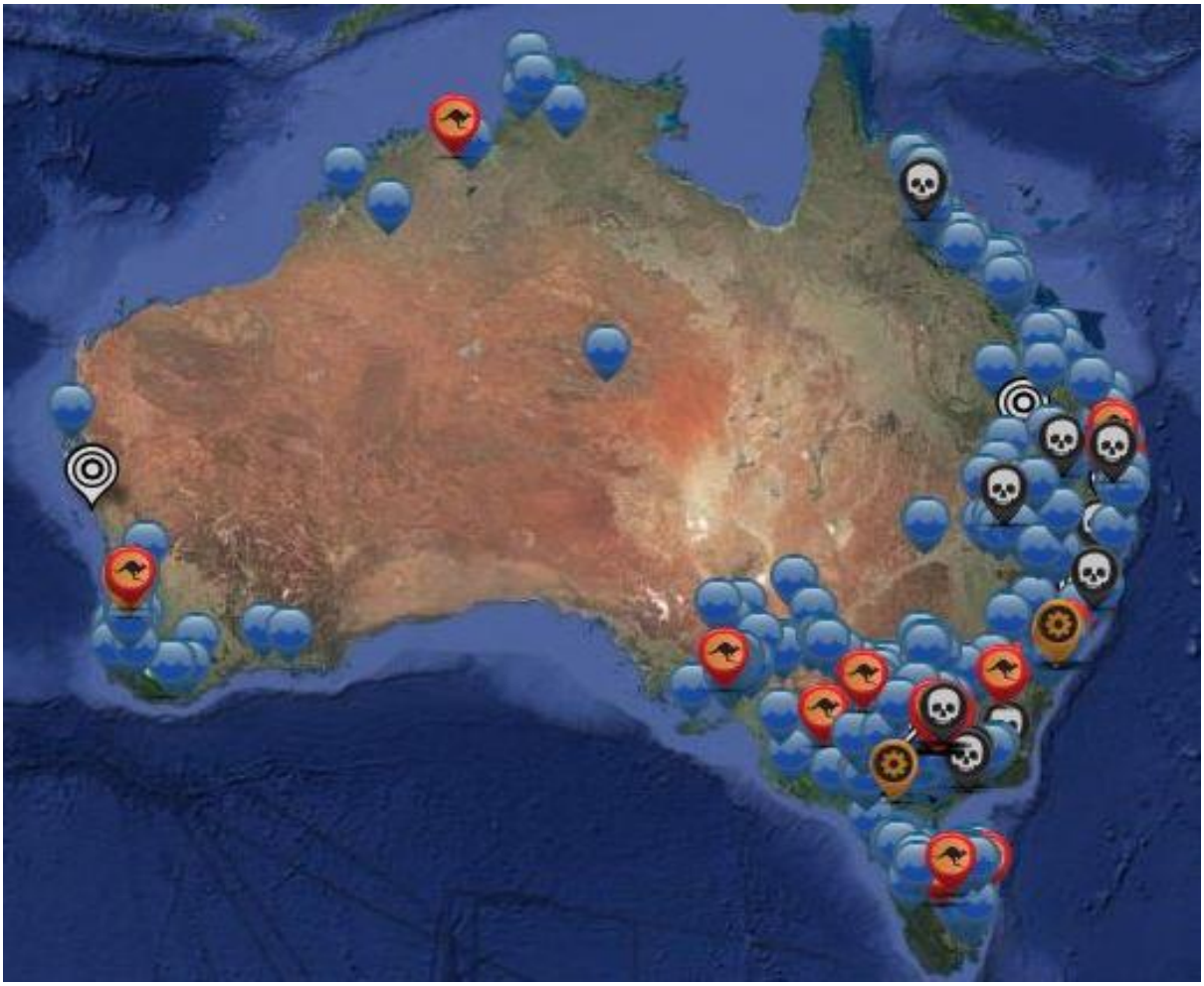
Pesticides in Australian Waterways Overview

"A Jigsaw with a Billion Missing Pieces"



Friends of the Earth Australia

Report and maps compiled by Anthony Amis

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Introduction

Since the early 2000's, FoE has been gathering information about pesticide incidents in Australia. The majority of this information concerns pesticide detections in waterways.

Limited scientific reports on pesticide pollution of waterways in Australia occurred before 2005, so Freedom of Information (FoI) requests to water authorities, particularly in Victoria, made up a large source of the information that FoE received.

Water authorities did some amount of testing for a range of pesticides, but the range varied depending on resources or policies of each particular water authority. Accrding to the FoI's, some water authorities, eg Barwon Water screened for ~70 pesticides a few times a year, whilst others tested for a handful only once a year. Consistency in monitoring across the state did not appear to occur, even in heavily population regions.

Melbourne Water for instance, up to 2005, only tested for several phased out organochlorines and 2,4-D (Atrazine testing only started in 2005) ***(154).*** **Yet the Yarra River, the source of drinking water for one third of Melbourne's population, drained some of the most intensively farmed land in the country, with hundreds of pesticides being used.**

After several FoI requests over a couple of years, it became clear that a range of pesticides were being detected, yet only a very small percentage were actually tested for, meaning that the extent of the problem was largely unknown.

It wasn't until 2007/8 with the Publication of ***"Pesticide Residues in Victorian Waterways- A Review"*** ***(152)*** **that the Victorian Government began to take the issue more seriously, however it was evident that this publication had not sourced information directly from water authorities, as there were many pesticides that had been picked up by water authorities, but not published in that report.**

Since 2007/8 there have been several impressive scientific initiatives, particularly in Victoria, to address the previous lack of information. This is encouraging and requires ongoing support from Government.

The situation in Victoria was not unique. For much of Queensland and New South Wales for example, the situation was arguably worse, because in those states local government is mostly responsible for monitoring of drinking water supplies. What resources do local councils have to properly test for contaminants in their water supplies?

During the 2000's, the Great Barrier Reef issue in Queensland began to dominate pesticide and waterway research in Australia, although the Tasmanian Government also initiated an impressive testing regime in 2005 which unfortunately stopped in July 2014 just as the most "interesting" results were occurring.

People associated with Friends of the Earth pulled together the idea of a National Pesticide Map in 2015 as a way of presenting pesticide hotspots around Australia and as a means of showing the extent of pesticide contamination across Australia and its inter-generational legacy. A large portion of information used in this report has been sourced from the Australian Pesticide Map.
https://pesticides.australianmap.net/

Australian Drinking Water Guidelines

The Australian Drinking Water Guidelines (ADWG), published by the National Health and Medical Resource Council (NHMRC) have a number of Chemical Fact sheets that provide drinking water guideline levels for hundreds of chemicals, including pesticides. One problem with the fact sheets is that the sources relating to Australian pesticide detections, appear to be limited. It is apparent that the NHMRC do not get information on pesticide detections directly from water authorities, but rather rely on information sourced from a limited range of published scientific reports.

Because of this problem, not only are there limitations in the NHMRC methodology regarding detections of particular pesticides, but also it is unclear how the NHMRC determine which pesticides/chemicals should have a guideline and which ones shouldn't. For instance the ADWG provides guidelines for a number of pesticides which have never been detected in Australian waterways, and no guideline levels for a range of pesticides that have been regularly detected in Australian waterways. This study confirms this.

Surely a way to resolve this issue would be for the NHMRC to contact every water authority in the country and ask for their positive water sampling data. A list could then be generated and work done to determine guideline levels for the pesticides most detected and most toxic of chemicals that currently do not have guidelines. This list would also be useful in determining the range of pesticides tested for and how regularly such tests are occurring.

Such information vacuums are not surprising when one understands that there is no Government Agency in Australia set with the task of monitoring biocide usage. As a result water authorities, and the NHMRC, have little idea about exactly what pesticides are being sprayed in water supply catchments across Australia and in what quantity, let alone what types of pesticides and in what concentrations could be entering water supplies.

Whilst not the fault of the water authorities or the NHMRC, this is a sad reflection of the *'cone of silence'* that effectively safeguards chemical users and manufacturers from outside scrutiny. The legislation and regulations that allow for the use of pesticides in Australia could be described as being obsolete, disjointed and set to safeguard the interest of manufacturers and polluters, rather than safeguarding the Australian public from the potential poisoning of their drinking water.

This report should not been seen as being authoritative, but rather the cobbling together of information accumulated over the years. Some of this information has never seen the light of day and some has. Almost all of the information is referenced, however there is some information gleaned from 'old' untitled government reports, where stating exact references was problematic. There is bound to be a large amount of information missing or not located before publication, but due to a number of limitations this information could not be included in this edition.

The report collates results taken from grab samples, which are limited in terms of profiling concentrations of pesticides over a length of time. Results gained from other sampling methods such as passive samplers have not been included in this study. The ADWG's have guidelines which appear to accept grab samples only, a sample taken to represent a moment in time, rather than passive samplers which can monitor pollution levels of a longer period of time eg a month. Also note that all measurements used in this study are micrograms per litre represented as µg/L.

Also note that pesticide detections in this report are based on locations, meaning that if multiple detections at one site have been found, only one detection (the highest) will usually be reported.

There also is a bias in the data in that much of it relates to testing carried out over the past thirty years, particularly the past ten. Before this time, there was almost no testing for pesticides in Australian waterways, so for the years immediately following WWII through to the early 1970's we have next to no information. It is highly likely that organochlorines such as DDT would far outweigh many of the recently detected pesticides, but it is impossible to try to quantify these information gaps.

ANZECC Guidelines

The Australian and New Zealand Guidelines for Fresh and Marine Water *(153)* were published in 2000. They provide information and a framework for interested parties regarding what levels of toxicants in waterways could cause environmental harm. They offer trigger levels for waterways based on the condition of the waterway. (eg high conservation value waterways will be offered a trigger level of 99%, whereas more disturbed waterways are given trigger levels

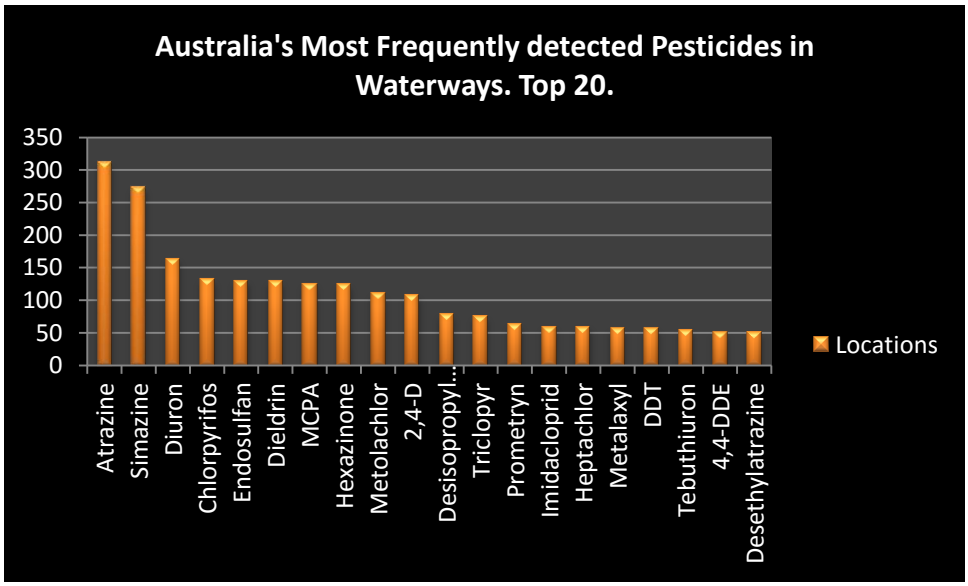
of 95%, 90% or 80%). Many urban streams for instance will be given a trigger level of 80%, meaning that because this waterway is regarded as being degraded, a lower trigger level for environmental protection is granted than a pristine waterway. Generally speaking, the lower the trigger level, the higher amount of toxicant is granted. This report has listed trigger levels for the handful of pesticides granted trigger levels under the ANZECC Guidelines given the reader an easy way to determine if ANZECC guidelines have been breached.

Clarification of Pesticides Listed

This report lists pesticides that are listed as Fact Sheets in the 2011 Australian Drinking Water Guidelines and those with trigger levels published under the 2000 ANZECC Guidelines. It also lists pesticides that have been detected in Australian waterways, but not listed in either ADWG or ANZECC Guidelines.

Findings

- **186 pesticides have been detected in Australian waterways,**
- **Triazines/Triazinones account for ~28% of these detections,**
- **~41% of pesticides detected in Australian waterways do not have ADWG levels,**
- **~35% of detections have ADWG levels,**
- **~21% of pesticides with ADWG levels, have not been detected in Australian waterways.**
- **75% of AGVET chemicals registered for use remain untested in Australian waterways,**
- **10.9% of pesticides detected in Australian waterways have ANZECC Guidelines**
- **3.5% of all AGVET chemicals registered for use in Australia have ANZECC Guidelines**

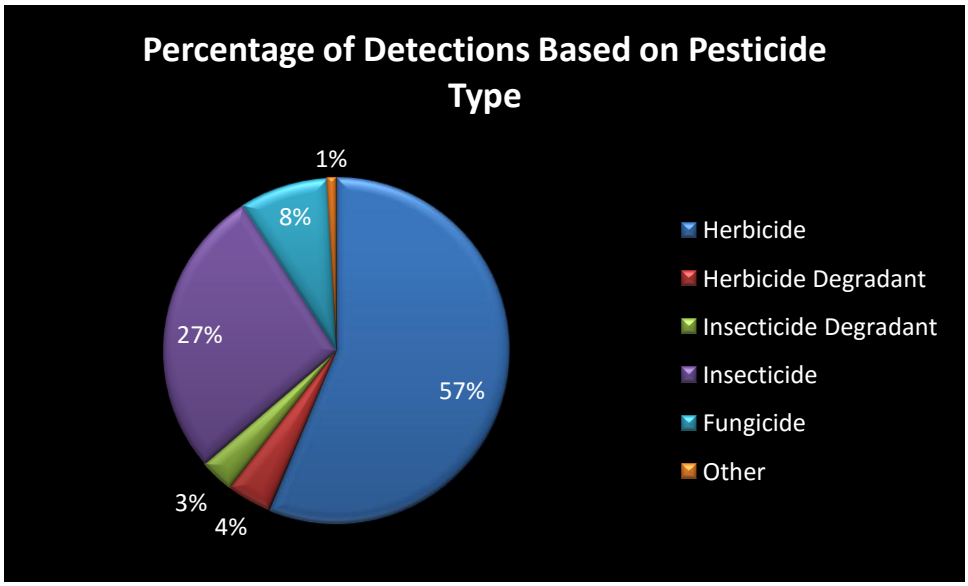


This study has found a total of 186 different pesticides (and metabolites) that have been detected in thousands of locations in Australian waterways through a variety of scientific reports and testing by water authorities. Triazine herbicides, Atrazine, Simazine and Prometryn dominate the list.

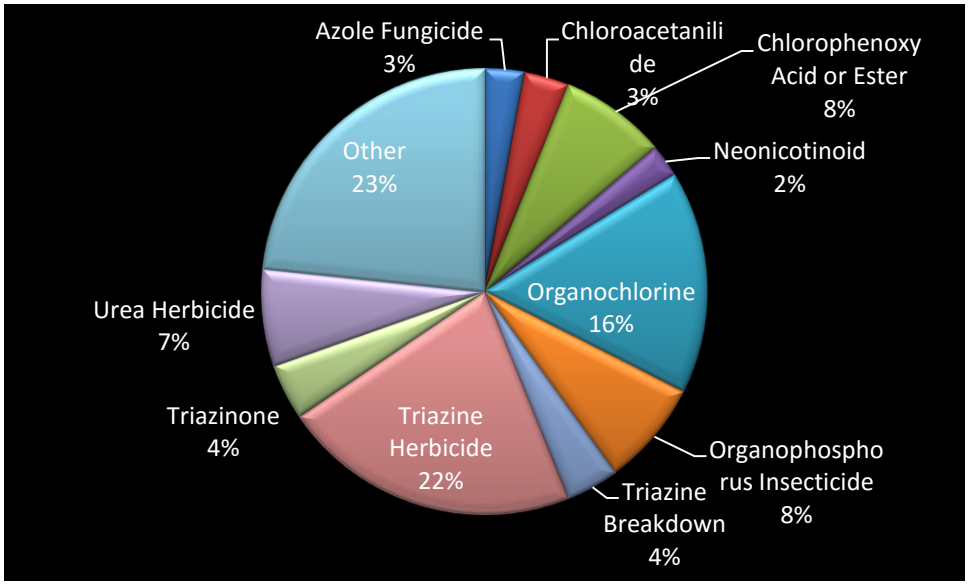
If you also include the metabolites of Atrazine and Simazine (Desisopropyl Atrazine and Desethylatrazine) and the herbicides Ametryn, Terbutryn as well as

Triazinones such as Hexazinone and Metribuzin, ~28% of all locations where pesticides have been detected relate to triazines/triazinones.

It is also worth noting that although Glyphosate is the most commonly used herbicide in Australia, only 32 locations of water pollution from Glyphosate could be located in the research. This can partly be explained by water authorities having a rather blasé approach to Glyphosate, regarding it as having limited ability to runoff and having a low toxicity in relation to a host of other pesticides. Because of this it is rarely tested for or not focused on.

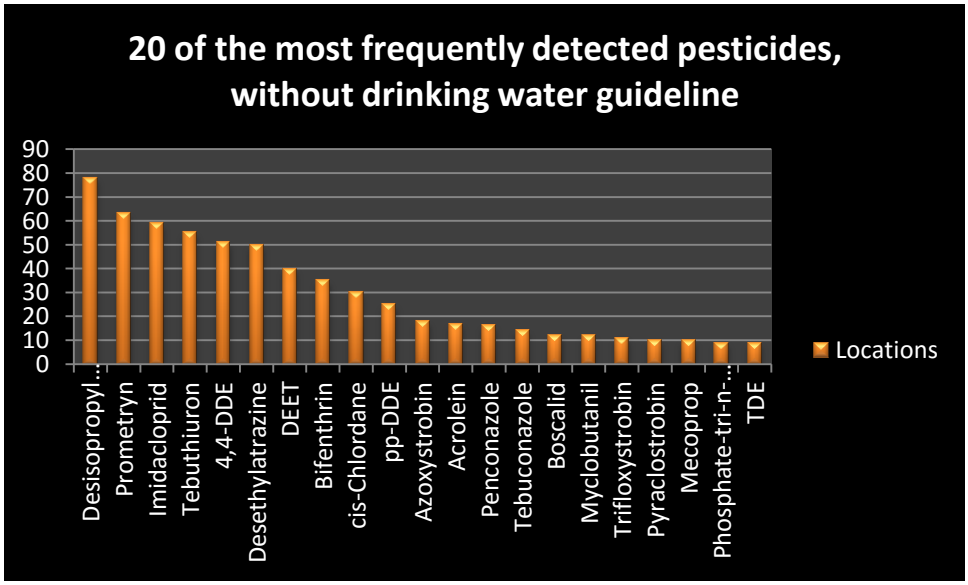


Of the 20 most commonly detected pesticides, 14 have Guidelines levels published in the Australian Drinking Water Guidelines. The most commonly detected pesticides, not having guideline levels include metabolites of Atrazine and Simazine (Desisopropyl Atrazine and Desethylatrazne), Prometryn, Tebuthiuron, metabolites of DDT, DEET, Heptachlor Epoxide, Endosulfan Sulphate and the widely used Neonicotinoid, Imidacloprid.



Detections based on type of pesticide

Along with Glyphosate, Neonicotinoids have been concerning members of the public across the world in recent years due to their association with bee deaths. It is also worth noting that a number of fungicides have recently been detected in Australian waterways, yet drinking water guidelines have not been granted for many of these.



Almost one quarter of ADWG listed pesticides have never been detected in a waterway, let alone a water supply in Australia.

Of the 240+ pesticides and metabolites found in both the ADWG and detected in waterways, ~41% had detections in waterways, but no guideline level published in the ADWG. ~35% had detections and had guideline levels. ~21% of pesticides that have guideline levels set by the ADWG have not been detected in Australian waterways at all. Priority therefore for establishing guideline levels must be

directed at chemicals that are being detected in waterways, rather than those that are not. How is it in the best interests of Australian water supply catchments that ~41% of pesticides detected in waterways, have no health based guideline?

This of course does not include the large range of pesticides that have not been detected because they have not been tested for. There are currently more than 800 agvet chemicals in use in Australia, and 8000 agvet products registered for use in Australia *(155).* (This means approximately three quarters of agvet chemicals in Australia remain untested for in waterways, given that less than 200 have actually been tested for!)

In terms of ecological guidelines, compiled in the ANZECC Guidelines *(153)* published in October 2000, only 25 (10.9%) of the pesticides detected across Australian waterways in this study have ANZECC ecological guidelines. This highlights the real lack of environmental accountability in terms of offsite impacts of agricultural pesticides.

How is it in the best interests of the Australian environment that 89% of pesticides detected in waterways, don't have ecological levels according to the ANZECC Guidelines (which themselves only provide guidelines for 28 pesticides - 3.5% of the total Agvet chemicals in use in Australia)? Why have the ecological guidelines not been updated in 16 years and why are these pesticides continuing to be detected in waterways?

Finally, with the billions of dollars generated by Australia's agricultural industry, and billions of dollars generated by Australia's water industry, why is it left to a volunteer working in a poorly resourced environmental organisation, to attempt to quantify what pesticides are the most at risk in terms of polluting Australia's water supplies?

Breaches to Australian Drinking Water Guidelines – Pesticide Incidents

Location	Pesticide	Date	µg/L	2011* Guideline µg/L	Level Exceeding Guideline	Validation
Dundurrabin Dam (NSW)	Heptachlor	1989	1950	0.3	6500x	*Quoted in reference (87)*
Dianella (WA) Groundwater	Fenamiphos	1994	1000	0.5	2000x	*Difficult to determine if water was consumed or not (41)*
Nathalia (Vic) Broken Creek	Amitrole	Aug 1972	430	0.9	477 x	*Difficult to determine if water was u/s of offtake consumed or not (36)*
Swan Hill (Vic) Murray River	Amitrole	Aug 1972	320	0.9	355.56 x	*Difficult to determine if water was u/s of offtake consumed or not (36)*
Dundurrabin Dam (NSW)	Dieldrin	1989	100	0.3	333.33 x	*Quoted in reference (87)*
Dundurrabin Dam (NSW)	Chlordane	1989	600	2	300 x	*Quoted in reference (87)*
Dianella (WA) Groundwater	Atrazine	1994	2000	20	100 x	*Difficult to determine if water was consumed or not (41)*
Woori Yallock Creek (Vic)	Dieldrin	1981	10.36	0.3	34.53 x	Incident occurred well upstream of w/s. Sugarloaf Res Commissioned Nov 1980? (101)
Warren Reservoir (SA)	Atrazine	1998	150	20	7.5 x	Incident occurred well upstream of reservoir – powder activated carbon in use? (42)
Coffs Harbour (NSW) Water Tanks	Dieldrin	1986/7	1.9	0.3	6.33 x	See (12)
South Para Reservoir (SA)	Atrazine	1998	110	20	5.5 x	Incident occurred upstream of reservoir – powder activated carbon in use? (42)
Wingcaribee Filtration Plant (NSW)	Triclopyr	2007	80	20	4 x	See (146)
Rainwater Tank (SA)	Dieldrin	1982	0.88	0.3	2.93 x	Exact location not stated (6)
Reservoir (SA)	Dieldrin	1975	0.7	0.3	2.5 x	Exact location not stated (6)
South Para Reservoir (SA)	Atrazine	1998	43.6	20	2.18 x	Incident occurred upstream of reservoir – powder activated carbon in use? (42)

Kerang (Vic) Channel 14/2	Esfenvalerate	2005	65	30	2.17 x	See (52)
Mulwala (NSW)	Molinate	1994	7.2	4	1.8 x	See (18)
Reservoir (SA)	Dieldrin	1976	0.47	0.3	1.56 x	Exact location not stated (6)
Pacific Palms (NSW)	Aldrin	1989	4	3	1.33 x	See (12)
Pacific Palms Tanks (NSW)	Dieldrin	1989	0.4	0.3	1.33 x	See (12)
Wurdee Boluc Reservoir (Vic)	2,4-D	2003	34	30	1.13x	See (3)

Some Near Breaches to Australian Drinking Water Guidelines – Pesticide Incidents

Location	Pesticide	Date	µg/L	2011* Guideline µg/L	% of ADWG	Validation
Wurdee Boluc Reservoir (Vic)	2,4-D	2003	27	30	90%	See (3)
Darling Downs (QLD)	Endosulfan	2002	18	20	90%	See (45)
SA Reservoir	Aldrin	1974	0.23	0.3	76.7%	See (6)
Yarra River (Vic)	Simazine	2008/9	15	20	75%	See (21)
Wangaratta (Vic)	Heptachlor	1989	0.22	0.3	73.3%	See (114)
Stony Creek Reservoir (Vic)	2,4-D	2003	20	30	66.7%	See (3)
SA Reservoir	Aldrin	1976	0.2	0.3	66.7%	See (6)
Dalby Weir (QLD)	Atrazine	2001	12	20	60%	See (45)
Ballina (NSW)	Lindane	1986/7	6	10	60%	See (12)
Broken Creek Numurkah (Vic)	2,4-D	2005	17	30	56.7%	See (4)
Cox Creek (SA)	Propyzamide	1986	36	70	51.4%	See (64)
Lorrina (Tas)	Atrazine	1993/4	9.3	20	46.5%	See (46)
Olangolah Dam (Vic)	DDT	1994	4	9	44.4%	See (73)
Dumbleton Weir (Qld)	Diuron	2002	8.5	20	42.5%	See (33)

How to Use this Publication

The premise behind this publication is simple. What levels of pesticides have been recorded in Australian waterways. Is the level that a community may be exposed to in one part of Australia, high or low, in comparison to other locations around Australia. Has the pesticide that has been detected, also been detected elsewhere and if so where. What values were recorded.

In this publication each pesticide has been granted a pesticide sheet. On the sheet, the pesticide name is stated. Below the pesticide name is the guideline for this pesticide as published in the latest edition of the Australian Drinking Water Guidelines. If there is no guideline, then there will be no number. All guideline levels are recorded in parts per billion, µg/L.

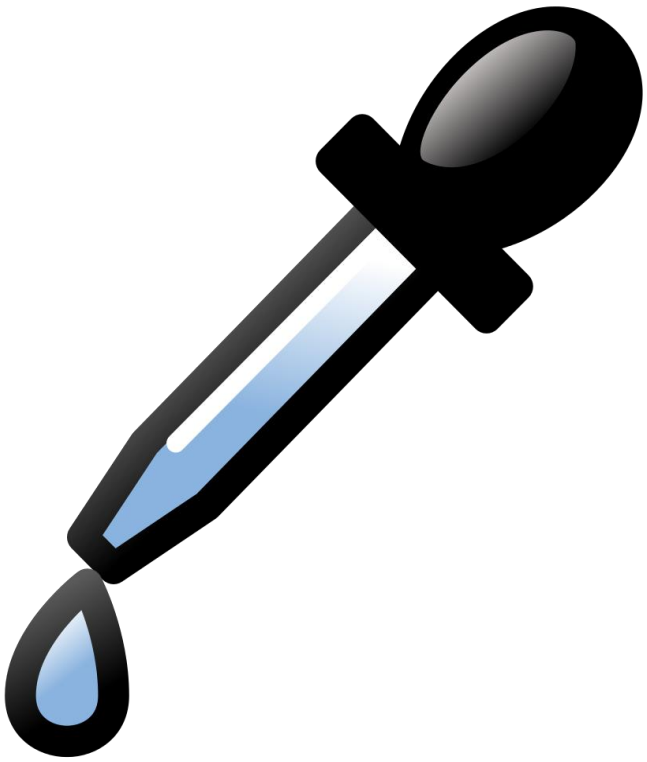
One part per billion (1 µg/L is equivalent to one drop of liquid in an Olympic size swimming pool full of water.
http://www.tceq.texas.gov/assets/public/remediation/superfund/jonesroad/ppb_chart.pdf

The next line refers to the ecological guidelines granted under the ANZECC Guidelines. The % numbers are the trigger levels granted under the Guidelines. Again, if there are no trigger levels, the space is left blank. This will apply to most pesticides listed in this report.

The section of the Pesticide Sheet, Number of Locations on Australian Pesticide Map, provides a link to the chemical page on the Australian Pesticide Map database. The red number on the right hand side refers to the number of locations around Australia that the particular pesticide has been detected. It does not refer to total detections, but rather total locations.

Following this are the headings Waterway and Water Supply. If the pesticide was detected in a typical waterway (non drinking water supply), it is listed under Waterway. If the pesticide was detected upstream of a drinking water supply off-take (water supply), then the pesticide is listed under water supply. In some cases it has been impossible to determine if the pesticide was detected in a water supply not. If this is the case, then the pesticide will be listed under waterway. If a pesticide has been detected well upstream of a known water supply, it is still listed under Water Supply.

No data has been provided in this report regarding treatment processes used in the various water supplies listed. It is assumed that filtration processes will remove pesticides to varying degrees, depending on what filtration process is applied, so the amount of pesticide detected on the pesticide sheet, will not necessarily correspond to the levels that come through consumers taps.



