



Safe Drinking Water Act 2003

Water Storage Manager

2018-19 Annual Report



List of Abbreviations and Acronyms

BGA	Blue-green Algae
CMA	Catchment Management Authority
CHW	Central Highlands Water
CW	Coliban Water
DELWP	Department of Environment, Land, Water and Planning
DHHS	Department of Health and Human Services
EMS	Environmental Management System
EPA	Environment Protection Authority
GMW	Goulburn-Murray Water
GVW	Goulburn Valley Water
GWMWater	Grampians Wimmera Mallee Water
LMW	Lower Murray Water
LWM	Local Water Manager
OFI	Opportunity for Improvement
RC	Regional Coordinator
RMP	Risk Management Plan
Regulations	Safe Drinking Water Regulations 2015
The Act	Safe Drinking Water Act 2003
The Circular	Blue-Green Algae Circular for 2018/19
WSM	Water Storage Manager

Front cover photo: Lake Eildon

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1. Introduction

Goulburn-Murray Rural Water Corporation, trading as Goulburn-Murray Water (GMW), is defined as a Water Storage Manager (WSM) under the *Safe Drinking Water Act 2003* (the Act). This 2018/19 Annual Report to the Secretary of the Department of Health and Human Services (DHHS) has been prepared to satisfy the annual reporting requirements of the Act and Safe Drinking Water Regulations 2015 (Regulations).

This report demonstrates GMW's ongoing commitment to managing risks to the quality of the water the corporation delivers to water suppliers.

The report contains the following sections:

- Section 2 Roles and responsibilities of GMW under the Act and Regulations
- Section 3 Regulations component report
- Section 4 Other relevant information and activities

Further information regarding this report can be obtained by contacting the Manager Water Quality during business hours on (03) 5826 3500 or by email reception@gmwater.com.au.

2. Goulburn-Murray Water Systems and Role

GMW manages the bulk water delivery and transfer for around 30% of Victoria's land area, or approximately 68,000 km² (Figure 1). GMW operates 22 storages in its region including Murray-Darling Basin Authority storages managed by Victoria. GMW's area of operation includes the Upper Murray, Ovens, King, Broken, Goulburn, Campaspe and Loddon river basins as well as the River Murray. GMW also operates an extensive network of water distribution channels, pipelines and natural carriers to deliver raw water to its customers. Customers take water from these supply systems via a pump or a gravity irrigation outlet.

Water supplied by GMW is not treated to improve its suitability for any particular use and should never be considered fit for human consumption without first being properly treated.

GMW provides water to six urban water corporations (water suppliers) in accordance with bulk entitlements granted under the Water Act 1989:

- Coliban Water (CW)
- Central Highlands Water (CHW)
- North East Water (NEW)
- Goulburn Valley Water (GVW)
- Grampians Wimmera Mallee Water (GMMW)
- Lower Murray Water (LMW)

At times water may also be supplied to the three metropolitan water corporations via Melbourne Water infrastructure (see Section 4.3).

The bulk entitlements provide for quantity of supply, but make no guarantee of quality. Raw (untreated) water is supplied by GMW to water suppliers for treatment and distribution to their customers in 136 towns via 80 offtake points across northern Victoria (see Appendix 1 for a list of towns supplied including water sources).

GMW provides raw water to water suppliers in four different ways:

1. From GMW storages directly via water supplier infrastructure e.g. Nagambie from Goulburn Weir/Lake Nagambie.
2. Via the outlet works of GMW storages e.g. Bendigo from Lake Eppalock.
3. Indirectly from rivers supplied by GMW storages e.g. Seymour from Goulburn River, supplied by Lake Eildon.
4. Via GMW's channel system e.g. towns in the Goulburn Murray Irrigation District.

There were no changes during 2018/19 to water supply arrangements where GMW is the Water Storage Manager.

GMW's commitment to drinking water quality management is reflected in the corporate Safe Drinking Water policy. The objective of this policy is to ensure that GMW meets its obligations as a WSM under the Act and Regulations. It requires GMW to *address threats to safe drinking water as a WSM by preparing and implementing a risk management plan in relation to its supply of water to a water supplier.*

GMW is required to consider risk management for all of the water supply mechanisms it uses to provide water to water suppliers. This includes risks associated with:

- the catchment leading to each storage;
- each storage itself;
- the supply of water downstream of storages using natural carriers such as rivers and creeks; and
- the supply of water via channel and pipeline systems to each drinking water offtake point.

A Safe Drinking Water Act Water Storage Manager Risk Management Plan (RMP) has been prepared and implemented in accordance with the Act and Regulations and is regularly reviewed by GMW. The plan includes requirements of the Act and Regulations and outlines GMW activities to manage the risks to water quality. The RMP includes a section that specifically focuses on risks in and around GMW's storages and within GMW's irrigation districts.

GMW communicates regularly with water suppliers to discuss any issues arising from the RMP or operations including incident response, blue-green algae and water resource management as well as sharing other relevant information. Engagement with each water supplier includes two scheduled water supplier-WSM meetings each year and additional communication when required.

