

1923.

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VICTORIA.

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STATE RIVERS AND WATER SUPPLY COMMISSION.

---

EIGHTEENTH  
ANNUAL REPORT.

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1922-23.

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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,

J. S. DETHRIDGE, COMMISSIONER,

E. SHAW, COMMISSIONER.

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ANNUAL REPORT, 1922-23.

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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 1922-23, 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, 1923. 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) .. .. .	738,244
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 .. .. .	18,778
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 .. .. .	187,566
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>1,212,035</b>

## B.—MAIN SUPPLY WORKS.

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

Cost Apportioned and to be Apportioned to Districts benefited.

Name of Work.	Capital Debit at 30th June, 1923.	Tentative Debits to Districts, 1922-23. £	
Goulburn Main Channels (Free Headworks excluded)—	£		
1. East Goulburn .. .. .	134,614	{ Rodney .. .. . 120,000 Tragowel Plains .. .. . 100,000 Rochester .. .. . 74,000 Tongala .. .. . 58,000 Shepparton .. .. . 57,000 Deakin .. .. . 24,000 Dingee .. .. . 15,000 Stanhope .. .. . 15,000 463,000	
2. Waranga Reservoir to Campaspe .. .. .	258,897		
3. West of Campaspe .. .. .	223,970		
	617,481		
Goulburn Storages—			
4. Sugarloaf Reservoir .. .. .	867,512		
5. Waranga Reservoir Enlargement .. .. .	368,652		
	1,236,164		1,236,164
Bacchus Marsh and Werribee Schemes—			
6. Ballan Tunnel .. .. .	18,899	{ Werribee .. .. . 8,000 Bacchus Marsh .. .. . 74,683 Werribee .. .. . 46,000	
7. Pykes Creek Reservoir .. .. .	63,784		
8. Melton Reservoir .. .. .	84,226		
	166,909		166,909
Maffra Scheme—			
9. Glenmaggie Reservoir .. .. .	207,160		207,160
Red Cliffs Scheme—			
10. Main and Distributary Channels .. .. .	383,461	Irrigation District to be debited later .. .. .	383,461
Flood Protection Districts—			
11. Kooweerup and Cardinia .. .. .	176,984	Lower Kooweerup and Cardinia .. .. . 81,000	
12. Goulburn Levees .. .. .	30,697		
	207,681		207,681
Carried forward .. .. .			<b>4,030,891</b>

WORKS UNDER CONTROL OF COMMISSION—*continued.*Capital Debit  
at 30th June,  
1923.  
Exclusive  
of Cost of Loan  
Flotation.

Brought forward .. ..

£  
4,030,891

## 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, 1923.
	£	£	£	£
1. Bacchus Marsh .. ..	76,115	8,906	493	66,716
2. Boort .. ..	61,206	35,259	1,294	24,653
3. Campaspe .. ..	64,166	52,685	305	11,176
4. Cohuna .. ..	157,587	49,197	658	107,732
5. Deakin .. ..	87,034	34,748	2,144	50,142
6. Dingee .. ..	13,501	..	..	13,501
7. Dry Lake .. ..	1,704	686	299	719
8. Gannawarra .. ..	87,622	33,179	180	54,263
9. Kerang .. ..	85,280	35,338	2,334	47,608
10. Koondrook .. ..	118,588	30,872	1,562	86,154
11. Merbein .. ..	181,146	..	133	181,013
12. Mystic Park .. ..	10,303	..	..	10,303
13. Nyah .. ..	76,300	..	..	76,300
14. Rochester .. ..	142,793	..	..	142,793
15. Rodney .. ..	427,711	149,949	8,967	268,795
16. Shepparton .. ..	87,648	..	306	87,342
17. Stanhope .. ..	48,574	..	..	48,574
18. Swan Hill .. ..	98,078	19,799	371	77,908
19. Tongala .. ..	71,494	..	..	71,494
20. Tragowel Plains .. ..	202,828	124,534	527	77,767
21. Tresco .. ..	45,529	..	..	45,529
22. Werribee .. ..	71,685	..	..	71,685
	2,216,892	575,152	19,573	1,622,167

1,622,167

## D.—WATERWORKS AND FLOOD PROTECTION 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, 1923.				
	£	£	£	£				
1. Birchip .. ..	364,738	700	2,273	361,765				
2. Sea Lake .. ..								
3. Tyrrell .. ..								
4. Wycheproof .. ..								
5. Carwarp .. ..	11,651	..	..	11,651				
6. Coliban .. ..	1,290,663	..	..	1,290,663				
7. Dandenong .. ..	26,751	5,128	1,506	20,117				
8. Karkaroc .. ..	137,626	..	2,493	135,133				
9. Kerang North-west Lakes .. ..	1,879	..	..	1,879				
10. Long Lake .. ..	60,766	..	571	60,195				
11. Mornington Peninsula .. ..	314,917	..	..	314,917				
12. Ouyen .. ..	14,763	..	..	14,763				
13. Tyntynder .. ..	125,914	..	..	125,914				
14. Upper Western Wimmera .. ..	55,205	26,567	3,230	25,408				
15. Upper Wimmera United .. ..	65,091	10,918	3,830	50,343				
16. Walpeup East .. ..	4,446	..	..	4,446				
17. Walpeup West .. ..	18,138	..	..	18,138				
18. Werribee .. ..	10,602	..	..	10,602				
19. Western Wimmera .. ..	220,218	106,268	12,318	101,632				
20. Wimmera United .. ..	151,611	25,474	8,671	117,466				
21. Wonthaggi .. ..	63,682	..	7,544	56,138				
22. Yelta .. ..	3,703	..	..	3,703				
23. Wimmera Main Channels .. ..	190,931	..	..	190,931				
24. Wimmera Storages—	Amounts being debited to Districts benefited.	190,931	..	190,931				
Fyans Lake .. ..					42,050	..	..	42,050
Taylors Lake .. ..					179,955	..	..	179,955
Pine Lake .. ..					18,316	..	..	18,316
Lake Whitton .. ..	10,333	..	..	10,333				
25. Echuca Flood Protection .. ..	917	..	..	917				
	3,384,866	175,055	42,436	3,167,375				

3,167,375

Carried forward .. ..

8,820,433

WORKS UNDER CONTROL OF COMMISSION— <i>continued.</i>				Capital Debit at 30th June, 1923. Exclusive of Cost of Loan Flotation.
Brought forward .. ..				£ 8,820,433
<b>E.—WATERWORKS TRUSTS DISTRICTS.</b>				
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, 1923.
	£	£	£	£
1. Avoca Water Trust—				
Rural District .. ..	9,890	2,494	1,867	5,529
Urban District (Quambatook)	3,842	..	398	3,444
2. Carrum Waterworks Trust ..	27,112	7,732	2,856	16,524
3. Loddon United Waterworks Trust—				
Rural District .. ..	22,534	1,717	4,611	16,206
Urban District (Mitiamo) ..	2,850	..	57	2,793
	66,228	11,943	9,789	44,496
<b>Grand Total .. ..</b>				<b>£ 8,820,433</b>

### 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, 21,296 square miles, equal to about 13,630,000 acres.

The area under irrigated culture, for all kinds of crop, was 350,727 acres, being an increase of 62,820 acres over the area irrigated in the previous year, and 44,765 acres above the average of the last four years. The area irrigated last year includes over 17,000 acres watered under yearly permits authorizing the diversion of water from streams throughout the State.

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

Controlling Authorities.	Number of Towns Supplied.	Estimated Population Served.
Commission ... ..	57	100,610
Waterworks Trusts ... ..	100	163,820
Local Governing Bodies ... ..	18	74,570
Totals ... ..	175	339,000

## LANDS UNDER IRRIGATED CULTURE.

The two Statements herewith show the extent of Areas Irrigated for last year in detail, and for the last five years totalled for purposes of comparison.

## STATEMENT OF THE EXTENT OF IRRIGATION AND OF AREAS OF DIFFERENT KINDS OF CROPS WATERED—YEAR 1922-23.

Name of District.	Area Irrigated (Acres).							Total.
	Cereals.	Lucerne grown for Pasture and Hay.	Sorghum and other Annual Fodder Crops.	Pastures.	Vineyards, Orchards, and Gardens.	Fallow.	Miscellaneous.	
<i>Supplied from Goulburn State Works.</i>								
Shepparton .. .. .	1,357	3,223	456	1,526	8,279	65	478	15,384
Rodney .. .. .	4,647	25,989	1,186	15,307	8,609	2,062	642	58,442
Deakin .. .. .	560	1,420	375	341	32	375	10	3,113
Stanhope .. .. .	212	6,887	834	540	563	785	..	9,821
Tongala .. .. .	1,709	7,700	461	1,634	1,965	1,107	38	14,614
Rochester .. .. .	2,002	16,952	1,949	4,592	2,170	798	124	28,587
Echuca North .. .. .	539	351	219	1,374	..	230	143	2,856
Dingee .. .. .	345	1,784	228	1,177	32	..	..	3,566
Tragowel Plains .. .. .	8,259	601	7,082	13,326	12	228	..	29,508
Boort .. .. .	..	131	..	..	..	..	..	131
Totals .. .. .	19,630	65,038	12,790	39,817	21,662	5,650	1,435	166,022
<i>Supplied from Murray State Works.</i>								
<i>(a) Kow Swamp Works.</i>								
Kerang .. .. .	7,662	536	3,979	9,785	10	..	1	21,973
Dry Lake .. .. .	51	..	42	150	3	..	..	246
Lands supplied direct (outside Districts) .. .. .	2,050	1,902	607	1,753	17	..	..	6,329
Totals .. .. .	9,763	2,438	4,628	11,688	30	..	1	28,548
<i>(b) Other Works.</i>								
Cohuna .. .. .	1,964	6,167	1,766	5,452	177	104	575	16,205
Gannawarra .. .. .	5,377	1,447	3,530	8,899	4	5	671	19,933
Koondrook .. .. .	5,243	1,313	2,461	6,841	476	18	2	16,354
Merbein .. .. .	..	83	..	..	7,459	..	97	7,639
Nyah .. .. .	..	10	40	10	2,570	30	20	2,680
Red Cliffs .. .. .	..	..	..	..	4,825	..	..	4,825
Swan Hill .. .. .	3,970	3,709	2,014	2,421	2,431	338	31	14,914
Tresco .. .. .	..	..	..	..	1,558	..	..	1,558
Totals .. .. .	16,554	12,729	9,811	23,623	19,500	495	1,396	84,108
Totals (Murray State Works) .. .. .	26,317	15,167	14,439	35,311	19,530	495	1,397	112,656
<i>Supplied from Loddon State Works.</i>								
Boort .. .. .	3,926	233	2,131	3,357	16	..	..	9,663
<i>Supplied from other State Works.</i>								
Bacchus Marsh .. .. .	..	1,643	106	531	115	138	..	2,533
Campaspe .. .. .	435	361	25	134	6	10	..	971
Coliban .. .. .	235	524	473	616	3,993	326	251	6,418
Kerang North-West Lakes .. .. .	2,044	222	769	2,662	274	125	27	6,123
Mystic Park .. .. .	2,063	1,013	1,169	2,154	21	10	..	6,430
Werribee .. .. .	400	4,427	100	200	125	50	50	5,352
Western Wimmera .. .. .	..	40	163	27	1,323	..	..	1,553
Totals .. .. .	5,177	8,230	2,805	6,324	5,857	659	328	29,380
<i>Supplied from other Works.</i>								
First Mildura District .. .. .	..	113	175	..	11,577	..	295	12,160
Kerang—Outside Districts (Private Diversions) .. .. .	2,228	167	415	1,213	6	..	..	4,029
Other Private Diversions throughout the State .. .. .	3,026	3,731	2,836	2,765	2,413	2,046	..	16,817
Totals .. .. .	5,254	4,011	3,426	3,978	13,996	2,046	295	33,006
<b>Grand Totals, 1922-23 .. .. .</b>	<b>60,304</b>	<b>92,679</b>	<b>35,591</b>	<b>88,787</b>	<b>61,061</b>	<b>8,850</b>	<b>3,455</b>	<b>350,727</b>
Grand Totals, 1921-22 .. .. .	25,039	82,226	28,112	88,195	55,601	4,867	3,867	287,907

## COMPARATIVE STATEMENT OF THE EXTENT OF IRRIGATION, 1918-19 to 1922-23.

	Area under Irrigation (Acres).				
	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.
Goulburn State Works .. .. .	123,242	180,279	129,017	141,562	166,022
Murray State Works .. .. .	89,221	118,759	93,286	90,668	112,656
Loddon State Works .. .. .	18,973	11,272	13,388	8,380	9,663
Other State Works .. .. .	17,743	24,598	18,282	17,564	29,380
Mildura and Private Diversions .. .. .	32,980	36,340	28,561	29,733	33,006
Totals .. .. .	282,159	371,248	282,534	287,907	350,727

## 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 and compulsory irrigation charges made. 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 new Urban Waterworks Districts of Berwick, Bittern, Carrum No 2, Cranbourne, and Somerville—all connected with the Mornington Peninsula Scheme; while a rate was also made for the first time in the Mystic Park Irrigation and Water Supply District, and an irrigation charge in the Tresco Irrigation and Water Supply District. Portions of the Rochester and Deakin Irrigation and Water Supply Districts were excised, and these areas, together with an area of land not formerly in a district, now form the newly constituted Irrigation and Water Supply District of Echuca North, in which a rate and irrigation charge were made during the year.

In twenty-six 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 Cardina 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 have 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 rate on the basis of £8 per 640 acres was fixed by the Commission on the first division lands of the Western Wimmera and Wimmera United Waterworks Districts, while in the Birchip, Carwarp, Karkaroc, Long Lake, Sea Lake, Tyntynder, Tyrrell, Upper Western Wimmera, Upper Wimmera United, and Wycheproof Waterworks Districts the minimum was fixed at £10 13s. 4d. per 640 acres; in the Walpeup West Waterworks District the minimum was fixed at £3 6s. 8d. per 640 acres.

In seventeen districts the Commission made and levied compulsory irrigation charges, details of which 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, 1923.	Period of Rate.	Estimated Number of Persons dwelling in District.
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#### IRRIGATION AND WATER SUPPLY DISTRICTS.

	Valuation by Commission.	Divisions.			Period of Rate.	Estimated Number of Persons dwelling in District.
		1st.	2nd.	3rd.		
		s. d.	s. d.	s. d.		
1. BACCHUS MARSH ..	£ 11,347	1 0	..	..	1st July, 1922, to 30th June, 1923	760
2. BOORT ..	15,514	2 0	1 0	..	" " "	900
3. CAMPASPE ..	10,116	2 0	1 0	0 6	" " "	560
4. COHUNA ..	20,639	2 0	1 0	..	" " "	1,175
5. DEAKIN ..	58,709	1 8	0 10	0 5	" " "	2,000
6. DINGEE ..	2,874	1 0	..	..	" " "	230
7. DRY LAKE ..	250	(No rate made)			" " "	11
8. ECHUCA NORTH ..	4,468	1 0	0 6	..	1st July, 1922, to 30th June, 1923	540
9. GANNAWARRA ..	15,094	2 0	1 0	..	" " "	566
10. KERANG ..	17,677	2 6	1 3	0 7½	" " "	854
11. KOONDROOK ..	16,148	2 0	1 0	..	" " "	758
12. MERBEIN ..	25,807	1 0	..	..	" " "	3,100
13. MYSTIC PARK ..	4,607	6 0	..	..	" " "	101
14. NYAH ..	5,842	1 0	..	..	" " "	1,040
15. ROCHESTER ..	41,458	1 0	0 6	0 3	" " "	2,920
16. RODNEY ..	144,901	1 0	0 6	0 3	" " "	5,650
17. SHEPPARTON ..	32,026	1 0	..	..	" " "	1,885
18. STANHOPE ..	14,455	1 0	..	..	" " "	1,000
19. SWAN HILL ..	15,091	1 0	..	..	" " "	980
20. TONGALA ..	15,782	1 0	..	..	" " "	1,900
21. TRAGOWEL PLAINS ..	33,114	1 0	0 6	..	" " "	1,300
22. WERRIBEE ..	12,525	1 0	..	..	" " "	570

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, 1923.	Period of Rate.	Estimated Number of Persons dwelling in District.
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## WATERWORKS DISTRICTS.

	Valuation by Commission.	Divisions.			Period of Rate.	Estimated Number of Persons dwelling in District.
		1st.	2nd.	3rd.		
		£ s. d.	s. d.	s. d.		
23. AXE CREEK .. ..	1,628	2 0	..	..	1st July, 1922, to 30th June, 1923	230
24. BIRCHIP .. ..	31,593	2 4	1 2	0 7	" " "	2,500
25. CARWARP .. ..	7,745	2 10	1 11	0 11½	" " "	600
26. HARCOURT .. ..	6,220	1 6	..	..	" " "	590
27. KARKAROOC .. ..	112,845	2 2	1 1	0 6½	" " "	3,560
28. KERANG N.W. LAKES	6,003	0 6	..	..	" " "	525
29. LONG LAKE .. ..	66,332	2 10	1 5	0 8½	" " "	1,890
30. SEA LAKE .. ..	54,439	2 8	1 4	0 8	" " "	2,205
31. TYNTYNDER .. ..	45,172	3 4	1 8	0 10	" " "	2,720
32. TYRBELL .. ..	53,363	3 4	1 8	0 10	" " "	3,500
33. UPPER WEST'N WIMMERA	53,808	1 6	0 9	0 4½	" " "	1,600
34. UPPER WIMMERA UNITED	81,965	1 6	0 9	0 4½	" " "	2,200
35. WALPEUP EAST .. ..	19,726	0 9	0 4½	..	" " "	1,800
36. WALPEUP WEST .. ..	59,853	0 7	0 3½	..	" " "	3,700
37. WERRIBEE .. ..	6,478	2 0	..	..	" " "	116
38. WESTERN WIMMERA .. ..	268,434	1 2	0 7	0 3½	" " "	8,900
39. WIMMERA UNITED .. ..	245,382	1 2	0 7	0 3½	" " "	6,600
40. WYCHEPROOF .. ..	52,768	2 4	1 2	0 7	" " "	2,370
41. YELTA .. ..	2,130	3 4	..	..	" " "	75

## URBAN DIVISIONS AND DISTRICTS.

	Municipal Valuation.				Period of Rate.	Estimated Number of Persons dwelling in District.
		£	s. d.	s. d.		
42. BACCHUS MARSH .. ..	9,880	..	..	1 6	1st July, 1922, to 30th June, 1923	1,728
43. BERRIWILLOCK .. ..	1,188	..	..	3 6	" " "	140
44. BERWICK .. ..	2,100	..	..	1 0	1st Jan., 1923, to 30th June, 1923	500
45. BEULAH .. ..	2,869	..	..	2 9	1st July, 1922, to 30th June, 1923	550
46. BIRCHIP .. ..	5,104	..	..	2 0	" " "	910
47. BITTERN .. ..	256	..	..	1 6	1st Jan., 1923, to 30th June, 1923	55
48. CARRUM .. ..	23,000	..	..	1 6	1st July, 1922, to 30th June, 1923	2,000
49. CARRUM No. 2 .. ..	12,000	..	..	1 6	" " "	4,000
50. COHUNA .. ..	7,116	..	..	2 0	" " "	757
51. COROP .. ..	357	..	..	2 0	" " "	90
52. CRANBOURNE .. ..	1,200	..	..	2 6	" " "	190
53. CULGOA .. ..	725	..	..	4 0	" " "	150
54. DANDENONG .. ..	30,045	..	..	1 6	" " "	3,900
55. DIMBOOLA .. ..	8,678	..	..	1 9	" " "	1,350
56. FRANKSTON .. ..	14,515	..	..	1 6	" " "	3,095
57. HOPETOUN .. ..	2,456	..	..	2 9	" " "	450
58. JEPARIT .. ..	4,415	..	..	2 3	" " "	675
59. JUNG JUNG .. ..	595	..	..	3 0	" " "	130
60. KOONDROOK .. ..	3,176	..	..	2 6	" " "	450
61. LAKE BOGA .. ..	1,977	..	..	3 0	" " "	305
62. LASCELLES .. ..	627	..	..	3 6	" " "	120
63. MERBEIN .. ..	4,557	..	..	4 0	" " "	630
64. MINYIP .. ..	3,600	..	..	3 0	" " "	600
65. MORNINGTON .. ..	11,440	..	..	2 0	" " "	1,600
66. NATIMUK .. ..	2,867	..	..	1 6	" " "	420
67. NYAH .. ..	701	..	..	2 6	" " "	177
68. OUYEN .. ..	5,403	..	..	2 9	" " "	700
69. RAINBOW .. ..	5,462	..	..	2 3	" " "	900
70. RUPANYUP .. ..	2,620	..	..	3 0	" " "	400
71. SEA LAKE .. ..	4,742	..	..	2 6	" " "	560
72. SOMERVILLE .. ..	1,512	..	..	1 3	1st Jan., 1923, to 30th June, 1923	225
73. SOUTH FRANKSTON .. ..	2,769	..	..	5 0	1st July, 1922, to 30th June, 1923	240
74. ULTIMA .. ..	2,528	..	..	3 0	" " "	325
75. WATCHEM .. ..	1,483	..	..	3 6	" " "	170
76. WERRIBEE .. ..	8,739	..	..	2 0	" " "	1,250
77. WONTHAGGI .. ..	25,914	..	..	1 6	" " "	7,000
78. WOOMELANG .. ..	1,748	..	..	3 0	" " "	410
79. WYCHEPROOF .. ..	3,855	..	..	2 6	" " "	745



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, 1923.	Period of Rate.	Estimated Number of Persons dwelling in District.
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## COLIBAN SYSTEM.

