

WATER RESOURCES AND SEWERAGE

WATER RESOURCES AND THEIR CONTROL*

Ministry of Water Resources and Water Supply

The Ministry of Water Resources and Water Supply was established under the *Water Resources Act 1975* for the purpose of ensuring that the water resources of Victoria are utilised in the most efficient manner.

The *Water Resources Act 1975* vested in the Minister of Water Supply the administration of the Water Act, the Melbourne and Metropolitan Board of Works Act (in respect of water, sewerage, and drainage functions), the Geelong Waterworks and Sewerage Act, the Latrobe Valley Act, the Mildura Irrigation and Water Trusts Act, the West Moorabool Water Board Act, the Dandenong Valley Authority Act, the Sewerage Districts Act, the Groundwater Act Part V, the River Improvement Act, and the Drainage of Land Act.

As part of the Ministry, there is a Water Resources Council, consisting of eleven members appointed by the Governor in Council and comprising the Director of Water Resources who is chairman; the three commissioners of the State Rivers and Water Supply Commission; the chairman, secretary, and engineer-in-chief of the Melbourne and Metropolitan Board of Works; a representative or nominee from each of the Waterworks Trust Association of Victoria, the Victorian Irrigators Central Council, and the Ministry for Conservation, and the Co-ordinator of Works from the Victorian Treasury. The functions of the Council are to investigate and advise the Minister generally on matters pertaining to the water resources of Victoria or to water supply, drainage, or sewerage throughout Victoria, referred to it by the Minister.

During 1981, the Ministry was involved in a number of new and on-going studies, including:

- (1) *Study into institutional arrangements*. This study was aimed at investigating the responsibilities and activities of the various authorities involved in water management in Victoria with a view to identifying areas of overlapping and conflicting interest.
- (2) *Urban Water Services Financing Study*. This study was concerned with assessing both the capital requirements for urban water and sewerage services in Victoria to the year 2000, and the implications of alternative financing methods for selected urban centres.
- (3) *Thomson River Biota Study*. Field work in connection with this study, to assess the impact of construction sediment and flow regulation upon the substrata and biota downstream from the Thomson River dam site, has been completed.
- (4) *Nutrient reductions trials*. A twelve-month pilot study of alternative nutrient reduction processes for sewage effluent, at the Lilydale Sewerage Authority was planned to be completed in February 1982. Results of the study will determine which process is adopted at Lilydale and will also have State-wide application.
- (5) *Reclaimed Water Committee*. Timber growth trials conducted at Mildura, Horsham, and Robinvale to determine the feasibility of growing native trees on land irrigated with sewage effluent. Vegetable growth trials to determine the feasibility of growing vegetables

* A special article on "Water and Victoria's environment" can be found in Chapter I of this *Year Book*.

on land irrigated with sewage effluent, and associated investigations aimed at determining the health effects resulting from such re-use, particularly the possibility of toxic heavy metal accumulation in the vegetables and the retention of pathogenic bacteria and viruses, have now been completed.

A report has been prepared reviewing the reticulated water supply systems in the Yarra catchment which are outside the area administered by the Melbourne and Metropolitan Board of Works for water supply. Basic data was assembled on the seven Waterworks Trusts within the region; this included descriptions and plans of present and future works, statistics, financial information, and details of proclaimed water supply catchments.

Further references: *Water resources and their control, Victorian Year Book 1977*, pp. 373-4; 1979, pp. 291-2

MELBOURNE AND METROPOLITAN BOARD OF WORKS

Introduction

The Melbourne and Metropolitan Board of Works is the authority for providing water supply, sewerage, and main drainage services to the Melbourne metropolitan area. It is also Melbourne's metropolitan planning authority. The formation of a body such as the Board was urged by an 1889 Royal Commission into Melbourne's sanitary conditions after continuous agitation by local municipalities for a sewerage system in the city. The Board was constituted by an Act of the Victorian Parliament in 1890 and began operations in July 1891. Its initial functions were to provide a sewerage system for Melbourne and the metropolitan area, and to assume responsibility for the city's water supply, previously administered by the Public Works Department.

In the years since its inception, the Board, in addition to assuming responsibility for main drainage, has also been made responsible for maintenance and improvement of metropolitan rivers and watercourses, town planning, and metropolitan parks. With the exception of town planning, the Board's responsibilities are laid down in the *Melbourne and Metropolitan Board of Works Act 1958* (as amended). Until 1 August 1978, the Board comprised 54 unpaid commissioners, a full-time elected chairman, and from 1975, a deputy chairman. Commissioners who were required to be members of a municipal council, could not hold their seats for more than three years without reappointment, while the maximum term for the chairman was four years before his appointment was reviewed. The deputy chairman's term was also for four years. Following recommendations by a Board of Inquiry, the composition of the Board was changed on 1 August 1978. It now comprises a full-time appointed chairman and six part-time members, four elected by area commissions comprising groupings of municipalities and two appointed by the Victorian Government. Their appointments are for four-year terms.

Acts of the Victorian Parliament empower the Board to levy four rates annually: the water rate, metropolitan general rate (for sewerage services), metropolitan drainage and river improvement rate, and the metropolitan improvement or planning rate, all of which are based on net annual valuations of rateable properties but subject to specified minimum charges. The incoming revenue is used to operate and maintain the water, sewerage, and main drainage systems, to pay interest and redemption charges on loans raised for capital works, and to meet administrative expenses.

The proceeds of the metropolitan improvement rate meet annual expenditure for town planning, the Board's statutory contribution towards financing the Melbourne underground rail loop, payments of compensation for lands reserved under the Metropolitan Planning Scheme, and for metropolitan parks. The capital works of the Board are financed mainly from money which the Board is given approval to borrow after the annual meeting of the Australian Loan Council has considered the projected loan programmes of semi-governmental authorities throughout Australia.

Further reference: *Board of Inquiry into the Melbourne and Metropolitan Board of Works, 1977, Victorian Year Book, 1980*, pp. 304-6

Melbourne's water storages

Water to Melbourne and the metropolitan area is supplied from seven storage reservoirs drawing on the water resources of mountain catchment areas. Pipelines carry the water from on-stream storages distant from the city to off-stream storages located around the

perimeter of the metropolitan area. Water is then conveyed to service reservoirs and elevated tanks throughout the suburbs for distribution to consumers.

When the Upper Yarra Dam was completed in 1957, the capacity of the storage reservoirs serving the supply system was increased to 296,000 megalitres, comprising Yan Yean Reservoir (30,000 megalitres), Maroondah (22,000), O'Shannassy (4,000), Silvan (40,000), and Upper Yarra (200,000).