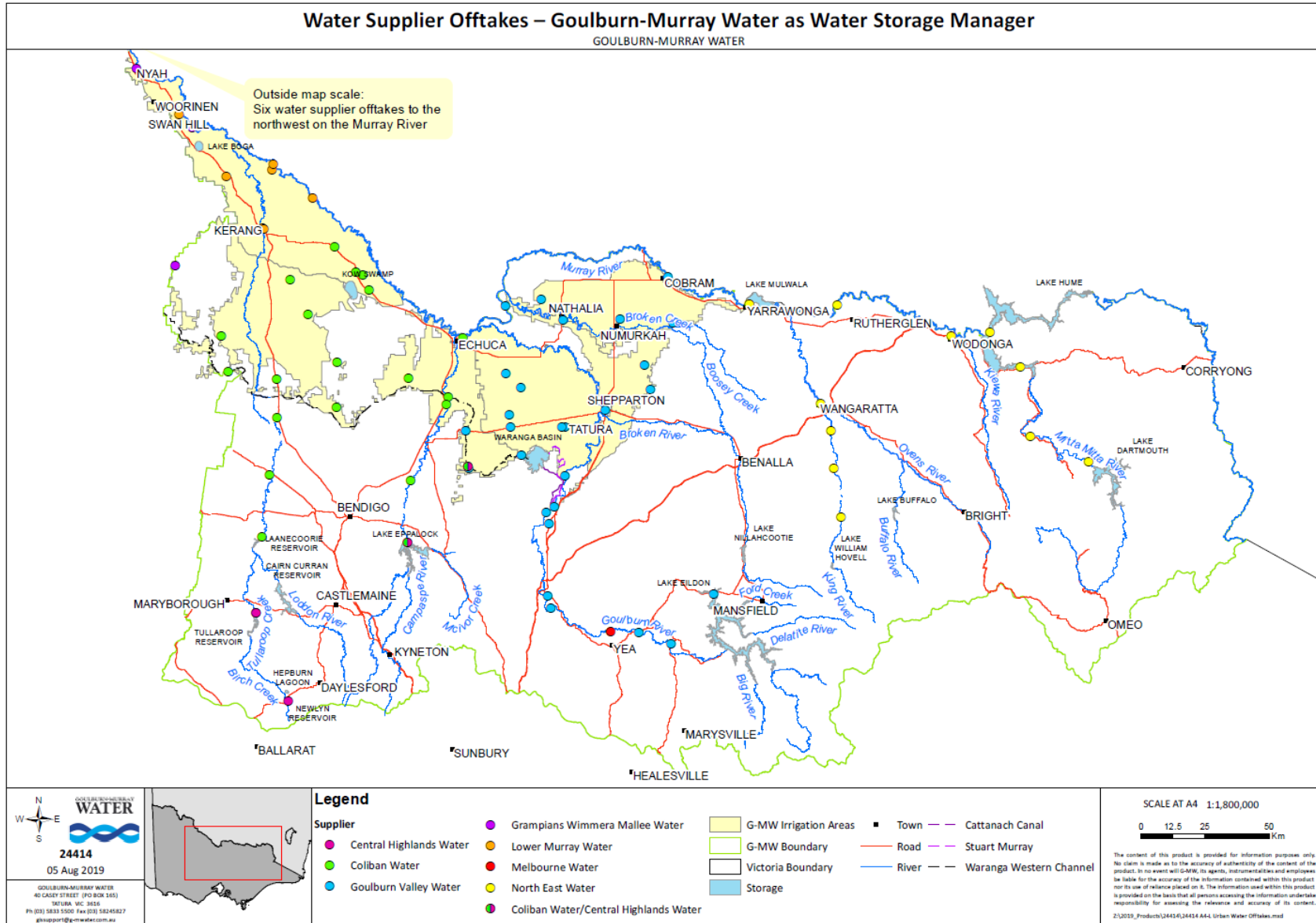
Water suppliers are invited to participate in GMW's risk identification and review process for the storages and irrigation areas relevant to their raw water offtakes. This involves participation in a review workshop to ensure that all hazards to water quality are identified and appropriately rated, which helps to ensure a consistent understanding of hazards amongst the organisations. Risk assessment reviews are scheduled every 2 to 5 years based on a calculated overall risk rating for each storage or irrigation area. During 2018/19 risk assessments were reviewed for 10 storages (see Section 4.1).

GMW has entered into a Memorandum of Understanding with each of its seven water suppliers and Melbourne's three retail water businesses that documents commitment by the parties to work together and share information relevant to the implementation of their respective RMPs.

GMW also engages with representatives of the North East, Goulburn Broken and North Central catchment management authorities (CMAs) and other organisations with a role in land and/or water management to enable knowledge exchange and a coordinated approach to issues impacting water quality. Section 4.1 provides a summary of activities GMW undertakes to manage risks to water quality, including water quality monitoring.

Regular water quality monitoring is undertaken at GMW storages for basic physico-chemical parameters and blue-green algae (BGA). Regular testing for BGA is undertaken in other parts of GMW's system where it has been determined, based on historical data, that there is a likelihood of high algae counts. The frequency of monitoring at each location is based on BGA risk, which is determined from frequency of historic blooms and the consequence of high BGA levels. The consequence takes into consideration presence of town water offtakes, size of population supplied, the type of recreation permitted and popularity. Section 3.1 provides an overview of BGA management and warnings during 2018/19.

