

1929.

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VICTORIA.

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STATE RIVERS AND WATER SUPPLY COMMISSION.

---

TWENTY-FOURTH  
ANNUAL REPORT.

---

1928-29.

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PRESENTED TO BOTH HOUSES OF PARLIAMENT PURSUANT TO THE PROVISIONS OF THE  
WATER ACTS.

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# STATE RIVERS AND WATER SUPPLY COMMISSION.

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WM. CATTANACH, CHAIRMAN,  
E. SHAW, COMMISSIONER,  
R. H. HORSFIELD, COMMISSIONER.

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## ANNUAL REPORT, 1928-29.

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In compliance with the provisions of the Water Acts, the State Rivers and Water Supply Commission submits the following Report and Statement for the Financial Year 1928-29, and Estimates for the ensuing year.

# WORKS UNDER CONTROL OF COMMISSION.

The following statement gives a brief description, summary of cost, and other particulars relative to the undermentioned works controlled by the Commission.

## A.—FREE HEADWORKS.

DESCRIPTION OF WORKS.	Capital Debit at 30th June, 1929. Exclusive of cost of Loan Flotation.
1. <b>Broken River Works</b> :—Casey's Weir and offtake, with about 59 chains of channel to the Broken Creek ; Gowangardie Weir with offtake sluice .. ..	£ 14,853
2. <b>Goulburn River Works</b> :—Weir on the Goulburn River, about 9 miles above Murchison ; channel therefrom, about 23½ miles, to Waranga Reservoir ; and that Reservoir (but exclusive of the work of its enlargement) .. ..	739,552
3. <b>Kerang North-West Lakes Works</b> :—Weir on the Loddon River at its confluence with the Pyramid Creek ; regulating weirs at the effluence from the Loddon of the Sheepwash and Washpen Creeks ; channel from the Washpen Creek regulator to Reedy Lake, Middle Lake, Third Lake, Lake Charm, Race-course Lake, Cullen's Lake, Kangaroo Lake, and Lake Tutchewop, and to the Little Murray River, with water storage works at these lakes .. ..	22,996
4. <b>Kow Swamp Works</b> :—Intake from the Murray River with regulator, at the effluence of the Gunbower Creek ; channel thence to the Kow Swamp Reservoir ; and that Reservoir ; channel along the northern side of the reservoir ; channel from the outlet of the reservoir, about 23½ miles, to the left bank of the Loddon River ..	187,944
5. <b>Lake Lonsdale Reservoir</b> :—Reservoir at Lake Lonsdale, on the Little Wimmera River, near Ledcourt .. ..	49,054
6. <b>Loddon River Works</b> :—Laanecoorie Weir, on the Loddon ; Bridgewater Weir, on the Loddon ; Kinypanial Weir, on the Loddon .. ..	167,636
7. <b>Long Lake Pumping Works</b> :—Inlet to Lake Baker, from the Little Murray River ; water storage works at Lake Baker and Long Lake, with channel connecting these lakes ; pumping plant at Long Lake, with rising main thence about 7 miles to allotment 10M, parish of Kooem ; system of main distributary channels, about 85 miles in length .. ..	27,346
8. <b>Lower Wimmera Compensation Works</b> :—Drung Drung Weir, on the Wimmera, near allotment 29, parish of Longerenong ; Dimboola Weir, on the Wimmera, near Dimboola township ; Antwerp Weir, on the Wimmera, at Antwerp Station home- stead ; Jeparit Weir, on the Wimmera, near Jeparit township .. ..	8,558
Total .. ..	<b>1,217,939</b>

## B.—MAIN SUPPLY WORKS.

### IRRIGATION AND WATER SUPPLY DISTRICTS, WATERWORKS DISTRICTS, AND FLOOD PROTECTION DISTRICTS.

Cost Apportioned and to be Apportioned to Districts benefited.

Name of Work.	Capital Debit at 30th June, 1929. £	Tentative Debits to Districts, 1928-29. £	
Goulburn Main Channels (Free Headworks excluded)—	£	Rodney .. .. 120,000 Tragowel Plains .. .. 100,000 Rochester .. .. 74,000 Tongala .. .. 58,000 Shepparton .. .. 57,000 Deakin .. .. 24,000 Boort .. .. 20,000 Echuca North .. .. 17,000 Dingee .. .. 15,000 Stanhope .. .. 15,000 South Shepparton .. .. 9,000 509,000	<b>1,708,340</b>
Goulburn Storages—			
5. Eildon Reservoir .. ..	1,496,497		
6. Waranga Reservoir Enlargement .. ..	602,270		
	2,098,767		<b>2,098,767</b>
Bacchus Marsh and Werribee Schemes—			
7. Ballan Tunnel .. ..	20,966	{ Werribee .. .. 8,000	
8. Pykes Creek Reservoir .. ..	118,385	{ Bacchus Marsh .. .. 77,425	
9. Melton Reservoir .. ..	85,550	{ Werribee .. .. 85,333	
	224,901		<b>224,901</b>
10. Bellarine Peninsula .. ..	145,557	Waterworks Districts to be debited later	<b>145,557</b>
Maffra-Sale Scheme—			
11. Glenmaggie Reservoir and Channels .. ..	1,104,097	Irrigation Districts to be debited later ..	<b>1,104,097</b>
Red Cliffs Scheme—		Irrigation District Progressing	
12. Main and Distributary Channels .. ..	763,410	Debit .. .. 470,000	<b>763,410</b>
Millewa District—			
13. Main and Distributary Channels .. ..	480,886	Waterworks Districts to be debited later	<b>480,886</b>
Flood Protection Districts—			
14. Kooweerup and Cardinia .. ..	359,160	Lower Kooweerup and Cardinia 145,000	
15. Goulburn Levees .. ..	59,955	Echuca, Kanyapella, and Loch	
	419,115	Garry .. .. 16,967	<b>419,115</b>
Carried forward .. ..			<b>8,163,012</b>

WORKS UNDER CONTROL OF COMMISSION—*continued.*Capital Debit  
at 30th June,  
1929,  
Exclusive  
of Cost of Loan  
Flotation.

£

8,163,012

Brought forward .. ..

## C.—IRRIGATION AND WATER SUPPLY DISTRICTS.

Distributary Works within Districts under the control of the Commission.

Name of District (Including Urban Divisions).	Total Capital Expenditure.	Capital Written Off by Acts 1925 and 1951.	Redemption Paid to Treasury.	Capital Debit at 30th June, 1929.
	£	£	£	£
1. Bacchus Marsh .. ..	99,218	8,906	493	89,819
2. Boort .. ..	97,606	35,259	1,794	60,553
3. Campaspe .. ..	64,542	52,685	305	11,552
4. Cohuna and Gannawarra ..	370,600	82,376	1,386	286,838
5. Deakin .. ..	92,088	34,748	2,144	55,196
6. Dingee .. ..	16,569	..	..	16,569
7. Dry Lake .. ..	1,704	686	299	719
8. Echuca North .. ..	22,640	..	..	22,640
9. Fish Point .. ..	15,078	..	..	15,078
10. Kerang .. ..	127,352	35,338	2,334	89,680
11. Koondrook .. ..	217,765	30,872	1,562	185,331
12. Leitchville .. ..	37,575	..	..	37,575
13. Merbein .. ..	216,878	..	133	216,745
14. Mystic Park .. ..	15,499	..	..	15,499
15. Nyah .. ..	106,221	..	..	106,221
16. Rochester .. ..	285,895	..	..	285,895
17. Rodney .. ..	672,045	149,949	8,967	513,129
18. Shepparton .. ..	150,423	..	546	149,877
19. South Shepparton .. ..	34,351	..	..	34,351
20. Stanhope .. ..	73,843	..	53	73,790
21. Swan Hill .. ..	173,059	19,799	371	152,889
22. Third Lake .. ..	24,770	..	..	24,770
23. Tongala .. ..	108,582	..	..	108,582
24. Tragowel Plains .. ..	366,601	124,534	527	241,540
25. Tresco .. ..	90,595	..	..	90,595
26. Werribee .. ..	123,334	..	10,242	113,092
	3,604,833	575,152	31,156	2,998,525

2,998,525

## D.—WATERWORKS DISTRICTS.

Distributary Works within Districts under the control of the Commission.

Name of District (Including Urban Districts).	Total Capital Expenditure.	Capital Written Off by Acts 1925 and 1951.	Redemption Paid to Treasury.	Capital Debit at 30th June, 1929.
	£	£	£	£
1. Birchip .. ..	745,886	700	2,473	742,713
2. Sea Lake .. ..				
3. Tyrrell .. ..				
4. Wycheproof .. ..				
5. Carwarp .. ..	40,156	..	..	40,156
6. Coliban .. ..	1,561,860	..	..	1,561,860
7. Coreena .. ..	43,453	..	..	43,453
8. Dandenong .. ..	37,063	5,128	1,506	30,429
9. Dering .. ..	10,915	..	..	10,915
10. Eureka .. ..	4,008	..	..	4,008
11. Karkarooc .. ..	252,211	..	2,893	249,318
12. Kerang North-West Lakes ..	1,952	..	..	1,952
13. Long Lake .. ..	112,524	..	1,081	111,443
14. Mornington Peninsula .. ..	678,976	..	..	678,976
15. Ouyen .. ..	18,388	..	..	18,388
16. Pyramid Hill .. ..	4,696	..	1,300	3,396
17. Tyntynder .. ..	238,851	..	60	238,791
18. Upper Western Wimmera .. ..	88,287	26,567	3,450	58,270
19. Upper Wimmera United .. ..	124,402	10,918	4,499	108,985
20. Walpeup West .. ..	31,560	..	..	31,560
21. Werribee .. ..	11,635	..	..	11,635
22. Western Wimmera .. ..	323,040	106,268	13,198	203,574
23. Wimmera United .. ..	261,167	25,474	10,231	225,462
24. Wonthaggi .. ..	75,355	..	9,071	66,284
25. Yelta .. ..	5,689	..	..	5,689
26. Wimmera Main Channels .. ..	121,664	..	..	121,664
27. Wimmera Storages—				
Fyans Lake .. ..	43,685	..	..	3,685
Taylors Lake .. ..	204,377	..	..	204,377
Pine Lake .. ..	172,150	..	..	172,150
Lake Whitton .. ..	10,336	..	..	10,336
	5,224,286	175,055	49,762	4,999,469

4,999,469

Carried forward .. .. 16,161,006

WORKS UNDER CONTROL OF COMMISSION— <i>continued.</i>					Capital Debit at 30th June, 1929. Exclusive of Cost of Loan Flotation.
Brought forward .. .. .					£ 16,161,006
E.—WATERWORKS TRUSTS DISTRICTS.					
DISTRICTS HELD IN TRUST BY THE COMMISSION.					
Name of Trust.	Total Advances by State.	Capital Written Off by Acts 1625 and 1651.	Redemption Paid to Treasury.	Capital Debit at 30th June, 1929.	
	£	£	£	£	
1. Avoca Water Trust—					
Rural District .. .. .	8,333	2,494	2,420	3,419	
Urban District (Quambatook) .. .. .	4,412	..	581	3,831	
2. Carrum Waterworks Trust .. .. .	38,800	7,732	4,282	26,786	
3. Loddon United Waterworks Trust—					
Rural District .. .. .	22,876	1,717	6,417	14,742	
Urban District (Mitiamo) .. .. .	4,985	..	134	4,851	
	79,406	11,943	13,834	53,629	
Grand Total .. .. .					£ 16,161,006

### LANDS SUPPLIED WITH WATER WITHIN THE STATE.

The area of country lands within the State artificially supplied with water for domestic and ordinary use and for watering stock is approximately 23,953 square miles, equal to about 15,330,000 acres.

The area under irrigated culture for all kinds of crops was 471,695 acres. Although this area is 5,805 acres less than the area irrigated in the previous year, it is 86,139 acres above the average of the previous five years, and 121,460 acres above the average of the previous ten years. The area irrigated last year includes 17,700 acres watered under yearly permits granting authority to divert water from streams throughout the State.

The decrease in the area watered was almost entirely in the irrigation of cereal and other annual crops, the position in regard to permanent crops under irrigated culture being maintained, and even increased.

The number of separate towns supplied, exclusive of the city of Melbourne and suburbs, is as shown in the following statement :—

Controlling Authorities.	Number of Towns Supplied.	Estimated Population Served.
Commission ... ..	89	119,200
Waterworks Trusts ... ..	111	192,600
Local Governing Bodies ... ..	18	75,000
Totals ... ..	218	386,800

## LANDS UNDER IRRIGATED CULTURE.

The two Statements hereunder show the extent of Areas Irrigated—(A) during last year in detail, and (B) during the last five years totalled for purposes of comparison.

(A) STATEMENT OF THE EXTENT OF IRRIGATION AND OF AREAS OF DIFFERENT KINDS OF CROPS WATERED—YEAR 1928-29.

Name of District.	Area Irrigated (Acres).							
	Cereals.	Lucerne grown for Pasture and Hay.	Sorghum and other Annual Fodder Crops.	Pastures.	Vineyards, Orchards, and Gardens.	Fallow.	Miscellaneous.	Total.
<i>Supplied from Goulburn State Works.</i>								
Katandra .. .. .	1,200	1,560	960	750	20	250	20	4,760
North Shepparton .. .. .	1,450	1,600	1,100	250	250	100	50	4,800
Shepparton .. .. .	1,250	2,900	850	1,100	8,950	460	150	15,660
South Shepparton .. .. .	900	1,640	900	1,400	20	250	30	5,140
Rodney .. .. .	5,803	31,201	1,349	10,144	8,328	871	461	58,157
Stanhope .. .. .	790	10,457	319	172	310	92	6	12,146
Tongala .. .. .	1,871	12,489	869	2,679	1,582	458	100	20,048
Rochester .. .. .	4,783	26,268	2,211	8,537	2,124	256	321	44,500
Echuca North .. .. .	321	2,118	476	1,666	..	135	185	4,901
Dingee .. .. .	327	1,177	..	178	21	428	1,105	3,236
Calivil .. .. .	1,089	878	217	824	6	38	1,075	4,127
Tragowel Plains .. .. .	11,378	1,756	7,966	28,598	40	1,356	1,655	52,749
Deakin .. .. .	1,163	879	171	824	..	50	16	3,103
Boort .. .. .	2,275	171	1,949	7,603	14	319	..	12,331
Totals .. .. .	34,600	95,094	19,337	64,725	21,665	5,063	5,174	245,658
<i>Supplied from River Murray State Works.</i>								
<i>(a) Torrumbarry Weir.</i>								
Leitchville .. .. .	483	1,587	174	147	21	88	779	3,279
Cohuna .. .. .	1,736	3,706	1,660	7,870	109	766	2,091	17,938
Gannawarra .. .. .	2,516	1,334	2,427	15,473	66	334	969	23,119
Koondrook .. .. .	4,442	1,600	2,762	10,958	785	..	56	20,603
Swan Hill .. .. .	3,663	4,378	2,073	4,612	3,179	271	..	18,176
Third Lake .. .. .	1,185	102	214	2,249	2	..	..	3,752
Mystic Park .. .. .	379	223	390	635	10	60	..	1,697
Tresco .. .. .	..	35	40	..	1,310	..	..	1,385
Fish Point .. .. .	151	276	223	1,298	19	..	..	1,967
Kerang .. .. .	4,821	1,039	4,970	24,251	11	190	..	35,282
Dry Lake .. .. .	..	..	115	160	2	..	..	277
Kerang North-West Lakes .. .. .	1,107	173	490	3,539	486	..	..	5,795
Lands supplied direct (outside Districts) .. .. .	1,336	1,599	515	3,666	26	..	7	7,149
Totals .. .. .	21,819	16,052	16,053	74,858	6,026	1,709	3,902	140,419
<i>(b) Direct from River.</i>								
Nyah .. .. .	..	..	100	..	2,611	..	10	2,721
Red Cliffs .. .. .	..	140	30	..	10,100	..	..	10,270
Merbein .. .. .	..	50	..	..	7,300	..	..	7,350
Totals .. .. .	..	190	130	..	20,011	..	10	20,341
Totals (River Murray State Works) .. .. .	21,819	16,242	16,183	74,858	26,037	1,709	3,912	160,760
<i>Supplied from Loddon and Other Northern State Works.</i>								
Boort .. .. .	758	57	649	2,534	4	106	..	4,108
Coliban .. .. .	146	539	354	1,603	5,026	118	204	7,990
Campaspe .. .. .	127	270	..	357	..	..	..	754
Western Wimmera .. .. .	..	18	..	..	1,287	..	15	1,320
Totals .. .. .	1,031	884	1,003	4,494	6,317	224	219	14,172
<i>Supplied from Southern State Works.</i>								
Bacchus Marsh .. .. .	31	1,723	50	699	223	203	..	2,929
Werribee .. .. .	200	3,043	152	2,349	301	780	475	7,300
Narre Warren .. .. .	..	..	..	..	650	..	..	650
Maffra .. .. .	367	964	675	2,528	..	1,293	522	6,349
Sale .. .. .	90	707	233	1,170	..	348	112	2,660
Totals .. .. .	688	6,437	1,110	6,746	1,174	2,624	1,109	19,888
<i>Supplied from other Works.</i>								
First Mildura District .. .. .	..	265	120	..	11,288	..	170	11,843
Private Diversions—Kerang (outside Districts) .. .. .	342	119	277	936	..	..	..	1,674
Other Private Diversions throughout the State .. .. .	2,400	3,400	3,100	2,700	4,200	1,500	400	17,700
Totals .. .. .	2,742	3,784	3,497	3,636	15,488	1,500	570	31,217
<b>Grand Totals 1928-29 .. .. .</b>	<b>60,880</b>	<b>122,441</b>	<b>41,130</b>	<b>154,459</b>	<b>70,681</b>	<b>11,120</b>	<b>10,984</b>	<b>471,695</b>
Grand Totals, 1927-28 .. .. .	91,538	121,540	60,104	118,153	71,043	6,727	8,395	477,500

(B) COMPARATIVE STATEMENT OF THE EXTENT OF IRRIGATION, 1924-25 TO 1928-29.

Source of Supply.	Area under Irrigation (Acres).				
	1924-25.	1925-26.	1926-27.	1927-28.	1928-29.
Goulburn State Works .. .. .	179,720	175,313	206,459	261,812	245,658
River Murray State Works .. .. .	135,470	112,775	140,256	156,202	160,760
Loddon and other Northern State Works .. .. .	19,258	14,882	12,205	14,485	14,172
Southern State Works .. .. .	8,560	10,593	16,894	14,085	19,888
Mildura and Private Diversions .. .. .	32,495	30,122	30,718	30,916	31,217
Totals .. .. .	375,503	343,685	406,532	477,500	471,695

## VALUATIONS, RATES, FLOOD PROTECTION CHARGES, AND COMPULSORY IRRIGATION CHARGES.

The statements which follow set forth the whole of the Districts supplied by the Commission with water for domestic and ordinary use and for watering cattle or other stock, together with the annual value of the lands and tenements in such Districts, and the rates, flood protection charges, and compulsory irrigation charges made in all Districts. An estimate of the number of persons dwelling in such Districts is also appended.

During the year rates were, for the first time, made in the Urban Waterworks Districts of Mount Martha, Tempy, and Werrimull, and for a half-year in the Urban Districts of Chinkapook, Patchewollock, and Speed; rates were also made for the first time in the Baring, Kia and Upper Millewa Waterworks Districts, and for a half-year in the Coreena Waterworks District. In the Red Cliffs Irrigation and Water Supply District a rate and compulsory irrigation charge, and in the Maffra and Sale Irrigation and Water Supply Districts compulsory irrigation charges were made for the first time, while in the Calivil, Katandra, and North Shepparton Irrigation and Water Supply Districts, rates for a half-year were also, for the first time, made.

The Waterworks Districts of Tyrrell and Walpeup East were amalgamated to form one district, and this area, together with an area of land not previously within a district was then subdivided into the Tyrrell, Baring, and Kia Waterworks Districts.

In thirty-three Districts the lands were, for the purpose of making and levying rates, arranged in divisions (not more than three in number), in accordance with the relative benefits derived by such lands from the works. The Lower Kooweerup and Cardinia Flood Protection Districts, where the charging is on an acreage basis, were similarly divided into three divisions. As heretofore in the Urban portion of the Coliban system, a minimum and tapering rate has been made, while the Carrum Waterworks Trust District has, as in past years, been arranged in five rating divisions in accordance with the relative benefits derived by such lands from the works.

Under the powers conferred by Section 5 of the *Water Act* 1916, a minimum annual rate on the basis of £10 13s. 4d. per 640 acres was fixed by the Commission on the first division lands of the Birchip, Carwarp, Karkaroc, Long Lake, Sea Lake, Tyntynder, Tyrrell, Upper Western Wimmera, Upper Wimmera United, Western Wimmera, Wimmera United, Wycheproof, and Yelta Waterworks Districts, while in the Baring, Carwarp Central, and Kia Districts the minimum was fixed at £16 per 640 acres, in Eureka District at £18 13s. 4d. per 640 acres, in Dering and Lower Millewa Districts at £21 6s. 8d. per 640 acres, in the Upper Millewa District at £26 13s. 4d. per 640 acres, in the Coreena District at £34 13s. 4d. per 640 acres, and in the Walpeup West Waterworks District at £5 6s. 8d. per 640 acres.

In twenty-five Districts the Commission made and levied compulsory irrigation charges, while in five Flood Protection Districts and in five Waterworks Trusts Districts taken over by the Commission a rate or charge was also made. Details of all rates and charges made are set out hereunder:—

### A.—VALUATIONS, RATES, AND FLOOD PROTECTION CHARGES.

Districts Supplied with Water for Domestic and Ordinary Use and for Watering Cattle or other Stock.	Annual Value of Lands and Tenements.	Rate in the £1 made during Year ended 30th June, 1929.	Period of Rate.	Estimated Number of Persons dwelling in District.
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#### IRRIGATION AND WATER SUPPLY DISTRICTS.

	Valuation by Commission.	Divisions.				
		1st.	2nd.	3rd.		
	£	s. d.	s. d.	s. d.		
1. BACCHUS MARSH ..	15,006	1 0	..	..	1st July, 1928, to 30th June, 1929	780
2. BOORT ..	18,200	2 0	1 0	..	" " "	647
3. CALIVIL ..	12,588	0 6	..	..	1st Jan., 1929, to 30th June, 1929	200
4. CAMPASPE ..	11,190	2 0	1 0	0 6	1st July, 1928, to 30th June, 1929	576
5. COHUNA ..	22,576	2 0	1 0	..	" " "	1,155
6. DEAKIN ..	52,192	1 8	0 10	0 5	" " "	1,790
7. DINGEE ..	3,603	1 0	..	..	" " "	200
8. DRY LAKE ..	250	(No rate made)			" " "	14
9. ECHUCA NORTH ..	5,655	1 0	0 6	..	1st July, 1928, to 30th June, 1929	568
10. FISH POINT..	1,562	1 0	..	..	" " "	155
11. GANNAWARRA ..	18,156	2 0	1 0	..	" " "	657
12. KATANDRA ..	8,449	0 6	..	..	1st Jan., 1929, to 30th June, 1929	600
13. KERANG ..	22,101	2 4	1 2	0 7	1st July, 1928, to 30th June, 1929	1,130
14. KOONDRICK ..	20,672	2 0	1 0	..	" " "	1,240
15. LEITCHVILLE ..	6,500	2 0	..	..	" " "	255
16. MAFFRA ..	28,505	1 0	..	..	" " "	1,072
17. MERBEIN ..	26,497	1 0	..	..	" " "	3,500
18. MYSTIC PARK ..	4,622	1 0	..	..	" " "	115
19. NORTH SHEPPARTON ..	36,456	0 6	..	..	1st Jan., 1929, to 30th June, 1929	1,250



A.—VALUATIONS, RATES, AND FLOOD PROTECTION CHARGES—*continued.*

Districts Supplied with Water for Domestic and Ordinary Use and for Watering Cattle or other Stock.	Annual Value of Lands and Tenements.	Rate in the £1 made during year ended 30th June, 1929	Period of Rate.	Estimated Number of Persons dwelling in District.
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IRRIGATION AND WATER SUPPLY DISTRICTS—*continued.*

	Valuation by Commission.	Divisions.				
		1st.	2nd.	3rd.		
	£	s. d.	s. d.	s. d.		
20. NYAH .. ..	6,809	1 0	..	..	1st July, 1928, to 30th June, 1929	1,000
21. RED CLIFFS .. ..	23,623	1 0	..	..	" " "	2,650
22. ROCHESTER .. ..	65,458	1 0	0 6	0 3	" " "	4,086
23. RODNEY .. ..	144,940	1 0	0 6	0 3	" " "	5,565
24. SALE .. ..	14,119	1 0	..	..	" " "	612
25. SHEPPARTON .. ..	39,309	1 0	..	..	" " "	2,510
26. SOUTH SHEPPARTON .. ..	15,117	1 0	..	..	" " "	520
27. STANHOPE .. ..	15,085	1 0	..	..	" " "	770
28. SWAN HILL .. ..	23,868	1 0	..	..	" " "	1,470
29. THIRD LAKE .. ..	2,351	2 0	..	..	" " "	165
30. TONGALA .. ..	29,318	1 0	..	..	" " "	2,240
31. TRAGOWEL PLAINS .. ..	43,595	1 0	0 6	..	" " "	1,730
32. WERRIBEE .. ..	17,401	1 0	..	..	" " "	690