The supposed 'safe' dose of pesticides such as Dieldrin, Aldrin, Heptachlor, Profenofos, Fenamiphos, Fipronil, Parathion Methyl, Amitrole and Terbufos is the equivalent to <1 drop of chemical dropped into a body of water the size of an Olympic Sized Swimming Pool!

Hormones can operate at levels as low as one part per trillion, or one thousandth of one drop in an Olympic Sized Swimming Pool.

Many of the pesticides listed in this publication are suspected and known Endocrine Disruptors, meaning that they can impact on the human endocrine system. It is highly probable that many of these pesticides could have their safety guidelines reduced as more information comes to hand about the problems of low level exposure. Levels that may appear to be safe now, may be reduced in the future. It is interesting to note however, that the 2011 Australian Drinking Water Guidelines saw increases in guideline levels for 46 pesticides, with a reduction in guideline levels for 24. Overall, since 1980, there has been a trend towards decreasing guideline levels, with decreases occurring for 24 pesticides listed in 6 versions of the ADWG's, with increases for 18.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: 1,3-Dichloropropene

Halogenated Organic, Fumigant/Nematicide

2011 Australian Drinking Water Guideline: 100µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: 2-Chlorophenol

Chlorinated Phenol, Microbiocide

2011 Australian Drinking Water Guideline: 300µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	Degradant from phenoxy herbicides such as 2,4,5-T and 2,4-D.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: 2,2-DPA

Chlorinated Alphatic Herbicide (see Dalapon)

2011 Australian Drinking Water Guideline: 500µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Also known as Dalapon.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: 2,4,D

Chlorophenoxy acid or ester/Herbicide Plant Growth Regulator

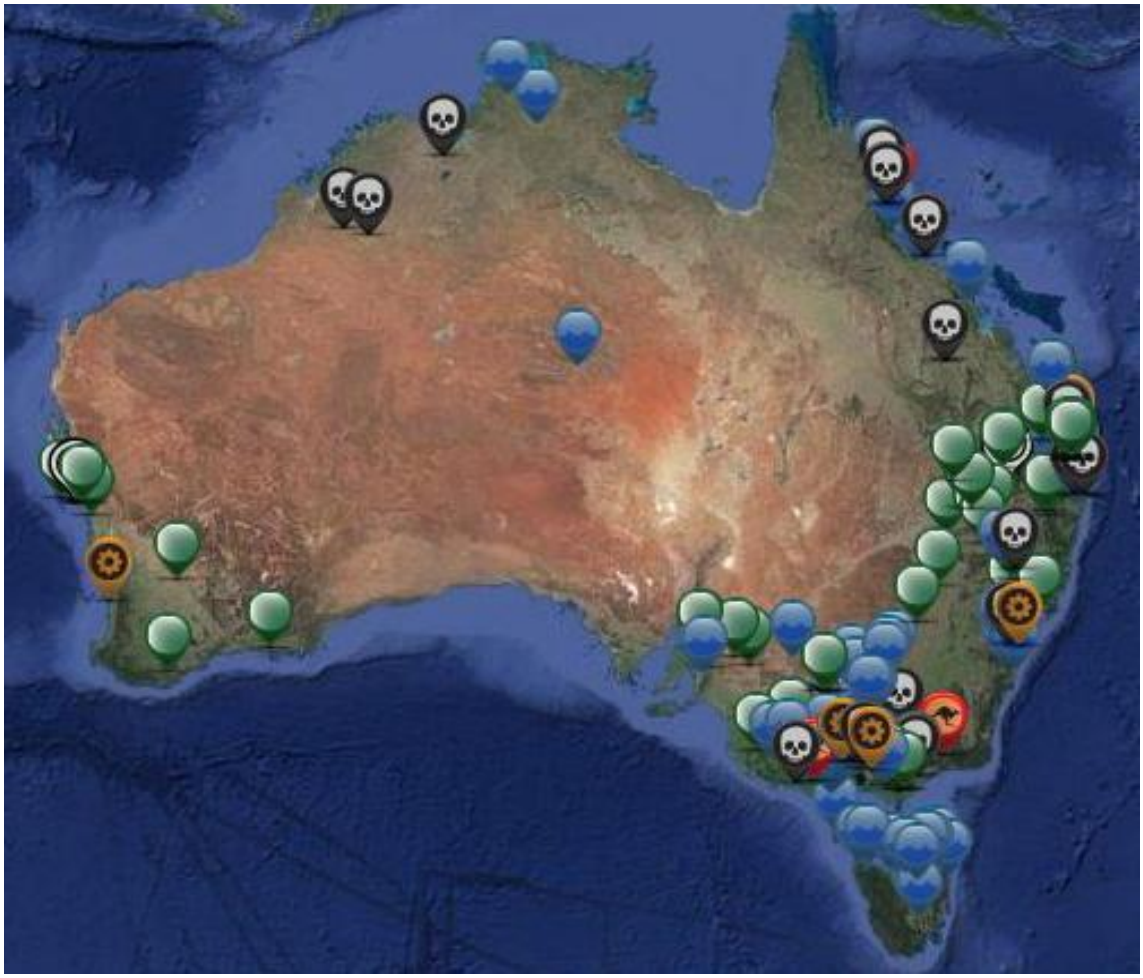
2011 Australian Drinking Water Guideline: 30µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	140µg/L	280µg/L	450µg/L	830µg/L

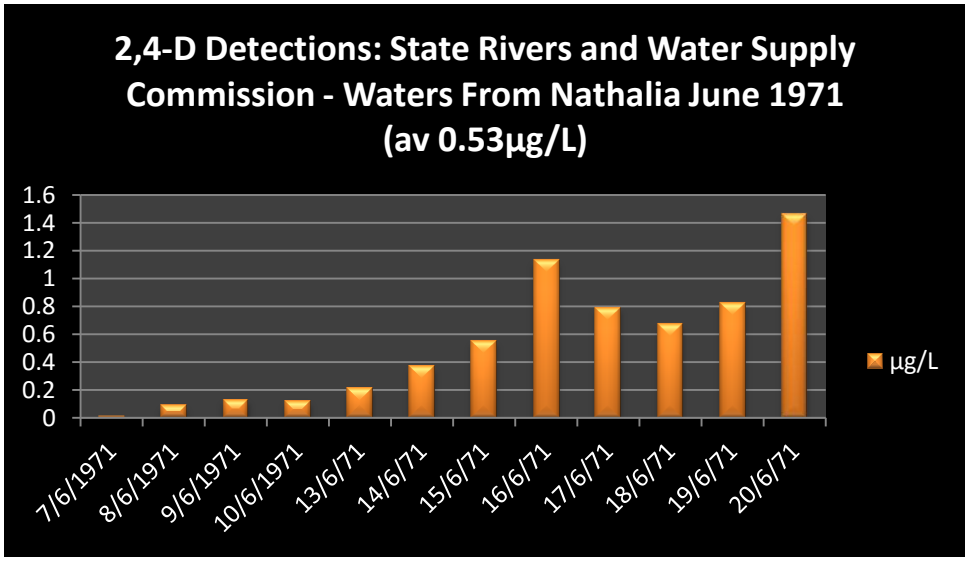
Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/24-d/	**107**

Highest Levels Detected

Waterway:	1978? Nufarm Industrial Waste (Vic) 173,000µg/L *(1)* 9/5/06 Murray Valley Channel 1/5 (Vic) 2960µg/L *(2)* 12/5/06 Murray Valley Channel 1/5 (Vic) 2110µg/L *(2)* 11/5/06 Murray Valley Channel 1/5 (Vic) 1950µg/L *(2)* 10/5/06 Murray Valley Channel 1/5 (Vic) 1920µg/L *(2)*
Water Supply:	12/5/03 Wurdee Boluc Reservoir (Vic) 34µg/L *(3)* 19/8/03 Wurdee Boluc Inlet Channel (Vic) 27µg/L *(3)* 5/8/03 Stony Creek Reservoir #3 (Vic) 20µg/L *(3)* 2005 June Broken Creek Numurkah (Vic) 17µg/L *(4)* 11/7/14 Clyde River (Tas) 11.2µg/L *(5)* 1985 Unspecified Rainwater Tank SA 4µg/L* *(6)*
Other Notes:	**Likely to be the 10th most commonly detected pesticide in Australian waterways.** 2,4-D has been detected in water across most states, particularly in Tasmania, Victoria, NSW and Qld. Frequently detected in stormwater and in domestic water supplies. Melbourne stormwater from 6 positive samples averaged 0.041µg/L, Upper Yarra from 3 positive samples 0.061µg/L, Victorian Water Supplies from 20 positive samples 0.125µg/L. Average Tasmanian detections from 20 positive samples 0.987µg/L. Levels in Sydney Water Supplies from 6 positive samples averaged 0.052µg/L. Samples from North Queensland ranged for 0.4 to 27µg/L(7).



2,4-D detections across the Australian landscape. The green points refer to spray drift incidents, the blue refer to water, skulls refer to health incidents.



Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: 2,4-Dichlorophenol

Chlorinated Phenol

2011 Australian Drinking Water Guideline: 200µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=2%2C4-dichlorophenol	1

Highest Levels Detected

Waterway:	1978? Nufarm Industrial Waste (Vic) 416,000µg/L *(1)*
Water Supply:	
Other Notes:	Degradant from phenoxy herbicides such as 2,4,5-T and 2,4-D.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: 2,4,5-T

Chlorophenoxy acid or ester/Herbicide

2011 Australian Drinking Water Guideline: 100µg/L (1994)

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/245-t/	22

Highest Levels Detected

Waterway:	1978? Nufarm Industrial Waste (Vic) 4000µg/L *(1)* 1973 Clear Creek (Vic) 690µg/L *(9)* 1973 Clear Creek (Vic) 500µg/L *(9)* 1981 Tarra River (Vic) 200µg/L (within water supply?) *(10)* 1977 July Narbethong (Vic) 10µg/L *(11)*
Water Supply:	1986/7 Byron Spring Water NSW 1ug/L *(12)*
Other Notes:	Four of the five highest readings all relate to testing conducted by the Forestry Commission downstream of pine plantations. It was Victorian Government policy between 1968-1978 to aerially spray pine plantations with 2,4,5-T mixed with diesel. Banned in Australia early 1990's.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: 2,4,6-Dichlorophenol

Phenoxy herbicide degradant

2011 Australian Drinking Water Guideline: 20µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Degradant from phenoxy herbicides such as 2,4,5-T and 2,4-D.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: 2,4,6-Trichlorophenol

Chlorinated Phenol

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=2%2C4%2C6-trichlorophenol	**1**

Highest Levels Detected

Waterway:	**1978? Nufarm Industrial Waste (Vic) 48,000µg/L** *(1)*
Water Supply:	
Other Notes:	**Also known as Dowicide.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: 2,6-D

Alkylated Phenol

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=2%2C6-D	1

Highest Levels Detected

Waterway:	
Water Supply:	4/11/13 Redbank Reservoir (Vic) 0.01µg/L *(8)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: 2,4,6-T

Chlorinated Phenol

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=2%2C4%2C6-T	3

Highest Levels Detected

Waterway:	
Water Supply:	4/11/13 Redbank Reservoir Vic 0.05µg/L *(8)* 11/11/13 Sugarloaf Reservoir Avoca (Vic) 0.04µg/L *(8)* 14/11/13 Talbot Reservoir Vic 0.01µg/L *(8)*
Other Notes:	Sugarloaf Reservoir supplies drinking water to Avoca and Talbot Reservoir supplies drinking water to Maryborough and surrounding communities in Victoria's central west. Also known as Dowicide

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: 3,4 Dichloroaniline

Breakdown Product. Precurser to herbicide Propanil

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=3%2C6+dichloroaniline	2

Highest Levels Detected

Waterway:	2008-9 Alice Springs Recycled Water 0.01-0.05µg/L *(13)* 2015 July Sydney Harbour *(14)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: 4 Chlorophenoxy Acetic Acid

Synthetic Pesticide – Similar to group of plant hormones called auxins

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=4+chlorophenoxy+acetic+acid	**4**

Highest Levels Detected

Waterway:	
Water Supply:	**2004-6 Brisbane Water Tank 366µg/L *(15)*** **9/12/09 Colac Water Supply 0.05µg/L *(16)*** **18/9/07 Barwon Water Inlet Channel 0.04µg/L *(16)***
Other Notes:	**Also detected in Sydney Harbour 2015 *(14)*.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: 4,4-DDD

Metabolite of organochlorine insecticide DDT

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/44-ddd/	**5**

Highest Levels Detected

Waterway:	**7/9/09 Sediment. Wetland Lynbrook Estate (Vic)** *(17)* **2010 April Sediment. Regent Street Mt Waverley (Vic)** *(17)* **1/3/10 Yarra River (Vic) Estuary Sediment** *(17)* **1/3/10 Maribyrnong River (Vic) Estuary Sediment** *(17)* **1992 Willbriggie Irrigation Area sediment** *(18)*
Water Supply:	**2009-10 Upper Yarra River 0.022µg/L** *(21)*
Other Notes:	**A metabolite/breakdown product of the insecticide DDT. Found in waterway sediment. It is also found in the body fat animals including fish.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: 4,4-DDE

Metabolite of organochlorine insecticide DDT

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/44-dde/	51

Highest Levels Detected

Waterway:	1982 Werribee River (Vic) 500µg/L *(19)* 1982 Little River Estuary (Vic) 10µg/L *(19)* 1982 Lerderderg River Estuary (Vic) 10µg/L *(19)* 22/3/72 King River (Vic) 0.04µg/L *(20)* 23/12/80 Myers Creek Toolangi (Vic) 0.01µg/L *(19)*
Water Supply:	2009/10 Upper Yarra River 0.024µg/L *(21)* 15/10/80 Stringybark Creek (Vic) 0.02µg/L *(19)* 18/6/80 Stringybark Creek (Vic) 0.01µg/L *(19)* 2/7/80 Olinda Creek (Vic) 0.01µg/L *(19)* 2/7/80 Wandin Yallock Creek (Vic) 0.01µg/L *(19)* 2/7/80 Upper Yarra River (Vic) 0.01µg/L *(19)*
Other Notes:	**Likely to be the 19th most commonly detected pesticide in Australian waterways.** A metabolite/breakdown product of the insecticide DDT. Often found in waterway sediment. It is also found in the body fat of animals including fish. Likely to be widespread across Australia. Has been detected in most states and has also been detected recently. It contaminates a wide area of waterway sediment in Melbourne and Westernport. Has also been detected recently in northern Queensland and the Willbriggie Irrigation Area NSW in the 1990's. Also see p,p-DDE

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: 4,4-DDT

Metabolite of organochlorine insecticide DDT

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=4%2C4%2CDDT	2

Highest Levels Detected

Waterway:	
Water Supply:	2009/10 Upper Yarra River 0.046µg/L *(21)*
Other Notes:	A metabolite/breakdown product of the insecticide DDT. Found in waterway sediment. It is also found in the bodyfat animals including fish. Likely to be widespread across Australia.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Acephate

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 8µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Acetamiprid

Neonicotinoid Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=acetamiprid	6

Highest Levels Detected

Waterway:	7/2/13 Badgery Creek (NSW) 0.38µg/L *(22)* 7/2/13 Eastern Creek (NSW) 0.37µg/L *(22)* 7/2/13 Nepean River (NSW) 0.12µg/L *(22)* 7/2/13 South Creek (NSW) 0.11µg/L *(22)* 7/2/13 Winnamatta Creek (NSW) 0.05µg/L *(22)*
Water Supply:	
Other Notes:	A neonicotinoid insecticide rarely tested for in Australia.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Acrolein

Aldehyde Algaecide/Fumigant

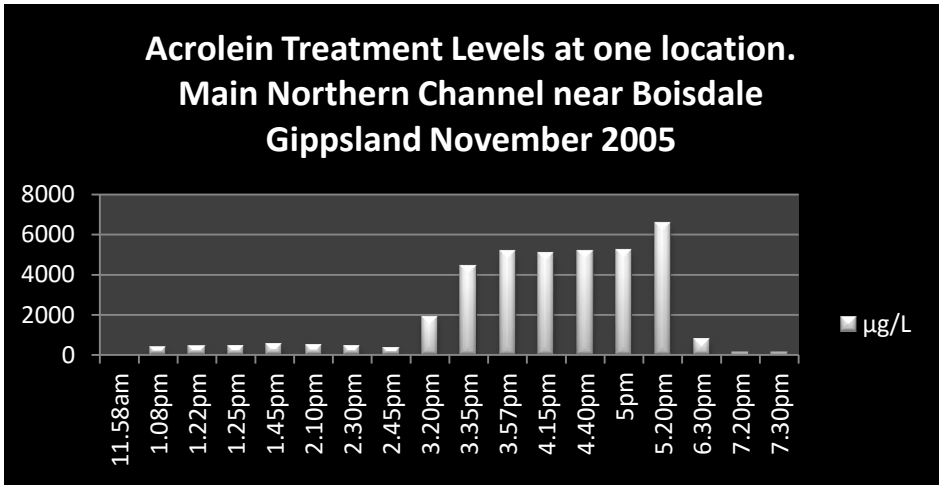
2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

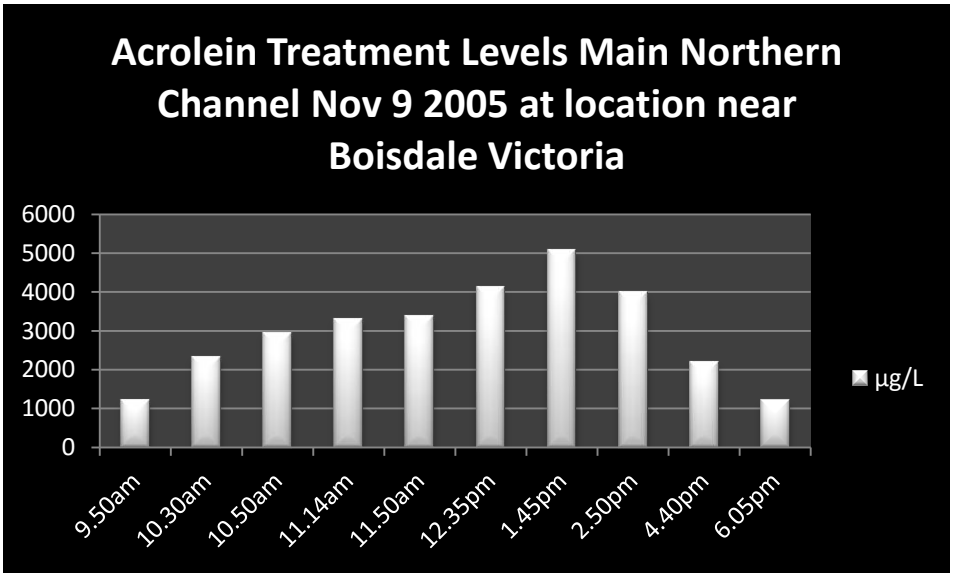
Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=acrolein	17

Highest Levels Detected

Waterway:	**Maximum amount allowed: 15,000µg/L** *(24)* **8/11/05 Main Northern Channel Gippsland (Vic) 6560µg/L** *(25)* **16/1/05 Main Northern Channel Gippsland (Vic) 5,908.9µg/L** *(25)* **8/11/05 Main Northern 3rd Treatment Gippsland (Vic) 5,144µg/L** *(25)* **9/11/05 Main Northern Coloes Road Gippsland (Vic) 5,052µg/L** *(25)*
Water Supply:	**9/11/05 Heywood (Vic) Intermittent Supply 2978µg/L** *(25)*
Other Notes:	**Used in irrigation drains and channels to kill submerged aquatic weeds. In the 1970's it was estimated that ~66,000kg of Acrolein was used to control weeds in 4000km of channels across Australia.** *(23)* **It is explosive and highly flammable. It is also used in plastics and metal manufacturing. Very little information could be found regarding Acrolein detections in Australian waterways. Also detected in recycled water Queensland.** *(36)*



These Acrolein treatments by Southern Rural Water are conducted to control submerged weeds. Acrolein is commonly used by water authorities across irrigation regions of Australia to control aquatic weeds. According to Southern Rural Water 11 October 2006: "It should be noted that SRW has only recently begun to use Acrolein again, after its use was postponed for a number of years to ensure that associated risks could be appropriately managed and minimised. Because of the chemical mixture of Acrolein and the rate at which it breaks down in water, monitoring only occurs during treatment to ensure that the treatment front has dissipated and levels have returned to background levels…"



Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Aldicarb

N-Methyl Carbamate Insecticide/Nematicide

2011 Australian Drinking Water Guideline: 4µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=aldicarb	1

Highest Levels Detected

Waterway:	2008 Galathea Creek NSW *(26)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Aldrin

Organochlorine Insecticide

2011 Australian Drinking Water Guideline: 0.3µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/aldrin/	19

Highest Levels Detected

Waterway:	1/2/88 Cairns Esplanade Mudflats (sediment) 271µg/L *(27)* 1/2/88 Cairns Salt Water Creek (sediment) 103µg/L *(27)* 1977 Unspecified Bore SA 1µg/L *(6)* 1979 Unspecified Stream SA 0.27µg/L *(6)* 1974 Unspecified Bore SA 0.15µg/L *(6)*
Water Supply:	1989 Pacific Palms (NSW) 0.1 - 0.4µg/L *(12)* 1974 Unspecified SA Reservoir 0.23µg/L*(6)* 1976 Unspecified SA Reservoir 0.2µg/L *(6)* 1978 Unspecified SA Reservoir 0.12µg/L*(6)* 1986-7 Coffs Harbour (NSW) Tank Water 0.06µg/L *(12)* 1979 Unspecified SA Reservoir 0.06µg/L *(6)*
Other Notes:	Banned in Australia in 1992. Residues likely to be widespread across Australia.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Alpha-Cypermethrin

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=alpha-cypermethrin	**1**

Highest Levels Detected

Waterway:	
Water Supply:	**8/1/14 Currie (Tas) 0.006µg/L** *(28)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Ametryn

Triazine Herbicide

2011 Australian Drinking Water Guideline: 70µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/ametryn/	44

Highest Levels Detected

Waterway:	1990's-2000's Sugar Cane Areas 300µg/L *(72)* 1990's Lower Burdekin (Qld) 6µg/L *(29)* 2006-7 Lower Burdekin (Qld) 1.8µg/L *(30)* 2012-13 Herbert River Catchment (Qld) 0.34µg/L *(31)* 2009-10 Sandy Creek (Qld) 0.24µg/L *(32)*
Water Supply:	2002 Dumbleton Weir (Qld) 0.3µg/L *(33)*
Other Notes:	Detected at low levels (<0.1µg/L) in the Swan and Canning River catchments (WA) 2006/7 *(50).* Detected at low levels at many Queensland coastal locations 2002-13, including offshore in the Great Barrier Reef and neighbouring islands. The ADWG also write: ***"Ametryn has been reported in Australian source waters at concentrations up to 0.3 mg/L in sugar cane growing areas (Mitchell et al, 2004)."***

Ametryn detections concentrated almost entirely along the Queensland coast in streams/rivers flowing into the Great Barrier Reef.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Amitraz

Formamidine Insecticide

2011 Australian Drinking Water Guideline: 9µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=amitraz	1

Highest Levels Detected

Waterway:	Detected in the Gwydir River Basin (NSW) in 2008. *(34)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Amitrole

Unclassified Herbicide

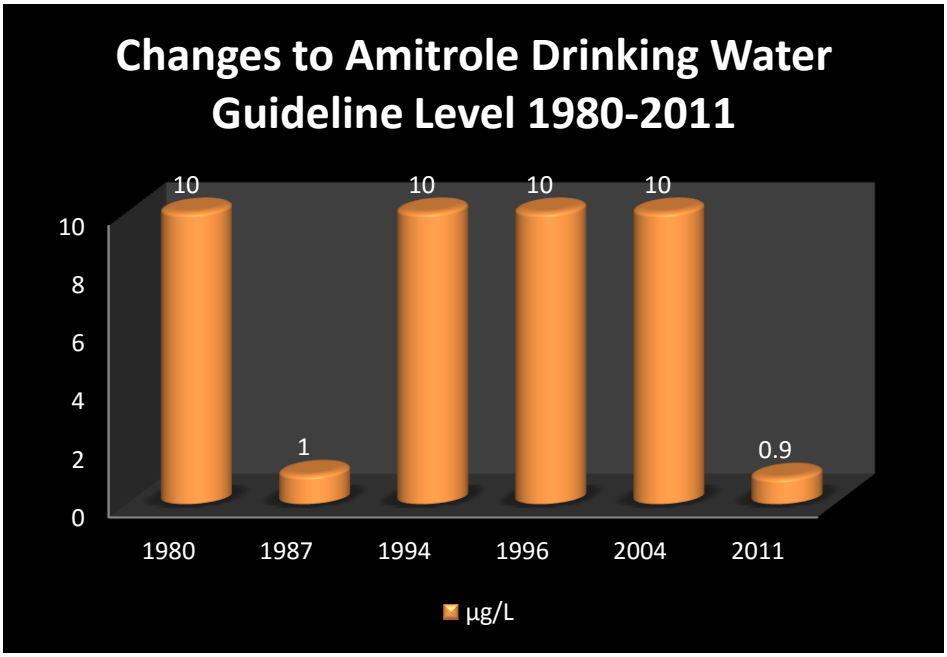
2011 Australian Drinking Water Guideline: 0.9µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/amitrole/	14

Highest Levels Detected

Waterway:	August 1972 Murrabit Lot D Drain 3 (Vic) 72,000µg/L *(35)* August 1972 Drain 3 Kerang (Vic) 72,000µg/L *(35)* August 1972 Drain 3 Kerang (Vic) 66,000µg/L *(35)* August 1972 Drain 3 Kerang (Vic) 55,000µg/L *(35)* August 1972 Drain 3 Kerang (Vic) 52,000µg/L *(35)*
Water Supply:	23/8/72 Broken Creek Nathalia (Vic) 430µg/L* *(35)* August 1972 Murray River Swan Hill 320µg/L* *(35)*
Other Notes:	Broken Creek and drainage detections likely to be a result of Arrowhead (aquatic weed) spraying. (*The 1972 data for Broken Creek and Swan Hill did not specify exactly if the samples were taken upstream or downstream of drinking water offtakes). High detections (up to 19.5mg/L) Tongala (Vic) 1961. Also detected at Swanbank Power Station (Qld) 2013-14 at 0.5µg/L *(36).* The ADWG for Amitrole was reduced from 10µg/L in 2004 to 0.9µg/L in 2011. No explanation is given in the Guidelines as to why this reduction took place.