In the 23 years since Upper Yarra was commissioned, this storage capacity has more than doubled to 705,000 megalitres by construction of Greenvale (27,000 megalitres), Cardinia (287,000 megalitres), and Winneke (95,000 megalitres). Work is progressing on a new major reservoir on the Thomson River, in Gippsland, which will add another 1.1 million megalitres of water storage and give Melbourne, by the mid 1980s, a supply system with a storage capacity equivalent to three times the expected annual demand at that time.

Other major works undertaken since 1957—and particularly following the severe drought of 1967–68—include duplication of the transfer main between the Upper Yarra and Silvan Reservoirs; diversion of several Yarra tributaries into the supply system; construction of the Yarra Valley Conduit to further increase transfer capacity between Upper Yarra and Silvan; construction of a transfer main between Silvan and Cardinia Reservoirs; and the Thomson-Yarra Tunnel and Easton and Swingler Diversion Works to transfer water from the Thomson River to the Upper Yarra Reservoir.

Greenvale Reservoir is on Yuroke Creek, a branch of the Moonee Ponds Creek in the north of the city, and serves Melbourne's north-western and western suburbs to Werribee. Greenvale is supplied by pipeline from the Silvan Reservoir near Monbulk in the Dandenong Ranges, east of Melbourne. Silvan stores water from the O'Shannassy, Upper Yarra, and Thomson systems.

Cardinia is by far the biggest of the Board's storages with a capacity of 287,000 megalitres. It supplies Melbourne's south-eastern suburbs as far south as the boundary of Frankston and the State Rivers and Water Supply Commission Mornington Peninsula system and is fed from the Upper Yarra system via a pipeline from the southern end of the Silvan Reservoir. Supply to Silvan is supplemented by the new Yarra Valley Conduit from the Upper Yarra Reservoir which enables water diverted into the Upper Yarra from the Thomson River to be transferred to Cardinia Reservoir. This system also provides a marked degree of regulation of water from the Thomson River pending construction of the Thomson Dam.

Cardinia, with its large storage, supplies water to both the Dandenong and Notting Hill service reservoirs. The main dam embankment, with a base width of 303 metres, is rockfill with an impervious earth core. It has a maximum height of 86 metres, a crest length of 1,542 metres and contains about 3.7 million cubic metres of earth and rock. Cardinia started filling in 1973 and filled for the first time late in October 1977. The reservoir, which was designed by the Snowy Mountains Engineering Corporation, has a shoreline of about 56 kilometres and a surface area of approximately 1,300 hectares.

In mid 1973, the Victorian Government announced a dam building programme aimed at further increasing the storage capacity of Melbourne's water supply system. Included in this programme is the Thomson Reservoir as the main component of the third stage of the Board of Works' largest water supply project to date—the diversion of water from the Thomson River, about 170 kilometres east of Melbourne, into the Upper Yarra system. Construction work on the Thomson project started in 1969 and the first stage—allowing diversion of water from the Thomson through a 19.6 kilometre tunnel to Fehrings Creek, a tributary of the Yarra—was commissioned in September 1974. Water from the Thomson was diverted into the tunnel, then into the Yarra River via Fehrings Creek. From the Yarra, the flow entered the Upper Yarra Reservoir. Stage two of the project involved extending this tunnel at both its western and eastern ends. The western extension carried the tunnel to the Yarra River near the Reservoir, thereby superseding the outlet into Fehrings Creek. The eastern tunnel extension allows diversion of flow from the Thomson at a point known as Swingler, just below the confluence of the Thomson and Jordan Rivers, thus making use of a larger catchment area. Incorporating a concrete diversion dam at Swingler, stage two was completed early in the second half of 1977. The major component of the third stage of the Thomson Diversion Scheme is a large storage on the Thomson River, north of Erica, to be formed by the Thomson Dam. When completed,

this dam will be about 165 metres high and the earth and rockfill structure will form a reservoir inundating about 2,200 hectares. The dam will impound about 1.1 million megalitres and the proposed reservoir will extend for some 23 kilo.metres north of the wall.

A final decision to proceed with the Thomson Dam and its associated works was made by the Victorian Government early in 1976 after a study of the environmental implications during both the construction and operation of the dam. During the study, members of the public were able to make written submissions, either as individuals or collectively, on any aspect of the investigation, and these submissions were taken into account during preparation of the final report and recommendations. Apart from the Thomson Dam, the works involved in the third and final stage of the Thomson scheme entail an extension of the Thomson-Yarra diversion tunnel in a south-easterly direction for about 5.5 kilometres from Swingler to emerge within the proposed Thomson Reservoir, and allowing water to be transferred to the Upper Yarra system as required, as well as outlet works in the Thomson Dam for the release of water for other uses downstream. Excavation of the tunnel is complete and construction of the dam embankment and associated works is proceeding. The Thomson Reservoir will store water during wetter years when inflows are high and thus provide an adequate water supply for Melbourne during drier years. This will enable the Board to operate its available storages much more efficiently than would be possible without a large back-up storage such as the Thomson. In addition, the dam will provide regulation of the stored water to supplement the variable flows in the Thomson River for the irrigators and water users in the Thomson Valley.

The augmentation programme announced in 1973 also included the Winneke Reservoir Project (95,000 megalitres live capacity), to develop the resources of the Yarra River at Yering Gorge and the nearby Maroondah aqueduct. Commissioned in November 1980, the Winneke scheme comprises an intake and pumping station on the Yarra in Yering Gorge; a "pressure tunnel" from the pumping station to the reservoir; a draw-off structure and tunnel from the reservoir to carry water to a pumping station below the main dam wall; a pipeline rising from this pumping station to a water treatment plant; a "clearwater" storage basin adjacent to the treatment plant; and a pipeline from the storage basin through which treated water is transferred to the supply system.

The main dam is 85 metres high and 1,000 metres long and impounds 95,000 megalitres of water and is flanked by two smaller saddle dams. Comprehensive treatment of Winneke water is necessary because it is drawn from a habitated catchment. The treatment plant is located close to the southern end of the main dam. It uses conventional water treatment methods in which chemicals are added to clarify water which is then filtered and chlorinated. As with the rest of Melbourne's water supply, water from Winneke is fluoridated in line with the requirements of the *Health (Fluoridation) Act 1973*.

A final decision to proceed with this project followed a comprehensive environmental study of the implications of the proposal, as a result of which significant changes were made to the original proposals to overcome environmental objections.