	Municipal Valuation. £	s. d.			
80. COLIBAN .. ..	311,561		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, 1922, to 30th June, 1923	61,000

## WATERWORKS TRUSTS.

	Municipal Valuation. £	s. d.			
81. AVOCA .. ..	38,474	.. .. 0 4½		1st January, 1923, to 31st December, 1923	1,335
82. MITIAMO (URBAN) ..	678	.. .. 4 0		" " "	150
83. QUAMBATOOK (URBAN)	2,952	.. .. 2 9		" " "	300
84. CARRUM .. ..	30,028		1st Division .. 3 8 2nd Division .. 1 10 3rd Division .. 1 4 4th Division .. 1 0 5th Division .. 0 4	" " "	1,600
	Valuation by Commission. £				
85. LODDON UNITED ..	105,835		1st Division .. 0 8 2nd Division .. 0 4 3rd Division .. 0 2	" " "	3,000

## FLOOD PROTECTION DISTRICTS.

	Valuation by Commission £	s. d.			
86. ECHUCA (HIGH-ST.) ..	845	.. .. 3 0		1st July, 1922, to 30th June, 1923	73
87. CARDINIA .. ..	35,299		1st Div. (p.ac.) 3 0 2nd Div. (p.ac.) 1 6 3rd Div. (p.ac.) 0 9	" " "	850
88. LOWER KOOWEERUP	51,954		1st Div. (p.ac.) 2 0 2nd Div. (p.ac.) 1 0 3rd Div. (p.ac.) 0 6	" " "	2,300

## 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 ..	6,673	3,323	3,323	22s. 6d.	1st October, 1922, to 30th April, 1923
2. COHUNA .. ..	34,722	22,435	22,519	7s.	1st September, 1922, to 30th April, 1923
3. DINGEE .. ..	5,449	4,498	4,498	7s.	" " " "
4. ECHUCA NORTH ..	12,978	5,651	5,651	7s. 6d.	" " " "
5. GANNAWARRA ..	44,189	17,102	17,102	7s.	" " " "
6. KOONDROOK ..	52,691	14,030	14,030	7s.	" " " "
7. MERBEIN .. ..	8,217	7,641	19,138	24s. Min. 60s. per acre.	1st August, 1922, to 30th April, 1923
8. NYAH .. ..	3,602	3,085	7,651	20s. Min. 50s. per acre.	" " " "
9. ROCHESTER ..	123,166	35,614	35,673	6s.	1st September, 1922, to 30th April, 1923
10. RODNEY .. ..	266,755	185,686	50,015	6s.	" " " "
11. SHEPPARTON ..	21,478	19,187	19,187	6s.	" " " "
12. STANHOPE ..	23,868	17,621	13,763	6s.	" " " "
13. SWAN HILL ..	19,750	13,818	13,818	6s.	" " " "
14. TONGALA ..	27,176	20,634	19,383	6s.	" " " "
15. TRAGOWEL PLAINS	181,304	127,881	25,589	7s.	" " " "
16. WERRIBEE ..	9,993	7,913	7,935	12s.	1st October, 1922, to 30th April, 1923
17. TRESKO .. ..	3,870	2,671	2,671	16s. Min. 40s. per acre.	1st January, 1922, to 31st December, 1922

## CONTRACTS.

## STATEMENT OF CONTRACTS ENTERED INTO DURING THE YEAR ENDED 30TH JUNE, 1923.

No.	Name of Contractor.	Work or Supply.	Amount (Loan and Vote).		
			£	s.	d.
1883	Australian Portland Cement Co.	30,000 casks Cement	25,500	0	0
1884	Malcolm Moore Pty. Ltd.	End-tipping Trucks	1,068	0	0
1885	G. F. Sewell	Side-tipping Trucks	2,316	0	0
1886	Austral Otis Eng. Co. Ltd.	Boiler Fronts, &c., Merbein	267	10	0
1887	G. F. Sewell	Channer Wheels	925	0	0
1888	Government Dockyards, N.S.W.	Movable Steel Trestles, Torrumbarry Weir	6,634	10	0
1889	Mephan Ferguson Pty. Ltd.	Steel Chute for Rock-breaker	66	0	0
1890	McDonald and Mann	Painting, &c., Offices, Jolimont	59	14	6
1891	A. J. Bell	Firewood, Nyah	600	0	0
1892	R. Harris	Firewood, Nyah	600	0	0
1893	M. O'Halloran	Firewood, Merbein	867	13	6
1894	Wm. Russell	Firewood, Merbein	630	0	0
1895	J. H. Saddler	Firewood, Cohuna	131	5	0
1896	J. C. Waiting	Firewood, Cohuna	62	10	0
1897	Thos. Bubb	Firewood, Cohuna	361	13	6
1898	Thos. Church	Firewood, Cohuna	312	10	0
1899	Wm. Hartley	Firewood, Cohuna	193	15	0
1900	Jas. Storey	Firewood, Cohuna	425	0	0
1901	James Bell	Firewood, Cohuna	287	10	0
1902	W. A. Cornwall	Main Channel, Maffra	881	19	3
1903	Shanahan Bros.	Main Channel, Maffra	949	16	5
1904	Griffiths Bros.	Main Channel, Maffra	809	0	10
1905	Jaques Bros. Pty. Ltd.	Rock-breaker	934	0	0
1906	Austral Otis Engineering Co.	Concrete Skips	120	0	0
1907	F. Russell	Firewood, Merbein	561	2	6
1908	H. E. Ward	Firewood, Merbein	558	6	8
1909	H. G. Crombie	Firewood, Koondrook	300	0	0
1910	W. E. Crombie	Firewood, Koondrook	150	0	0
1911	Geo. Wakefield	Firewood, Merbein	2,327	17	6
1912	Fowler Bros.	Main Channel, Maffra	890	16	8
1913	W. Duffy	Firewood, Nyah	325	0	0
1914	A. Harris	Firewood, Nyah	162	10	0
1915	Alfred Harman	Drag Line Excavator	5,158	13	0
1916	George Webb	Firewood, Merbein	1,408	15	0
1917	George Halls	Firewood, Merbein	1,425	0	0
1918	Alex. Robinson	Firewood, Merbein	633	15	0
1919	E. J. Curnow	Painting Engineer's Residence, Pyramid Hill	56	17	0
1920	Australian Portland Cement Co.	30,000 casks Cement	25,500	0	0
1921	W. E. Bramley	Firewood, Cohuna	135	8	4
1922	A. J. Monro	Firewood, Cohuna	218	15	0
1923	E. S. Hipwell	Firewood, Cohuna	147	18	4
1924	Saddler and Waiting	Firewood, Cohuna	70	8	0
1925	R. Masters	Firewood, Cohuna	137	15	6
1926	F. Honeychurch	Firewood, Cohuna	151	18	0

## DISTRICTS ADMINISTERED FROM COHUNA CENTRE.

During the season the pumping was extremely heavy owing to the low state of the river and very little gravitation water being available. There was a great demand for water throughout the season, but it was satisfactorily met.

The most important works carried out during the period under review were those relating to the provision of an entire gravitation supply to the Cohuna and Gannawarra Districts, which has been made possible by Torrumbarry Weir and which will take the place of the present part gravitation and costly pumping scheme. The new supply will take off from the River Murray above Torrumbarry Lock-Weir which will hold the river flow to the required level, so that the water will gravitate *via* Gunbower and Taylors Creek to a point about 4 miles distant from the present Cohuna Main Channel.

The excavation of the main channel—4 miles in length—from Taylors Creek to connect the existing Cohuna System with a gravitation supply from the Torrumbarry Weir has been completed. The two important regulators and six of the eight necessary bridges have also been constructed and the work as a whole will be available for gravitation supplies during the coming irrigation season. The new gravitation works also involve the raising of the existing banks of Gunbower and Taylors Creeks. Surveys of this work are well forward and arrangements are being made to have the first stage (which will admit of a full supply by gravitation to Cohuna District from Torrumbarry Weir) completed in time to render unnecessary any further use of the pumping plant at Cohuna Headworks. The final stage of raising the levels of these creeks as designed for delivering supplies along the connecting channel will be completed during the year.

In Gannawarra District work consisted mainly of maintenance and repairs, special attention having been given to clearing weeds from channels wherever necessary.

## CONTRACTS—continued.

STATEMENT OF CONTRACTS ENTERED INTO DURING THE YEAR ENDED 30TH JUNE, 1923—continued.

No.	Name of Contractor.	Work or Supply.	Amount (Loan and Vote).	
			£	s. d.
		Brought forward .. ..	134,885	6 2
1967	T. Collins .. ..	Glenorchy-Charlton Channel .. ..	173	8 9
1968	W. Broadwood .. ..	Glenorchy-Charlton Channel .. ..	177	5 6
1969	T. Collins .. ..	Glenorchy-Charlton Channel .. ..	166	19 11
1970	T. Collins .. ..	Glenorchy-Charlton Channel .. ..	161	16 3
1971	T. Sutherland .. ..	Mewburn Park Channel, Maffra .. ..	119	13 9
1972	J. W. Boal .. ..	Boisdale Channel, Maffra .. ..	520	17 6
1973	A. LePlastrier and Co. Pty. Ltd. .. ..	Steel Chutes, Sugarloaf Reservoir .. ..	398	0 0
1974	John Mannix .. ..	Firewood, Tresco .. ..	690	16 0
1975	A. J. Fisher .. ..	Glenorchy-Charlton Channel .. ..	183	6 3
1976	S. G. Anderson .. ..	Workmen's Cottages .. ..	162	0 0
1977	D. Conacher .. ..	Workmen's Cottages .. ..	162	0 0
1978	Thompson and Co. (Castlemaine) .. ..	Electric Generating Set .. ..	7,896	15 0
1979	Thompson and Co. (Castlemaine) .. ..	Boilers, &c., Millewa .. ..	3,958	10 0
1980	W. Dole and Son .. ..	Glenorchy-Charlton Channel .. ..	122	0 0
1981	G. H. Dunlop .. ..	Drag Line Excavator, Maffra .. ..	4,594	0 0
1982	Jos. Bryant .. ..	Excavation Drain, Carrum .. ..	399	7 6
1983	H. E. Shiells .. ..	Excavation Drain, Carrum .. ..	30	8 4
1984	English Electric Co. .. ..	Transformer, Red Cliffs .. ..	430	0 0
1985	Anderson and Boal .. ..	Glenorchy-Charlton Channel .. ..	98	18 9
1986	Anderson and Boal .. ..	Glenorchy-Charlton Channel .. ..	135	5 8
1987	Anderson and Boal .. ..	Glenorchy-Charlton Channel .. ..	195	5 0
1988	Anderson and Boal .. ..	Glenorchy-Charlton Channel .. ..	140	18 2
1989	Anderson and Boal .. ..	Glenorchy-Charlton Channel .. ..	135	3 9
1990	Anderson and Boal .. ..	Glenorchy-Charlton Channel .. ..	134	1 11
1991	E. J. Broadwood .. ..	Glenorchy-Charlton Channel .. ..	417	0 10
1992	Thompson and Co. (Castlemaine) .. ..	Ejector Condenser, Millewa .. ..	278	5 0
1993	George Webb .. ..	Firewood, Merbein .. ..	600	0 0
1994	Irwin Storer .. ..	Firewood, Merbein .. ..	1,300	0 0
1995	A. J. Bell .. ..	Firewood, Nyah .. ..	425	0 0
1996	W. N. Harvey .. ..	Firewood, Nyah .. ..	212	10 0
1997	W. Duffy .. ..	Firewood, Nyah .. ..	425	0 0
1998	Herbert Crowther .. ..	Survey, Kerang North-west Lakes District .. ..	750	0 0
1999	J. H. Summers .. ..	Firewood, Nyah .. ..	800	0 0
2000	Chas. Jackson .. ..	Firewood, Merbein .. ..	650	0 0
2001	J. J. O'Halloran .. ..	Firewood, Merbein .. ..	956	5 0
2002	S. A. Stevens .. ..	Tandarra-Calivil Channel .. ..	2,228	14 8
2003	Henry Casey .. ..	Tandarra-Calivil Channel .. ..	640	8 6
2004	Allan N. Ackland .. ..	Tandarra-Calivil Channel .. ..	898	5 4
2005	Ketterer and O'Halloran .. ..	Tandarra-Calivil Channel .. ..	944	19 9
2006	Mooney and Abraham .. ..	Tandarra-Calivil Channel .. ..	805	18 3
2007	J. Tuana .. ..	Waranga-Kyabram Channel .. ..	898	7 10
2008	Atkinson and Fox .. ..	Waranga-Kyabram Channel .. ..	538	19 10
2009	Thos. Malone .. ..	Waranga-Kyabram Channel .. ..	2,257	18 8
2010	A. W. Cain .. ..	Firewood, Hume Reservoir .. ..	750	0 0
2011	Justin Kennedy .. ..	Firewood, Hume Reservoir .. ..	412	10 0
2012	Australian Portland Cement Co. .. ..	30,000 casks Cement .. ..	24,750	0 0
2013	Wm. Russell .. ..	Firewood, Merbein .. ..	937	10 0
2014	M. O'Halloran .. ..	Firewood, Merbein .. ..	937	10 0
2015	H. P. Cornell .. ..	Boring for Water, Murrayville .. ..	225	0 0
2016	Herbert E. Ward .. ..	Firewood, Merbein .. ..	900	0 0
2017	Frederick Russell .. ..	Firewood, Merbein .. ..	637	10 0
2018	Government Dockyards, N.S.W. .. ..	Mild Steel Pipes, Millewa .. ..	4,158	0 0
		Total .. ..	£205,807	17 10

## PIECE-WORK AND DIRECT LABOUR.

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

Works.	Amount.
River Murray Storages (Hume and Torrumbarry) .. ..	£149,866
Wimmera Mallee System .. ..	148,774
Red Cliffs and Merbein Irrigation Areas .. ..	132,699
Sugarloaf Reservoir .. ..	81,497
Maffra District (Glenmaggie Reservoir) .. ..	51,326
Nyah, Rodney, Shepparton, Swan Hill, and Coloma Districts .. ..	36,542
Mallee Tanks, Clearing Roads (Mallee) .. ..	27,614
Koo-wee-rup and Cardinia .. ..	25,655
Kerang, Kerang Lakes, Koondrook, Boort, and Tragowel Plains Districts .. ..	24,992
Goulburn Main and Distributary Channels .. ..	24,134
Mornington Peninsula .. ..	22,342
Millewa Waterworks District .. ..	17,089
Waranga Reservoir .. ..	15,945
Bacchus Marsh and Werribee Districts .. ..	11,699
Torrumbarry Districts .. ..	8,062
Coliban and Other Districts .. ..	9,814
Total .. ..	£788,050

## WORKS CARRIED ON OR COMPLETED DURING THE YEAR ENDED 30TH JUNE, 1923.

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### COLIBAN DISTRICT.

The work of restoring and enlarging the structures on the Main Channel which conveys water from the Storages for the services of Castlemaine, Bendigo, and surrounding districts supplied by the Coliban System of Works has been continued during the year. A considerable increase in the carrying capacity of the Main Channel has been effected, and the Channel is now capable of carrying full supplies for all present requirements. The improvement works are being further extended to meet growing demands for water.

The new by-wash at the Harcourt Reservoir has been completed and this Reservoir will be utilized to its full supply level in the coming season.

About 12 miles of pipe mains in Bendigo, Castlemaine, and other centres have been scraped, and in every case good results have been obtained. Further pipe scraping will be done as far as practicable during the ensuing year.

Arrangements have been made to construct an improved device for screening the water at the end of the Main Channel where deliveries are made to the Reservoirs from which supplies to Bendigo are drawn.

### IRRIGATION AND WATER SUPPLY DISTRICTS.

#### RODNEY DISTRICT.

Notwithstanding the abnormally dry season and the consequent great demand for water for irrigation, the requirements of land-holders were reasonably well met, a total area of no less than 58,440 acres being irrigated including some 26,000 acres of lucerne.

The subdivision of several large holdings necessitated the construction of many new works such as culverts, syphons, measuring boxes and checks. About 5 miles of new distributary channels have been constructed and several miles of existing channels have been remodelled and enlarged. The extensive works for the enlargement of the Wilson Channel have been completed as far as the Cussen Channel; and surveys are now being carried out with a view to the enlargement of other main channels, so as to cope with the increasing demand for water for irrigation. The new Waranga-Kyabram Main Channel is being constructed to enable increased supplies to be conveyed to Lancaster, Kyabram and Wyuna.

Surveys have been made for the location of several miles of new distributary channels. These will be constructed during the ensuing year.

#### SHEPPARTON DISTRICT.

To improve supplies within this District, 10 additional checks or regulators and 18 outlets have been constructed, 2 miles of channels have been remodelled and topped up, and 60 chains of channels have been lined with concrete.

Drainage works have been extended and improved, one mile of drain having been constructed, 2 miles of existing drains enlarged, and 10 additional syphons provided.

Supplies to meet the heavy demand for water for irrigation were well maintained though with some difficulty towards the end of the exceptionally dry season which was experienced.

#### SWAN HILL DISTRICT.

Some 50 chains of the Main Western Channel were enlarged; 76 chains of levee banks strengthened and improved;  $2\frac{1}{2}$  miles of channels were lined with concrete; 250 chains of new supply channels constructed and the necessary structures built; 46 chains of drainage channel were excavated; and 40 chains of drainage channel deepened.

Very satisfactory progress has been made by soldier settlers in the orchard area of Woorinen, while the condition of all other settlers is satisfactory.

An area of 419 acres of Crown land within the Swan Hill District, and known as the Timber Reserve, has been subdivided into six blocks. Several private estates comprising in all 1,878 acres adjoining the district were purchased by the Commission and subdivided into 47 holdings nearly all of which have been allotted. The District will be extended to include these lands.

## DISTRICTS ADMINISTERED FROM KERANG CENTRE.

Notwithstanding the abnormally small flow in the River Murray during the past season, which necessitated the placing of such restrictions on diversions throughout the District that during March and April the quantity pumped from the Murray at Koondrook was reduced to one-third of the capacity of the pumping plant, the Commission was able to supply to Koondrook District irrigators 14,852 acre-feet of water, which was 822 acre-feet in excess of the total water-rights allotted within this District.

