



26<sup>th</sup> August 2020

National Water Reform 2020

Productivity Commission

Lodgement online at [water.reform.2020@pc.gov.au](mailto:water.reform.2020@pc.gov.au)

Dear Commissioners

**RE: National Water Reform Inquiry - Submission from *Friends of Latrobe Water***

Friends of Latrobe Water (FLoW) welcomes this opportunity to provide input to the Productivity Commission to assist with its review of National Water Reform.

FLoW advocates for the protection of Latrobe Valley's water sources and safeguarding the protection of the Gippsland Lakes from industry activities, including coal mine rehabilitation and coal ash contamination.

Threats include –

- Declining water flows
- Changes in flows
- Overallocation of water sources
- Priority sharing of water resources

In consideration of the Commission's 2017 recommendations that jurisdictions recommit to a renewed NWI, FLoW has concerns with,

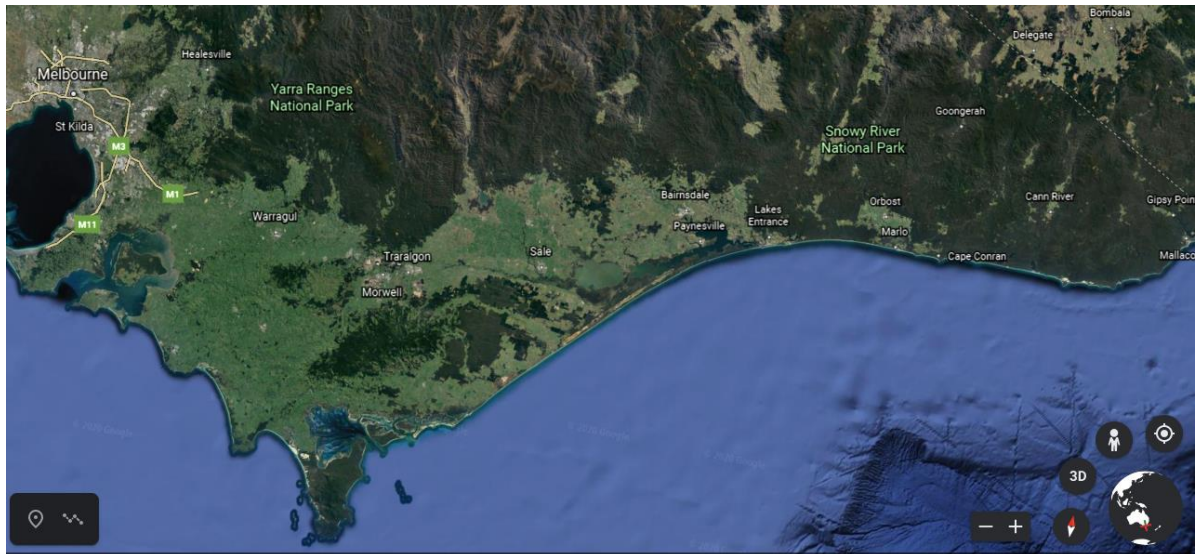
- policy settings for alternative water sources in entitlement and planning frameworks
- other policy settings relating to:
  - urban water management
  - environmental water management
  - decision-making on building and supporting new infrastructure.

In context to the regional area of Gippsland in Victoria, alignment of water policy on a statewide basis is challenging due to the dominance and current governance of mining in the Latrobe Valley in Gippsland's central west. This has resulted in substantial impacts to water flow, quality and chemistry to all other beneficial users downstream including environmental water health.

In responding to the Issues Paper on the scope of this inquiry FLoW will also address,

- emerging challenges faced by Governments, water providers and water users, such as climate change or changes in economic circumstances
- the interaction of water policy with other areas (such as land use planning and urban development)
- the impacts of climate change on water resources
- the provision of reliable water services to regional and remote communities
- the principles to be satisfied for any Government investment in major water infrastructure.

The Gippsland region is 41,600 square kilometres in extent (covering 18 per cent of Victoria) and is characterised by several distinct areas, the western part of the region extends to the fringe of Melbourne, the south covering the coastal areas, the central/west part containing significant industry including three open cut coal mines holding large bulk water entitlements and the eastern part forms the southern extent of the Australian eastern seaboard.



Gippsland has a dynamic water system of national and international significant waterbodies and waterways providing the arteries and natural capital to support and sustain our economic and social wellbeing as well as sustaining important cultural and biological significance. The area also has a complex regime of consumptive water uses ranging from extensive coal mining & other industrial processes, irrigation, drinking water supplies, agribusiness (agriculture, forestry, fishing and processing) to major offshore oil & gas extraction depleting the onshore aquifer from overdraw of groundwater. Offshore hydrocarbon extractions in Commonwealth waters are not subject to any form of state licenced groundwater agreements.

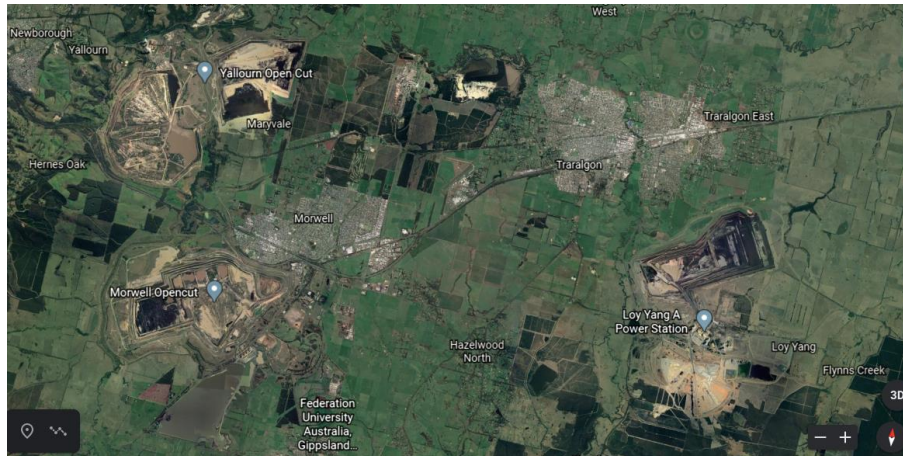
The economic value to the state is worth more than the impacts from lowering of the water table onshore by at least 50m resulting in coastal subsidence implications and resultant seawater intrusion into coastal aquifers.

*Exploration and production offshore is subject to Federal regulation but managed in cooperation with DPI [now DJPR]. SRW does not regulate groundwater in Bass Strait. ...As offshore oil and gas reservoirs are depleted the pressure in the basin falls. This has been observed in onshore observation bores as falling groundwater levels (see Chapter 6: Regional trends).<sup>1</sup>*

The Thomson and Latrobe river systems are regulated, meaning they are characterised by large dams and weirs. These rivers are important sources of water for urban centres — including Melbourne — as well as irrigated agriculture and power generation. The Victorian Environmental Water Holder has entitlements to water in the Thomson, Macalister and Latrobe rivers to protect the health of these rivers and wetlands, some of which are RAMSAR listed.