Winneke supplies the northern and western suburbs of Melbourne and thus reduces the demand on Silvan and other reservoirs supplying this area. Water is conveyed to homes and industry in the Melbourne metropolitan area from various service reservoirs situated in convenient places so that an adequate pressure can be maintained in the mains. There are 86 service reservoirs and tanks with a combined capacity of 2,187 megalitres. Underground distribution and reticulation mains convey the water from the service reservoirs to its point of use.

As part of its water supply catchment management programme, the Board is carrying out extensive forest hydrology research at Coranderrk and North Maroondah, two eucalypt forest areas north and south of Healesville. The experiments are designed to determine a scientifically based, efficient catchment management policy related to water yield and quality. At Coranderrk, the effects of two different timber harvesting operations applied to mature eucalypt forests are being monitored, while at North Maroondah studies are being made to assess the effects of a regenerated eucalypt forest on water yield.

Following consideration of the results of this research up to 1979, the Victorian Government announced in 1981 that commercial logging of timber from the Board's catchments would not be permitted.

In the interest of preserving water quality, public access to the Board of Works' forested catchment areas is not allowed, but there are picnic and passive recreational facilities at all the Board's storages except the O'Shannassy Reservoir. Public access is also available to four smaller reserves — Donnelly's Weir, Coranderrk Weir, Fernshaw, and the top of Black Spur. All the reserves are easily reached by car.

Total water consumption for 1980-81 was 453,306 megalitres, which was the highest on record. Rainfall over the catchment area averaged 1,054 mm, compared with the long-term average of 1,349.7 mm.

At 30 June 1981, there were 913,652 properties or an estimated 2,527,000 persons in Melbourne supplied with reticulated water.

**VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
WATER SUPPLY SYSTEMS: STREAMFLOW YIELDS
(megalitres)**

Year	Yan Yean	Maroondah	O'Shannassy	Upper Yarra	Thomson	Total water yield
1976-77	21,600	104,400	120,400	219,500	80,000	545,900
1977-78	20,800	79,400	109,200	216,900	67,100	493,400
1978-79	25,400	109,700	103,900	227,900	75,900	542,800
1979-80	14,300	72,800	79,900	122,400	76,800	366,200
1980-81	10,900	96,600	98,400	183,800	112,400	502,100

Further references: Thomson-Yarra Development Scheme, *Victorian Year Book* 1974, p. 253; Cardinia Reservoir, 1975, pp. 188-9; Lower Yarra Development Scheme, 1979, pp. 295-6

Cost of water supply system

The cost of capital works in respect of the water supply system under the control of the Board is shown in the following table for each of the years 1975-76 to 1979-80:

**VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
CAPITAL OUTLAY ON WATERWORKS
(\$'000)**

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80
Yan Yean system (including Greenvale)	82	45	42	30	27
Maroondah system (including Watson's Creek and Sugarloaf)	8,574	21,286	42,355	55,435	49,177
O'Shannassy, Upper Yarra, and Thomson system (including Silvan and Cardinia)	23,041	28,473	22,657	19,297	22,672
Service reservoirs	4,523	3,686	4,704	4,904	3,935
Large mains and pumping stations	14,086	18,488	19,330	9,470	5,097
Reticulation	8,766	9,590	17,712	12,566	14,108
Afforestation	6	21	20	—	—
Investigations, future works	Cr.91	1	Cr.154	Cr.209	Cr.308
Total outlay	58,987	r 81,590	106,666	101,493	94,708

Consumption of water

During the year ended 30 June 1981, the maximum consumption of water in Melbourne and suburbs on any one day was 2,933 megalitres on 19 January 1981, and the minimum consumption was 771 megalitres on 14 July 1980 and 8 June 1981.

The following table shows, for each of the years 1976-77 to 1980-81, the number of properties supplied with water and sewers, the quantity of water consumed, the daily average consumption, the daily average consumption per head of population served, etc.:

**VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
WATER CONSUMPTION AND SEWERAGE CONNECTIONS**

Year	Improved properties supplied with water at 30 June	Total annual consumption of water	Consumption of water on any one day		Daily average of annual consumption of water	Daily consumption of water per head of population served	Improved properties for which sewers were provided at 30 June
			Maximum	Minimum			
	number	megalitres	megalitres	megalitres	megalitres	litres	number
1976-77	850,834	381,489	2,273	638	1,045	423.59	689,336
1977-78	868,640	402,632	2,399	705	1,103	444.08	716,670
1978-79	875,485	393,626	2,297	694	1,078	434.85	748,787
1979-80	899,341	446,801	2,657	714	1,221	488.90	768,647
1980-81	913,652	453,306	2,933	771	1,242	491.49	793,118

Sewerage system

The cost of sewerage works during each of the years 1975-76 to 1979-80, is shown in the following table:

**VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
CAPITAL OUTLAY ON SEWERAGE SYSTEM
(\$'000)**

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80
Farm purchase and preparation	898	742	574	1,235	1,793
Treatment works	10,409	7,458	4,942	4,164	2,675
Outfall sewer and rising mains	393	354	89	Cr.214	104
Pumping stations, buildings, and plant	1,969	921	1,207	1,491	865
Main and branch sewers	45,249	33,575	14,368	9,669	17,463
Reticulation sewers	26,554	30,667	50,378	46,621	45,128
Sanitary depots	—	3	61	Cr.15	1
Investigations	Cr.121	11	56	Cr.48	Cr.377
Total outlay	85,351	73,731	71,675	62,903	67,652

Disposal of nightsoil from unsewered premises

The responsibility for the collection, removal, and disposal of nightsoil from unsewered premises within the Melbourne metropolitan area was transferred from the individual municipal councils to the Melbourne and Metropolitan Board of Works by legislation in 1922. By agreement, each council pays to the Board a prescribed amount per annum to offset the cost of the service, etc. For the year 1979-80, working expenses were \$361,410, costs of conveying and treatment \$155,674, and investment \$52,113, making a total of \$569,198. Revenue was \$503,886, giving a deficit of \$65,311.

Drainage

The Board has been responsible for main stormwater drainage in the Melbourne metropolitan area since 1923. The current drainage area under the Board's control covers some 1,890 square kilometres. Besides being responsible for underground drains and the smaller creeks and watercourses, the Board also has responsibility over the metropolitan rivers within the drainage area. However, considerable portions of the catchments of these rivers are outside the Board's area of jurisdiction, a situation which has caused many problems. Local drainage responsibilities, those areas draining less than about 60 hectares, rest with the respective municipal councils.