## WATERWORKS DISTRICTS.

33. AXE CREEK .. ..	1,683	2 0	..	..	1st July, 1928, to 30th June, 1929	260
34. BARING .. ..	1,235	5 0	2 6	1 3	" " "	150
35. BIRCHIP .. ..	40,519	2 4	1 2	0 7	" " "	2,650
36. CARWARP .. ..	9,397	3 10	1 11	0 11½	" " "	740
37. CARWARP CENTRAL .. ..	1,065	5 0	2 6	..	" " "	195
38. COREENA .. ..	12,148	2 6	1 3	0 7½	1st Jan., 1929, to 30th June, 1929	400
39. DERING .. ..	2,392	6 0	3 0	1 6	1st July, 1928, to 30th June, 1929	215
40. EUREKA .. ..	1,647	4 0	2 0	1 0	" " "	115
41. HARCOURT .. ..	8,686	1 6	..	..	" " "	600
42. KARKAROOC .. ..	147,963	2 2	1 1	0 6½	" " "	4,000
43. KERANG N.W. LAKES .. ..	8,155	0 6	..	..	" " "	575
44. KIA .. ..	5,055	5 0	2 6	1 3	" " "	300
45. LONG LAKE .. ..	72,741	2 10	1 5	0 8½	" " "	2,330
46. LOWER MILLEWA .. ..	13,521	5 0	2 6	1 3	" " "	2,300
47. NARRE WARREN .. ..	3,219	1 0	..	..	" " "	280
48. SEA LAKE .. ..	67,539	2 8	1 4	0 8	" " "	2,410
49. TYNTYNDER .. ..	56,507	3 4	1 8	0 10	" " "	3,000
50. TYRRELL .. ..	102,565	3 4	1 8	0 10	" " "	5,560
51. UPPER MILLEWA .. ..	8,991	7 6	3 9	..	" " "	1,200
52. UPPER WEST'N WIMMERA .. ..	64,970	1 6	0 9	0 4½	" " "	1,670
53. UPPER WIMMERA UNITED .. ..	114,261	1 6	0 9	0 4½	" " "	2,750
54. WALPEUP WEST .. ..	75,458	0 9	0 4½	..	" " "	3,000
55. WERRIBEE .. ..	7,813	2 0	..	..	" " "	140
56. WESTERN WIMMERA .. ..	305,691	1 2	0 7	0 3½	" " "	9,000
57. WIMMERA UNITED .. ..	343,844	1 2	0 7	0 3½	" " "	7,800
58. WYCHEPROOF .. ..	77,518	2 4	1 2	0 7	" " "	2,950
59. YELTA .. ..	2,771	3 4	..	..	" " "	150

## WATERWORKS TRUSTS.

	Municipal Valuation.	£	s. d.			
			s.	d.		
60. AVOCA .. ..	40,573	..	..	0 4	1st January, 1929, to 31st December, 1929	990
61. MITIAMO (URBAN) .. ..	998	..	..	4 0	" " "	190
62. QUAMBATOOK (URBAN) .. ..	4,333	..	..	2 6	" " "	330
63. CARRUM .. ..	31,139	1st Division	..	3 8	" " "	1,500
		2nd Division	..	1 10		
		3rd Division	..	1 0		
		4th Division	..	0 10		
		5th Division	..	0 3		
		Valuation by Commission.				
	£					
64. LODDON UNITED .. ..	100,321	1st Division	..	0 8	" " "	3,520
		2nd Division	..	0 4		
		3rd Division	..	0 2		

A.—VALUATIONS, RATES, AND FLOOD PROTECTION CHARGES—*continued.*

Districts Supplied with Water for Domestic and Ordinary Use and for Watering Cattle or other Stock.	Annual Value of Lands and Tenements.	Rate in the £1 made during year ended 30th June, 1929.	Period of Rate.	Estimated Number of Persons dwelling in District.
URBAN DIVISIONS AND DISTRICTS.				
	Municipal Valuation. £	s. d.		
65. BACCHUS MARSH ..	16,890	.. .. 1 6	1st July, 1928, to 30th June, 1929	1,856
66. BERRIWILLOCK ..	1,669	.. .. 3 6	" " "	160
67. BERWICK ..	3,695	.. .. 2 0	" " "	900
68. BEULAH ..	4,704	.. .. 2 3	" " "	500
69. BIRCHIP ..	7,989	.. .. 1 8	" " "	975
70. BITTERN ..	301	.. .. 3 0	" " "	86
71. BRIM ..	1,339	.. .. 4 0	" " "	240
72. CARRUM ..	87,593	.. .. 1 4	" " "	6,360
73. CARWARP ..	250	.. .. 5 0	" " "	30
74. CHILLINGOLLAH ..	601	.. .. 5 0	" " "	85
75. CHINKAPOOK ..	688	.. .. 3 0	1st Jan., 1929, to 30th June, 1929	120
76. COHUNA ..	9,851	.. .. 1 9	1st July, 1928, to 30th June, 1929	1,010
77. COROP ..	280	.. .. 2 0	" " "	90
78. CRANBOURNE ..	2,571	.. .. 2 0	" " "	250
79. CULGOA ..	1,486	.. .. 3 6	" " "	160
80. DANDENONG ..	53,134	.. .. 1 3	" " "	4,425
81. DIMBOOLA ..	15,769	.. .. 1 6	" " "	1,590
82. DINGEE ..	555	.. .. 4 0	" " "	90
83. FRANKSTON ..	45,723	.. .. 1 4	" " "	5,350
84. HASTINGS ..	1,814	.. .. 3 0	" " "	430
85. HOPETOUN ..	6,984	.. .. 2 3	" " "	700
86. JEPARIT ..	8,930	.. .. 1 9	" " "	840
87. JUNG JUNG ..	940	.. .. 3 0	" " "	160
88. KOONDROOK ..	3,873	.. .. 2 6	" " "	485
89. LAKE BOGA ..	2,524	.. .. 3 0	" " "	360
90. LALBERT ..	1,034	.. .. 5 0	" " "	150
91. LASCELLES ..	1,053	.. .. 3 6	" " "	130
92. LEITCHVILLE ..	2,222	.. .. 3 0	" " "	260
93. LOCKINGTON ..	1,336	.. .. 3 6	" " "	236
94. MANANGATANG ..	2,281	.. .. 3 6	" " "	190
95. MARNOO ..	1,712	.. .. 3 6	" " "	300
96. MARONG ..	752	.. .. 3 0	" " "	300
97. MERBEIN ..	8,219	.. .. 3 0	" " "	700
98. MINYIP ..	6,239	.. .. 2 9	" " "	800
99. MORNINGTON ..	32,143	.. .. 1 6	" " "	2,200
100. MOUNT MARTHA ..	4,573	.. .. 2 3	" " "	130
101. NANDALY ..	382	.. .. 6 0	" " "	105
102. NATIMUK ..	3,969	.. .. 1 6	" " "	590
103. NORTH WONTHAGGI ..	3,554	.. .. 2 0	" " "	1,000
104. NULLAWIL ..	804	.. .. 5 0	" " "	105
105. NYAH ..	797	.. .. 2 6	" " "	170
106. NYAH WEST ..	4,936	.. .. 2 9	" " "	285
107. OUYEN ..	11,888	.. .. 2 6	" " "	950
108. PAKENHAM ..	5,640	.. .. 2 0	" " "	650
109. PATCHEWOLLOCK ..	605	.. .. 3 0	1st Jan., 1929, to 30th June, 1929	160
110. PIANGIL ..	1,874	.. .. 3 6	1st July, 1928, to 30th June, 1929	200
111. PYRAMID HILL ..	2,616	.. .. 3 0	" " "	600
112. RAINBOW ..	9,641	.. .. 1 9	" " "	950
113. RED CLIFFS ..	10,148	.. .. 3 0	" " "	740
114. RUPANYUP ..	5,783	.. .. 2 9	" " "	700
115. SEA LAKE ..	7,517	.. .. 2 0	" " "	610
116. SOMERVILLE ..	1,575	.. .. 2 6	" " "	260
117. SOUTH FRANKSTON ..	7,383	.. .. 2 9	" " "	700
118. SPEED ..	528	.. .. 5 0	1st Jan., 1929, to 30th June, 1929	110
119. SPRINGVALE ..	22,217	.. .. 1 6	1st July, 1928, to 30th June, 1929	1,700
120. STANHOPE ..	878	.. .. 4 0	" " "	300
121. TEMPY ..	429	.. .. 6 6	" " "	140
122. ULTIMA ..	3,142	.. .. 3 0	" " "	390
123. WAITCHIE ..	382	.. .. 5 0	" " "	85
124. WATCHEM ..	2,449	.. .. 3 0	" " "	265
125. WERRIBEE ..	19,090	.. .. 1 6	" " "	1,500
126. WERRIMULL ..	547	.. .. 8 0	" " "	160
127. WONTHAGGI ..	34,670	.. .. 1 6	" " "	9,000
128. WOOMELANG ..	2,899	.. .. 2 9	" " "	425
129. WOORINEN ..	540	.. .. 4 0	" " "	60
130. WYCHEPROOF ..	8,833	.. .. 2 0	" " "	810

A.—VALUATIONS, RATES, AND FLOOD PROTECTION CHARGES—*continued.*

Districts Supplied with Water for Domestic and Ordinary Use and for Watering Cattle or other Stock.	Annual Value of Lands and Tenements.	Rate in the £1 made during year ended 30th June, 1929.	Period of Rate.	Estimated Number of Persons dwelling in District.
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## COLIBAN SYSTEM.

	Municipal Valuation. £	<i>s. d.</i> On Valuations up to £300 .. 1 6 (Minimum 20s.) From £301 up to £700 .. 1 3 From £701 on 1 0 Vacant lands .. 1 6	1st July, 1928, to 30th June, 1929	61,000
131. COLIBAN .. ..	371,000			

## FLOOD PROTECTION DISTRICTS.

	Valuation by Commission. £	<i>s. d.</i>	1st July, 1928, to 30th June, 1929	
132. ECHUCA (HIGH-ST.)	1,454	.. .. 2 0		80
133. CARDINIA ..	36,206	1st Div. (p.ac.) 3 0 2nd Div. (p.ac.) 1 6 3rd Div. (p.ac.) 0 9	" " "	900
134. LOWER KOOWEERUP }	54,834	1st Div. (p.ac.) 2 0 2nd Div. (p.ac.) 1 0 3rd Div. (p.ac.) 0 6	" " "	2,700
135. KANYAPELLA ..	14,494	1st Div. (p.ac.) 0 7 2nd Div. (p.ac.) 0 3½	" " "	68
136. LOCH GARRY ..	40,886	Per acre .. 0 6	" " "	200

## B.—COMPULSORY IRRIGATION CHARGES.

Irrigation and Water Supply District.	Area of District in Acres.	Area at present Irrigable in Acres.	Water Rights apportioned (including Extra Rights) in Acre-feet.	Compulsory Charge per Acre-foot of Water Right.	Period of Charge.
1. BACCHUS MARSH ..	6,684	3,360	3,360	22s. 6d.	1st October, 1928, to 30th April, 1929
2. COHUNA .. ..	34,662	22,261	22,344	6s.	1st September, 1928, to 30th April, 1929
3. DINGEE .. ..	6,383	4,494	4,494	7s.	" " " "
4. ECHUCA NORTH ..	13,543	5,515	5,584	7s. 6d.	" " " "
5. FISH POINT .. ..	5,788	3,761	1,847	8s.	" " " "
6. GANNAWARRA ..	52,766	19,865	19,915	6s.	" " " "
7. KOONDROOK .. ..	61,114	18,789	18,789	6s.	" " " "
8. LEITCHVILLE ..	9,816	8,047	2,717	7s.	" " " "
9. MAFFRA .. ..	19,782	8,921	4,479	10s.	1st October, 1928, to 30th April, 1929
10. MERBEIN .. ..	8,445	7,665	19,110	24s. Min. 60s. per acre	1st August, 1928, to 30th April, 1929
11. MYSTIC PARK ..	18,181	9,076	3,074	6s.	1st September, 1928, to 30th April, 1929
12. NYAH .. ..	3,678	3,089	7,662	20s. Min. 50s. per acre	1st August, 1928, to 30th April, 1929
13. RED CLIFFS .. ..	30,753	11,233	28,083	28s.	1st August, 1928, to 30th April, 1929
14. ROCHESTER .. ..	165,274	53,632	54,319	6s.	1st September, 1928, to 30th April, 1929
15. RODNEY .. ..	267,984	190,060	58,850	6s.	" " " "
16. SALE .. ..	13,508	7,339	1,865	10s.	1st October, 1928, to 30th April, 1929
17. SHEPPARTON .. ..	24,680	21,791	21,791	6s.	1st September, 1928, to 30th April, 1929
18. SOUTH SHEPPARTON	33,669	19,356	4,877	8s.	" " " "
19. STANHOPE .. ..	26,011	18,862	18,015	6s.	" " " "
20. SWAN HILL .. ..	35,410	21,269	21,269	6s.	" " " "
21. THIRD LAKE .. ..	11,808	4,008	2,673	7s.	" " " "
22. TONGALA .. ..	45,476	29,489	28,278	6s.	" " " "
23. TRAGOWEL PLAINS	212,739	147,890	31,065	7s.	" " " "
24. TRESKO .. ..	3,898	2,410	6,025	16s. Min. 40s. per acre.	1st January, 1928, to 31st Dec., 1928
25. WERRIBEE .. ..	9,984	7,910	7,933	12s.	1st October, 1928, to 30th April, 1929

# CONTRACTS.

STATEMENT OF CONTRACTS ENTERED INTO DURING THE YEAR ENDED 30TH JUNE, 1929.

No.	Name of Contractor.	Work or Supply.	Amount (Loan and Vote).		
			£	s.	d.
2544	Australian Cement Ltd. .. ..	4,500 tons cement .. ..	20,671	17	6
2545	Kandos Cement Co. Ltd. .. ..	500 tons cement .. ..	3,216	4	4
2546	W. H. Osborn .. ..	Waranga Western Main Channel Extension ..	488	14	5
2547	W. O'Connor .. ..	Firewood, Merbein .. ..	413	12	0
2548	J. H. Storer .. ..	Firewood, Merbein .. ..	900	0	0
2549	R. G. Holmes .. ..	Firewood, Merbein .. ..	2,639	14	0
2550	M. P. Cairns .. ..	Firewood, Merbein .. ..	541	16	0
2551	J. J. O'Halloran .. ..	Firewood, Merbein .. ..	825	0	0
2552	M. O'Halloran .. ..	Firewood, Merbein .. ..	900	0	0
2553	F. Geach .. ..	Firewood, Merbein .. ..	292	19	0
2554	M. P. Cairns .. ..	Firewood, Merbein .. ..	718	15	0
2555	A. J. Lindorff .. ..	Firewood, Nyah .. ..	700	0	0
2556	A. G. Resuggan .. ..	Firewood, Nyah .. ..	170	2	0
2557	A. J. Bell .. ..	Firewood, Nyah .. ..	350	0	0
2558	A. W. Osborne .. ..	Firewood, Nyah .. ..	1,053	17	0
2559	P. Mannix .. ..	Firewood, Nyah .. ..	1,057	0	0
2560	W. H. Duffy .. ..	Firewood, Tresco .. ..	615	0	0
2561	Australian Wood Pipe Co. .. ..	Wood Stave Pipes, Bendigo .. ..	2,249	15	8
2562	Hume Pipe Co. (Australia) Ltd. ..	Reinforced Concrete Pipes, Bendigo .. ..	670	0	0
2563	Janetzki Bros. .. ..	Earthen Storage, Patchewollock .. ..	853	15	8
2564	F. Boys .. ..	Waranga Western Main Channel Extension ..	540	12	1
2565	W. E. Chatterton .. ..	Boring for water, Walpeup West .. ..	237	10	0
2566	Janetzki Bros. .. ..	Earthen Storage, Brim .. ..	508	13	3
2567	J. T. Cleary .. ..	Main Western Channel, Carwarp .. ..	137	15	0
2568	C. R. Brownlaw .. ..	Main Western Channel, Carwarp .. ..	117	15	0
2569	A. J. Laird .. ..	Erection Buildings, Merbein .. ..	268	0	0
2570	Australian Wood Pipe Co. Ltd. ..	Wood Stave Pipes, Bendigo .. ..	1,777	1	10
2571	H. E. Ward .. ..	Firewood, Merbein .. ..	891	13	4
2572	H. E. Ward .. ..	Firewood, Merbein .. ..	693	7	0
2573	W. H. Osborn .. ..	Waranga Western Main Channel Extension ..	478	7	3
2574	W. H. Osborn .. ..	Waranga Western Main Channel Extension ..	450	0	0
2575	Fraser & Powrie .. ..	Eastern Goulburn Main Channel Extension ..	502	9	2
2576	Mooney & Abrahams .. ..	Eastern Goulburn Main Channel Extension ..	373	19	1
2577	Fraser & Powrie .. ..	Eastern Goulburn Main Channel Extension ..	305	10	10
2578	G. T. Doherty .. ..	Eastern Goulburn Main Channel Extension ..	299	1	3
2579	Bethune Bros. .. ..	Boring for water, Walpeup West .. ..	247	10	0
2580	W. J. McCready .. ..	Waranga Western Main Channel Extension ..	251	5	4
2581	W. J. McCready .. ..	Waranga Western Main Channel Extension ..	257	4	3
2582	W. H. Osborn .. ..	Waranga Western Main Channel Extension ..	315	10	6
2583	H. Prior .. ..	Waranga Western Main Channel Extension ..	280	2	10
2584	F. L. Kemp .. ..	Waranga Western Main Channel Extension ..	268	7	9
2585	F. L. Kemp .. ..	Waranga Western Main Channel Extension ..	289	11	6
2586	Australian Wood Pipe Co. Ltd. ..	Wood Stave Pipes, Maffra .. ..	6,220	10	2
2587	Kandos Cement Co. Ltd. .. ..	500 tons cement .. ..	3,184	7	6
2588	Australian Cement Co. .. ..	4,500 tons cement .. ..	20,671	17	6
2589	Byrne & Newall .. ..	Waranga Western Main Channel Extension ..	278	12	5
2590	W. J. Byrne .. ..	Waranga Western Main Channel Extension ..	238	13	5
2591	Beasley & Timewell .. ..	Crushed Bluestone, Pykes' Creek Reservoir ..	1,429	7	9
2592	Alfred T. Harman .. ..	Conversion Dragline Excavator .. ..	1,450	0	0
2593	Thompsons Engineering & Pipe Co. Ltd.	Steel Pipes, Bellarine Peninsula .. ..	11,189	10	0
2594	Alfred T. Harman .. ..	Dragline Excavator .. ..	3,885	0	0
2595	W. E. Chatterton .. ..	Boring for water, Walpeup West .. ..	1,460	0	0
2596	Australian Cement Ltd. .. ..	4,500 tons cement .. ..	20,671	17	6
2597	Kandos Cement Co. Ltd. .. ..	500 tons cement .. ..	3,184	7	6
2598	E. J. Finegan .. ..	Earthen Storage, Maffra .. ..	624	18	0
	Sundry small contracts at piece-work rates				
	—Distributary channels .. ..		167,851	0	0
		Total .. ..	291,159	11	7

## DIRECT LABOUR.

The construction of the larger works is still being mainly carried out by "Direct Labour." The principal payments during the year were on the following works:—

Works.	Amount.
Wimmera Mallee System .. ..	£132,667
Goulburn Main Channels .. ..	127,702
River Murray Storages (Hume Reservoir, Mildura Lock Weir) .. ..	94,819
Boort, Tragowel Plains, Nyah, Rodney and Shepparton Districts .. ..	54,024
Coliban District .. ..	48,195
Maffra District (Glenmaggie Reservoir) and Sale District .. ..	40,232
Bellarine Peninsula .. ..	39,421
Bachus Marsh and Werribee Districts .. ..	38,294
Merbein, Millewa, Red Cliffs, Coreena, Carwarp and Walpeup Districts .. ..	31,832
Campaspe and Loddon River Storages .. ..	30,129
Kerang Lakes, Kerang, Mystic Park, Koondrook, Cohuna and Swan Hill Districts .. ..	27,628
Mornington Peninsula .. ..	25,926
Dandenong Creek Drainage .. ..	14,812
Kooweerup, Cardinia and Other Flood Protection Districts .. ..	11,955
Eildon and Waranga Reservoirs .. ..	11,332
Mallee Tanks and Clearing Roads (Mallee) .. ..	7,440
Other Districts .. ..	3,466
Total .. ..	£739,874

## WORKS CARRIED ON OR COMPLETED DURING THE YEAR ENDED 30TH JUNE, 1929.

### COLIBAN DISTRICT.

The work of regrading and enlarging the Main Channel, lining portions of it with concrete, and replacing with concrete old timber flumes and other structures, has been satisfactorily advanced during the year. This work has added materially to the carrying capacity of the channel, and, as anticipated, has substantially lessened the seepage and other losses of water. During the year a number of improvements and enlargements to the reticulation of Bendigo and Eaglehawk have been effected, the most important being located at Quarry Hill, where the working pressure in the mains is now satisfactory.

The enlargement of the Spring Gully Reservoir has been completed. Formerly the capacity of this Reservoir was only some 400 acre feet, but by increasing the height of the embankment it is now possible to store 2,000 acre feet of water. It is expected that this Reservoir will later form the headworks of an economical system of pipe reticulation that will eventually replace the existing wasteful open channel system which at present forms the only means whereby irrigation supplies are now distributed at White Hills, Epsom, and Huntly. The installation of such a system of pressure supply by pipes was brought into operation at South Lockwood during the year. The system has worked smoothly, has resulted in economical distribution and application of the water, and is rapidly gaining in favour amongst the users on account of its ease of operation and its effectiveness.

Throughout the District, on various reserved areas held by the Commission, from 1,500 to 2,000 seedling trees have been planted and are now making good headway.

In view of the important districts dependent for their water on the Raywood Race, which is supplied through the "Lightning Hill" Syphon at Eaglehawk, the Commission has decided to replace a considerable length of the existing syphon, which is 16 inches in diameter, with a new steel pipe 18 inches in diameter. This will substantially augment the supply and should meet all present demands.

The New Service Reservoir at Specimen Hill, Bendigo, was brought into operation during the year and has greatly improved the general water supply conditions. Notwithstanding a leakage in the outlet main from the storage due to settlement of a portion of its concrete lining over some old unknown mine workings, a satisfactory head of water was retained in the basin throughout the summer season. The defective portions of this main have now been effectively reinforced by introducing a short length of steel lining, the workings under the line have been refilled, and no further trouble in this direction should recur.

At the suggestion of landholders in the district, the Porcupine Race at Castlemaine has been renamed "Swinburne Channel" in honour of the late Hon. George Swinburne, who was Minister for Water Supply when the Water Act of 1905 was passed.

### IRRIGATION AND WATER SUPPLY DISTRICTS.

#### RODNEY DISTRICT.

The season 1928-29 was marked by more than average irrigation activity. Over 60,000 acre feet, the greatest quantity for many years, were delivered to users. A net area of over 58,000 acres was irrigated, including some 31,000 acres of lucerne, 8,000 of orchards and vines, and the rest cereal or summer fodder crops and pastures.

During the year attention was given to improving the supply to various parts of the District. About 25 miles of existing channel were remodelled, while three new spur channels, totalling about  $1\frac{1}{2}$  miles in length, were constructed to supply lands not previously served. Surveys were also carried out to investigate numerous other proposals where supplies were required.

Throughout the season close attention was given to the problem of reducing loss and wastage of water in the long channels of the District. The system of gauging channel flows was checked, new gauges being introduced at necessary points. The work of replacing the old timber structures, installed by the former Trust, was carried on; six wooden checks and four head-sluices being replaced with concrete structures and two brick checks strengthened, with good results in reducing leakage. In addition four main road bridges and two occupation bridges were replaced with the concrete arch type, and several smaller bridges with pipe culverts. This work has allowed improved distribution and has lessened loss and maintenance cost.

The work of installing Dethridge meter-wheels throughout the District is well advanced, about 800 meters being installed for the year. A new small pattern meter has been designed, and a number were put in and are giving good service in orchards and small pasture blocks.

Drainage is becoming an increasingly urgent matter in Rodney as in most Irrigation Districts. A number of test wells have been sunk in various typical parts of the District, and monthly readings are taken so as to check the movements of the underlying water table. These have been most reassuring, showing no dangerous rise of the water table anywhere in the areas tested, and there is at present no indication of any trouble from this source. Extensive surveys have been made in Wyuna and Undera, with a view to locating outfalls for channels for surface drainage and carrying off storm waters which in some parts are proving difficult at certain times.

#### DISTRICTS ADMINISTERED FROM SHEPPARTON CENTRE.

In the Shepparton District, new works, principally the extension of the channel systems, both for irrigation and drainage, were carried out. Banks on the No. 1c Channel, the Lemnos Channel, and on small portions of channels throughout the Dennis' Estate subdivision were topped up. The Barrel syphon on the Kaarimba Loop Channel was completed and operated during the watering season. Extensive beaching on the downstream side of structures has been undertaken throughout the Eastern Goulburn Main Channel Extension, and also on the main supply channels throughout the Settlement.

In the recently constituted North Shepparton District, new distributary channels from existing main channels were constructed. Amongst others, Kaarimba spur-channels, a total length of  $7\frac{1}{2}$  miles, were constructed together with all bridges, structures and outlets, as well as the Congupna No. 2 Channel spur-channels, totalling 3 miles 20 chains in length, and Congupna No. 3 Channel spur-channels, these last comprising a total length of 7 miles.

A spur-channel 75 chains in length from the Eastern Goulburn Main Channel Extension has been constructed to supply soldier settlers in the parish of Pine Lodge. All these new channels, which cover a very extensive area, will be put into operation next watering season, and should greatly benefit crops and stock fodder throughout the District.

In the Katandra District, which has been constituted since last Report, an extension of the Eastern Goulburn Main Channel from 16 miles 35 chains to 18 miles, and the construction of about  $6\frac{1}{2}$  miles of distributary channels were carried out. All structures, bridges, and outlets on these works are now completed.

On the Drainage Channel known as No. 3, referred to in last Report, a total length of 3 miles 67 chains has been constructed during the year, and an extension of the No. 2 Drainage Channel, also referred to in last Report, was also carried out for a further 55 chains. This channel now also acts as an outfall for a Seepage Drain, which has been constructed for a distance of 2 miles 72 chains along the western bank of the Eastern Goulburn Main Channel Extension.

#### SWAN HILL DISTRICT.

During the year 2 miles 37 chains of irrigation channels and 73 chains of drainage channels were constructed, including 12 chains of pipe drain. Seventy chains of irrigation channels were remodelled and lined with cement concrete. Twenty-one Dethridge meter wheels were installed, and numerous other structures, including 15 culverts, 7 checks and 10 small outlets, were put in. An old bridge on the Main Road over the No. 1 Channel was removed and replaced with a pipe culvert, thus effecting great improvement to the roadway. Portion of the Western Channel was enlarged, thereby permitting an increased supply of water being sent out to Woorinen. Owing to the dry season there was an exceptional demand for water, but all requirements were met without difficulty.

The District is being extended to include a further area of about 1,091 acres in the Parish of Tyntynder in the northern portion of the District, the owners of which have been pressing for some years to have their land brought under irrigation.

