

# Safe Drinking Water Act 2003

## Water Storage Manager

### 2016-2017 Annual Report



# Document History and Distribution

## Version (s)

Document (version)	Date	Authors	Notes
1	28 June 2017	Lydia Drake, Emma Mongan, Greg Smith	Draft
2	2 October 2017	As above	Final

## Distribution

Version	Recipients	Date	Notes
1	Mark Bailey	21 August 2017	Draft for approval
1	Leanne Wells DHHS	14 September 2017	DHHS review
2	Mark Bailey, Scott Barber, Geoff Cutter	9 October 2017	Management approval
2	Suzie Sarkis, Leanne Wells	19 October 2017	Report also added to GMW's website

## List of Acronyms

BGA	Blue-Green Algae
CMA	Catchment Management Authority
CHW	Central Highlands Water
CW	Coliban Water
DELWP	Department of Environment, Land, Water & Planning
DHHS	Department of Health & Human Services
GMW	Goulburn-Murray Water
GVW	Goulburn Valley Water
GMMWater	Grampians Wimmera Mallee Water Corporation
LMW	Lower Murray Water
LWM	Local Water Manager
MVIA	Murray Valley Irrigation Area
OPI	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 2016/17

*Front cover photo: Aerial of Stuart Murray Canal, Cattanach Canal and Waranga Basin*

# Contents

Document History and Distribution .....	2
Version (s).....	2
Distribution .....	2
1. Introduction.....	4
2. Goulburn-Murray Water systems & role.....	5
3. Regulation Components Report.....	8
3.1 <i>Emergency and incident management</i> .....	8
3.2 <i>Summary of exemptions and undertakings</i> .....	11
3.3 <i>Risk Management Plan audit findings and issues raised</i> .....	11
3.4 <i>Water treatment processes</i> .....	12
4. Other Relevant Information .....	12
4.1 <i>Other activities</i> .....	12
4.2 <i>Advising People about Non-potable Water Supplies</i> .....	13
4.3 <i>Melbourne Water</i> .....	13
5. Further Information.....	14
Appendix 1 - Towns supplied where GMW is the water storage manager .....	15
Appendix 2 - Environmental incidents reported during 2016/17 related to water quality .....	19

# 1. Introduction

Goulburn-Murray Rural Water Corporation, trading as Goulburn-Murray Water (GMW), is defined as a Water Storage Manager under the *Safe Drinking Water Act 2003*. This 2016/17 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 *Safe Drinking Water Act 2003* (the Act) and Safe Drinking Water Regulations 2015 (Regulations).

This report also 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 Mark Bailey, Manager Water Resources, or Greg Smith, Manager Water Quality during business hours on (03) 5826 3516 or (03) 5826 3732 respectively or by email [mark.bailey@gmwater.com.au](mailto:mark.bailey@gmwater.com.au), [greg.smith@gmwater.com.au](mailto:greg.smith@gmwater.com.au).

Water quality data collected by GMW is available to the public via the Victorian Water Measurement Information System at <http://data.water.vic.gov.au/monitoring.htm> or by contacting Greg Smith on the above email.

## 2. Goulburn-Murray Water Systems & Role

GMW manages the bulk water delivery and transfer for around 30% of Victoria's land area, or approximately 68,000 km<sup>2</sup> (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 Murray River. 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 chlorinated or 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 bulk water in accordance with Bulk Entitlement Orders to six urban water corporations (water suppliers): Coliban Water, Central Highlands Water, North East Water, Goulburn Valley Water, GWMWater (Grampians Wimmera Mallee Water Corporation), Lower Murray Water. At times water may also be supplied to Melbourne Water (see section 4.3). The bulk entitlements provide for quantity of supply, but make no guarantee of quality. GMW does not operate the reticulated supply systems. Raw (untreated) water is supplied by GMW to water suppliers for treatment and supply to their customers in 131 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 storages directly (via water supplier infrastructure) e.g. Nagambie from Goulburn Weir.
2. Via the outlet works of storages (GMW infrastructure) e.g. Bendigo from Lake Eppalock.
3. Indirectly from rivers supplied by 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 to water supply arrangements where GMW is the Water Storage Manager during 2016/17.