The drainage functions of the Melbourne and Metropolitan Board of Works are aimed at the control of flooding, erosion, and pollution and include construction of works, maintenance of works and natural channels, and policing of regulations. Total prevention of flooding is not financially feasible so efforts are directed towards control and minimisation of the effects. Structural measures such as pipes and channels considerably improve the hydraulic efficiency of a waterway. (Lined channels are often used to overcome the susceptibility of many of Melbourne's soils to erosion.) However, such

solutions are not always viable. Alternative solutions such as retarding basins have been successfully provided and 27 such basins are operated by the Board. A retarding basin is a reservoir, normally empty, having an outlet, always open, which is smaller than the inlet. During high flows the constriction holds back some of the flow and this only gradually escapes to the downstream system as the inflow subsides.

Other measures to minimise flooding take the form of regulations. The prevention of building in flood prone areas, the setting of designated flood levels which control floor levels in new buildings, and the restriction of filling in flood plains which uses up valuable natural flood storage, are examples of such regulations.

The Board carries out continual maintenance to ensure the required waterway area is always available. Such maintenance includes the removal of sedimentation, erosion prevention measures, clearing debris and rubbish, and de-snagging. In so doing the appearance of the creeks and watercourses is preserved and dangerous areas eliminated.

The Board is also the delegated agency of the Environmental Protection Authority in regard to pollution of the rivers, creeks and drains in the Melbourne metropolitan area. These responsibilities include conditional licensing of trade and industrial waste discharges, monitoring and analysing samples, and reporting any infringement or illegal discharge to the Authority.

At 30 June 1981, the total length of constructed drains under the Board's control was 526 kilometres.

Finance

Assessed value of property

The net annual value of property in 1977-78 to 1979-80 for the purpose of the Board's rating is shown in the following table:

**VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
ASSESSED VALUE OF PROPERTY RATED
(\$m)**

Rate	Net annual value of property		
	1977-78	1978-79	1979-80
Water rate	1,641.5	1,677.9	1,719.5
Metropolitan general rate (for sewerage services)	1,321.6	1,374.5	1,435.7
Metropolitan drainage and river improvement rate	1,360.6	1,382.6	1,402.1
Metropolitan improvement rate	1,668.9	1,706.5	1,743.9

Finance for capital works

Capital works are financed mainly from money which the Board is given approval to borrow after the annual meeting of the Australian Loan Council has considered the projected loan programmes of semi-governmental authorities throughout Australia.

Board's borrowing powers and loan liability

The Board is empowered under section 187 of its Act to borrow up to \$2,000m, exclusive of loans of \$4.8m originally raised by the Victorian Government for the construction of waterworks for the supply of Melbourne and suburbs. In addition, the Board may, under section 200 of its Act, receive advances by way of loan from the Treasurer of Victoria, and the value of these loans is not included in the limit of \$2,000m quoted in section 187. At 30 June 1980, the Board's total loan liability amounted to \$1,586.6m, of which \$1,322m had been incurred under section 187. All money borrowed is charged and secured upon the Board's revenues.

Revenue, expenditure, etc.

The following table shows the revenue, expenditure, surplus or deficit, and capital outlay of the Board in respect of its water supply, sewerage, and drainage functions during each of the years 1975-76 to 1979-80. The Board keeps a separate account of its financial activities as the Metropolitan Planning Authority.

VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
REVENUE, EXPENDITURE, ETC.
(\$'000)

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80
REVENUE					
Water supply—					
Water rates and charges (including revenue from water supplied by measure)	57,140	67,189	73,951	82,037	111,452
Sewerage—					
Sewerage rates	73,237	84,228	92,390	103,792	121,972
Trade waste charges	5,033	6,681	7,411	7,989	9,717
Sanitary and misc. charges	1,456	2,423	2,712	3,042	4,127
Metropolitan farm—					
Grazing fees, rents, pastures, etc.	4	3	2	4	3
Balance, livestock account	Dr. 4	229	421	1,279	2,374
Metropolitan drainage and rivers—					
Drainage and river improvement rate	10,353	11,870	13,697	15,541	18,499
River water charges	11	12	16	18	122
Total	147,231	172,635	190,600	213,702	268,266
EXPENDITURE					
Water supply—					
Management	7,690	8,694	10,445	12,087	15,199
Maintenance	14,158	16,488	18,847	20,819	23,784
Water supply works	1,652	1,652	1,652	1,932	(a)
Sewerage—					
Management	9,617	10,755	13,144	13,754	15,507
Maintenance	15,320	19,599	22,102	24,747	27,382
Sewerage works	3,068	3,068	3,068	3,588	(a)
Metropolitan farm—					
Management	658	813	884	941	1,027
Maintenance	2,548	2,992	3,383	3,751	4,308
Metropolitan drainage and rivers—					
Management	1,588	1,735	2,165	3,164	3,510
Maintenance	3,421	4,162	4,691	4,705	5,306
Drainage works	1,180	1,180	1,180	1,380	(a)
Pensions and allowances	513	844	—	—	—
Loan flotation expenses	720	1,128	672	1,593	2,430
Interest (including exchange)	64,161	74,246	89,052	106,304	118,818
Contributions to—					
Sinking fund	2,408	2,727	3,172	3,693	4,074
Loans redeemed reserve	5,610	6,436	7,159	7,850	8,378
Renewals fund	1,466	1,796	2,449	3,168	5,632
Depreciation	1,015	1,019	372	299	309
Superannuation account	4,505	4,965	5,317	5,653	5,450
Municipalities for valuations, etc.	279	265	444	442	441
Rates equalisation reserve	3,674	4,371	202	Cr. 6,468	2,952
Appropriations for contingencies, etc.	1,880	3,200	200	300	—
Insurance fund	..	..	..	..	4,500
Capital works	..	..	..	..	18,400
Other	100	500	—	—	859
Total	147,231	172,635	190,600	213,702	268,266
Capital outlay at 30 June—					
Water supply	434,343	515,931	622,597	724,091	818,798
Sewerage	627,037	700,769	772,445	835,348	903,001
Drainage and river improvement works	66,139	74,098	83,343	91,981	101,339

(a) Not now apportioned between services. See contributions to capital works.

Town planning, metropolitan freeways, etc.

As a result of the passing of the *Metropolitan Bridges, Highways, and Foreshores Act 1974* by the Victorian Parliament, the Board's road-making powers, road assets, etc., and certain officers and other employees were transferred to the Country Roads Board, on 1 July 1974.

