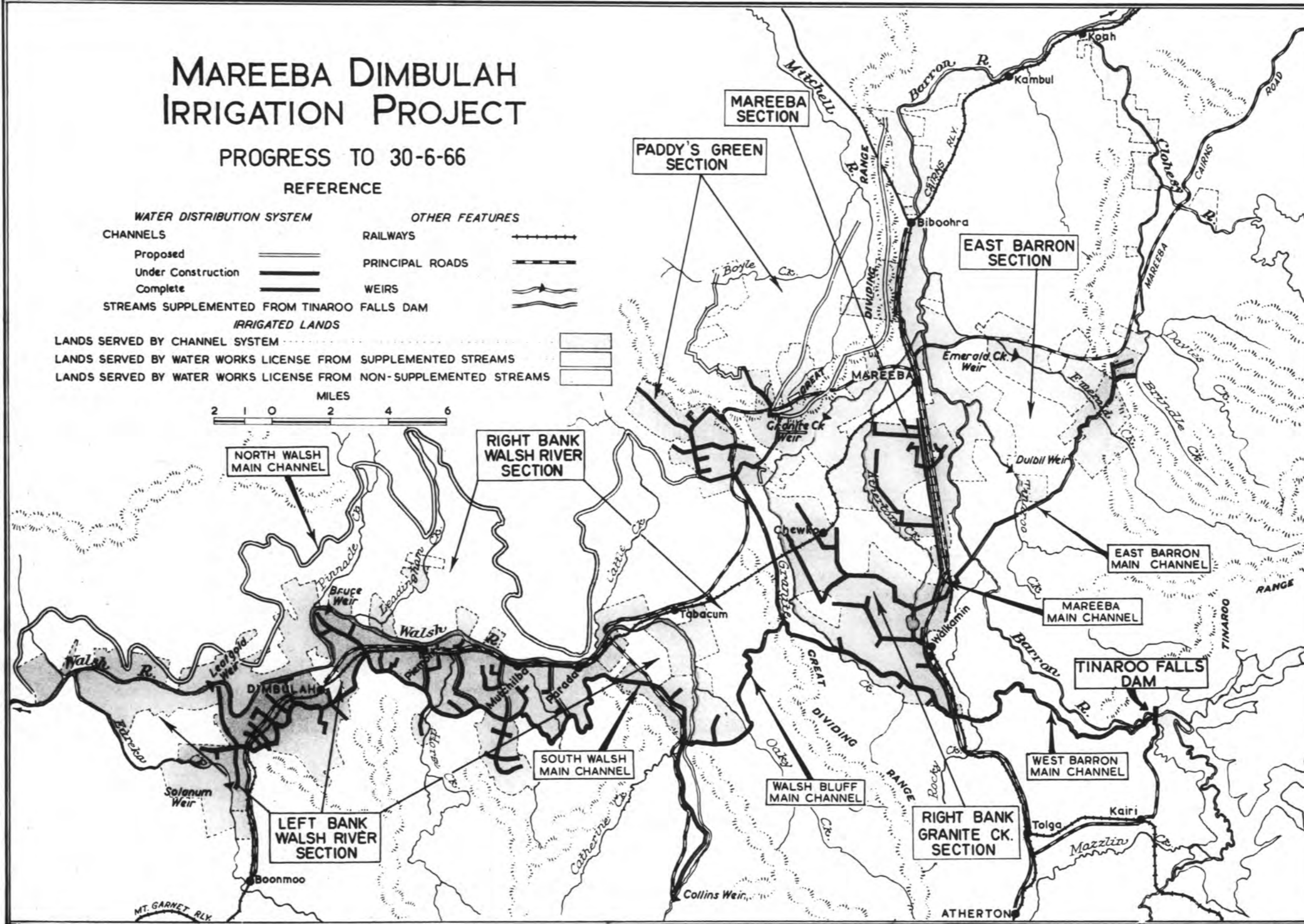
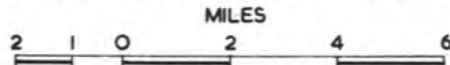