GMW's commitment to drinking water quality management is reflected in the corporate drinking water quality policy. This policy requires GMW to *address threats to safe drinking water by preparing and implementing a Risk Management Plan to meet its obligations as a Water Storage Manager under the Safe Drinking Water Act 2003*.

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:

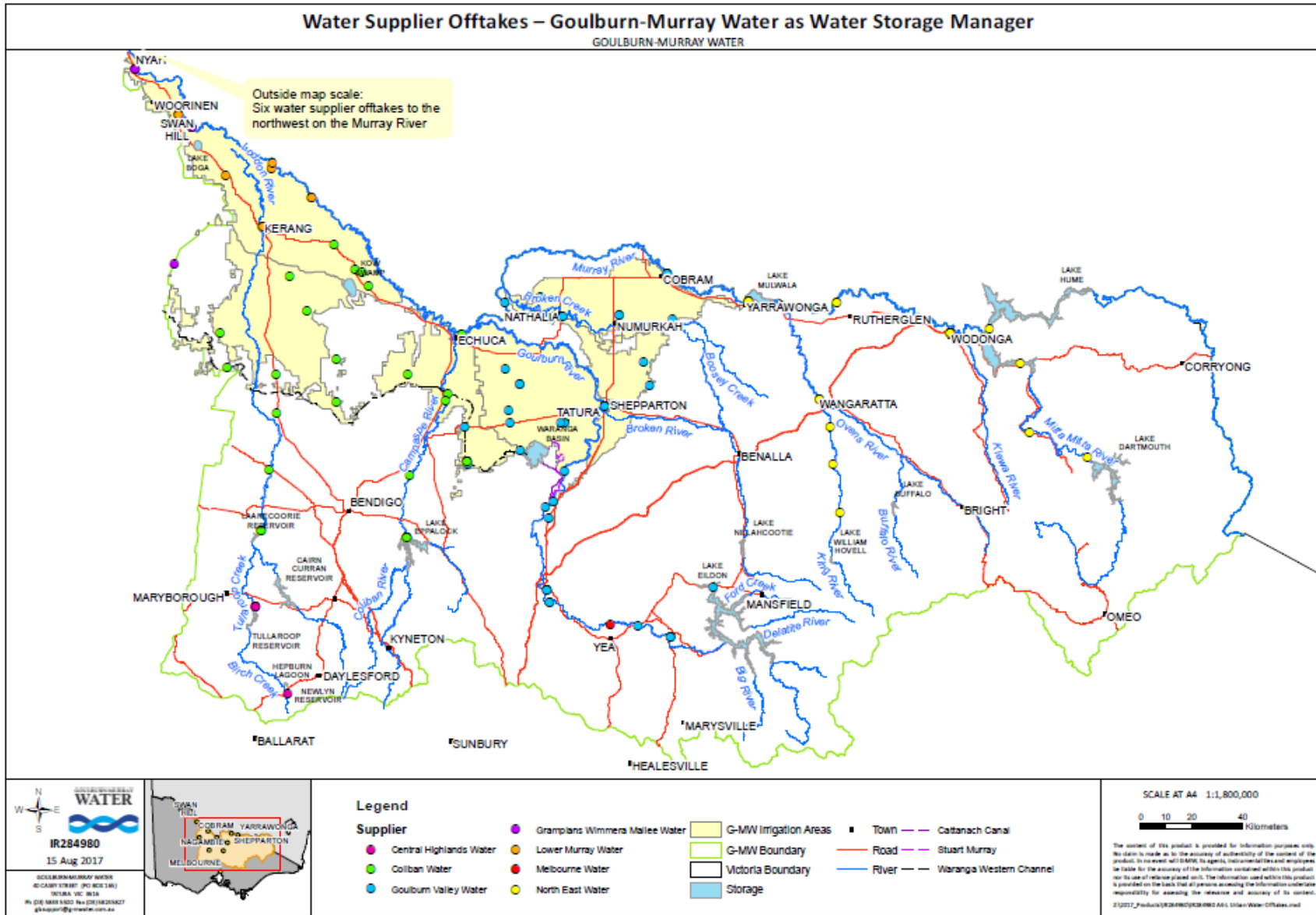
- the catchment leading to the storage;
- the storage itself;
- the supply of water downstream of storages using natural carriers such as rivers and creeks; and
- the supply of water via channel systems to each drinking water off take point.