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<sup>1</sup>[http://www.srw.com.au/files/General\\_publications/GGA - Chapter 3 - Management and use.pdf](http://www.srw.com.au/files/General_publications/GGA_-_Chapter_3_-_Management_and_use.pdf)



**Latrobe Valley Coal mines**

EPA Victoria are tasked with managing pollution and providing input to project proposals as a responsible authority. However, projects are assessed in isolation rather than to the projects cumulative effect on the environment. Consequently, the deteriorating state of our environment has more to do with poor regulatory management and oversight to continually approve and tolerate wastewater discharges into Gippsland's waterways on top of legacy pollution from gold mining (mercury, arsenic) and ash leachate from coal mines. Effective land use policy and its protective legislation have failed Gippslanders and the receiving environment.<sup>2 3 4 5 6 7 8</sup>

All wastewaters are deemed a contaminant to surface waters for any deviations in pH causes changes to existing ecosystems, both surface and subsurface. Then there are the sediment load discharges noted as solid pollutants that smothers bottom feeders and the deposition of heavy metals that enter waterways from poor initial testing of wastewaters due to self-regulation. The ash ponds in the Latrobe Valley **each hold millions of tonnes of coal ash**. Cleaning them up is critical to protecting water sources, preventing air pollution, and future land-use planning.

More importantly, all discharges of wastewater are dependent on an increased velocity of water flow to reduce concentrations of contaminants and to flush the pollutants downstream otherwise they become more concentrated in the localised area with siltation and only the finer sediments flowing further. Either way pollution of soils, drinking waters and recreational waters are problematic in times of both increased and decreased flows.

While water reform has achieved positive results for some objectives of the NWI, it is to the **growing complexity of water issues combined with climate change and poor planning, not initially foreseen in 2004, that improvement and flexibility is needed**. Much greater guidance and scrutiny to what the States and Territories are currently undertaking is required.

<sup>2</sup> <https://www.audit.vic.gov.au/report/rehabilitating-mines>

<sup>3</sup> <https://www.audit.vic.gov.au/report/managing-environmental-impacts-domestic-wastewater>

<sup>4</sup> <https://www.audit.vic.gov.au/report/protecting-victorias-coastal-assets>

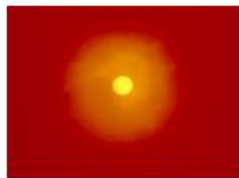
<sup>5</sup> <https://www.audit.vic.gov.au/report/improving-victorias-air-quality>

<sup>6</sup> <https://www.audit.vic.gov.au/report/effectiveness-environmental-effects-statement-process>

<sup>7</sup> <https://www.audit.vic.gov.au/report/managing-victorias-planning-system-land-use-and-development>

<sup>8</sup> <https://www.audit.vic.gov.au/report/meeting-obligations-protect-ramsar-wetlands>





Drying & Warming Climate



Quality & Salinity



Growing Urban Demand



Over-allocation to irrigation



Uncapped Groundwater Extraction

## The big 10 water scarcity factors



Expanding Plantations



Expanding Farm Dams



The Environmental Flows Imperative



Mining and Coal Seam Gas



Bushfire Recovery Impacts

Source - 2013 Presentation by Professor Craig Simmons, Director for National Centre for Groundwater Research and Training<sup>9</sup>

**OUT OF THESE 10 FACTORS NOTED FOR WATER SCARCITY,  
GIPPSLAND IS IMPACTED BY 9**

### National Groundwater Strategic Plan for Our Future Needs

- red dot points are FLoW's connections to Gippsland

#### Mining and energy (CSG/shale, coal mining, geothermal energy, climate change)

- *aquifer depletion, subsidence, coal mining power generation in Latrobe Valley and rehabilitation potentially requiring up to 2,700GL of water to fill 3 pit voids over many decades to come plus up to 15GL annually allowing for evaporation*

#### Surface water (SW) – groundwater (GW) connectivity

- *Environmental impacts historically only considered when GW infiltrated surface waters*
- *Combination of SW and GW biota often associated with the direction of SW-GW exchange > much still to be understood for the Gippsland Basin Hydrogeology*
- *Aquatic life & habitat impacted increasing mosquito infestation*

#### Managed aquifer recharge (MAR)

- *Injection of non-potable water would have higher Total Dissolved Solids and particulate matter which may result in clogging of pore space with sustained injection into groundwater*

#### Groundwater dependent ecosystems (GDEs)

- *Habitats for biota (microbes and invertebrates) & maintains aquifer health. Impacted by irrigation/fertilisation. salinity, contamination (acids, heavy metals) altered flows. Provides ecosystem service, vulnerable to altered groundwater regime and extinction.*

<sup>9</sup> [http://aclca.org.au/docs/craig\\_simmons\\_presentation.pdf](http://aclca.org.au/docs/craig_simmons_presentation.pdf)

### Groundwater quality issues, including seawater intrusion (SWI)

- *aquifer depletion from decades of offshore oil & gas extraction and dewatering of open cut coal mines, coal ash leachates, pesticides, nutrients, emerging contaminants, pathogens*

### Impacts of climate change on groundwater resources

- *lack of aquifer recharge, decreased flows, poor water quality, increased water temps, low oxygen*

### Advancing the state of modelling in practice

- *how can you model with increasingly variable rainfall?*

### Improved governance, policy and monitoring

- *too many Auditor General reports identifying systemic failures within responsible agencies and government departments for water management in Gippsland*

### Community acceptance/understanding

- *poor understanding of water issues and natural capital as an ecoservice*

### Uncertainty / Knowledge adoption / dissemination

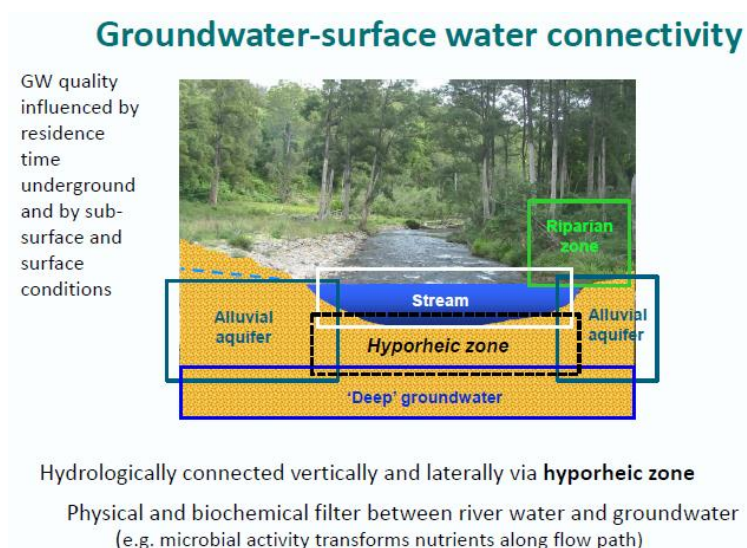
- *loss of historical river knowledge, shared resources, consultants hold historical water data*