Figure 1: GMW's area of operation



3. Regulation Components Report

3.1 *Emergency and incident management*

Safe Drinking Water Regulation 17 – Additional details to be included in annual reports of water storage managers:

(a) information about actions taken by the water storage manager in respect of each emergency, incident or event that has arisen that has affected—

(i) the quality of the water supplied for drinking purposes generally; and

(ii) the quality of the water supplied where that supply posed a risk to human health;

(b) any issues that may have arisen out of the taking of the actions referred to in paragraph (a);

Section 22 Notifications

There were no incidents that required GMW to report to DHHS under Section 22 of the Act during 2018/19.

Other emergencies, issues or events

In order to understand the incident information below, it should be noted that the catchments in northern Victorian where water is harvested are open to a wide variety of land and water based activities and are not closed to access and/or use like some of Melbourne's water supply catchments. These land use activities include agriculture, aquaculture, mining, forestry, industry, regional urban centres, townships, major transport infrastructure and recreation.

During 2018/19 GMW recorded 18 incidents that had the potential to affect the quality of water delivered to a water supplier. GMW notified the relevant water supplier in each instance. Each incident was handled using GMW's Incident Response and Recovery Plan and associated procedures. This plan includes processes for communicating about, responding to and reviewing the incidents. Details of these incidents are listed in Appendix 2.

GMW continues to work with water suppliers and other catchment partners to minimise the impact to water quality from incidents and activities that occur within GMW's area of operation.

Blue-green Algae Management

Management of Blue-green Algae (BGA) by GMW is a key program that addresses a common threat to the supply of safe water. The Blue-green Algae Circular (the Circular) issued by the Department of Environment, Land, Water and Planning (DELWP) provides the main guidance for BGA preparedness and response.

High levels of BGA regularly occur in waterbodies within GMW's region and have the potential to affect drinking water supplies. In accordance with the Circular, GMW is the Local Water Manager (LWM) for BGA risk management in its storages and water supply network (largely open channels) and is the Regional Coordinator (RC) for BGA preparedness and response across the region. Algae in the River Murray is primarily monitored and managed by New South Wales authorities, in partnership with GMW and other Victorian agencies via the Murray Region Algal Coordinating Committee (MRACC).

GMW prepared BGA Response Plans and monitoring programs for all GMW-managed water bodies and river basins, in accordance with the protocols set out in the Circular. These plans provided guidance on the preparation for and response to BGA incidents, including notification of relevant stakeholders. GMW continued to engage with relevant stakeholders, including hosting the pre-season meeting on 26 October 2018, which is also a requirement of the Circular.

Monitoring programs focus on those sites and parameters that can affect recreation and system operations, in particular major storages and weirs. These assets are monitored at least monthly throughout the year, with frequency increasing during the summer months for many assets when the risk of harmful BGA levels being reached is higher.

A BGA Status Report is circulated at least monthly to a broad range of stakeholders including the DHHS, DELWP, water suppliers, CMAs and local government. The report contains the latest BGA laboratory results for GMW's storages and key water supply assets.

BGA warnings issued by GMW are communicated to stakeholders, customers and public via multiple mechanisms including GMW's website, the BGA hotline, letters, text messages, social media and the BGA Status Report.

BGA Warnings

In 2018/19, 29 BGA warnings were issued based on recreational guidelines. The only year with more warnings issued was 2015/16, primarily due to the Murray River bloom; the annual average is 12 warnings. In addition, three warnings issued during 2017/18 were still in place after 1 July 2018. Table 1 summarises the BGA warnings issued by GMW in 2018/19 or still in place and the water suppliers notified.

A recreation warning was issued for Waranga Basin in early 2019, only the second time in recorded history this has been necessary. The bloom extended into GMW's Central Goulburn, Rochester and Loddon Valley irrigation area channels. GMW followed all protocols outlined in the Circular including increased monitoring sites and frequency together with regular communication with Goulburn Valley Water, Coliban Water and Grampians Wimmera Mallee Water. Existing arrangements for sharing of test results between water agencies continued throughout the bloom. The GMW website was a key source of information for customers and the public. A debrief for this bloom occurred in June 2019 and included the 3 water suppliers impacted by the bloom and DHHS. GMW will take the debrief outcomes into consideration in future BGA management.