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. Copies of the RMP are available to the public upon request to GMW. The plan includes general requirements and considers GMW activities to manage the risk to water quality. There is also a section that specifically focuses on risks in and around GMW's storages and within GMW's irrigation districts.

GMW meets regularly with water suppliers to discuss any issues arising from the RMP or operations including incident response, blue-green algae levels, risk identification, sharing of information and water resource management. GMW also engages with representatives of 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.



Figure 1: GMW's area of operation



## 3. Regulation Components Report

### 3.1 Emergency and incident management

#### Regulations

17(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;

17(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 2016/17.

#### 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 2016/17 GMW recorded 11 incidents that were regarded as having the potential to affect the quality of water supplied to a water supplier. GMW notified the relevant water supplier in each instances, except for water suppliers' own wastewater incidents where there were no other water suppliers impacted. 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.

Black water events occurred in the Murray and Goulburn Rivers in late 2016 and early 2017 respectively due to intense rainfall. GMW, relevant water suppliers and CMAs were involved in managing these incidents. The Goulburn Broken Catchment Management Authority has established a working group to learn from the Goulburn River black water event that impacted the Shepparton region early January 2017. GMW and Goulburn Valley Water are part of this working group.

GMW continues to work with water suppliers and other catchment partners to minimise the impact to water quality from incidents and events 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 annual 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 (cyanobacteria) 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. BGA 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 a pre-season meeting on 28 October 2016, which was also a requirement of the Circular.

Monitoring programs focus on those sites and parameters that can affect recreation and system operations, in particular blue green algae in 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**

In 2016/17, 12 BGA warnings were issued based on recreational guidelines. Table 1 summarises the BGA warnings issued by GMW in 2016/17 and the Water Suppliers notified.

A recreation warning occurred for the first time at Waranga Basin in early 2017. The bloom also extended into GMW's Central Goulburn, Rochester and Loddon Valley irrigation area channels. GMW was the incident controller for this incident and followed all protocols outlined in the Circular. This included increased monitoring sites and frequency together with regular communication with Goulburn Valley Water, Coliban Water and GWMWater. 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. The longest warning was in place for 29 days for parts of the Loddon Valley Irrigation Area. A debrief for this bloom occurred in July 2017 and included Coliban Water and Goulburn Valley Water. GMW will take the outcomes of the debrief into consideration in future BGA management.

**Table 1: Blue Green Algae Recreational Warnings Issued by GMW 2016/17**

Basin/System	Location	Warning dates (duration)	WS notified <sup>1</sup>
Murray River Basin	Blampieds Lagoon	17/3/17 – 21/4/17 35 days	No WS impacted
Broken River Basin	Mokoan Remote Storage Dam	7/12/2016 – 9/3/2017 92 days	No WS impacted
Goulburn River Basin	Waranga Basin	29/3/17 – 21/4/17 23 days	GVW
Tungamah Water District	Entire Water District	18/5/17 – 20/6/17 33 days	No WS impacted
Central Goulburn Irrigation Area	CG Channel 7, CG Channel 8 & CG Channel 9	23/3/17 – 21/4/17 29 days	GVW
Rochester Irrigation Area	Entire irrigation area	30/3/17 – 21/4/17 22 days	GVW, CW
Loddon Valley Irrigation Area	Entire irrigation area	23/3/17 – 21/4/17 29 days	CW, GWMWater
East Loddon Water District	Entire Water District	28/3/17 – 21/4/17 24 days	CW
West Loddon Water District	Entire Water District	30/3/17 – 21/4/17 22 days	No WS impacted
Campaspe River Basin	Lake Eppalock	1/3/2017 – 17/8/2017 169 Days	CW
Loddon River Basin	Tullaroop Reservoir	11/1/17 – 10/5/17 119 days	CHW
Loddon River Basin	Hepburns Lagoon	9/2/2017 – ongoing	No WS impacted
Loddon River Basin	Laanecoorie Reservoir	10/3/2017 – 10/5/17 61 days	CW
Torrumbarry Irrigation Area	Gum Lagoon	24/2/17 – 30/3/17 34 days	No WS impacted
Torrumbarry Irrigation Area	Lake Boga	17/2/16 – 19/8/16 184 days	No WS impacted

<sup>1</sup>Goulburn Valley Water (GVW), Coliban Water (CW), Central Highlands Water (CHW).