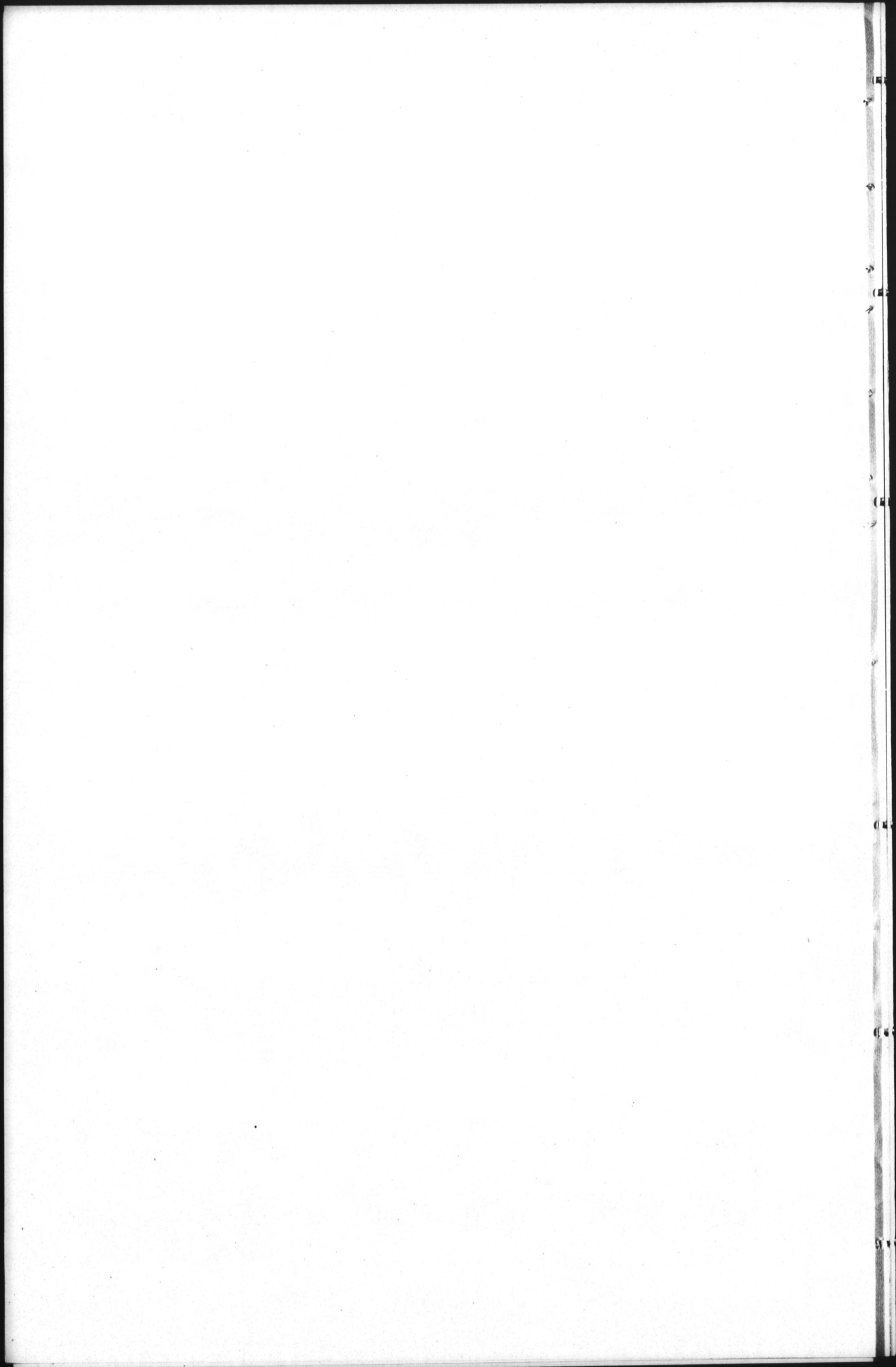
MAREEBA DIMBULAH IRRIGATION PROJECT

PROGRESS TO 30-6-66

REFERENCE

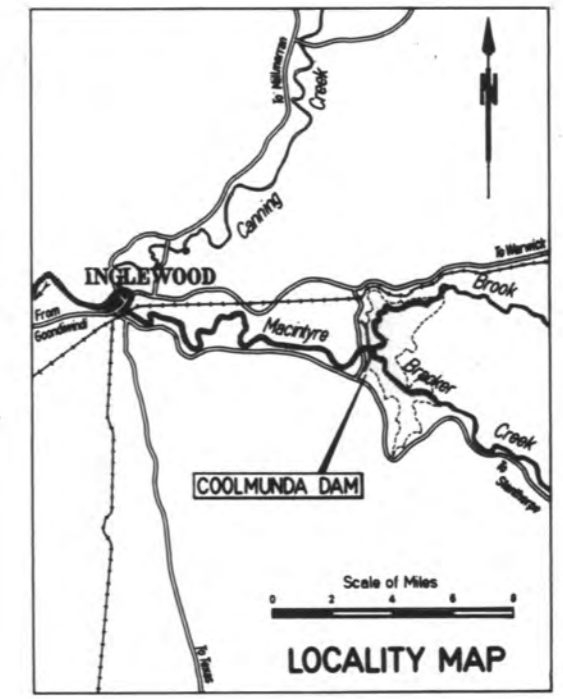
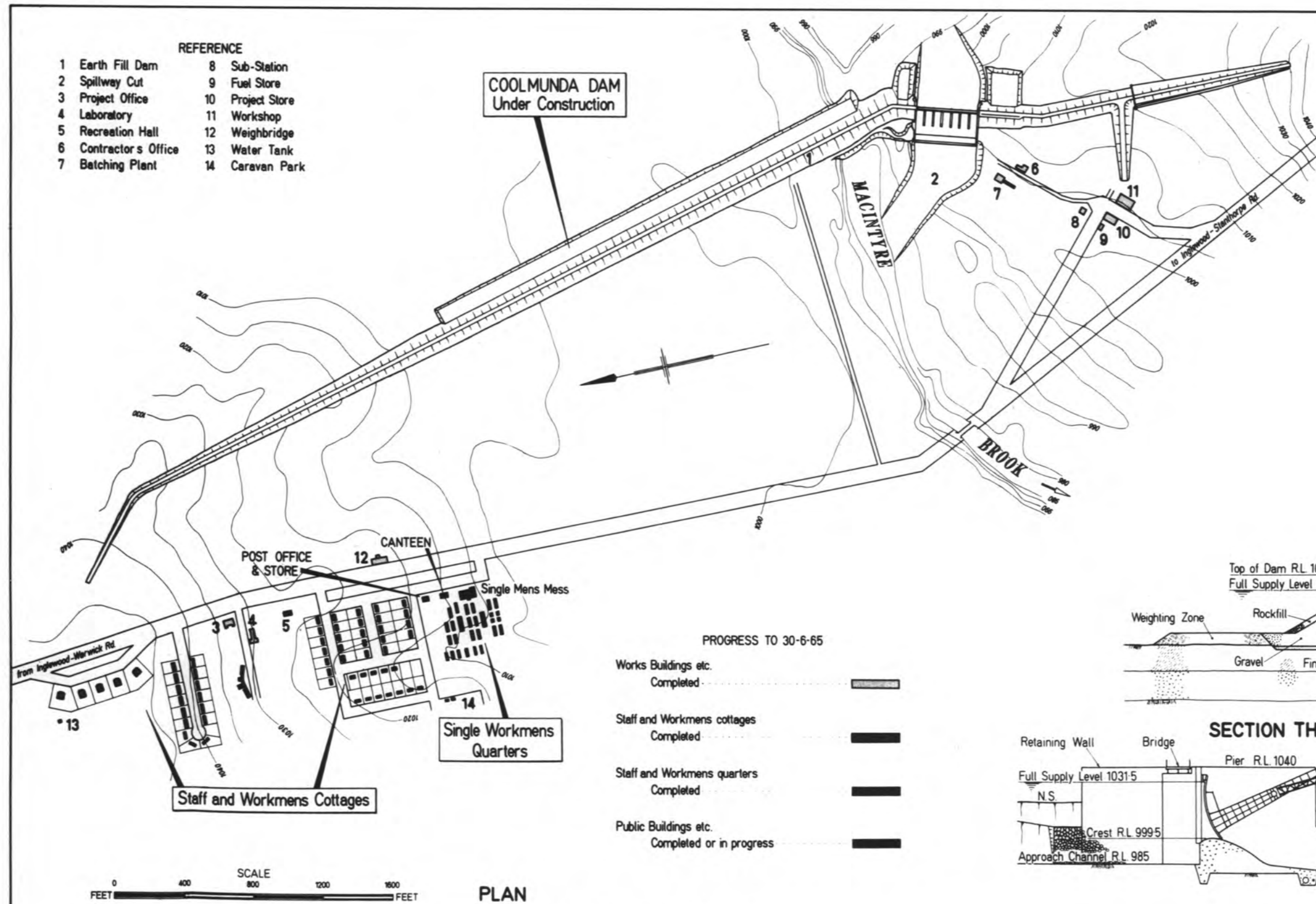
WATER DISTRIBUTION SYSTEM		OTHER FEATURES	
CHANNELS		RAILWAYS	
Proposed		PRINCIPAL ROADS	
Under Construction		WEIRS	
Complete			
STREAMS SUPPLEMENTED FROM TINAROO FALLS DAM			
IRRIGATED LANDS			
LANDS SERVED BY CHANNEL SYSTEM			
LANDS SERVED BY WATER WORKS LICENSE FROM SUPPLEMENTED STREAMS			
LANDS SERVED BY WATER WORKS LICENSE FROM NON-SUPPLEMENTED STREAMS			