There has been a keen demand for irrigation land, and all vacant blocks suitable for settlement have now been taken up.

#### DISTRICTS ADMINISTERED FROM KERANG CENTRE.

Following an abnormally dry winter and a succession of severe frosts, irrigation commenced throughout the several Districts early in August, 1928, and, excepting periods of cessation due to showery weather in October and April, proceeded uninterruptedly until the season closed towards the end of May, 1929. The aggregate quantity of water supplied to the Districts was a record, exceeding that of the preceding season, which was likewise one of low rainfall. The Commission was able to meet all demands, increased deliveries being possible as a result of the improvements effected to the main and distributary channel systems during the past few years, and of the careful regulation of stored water. Officers in charge of Districts drawing supplies from the Torrumbarry Weir on the River Murray met in conference from time to time to ensure that the Torrumbarry System was used to the best advantage.

In the Kerang District, extensive works in connexion with the renewal of old timber structures, together with the remodelling of channels, were undertaken. Portions of the No. 1 Left Branch and No. 6 Channels and several minor spurs were deviated to avoid swampy ground and awkward road crossings. On the Kerang East Main Channel and branches north of the Kerang-Echuca Main Road new regulators in reinforced concrete were built, and at the extremity of No. 2A distributary channel, Pyramid Creek frontage, suitable escape works have been provided for the safe working of the Kerang East system.

The work of installing meter outlets was steadily pursued, nearly 300 meters being already in satisfactory operation in the Kerang area.

In addition to the construction of numerous minor checks, culverts and subways on small branch channels, further reinforced concrete regulators, to replace worn out timber structures, were built on a number of distributary channels. At No. 1 Main Channel in the vicinity of Boort road crossing, checks in reinforced concrete of the drop-bar type, two openings of 6 feet each, were installed to improve the supply to lands south of Kerang, and at the same time to relieve the pressure on lower sections, where the water had been held above natural surface.

Surveys are being made to determine whether the Kerang East Main Channel, south of the Kerang-Echuca Road, which at present runs in close proximity to the No. 5 Macorna North Channel, could be fed from the No. 5 Channel, thus enabling the Commission to abolish approximately  $2\frac{1}{2}$  miles of the old Kerang East Main Channel.

Investigations are being carried out with a view of determining the most efficient and economical means of conveying irrigation supplies from Torrumbarry to Kerang, Kerang North-West Lakes and Swan Hill Districts. In this connexion, the Commission has under consideration a proposal to enlarge the Macorna Channel to discharge 450 cubic feet per second, together with suggested improvement works along the course of the Loddon River, Pyramid Creek and North-West Lakes Main Channel.

In the Koondrook Irrigation and Water Supply District, further work was undertaken in the direction of improving channel waterways generally. Between Koondrook and Myall, additional sections of the Northern Main Channel were enlarged, together with waterways of timber occupation culverts two miles or so below the headworks. The doors of the main offtake regulator on Gunbower Creek were renewed, the apron of the spillway was extended, and cushion walls were built over same, as required. Portions of the Northern Spur 13 were remodelled, and Spur 15 was extended to serve the south-east portion of Tye's Closer Settlement Estate, Gonn Crossing, previously irrigated directly from Reedy Creek, which will now be reserved for drainage purposes only.

The bed of Reedy Creek in Tye's Estate was cut and graded for about one half-mile south to the high level drain, Barr Creek outfall, and a connexion was made to enable the draining of surplus water to the high level system at times when the River Murray outfall is submerged. This connexion will reduce pumping on the low level system to a minimum. Plans and estimates were prepared for a proposed extension of the Murrabit drainage system to serve Closer Settlement and other lands near Myall.

During the greater part of the Irrigation Season the North-West Lakes storages were maintained at or near Full Supply Level by water diverted from the Torrumbarry Weir storage, there being no appreciable flow in the Loddon River other than the freshets during October. Surplus water was from time to time sent from Lake Tutchewop to Lake Boga via Fish Point channel. In addition to extending stone protective works at Kangaroo Lake Levee, a section of the north-western shore of Lake Tutchewop near the outlet regulator, where erosion was taking place, was protected by laying precast concrete blocks on compacted gravel bed.

In the Third Lake District, the No. 6 spur-channel was constructed to Barr Creek, where escape works were provided. The No. 6B Channel was extended to serve certain lands north of Barr Creek, the crossing of which watercourse was effected by means of a galvanized iron flume 240 feet in length.

A new office is being erected by the Commission at Kerang.

#### DISTRICTS ADMINISTERED FROM COHUNA CENTRE.

As the weather during the month of July, 1928, was comparatively dry, a general demand for irrigation water was received in August, and arrangements were accordingly made to make supplies available earlier than usual in the three Districts administered from this centre, namely, Cohuna, Gannawarra, and Leitchville. With the continuance of dry conditions throughout the summer, there was a heavy demand for water during the irrigation season, but, notwithstanding this, all demands were met, water being actually made available until the fourth week in May.



The dry conditions prevailing throughout the year have had a marked effect on the lowering of the water table in the subsoil in this Centre, more especially Cohuna, which is observed from the regular gaugings taken of the water level in the test wells put down in each of the Districts. This improvement has been greatly added to by the new drainage system and the more careful and systematic use of water for irrigation. During the period under review the drainage system to serve the Leitchville District was completed by making connexion to the Leitch's Creek Main Drain of the Cohuna District, and thus the original undertakings for the drainage of the Cohuna and Leitchville Districts have now been completed. Further extensions of the systems are being investigated, mainly at the request of the landowners who, having observed the benefit to be obtained by drainage, have in some cases agreed to contribute towards the initial cost of connecting their blocks to the Main Drainage System. The beneficial effects of these drainage systems continue to be also shown by the reclamation to productivity of further areas of previously alkali-affected land. There are now 67 miles of drainage channels in Cohuna and Leitchville Districts, and a locally-designed mud-scoop is engaged continually on the removal of the silt deposited in the bed of these drains. The use of the Barr Creek as an irrigation water carrier was discontinued three years ago, and it is now essentially the main carrier for drainage water, all the drainage channels emptying into it. The offtake from the Gunbower Creek has also been banked off so as to prevent leakage through the regulator, and thus reduce the water level in the Barr Creek.

The work of installing Dethridge meter wheels to replace the old timber orifices has been steadily proceeded with during the year, 74 and 26 being replaced in the Cohuna and Gannawarra Districts respectively. The total numbers of wheels in these Districts are 368 and 260, whilst 84 are in use in the Leitchville District. Many irrigators have expressed their approval of the installation of this positive means of measuring the quantity of water delivered, but of more importance in the Cohuna District is the fact that these meters tend to check the careless use and waste of water which was possible with the old type of orifice measurement.

Maintenance and repair works have been carried out in all Districts administered from this centre. The original timber structures in the Cohuna and Gannawarra Districts, taken over from the Trusts which originally administered these Districts, are now coming to the end of their usefulness, especially road bridges. One road bridge and two regulators were reconstructed, and five regulators, seven occupation, and 39 road bridges were repaired, including the complete redecking of seven road bridges. On two channels, concrete structures were installed to provide for the escape of water in cases of emergency.

In the Cohuna Urban Division 16 chains of 3-inch and 6 chains of 4-inch concrete pipes were replaced with cast-iron pipes on account of the excessive leakage. Minor extensions of pipe reticulation were carried out. The concrete water tower was cleaned out and coated with bituminous emulsion.

In the Leitchville Urban Division one of the galvanized iron tanks of the storage was replaced with a new 7,000-gallon iron tank.

#### DISTRICTS ADMINISTERED FROM LODDON CENTRE.

The weather for the year proved very dry, only 997 points of rain falling for the twelve months ended 30th June, 1929. During the irrigation season some extremely hot periods were experienced; and, consequently, the demand for water was consistent throughout. A commencement with irrigation was made in August, 1928, and channels were kept running till the middle of May. The extensive remodelling works carried out by the Commission in the Tragowel Plains District during the past five years have been of great benefit to irrigators. A total of 42,000 acre feet was delivered to the District in the irrigation period, being 7,000 acre feet more than in any previous season.

In the Tragowel Plains District the Commission's programme of remodelling channels and structures has been practically completed. Ten old wooden bridges have been replaced with concrete pipe structures, 20 timber stops were substituted with concrete, and one timber flume was replaced with a double 24-inch syphon.

The Calivil District was constituted during the year, and supplies were delivered through the new channels. The water proved of great value to farmers, especially to those who had been sufficiently enterprising to establish lucerne plots during their first year under irrigation. The Calivil District has been the scene of a good deal of constructional activity. Twelve branch channels involving the excavation of 205,000 cubic yards of earthwork, and the construction of three reinforced concrete pipe subways, sixteen reinforced concrete road bridges of varying dimensions, nineteen reinforced concrete regulators, and thirteen occupation bridges for farmers, have been completed. This work included the first six miles of the new Mologa Channel, designed to supply the lands lying between the present eastern boundaries of the Calivil and Tragowel Plains Districts and the Bullock Creek.



During the year small drainage works were carried out in the Dingee District.

In the Pyramid Hill Urban District, beside reticulation extensions, the very important work of providing a new additional standpipe for the water supply of Pyramid Hill township has been commenced. This standpipe will be of a capacity of 120,000 gallons and will replace the present storage of 40,000 gallons capacity.

#### BOORT DISTRICT.

During the year Boort District, which was previously administered from the Loddon Centre, has been constituted a new Centre to be administered by a separate staff, located in Boort township.

Watering in Boort started about the end of August, 1928, and continued until the 25th May, 1929. Except for short periods immediately following spring and autumn rains, the demand was keen and steady. The supply of water throughout was constant and plentiful, the total quantity delivered being 12,950 acre feet, 75 per cent. of which was supplied from Goulburn Storage and the balance from Laanecoorie. The average rainfall over the District for the year was about  $9\frac{1}{2}$  inches.

The total area of the District is 96,000 acres, of which 16,439 acres were irrigated during the first watering.

Repairs and maintenance work in the District were carried out. Worn and sunken channel banks and old timber structures were attended to, particular attention being given to headworks on the Loddon River and branch streams. Old timber structures beyond repair are gradually being replaced and several new minor structures have been erected.

The work of remodelling channels is being steadily advanced; 2 miles were completed in July and August, 1928, and  $4\frac{1}{2}$  miles are now in hand. In addition scoop teams are engaged removing silt beds and improving low sections of banks along channels.

Test wells have been put down throughout the District and regular readings made. In no case has any appreciable rise in the water table been recorded.

In the area of the Loddon United District controlled from Boort Centre all dams commanded by the Catumnal Channel were filled. A supply of water for contractors and construction gangs on the Waranga Western Channel was kept going and several landholders took advantage of the plentiful supply to irrigate small areas of their holdings.

Regular monthly meetings of the District Advisory Board were held and several minor matters were brought forward and adjusted. All members have repeatedly expressed appreciation of the plentiful and regular supply of water.

#### DISTRICTS ADMINISTERED FROM ROCHESTER CENTRE.

During the year under review 4,545 acres situated on the northern boundary were added to the Rochester District, bringing the area to 165,223 acres. This increase was made possible by new channel construction in the previous year. A further length of  $7\frac{1}{2}$  miles of supply channels, recently constructed in the parishes of Wharparilla and Turrumberry North, will result in a further area of 4,740 acres being added to the District for the coming year, thus making a total area of 169,963 acres. Exclusive of the Waranga Western Channel, which also supplies other Districts, there are now over 290 miles of distributary channels in the Rochester District, supplying water rights totalling 54,319 acre feet, as well as domestic and stock supplies.

Water deliveries for the year reached record figures, being slightly in excess of 54,000 acre feet. Deliveries during October and April were negligible owing to fairly heavy rains, but during the other six months of the irrigation season the demand was heavy and continuous. All demands were met and irrigators generally and lucerne growers in particular had a profitable season.

In addition to the supply channels already referred to, 17 miles of drainage channels were constructed. The drainage works consisted of the Nanneella Drainage Channel No. 2,  $3\frac{1}{2}$  miles; Bamawm Drainage Channel No. 3,  $9\frac{1}{2}$  miles; Rankin's drainage channel,  $1\frac{3}{4}$  miles; and four short drainage channels emptying into main drains. The total length of drainage channels is now 52 miles. On the Bamawm Drainage Channel No. 1,  $3\frac{1}{4}$  miles were deepened to provide outlets for the tile drainage of certain citrus orchards; and portion of the Ballendella Drainage Channel was remodelled and deepened.

Further remodelling of the Bamawm Extension Channels, necessitated by the Wharparilla Extensions, was put in hand and a length of 2 miles 60 chains involving some 18,000 cubic yards was completed.

To supply Echuca North District the Cornelia Creek Channel, which supplies part of the area, was surveyed and cross sectioned for remodelling with an excavator. Structures were duplicated to provide for the larger stream, and earthworks will be undertaken during the coming year.

Following requests for irrigation supplies in areas west and north of the District, preliminary investigations were made into the practicability of supplying Wanurp, Terrick Terrick East and Patho.

In the Urban Division of Lockington, which is fast becoming a good business centre, works of maintenance were carried out in connexion with the reticulated supply, which is proving of great benefit.

#### DISTRICTS ADMINISTERED FROM TONGALA CENTRE.

During the past year settlers on the various Districts appear to have consolidated their positions; this is due to the fact that lessees have in most cases fully developed their holdings and have obtained full requirements of stock and plant. Coupled with this are the high yields given by the excellent class of dairy stock bred in the District.

The amount of water supplied to the various Districts during the past season constituted a record. This is due partly to the additional development on the different holdings, but also to the dry weather conditions from October to March creating a constant demand for water. The completion of the Sternberg Channel, enabling an auxiliary supply of water to be obtained for Tongala District from Rodney District Channels, made it possible to at all times carry sufficient water to meet every need.

The capacity of the Wyuna Main Channel having proved inadequate to meet the growing demand for irrigation water, works for the enlargement of this channel were taken in hand at the beginning of this year, when a dragline excavator was put into operation to enlarge the channel from a capacity of 250 cusecs to 400 cusecs. Up to the present a section of  $2\frac{1}{2}$  miles of channel has been enlarged. It is proposed to carry this work on to the 10 mile point, at which the No. 1 and No. 2 Main Channels for the Stanhope District take off, thus providing a large enough capacity to meet all demands for many years to come.

Dairying is now more extensively carried on, and this is reflected in an increase of approximately 50 per cent. in the turn-over of the local butter factory, a Co-operative Company which was assisted by the Commission in its establishment and is now justifying the aid given it.

Fruit-growers experienced another trying year; the peach crop was badly affected by the ravages of the green aphid last spring, but yields of apricots and pears were fair. These Districts are proving themselves particularly suitable for the stone fruits and pears.

Agistment of sheep on lucerne blocks is still carried on, landowners preferring to let their lucerne stands for grazing over a period.

In the Tongala District the principal work of the year, apart from routine maintenance and repair, has been the construction of the main drainage channels for surface drainage reticulation of the District.

At the time of the last report, work had been commenced on the lower 6 miles of the No. 1A Main Drainage Channel. During the year 14 miles of this channel and 7 miles of the No. 2 Drainage Channel have been completed. Work is now well advanced on a further 6 miles of the No. 1A and 8 miles of No. 2 Channels, and practically finishes the two main drains. Work for the construction of the spur drains will at once be taken up, and it is expected that the whole of the necessary channelling will be completed during the coming season. The construction of concrete bridges and other structures on these channels is being carried on, as nearly as possible, simultaneously with the earthwork, and up to date on these two channels two double and 46 single arch type bridges as well as eight drainage channel syphons have been installed.

In the Stanhope District miscellaneous irrigation spur channels have been constructed to give greater facility for water distribution. The chief work however in this District, as in the Tongala District, has been the construction of drainage channels.

During the year 27 miles of these drainage channels, including smaller spurs, were completed, and all necessary concrete structures, principally 4 double and 29 single arch type bridges and 9 pipe culverts, were provided. Drainage reticulation, with the exception of small miscellaneous works, is now completed in this District. Already these channels have proved of great value to irrigators in preventing flooding of lucerne ground.

In the Deakin District, works of maintenance of channels have been carried out, and a good supply of water has been available. An application having been received from certain landowners in the parish of Carag Carag for the formation of a new Irrigation and Water Supply District, plans are now in hand for the construction of channels on this area of approximately 7,000 acres, and it is expected that construction will be completed before the end of this year. The new district when constituted will be known as the Timmering Irrigation and Water Supply District.

In Echuca North District 2 miles of the Main Channel supplying the District were cleaned out and enlarged. The benefit of this work was manifest in the increased supply of water it was possible to give the irrigators in this District. Extensions of channels are now in hand to improve the supply of water for various landowners.

## BACCHUS MARSH AND WERRIBEE DISTRICTS.

In the Bacchus Marsh Irrigation District, the Main Supply Channel was remodelled and concrete-lined for a distance of 5 chains, a concrete storm-water shoot was constructed in Vallences Gully, and the sides on the concrete storm-water shoot at Pigotts Gully were raised.

On the Werribee North Channel 2 chains of 12-inch diameter concrete pipes were laid to replace the old timber flume over the depression at McGillivrays. On the Main Supply Channel 20 chains of storm-water drains were enlarged and 10 chains of extra storm-drains were constructed.

To prevent scour along the banks of Myers Creek, which conveys the water from the Tunnel into Pykes Creek Reservoir, protective works consisting of stone filling and pitching were carried out along the bed and banks of this creek for a distance of 10 chains. The tunnel was cleaned out for a distance of 20 chains and concrete lined to the extent of 123 feet and inspection shafts were retimbered.

On the eastern slopes of Pykes Creek Reservoir, 9,000 *Pinus insignis* seedlings were planted. The trees planted in 1924-26 are making excellent growth, many now reaching to a height of 10 feet.

In connexion with the Gorge to Gorge Scheme for the supply of an additional area of 1,000 acres not commanded by the existing systems, the construction works are now complete from the Lerderderg River pipe syphon and are connected up with the low-level works. These works included the installation of 724 feet of 24-inch diameter pipes over the Goodmans Creek, five concrete pipe road crossings, and 80 chains of concrete lining, as well as the excavation of 9 miles of storm-water drains and the construction of ten concrete crossings and storm-water shoots.

Owing to the erosion of the Lerderderg and Werribee River banks, it was necessary to carry out additional protective works at Millers and Ramseys. The willows planted at the Commission's protective works were again pruned and layered. All such works constructed by the Commission on the Lerderderg and Werribee Rivers are in excellent condition.

At the Commission's workshops at Bacchus Marsh, 2,300 large Dethridge meter wheels and 320 small wheels were constructed, tar coated and despatched to various Districts under the control of the Commission.

In Werribee District the main works during the year were the lining of several channels with concrete. On the Main Channel 10 chains were lined with 2-inch concrete, and a new measuring weir was constructed to measure the water delivered into the District. Spur Channel 3k was concrete lined for 111 chains, and Spur 4k for 29 chains.

Last year was one of the best experienced in the Werribee Irrigation District. Very little rain fell during the period from August, 1928, to April, 1929, and consequently irrigation was continuous between those dates, a record quantity of water being delivered. Over 23,000 acre-feet were drawn from the Melton Dam and 14,200 acre-feet were delivered to settlers. The supply was ample and, as a result of the channel lining which had been carried out, an efficient service in the delivery of the water was given.

The Urban Settling Basin and the Water Supply Tower for the use of the township were cleaned out and the interior of the latter sprayed with bituminous emulsion.

An extension of the urban mains in 2-inch galvanized piping was made for 1,560 feet along Duncans-road, so as to give several small landholders who adjoin the Urban District, but whose holdings are within the Irrigation District, a supply of water under pressure. This service is paid for by special agreement charge.

The water supplied to the Urban District throughout the year has been satisfactory. The Werribee Shire Council is negotiating for a water supply to the township from the system controlled by the Melbourne and Metropolitan Board of Works and it is probable that this change of supply of which the Commission approves will come into force shortly.

In the Waterworks District the Commission cleaned out and enlarged three earthen tanks and arranged for the construction of five new tanks on the Dry Area for the Closer Settlement Board. The long dry summer again proved to those farmers within the Waterworks District that the supply given them is invaluable. As a result of the three runs of water given, dams in this District always contained a supply of good water, while the tanks on the lands outside the District held only a small quantity of indifferent water.

## MERBEIN DISTRICT.

To supply new areas to which water rights have been granted, some 15 chains of pipe line and 4 chains of open channel have been constructed during the year. The banks of various channels, totalling about 18 chains in length, have been raised to increase their carrying capacities where these channels were in fill and where a certain amount of subsidence had occurred.

One new road bridge with 24 feet road width has been constructed across the Main Channel near the Merbein Central School, and eight old timber road culverts have been reconstructed with reinforced concrete pipes.

A considerable amount of repair work was effected during the year, in all about 450 chains of concrete lining receiving attention. Practically all of this work was carried out with bitumen-sand mixture and proved satisfactory.

To meet the District demands five general waterings and one special watering were given during the year. As in 1927-28, it was found necessary to commence the first watering early in the season. A number of irrigators, as a consequence, did not take the second watering, but notwithstanding, their vines, which did not again receive water until the third watering, did not show any signs of water shortage. It is expected that this practice will be extended during the coming season.

The total rainfall recorded at Merbein for the twelve months covered by this report was only 340 points and in consequence waterings were particularly heavy.

To provide an outfall for a number of lowlying allotments in the north-west portion of the District, a drainage system comprising 21 chains of 9-inch pipes, 37 chains of 6-inch pipes and 17 chains of concrete lined ditch with the necessary inspection pits was completed during the year. Six new pits were put down on the Birdwood Drainage system to facilitate cleaning operations, and some 9 chains of open cut were replaced with 9-inch pipes.

As in the previous year, a considerable amount of subsoil drainage was carried out by settlers, principally to blocks that had already been partly drained. Practically all these have shown a marked improvement.

Dried fruit returns show an increase on the previous two seasons, returns totalling 11,856 tons as compared with 6,008 for 1927-28 and 9,850 for 1926-27.

The Merbein Township is progressing steadily and is now supplied with electric light by power from Mildura.

#### RED CLIFFS DISTRICT.

The main works in this District having been completed, works of a minor nature only were carried out during the year. Maintenance work on the channels was given attention, and noxious weeds on reserves were eradicated and cracks and weak places in the concrete lining of channels repaired to prevent leakage.

The irrigation of the Settlement was carried out to schedule and all requirements were met. Five irrigations were provided and a short run was given for domestic and stock requirements.

Although the area of vines planted in the Settlement has not materially altered since last report the yield of dried fruit was double that of the previous year, being 17,000 tons as compared with 8,500 tons in 1927-28, and 11,000 tons in 1926-27. Seasonal conditions were responsible for the lower figure in 1927-28, frosts and hail seriously damaging the vines. Individual yields of 3 tons to the acre were reported in some cases for this season.

Large quantities of fresh grapes were also marketed, and citrus fruits were harvested from the young citrus groves that are now beginning to bear profitable crops. The dry season was exceptionally favorable for drying the fruit, under 2 inches of rain having fallen for the six months ended 30th June, 1929. These conditions enabled the production of a good average quality.

The maximum production from the Settlement has not yet been reached as there are still areas of young vines and citrus to come into bearing.

The roads throughout the Settlement are being steadily improved. A number of main roads leading out from the township have been constructed of blue metal with bituminous surfaces to stand the heavy traffic of fruit carting to the packing sheds.

In the Red Cliffs Township steady progress is being maintained, electric light and power having now been introduced by the Shire Council. A number of new residences were connected to existing water mains, and provision has now been made for the installation of a larger engine and pump to meet the growing demands of the Urban water supply system generally.

### NYAH DISTRICT.

During the year the length of supply channels lined with concrete was extended, bringing the total length so lined to  $44\frac{1}{2}$  miles.

Irrigation channels were cleaned out and 44 chains of concrete lining were treated with bitumen to minimize seepage. Two old timber bridges were replaced with new concrete structures. Considerable progress was made with the improvement of the drainage system. Drainage channels were cleaned out and deepened where required.

Watering of the settlement was carried out satisfactorily during the season, all requirements being fully met.

The dried fruit crop for the season was a record for the District. A total of 3,500 tons of dried fruit was packed by the Nyah Packing Sheds, compared with 2,400 tons for the 1928 harvest and 3,200 tons for the 1927 harvest.

Growers were visited on their allotments and regularly instructed in irrigation and cultural practices by officers of the Commission.

### MYSTIC PARK DISTRICT.

During the year the channel system in this District has been improved by the remodelling of  $9\frac{1}{2}$  miles of earthen channels. Six new structures have been constructed and two remodelled. Nine meter outlets have been constructed and measuring wheels are now being installed.

Repairs have been made to the fill bank on No. 1 Spur Channel, drift sand being cleaned out of portion of this channel which adjoins Mallee country and is subject to frequent stoppages.

Irrigation supplies were received from Lake Kangaroo by gravitation throughout the year, the Lake being kept at full supply level by carefully regulated flow from the Torrumbarry System.

### TRESCO DISTRICT.

In this District construction work during the year comprised the installation of three concrete regulators, two outlets and two pipe culverts. The old flume on No. 9 Channel serving the area west of the railway has been reconstructed in reinforced concrete for a length of 9 chains. Maintenance work carried out during the year included the treatment of some 140 chains of concrete lined channel with bituminous emulsion while 50 chains of unlined channel have been freed from weed growth and regraded. One hundred and sixty chains of drains have been cleaned out during the year and noxious weeds have been cut along channel banks for a total length of 14 miles.

A gauge staff has been erected in Lake Boga near the pumping plant, zero on the gauge being set at R.L. 211.75 feet.

Owing to the dry winter of 1928, the watering season commenced earlier than usual. Five waterings were given under water right and one special watering for citrus under sales of water conditions.

The returns from the Tresco Fruitgrowers Association showed that 1,606 tons of Doradillos were despatched from the settlement last season as compared with 1,239 tons for season 1927-28. In addition 73 tons of other grapes were forwarded to the distilleries. The sultana yield for the season amounted to 120 tons, an increase of 44 tons on season 1927-28 and  $58\frac{1}{2}$  tons on season 1926-27. Other dried fruits despatched from the settlement were 4 tons of currants and  $6\frac{1}{2}$  tons of lexias.

Fifty tons of lemons have been despatched to factories while approximately 4,000 cases of Washington Navel Oranges have already been forwarded to market from the central packing shed, and it is expected that 13,000 cases will be handled before the season closes.