Also, under the same Act, the Board's responsibility for foreshores reverted to the Public Works Department.

In respect of its town planning functions, the Board now operates under the authority of the Minister for Planning.

The following table summarises the revenue, expenditure, and capital outlay of the Board in connection with its functions as the Metropolitan Planning Authority during the period 1975-76 to 1979-80:

**VICTORIA—MELBOURNE AND METROPOLITAN BOARD OF WORKS:
METROPOLITAN IMPROVEMENT FUND: REVENUE ACCOUNT
AND CAPITAL OUTLAY
(\$'000)**

Particulars	1975-76	1976-77	1977-78	1978-79	1979-80
REVENUE					
Metropolitan improvement rate and sundry income	14,972	16,344	17,447	17,995	19,447
Recoup from Country Roads Board	—	—	—	—	—
Sales of land	5,225	1,644	4,781	2,766	2,565
Other	665	19	—	—	—
Total revenue	20,863	18,007	22,228	20,761	22,012
EXPENDITURE					
Management	4,249	4,576	4,864	5,650	6,453
Maintenance	38	305	453	757	1,027
Interest	77	120	210	51	51
Contributions to sinking fund	Cr. 24	—	—	—	—
Reserved land and acquisitions	4,759	5,557	2,409	7,084	2,415
Metropolitan parks land acquisitions	3,812	6,080	6,629	2,775	6,677
Special Road Projects acquisitions, etc.	553	—	—	—	—
Construction works	308	894	1,451	1,284	1,847
Road and foreshore works	—	—	—	—	—
Contribution to Melbourne Underground Rail Loop Authority	1,261	1,372	2,250	3,036	3,900
Transfer to rates equalisation fund	5,469	Cr. 1,289	3,540	Cr. 337	Cr. 828
Other	361	392	422	461	470
Total expenditure	20,863	18,007	22,228	20,761	22,012
Capital outlay at 30 June	44,825	55,591	61,238	69,498	75,715

STATE RIVERS AND WATER SUPPLY COMMISSION

Operations

Following a Royal Commission on water supply, the Victorian Parliament passed the Irrigation Act of 1886 which vested the right to the use and control of all surface waters of Victoria in the Crown. This Act also provided for the establishment of irrigation trusts. Within a few years, large areas of Victoria were included in their districts. Inadequate water conservation, divided control of water resources, insufficient charges, and irregular revenue because water was used on a large scale only in dry years, caused most of the trusts to fail. Their failure made clear the need for a single authority to manage Victoria's water resources and resulted in the formation of the State Rivers and Water Supply Commission.

The State Rivers and Water Supply Commission was constituted under the Water Act passed by the Victorian Parliament in 1905. Under the provisions of the Act, the Commission was made responsible for the conservation and distribution of Victoria's water resources and control of the waters from rivers and beds and banks of streams and the control of the other natural sources outside of the Melbourne metropolitan area.

In recent years the Commission's role has broadened. The *Groundwater Act* 1969 gave the Commission additional responsibilities in regard to control of underground water. Amendments to the Local Government Act in 1973 extended the Commission's powers over sub-division of land. Prior to the amendment, the Commission's approval was only required for sub-divisions within irrigation districts: its approval is now required for all sub-divisions outside the Melbourne metropolitan area. The *Drainage of Land Act* 1975 conferred on the Commission additional powers relating to the drainage of land, and



The opening of the 1981 Commonwealth Heads of Government Meeting took place in the Melbourne Town Hall on 30 September 1981.

Australian Information Service



The eastern annexe of the Royal Exhibition Building housed the Meeting Hall for the 1981 Commonwealth Heads of Government Meeting.

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The Prime Minister of Australia, the Rt. Hon. John Malcolm Fraser, C.H., and Mrs Fraser welcoming Prince Mabandla N.F. Dlamini, and his wife to the opening ceremony of the 1981 Commonwealth Heads of Government Meeting.

Australian Information Service



(Top) The Prime Minister of Australia, host of the 1981 Commonwealth Heads of Government Meeting, accompanies Her Majesty The Queen on a tour of the Meeting Rooms in the Royal Exhibition Building.

(Above) A 1981 Commonwealth Heads of Government Meeting session in progress in Melbourne's Royal Exhibition Building.

(Below) As part of the 1981 Commonwealth Heads of Government Meeting activities, the Australian Exhibition was held in the Great Hall of the Royal Exhibition Building.

Australian Information Service





Her Majesty The Queen and His Royal Highness The Duke of Edinburgh with heads of delegation before dinner on the *Britannia* at Station Pier during the Commonwealth Heads of Government Meeting in Melbourne in October 1981.

(Front row, from left): Prince Fatafahi Tu'ipelehake, of Tonga; Mrs Thatcher, of Britain; President Daniel arap Moi, of Kenya; Dr Sir Seewoosagur Ramgoolam, of Mauritius; President Banda, of Malawi; Prince Philip; Mr Fraser, of Australia; Her Majesty, President Nyerere, of Tanzania; Mrs Gandhi, of India; President Kaunda, of Zambia; Prime Minister Adams, of Barbados; Mr Brincat, of Malta; President Burnham, of Guyana; and Prime Minister Otema Allimadi, of Uganda.

(Middle row, from left): Ratu Sir Kamiseva Mara, of Fiji; Mr Bishop, of Grenada; President Tabi, of Kiribati; Mr Seaga, of Jamaica; Mr Alebua, of the Solomon Islands; Prime Minister, Azizur Rahman, of Bangladesh; Mr Ranasinghe Premadasa, of Sri Lanka; Mr Muldoon of New Zealand; Prince Mabandla N. f. Dlamini, of Swaziland; President Kyprianou, of Cyprus; Mr Assan Camara, of Gambia; Dr Isaac Chinebuah, of Ghana; President Masire, of Botswana; Prime Minister Mugabe, of Zimbabwe; and Prime Minister Lee Kuan Yew of Singapore.

(Back row, from left): Prime Minister Taisi Tupuola Tufuga Efi, of Western Samoa; Mr Trudeau, of Canada; President Shagari, of Nigeria; Mr Lini, of Vanuatu; Sir Julius Chan, of Papua New Guinea; Dr Conteh, of Sierra Leone; Mr Josie, of St Lucia; Mr Hodoul, of the Seychelles; Prime Minister Mr George Price, of Belize; Mr Rampersad, of Trinidad and Tobago; Tan Sri Ghazali bin Shafie, of Malaysia; Mr Roberts, of the Bahamas; Mr Shridath Ramphal, Secretary-General of the Commonwealth; and Mr Molapo, of Lesotho.