Table 1: Blue Green Algae Recreational Warnings issued by GMW 2018/19

Basin/System	Location	Warning dates (duration)	Water Supplier (WS) notified
Goulburn River Basin	Lake Nagambie/Goulburn Weir - confined to Turners Lane Backwaters East & West near Kirwan's Bridge	25/3/19 - 30/8/19 158 days	GVW
	Lake Nagambie/Goulburn Weir	23/5/19 – 30/8/19 99 days	GVW
	Waranga Basin	1/3/19 - 3/7/19 124 days	GVW
Central Goulburn Irrigation Area	CG No 7 & 8	26/2/19 - 8/7/19 132 days	GVW
	CG No 9	26/2/19 - 16/7/19 140 days	GVW
	CG channel 12/7/9	10/1/19 - 16/7/17 187 days	No WS impacted
Rochester Irrigation Area	Entire irrigation area	26/2/19 - 8/8/19 163 days	GVW/CW
	Roch channel 23 -RO716	5/2/19 - 8/8/19 184 days	No WS impacted
Campaspe River Basin	Lake Eppalock	27/6/18 - 9/8/18 43 days	CW
		18/2/19 - 26/7/19 158 days	CW
Loddon River Basin	Cairn Curran Reservoir	15/12/17 - 9/8/18 237 days	No WS impacted

Basin/System	Location	Warning dates (duration)	Water Supplier (WS) notified
		5/3/19 - 8/8/19 156 days	No WS impacted
Loddon River Basin	Hepburns Lagoon	9/2/17 - 11/10/18 609 days	No WS impacted
		24/1/19 - 23/5/19 119 days	No WS impacted
	Tullaroop Reservoir	17/4/19 - ongoing [^]	CHW
	Loddon River from Loddon Weir to Kerang Weir Pool	21/5/19 - 4/6/19 14 days	LMW
Loddon Valley Irrigation Area	LV channels East of the Loddon River	21/2/19 - 16/7/19 145 days	CW
	LV channels West of the Loddon River	21/2/19 - 28/6/19 127 days	CW
East Loddon Water District	East Loddon Storage Dam	1/5/19 - 9/7/19 69 days	CW
West Loddon Water District	Waranga Western Channel west of the Loddon River	21/2/19 - 28/6/19 127 days	CW
Normanville Water District	Normanville Pipeline Customers	2/4/19 - 6/6/19 65 days	GWMW
	Mysia/Catumnal Customers	2/4/19 - 16/5/19 44 days	CW
Torrumbarry Irrigation Area	National Channel system - No 1 Lagoon	1/2/19 - 28/2/19 27 days	No WS impacted
	National Channel system - No 2 Lagoon	6/2/19 - 15/3/19 37 days	No WS impacted
	Gunbower Creek System - Gum Lagoon	1/2/19 - 28/2/19 27 days	No WS impacted
	Kow Swamp	14/3/19 - 21/5/19 68 days	No WS impacted
	Pyramid Creek System	14/3/19 - 16/5/19 63 days	No WS impacted
	Marcorna Main Channel system	28/2/19 - 16/5/19 77 days	LMW
	Loddon Weir Kerang Weir and downstream of Kerang Weir	20/2/19 - 4/6/19 104 days	LMW
	TIA No 7 Channel, Reedy Lake, Middle Lake	17/4/19-16/5/19 29 days	No WS impacted
	Little Murray River	17/4/19-16/5/19 29 days	LMW

[^]Recreational warning was ongoing at the time of preparation of this report.

In accordance with the 2018/19 BGA response plans, GMW advised DELWP and DHHS via the BGA status report of any BGA levels that had the potential to affect public health through drinking water or recreational contact. DHHS and DELWP were also notified via telephone and email when the concentration of BGA exceeded a recreational trigger and/or widespread BGA scums were observed.

BGA factsheets and information on the current BGA warnings for GMW's storages and irrigation areas can be found on the BGA Warnings webpage <http://www.gmwater.com.au/bluegreenalgae-alert/>. During the 2018/19 Waranga bloom an additional map with channel system detail was added to the website so that customers could zoom in to determine if their property was impacted.

In addition, the public can access warning information by calling GMW's BGA Hotline on (03) 5826 3785, by contacting GMW directly during business hours on 1800 013 357 or by emailing reception@gmwater.com.au

3.2 Summary of exemptions and undertakings

Safe Drinking Water Regulation 17 –

(c) A summary of every written undertaking by the water storage manager accepted by the Secretary under section 30 of the Act.

(f) Details of any exemption granted to the water storage manager under section 8 of the Act and any condition imposed in relation to any exemption.

There were no exemptions or undertakings in place with DHHS during 2018/19.

3.3 Risk Management Plan audit findings and issues raised

Safe Drinking Water Regulation 17 –

(d) A summary of the findings of the most recent risk management plan audit and any issues that the approved auditor raised during the risk management plan audit.

The Secretary to the Department of Health and Human Services did not require GMW to undertake an audit of its risk management plan during the 2018/19 reporting period. Actions to address recommendations identified in previous audits were detailed during previous reporting periods. There were no further actions undertaken in the 2018/19 reporting period.

3.4 Water treatment processes

Safe Drinking Water Regulation 17 –

(e)(i) a summary of the process by which the water supplied by the water storage manager is disinfected or treated and any other processes applied to the water by the water storage manager, and any issues arising out of the application of those processes; and

(e)(ii) a list of all the chemicals and other substances, and any processes, used by a water storage manager to disinfect or treat the water supplied, or to be supplied, by it for drinking purposes;

GMW does not disinfect, treat or process any water supplied to its customers. All water supplied by GMW is not suitable for direct human consumption. All GMW customers are advised of this (see also Section 4.2).

Chemicals are used in and adjacent to water systems to control weeds. All herbicide application is undertaken in accordance with GMW's operating guidelines, which include utilising trained staff, notifying the relevant water supplier and adherence to product labels and minor use permits.