Notwithstanding also the consistently low state of the River, Kow Swamp Storage was with careful regulation filled to its maximum capacity. This enabled a stream to be sent down the Contour Channel to the North-West Lakes Storage System, the principal storages of which were filled before the River Murray fell below the sill level of Kow Swamp Head-works.

Extensive repairs were carried out to the flume over the Calivil Creek on the Kerang East Main Channel; and a 24-inch reinforced pipe subway on No. 1 Right Branch Channel, Wandella section, was constructed. The new spur channel from the Gunbower West Main Channel through allotments 3 and 3A, Parish of Macorna, together with the concrete culverts and regulator, was completed.

Between Third Lake and Lake Charm the levees on the East were strengthened; and at the outlet of Kangaroo Lake the wings of the regulator were extended, new cut off walls constructed, and the slopes, including the apron, beached. The works of raising and strengthening sections 1, 2 and 3 of the Kangaroo Lake levee were undertaken when that Lake was at a low level, and the stone protective work was considerably extended to cover the portions most exposed to wave action.

A new reinforced concrete outlet containing a six feet opening was built on the east side of the Kangaroo-Tutchewop channel upstream of the channel regulator.

The line of the proposed channel to connect Lake Tutchewop with Lake Boga is being surveyed, and contracts for the earthworks will be let at an early date, as it is the intention of the Commission to make use of the works during the coming season.

The joint work of bridging over the piers of the new concrete regulator on the Loddon River below Kerang comprising seven spans of 15 feet each, was completed and the roadways together with the approaches were graded and loamed.

On the Little Murray River at Benjeroop, near its offtake from the River Murray and upstream from the Loddon River junction, a large and substantial reinforced concrete regulator containing eight drop bar openings each 6 feet 8 inches in the clear, and a navigation pass 54 feet wide with massive piers, was constructed. A special feature of this work is the composite truss which spans the navigation pass, and which supports the needle bars used for closing the opening when diversions are taking place. At times of flood the whole structure with the exception of the piers marking the navigable opening will be submerged, and the truss can be floated out of position and moored downstream or lifted on skids to the river bank. During periods when the river is navigable from the River Murray offtake, the truss may be lifted off the piers by suitable gearing, and floated out to give a clear passage for barges. By means of this regulator the water sent down from Torrumbarry Weir *via* the Pyramid Creek and the Loddon River for the service of a large portion of the Swan Hill District may be headed up to give the requisite full supply level at the weir on the Little Murray River upstream from Swan Hill, when the Murray at Benjeroop is at a low level during the irrigation season.

The balance of Tye's Estate at Gonn Crossing in the Koondrook Irrigation District was purchased for settlement purposes, and subdivided into closer settlement allotments. The necessary works for the supply of this subdivision have been constructed. Several new pipe occupation crossings were also completed in this locality.

The valuable properties adjoining Tye's and known as Ross and Anderson's, situated at Gonn Crossing, which will be traversed by the Kerang-Gonn Railway, were also acquired for settlement. These areas will be subdivided at an early date into lots suitable for closer settlement, and will be supplied with water from the Koondrook system.

## DISTRICTS ADMINISTERED FROM COHUNA CENTRE.

During the season the pumping was extremely heavy owing to the low state of the river and very little gravitation water being available. There was a great demand for water throughout the season, but it was satisfactorily met.

The most important works carried out during the period under review were those relating to the provision of an entire gravitation supply to the Cohuna and Gannawarra Districts, which has been made possible by Torrumbarry Weir and which will take the place of the present part gravitation and costly pumping scheme. The new supply will take off from the River Murray above Torrumbarry Lock-Weir which will hold the river flow to the required level, so that the water will gravitate *via* Gunbower and Taylors Creek to a point about 4 miles distant from the present Cohuna Main Channel.

The excavation of the main channel—4 miles in length—from Taylors Creek to connect the existing Cohuna System with a gravitation supply from the Torrumbarry Weir has been completed. The two important regulators and six of the eight necessary bridges have also been constructed and the work as a whole will be available for gravitation supplies during the coming irrigation season. The new gravitation works also involve the raising of the existing banks of Gunbower and Taylors Creeks. Surveys of this work are well forward and arrangements are being made to have the first stage (which will admit of a full supply by gravitation to Cohuna District from Torrumbarry Weir) completed in time to render unnecessary any further use of the pumping plant at Cohuna Headworks. The final stage of raising the levels of these creeks as designed for delivering supplies along the connecting channel will be completed during the year.

In Gannawarra District work consisted mainly of maintenance and repairs, special attention having been given to clearing weeds from channels wherever necessary.

In Cohuna Urban District the principal work consisted of 18 chains of 4-inch diameter water main being laid in Channel-street, Cohuna, and the installation of a number of water meters on the service pipes of the residents.

## DISTRICTS ADMINISTERED FROM LODDON CENTRE.

In Tragowel Plains District a further length of 10 miles of channel has been constructed or remodelled; three bridges have been reconstructed, six checks built, and thirteen meter outlets provided.

In Boort District, in anticipation of the increased water supply from the Goulburn System, the Kinypanial Creek from the sluice-head on the River Loddon towards Fernihurst has been cleaned out, and some  $9\frac{1}{2}$  miles of the distributary channels have been remodelled. Several checks and one syphon have been built; and a number of the older structures have been renewed.

In Dingee District, improvements to the Main Channel have been carried out by protecting the banks from scour. Numerous minor works for the maintenance and improvement of the distributary channels have also been constructed.

## DISTRICTS ADMINISTERED FROM ROCHESTER CENTRE.

In the Rochester District good progress has been made with the construction of new works for the improvement and extension of distribution and drainage works. Several spur channels (about  $2\frac{1}{2}$  miles in all) were constructed, including a short length of channel lined with concrete. Three and a half miles of the Cornelia Creek Channel were reconstructed. This has resulted in a greatly improved supply to the area served. Meter outlets, drainage subways, and other structures have been installed where necessary, and the work of maintaining channel banks, bridges, and other structures, has been carried out.

The Strathallan Drainage Channel, which is about 6 miles in length, was constructed for the purpose of facilitating the escape of flood waters from an area of about 4,000 acres liable to flooding between the Waranga Western Channel and Strathallan. The usefulness of this channel has been proved by the rapidity with which flood waters are now drained off after any flooding.

For the prevention of seepage 40 chains of channels were lined with  $1\frac{1}{2}$  inch concrete, and existing  $\frac{1}{2}$  inch concrete-lined channels have been repaired, while about 6 chains of channel were pug trenched.



The Echuca North Irrigation and Water Supply District (formerly part of Deakin District) which embraces an area of 13,607 acres in the parishes of Echuca North and Echuca South, and is supplied from the Goulburn-Waranga Head-works by way of the Tongala and Rochester District systems has been constituted and is being locally administered by the Commission's officers at Rochester and Tongala. The necessary distributary works were constructed, water rights allotted, and supplies delivered during last Irrigation Season. The channel known as the Village Settlement Channel will be remodelled and ready for extended use next season.

In the Campaspe District considerable maintenance work has been carried out. A quantity of stone filling has been placed on the upstream slope of the Weir; and the channels and bridges have received necessary attention. The bridges being old wooden structures, arrangements will be made for the redecking of several of them during the ensuing year.

#### DISTRICTS ADMINISTERED FROM TONGALA CENTRE.

In the Tongala District the No. 3 Channel was extended 120 chains to command additional land recently included in the District; 20 outlets and 10 culverts were constructed to meet the requirements of new subdivisions supplied from existing works. A section of 30 chains of the main channel was pug trenched. This had the desired effect of stopping seepage which threatened to be troublesome.

During the year an additional area of 1,500 acres has been purchased for Closer Settlement. Three-inch contour surveys of this area have been made; and channel surveys have been completed. Channel surveys have also been carried out for the reticulation of the area adjoining the District on the north-east and which will be included in the Tongala District next year.

The Koyuga Main Channel has been extended 2 miles to supply water to the northern portion of the Echuca North District. This extension also provides an outfall for the Koyuga Channel System.

In the Stanhope District, the construction work carried out during the year comprised  $2\frac{1}{2}$  miles of new channel with an off-take from the Waranga-Deakin Main Channel. The No. 8E Spur Channel at Bonshaw has been extended 80 chains to command some 700 acres recently added to the District. Owing to the increasing demand for water in the western portion of this District, it was found necessary to top up the No. 9 Main Channel through the Bonshaw Estate. This has enabled an increased supply to be sent along when necessary to meet heavy demands. The channels through the sandy portions of the District had to be pug trenched owing to seepage; and it is likely that cement lining will have to be resorted to on some portions of these channels at an early date.

Surveys have been completed for the supply to the McQueen's Estate of about 620 acres of purchased land which will be included in the Stanhope District in the ensuing year.

In the Deakin District, in addition to general maintenance and repair work, 6 miles of the Carag Carag Channel were cleared of silt; and continual cutting of rushes in all old channels has been carried out. Constant attention has had to be given to the old wooden structures in this District, and consideration is being given to the question of replacing many of them with new ones built of concrete.

The permanent survey of the drainage system to meet the requirements of Stanhope, Tongala, and portion of the Deakin District has been completed, and the question of constructing the Main Drainage Channel is now being considered. Surveys are now being carried out for the complete Channel reticulation of that portion of the Deakin District lying between the Tongala and Stanhope Districts.

#### BACCHUS MARSH AND WERRIBEE DISTRICTS.

In Bacchus Marsh District 2 miles of concrete-lined channels were constructed, being part of the system for the supply of the Hopetoun area. Two measuring wheels, six storm water shoots, twelve concrete outlets, three 12-inch diameter concrete pipe syphons (6 chains in all) across Comadai Creek, were constructed; also 10 chains of 15-inch diameter pipes were laid to form a syphon across the Comadai Valley. About  $2\frac{1}{2}$  chains of the concrete-lined Hopetoun Channel which was carried away by a land-slip in February last has been replaced by a 24-inch diameter pipe syphon. The Woolpack Inn Channel has been concrete lined for a length of 15 chains, and two measuring wheels and twelve outlets have been provided. The overflow pipes on the Maddingley and Werribee North Channels at Simons have been renewed. The Darley Township Channels have been concrete lined for a distance of 10 chains.

Ten chains of the main supply Channel at Sheas bank were concrete lined, and good progress has been made with the repairs to old concrete lining which was damaged by a severe storm last year. Silt has been scooped out of the bed of the Darley Channel for a length of 61 chains to an average depth of 18 inches.

The protective work on the Lerderderg River at Millers Bridge is practically completed; and the existing works for the prevention of erosion at Ramsey's, Grieve's, and Anderson's have proved very successful.

The pipe reticulation of the privately subdivided estate known as Dicksonia, adjoining the town of Bacchus Marsh on the north, has been completed, and the system is working satisfactorily.

The Pykes Creek Reservoir embankment road has been topped up (in some places as high as 4 feet) and the stone pitchers and guard rail fence have been raised.

At the request of the landowners concerned, a trial survey has been made of a scheme to supply about 500 acres in the Lerderderg River Valley that are too high to be commanded by existing works. When some further investigations are completed the proposal will in due course be considered by the Commission.

In the Werribee District the works were completed for the supply of the new area of 1,100 acres purchased from Mr. P. N. Lock for soldier settlement, and water was delivered to the new settlers thereon towards the end of the irrigation season. Drainage works for both surface and subsoil drainage of the older portion of the District have been extended and are now approaching completion. Portion of the 168 acres of land near the Werribee Township, which was subdivided into small areas for sale by public auction, has been disposed of at prices up to £80 per acre. The balance of this area will be made available at a later date. The settlers on this estate now number approximately 200, half of whom are discharged soldiers. These latter are now well established, and generally are making good progress.

Surveys have been carried out and investigations are being made in connexion with a proposed dam at Cobbledicks Ford, with a view to providing additional storage for the supply of Werribee District.

In the Werribee Waterworks District the demand for domestic and stock supplies during the summer was particularly heavy, but all demands were met. It is intended to remodel portion of the channels in this District before the coming season to give an improved supply.

In the Werribee Urban District experiments with filters and sedimentation tests have been carried on with the view of determining the best method of improving the supply to the town. These experiments have not yet been completed. On the whole, the quality of water supplied throughout the year has been good, and no complaints have been received.

#### MERBEIN DISTRICT.

Satisfactory progress continues to be made in this District. The year's returns of dried fruits was a record one for Merbein, the yield of sultanas and currants being especially good. In the latest subdivision of Birdwood the prospects for good crops in the coming season are very promising.

Lining of supply channels with cement concrete was continued throughout the year. During that period approximately 170 chains of channels were completed. This work has been pushed forward to such an extent that there now remains only about 140 chains to complete the lining of the whole channel system of the District. Seepage from channels has already been reduced to a minimum as a result of channel lining.

In the Merbein Township extensions of reticulation have been carried out, and every effort is being made to give a full supply.

#### RED CLIFFS DISTRICT.

During the year considerable progress has been made in this new District. Since last Report 73 blocks have been made available, bringing the total number within the settlement to 701.

Out of a total area of 15,800 acres subdivided about 14,400 acres have now been cleared, including practically the whole of the 12,500 acres allotted in the five subdivisions. The first, second and portion of the third subdivisions have been planted, and were supplied with water for irrigation during the year.

The main and re-lift pumping plants described in the last Annual Report are now practically complete. The second turbine pumping unit and electrical equipment



at the main station, together with a re-lift motor-driven plant, were brought into operation in October last. A commencement has been made with the installation of a duplicate generating unit, and a spare transformer at the main plant, to insure continuity of supply of power to the important re-lift system.

Twenty-four miles of channels with all necessary structures have been constructed during the year. The total length of channels within the settlement is now 104 miles, involving some 620,000 cubic yards of excavation. The lining of  $5\frac{1}{2}$  miles of channels with cement has been completed, and this work is being proceeded with as rapidly as possible.

In the Red Cliffs township, further sales have been effected, and a total of 192 blocks have now been sold at prices ranging as high as £15 per foot.

The township has been reticulated. A rising main of 9-inch wood pipe, 145 chains in length, has been laid from Regulator No. 1 in the main channel, where an engine and pump have been installed, and consumers are now making their connexions.

Arrangements are being made for the establishment of a riverside suburb near the main pumps and a number of cottages and quarters for the employees of the Commission will be erected during the coming year. Later on, residential allotments will be sold by auction.

#### NYAH DISTRICT.

Works of channel lining and drainage have been continuously carried on. Four and a half miles of channels were concrete lined, making a total of  $22\frac{1}{2}$  miles lined in the settlement. The beneficial effects of lining and drainage are quite apparent in every case.

Despite the low state of the River Murray in the autumn, regulation of its stream by the Commission and close supervision of private diversions enabled irrigation supplies to be maintained. Vines at Tyntynder West Soldier Settlement yielded their first crop, and several of the soldier settlers have had exceptionally good returns. Soldiers' blocks on the Nyah North Extension are in a forward condition and should come into bearing in the ensuing season.

At the township of Nyah West considerable progress has been made. A new bank and several brick shops have been erected and a large hotel is being built of concrete. At the request of residents the Commission has undertaken the pipe reticulation of the township and this work is now in hand.

#### MYSTIC PARK DISTRICT.

In the recently constituted Mystic Park Irrigation and Water Supply District, extensive maintenance works are being carried out to bring up to the Commission's standard the privately constructed channels taken over by the Commission. Bridges and culverts have also been rebuilt and alterations to the pumping plant are in progress. This district, which is supplied from Kangaroo Lake, one of the North West Lakes, was, as set out in the last Annual Report, taken over by the Commission at the request of the land-owners.

#### TRESCO DISTRICT.

In this District, which was also taken over at the request of landowners and constituted an Irrigation and Water Supply District, the work of remodelling the drainage system has been pushed ahead, and, during the year  $6\frac{1}{2}$  miles of drains have been regraded and enlarged. By means of a pipe syphon at what is known as the Big Fill, drainage water from the Eastern drainage system has been diverted under the main channel into the western drainage system and now flows into the Dry Lake instead of into Lake Boga.

Surveys are being carried out for a channel connecting Lake Tutchewop and Lake Boga to enable a supply of water from the River Murray at Torrumbarry to be diverted through the Kerang Lakes into Lake Boga and so provide a better water supply to Tresco District.

Lining of channels with cement concrete is being carried out and some 40 chains have been completed. Preparations are being made for 80 chains more to be done before next watering.

The main pumping plant has been overhauled and new boilers and a new chimney stack have been installed. At the re-lift, a new plant capable of delivering 11 cubic feet per second is in course of erection.

### MAFFRA DISTRICT IRRIGATION SCHEME.

Good progress was made during the year with the construction of the cyclopean dam on the Macallister River, some 21,000 cubic yards of concrete having been placed in position. With the full modern plant now installed, the greater portion of the remaining wall should be built during the coming year and all outlet pipes should be in position enabling all necessary volumes to be diverted for the summer of 1924-1925. This dam when completed will store over 150,000 acre feet and with ordinary unregulated river flows will provide ample supplies to irrigate some 80,000 acres of suitable land which extends from the Weir site as far as Sale.

Although steady satisfactory progress was made with the construction of the dam and adjoining rock outlets, the results secured on the main channels were disappointing, solely on account of inability to secure contractors with suitable plants to carry out the work at reasonable rates. Consequently most of the work has had, up to the present, to be done by the Commission's own teams. In order to cope with this difficulty, arrangements have now been made to make available for the construction of the heavier sections of the main channels a Steam-driven Drag Line Excavator, capacity 100 cubic yards per hour, a Steam Shovel, capacity 50 cubic yards per hour, and the Commission's No. 2 Bucket Dredger from Kooweerup, capacity 75 cubic yards per hour. These machines combined with the special mechanical appliances already working should be able to complete cutting the Northern Main Channel in time for diversion for the watering season of 1924-25, and thus set free the Commission's own horse teams for the work of cutting the smaller distributary channels. Under these conditions it is expected that much more satisfactory progress will be made during the coming year so as to enable a good start to be made in the season of 1924-25 by the irrigation of almost the whole of the Boisdale flats and a large portion of the Newry flats these being the areas for the service of which the scheme was originally launched although provision was subsequently made for the inclusion of a much larger area of very suitable adjacent lands.

### INVESTIGATIONS OF NEW IRRIGATION AND WATER SUPPLY PROPOSALS.

At the special request of local bodies and land-owners concerned, further investigations have been made in respect to the Eppalock Storage Scheme on the Campaspe River for the irrigation of about 130,000 acres of land south of the Waranga Western Main Channel in the Shires of Rochester and Huntly. Details of cost were drawn up, and to ascertain as far as practicable the views of all concerned arrangements were made for the taking of a poll of land-owners within the area commanded.

Other schemes investigated or being investigated by the Commission at the instance of local bodies and land-holders were works to irrigate an area near Rutherglen, a proposed storage at Woolshed Lake, to augment the supply from the Waranga Western Main Channel to the Boort District; also a scheme for a storage at Vaughan, near Castlemaine, for the irrigation of rich valley lands, and a scheme for a reticulated supply to Newstead.

Investigations are also proceeding in regard to additional storages on the Lerderg and Werribee Rivers, at Blackwood, and Cobbleticks respectively.

### WATERWORKS DISTRICTS.

#### CARWARP DISTRICT.

During the year water was supplied by the Red Cliffs pumps. A complete watering of the whole area was effected by April, 1923. In order to expedite watering, a large number of pipe culverts throughout the District have been duplicated. The East Branch Channel was extended a distance of  $3\frac{1}{2}$  miles to give a water supply to areas in Nurnurnemal. An extension is being made from Keillors Branch to supply part of the new Millewa area known as Widgil. A scheme for the supply of water to the high lands surrounding Carwarp Railway Station by means of a pump, rising main and about 12 miles of new channels has been prepared and has been accepted by the land-owners concerned. It is expected that this scheme will be completed in time for next watering.