### Shortage of Skilled Professionals and Capacity Building

- *siloeing departments and bureaucracy stifling scientist's work leading to apathy*

## **THREATS TO SURFACE AND GROUNDWATER SYSTEMS<sup>10</sup>**

- Climate change
- Over-extraction
  - Irrigation
  - Mining/gas
- Contaminants
  - Salinity, acidity
  - Pesticides, organics, metals, nutrients, radionuclides, emerging contaminants
  - Pathogens



<sup>10</sup> <http://groundwater.com.au/videos/2018-iah-ncgrt-distinguished-lecture-series-presented-by-dr-jennifer-stauber-chief-research-scientist-csiro-land-water> notes collated from attending lecture & viewing subsequent video

## REGULATORY THREATS

- Complex mix of State and Federal policy settings, regulators, instrumentalities resulting in significant crossover in objectives, jurisdictional responsibilities and management
- Ongoing disconnect and siloed department policy for water use
- Land use hierarchy of priority based on imprecise perceived economic benefits
- Policy creation informed and undermined by bureaucratic processes rather than credible scientific datasets
- Potential dependence on Class A recycled 'waters' for agriculture irrigation and providing fill for rehabilitation of Latrobe Valley coal mines.
- Increasing use of biosolids & sewerage sludge as a beneficial use
- Lack of departmental transparency, accountability and clarity for proposed objectives
- Failure to acknowledge emerging contaminants as a serious threat to water quality
- Increase use of recycled waters impacting receiving environment
- Ongoing land and coastal subsidence (collapse of outer dunal barriers), urban water augmentation and use of recycled waters.

The most current 2020 **ENVIRONMENTAL WATER REQUIREMENTS REPORT: Latrobe environmental water requirements investigation**<sup>11</sup> reveal a damning state of the river basin

### 4.7 System limitations

*Maintaining the ecological objectives and supporting functions in the Latrobe catchment cannot be achieved through the provision of the recommended environmental flow regime alone. Other threats and constraints can limit the achievement of objectives in parts of the Latrobe system. These limitations include:*

- *Deterioration of water quality and saline intrusion*
- *Stream bed and bank condition*
- *Exotic species*
- *Flow limiting infrastructure*
- *Barriers to fish movement*
- *Grazing pressure*

*Complementary management actions are recommended for these system limitations to help optimise the benefit of improvements in the flow regime.*

#### ***Deterioration of water quality and saline intrusion***

*Declining water quality is evident through the catchment. Threats include acidification, eutrophication, pollution, litter and stormwater inputs. Water quality is an important factor for the survival of most flora and fauna. The water quality of the study area reflects ongoing significant impacts from catchment clearance, poor riparian cover and stock access to the waterway. The high nutrient concentrations are expected to lead to eutrophic conditions in the river, impacting the habitat and contributing to oxygen-stress. Maintaining water quality in the Latrobe catchment cannot be achieved through the provision of the recommended environmental flow regime alone.*

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<sup>11</sup> [https://www.water.vic.gov.au/data/assets/pdf\\_file/0027/476730/LVRRS-Environmental-Flow-Recommendations-Study-.pdf](https://www.water.vic.gov.au/data/assets/pdf_file/0027/476730/LVRRS-Environmental-Flow-Recommendations-Study-.pdf)

*Aside from these water quality threats from upstream, saline intrusion is a major consideration. **Saline intrusion events** into Dowds Morass are anticipated to become more frequent and last longer with **climate change, the associated sea level rise and reduced flows from upstream.***

## **WATER QUALITY**

### *4.6 Supporting functions: Water quality<sup>12</sup>*

*The environmental objectives relating to water quality for the Latrobe system are:*

- *Maintain adequate flows to reduce potential of prolonged stratified conditions in pools and promote adequate levels of water quality to allow fish and macroinvertebrate populations to persist.*
- *Maintain adequate flows to promote levels of water quality to allow fish and macroinvertebrate populations to persist, particularly through avoiding/reducing eutrophication and algal blooms.*
- *Limit surface water salinity to enable growth and reproduction of emergent vegetation and submerged aquatic macrophytes.*
- *Maintain freshwater supply to Latrobe Estuary, Dowd Morass, Sale Common, Heart Morass, and also associated freshwater/brackish habitats.*

When we look at the considerations needed for our future water management it is alarming that surface and groundwaters are still accorded a lower priority of natural capital and essential worth. It is to the future that Gippsland now look to our State and Federal governments for improved land use legislative and policy frameworks based on rational decision planning and capital accounting of the environments surface and ground waters.

The condition of Gippsland waterways was last assessed using the Index of Stream Condition in 2010 so the real condition is not known.<sup>13</sup>

#### ***Thomson basin***

*55% of stream length in good or excellent condition*

*41% in moderate condition*

***3% in poor condition***

***1% in very poor condition***

#### ***Latrobe basin***

*34% of stream length in good or excellent condition*

*44% in moderate condition*

***9% in poor condition***

***13% in very poor condition***

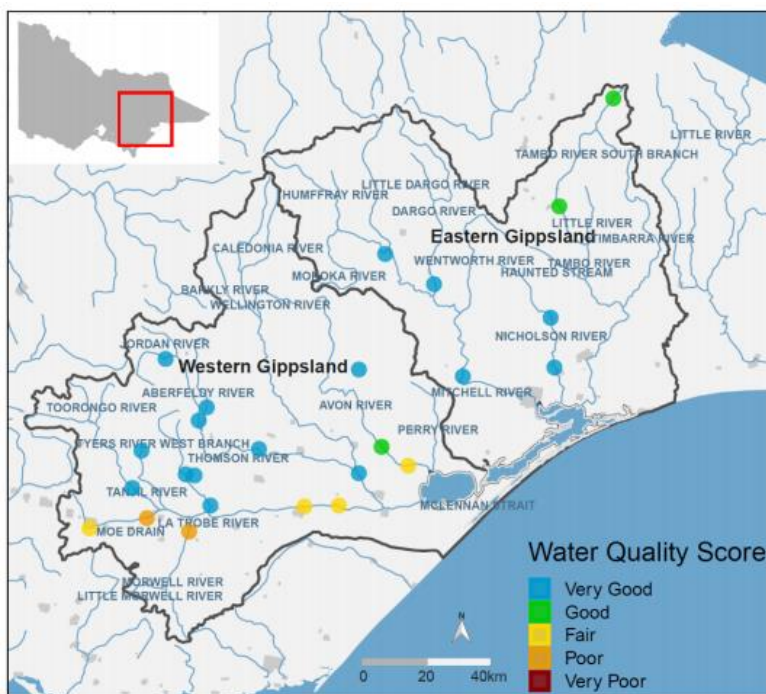
The Latrobe and Thomson Basin are the main contributors to poor surface water quality and sediment loading to the Ramsar listed Gippsland Lakes from upstream mining and agricultural processes.