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management of flood plains, outside the Melbourne and Metropolitan Board of Works and Dandenong Valley Authority areas.

The Commission comprises three commissioners appointed by the Governor in Council. At 31 August 1981, it employed a permanent workforce of 1,804 persons throughout Victoria. Of the permanent staff, 461 were engaged in engineering, surveying, drafting, and other professional occupations; a further 528 were engaged in water distribution, district operations, and maintenance; another 509 were engaged in accounting and administrative functions; and 306 on miscellaneous works. Of the casual labour force of 995 persons, 130 were engaged on construction projects, 796 on district maintenance, and 69 on miscellaneous works.

In addition to the administration of flood protection, drainage, and river improvement works throughout Victoria, more than 60 large storages, 320 subsidiary reservoirs, and 30,000 kilometres of channels and pipelines are operated by the Commission to supply water for irrigation, stock and domestic purposes, and reticulated town supplies. All these works were designed and constructed, and are operated and maintained, by the Commission. Delivery of irrigation water totalled 3,076,435 megalitres for 1980-81.

The Commission's engineering functions are divided among the following five Branches, each under the control of a director:

- (1) Engineering and Technical Services Branch is responsible for survey, design, and construction of major projects, maintenance and operation of major storages, and laboratory services;
- (2) Rural Water Supplies Branch is responsible for design of works and operation and maintenance of irrigation, drainage, flood protection, river improvement districts, and flood plain management;
- (3) Urban Water Services Branch is responsible for the construction, operation, and maintenance of urban water supply systems, as well as engineering and financial supervision of local water supply and sewerage authorities;
- (4) Mechanical Branch is responsible for the design, construction, and maintenance of the Commission's mechanical and electrical engineering works as well as supervising the Commission's plant and vehicle fleets; and
- (5) Planning and Development Branch is responsible for investigations of major proposals and salinity control works, developing corporate works programmes and management of the technical computer facilities.

Support services to these Branches are supplied by the Finance, Stores, Personnel, Property and Legal Services, Valuations, and Secretarial Divisions of the Commission.

Outside the Melbourne metropolitan area there are now 460 towns served by a reticulated water supply scheme, of which 126 are managed by the Commission and the remaining 334 are managed by 204 local water authorities. There are also 139 sewerage authorities, 28 river improvement trusts, and 4 drainage trusts serving Victoria outside the Melbourne metropolitan area.

Other services offered by the Commission include: irrigation and agricultural extension services, such as surveying, irrigation land layout, and surface and underground drainage layout; salinity control; licensing and control of private diversions from rivers and streams and from underground sources; and assessment, licensing, and policing of discharges to water outside the Melbourne metropolitan and La Trobe Valley and Dandenong Valley areas. The Commission has also developed, patented, and arranged for the manufacture under licence of small control structures, both manual and automatic, for use in farm channels.

VICTORIA—MAJOR WATER SUPPLY PROJECTS COMPLETED, 1972 to 1981

Project	Features
Merrimu Tunnel Stage 2 (Lerderderg River to Goodmans Creek)	Tunnel 4 kilometres long, 2.7 metres diameter
Rosslynne Reservoir	Earth and rockfill dam, storage 24,500 megalitres
South Otway Pipeline	80 kilometre concrete-lined, mild steel pipes of 450 mm diameter

VICTORIA—MAJOR WATER SUPPLY PROJECTS COMPLETED, 1972 to 1981—*continued*

Project	Features
Tarago-Western Port Pipeline	90 kilometre concrete-lined, mild steel pipes of 1,050 mm diameter
Cardinia-Frankston Pipeline (Stage 1)	11.73 kilometres concrete-lined, mild steel pipes 1,420 mm diameter
Millewa Domestic and Stock Scheme	Replacement of channels with pipelines, serving 227,000 hectares
Mildura-Merbein Groundwater Interception Scheme	Construction of bores adjacent to Murray River, and pipeline to inland evaporation basin, to intercept saline groundwater entering Murray River
Dartmouth Dam (River Murray Commission)	Earth and rockfill dam storage, capacity 4,000,000 megalitres

Future programmes

Proposed expenditure on major works, urban water supply, sewerage, environmental protection, and water quality under the Commission's six-year programmes of capital works for the period 1981-82 to 1986-87 requires an allocation of \$294m (at December 1980 prices) over the programme period, but this is subject to the availability of funds. This involves an average annual expenditure of \$49m.

Major provisions in the programme include:

- (1) Completion of three major water conservation dams already under construction and commencement of three further dams to provide water for urban, industrial, and irrigation supplies. Total estimated cost of these projects is \$85m.
- (2) Expenditure of \$37m for the construction of works to augment the Mornington Peninsula water supply system and to improve its operating capabilities.
- (3) Expenditure of \$9m on improvements in the Bellarine Peninsula water supply system.
- (4) Continuance of a programme aimed at enhancing the viability of existing communities dependent on irrigation, having regard to the need to protect Murray River water quality. Works and measures in hand include surface and sub-surface drainage in the Shepparton Region. Together with schemes expected to commence in the next six years, total expenditure will be \$35.5m. This includes amounts for ongoing investigations and monitoring.
- (5) A continuing programme, estimated to cost \$11.4m over the six-year period for water quality improvement works within the Commission's urban water supply systems.
- (6) Allocations for improvements to, and for water treatment at, urban centres, particularly those on the Murray River and in the Wimmera-Mallee areas.
- (7) Continuation of a programme of studies and works relating to flood plain management. Estimated expenditure will be approximately \$1.7m per year.

Irrigation

Most irrigation is carried out in districts directly controlled by the Commission, although there is an increasingly large proportion of "private diverters", that is, irrigators who are authorised to take water from watercourses but whose holdings are not located inside an irrigation district. In the irrigation districts, water assigned to a given district is allocated to lands commanded by the channel system and suitable for irrigation on the basis of a water right. Irrigators pay a fixed sum for the volume of water allocated under water rights whether or not the water is actually used. Water rights are available in all but the driest years, and volumes in excess of water rights are usually available. The water right system ensures the irrigators of a minimum volume of water each year (except in severe drought years). Similarly, the Commission can rely on fairly constant revenue to meet the costs of district operations.

A feature of Victorian irrigation policy has been the development of closer settlement by intensive irrigation, that is, by allocating relatively large quantities of water per holding instead of limiting the allocation of water to a portion of each holding. This has meant that Victorian irrigation is predominantly devoted to dairying and horticulture, rather than to sheep raising. Delivery of irrigation water totalled 3,076,435 megalitres for 1980-81.