Although the Australian Drinking Water Guidelines are updated every few years (a much better outcome than the ANZECC Guidelines which have not been updated since 2000), no explanation is given as to why guideline levels for specific chemicals are increased or decreased over the years.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: AMPA

Breakdown product of Glyphosate

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=ampa	4

Highest Levels Detected

Waterway:	12/4/06 Drain 8 Ardmona (Vic) 830µg/L *(2)* 10/4/06 Community Surface Drain Rodney (Vic) 50µg/L *(2)* 2013-4 Swanbank Power Station Recycled max: 19µg/L *(36)* 2013-4 Swanbank Power Station Recycled average: 6.1µg/L *(36)*
Water Supply:	2011/12 Lake Wivenhoe (Qld) 1.5µg/L *(37)*
Other Notes:	A breakdown product of the herbicide Glyphosate, rarely tested for in Australia.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Asulam

(Other) Carbamate Herbicide

2011 Australian Drinking Water Guideline: 70µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Atrazine

Triazine Herbicide

2011 Australian Drinking Water Guideline: 20µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.7µg/L	13µg/L	45µg/L	150µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/atrazine/	312

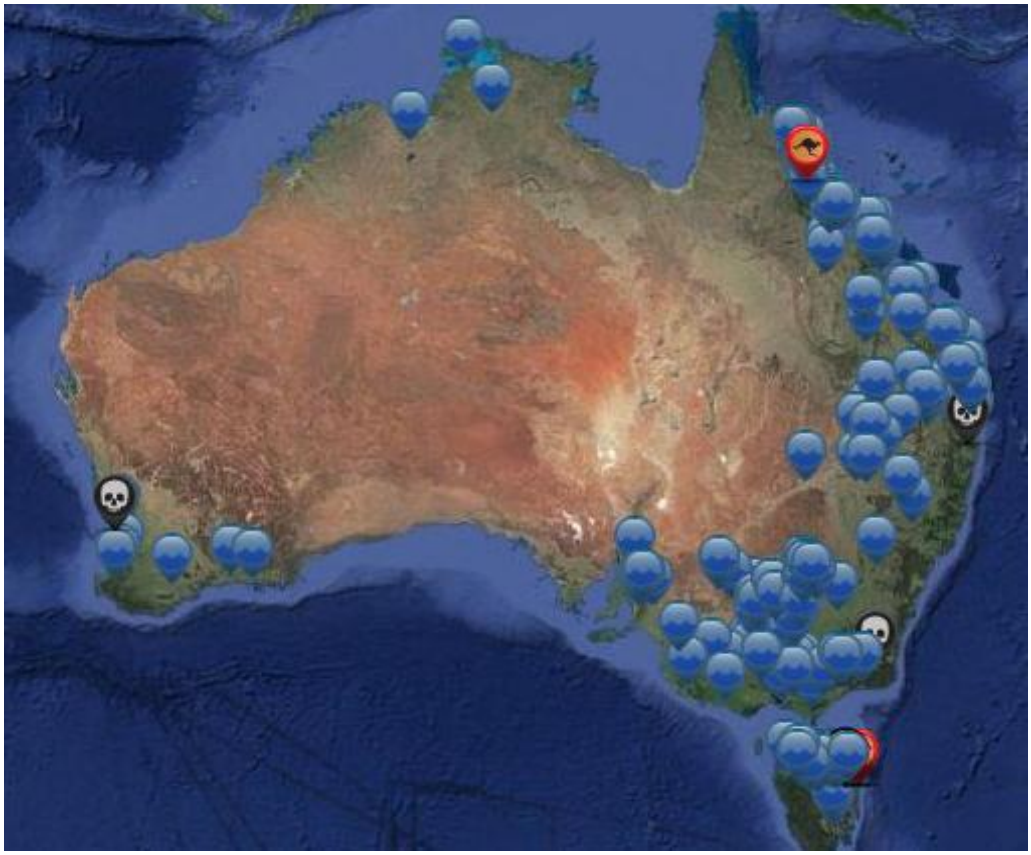
Highest Levels Detected

Waterway:	1989-92 Northern Tasmanian Stream 53,000µg/L *(147)* 26/7/89 Blackwood River (WA) Maidments Plantation – Runnel 22,000µg/L *(39)* 1996 Condamine-Balonne River (Qld) 2,400µg/L *(40)* 28/7/89 Blackwood River WA – Maidments Plantation 1,400µg/L *(39)* 26/7/89 Blackwood River WA – Maidments Plantation 1,300µg/L *(39)*
Water Supply:	1992 Dianella Perth (WA) Groundwater 2,000µg/L *(41)* 1998 Plantation Stream Warren Reservoir (SA) 150µg/L *(42)* 4/9/98 South Para Reservoir (SA) ~110µg/L* *(43)* 30/7/98 South Para Reservoir (SA) 43.6µg/L *(44)* November 2001 Dalby Weir (Qld) 12µg/L *(45)* 1993/4 Lorrina (Tas) 9.3µg/L *(46)*
Other Notes:	**The most commonly detected pesticide in Australian waterways.** Widely detected across Australia, particularly in the eastern states. Highest detected levels appear to between 1989-2003, however Atrazine is still frequently detected. In Tasmania between 2006-2012 Atrazine was detected at 7 locations at <1.4µg/L. Atrazine has also been regularly detected in waterways along the Queensland coast and Great Barrier Reef with the highest levels appearing to be recorded at Baratta Creek 2009-10 (13.15µg/L). Atrazine has been

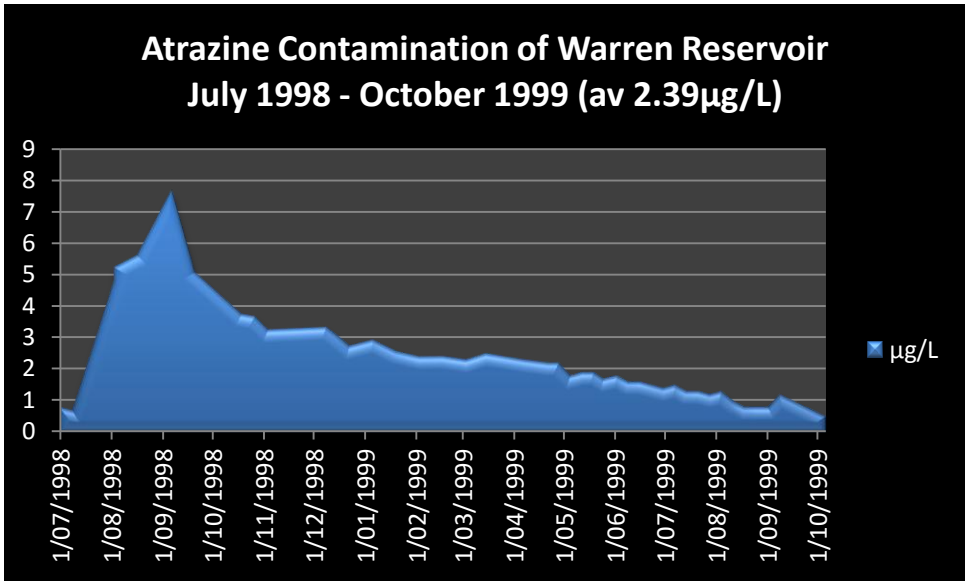
	commonly detected in groundwater and sediment across Australia. It was regularly detected in the Murrumbidgee Irrigation district in the 1990's–2010's. Willbriggie Irrigation Area in the 1990's recorded Atrazine in water channels as high as 88µg/L. 104µg/L recorded in the Murrumbidgee Irrigation Area in August 2011 (See Murrumbidgee Irrigation Licence Compliance Reports for more information). **Atrazine has been recorded as high as 46µg/L (Coleambally Outfall Drain) September 2013, 42µg/L South Drain Yanco Creek (NSW) September 2013. (See Coleambally Irrigation Licence Compliance Reports for more information).** **Perhaps the most serious water supply incidents regarding Atrazine occurred in the late 1990's in three reservoirs that supply the northern regions of Adelaide with drinking water. Between 1997-2000 contamination from pine plantation herbicides Atrazine and Hexazinone occurred in the Warren, South Para and Barossa Reservoirs. Average Atrazine levels in the Barossa Reservoir were 1.65µg/L in 1998 and 1.46µg/L in 1999. Average Atrazine levels in the South Para Reservoir were 3.98µg/L in 1998 and 1.3µg/L in 1999. Average Atrazine levels in the Warren Reservoir were 4.36µg/L in 1998 and 1.58µg/L in 1999** ***(44).***

Since 2002, Professor Tyrone Hayes has been warning people around the world about the dangers and endocrine disrupting properties of Atrazine at levels as low as 0.1µg/L (that's 200 times lower than the Australian Drinking Water Guideline of 20µg/L).

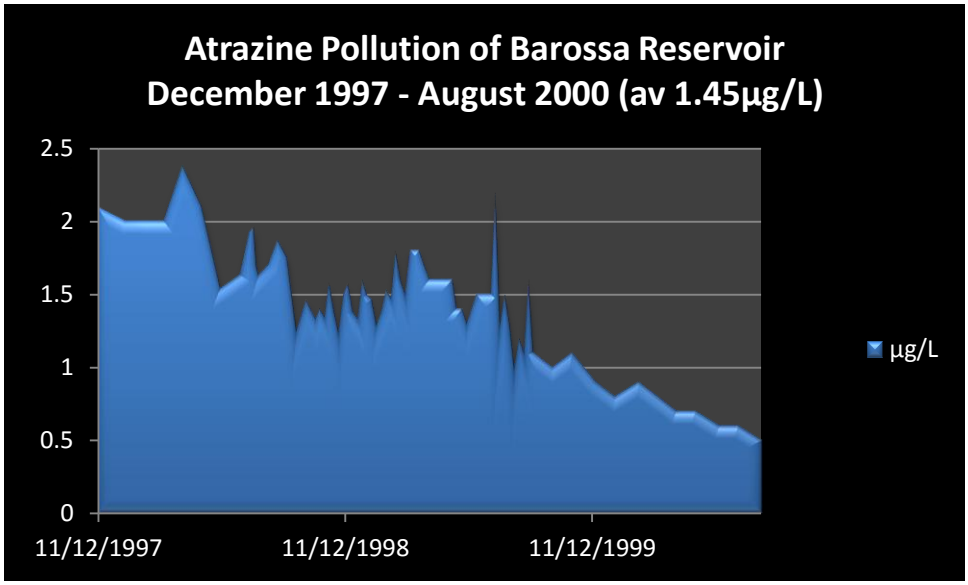
http://www.environmentalhealthnews.org/ehs/news/2013/atrazine-health



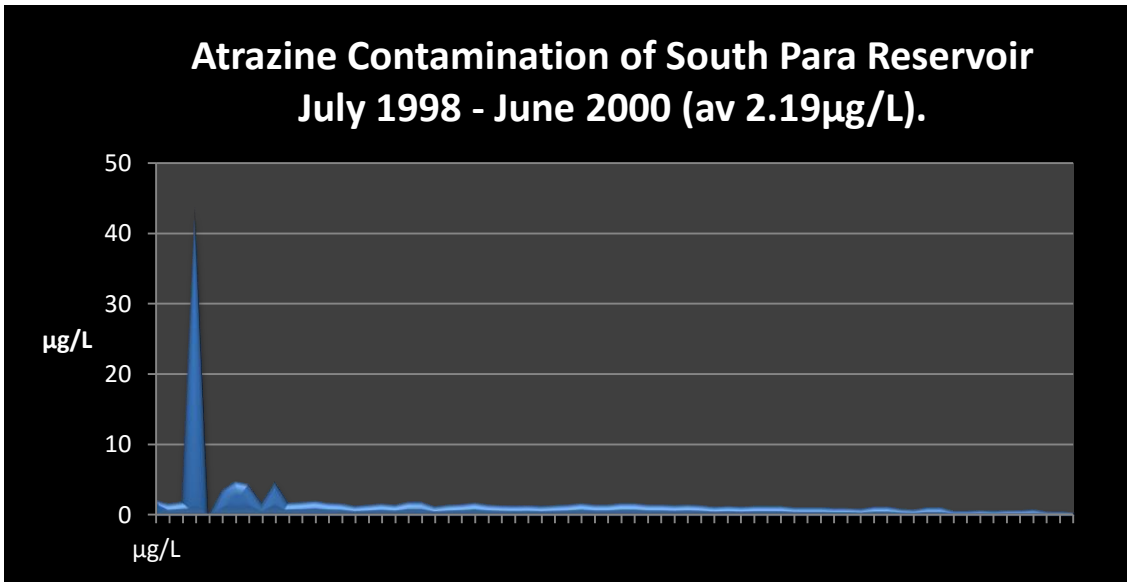
Atrazine is the most commonly detected pesticide in Australian waterways, occurring in all States and Territories. The following graphs highlight the contamination of Atrazine in Warren and Barossa Reservoirs and the length of time that it takes for an Atrazine pollution event to work through water supply systems.



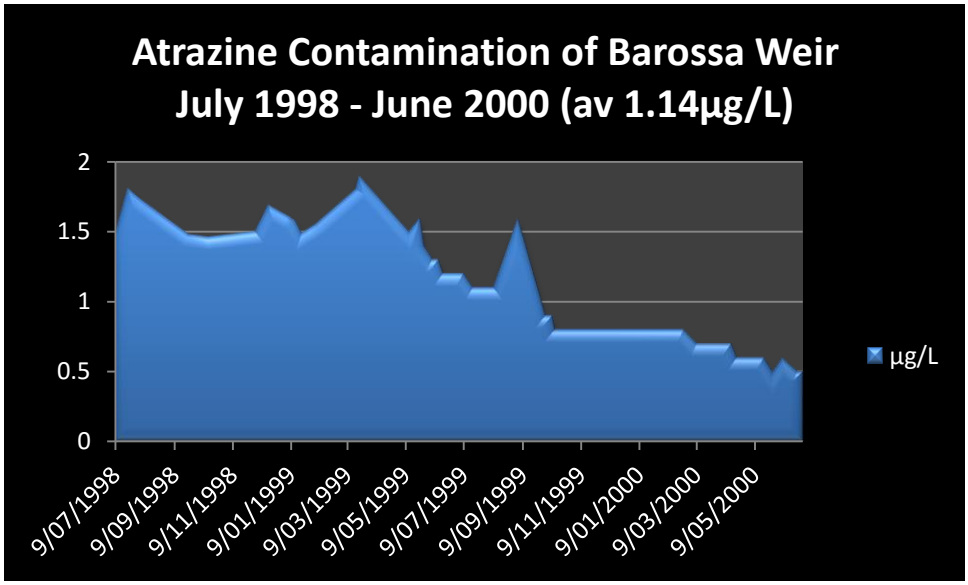
One year after reaching a peak level in Warren Reservoir, Atrazine was still being detected.



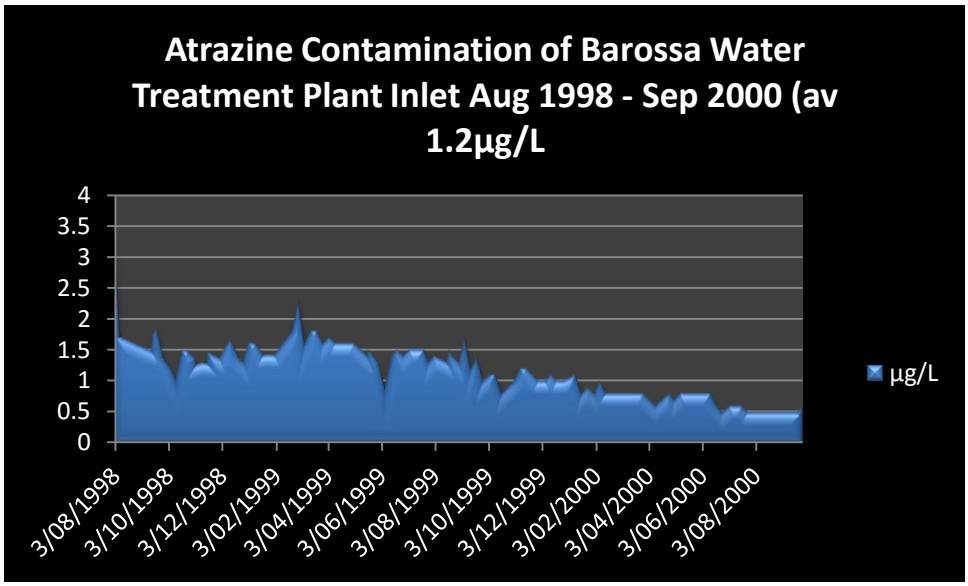
Atrazine within the waters of Barossa Reservoir decreased by 75% in over 2 years.



***Atrazine levels in South Para Reservoir 30/7/98–15/6/00. Continual runoff of atrazine into the reservoir was ongoing for 2 years, highlighting the high residual* and runoff properties of Atrazine. Average Atrazine levels were 2.19µg/L over the 2 year period after an initial spike in 1998.**



At Barossa Weir, Atrazine concentrations remained at concerning levels for at least 2 years.



At Barossa Water Treatment Atrazine had reduced in quantity by ~two-thirds in two years. Are similar scenarios unfolding across Australia? Does Atrazine continue to leach off-site for 2 years after application? Is this a common occurrence? Is the Atrazine that is detected in waterways, the result of spraying from 2, 3, 4 years ago?

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Atrazine-2-hydroxy

Breakdown product of Atrazine

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=atrazine-2-hydroxy	2

Highest Levels Detected

Waterway:	April 2010: Jawbone Conservation Reserve Williamstown (sediment) 3µg/kg *(47)* April 2010: Cala Street Ponds Footscray 2µg/kg *(17)*
Water Supply:	
Other Notes:	Detected in two locations in wetlands in Melbourne.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Atrazine-3-hydroxy

Breakdown product of Atrazine

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=atrazine-3-hydroxy	1

Highest Levels Detected

Waterway:	**April 2010: Queens Park Moonee Ponds (sediment) 7µg/kg** *(17)*
Water Supply:	
Other Notes:	**Detected in one location in a wetland in Melbourne.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Azinphos Methyl

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 30µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.01µg/L	0.02µg/L	0.05µg/L	0.11µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=azinphos+methyl	**2**

Highest Levels Detected

Waterway:	**Feb 2001 Manly Lagoon (NSW) Fish kill from Warringah Golf Club resulted in 10,000 dead fish *(48)***
Water Supply:	**10/12/09 Starvation Creek (Vic) 0.003µg/L *(17)***
Other Notes:	**Starvation Creek is located in the Upper Yarra and is a forested catchment, meaning that the detection of Azinphos Methyl is likely to be a result of spray drift.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Azoxystrobin

Strobin Fungicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/azoxystrobin/	**18**

Highest Levels Detected

Waterway:	**21/1/10 Dandenong Creek Wantirna (Vic) 0.002µg/L *(17)*** **21/1/10 Gardiners Creek (Vic) 0.002µg/L *(17)*** **21/1/10 Koonung Creek (Vic) 0.001µg/L *(17)*** **20/1/10 Darebin Creek (Vic) 0.001µg/L *(17)*** **19/1/10 Jacksons Creek (Vic) 0.001µg/L *(17)***
Water Supply:	**2009/10 Upper Yarra River 0.02µg/L *(21)*** **10/12/09 Starvation Creek (Vic) 0.003µg/L *(17)*** **2008 Cockatoo Creek (Vic) 0.003µg/L *(21)*** **December 2011 Narracan Creek (Vic) 0.002µg/L *(49)*** **March 2012 Easterbrook Creek (Vic) 0.002µg/L *(49)*** **21/1/10 Spadonis Reserve (Vic) 0.001µg/L *(17)***
Other Notes:	**Also detected in sediment in streams flowing into Westernport Bay in 2011/12 and Berwick Springs (Vic) in 2010.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Benalaxyl

Xylylalanine Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=benalaxyl	6

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	Six locations at <0.01µg/L in the Swan/Canning River catchments in Western Australia 2007. *(50)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Benomyl

Benzimidazole Fungicide

2011 Australian Drinking Water Guideline: 90µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Bensulfuron Methyl

Sulfonylurea Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=bensulfuron+methyl	3

Highest Levels Detected

Waterway:	1993 November Willbriggie Irrigation Area ~5.8µg/L *(18)* 1992/3 Willbriggie Irrigation Area drains 4.9µg/L *(18)* 1994 March Willbriggie Irrigation Area drains 0.08 µg/L *(18)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Bentazone

Unclassified Herbicide

2011 Australian Drinking Water Guideline: 400µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: BHC-Alpha

Organochlorine Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=bhc-alpha	3

Highest Levels Detected

Waterway:	1971 Unspecified SA Reservoir 0.1µg/L *(6)* 1977 Unspecified SA Stream 0.04µg/L *(6)* 1977 Unspecified SA Stream 0.01µg/L *(6)* (Beta) 1971 Unspecified Location Murray River (SA) <0.01 µg/L *(6)*
Water Supply:	
Other Notes:	Detected in sediment in Maribyrnong River western Melbourne in 2010 *(17)* and the Willbriggie Irrigation Area NSW 1990's *(18)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Bifenthrin

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/bifenthrin	**35**

Highest Levels Detected

Waterway:	**25/7/12 Detention basin Jamison Creek (NSW) 4.7µg/L *(51)** 25/7/12 Stormwater pit Jamison Creek (NSW) 3.8µg/L *(51)* 18/7/12 Stormwater outlet Jamison Creek (NSW) 0.6µg/L *(51)* 13/7/12 Jamison Creek (NSW) 0.2µg/L *(51)* 6/10/09 Lynbrook Estate Wetlands (Vic) 0.14µg/L *(17)***
Water Supply:	**October 2005 Channel 14/2 Kerang (Vic) 100µg/L *(52)* 23/8/06 Denman (WA) 0.08µg/L *(53)***
Other Notes:	**Bifenthrin is used as a termite control and strongly binds to sediment. It has been detected in sediment at multiple sites in Melbourne between 2009-14 (*17*),. It has also been detected in sediments in the Brisbane River in Queensland and Swan/Canning River in Western Australia. It has been found in oysters in the Gold Coast and Redcliffe areas of Queensland and was linked in 2012 to the death of thousands of crayfish in the Jamison Creek catchment in NSW. *Bifenthrin was detected in sediment in private detection basin at 170,000µg/L and 9,800µg/L at stormwater outlet. *(51)***

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Bioresmethrin

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline: 100µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Boscalid

Anilide Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=boscalid	17

Highest Levels Detected

Waterway:	2/6/09 Coal River (Tas) 0.46µg/L *(5)* 8/5/12 Tuckers Creek (Tas) 0.23µg/L *(5)*
Water Supply:	2009-10 Upper Yarra River 0.02µg/L *(21)*
Other Notes:	Detected often in sediment, Westernport, Western Melbourne and Werribee River estuary.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Bromacil

Uracil Herbicide

2011 Australian Drinking Water Guideline: 400µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=bromacil	28

Highest Levels Detected

Waterway:	1992 October Merungle Hill (NSW) 15µg/L *(18)* 1991-3 Murrumbidgee Irrigation Area 4.9µg/L *(18)* 2001 Shepparton groundwater 2.5µg/L *(54)* 1994-5 Murrumbidgee Irrigation Area 1.8µg/L *(18)* 2009-10 Sandy Creek (Qld) 0.03µg/L *(55)*
Water Supply:	
Other Notes:	Has been detected washing off into Great Barrier Reef in the past decade. Has been detected as far offshore as Great Keppel Island. Also detected in Queensland's Fitzroy River. Also detected in the Murray and Murrumbidgee Irrigation Districts in the 1990's.

Bromacil detections in Australian waterways have been concentrated along the Queensland coast and also the Murrumbidgee Irrigation Area in Southern New South Wales.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Bromoxynil

Hydroxybenzonitrile Herbicide

2011 Australian Drinking Water Guideline: 10µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=bromoxynil	2

Highest Levels Detected

Waterway:	**2013-14 Swanbank Power Station Recycled 0.08µg/L** *(36)*
Water Supply:	**4/11/13 Lexton Reservoir (Vic) 0.01µg/L** *(8)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Bupirimate

Pyrmidine Fungicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=bupirimate	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Detected 2007-2009 Mt Lofty Ranges (SA)** *(56)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Buprofezin

Unclassified Insect Growth Regulator

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=buprofezin	1

Highest Levels Detected

Waterway:	**2010 April Hedgley Dean (Vic) sediment** ***(17)***
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Captan

Thiophthalimide Fungicide

2011 Australian Drinking Water Guideline: 400µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Carbaryl

N-Methyl Carbamate Insecticide/Nematicide/Plant Growth Regulator

2011 Australian Drinking Water Guideline: 30µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/carbaryl/	15

Highest Levels Detected

Waterway:	1992 Darwin Rural Area 4.5µg/L *(59)* 2013/14 Swanbank Power Station Recycled 0.08µg/L *(36)* 10/12/09 Merri Creek (Vic) Clifton Hill 0.004µg/L *(21)* 21/4/10 Beaconsfield Wetland (Vic) 0.004µg/L *(17)* 19/1/10 Maribyrnong River (Vic) Keilor 0.003µg/L *(17)*
Water Supply:	2009/10 Upper Yarra River 0.039µg/L *(21)* 2008 Sheep Station Creek (Vic) 0.03µg/L *(21)* 10/12/09 Spadonis Reserve (Vic) 0.007µg/L *(17)* 2008 Wandin Yallock Creek (Vic) 0.005µg/L *(21)* 10/12/09 Starvation Creek Reservoir (Vic) 0.003µg/L *(17)*
Other Notes:	Also detected 2015 in Sydney Harbour, and 2007-9 in the Mt Lofty Ranges (SA)

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Carbendazim

Benzimidazole Breakdown Product/Fungicide

2011 Australian Drinking Water Guideline: 90µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=carbendazim	3

Highest Levels Detected

Waterway:	2013/14 Swanbank Power Station Recycled 0.4µg/L *(36)* May 2009 Cooloothin Creek (Qld) 0.0004µg/L *(60)*
Water Supply:	
Other Notes:	Also detected at Wayha Creek (Qld) just south of Noosa Heads and multiple locations north of Noosa Heads. Linked with fish deformities at Sunland Fish Hatchery in 2009. http://www.brisbanetimes.com.au/queensland/threeheaded-fish-found-on-sunshine-coast-20090712-dhpk.html

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Carbofuran

N-Methyl Carbamate Insecticide/Nematicide

2011 Australian Drinking Water Guideline: 10µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Carboxin

Carboxamide Fungicide

2011 Australian Drinking Water Guideline: 300µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Carfentrazone-ethyl

Triazolone Herbicide

2011 Australian Drinking Water Guideline: 100µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Chlorantraniliprole

Anthranilic Diamide Insecticide

2011 Australian Drinking Water Guideline: 6000µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Chlordane

Organochlorine Insecticide

2011 Australian Drinking Water Guideline: 2µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.03µg/L	0.08µg/L	0.14µg/L	0.27µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/chlordane/	16

Highest Levels Detected

Waterway:	1978 Unspecified SA Stream 1.1µg/L *(6)* 1987 Upper Blackwood River (WA) 0.021µg/L *(61)* 1996 Darwin 0.01µg/L *(62)*
Water Supply:	1986/7 Tweed Tank Water (NSW) 0.8µg/L *(12)* 2002 March Hope Valley Treatment Plant (SA) 0.04 µg/L *(44)* 2007 Kerrie Reservoir (Vic) 0.01µg/L *(63)*
Other Notes:	Final registration in Australia cancelled in 1997. *1989 Dundurrabin Dam (NSW) was reported to have Chlordane levels 100 times above the then Australian Drinking Water Criteria *(87)*. The Guideline in 1989 was 6µg/L, meaning that levels as high as 600µg/L must have been recorded.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Chlorphenvinphos

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 2µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/chlorfenvinphos/	1

Highest Levels Detected

Waterway:	1996 Bundaberg Groundwater *(54)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Chloropicrin

Inorganic Fumigant/Nematicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
Number of water locations highlighted on Australian Pesticide Map:				

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Chlorothalonil

Substituted Benzene Fungicide

2011 Australian Drinking Water Guideline: 50µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=chlorothalonil	5

Highest Levels Detected

Waterway:	1986/7 Cox Creek (SA) 6.07µg/L *(64)* 1986/7 Vince Creek (SA) 0.53µg/L *(64)*
Water Supply:	7/8/13 Currie (Tas) <0.009µg/L *(28)*
Other Notes:	April 2010 sediment Sharps Road Keilor *(17)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Chlorpyrifos

Organophosphorus Insecticide/Nematicide

2011 Australian Drinking Water Guideline: 10µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.00004 µg/L	0.01µg/L	0.11µg/L	1.2µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/chlorpyrifos/	132

Highest Levels Detected

Waterway:	1996 May Norman Creek (Qld) 525µg/L *(65)* 1996 October Kedron Brook (Qld) 190µg/L *(65)* 1996 October Cooparoo Creek (Qld) 70µg/L *(65)* 1992 October Willbriggie Rice Bay (NSW) 38µg/L *(18)* 1995 March Mehi River (NSW) 26µg/L *(66)**
Water Supply:	8/5/14 Tod Reservoir 2.56µg/L *(44)* 2007-9 Mt Lofty Ranges (SA) av. 0.12µg/L - 0.19µg/L *(56)* 1984 Unspecified Rainwater Tank (SA) 0.19µg/L *(6)* January 2006 Katamatite (Vic) 0.089µg/L *(52)* 2006 Sheep Station Creek (Vic) 0.04µg/L *(21)*
Other Notes:	**Likely to be the 4th most commonly detected pesticide in Australian waterways.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Chlorsulfuron

Sulfonylurea Herbicide

2011 Australian Drinking Water Guideline: 200µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=chlorsulfuron	2

Highest Levels Detected

Waterway:	
Water Supply:	25/8/15 Oodla Wirra Reservoir (SA) 0.28µg/L (Non-potable?) *(136)* 28/10/13 Gumeracha Weir (SA) 0.05µg/L *(44)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Chlorthal-Dimethyl

Alkyl Phthalate Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=chlorthal	4

Highest Levels Detected

Waterway:	1980 Unspecified SA Stream 32µg/L *(6)* 1983 Unspecified SA Stream 0.75µg/L *(6)* 1984 Unspecified SA Stream 0.42µg/L *(6)* 1985 Unspecified SA Stream 0.2µg/L *(6)* 1982 Unspecified SA Stream 0.09µg/L *(6)*
Water Supply:	13/9/13 Gumeracha Weir (SA) 2.62µg/L *(44)* 1983 Unspecified Rainwater Tank SA 0.57µg/L *(6)* 1984 Unspecified Rainwater Tank SA 0.48µg/L *(6)* 31/5/10 Little Para River (SA) 0.43µg/L *(44)* 1983 Unspecified SA Reservoir 0.08µg/L *(6)* 24/9/98 Hougraves Weir (SA) 0.07µg/L *(44)*
Other Notes:	Also known as DCPA (see Dachtal)

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: cis-Chlordane

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=cis-chlordane	30

Highest Levels Detected

Waterway:	29/4/10 Sharps Rd Wetland Keilor (Vic) sediment *(17)* 29/1/10 Nillumbik Lake Diamond Creek (Vic) sediment *(17)*
Water Supply:	
Other Notes:	Multiple detections in South East Queensland 2013-14 *(123).* Also known as a-Chlordane.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Clomazone

Unclassified Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=clomazone	2

Highest Levels Detected

Waterway:	
Water Supply:	11/7/14 Clyde River (Tas) 0.1µg/L *(5)*
Other Notes:	Also detected 7/3/12 Panatana Rivulet (Tas) *(5)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Clopyralid