4. Other Relevant Information

4.1 Other activities

GMW has completed individual risk assessments for each GMW storage and irrigation area as well as an organisation-wide risk assessment. All assessments are regularly reviewed. Review of risk assessments occurred for the following storages during 2018/19: Lake Buffalo, Dartmouth Dam, Lake Eppalock, Hepburns Lagoon, Newlyn Reservoir, Tullaroop Reservoir, Hume Dam, Lake Nillahcootie, Lake William Hovell and Yarrawonga Weir.

GMW continues to implement key programs to manage the identified risks to water quality. Examples of the types of activities undertaken by GMW are summarised in Table 2.

Table 2: GMW Key Programs

Program	2018/19 Activities/Achievements
Blue green algae management	All warnings were managed in accordance with DELWP BGA Circular, including notification to relevant water suppliers and sharing of test results (Section 3.1).
Water quality monitoring	Water quality monitoring and analysis was undertaken at 15 storages. This data was used to prepare quarterly exception reports and the annual Major Storages Water Quality report, which were sent to relevant stakeholders, including water suppliers.
External Stakeholder controls	Continued engagement with regional and state catchment partners including implementation of Regional Catchment Strategies and review of State Environment Protection Policies.
GMW staff training	Training occurs biennially, last training was 2017/18. The internal factsheet is available on GMW's intranet.
Best Management Practices	The Best Management Practice Register was kept up to date.
Statutory Planning	1449 applications reviewed from 28 local government authorities and DELWP.
Land Management	Review of lease conditions as required. Site inspections completed and records of these inspections maintained.
Land and On Water Management Plans	Implementation and review (where required) of the existing 13 Land and On Water Management plans, including consultation with water suppliers and other key stakeholders. Some examples of works completed during the reporting period include: <ul style="list-style-type: none"> • Removal of three disused underground fuel tanks in close proximity to Lake Eildon. Testing in immediate vicinity of tanks confirmed no fuel contamination of soil. • Ongoing GMW weed management program at Lake Buffalo, supported by active weed management by leasee. • Lake William Hovell recreation area pine post fences replaced with recycled plastic bollards to restrict vehicles from grassed areas and edge of lake. • Fire management plans updated. • Federally funded "Green Army" completed 22 weeks of work at Lake Eppalock. Projects included reinstatement and repair of traffic control bollards, storage perimeter land rubbish collection and planting 5000 trees and shrubs to assist with Grey Crowned Babbler population recovery.
Lake Eildon houseboats and on-water services	Ongoing management of on-water fuel and sewage facilities, houseboat inspections undertaken in accordance with schedule and details of inspections documented.

Program	2018/19 Activities/Achievements
Weed Management	All herbicide applications conducted in accordance with the GMW Herbicide Operating Manual, including notification to Water Suppliers when required. Update of water supplier offtake locations into GMW asset management database (as well as GIS) to allow for more organisation-wide identification of offtake points to factor in water supplier notification when required.
Environmental Management System (EMS)	GMW maintained its ISO14001 accreditation. Continuation of compliance audits conducted by GMW staff in accordance with the Health Safety and Environment Audit Schedule. Staff are continuing to complete annual online Health Safety and Environment refresher training.
Incident Response	Mandatory completion of online training module "Incident Response and Emergency Management" required for all GMW staff. Refer to Section 3.1 for details on GMW's incident response
GMW Operations including surveillance, fire management	Various activities including channel and storage erosion control and prevention works, fencing, licensing and monitoring of activities on GMW land. GMW activities are conducted in accordance with the approved EMS. Notification to relevant water supplier if water quality impacted.
Water Resource Management	All bulk water operating agreements with water suppliers have been finalised. Worked with LMW to ensure water returned to the Little Murray River from Lake Boga did not adversely impact the Swan Hill water treatment plant operation.

4.2 Advising People about Non-potable Water Supplies

All water supplied by GMW is not suitable for human consumption or related uses without first being properly treated. GMW has a Customer Information Statement to advise customers of the non-potable nature of the water supplied. This statement is provided to all new customers and periodically provided to all GMW customers via customer newsletters. It is also located on the GMW website: www.gmwater.com.au

Customer invoices, licenses and leases include a statement about the non-potable nature of the water supplied by GMW. The public and stakeholders are also made aware via statements included in the BGA status report and signs on non-potable water taps at GMW properties.

4.3 Melbourne Water

The Sugarloaf (or North-South) Pipeline was constructed to supply water from the Goulburn River downstream of Lake Eildon to Melbourne Water's Sugarloaf Reservoir (and subsequently to Yarra Valley Water, City West Water, and South East Water). The pipeline has not been utilised since November 2010. GMW's agreement with Melbourne Water and Bulk Entitlements with the three retail water businesses is still in place. GMW has therefore continued to provide the opportunity for Melbourne Water to be involved in GMW's identification and management of risks to water quality within the Goulburn catchment.