## WIMMERA-MALLEE WATER SUPPLY.

The whole of the districts comprising the Wimmera-Mallee Domestic and Stock System of some 11,000 square miles in area received full supplies of water in rotation during the year, over 4,500 miles of the Commission's main and branch channels being run. The watering was rendered generally very difficult, especially in the northern areas, through drifting sand, owing to the extremely dry summer and autumn. Adequate supplies were also given to all the urban districts controlled by the Commission and local Waterworks Trusts connected to this system.

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

To enable supplies from Taylors Lake and Pine Lake storages to be made available for the Wimmera United district and the eastern portion of the Karkaroc district, the Taylors Lake Main Outlet Channel has been extended 16 miles to connect with East Karkaroc Main Channel north of Rupanyup. It is intended to further extend this channel to command the remainder of the Wimmera-Mallee System. A commencement has also been made with the construction of a supplementary main channel of 18 miles to connect with the West Karkaroc Main Channel near Kewell, and so avoid the costly duplication of the Main Western Channel flumes at Jung which would otherwise be necessary.

A commencement has been made with a reticulation scheme for the new urban district of Brim. The storage is completed and has been filled, and the reticulation works are in progress. New earthen storages have been completed near Lah and Massey Railway Stations.

Channel extensions to newly-settled areas in Karkaroc District, and several short channels to supply hitherto unsupplied areas in the older settled portions of the other districts, have been constructed, comprising in all 30 miles, and surveys have also been made for still further extensions.

During the year various extensions and renewals to the urban reticulations of Hopetoun, Jeparit, Rainbow, Dimboola, and Rupanyup have been put in hand to cope with recent development in these towns.

## BIRCHIP, WYCHEPROOF, SEA LAKE, AND TYRRELL DISTRICTS.

Considerable extensions in area have been made to the Tyrrell District chiefly to cover portions of the Mallee Soldier Settlements commandable by gravitation from the channel system. Fifty miles of new channels have been constructed, most of which have already received a run of water, and surveys for an additional 50 miles have been made.

During the year a supply of water was run to the Patchewollock district for the first time. The main channel traverses some 8 miles of loose sandy country, which necessitated special and costly treatment by clay lining. The effect of this work was so satisfactory that investigations are now being made with a view to supplying areas which are at present cut off by considerable patches of sandy desert country.

A new storage for Ouyen has been completed and filled, the total storage now being 360,000 cubic yards, thus insuring ample supplies for the town and local railway requirements.

At Austral Gypsum a new earthen storage of 10,000 cubic yards has been completed and filled.

The enlargement of Tyrrell West and Ouyen Main Channels has been continued, good progress having been made, the result being that this season's watering of the Ouyen system has been greatly expedited.

Extensions and renewals of reticulation in the urban districts of Wycheproof, Berriwillock, and Birchip have been carried out to cope with recent development.

## SUPPLY TO MARNOO AND CHARLTON DISTRICTS.

A commencement has been made with the construction of the Charlton Main Channel, contracts for some 20 miles of excavation having been let, of which 10 miles are completed. The erection of concrete bridges and structures is in progress. The method of constructing the earthwork by piece-work contracts has been adopted in

order to expedite the work. Serious delay was caused by seasonal difficulties and shortage of suitable teams, but it is expected that good progress will be made during the coming year, as conditions are likely to be more favorable.

Final surveys have been completed to the 60-mile peg, and the survey of the balance is well in hand.

The past very dry summer has shown clearly the necessity for this channel for the proper supply of the Marnoo, Swanwater, and Charlton rural districts, as well as for the town of Charlton.

#### LONG LAKE AND TYNTYNDER DISTRICTS.

Some 20 miles of new channels have been constructed, and 14 miles of existing channels have been enlarged to form a main connecting channel to enable full supplies by gravitation to be made available for Tyntynder District without passing through Nyah Irrigation District, thus avoiding the consequent interference with irrigation watering in that locality.

A considerable area, including that portion of the Mallee Soldier Settlements at present commanded from the channel system by gravitation has been added to Tyntynder District.

A reticulation scheme for the supply of Nyah West township has been accepted by the residents, and is in course of construction. At Piangil a similar scheme has been accepted, and will be commenced forthwith. A scheme of reticulation for the town of Manangatang has been formulated and submitted to the residents for approval.

#### MORNINGTON PENINSULA DISTRICT.

The reservoirs at Beaconsfield, Frankston, South Frankston, Mornington and Bittern were kept fully supplied during the year, thus maintaining ample supplies for the Naval Base and the reticulated bayside townships of Mornington, Frankston, Cranbourne, Seaford, Carrum, Chelsea, Edithvale and Aspendale. Besides carrying out large extensions of mains in all existing districts, the work of reticulating the townships of Bittern, Somerville and Berwick (lower level) was completed and these townships are now receiving the benefits of reticulated supplies.

The new storage on Heywoods Hill, 2 miles north of Dandenong, was filled and kept fully supplied throughout the year thus providing an ample supply at adequate pressures for all parts of Dandenong. The work of connecting this storage with the Beaconsfield Reservoir by means of a large main supply race with syphons of ample size is now well advanced, and it is expected that supplies from this source will be available in the coming summer.

The Dandenong storage will then be capable of meeting all demands not only by Dandenong and its immediate vicinity, but also by the rapidly growing and important centres at Noble Park, Sandown and Spring Vale. In addition, therefore, to providing large extensions for Dandenong, a start has been made with the work of laying the necessary large main connecting the storage with Spring Vale, *via* Noble Park and Sandown. This will be 15-in. diameter for the first 1½ miles, and will make ample provision for the great early expansions in population which must be anticipated in these new centres. The necessary pipes have been secured, and a start will be made immediately with the work of laying the main and branches. The most thickly populated portions of the new towns should be reticulated during the coming year.

A scheme for the reticulation of the town of Hastings from the main supply line to Bittern, some 2½ miles distant, has been prepared, and is being submitted for approval.

Although the supply now being drawn temporarily from the Upper Toomuc Creek catchment is at present ample in volume and good in quality, yet the success of the whole scheme of supply is so marked, and the benefits to be derived from an assured and abundant supply of water is so manifest to all, that in order to cope with the rapidly growing demands from all quarters, it is considered desirable to push steadily on with the main supply race to tap successively the Cannibal Creek and the other principal feeders of the Bunyip River, as provided in the full scheme. As soon, therefore, as the main supply race from Berwick to Dandenong is completed, early in the coming year, a start will be made with the continuation of the main race from Toomuc Creek crossing easterly to Cannibal Creek. This will provide amply for all extensions and demands as they arise.

#### WONTHAGGI DISTRICT.

The supply of water to this district was satisfactorily maintained throughout the year. Notwithstanding the prolonged dry season the storage in the Lance Creek Reservoir proved ample for all requirements.

It is anticipated that the demand for water in the near future will be increased, and investigations are being carried out with a view to increasing the discharge of the main pipe line to meet this demand and at the same time provide a sufficient supply for North Wonthaggi.

#### NORTHERN MALLEE WATER SUPPLY.

In that portion of the Northern Mallee about 1,250,000 acres adjoining the Wimmera-Mallee Districts, but above their channel levels, a large amount of work has been done during the year. Roads have been cleared and grubbed, while additional bores and tanks have been provided.

#### BORES.

During the year two bores were completed in the parishes of Underbool and Boinka. In the Underbool bore good water was struck at a depth of 412 feet; and, in the Boinka bore, water of usable but somewhat inferior quality was obtained at a depth of 500 feet. Boring was discontinued at 700 feet. A bore is being sunk near the township of Murrayville, Parish of Danyo, and has reached a depth of 320 feet. Good water has already been obtained, but the bore is being continued to a greater depth in order to obtain a larger volume of supply. Tenders are being invited for the sinking of three new bores in the Parishes of Duddo, Tyalla and Nyang. The total number of successful public bores in this District is now 94.

#### TANKS.

Thirteen catchment tanks, having a total capacity of 35,000 cubic yards, were completed. There are now 176 tanks in this area having a total storage capacity of 950,800 cubic yards, equal to 160,440,000 gallons.

#### WINDMILLS.

Three windmills have been erected on the banks of the River Murray to give a water supply to soldier settlers on the Murray Frontage blocks in the Parishes of Wemen, Liparoo and Colignan. In addition, a number of hand pumps have been placed on the river where the demand did not justify the erection of windmills.

#### ROADS.

During the year 240 miles of roads have been grubbed bringing the total length of roads grubbed and cleared throughout the District to 3,840 miles. Upwards of 670 sand hills, of a total length of 85 miles, were improved by rubbing with local limestone, and 30 hills, totalling 3 miles in length, by the removal of sand by scooping.

#### WATER SUPPLY, MALLEE SOLDIER SETTLEMENTS.

During the past year 195 miles of new channels have been constructed (142 miles by contract and 53 miles by the Commission's own teams) in the Northern Mallee apart from the portion referred to as being above supply level. Nine new earthen storages have also been excavated in various places, all of which, if not already supplied, will receive supplies during the watering season now in progress. The total length of channels constructed to date in Mallee Soldier Settlements is 405 miles. As the construction work in this area is nearing completion, some of the Commission's teams have been transferred to the new Millewa District. Those portions of the Mallee Soldier Settlement Areas which are at present commanded by the Wimmera-Mallee System are being added to the Tyntynder and Tyrrell Districts, which they adjoin. Surveys for 70 miles of additional channels have been made. Much of this channelling is in areas at present unoccupied. Construction will, therefore, be undertaken only as found necessary.



## WATER SUPPLY, MILLEWA.

An area of about 1,000,000 acres of very suitable agricultural land comprising the northern portion of the County of Millewa will be opened up by the 55 miles of railway from Red Cliffs projected for the service of that territory. The construction of the first 35 miles of line already authorized is nearing completion. A scheme for the eventual channel reticulation of the whole of this area has been drawn up on lines which will permit of the gradual service of the area in successive stages as required by its development and occupation.

The scheme will comprise two main lifts of approximately 125 and 150 feet. The first lift is from Lake Cullulleraine, a depression on the edge of the river flats about 5 miles from the River Murray. The supply to this storage will be temporarily drawn from the river near the No. 9 lock by a low lift pumping plant, pending the completion of the lock now under construction, and the deepening of the inlet channel sufficiently to give a gravitation supply to the lake. Nineteen miles of main channels involving heavy earthwork have already been constructed, and the system of smaller distributary channels is being rapidly pushed on to supply 136 blocks which were recently allotted. Suitable storages have also been located at convenient distances from the new railway stations, some of which are now being built, and all will be ready to receive supplies early in the new year, when it is expected the first lift pumps and rising main will be ready for operation. The first unit at the Main Pumping Station at Lake Cullulleraine is being erected, and pipes for the rising main are being delivered.

Surveys are being carried out by three parties for the extension of channels into a further area now being subdivided. An examination is also being made of the country towards Sunset, which may be commanded by a southerly extension of this scheme.

## CATCHMENT TANKS AND ROADS IN THE MILLEWA AND SUNSET AREAS.

A large amount of work, preliminary to settlement, has been undertaken in the Millewa areas served by the railway line at present under construction from Red Cliffs to Varleys Tank, and for which the permanent water supply works are described above. Four large tanks and fifteen small tanks of a total capacity of 10,000 cubic yards were constructed in the Sunset and Millewa areas to provide preliminary supplies for contractors to excavate large public storages and for the service of the new settlers entering upon these lands. Plans have been prepared for six additional large tanks, totalling 65,000 cubic yards. During the year 90 miles of roads have been grubbed in the new Millewa country.

## DRAINAGE AND FLOOD PROTECTION SCHEMES.

## KOOWEERUP AND CARDINIA.

Satisfactory progress was made during the year with the construction of drainage and flood protection works in the Kooweerup Area. The works in the Lower Kooweerup District were so well advanced that early in the coming year the whole of the drains in this district should be completed. That very important protective work known as the Northern Boundary Drain,  $5\frac{1}{2}$  miles in length, was completed and is now ready to divert the main flood waters of the Ararat Creek. A smaller extension of this drain towards Tynong township is being carried out to give security against the smaller flood flows coming from the north on the east side of Ararat Creek. Recent heavy floodings in the northern water-courses west of the Bunyip River have been carried very completely by the Northern Boundary Drain; and it is evident that the Kooweerup District is now protected from any trouble likely to arise from these sources excepting most abnormal floods. The south-eastern embankment of the Main Canal has been raised another  $3\frac{1}{2}$  miles as far as Cora Lynn, so that the main carrier is now protected against overflow and consequent breaching of its banks in vital parts.

The enlargement of the No. 7 Yallock Drain has been so well advanced by the Drag Line Excavator, in spite of many adverse conditions, that this important outlet for the King Parrot Creek waters will be completed to the eastern boundary of the district by the summer. The Yallock cut was enlarged, chiefly by bucket dredger, from Bayles to the No. 5 Road, some  $1\frac{1}{2}$  miles, thus completing the Yallock Main Outlet Drain to its full capacity right to the sea.

In order to protect the eastern portion of the Swamp and adjacent low country on the west side of Lang Lang River, between Lang Lang town and Heaths Hill, from incessant difficulties caused by continual overflows from the river even when in moderate flood, this water-course in the vicinity of Heaths Hill was completely cleared, enlarged, straightened and leveed, while a new river course with heavy protective banking on the low side was cut by the No. 3 Bucket Dredger for  $3\frac{1}{4}$  miles northerly from the South Gippsland railway line. The consequent improvement in the Swamp area is already well marked, and it is evident that when this work is completed in the coming year all trouble from flooding from the Lang Lang River, with the resultant heavy losses, should cease entirely.

With the completion of the works in the Lower Kooweerup Area, attention is now being given to the carrying out of the minor scheme of works of the Upper Kooweerup Area. On the west side of the Main Canal, a main lateral drain is being cut by the No. 2 Bucket Dredger along Walkers Drain to Garfield. This will form the outlet into the Main Canal for a system of minor drains protecting the Garfield and Bunyip Swamp Areas. As soon as these works are completed, a start will be made with similar works on the eastern side of the Main Canal, in the Iona and Longwarry areas.

During the year in the Kooweerup Area nearly 400,000 cubic yards of earthwork were excavated, most of it being machine cut by the bucket dredgers and drag line excavator. Maintenance work was restricted chiefly to road repairs and to the removal of noxious weeds from some 25 miles of drainage reserve. About 24 miles of sanded roadways, constructed under the drainage scheme, and maintained by the Commission up to the latter end of last year, have since been handed over to the respective Shire Councils for future maintenance.

In the Cardinia District, the natural inlet from the sea, forming the outlet for the main drainage channel receiving the Cardinia and Toomuc Main Channels, was levee-banked on both sides for a total length of 2 miles, with pipe outlets, having flap doors attached, to provide for lateral drainage. The Toomuc Main Channel has been constructed, under contract, for 2 miles above its junction with the Cardinia Channel, by drag line excavator. The Toomuc Catch Drain was extended a further 60 chains making a total length of 3 miles completed, and Duffis Drain was completed. During the year, in the Cardinia District, approximately 86,000 cubic yards of earthwork were excavated by dredger and horse work; about 30 acres of scrub were cleared; two bridges, having a total length of 100 feet, were constructed; 60 chains of fencing were erected; and some 8 miles of drains cleaned out.

The construction of several drains, including the Main Officer Drain, intended to have been carried out during the year, had to be suspended owing partly to adverse weather conditions but primarily to the excessively high rates asked by contractors. It is expected, however, that these will be taken in hand and completed during the coming year.

#### SNOWY RIVER—ORBOST FLATS.

The Commission is now engaged in drawing up a comprehensive scheme for the protection from flooding of the rich flats near Orbost, which are frequently flooded from the Snowy River. The flooding is, however, of such an extensive character that the preparatory investigations alone are exceedingly heavy.

#### ECHUCA.

The Echuca (High-street) Flood Protection Works are proving successful, the area protected having been again secured from considerable damage and inconvenience, which but for these works would have been inevitable, on account of the recent flooded conditions of the Rivers Murray and Campaspe.

#### GOULBURN LEVEES.

During the year extensive surveys were carried out in the Goulburn Valley below Loch Garry to investigate a proposal, known as Findlay's Scheme, for carrying flood waters from Loch Garry to the River Murray at the Deep Creek Outlet by means of a direct floodway formed by levees or training banks about one mile apart. Plans and estimates of a scheme on the above lines were prepared. The estimated cost of the scheme, which would benefit some 80,000 acres, was £103,000. As a result of the investigation, it would appear that the scheme did not compare favorably with the one submitted by the Commission to the land-owners in 1920, which would have given a high degree of benefit to the whole area (120,000 acres) but which was rejected by the land-owners. The promoters were therefore informed that this scheme could not be recommended.

As the majority of the landowners affected by the Loch Garry Minor Flood Protection Scheme referred to in the 16th Annual Report have agreed that a Flood Protection District be constituted, it is proposed to proceed with the constitution of the District (which will embrace some 40,000 acres) and with the carrying out of the scheme of works.

#### MURRAY LEVEES.

The Members of the Inter-State Committee of Representatives on Murray Levee Proposals, comprising officers of the New South Wales Water Conservation and Irrigation Commission and the State Rivers and Water Supply Commission of Victoria, met during the year at various places along the River Murray (where levee banks were proposed) and at Sydney and Melbourne. A number of applications for permission to erect levee banks were received from both States and were dealt with by the Committee.

#### RIVER EROSION AND GENERAL.

From various parts of the State, applications were received during the year for permission to carry out flood protection drainage and other works. These proposals have been investigated, and in many cases permission has been given under the provisions of the *Water Act 1915* to the interested parties to construct, at their own expense, approved works for the protection of their holdings.

As requested by a number of settlers on the Yarra Flats at Yering, surveys have been undertaken and a scheme of Flood Protection and Drainage is being prepared. Investigations of other proposed schemes are being made with a view to districts being formed and works carried out if found practicable.

At the instance of the Municipal Councils and landowners concerned in the Latrobe River Flats, embracing some 30,000 acres, investigations have been carried out and arrangements made for the necessary surveys to enable a Flood Protection Scheme to be considered. Similar action has also been taken in respect to the fertile flats of the Tarwin River between Tarwin township and Andersons Inlet.

The Commission is also considering a scheme for the protection from flooding of lands at Hallam which would, if protected, be most suitable for intensive cultivation. †

#### 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. The field observations and office work are being kept up to date, and the results of all gaugings since the last publication in 1918 have been tabulated and are available to the end of 1922.

During the year a gauging station has been established on the Lerderderg River at Darley, making a total for the State of 50 stations.

#### 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.

Owing to the abnormally dry year, the flow in all streams in the State was much below the average during the Autumn, and the demand for water for irrigation and other purposes was so great that it was found necessary during the months of March, April and May, to enforce special restrictions on diversions of water for irrigation from the Rivers Murray and Macallister, and the Broken, Seven and Honeysuckle Creeks, so that the available water supply could be equitably distributed.

In addition to renewals of 1,173 permits previously granted, 300 new permits were issued during the year.

The authorized diversions now in force are :—

Yearly permits .. .. .	1,473
Flood permits ‡ .. .. .	1
Licences .. .. .	27
Total .. .. .	1,501



## GOULBURN HEAD-WORKS 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 Main Channel, extending westerly from the Waranga Reservoir to the Serpentine Creek, a distance of 92 miles; and the Main Eastern Channel, which extends from the Goulburn Weir to the Shepparton District, a distance of  $31\frac{1}{2}$  miles. The total length of main channels is 147 miles. The irrigation districts supplied are Shepparton, Rodney, Deakin, Tongala, Stanhope, Rochester, Echuca North, Dungee, and Tragowel Plains.

Advantage was taken of the abnormally low condition of the Goulburn River during the Summer months of 1923 to pump out the tail pool below the Goulburn Weir and to face with concrete the portions of rock in the river bed which have a tendency to be eroded by the swirl of the water cascading over the weir.