Pyridinecarboxylic Acid Herbicide

2011 Australian Drinking Water Guideline: 2000µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=clopyralid	5

Highest Levels Detected

Waterway:	October 12 Edinburgh Gardens (Vic) 0.059µg/L *(67)* October 12 Ti Tree Creek Berwick (Vic) 0.056µg/L *(67)* October 12 Wallan Wetlands (Vic) 0.03µg/L *(67)* October 12 Darling St East Melbourne (Vic) 0.01µg/L *(67)*
Water Supply:	April 1983 Ryans Creek (Vic) 15µg/L *(68)* April 1983 Ryans Creek (Vic) 1µg/L *(68)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Clothiandin

Neonicotinoid Insecticide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=clothiandin	**6**

Highest Levels Detected

Waterway:	**7/12/13 Eastern Creek (NSW) 0.42µg/L *(22)*** **29/1/13 South Creek (NSW) 0.12µg/L *(22)*** **29/1/13 Cosgrove Creek (NSW) 0.12µg/L *(22)*** **29/1/13 Bell Creek (NSW) 0.09µg/L *(22)*** **7/2/13 Wianamatta Creek (NSW) 0.06µg/L *(22)***
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Cyanazine

Triazine Herbicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=cyanazine	**4**

Highest Levels Detected

Waterway:	**1989-1992 Northern Tasmania 5.2µg/L** *(69)* **14/1/14 Panatana Rivulet (Tas) 0.9µg/L** *(5)* **25/8/08 Brid River (Tas) Trace** *(5)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Cyfluthrin

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline: 50µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Cyhalothrin

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=cyhalothrin	1

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**27/1/10 sediment Tahbilk Wetland (Vic)** *(70)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Cypermethrin

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline: 200µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=cypermethrin	2

Highest Levels Detected

Waterway:	1989-91 Guildford (Tas) 0.5µg/L *(38)*
Water Supply:	
Other Notes:	9/12/09 Arundel Creek (Vic) sediment *(17)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Cyproconazole

Azole Fungicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=cyproconazole	2

Highest Levels Detected

Waterway:	
Water Supply:	**2008? Sheep Station Creek (Vic) 0.39µg/L** *(21)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Cyprodinil

Pyrimidine Fungicide

2011 Australian Drinking Water Guideline: 90µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=cyprodinil	13

Highest Levels Detected

Waterway:	
Water Supply:	8/11/12 White Swan Reservoir (Vic) 0.01µg/L *(8)* 2008? Upper Yarra River (Vic) 0.01µg/L *(17)*
Other Notes:	Also found in sediment at Spadonis Reserve (Vic) Upper Yarra River*(17)*, 7/9/09 Little Yarra River sediment (Vic)*(17)*, Westernport Bay sediment (Vic) *(71)*, Mt Lofty Ranges (SA) 2007-9 *(56)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Dachtal

Alkyl Phthalate Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=dachtal	9

Highest Levels Detected

Waterway:	December 1986 Cox Creek (SA) 88µg/L *(64)* 1986/7 Cox Creek (SA) 31µg/L *(64)* 1984/5 Vince Creek (SA) 8.6µg/L *(64)* 1986/7 Mt Lofty Golf Course (SA) 6.6µg/L *(64)* 1984/5 Sutton Creek (SA) 0.18µg/L *(64)*
Water Supply:	
Other Notes:	Also known as DCPA (see: Chlorthal-Dimethyl)

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Dalapon

Unclassifed Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=dalapron	3

Highest Levels Detected

Waterway:	**2008/9 Alice Springs Wastewater 0.04µg/L** *(13)*
Water Supply:	**2011/12 Wivenhoe Dam (Qld) Recycled Water 0.17µg/L** *(37)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: DDT

Organochlorine Insecticide

2011 Australian Drinking Water Guideline: 9µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.006 µg/L	0.01µg/L	0.02µg/L	0.04µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/ddt/	57

Highest Levels Detected

Waterway:	1982 Werribee River (Vic) 6700µg/L *(19)* 1982 Werribee Irrigation District Drain 5 10µg/L *(19)* 1971-2 Brisbane River (Qld) 1.7µg/L *(72)* 1971 Unspecified Location Murray River SA 1.2µg/L *(6)* 1984-5 Vince Creek (SA) 1.18µg/L *(64)*
Water Supply:	1994 January Olangolah Dam/No 4 Service Basin (Vic) 4µg/L *(73)* 1990 Ovens River (Vic) Storm Event 3.8µg/L *(74)* 1994 Ovens River (Vic) Myrtleford 0.34µg/L *(75)* 1980 Unspecified Rainwater Tank (SA) 0.18µg/L *(6)* 1979 Unspecified SA Reservoir 0.02µg/L *(6)* 6/1/71 Wangaratta (Vic) 0.01µg/L *(76)*
Other Notes:	**Likely to be the 16th most commonly detected pesticide in Australian waterways.** First used in the 1940's. Banned in Australia in 1987. Commonly detected in sediment and throughout the food chain. DDT is still being detected in sediment in the 2010's, long after being banned. The Yarra River estuary in Melbourne has some of the highest DDT sediment levels in the world *(77)*. Also detected in Bore Water SA 1970's *(6)*. Residues of DDT probably still pollute a multitude of waterways across Australia and if thoroughly tested for, would probably be the most commonly detected pesticide in the Australian environment.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: DEET

Unclassified Insect Repellent

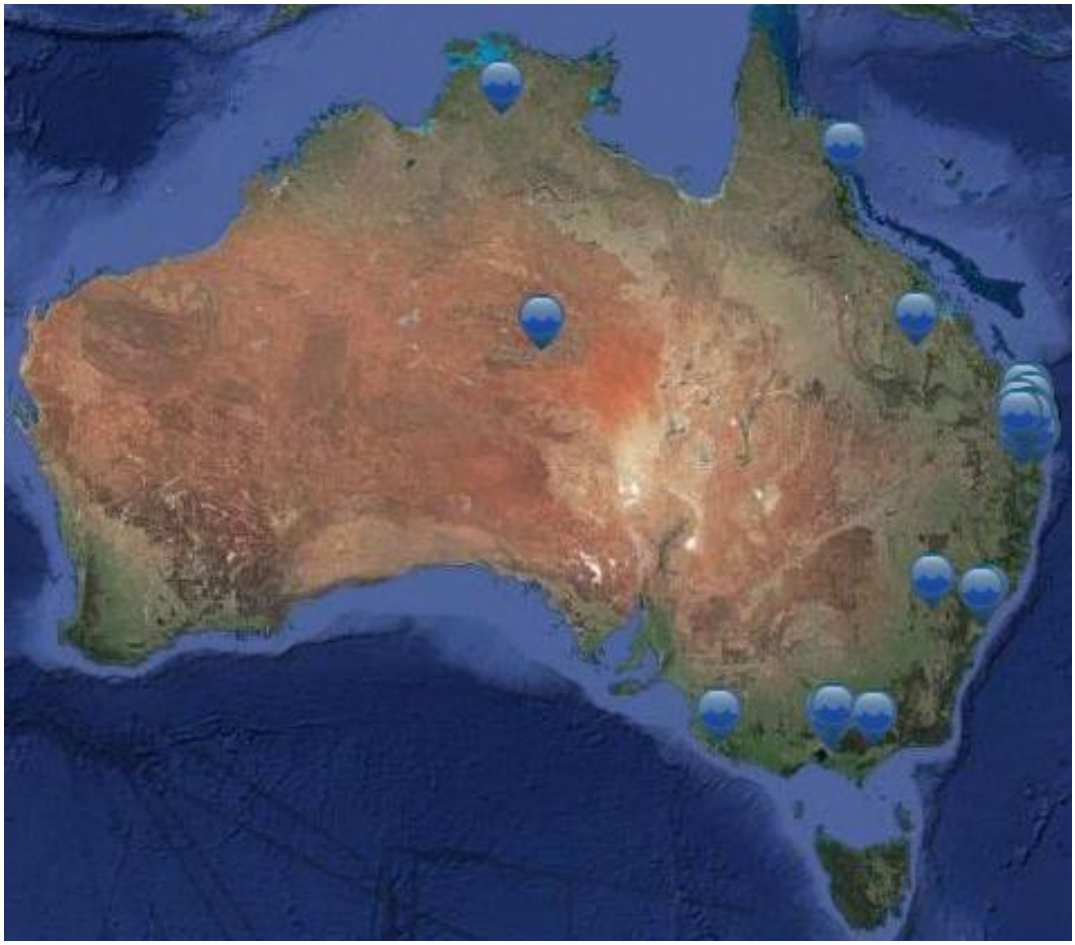
2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/deet/	40

Highest Levels Detected

Waterway:	27/4/12 Fitzgibbon (Qld) Stormwater 0.86µg/L *(78)* 7/3/12 Makerston St (Qld) Stormwater 0.86µg/L *(78)* 2009-10 Comet River (Qld) 0.63µg/L *(32)* 23/1/12 Hornsby (NSW) 0.48µg/L *(78)* 5/2/12 Banyan Reserve (Vic) 0.43µg/L *(78)*
Water Supply:	21/3/11 Yarra River Sugarloaf Offtake (Vic) 0.05µg/L *(79)*
Other Notes:	Also detected in stormwater runoff in Melbourne. Multiple detections have recently been recorded in South East Queensland *(123)*.



Detections of DEET so far recorded in Australia. It is likely that DEET would be detected across the continent if testing was conducted at multiple locations.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Deltamethrin

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline: 40µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Desethylatrazine

Triazine Breakdown Product

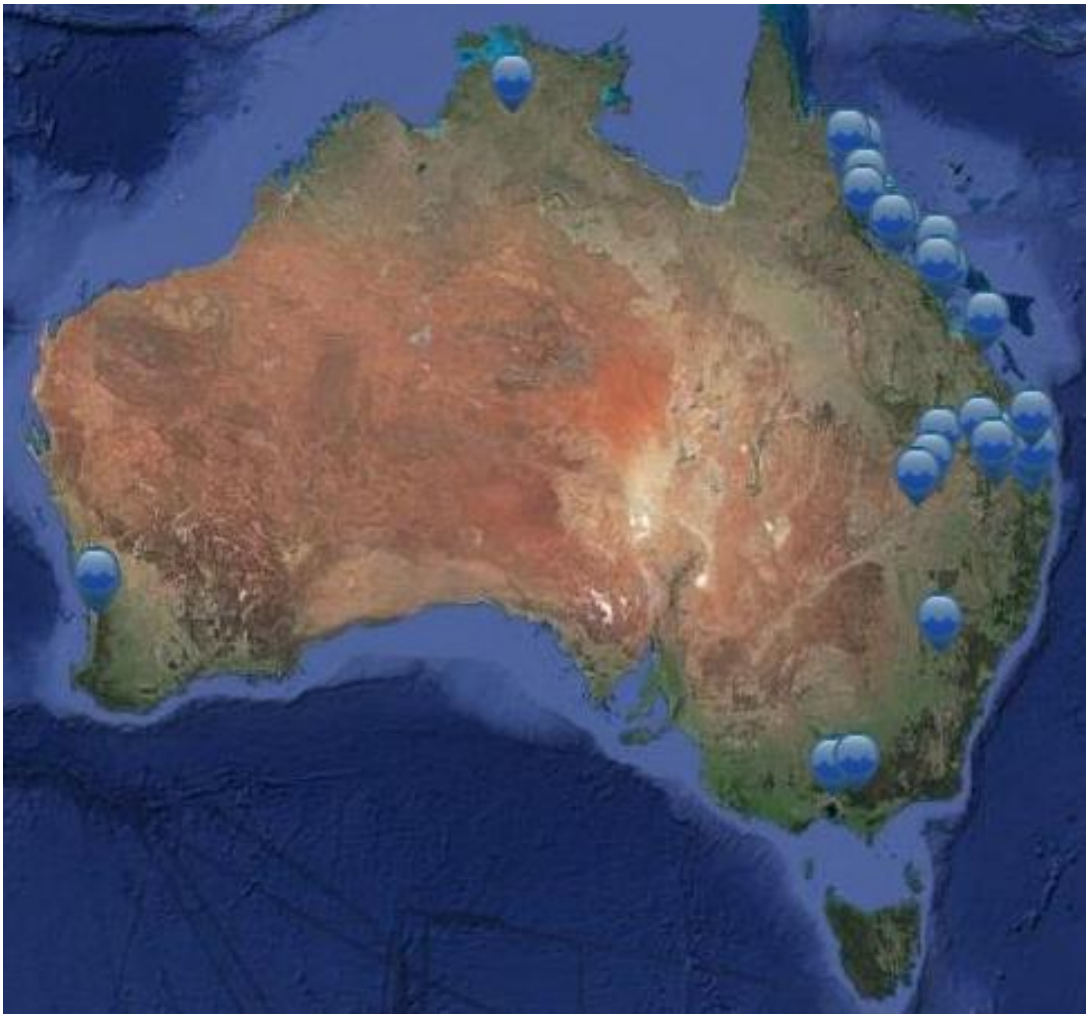
2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/desethylatrazine/	50

Highest Levels Detected

Waterway:	2005-6 Lower Burdekin (Qld) 1.2µg/L *(80)* September 1997 Mt. Canobolas (NSW) 0.9µg/L *(81)* 2009-10 Baratta Creek (Qld) 0.89µg/L *(32)* 2013-14 Swanbank Power Station (Qld) 0.7µg/L *(36)* 2009-10 Pioneer River (Qld) 0.27µg/L *(32)*
Water Supply:	2002 Dumbleton Weir (Qld) 0.1µg/L *(33)* 10/12/09 Starvation Creek (Vic) 0.007µg/L *(17)*
Other Notes:	**Likely to be the 20th most commonly detected pesticide in Australian waterways.** Breakdown product of Atrazine. Also found throughout Swan/Canning River catchment in WA, Melbourne wetlands and along Queensland Coast as well as on offshore islands in Great Barrier Reef. Has also been detected in sediment. Multiple detections have recently been found in South East Queensland *(123).*



Where Atrazine is found, it is highly probable that Desethylatrazine will be found too. How many water authorities test for Desethylatrazine?

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Desisopropyl-atrazine

Triazine Breakdown Product

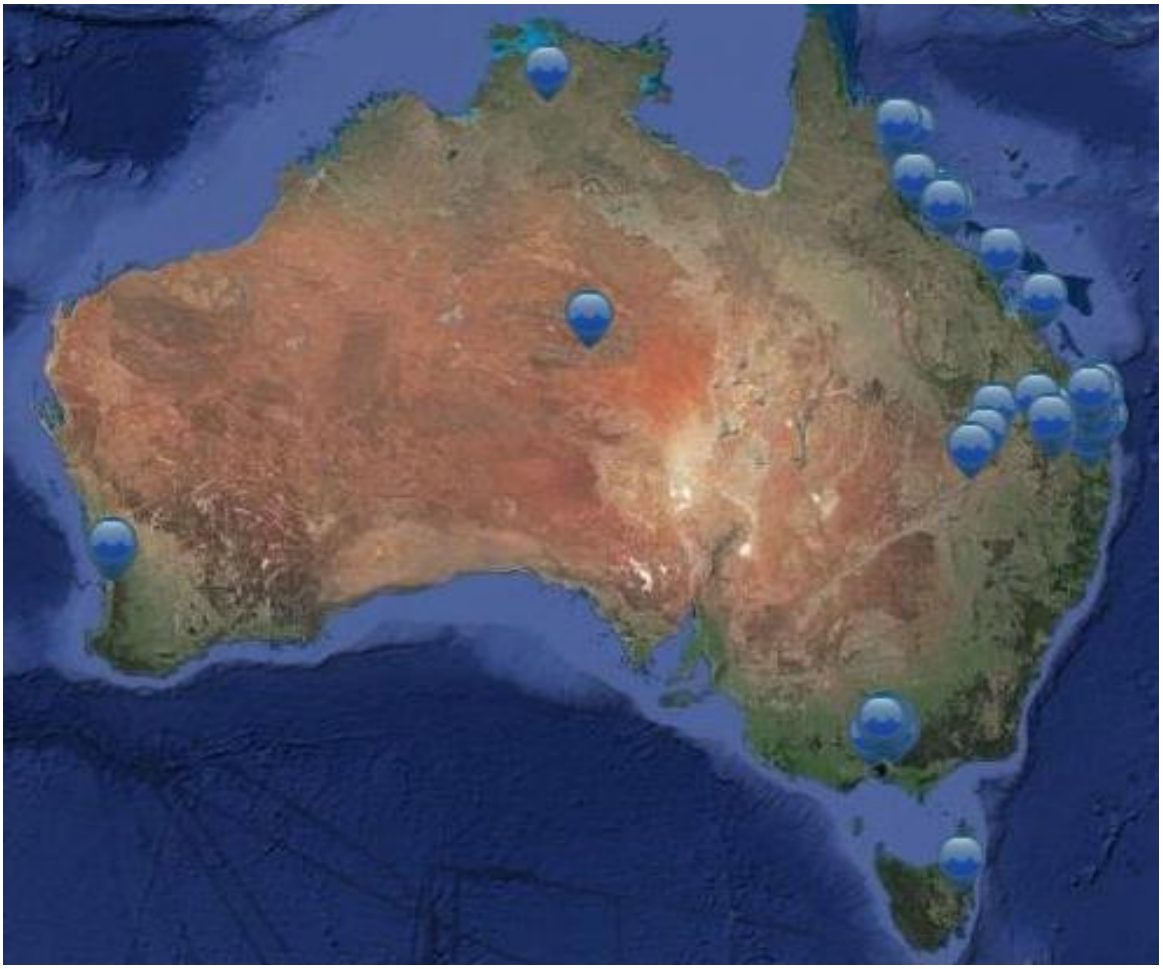
2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/desisopropyl-atrazine/	**78**

Highest Levels Detected

Waterway:	**Feb 2013 Darling Street East Melbourne 0.714µg/L** *(67)* **20/9/07 Macquarie Catchment (Tas) 0.45µg/L** *(82)* **19/1/10 Meadow Heights (Vic) 0.31µg/L** *(17)* **2009-10 Baratta Creek (Qld) 0.28µg/L** *(32)* **20/4/10 Cherry Lake Altona (Vic) 0.25µg/L** *(17)*
Water Supply:	
Other Notes:	**Most likely to be the 11th most commonly detected pesticide in Australian waterways.** **Breakdown product of Atrazine and Simazine. Also found throughout Swan/Canning River catchment in WA and along Queensland Coast. Widespread detections at higher levels in wetlands throughout Melbourne region. Multiple detections have recently been found in South East Queensland** *(123).*



Where Atrazine and Simazine are used, there is a high chance that their breakdown product Desisopropyl Atrazine will be found too. No Guideline exists for this chemical in the Australian Drinking Water Guidelines, despite it being detected in multiple locations.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: DIA (Deisopropyl Atrazine)

Triazine Breakdown Product

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/dia/	1

Highest Levels Detected

Waterway:	
Water Supply:	**2009/10 Yarra River u/s Sugarloaf Reservoir 1.3µg/L** ***(21)***
Other Notes:	**Metabolite/Breakdown product of Atrazine.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Diazinon

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 4µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.00003 µg/L	0.01µg/L	0.2µg/L	2µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/diazinon/	35

Highest Levels Detected

Waterway:	2012 Nov Murrumbidgee Irrigation Area (Site WS) 0.217µg/L *(83)* 2012 Nov Murrumbidgee Irrigation Area (Site MIRMCM) 0.204µg/L *(83)* 2013/4 Swan Bank Power Station (Qld) 0.17µg/L *(36)* 2012 Nov Murrumbidgee Irrigation Area (Site MDJWE) 0.167µg/L *(83)* 2011-12 Herbert River Catchment (Qld) 0.157µg/L *(31)*
Water Supply:	24/8/98 Barossa Water Treatment Plant Inlet 0.6µg/L *(44)* December 2011 Narracan Creek (Vic) 0.008µg/L *(49)*
Other Notes:	Also detected in the 1994/5 Murray Irrigation District, 1991-3 Coleambally Irrigation District and Swan/Canning River catchments WA 2006/7.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Dicamba

Benzoic acid Herbicide

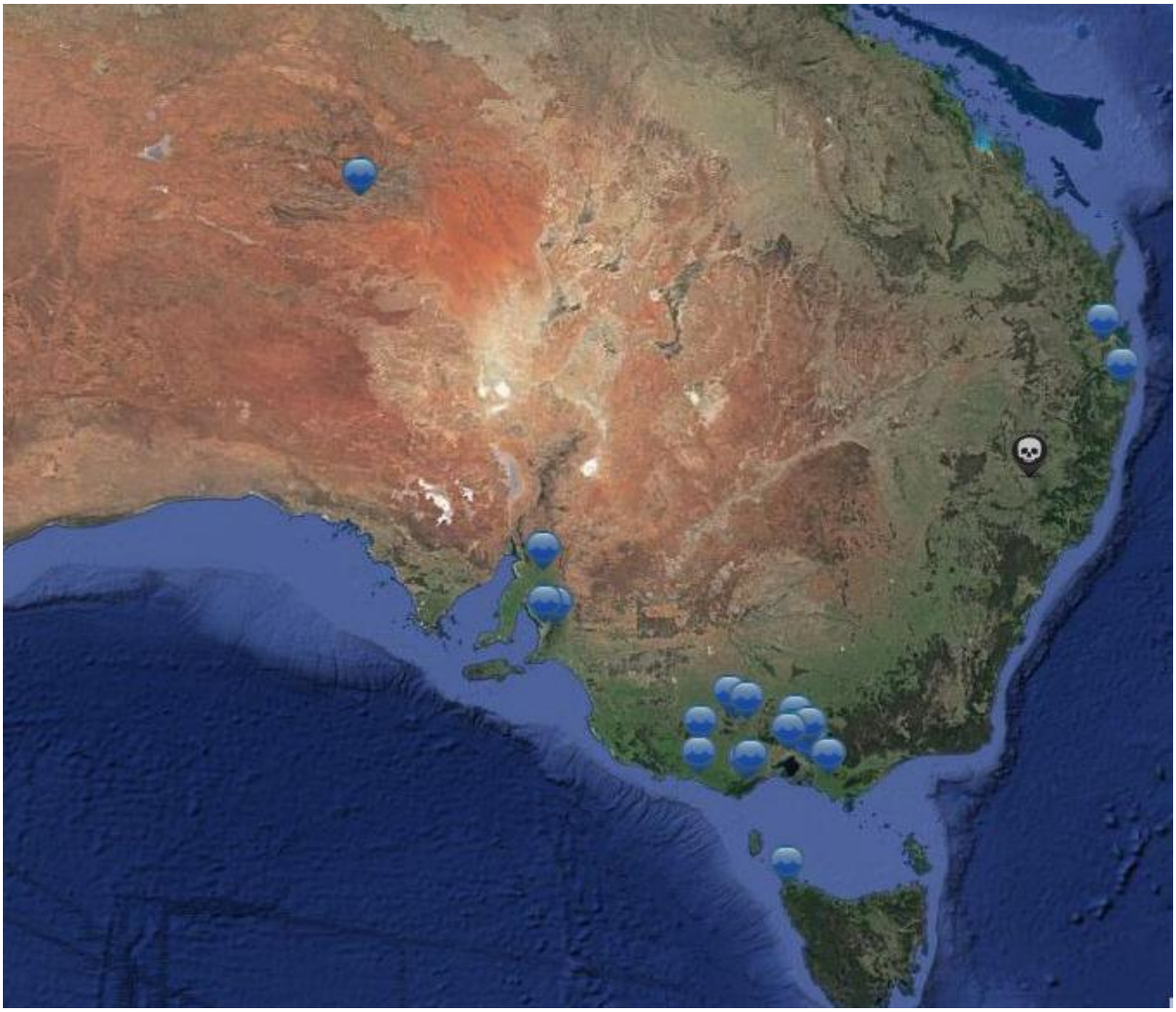
2011 Australian Drinking Water Guideline: 100µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/dicamba/	**22**

Highest Levels Detected

Waterway:	**1978? Nufarm Industrial Waste (Vic) 133,000µg/L *(1)*** **2013/14 Swanbank Power Station (Qld) 0.34µg/L *(36)*** **2008/9 Alice Springs Waste Water 0.24µg/L *(13)*** **3/7/12 Welcome River (Tas) 0.12µg/L *(5)*** **October 2012 Wallan Wetlands (Vic) 0.12µg/L *(67)***
Water Supply:	**29/5/03 Wilsons River (NSW) 1.8µg/L *(84)*** **27/2/10 Bundaleer Reservoir (SA) 0.5µg/L *(44)*** **30/9/13 Bundaleer Reseroir (SA) 0.4µg/L *(44)*** **17/9/13 Matthews Creek (Vic) 0.35µg/L *(3)*** **15/10/12 Bundaleer Reservoir (SA) 0.3µg/L *(44)*** **29/9/14 Gumeracha Weir (SA) 0.3µg/L *(44)***
Other Notes:	**Detected in several water supplies across South Australia, Victoria and in the Wilsons River in NSW. Also detected via stormwater in a number of locations, particularly across Melbourne.**



Australian Dicamba detections. Dicamba is likely to be widespread across Australia, but who is testing for it?

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Dichlorprop

Chlorophenoxy Acid or Ester Herbicide

2011 Australian Drinking Water Guideline: 100µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**"There are few available data for dichlorprop in Australian drinking water. In Australian treated sewage, dichlorprop was below 0.5 µg/L (supporting data, NRMMC/EPHC/NHMRC 2008)** (72).

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Dichlorvos

Organophosphorus Breakdown Product/Impurity/Insecticide

2011 Australian Drinking Water Guideline: 5µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=dichlorvos	3

Highest Levels Detected

Waterway:	20/1/10 Merri Creek (Vic) 0.009µg/L *(17)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Diclofop-Methyl

Aryloxyphenoxy propionic acid, Chlorophenoxy acid or ester Herbicide

2011 Australian Drinking Water Guideline: 5µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/diclofop/	1

Highest Levels Detected

Waterway:	2013/14 Swanbank Power Station (Qld) 2.4µg/L *(36)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Dicofol

Organochlorine Insecticide

2011 Australian Drinking Water Guideline: 4µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Dieldrin

Organochlorine Breakdown Product/Insecticide

2011 Australian Drinking Water Guideline: 0.3µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/dieldrin/	129

Highest Levels Detected

Waterway:	1/2/88 Cairns (Qld) Mud Flats 6µg/L *(85)* 2001 Serpentine-Jarrahdale Landfill (WA) 0.4µg/L *(86)* 1986 Unspecified Bore SA 1.2µg/L *(6)* 1984 Unspecified Bore SA 0.8µg/L *(6)* 1975 Unspecified Bore SA 0.4µg/L *(6)*
Water Supply:	1981* Woori Yallock Creek (Vic) 10.36µg/L *(101)* 1986-7 Coffs Harbour (NSW) Water Tanks 1.9µg/L *(12)* 1982 Unspecified Rainwater Tank SA 0.88µg/L *(6)* 1975 Unspecified SA Reservoir 0.7µg/L *(6)* 1976 Unspecified SA Reservoir 0.47µg/L *(6)* 1989 Pacific Palms (NSW) Tank Water 0.4µg/L *(87)*
Other Notes:	**Likely to be the 6th most commonly detected pesticide in Australian waterways.** Nationwide recall process 1987. Commonly detected throughout waterways and sediment across Australia. Still being detected in waterways such as the Yarra River as late as 2009. Found in wetlands and waterways across Melbourne in 2010, decades after it was last used. *1989 Dundurrabin Dam (NSW) reported to have Dieldrin levels 100 times above Australian Drinking Water Criteria (*87*). (This would have been a level as high as 100µg/L, based on the 1987 Guideline level of 1µg/L, however information confirming this level has not been located in the production of this publication.)