5. Further Information

This report and further information is available from our website <http://www.g-mwater.com.au> or by contacting:

Goulburn-Murray Water
40 Casey Street
PO Box 165
Tatura VIC 3616

Free call: 1800 013 357
Standard call: (03) 5826 3500
Fax: (03) 5826 3334
Email: reception@gmwater.com.au

Appendix 1 - Towns supplied where GMW is the water storage manager

Water Supplier Offtakes - GMW as Water Storage Manager ¹			
Water System/ Irrigation Area (IA)	Supply Source	Water Treatment Plant ²	Towns Supplied
Central Highlands Water			
Loddon	Tullaroop Reservoir	MARYBOROUGH	Maryborough, and district
Bullarook	Newlyn Reservoir	WHITE SWAN	Ballarat and district
Campaspe	Lake Eppalock	WHITE SWAN	Ballarat and district
Rochester IA	Waranga Western Channel (Colbinabbin)	WHITE SWAN	Ballarat and district
Coliban Water			
Campaspe	Lake Eppalock	BENDIGO	Bendigo, Axedale, Huntly, Marong, Raywood, Sebastian
Rochester IA	Waranga Western Channel (Colbinabbin)	BENDIGO	Bendigo, Axedale, Huntly, Marong, Raywood, Sebastian
Pyramid Hill IA	PH Channel No.3	BOORT	Boort
Loddon	Loddon River (Bridgewater offtake)	BRIDGEWATER	Bridgewater, Inglewood
Torrumbarry IA	Gunbower Creek (Cohuna offtake)	COHUNA	Cohuna
Pyramid Hill IA	PH Channel No.1	N/A – regulated ³	Dingee
Murray	River Murray (Echuca offtake)	ECHUCA	Echuca
Campaspe	Campaspe River (Goornong offtake)	GOORNONG	Goornong
Torrumbarry IA	Taylor's Creek	GUNBOWER	Gunbower
Campaspe	Lake Eppalock	HEATHCOTE	Heathcote, Tooborac
Rochester IA	Waranga Western Channel (Colbinabbin)	HEATHCOTE	Heathcote, Tooborac
Pyramid Hill IA	East Loddon Pipeline	N/A – regulated ³	Jarklin
Loddon	Loddon River (Laanecoore offtake)	LAANECOORIE	Laanecoore, Bealiba, Dunolly, Tarnagulla
Torrumbarry IA	T 1 Channel	LEITCHVILLE	Leitchville
Torrumbarry IA	Gunbower Creek (Leitchville offtake)	LEITCHVILLE	Leitchville
Rochester IA	Waranga Western Channel via R Channel No. 24 (piped)	LOCKINGTON	Lockington
Pyramid Hill IA	PH 10/1 Channel	N/A – regulated ³	Macorna
Pyramid Hill IA	Mitiamo spur off the PH No. 1 Channel	N/A – regulated ³	Mitiamo
Pyramid Hill IA	Waranga Western Channel (Mysia offtake)	N/A – regulated ³	Mysia

Water Supplier Offtakes - GMW as Water Storage Manager¹

Water System/ Irrigation Area (IA)	Supply Source	Water Treatment Plant ²	Towns Supplied
Pyramid Hill IA	PH 5/1 Channel	PYRAMID HILL	Pyramid Hill
Rochester IA	Waranga Western Channel (Rochester offtake)	ROCHESTER	Rochester
Campaspe	Campaspe River (Rochester offtake)	ROCHESTER	Rochester
Pyramid Hill IA	East Loddon Pipeline	SERPENTINE	Serpentine
Goulburn Valley Water			
Goulburn	Goulburn River (Alexandra offtake)	ALEXANDRA	Alexandra, Eildon, Thornton
Murray	River Murray (Barmah offtake)	BARMAH	Barmah
Goulburn	Lake Eildon	BONNIE DOON	Bonnie Doon
Goulburn	Goulburn River (Tallarook offtake)	BROADFORD	Broadford, Waterford Park
Murray	River Murray (Cobram offtake)	COBRAM	Cobram, Strathmerton, Yarroweyah
Rochester IA	Waranga Western Channel (Colbinabbin offtake)	COLBINABBIN	Colbinabbin
Rochester IA	Waranga Western Channel (Corop offtake)	N/A - regulated ³	Corop
Shepparton IA	East Goulburn Main Channel	DOOKIE	Dookie
Central Goulburn IA	CG 12/9 Channel	GIRGARRE	Girgarre
Goulburn	Lake Nagambie/Goulburn Weir (Baxters Road offtake)	N/A – regulated ³	Goulburn Weir
Murray Valley IA	MV 7/3 Channel	KATAMATITE	Katamatite
Shepparton IA	SH 2/24 Channel (piped)	KATANDRA WEST	Katandra West
Goulburn	Lake Nagambie/Goulburn Weir (Kirwans Bridge offtake)	N/A – regulated ³	Kirwans Bridge
Central Goulburn IA	CG 9 Channel	KYABRAM	Kyabram, Merrigum
Goulburn	Goulburn River (Molesworth offtake)	N/A – regulated ³	Molesworth
Goulburn	Goulburn River (Murchison offtake)	MURCHISON	Murchison
Goulburn	Lake Nagambie/Goulburn Weir (Nagambie offtake)	NAGAMBIE	Nagambie
Murray Valley IA	Broken Creek	NATHALIA	Nathalia
Murray Valley IA	MV 6/6 Channel	NUMURKAH	Numurkah, Wunghnu