In the Tresco Township the local Progress Association has effected marked improvements by ploughing portions of Sanderson Avenue, and a considerable number of trees have been planted and fenced in for protection from stock.



## FISH POINT DISTRICT.

In extending irrigation supplies in this District, a further length of 25 chains of earthen channel was constructed during the year, bringing the total mileage of channels supplying this District to approximately 18 miles. In connexion with this extension, a small concrete regulator was installed, other structures completed during the year being four road subways, three channel subways and three pipe outlets. Noxious weeds were very troublesome and portions of channel banks had to be cleaned several times. Channel banks, where subject to erosion, have also been planted with protecting grasses.

Good use was made of water during the year, irrigators using practically all of their water-rights, and, in addition, taking, under Sales of Water conditions, further supplies equal to about two-thirds of the amount allotted under water-right. During the year all water was supplied through meter outlets.

## MAFFRA-SALE IRRIGATION DISTRICTS.

The past year has shown a marked increase in the use of water for irrigation purposes in this centre; in the Maffra District the area under irrigation culture has increased from 3,527 acres in 1927-28 to 6,349 acres, while in the Sale District the area has increased from 1,366 acres to 2,660 acres, this being the first year in which a definite water right was allotted to each holding.

During the year 9 miles of irrigation and water supply channels and 8 miles of drainage channels have been constructed; in addition 340 concrete outlets were constructed in existing channels.

The footbridge over the Main Wall of the Glenmaggie Dam has been completed and ladders constructed in the valve towers. The construction plant has been dismantled and stored, while the site of the weir generally has been cleared and put in order. A substantial road bridge with piers based on concrete footings and steel girders has been completed across the Macalister River to replace the bridge at Grogans and the new road thereto gravelled and opened for traffic.

In October of this year, a record flood occurred in the Macalister River when 5 feet of water was discharged over the spillway of the weir without difficulty; this flood, however, did some damage to the Northern Tinamba Channel, and, to prevent a recurrence, additional floodways are being provided in the channel.

Two dragline excavators were operated steadily throughout the year on the construction of Main Drainage Channels in the Districts. The Main Nuntin Drainage Channel has now reached a point at which considerable relief can be given to the lowlying Main Nuntin flats, hitherto always subject to inundation after heavy local rains. The subsoil water is now being drained away and great benefit will be derived from this work. One section of a Drainage Channel known as the Lake Wellington Drainage Channel has been constructed as far as the north-east corner of Cobain's Estate and has practically drained all the water from Lakes Kakydra and Melanydra.

A supply of water was made available to the Township of Stratford during the year, the supply being conveyed by branch channel from the main outlet channel of the Glenmaggie Reservoir to a service basin on Powerscourt Hill from which a 12-inch wood-main  $3\frac{1}{2}$  miles long delivers the town's requirements into the Stratford Waterworks Trust's reticulation main.

The residents of the township of Heyfield having accepted the Commission's proposals for a reticulated water supply from the Glenmaggie Reservoir, a contract has been let for the construction of an earthen storage close to the town, and arrangements have been made to put in hand the balance of the work during the coming year.

Closer settlement in the District has continued to develop and the applications for blocks are far in excess of the number of blocks made available. During the year 22 farm blocks and 10 agricultural labourers' allotments were settled. The progress of settlers generally is good, and the result obtained by the use of the water throughout the district has been most gratifying, particularly so with lucerne, mixed pastures and maize.

The good results being obtained from irrigation in the areas supplied have brought about numerous requests for extensions of the channel system, and while some of the requests are from isolated places, they are generally in considerable compact areas. Surveys have been completed with the view to extensions on the west of the Sale District boundary and along the west of the Boisdale area in the Maffra District. Another large extension desired by owners lies along the east side of the Avon River between the Valencia Creek crossing and Stratford. This will embrace a very large and valuable area of rich river flats and good land adjoining.

## INVESTIGATIONS OF NEW IRRIGATION AND WATER SUPPLY PROPOSALS.

Investigations have been continued with a view to ascertaining the most satisfactory and economical means of making adequate provision to meet the requirements of the Loddon Area south of, but not commandable by, the Main Waranga Western Channel. The site near Baringhup, on the Loddon River, above Laanecoorie, at first seemed to offer considerable advantages, as the surface contours showed that a very considerable quantity of water could be there stored. While the height of the dam required was not excessive, surveys showed that its length would be very considerable, and exploratory shafts and borings proved that the bed rock was in places overlaid by a great depth of clay, sands, and gravels, some of these latter carrying a considerable quantity of water. Under these conditions, it was found, on taking out approximate estimates, that the cost of water made available would be too high to admit of a financially practicable scheme being put forward. Investigations are now being made into other proposals which may prove capable of providing for irrigation as well as for the domestic and stock supply in this portion of the Loddon Valley. In connexion with this the possibility of increasing the capacity of the Laanecoorie Weir on the Loddon above Bridgewater is being investigated.

At the proposed site on the Campaspe River at Eppalock, investigations into the suitability of the rock for foundations were continued by means of the diamond drill and exploratory excavation. Much of the rock was found to be of a soft nature, sometimes to a great depth, and approximate estimates taken out showed that even on the most favorable site, located after prolonged investigation, the cost of construction would be too great in proportion to the water made available from such a storage to permit of a financially sound scheme being put forward. As in the case of the Loddon Valley, investigations are now being undertaken to ascertain if it is possible to establish some minor scheme or schemes on the Campaspe River or its tributaries which, while utilizing the work already carried out, will allow a supply to be given at a smaller cost to the landholder.

Investigations have been made with respect to requests for the extension of the North Shepparton Irrigation District to include lands in Bunbartha, Nathalia, Narioka, and Dunbulbalane districts. Estimates of the schemes generally were submitted to interested landholders and were approved. The extension will be carried out as early as practicable.

Following a petition from landholders in the Boosey Creek area near Katamatite for a water supply, the Commission intends having investigations made into the proposal.

In connexion with proposals to provide supplies from the Goulburn System to lands along the eastern side of Bullock Creek to be known as Terricks District, and to lands between Rochester and Dingee Irrigation Districts to be known as Milloo District, estimates were prepared and schemes submitted to interested landholders. These schemes were accepted generally, and the construction of the necessary works will be put in hand.

In connexion with the proposal for a water supply to certain lands in the Shires of Bulla, Keilor, Melton, Braybrook, and Werribee, investigations were completed and estimates of cost of works to provide supplies for domestic and stock purposes as well as for limited irrigation from suitable sites on Riddells Creek at Wooling Swamp and on Deep Creek at Konagaderr were prepared for submission to the landholders concerned.

Investigations are being made into a proposal for a water supply from Diamond Creek to lands in the Hurstbridge District.

Investigations have been made for an extension from the new Waranga Western Channel to provide a domestic and stock water supply to the Normanville area and the country between that area and the Avoca River near Quambatook. The proposal, if adopted, will also provide for the development of limited irrigation at a later date to this and the Leaghur areas.

With a view to ultimately supplying the Western District towns which naturally should depend on the Otway Watershed for their water supply, a move has been made by local authorities in that area to protect these valuable water-gathering grounds. A preliminary investigation made shows that the proper preservation of this area is essential for that purpose.

At the request of landholders investigations were made into a proposal to irrigate certain lands from Lake Burrumbeet. It was found, however, that the waters of the lake were unsuitable for irrigation purposes and that the scheme could not be recommended.

## WATERWORKS DISTRICTS.

## CARWARP DISTRICT.

The watering of this District for domestic and stock supply was satisfactorily completed, all requirements being met.

The season was exceptionally dry, and great difficulty was experienced in getting the water through some of the channels, on account of drift sand from fallow land silting up the channels. This year was the worst experienced in this respect, the reason being that the areas of fallow and clearing are increasing and the recent years have been very dry, causing scarcity of natural vegetation.

The rainfall for the last fifteen months totals  $6\frac{3}{4}$  inches and for the last six months under 2 inches. As a result, the cost of distribution of the water was very heavy.

The improvements to the Main Eastern Channel proposed in last report were carried out, enabling a larger stream than formerly to be carried and materially helping in overcoming the difficulties of distribution.

## CARWARP CENTRAL DISTRICT.

In this District water is supplied for domestic and stock use to a small area too high to be commanded by the Carwarp District Channel system without pumping. A steam portable engine and pump is used to lift the water from the Carwarp Main Eastern Channel to a point where it will gravitate throughout the Carwarp Central area. The water for the Carwarp Township Urban Supply is also supplied from this system.

The scheme is proving satisfactory, and all requirements for domestic and stock water have been met. Trouble with sand drift silting up channels, on account of the dry season, was, however, a difficulty that had to be overcome in order to distribute the water to dams, and this work materially added to the cost of the year's working expenses.

## COREENA DISTRICT.

The installation of the pumping plant and rising main, referred to in the last Report, has been completed, and a channel,  $1\frac{3}{4}$  miles in length, has been excavated from the River Murray to a billabong on which the pumping plant is situated. The length of channels constructed during the year is 55 miles 69 chains, bringing the total to  $90\frac{3}{4}$  miles.

The first watering of the Coreena District took place during October-December, 1928, the watering period taking 51 days during which approximately 70 miles of channels were run and 47 tanks were filled. The channels run represent two-thirds and tanks filled one-third of those which will be in operation when all allotments are supplied.

## YELTA DISTRICT.

Since the last Annual Report 1 mile 75 chains of new channel have been excavated, while 2 miles 25 chains of the Yelta Main Channel have been remodelled. Repairs have been made to channel banks where erosion, due to the heavy rains of February, 1928, had taken place; two new 24 feet wide road culverts of 24 inch reinforced concrete pipes have been constructed and 1 road culvert 24 feet wide has been reconstructed with 24 inch reinforced concrete pipes. Watering was given in December, 1928, and a satisfactory supply was provided throughout the District.

## WIMMERA-MALLEE WATER SUPPLY.

Continued dry seasons during the past five years have seriously reduced volumes stored in the main reservoirs, adjacent to the Grampians, forming the headworks of the System. Demands, unusually heavy during last season, caused this season's watering to be commenced with almost depleted storages. Requirements steadily increased, and the difficulty of the position became so accentuated that, as indicated in the last Annual Report, the Commission decided to undertake the construction of the Loddon-Avoca extension of the Waranga Western Channel so as to relieve the position by making available surplus Goulburn River flows to practically the northern half of the extensive Wimmera-Mallee area.

The construction was pushed on so vigorously that the work was completed by June, 1929, thus enabling the channel to be used for the present watering of the northern half of the area with the greatest possible advantage. The beneficial results from this work are already evident, apart from relieving the strain on the Grampians reservoirs. A very considerable saving has already been made by the much more effective and rapid distribution and supervision of the water in the northern areas of the Wimmera-Mallee system commanded by it. This result will be even more pronounced when normal years are experienced.

The construction of this cross country Waranga Extension channel, which is 129 miles long, from the Loddon to Beulah East involved  $2\frac{1}{2}$  million cubic yards of excavation in earth and some 20,000 cubic yards of stone, 300 bridges, syphons, and numerous other structures,



The dry spring and summer caused a considerable extra expenditure in the maintenance of the channel system, chiefly owing to the excessive sand drift experienced, which involved the employment of many additional teams and men for clearing operations prior to the running of the water. Notwithstanding these adverse conditions full domestic and stock supplies of water were furnished through the 5,800 miles of channels to the 11,000 square miles of country commanded by the system.

Adequate supplies of water were also given to a number of towns within the Wimmera-Mallee Districts controlled by local Waterworks Trusts, as well as to the steadily increasing number of towns with full reticulation systems operated and administered directly by the Commission, of which there are now 36, namely :—

Berriwillock	Dooen	Marnoo	Patchewollock	Ultima
Beulah	Hopetoun	Minyip	Quambatook	Waitchie
Birchip	Jeparit	Nandaly	Rainbow	Watchem
Brim	Jung Jung	Natimuk	Rupanyup	Woomelang
Chillingollah	Lalbert	Nullawil	Sea Lake	Woorinen
Chinkapook	Lascelles	Nyah West	Speed	Wycheproof
Culgoa	Manangatang	Ouyen	Tempy	Yaapeet
Dimboola				

WESTERN WIMMERA, UPPER WESTERN WIMMERA, WIMMERA UNITED, UPPER WIMMERA UNITED, AND KARKAROOC DISTRICTS.

In addition to the Waranga Western Channel extension already mentioned, some 30 miles of distributary channel were constructed in the above Districts. The Jung West Channel, some 15 miles in length, was constructed in order that the Yarriambiack Creek might be wholly superseded, as this natural watercourse has been a serious water waster in past years. Small channel extensions were also made in the Dimboola, Quantong, Donald, and Corack districts.

At Dimboola a reservoir of some 310,000 cubic yards capacity was constructed and filled from the Jung-Dooen Channel system. This permits of the costly high lift pumping from the Wimmera River being abandoned, and should effect a great improvement in the quality of water which hitherto had to be supplied from the old river storage.

At Hopetoun in the Karkarooc District an additional reservoir, with some 70,000 cubic yards capacity, was constructed to supplement the supplies to the town. To meet requirements in the growing towns of Jeparit, Dimboola, Hopetoun, Minyip, and Beulah, many main extensions were made during the year.

Proposals submitted by the Commission for the domestic and stock water supply to an area of 50 square miles west of the Wimmera River and south of Lake Hindmarsh were unanimously accepted by the landholders concerned. This tract of country is east of the boundary of usable bore water, and its development has been retarded as a result of the lack of an adequate water supply. The installation of a permanent supply will mean a very considerable increase in the productivity of the area. The works of this scheme consist of a pipe syphon  $1\frac{3}{4}$  miles long across the valley of the Wimmera River near Antwerp, tapping the Antwerp Channel, and the construction of some 40 miles of distributary channels with the necessary structures. Advantage will also be taken of the syphon to provide a pipe reticulated water supply for the township of Antwerp. Construction work has already been commenced, and the scheme will be ready for this season's watering.

At Rupanyup a new reservoir of some 50,000 cubic yards capacity is being built and the old storages are being improved. This, while doing away with much waste of water in the Dunmunkle Creek, will provide an ample supply of good quality water for the town.

The township of Yaapeet was reticulated and the scheme put into operation during last summer. Investigations are also being made into the possibility of a supply to the township of Noradjuha.

During the year investigation was made into a scheme for the distribution of Wartook stored water to Horsham and its vicinity. The new proposal will deliver water from a high level basin on the flank of Mt. Zero by means of a large pipe main to an elevation on the north side of the Wimmera sufficiently high to give supplies by gravitation, not only to Horsham, but to the whole of the adjacent northern ridge as well as to Dimboola town.

BIRCHIP, WYCHEPROOF, SEA LAKE, DERING, EUREKA, BARING, AND TYRRELL DISTRICTS.

The supply for practically the whole of these Districts will be given during the current watering from the new Waranga Western Channel extension.

Distributary channels from Charlton Channel system to a large area south of Wycheproof are being constructed and will be completed for the present run of water.

In the Walpeup area some 50 miles of distributary channels were constructed from the north end of the Dennyning system. The watering of this area, on account of the unusually dry season, has been considerably hampered owing to the porous nature of the soil and recurrence of sand drifts.

Further investigations in connexion with a supply to the high country adjacent to Walpeup were carried out and preliminary surveys were made for a channel water supply to high areas west of Nyarrin and north of Kulwin. The Commission is also enquiring into the possibilities for a pipe reticulation supply to the townships of Walpeup and Underbool.

Additions to the town storages of Wycheproof, Birchip, Tempy, Chinkapook, and Ouyen have been made and the storage supplying Speed township is at present being enlarged. Extensions to mains were made in Wycheproof and Birchip Urban Districts.

#### LONG LAKE AND TYNTYNDER DISTRICTS.

In Long Lake District an extension to the channel known as Mann's was made and a number of channels in the District remodelled.

The whole of the supply to these Districts will be given this watering season from the new Waranga Western Channel extension, and already the general watering has been greatly expedited.

The Commission has in hand the construction of an additional reservoir for the township of Ultima, and extensions to mains were made in Quambatook, Manangatang, and Nyah West Urban Districts.

#### MORNINGTON PENINSULA DISTRICTS.

The construction of the new reservoir in the Eumemmerring Valley, some 3 miles north-east of Dandenong, referred to in last Annual Report, was commenced. It is proposed to build the first stage of this reservoir to R.L. 220.00, having a capacity of 3,100 acre feet and involving approximately 200,000 cubic yards of excavation. The maximum depth at this stage would be 42 feet. Provision has also been made to enable an enlargement of the reservoir being carried out at a future date to a maximum final capacity of 60,000 acre feet.

The proximity of this storage basin to the Hallam Valley Settlement as well as the closely populated areas of Dandenong and Spring Vale, the bayside townships between Mordialloc and Frankston and the contiguous areas, renders this storage a most valuable asset to the scheme.

The tunnel 18 chains long from the Beaconsfield Reservoir through the hill on O'Neills Road to enable a future augmented supply to be carried to the new reservoir is completed.

The Mornington Peninsula scheme has been further extended to embrace the township of Beaconsfield, while considerable extensions to the existing reticulation systems in the townships of Dandenong, Spring Vale, Mornington, Mount Martha, South Frankston, and others on the foreshore from Mordialloc to Frankston were also carried out.

Schemes for supply to the townships of Garfield and Bunyip and Crib Point were approved by the townspeople concerned, and it is intended to proceed with these works at an early date.

The investigation of a supply to the important bayside townships of Dromana, Rosebud, Rye, Sorrento, and Portsea is nearing completion and will shortly receive consideration.

At the request of the Government the Commission undertook the clearing and grubbing of the Police Paddock and the eradication of the blackberries and other noxious weeds thereon. An area of 720 acres, a large portion of which was closely timbered land, was cleared and grubbed ready for ploughing. The blackberries on 300 acres of this land were cut down and burnt and the land was ploughed with tractors.

The first stage of a reclamation scheme on the Dandenong Creek between the Princes Highway at Dandenong and the area known as the Police Paddock was put in hand so as to give some relief to the lower portions of Dandenong township, which are badly flooded at times from the creek overflow. The work done has already demonstrated the value of the increased capacity during high flow of a section of the creek adjoining the Dandenong Park.

When the Paterson River Cut at Carrum was made about 40 years ago, water, which hitherto found its way into the Kananook Creek, was diverted into Hobson's Bay at Carrum. This has caused the creek to become a stagnant watercourse. At the request of the Frankston Council the Commission, with the Public Works Department, prepared a scheme for pumping sea water from Hobson's Bay to flush the creek. This scheme, which was approved by the Shire Council, provides for a jetty 410 feet long to carry a 39-inch steel suction pipe and pump which will discharge 60 cubic feet per second into the creek near Seaford. This will flush the creek from Seaford to Frankston and, if necessary, from Seaford to Carrum. The works will be carried out by the Commission and the Public Works Department, the Council bearing three-fourths and the Government one-fourth (not exceeding £2,000) of the total cost estimated at £5,680. The Council also proposes to clean out the creek and enlarge it where necessary, the Commission on its part lending one of its dragline excavators.

### BELLARINE PENINSULA WATER SUPPLY SCHEME.

Substantial progress was made during the year with this scheme which was commenced in the previous year. When completed the winter and spring flows of the Upper Barwon River and its tributaries in the Otway Ranges will be tapped and conveyed by earthen channel, with 54-inch diameter pipe syphons over watercourses, to the main storage reservoir at Wurdee Boluc. Supplies of water as required will be drawn from this reservoir by channels and pipes for the use of the city of Geelong and the towns of Queenscliff, Drysdale, Barwon Heads, and other important centres on the Bellarine Peninsula.

The works completed to date comprise the Wurdee Boluc Reservoir of 9,500 acre feet capacity (1st stage);  $15\frac{1}{2}$  miles of main inlet channel, including 1 mile 14 chains of 54 inch diameter pipe syphons; 8 miles of branch channels tapping Retreat and Pennyroyal Creeks;  $17\frac{1}{2}$  miles of outlet channel with necessary structures to convey the water to the new pipe head basin at Waurm Ponds of 260 acre feet capacity which has also now been completed.

In October a commencement was made with the storage of water in Wurdee Boluc, and some supplies were made available to the Geelong Water Trust last summer through a 24-inch diameter wood pipe main, which will eventually also convey the supplies to the Bellarine Peninsula. For the purpose of supplying Geelong the Geelong Water Trust laid a 21-inch diameter connecting main from this pipe to its Montpellier Basin.

To supplement the Wurdee Boluc Storage an extension of the inlet channel to tap Goslings Creek, involving the construction of a further 8 miles of main channel, including  $1\frac{1}{4}$  miles of 54 inch diameter steel pipe syphons, is rapidly nearing completion, and a further short extension to Dewings Creek for the same purpose is contemplated.

Arrangements are now in hand for the laying of a 16-inch diameter main 14 miles long from the Geelong offtake to feed a proposed main service basin near Drysdale from which supplies will be distributed to the Bellarine Peninsula towns. Three miles forty-eight chains of this main have already been secured for this work, and tenders will be invited for the balance as necessary. Although the season has been unusually dry, some 2,000 acre feet have already been stored in Wurdee Boluc Reservoir. This, it is anticipated, will be considerably augmented before the summer, and will furnish useful supplies for the coming season's requirements.

### WONTHAGGI DISTRICT.

Several extensions of the reticulation were carried out to supply new subdivisions within the District. During the year the water in the main storage reservoir was chemically treated to maintain the purity of the supply.

The new electrically driven pump recently installed proved satisfactory and capable of supplying the maximum demands of the State Mine, the railways, and the township.

A proposal to supply water to the township of Hicksborough by extension of the works of the Wonthaggi District was investigated, and a scheme was submitted for the consideration of the local residents.

### NORTHERN MALLEE WATER SUPPLY.

In the Northern Mallee areas, adjoining those supplied by the Wimmera-Mallee scheme, but above the levels of its channels, a considerable amount of work has been done in opening up new country by cutting tracks, clearing, and grubbing roads, and in providing tanks, bores, and other means of water supply for contractors and new settlers.

### BORES.

Five additional bores have been put down in Walpeup West Waterworks District. Usable water not being obtained at the bore in the parish of Pallarang, which was commenced last year, boring operations were discontinued at 895 feet. In the parish of Koonda, at south-west corner of allotment 23, a bore was sunk to 800 feet, but usable water not being obtained boring was discontinued.

At Murrayville township, a bore was sunk to a depth of 558 feet and excellent water, which rose to within 100 feet of the surface, was obtained. In the parish of Boinka, a bore was sunk to a depth of 585 feet, usable water, struck at 557 feet, rose to within 80 feet of the surface. In the parish of Manpy, a bore was sunk to a depth of 600 feet, usable water, struck at a depth between 420 and 520 feet, rose to within 36 feet of the surface. In the parish of Koonda, at south-west corner of allotment 5, a bore was sunk to a depth of 509 feet, usable water, struck at 475 feet, rose to within 75 feet of the surface.

In the parish of Purnya, a bore has been sunk to a depth of 230 feet. As salt water only has so far been struck, boring is being continued. It is anticipated that boring to a depth of over 500 feet will be necessary.

Successful bores in the Northern Mallee now number 103.

### TANKS.

There are in the Mallee areas 260 public earthen tanks of total storage capacity 1,209,617 cubic yards, equal to 204,425,000 gallons. Of these tanks, 61 are in the county of Millewa, and have a total storage capacity of 125,268 cubic yards, equal to 21,170,000 gallons.

## ARTIFICIAL CATCHMENTS.

During the year, 3 half standard size ironclad catchments have been, and 1 full size is being, constructed in the Nowingi area. As this part of the Mallee, which is suitable for settlement, cannot be economically supplied with water by the extension of the ordinary channel system and as natural catchments and holding ground for storages are unobtainable, it is proposed that the water supply for farmers will be by means of artificial catchments of sheet iron discharging into watertight covered storages. The storages now being constructed are for the purpose of supplying water to contractors and to meet the preliminary requirements of settlers.

## WINDMILLS.

The windmills and hand pumps erected on the bank of the River Murray for the purpose of supplying Soldier Settlers on the Murray frontage have continued to operate satisfactorily and have been of great value during the past dry summer.

## ROADS.

During the year, 40 miles of tracks have been cut in the Millewa country, bringing the total length of tracks cut in unsettled areas to 324 miles. Of  $84\frac{3}{4}$  miles of roads grubbed during the year  $68\frac{1}{4}$  miles were in the Nowingi extension area, and  $13\frac{1}{2}$  miles in the Millewa country. The total length of roads grubbed and cleared by the Commission in the Mallee is now 5,789 miles. Ninety-seven sandhills of a total length of  $14\frac{1}{2}$  miles have also been improved by rubbing with local limestone.

## MILLEWA WATERWORKS DISTRICTS.

The Millewa domestic and stock water supply scheme, which is designed to serve about 1,000,000 acres adjacent to the Red Cliffs-Meringur Railway and its possible extension, has been so far completed to include the whole of the lands which have been settled.

The works necessary to extend the channel system to provide a water supply to the country about to be made available towards the South Australian border can be carried out as required, simultaneously with the selection of the area.

The fifth annual watering of the system was given during the year and the sixth annual watering is now in progress. Notwithstanding the unfavorable seasons, the waterings have been carried out very successfully.

This area was previously divided into the Lower and the Upper Millewa Districts, but for administration purposes they are now designated as Millewa and Millewa Central Districts. The Millewa District comprises 606 square miles, and is supplied by a one lift pumping plant, while the Millewa Central District comprises about 320 square miles of high country, supplied by a separate channel system from a relift pumping plant. The annual watering of both Districts for the current year is now almost completed.

Five miles of channels were constructed in these Districts during the period under review, making a total of 669 miles of channels in the area. This work practically completes the reticulation of the settled area.

The pipe reticulation water supply for the township of Werrimull has now been in successful operation for 18 months, and it has been found necessary to make several extensions to the mains during the year to cope with the development of the township.

A new pipe reticulated supply has been constructed for the township of Meringur, the present terminus of the railway from Red Cliffs. Supply was made available to the residents this year. To provide for this service it has been found necessary to enlarge the storage reservoir which was originally provided only for district purposes.

## DRAINAGE AND FLOOD PROTECTION SCHEMES.

## KOOWEERUP AND CARDINIA.

Experience of the past five years has demonstrated the effectiveness of the flood protection works in connexion with the Kooweerup and Cardinia Districts for all except most abnormal seasons.