The excavation of earthwork on the extension of Waranga Western Main Channel—6 miles 30 chains in length—from Bears Lagoon to the Loddon River has been completed. One of the three regulators that will be required has been constructed, also two 10-ft. diameter syphons and three concrete bridges. The site of the proposed dam and regulator on the Loddon River has been determined by survey. Unfavourable weather conditions have delayed progress; but it is expected to have the work as a whole sufficiently advanced to supply Boort channels during the coming irrigation season. Surveys are now in hand in connexion with the extension of this channel on the west side of the River Loddon.

The permanent survey of the Tandarra to Calivil Main Channel—26 miles in length—has been completed. Plans and sections have been prepared for 15 miles of this work, and contracts for the earthwork on the first 4 miles have been let. This channel is designed to carry 300 cusecs to the Bullock Creek crossing, reducing to 200 cusecs at its junction with the existing Tragowel Main Channel. The new channel will materially supplement the supply to Tragowel Plains District, and will also command a large area of good irrigation land along its route thereto.

Designs for the proposed extension of the Eastern Goulburn Main Channel are being prepared. This channel will be extended approximately 23 miles, and its carrying capacity will be 350 cusecs at the point of offtake (present terminus) reducing to 80 cusecs at its end. It will supply a large area lying between the East Goulburn Main Channel and the Goulburn River south of the Shepparton Irrigation and Water Supply District and a considerable area north of that District. Surveys have been made, and plans and sections prepared, for the first 8 miles of the Main Channel Extension.

Surveys of the first 8 miles from the Goulburn Weir have been made and sections are being plotted of the existing Eastern Goulburn Main Channel, the capacity of which is to be increased from 330 to 550 cusecs to meet requirements of the largely increased area to be brought under irrigation.

Surveys of distributary channels within the parishes of Kialla and Arcadia have been completed and about 5 miles of these channels are now being constructed.

An open drain—2 miles in length—has been excavated for the purpose of obviating seepage on land on the East side of the Waranga Western Main Channel and immediately south of Lake Cooper. Improved conditions have already resulted.

## NEW STORAGES.

### SUGARLOAF RESERVOIR.

The dam for this reservoir is situated on the Goulburn River below the junction of the Delatite River, about 18 miles from Alexandra. The bed of the river at the site is at an elevation of about 700 feet, the datum being low water, Hobson's Bay. The design now being carried out will store water to a height of 820 feet above the same datum, and will have a capacity of about 300,000 acre feet. Surveys made show that a storage basin to the elevation of 875 feet above datum, with a capacity of 918,000 acre feet, could be constructed, and, when necessary, such increased capacity could be attained by progressive stages.

The dam being constructed consists of a diaphragm wall of reinforced concrete, built from bed rock—which in places is 75 feet below ground surface—to crest level, a wall of clayey material on the upstream side of the diaphragm, and supporting masses of rock quarried from the adjacent hills. The diaphragm at the extreme Eastern or Mount Pinniger end of the dam has been completed for a length of 170 feet to a height of 135 feet above the river bed, *i.e.*, to the full height required for the first stage. The

remaining portion of the diaphragm, which is nowhere less than 100 feet above the river bed, is being raised to a height of 121 feet, parts of it being already completed to that height.

The embankment is completed to a height of 100 feet, and trestles are being erected for raising it to a height of 121 feet. Both the upper and lower sets of valves in the valve tower are in position. During the past season the valves have been operated by means of temporary gearing, but the hydraulic lifters for operating them are now being installed. Additional concrete has been placed in the apron in the river bed below the dam, and in the gravity section of the dam across the river, the present height of which is 55 feet above the bed.

In order to bring portion of the rock excavated from Mount Sugarloaf on to the bank at a higher level, it became necessary to lift the high level bridge connecting the upper Sugarloaf quarries with the bank. This bridge consists of three spans of iron girders on concrete piers, the total length being more than 150 feet. The raising of the deck level of this bridge some 20 feet was successfully carried out.

Considerable alterations were made to the crushing and concreting plant during the year to obtain increased capacity, a large new gyratory crusher, and a 30 cubic foot concrete mixer being installed, as well as a chute and bin for feeding spalls to the crusher. About half a mile of road was constructed leading from the main road between Alexandra and the reservoir to a point on the upstream side of the dam, and a few chains therefrom, at a level above that proposed for the second stage.

The maximum number of men employed during the year was 525, the average being between 300 and 400.

#### WARANGA RESERVOIR ENLARGEMENT.

In last year's report it was explained that the Government, at the request of the Commission, had seen fit to appoint a Board of Inquiry to investigate the cause of certain escapes of water which had occurred when the water was at high level in the preceding irrigation season.

During the low-water period the Board made exhaustive investigation, and after reviewing the matter at great length, reported: "While unable to commit itself to the definite assertion that the leaks were caused by yabbies or similar boring creatures, the Board considers that these may be strongly presumed to be the true cause; that nothing has been discovered by the Board to negative such a presumption, and that the Board is unable to point to any other cause."

The remedial measure proposed by the Board is in the nature of a wall of reinforced concrete, in a suitable position in the downstream slope, keyed into the natural formation at the bottom, and reaching to within a few feet of top water level.

A commencement has been made with this work, and every effort will be made to complete it throughout the portion of the embankment—about 2,000 feet in length—in which leaks have occurred, before next high-water season.

Among other works carried out during the year was the removal of a large quantity of silt which had accumulated in the approach channel to the Minor Outlet, and the repair of portion of the stone facing on the embankment, which was damaged by wave action during an abnormal storm in October, 1922.

#### WIMMERA STORAGES.

The new main channel connecting the Wimmera River with Taylors Lake and Pine Lake proved conclusively its value as a feeder to these storages. Taylors Lake was filled without delay practically to its full capacity (30,000 acre-feet) and a volume of some 20,000 acre-feet was also diverted into Pine Lake, filling it to its natural surface level. This channel also commands Green and Dock Lakes, and results show that it will be of ample capacity to also supply the storage which it is proposed to establish in due course at these depressions.

Considerable progress has been made with the construction of the valve tower and outlet structures at Pine Lake, and a start will be made with the earthwork of the storage in the ensuing summer. This embankment will be built in two stages, the first one raising the full supply level to 463.00 R.L., with a capacity of 34,000 acre-feet. The volume of earthwork involved in the first stage is about 100,000 cubic yards. The ultimate holding capacity of this Pine Lake storage will be 62,000 acre-feet.

The storage capacity for the Wimmera-Mallee Scheme is now 148,170 acre-feet, as against 69,000 acre-feet of a few years ago. Works now in course of construction will carry the storage provision to no less than 210,000 acre-feet.

### TOTAL STORAGES IN STATE.

In 1902 the total capacity of storages in the State was 172,000 acre-feet. The present capacity is about 792,000 acre-feet, and when the Sugarloaf, Wimmera, and Maffra Storages are complete the total capacity will exceed 1,264,000 acre-feet. The Hume Reservoir, in course of construction, will also contain fully 1,000,000 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
Sugarloaf (part of 300,000 acre-feet)	.. .. .	40,000
<i>Loddon-Murray System—</i>		394,100
Laanecoorie .. .. .	.. .. .	14,000
Kerang North-west Lakes .. .. .	.. .. .	88,500
Kow Swamp .. .. .	.. .. .	40,860
Lake Boga .. .. .	.. .. .	28,000
Long Lake .. .. .	.. .. .	3,820
<i>Wimmera-Mallee System—</i>		175,180
Lake Lonsdale .. .. .	.. .. .	45,480
Wartook .. .. .	.. .. .	23,800
Fyans Lake .. .. .	.. .. .	17,100
Taylors Lake .. .. .	.. .. .	30,000
Pine Lake (part of 62,000 acre-feet)	.. .. .	20,000
Lower Wimmera Weirs .. .. .	.. .. .	2,870
Batyo Catyo (Avon Regulator) .. .. .	.. .. .	5,000
Lake Whitton .. .. .	.. .. .	1,300
Earthen Storages, Township Reservoirs, and Mallee Tanks .. .. .	.. .. .	2,620
<i>Coliban System—</i>		148,170
Upper Coliban .. .. .	.. .. .	22,500
Malmsbury .. .. .	.. .. .	12,300
Subsidiary Reservoirs .. .. .	.. .. .	5,070
<i>Werribee System—</i>		39,870
Pykes Creek .. .. .	.. .. .	14,850
Melton .. .. .	.. .. .	17,000
<i>Miscellaneous—</i>		31,850
Wonthaggi .. .. .	.. .. .	1,550
Sundry Township Reservoirs .. .. .	.. .. .	1,450
<b>Total capacity of existing Storages .. .. .</b>		<b>792,170</b>
<b>ADDITIONAL STORAGE BEING PROVIDED BY WORKS IN COURSE OF CONSTRUCTION.</b>		
<i>Goulburn System—</i>		
Sugarloaf Reservoir (balance of 300,000 acre-feet)	.. .. .	260,000
<i>Wimmera-Mallee System—</i>		
Pine Lake (balance of 62,000 acre-feet) .. .. .	.. .. .	42,000
Green Lake .. .. .	.. .. .	20,000
<i>Maffra System—</i>		62,000
Glenmaggie Reservoir .. .. .	.. .. .	150,000
<i>Murray System—</i>		
Hume Reservoir, at Junction with Mitta River, half share .. .. .	.. .. .	500,000
<b>Total capacity of Storages, when works in hand are completed .. .. .</b>		<b>1,764,170</b>

### UTILIZATION OF NEW STORAGES.

In last year's report it was explained that the area at present governed and supplied with water for irrigation by the existing Goulburn system is some 400,000 acres, that the water-rights allotted in this area amount to about 160,000 acre-feet, and that with the aid of the new storages it was anticipated that it would become practicable to allot additional water-rights to the extent of about 200,000 acre-feet. Further, it was explained that the new allocation should be used in the first place to strengthen the supplies to existing districts, and after that to provide supplies either on the basis of 1 acre-foot of water to each acre of irrigable land, or 1 acre-foot to some greater number of acres of land as may seem best after a careful study of all the local conditions. In pursuance of the policy thus set out works have been commenced for the conveyance of increased supplies to existing irrigation areas in the vicinity of Kyabram, Tongala, and Wyuna, which for some seasons past have suffered inconvenience through shortage during times of strong demand.

For the improvement of supply to the Tragowel Plains Irrigation District, and the supply of water to large new areas between the boundary of that District and the Bullock Creek, a new main channel is being constructed from the existing Waranga

Western Main Channel, at a point in the Parish of Tandarra, to the existing No. 1 Tragowel Main at the northern boundary of the Parish of Jarklan. This will release that portion of the present Waranga Western Main Channel between Tandarra and Bears Lagoon, so as to make it available for lands south of Tragowel Plains, and also lands on the west side of the Loddon River.

The extension of the Waranga Western Main Channel from Bears Lagoon to the Loddon River is approaching completion, and the weir crossing at the Loddon River will be taken in hand as soon as the flood season is over. Other areas in which surveys and other investigations are in progress with a view to early commencement of distributaries are those to the west and north of the existing Rochester District and the west of the existing Stanhope and Tongala Districts.

On the eastern side of the Goulburn River distributary channels for the supply of the Parish of Kialla are being pushed on. Enlargement works on the existing main channel near its offtake from the Goulburn Weir are about to be taken in hand, and tenders are being invited for extension of the same main channel from its present termination at Pine Lodge towards Katandra. When this main channel is in hand distributary works will be commenced for supply of the lands suitable for irrigation between it and the Goulburn River.

## RIVER MURRAY WATERS.

### 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 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 Darling or the River Murrumbidgee, as may be decided by the Government of New South Wales. The Acts also provide that for purposes of construction the Minister for Public Works of New South Wales shall be the Constructing Authority for that State; that, for the State of 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.

During the year a Conference was held between representatives of the Governments of the Commonwealth and the States of New South Wales, Victoria, and South Australia, when it was agreed, *inter alia*, that the proposal arising out of the Premiers' Conference in 1920 that the River Murray Waters Acts be amended to extend the powers of construction by the River Murray Commission be not proceeded with. It was agreed in its place to submit to each Parliament a measure enacting among other things that the construction of works provided for in the River Murray Agreement which will provide for the needs of irrigation shall have precedence over the construction of any such works which will be primarily for the requirements of navigation; and also that the contribution of the Commonwealth Government to the cost of the scheme which in the original Agreement is limited to £1,000,000 shall be made one-fourth of the actual cost, which is now estimated at fully double the amount first estimated many years ago.

The Constructing Authority for New South Wales has now practically completed the necessary plant and is engaged placing concrete on the section of the Hume Reservoir within its territory.

The Constructing Authority for South Australia has completed one weir and lock at Blanchetown, and has three others in progress, one near Lake Bonney, one at the offtake to Lake Victoria, and one near Renmark. The Lake Victoria Storage Works are well advanced towards completion.

The State Rivers and Water Supply Commission, the Constructing Authority for Victoria, has made good progress with the Victorian section of the Hume Reservoir and has practically completed the Torrumbarry Weir and Lock described hereafter.

The question of providing for the use of the Hume Reservoir for the generation of Electricity having been raised by the Electricity Commission for Victoria, it was agreed between the contracting Governments that their representatives on the River Murray Commission should act as their representatives on a Conference respecting the use of the waters of the Hume Reservoir for the purpose named, and the Conference is now sitting. At the request of the Government of Victoria this Conference is also investigating a suggestion that the capacity of Hume Reservoir be considerably increased above the 1,100,000 acre feet which has hitherto been regarded as the volume provided for in the Agreement. The investigations of the Conference are well advanced, and its report may be expected at an early date.

### HUME RESERVOIR.

The construction of the main embankment is in progress over a distance of 1,700 feet of the flat on the Victorian side. During the year 174,200 cubic yards of earthwork have been excavated from borrow-pits on the upstream and downstream sides of the bank by three steam shovels, and conveyed to the embankment by means of steam trams, and consolidated with scoops. Material amounting to 113,800 cubic yards has also been brought by steam tram from the excavations on the New South Wales side, and placed in the embankment, making a total of 288,000 cubic yards of earthwork placed during the year.

The core trench has been excavated to solid granite for a distance of fifteen hundred feet from the Victorian end of the embankment, the amount excavated being 21,500 cubic yards. This section of the trench has been filled with concrete and the core wall is being extended above the natural surface. The quantities of concrete and steel reinforcement placed in the core wall during the year are 11,000 cubic yards and 87 tons respectively. Gravel to the extent of 14,800 cubic yards has been transferred from Chiltern gravel heaps to the works for use as material for the concrete.

Three steam shovels, four locomotives, four locomotive cranes, three conveyors, an air compressor, trucks and waggons, workshop machinery, pumps, electric generator and motors, steam and oil engines, boilers and concrete mixers represent the plant in operation on the works.

Additional residences have been built for the accommodation of the Commission's local staff, gangers and workmen, together with various buildings for housing machinery on the works. Several buildings have been privately erected, including a church and five shops. Considerable additions and improvements have been made to the water supply and drainage works of the township, with most satisfactory results. An efficient electric lighting system has been installed on the works and throughout the township. Most of the streets have been formed and planted with trees.

The average numbers of men and horses employed during the year were 364 and 123 respectively, the corresponding numbers employed at the end of June, 1923, being 358 and 112.

### TORRUMBARRY WEIR AND LOCK.

During the year a programme of work was drawn up to enable the construction of the Weir and Lock to be completed, so as to be available for irrigation purposes for the season 1923-24. This was generally adhered to, two and three shifts per day being worked when necessary; and it is expected that the structure will be ready for use for the next irrigation season. The whole of the construction work in the lock chamber, including the placing of the iron work and the construction of the gates, has been completed, and the lock is now ready for navigation. All work has been completed in the Navigation Pass, including the driving of sheet piling both upstream and downstream, the concreting of the floor and land abutment walls, stone beaching, the erection of steel trestles for the weir, and the track for their use as a stand during periods of high water.

About the middle of December, 1922, the river diversion works were commenced and, on 19th March, 1923, the river was successfully diverted through the lock chamber. The placing of earth in the diversion dam and the stone beaching of the face were then proceeded with, and the dam was well above flood level by the 30th June, 1923, and is now practically completed.

During the year 18,900 tons of materials have been transported to the works by the 2-foot gauge tram line, including 2,000 cubic yards of sand excavated from the sand-pits 2 miles from the works, 7,000 cubic yards of gravel from Carisbrook, and 5,700 cubic yards of stone spalls from Axedale and Edgecombe.

The average numbers of men and horses employed during the year were 278 and 149 respectively, the corresponding numbers at the end of June, 1923, being 178 and 71.

The materials of construction placed in the Torrumbarry Weir and Lock as completed are 330,000 cubic yards of earthwork; 20,000 cubic yards of concrete; 400 tons of iron and steel; 42,000 square feet of timber and steel sheet piling.

It is confidently expected that Torrumbarry Weir and Lock will be completed and in operation during the 1923-4 irrigation season.

### ILLUSTRATION OF TORRUMBARRY WEIR AND LOCK.

A drawing showing the appearance which this work will present when completed and in operation is published at the end of this Report.

### MILDURA WEIR AND LOCK.

The site for a Lock-Weir—No. 11 from the river mouth—has been selected about half a mile downstream from Mildura. This work will form a lock pool for about 40 miles upstream from its site; and, besides reducing the suction lift at the Mildura

and Red Cliffs Pumping Stations, will form a local storage of great value in time of extreme low flow in the river. The work which is actually in hand is expected to take between two and three years to complete.

## WORKS CONTROLLED BY OTHER AUTHORITIES.

### SEWERAGE IN COUNTRY DISTRICTS.

The Bendigo Sewerage Authority has completed the construction of the outfall sewer and treatment works, and is now proceeding with the reticulation of the city, which is already sufficiently advanced to enable the sewage of a number of houses to be dealt with.

Contracts have been let by the Ballarat Sewerage Authority for the construction of portion of the main sewer, and satisfactory progress is being made with this work. Contracts were also let for the supply of reinforced concrete and earthenware pipes. It is anticipated that rapid progress will be made with the scheme, and that the main and outfall sewers, the treatment works, and some reticulation work will be completed during the ensuing year.

A scheme for sewerage the town of Colac has been generally approved by this Commission. A poll of the ratepayers having been favorable to the project the question of constituting a Sewerage Authority for Colac is now receiving consideration.

Plans and estimates for a sewerage scheme for Mildura have been submitted by the Borough Council. These are now being examined by the Commission with a view to the constitution of a Sewerage Authority.

The Geelong Waterworks and Sewerage Trust, acting under special legislation, is arranging for the extension of its sewerage system in the immediate future.

### COUNTRY WATER SUPPLIES.

Under the general supervision of the Commission many important works were carried out during the year by Waterworks Trusts and Local Governing Bodies, of which there are now 100 and 18 respectively.

A new excavated storage reservoir of 20,000,000 gallons capacity was constructed by the Colac Trust to improve the supply to that town and to insure a supply for sewerage purposes.

The Healesville Trust completed a scheme of water supply to the high-level zone and also carried out extensive additions to the reticulation of the town, the result being a much improved service to the residents.

The town of Kaniva, being part of the Lawloit Waterworks Trust District, was proclaimed an Urban District, and the reticulation of the town, including the construction of a reinforced concrete tower, was satisfactorily completed.

Works are in progress at Lorne for increasing the water supply by means of a new line of 6-inch pipes from the St. Georges River. This work is supplementary to the Erskine River scheme and will insure an ample supply of water for all purposes.

The Wodonga Waterworks Trust has commenced operations in connexion with the new pumping scheme from the River Murray, and work is in progress on the reinforced concrete tower and pumping plant.

Substantial improvements to the reticulation of Mansfield have been carried out, and have proved highly satisfactory. Improvements to the reticulation and pumping plant, including a 12-inch main, an electric motor and pump, were carried out at Swan Hill, and consideration is now being given to further extensions. A new pump and motor is being installed at Warragul which, it is anticipated, will reduce the annual charges and at the same time give an increased supply to the town.