	Detected in 1990's in sediment in the Willbriggie Irrigation Area (NSW). Detected in water tanks in Ballina NSW 1980's. King River Vic, Woori Yallock Creek 1981, Broken Creek 1980. Multiple detections still occurring in South East Queensland in recent years *(123).*

Recent Dieldrin detections in waterways in South East Queensland are still occurring, 3 decades after it was last used.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Difenconazole

Azole Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=difenconazole	6

Highest Levels Detected

Waterway:	2008 Watts River (Vic) 0.02µg/L *(21)* December 2013 Gisborne Stormwater Drain 0.012µg/L *(88)*
Water Supply:	2009/10 Upper Yarra River (Vic) 0.15µg/L *(21)* 2008 Woori Yallock Creek (Vic) 0.1µg/L *(21)* 2008 Cockatoo Creek (Vic) 0.08µg/L *(21)* 2008 Shepherd Creek (Vic) 0.01µg/L *(21)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Diflubenzuron

Benzoylurea Insect Growth Regulator/Insecticide

2011 Australian Drinking Water Guideline: 70µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Dimethenamid

Amide Herbicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=dimethenamid	**1**

Highest Levels Detected

Waterway:	**7/3/12 Panatana Rivulet (Tas) Trace *(5)***
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Dimethoate

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.1µg/L	0.15µg/L	0.2µg/L	0.3µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/dimethoate/	**19**

Highest Levels Detected

Waterway:	**1998/2001?Tuppal Creek NSW 0.2µg/L *(89)*** **1994 Mitchell River (Vic) 0.12µg/L *(90)*** **2005 April Mooki River Ruvigne (NSW) 0.05µg/L *(91)*** **21/4/10 Beaconsfield Wetland (Vic) 0.004µg/L *(17)*** **6/10/09 Dandenong Creek Wantirna 0.003µg/L *(17)***
Water Supply:	**2009/10 Upper Yarra River 0.094µg/L *(21)*** **10/12/09 Spadonis Reserve (Vic) 0.061µg/L *(17)*** **10/12/09 Platypus Wetlands (Vic) 0.059µg/L *(17)*** **10/12/09 Starvation Creek (Vic) 0.002µg/L *(17)***
Other Notes:	**Detected in the Namoi River (NSW 1998). Widespread detections across Melbourne wetlands 2009-10 mostly at 0.002µg/L.**

Dimethoate is another herbicide rarely tested for in Australian waters. Recent detections in the Melbourne region 2009-10 suggest that it is most likely to be commonly found in many other regions of Australia.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Dimethomorph

Morpholine Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=dimethomorph	4

Highest Levels Detected

Waterway:	21/4/10 Berwick Spring (Vic) 0.002µg/L *(17)*
Water Supply:	2009/10 Upper Yarra River 0.01µg/L *(21)*
Other Notes:	2013 Gisborne (Vic) stormwater *(88)*, 2013 Jacksons Creek (Vic) sediment *(88)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Diphenylamine

Amine Fungicide/Insecticide/Plant Growth Regulator

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=diphenylamine	**6**

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Detected in sediment in Jacksons Creek (Vic) and stormwater drain Gisborne (Vic) 2012/13** ***(88).***

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Diquat

Bipyridylium Dessicant/Herbicide

2011 Australian Drinking Water Guideline: 7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.01µg/L	1.4µg/L	10µg/L	80µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=diquat	2

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Diquat is registered for use in water storage areas used for human consumption.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Disulfoton

Organophosphorus Insecticide/Nematicide

2011 Australian Drinking Water Guideline: 4µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Diuron

Urea Herbicide

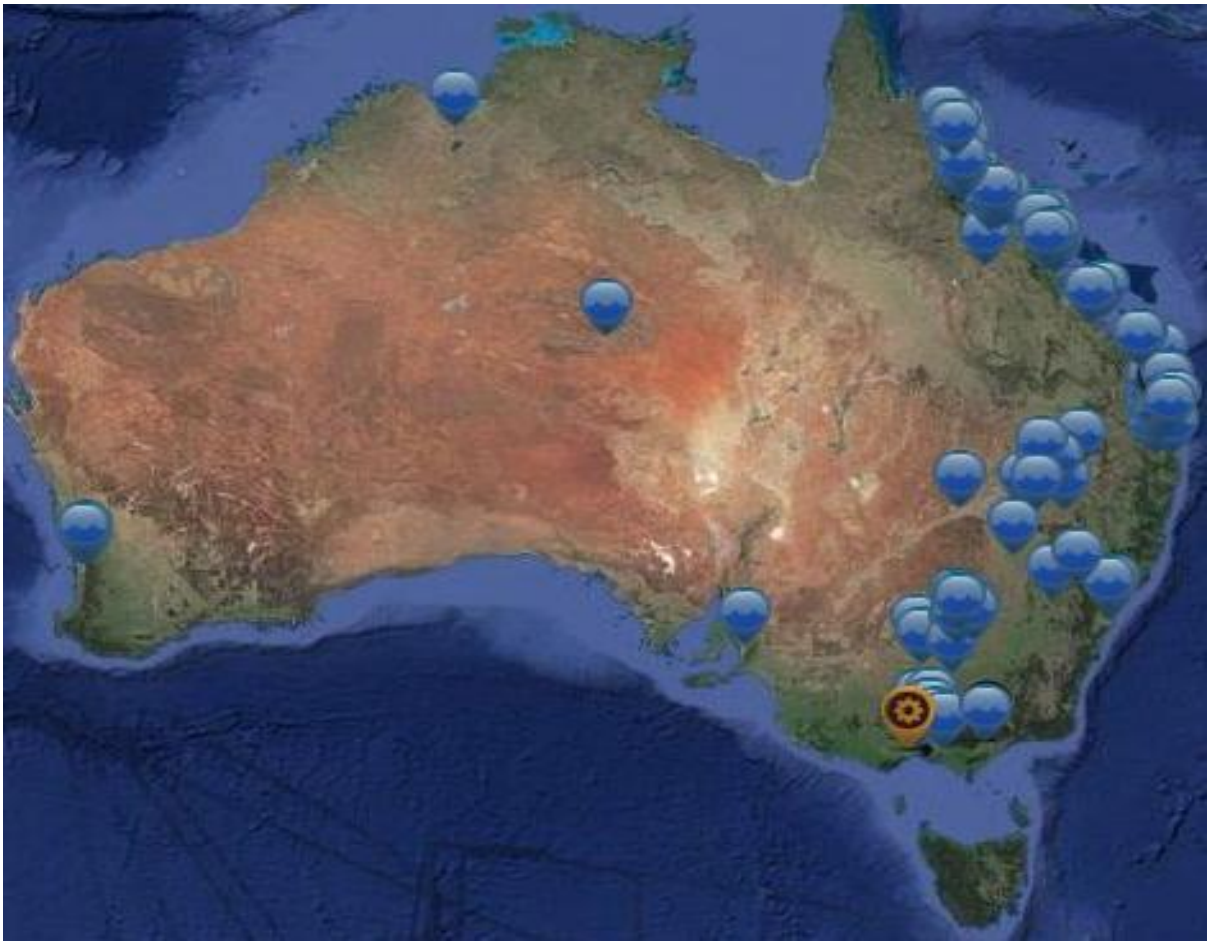
2011 Australian Drinking Water Guideline: 20µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/diuron/	164

Highest Levels Detected

Waterway:	2005 December Burnett River Sugarcane Farm (Qld) 280µg/L *(92)* 2014 April Murrumbidgee Irrigation Area (Gogeldrie Main Drain at Gooragool Lagoon) 245µg/L *(93)* (? Date) Bundaberg Farm (Qld) 120µg/L *(92)* 2014 June Murrumbidgee Irrigation Area (Gogeldrie Main Drain at Gooragool Lagoon) 47.9µg/L *(93)* 2012-13 Boundary Creek (Qld) 34µg/L *(94)*
Water Supply:	2002 February Dumbleton Weir (Qld) 8.5µg/L *(33)*
Other Notes:	**Most likely to be the 3rd most commonly detected pesticide in Australian waterways.** Widespread detections across eastern Australia, particularly Queensland and the Great Barrier Reef. Also detections in Swan/Canning River Catchment in Western Australia and Alice Springs. Widespread detections across wetlands in Melbourne. High levels detected in Murrumbidgee Irrigation Area 1990-2014. Detections also in Coleambally Irrigation Area 1994-2015 and Namoi-Gwydir Rivers in 1990's. More detections very likely to occur in domestic water supplies in Queensland.



Diuron is often discussed in regards to its impacts in Queensland and the Great Barrier Reef. However, Diuron is widely detected across Australia, with very high levels also recorded in the Murrumbidgee Irrigation Area.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Endosulfan

Organochlorine Insecticide

2011 Australian Drinking Water Guideline: 20µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.03µg/L	0.2µg/L	0.6µg/L	1.8µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/endosulfan/	**130***

Highest Levels Detected

Waterway:	**1990's Onfarm Water Storages (NSW) 45µg/L *(95)*** **1991 December Gwydir River (NSW) ~7µg/L *(96)*** **1994-5 Murrumbidgee Irrigation Area (NSW) 2.51µg/L *(18)*** **1997 January Gwydir River (NSW) 1.75µg/L *(96)*** **1984 Gil Gil Creek (NSW) 1.5µg/L *(98)***
Water Supply:	**2002 Darling Downs Rainwater Tank (Qld) 18µg/L *(45)*** **20/11/03 Emigrant Creek (NSW) 0.4µg/L *(97)*** **13/11/03 Emigrant Creek (NSW) 0.4µg/L *(97)*** **2010 Upper Yarra River (Vic) 0.31µg/L *(21)*** **1997 Gunnedah Rainwater Tank (NSW) 0.27µg/L *(99)*** **1997 Gunnedah Rainwater Tank (NSW) 0.12µg/L *(99)***
Other Notes:	**Likely to be the 5th* most commonly detected pesticide in Australian waterways. (*includes detections of Endosulfan Sulfate) Banned in Australia October 2010. Widespread detections particularly in north central NSW during the 1990's due to cotton cropping. Detected often in the Murrumbidgee Irrigation and Coleambally Irrigation Areas during the 1990's and northern Victoria in the mid 2000's . Also detected infrequently in Melbourne waterways/wetlands. Very likely that Endosulfan has contaminated hundreds of waterways throughout Australia. Multiple detections of Endosulfan Sulfate still being detected in South East Queensland *(123).***

Endosulfan was finally banned almost 30 years after concerns were first raised. Northern NSW/Southern QLD cotton crops were the major Endosulfan hotspot region particularly in the 1990's. Endosulfan has also been detected in the New Zealand alps as a result of spraydrift from NSW, a distance of ~2500km.

http://www.ncbi.nlm.nih.gov/pubmed/22070086

Endosulfan Sulphate, a breakdown product of Endosulfan has also recently been detected in numerous water supplies throughout South East Queensland (123).

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Endothal

Unclassified Defoliant Herbicide

2011 Australian Drinking Water Guideline: 100µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Endrin

Organochlorine Avicide/Insecticide

2011 Australian Drinking Water Guideline: 1µg/L*(1987)

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.01µg/L	0.02µg/L	0.04µg/L	0.06µg/L

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/endrin/	20

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	Banned in Australia. Multiple detections in South East Queensland in recent years. *(123)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: EPTC

Thiocarbamate Herbicide

2011 Australian Drinking Water Guideline: 300µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Esfenvalerate

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline: 30µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
		0.001µg/L		

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=esfenvalerate	2

Highest Levels Detected

Waterway:	
Water Supply:	2005 Channel 14/2 Kerang (Vic) 65µg/L *(52)*
Other Notes:	Detected in sediment in Watsons Creek estuary in Westernport Bay 2010/11 *(102).* No Australian Drinking Water Guideline for Esfenvalerate existed in 2005. The Guideline only occurred in 2011. It is also interesting to note that this pollution incident was not detected by the local drinking water authority, who do not test for Esfenvalerate. Two other insecticides were also detected, Bifenthrin (100µg/L) and Tauflavinate (75µg/L). Drinking water guidelines for these two insecticides are non-existent.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Ethion

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 4µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=ethion	2

Highest Levels Detected

Waterway:	March 2014 Jacksons Creek (Vic) 0.035µg/L *(88)*
Water Supply:	
Other Notes:	Also detected in drain at Moe (Vic) June 2007 *(103).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Ethofumesate

Unclassified Herbicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=ethofumesate	**2**

Highest Levels Detected

Waterway:	**7/11/12 Panatana Rivulet (Tas) 0.1µg/L** *(5)* **16/3/12 Tuckers Creek (Tas) 0.04µg/L** *(5)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Ethoprophos

Organophosphorus Insecticide/Nematicide

2011 Australian Drinking Water Guideline: 1µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Associated with spray drift in the Coffs Harbour region during the 1980's** ***(104).***

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Etridiazole

Azole Fungicide

2011 Australian Drinking Water Guideline: 100µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Fenamiphos

Organophosphorus Insecticide/Nematicide

2011 Australian Drinking Water Guideline: 0.5µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=fenamiphos	16

Highest Levels Detected

Waterway:	2013-14 Swanbank Power Station (Qld) 0.14µg/L *(36)* Jan 2010 Darebin Creek Fairfield (Vic) 0.009µg/L *(17)* 21/4/10 Berwick Springs Wetland (Vic) 0.005µg/L *(17)* 19/1/10 Maribyrnong River Keilor (Vic) 0.001µg/L *(17)*
Water Supply:	February 1993 Perth Groundwater 1000µg/L *(41)* 10/12/09 Starvation Creek Reservoir (Vic) 0.002µg/L *(17)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Fenarimol

Pyrimidine Fungicide

2011 Australian Drinking Water Guideline: 40µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=fenarimol	3

Highest Levels Detected

Waterway:	
Water Supply:	April 2007 Cock Creek (SA) ~10µg/L *(105)* April – June 2007 Cock Creek (SA) av. 4.3µg/L *(105)* 2009-10 Upper Yarra River (Vic) 0.2µg/L *(21)*
Other Notes:	Also detected in sediment Dandenong Creek Wantirna Dec 2009 *(17).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Fenitrothion

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.1µg/L	0.2µg/L	0.3µg/L	0.4µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=fenitrothion	1

Highest Levels Detected

Waterway:	9/7/12 Sulphur Creek (Tas) Trace Levels *(5)*
Water Supply:	
Other Notes:	Banned in Australia for most uses 2004.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Fenoxycarb

Juvenile Hormone Mimic/Other Carbamate/ Insect Growth Regulator/Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=fenoxycarb	7

Highest Levels Detected

Waterway:	
Water Supply:	2009/10 Upper Yarra River (Vic) 0.034µg/L *(21)* 2008 Woori Yallock Creek (Vic) 0.03µg/L *(21)* 2008 Cockatoo Creek (Vic) 0.016µg/L *(21)* 10/12/09 Starvation Creek (Vic) 0.004µg/L *(17)* 2008 Upper Yarra River (Vic) 0.002µg/L *(21)* 21/1/10 Spadonis Reserve (Vic) 0.001µg/L *(17)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Fenthion

Organophosphorus Avicide/Insecticide

2011 Australian Drinking Water Guideline: 7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Fenvalerate

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline: 60µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	3

Highest Levels Detected

Waterway:	20/4/10 Cherry Lake Altona (Vic) 0.033µg/L *(17)* 1984 February Channel No. 2 Boort (Vic) Fish kill *(107)*
Water Supply:	2012-13 Wivenhoe Dam Recycled (Qld) 1µg/L *(37)* 1986/7 Yabby deaths Rainbow (Vic) *(106)*
Other Notes:	Also detected in sediments near Westernport Bay Victoria *(102).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Fipronil

Pyrazole Insecticide

2011 Australian Drinking Water Guideline: 0.7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=fipronil	5

Highest Levels Detected

Waterway:	2013-14 Swanbank Power Station (Qld) 0.4µg/L *(36)* 2010 April Chirnside Park (Vic) 0.01µg/L *(17)* 15/6/11 Bendigo Creek (Vic) 0.006µg/L *(70)* 17/12/11 Lake Buninjon (Vic) 0.001µg/L *(70)*
Water Supply:	2009-10 Upper Yarra River (Vic) 0.22µg/L *(21)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Flamprop-Methyl

Arylalanine Fungicide

2011 Australian Drinking Water Guideline: 4µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Fludioxonil

Unclassified Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=fludioxonil	1

Highest Levels Detected

Waterway:	2007-2009 Cocks Creek (SA) Mt Lofty Ranges *(105)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Fluometuron

Urea Herbicide

2011 Australian Drinking Water Guideline: 70µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=fluometuron	13

Highest Levels Detected

Waterway:	1997 October Thalaba Creek (NSW) 31µg/L *(108)* 1997 Gwydir River (NSW) 9µg/L *(108)* 2002-7 Mooki River (NSW) Ruvigne 1.6µg/L *(91)* 2013-14 Swanbank Power Station (Qld) 0.1µg/L *(36)*
Water Supply:	
Other Notes:	Detected in runoff from cotton crops in NSW 1990's.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Flupropanate

Unclassified Herbicide

2011 Australian Drinking Water Guideline: 9µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Fluroxypur

Pyridinecarboxylic Acid Herbicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=fluroxypur	**5**

Highest Levels Detected

Waterway:	**2013-14 Swanbank Power Station (Qld) 3µg/L *(36)*** **2009-10 Sandy Creek (Qld) 0.2µg/L *(32)*** **Feb 2013 Darling St East Melbourne 0.021µg/L *(67)***
Water Supply:	**14/11/13 Talbot Reservoir (Vic) 0.01µg/L *(8)***
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Flusilazole

Azole Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=flusilazole	1

Highest Levels Detected

Waterway:	2013 Gisborne (Vic) Stormwater 0.012µg/L *(88)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Fluvalinate

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=fluvalinate	1

Highest Levels Detected

Waterway:	
Water Supply:	**2011-2013 Lake Wivenhoe Recycled 1µg/L** *(37)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Glyphosate

Phosphonoglycine Herbicide

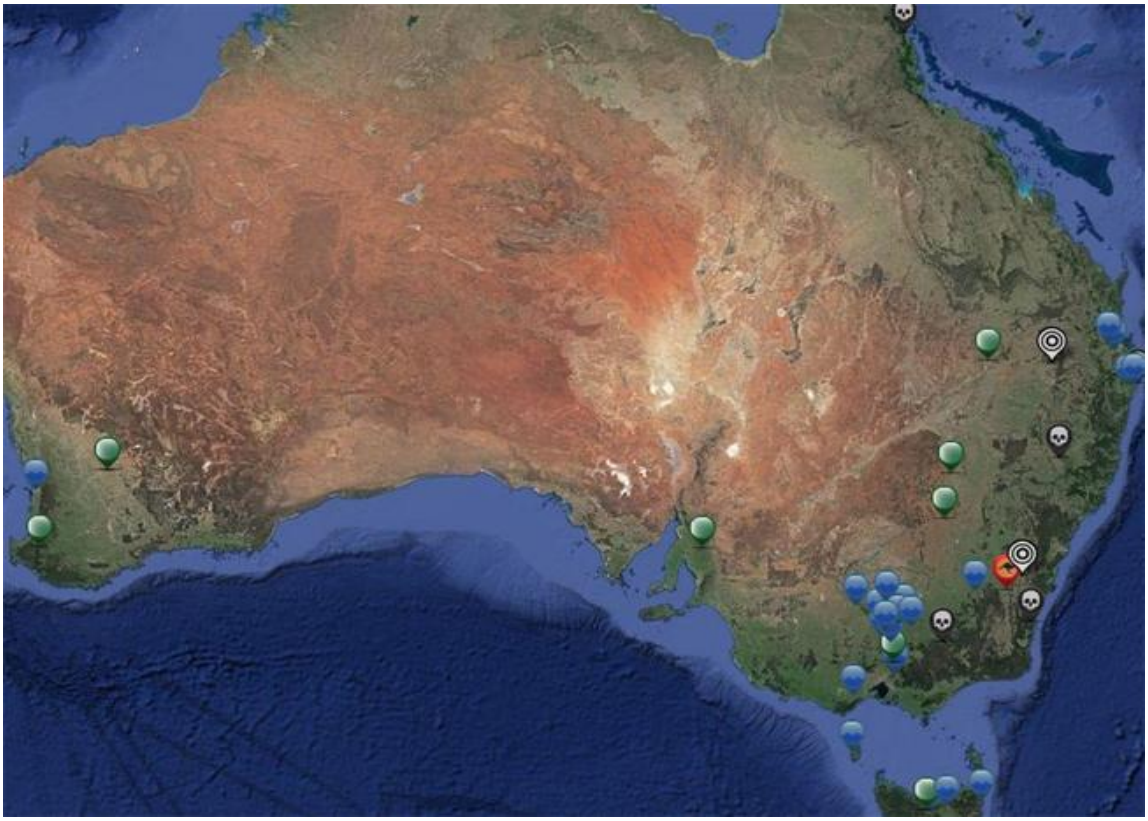
2011 Australian Drinking Water Guideline: 1000µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	370µg/L	1200µg/L	2000µg/L	3600µg/L

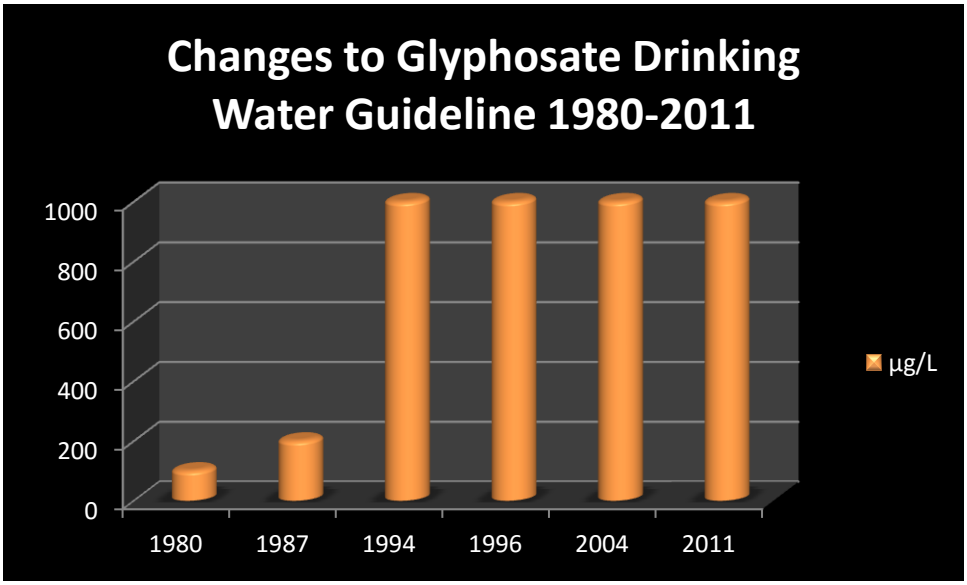
Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/glyphosate/	32

Highest Levels Detected

Waterway:	2011 Shepparton Drain (Vic) 11,420µg/L* *(150)* 12/4/06 Channel 8 Ardmona (Vic) 10,600µg/L *(2)* 8/5/14 Site 68 Goulburn Murray Water Drain/Channel (Vic) 6700µg/L *(151)* 12/5/14 Site 67 Goulburn Murray Water Drain/Channel (Vic) 5600µg/L *(151)* 2011 Waaia Channel (Vic) 3252µg/L *(150)*
Water Supply:	5/5/95 Jandalot Mound – JE6A (WA) 380µg/L *(112)* 21/8/03 Wilson River (NSW) 209µg/L *(97)* 6/4/95 Broken Creek (Vic) 170µg/L *(110)* 8/5/06 Broken Creek (Vic) 160µg/L *(110)* 2007 Lake Nagambie (Vic) 120µg/L *(110)* April 2007 Waranga Western Channel (Vic) 120µg/L *(110)*
Other Notes:	Detected in ~5 other water supplies 0.5-32µg/L in NSW, Victoria and Tasmania. Also detected in recycled water in Queensland <=2µg/L. *(36)* *This level was recorded immediately after spraying. Glyphosate level dropped to 190µg/L within 6 hours.



There has been little testing for Glyphosate in Australian waterways



The Australian Drinking Water Guideline for Glyphosate has not changed since 1994. Between 1980 and 1994, the "safe" level for Glyphosate increased ten fold.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Haloxyfop

Aryloxyphenoxy Propionic Acid Herbicide

2011 Australian Drinking Water Guideline: 1µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=haloxyfop	7

Highest Levels Detected

Waterway:	2013-14 Swanbank Power Station (Qld) 5µg/L *(36)* 2015 Tindall Aquifer Katherine (NT) 0.001µg/L *(113)*
Water Supply:	
Other Notes:	Also detected in North Queensland Rivers *(125)* and Waste Water Treatment Plants *(109).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Heptachlor

Organochlorine Insecticide

2011 Australian Drinking Water Guideline: 0.3µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.01µg/L	0.09µg/L	0.25µg/L	0.7µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/heptachlor/	59*

Highest Levels Detected

Waterway:	1980's Lefroy Brook (WA) 0.17µg/L *(61)* 1990 Ovens River (Vic) 0.08µg/L *(74)* 1974 Unspecified Bore SA 0.03µg/L *(6)* 1987 Upper Blackwood River (WA) 0.007µg/L *(61)* 2006/7 Swan River (WA) storm water *(50)*
Water Supply:	11/4/89 Wangaratta (raw) (Vic) 0.22µg/L *(114)* May 2001 Gumeracha Weir (SA) 0.06µg/L *(44)* 29/9/89 Wangaratta (raw) (Vic) 0.028µg/L *(114)* 11/4/89 Wangaratta (treated) (Vic) 0.02µg/L *(114)* 18/10/00 Katamatite (Vic) 0.02µg/L *(4)* 1/2/89 Wangaratta (Raw) (Vic) 0.018µg/L *(114)*
Other Notes:	**Most likely to be the 15th* most commonly detected pesticide in Australian waterways (Includes detections of Heptachlor Epoxide).** Banned in Australia. Detected in Melbourne water supply February 2000 at Johns Hill Plant 0.013µg/L *(58).* Multiple detections of Heptachlor Epoxide recently detected in South East Queensland *(123).* *In 1989, Dundurrabin Dam (NSW) was reported to have Heptachlor levels 650 times above Australian Drinking Water Criteria *(87).* The ADWG at that time was 3µg/L, meaning that the levels recorded at Dundurrabin would have been 1950µg/L.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Hexachlorobenzene

Organochlorine Fungicide/Insecticide/Microbiocide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=hexachlorobenzene	6

Highest Levels Detected

Waterway:	9/2/72 Ovens River (Vic) 0.06µg/L *(76)*
Water Supply:	16/12/71 Wangaratta Reservoir Pump 0.02µg/L *(76)* 16/12/71 Wangaratta Filtered Water 0.006µg/L *(76)* 13/9/00 Violet Town (Vic) 0.004µg/L *(4)* 2/8/00 Katunga (Vic) 0.003µg/L *(4)* 12/7/00 Picola (Vic) 0.003µg/L *(4)*
Other Notes:	Also widely detected during 1970's in milk products, particularly in Victoria and a wide range of fish species in South Australia in the 1970's.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Hexazinone

Triazinone Herbicide

2011 Australian Drinking Water Guideline: 400µg/L

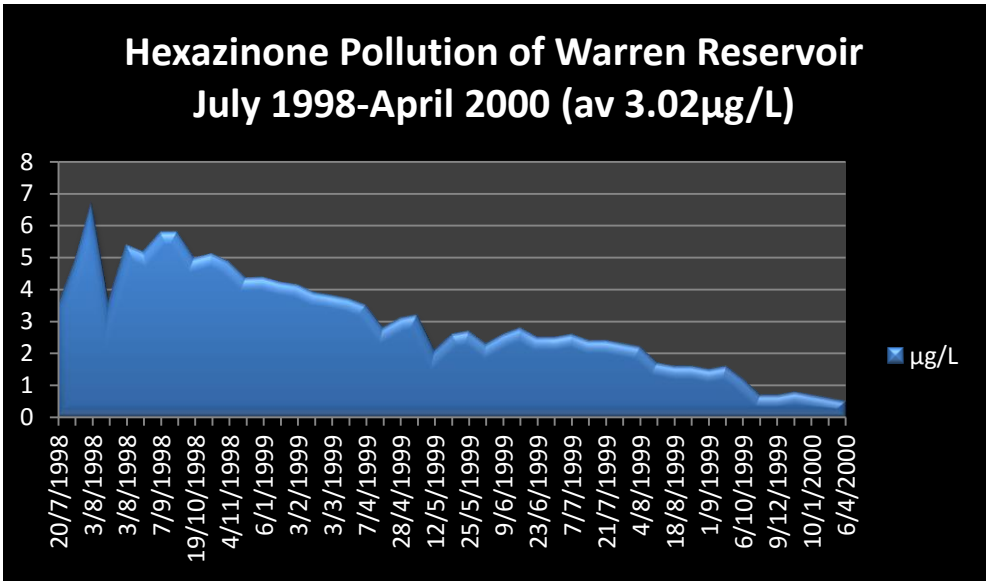
2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/hexazinone/	124

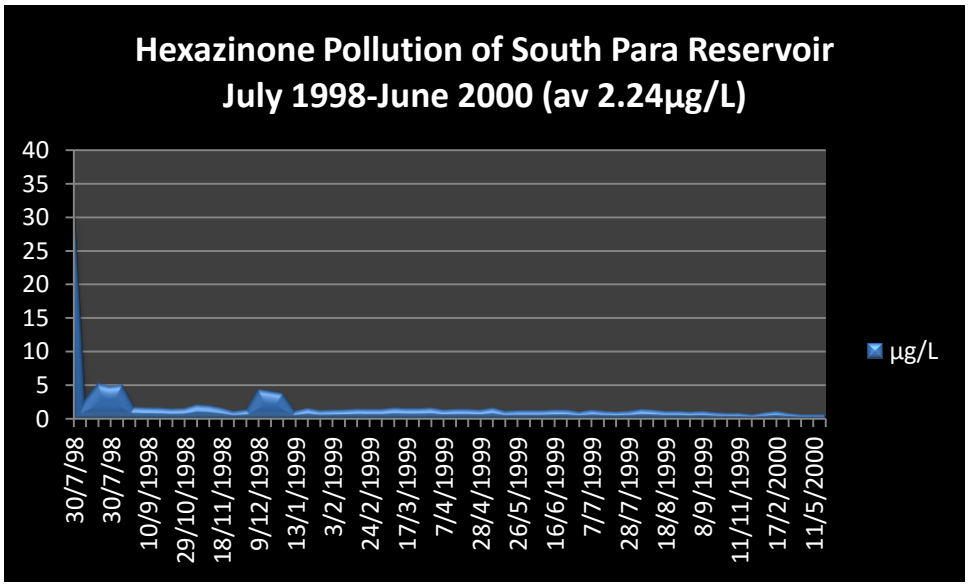
Highest Levels Detected

Waterway:	26/7/89 Blackwood River (WA) Plantation Runnel 5800µg/L *(39)* 28/7/89 Blackwood River (WA) Plantation Runnel 3500µg/L *(39)* 1989 Blackwood River (WA) 18µg/L *(39)* 2012-13 Boundary Creek (Qld) 16µg/L *(94)* 1999 Leckie Plantation (Vic) 15µg/L *(115)*
Water Supply:	30/7/98 South Para Reservoir (SA) 35.4µg/L *(44)* 9/7/99 Warren Reservoir (SA) 16.4µg/L *(44)* 1/7/99 Warren Reservoir (SA) 15.7µg/L *(44)* 4/3/05 Korweinguboora Reservoir (Vic) 9.5µg/L *(3)* 9/7/99 Warren Reservoir (SA) 7.5µg/L *(44)* 3/8/98 Warren Reservoir (SA) 6.73µg/L *(44)*
Other Notes:	**Likely to be the 8th most commonly detected pesticide in Australian waterways.** Widely detected across Australia, particularly Victoria, South Australia, Western Australia, Tasmania and the coastal regions of Queensland. Has been detected near islands offshore in Great Barrier Reef.