Water Supplier Offtakes - GMW as Water Storage Manager¹

Water System/ Irrigation Area (IA)	Supply Source	Water Treatment Plant ²	Towns Supplied
Murray Valley IA	MV 9/9/6 Channel	PICOLA	Picola
Central Goulburn IA	Waranga Basin	RUSHWORTH	Rushworth
Goulburn	Goulburn River (Seymour offtake)	SEYMOUR	Seymour, Avenel, Tallarook, Trawool
Goulburn	Goulburn River (Shepparton offtake)	SHEPPARTON	Shepparton, Congupna, Tallygaroopna, Toolamba, Mooroopna
Central Goulburn IA	CG 1/12/9 Channel	STANHOPE	Stanhope
Central Goulburn IA	CG 3/5A Channel	TATURA	Tatura
Central Goulburn IA	CG 2/5/6 Channel	TATURA	Tatura
Central Goulburn IA	CG 28/9 Channel	TONGALA	Tongala
Grampians Wimmera Mallee Water			
Murray	River Murray (Nyah offtake)	N/A – regulated ³	Berriwillock, Chillingollah, Chinkapook, Waichie
Murray	River Murray - Piangil Pump Station	MANANGATANG	Manangatang
Loddon Valley IA	4/1 Channel (Normanville Pipeline)	QUAMBATOOK	Quambatook
Murray	River Murray - Swan Hill (Pental Island)	SEA LAKE	Sea Lake
Murray	River Murray - Swan Hill (Pental Island)	N/A – regulated ³	Culgoa, Lalbert, Nullawil, Ultima
Murray	River Murray (Wemen offtake)	OUYEN, UNDERBOOL	Ouyen, Underbool
Murray	River Murray (Wemen offtake)	N/A – regulated ³	Nandaly, Patchewollock, Speed, Temy, Walpeup
Lower Murray Water			
Murray	River Murray (Mildura offtake)	MILDURA & MILDURA WEST	Mildura, Mildura West, Irymple, Merbein
Murray	River Murray (Mildura West offtake)	MILDURA & MILDURA WEST	Mildura, Mildura West, Irymple, Merbein
Loddon	Loddon River (Kerang alt. offtake)	KERANG	Kerang
Murray	River Murray (Koondrook offtake)	KERANG	Kerang
Torrumbarry IA	Torrumbarry 14/2 Channel	KERANG	Kerang
Murray	River Murray (Koondrook offtake)	KOONDROOK	Koondrook
Murray	River Murray (Murrabit offtake)	MURRABIT	Murrabit
Torrumbarry IA	Torrumbarry 2/11/4 Channel	MURRABIT	Murrabit
Torrumbarry IA	Kangaroo Lake (Mystic Park Non Potable offtake)	N/A – regulated ³	Mystic Park

Water Supplier Offtakes - GMW as Water Storage Manager¹

Water System/ Irrigation Area (IA)	Supply Source	Water Treatment Plant ²	Towns Supplied
Murray	River Murray (Piangil town offtake)	PIANGIL	Piangil
Murray	River Murray (Red Cliffs offtake)	RED CLIFFS	Red Cliffs
Murray	River Murray (Robinvale offtake)	ROBINVALE	Robinvale
Murray	River Murray (Swan Hill offtake)	SWAN HILL	Lake Boga, Nyah, Nyah West, Swan Hill, Woorinen South
Melbourne Water			
Goulburn	Goulburn River (via Sugarloaf Pipeline at Killingworth)	MELBOURNE - various	Melbourne metropolitan region
North East Water			
Murray	Lake Hume	BELLBRIDGE	Bellbridge
Murray	Mitta Mitta River (Dartmouth offtake)	DARTMOUTH	Dartmouth
Murray	Mitta Mitta River (Eskdale offtake)	ESKDALE	Eskdale
King	King River (Moyhu offtake)	MOYHU	Moyhu
King	King River (Oxley offtake)	OXLEY	Oxley
Murray	Lake Hume / Mitta Mitta River	TALLANGATTA	Tallangatta
Ovens	River Murray (Wahgunyah offtake)	WAHGUNYAH	Wahgunyah, Rutherglen
Ovens	Ovens River (confluence with King River)	WANGARATTA	Wangaratta, Glenrowan
King	Shallow groundwater bore adjacent King River	WHITFIELD	Whitfield
Murray	Wodonga Creek (an anabranch of the Murray River)	WODONGA	Wodonga, Bandiana, Baranduda, Bonegilla, Kiewa, Tangambalanga Barnawartha, Chiltern, Springhurst
Murray	Lake Mulwala/Yarrowonga Weir	YARRAWONGA	Yarrowonga, Bundalong, Devenish, St. James, Tungamah, Goorambat

¹ All water supplied by GMW is raw i.e. not treated.