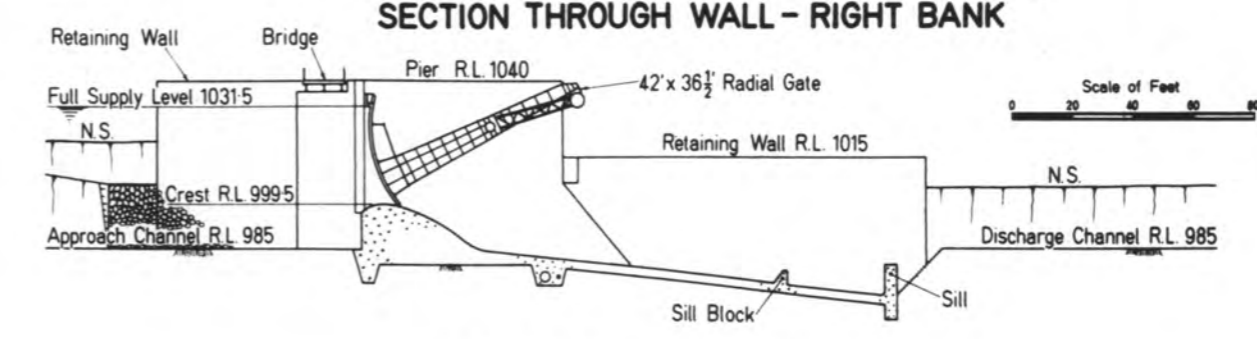
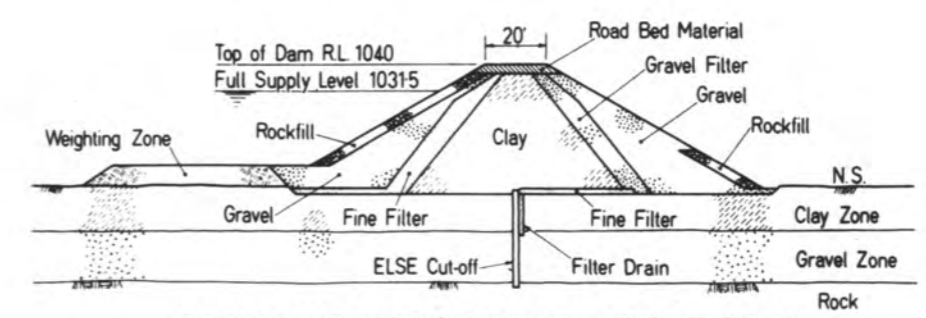
- REFERENCE**
- | | |
|----------------------|------------------|
| 1 Earth Fill Dam | 8 Sub-Station |
| 2 Spillway Cut | 9 Fuel Store |
| 3 Project Office | 10 Project Store |
| 4 Laboratory | 11 Workshop |
| 5 Recreation Hall | 12 Weighbridge |
| 6 Contractors Office | 13 Water Tank |
| 7 Batching Plant | 14 Caravan Park |