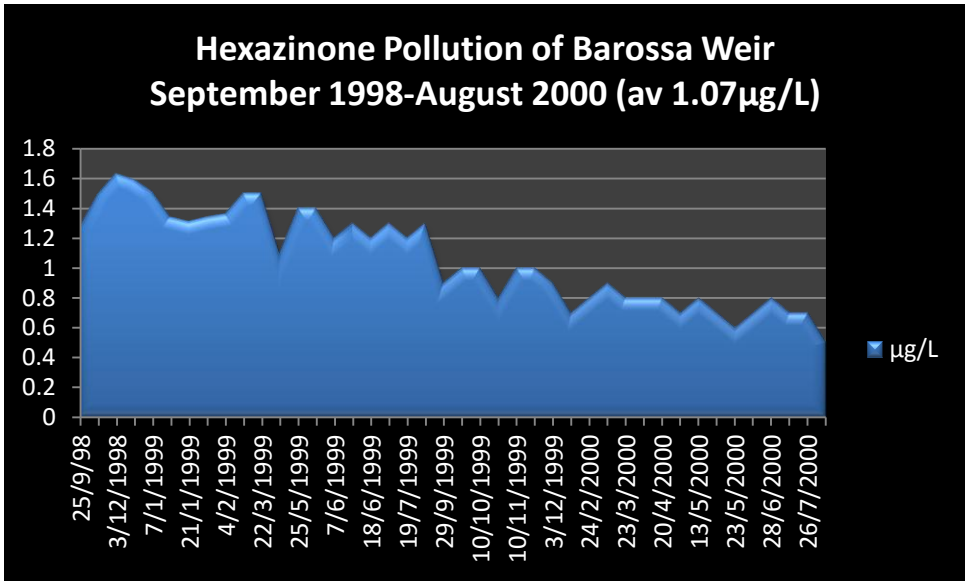
Hexazinone has been frequently detected across Australia. Many detections in Tasmania, Victoria and South Australia have been associated with pine plantations.



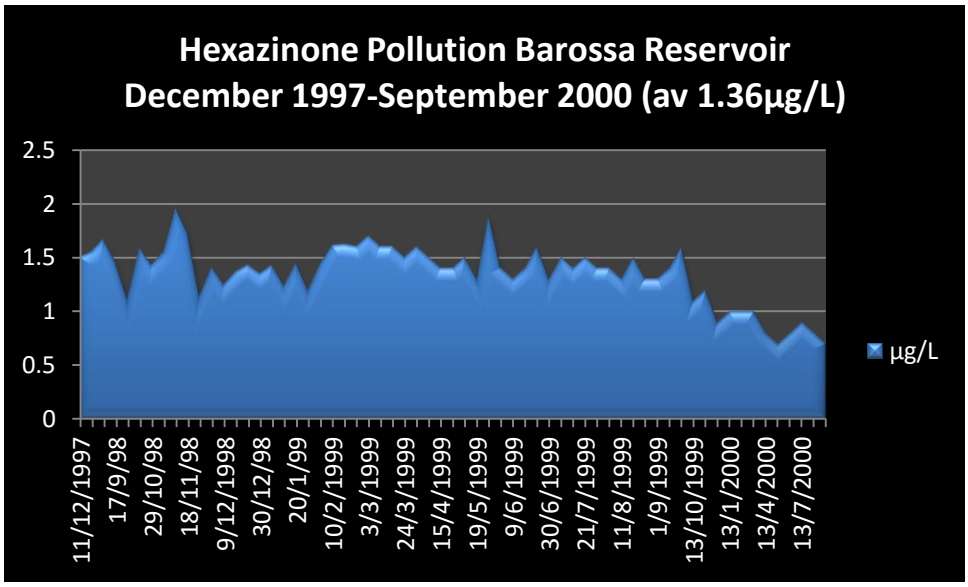
Warren Reservoir was contaminated with Atrazine and Hexazinone between 1998 – 2000. Hexazinone is residual and as this graph shows can remain in waterways years after application.



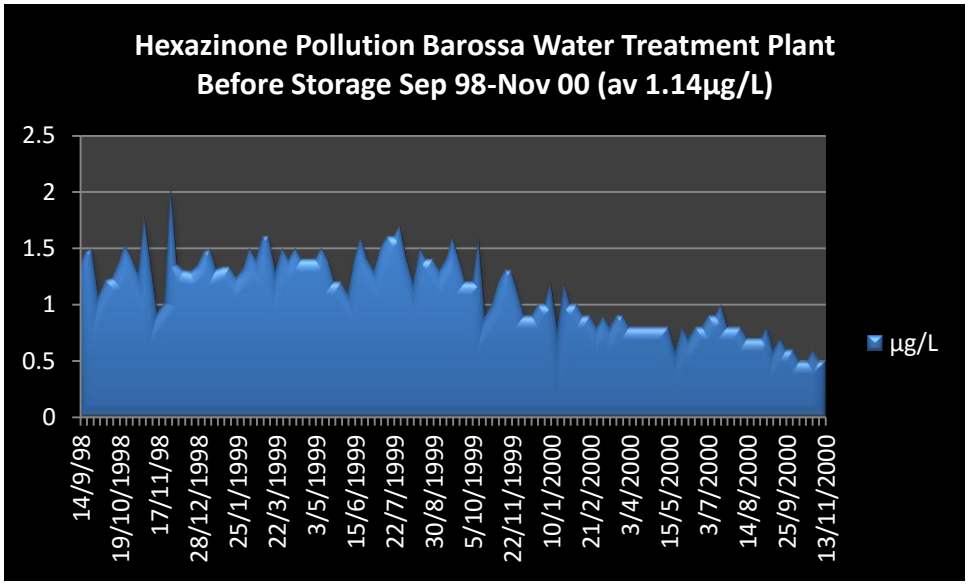
Hexazinone was likely to have continued leaching into South Para Reservoir after testing stopped in May 2000. Contamination of the reservoirs was first noted in July 1997. (156)



It took almost 2 years for Hexazinone levels to halve at Barossa Weir. At this rate Hexazinone could well have continued to leach into the waterways well into 2002 and possibly longer.



Barossa Weir showed an even slower decline in Hexazinone residues.



Powder Activated Carbon was used at Barossa Water Treatment Plant after Atrazine and Hexazinone was detected in 1997. At Barossa Water Treatment plant in November 2000, Hexazinone levels were approximately half of those recorded September 1998. Records have not been located post November 2000, but at this rate Hexazinone would have continued to be present at the water treatment plant well into 2002.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Imazapyr

Imidazolinone Herbicide

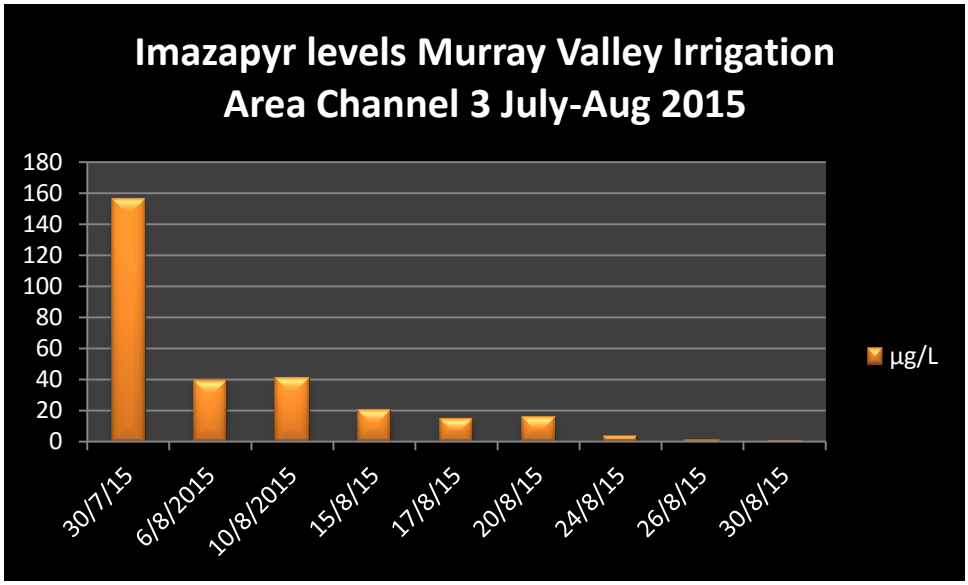
2011 Australian Drinking Water Guideline: 9000µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

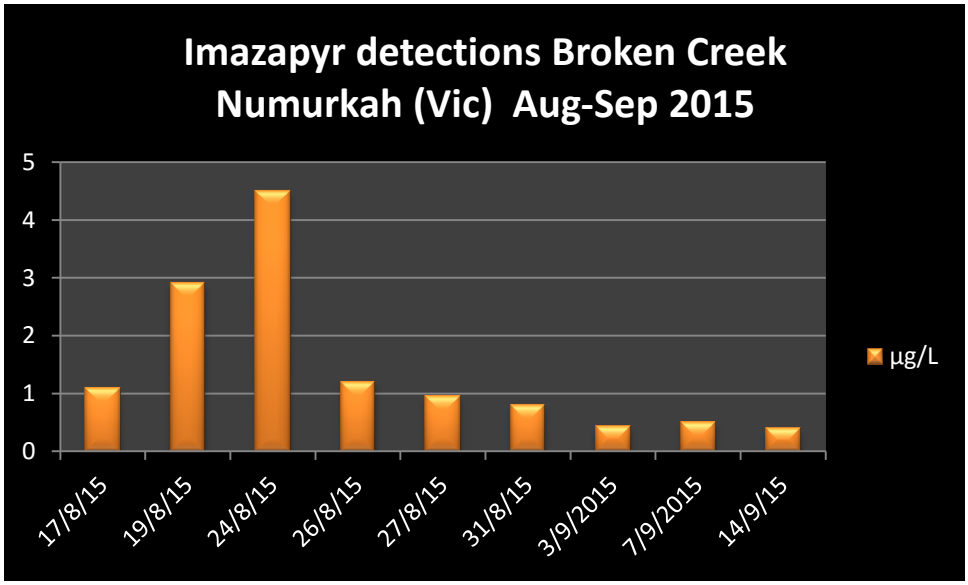
Number of water locations highlighted on Australian Pesticide Map:	10

Highest Levels Detected

Waterway:	30/7/15 Murray Valley Irrigation Area (Vic) Channel 3 156µg/L *(148)* 9/8/15 Shepparton Irrigation Area Channel (Vic) 4/25 110µg/L *(148)* 6/8/15 Central Goulburn Irrigation Area (Vic) Channel 10/5 97.2µg/L *(148)* 30/7/15 Murray Valley Irrigation Area (Vic) Channel 2/5 97µg/L *(148)* 17/8/15 Central Goulburn Irrigation Area (Vic) Channel 10/5 93.3µg/L *(148)*
Water Supply:	17/8/15 Broken Creek u/s Numurkah (Vic) 5.2µg/L *(148)* 4/8/15 Broken Creek u/s Nathalia (Vic) 4.5µg/L *(148)* 26/8/15 Broken Creek Numurkah (Vic) 4.5µg/L *(148)* 19/8/15 Broken Creek Numurkah (Vic) 3µg/L *(148)* 24/8/15 Broken Creek u/s Numurkah (Vic) 3µg/L *(148)* 19/8/15 Broken Creek Numurkah (Vic) 2.9µg/L *(148)*
Other Notes:	2015 Imazapyr Controversy where the herbicide did not degrade to "safe" levels well after it was planned to. http://www.mmg.com.au/local-news/country-news/authority-cops-spray-over-timing-1.98816#



Imazapyr residues remained in this Channel system for one month.



Broken Creek supplies towns such as Nathalia and Numurkah with drinking water.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Imidacloprid

Neonicotinoid Insecticide

2011 Australian Drinking Water Guideline:

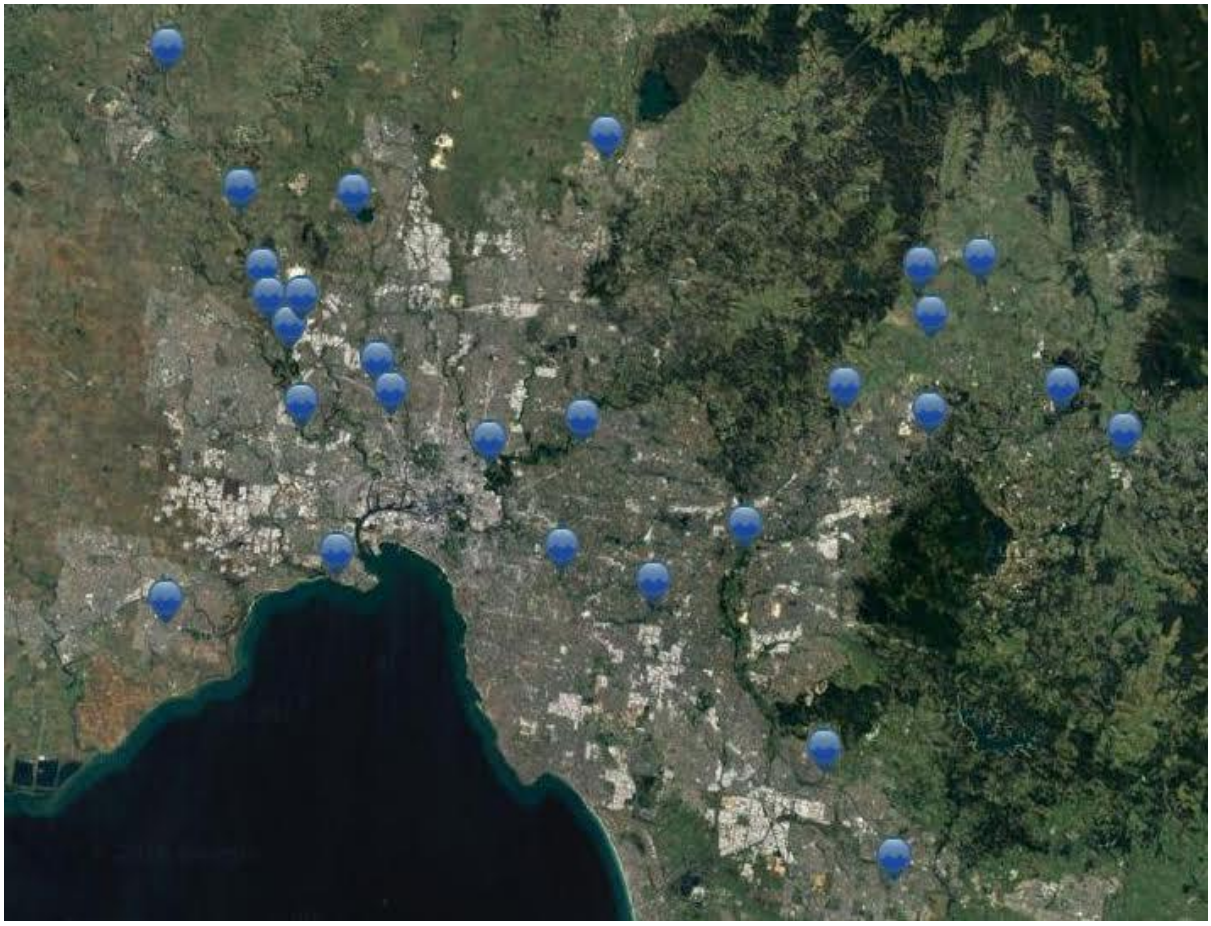
2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/imidacloprid/	59

Highest Levels Detected

Waterway:	7/2/13 Yarramundi Lagoon (NSW) 4.56µg/L *(22)* 2015 Tindall Aquifer Katherine (NT) 0.8µg/L *(113)* 7/2/13 Badgery Creek (NSW) 0.74µg/L *(22)* 21/4/10 Berwick Springs (Vic) 0.49µg/L *(17)* 7/2/13 Eastern Creek (NSW) 0.42µg/L *(22)*
Water Supply:	2009-10 Upper Yarra River (Vic) 0.59µg/L *(21)* 2008? Olinda Creek (Vic) 0.045µg/L *(21)* 21/1/10 Spadonis Reserve (Vic) 0.026µg/L *(17)* 2008? Woori Yallock Creek (Vic) 0.01µg/L *(21)*
Other Notes:	**Possibly the 14th most commonly detected pesticide in Australian waterways.** Detected in urban waterways and wetlands in Melbourne and Sydney. Also detected along the Queensland coast, including Great Barrier Reef.

Imidacloprid is likely to be widely found throughout Australian waterways, few studies however have tried to detect it. Neonicotinoids have caused controversy over the past few years, due to bee colony collapse.



Imidacloprid was widely detected in stormwater throughout the Melbourne region in 2009-10. Imidacloprid is registered for use in home gardens

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Indoxacarb

Unclassified Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=indoxacarb	7

Highest Levels Detected

Waterway:	
Water Supply:	**2009/10 Woori Yallock Creek (Vic) 0.33µg/L *(21)*** **2008 Cockatoo Creek (Vic) 0.27µg/L *(21)*** **2008 Watts River (Vic) 0.05µg/L *(21)*** **2008 Shepherd Creek (Vic) 0.04µg/L *(21)*** **7/9/09 Platypus Wetlands Lilydale (Vic) 0.005µg/L *(17)***
Other Notes:	**All detections in the Upper Yarra River catchment, upstream of Sugarloaf Reservoir, which supplies drinking water to Melbourne's northern and western suburbs.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Iprodione

Dicarboximide Fungicide

2011 Australian Drinking Water Guideline: 100µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=iprodione	4

Highest Levels Detected

Waterway:	**March 2014 Jackson Creek (Vic) Recycled 0.036µg/L** *(88)*
Water Supply:	**2008 Sheep Station Creek (Vic) 3µg/L** *(21)*
Other Notes:	**Also found in sediment at Donnelly's Creek (Vic)** *(17)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Lindane

Organochlorine Drug/Insecticide/Rodenticide

2011 Australian Drinking Water Guideline: 10µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.07µg/L	0.2µg/L	0.4µg/L	1µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/lindane/	37

Highest Levels Detected

Waterway:	1978 Unspecified SA Stream 0.52µg/L *(6)* 1980 Unspecified SA Stream 0.16µg/L *(6)* 1971 Unspecified Location Murray River SA 0.12µg/L *(6)* 1979 Unspecified SA Stream 0.1µg/L *(6)* 26/11/80 Wandin Yallock Creek (Vic) 0.08µg/L *(19)*
Water Supply:	1986/7 Ballina (NSW) Reticulated Water 6µg/L *(12)* 1984/5 Sutton Creek (SA) 0.74µg/L *(64)* 1984/5 Vince Creek (SA) 0.35µg/L *(64)* 1984/5 Cox Creek (SA) 0.32µg/L *(64)* 1978 Unspecified SA Reservoir 0.07µg/L *(6)* 1979 Unspecified SA Reservoir 0.07µg/L *(6)*
Other Notes:	Widespread detections, particularly in South Australia and Victoria. Detected in fish in South Australia during the 1970's and milk in Victoria during the same period. Has been detected in groundwater in Perth and sediment in the Johnston River in Northern Queensland. Wandin Yallock Creek 1980 *(101).* Widespread detections in South East Queensland 2013-4 *(123).* Deregistered for general use in Australia in 1985.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Linuron

Urea Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/?s=linuron	5

Highest Levels Detected

Waterway:	1994 Rosebud (Vic) Bore Water 0.4µg/L *(116)* 2012 October Ti-Tree Creek Berwick (Vic) 0.004µg/L *(67)*
Water Supply:	2009/10 Upper Yarra River 0.6µg/L *(21)*
Other Notes:	Also detected in sediment in a number of locations in the Westernport Bay (Vic) catchment in 2012 *(102)* and at Berwick Springs (Vic) in 2010 (*17).* Detected in the Upper Yarra Catchment in the early 1980's *(101).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Maldison/Malathion

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 70µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.002µg/L	0.05µg/L	0.2µg/L	1.1µg/L

Number of water locations highlighted on Australian Pesticide Map: http://pesticides.australianmap.net/chemicals/malathion-maldison/	26

Highest Levels Detected

Waterway:	1992/3 Willbriggie Farm Drain 30µg/L *(18)* 1992 October Willbriggie Rice Bay 25µg/L *(18)* 1992 October Willbriggie Irrigation Area 15µg\/L *(18)* 1991 October Willbriggie Irrigation Area Rice ~8µg\/L *(18)* 1993 October Willbriggie Irrigation Area ~5.5µg/L *(18)*
Water Supply:	1984 Unspecified Rainwater Tank SA 2.6µg/L *(6)*
Other Notes:	Detected in the Coleambally Irrigation and Murray Irrigation Areas (NSW) in the 1990's. Detected in Murrumbidgee Irrigation Area 2010's. Detected in Yarra River just downstream of the yet to be constructed Sugarloaf Dam 26/11/80 2.6µg/L *(19)*. Detected in sediment of Arundel Creek (Vic) in 2009/10. If ingested into the body, Malathion converts to Malaoxon, which is 61 times more toxic. Malathion also converts to Malaoxon during the chlorination of water *(149)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Mancozeb

Dithiocarbamate-ETU/Inorganic Zinc Fungicide

2011 Australian Drinking Water Guideline: 9µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: MCPA

Chlorophenoxy Acid or Ester Herbicide

2011 Australian Drinking Water Guideline: 40µg/L

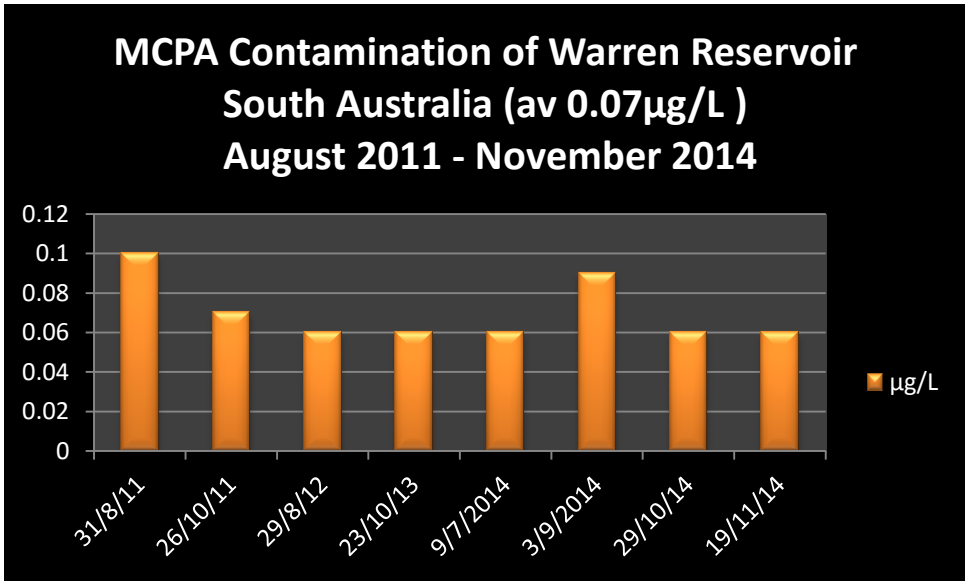
2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/mcpa/	125

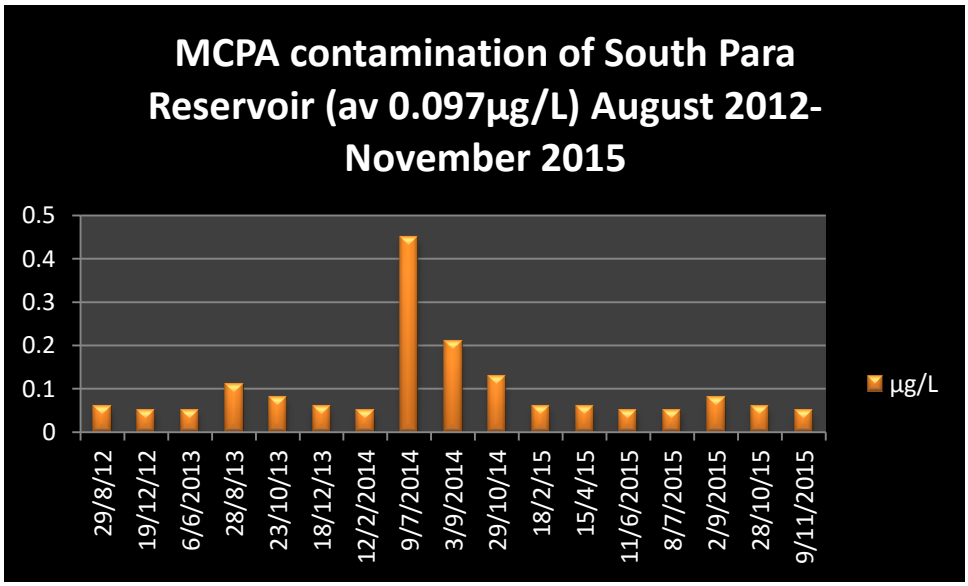
Highest Levels Detected

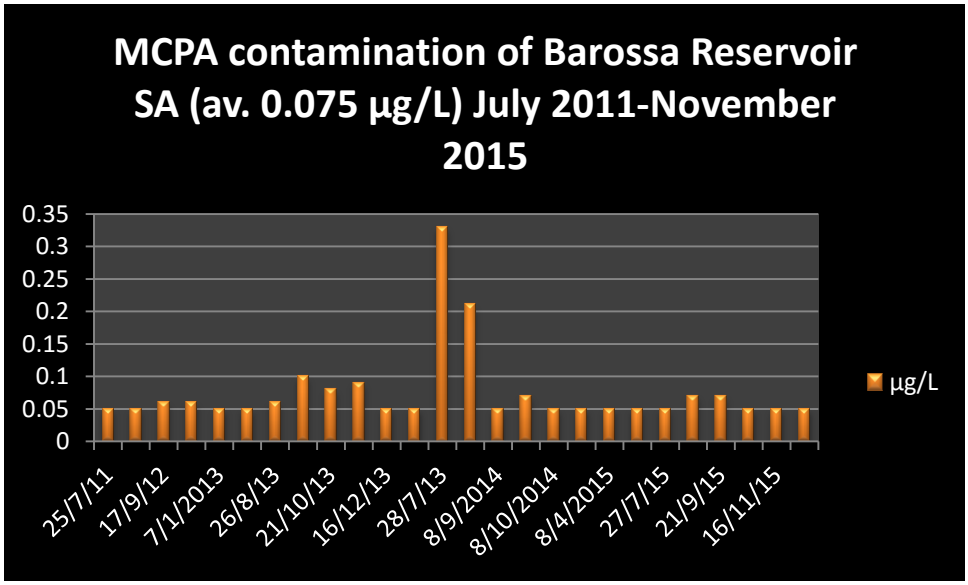
Waterway:	14/1/14 Rubicon River (Tas) 19.1µg/L *(5)* 2013-14 Swanbank Power Station (Qld) 3.9µg/L *(36)* 29/5/07 Duck River (Tas) 2.36µg/L *(5)* 1/12/97 South Drain at Yanco Creek (NSW) 1.9µg/L *(117)* 1995 Dec South Drain at Yanco Creek (NSW) 1.3µg/L *(117)*
Water Supply:	17/9/13 Matthews Creek (Vic) 4.6µg/L *(3)* 19/7/11 Matthews Creek (Vic) 2.7µg/L *(3)* 6/8/12 Matthews Creek (Vic) 2.7µg/L *(3)* 10/2/07 George River (Tas) 1.11µg/L *(5)* 22/8/11 Little Para River (SA) 0.99µg/L *(44)* 2/12/10 South Esk System (Tas) 0.83ug/L *(118)*
Other Notes:	**Possibly the 7th most commonly detected pesticide in Australian waterways.** Widespread detections in water supplies in South Australia at average levels of ~0.09µg/L. Also commonly detected in Tasmanian and Victorian streams. Detected occasionally in the Murrumbidgee and Coleambally Irrigation Areas in the 1990's. Detected in stormwater in Melbourne, Sydney and Brisbane. Detected occasionally in North Queensland.