In accordance with the 2016/17 BGA response plans, GMW advised DELWP and DHHS of any BGA levels that had the potential to affect public health through drinking water or recreational contact via the BGA status report. DHHS and DELWP were notified via telephone and email when the total biovolume of known toxic BGA species exceeded the recreational trigger (4 mm<sup>3</sup>/L) 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.g-mwater.com.au/bluegreenalgae-alert/>. 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@g-mwater.com.au](mailto:reception@g-mwater.com.au).

### 3.2 Summary of exemptions and undertakings

Regulation 17(c) a summary of every written undertaking by the water storage manager accepted by the Secretary under section 30 of the Act.

Regulation 17(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 2016/17.

### 3.3 Risk Management Plan audit findings and issues raised

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 their risk management plan during the 2016/17 reporting period. Table 2 provides a summary of actions undertaken by GMW during the reporting period for the identified opportunities for improvement made by auditors during the 2016 audit.

**Table 2: 2016 Audit Progress Report**

Action	Progress Report*
<i>OFI 1. While radiological hazards are dealt with in the risk assessment, GMW should consider natural sources of these hazards and not just those originating from landfill leachate and dumping. Consequently, GMW should review the geology in its area for natural sources of radiological hazards and assess whether there is a significant source. This information is important for groundwater sources and surface water, which is under the influence of groundwater (the latter part only being relevant for GMW).</i>	Complete. Investigation of geology in GMW region completed, negligible risk. No further action required.
<i>OFI 2. Consider whether flow management can be formalised as a method for managing/improving 'in channel' water quality.</i>	Complete. Flow management method listed as a potential operational tool in SDWA Risk Management Plan and included in each Irrigation Area Operation Manual.
<i>OFI 3. Review the partnership agreements [for waterway incidents] and ensure that they are updated for currency including removing the requirement for contact details to be contained in this document.</i>	Complete. Regional response agreements have been superseded by state emergency arrangements under the EMMV framework. DELWP is the designated control agency for water incidents.
<i>OFI 4. Review how currency details are stated on documents to facilitate ease of visualisation of currency without always having to check in DM.</i> <i>OFI 7. Ensure that review dates are more clearly articulated on documents to improve currency identification.</i>	Complete. SDWA and related documents reviewed and altered as required.
<i>OFI 8. An opportunity exists to strengthen the RMP around specific procedure training and recording of</i>	Complete. Review of procedure-specific training completed.

competency at Section 2.5.1.

SDWA RMP now includes details on relevant procedure related training.

\*OFIs 5 and 6 completed in 2015/16

### 3.4 Water treatment processes

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

(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).

While GMW does not treat or process any water for drinking water purposes, please note the following:

- GMW sometimes applies herbicides to vegetation adjacent to channels used to supply water suppliers. All herbicide application is undertaken in accordance with GMW's operating guidelines, including having appropriately trained staff, notification of the relevant water supplier and adherence to product labels and minor use permits.
- When necessary (locust plagues, for example), GMW only uses pesticides that are suitable for use adjacent to waterways and in a manner consistent with current best management practices and regulations.

## 4. Other Relevant Information

### 4.1 Other activities

GMW has completed individual risk assessments for GMW storages and irrigation areas as well as an organisation-wide risk assessment. All assessments are regularly reviewed. GMW continues to implement a number of key programs to manage the identified risks to water quality; examples of the types of activities undertaken by GMW are summarised in Table 3.