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<sup>12</sup> [https://www.water.vic.gov.au/data/assets/pdf\\_file/0027/476730/LVRRS-Environmental-Flow-Recommendations-Study-.pdf](https://www.water.vic.gov.au/data/assets/pdf_file/0027/476730/LVRRS-Environmental-Flow-Recommendations-Study-.pdf) P97

<sup>13</sup> <https://www.wgcma.vic.gov.au/our-region/waterways/our-waterways>

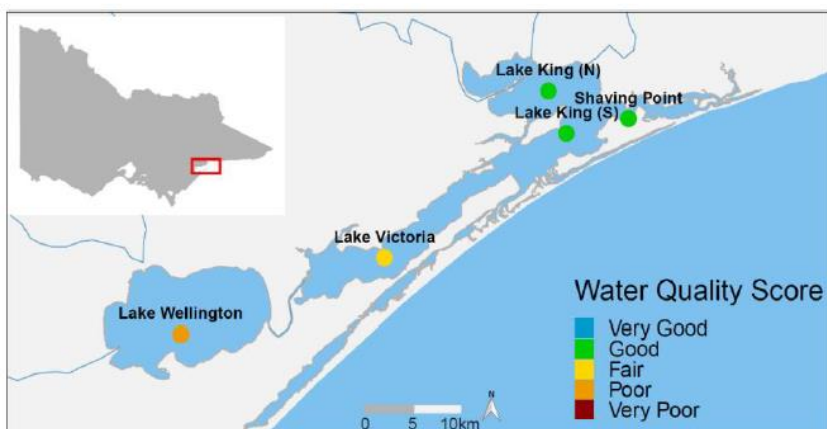




**Figure 14:** Location and WQI scores of DELWP's monitoring sites in the Gippsland Lakes catchment.

#### ***EPA Report Card for water quality 2018–19 Gippsland Lakes and catchment<sup>14</sup>***

*The Gippsland Lakes are a series of large, shallow coastal lagoons, 354 km<sup>2</sup> in size, and approximately 70 km in length. The lakes are connected to Bass Strait by a narrow, artificially maintained channel at Lakes Entrance. The catchment is 20,600 km<sup>2</sup> consisting of mostly state reserves, forests and national parks (60%) and rural land (39%). Five major river systems drain directly into the lakes and out into Bass Strait through the entrance. Report Card for Gippsland Lakes and the catchments is calculated using data from DELWP and EPA. In 2018–19, water quality varied from 'Very Good' in the majority of the catchments, to 'Poor' in the lower reaches of main rivers and Lake Wellington.*



**Figure 18:** Locations and WQI scores of EPA's long-term marine monitoring sites in Gippsland Lakes.

*In the 2018–19 period, the Gippsland region experienced drought. This reduced the volume of water coming into the Gippsland Lakes from rivers. **This water would bring pollutants such as sediment and nutrients.***

<sup>14</sup> <https://www.epa.vic.gov.au/about-epa/publications/1857>

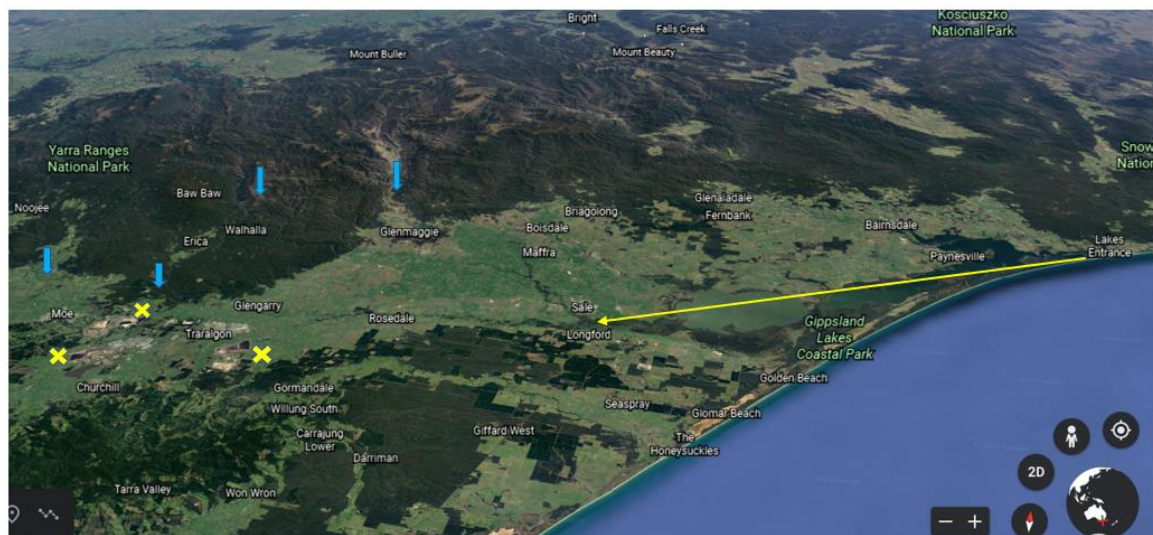


*Lake Wellington is a sink for sediments, nutrients and contaminants. Wind and waves within the shallow waters of the lake can resuspend sediments and nutrients. Algal blooms often develop because of the high availability of nutrients.*

## DEEP DREDGING OF LAKES ENTRANCE MOUTH INTO THE GIPPSLAND LAKES



Source photo<sup>15</sup>



- ✕ Latrobe Valley coal mines in the Latrobe catchment
- Incremental **expansion of salt wedge from deep dredging** of entrance
- ↓ Headwaters that flow into the Latrobe and Thomson catchments

The change in dredging regime since 2008 from side cast to trailing suction hopper dredge (TSHD) have had an enormous impact on salinity levels of the upper lakes and lower estuaries of the Latrobe River. Combined with surface water abstractions from the Thomson and Macalister Rivers freshwater input is required in the root zone to push the salt wedge back which has not been successful due to variable rainfall and entitlement rights. **The ability of the salt wedge to penetrate throughout the estuary depends entirely on the incoming river flows.**

<sup>15</sup> <https://www.infrastructurevictoria.com.au/wp-content/uploads/2019/04/Aither-Gippsland-Regional-Profile-March-2019.pdf>

A 10-year permit for dredged material under the Environment Protection (Sea Dumping) Act 1981 is due to expire in 2023.<sup>16</sup> Currently, the salt wedge influx from the deeper dredging is over 80km inland from the entrance.