A matter of importance equal to the reasonable control of outside flood discharges is the establishment of an effective system of internal drainage to cope with local conditions, and the Commission with this objective has, during the past year, confined its operations chiefly to the reconstruction of lateral feeders and to maintenance. During the year approximately 100 miles of these subsidiary and minor drains have been reconstructed or cleaned out and regraded. All growth has been removed from many miles of main drain reserves; and approximately 30 miles of drains and banks treated for the extermination of vermin and noxious weeds.

In the Garfield Area the enlargement of the 13-mile drain has been completed, by piece-work, from its junction with Walkers Drain to the foot of the high ground in close proximity to the Garfield township.

Structural work in these Districts has included the building of 8 timber bridges for a total length of 240 lineal feet; the installation of 4 concrete outlets and spillovers; the erection of 40 chains of post and rail guard fencing; and the necessary maintenance and repairs to existing structures.

In the removal of the accumulated sand from the bed of the Kooweerup Main Canal six privately owned suction plants, capable of delivering from 15,000 to 20,000 tons of sand per month, are now successfully operating, under an arrangement with the Commission, over a total length of approximately 9 miles, allotted in sections to six independent applicants. The average output during the year has varied between 4,000 and 6,000 tons per month and the total quantity of sand removed to date is approximately 170,000 tons, at a royalty of 3d. per ton. The demand for this class of coarse clean sand is increasing and it is expected that the undertaking will eventually develop into a prosperous commercial enterprise.

#### ECHUCA.

During the year the levee works of this District continued to prove effective, and properties within the District have again received complete protection from floods.

#### LOCH GARRY.

In October, 1928, a flood similar to that of June of the same year passed down the Goulburn River. Many hundreds of acres of crops were effectively protected from the flood waters, by the levee banks which as before, stood up well, and proved that the scheme is effectively serving its purpose.

#### KANYAPELLA.

In this District the works of the Commission prevented the flooding of the low-lying lands of the District during the year when the level of the Goulburn River rose above the bed of the Warrigal Creek Regulator. Steps are now being taken to prevent drainage water from Rodney coming into the Flood Protection District. When this is done the landowners therein will be further secured from flooding.

#### CARRUM.

The bucket dredge made considerable progress during the year in cutting the new Canal for the Eumemmerring Creek and has completed the work from the South Gippsland Railway Line down to Pillars Bridge. McDonalds Embankment has been topped up, and the southern embankment from Elliotts Lookout to Wells Road has been completed, the work being joined up to the existing protective embankment from Carrum.

The construction of a regulator on the Eel Race Drain at Carrum where it joins the Patterson River to control the water of this river during flood periods was commenced. The existing timber tide gate on the Main Swamp Drain at Mascot Avenue, Carrum, is also being replaced with a suitable concrete structure. On completion of these works, together with the closing of the gaps in the levee bank at Carrum, arrangements will be made for the main flow of the flood waters of the Dandenong Creek to be discharged through the Patterson River to the sea at Carrum, thus affording protection to the lands on the north side of the Main Mordialloc Drain between Pillars Bridge and Mordialloc township.

#### MURRAY LEVEES.

During the year, many applications for permission to erect levee banks to protect their lands from River Murray floods, were received from landholders in the States of New South Wales and Victoria. These applications were dealt with, after investigation, by the Interstate Committee of Representatives on Murray Levee Proposals, which is comprised of officers of the New South Wales Water Conservation and Irrigation Commission and the State Rivers and Water Supply Commission of this State.

#### RIVER EROSION, DRAINAGE, AND GENERAL.

During the year, many applications for permission to carry out flood protection, drainage, and other works have been received; and, where investigations have shown that the proposals were reasonable, the applicants have been granted permission, under the provisions of the *Water Act 1915*, to carry out the works at their own cost.

At the request of the Closer Settlement Board a report on the possibility of reclaiming the Island Morass, Kilmany Park Estate, Sale, and estimates of several alternative schemes were prepared.

At the request of the Closer Settlement Board, further investigations were also made in connection with the erosion of the Ovens River at Merriang Estate, Myrtleford. A report and an estimate of a proposal to protect the estate were prepared.

The erosion on the banks of the Avon River in the Maffra District at Boisdale caused serious damage to the Commission's channel at one point and in other places is extending very close to the works. In order to protect the works and prevent further damage, stone filled cribs on the lines of those used in the Bacchus Marsh District have been erected along these points of the river bank. The effect will be watched with the view to future works along this river.



## RIVER GAUGING.

As provided by section 32 of the *Water Act* 1915, the work of gauging and recording the flows of the principal rivers and streams of the State has been continued. The returns of volumes stored in reservoirs have been made available weekly for publication.

During the year, a new gauging station was established on the River Murray at a site approximately 3 miles below the junction of that stream with the Wakool River. Arrangements were made with the Commonwealth Meteorologist to make information concerning the river height at this station available for publication in the daily press.

As sufficient information has been obtained in regard to the behaviour of the Bemm, Cann, and Genoa Rivers, the gauging of these streams at Club Terrace, Weeagua, and Wangrabelle, respectively, has been discontinued. The number of gauging stations in the State is now 62.

## DIVERSION OF WATER.

In the exercise of the right of the State to the use and flow, and to the control, of water in rivers, creeks, streams and watercourses, lakes, lagoons, swamps, and marshes, supervision has been maintained over all such waters.

Consequent on the low flow in many streams, it was found necessary during the last week in December to restrict the diversion from some of the tributaries of the Ovens and Loddon Rivers. Early in January restrictions were also enforced on diversions from the Murray River below Wodonga, the Little, Broken and Barwon Rivers, and the Badger, Willimigongon, Diamond and Broken Creeks. These restrictions were kept in force until the middle of April, when they were gradually lifted.

The conditions during part of the year were favorable for irrigation, and the demand for authority to divert water was in excess of the previous year. Authorized diversions now in force are :—

Yearly permits	..	..	..	..	1,809
Flood Permit	..	..	..	..	1
Licences	..	..	..	..	12
					<hr/> 1,822 <hr/>

## GOULBURN HEADWORKS AND MAIN CHANNELS.

These works comprise the Goulburn Weir; the Goulburn-Waranga Channel, extending from the weir to Waranga Reservoir, a distance of  $23\frac{1}{2}$  miles; the Waranga Reservoir, the Waranga-Rodney Channel, a distance of  $4\frac{1}{2}$  miles; the Main Channel, extending westerly from the Waranga Reservoir to the Loddon River, a distance of 98 miles; the Tandarra-Calivil Main Channel, extending from 64 miles 69 chains on the Waranga Western Main Channel north-westerly to Tragowel Plains No. 1 Main Channel, a distance of 26 miles; and the Main Eastern Channel, which extends from the Goulburn Weir to the Katandra Area, a distance of  $49\frac{1}{2}$  miles. The total length of main channels is 202 miles. The irrigation districts supplied are South Shepparton, Shepparton, North Shepparton, Katandra, Rodney, Deakin, Tongala, Stanhope, Rochester, Echuca North, Dingee, Calivil, Tragowel Plains, and Boort.

Surveys and detailed investigations in connexion with a proposal to increase by 600 cubic feet per second the maximum volume that can now be delivered through the Goulburn-Waranga Channel into Waranga Reservoir from the Goulburn Weir have been completed, and estimates are being prepared for consideration.

General maintenance work has proceeded satisfactorily at Goulburn Weir and on the Goulburn-Waranga Channel.

The Eastern Goulburn Main Channel has been further extended during the year to the northern boundary of the parish of Katandra, a distance of  $1\frac{3}{4}$  miles, to supply lands recently purchased by the Commission and other lands in the parish of Dunbulbalane which will be included in the Katandra District. The extension involved the excavation of about 37,000 cubic yards of earth, and the construction of two bridges and one regulator of reinforced concrete design.

The work of enlarging the Eastern Goulburn Main Channel has proceeded satisfactorily throughout the year, the two dragline excavators and bucket dredge having been employed continuously. The excavation which increases by 66% the capacity as originally designed has been completed for a total length of 18 miles; 6 miles having been completed during the year. Only 13 miles of enlargement of this channel now remain to be done.

In order to protect the side slopes of the deep sections of the enlarged channel and with a view to obviating the necessity for beaching the whole of the side slopes below full supply level, a reinforced concrete regulator has been constructed near the Headworks to maintain the water

level at a constant height upstream. The work of duplicating the original 10 feet diameter reinforced concrete syphon under Muddy Creek with another 10 feet reinforced concrete tube has now being completed.

The Waranga Western Main Channel is being enlarged to meet the requirements of the proposed extensions of the Rochester, Calivil, Tragowel Plains and other Districts, as well as for the additional requirements arising from the extension of the channel west of the Loddon River. Three dragline excavators are operating on those sections requiring immediate enlargement. The enlargement of one mile of channel has already been completed while the capacity of the channel has been considerably increased for an additional  $10\frac{1}{2}$  miles by the machines working from one side of the channel only. It is proposed to complete this latter length to its ultimate capacity by operating the machines on the opposite side of the channel.

A commencement was made with the construction of a reinforced concrete emergency outlet on the Waranga-Western Channel at 25 miles 19 chains to discharge water into Lake Cooper should occasion require such an additional outlet.

The work of placing additional beaching on several sections of the Waranga Western Main Channel has proceeded as opportunity permitted. General maintenance has received proper attention.

Earthworks for the first 8 miles of the Waranga Western Main Channel extension, west of the Loddon River, to provide winter surplus flows to the northern half of the Wimmera-Mallee area, were let by contract and during the latter part of 1928 it was decided with a view of expediting the completion of the work to let practically the whole of the balance of the earthworks in small sections by piecework; gangs working day work on structures were also very considerably increased, resulting in the completion of about 27 miles of channel construction in eight months. From 0 miles to 32 miles over 1,000,000 cubic yards of earth including about 20,000 cubic yards of stone were excavated while 58 road and occupation bridges, the railway bridge at Mysia, four regulators and other structures were built.

The capacity of the channel as now excavated is 200 cusecs from the offtake at the Loddon River to 14 miles, and 100 cusecs from 14 miles on. As the channel for  $6\frac{1}{2}$  miles from the Loddon River, and at places between 14 miles and  $16\frac{1}{2}$  miles, passes through country subject to heavy cross-drainage, it has been constructed with the full supply level below natural surface with open banks to allow of free passage of flood waters.

## NEW STORAGES.

### EILDON RESERVOIR.

Work in the early part of this year was confined to extending the concrete lining in portion of the bywash channel, where the rock had been affected by floods, and to replacing further rockfill in the downstream side of the bank. Before this latter work was completed a subsidence occurred on 26th April, 1929, in the portion of the bank upstream of the corewall and near the middle of its length. About 1,000 feet in length of the upstream portion of the bank was affected by the initial subsidence to a maximum depth of 26 feet below crest level. The subsidence gradually extended somewhat.

An Inquiry Board consisting of Professor R. W. Chapman, chairman, and Messrs. H. H. Dare and E. G. Ritchie, was appointed to inquire into the cause of the subsidence, and other matters connected with the reservoir, and in its report made certain recommendations which are now being carried out. The Board concurs in the Reservoir being used for the storage of about two-thirds of its original capacity pending its recommendations being carried out.

### PYKES CREEK RESERVOIR ENLARGEMENT.

As stated in the last Report, the capacity of this Reservoir is being increased from 14,850 acre-feet to about 21,000 acre-feet, necessitating the raising of the crest level of the bank by some 10 feet.

The raising of the dam was continued, the material being obtained from excavations adjacent to the works while the quantity placed for the year was 61,700 cubic yards.

The core trench was excavated to the depth of the old clay core and filled with new clay obtained from pits near the work, the quantity obtained from these pits and placed in the trench being 4,745 cubic yards.

Excavations in rock for foundations had to be carried out to various depths up to 20 feet, and cement grouting of these foundations had also to be carried out extensively to overcome the difficulties met with and secure watertightness.

Formations and cuttings for the road deviation are nearing completion.

The foundations, piers and abutments for the new bridge over Myers Creek which were being carried out for the Country Roads Board were completed, and handed over to the Board for completion of the superstructure.

**TOTAL STORAGES IN STATE.**

In 1902 the total capacity of storages in the State was 172,000 acre feet. The present capacity is 1,267,520 acre feet, which may be temporarily reduced during repairs to Eildon Weir. When the Wimmera Storages, Glenmaggie, Pykes Creek, and Eumemmerring Valley Reservoirs are complete the total capacity will be about 1,350,920 acre feet. The Hume Reservoir, in course of construction, will, unless otherwise decided by the Commonwealth and State Governments, contain 2,000,000 acre feet, half of which can, subject to the provisions of the River Murray Agreement, be credited to the State of Victoria. The following statement sets out the capacities of the various storages in the State :—

<b>EXISTING STORAGES.</b>								Capacities in Acre Feet.	
<i>Goulburn System—</i>									
Goulburn Weir	..	..	..	..	..	..	..	20,700	
Waranga	..	..	..	..	..	..	..	333,400	
Eildon (200,000 acre feet during repair )	..	..	..	..	..	..	..	306,000	
<i>Murray-Loddon System—</i>									660,100
Hume Reservoir (part of 2,000,000 acre feet—half share)	..	..	..	..	..	..	..	50,000	
Kow Swamp	..	..	..	..	..	..	..	40,860	
Laanecoorie	..	..	..	..	..	..	..	14,000	
Kerang North-west Lakes	..	..	..	..	..	..	..	92,000	
Lake Boga	..	..	..	..	..	..	..	28,000	
Long Lake	..	..	..	..	..	..	..	3,820	
<i>Wimmera-Mallee System—</i>									228,680
Lake Lonsdale	..	..	..	..	..	..	..	45,480	
Wartook	..	..	..	..	..	..	..	23,800	
Fyans Lake	..	..	..	..	..	..	..	17,100	
Taylor's Lake	..	..	..	..	..	..	..	30,000	
Pine Lake (part of 62,000 acre feet)	..	..	..	..	..	..	..	52,000	
Lower Wimmera Weirs	..	..	..	..	..	..	..	2,870	
Batyo Catyo (Avon Regulator)	..	..	..	..	..	..	..	5,000	
Lake Whitton	..	..	..	..	..	..	..	1,300	
Earthen Storages, Township Reservoirs, and Mallee Tanks	..	..	..	..	..	..	..	5,530	
<i>Maffra-Sale System—</i>									183,080
Glenmaggie Reservoir (part of 150,000 acre feet)	..	..	..	..	..	..	..	..	104,500
<i>Coliban System—</i>									
Upper Coliban	..	..	..	..	..	..	..	25,700	
Malmsbury	..	..	..	..	..	..	..	12,300	
Subsidiary Reservoirs	..	..	..	..	..	..	..	6,910	
<i>Werribee—</i>									44,910
Pykes Creek (part of 21,000 acre feet)	..	..	..	..	..	..	..	16,200	
Melton	..	..	..	..	..	..	..	17,000	
<i>Bellarine Peninsula System—</i>									33,200
Wurdee Boluc	..	..	..	..	..	..	..	9,500	
Service Basins..	..	..	..	..	..	..	..	260	
<i>Mornington Peninsula System—</i>									9,760
Beaconsfield, Frankston, and Mornington Reservoirs	..	..	..	..	..	..	..	1,560	
Service Basins..	..	..	..	..	..	..	..	180	
<i>Miscellaneous—</i>									1,740
Wonthaggi	..	..	..	..	..	..	..	..	1,550
<b>Total capacity of existing Storages</b>									<b>1,267,520</b>

**ADDITIONAL STORAGE BEING PROVIDED BY WORKS IN COURSE OF CONSTRUCTION.**

<i>Wimmera-Mallee System—</i>									
Pine Lake (balance of 62,000 acre feet)	..	..	..	..	..	..	..	10,000	
Green Lake	..	..	..	..	..	..	..	20,000	
<i>Maffra-Sale System—</i>									30,000
Glenmaggie Reservoir (balance of 150,000 acre feet)	..	..	..	..	..	..	..	45,500	
<i>Werribee System—</i>									
Pykes Creek (balance of 21,000 acre feet)	..	..	..	..	..	..	..	4,800	
<i>Mornington Peninsula System—</i>									
Eumemmerring Valley Reservoir (first stage)	..	..	..	..	..	..	..	3,100	
<i>Murray System—</i>									
Hume Reservoir, at junction with Mitta River, half-share of balance of 2,000,000 acre feet	..	..	..	..	..	..	..	950,000	
<b>Total capacity of Storages when works in hand are completed</b>									<b>2,300,920</b>

**WATER SUPPLY MAP OF THE STATE.**

A map of Victoria, showing its natural and artificial water resources, is inserted in this Report. The map shows effectively the development of the State's water supply enterprises under the administration of the Commission, and gives a comprehensive view of the various waterworks systems for Irrigation, Domestic, and Stock Supply, both Rural and Urban, and location of Flood Protection Districts.

Storage Reservoirs are indicated, also Main Channels, and principal Distributory Channels, together with the numerous Rural Waterworks Districts served thereby, the Urban Districts and other towns having Public Water Supplies, as well as those with Sewerage Systems. The map will prove useful for reference in connexion with matters relating to water supply.



## RIVER MURRAY WATERS AGREEMENT WORKS.

### GENERAL OUTLINE.

The scheme of works provided in the River Murray Waters Acts, passed by the Governments of the Commonwealth and of the States of New South Wales, Victoria, and South Australia, comprises storages on the Upper River Murray and at Lake Victoria, locks and weirs in the course of the River Murray from its mouth to Echuca, and also locks and weirs on the lower part of the River Murrumbidgee. The Acts also provide that, for purposes of construction, the Minister of Public Works of New South Wales shall be the Constructing Authority for that State; that for South Australia, the Commissioner of Public Works shall be the Constructing Authority; and that the State Rivers and Water Supply Commission shall be the Constructing Authority for Victoria.

A conference of representatives of the Commonwealth, New South Wales, Victorian, and South Australian Governments was held at Canberra on 27th and 28th February, 1928, when the question of the future development of the Murray Valley and the works of Water Conservation and Distribution necessary therefor was discussed. The conference decided that the programme of works to be constructed under the River Murray Agreement during the period ending June, 1932, be limited to the following, and be carried out by the present Constructing Authorities:—

- (1) The completion of the Hume Reservoir to 2,000,000 acre feet capacity;
- (2) The completion of the Lake Victoria Storage;
- (3) The completion of all weirs and locks from the mouth of the River Murray up to No. 11 (Mildura); and
- (4) The construction of weir and lock No. 15 (Euston).

This conference also decided that in order to co-ordinate present and future development of irrigation and production in the basin of the Murray and its tributaries, an Advisory Committee (now termed the River Murray Advisory Committee) be appointed, consisting of two representatives of each of the States of New South Wales, South Australia, and Victoria, and a representative of the Commonwealth Government and of the Development and Migration Commission, the last of whom was to be Chairman. The duties assigned to this Committee were (1) the collation of information regarding production in all States and the areas and suitability of lands available for settlement in the basin of the Murray and its tributaries; (2) the investigation of markets for irrigable products in Australia and abroad; (3) the advising on the co-ordination of production and future development in existing and new areas; and (4) the bringing under the notice of the Council for Scientific and Industrial Research problems requiring scientific investigation.

This Committee held its first meeting in May, 1928, and since then four further meetings have been held. At a meeting held in May, 1929, the Committee was, as a result of the recommendation of the British Economic Mission, requested by the Commonwealth Government to direct its attention to the question of the most economic capacity of the Hume Dam, and submit its views for the consideration of the Commonwealth, the Federal Loan Council, and the interested States.

In the intervals between the meetings of the Committee and since the last May meeting the staff of the Development and Migration Commission has, in co-operation with the staffs of the various Commissions and other State Authorities concerned, been engaged on the investigations set out in the original and additional terms of reference. In the meantime, the Federal Loan Council desires to curtail expenditure on the construction of the Hume Reservoir until such time as its ultimate capacity has been determined, arrangements being made for a part storage of at least 100,000 acre feet.

At a conference of Ministers representing the Commonwealth Government and the Governments of New South Wales, South Australia, and Victoria, it was decided to appoint an independent Committee to report on the question of the estimated cost of completing the Hume Reservoir to a capacity of 2,000,000 acre feet. Mr. E. G. Ritchie, M.Inst.C.E., Chief Engineer of Water Supply, Melbourne and Metropolitan Board of Works; Mr. W. G. T. Goodman, M.Inst.C.E., General Manager and Chief Engineer, Municipal Tramways Trust, Adelaide; and Mr. E. H. Graves, Land Valuer, Sydney, comprise the Committee which is now inquiring into the subject.

The Weir-Lock No. 10 at Wentworth has been completed by the New South Wales Authority, and is now in operation.

As a result of the reduction of the estimated annual expenditure, the New South Wales Authority found it necessary to suspend operations on the Weir and Lock No. 15 at Euston.

The storage works at Lake Victoria were fully completed by the Constructing Authority for South Australia, and maintenance work was carried out during the year. Locks Nos. 1, 2, 3, 4, 5, and 9 have been completed, and good progress has been made with the work on No. 6.

The State Rivers and Water Supply Commission, the Constructing Authority for Victoria, has finished the Weir-Locks at Torrumbarry and Mildura.

#### HUME RESERVOIR.

During the year, the Constructing Authority for New South Wales has been engaged on the Hume Reservoir within its territory. The main work carried out in this section has been the installation of the valves and the raising of the main wall to make possible the storage of 100,000 acre feet of water. The steel work for the Bethanga Bridge has also been delivered by the contractors and is now being erected.

In Victoria the construction of the main embankment was continued by the Water Commission. The height of the embankment extending from the Victorian bank of the river for about 1,000 feet is now about 43 feet above the flats. The remaining portion of the embankment to the high ground on the Victorian side is approximately 75 feet above the natural surface level.

The output during the year was the greatest since the commencement of the works. 588,737 cubic yards of earthwork were placed over a length of 2,400 feet; 2,901 cubic yards of rock were excavated from the core trenches of the embankment; 9,132 cubic yards of concrete and 140 tons of steel were placed in the core wall; and 30,426 cubic yards of gravel were transported from Chiltern to the works.

On 2nd February, 1929, the New South Wales concrete wall was closed and the water level allowed to rise in the Reservoir. The maximum amount of stored water since that date was 80,000 acre feet.

The two piers remaining to be done at Bethanga Bridge were completed, 1,009 cubic yards of concrete and 10 tons of steel reinforcement being placed. Both the New South Wales and Victorian approach banks to the Bridge were also completed, 2,552 square yards of beaching being placed.

Pending the erection of the Bethanga Bridge, temporary access has been provided for residents of Bethanga and district by the installation of a punt just upstream from the site of the bridge.

Topographical and soil surveys are now being carried out in connexion with the use of water for irrigation to lands along the Murray Valley from the Hume Reservoir to Picola, some 120 miles westward, distribution to be made by means of an outlet at the Reservoir and a diversion weir near Yarrawonga.

#### NO. 11 WEIR AND LOCK, MILDURA.

This weir and lock, which was completed last year, has worked satisfactorily, and has been of the greatest assistance in maintaining a reasonable level of supply for both Mildura and Red Cliffs, as well as improving the quality of the water itself by preventing undue percolation of salt affected water.

#### TORRUMBARRY WEIR AND LOCK.

This weir is acting admirably, and has practically revolutionized the supply of water to the important Kerang-Cohuna-Koondrook Centre, which previously had to depend mainly on an expensive pumping system. The gravitational supply is, in addition, of the greatest value to Swan Hill area, which also was formerly dependent on pumping.

## WORKS CONTROLLED BY OTHER AUTHORITIES.

(Under General Supervision of the Commission.)

## SEWERAGE IN COUNTRY DISTRICTS.

The Bendigo Sewerage Authority is completing the reticulation of its sewerage district. With the completion of the Golden Square area and the sewerage of Ironbark, plans for which are in course of preparation, the present scheme will be fully carried out.

The Ballarat Sewerage Authority has practically completed the sewerage of the city area and consideration is now being given to the sewerage of the suburban areas.

The Colac Sewerage Works have been in operation throughout the year. All tenements in the sewerage district are now connected to the sewers; the Horsham Sewerage Authority is deferring temporarily, construction of works pending consideration of an improved water supply to the town; and the Swan Hill Sewerage Authority has had prepared plans and specifications for the construction of sewers, pumping station and treatment works, and will shortly be inviting tenders for these works.

The Echuca Sewerage Authority is inviting tenders for the construction of works, and the Mildura Sewerage Authority, having completed the survey of the town, is now having detailed plans and specifications prepared with a view to inviting tenders at an early date.

Sewerage schemes for Ararat and Mornington were investigated, but the respective Councils decided not to proceed with the proposals at present owing to the high cost.

Applications for the constitution of Sewerage Authorities at Lorne and Warrnambool are under consideration while among other country centres contemplating the installation of sewerage are Bairnsdale, Dandenong, Maryborough, Shepparton and Wangaratta.

## COUNTRY WATER SUPPLIES.

Many important works were carried out by waterworks trusts and local governing bodies, of which there are now 111 and 18 respectively.

The Avenel Waterworks Trust is constructing a concrete standpipe and installing a pumping plant to augment the town water supply by pumping from Hughes Creek; the Echuca Borough Water Trust installed a new electric pumping plant automatically operated in order to reduce pumping charges and to provide an assured supply for sewerage purposes; the Hamilton Waterworks Trust commenced the construction of a new storage reservoir in Hamilton to conserve water for the summer requirements of the town; and the Healesville Waterworks Trust carried out some important extensions to its reticulation system.

The Kilmore Waterworks Trust carried out works to improve the supply to the townships of Kilmore and Wallan, and to the railways.

The Kooweerup Waterworks Trust was constituted during the year and plans and specifications have been prepared and approved for works including settling basin, pumping plant, elevated concrete tank and pipe reticulation of the town.

The Korumburra Waterworks Trust completed the construction of a pumping plant and a storage reservoir of 30,000,000 gallons capacity, the existing storages being inadequate, while the Korong Shire completed a new reservoir and pipe line to augment the water supply of the township of Wedderburn.

The Orbost Waterworks Trust has installed treatment works to purify the town water supply which was previously subject to discoloration; and the Portland Waterworks Trust put down bores from which the town supply is to be drawn. The tests of the bores have proved very satisfactory, an ample supply being obtained.

The Shepparton Waterworks Trust carried out extensive remodelling and extensions of the town reticulation.

The Stawell Borough Council has commenced the replacement of its main pipe line. The first section of 3 miles is being completed, and it is intended to relay further sections as circumstances permit.