In 1980-81, the area watered by private diversion from lakes, rivers, etc., was 75,753 hectares and the number of private diversions authorised for irrigation was 6,752. The water delivered was used mainly to produce annual and perennial pastures and fodder, as well as potatoes, tobacco, hops, vegetables, vines, fruits, and cereals. About half the area privately watered is supplied from streams regulated by storages, the other half being from streams wholly dependent on rainfall. Many private storage dams are being built, frequently at substantial cost, to insure against low flows in the natural source.

The following table shows the areas irrigated in Victoria for the years 1976-77 to 1980-81:

VICTORIA—AREA IRRIGATED
(hectares)

Source of supply	1976-77	1977-78	1978-79	1979-80	1980-81
Goulburn-Loddon system	276,782	272,339	259,836	256,350	264,786
Murray River system	191,227	181,643	179,329	193,553	192,216
Other northern systems	7,454	7,035	6,541	6,975	7,549
Southern systems	35,012	36,341	34,800	37,725	36,815
Private diversions	78,339	77,988	71,101	74,045	75,753
Total	588,814	575,346	551,607	568,648	577,119

Further references: Irrigation, *Victorian Year Book* 1962, pp. 479-83; Wimmera-Mallee region water supply, 1963, pp. 499-501; Flood protection, river improvement, and drainage, 1963, pp. 501-2; Underground water, 1964, pp. 544-5; Water supply in Victoria, 1964, pp. 535-44; Goulburn-Murray Irrigation District, 1965, pp. 477-9; Spray irrigation in agriculture and dairying, 1965, p. 502; Private irrigation development, 1966, pp. 477-9; Water Research Foundation, 1966, pp. 479-80; River improvement, 1967, p. 298; Rivers and streams fund, 1967, p. 298; Dandenong Valley Authority, 1968, pp. 300-1; Water conservation, 1969, pp. 309-10; Water supply to Western Port, 1971, pp. 288-90; Lake William Hovell dam, 1972, pp. 294-5; River Murray Agreement and the River Murray Commission, 1972, pp. 296-301; Ten year plan, 1974, pp. 298-304; Millewa pipeline project, 1974, pp. 296-7; Snowy Mountains Hydro-Electric Scheme, 1974, pp. 298-304; Millewa Scheme, 1975, pp. 403-6; Tarago-Western Port pipeline, 1975, pp. 406-7; Storages, 1979, pp. 303-5; Water pollution control, 1981, p. 312

COUNTRY TOWN SUPPLIES

Introduction

During the gold rushes of the 1850s, large numbers of persons migrated to areas without adequate water supply either for domestic or mining purposes. The mining population was too unsettled to accept responsibility and no suitable supply authority existed. The Victorian Government, therefore, established the Department of Victorian Water Supply which constructed reservoirs where needs were most pressing. The earliest reticulated supplies were to Bendigo in 1859, Ballarat in 1862, and Geelong in 1865. From 1872, government loans enabled municipal corporations to construct many waterworks of enduring value.

The first comprehensive legislation for the supply of water to country districts was the Water Conservation Act of 1881. This Act provided for the constitution of waterworks trusts to construct and manage supply works throughout Victoria. More detailed legislation to control supplies in urban areas was added in 1884.

By 1945, there were 258 cities and towns in Victoria with water supply systems, providing reticulated supplies to 51 per cent of Victoria's population outside the Melbourne metropolitan area. There are now 460 cities and towns with reticulated water supplies. Supplies to 126 of these are managed by the State Rivers and Water Supply Commission—either as part of its major urban supply systems or as isolated towns in areas supplied for irrigation or domestic and stock purposes. The remaining 334 towns are supplied by local water authorities.

Eighty-two towns are supplied by the Commission's major urban supply systems on the Mornington Peninsula, Bellarine Peninsula, Otways, and Coliban areas which were constructed primarily to supply towns (although a substantial volume of water for irrigation is supplied to the Bendigo-Castlemaine areas). A further sixty towns are supplied from irrigation or waterworks districts in isolated areas of the State.

Local authorities

The administration of water and sewerage systems by separate authorities in country towns is unique to Victoria. Each authority enjoys autonomy in most of its functions but,

VICTORIA—LANDS UNDER IRRIGATED CULTURE: EXTENT OF IRRIGATION AND AREAS WATERED, 1980-81

Name of district, area, etc.	Total area of holdings in irrigation districts	Area classified as suitable for irrigation	Water rights apportioned (including extra water right)	Area irrigated, (including lands adjoining a district)										
				Total	Cereals including millet	Lucerne grown for pasture and hay	Sorghum and other annual fodder crops	Pastures			Vine- yards	Orchards	Market gardens	Fallow and mis- cellaneous
								Native	Annual	Perennial				
	hectares	hectares	megalitres	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares
GOULBURN-CAMPASPE-LODDON SYSTEM														
Shepparton	82,449	75,963	181,560	38,105	2,421	172	19	374	12,588	17,860	100	3,727	453	391
Rodney	109,136	100,791	254,356	58,735	2,447	745	500	726	20,136	29,175	62	3,173	1,433	338
Tongala-Stanhope	31,179	28,630	105,082	25,476	318	143	34	10	6,994	17,609	1	185	26	156
Deakin	63,266	41,481	43,660	11,306	355	160	7	13	5,563	4,651	—	—	388	169
Rochester	75,610	68,985	148,275	42,224	2,983	801	16	262	15,750	21,059	—	11	759	583
Dingee	4,379	3,823	10,051	2,524	84	—	—	—	746	1,694	—	—	—	—
Calivil	26,734	24,720	39,983	11,017	488	157	—	40	5,879	4,215	—	—	—	238
Tragowel Plains	88,806	76,218	121,951	47,541	4,036	54	197	1,884	32,278	6,480	—	—	—	2,612
Boort	47,290	40,607	53,601	22,800	3,958	695	38	10	11,279	2,212	—	—	300	4,308
Campaspe	8,537	8,123	19,415	3,679	316	276	—	45	458	2,332	—	—	183	69
East Loddon	—	—	—	291	—	14	—	—	128	149	—	—	—	—
West Loddon	—	—	—	1,088	105	16	—	—	458	8	—	—	—	501
Total	537,386	469,341	977,934	264,786	17,511	3,233	811	3,364	112,257	107,444	163	7,096	3,542	9,365
MURRAY RIVER SYSTEM (Tpprumbarry Weir)														
Cohuna	52,290	49,030	135,534	41,443	595	509	495	640	20,048	18,926	—	—	121	109
Koondrook	38,146	32,555	73,284	25,816	2,495	12	352	334	16,753	5,231	—	148	24	467
Swan Hill	15,518	14,754	55,753	10,269	91	197	14	10	1,415	3,692	1,114	442	365	2,929
Third Lake	9,279	8,401	13,196	3,914	506	185	99	120	2,626	171	—	1	2	204
Mystic Park	8,673	7,735	11,476	3,970	92	32	—	10	2,949	415	27	14	8	423
Tresco	1,842	983	5,310	998	—	2	—	—	14	—	738	136	108	—
Fish Point	7,431	7,044	9,890	5,090	728	5	71	1,047	1,548	300	—	—	9	1,382
Kerang	34,251	29,729	61,983	23,209	1,339	125	131	1,941	14,491	4,041	—	—	4	1,137
Kerang North-West Lakes	—	—	—	800	286	40	—	—	222	13	82	43	1	113
Total	167,430	150,231	366,426	115,509	6,132	1,107	1,162	4,102	60,066	32,789	1,961	784	642	6,764
Murray Valley (Yarrowonga Weir)	128,910	113,427	254,127	56,866	4,600	436	456	—	25,405	22,311	125	1,704	213	1,616