Consideration is being given to extensive improvements to the Nhill water supply, including the construction of a new well and alterations to the reticulation. The Wangaratta Trust is contemplating considerable improvements to its supply and has recently let contracts for new pipe mains. A proposal to construct a low level service from the Goldfields Reservoir is under consideration by the Maryborough Waterworks Trust in order to relieve the demand on the existing works and give an improved supply to the railways.

Pipe extensions and minor works were carried out at Kyabram, Maffra, Marysville, Murchison, Rushworth, Rochester, Tatura, Traralgon, Woodend, Yackandandah, Beechworth, Morwell, Wahgunyah, and Stawell.

The Corryong Waterworks Trust was constituted, and it is expected that an early commencement will be made with the construction of the works.

New schemes are under consideration for the supply of Casterton, Coleraine, Toora, Trafalgar, Yarra Junction, Port Fairy, and Portland.



## GENERAL.

### LANDS UNDER CLOSER SETTLEMENT IN IRRIGATION DISTRICTS.

As forecasted in its last Annual Report, the Commission, after meeting the requirements of the remaining soldier applicants, has again made irrigation lands available under ordinary closer settlement conditions.

During the past year 312 applications for irrigable blocks were granted, 103 of the applicants being discharged soldiers, and 209 civilians. The year's demand was met with the allotments on hand, and by the subdivision of some 7,500 acres, in various districts, 4,600 acres of which were purchased during the year.

In the districts supplied by the Goulburn Irrigation System, 4,100 acres were made available. The principal extension of settlement was at Tongala, where four estates—known as McLeod's, Taylor's, Nihill's and McDonald's—containing 1,860 acres, were purchased, and subdivided into 31 holdings. Other properties in the Goulburn Valley subdivided during the year were—Thomas's Estate of 520 acres at Shepparton; Nicholl's and Seamons's, in the Rodney District, comprising 780 acres; McQueen's, of 620 acres, in Stanhope District; and Hicks's, of 320 acres, at Echuca North. These additional properties together provided holdings for 23 settlers.

In the irrigation districts served by the River Murray schemes, the area subdivided was 3,400 acres. This total included 1,200 acres at Swan Hill—in estates known as Berry's, Holloway's, Rangott's and Sunda Singh's—which were cut up into 38 allotments, and 510 acres on the Murray frontage at Koondrook—part of Tye's Riverside Estate acquired by the Commission in the previous year—which yielded 17 blocks.

The balance is represented by two further subdivisions of the irrigable portion of Red Cliffs Estate, which together contributed 79 holdings; about half of these were allotted to returned soldiers, and the remainder to civilian settlers. The five subdivisions of this extensive settlement so far made have provided 701 allotments, which, with the exceptions referred to, have been allotted to soldiers. These subdivisions, together with the areas taken for roads, channels, reserves and railway, account for about 14,700 acres of the 33,000 acres purchased at Red Cliffs. In addition, 3,000 acres of the non-irrigable portion have been advantageously disposed of in large areas. The remainder of the property—approximately 10,000 acres more or less irrigable, and 5,000 acres unsuitable for irrigation—will be disposed of as occasion arises.

Since the commencement of the repatriation of Victoria's soldiers, the Commission has found irrigable closer settlement holdings for a total of 2,145 duly qualified soldier settlers. Taken as a whole the soldier settlers are making good on their holdings. Some whose health was impaired by the war, having found the work of an irrigable farm too great a strain on their physical resources, and some for various other reasons, transferred their blocks. Notwithstanding this, there are some 610 settled in the Goulburn districts, while in the Murray areas and Southern districts there are 1,260, of whom 666 are at Red Cliffs. About 336 of the soldier settlers obtained their blocks under the provisions of section 20 of the *Closer Settlement Act 1915*.

A very important feature of the Commission's closer settlement activities during the year has been the preparation for meeting the anticipated demand for irrigation blocks by oversea land seekers, under the new immigration policy recently adopted by the State. To this end the Commission has acquired, for subdivision, over 40 properties, in various districts, embracing 17,500 acres, which, added to a like area held in reserve,

makes a total of 34,500 acres available for subdivision. Of this total, more than 15,000 acres are in localities which are already served by the Goulburn Irrigation System, or are commandable by extensions of that system. The area to be so supplied by extensions includes some 3,000 acres contiguous to the existing Shepparton Irrigation District, about 9,000 acres, situate to the north of that District, commandable from an extension of the East Goulburn Main Channel, and 3,000 acres in the parishes of Calivil and Pompapiel, between the Waranga Western Main Channel and the existing Tragowel Plains Irrigation District. On the Murray frontages the Commission has, in process of subdivision, the area of 3,660 acres, known as Tye's, Roberts's, and Anderson's Estates, near Kerang, which will be served by the gravitation channel system of the Koondrook Irrigation District, now strengthened by the new Torrumbarry Lock-Weir. There is also, in reserve, the balance of the irrigable portion of Red Cliffs Settlement already referred to, comprising an area of approximately 10,000 acres, which will be subdivided, channelled, and gazetted available for application as the demand for blocks arises.

In addition to the provision made for new settlers in the established irrigation districts of the north, the Commission has acquired considerable areas of fertile lands in Gippsland. These lands will be commanded by the works of the new gravitation channel system now in course of construction at Maffra. These works include a storage reservoir, with a capacity of 150,000 acre-feet, on the Macallister River, above Maffra, and a system of main and distributary channels for the service of the rich river flats along the Macallister, Thomson, and Avon Rivers. During the year the Commission acquired, in this locality, eight properties having an aggregate area of 2,700 acres, and holds in reserve a similar area acquired previously, and which is temporarily leased pending the inauguration of the irrigation scheme next year. These estates will together provide about 100 holdings suitable for the cultivation of sugar beet and the growing of lucerne for dairying.

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 twenty times as many families as were living on them prior to their subdivision for closer settlement. The statement shows also particulars of settlement effected under section 20 of the *Closer Settlement Act 1915*, outside the large estates subdivided by the Commission :—

Closer Settlement Estates.	Area of Lands purchased by the State in Acres.	Properties Subdivided.						Present Increase in Number of Families.
		Area in Acres.	Number.	Number of Families thereon when Purchased.	Subdivided into—		Number of Closer Settlement Blocks now occupied.	
					Number of Closer Settlement Blocks.	Average Area in Acres.		
Shepparton .. ..	14,100	11,200	27	25	337	32	326	301
East Goulburn .. ..	9,000	..	..	..	..	..	..	..
Rodney .. ..	900	900	3	1	10	88	6	5
Stanhope .. ..	21,500	21,500	7	13	315	63	295	282
Kyabram .. ..	3,000	3,000	7	10	56	53	55	45
Tongala .. ..	18,300	18,100	37	34	294	59	283	249
Koyuga .. ..	4,200	4,200	} Pt. 1	..	{ 52	77	52	52
Cornelia Creek .. ..	2,500	2,500						
Nanneella .. ..	9,000	9,000	17	7	105	83	105	98
Echuca .. ..	3,600	3,600	8	4	30	116	29	25
Bamawm .. ..	13,400	13,400	28	21	179	71	179	158
Dingee .. ..	500	500	3	1	15	30	13	12
Calivil .. ..	3,300	..	..	..	..	..	..	..
Cohuna .. ..	12,000	12,000	29	10	134	86	127	117
Koondrook .. ..	7,600	3,900	7	4	51	74	41	37
Swan Hill .. ..	12,500	12,500	34	16	295	40	289	273
Nyah .. ..	3,800	3,800	8	1	208	17	207	206
Merbein .. ..	8,300	8,300	..	..	384	21	384	384
Red Cliffs .. ..	33,000	17,700	1	3	701	16 $\frac{1}{2}$	694	691
Bacchus Marsh .. ..	70	70	1	..	2	3 $\frac{1}{2}$	2	2
Werribee .. ..	10,000	10,000	Pt. 1	11	238	38	232	221
Maffra .. ..	7,700	4,900	7	4	107	41	69	65
	198,270	161,070	226	165	3,527	42	3,402	3,237
Properties under Sec. 20, C. S. Act 1915, outside above Estates	18,710	..	..	..	..	..	204	..
	216,980							



PROGRESS OF IRRIGATED CLOSER SETTLED DISTRICTS.

During the past year the development of the holdings in the irrigated areas noted in earlier reports has been steadily continued, and a considerable increase in the value of the stock, implements, and permanent improvements owned by the settlers has been reported. In the older districts settlers have continued to improve their farms, with satisfactory financial results, while in the newer districts a most marked and gratifying development has taken place.

In Red Cliffs, the largest soldier settlement in the State, a number of the blocks will this year reach a producing stage, although less than three years under cultivation. At the other important small fruit centres of Merbein, Nyah, and Woorinen, most gratifying progress can also be reported; and from all these centres the tonnage production of fruit promises to be most satisfactory.

In the districts already named, as well as at Swan Hill, Kerang, Shepparton, and other irrigation centres, citrus orchards are also coming into full bearing, and settlers are getting into a position where a return for the labour of the past few years can be expected.

In Cohuna, Rochester, Stanhope, Tongala, and Swan Hill Districts, where settlers are devoting their attention to all forms of irrigated culture, with, however, a great preponderance in favour of dairying, pig-raising, and sheep-fattening, good progress has been made, returns, particularly from pig-raising, being satisfactory. The settlers also in these districts are improving the quality of their dairy herds, many of them being now prize-takers at various shows.

Considerable development in irrigation is anticipated in the Kerang and Koondrook Districts, now that increased water supplies can be provided through the new Torrumbarry Weir, and railway facilities are guaranteed by the new Border Railway to Gonn Crossing. These districts are already fairly well settled, but the new transit and water facilities should create a marked increase in production. The district has already an international reputation, as a soldier settler at Gonn Crossing produced citrus fruit which won the *Daily Mail* competition in London against the world.

The value of lucerne as stock and poultry feed is each year becoming more recognised, and as a result settlers in both Bacchus Marsh and Werribee, which are now recognised lucerne-growing centres, have not only been obtaining good returns, but are finding a much more stable market for their products.

It is anticipated that water for irrigation will be available at Maffra next year, and with a view of assisting settlers in preparing their land for irrigation the Commission has transferred to that centre one of its most experienced supervisors.

At Kyabram centre a large co-operative fruit cannery was erected last year, while the cannery at Shepparton, one of the most important centres for large fruit growing under irrigation, was again used to its full capacity during the last fruit season. The total output of the two canneries last season was 4,800,000 cans, being no less than 25 per cent. of the total Australian pack, and nearly 50 per cent. of Victoria's. While the products will now bear the closest comparison with any in the world, it is undoubtedly difficult to dispose of them owing mainly to the great slump in oversea markets resulting from the great war. The position has become so serious that every effort must be made to foster new and expand old markets if the industry is to be maintained. While this particularly applies to the disposal of large fruits, it is also applicable in regard to the sale of such small fruits as raisins and currants, for which new market outlets must, if at all practicable, be found.

A gratifying feature in the development of the various irrigation districts is the establishment by settlers and others of factories to treat the products. In Werribee, a Milk Products Factory has been established; in Rochester, Stanhope, Tatura, and Tongala new or enlarged butter factories have been provided; while a fruit cannery has, as previously stated, been erected at Kyabram. Sales of lands in new townships in Irrigation Districts have been also most successful, showing most unmistakably the confidence of business men in the future of the irrigation districts.

## ADMINISTRATION.

### EXTENSIONS AND EXCISIONS.

As indicated in the last Annual Report, an area of 2,000 acres known as Lock's land has been added to the Werribee Irrigation and Water Supply District, making it now 10,000 acres. Of the added area 1,000 acres were purchased for soldier settlement, and are now occupied by discharged soldiers. Some necessary minor extensions of the Bacchus Marsh, Rochester, Rodney, and Shepparton Irrigation Districts were made, and small excisions from Deakin and Rodney Irrigation Districts were effected.

Following the provision of increased storage at Sugarloaf and Waranga, it is proposed to extend the Stanhope and Tongala Irrigation Districts by adding thereto considerable areas now included in Deakin District, portions of which have been already acquired and allotted for soldier settlement.

The Dandenong Waterworks District, which was taken over by the Commission from the Dandenong Waterworks Trust, has been extended to include a number of other towns supplied from the same source, and the name of the District has been changed to Mornington Peninsula Waterworks District.

Karkaroc and Tyntynder Waterworks Districts were extended by the addition of 75 square miles and 230 square miles respectively of country not heretofore included in any Waterworks District. Tyrrell Waterworks District was extended by including therein an area of 188 square miles excised from Walpeup East Waterworks District and some 40 square miles not hitherto forming part of any Waterworks District. Werribee Waterworks District was extended by the addition of 500 acres. From Carwarp Waterworks District an area of about 4,000 acres was excised and included in the new Red Cliffs Irrigation District.

### NEW AND PROPOSED DISTRICTS.

The Red Cliffs Irrigation and Water Supply District, comprising about 26,000 acres, occupied by 701 settlers, has now been constituted.

The Urban Districts of Bittern and Somerville, in Mornington Peninsula, have been proclaimed. The name of the Kaneira Urban District has been changed to Culgoa.

### STAFF.

Mr. R. Horsfield, one of the Commission's principal engineers, resigned, having accepted an appointment as a member of the newly formed Irrigation Commission of South Australia.

Mr. A. W. Lord, Resident Engineer at Hume Reservoir Works, resigned to accept an appointment with the Irrigation Commission of Queensland, and was succeeded by Mr. A. W. Johnson, transferred from the position of Engineer in Charge of Waranga Reservoir Works, the vacancy thus created being filled by the transfer of Mr. H. M. Sherrard, Assistant Engineer at Sugarloaf Reservoir Works. Mr. W. A. Robertson was in turn appointed to fill the vacancy caused by the transfer of Mr. Sherrard. Mr. J. Blackburn was transferred to Ouyen to take charge of the districts controlled from that centre, and Mr. W. G. Smalley was appointed Collector at Ouyen in place of Mr. C. P. Hay, transferred to the position of Collector at Red Cliffs. Mr. C. M. B. Neylon, District Engineer at Red Cliffs, was transferred to the Head Office Engineering Staff; Mr. S. P. Bromfield, District Engineer at Cohuna Centre, being transferred to Red Cliffs to fill the position thus rendered vacant. The vacancy created at Cohuna Centre was filled by the transfer of Mr. H. C. Valentine from Nyah, Mr. A. I. Champion being appointed in his place. Mr. O. J. Cobain, Secretary and Collector for Tresco District, resigned, and Mr. J. R. Moore, of the Swan Hill Staff, was appointed in his place, whilst Mr. L. W. Martin was appointed District Officer for Tresco and Mystic Park. The Commission records with deep regret the death of Mr. R. W. Harvie, a valued and respected officer who has been in its service for many years.

### FIRE INSURANCE.

The Commission has continued its policy of carrying the fire risks on its own buildings. The premiums thus saved now amount to £3,450.

## RECEIPTS, DISBURSEMENTS, AND ESTIMATES.

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The receipts of the Commission for the year under review amounted to £351,439, a record collection, being an improvement of £32,376 over last year, and some £117,000 over five years ago. The revenue is evenly distributed between Irrigation Districts and Waterworks Districts.

The net disbursements from Annual Votes amounted to £183,962, being, notwithstanding the great expansion of irrigation, only £11,482 more than for the previous twelve months. The expenditure of loan moneys amounted to £1,248,061. Details, which are given in another portion of the Report, show that nearly half of this amount was expended in the provision of storages.

Receipts in the twenty-two Irrigation and Water Supply Districts amounted to £170,205, which is the highest collection yet made, and represents an improvement of £22,542 over the previous year. After debiting the districts with working expenses and all interest chargeable, the deficit for the year was only £8,095, an improvement of £4,859 on the figures for the previous twelve months.

In the Coliban Districts the loss for the year was £24,706, which is £2,602 less than in 1921-22. This improvement has resulted from increased sales of water, but, as pointed out in previous Reports, the rating in these districts is specially limited by the Water Acts, and reductions in the annually recurring loss will only be obtained by a substantial advance in the progress of the whole area.

The Commission, in addition to the Coliban Districts, has the direct administration of fifty-six Waterworks Districts. The receipts from these districts were £121,325, an advance of £4,950 over the year preceding. The figures, after defraying all working expenses and interest chargeable, show a profit for the year of £4,415, thus reducing the aggregate revenue deficit of the districts to £27,306.

The Commission has also the control of several Flood Protection Districts and, although works are still in an uncompleted state, charges were levied and a revenue of £4,252 was obtained, being an increase of £960 over the amount collected in the previous year. The revenue from this source will be materially increased as the protective works are advanced.

The Estimate of disbursements during the ensuing year is £221,500, an advance of only £11,000 over the previous year. This increase is also due almost entirely to the establishment of new districts, which will later give a good revenue return. The Estimate of receipts has been increased to £355,000, an improvement of £15,000 over the Estimate for last year.

The Loan Liability of the State for Works of Water Supply at the close of the year was £13,318,190. Of this total £1,247,559 is for Free Headworks; £1,263,228 was written off; £147,046 was advanced to some early-formed Local Authorities; £576,237 has not been expended; £394,583 has been paid off by Authorities; and £3,021,242 is represented by Uncompleted Works which are not yet revenue-producing, and are set out separately in the Statement of Loan Liability in this Report. The balance of £7,062,878 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 £542,761. Of this amount, £131,800 is not chargeable to any districts, being debitable against Free Headworks, Amounts Written Off, and Unexpended Balances; while £123,124, although recorded for future charging, is not at present debitable, being interest on cost of Uncompleted Works, which are not yet revenue-producing, leaving £287,837 as chargeable this year against the Commission and other Authorities. This latter amount is £30,359 in excess of the amount debitable against the Commission and other Authorities in the previous year, and of this approximately £10,000 is accounted for by the higher rate of interest that is now payable on recently converted loans. The amount available last year from the Revenue of the Commission and other Authorities to meet such interest (after providing a sum of £25,122 for non-revenue producing works and services not chargeable to any district) was £226,760, as set out in the statement on page 42.

## RECEIPTS AND DISBURSEMENTS.

STATEMENT of Moneys received and disbursed during the year ended 30th June, 1923.

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 ... ..	41,498	14,578	...	14,578	26,920	...
Other State Works—						
Broken River ... ..	7	311	...	311	...	304
Goulburn ... ..	310	2,289	...	2,289	..	1,979
Kow Swamp ... ..	432	1,722	...	1,722	...	1,290
Lake Lonsdale ... ..	6	543	...	543	...	537
Loddon River ... ..	6	347	...	347	...	341
North-West Lakes ... ..	267	604	...	604	...	337
Irrigation Districts ... ..	170,205	108,881	13,507	95,374	74,831	...
Waterworks Districts ... ..	91,960	46,698	13,600	33,098	58,862	...
Urban Districts and Divisions ... ..	29,365	9,123	...	9,123	20,242	...
Flood Protection Districts... ..	4,252	957	...	957	3,295	...
Licences, Diversions, Miscellaneous	13,131	4,682	...	4,682	8,449	...
	351,439	190,735	27,107	163,628	192,599	4,788
<i>Not Revenue Producing—</i>						
River Gauging, Surveys and Re- ports, New Projects ... ..	...	4,676	...	4,676	...	4,676
Waterworks Trusts						
Boring for Water, Road	} Cost of Administration					
Clearing, Mallee and Land Settlement		...	9,050	...	9,050	...
Loan Works ... ..	...	6,608	...	6,608	...	6,608
Totals ... ..	351,439	211,069	27,107	183,962	192,599	25,122
					£2,000	
					£165,477	

## COLIBAN SYSTEM.

STATEMENT of Moneys received and disbursed during the year ended 30th June, 1923, and of Interest charged at the rate of 4 per cent. on Capital Debits.