**Table 3: GMW Key Programs**

Program	2016-17 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.
Water quality monitoring	Water quality monitoring and analysis undertaken at 15 storages (242 samples). Quarterly exception reports and annual report sent to relevant stakeholders including water suppliers.
External Stakeholder controls	Continued engagement with regional and state catchment

Program	2016-17 Activities/Achievements
	partners including implementation of Regional Catchment Strategies and review of State Environment Protection Policies.
GMW staff training	Review of internal SDWA awareness raising factsheet. Six staff training sessions held.
Best Management Practices	Best Management Practice Register kept up to date
Statutory Planning	1311 applications reviewed from 26 local government authorities and DELWP.
Land Management	Review of lease arrangements as required. Routine inspections of facilities.
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..
Lake Eildon houseboats and on-water services	Ongoing management of on-water facilities, houseboat inspections undertaken in accordance with schedule, implementation of the Water (Lake Eildon Recreational Area) (Houseboats) Regulations 2013. Input into DELWP's review of Regulations.
Weed Management	Review of communication strategy with water suppliers for herbicide application upstream of town offtakes. All herbicide applications conducted in accordance with the GMW Herbicide Operating Manual including notification Water Suppliers when required.
Environmental Management System	Maintained ISO14001 accreditation. Passed External OHS/EMS audit.
Incident Response	Passed OHS/EMS Audit. 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 prevention works, fencing, licensing and monitoring of activities on GMW land. GMW activities are conducted in accordance with the approved Environmental Management System. Notification to relevant water suppliers if water quality impacted.
Water Resource Management	Finalised three Bulk Water Operating Plans with water suppliers

In 2016, GMW entered into an updated SDWA Memorandum of Understanding (MoU) with each of the seven water suppliers and Melbourne's three water retail businesses. The MoUs establish a commitment by the parties to work together and share information relating to the development and implementation of their respective RMPs in line with the SDWA and the 2015 Regulations.

#### **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. Following consultation with DHHS and water suppliers in 2007, GMW developed a Customer Information Statement to advise customers of the non-potable nature of the water supplied. This statement was reviewed and updated in 2015/16, provided to all GMW customers and is located on the GMW website (<http://www.g-mwater.com.au>). Customer invoices include a statement regarding the non-potable nature of the water supplied by GMW.

#### **4.3 Melbourne Water**

The Sugarloaf (or North-South) Pipeline was constructed to supply water from the Goulburn catchment 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 in operation since November 2010. GMW's



agreement with Melbourne Water and Bulk Entitlements with the three water retail 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](mailto:reception@gmwater.com.au)



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

Water Supplier Offtakes - GMW as Water Storage Manager*			
Water System/ Irrigation Area (IA)	Supply Source	Water Treatment Plant	Towns Supplied
<b>Central Highlands Water</b>			
Loddon	Tullaroop Reservoir	MARYBOROUGH	Maryborough, Alma, Timor, Carisbrook, Daisy Hill, Majorca, Talbot
Bullarook	Newlyn Reservoir	BALLARAT	Ballarat
<b>Coliban Water</b>			
Campaspe	Lake Eppalock	BENDIGO	Bendigo, Axedale, Epsom, Huntly, Maiden Gully, Marong, Raywood, Sebastian
Rochester IA	Waranga Western Channel	BENDIGO	Bendigo, Axedale, Epsom, Huntly, Maiden Gully, 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	Nil - regulated <sup>#</sup>	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
Pyramid Hill IA	East Loddon Pipeline	Nil - regulated <sup>#</sup>	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 (No 24 Channel – spur off Waranga Western Channel)	LOCKINGTON	Lockington
Pyramid Hill IA	PH 10/1 Channel	Nil - regulated <sup>#</sup>	Macorna
Pyramid Hill IA	Mitiamo spur off the Pyramid Hill No. 1 Channel	Nil - regulated <sup>#</sup>	Mitiamo