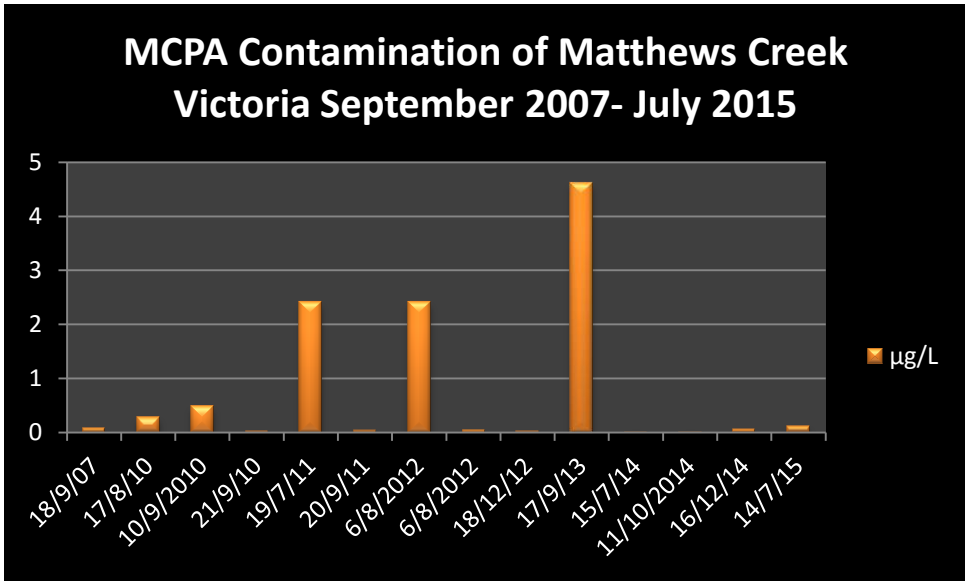
MCPA has been widely detected throughout eastern Australia, particularly in Tasmania, Victoria and South Australia.



SA Water continues to detect MCPA in a number of reservoirs and waterways in South Australia. Consistent levels have been detected in Warren Reservoir for 3 years and Barossa Weir South Para Reservoir for a similar amount of time.







Matthews Creek in the Geelong water supply system has recorded the highest levels of MCPA in Victoria. Could one farm be the source of the herbicide?

***Map showing the extent of MCPA contamination of waterways throughout South Australia in recent years. MCPA has also been detected in North Adelaide Tank Zone EL51 in December 2012 at 0.5*µg/L. How many people were exposed to MCPA in their drinking water?**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Mecoprop

Chlorophenoxy Acid or Ester Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=mecoprop	10

Highest Levels Detected

Waterway:	2013-14 Swanbank Power Station (Qld) 0.19µg/L *(36)* 2008 July Parafield Wetlands (SA) 0.03µg/L *(119)* 2008/09 Alice Springs Recycled Water 0.02µg/L *(13)*
Water Supply:	8/11/11 Warrnambool Headworks (Vic) 0.03µg/L *(120)* 7/11/11 Simpson (Vic) 0.01µg/L *(120)* 8/11/11 Macarthur (Vic) 0.01µg/L *(120)* 4/11/13 Redbank Reservoir (Vic) 0.01µg/L *(8)*
Other Notes:	Mecoprop has also recently been detected in Sydney Harbour *(45)* and Waste Water Treatment Plants in Queensland *(121).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Metalaxyl

Xylylalanine Fungicide

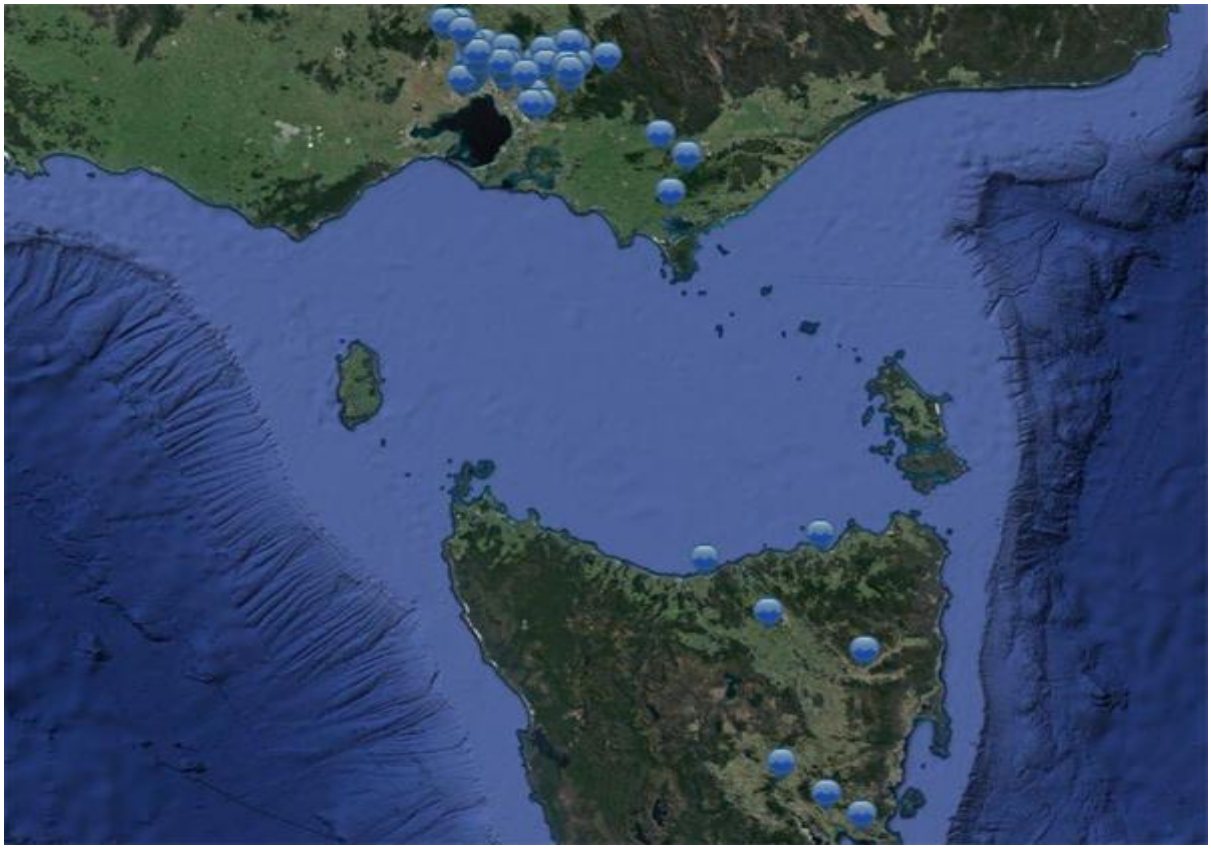
2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/metalaxyl/	57

Highest Levels Detected

Waterway:	2013-2014 Swanbank Power Station (Qld) 1µg/L *(36)* 15/1/10 Liffey River (Tas) 0.5µg/L *(5)* 15/1/10 St Pauls River (Tas) 0.42µg/L *(5)* 20/1/13 Carlton River (Tas) <0.2µg/L *(5)* 21/4/10 Berwick Springs (Vic) 0.19µg/L *(17)*
Water Supply:	2009-10 Upper Yarra River (Vic) 0.012µg/L *(21)* 2008 Sheep Station Creek (Vic) 0.005µg/L *(21)* 2008 Woori Yallock Creek (Vic) 0.005µg/L *(21)* 21/1/10 Spadonis Reserve (Vic) 0.005µg/L *(17)* 10/12/09 Starvation Creek Reservoir (Vic) 0.003µg/L *(17)* 2008 Shepherd Creek (Vic) 0.002µg/L *(21)*
Other Notes:	**Possibly the 16th most commonly detected pesticide in Australian waterways.** Mostly detected in Victoria and Tasmania. Commonly found in stormwater throughout Melbourne suburbs.



Metalaxyl detections in recent years in Victoria and Tasmania.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Metaldehyde

Aldehyde Mollusicide

2011 Australian Drinking Water Guideline: 20µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Methabenziazuron

Urea Herbicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=methabenziazuron	**1**

Highest Levels Detected

Waterway:	**19/1/12 Tuckers Creek (Tas) 0.5µg/L** *(5)* **9/11/11 Tuckers Creek (Tas) 0.2µg/L** *(5)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Metham

Dithiocarbamate-MITC

Algaecide/Fumigant/Fungicide/Microbiocide/Nematicide

2011 Australian Drinking Water Guideline: 1µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Methamidophos

Organophosphorus Breakdown Product/Insecticide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=methamidophos	**1**

Highest Levels Detected

Waterway:	**1994 Koo-Wee-Rup (Vic) Drain 0.12µg/L** ***(90)***
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Methidathion

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 6µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=methidathion	**1**

Highest Levels Detected

Waterway:	**2007 Helena River (WA) <0.1µg/L *(50)***
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Methiocarb

N-Methyl Carbamate Insecticide/Molluscicide

2011 Australian Drinking Water Guideline: 7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=methiocarb	1

Highest Levels Detected

Waterway:	
Water Supply:	**2009/10 Upper Yarra Catchment (Vic) 1.2µg/L** *(21)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Methomyl

N-Methyl Carbamate Breakdown Product/Insecticide

2011 Australian Drinking Water Guideline: 20µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.5µg/L	3.5µg/L	9.5µg/L	23µg/L

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=methomyl	7

Highest Levels Detected

Waterway:	9/9/09 Dandenong Creek Wantirna (Vic) 0.014µg/L *(17)* 21/4/10 Berwick Springs (Vic) 0.011µg/L *(17)* 19/1/10 Maribyrnong River Keilor (Vic) 0.002µg/L *(17)*
Water Supply:	10/12/09 Platypus Wetlands Lilydale (Vic) 0.051µg/L *(17)* 10/12/09 Spadonis Reserve (Vic) 0.019µg/L *(17)*
Other Notes:	In 2002 a 3 tonne fish kill in Prospect Creek (NSW) caused by a Methomyl spill *(122).* Methomyl has also recently been detected in South Queensland water supplies *(123).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Methoxychlor

Organochlorine Insecticide

2011 Australian Drinking Water Guideline: 300µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=methoxychlor	3

Highest Levels Detected

Waterway:	1975 Unspecified Bore SA 0.01µg/L *(6)*
Water Supply:	2006 March Dumbalk (Vic) 0.2µg/L *(120)* 20/8/01 Myponga Creek (SA) 0.07µg/L *(44)*
Other Notes:	Detected in sediment at Larrakeah Naval Base in Darwin 1990 *(124).* Also detected in Dundurrabin Dam (NSW) in late 1980's *(87).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Methyl Bromide

2011 Australian Drinking Water Guideline: 1µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=methyl+bromide	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Metiram

2011 Australian Drinking Water Guideline: 9µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Metolachlor

Chloroacetanilide Herbicide

2011 Australian Drinking Water Guideline: 300µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/metolachlor/	110

Highest Levels Detected

Waterway:	Nov 9 1993 Willbriggie Irrigation Area (NSW) 140µg/L *(18)* Nov 11 1993 Willbriggie Irrigation Area 120µg/L *(18)* Nov 21 1993 Willbriggie Irrigation Area 115µg/L *(18)* Nov 19 1993 Willbriggie Irrigation Area 112µg/L *(18)* 2002-7 Namoi River Catchment (NSW) 18.6µg/L *(91)*
Water Supply:	11/2/11 Sugarloaf Reservoir Offtake Yarra 0.273µg/L *(58)* 2012 March Easterbrook Creek (Vic) 0.11µg/L *(49)* 14/11/13 Tullaroop Reservoir (Vic) 0.001µg/L *(8)*
Other Notes:	**Possibly the 9th most commonly detected pesticide in Australian waterways.** Detected in stormwater throughout Melbourne <0.002 µg/L and Swan River Catchment in Perth <0.001µg/L and in stormwater in Adelaide. Detected in Great Barrier Reef North Queensland <0.001µg/L. Detected in Strzelecki Ranges, sediment in Westernport Bay, north-central NSW and Darling River Bourke NSW in 1990's. Detected in Lower Burdekin Catchment, Herbert River, Suttor River, Sandy Creek, Fitzroy River and Baratta Creek Qld. Recently, widely detected throughout South East Queensland *(123).*

Metolachlor has been widely detected, particularly across the eastern coast of Australia.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Metoxuron

Urea Herbicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map:	**1**

Highest Levels Detected

Waterway:	
Water Supply:	**16/5/95 Jandalot Mound (WA) 0.5ug/L** ***(112)***
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Metribuzin

Triazinone Herbicide

2011 Australian Drinking Water Guideline: 70µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=metribuzin	18

Highest Levels Detected

Waterway:	1989-1992 Northern Tasmanian Streams 1.3µg/L *(69)* 20/4/10 Cherry Lake Altona (Vic) 0.99µg/L *(17)* 2011-12 Herbert River (Qld) 0.416µg/L *(31)* 1994 Rosebud (Vic) 0.28µg/L *(90)* 1994 Mitchell River (Vic) 0.24µg/L *(90)*
Water Supply:	7/5/95 Jandalot Mound (WA) 0.3ug/L *(112)* 15/1/10 St Pauls River (Tas) 0.18µg/L *(5)* 2011 December Narracan Creek (Vic) 0.072µg/L *(49)*
Other Notes:	Also detected at Koo-Wee-Rup Vic 1994 *(90)* and various Tasmanian streams 1989-1994 *(69)*. Also found in sediment at Donnelly's Creek (Vic) 2010 *(17)*. Detected in the Herbert River and Barratta Creek catchments of North Queensland *(125)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Metsulfuron Methyl

Sulfonylurea Herbicide

2011 Australian Drinking Water Guideline: 40µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/metsulfuron-methyl/	21

Highest Levels Detected

Waterway:	14/1/14 Rubicon River (Tas) 0.38µg/L *(5)* 5/9/07 Duck River (Tas) 0.24µg/L *(5)* 1/5/13 Montagu River (Tas) 0.13µg/L *(5)* 7/3/12 Gawler River (Tas) 0.12µg/L *(5)* October 2012 Wallan Wetlands 0.057µg/L *(67)*
Water Supply:	2/12/10 South Esk System (Tas) 0.83µg/L *(118)* 20/1/14 Gumeracha Weir (SA) 0.42µg/L *(44)* 30/4/07 George River (Tas) 0.3µg/L *(5)* 2010 December Lilydale (Tas) 0.1µg/L *(118)* 28/7/14 Barossa Weir (SA) 0.06µg/L *(44)*
Other Notes:	Also detected at a number of locations in Melbourne wetlands 2012/3 *(67)* and northern Tasmanian streams 2011-14 *(5)*. Trace levels also found upstream of Lake Tinaroo (Qld) 2013 *(109)* and other North Queensland waterways *(125)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Mevinphos

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 5µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Molinate

Thiocarbamate Herbicide

2011 Australian Drinking Water Guideline: 4µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.1µg/L	3.4µg/L	14µg/L	57µg/L

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/molinate/	**40**

Highest Levels Detected

Waterway:	**1992 October Willbriggie Irrigation Area (Rice Bay) 1840µg/L *(18)*** **1992 October Willbriggie Irrigation Area (Drain) 1480µg/L *(18)*** **1991 October Willbriggie Irrigation Area 818µg/L *(18)*** **19/11/92 Willbriggie Irrigation Area (Drain) 700µg/L *(18)*** **29/11/93 Willbriggie Irrigation Area (Drain) 270µg/L *(18)***
Water Supply:	**1994/5 Mulwala (NSW) Offtake 7.2µg/L *(18)***
Other Notes:	**Widespread detections in rice growing regions, mostly Willbriggie Irrigation Area and Coleambally Irrigation Areas in the Murrumbidgee River catchment, southern NSW. Creeks downstream of drains/channels have recorded high levels of Molinate: November 2011 Box Creek (64µg/L) *(126)*, October 1994 Yanco Creek (19µg/L), 1994 Mirool Creek (40µg/L) *(18).***

Molinate is mainly associated with rice cropping in the Willbriggie and Coleambally Irrigation Areas of Southern NSW. It has also been detected in southern Victoria at Birregurra in 2009 and 2012. Molinate has also been detected in stormwater at Brisbane.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Monuron

Urea Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=monuron	2

Highest Levels Detected

Waterway:	1961 Swan Hill (Vic) 18000µg/L *(127)* 1962 Tongala (Vic) 6600µg/L *(128)*
Water Supply:	
Other Notes:	Aquatic weed herbicide trialled in Victoria in the 1960's

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Myclobutanil

Azole Fungicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=myclobutanil	**12**

Highest Levels Detected

Waterway:	
Water Supply:	**2008/9 Upper Yarra River (Vic) 2.9µg/L *(21)*** **2008 Sheep Station Creek (Vic) 2.1µg/L *(21)*** **2008 Stringybark Creek (Vic) 0.05µg/L *(21)*** **10/12/09 Spadonis Reserve (Vic) 0.038µg/L *(17)*** **2008 Wandin Creek (Vic) 0.03µg/L *(21)*** **2008 Woori Yallock Creek (Vic) 0.02µg/L *(21)***
Other Notes:	**Also detected in wetlands and sediment in suburban Melbourne 2009-10 *(17)*, sediment in Westernport Bay (Vic) 2012 *(71)* and low levels detected in the Mount Lofty Ranges (SA) between 2007-9 *(105)* and Corner Inlet Catchment (Vic) 2009-10 *(129)*.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Napropamide

Amide Herbicide

2011 Australian Drinking Water Guideline: 400µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Nicarbazin

Unclassfied Avicide

2011 Australian Drinking Water Guideline: 1000µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Norflurazon

Pyridazinone Herbicide

2011 Australian Drinking Water Guideline: 50µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Omethoate

Organophosphorus Breakdown Product/Insecticide

2011 Australian Drinking Water Guideline: 1µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: O-Phenylphenol

Phenol Microbiocide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=o-phenylphenol	**6**

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**December 2013 sediment samples from the Jacksons Creek catchment (Vic)** ***(88).***

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Oryzalin

2,6-Dinitroaniline Herbicide

2011 Australian Drinking Water Guideline: 400µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Oxadiazon

Unclassified Herbicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=oxadiazon	4

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Detected in Swan River catchment April/May 2007 Western Australia at <0.001µg/L** ***(50).***

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Oxadixyl

Anilide Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=oxadixyl	6

Highest Levels Detected

Waterway:	21/4/10 Berwick Springs (Vic) 0.012µg/L *(17)* 6/12/09 Dandenong Creek Wantirna (Vic) 0.008µg/L *(17)*
Water Supply:	2009/10 Upper Yarra River 0.39µg/L *(21)* 10/12/09 Starvation Creek (Vic) 0.005µg/L *(17)*
Other Notes:	Also found in sediment at Westernport Bay (Vic) 2012 *(102)* and sediment at Platypus Wetlands Lilydale (Vic) 2010 *(17)*. Detected in Corner Inlet Catchment 2009-10 *(129)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Oxamyl

N-Methyl Carbamate Insecticide/Nematicide

2011 Australian Drinking Water Guideline: 7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Oxychlordane

Organochlorine Breakdown Product

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=oxychlordane	4

Highest Levels Detected

Waterway:	1998-2001 Tuppal Creek (NSW) 0.02µg/L *(130)*
Water Supply:	1980's Dundurrabin Dam (NSW) *(87)*
Other Notes:	Breakdown product of the organochlorine insecticide Chlordane, which was also used as an ant repellent. Also detected in sediment at 2011/12 Middle Creek 4µg/kg (Strzelecki Ranges Vic) *(49)* and Platypus Wetlands Lilydale 8µg/kg (Vic) in 2010 *(17)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Paraquat

Bipyridylium Herbicide

2011 Australian Drinking Water Guideline: 20µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=paraquat	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Linked to fish kill near Maryborough (Qld) 1980's and pollution of waterway near Bulehdulah (NSW) 1998 due to truck accident *(131)*. Paraquat was also used for aquatic weed control in northern Victoria in 1980's.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Parathion

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 20µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.0007µg/L	0.004µg/L	0.01µg/L	0.04µg/L

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=parathion	3

Highest Levels Detected

Waterway:	1998 July Victoria Creek Williamstown (SA) 0.6µg/L *(44)* 1984/5 Cox's Creek (SA) 0.48µg/L *(64)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Parathion Methyl

Organophosphorus Insecticide/Nematicide

2011 Australian Drinking Water Guideline: 0.7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=parathion	**5**

Highest Levels Detected

Waterway:	**Detected in a number of Murray Goulburn Water Irrigation channels in August – September 2005** ***(52).***
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Pebulate

Thiocarbamate Herbicide

2011 Australian Drinking Water Guideline: 30µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Penconazole

Azole Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=penconazole	16

Highest Levels Detected

Waterway:	March 2014 Jacksons Creek (Vic) 0.019µg/L *(88)* March 2014 Jacksons Creek Sunbury (Vic) 0.017µg/L *(88)* December 2013 Riddells Creek (Vic) 0.017µg/L *(88)*
Water Supply:	2009/10 Upper Yarra River 0.05µg/L *(21)* 2008 Cockatoo Creek (Vic) 0.01µg/L *(21)* 2008 Woori Yallock Creek (Vic) 0.01µg/L *(21)*
Other Notes:	2009 Platypus Creek Wetland (Vic) sediment *(17)*, 2010 Coranderrk Creek sediment *(17)*, Mt Lofty Ranges (SA) *(56)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Pendimethalin

2,6-Dinitroaniline Herbicide

2011 Australian Drinking Water Guideline: 400µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=pendimethalin	16

Highest Levels Detected

Waterway:	
Water Supply:	2009/10 Upper Yarra River 0.04µg/L *(21)* 2009/10 Woori Yallock Creek (Vic) 0.04µg/L *(21)* 2009/10 Cockatoo Creek (Vic) 0.04µg/L *(21)* 2008 Shepherd Creek (Vic) 0.02µg/L *(21)* 21/1/10 Spadonis Reserve (Vic) 0.01µg/L *(17)* 21/1/10 Starvation Creek Reservoir (Vic) 0.01µg/L *(17)*
Other Notes:	Also detected in Swan River Catchment 2007 (WA) <0.001µg/L *(50)*, Namoi and Gwydir River Catchments (NSW) late 1990's *(132)*, and a number of waterways in North Queensland 2011-13. Also detected in sediment at Avondale Heights and Craigieburn in wetlands in the Melbourne region 2009 *(17)*, due to stormwater pollution.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Pentachlorophenol

Chlorinated Phenol Algaecide/ Fungicide/ Herbicide/ Impurity/ Microbiocide/ Molluscicide/ Wood Preservative

2011 Australian Drinking Water Guideline: 10µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	3.6µg/L	10µg/L	17µg/L	27µg/L

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=pentachlorophenol	3

Highest Levels Detected

Waterway:	1978? Nufarm Industrial Waste (Vic) 6000µg/L *(1)*
Water Supply:	2005 October Sunday Creek Reservoir (Vic) 2µg/L *(4)* 2005 December Broken Creek Numurkah (Vic) 1µg/L *(4)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Permethrin

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline: 200µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=permethrin	8

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Widespread detections in wetland sediment across Melbourne 2009-10 *(17)* and sediment in the Jacksons Creek catchment (Vic) in 2013. Highest levels 84µg/kg 7/9/09 at Darebin (Vic) *(17)*. Permethrin also linked to death of eels in Darebin Creek Melbourne May 2016 *(133)*.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Phosphate-Tri-N-Butyl

Organophosphorus Compound

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=phosphate+tri-n-butyl	9

Highest Levels Detected

Waterway:	**Swan River/Canning River Catchments WA <0.001µg/L** ***(50)***
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Picloram

Pyridinecarboxylic Acid Herbicide

2011 Australian Drinking Water Guideline: 300µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/picloram/	12

Highest Levels Detected

Waterway:	28/10/74 Scarsdale Plantation (Vic) 47.67µg/L *(134)* 2013-14 Swanbank Power Station (Qld) 0.25µg/L *(36)* Feb 2013 Sanctuary Lakes Leopold (Vic) 0.14 µg/L *(67)* Feb 2013 Troups Creek Narre Warren 0.079µg/L *(67)*
Water Supply:	2/4/12 Little Para River (SA) 1.4µg/L *(44)* 7/12/13 Deloraine (Tas) 1.07µg/L *(28)* 3/1/12 Kersbrook Creek (SA) 0.9ug/L *(44)* 17/6/13 Kersbrook Creek (SA) 0.7ug/L *(44)* 18/6/12 Kersbrook Creek (SA) 0.5ug/L *(44)* 28/5/12 Torrens River Gorge Weir (SA) 0.4µg/L *(44)*
Other Notes:	Also detected 2013/14 upstream of Lake Tinaroo (Qld) *(109).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Piperonyl Butoxide

Unclassfied Insecticide/Synergist

2011 Australian Drinking Water Guideline: 600µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=piperonyl+butoxide	13

Highest Levels Detected

Waterway:	December 2013 Jacksons Creek (Vic) 0.14µg/L *(88)* 2013-14 Swanbank Power Station (Qld) 0.1µg/L *(36)*
Water Supply:	
Other Notes:	Also detected Swan River/Canning River catchments (WA) 2007 <0.001µg/L *(50)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Pirimicarb

N-Methyl Carbamate Insecticide

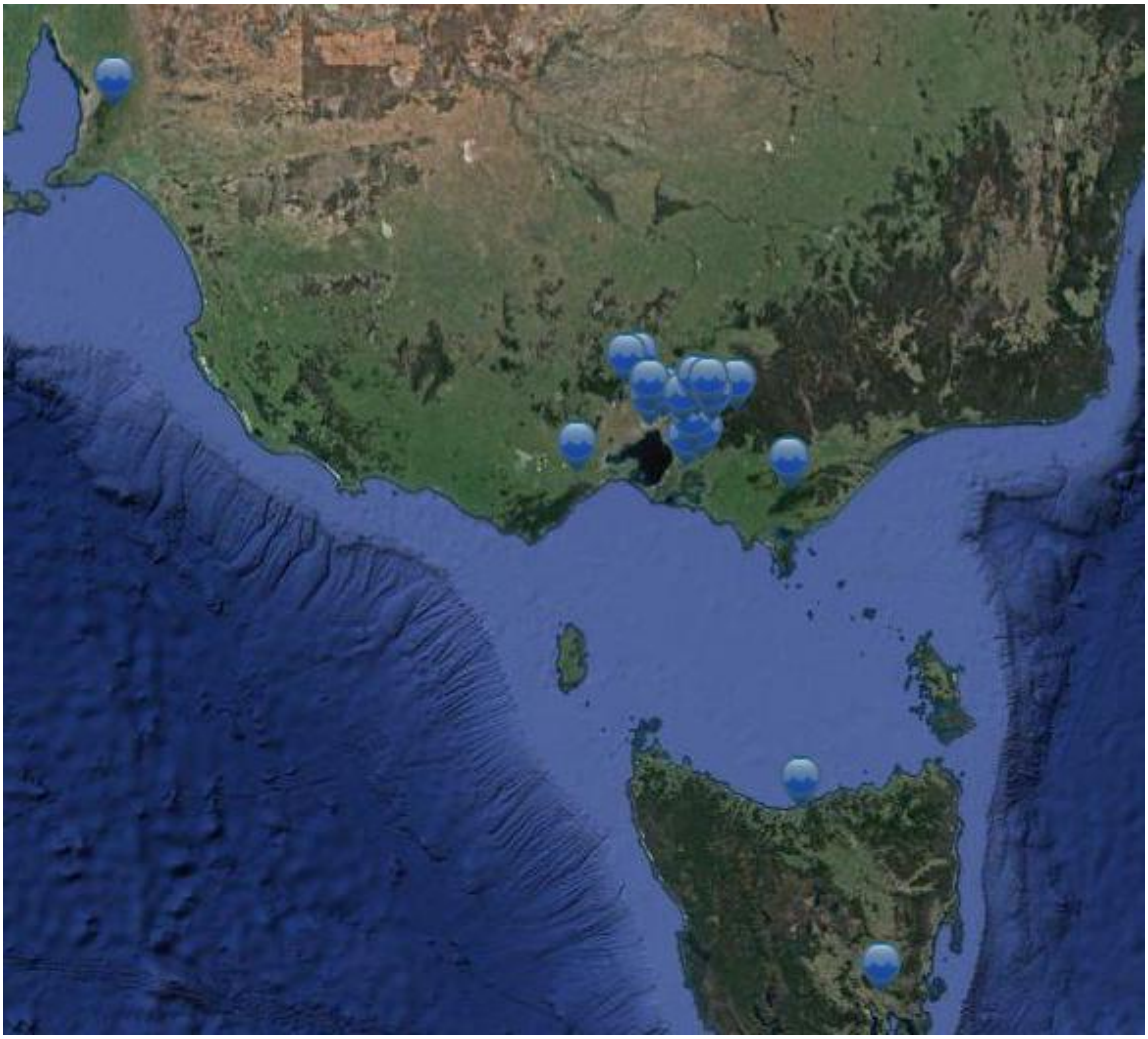
2011 Australian Drinking Water Guideline: 7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/pirimicarb/	25

Highest Levels Detected

Waterway:	7/3/12 Panatana Rivulet (Tas) >0.04µg/L *(5)* 21/4/10 Berwick Springs (Vic) 0.018µg/L *(17)* 2012 March Middle Creek (Vic) 0.017µg/L *(49)* 9/9/09 Dandenong Creek Wantirna (Vic) 0.007µg/L *(17)* 20/1/10 Merri Creek Clifton Hill (Vic) 0.002µg/L *(17)*
Water Supply:	2008 Sheep Station Creek (Vic) 1.4µg/L *(21)* 4/4/08 Coal River (Tas) 0.08µg/L *(5)* 22/10/09 Little Yarra River (Vic) 0.015µg/L *(17)* 7/9/09 Spadonis Reserve (Vic) 0.008µg/L *(17)* 2008 Stringybark Creek (Vic) 0.006µg/L *(21)* 2008 Woori Yallock Creek (Vic) 0.005µg/L *(21)*
Other Notes:	Widespread detections in wetlands across Melbourne 2010 as a result of storm water pollution *(17).* Detected in sediment Westernport Bay 2012 *(102).* Also detected in Mount Lofty Ranges (SA) 2007-9 *(56).*



Pirimicarb has been widely detected in stormwater throughout the Melbourne region. It's source?