District.	Capital Debit at 30th June, 1923.	Receipts.	Disbursements and Interest Charged.			Excess.	
			Disbursements.	Interest.	Total.	Receipts over Disbursements and Interest.	Disbursements and Interest over Receipts.
	£	£	£	£	£	£	£
Coliban ... ..	1,281,873	39,751	13,213	51,275	64,488	...	24,737
Axe Creek ... ..	1,750	373	298	70	368	5	...
Harcourt ... ..	7,040	1,374	1,067	281	1,348	26	...
Totals ... ..	1,290,663	41,498	14,578	51,626	66,204	31	24,737

## FLOOD PROTECTION DISTRICTS.

STATEMENT of Moneys received and disbursed from 1st July, 1920, to 30th June, 1923; and of Interest charged at the rate of 4 per cent. on Capital Debits; and also of Depreciation and Redemption charged as at 30th June, 1923.

## RECEIPTS.

District.	1st July, 1920, to 30th June, 1922.	1922-23.			Grand Total at 30th June, 1923.
		Charge.	Interest and Miscellaneous.	Total.	
	£	£	£	£	£
1. Cardinia .. ..	927	1,332	4	1,336	2,263
2. Echuca .. ..	254	127	..	127	381
3. Lower Kooweerup .. ..	3,183	2,715	74	2,789	5,972
Totals .. ..	4,364	4,174	78	4,252	8,616

## DISBURSEMENTS, AND INTEREST DEPRECIATION AND REDEMPTION CHARGED.

District.	DISBURSEMENTS.					INTEREST CHARGED.			(A) DEPRE- CIATION. (B) RE- DEMP- TION.	Grand Total at 30th June, 1923.
	1st July, 1920, to 30th June, 1922.	1922-23.			Total at 30th June, 1923.	1st July, 1920, to 30th June, 1922.	1st July, 1922, to 30th June, 1923.	Total at 30th June, 1923.		
		Repairs and Mainte- nance.	Manage- ment.	Total.						
	£	£	£	£	£	£	£	£	£	
1. Cardinia .. ..	417	200	92	292	709	500	1,049	1,549	..	2,258
2. Echuca .. ..	132	35	49	84	216	72	37	109	..	325
3. Lower Kooweerup .. ..	1,124	402	179	581	1,705	2,140	2,191	4,331	..	6,036
Totals .. ..	1,673	637	320	957	2,630	2,712	3,277	5,989	..	8,619

## IRRIGATION AND WATER SUPPLY DISTRICTS.

STATEMENT of Moneys received and disbursed from 1st May, 1906, to 30th June, 1923; and of Interest, charged at the rate of 4 per cent. on Capital Debits; and also of Depreciation and Redemption charged, as at 30th June, 1923. (Free Head-works excluded.)

## RECEIPTS.

District.	1st May, 1906, to 30th June, 1922.	1922-23.					Total.	Grand Total at 30th June, 1923.
		Rates.	Compulsory Irrigation Charge.	Water Sales.	Interest and Miscellaneous.	Total.		
	£	£	£	£	£	£	£	
1. Bacchus Marsh .. .. .	46,256	551	3,563	1,196	547	5,857	52,113	
2. Boort .. .. .	35,374	1,497	..	846	13	2,356	37,730	
3. Campaspe .. .. .	10,561	747	..	67	1	815	11,376	
4. Cohuna .. .. .	106,877	2,026	7,466	475	950	10,917	117,794	
5. Deakin .. .. .	65,402	4,176	..	1,159	22	5,357	70,759	
6. Dingee .. .. .	11,445	146	1,467	157	338	2,108	13,553	
7. Dry Lake .. .. .	492	..	..	..	29	29	521	
8. Gannawarra .. .. .	79,936	1,519	5,839	1,005	622	8,985	88,921	
9. Kerang .. .. .	69,126	2,047	..	2,961	55	5,063	74,189	
10. Koondrook .. .. .	68,029	1,278	4,046	208	1,016	6,548	74,577	
11. Merbein .. .. .	121,066	1,260	20,961	388	1,490	24,099	145,165	
12. Mystic Park .. .. .	..	1,119	..	525	4	1,648	1,648	
13. Nyah .. .. .	34,150	289	6,156	67	1,115	7,627	41,777	
14. Rochester .. .. .	98,579	1,968	10,286	1,804	370	14,428	113,007	
15. Rodney .. .. .	288,114	7,177	14,918	2,526	741	25,362	313,476	
16. Shepparton .. .. .	49,064	1,416	5,232	215	806	7,669	56,733	
17. Stanhope .. .. .	8,115	688	3,202	284	129	4,303	12,418	
18. Swan Hill .. .. .	60,785	670	3,730	2,065	1,014	7,479	68,264	
19. Tongala .. .. .	42,960	806	5,307	224	775	7,112	50,072	
20. Tragowel Plains .. .. .	123,702	1,511	8,158	2,325	141	12,135	135,837	
21. Tresco .. .. .	..	121	3,534	..	294	3,949	3,949	
22. Werribee .. .. .	17,140	538	3,846	1,830	145	6,359	23,499	
Totals .. .. .	1,337,173	31,550	107,711	20,327	10,617	170,205	1,507,378	

## DISBURSEMENTS, AND INTEREST DEPRECIATION AND REDEMPTION CHARGED.

District.	DISBURSEMENTS.					INTEREST CHARGED.			(A) DEPRECIATION. (B) REDEMPTION.	Grand Total at 30th June, 1923.	
	1st May, 1906, to 30th June, 1922.	1922-23.				Total at 30th June, 1923.	1st May, 1906, to 30th June, 1922.	1st July, 1922, to 30th June, 1923.			Total at 30th June, 1923.
		Repairs and Maintenance.	Distribution of Water.	Management.	Total.						
	£	£	£	£	£	£	£	£	£		
1. Bacchus Marsh .. .. .	11,149	395	949	165	1,509	12,658	39,631	4,497	44,128	..	56,786
2. Boort .. .. .	19,696	282	791	164	1,237	20,933	12,586	953	13,539	(B) 900	35,372
3. Campaspe .. .. .	6,777	202	256	156	614	7,391	6,475	447	6,922	..	14,313
4. Cohuna .. .. .	80,438	1,408	6,275	288	7,971	88,409	41,431	3,602	45,033	(A) 9,010	142,452
5. Deakin .. .. .	27,709	739	1,204	230	2,173	29,882	41,778	2,946	44,724	..	74,606
6. Dingee .. .. .	5,681	382	651	93	1,126	6,807	9,419	1,136	10,555	..	17,362
7. Dry Lake .. .. .	1	..	..	..	..	1	491	29	520	..	521
8. Gannawarra .. .. .	54,684	1,431	5,786	337	7,554	62,238	27,222	2,148	29,370	(A) 5,694	97,302
9. Kerang .. .. .	35,898	866	1,102	376	2,344	38,242	28,601	1,895	30,496	(A) 450 (B) 2,000	71,188
10. Koondrook .. .. .	47,209	991	4,238	365	5,594	52,803	38,401	3,243	41,644	(A) 4,501	98,948
11. Merbein .. .. .	86,627	84	17,933	462	18,479	105,106	38,846	6,650	45,496	(A) 9,928	160,530
12. Mystic Park .. .. .	..	114	2,082	200	2,396	2,396	..	206	206	..	2,602
13. Nyah .. .. .	29,330	440	4,847	346	5,633	34,963	14,522	2,828	17,350	(A) 3,802	56,115
14. Rochester .. .. .	50,714	1,583	3,718	670	5,971	56,685	80,741	8,489	89,230	..	145,915
15. Rodney .. .. .	121,494	1,663	7,240	953	9,856	131,350	175,633	15,137	190,770	..	322,120
16. Shepparton .. .. .	24,755	1,354	1,082	387	2,823	27,578	43,307	5,682	48,989	..	76,567
17. Stanhope .. .. .	5,512	662	905	168	1,735	7,247	8,209	2,511	10,720	..	17,967
18. Swan Hill .. .. .	42,876	2,101	2,984	366	5,451	48,327	19,767	2,884	22,651	(A) 4,768	75,746
19. Tongala .. .. .	23,469	1,056	1,272	250	2,578	26,047	49,046	5,153	54,199	..	80,246
20. Tragowel Plains .. .. .	54,459	1,520	2,491	248	4,259	58,718	73,915	7,032	80,947	..	139,665
21. Tresco .. .. .	..	368	4,053	408	4,829	4,829	..	911	911	..	5,740
22. Werribee .. .. .	4,362	385	628	229	1,242	5,604	16,237	4,147	20,384	..	25,988
Totals .. .. .	732,840	18,026	70,487	6,861	95,374	828,214	766,258	82,526	848,784	41,053	1,718,051

## WATERWORKS DISTRICTS.

STATEMENT of Moneys received and disbursed from 1st May, 1906, to 30th June, 1923; 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, 1923. (Free Head-works excluded.)

## RECEIPTS.

District.	1st May, 1906, to 30th June, 1922.	1922-23.				Total.	Grand Total at 30th June, 1923.
		Rates.	Water Sales.	Interest and Miscellaneous.	Total.		
	£	£	£	£	£	£	
1. Birchip .. .. .	197,866	3,926	56	11	3,993	220,680	
2. Sea Lake .. .. .		6,760	140	22	6,922		
3. Tyrrell .. .. .		6,000	..	112	6,112		
4. Wycheproof .. .. .		5,690	84	13	5,787		
5. Carwarp .. .. .	2,952	669	..	686	3,638		
6. Karkaroc .. .. .	78,354	11,194	29	63	11,286	89,640	
7. Kerang North-West Lakes .. .. .	1,572	127	2	1	130	1,702	
8. Long Lake .. .. .	79,982	8,430	82	57	8,569	88,551	
9. Mornington Peninsula .. .. .	10,690	..	3,664	17	3,681	14,371	
10. Tyntynder .. .. .	35,799	5,319	118	88	5,525	41,324	
11. Upper Western Wimmera .. .. .	31,061	3,919	..	4	3,923	34,984	
12. Upper Wimmera United .. .. .	55,585	5,815	..	12	5,827	61,412	
13. Walpeup East .. .. .	3,958	472	..	11	483	4,441	
14. Walpeup West .. .. .	9,655	1,780	..	47	1,827	11,482	
15. Werribee .. .. .	1,929	584	15	1	600	2,529	
16. Western Wimmera .. .. .	121,065	11,264	1,432	41	12,737	133,802	
17. Wimmera United .. .. .	129,898	13,067	471	56	13,594	143,492	
18. Yelta .. .. .	1,039	217	60	1	278	1,317	
Totals .. .. .	761,405	85,233	6,153	574	91,960	853,365	

## DISBURSEMENTS, AND INTEREST DEPRECIATION AND REDEMPTION CHARGED.

District.	DISBURSEMENTS.					INTEREST CHARGED.					Grand Total at 30th June, 1923.
	1st May, 1906, to 30th June, 1922.	Repairs and Maintenance.	Distribution of Water.	Management.	Total.	Total at 30th June, 1923.	1st May, 1906, to 30th June, 1922.	1st July, 1922, to 30th June, 1923.	Total at 30th June, 1923.	(A) DEPRECIATION. (B) REDEMPTION.	
	£	£	£	£	£	£	£	£	£	£	£
1. Birchip .. .. .	91,016	4,053	3,076	1,262	8,391	99,407	117,265	14,405	131,670	..	231,077
2. Sea Lake .. .. .											
3. Tyrrell .. .. .											
4. Wycheproof .. .. .											
5. Carwarp .. .. .	6,810	153	108	30	291	7,101	2,516	439	2,955	A 586	10,642
6. Karkaroc .. .. .	30,603	2,194	1,105	522	3,821	34,424	49,336	6,693	56,029	..	90,453
7. Kerang N.W. Lakes .. .. .	864	23	21	20	64	928	717	75	792	..	1,720
8. Long Lake .. .. .	55,193	2,589	2,610	368	5,567	60,760	25,181	3,508	28,689	A 8,305	97,754
9. Mornington Peninsula .. .. .	2,049	320	16	26	362	2,411	8,641	3,319	11,960	..	14,371
10. Tyntynder .. .. .	23,640	1,542	1,179	301	3,022	26,662	22,309	3,807	26,116	..	52,778
11. Upper Western Wimmera .. .. .	15,781	466	642	119	1,227	17,008	12,192	2,352	14,544	{ A 606 B 1,500	33,658
12. Upper Wimmera Untd. .. .. .	22,901	304	672	169	1,145	24,046	29,249	3,987	33,236	B 2,000	59,282
13. Walpeup East .. .. .	3,026	155	..	130	285	3,311	1,362	162	1,524	..	4,835
14. Walpeup West .. .. .	7,641	269	557	200	1,026	8,667	2,517	664	3,181	A 1,200	13,048
15. Werribee .. .. .	659	37	90	40	167	826	2,077	530	2,607	..	3,433
16. Western Wimmera .. .. .	63,125	1,864	2,567	477	4,908	68,033	48,356	6,906	55,262	{ A 2,422 B 5,400	131,117
17. Wimmera United .. .. .	53,436	700	1,561	436	2,697	56,133	68,251	7,472	75,723	B 4,400	136,256
18. Yelta .. .. .	459	10	90	25	125	584	592	148	740	..	1,324
Totals .. .. .	377,203	14,679	14,294	4,125	33,098	410,301	390,561	54,467	445,028	26,419	881,748

## DISTRICTS HELD IN TRUST BY THE COMMISSION.

STATEMENT OF RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED 31ST DECEMBER, 1922.

## RECEIPTS.

Name of Trust.	Bank Balance, at 31st December, 1921.	1922.				Grand Total, 31st December, 1922.
		Rates.	Water Sales.	Interest and Miscellaneous.	Total.	
	£	£	£	£	£	£
Avoca .. .. .	Cr. 5	648	175	31	854	859
Avoca (Quambatook, Urban) .. .. .	Cr. 69	420	18	12	450	519
Carrum .. .. .	Dr. 213	2,378	..	395	2,773	2,560
Loddon United .. .. .	Cr. 1,829	2,391	..	24	2,415	4,244
Loddon United (Mitiamo, Urban) .. .. .	Cr. 8	152	100	6	258	266
Totals .. .. .	Cr. 1,911 Dr. 213	5,989	293	468	6,750	8,448

## DISBURSEMENTS.

Name of Trust.	1922.				Interest.	(A) Depreciation. (B) Redemption.	Grand Total, 31st December, 1922.	Bank Balance carried forward, 1st January, 1923.
	Repairs and Maintenance.	Water Distribution.	Management.	Total.				
	£	£	£	£	£	£	£	
Avoca .. .. .	394	..	111	505	230	B 86	821	Cr. 38
Avoca (Quambatook, Urban) .. .. .	105	97	55	257	143	A 60 B 29	489	Cr. 30
Carrum .. .. .	1,180	..	228	1,408	658	B 294	2,360	Cr. 200
Loddon United .. .. .	1,516	883	231	2,630	676	B 260	3,566	Cr. 678
Loddon United (Mitiamo, Urban) .. .. .	55	..	22	77	116	A 28 B 13	234	Cr. 32
Totals .. .. .	3,250	980	647	4,877	1,823	A 88 B 682	7,470	Cr. 978



## URBAN DISTRICTS AND DIVISIONS.

STATEMENT of Moneys received and disbursed from 1st May, 1906, to 30th June, 1923; 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, 1923. (Free Head-works excluded.)

## RECEIPTS.

District or Division.	1st May, 1906, to 30th June, 1922.	1922-23.				Grand Total at 30th June, 1923.
		Rates.	Water Sales.	Interest and Miscellaneous.	Total.	
	£	£	£	£	£	£
1. Bacchus Marsh .. .. .	14,293	737	544	9	1,290	15,583
2. Berriwillock .. .. .	967	191	9	2	202	1,169
3. Berwick .. .. .	..	73	..	41	114	114
4. Beulah .. .. .	4,255	384	9	21	414	4,669
5. Birchip .. .. .	10,831	496	367	65	928	11,759
6. Bittern .. .. .	..	2	42	6	50	50
7. Carrum No. 1 .. .. .	2,066	2,133	..	403	2,536	4,602
8. Carrum No. 2 .. .. .	..	664	..	..	664	664
9. Cohuna .. .. .	3,690	646	144	24	814	4,504
10. Corop .. .. .	351	36	..	..	36	387
11. Cranbourne .. .. .	..	32	..	21	53	53
12. Culgoa .. .. .	991	137	44	..	181	1,172
13. Dandenong .. .. .	5,437	2,328	156	179	2,663	8,100
14. Dimboola .. .. .	19,701	741	733	24	1,498	21,199
15. Frankston .. .. .	2,286	1,413	146	225	1,784	4,070
16. Hopetoun .. .. .	4,520	335	66	18	419	4,939
17. Jeparit .. .. .	5,465	508	131	1	640	6,105
18. Jung Jung .. .. .	544	92	17	..	109	653
19. Koondrook .. .. .	3,346	356	..	2	358	3,704
20. Lake Boga .. .. .	2,824	305	38	29	372	3,196
21. Lascelles .. .. .	766	101	22	3	126	892
22. Merbein .. .. .	479	842	39	5	886	1,365
23. Minyip .. .. .	6,405	521	53	1	575	6,980
24. Mornington .. .. .	1,298	1,303	110	97	1,510	2,808
25. Natimuk .. .. .	6,095	222	223	..	445	6,540
26. Nyah .. .. .	285	84	2	1	87	372
27. Ouyen .. .. .	3,079	774	495	15	1,284	4,363
28. Rainbow .. .. .	9,223	621	132	2	755	9,978
29. Rupanyup .. .. .	5,274	395	46	3	444	5,718
30. Sea Lake .. .. .	5,769	574	187	28	789	6,558
31. Somerville .. .. .	..	25	..	22	47	47
32. South Frankston .. .. .	280	693	..	..	693	973
33. Ultima .. .. .	2,759	355	13	10	378	3,137
34. Watchem .. .. .	1,854	249	16	1	266	2,120
35. Werribee .. .. .	5,979	838	158	13	1,009	6,988
36. Wonthaggi .. .. .	39,948	1,944	1,478	56	3,478	43,426
37. Woomelang .. .. .	5,370	256	529	24	809	6,179
38. Wycheproof .. .. .	6,360	461	166	32	659	7,019
Totals .. .. .	182,790	21,867	6,115	1,383	29,365	212,155