*"The saltwater wedge has now progressed up the lake chain as far as the Port of Sale, and the high salinity in the Latrobe River threatens the adjoining Dowd and Heart Morass," he said. Rising salinity levels in the world-renowned Gippsland Lakes is putting the wetlands at risk, with a recent government report acknowledging it did not know the long-term risks of the problem.*

*Salinity levels have risen dramatically in recent years, threatening the ecosystem. The shoreline has been eroded and vegetation and fish species are dying.*

*Salinity levels have rapidly increased since dredging in 2008, which almost doubled the port depth to 5.5 metres.*

*A lack of freshwater inflows, evaporation and the permanent entrance to the ocean via Lakes Entrance have all contributed to the problem.<sup>17</sup>*

**What is in contention is whether the dredging is needed to the level it is and should it be raised 2 metres higher to reduce tidal speed, scour and salinity on the internal Lakes system.**

## **IMPACTS ON INTERNATIONALLY AND NATIONALLY SIGNIFICANT WETLANDS**

The Thomson and Latrobe catchments include five wetlands and wetland complexes that are listed as nationally important. The lower Thomson and Latrobe catchments contain part of the Gippsland Lakes Ramsar site and the nationally listed Lake Wellington Wetlands and Lake Victoria Wetlands.

## **HOW SLOW THE MACHINATIONS OF GOVERNMENT MOVE!**

Inquiry into Auditor-General's Report no. 202: *Meeting Obligations to Protect Ramsar Wetlands (2016)*<sup>18</sup> This was a follow-up inquiry responding to the 2016 VAGO audit<sup>19</sup> which considered whether the Department of Environment, Land, Water and Planning (DELWP) was meeting its obligations to protect Ramsar wetlands in Victoria. The Public Accounts and Estimates Committee determined they were along with setting numerous recommendations.

But how can DELWP be proactive if Melbourne Water are intent on pinching Gippsland's fresh water resources via augmenting inter-catchment transfer opportunities, Southern Rural Water (SRW) is doing a great job at overallocating our already depleted water resources and Gippsland Ports are overseeing a deep dredging nightmare allowing fast tidal inflows to impact fresh-water flow dependent habitats and scouring of ecological requirements for migratory birds to name a few.

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<sup>16</sup> <https://www.gippslandports.vic.gov.au/wp-content/uploads/2017/05/Ten-Year-Sea-Dumping-Permit-SD2013-2442.pdf>

<sup>17</sup> <https://www.theage.com.au/national/victoria/salinity-levels-continue-to-cause-concern-for-gippsland-lakes-20141128-11w6ot.html>

<sup>18</sup> <https://www.parliament.vic.gov.au/paec/inquiries/article/4521>

<sup>19</sup> <https://www.audit.vic.gov.au/report/meeting-obligations-protect-ramsar-wetlands?section=>

A 2016 audit report<sup>20</sup> by the Auditor General assessed how effectively Victoria's Ramsar wetlands are being managed. It found:

- *a number of effective on-ground management outcomes, but not clearly linked to management plan actions or risks.*
- *Improved needed for governance, coordination and oversight to effectively meet its obligations under the Ramsar Convention.*

*Systemic issues in environment management:*

- *complicated and poorly coordinated governance arrangements*
- *a lack of oversight and accountability*
- *limitations in data leading to poor evaluation*

*Recommended*

- *Robust governance arrangement for managing Ramsar sites*
- *Oversight of management plans*
- *Statewide monitoring, evaluation and reporting framework*

**Case study: Restoring habitat for the little tern and fairy tern at Gippsland Lakes**

At Gippsland Lakes, Parks Victoria used adaptive management to restore habitat and breeding grounds for the little tern and fairy tern—threatened migratory birds. The ecological character description (ECD) for the site includes the presence and breeding of the terns as part of the Gippsland Lakes ecological character. However, because of the poor quality of the habitat, terns had not used Crescent Island in Lake Victoria for more than six breeding seasons.

From May to June 2015, sand from dredge sites was relocated to Crescent Island and Pelican Island to address erosion, alongside targeted revegetation. The project resulted in 19 fairy tern fledglings and eight little tern fledglings being raised at these islands. Also, three pairs of endangered hooded plovers nested on the new habitat and raised six fledglings between them. More than 20 species of non-threatened birds also used the new habitat at Crescent Island.

Source: VAGO based on information provided by Parks Victoria.



The real story behind this is the deep dredging of the entrance **causes** increased tidal flows scouring the sand surface off Gippsland Lakes inner islands impacting nesting sites to endangered fauna so they had to replace the sand to restore habitat.

A 2003 updated Flora & Fauna Guarantee Action Statement<sup>21</sup> noted,

**Intended Management Action**

- These actions will be undertaken by the Gippsland Area CNR:  
...**tidal fluctuations is a problem to be overcome.**

**Other Desirable Management Action**

<sup>20</sup> <https://www.audit.vic.gov.au/report/meeting-obligations-protect-ramsar-wetlands?section=>

<sup>21</sup> [https://www.environment.vic.gov.au/data/assets/pdf\\_file/0024/32874/Little Tern Sterna albifrons sine nsis.pdf](https://www.environment.vic.gov.au/data/assets/pdf_file/0024/32874/Little_Tern_Sterna_albifrons_sine_nsis.pdf)

- Obtain from the Port of Melbourne Authority a **longterm plan for dredging in the Gippsland Lakes** and other estuaries within East Gippsland.

**IRONY** – Gippsland Ports deep dredging contributed to the problem with consequential speed of tidal flows, gets a grant to fix it,<sup>22</sup> then wins a prize<sup>23</sup> while initial problem of deep entrance dredging still remains. **How's that for a management plan?**

## IRRIGATION

### **NWI - Assigning Risks for Changes in Allocation**

48. *Water access entitlement holders are to bear the risks of any reduction or less reliable water allocation, under their water access entitlements, arising from reductions to the consumptive pool as a result of:*

- (i) seasonal or long-term changes in climate; and*
- (ii) periodic natural events such as bushfires and drought.*

49. *The risks of any reduction or less reliable water allocation under a water access entitlement, arising as a result of bona fide improvements in the knowledge of water systems' capacity to sustain particular extraction levels are to be borne by users up to 2014. Risks arising under comprehensive water plans commencing or renewed after 2014 are to be shared over each ten year period in the following way:*

- i) water access entitlement holders to bear the first 3% reduction in water allocation under a water access entitlement;*
- ii) State/Territory governments and the Commonwealth Government to share one-third and two-thirds respectively reductions in water allocation under water access entitlements of between 3% and 6%; and*
- iii) State/Territory and Commonwealth governments to equally share reductions in water allocation under water access entitlements greater than 6%.*

**If the water resources become overallocated with new water plans, will the same percentage reductions, as noted in NWI paragraphs 48 and 49, continue with all entitlements holders, including environment, proportionately suffer?**

## OVERALLOCATION OF OUR WATER RESOURCES

Investing in efficient water systems in Gippsland has certainly benefitted the agricultural sector but economic development for agriculture should not be at the expense of degrading the environment further. Productivity should actively provide for each region's competing water uses with a greater emphasis on justifying rational planning proposals to support overall economic & environmental health.