<b>Water Supplier Offtakes - GMW as Water Storage Manager*</b>			
<b>Water System/ Irrigation Area (IA)</b>	<b>Supply Source</b>	<b>Water Treatment Plant</b>	<b>Towns Supplied</b>
Pyramid Hill IA	Waranga Western Channel (Mysia offtake)	MYSIA	Mysia
Pyramid Hill IA	PH Channel No. 1 (12/5/1)	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
<b>Goulburn Valley Water</b>			
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)	Nil - regulated <sup>#</sup>	Corop
Shepparton IA	East Goulburn Main Channel	DOOKIE	Dookie
Central Goulburn IA	CG 12/9 Channel	GIRGARRE	Girgarre
Goulburn	Lake Nagambie (Baxters Road offtake)	Nil - regulated <sup>#</sup>	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 (Kirwans Bridge offtake)	Nil - regulated <sup>#</sup>	Kirwans Bridge
Central Goulburn IA	CG 9 Channel	KYABRAM	Kyabram, Merrigum
Goulburn	Goulburn River (Molesworth offtake)	Nil - regulated <sup>#</sup>	Molesworth
Goulburn	Goulburn River (Murchison offtake)	MURCHISON	Murchison
Goulburn	Lake Nagambie (Nagambie offtake)	NAGAMBIE	Nagambie
Murray Valley IA	Broken Creek	NATHALIA	Nathalia
Murray Valley IA	MV 6/6 Channel	NUMURKAH	Numurkah, Wunghnu
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

<b>Water Supplier Offtakes - GMW as Water Storage Manager*</b>			
<b>Water System/ Irrigation Area (IA)</b>	<b>Supply Source</b>	<b>Water Treatment Plant</b>	<b>Towns Supplied</b>
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
<b>GMMWater</b>			
Murray	River Murray (Nyah offtake)	Nil - regulated <sup>#</sup>	Berriwillock, Chilingollah, 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)	Nil - regulated <sup>#</sup>	Culgoa, Lalbert, Nullawil, Ultima
Murray	River Murray (Wemen offtake)	OUYEN, UNDERBOOL	Ouyen, Underbool
Murray	River Murray (Wemen offtake)	Nil - regulated <sup>#</sup>	Nandaly, Patchewollock, Speed, Temy, Walpeup,
<b>Lower Murray Water</b>			
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, KOONDROOK	Kerang, Koondrook
Torrumbarry IA	Torrumbarry 14/2 Channel	KERANG	Kerang
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)	Nil - regulated <sup>#</sup>	Mystic Park
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

<b>Water Supplier Offtakes - GMW as Water Storage Manager*</b>			
<b>Water System/ Irrigation Area (IA)</b>	<b>Supply Source</b>	<b>Water Treatment Plant</b>	<b>Towns Supplied</b>
Murray	River Murray (Swan Hill offtake)	SWAN HILL	Lake Boga, Nyah, Nyah West, Swan Hill, Woorinen South
<b>Melbourne Water</b>			
Goulburn	Goulburn River (via Sugarloaf Pipeline at Killingworth)	MELBOURNE	Melbourne
<b>North East Water</b>			
Murray	Lake Hume	BELLBRIDGE	Bellbridge
Murray	Mitta Mitta River (Dartmouth offtake)	DARTMOUTH	Dartmouth
Murray	Mitta Mitta River (Eskdale offtake)	ESKDALE	Eskdale
Ovens	Ovens River (confluence with King River)	WANGARATTA	Wangaratta, Glenrowan
Ovens	King River (Moyhu offtake)	MOYHU	Moyhu
Ovens	King River (Oxley offtake)	OXLEY	Oxley
Ovens	River Murray (Wahgunyah offtake)	WAHGUNYAH	Wahgunyah, Rutherglen
Murray	Lake Hume / Mitta Mitta River	TALLANGATTA	Tallangatta
Ovens	Shallow groundwater bore adjacent King River	WHITFIELD	Whitfield
Murray	Wodonga Creek (an anabranch of the Murray River)	WODONGA	Wodonga, Bandiana, Baranduda, Bonegilla, Ebden, Kiewa, Tangambalanga, Barnawartha, Chiltern, Springhurst
Murray	Lake Mulwala	YARRAWONGA	Yarrawonga, Bundalong, Devenish, St. James, Tungamah