## DISBURSEMENTS, AND INTEREST DEPRECIATION AND REDEMPTION CHARGED.

District or Division.	DISBURSEMENTS.					INTEREST CHARGED.				(A) DEPRECIATION.		Grand Total at 30th June, 1923.
	1st May, 1906, to 30th June, 1922.	1922-23.				Total at 30th June, 1923.	1st May, 1906, to 30th June, 1922.	1st July, 1922, to 30th June, 1923.	Total at 30th June, 1923.	(A)	(B)	
		Repairs and Maintenance.	Distribution of Water.	Management.	Total.							
£	£	£	£	£	£	£	£	£	£	£	£	
1. Bacchus Marsh .. .. .	3,983	12	190	105	307	4,290	9,635	1,055	10,690	(a)(b) 626	15,606	
2. Berriwillock .. .. .	525	29	99	25	153	678	437	43	480	(a) 37	1,195	
3. Berwick .. .. .	..	6	5	2	13	13	..	101	101	..	114	
4. Beulah .. .. .	1,623	98	106	40	244	1,867	2,569	229	2,798	(a) 40	4,705	
5. Birchip .. .. .	4,938	129	205	82	416	5,354	5,250	383	5,633	(a)(b) 720	11,707	
6. Bittern .. .. .	..	5	1	2	8	8	..	42	42	..	50	
7. Carrum, No. 1 .. .. .	586	224	12	128	364	950	1,480	2,182	3,662	..	4,612	
8. Carrum, No. 2 .. .. .	..	59	3	32	94	94	..	585	585	..	679	
9. Cohuna .. .. .	1,049	8	83	85	176	1,225	2,172	596	2,768	(a)(b) 366	4,359	
10. Corop .. .. .	148	..	11	6	17	165	160	19	179	(a) 24	368	
11. Cranbourne .. .. .	..	5	1	2	8	8	..	45	45	..	53	
12. Culgoa .. .. .	559	10	47	24	81	640	569	81	650	(a) 27	1,317	
13. Dandenong .. .. .	1,472	262	64	175	501	1,973	3,465	2,177	5,642	(a) 500	8,115	
14. Dimboola .. .. .	11,907	295	689	113	1,097	13,004	5,317	392	5,709	(a) 1,620 (b) 830	21,163	
15. Frankston .. .. .	617	159	8	102	269	886	1,669	1,524	3,193	..	4,079	
16. Hopetoun .. .. .	2,330	47	422	34	503	2,833	1,965	229	2,194	(b) 150	5,177	
17. Jeparit .. .. .	1,091	54	105	53	212	1,303	3,646	336	3,982	(b) 100	5,385	
18. Jung Jung .. .. .	504	31	23	24	78	582	174	44	218	..	800	
19. Koondrook .. .. .	1,625	..	121	39	160	1,785	1,485	149	1,634	(a) 165	3,584	
20. Lake Boga .. .. .	874	54	95	35	184	1,058	1,781	154	1,935	(a)(b) 234	3,227	
21. Lascelles .. .. .	481	5	15	33	53	534	511	66	577	(a) 64	1,175	
22. Merbein .. .. .	198	143	280	50	473	671	352	298	650	(a) 50	1,371	
23. Minyip .. .. .	1,888	31	21	31	83	1,971	3,812	226	4,038	(a) 323	6,332	
24. Mornington .. .. .	345	131	8	74	213	558	953	1,304	2,257	..	2,815	
25. Natimuk .. .. .	1,122	11	7	74	92	1,214	4,130	346	4,476	(b) 750	6,440	
26. Nyah .. .. .	93	3	35	15	53	146	85	25	110	(a) 36	292	
27. Ouyen .. .. .	1,694	103	410	137	650	2,344	1,897	631	2,528	(a) 50	4,922	
28. Rainbow .. .. .	1,877	41	99	61	201	2,078	5,912	509	6,421	(a)(b) 960	9,459	
29. Rupanyup .. .. .	2,061	15	106	29	150	2,211	2,881	205	3,086	(a) 294	5,591	
30. Sea Lake .. .. .	3,765	129	242	62	433	4,198	1,824	174	1,998	(a) 374	6,570	
31. Somerville .. .. .	..	5	1	2	8	8	..	39	39	..	47	
32. South Frankston .. .. .	79	61	4	31	96	175	201	597	798	..	973	
33. Ultima .. .. .	1,080	71	68	29	168	1,248	1,610	197	1,807	(a) 100	3,155	
34. Watchem .. .. .	567	28	22	33	83	650	1,300	160	1,460	(a) 80	2,190	
35. Werribee .. .. .	1,814	50	263	54	367	2,181	3,946	574	4,520	(a) 357	7,058	
36. Wonthaggi .. .. .	5,314	85	275	226	586	5,900	27,410	2,315	29,725	(b) 7,500	43,125	
37. Woomelang .. .. .	1,856	33	146	48	227	2,083	3,456	364	3,820	(a) 200	6,103	
38. Wycheproof .. .. .	3,357	20	231	51	302	3,659	2,855	249	3,104	(a) 402	7,165	
Totals .. .. .	61,422	2,452	4,523	2,148	9,123	70,545	104,909	18,645	123,554	16,979	211,078	

## LOAN EXPENDITURE.

STATEMENT OF LOAN EXPENDITURE DURING THE YEAR ENDED 30TH JUNE, 1923.

Works.	Loans Application Act No. 3126.		Loans Application Act No. 3190 and other Sources.		Total.	
	£	s. d.	£	s. d.	£	s. d.
<i>Free Headworks.</i>						
1. Goulburn Weir .. .. .	..	..	1,339	17 3	1,339	17 3
2. Kerang North-West Lakes .. .. .	268	0 3	834	2 7	1,102	2 10
3. Kow Swamp .. .. .	113	0 1	..	..	113	0 1
<i>River Murray Waters Acts—Works.</i>						
4. Storages, Weir and Locks .. .. .	..	..	224,479	0 5	224,479	0 5
<i>Reservoirs and Storages.</i>						
5. Goulburn Storages—						
Sugarloaf Reservoir .. .. .	10,414	3 2	128,770	8 8	139,184	11 10
Waranga Reservoir Enlargement .. .. .	3,233	4 2	19,823	4 9	23,056	8 11
6. Maffra, Glenmaggie Dam .. .. .	17,547	7 11	89,601	8 11	107,148	16 10
7. Melton Reservoir .. .. .	..	..	494	7 5	494	7 5
8. Wimmera-Mallee Storages—						
Taylors Lake .. .. .	27	1 5	29,444	2 7	29,471	4 0
Pine Lake .. .. .	..	..	16,678	18 8	16,678	18 8
Fyans Lake .. .. .	..	..	3,857	11 2	3,857	11 2
<i>Waterworks Districts.</i>						
9. Birchip, Sea Lake, Tyrrell, and Wycheproof .. .. .	..	..	47,705	10 4	47,705	10 4
10. Carwarp .. .. .	20	5 3	1,355	11 8	1,375	16 11
11. Karkaroc .. .. .	..	..	16,339	1 0	16,339	1 0
12. Long Lake .. .. .	..	..	1,397	2 9	1,397	2 9
13. Millewa .. .. .	1,188	15 10	25,180	1 7	26,368	17 5
14. Mornington Peninsula .. .. .	517	6 5	41,613	4 1	42,130	10 6
15. Tyntynder .. .. .	..	..	28,430	3 8	28,430	3 8
16. Walpeup East and Walpeup West .. .. .	12	6 8	3,074	12 0	3,086	18 8
17. Werribee .. .. .	..	..	31	18 8	31	18 8
18. Western Wimmera .. .. .	..	..	3,513	18 7	3,513	18 7
19. Wimmera United .. .. .	..	..	8,987	1 11	8,987	1 11
20. Wimmera Main Channels .. .. .	..	..	8,003	11 5	8,003	11 5
<i>Towns.</i>						
21. Bacchus Marsh and Werribee .. .. .	0	7 6	621	0 2	621	7 8
22. Berrillock, Beulah, and Birchip .. .. .	..	..	445	19 8	445	19 8
23. Cohuna .. .. .	..	..	520	7 11	520	7 11
24. Coliban .. .. .	1,784	9 0	5,306	0 2	7,090	9 2
25. Culgoa, Dimboola, Hopetoun, and Jeparit .. .. .	..	..	1,130	11 5	1,130	11 5
26. Jung Jung, Koondrook, Lake Boga, and Lascelles .. .. .	..	..	176	14 9	176	14 9
27. Merbein, Minyip, Nyah, and Nyah West .. .. .	..	..	1,548	4 0	1,548	4 0
28. Ouyen .. .. .	..	..	5,492	17 1	5,492	17 1
29. Rainbow, Rupanyup, and Sea Lake .. .. .	..	..	329	11 2	329	11 2
30. Ultima and Watchem .. .. .	..	..	50	9 9	50	9 9
31. Woomelang and Wycheproof .. .. .	..	..	673	3 4	673	3 4
32. Wonthaggi .. .. .	3	15 0	65	14 9	69	9 9
<i>Irrigation and Water Supply Districts.</i>						
33. Bacchus Marsh and Werribee .. .. .	..	..	14,490	10 9	14,490	10 9
34. Boga .. .. .	10	0 0	225	18 9	235	18 9
35. Boort .. .. .	247	14 3	1,812	4 4	2,059	18 7
36. Campaspe .. .. .	10	10 0	22	0 3	32	10 3
37. Cohuna .. .. .	..	..	5,053	19 4	5,053	19 4
38. Deakin .. .. .	..	..	45	16 0	45	16 0
39. Dingee .. .. .	7	3 1	160	9 6	167	12 7
40. Gannawarra .. .. .	10	0 0	1,105	5 11	1,115	5 11
41. Kerang .. .. .	87	19 8	793	6 8	881	6 4
42. Koondrook .. .. .	563	13 5	2,064	15 7	2,628	9 0
43. Merbein .. .. .	..	..	11,661	3 10	11,661	3 10
44. Mystic Park .. .. .	546	8 3	7,491	15 0	8,038	3 3
45. Nyah .. .. .	..	..	9,986	8 9	9,986	8 9
46. Red Cliffs .. .. .	34,281	19 4	157,241	18 11	191,523	18 3
47. Red Cliffs—Clearing land charged to Discharged Soldiers' Settlement Fund .. .. .	..	..	51,928	2 9	51,928	2 9
48. Rochester .. .. .	3,640	11 5	4,855	1 4	8,495	12 9
49. Rodney .. .. .	599	19 9	20,108	2 0	20,708	1 9
50. Shepparton .. .. .	163	4 2	4,501	3 3	4,664	7 5
51. Stanhope .. .. .	74	14 4	1,517	11 9	1,592	6 1
52. Swan Hill .. .. .	..	..	11,630	18 10	11,630	18 10
53. Tongala .. .. .	98	7 7	1,245	19 6	1,344	7 1
54. Tragowel Plains .. .. .	954	1 3	2,997	1 3	3,951	2 6
55. Tresco .. .. .	12,219	17 10	32,951	1 10	45,170	19 8
56. Goulburn Main Channels .. .. .	5,342	10 9	29,402	19 2	34,745	9 11
<i>Flood Protection and Drainage Districts.</i>						
57. Snowy River and Other Districts .. .. .	239	6 6	1,957	13 8	2,197	0 2
58. Goulburn Levees .. .. .	..	..	822	1 8	822	1 8
59. Kooweerup and Cardinia .. .. .	449	9 4	39,031	17 6	39,481	6 10
<i>Miscellaneous.</i>						
60. Investigations Storages .. .. .	147	13 1	285	18 10	433	11 11
61. Torrumbarry Districts—New Districts commanded by Torrumbarry Lock-Weir .. .. .	3,235	19 2	17,293	2 0	20,529	1 2
Totals .. .. .	98,061	5 10	1,150,000	3 2	1,248,061	9 0

STATEMENT OF EXPENDITURE DURING THE YEAR ENDED 30TH JUNE, 1923.

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) .. .. .	4,545	16 1
2. Clearing Roads .. .. .	23,454	3 11
Total .. .. .	£28,000	0 0



## 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, 1924, 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, 1924.

## ESTIMATED DISBURSEMENTS.

## A.

Revenue Producing Works—	
Coliban District .. .. .	£13,400
Irrigation and Water Supply Districts .. .. .	112,500
Waterworks Districts .. .. .	47,300
Drainage and Flood Protection Districts .. .. .	2,000
Diversions from Streams .. .. .	500
General Expenditure and Salaries (proportion) over £250 to be apportioned to above Districts .. .. .	20,450
	£196,150

## B.

Non-Revenue Producing Works—	
General Services—	
River Gaugings, Surveys, New Projects, Boring for Water, Land Settlement, General Expenditure and Salaries (proportion) over £250 .. .. .	£11,000
Loan Works, Services on Account defrayed from Votes .. .. .	7,000
Waterworks Trusts Administration .. .. .	2,500
	£20,500

## C.

Non-Revenue Producing Works—	
Free Headworks—	
Broken River .. .. .	£275
Goulburn-Waranga .. .. .	1,750
Kow Swamp .. .. .	1,600
Lake Lonsdale and Lower Wimmera .. .. .	500
Loddon River .. .. .	325
North-west Lakes .. .. .	400
	£4,850
	£221,500

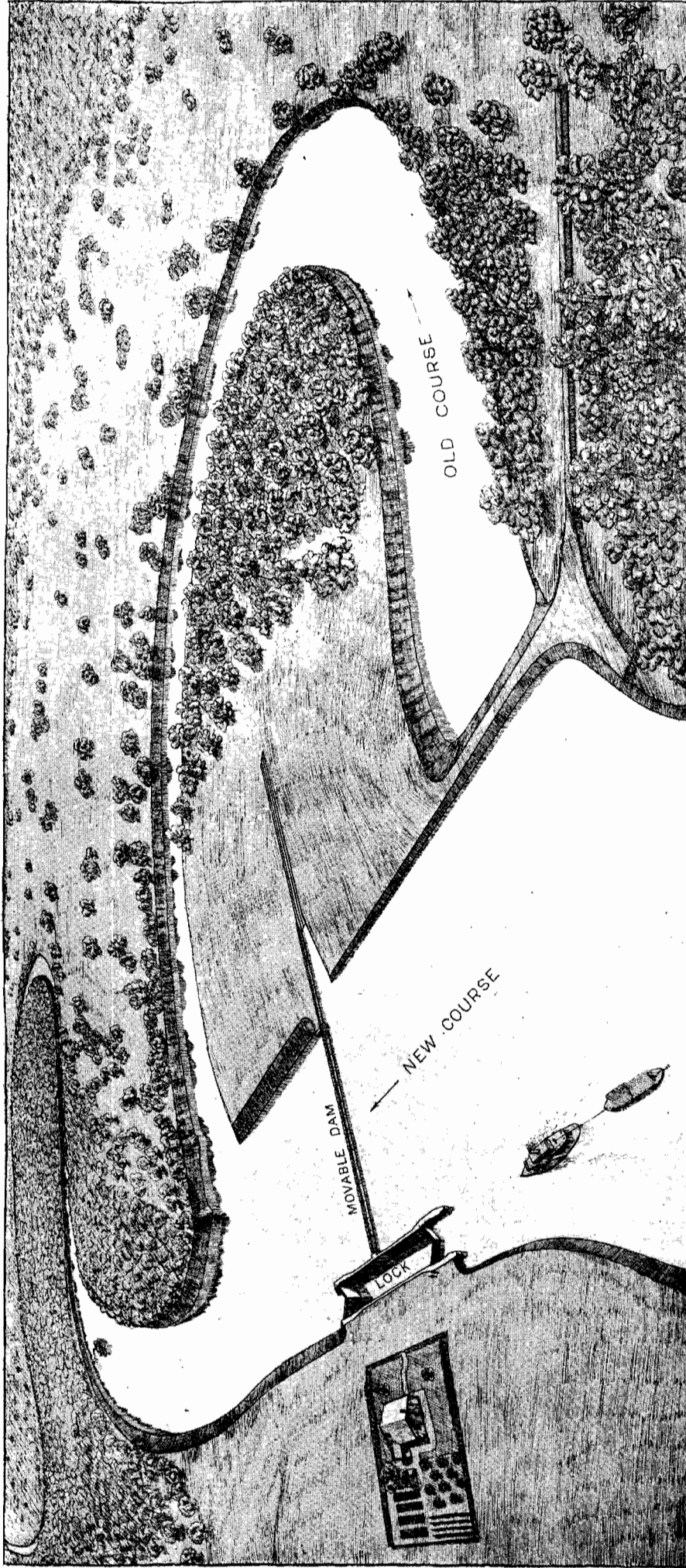
## ESTIMATED RECEIPTS.

Coliban District .. .. .	£40,000
Irrigation and Water Supply Districts .. .. .	170,000
Waterworks Districts .. .. .	127,000
Flood Protection Districts .. .. .	5,000
Miscellaneous .. .. .	13,000
	£355,000
Estimated amount available from Revenue Producing Works to meet Interest .. .. .	£158,850
Less expenditure as per "B" and "C" above on Non-Revenue Producing Works .. .. .	25,350
	£133,500
To which add Estimated Revenues from other Authorities—	
Waterworks Trusts .. .. .	£39,500
Local Bodies .. .. .	25,500
	£65,000
Total Estimated amount available from Revenues of all Authorities to meet Interest .. .. .	£198,500

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, 1923:—

Works.	Loan Liability of State for Works of Water Supply at 30th June, 1923, exclusive of Melbourne Water Supply.					Interest by State on Net Advances.	Total Interest of £542,761 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 Works. (D.) Loans Unexpended.	Balance at Debit of Authorities.		(A.) Written Off. (B.) Free Head-works. (C.) Uncompleted Works. (D.) Loans Unexpended.	Commission and Other Authorities.					
Completed Works— Commission—	£ 3,058,774	£ 42,436	£ 3,016,338	£ 175,055	£ 2,841,283	£ 122,926	£ 115,792	£165,477 (after providing £25,122 for non-revenue producing works, including Free Head-works).	£ 7,134	£ 70,190	£ 19,204	£ 4,623	
	Waterworks Districts .. .. .	2,317,032	19,573	2,297,459	(A.) 575,152	1,722,307	(A.) 23,439						(A.) 7,134
	Irrigation and Water Supply Districts .. .. .	628,412	90	628,322	(C.) 157,096	471,226	(C.) 6,402						(C.) 6,402
	Goulburn Channel Works (Free Districts supplied are being debited with their pro- Headworks excluded) Pykes Creek, Melton, and } Distributary Works } portion of Interest on this Expenditure	152,745	..	152,745	(C.) 39,311	113,434	(C.) 6,225						(C.) 1,602
	Mornington Peninsula .. .. .	323,623	..	323,623	(C.) 38,828	284,795	(C.) 13,189						(C.) 1,582
	Kooweerup and Cardinia Flood Protection Schemes .. .. .	179,324	..	179,324	(C.) 97,169	82,155	(C.) 7,308						(C.) 3,960
	Sugarloaf Reservoir and Waranga Reservoir Enlargement .. .. .	1,254,485	..	1,254,485	(C.) 1,254,485	..	(C.) 51,124						(C.) 51,124
	Maffra Irrigation and Water Supply District .. .. .	210,034	..	210,034	(C.) 210,034	..	(C.) 8,559						(C.) 8,559
	Red Cliffs Irrigation and Water Supply District .. .. .	372,729	..	372,729	(C.) 372,729	..	(C.) 15,190						(C.) 15,190
	Waterworks Trusts (including First Mildura) .. .. .	1,598,248	219,344	1,378,904	(A.) 316,537	1,062,367	(A.) 56,195						(A.) 12,900
Other Authorities—	£ 761,761	£ 112,690	£ 649,071	(A.) 163,760	£ 485,311	£ 26,452	£ 19,778	£ 61,283	£ 6,674	£ 43,295	£ 5,993		
	Local Bodies (Municipalities) .. .. .	672,943	..	672,943	(C.) 672,943	..	(C.) 27,425					(C.) 27,425	
	River Murray Agreement Works .. .. .	32,754	30	32,724	(A.) 32,724	..	(A.) 1,334					(A.) 1,334	
	Irrigation and Waterworks Trusts Abolished .. .. .	1,247,979	420	1,247,559	(B.) 1,247,559	..	(B.) 50,842					(B.) 50,842	
	Free Headworks .. .. .	147,046	..	147,046	(B.) 147,046	..	(B.) 5,993					(B.) 5,993	
	Free Grants to Local Authorities .. .. .	178,647	..	178,647	(C.) 178,647	..	(C.) 7,280					(C.) 7,280	
	Surveys, Exploratory, and Preliminary Works, including Purchase of Land reserved for Reservoirs .. .. .	576,237	..	576,237	(D.) 576,237	..	(D.) 23,484					(D.) 23,484	
	Loan Moneys unexpended .. .. .	13,712,773	394,583	13,318,190	6,255,312	7,062,878	542,761					254,924	
	Totals .. .. .	18,712,773	394,583	18,318,190	6,255,312	7,062,878	542,761					254,924	226,760



RIVER MURRAY WORKS.  
TORRUMBARRY WEIR AND LOCK.  
(This work is 20 miles by road downstream from Echuca.)

Dated at the Office of the State Rivers and Water Supply Commission, Treasury  
Gardens, Melbourne, the 30th day of October, 1923.

WM. CATTANACH, Chairman.

J. S. DETHRIDGE, Commissioner.

E. SHAW, Commissioner.

M. NALLY, Secretary.