**To enable the siloing of instrumentalities in roles without subscribing to a criterion of shared and considered understanding will continue to contribute to poor policy devoid of rational decision-making.**

<sup>22</sup> <https://www.timbull.com.au/newsroom/media/date/2018/5?catid=1&start=6>

<sup>23</sup> [https://www.marineandcoasts.vic.gov.au/data/assets/pdf\\_file/0024/405717/Victorian\\_Coastal\\_Awards\\_2018\\_WebBooklet\\_2.pdf](https://www.marineandcoasts.vic.gov.au/data/assets/pdf_file/0024/405717/Victorian_Coastal_Awards_2018_WebBooklet_2.pdf)



## NWI - Water Resource Accounting

### Outcome

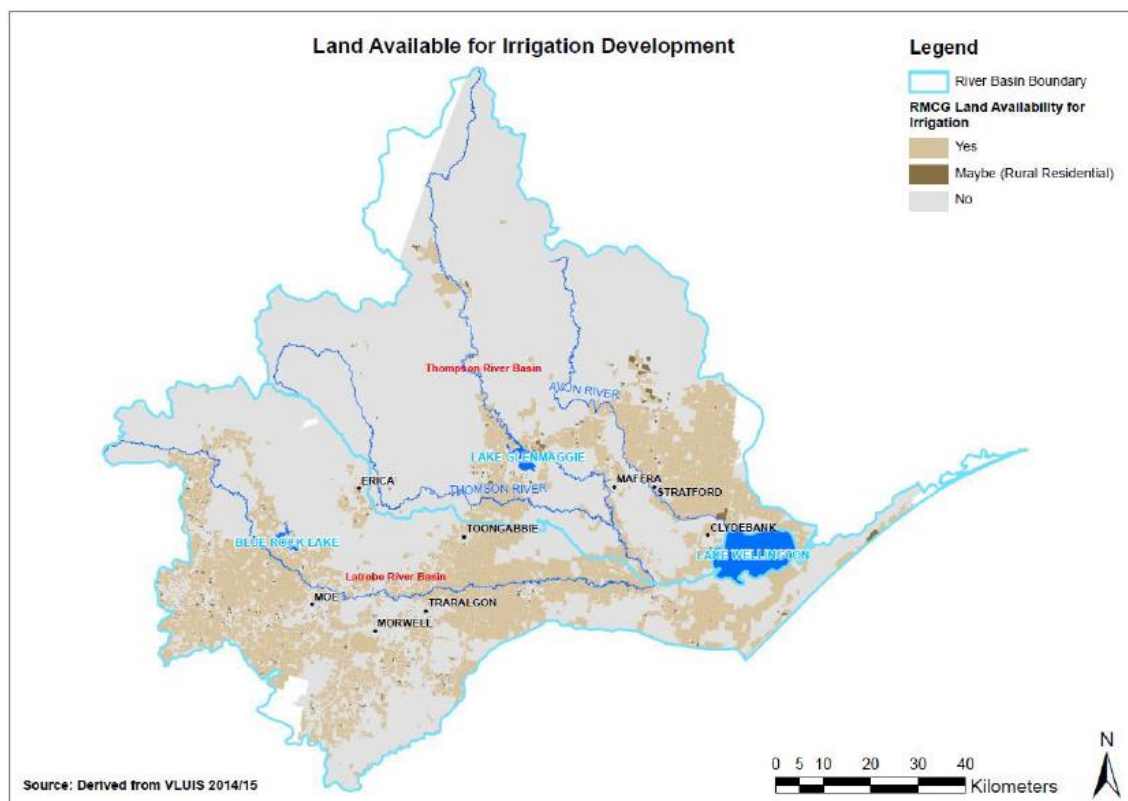
80. The Parties agree that the outcome of water resource accounting is to ensure that adequate measurement, monitoring and reporting systems are in place in all jurisdictions, to support public and investor confidence in the amount of water being traded, extracted for consumptive use, and recovered and managed for environmental and other public benefit outcomes.<sup>24</sup>

### Can it be critiqued that the State and water authorities have achieved this outcome 80?

Presently, the authority charged with take and use water licences in Gippsland, Southern Rural Water (SRW) is offering up irrigation potential, again [August 2020], even though feasibility studies in 2018 under the Australian Government National Water Infrastructure Development Fund (NWIDF) proved economically unviable to farmers.

What was offered to dryland farmers in 2018 fell over due to poor economics.<sup>25</sup>

So, SRW has offered up the same proposals again<sup>26</sup> to expand irrigation in Gippsland threefold when environmental flows are normally in a stressed condition and the rehabilitation of the Latrobe Valley three large coal pits are yet to be finalised. A potential 2,780 GL could be needed to fulfil full pit lake option allowing approx. 15GL top up per year for evaporation.



**THIS IS HOW WATER RESOURCES BECOME OVERALLOCATED**

<sup>24</sup> <https://www.pc.gov.au/inquiries/completed/water-reform/national-water-initiative-agreement-2004.pdf>

<sup>25</sup> <http://www.srw.com.au/wp-content/uploads/2018/06/SVID-FAQs-updated-June-web-final.pdf>

<sup>26</sup> <http://www.srw.com.au/central-gippsland-irrigation-study-funding/>

As a water corporation and 'so-called' responsible authority, SRW have a range of functions including -

- Irrigation Supply,
- Licensing access to water from groundwater and rivers,
- Managing Large Dams and Weirs to harvest, store and deliver bulk water entitlements for their own irrigation customers, urban water authorities and Latrobe Valley power generators.

Consequently, their obligations and priorities vary considerably to their separate customer groups. Whilst their strategic focus is used for irrigation, industrial and urban supply, they are supposed to **manage it sustainably and responsibly to maximise its economic value with minimal environmental impact.**

Expanding irrigation in Gippsland,

- Is not sustainable,
- Will not promote climate resilience
- Is environmental irresponsible
- Puts at threat viable recreational and tourism assets
- Is a conflict of interest for their regulatory and legislative commitments to balance environmental, economic and social outcomes
- Shows a lack of understanding to the numerous complexities for hydrogeology and impacts to our groundwater and catchments

## **ALTERNATE WATER**

Using alternate water in Gippsland on a large scale is now an option because of the need to find an alternate water source for the rehabilitation of the three Latrobe Valley coal mines with water.<sup>27</sup> This could result in a government invested pipeline from the large urban and regional treatment plants. Value adding could then allow access to same recycled water to expand and/or supplement irrigation in Gippsland which is an objective of the NWI to enable our regions to be drought resilient.