The Upper Macedon Waterworks Trust is constructing a storage reservoir at the head of the Turritable Creek to improve the supply during the summer months; the Wangaratta Waterworks Trust is arranging to install an electric pumping plant of 60,000 gallons per hour capacity, the old plant being unable to meet the increasing requirements; and the Woodend Waterworks Trust is enlarging a section of its main pipe line from Falls Creek to enable more water to be stored in the local reservoirs during the winter months.

The Yarram Waterworks Trust relaid a section of the main pipe line from the Tarra River with larger pipes, the old main being in bad order in this section and of insufficient size to meet the growing demands of the town; while, during the year, the Yarrawonga Urban Waterworks Trust installed a new electric pumping plant to enable a reduction in pumping costs which, with the old steam plant, were very heavy.

Pipe extensions and minor works were carried out at Alexandra, Colac, Hamilton, Horsham, Kerang, Kyabram, Lorne, Maffra, Mansfield, Morwell, Murchison, Murtoa, Nhill, Romsey, Rushworth, Swan Hill, Toora, Trafalgar, Warrnambool, and Warragul.

Proposed water supply schemes for Foster, Lakes Entrance, Port Fairy and Tallarook were investigated.

Proposed improvements were investigated in connection with the existing schemes of Avoca, Beaufort, Gisborne, Kyneton, Macedon, Numurkah, Rochester, Rushworth, Seymour, Sunbury, Tongala, Warracknabeal, and Woodend.

## GENERAL.

## LANDS UNDER CLOSER SETTLEMENT IN IRRIGATION DISTRICTS.

Notwithstanding that the abnormal demand for irrigable Closer Settlement land which took place during the few years succeeding the War has been satisfied, and that lately there has been a considerable decline in the number of landseekers arriving from overseas, the Commission has received during the year a fairly continuous stream of applications for farms in the irrigation areas. The total number of applications approved since last report was 170, and of this number 137 allotments were granted to Local Applicants, 27 to Discharged Soldiers, and 6 to Overseas Settlers.

In addition to the number of new settlers placed on farm allotments, 91 lessees who had already established themselves were provided with additional areas from allotments, the leases for which had, for various reasons, been vacated. Fifty-five of the applications so approved were received from Discharged Soldier Settlers, who had developed their holdings to such a degree as to enable them to successfully undertake the farming of the larger areas under irrigation.

The water supply scheme having been completed, an area of 3,780 acres comprising three subdivisions of 1,000, 1,500, and 1,280 acres respectively, being portions of the new Calivil Settlement in the parishes of Calivil and Pompapiel, were made available. An outstanding feature in connexion with the subdivision of this estate is that in each case the number of applications received far outnumbered the holdings available, a fact which serves to indicate the eagerness with which irrigable farms are sought. The capital in possession of the 26 successful applicants totalled £25,773. The Commission still holds in reserve for future subdivision in this district the Pompapiel Forest Reserve, comprising some 940 acres, which was taken over last year from the Forest Commission for subdivision into Closer Settlement farms.

With the exception of the area reserved for township, the remaining portion of the Katandra Estate, which had been temporarily leased during the construction of the necessary water supply channels, was subdivided into 25 allotments, with a total area of 1,684 acres, and made available for application. These holdings, like those at Calivil, were fully applied for and allotted to settlers who, similarly, possessed sufficient capital to carry them through the developmental period.

At Hallam Valley, where the market gardening settlement has been established, the Commission holds 1,440 acres for future subdivision, pending the completion of the reclamation works.

Not the least important feature in regard to the irrigated Closer Settlement areas has been the facility with which a number of the lessees in the older districts have been able to dispose of their holdings at much financial gain, after having, during the period of their occupancy, abundantly proved the possibilities of the profitable results to be obtained from farming under irrigation conditions. The Commission approved of 104 applications to transfer during the year.

The following statement shows the lands purchased and subdivided by the State, and the extent of settlement on each estate. The subdivided portions of these estates are already supporting about sixteen times as many families as resided thereon prior to their subdivision for Closer Settlement :—

Closer Settlement Estates.	Area of Lands purchased by the State in Acres.	Properties Subdivided.					Number of Closer Settlement Blocks now occupied.	Present Increase in Number of Families.
		Area in Acres.	Number.	Number of Families thereon when Purchased.	Subdivided into—			
					Number of Closer Settlement Blocks.	Average Area in Acres.		
Shepparton .. .. .	14,170	14,170	33	29	384	34	369	340
East Goulburn .. .. .	13,400	13,400	21	20	162	74	160	140
Rodney .. .. .	3,230	3,230	8	5	55	57	43	38
Stanhope .. .. .	21,500	21,500	7	13	279	66	264	251
Kyabram .. .. .	4,600	4,600	10	12	69	62	63	51
Tongala .. .. .	19,090	19,090	41	36	309	60	296	260
Koyuga .. .. .	4,200	4,200	} Pt. 1	..	{	54	73	52
Cornelia Creek .. .. .	2,500	2,500				19	161	19
Nanneella .. .. .	9,040	9,040	18	8	124	70	119	111
Echuca .. .. .	3,600	3,600	8	4	30	105	30	26
Bamawm .. .. .	13,400	13,400	28	21	192	65	192	171
Dingee .. .. .	500	500	3	1	20	23	17	16
Calivil .. .. .	4,800	3,860	8	6	26	149	26	20
Cohuna .. .. .	12,000	12,000	29	10	142	80	120	110
Koondrook .. .. .	9,060	9,060	14	10	129	64	88	78
Swan Hill .. .. .	12,500	12,500	34	16	325	36	312	296
Nyah .. .. .	3,800	3,800	8	1	236	15	232	231
Merbein (Crown) .. .. .	8,300	8,300	..	..	418	20	413	413
Red Cliffs .. .. .	33,000	18,000	1	3	689	17	679	676
Bacchus Marsh .. .. .	70	70	1	..	2	36	2	2
Werribee .. .. .	10,000	10,000	1	11	229	36	224	213
Hallam .. .. .	3,300	1,860	7	4	96	19	89	85
Maffra-Sale .. .. .	10,570	8,970	23	22	175	48	173	151
216,630		197,650	304	232	4,164	59	3,982	3,750
Properties acquired under Sec. 20, <i>Closer Settlement Act</i> 1915, outside above Estates		19,540	..	..	..	..	203	..
236,170								

# PROGRESS OF IRRIGATED CLOSER SETTLED DISTRICTS.

That the advantages afforded by Irrigated Closer Settlement under the jurisdiction of the Commission are becoming increasingly recognized has been illustrated to a great degree during the past twelve months. Not only has the type of applicant been quite equal to those of previous years, but the number attracted by the opening up of the remaining portions of the Maffra-Sale, Katandra, and Calivil Estates has exceeded the number of holdings available by over 200 per cent., and their financial resources and previous experience have been such that their success seems assured. The average financial resources of those who were allotted blocks in the last portions of the above estates approached £1,000, the greater part of which was cash.

The demand for holdings in the older irrigation areas is very brisk, and a good class of settler is taking up blocks either by transfer direct from the original holder or by taking up relinquished areas.

Irrigated Closer Settlement, involving as it does more intensive culture, has led to an increased and more uniform demand for water, with the result that there is a greater stability in the area irrigated in successive years than before the establishment of closer settlement; and, while there is over a number of years a large increase in the area irrigated, the variation in areas watered through dry and wet seasons is not nearly so marked as before the introduction of closer settlement.

This is mainly due to the replacement of native pastures and cereals by lucerne, vineyards, orchards, and citrus groves, which require watering to a great extent apart from seasonal changes; for example, in 1907-8 lucerne comprised under 14 per cent. of the area irrigated, in 1928-9 it comprised fully 30 per cent., and whilst in 1907-8 vineyards, orchards, and citrus groves comprised only 6½ per cent. of the area irrigated, in 1928-9 they represented 15 per cent.

These increases in the area irrigated, especially of lucerne, have enabled the farmers in the irrigation areas to increase their flocks and herds at a time when in the remainder of the State they have either remained stationary or decreased. In addition, they have also helped to minimize the effects of the present drought by providing feed for an increased number of sheep; thus the number of sheep in the irrigation counties of Tatchera, Gunbower, Bendigo, and Rodney as at 1st March, 1929, was practically two million, as against an average of one and a third million in the five-year period ending on the same date in 1927; this represented an increase of over 50 per cent. in the number of sheep in these counties. As during this period there had also been a slight increase in number of sheep in the non-irrigated areas of the State, it would appear that the bulk of these sheep has come from the partially drought-stricken areas of the Western Riverina.

In the dried fruit irrigation districts, the most interesting fact was the large yield per acre. Although the vines had been severely damaged by the frosts of September, 1927, an average of nearly 2 tons per acre was obtained, the total yield for Victoria being over 48,000 tons, exclusive of spirit or grapes sold fresh on the open market. At the commencement of the harvest the attention of all growers was directed to the desirability of obtaining better grades, and this was eminently successful at Red Cliffs, where 75 per cent. of the 13,100 tons of sultanas harvested was of the highest grades. In some individual cases very high percentages of highest grades of four-crown fruit were obtained, several getting over 90 per cent., thus indicating what can be done by care and attention during the drying season. The same result, unfortunately, was not obtained at Woorinen or Nyah, but this can be attributed to the poorer drying season experienced, numerous settlers having to utilize small dehydrators to finish off their fruit.

In regard to canned fruits, the outlook is much more promising, as the demand from overseas, especially Canada, is most gratifying, and from present indications there should be no difficulty in disposing of the large pack which appears to be likely next season. In this respect the appointment of a Trade Commissioner to Canada, advocated in previous reports, is having a beneficial effect.

The suitability of the irrigation areas for dairying was again illustrated by the result of the Standard Herd Test conducted by the Department of Agriculture. The total number of herds tested in the State which averaged over 350 lb. of butter fat per cow was 56, of which no less than seventeen were from irrigation districts, although only 10 per cent. of the cows in the State are in the irrigation areas. First, second, and fifth places were obtained by Commission settlers, the remainder being well up. In the individual cow test, settlers in the irrigation areas were again very prominent, the first place being secured by a Commission settler, whose cow produced 732 lb. of butter fat for the nine months period of test. The same settler had another cow in the test which has the remarkable record of having produced over 600 lb. of butter fat per year for the last five years.



Further successes were gained at the Royal Agricultural Show, no less than fifteen first places being obtained for the irrigable areas in the Jersey, Milking-Shorthorn, Red Polls, and Friesian classes. In addition, the *Weekly Times* butter-fat production test was won by a cow from the irrigation areas, as was also the first prize in the Payne Test for the most economical production of butter fat.

Now that the Herd Test Association movement is becoming thoroughly established, a still further improvement in the dairy industry can be looked forward to in the irrigation districts. This movement has convinced the old type dairyman, who looked for quantity rather than quality, that good testing stock and pedigreed bulls with good butter-fat records are absolute necessities if dairying is to be made a real payable proposition. The Department of Agriculture is giving wonderful assistance by supplying at half cost, to approved settlers, pure-bred bulls with known butter-fat records. To date no less than 90 of the total (470) supplied under this scheme have gone to the irrigated areas.

Along with the spread of Herd Testing, another scheme to promote better farming generally in the irrigation areas is the Farm Competition. This was first inaugurated in Cohuna in 1927 by the local Agricultural Society. Since then it has spread to Maffra-Sale, Rochester, and Tongala, the total entries last year being 61. The judges comprise officers from the Department of Agriculture and the Commission, who give much valuable information to the entrants, and the friendly rivalry amongst them is in itself doing a great deal towards better irrigation farming in all its branches.

While the fall in the price for eggs last year retarded somewhat the rapid development of the poultry industry made during the last few years in the irrigation districts, now that prices have been stabilized once more the marked increase made in previous years can be again looked forward to. The settlers at Narre Warren and Hallam are now entering seriously into this profitable side-line, and it will no doubt be of as great assistance to them as it has been to those on the Rochester, Stanhope, Shepparton, Murrabit, Werribee, and Katandra Estates, where the industry is now thoroughly established.

The severe frosts experienced throughout the whole State during June and July was a severe setback to the citriculturists, and in many cases the growers lost heavily. Experiments are being carried out by the settlers at Gonn Crossing with a view to evolving an economical method of prevention of damage by frost. During the year the Commission was instrumental in obtaining the services of Mr. Barclay, of the Meteorological Bureau, and as his visit to the Murrabit District coincided with two of the heaviest frosts experienced, it is anticipated that much good will result from his advice.

In the Werribee District settlers have, by the increased use of permanent pastures and by better methods of treating milk on the farms, so improved the quality that there has been a considerable expansion of the whole milk industry. This is being reflected throughout the District generally, inasmuch as the returns from dairying have greatly increased, and the settlers are again making this line their mainstay. The swing over from lucerne-growing for hay to dairying is shown by the increase in the number of dairy cows, which in 1923 totalled only 855, increasing in 1929 to 1,855. The area of permanent pasture has increased to such an extent that it is now almost equal to that of lucerne, being 2,350 acres and 3,040 acres respectively. This change is proving most beneficial to the settlement generally, and will no doubt result in a substantial financial improvement during the current season.

Settlement on the areas purchased on the two schemes, Katandra and Maffra-Sale, under the Migration Agreement with the British and Commonwealth Governments, has been practically completed, only a small area in the Sale District being unallotted. As stated above there has been a keen demand for the blocks in these districts, both from local and overseas settlers. Both districts are proving their worth for dairying and its allied industries. Flourishing Herd Testing Associations have been established at Maffra and Sale, and a number of the Katandra settlers are members of the North Shepparton Association. This last Association has the record of being the first one in the State in which every member possessed only pure-bred bulls.

The appointment of Mr. Supervisor Ryland, with two local officers, to act with the three representatives of the overseas settlers at Tongala, Shepparton, and Murrabit respectively as a "Joint Committee" to deal with complaints and various matters appertaining to the overseas settlers generally, or individually, has been most successful. Many matters have been dealt with during the past year, and in practically every case a solution satisfactory to both settlers and the Commission has been arrived at. By this means many misunderstandings have been overcome, with the result the overseas settlers generally are becoming better established.

Last February the Bendigo Agricultural Society organized a tour through the irrigation areas of the Goulburn Valley, and those who took part expressed great satisfaction at the development that has taken place, and were greatly impressed with the value of irrigation. They were conducted around the different districts by the respective officers of the Commission in charge of each district visited.

The second Annual Conference of District Advisory Boards representative of the irrigators in the Commission's Districts was held at Kerang, the Chairman of the Commission presiding. The Conference was entirely successful, many matters of interest to both the irrigators and the Commission being discussed. At the close of the Conference delegates were given an opportunity of inspecting the Kerang, Koondrook, and other Irrigation Districts in the vicinity, and were thus able to obtain much valuable information.

The Commission has continued its policy of helping the settlers to improve their social conditions by the provision of facilities for mental and physical recreation, and during the past year the hall at Katandra mentioned in the last report has been completed, and arrangements have been made for the erection of another at Woorinen.

In addition, a new recreation reserve has been provided at Red Cliffs, and facilities have been provided for tennis courts at Red Cliffs and Cliffside. Arrangements are also practically finalized for the extension of the Show Ground at Tongala.

The Annual Conference of Supervisors was again held during September, when various subjects pertaining to the betterment of the settlers' progress were discussed, and as a result it is anticipated that from the suggestions made and information supplied even better progress will be shown during the ensuing year. After the Conference the Supervisors visited the Werribee Research Farm, over which they were conducted by officers of the Department of Agriculture, and where they were able to note the beneficial results of the various experiments being carried out, especially with lucerne and permanent pastures.

The Irrigation Research Committee, comprising representatives of the Department of Agriculture and the Commission, has continued manurial and other experiments at Cohuna, Stanhope, Rochester, and Tongala. In addition, experimental plots have this year been laid out at Murrabit, and judging from the beneficial results obtained in the other districts they should prove a great help to the settlers on this estate in determining the best treatment for the various crops. The special work on the Tresco Irrigation Settlement has been continued, and the improvement mentioned in the last report maintained.

During the year the Department of Agriculture purchased a block of 100 acres at Tatura to establish an irrigation experimental orchard, and this should be of great assistance and benefit to the fruit-growers in the irrigation areas of the Goulburn Valley.

It is estimated that 40,000,000 tins of canned fruits are now produced in Australia, and of this no less than 60 per cent. is processed by Co-operative Canneries established in Irrigation Districts. A most gratifying development in regard to Co-operative Canneries is that notwithstanding many prognostications as to failure of Co-operative Canneries generally, the pioneer Cannery at Shepparton, after meeting all its interest and instalments when due, has arranged to pay off all its debt to the State Government, and to in future carry on without any guarantee from the Government for its trading operations. This satisfactory result arises from most expert management on the part of the directors and from loyal support by the fruit-growers who supported the Cannery through all its vicissitudes. The result obtained at Shepparton should be obtained at the Co-operative Canneries at Mooroopna and Kyabram provided the fruit-growers continue the support they are giving the two Companies, which have been established entirely in their own interests. As previously mentioned, the outlook for canned fruits is much improved, and following on the successful introduction of this product into Canada by means of an accredited representative, it is believed that even greater results would follow the appointment of a representative or representatives in the East where the United States of America is fast building up a business which should certainly be shared in by Australia.

A review of the irrigation operations for the year shows that, of the areas watered, those under lucerne and fodders represent no less than 35 per cent., pastures another 33 per cent., while areas cultivated as orchards and vineyards represent only some 15 per cent. of the area irrigated in the State. This is interesting in view of the statement frequently made that irrigation in Victoria means fruit-growing. As a matter of fact, while that industry is most important and valuable, its extent is relatively small compared to that of fodder growing, particularly for dairying and stock production. The rapid development that is taking place in planting of mixed pasture grasses will still further greatly increase the high percentage shown by the above figures.

## ADMINISTRATION.

### EXTENSIONS AND EXCISIONS.

The Rochester Irrigation District has been extended by adding an area of 4,800 acres in the parishes of Turrumberry North and Wharparilla, supplied by recent extensions of the Rochester Channel System, and not previously within any constituted district.

Leitchville Irrigation District was extended by the addition of 3,260 acres formerly within Kerang Irrigation District, and 160 acres not previously in any district.

Swan Hill Irrigation District has been extended by adding 1,100 acres in the parish of Tyntynder not previously in any constituted district, but now served by extensions of the Swan Hill Channels.

In the Maffra-Sale Irrigation System, the Maffra District was extended by adding 3,430 acres in the parish of Tinamba, and the Sale District by adding 1,660 acres in the parishes of Sale and Bundalaguah, not formerly in any district. Some 1,300 acres which were only tentatively included at the constitution of the Sale District were excised as a result of a readjustment of boundaries.

Minor extensions were made to the Echuca North, Fish Point, Third Lake, and Koondrook Irrigation Districts.

The Coreena Waterworks District, on the River Murray, was extended by the inclusion of some 13 square miles, formerly part of Tyntynder Waterworks District, and was reduced in extent, by the excision of 90 square miles, of lands comprising State Forest and River Frontages which could not be rated.

The Tyrrell Waterworks District was extended by the addition of 16 square miles excised from Walpeup West District when reticulated by the Tyrrell channels, while 1,440 acres were excised from Tyrrell District and added to Eureka District.

The Wimmera United Waterworks District was extended by the addition of 820 acres, excised from the Shire of Kara Kara Waterworks Trust District, while some 7 square miles were transferred from Long Lake Waterworks District to the Avoca Water Trust District, and a further 8 square miles were excised from the former district, as they were not at present rateable.

Narre Warren Waterworks District in the Hallam Valley Area was extended by the addition of 1,270 acres excised from Mornington Peninsula Waterworks District.

Minor extensions were also made to the Dimboola Urban District in the Western Wimmera Waterworks District and to Red Cliffs Urban Division of Red Cliffs Irrigation District.

### NEW AND PROPOSED DISTRICTS.

Following the construction of the distributary channel system for the service of extensive areas north of Shepparton Irrigation District and within the Waterworks Districts of the Shires of Shepparton, Numurkah, and Tungamah Waterworks Trusts, an area of 64,300 acres in the parishes of Congupna, Katandra, Mundoona, Pine Lodge, Shepparton, and Tallygaroopna was constituted the North Shepparton Irrigation and Water Supply District, while an area of 14,200 acres in the parishes of Congupna, Dunbulbalane and Katandra was constituted the Katandra Irrigation and Water Supply District.

The distributary channels from the Tandarra-Calivil Main Channel for the supply of the proposed Calivil Irrigation District referred to in last Annual Report, having been completed, an area of 45,750 acres commanded by these channels, was constituted the Calivil Irrigation and Water Supply District.

The Lower Millewa and Upper Millewa Waterworks Districts were renamed "Millewa" and "Millewa Central" Waterworks Districts respectively.

Reticulation works having been completed for the supply of the townships of Meringur, in Millewa Central Waterworks District, Speed, in Tyrrell Waterworks District, and Yaapect, in Karkaroc Waterworks District, these townships have been proclaimed Urban districts.

### STAFF.

Mr. G. Laing, engineer, who had for a number of years held the office of General Superintendent of Closer Settlement, retired from the service of the Commission on 31st January, 1929, and Mr. J. A. Aird, previously assisting Mr. Laing, was appointed to the vacancy.

Mr. E. J. Lupson, District Engineer at Kooweerup, was transferred to Head Office, and Mr. F. M. Shaw, Resident Engineer at various works, was transferred to a similar position at Pykes Creek Reservoir.

Mr. J. Martin was transferred from the position of Works Overseer at Pine Lake to the position at Birchip rendered vacant by the retirement of Mr. W. Murray.

Mr. B. Davis was appointed Reservoir Keeper at Goulburn Weir in place of Mr. T. Lucas, also retired.

Mr. J. A. P. Ham was appointed District Secretary and Collector for Frankston in place of Mr. J. E. Jones, deceased.

Other officers who retired during the year were Messrs H. S. Teague, T. Hawkless, C. T. Dadswell, and J. West.

### FIRE INSURANCE.

The Commission has continued its policy of carrying the fire risk on its own buildings. The premiums thus saved now amount to £7,310.



## RECEIPTS, DISBURSEMENTS, AND ESTIMATES.

Last year's collections amounted to £539,665. This constitutes a record, and exceeds the receipts of some three years ago by no less than £134,940. The revenue collected in the Irrigation Districts amounted to £262,364, that in the Waterworks to £227,859, and the balance of £49,442 was received from all other sources. These moneys were collected as a result of 161 different water rates and charges made in the various districts directly controlled by the Commission. In the North-West Mallee, where vast areas of Crown lands are in process of settlement crops were practically a failure, the Government finding it necessary to grant sustenance allowances. The result has been that £50,000 water charges had to be carried over which would have been collected under ordinary normal seasonal conditions.

The expenditure under the Annual Vote amounted to £265,018. This shows a small advance of only £5,716 over last year notwithstanding the great extension of water supply works. The loan expenditure for the year was £1,436,642. These moneys were expended over all parts of the State, and full particulars are set down in another portion of this Report.

From the Irrigation Districts, now numbering 32, the receipts totalled £262,364. While this is a substantial improvement on the collections for the previous year, and is only short by £9,481 of meeting this year the debits for working expenses and interest chargeable on completed works, it is undoubted that in a number of Districts the Irrigation charges will have to be adjusted and in some cases increased to meet additional expenditure. As a result of the Loan Expenditure, several new and important districts are being constituted and developed, and this should in itself gradually account for a substantial increase of revenue under this division. Full details of the financial position of each district are shown elsewhere in this Report.

In the Coliban District the deficit for the year was £31,875. As previously pointed out, the rating in these districts is limited by the Water Acts, and any substantial diminution of the annual loss can only be attained by a general development of the whole district.

The number of Waterworks Districts under the direct control of the Commission, exclusive of the Coliban system, shows a steady increase, and now amounts to 99, which includes 67 township supplies. The total receipts in all districts amounted to £183,307, which, after meeting all working expenses and interest debitable on completed works, left a debit balance of only £7,778.

In the five Flood Protection Districts, where the works are carried out and maintained under the provisions of the Water Acts, the receipts amounted to £8,510. Although this is an advance of £1,274 on the collections for last year, it will be necessary in such Districts as Cardinia and Kooweerup to either increase the rating or extend the rateable areas.

The disbursements for the next financial year are estimated at £267,500, an advance of only £2,010 on those for 1928-1929. On the other hand, the receipts are estimated at £600,000, showing an advance of no less than £83,000 on the estimated revenue of the previous year.

The Loan Liability of the State for Works for Water Supply at the close of the year was £22,024,063. Of this total, £1,253,658 is for Free Headworks; £1,263,228 was Written Off; £147,046 was advanced to some early-formed Local Authorities; £135,288 has not been expended; £1,927,440 is represented by River Murray Works; and £5,519,440 by Uncompleted or Unallotted Works which are not revenue producing, details of which are set out separately in the Statement of Loan Liability in this Report. The balance of £11,777,963 is the sum in respect of which those benefited by the various works are this year liable for payment of interest.

The present interest charges on loans amount to £1,008,549. Of this amount, £128,194 is not chargeable to any districts, being debitable against Free Headworks, Amounts Written Off, and Unexpended Balances, and £88,262 is debitable against River Murray Works, while £252,756 is not at present debitable, being interest on cost of Uncompleted or Unallotted Works which are not yet revenue producing, leaving £539,337 as chargeable against the Commission and other Authorities. The amount available last year from the revenue of the Commission and other Authorities to meet such interest (after providing a sum of £28,536 for non-revenue producing works and services not chargeable to any districts) was £370,422, as set out in the statement on page 50.

## FINANCIAL POSITION.

The Statement of Loan Liability on page 50 of this Report sets out the present aggregate financial position in connexion with Works both for Irrigation and Domestic and Stock Supply as well as for Flood Protection and Drainage Services.

That Statement shows in detail the extent of the State's liability, although a large portion represents Amounts Written Off and other Amounts which cannot be charged to water users, such as Free Headworks.