² Water supplier's water treatment plant

³ Regulated supply as defined under the Act i.e. water supplied by Water Suppliers that is not intended for drinking but could be mistaken as drinking water

Appendix 2 - Water quality incidents reported during 2018/19 related to water provided to Water Suppliers

Risk #	Date	Incident Description	Location	Action undertaken by GMW
IRIS003465	12/07/2018	Potential contamination issue from mining operation adjacent to Morning Star Creek. Water sampling indicated that the Water Treatment Plant may not be separating arsenic from discharge water that discharges into filter pond adjacent to the creek. Pond may also be contaminated from historic mine tailings. The pond is to be decommissioned by the licence holder. EPA assessed current human health risk as low	Goulburn Basin - Morning Star Creek, Woods Point	GMW notified Goulburn Valley Water
IRIS003621	18/01/2019	High levels of BGA detected in Lake Hume by Water NSW	Murray River - Lake Hume	Actions completed in accordance with BGA Alert 3 Checklist - North East Water notified
IRIS003680	18/02/2019	High levels of BGA detected in Lake Eppalock	Campaspe Basin - Lake Eppalock	Actions completed in accordance with BGA Alert 3 Checklist - Coliban Water notified
IRIS003684	21/02/2019	High levels of BGA detected in all channels in the Loddon Valley Irrigation Area and the West Loddon Water District	Loddon Valley Irrigation Area - all in channels in irrigation area and West Loddon Water District	Actions completed in accordance with BGA Alert 3 Checklist - Coliban Water notified
IRIS003683	21/02/2019	High levels of BGA detected in the Loddon River from the Kerang Weir Pool to the confluence of the Little Murray River	Loddon Basin - Loddon River, Kerang Weir Pool to the confluence of the Little Murray River	Actions completed in accordance with BGA Alert 3 Checklist - Lower Murray Water notified
IRIS003687	26/02/2019	High levels of BGA detected in Rochester Irrigation Area	Rochester Irrigation Area - all channels	Actions completed in accordance with BGA Alert 3 Checklist - Coliban Water and Goulburn Valley Water notified

Risk #	Date	Incident Description	Location	Action undertaken by GMW
IRIS003686	28/02/2019	High levels of BGA detected in the Marcorna (No.2) Channel System	Torrumbarry Irrigation Area - Marcorna (No.2) Channel System	Actions completed in accordance with BGA Alert 3 Checklist - Lower Murray Water notified
IRIS003689	1/03/2019	High levels of BGA detected in Waranga Basin	Goulburn Basin - Waranga Basin	Actions completed in accordance with BGA Alert 3 Checklist - Goulburn Valley Water notified
IRIS003691	5/03/2019	Truck carrying frozen chickens crashed off Murchison Bridge into Goulburn River leaking oil and diesel	Goulburn Basin - Goulburn River, Murchison	GMW notified Goulburn Valley Water; Murchison town offtake located 150m upstream of incident. Assisted EPA and DELWP with information as required.
IRIS003715	26/03/2019	High levels of BGA detected in Turner Island backwaters of Goulburn Weir	Goulburn Basin - Goulburn Weir, Turner Island Backwaters	Actions completed in accordance with BGA Alert 3 Checklist - Goulburn Valley Water notified
IRIS003728	3/04/2019	High levels of BGA detected in Normanville Water District	Normanville Water District - Mysia/Catumnal and Normanville	Actions completed in accordance with BGA Alert 3 Checklist - Coliban Water and GWM Water notified
IRIS003737	17/04/2019	High levels of BGA detected in Tullaroop Reservoir	Loddon Basin - Tullaroop Reservoir	Actions completed in accordance with BGA Alert 3 Checklist - Central Highlands Water notified
IRIS003742	17/04/2019	High levels of BGA detected in the Little Murray River from the confluence of the Loddon River to the confluence with the Murray River	Torrumbarry Irrigation Area - Little Murray River	Actions completed in accordance with BGA Alert 3 Checklist - Lower Murray Water notified
IRIS003750	1/05/2019	High levels of BGA detected in East Loddon Water District	Loddon Valley Irrigation Area - East Loddon Water District	Actions completed in accordance with BGA Alert 3 Checklist - Coliban Water notified

Risk #	Date	Incident Description	Location	Action undertaken by GMW
IRIS003769	21/05/2019	High levels of BGA detected in the Loddon River from Loddon Weir to Kerang Weir	Loddon Basin - Loddon River, Loddon Weir to Kerang Weir	Actions completed in accordance with BGA Alert 3 Checklist - Lower Murray Water notified
IRIS003770	23/05/2019	High levels of BGA detected in Goulburn Weir	Goulburn Basin - Goulburn Weir	Actions completed in accordance with BGA Alert 3 Checklist - Goulburn Valley Water notified
IRIS003775	6/06/2019	Oil slick on the Goulburn River 500-1000 metres long. Potentially from a car being removed from river the previous day (could not be confirmed)	Goulburn Basin - Goulburn River, Nagambie Caravan Park	GMW notified Goulburn Valley Water. GMW contacted Strathbogie Shire and Nagambie Police for further information about car removal and any associated oil/fuel spills
IRIS003785	19/06/2019	Black water from Bet Bet Creek associated with spike in flow entering the reservoir	Loddon River - Laanecoorie Reservoir, Bet Bet Creek	GMW notified Coliban Water and North Central Catchment Management Authority. Water quality and quantity observations were noted and shared