### **Melbourne water**

*Rainwater, stormwater, and recycled water resources present opportunities to adapt to climate change and population growth. Increasing our use of these diverse sources of water is a key element of the portfolio approach outlined in this strategy, discussed further in Chpt 6.*<sup>28</sup>

However, if recycled water is the preferred option for rehabilitation, could government investment in pipe infrastructure actually work against Gippsland and irrigators to import a contamination problem into our waterways. There is growing evidence that the beneficial use aspect of biosolids and recycled water are not so beneficial after all.

**Worst, it would appear from all the current reviews associated with Australian guidelines for water recycling the water industry do not want to have to deal with PFAS, in particular.**

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<sup>27</sup> [https://www.water.vic.gov.au/data/assets/pdf\\_file/0030/477057/LVRRS-Alternative-Water-factsheet.pdf](https://www.water.vic.gov.au/data/assets/pdf_file/0030/477057/LVRRS-Alternative-Water-factsheet.pdf)

<sup>28</sup> [https://www.melbournewater.com.au/sites/default/files/2017-09/Melbourne-Water-System-Strategy\\_0.pdf](https://www.melbournewater.com.au/sites/default/files/2017-09/Melbourne-Water-System-Strategy_0.pdf) P51

These national guidelines have been developed under the auspices of the National Water Quality Management Strategy (NWQMS) but is the process fully transparent, are the studies used up to date and could there be potential legal implications on its use. If piped recycled water becomes available to the mine operators for rehabilitation could/will that same pipeline provide farmers with access to a new source of water?

**But it is to the review guidelines with National Water Quality Management Strategy<sup>29</sup> that prove this undermining of our human rights to be protected by 'responsible authorities' to ensure our receiving environment and the food we eat is, in fact, safe.**

*Explanatory Paper on Draft Revisions to Public Health Components of the Australian Guidelines for Water Recycling:*

*Managing Health and Environmental Health Risks (Phase 1)*

**SCOPE OF CHANGES**

*The revision is restricted to updating components relating to human health risks based on data and information published since the Phase 1 document was finalised in 2006. This includes a range of Australian data produced to support application of the guidelines.*

*The primary changes are to Chapter 3 (Managing Health Risks in Recycled Water), Chapter 5 (Monitoring) and Appendix 2 (Calculating Microbial Targets) with limited changes to Chapters 1 (Introduction) and 2 (Management Framework) and Appendix 3 (Preventive Measures). The environmental risk components (e.g. Chapter 4 Managing Environmental Risks) have not been reviewed. The principles and the basic structure of the Guidelines are strongly supported and have not been changed.*

*Chapter 4 and 6 (Consultation and Communication); Appendices 1 (Case Studies), 4 (Environmental Risk Assessment), 5 (Environmental Reference Tables), 6 (Nutrient and Buffer Strips) and 7 (Communication Case Studies) have not been changed and are not included in the consultation draft. They will be retained in the final version. These Chapters and Appendices can be downloaded from the existing guidelines at:*

**3.3. Chapter 3 Managing health risks in recycled water**

*The chapter has been updated using new data (largely from 2015-2016) to refine default concentrations of pathogens in sewage (virtually no change). Unlike the existing data used in the 2006 version the new data has been published (Deere and Khan 2016; King et al 2017)<sup>30</sup>*

A submission for the PFAS Draft NEMP2 by VicWater,<sup>31</sup> peak industry association for water business in Victoria, articulates this well in the following,<sup>32</sup>

5. ***Beneficial reuse of biosolids and recycled water*** will require a holistic and health-centric approach, which will need to be articulated more clearly. There is a current dichotomy between the current mandate to encourage beneficial reuse of biosolids and recycled water, versus the (as yet unknown) risk of PFAS potentially impacting human health. Biosolids applications on land could potentially lead to future health impacts and landfilling causes

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<sup>29</sup> <https://www.waterquality.gov.au/about>

<sup>30</sup> <https://www.waterquality.gov.au/guidelines/recycled-water>

<sup>31</sup> <https://vicwater.org.au/about-us/>

<sup>32</sup> <https://vicwater.org.au/2019/06/20/vicwater-pfas-draft-nemp2-submission/>

*potential detrimental leachate. Clear expectations relating to the disposal and/or treatment of PFAS are needed.*

- *It is suggested that federal and state governments:*
  - *Support further research to understand the environmental and human health risks from the use of PFAS contaminated biosolids and recycled water.*
  - *Articulate a holistic and health-centric approach, and incentivise and appropriately resource solutions to develop new innovative solutions to treating and disposing of PFAS.*
- 6. **Guidance:** *There appears to be confusion over whether the NEMP2 is a legally binding document or a guidance document (a standard). Questions were raised as to whether there are transition plans in place to support water corporations towards reducing PFAS levels. Further, the document states that “further work, in collaboration with the water industry, will be undertaken to establish criteria and guidance for water authorities and environmental regulators based on current science” (Section 15, Wastewater Treatment, p.61), without stating a timeframe...*
- 7. **Customer willingness to pay:** *the Victorian Essential Services Commission’s (ESC) PREMO approach stipulates extensive customer consultation to determine a water corporation’s future expenditure. In light of PFAS sampling and treatment resource intensity, uncertainty around surrounding research findings and potential health impacts, this approach could prove challenging. If water corporations were to reduce PFAS during its treatment processes, the cost of upgrading and/or changing infrastructure would be substantial. Consultation relating to PFAS has been undertaken with industry; not with the broader community (yet), which will be of a sensitive nature.*
  - a. *It is suggested that:*
    - i. *EPA Victoria consult with the ESC as to next steps relating to willingness-to-pay consultation and/or potential incorporation into the Statement of Obligations (SoO).*
    - ii. *A concise community message plan be developed, including watching briefs.*

**This review should be mindful of Victoria’s new laws intended to commence on 1 July 2021 under the Environment Protection Act 2017<sup>33</sup> for the management of contamination which includes PFAS. Transparent disclosures and legal liability should be established prior to its expanded use.**

*Contaminated land can be dangerous to the environment and human health. If you’re managing or controlling land, you have an obligation to manage the contamination risks.<sup>34</sup>*

FLoW is also concerned that no baseline levels exist in our Gippsland waterways and that evidence of indicative species for ecotoxicity testing for sediment weight-of-evidence toxic scoring system (Vic Draft SEPPS) is not a true reflection how the SEPPS will protect human and environmental health as this subsurface system (Groundwater Dependent Ecosystems) has already been greatly impacted.