Taking the figures in the Report the position in regard to Non-revenue and Revenue producing works is :—

	£	£
Gross deficit including all Written Off and Irrecoverable Amounts ..	638,127	
To which certain Amounts are debited for Pensions by Treasury ..	5,391	
	<hr/>	
Making a total of .. .. .		643,518
Included in this is Interest on—		
CAPITAL WRITTEN OFF 30 years ago (£1,263,228)		
FREE HEADWORKS declared 24 years ago (£1,400,704)		
RIVER MURRAY AGREEMENT WORKS (£1,927,440)		
Totalling .. .. .	210,261	
LOSS ON COLIBAN District where Rate is limited by Water Acts in lieu of general Writing Off .. .. .	31,875	
GENERAL SERVICES rendered by Water Commission chargeable to whole State (see page 43 of Report) .. .. .	28,536	
INTEREST ON LOAN MONEYS in hand at Treasury .. .. .	6,195	
	<hr/>	276,867
Deducting the above there remains to be accounted for a further sum of		366,651
At present there are Works under construction from which it is impracticable to obtain Revenue until completed or until districts connected with them have been settled so that Revenue could be collected. These comprise amongst others—Eildon and Waranga Reservoirs; Maffra and Sale Irrigation Districts; new Goulburn Districts; Kooweerup and Cardinia Flood Protection Districts; and Bellarine, Millewa, and other Domestic and Stock Schemes. The Interest on these would amount to .. .. .		252,756
		<hr/>
Leaving still to be accounted for a sum of .. .. .		113,895
The Interest chargeable to Districts controlled by the Commission is fixed by the Water Acts at 4 per cent., which until recently was sufficient. The percentage now charged by the Treasury is £4 14s. 3d., and this represents approximately a sum of .. .. .		69,998
		<hr/>
Leaving after excluding Interest on Free Headworks, Amounts Written Off, River Murray Works, and other Items mentioned .. .. .		43,897

From the above particulars it will be seen that considerable sums have many years ago been debited as and for Free Headworks and Capital Written Off, and the interest on these amounts, which cannot be charged to water users, still appears as a charge against Country Water Supply. There is also a large debit standing against the River Murray Agreement Works, which are being jointly constructed by the States of Victoria, New South Wales, South Australia, and the Commonwealth. This capital, although debited to Country Water Supply, cannot be allocated to any District. The next division of the above expenditure relates to Uncompleted and Unallotted Works, and these embrace large water supply schemes in various portions of the State where the development must be gradual following the introduction of intensive culture. One of the largest of these works is the Maffra-Sale Scheme, and the progress being made in this district gives every indication of a pronounced success. In the Bellarine District satisfactory returns should be shown in a comparatively short period, while in the North-West Mallee a return to normal seasonal conditions will undoubtedly lead to a considerable increase of revenue. Important additional Irrigation Districts are being established in the Goulburn Valley, and while this has led to a great increase of population in these areas, the successful development of these districts can only be gradually attained.

The Commission again directs attention to the increase in the average rate of interest paid by the Treasury and debited to Country Water Supply. The rate is now £4 14s. 3d. per centum, or 14s. 3d. higher than that which can be charged under the provisions of the present Water Acts.

The Receipts for last year amounted to £539,665, which is an increase of £45,916 over those of the previous year. For the incoming year the receipts have been estimated at £600,000, an increase of £83,000 over the estimate for 1928-29.

## RECEIPTS AND DISBURSEMENTS.

STATEMENT of Moneys received and disbursed during the year ended 30th June, 1929.

Works.	Receipts.	DISBURSEMENTS, exclusive of Interest, Redemption, and Depreciation Charges.			Excess.	
		From Annual Votes and Special Appropriation.	Deduct Capital and Other Disbursements not Chargeable to Districts.	Net Disbursements on Maintenance and Management.	Receipts over Net Disbursements.	Disbursements over Receipts.
	£	£	£	£	£	£
Coliban ... ..	44,552	15,335	...	15,335	29,217	...
Other State Works—						
Broken River ... ..	6	240	...	240	...	234
Goulburn ... ..	832	4,375	...	4,375	...	3,543
Kow Swamp ... ..	603	1,342	...	1,342	...	739
Lake Lonsdale ... ..	703	796	...	796	...	93
Loddon River ... ..	6	391	...	391	...	385
North-West Lakes ... ..	841	517	...	517	324	...
Irrigation Districts ... ..	262,364	117,171	...	117,171	145,193	...
Waterworks Districts ... ..	120,663	52,706	...	52,706	67,962	...
Urban Districts and Divisions ... ..	62,639	17,812	...	17,812	44,827	...
Flood Protection Districts... ..	8,510	1,544	...	1,544	6,966	...
Licences, Diversions, Miscellaneous	37,941	29,247	...	29,247	8,694	...
	539,665	241,476	...	241,476	303,183	4,994
Not Revenue Producing—						
River Gauging, Surveys and Re- ports, New Projects ... ..	...	4,486	...	4,486	...	4,486
Waterworks Trusts	} Cost of Administration	...	...	...	...	...
Boring for Water, Road		10,818	...	10,818	...	10,818
Clearing, Mallee and Land Settlement		8,238	...	8,238	...	8,238
Loan Works ... ..	...	...	...	...	...	...
Totals ... ..	539,665	265,018	...	265,018	303,183	28,536
Amount available to meet Depreciation ... ..					£500	
Amount available to meet Interest, as per page 50 of Report ... ..					£274,147	

## COLIBAN SYSTEM.

STATEMENT of Moneys received and disbursed during the year ended 30th June, 1929 ;  
and of Interest charged at the rate of 4 per cent. on Capital Debts.

District.	Capital Debit at 30th June, 1929.	Receipts.	Disbursements and Interest Charged.			Excess.	
			Disbursements.	Interest.	Total.	Receipts over Disbursements and Interest.	Disbursements and Interest over Receipts.
	£	£	£	£	£	£	£
Coliban ... ..	1,550,970	42,562	14,169	60,656	74,825	...	32,263
Axe Creek ... ..	1,750	383	367	70	437	...	54
Harcourt ... ..	7,040	1,465	749	282	1,031	434	...
Marong ... ..	2,100	142	50	84	134	8	...
Totals	1,561,860	44,552	15,335	61,092	76,427	442	32,317

## FLOOD PROTECTION DISTRICTS.

STATEMENT of Moneys received and disbursed from 1st July, 1920, to 30th June, 1929 ; and of Interest charged at the rate of 4 per cent. on Capital Debts ; and also of Depreciation and Redemption charged as at 30th June, 1929.

## RECEIPTS.

District.	1st July, 1920, to 30th June, 1922.	1928-29.			Grand Total at 30th June, 1929.
		Charge.	Interest and Miscellaneous.	Total.	
	£	£	£	£	£
1. Cardinia .. ..	10,434	2,121	72	2,193	12,627
2. Echuca .. ..	1,070	146	..	146	1,216
3. Kanyapella .. ..	881	319	5	324	1,205
4. Loch Garry .. ..	2,715	985	11	996	3,711
5. Lower Kooweerup .. ..	24,048	3,952	899	4,851	28,899
Totals ... ..	39,148	7,523	987	8,510	47,658

## DISBURSEMENTS, AND INTEREST DEPRECIATION AND REDEMPTION CHARGED.

District.	DISBURSEMENTS.					INTEREST CHARGED.			(A) DEPRE- CIATION. (B) RE- DEMP- TION.	Grand Total at 30th June, 1929.
	1st July, 1920, to 30th June, 1928.	1928-29.			Total at 30th June, 1929.	1st July, 1920, to 30th June, 1928.	1st July, 1928, to 30th June, 1929.	Total at 30th June, 1929.		
		Repairs and Mainten- ance.	Manage- ment.	Total.						
	£	£	£	£	£	£	£	£	£	£
1. Cardinia .. ..	2,702	332	217	549	3,251	9,328	1,800	11,128	..	14,379
2. Echuca .. ..	737	15	15	30	767	338	47	385	..	1,152
3. Kanyapella .. ..	227	50	62	112	339	402	139	541	..	880
4. Loch Garry .. ..	308	96	64	160	468	1,440	488	1,928	(B) 800	3,196
5. Lower Kooweerup .. ..	5,299	418	275	693	5,992	20,968	4,000	24,968	..	30,960
Totals .. ..	9,273	911	633	1,544	10,817	32,476	6,474	38,950	(B) 800	50,567

## IRRIGATION AND WATER SUPPLY DISTRICTS.

STATEMENT of Moneys received and disbursed from 1st May, 1906, to 30th June, 1929; and of Interest charged at the rate of 4 per cent. on Capital Debts; and also of Depreciation and Redemption charged, as at 30th June, 1929. (Free Headworks excluded.)

## RECEIPTS.

District.	1st May, 1906, to 30th June, 1928.	1928-29.					Grand Total at 30th June, 1929.
		Rates.	Compulsory Irrigation Charge.	Water Sales.	Interest and Miscellaneous.	Total.	
	£	£	£	£	£	£	£
1. Bacchus Marsh .. ..	77,979	783	3,585	1,088	27	5,483	83,462
2. Boort .. ..	53,577	1,891	..	4,204	24	6,119	59,696
3. Campaspe .. ..	16,104	869	..	101	8	978	17,082
4. Cohuna .. ..	163,814	2,302	6,403	1,361	72	10,138	173,952
5. Deakin .. ..	93,365	3,646	..	1,142	59	4,847	98,212
6. Dingee .. ..	24,307	191	1,576	250	41	2,058	26,365
7. Dry Lake .. ..	666	..	..	..	29	29	695
8. Echuca North .. ..	10,469	296	2,222	39	58	2,615	13,084
9. Fish Point .. ..	1,304	59	550	202	..	811	2,115
10. Gannawarra .. ..	131,181	1,803	6,076	1,513	136	9,528	140,709
11. Kerang .. ..	105,970	2,518	..	5,837	16	8,371	114,341
12. Koondrook .. ..	108,853	1,582	4,041	796	122	6,541	115,394
13. Leitchville .. ..	4,429	517	783	499	4	1,803	6,232
14. Maffra-Sale .. ..	..	2,137	2,493	1,666	66	6,362	6,362
15. Merbein .. ..	254,014	1,422	24,133	536	1,175	27,266	281,280
16. Mystic Park .. ..	6,576	268	845	110	15	1,238	7,814
17. Nyah .. ..	77,671	318	6,137	150	167	6,772	84,443
18. Red Cliffs .. ..	87,276	1,113	13,317	29,674	402	44,506	131,782
19. Rochester .. ..	196,181	3,483	16,082	2,402	335	22,302	218,483
20. Rodney .. ..	445,399	7,057	17,569	3,020	151	27,797	473,196
21. Shepparton .. ..	98,950	1,672	5,452	395	254	7,773	106,723
22. South Shepparton .. ..	4,815	629	1,661	160	13	2,463	7,278
23. Stanhope .. ..	37,794	718	4,693	430	350	6,191	43,985
24. Swan Hill .. ..	109,269	1,140	6,022	3,488	206	10,856	120,125
25. Third Lake .. ..	2,505	234	884	218	11	1,347	3,852
26. Tongala .. ..	90,512	1,410	6,639	521	195	8,765	99,277
27. Tragowel Plains .. ..	199,037	2,281	11,160	4,295	186	17,922	216,959
28. Tresco .. ..	18,536	..	1,337	62	7	1,406	19,942
29. Werribee .. ..	54,211	1,196	5,603	2,648	630	10,077	64,288
Totals .. ..	2,474,764	41,535	149,263	66,807	4,759	262,364	2,737,128

## DISBURSEMENTS, AND INTEREST DEPRECIATION AND REDEMPTION CHARGED.

District.	DISBURSEMENTS.						INTEREST CHARGED.			(A) DEPRECIATION. (B) REDEMPTION.		Grand Total at 30th June, 1929.
	1st May, 1906, to 30th June, 1928.	1928-29.				Total at 30th June, 1929.	1st May, 1906, to 30th June, 1928.	1st July, 1928, to 30th June, 1929.	Total at 30th June, 1929.	(A) DEPRECIATION. (B) REDEMPTION.		
		Repairs and Maintenance.	Distribution of Water.	Manage- ment.	Total.							
	£	£	£	£	£	£	£	£	£	£	£	
1. Bacchus Marsh	18,697	30	988	197	1,215	19,912	65,634	4,262	69,896	..	89,808	
2. Boort ..	28,888	851	1,167	281	2,299	31,187	21,071	3,087	24,158	(B) 1,400	56,745	
3. Campaspe ..	9,791	15	362	70	447	10,238	9,181	462	9,643	..	19,881	
4. Cohuna ..	105,687	1,690	1,216	437	3,343	109,030	63,213	5,305	68,518	(A) 9,010	186,558	
5. Deakin ..	37,246	300	869	182	1,351	38,597	59,361	3,135	62,496	..	101,093	
6. Dingee ..	12,386	428	611	78	1,117	13,503	15,894	1,193	17,087	..	30,590	
7. Dry Lake ..	1	..	..	..	..	1	665	29	694	..	695	
8. Echuca North	4,582	224	564	98	886	5,468	6,195	1,561	7,756	..	13,224	
9. Fish Point ..	551	290	240	43	573	1,124	868	596	1,464	..	2,588	
10. Gannawarra ..	77,780	1,532	1,192	395	3,119	80,899	53,816	5,237	59,053	(A) 5,694	145,646	
11. Kerang ..	58,716	1,923	1,598	531	4,052	62,768	42,712	3,435	46,147	(A) 450 (B) 2,700	112,065	
12. Koondrook ..	68,354	990	1,610	177	2,777	71,131	67,223	5,910	73,133	(A) 4,501	148,765	
13. Leitchville ..	1,238	562	460	158	1,180	2,418	2,532	1,275	3,807	..	6,225	
14. Maffra-Sale ..	..	74	1,863	258	2,195	2,195	..	4,280	4,280	..	6,475	
15. Merbein ..	210,070	1,282	18,181	307	19,770	229,840	81,697	7,768	89,465	(A) 9,928	329,233	
16. Mystic Park ..	5,317	206	157	99	462	5,779	2,648	583	3,231	..	9,010	
17. Nyah ..	66,427	372	4,738	430	5,540	71,967	35,805	4,165	39,970	(A) 3,802	115,739	
18. Red Cliffs ..	55,826	1,724	23,061	778	25,563	81,389	34,208	18,600	52,808	..	134,197	
19. Rochester ..	89,920	1,637	5,123	731	7,491	97,411	138,373	13,627	152,000	..	249,411	
20. Rodney ..	183,421	3,943	7,615	1,141	12,699	196,120	280,949	21,530	302,479	..	498,599	
21. Shepparton ..	39,661	402	489	363	1,254	40,915	81,461	7,066	88,527	..	129,442	
22. Sth. Shepparton	1,744	68	117	81	266	2,010	2,920	1,676	4,596	..	6,606	
23. Stanhope ..	18,415	941	1,413	154	2,508	20,923	24,865	3,351	28,216	..	49,139	
24. Swan Hill ..	66,646	1,615	1,736	487	3,838	70,484	46,074	5,989	52,063	(A) 4,768	127,315	
25. Third Lake ..	491	154	131	34	319	810	2,712	979	3,691	..	4,501	
26. Tongala ..	40,986	1,585	1,612	375	3,572	44,558	82,106	6,022	88,128	..	132,686	
27. Tragowel Plains	82,750	1,529	2,720	396	4,645	87,395	122,576	13,052	135,628	..	223,023	
28. Tresco ..	18,492	540	2,993	143	3,676	22,168	16,141	3,610	19,751	..	41,919	
29. Werribee ..	12,077	194	526	294	1,014	13,091	43,850	6,889	50,739	..	63,830	
Totals	1,316,160	25,101	83,352	8,718	117,171	1,433,331	1,404,750	154,674	1,559,424	42,253	3,035,008	

## WATERWORKS DISTRICTS.

STATEMENT of Moneys received and disbursed from 1st May, 1906, to 30th June, 1929; and of Interest charged at the rate of 4 per cent. on Capital Debts; and also of Depreciation and Redemption charged, as at 30th June, 1929. (Free Head-works excluded.)

## RECEIPTS.

District.	1st May, 1906, to 30th June, 1928.	1928-29.				Grand Total at 30th June, 1929.
		Rates.	Water Sales.	Interest and Miscellaneous.	Total.	
	£	£	£	£	£	£
1. Birchip .. .. .	374,186	4,863	71	61	4,995	408,593
2. Sea Lake .. .. .		8,627	154	89	8,870	
3. Tyrrell .. .. .		11,685	4	496	12,185	
4. Wycheproof .. .. .		8,211	85	61	8,357	
5. Carwarp .. .. .	8,484	578	..	28	606	9,090
6. Carwarp Central .. .. .	664	16	..	..	16	680
7. Dering .. .. .	1,053	628	..	7	635	1,688
8. Eureka .. .. .	656	277	..	16	293	949
9. Karkaroc .. .. .	149,471	15,271	..	82	15,353	164,824
10. Kerang North-West Lakes .. .. .	2,476	193	..	1	194	2,670
11. Long Lake .. .. .	132,643	9,247	40	144	9,431	142,074
12. Mornington Peninsula .. .. .	30,771	3,000	..	78	3,078	33,849
13. Narre Warren .. .. .	470	76	450	1	527	997
14. Tyntynder .. .. .	75,429	5,215	..	146	5,361	80,790
15. Upper Western Wimmera .. .. .	56,502	4,889	..	16	4,905	61,407
16. Upper Wimmera United .. .. .	94,119	7,982	63	69	8,114	102,233
17. Walpeup West .. .. .	20,839	1,994	40	89	2,123	22,962
18. Werribee .. .. .	6,026	795	20	4	819	6,845
19. Western Wimmera .. .. .	201,901	13,472	1,509	63	15,044	216,945
20. Wimmera United .. .. .	219,619	18,241	813	371	19,425	239,044
21. Yelta .. .. .	3,323	322	13	2	337	3,660
Totals .. .. .	1,378,632	115,582	3,262	1,824	120,668	1,499,300

## DISBURSEMENTS, AND INTEREST DEPRECIATION AND REDEMPTION CHARGED.

District.	DISBURSEMENTS.						INTEREST CHARGED.			(A) DEPRECIATION.	(B) REDEMPTION.	Grand Total at 30th June, 1929.
	1st May 1906, to 30th June, 1928.	1928-29.				Total at 30th June, 1929.	1st May, 1906, to 30th June, 1928.	1st July 1928, to 30th June, 1929.	Total at 30th June, 1929.			
		Repairs and Maintenance.	Distribution of Water.	Management.	Total.							
	£	£	£	£	£	£	£	£	£	£	£	£
1. Birchip ..	180,587	10,009	4,374	1,156	15,539	196,126	214,388	22,213	236,601	..	..	432,727
2. Sea Lake ..												
3. Tyrrell ..												
4. Wycheproof ..												
5. Carwarp ..	12,545	1,000	1,756	73	2,829	15,374	7,194	1,367	8,561	A	586	24,521
6. Carwarp Central ..	601	1	35	14	50	651	356	94	450	..	..	1,101
7. Dering ..	612	107	142	41	290	902	987	427	1,414	..	..	2,316
8. Eureka ..	1,050	53	136	36	225	1,275	405	160	565	..	..	1,840
9. Karkaroc ..	56,904	3,701	2,066	372	6,139	63,043	95,498	9,377	104,875	..	..	167,918
10. Kerang N.W. Lakes ..	1,467	..	86	25	111	1,578	1,167	76	1,243	A	..	2,821
11. Long Lake ..	83,715	2,453	1,798	477	4,728	88,443	51,604	5,286	56,890	A	8,305	153,638
12. Mornington Peninsula ..	4,648	142	418	96	656	5,304	26,688	2,422	29,110	..	..	34,414
13. Narre Warren ..	59	8	22	10	40	99	308	411	719	..	..	818
14. Tyntynder ..	46,811	2,959	1,529	358	4,846	51,657	48,866	6,160	55,026	..	..	106,683
15. Upper Western Wimmera	24,124	464	1,101	101	1,666	25,790	27,125	2,654	29,779	{ A 606 } { B 1,500 }	..	57,675
16. Upper Wimmera United	30,279	1,267	1,215	163	2,645	32,924	56,902	5,300	62,202	B	2,390	97,516
17. Walpeup West ..	15,769	1,113	..	128	1,241	17,010	8,227	1,210	9,437	A	1,200	27,647
18. Werribee ..	1,845	5	144	49	198	2,043	5,378	597	5,975	..	..	8,018
19. Western Wimmera ..	97,534	1,086	3,456	400	4,942	102,476	92,126	8,740	100,866	{ A 2,422 } { B 5,400 }	..	211,164
20. Wimmera United ..	75,913	2,956	2,841	380	6,177	82,090	128,127	11,059	139,186	B	5,310	226,586
21. Yelta ..	2,154	135	212	37	384	2,538	1,601	219	1,820	..	..	4,358
Totals ..	636,617	27,459	21,331	3,916	52,706	689,323	766,947	77,772	844,719	..	27,719	1,561,761

## DISTRICTS HELD IN TRUST BY THE COMMISSION.

STATEMENT OF RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED 31ST DECEMBER, 1928.

## RECEIPTS.

Name of Trust.	Bank Balance, at 31st December, 1927.	1928.				Grand Total for Year 1928.
		Rates.	Water Sales.	Interest and Miscellaneous.	Total.	
	£	£	£	£	£	£
Avoca .. .. .	Cr. 42	593	74	19	686	728
Avoca (Quambatook, Urban) .. .. .	Cr. 88	521	9	25	555	643
Carrum .. .. .	Cr. 79	2,022	..	190	2,212	2,291
Loddon United .. .. .	Dr. 429	2,489	10	23	2,522	2,093
Loddon United (Mitiamo, Urban) .. .. .	Cr. 130	222	100	14	336	466
Totals .. .. .	{ Cr. 339 } { Dr. 429 }	5,847	193	271	6,311	6,221

## DISBURSEMENTS.

Name of Trust.	1928.						Grand Total for Year 1928.	Bank Balance carried forward, 1st January, 1929.
	Repairs and Maintenance.	Water Distribution.	Management.	Total.	Interest.	(A) Depreciation. (B) Redemption.		
	£	£	£	£	£	£	£	£
Avoca .. .. .	263	..	70	333	219	B 99	651	Cr. 77
Avoca (Quambatook, Urban) .. .. .	71	129	37	237	161	A 60 } B 34 }	492	Cr. 151
Carrum .. .. .	973	..	233	1,206	1,297	B 238	2,741	Dr. 450
Loddon United .. .. .	530	882	255	1,667	657	B 295	2,619	Dr. 526
Loddon United (Mitiamo Urban) .. .. .	198	..	22	220	195	{ A 28 } { B 16 }	459	Cr. 7
Totals .. .. .	2,035	1,011	617	3,663	2,529	{ A 88 } { B 682 }	6,962	Cr. 235 } Dr. 976 }

## URBAN DISTRICTS

STATEMENT of Moneys received and disbursed from 1st May, 1906, to 30th June, of Depreciation and Redemption charged, as at 30th June, 1929. (Free Headworks)

## RECEIPTS.

District or Division.	1st May, 1906, to 30th June, 1928.	1928-29.				Grand Total at 30th June, 1929.
		Rates.	Water Sales.	Interest and Miscel- laneous.	Total.	
	£	£	£	£	£	£
1. Bacchus Marsh .. .. .	23,518	1,243	422	6	1,671	25,189
2. Berriwillock .. .. .	2,484	291	11	10	312	2,796
3. Berwick .. .. .	1,980	390	131	25	546	2,526
4. Beulah .. .. .	7,500	517	112	31	660	8,160
5. Birchip .. .. .	16,823	666	405	84	1,155	17,978
6. Bittern .. .. .	578	68	41	3	112	690
7. Brim .. .. .	1,026	281	17	12	310	1,336
8. Carrum .. .. .	31,483	6,280	870	108	7,258	38,741
9. Carwarp .. .. .	..	69	..	1	70	70
10. Chillingollah .. .. .	205	221	41	8	270	475
11. Chinkapook .. .. .	..	83	2	..	85	85
12. Cohuna .. .. .	9,161	888	139	65	1,092	10,253
13. Corop .. .. .	553	32	..	1	33	586
14. Cranbourne .. .. .	3,691	277	427	17	721	4,412
15. Culgoa .. .. .	2,462	264	122	8	394	2,856
16. Dandenong .. .. .	28,610	3,619	886	165	4,670	33,280
17. Dimboola .. .. .	29,953	1,216	600	149	1,965	31,918
18. Dingee .. .. .	231	105	3	2	110	341
19. Frankston .. .. .	19,570	3,356	434	100	3,890	23,460
20. Hastings .. .. .	453	279	7	8	294	747
21. Hopetoun .. .. .	8,599	752	214	51	1,017	9,616
22. Jeparit .. .. .	10,223	780	246	31	1,057	11,280
23. Jung Jung .. .. .	1,363	145	22	14	181	1,544
24. Koondrook .. .. .	5,918	427	21	3	451	6,369
25. Lake Boga .. .. .	5,042	367	38	21	426	5,468
26. Lalbert .. .. .	887	283	134	1	418	1,305
27. Lascelles .. .. .	1,693	188	5	13	206	1,899
28. Leitchville .. .. .	1,231	352	17	19	388	1,619
29. Lockington .. .. .	774	305	3	15	323	1,097
30. Manangatang .. .. .	1,980	499	75	9	583	2,563
31. Marnoo .. .. .	697	311	70	3	384	1,081
32. Merbein .. .. .	7,644	1,223	71	76	1,370	9,014
33. Minyip .. .. .	10,895	902	52	54	1,008	11,903
34. Mornington .. .. .	14,124	2,530	345	115	2,990	17,114
35. Mount Martha .. .. .	..	520	..	12	532	532
36. Nandaly .. .. .	278	159	..	2	161	439
37. Natimuk .. .. .	9,122	312	93	3	408	9,530
38. North Wonthaggi .. .. .	186	480	..	7	487	673
39. Nullawil .. .. .	229	256	12	10	278	507
40. Nyah .. .. .	855	101	6	1	108	963
41. Nyah West .. .. .	2,817	639	50	3	692	3,509
42. Ouyen .. .. .	12,934	1,468	639	62	2,169	15,103
43. Pakenham .. .. .	348	630	468	31	1,129	1,477
44. Patchewollock .. .. .	..	97	..	..	97	97
45. Piangil .. .. .	1,951	364	178	6	548	2,499
46. Pyramid Hill .. .. .	1,179	520	28	22	570	1,749
47. Rainbow .. .. .	14,914	834	162	42	1,038	15,952
48. Redcliffs .. .. .	4,296	1,688	148	69	1,905	6,201
49. Rupanyup .. .. .	9,490	805	62	39	906	10,396
50. Sea Lake .. .. .	11,175	741	288	62	1,091	12,266
51. Somerville .. .. .	1,245	208	51	5	264	1,509
52. South Frankston .. .. .	5,795	1,190	103	11	1,304	7,099
53. Speed .. .. .	..	63	..	..	63	63
54. Spring Vale .. .. .	5,493	1,989	135	17	2,141	7,634
55. Stanhope .. .. .	481	211	..	2	213	694
56. Tempy .. .. .	..	139	..	1	140	140
57. Ultima .. .. .	5,429	457	26	34	517	5,946
58. Waitchie .. .. .	177	121	16	3	140	317
59. Watchem .. .. .	3,995	400	12	30	442	4,437
60. Werribee .. .. .	14,437	1,446	284	113	1,843	16,280
61. Werrimull .. .. .	..	279	..	..	279	279
62. Wonthaggi .. .. .	63,933	2,618	2,066	21	4,705	68,638
63. Woomelang .. .. .	10,500	422	397	38	857	11,357
64. Woorinen .. .. .	209	121	..	1	122	331
65. Wycheproof .. .. .	10,921	902	112	56	1,070	11,991
Totals .. .. .	443,740	49,389	11,319	1,931	62,639	506,379



## AND DIVISIONS.

1929 ; and of Interest charged, at the rate of 4 per cent. on Capital Debits ; and also excluded).