VICTORIA—LANDS UNDER IRRIGATED CULTURE: EXTENT OF IRRIGATION AND AREAS WATERED, 1980-81—*continued*

Name of district, area, etc.	Total area of holdings in irrigation districts	Area classified as suitable for irrigation	Water rights apportioned (including extra water right)	Area irrigated, (including lands adjoining a district)										
				Total	Cereals including millet	Lucerne grown for pasture and hay	Sorghum and other annual fodder crops	Pastures			Vine- yards	Orchards	Market gardens	Fallow and mis- cellaneous
								Native	Annual	Perennial				
hectares	hectares	megalitres	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	hectares	
MURRAY RIVER SYSTEM—<i>continued</i>														
Direct from river by pumping—														
Nyah	1,566	1,327	9,307	1,070	—	1	10	55	20	151	611	24	165	33
Red Cliffs	5,505	5,177	43,789	4,881	—	8	—	24	50	6	4,525	182	16	70
Merbein	3,732	3,500	30,261	3,339	—	6	—	9	—	10	2,952	307	4	51
Robinvale	3,608	3,076	17,328	2,163	—	—	—	—	—	—	2,032	122	2	7
Carwarp-Yelta	—	—	—	318	169	20	—	14	88	—	—	—	—	27
Total	14,411	13,080	100,685	11,771	169	35	10	102	158	167	10,120	635	187	188
First Mildura Trust	15,863	8,070	73,792	8,070	—	—	—	—	—	214	6,220	284	—	1,352
Murray River system Total	326,614	284,808	795,030	192,216	10,901	1,578	1,628	4,204	85,629	55,481	18,426	3,407	1,042	9,920
OTHER NORTHERN SYSTEMS														
Coliban	—	—	—	4,563	2	54	25	283	590	2,875	23	586	100	25
Wimmera	—	3,054	—	2,986	17	—	—	—	29	2,876	—	34	20	10
Total	—	3,054	—	7,549	19	54	25	283	619	5,751	23	620	120	35
SOUTHERN SYSTEMS														
Bacchus Marsh	2,060	1,290	3,759	1,236	—	46	—	25	—	617	—	213	294	41
Werribee	3,762	3,553	9,665	3,186	—	58	—	—	—	1,168	—	34	1,912	14
Maffra-Sale	34,685	28,434	65,763	19,586	13	23	78	419	—	19,016	—	—	37	—
Central Gippsland	17,896	15,360	39,527	12,378	193	14	6	50	—	12,027	—	—	—	288
Mornington Peninsula	—	—	—	104	—	—	—	—	—	—	—	—	58	46
Bellarine Peninsula	—	—	—	125	—	—	—	—	—	—	—	—	105	20
Total	58,403	48,637	118,714	36,815	206	141	84	494	—	32,828	—	247	2,406	409
PRIVATE DIVERSIONS THROUGHOUT THE STATE														
	—	—	—	75,753	2,944	3,270	1,079	556	15,209	28,185	4,095	4,605	11,512	4,298
GRAND TOTAL 1980-81	922,403	805,840	1,891,678	577,119	31,581	8,276	3,627	8,901	213,714	229,689	22,707	15,975	18,622	24,027
GRAND TOTAL 1979-80	923,060	805,783	1,889,813	568,648	19,329	8,515	2,823	14,006	211,431	230,477	22,620	15,433	17,843	26,171

as the Victorian Government usually provides a high degree of financial assistance, it requires that each trust submits its operations and proposals to the Commission's scrutiny before approval and funds are forthcoming. At June 1981, there were 204 local water authorities supplying 334 Victorian country towns. A further three town supply systems are under construction.

Organisation

There are two broad classes of local water authority:

- (1) "Local governing bodies", which are municipal councils constituted as local governing bodies under the Water Act; and
- (2) "waterworks trusts", the commissioners of which might comprise:
 - (i) councillors for the time being of the municipality concerned plus one Victorian Government nominee;
 - (ii) councillors of one or more municipal ridings plus up to three nominees; or
 - (iii) commissioners elected directly by the water ratepayers.

Local governing bodies (16) are usually limited to cities or boroughs as their water supply districts must be essentially urban in character. Although a local governing body may be composed entirely of councillors and use the council's name, it is a separate legal entity and its business and accounts must be kept apart from the administration of municipal affairs. Waterworks trusts usually comprise about six commissioners and have jurisdiction over a waterworks district, within which there may be one or more urban districts, and in some cases, rural districts.

Five local water authorities operate under special Acts which are usually supplementary to the Water Act. These special authorities include the Mildura Urban Waterworks Trust, the First Mildura Irrigation Trust, the Geelong Waterworks and Sewerage Trust, the Latrobe Valley Water and Sewerage Board supplying water in bulk to towns and industries in the La Trobe Valley, and the West Moorabool Water Board which supplies water in bulk to the local authorities at Ballarat and Geelong. A number of small townships in Victoria are still supplied by local municipal councils under powers conferred by the Local Government Act. However, the provisions of that Act in relation to water supply are not sufficiently specific for the management of any substantial town water supply system. Although such supplies can receive consideration for a capital grant under the town water supplies assistance formula, the remainder of the costs must be found by the municipality concerned from its normal sources of loan funds.