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<sup>33</sup> <https://www.legislation.vic.gov.au/in-force/acts/environment-protection-act-2017/004>

<sup>34</sup> <https://www.epa.vic.gov.au/for-business/new-laws-and-your-business/manage-contaminated-land>



### ***Sediment toxicants and ecotoxicity***

*The benthic environment (i.e. the surface and sub-surface layers of sediment) have an important role in the storage and transport of toxicants. The Draft SEPP (Waters) proposes the use of indicator species for ecotoxicity testing, using a sediment weight-of-evidence toxicant scoring system. This inclusion in the Draft SEPP (Waters) will mean that if an emerging chemical causes toxicity to biota, then this should trigger further investigation to determine if the levels of this chemical are likely to cause harm to beneficial uses. This approach will provide a sensitive indicator of emerging chemicals and help to identify toxicity of complex chemical mixtures and reflects the science that has been developed for the new ANZECC guidelines, which are expected for release in 2018.<sup>35</sup>*

- **Emerging and legacy contaminants across land-use gradients and the risk to aquatic ecosystems 2019<sup>36</sup>**

- **Evidence of PFAS in treatment plants**

*PFAS in sewage treatment plant effluent and biosolids are a contaminant of concern for the wastewater industry, waste management industry and EPA. Landfills and sewage treatment plants can be considered vectors for PFAS from residential, industrial and commercial sources into the environment, as PFAS are not readily attenuated in landfills or sewage treatment plants due to their high solubility.<sup>37</sup>*

- **Evidence of PFAS entering groundwater from recycled water irrigation**

*Although wastewater is well-documented point source of PFASs to the receiving environments, such as rivers and oceans ... irrigation using treated wastewater may potentially distribute PFASs in a diffuse manner and its impact on groundwater is not well documented...*

*Victorian regulations require that recycled water must be chlorinated and UV-treated prior to use (EPA Victoria, 2003). **However, these treatment techniques do not remove PFASs from wastewater and oxidation treatment processes can also contribute to the formation of perfluoroalkyl acids (PFAAs) from precursor PFASs...***

*Considering that PFAS may persist in groundwater for centuries or longer, **the impacts of this type of contamination may have far-reaching implications for wastewater treatment providers, and the level of treatment required to eliminate persistent organic pollutants such as PFAS from recycled water.***

*...The occurrence of PFASs in recycled water impacted groundwater in the Melbourne region have been presented in this study. The use of contaminated recycled water from a WWTP [wastewater treatment plant] for irrigation and subsequent groundwater infiltration has far-reaching implications throughout the world. The use of both recycled water or groundwater contaminated with PFAS will result in the redistribution of PFASs in the environment. This redistribution of PFAS may then result in the risk of human exposure as the water is used for drinking and agriculture (Bräunig et al., 2017) and requires further research.<sup>38</sup>*

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<sup>35</sup> <https://www.water.vic.gov.au/waterways-and-catchments/rivers-estuaries-and-waterways/state-environment-protection-policy> P44

<sup>36</sup> <https://pubmed.ncbi.nlm.nih.gov/31426001/>

<sup>37</sup> <https://www.researchgate.net/publication/336603065> PFAS concentrations of landfill leachates in Victoria Australia - implications for discharge of leachate to sewer/link/5da7ebc3299bf1c1e4c8404d/download

<sup>38</sup> <https://www.researchgate.net/publication/326491603> Investigating recycled water use as a diffuse source of per-

## URBAN

FLoW's concern is the potential for Melbourne Water to incrementally harvest Gippsland's water via intercatchment transfers with the construction of pipelines to connect water storages. Potable water use across the urban and regional/rural grids are not given the same economic capital worth so, as a commodity, has a broad range of values. As natural capital for the ecoservice it provides, regional land use policy promotes its use and abuse by mining and allowable wastewater discharges into Gippsland waterways. **This must change.**

Market mechanisms and appropriately managed risks are significantly different for Gippsland to those in northern Victoria due to hydrological connectivity, diverse and growing mining industry and varied consumptive demands that appear to have some non-negotiables to transfer entitlements.

Could it be that facilitating water trading between and within the urban and rural sectors will have unintended consequences to that originally envisioned by the NWI. With a growing population, urban water's insatiable need for potable water vs irrigators security of supply vs environmental need could create water wars. Infrastructure funding has enabled the water grid to inter-connect with other water storages but also to augment intercatchment transfers between authorities.<sup>39</sup> The disconnecting of entitlements tied to the land also has the ability for urban authorities to purchase 'Wet Farms' in the Macalister District (MID), sold off as dry farms and the original properties water right will remain in the Thomson Dam and be diverted to Melbourne.

As population growth is centred in the urban area, taking water from the regions could be problematic if barriers no longer exist.

Under what criteria and authority determines who gets to keep their water allocation and who does not?

**Ultimately, can the power, which lies in our governments, be fair and rational as water management is spread across too many different departments/agencies, all with different policy settings and customer requirement for water in each regional area.**

Decision making around supply augmentation is a flawed process creating future uncertainty with surety of water supply for existing consumptive users potentially leading to economic losses to the region water was taken from.

## FUTURE

With a focus on balancing our precious water resources, expanding mining with its enormous water footprint, linking irrigation to unsustainable agriculture and resources, introducing potential environmental contamination through increased use of recycled water while

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[and polyfluoroalkyl substances PFASs to groundwater in Melbourne Australia?enrichId=rgreg-7b33bb4cf6a041afa2cb9ab44129c4f4-XXX&enrichSource=Y292ZXJQYWdlOzMyNjQ5MTYwMztBUzo2NjczMDExNzUxMTk4NzJAMTUzNjEwODQwNjE2OA%3D%3D&el=1 x 3& esc=publicationCoverPdf](#)

<sup>39</sup> <https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/4715/3992/7692/Central Region SWS draft report.pdf>

promoting increased harvesting and movement throughout the water grid will undermine confidence in our regional economies.

**Can environmental watering achieve the desired objectives when irrigation takes precedence?**

*Lake Glenmaggie is the major water-harvesting storage regulating the Macalister River. Maffra Weir is a small diversion weir located further downstream in Maffra.*

*Before the construction of Lake Glenmaggie, the Macalister River would regularly receive high and medium flows in winter and spring. Although Lake Glenmaggie regularly spills, high flows are less frequent than natural because much of the water is captured by the storage.*

*A notable impact of irrigation and water-harvesting is reversed seasonality of flows between Lake Glenmaggie and Maffra Weir. Summer flows through this reach are much higher than natural due to the delivery of irrigation water. Winter flows in this reach are lower than natural because a high proportion of the inflows are captured and there are no irrigation demands over winter. Below Maffra Weir, most flows are diverted for irrigation in summer/autumn.*

***The changed hydrology restricts fish migration, limits the growth and recruitment of in-stream and streamside plants and reduces the quality of in-stream habitat.***<sup>40</sup>

Ultimately, there needs to be effective cross-jurisdictional collaboration in all Federal and State departments that use or impact on water resources to ensure no further degradation of our natural capital.

- Appropriate datasets need to be urgently updated and increased to advise rational decision-making.
- Community representation and transparency needs to be assured.

We look forward to reading the Commission's findings in due course.

Tracey Anton

*Friends of Latrobe Water.*



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<sup>40</sup> <https://www.vewh.vic.gov.au/rivers-and-wetlands/gippsland-region/macalister-river>