## DISBURSEMENTS, AND INTEREST, DEPRECIATION, AND REDEMPTION CHARGED.

District or Division.	DISBURSEMENTS.						INTEREST CHARGED.				(a) DEPRECIATION.	(b) REDEMPTION.	Grand Total at 30th June, 1929.
	1st May, 1906, to 30th June, 1928.	1928-29.				Total at 30th June, 1929.	1st May, 1906, to 30th June, 1928.	1st July, 1928, to 30th June, 1929.	Total at 30th June, 1929.				
		Repairs and Maintenance.	Distribution of Water.	Management.	Total.								
	£	£	£	£	£	£	£	£	£	£	£	£	
1. Bacchus Marsh ..	5,958	15	181	101	297	6,255	16,837	1,442	18,279	(a)	686	25,220	
2. Berriwillock ..	1,410	31	24	34	89	1,499	1,008	208	1,216	(a)	55	2,770	
3. Berwick ..	267	18	51	20	89	356	1,739	425	2,164			2,520	
4. Beulah ..	3,227	91	145	35	271	3,498	4,012	319	4,331	(a)	64	7,893	
5. Birchip ..	7,807	196	308	73	577	8,384	7,814	633	8,447	(a) (b)	912	17,743	
6. Bittern ..	86	3	9	5	17	103	479	110	589			692	
7. Brim ..	295	10	9	26	45	340	566	175	741	(a)	84	1,165	
8. Carrum ..	5,480	294	872	300	1,466	6,946	26,040	5,700	31,740			38,686	
9. Carwarp ..			10	10	20	20		24	24			44	
10. Chillingollah ..	121	18	23	33	74	195	254	146	400	(a)	60	655	
11. Chinkapook ..		1	6	20	27	27		56	56			83	
12. Cohuna ..	2,484	52	286	74	412	2,896	5,729	662	6,391	(a) (b)	704	9,991	
13. Corop ..	245		10	6	16	261	274	19	293	(a)	42	596	
14. Cranbourne ..	526	12	35	60	107	633	3,192	648	3,840			4,473	
15. Culgoa ..	1,204	61	28	34	123	1,327	1,285	264	1,549	(a)	45	2,921	
16. Dandenong ..	5,444	161	478	160	799	6,243	22,155	3,850	26,005	(a)	500	32,748	
17. Dimboola ..	19,403	470	834	111	1,415	20,818	7,621	558	8,179	(a) 1,620 (b) 1,230		31,847	
18. Dingee ..	97		15	16	31	128	156	60	216	(a)	42	386	
19. Frankston ..	3,417	156	462	160	778	4,195	15,803	3,250	19,053			23,248	
20. Hastings ..	97	15	42	15	72	169	354	277	631			800	
21. Hopetoun ..	5,246	102	318	40	460	5,706	3,779	415	4,194	(b)	150	10,050	
22. Jeparit ..	2,128	61	39	67	167	2,295	6,734	855	7,589	(b)	800	10,684	
23. Jung Jung ..	916	24	28	28	80	996	504	83	587	(a)	30	1,613	
24. Koondrook ..	3,021	3	178	34	215	3,236	2,575	203	2,778	(a)	255	6,269	
25. Lake Boga ..	2,287	18	171	48	237	2,524	2,737	164	2,901	(a) (b)	270	5,695	
26. Lalbert ..	156	48	14	50	112	268	651	279	930	(a)	261	1,459	
27. Lascelles ..	902	47	12	26	85	987	934	110	1,044	(a)	112	2,143	
28. Leitchville ..	582	147	36	28	211	793	699	182	881	(a)	84	1,758	
29. Lockington ..	188	13	30	30	73	261	559	236	795	(a)	135	1,191	
30. Manangatang ..	596	53	42	53	153	749	1,057	335	1,392	(a)	260	2,401	
31. Marnoo ..	146	16	25	27	68	214	337	233	570	(a)	189	973	
32. Merbein ..	3,700	62	487	120	669	4,369	3,856	742	4,598	(a)	350	9,317	
33. Minyip ..	3,387	32	208	65	305	3,692	6,599	625	7,224	(a) 467 (b) 400		11,783	
34. Mornington ..	2,410	115	338	120	573	2,983	11,413	2,400	13,813			16,796	
35. Mount Martha ..		25	72	25	122	122		400	400			522	
36. Nandaly ..	117	39	12	17	68	185	104	69	173	(a)	72	430	
37. Natimuk ..	2,125	72	69	95	236	2,361	6,088	424	6,512	(b)	750	9,623	
38. North Wonthaggi ..	55	40	48	36	124	179	86	314	400	(a)	80	659	
39. Nullawil ..	68	73	18	21	112	180	157	164	321			501	
40. Nyah ..	339		24	22	46	385	385	55	440	(a)	60	885	
41. Nyah West ..	673	97	12	49	158	831	1,832	488	2,320	(a)	312	3,463	
42. Ouyen ..	5,152	302	441	128	871	6,023	7,429	1,317	8,746	(a)	350	15,119	
43. Pakenham ..	48	27	78	30	135	183	230	730	960	(a)	136	1,279	
44. Patchewollock ..		2	6	20	28	28		67	67			95	
45. Piangil ..	479	97	29	32	158	637	1,136	276	1,412	(a)	272	2,321	
46. Pyramid Hill ..	590	38	86	36	160	750	540	268	808	(a)	45	1,603	
47. Rainbow ..	2,822	61	52	62	175	2,997	9,830	918	10,748	(a)(b)	1,600	15,345	
48. Red Cliffs ..	2,561	10	636	101	797	3,358	1,567	607	2,174	(a)	240	5,772	
49. Rupanyup ..	3,146	43	217	23	288	3,434	5,199	572	5,771	(a)(b)	820	10,025	
50. Sea Lake ..	6,276	47	253	64	364	6,640	3,969	684	4,653	(a)	674	11,967	
51. Somerville ..	245	10	28	10	48	293	1,179	240	1,419			1,712	
52. South Frankston ..	896	50	148	50	248	1,144	4,923	920	5,843			6,987	
53. Speed ..			14	20	34	34		30	30			64	
54. Spring Vale ..	787	86	255	90	431	1,218	4,490	1,540	6,030			7,248	
55. Stanhope ..	138	10	24	31	65	203	313	141	454	(a)	96	753	
56. Tempy ..		18	9	21	48	48		84	84			132	
57. Ultima ..	2,155	41	19	36	96	2,251	3,026	380	3,406	(a)	160	5,817	
58. Waitchie ..	128		14	23	37	165	135	99	234	(a)	72	471	
59. Watchem ..	1,273	95	24	26	145	1,418	2,472	311	2,783	(a)	140	4,341	
60. Werribee ..	4,983	64	512	59	635	5,618	8,382	1,068	9,450	(a)	609	15,677	
61. Werrimull ..		10	25	20	55	55		128	128			183	
62. Wonthaggi ..	10,485	358	429	311	1,098	11,583	41,395	2,323	43,718	(b)	9,000	64,301	
63. Woomelang ..	3,523	56	90	67	213	3,736	6,297	653	6,950	(a)(b)	520	11,206	
64. Woorinen ..	78		12	20	32	110	131	100	231	(a)	34	375	
65. Wycheproof ..	5,679	70	524	58	652	6,331	4,839	441	5,280	(a)	624	12,235	
Totals ..	138,054	4,191	9,984	3,637	17,812	155,866	273,886	41,499	315,385		26,473	497,724	

# LOAN EXPENDITURE. STATEMENT OF LOAN EXPENDITURE DURING THE YEAR ENDED 30TH JUNE, 1929.

Works.	Loans Application Act No. 3506.	Loans Application Act No. 3582 and other Sources.	Total.
	£ s. d.	£ s. d.	£ s. d.
<i>Free Headworks.</i>			
1. Kerang North-West Lakes .. .. .	107 11 11	749 9 2	857 1 1
2. Kow Swamp .. .. .	15 7 8	..	15 7 8
<i>River Murray Waters Acts—Works.</i>			
3. Storages, Weirs and Locks .. .. .	17,354 5 4	206,698 17 7	224,053 2 11
<i>Reservoirs and Storages.</i>			
4. Campaspe and Loddon River Storages .. .. .	4,736 3 8	41,519 8 9	46,255 12 5
5. Goulburn Storages— Eildon Reservoir .. .. .	1,464 18 11	87,900 7 0	89,365 5 11
Waranga Reservoir Enlargement .. .. .	542 9 8	3,767 13 11	4,310 3 7
6. Maffra, Glenmaggie Reservoir .. .. .	..	17,627 4 10	17,627 4 10
7. Melton and Pykes Creek Reservoirs .. .. .	2,171 14 2	37,066 0 11	39,237 15 1
8. Wimmera-Mallee Storages—Pine Lake .. .. .	11 6 0	12,362 12 1	12,373 18 1
<i>Waterworks Districts.</i>			
9. Bellarine Peninsula .. .. .	458 8 10	80,338 8 1	80,796 16 11
10. Birchip, Sea Lake, Tyrrell, and Wycheproof .. .. .	..	55,809 3 4	55,809 3 4
11. Carwarp and Carwarp Central .. .. .	841 17 1	5,114 16 0	5,956 13 1
12. Coreena .. .. .	1,252 2 7	23,219 14 3	24,471 16 10
13. Dering, Baring, and Kia .. .. .	..	2,181 2 2	2,181 2 2
14. Karkaroc .. .. .	..	15,721 2 8	15,721 2 8
15. Kerang North West Lakes .. .. .	..	72 15 10	72 15 10
16. Long Lake .. .. .	..	7,159 13 1	7,159 13 1
17. Millewa and Nowingi .. .. .	2,586 18 9	19,080 12 2	21,667 10 11
18. Mornington Peninsula .. .. .	3 18 2	49,653 9 3	49,657 7 5
19. Tyntynder .. .. .	..	22,094 8 9	22,094 8 9
20. Walpeup .. .. .	22 19 11	2,754 10 8	2,777 10 7
21. Werribee .. .. .	..	42 3 7	42 3 7
22. Western Wimmera .. .. .	..	11,409 8 0	11,409 8 0
23. Wimmera United .. .. .	..	11,547 13 8	11,547 13 8
24. Wimmera Main Channels .. .. .	..	1,660 13 4	1,660 13 4
25. Yelta .. .. .	..	417 16 4	417 16 4
<i>Towns.</i>			
26. Bacchus Marsh and Werribee .. .. .	..	480 8 1	480 8 1
27. Berrillock, Beulah, Birchip, and Brim .. .. .	..	2,007 10 1	2,007 10 1
28. Cohuna, Leitchville, and Lockington .. .. .	0 11 4	691 10 8	692 2 0
29. Coliban .. .. .	..	69,253 15 8	69,253 15 8
30. Chillingollah, Chinkapook, Culgoa, and Dimboola .. .. .	..	10,434 18 0	10,434 18 0
31. Heyfield and Stratford .. .. .	..	5,960 18 3	5,960 18 3
32. Hopetoun, Jeparit, Jung Jung, Lake Boga, and Lalbert .. .. .	..	1,911 0 1	1,911 0 1
33. Lascelles, Manangatang, and Marnoo .. .. .	..	244 5 9	244 5 9
34. Meringur, Werrimull, and Carwarp .. .. .	..	1,121 3 10	1,121 3 10
35. Merbein, Pyramid Hill, and Red Cliffs .. .. .	35 8 5	1,280 1 8	1,315 10 1
36. Minyip, Nandaly, and Natimuk .. .. .	..	900 2 5	900 2 5
37. Nullawill, Nyah West, Ouyen, Patchewollock, and Piangil .. .. .	..	3,855 13 2	3,855 13 2
38. Rainbow, Rupanyup, and Sea Lake .. .. .	..	907 6 3	907 6 3
39. Speed, Temy, Ultima, and Waitchie .. .. .	..	2,481 14 0	2,481 14 0
40. Watchem and Woomelang .. .. .	..	700 18 9	700 18 9
41. Woorinen, Wycheproof, and Yaapect .. .. .	..	2,470 13 11	2,470 13 11
42. Wonthaggi and North Wonthaggi .. .. .	..	722 14 0	722 14 0
<i>Irrigation and Water Supply Districts.</i>			
43. Bacchus Marsh and Werribee .. .. .	..	16,048 5 0	16,048 5 0
44. Boort .. .. .	..	6,621 0 5	6,621 0 5
45. Calivil .. .. .	..	16,342 8 4	16,342 8 4
46. Cohuna and Gannawarra .. .. .	517 14 9	11,490 1 8	12,007 16 5
47. Deakin .. .. .	..	685 1 6	685 1 6
48. Dingee .. .. .	..	440 8 4	440 8 4
49. Fish Point .. .. .	7 16 2	361 7 3	369 3 5
50. Katandra .. .. .	..	10,130 2 11	10,130 2 11
51. Kerang .. .. .	340 8 8	10,119 8 6	10,459 17 2
52. Koondrook .. .. .	251 7 3	6,614 5 8	6,865 12 11
53. Leitchville .. .. .	136 8 6	6,078 9 11	6,214 18 5
54. Maffra, Sale .. .. .	..	46,789 3 10	46,789 3 10
55. Merbein .. .. .	..	4,792 11 2	4,792 11 2
56. Mystic Park .. .. .	..	1,807 9 10	1,807 9 10
57. North Shepparton .. .. .	..	223 18 11	223 18 11
58. Nyah .. .. .	122 19 11	1,321 18 10	1,444 18 9
59. Red Cliffs .. .. .	128 4 1	5,347 9 2	5,475 13 3
60. Rochester and Echuca North .. .. .	..	20,611 12 6	20,611 12 6
61. Rodney .. .. .	..	39,645 5 8	39,645 5 8
62. Shepparton .. .. .	..	12,705 5 10	12,705 5 10
63. South Shepparton .. .. .	..	2,902 16 10	2,902 16 10
64. Stanhope .. .. .	..	2,955 18 6	2,955 18 6
65. Swan Hill .. .. .	739 5 10	5,758 8 10	6,497 14 8
66. Third Lake .. .. .	..	529 11 3	529 11 3
67. Tongala .. .. .	..	6,944 9 3	6,944 9 3
68. Tragowel Plains .. .. .	..	22,156 11 3	22,156 11 3
69. Tresco .. .. .	5 9 0	835 6 11	840 15 11
70. Goulburn Main Channels .. .. .	17 7 1	274,021 11 1	274,038 18 2
<i>Flood Protection and Drainage Districts.</i>			
71. Gippsland Rivers and Other Districts .. .. .	8 5 7	324 12 2	332 17 9
72. Kooweerup, Cardinia, and Dandenong Creek .. .. .	..	44,592 19 11	44,592 19 11
<i>Miscellaneous.</i>			
73. Investigations Storages and Works .. .. .	..	1,127 5 7	1,127 5 7
74. Torrumbarry Districts—New Districts commanded by Tor- rumbarry Weir .. .. .	235 8 10	806 4 3	1,041 13 1
Totals .. .. .	34,116 18 1	1,402,525 11 1	1,436,642 9 2

## STATEMENT OF EXPENDITURE DURING THE YEAR ENDED 30TH JUNE, 1929.

### CONSTRUCTION OF TANKS AND FORMING ROADS IN THE MALLEE.

(This Expenditure was met by the Public Works Department.)

	£ s. d.
1. Mallee Tanks (Public Tanks) and Channels .. .. .	4,438 16 10
2. Clearing Roads .. .. .	10,138 7 9
Total .. .. .	£14,577 4 7

## ESTIMATES.

Anticipated requirements to meet Disbursements by the Commission and Estimate of the moneys available from its Revenues to provide the same for the year ending 30th June, 1930, with Estimate of the total amount available from the Revenues of all Authorities to meet interest payable by the State for the year ending 30th June, 1930.

## ESTIMATED DISBURSEMENTS.

## A.

Revenue Producing Works—		
Coliban District .. .. .	£13,400	
Irrigation and Water Supply Districts .. .. .	129,000	
Waterworks Districts .. .. .	70,000	
Drainage and Flood Protection Districts .. .. .	1,000	
Diversions from Streams .. .. .	500	
General Expenditure and Salaries (proportion) over £250 to be apportioned to above Districts .. .. .	27,000	
		£240,900

## B.

Non-Revenue Producing Works—		
General Services—		
River Gaugings, Surveys, New Projects, Boring for Water, Land Settlement, General Expenditure and Salaries (proportion) over £250 .. .. .	£12,000	
Loan Works, Services on Account defrayed from Votes .. .. .	7,000	
Waterworks Trusts Administration .. .. .	2,600	
		£21,600

## C.

Non-Revenue Producing Works—		
Free Headworks—		
Broken River .. .. .	£275	
Goulburn-Waranga .. .. .	1,750	
Kow Swamp .. .. .	1,750	
Lake Lonsdale and Lower Wimmera .. .. .	500	
Loddon River .. .. .	325	
North-West Lakes .. .. .	400	
		5,000
		£267,500

## ESTIMATED RECEIPTS.

Coliban District .. .. .	£45,000
Irrigation and Water Supply Districts .. .. .	320,000
Waterworks Districts .. .. .	190,000
Flood Protection Districts .. .. .	10,000
Miscellaneous .. .. .	35,000
	£600,000

Estimated amount available from Revenue Producing Works to meet Interest .. .. .	£359,100
Less expenditure as per "B" and "C" above on Non-Revenue Producing Works .. .. .	26,600
	£332,500
To which add Estimated Revenues from other Authorities—	
Waterworks Trusts .. .. .	62,000
Local Bodies .. .. .	23,000
	£85,000
Total Estimated amount available from Revenues of all Authorities to meet Interest .. .. .	£417,500

## STATEMENT OF LOAN LIABILITY.

STATEMENT of the amount provided by the State to meet Interest on its Loan Expenditure for Works of Water Supply, both State Works of Water Supply and Works vested in Authorities other than the Commission; and of the sums paid from the revenues of the Commission, and from the moneys received from such other Authorities, to provide such Interest for the year ended 30th June, 1929:—

Works.	Loan Liability of State for Works of Water Supply at 30th June, 1929, exclusive of Melbourne Water Supply.					Interest payable by State on Net Advances.	Total Interest of £1,008,549 debitable to—		Amount received from Revenues of all Authorities to meet Interest.
	Total Advances, including Cost of Loan Flotation.	Deduct Redemption Paid.	Net Advances.	(A.) Amounts Written Off. (B.) Free Head-works. (C.) Uncompleted or Unallotted Works. (D.) Loans Unexpended.	Balance at Debit of Authorities.		(A.) Written Off. (B.) Free Head-works. (C.) Uncompleted or Unallotted Works. (D.) Loans Unexpended.	Commission and Other Authorities.	
Completed Works— Commission	£	£	£	£	£	£	£	£	
	4,555,615	49,775	4,505,840	(A.) 175,055	4,330,785	206,334	(A.) 8,018	198,316	
	4,108,304	31,652	4,076,652	(A.) 575,152	3,501,500	186,680	(A.) 26,338	160,342	
	1,250,938	106	1,250,832	(C.) 731,982	518,850	57,281	(C.) 33,521	23,760	£274,147 (after providing £28,536 for non-producing works, including Free Head-works).
Completed Works— Commission	209,030	..	209,030	(C.) 52,228	156,802	9,571	(C.) 2,392	7,179	
	695,919	..	695,919	(C.) 135,969	559,950	31,867	(C.) 6,227	25,640	
	383,567	..	383,567	(C.) 218,317	165,250	17,564	(C.) 9,998	7,566	
	2,154,348	1,000	2,153,348	(C.) 2,153,348	..	98,608	(C.) 98,608	..	
Uncompleted or Unallotted Works— Commission	1,113,454	..	1,113,454	(C.) 1,003,838	109,616	50,989	(C.) 45,969	5,020	
	478,287	..	478,287	(C.) 478,287	..	21,902	(C.) 21,902	..	
	771,564	..	771,564	(C.) 290,012	481,552	35,332	(C.) 13,282	22,050	
	125,807	..	125,807	(C.) 125,807	..	5,761	(C.) 5,761	..	
Other Authorities— Commission	76,153	..	76,153	(C.) 76,153	..	3,487	(C.) 3,487	..	
	2,037,562	280,352	1,757,210	(A.) 316,537	1,440,673	80,468	(A.) 14,494	65,974	£96,275
	809,118	132,373	676,745	(A.) 163,760	512,985	30,990	(A.) 7,500	23,490	
	1,927,440	..	1,927,440	(C.) 1,927,440	..	88,262	(C.) 88,262	..	
Other Authorities— Commission	32,754	30	32,724	(A.) 32,724	..	1,498	(A.) 1,498	..	
	1,254,078	420	1,253,658	(B.) 1,253,658	..	57,418	(B.) 57,418	..	
	147,046	..	147,046	(B.) 147,046	..	6,733	(B.) 6,733	..	
	253,499	..	253,499	(C.) 253,499	..	11,609	(C.) 11,609	..	
Other Authorities— Commission	135,288	..	135,288	(D.) 135,288	..	6,195	(D.) 6,195	..	
	22,519,771	495,708	22,024,063	10,246,100	11,777,963	1,008,549	469,212	539,337	370,422
	..	..	..	..	..	..	..	..	
	Totals	..	..	..	..	..	..	..	..

Dated at the Office of the State Rivers and Water Supply Commission, Treasury Gardens,  
Melbourne, the 28th day of October, 1929.

WM. CATTANACH, Chairman.

E. SHAW, Commissioner.

RICHD. HORSFIELD, Commissioner.

P. J. O'MALLEY, Secretary.



MAP SHOWING  
**WATER RESOURCES AND DISTRIBUTION WORKS**  
FOR  
**IRRIGATION, DOMESTIC, AND STOCK SUPPLIES**  
REFERENCE

- NATURAL WATER RESOURCES - - - - - shown thus  
IRRIGATION DISTRICTS - - - - -  
EXTENSIONS PROPOSED - - - - -  
RURAL DOMESTIC AND STOCK SUPPLY DISTRICTS—  
ADMINISTERED BY COMMISSION - - - - -  
ADMINISTERED BY WATERWORKS TRUSTS - - - - -  
EXTENSIONS PROPOSED—INCLUDING PARTIAL IRRIGATION - - - - -  
FLOOD PROTECTION DISTRICTS - - - - -  
TOWN SUPPLIES—  
ADMINISTERED BY COMMISSION - - - - -  
ADMINISTERED BY WATERWORKS TRUSTS - - - - -  
COUNTRY SEWERAGE SYSTEMS - - - - -  
WORKS, THUS—  
STORAGES - - - - -  
WEIRS - - - - -  
TANKS - - - - -  
BORES - - - - -  
MAIN CHANNELS - - - - -  
DISTRIBUTARY CHANNELS - - - - -  
RAILWAYS - - - - -

DEVELOPMENT OF WATER CONSERVATION AND DISTRIBUTION UNDER THE COMMISSION.		
	As 30.6.1907.	As 30.6.1925.
CAPACITY OF STORAGES -	468,000 ac. ft.	1,267,500 ac. ft.
LENGTH OF CHANNELS -	4,000 miles	12,500 miles
IRRIGATION DISTRICTS—		
Number of Districts administered -	10	33
Number of Districts having Water Rights -	Nil	25
Total of such Water Rights -	Nil	398,000 ac. ft.
Area under Irrigated Culture -	108,000 acres	472,000 acres
Valuation for Rating purposes -	£196,000	£763,000
RURAL WATERWORKS DISTRICTS—		
Number of Districts administered -	3	20
Valuation for Rating purposes -	£125,000	£1,729,000
URBAN DISTRICTS—		
Number of Districts administered -	1	68
Valuation for Rating purposes -	£5,600	£523,000

RURAL DISTRICTS ADMINISTERED BY THE COMMISSION.

No. on Plan.	Name of District.	No. on Plan.	Name of District.	No. on Plan.	Name of District.
1	Bacchus Marsh	18	Mystic Park	24	Axe Creek
2	Boort	19	North Shepparton	25	Baring
3	Calivil	20	Nyah	26	Birchip
4	Campana	21	Red Cliffs	27	Carwarmp
5	Cobuna	22	Rochester	28	Carwarmp Central
6	Deakin	23	Rodney	29	Coreena
7	Dering	24	Sale	30	Dering
8	Dry Lake	25	Shepparton	31	Eureka
9	Echuca North	26	South Shepparton	32	Harcourt
10	Flah Point	27	Stanhope	33	Karkaroo
11	Gannawarra	28	Swan Hill	34	Kerang North-west Lakes
12	Katandra	29	Third Lake	35	Kia
13	Kerang	30	Tongala	36	Long Lake
14	Koonooka	31	Tragowel Plains	37	Millwaa
15	Leitchville	32	Tresco	38	Millwaa Central
16	Malra	33	Werribee	39	Narre Warren
17	Merbein			40	Sea Lake
				41	Tyntynder
				42	Tyrrill
				43	Upper Western Wimmera
				44	Upper Wimmera United
				45	Walpeup West
				46	Werribee
				47	Western Wimmera
				48	Wimmera United
				49	Wychebrook
				50	Yella
				51	Waterworks Trusts
				52	Avoca
				53	Carrum
				54	Loddon United
				55	Flood Protection
				56	Cardinia
				57	Echuca (High Street)
				58	Kanyapella
				59	Loch Lary
				60	Lower Koonooka