COOLMUNDA DAM
Under Construction



PROGRESS TO 30-6-65

Works Buildings etc. Completed	
Staff and Workmens cottages Completed	
Staff and Workmens quarters Completed	
Public Buildings etc. Completed or in progress	

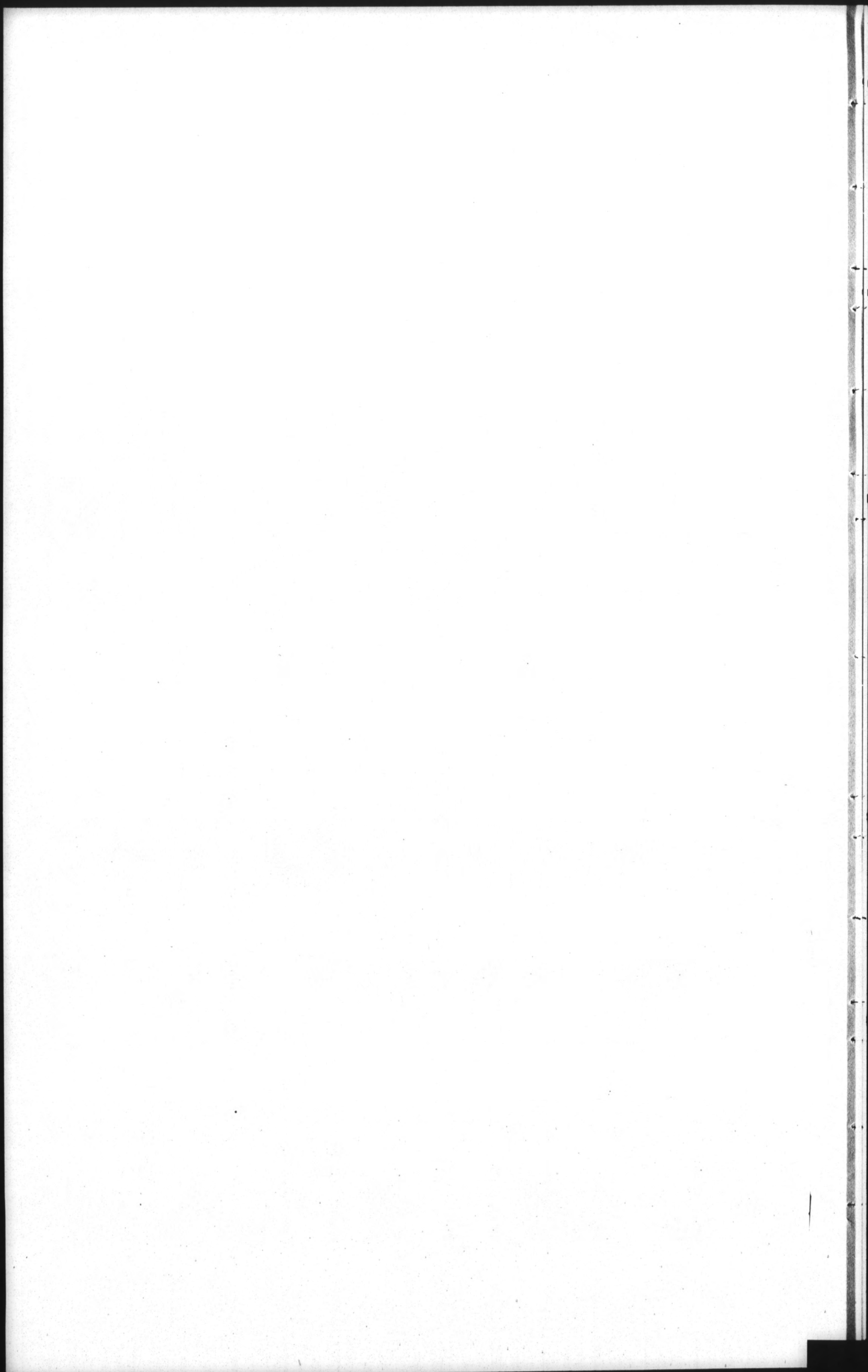


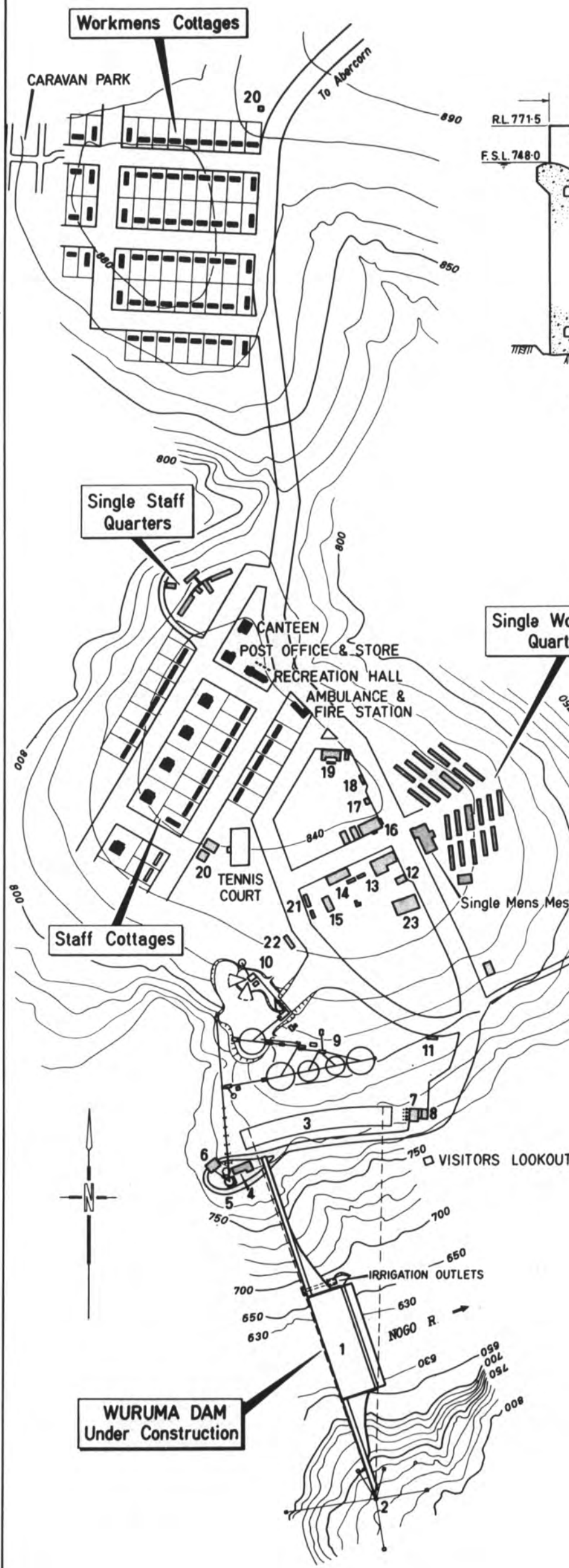
PLAN

COOLMUNDA DAM

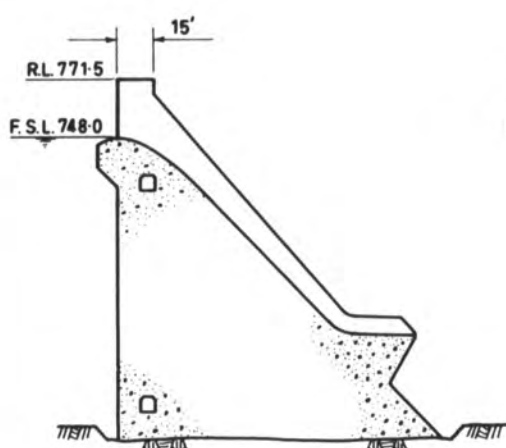
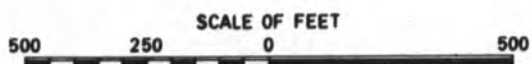
SECTION THROUGH WALL - RIGHT BANK

SECTION THROUGH SPILLWAY

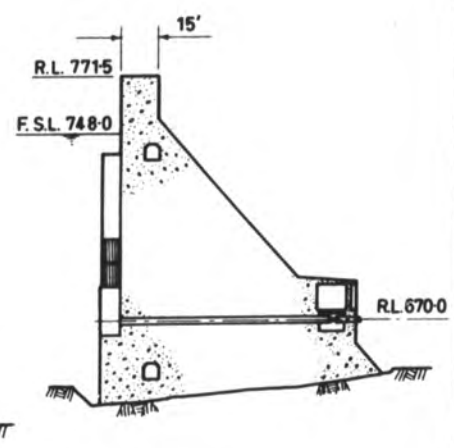




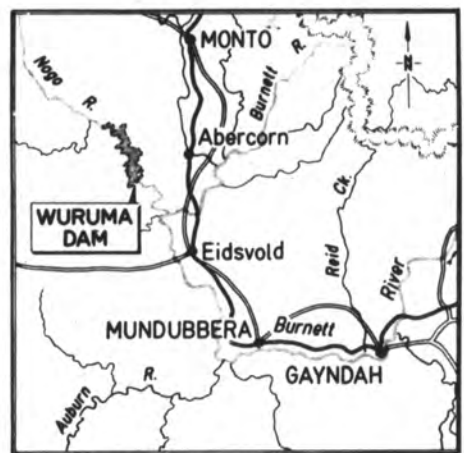