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

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

## Appendix 2 - Environmental incidents reported during 2016/17 related to water quality

Risk #	Date	Incident Description	Location	Action undertaken (by GMW)
IRIS002821	16/02/17	45 kL untreated sewage leaked from a Central Highlands Water gravity main along the Hepburn-Newstead Road, north of Hepburn Spring township. The sewage ran to Spring Creek which then flows to Jim Crow Creek – upstream of Cairn Curran Reservoir.	Other	GMW Diversions advised. No further action was considered necessary. Central Highlands Water managed incident i.e. no notification required. Sewage was contained and EPA involved in the water quality monitoring.
IRIS2893	30/03/17	High levels of BGA detected in Rochester-Campaspe Irrigation Area	Entire Rochester-Campaspe Irrigation Area	Actions completed in accordance with BGA Alert 3 Checklist – Goulburn Valley Water and Coliban Water notified.
IRIS2891	29/03/17	High levels of BGA detected in Waranga Basin.	Waranga Basin	Actions completed in accordance with BGA Alert 3 Checklist – Goulburn Valley Water notified.
IRIS2881	23/03/17	High levels of BGA detected in Loddon Valley Irrigation Area.	Loddon Valley Irrigation Area East of the Loddon River	Actions completed in accordance with BGA Alert 3 Checklist – Coliban Water and GWMWater notified.
IRIS002880	23/03/17	High levels of BGA detected in Central Goulburn Irrigation Area.	CG7, CG8 & CG9	Actions completed in accordance with BGA Alert 3 Checklist – Goulburn Valley Water notified.
IRIS002862	10/03/17	High levels of BGA detected in Laanecoorie Reservoir.	Laanecoorie Reservoir	Actions completed in accordance with BGA Alert 3 Checklist – Coliban Water notified.

Risk #	Date	Incident Description	Location	Action undertaken (by GMW)
IRIS002843	1/03/17	High levels of BGA detected in Lake Eppalock.	Lake Eppalock	Actions completed in accordance with BGA Alert 3 Checklist – Coliban Water notified.
IRIS002766	11/01/17	High levels of BGA detected in Tullaroop Reservoir.	Tullaroop Reservoir	Actions completed in accordance with BGA Alert 3 Checklist – Central Highlands Water notified.
IRIS002704	22/11/16	Due to significant flooding of the Murray River and its surrounds, low oxygen levels have been observed and recorded.	Torrumbarry Weir	Monitored and recorded dissolved levels. Water supplier (Coliban Water) notified.
IRIS002631	07/10/16	Expected discharge of mine wastewater at Costerfield (Manadalay Resources) into Wappentake Creek, which leads to Major Creek and the Goulburn River near Mitchelton. Main concern may be antimony.	Wappentake Creek at Costerfield, Goulburn Basin	Discussed with DHHS and Goulburn Valley Water. GBCMA advised. [no discharge eventuated]
IRIS002535	08/08/16	Sewage spill at Beechworth that entered Spring Creek following significant rainfall that infiltrated the reticulated sewerage system.	Beechworth	North East Water notified GMW of the incident.
-	-	<p>15 other potential water quality incidents recorded that did not pose a risk to water quality supplied to WS i.e. no water supplier offtakes downstream that could be impacted by the incident. Types incidents included:</p> <ul style="list-style-type: none"> <li>• Vehicle accidents with potential oil and fuel spills</li> <li>• Dairy effluent and industrial discharges</li> <li>• Illegal dumping</li> <li>• High levels of BGA</li> <li>• General poor water quality for unknown reasons</li> </ul>	Various (storage/waterway/channel/drain)	<p>Various</p> <p><i>Note these incidents were not included in summary section 3.1 as they did not have the potential to impact WS.</i></p>



Risk #	Date	Incident Description	Location	Action undertaken (by GMW)
-	-	<p>6 incidents where more than 5 animals have been found in GMW managed water bodies.</p> <p>129 incidents where less than 5 animals have been found in GMW managed water bodies.</p>	<p>Various (storage/waterway/channel/drain)</p>	<p>All carcasses removed from waterway and buried. Weekly inspections. No further action was required.* <i>Note these incidents were not included in summary section 3.1</i></p>