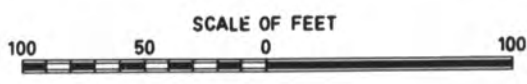
PLAN



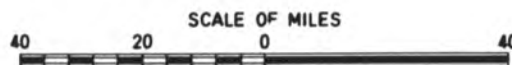
SECTION THROUGH SPILLWAY



SECTION THROUGH IRRIGATION OUTLETS



LOCALITY MAP



REFERENCE

- | | |
|--------------------------------|-------------------------|
| 1 Concrete Gravity Dam | 12 Welding Shed |
| 2 Cableway Tail Tower | 13 Mechanical Workshop |
| 3 Cableway Head Tower | 14 Carpenters' Workshop |
| 4 Laboratory | 15 Steel Bending Shed |
| 5 Batching Plant | 16 Project Store |
| 6 Cement Shed | 17 Fuel Store |
| 7 Compressor House | 18 Camp Gear Store |
| 8 Sub-Station | 19 Project Office |
| 9 Crushing and Screening Plant | 20 Water Tanks |
| 10 Sand Plant | 21 Diamond Drill Store |
| 11 Weighbridge | 22 Core Shed |
| | 23 Plant Shed |

PROGRESS TO 30-6-66

- | | |
|-----------------------------|--|
| Works Buildings etc. | |
| Completed or in progress | |
| Projected | |
| Staff and Workmens Cottages | |
| Completed or in progress | |
| Projected | |
| Staff and Workmens Quarters | |
| Completed or in progress | |
| Projected | |
| Public Buildings etc. | |
| Completed or in progress | |
| Projected | |

WURUMA DAM