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Pirimiphos Methyl

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 90µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Polihexanide

Disinfectant

2011 Australian Drinking Water Guideline: 700µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Prochloraz

Azole Fungicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=prochloraz	**4**

Highest Levels Detected

Waterway:	
Water Supply:	**2009/10 Upper Yarra River 0.06µg/L *(21)*** **2008 Woori Yallock Creek (Vic) 0.03µg/L *(21)*** **2008 Cockatoo Creek (Vic) 0.02µg/L *(21)***
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Procymidone

Unknown Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=procymidone	3

Highest Levels Detected

Waterway:	9/7/12 Panatana Rivulet (Tas) 0.04 - 0.1µg/L *(5)*
Water Supply:	2009/10 Upper Yarra River 0.91µg/L *(21)*
Other Notes:	Also detected in the Mount Lofty Ranges (SA) 2007-9 *(105).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Profenofos

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 0.3µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=profenofos	**2**

Highest Levels Detected

Waterway:	**2005 Feb Namoi River Bugilbone (NSW) 0.06µg/L** ***(91)*** **1998 Gwydir River Basin (NSW)** ***(132)***
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Prometryn

Triazine Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/prometryn/	63

Highest Levels Detected

Waterway:	2008 Watsons Creek (Vic) 21µg/L *(102)* 2007 December Tarwin River (Vic) 10µg/L *(103)* 1998 Gwydir River (NSW) 9µg/L *(108)* 2002-7 Mooki River (NSW) Ruvigne 0.95µg/L *(91)* 10/12/09 Merri Creek Clifton Hill (Vic) 0.9µg/L *(17)*
Water Supply:	2009/10 Upper Yarra River 21µg/L *(21)* 10/12/09 Platypus Wetlands Lilydale (Vic) 1.64µg/L *(17)* 10/12/09 Spadonis Reserve (Vic) 0.35µg/L *(17)* 10/12/09 Starvation Creek Reservoir (Vic) 0.3µg/L *(17)* 10/12/09 Little Yarra River (Vic) 0.21µg/L *(17)* 3/11/11 Sulphur Creek (Tas) 0.16ug/L *(5)*
Other Notes:	**Possibly the 13th most commonly detected pesticide in Australian waterways.** Also detected in 5 locations Northern Tasmania 2011-12 *(5)*, widespread detections across wetlands in Melbourne 2009/10 (stormwater pollution)*(17)*. Prometryn has been detected leaching into Great Barrier Reef 2012/13 at multiple locations *(135)* and northern NSW rivers in 1990's. Also detected in Brisbane stormwater 2013/14 *(36)*.

Another widely detected Herbicide

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Propachlor

Chloroacetanilide Herbicide

2011 Australian Drinking Water Guideline: 70µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=propachlor	2

Highest Levels Detected

Waterway:	7/7/14 Coal River (Tas) 0.11µg/L *(5)*
Water Supply:	4/12/13 Wurdee Boluc Reservoir (Vic) 1.8µg/L *(3)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Propanil

Anilide Herbicide

2011 Australian Drinking Water Guideline: 700µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Propargite

Unclassified Insecticide

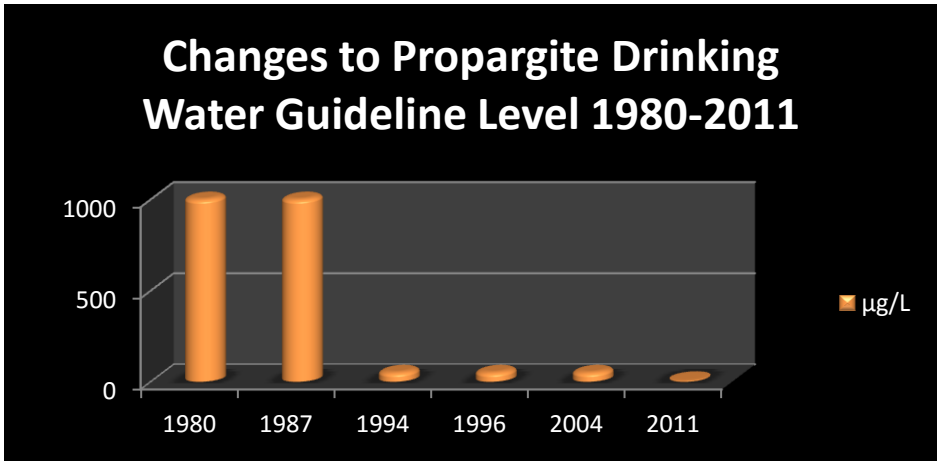
2011 Australian Drinking Water Guideline: 7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=propargite	**3**

Highest Levels Detected

Waterway:	**2000 Carole Creek (NSW) 1.1µg/L *(72)***
Water Supply:	**2008 Woori Yallock Creek (Vic) 0.15µg/L *(21)*** **2008 Cockatoo Creek (Vic) 0.1µg/L *(21)***
Other Notes:	



Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Propazine

Triazine Herbicide

2011 Australian Drinking Water Guideline: 50µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=propazine	7

Highest Levels Detected

Waterway:	1989-1992 Northern Tasmanian Streams 3.3µg/L *(69)* 2013/14 Swanbank Power Station (Qld) 0.9µg/L *(36)* 2009-10 Baratta Creek (Qld) 0.2µg/L *(125)*
Water Supply:	7/11/12 Lexton Reservoir (Vic) 0.1µg/L *(8)*
Other Notes:	Detected in Swan River/Canning River catchments 2006/7 *(50).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Propiconazole

Azole Fungicide

2011 Australian Drinking Water Guideline: 100µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/propiconazole/	29

Highest Levels Detected

Waterway:	2013-14 Swanbank Power Station 3µg/L *(36)* 9/9/09 Dandenong Creek Wantirna (Vic) 0.9µg/L *(17)* 2010 April Woodland Park Essendon (Vic) 0.022µg/L *(17)* 2013 December Jacksons Creek (Vic) 0.017µg/L *(88)* 8/9/09 Deep Creek Bulla (Vic) 0.01µg/L *(17)*
Water Supply:	1986-7 Coffs Harbour Spring Water 5.5µg/L *(12)* 1986-7 Coffs Harbour Spring Water 5µg/L *(12)* 1986-7 Coffs Harbour Spring Water 4.8µg/L *(12)* 1986-7 Tweed Tank Water 2.4µg/L *(12)* 1986-7 Byron Spring Water 0.6µg/L *(12)* 2009/2010 Upper Yarra River 0.021µg/L *(21)*
Other Notes:	Widespread detections across Melbourne wetlands 2009/10 due to stormwater pollution (also detected in sediment) *(17)*. Detected in Swan River catchment 2006/7 *(50)*, Oxley Creek Wastewater Plant (Qld) 2010 and Mount Lofty Ranges (SA) 2007-9 *(105)*. Also detected in Corner Inlet Catchment (Vic) 2009-10 *(129)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Propoxur

N-Methyl Carbamate Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=propoxur	2

Highest Levels Detected

Waterway:	
Water Supply:	1985 Unspecified Rainwater Tank (SA) 80µg/L *(6)* 1984 Unspecified Rainwater Tank (SA) 14µg/L *(6)*
Other Notes:	Also detected in waste water in northern Queensland

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Propyzamide

Amide Herbicide

2011 Australian Drinking Water Guideline: 70µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=propyzamide	4

Highest Levels Detected

Waterway:	1986 Unspecified SA Stream 0.04µg/L *(6)*
Water Supply:	7/12/86 Cox Creek (SA) 36µg/L *(64)* 1985/6 Cox Creek/Gore Creek (SA) 0.93µg/L *(64)* 1986/7 Cox Creek/Gore Creek (SA) 0.9µg/L *(64)* 1984/5 Sutton Creek (SA) 0.12µg/L *(64)* 11/7/14 Clyde River (Tas) 0.1µg/L *(5)* 7/7/14 Coal Creek (Tas) 0.06µg/L *(5)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Propyzamil

(?)

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=propyzamil	5

Highest Levels Detected

Waterway:	
Water Supply:	1985/6 Cox Creek (SA) 28µg/L *(64)* 1984 Vince Creek (SA) 3.72µg/L *(64)* 1985/6 Mt Lofty Golf Course (SA) 1.35µg/L *(64)* 1986/7 Mt Lofty Golf Course (SA) 0.58µg/L *(64)* 1985 Vince Creek (SA) 0.14µg/L *(64)* 1984/5 Sutton Creek (SA) 0.12µg/L *(64)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Protiophos

Organophosphorus Insectcide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=protiophos	1

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Detected 2011 Johnstone River (Qld)** *(137)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Pyraclostrobin

Strobin Fungicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=pyraclostrobin	**10**

Highest Levels Detected

Waterway:	**20/1/10 Maribyrnong River (Vic) Avondale Heights 0.003µg/L *(17)*** **8/10/09 Maribyrnong River (Vic) Sydenham 0.002µg/L *(17)***
Water Supply:	**2009/10 Upper Yarra River 0.1µg/L *(21)*** **2008 Woori Yallock Creek (Vic) 0.1µg/L *(21)*** **2008 Shepherd Creek (Vic) 0.01µg/L *(21)*** **2008 Cockatoo Creek (Vic) 0.008µg/L *(21)*** **20/10/09 Spadonis Reserve (Vic) 0.004µg/L *(17)*** **22/10/09 Little Yarra River (Vic) 0.003µg/L *(17)***
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Pyrasulfotole

Unknown Herbicide

2011 Australian Drinking Water Guideline: 40µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Pyrazophos

Organophosphorus Fungicide

2011 Australian Drinking Water Guideline: 20µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Pyrimethanil

Pyrimidine Fungicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=pyrimethanil	6

Highest Levels Detected

Waterway:	
Water Supply:	**2008 Sheep Station Creek (Vic) 70µg/L *(21)*** **2008 Woori Yallock Creek (Vic) 0.12µg/L *(21)*** **2008 Woori Yallock Creek (Vic) 0.09µg/L *(21)*** **21/1/10 Little Yarra River (Vic) 0.057µg/L *(17)*** **2008 Woori Yallock Creek (Vic) 0.004µg/L *(21)***
Other Notes:	**Also detected in sediment in Little Yarra River 2010, Spadonis Reserve (Vic) 2009 *(17)* and Westernport Bay in 2012 *(102).***

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Pyroxsulam

Triazolopyrimidine Herbicide

2011 Australian Drinking Water Guideline: 4000µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Quintozene

Substituted Benzene Algaecide/Fungicide/Nematicide

2011 Australian Drinking Water Guideline: 30µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Suspended from use in Australia in 2010 due to high dioxin content.**

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Silvex

Chlorophenoxy Acid or Ester Herbicide/Plant Growth Regulator

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=silvex	**1**

Highest Levels Detected

Waterway:	
Water Supply:	**2013 Green Hill Bore (Vic) 0.01µg/L *(8)***
Other Notes:	**Marketed in the US as Fenoprop**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Simazine

Triazine Herbicide/Algaecide

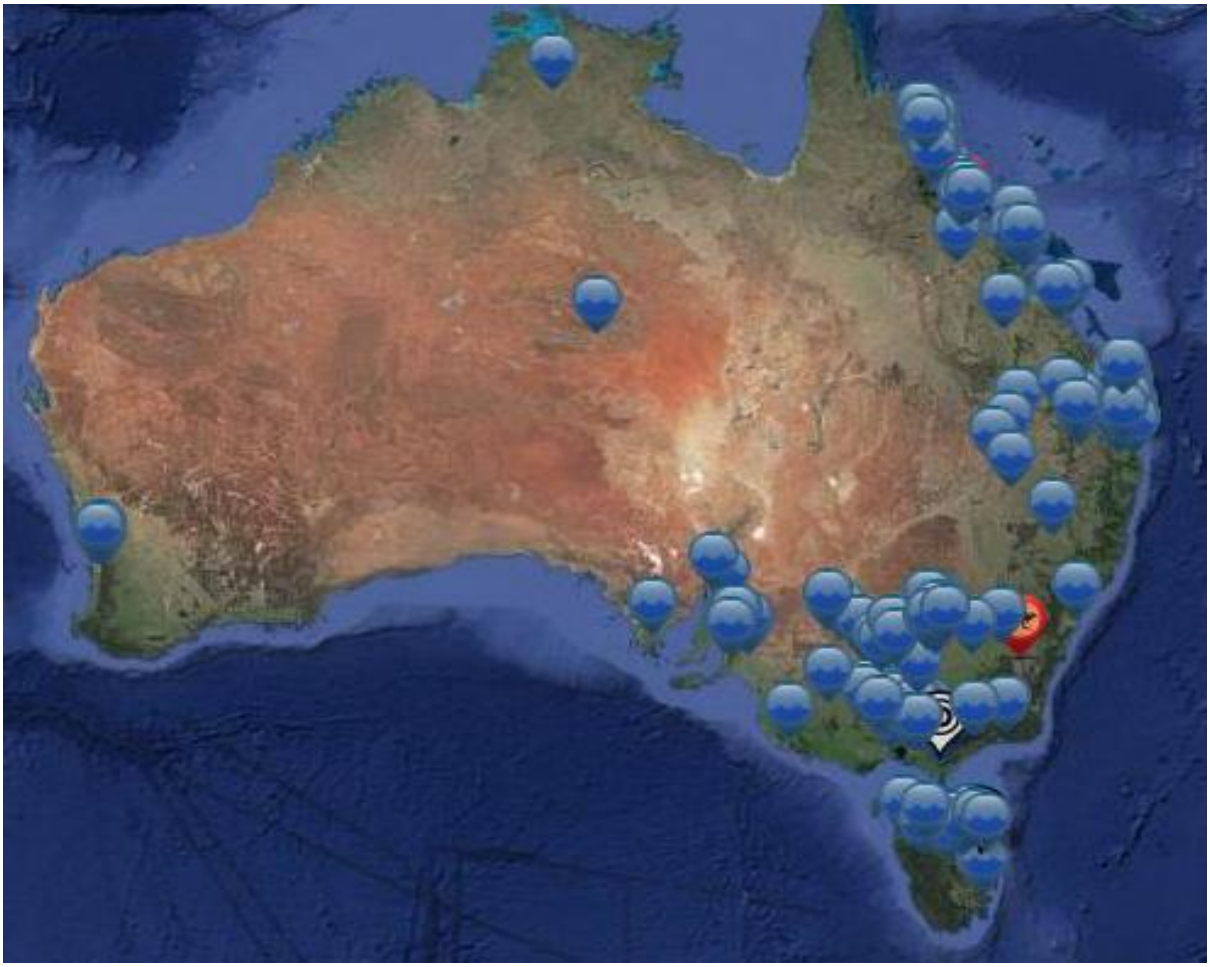
2011 Australian Drinking Water Guideline: 20µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.2µg/L	3.2µg/L	11µg/L	35µg/L

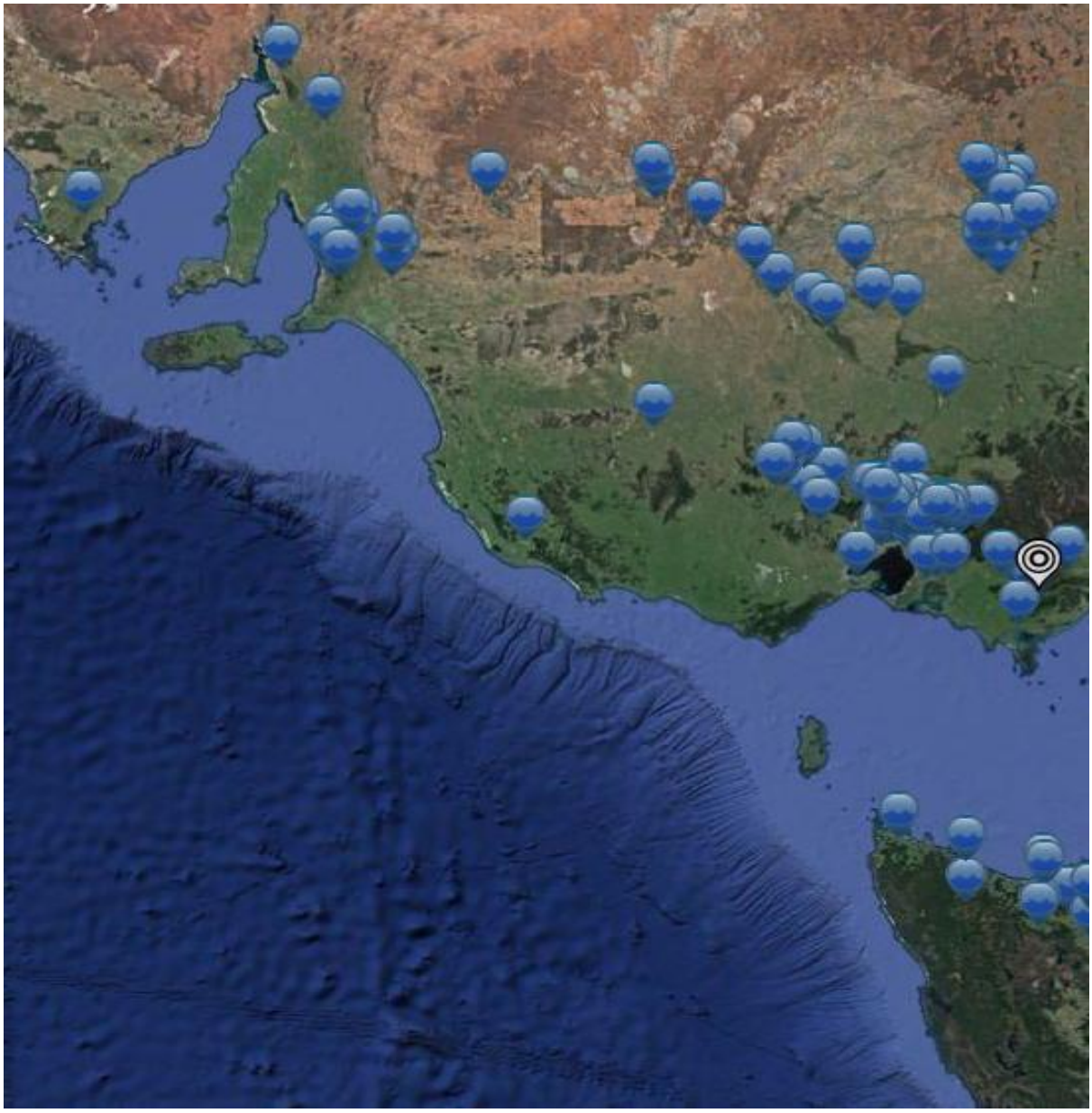
Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/simazine/	273

Highest Levels Detected

Waterway:	1989-1992 Northern Tasmanian Streams 478.5µg/L *(69)* 2010 Kilmore East Sunday Creek catchment (Vic) 16.2µg/L *(138).* (13.6 µg/L two months later). 2008 Watsons Creek (Vic) 15µg/L *(102)* 2009 Nov Murrumbidgee Irrigation Area (Fivebough Swamp by-pass drain - NSW) 14.5µg/L *(139)* 2014 June Murrumbidgee Irrigation Area (Gogeldrie Main Southern Channel – NSW) 9.21µg/L *(93)*
Water Supply:	2009/10 Upper Yarra River 15µg/L *(21)* 2/5/12 Murray River Mannum (SA) 8.2µg/L *(44)* 2/10/07 Brumby's Creek (Tas) 6.27µg/L *(28)* 3/8/98 Warren Reservoir (SA) 3.93µg/L *(44)* 4/11/04 Tea Tree Rivulet (Tas) 3.2µg/L *(28)* 29/7/15 Murray River Moorook (SA) 2.9µg/L *(136)*
Other Notes:	**Possibly the 2nd most commonly detected pesticide in Australian waterways.** Detected across Australia, but particularly in Victoria, Tasmania, South Australia and Queensland.



The second most commonly detected pesticide in Australian waterways. A review was supposed to have started into its use in Australia in 2008. It is still registered as an algaecide in swimming pools. 20-30 minutes of swimming in a swimming pool recently treated with simazine could see small children breach the Australian Drinking Water Guideline.



Simazine is frequently detected in Victoria, less so in Tasmania and South Australia. Simazine is the most frequently detected pesticide in Melbourne waterways.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Spinosad

Macrocyclic Lactone, Spinosyn Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=spinosad	1

Highest Levels Detected

Waterway:	
Water Supply:	2009-10 Upper Yarra River 0.03µg/L *(21)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Spirotetromat

Keto-enol Insecticide

2011 Australian Drinking Water Guideline: 200µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Sulfometuron Methyl

Sulfonylurea Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=sulfometuron+methyl	2

Highest Levels Detected

Waterway:	
Water Supply:	2/12/10 South Esk System (Tas) 0.25µg/L *(118)*
Other Notes:	Detected in 2007 at Western Creek (Tas) *(82)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Sulprofos

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 10µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Taufluvalinate

Pyrethroid Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=taufluvalinate	**1**

Highest Levels Detected

Waterway:	
Water Supply:	**2005 October Channel 14/2 Kerang (Vic) 75µg/L *(52)***
Other Notes:	**Also see Esfenvalerate**

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: TDE

Organochlorine Breakdown Product/Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=TDE	9

Highest Levels Detected

Waterway:	1982 Werribee Creek (Vic) 5500µg/L *(19)* 1982 Werribee Irrigation Drain 5 (Vic) 1400µg/L *(19)*
Water Supply:	15/10/80 Stringybark Creek (Vic) 0.03µg/L *(19)* 30/7/80 Woori Yallock Creek (Vic) 0.02µg/L *(19)* 16/12/71 Wangaratta Filtered Water 0.012µg/L *(20)*
Other Notes:	Detected in sediment in the Onkarparinga River (SA) 1985/6 *(6)* and Myers Creek, Wandin Yallock Creek, Olinda Creek and Stringybark Creek Victoria in 1980 *(19)*. Also detected in milk products during 1970's.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Tebuconazole

Azole Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=tebuconazole	14

Highest Levels Detected

Waterway:	2013-14 Swanbank Power Station (Qld) 1µg/L *(36)* 16/12/09 Dandenong Creek Wantirna (Vic) 0.042µg/L *(17)* 29/4/10 Woodland Park Essendon (Vic) 0.021µg/L *(17)* 2013 December Gisborne (Vic) Stormwater 0.02µg/L *(88)* 14/10/09 Koonung Creek (Vic) 0.01µg/L *(17)*
Water Supply:	2009/10 Upper Yarra River 0.04µg/L *(21)* 2008 Woori Yallock Creek (Vic) 0.03µg/L *(21)* 2008 Cockatoo Creek (Vic) 0.01µg/L *(21)* 2008 Hoddles Creek (Vic) 0.004µg/L *(21)* 2008 Wandin Yallock Creek (Vic) 0.002µg/L *(21)*
Other Notes:	Mainly detected in Melbourne stormwater *(17)*. Also detected in stormwater in Brisbane *(36)*. Detected in Johnstone River (Qld) in 2012 *(137)* and Middle Creek (Vic) in the Strzelecki Ranges *(49)*.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Tebufenazole

Triazole Fungicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=tebufenazole	**1**

Highest Levels Detected

Waterway:	
Water Supply:	**21/10/09 Platypus Wetlands Lilydale (Vic) 0.006µg/L** *(17)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Tebufenozide

Diacylhydrazine Insecticide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=tebufenozide	**5**

Highest Levels Detected

Waterway:	**November 2011 Billy Creek (Vic) 0.002µg/L** ***(49)*** **19/1/10 Maribyrnong River Keilor (Vic) 0.002µg/L** ***(17)***
Water Supply:	**2009/10 Upper Yarra River 0.045µg/L** ***(21)*** **10/12/09 Starvation Creek Reservoir (Vic) 0.001µg/L** ***(17)***
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Tebuthiuron

Urea Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	0.02µg/L	2.2µg/L	20µg/L	160µg/L

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/tebuthiuron/	**55**

Highest Levels Detected

Waterway:	**2004-5 Fitzroy River Basin 0.83µg/L (Qld)** *(142)* **2004-5 Fitzroy River Basin 0.72µg/L (Qld)** *(142)* **2009/10 Suttor River (Qld) 0.67µg/L** *(32)* **2009/10 Fitzroy River (Qld) 0.52µg/L** *(32)* **2009/10 Belyando River (Qld) 0.27µg/L** *(32)*
Water Supply:	
Other Notes:	**Possibly the 18th most commonly detected pesticide in Australian waterways.** **Multiple detections throughout Queensland, including the Great Barrier Reef where traces of Tebuthiuron have been detected km's offshore** *(135).* **Also detected in the Katherine River Northern Territory** *(141).* **South East Queensland has also reported widespread detections of Tebuthiuron** *(123).* **Levels are likely to be higher than those listed here.**

Tebuthiuron has been regularly detected in waterways flowing into the Great Barrier Reef along the Queensland coast.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Temephos

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 400µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=temephos	1

Highest Levels Detected

Waterway:	
Water Supply:	**18/12/07 Wurdee Boluc Inlet Channel 0.2µg/L** *(3)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Terbacil

Uracil Herbicide

2011 Australian Drinking Water Guideline: 200µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=terbacil	5

Highest Levels Detected

Waterway:	24/6/05 Little Swanport River (Tas) 0.32µg/L *(5)*
Water Supply:	4/11/04 Tea Tree Rivulet (Tas) 2.5µg/L *(5)* 4/11/04 Brushy Plains Rivulet (Tas) 0.6µg/L *(5)* 26/10/05 South Esk River Perth (Tas) 0.1µg/L *(5)*
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Terbufos

Organophosphorus Insecticide/Nematicide

2011 Australian Drinking Water Guideline: 0.9µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Terbuthylazine

Triazine Algaecide/Herbicide/Microbiocide

2011 Australian Drinking Water Guideline: 10µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=terbuthylazine	1

Highest Levels Detected

Waterway:	2007 Jan/Feb Perth Airport Main Drain <0.001µg/L *(50)*
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Terbutryn

Triazine Herbicide

2011 Australian Drinking Water Guideline: 400µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=terbutryn	38

Highest Levels Detected

Waterway:	2013/14 Swanbank Power Station (Qld) 0.06µg/L *(36)* 28/4/10 Jack Roper Reserve Broadmeadows (Vic) 0.022µg/L *(17)* 22/4/10 Mount Cooper (Vic) 0.022µg/L *(17)* 2011/12 Herbert River (Qld) 0.02µg/L *(31)* 20/1/10 Mill Park (Vic) 0.01µg/L *(17)*
Water Supply:	
Other Notes:	Detected at 20 locations in Melbourne through stormwater pollution *(17)*, also detected in stormwater in Perth (WA) *(50)*. Detected in numerous North Queensland waterways and the Great Barrier Reef *(135)*.

Terbutryn has not been widely tested for around Australia.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Tetraconazole

Azole Fungicide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=tetraconazole	**3**

Highest Levels Detected

Waterway:	
Water Supply:	**2009/10 Upper Yarra River 0.059µg/L *(21)*** **2008 Woori Yallock Creek (Vic) 0.01µg/L *(21)***
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Thiacloprid

Neonicotinoid Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=thiacloprid	7

Highest Levels Detected

Waterway:	7/2/13 Yarramundi Lagoon (NSW) 1.37µg/L *(22)* 29/1/13 Eastern Creek (NSW) 0.4µg/L *(22)* 29/1/13 South Creek (NSW) 0.35µg/L *(22)* 2013 Badgery Creek (NSW) 0.18µg/L *(22)* 29/1/13 Nepean Creek (NSW) 0.13µg/L *(22)*
Water Supply:	
Other Notes:	Neonicotinoid insecticide detected in study in Sydney waterways.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Thiamethoxam

Neonicotinoid Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=thiamethoxam	4

Highest Levels Detected

Waterway:	7/2/13 Eastern Creek (NSW) 0.2µg/L *(22)* 29/1/13 Bell Creek (NSW) 0.08µg/L *(22)* 29/1/13 South Creek (NSW) 0.04µg/L *(22)*
Water Supply:	
Other Notes:	Neonicotinoid insecticide detected in study in Sydney waterways.

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Thiobencarb

Thiocarbamate Herbicide

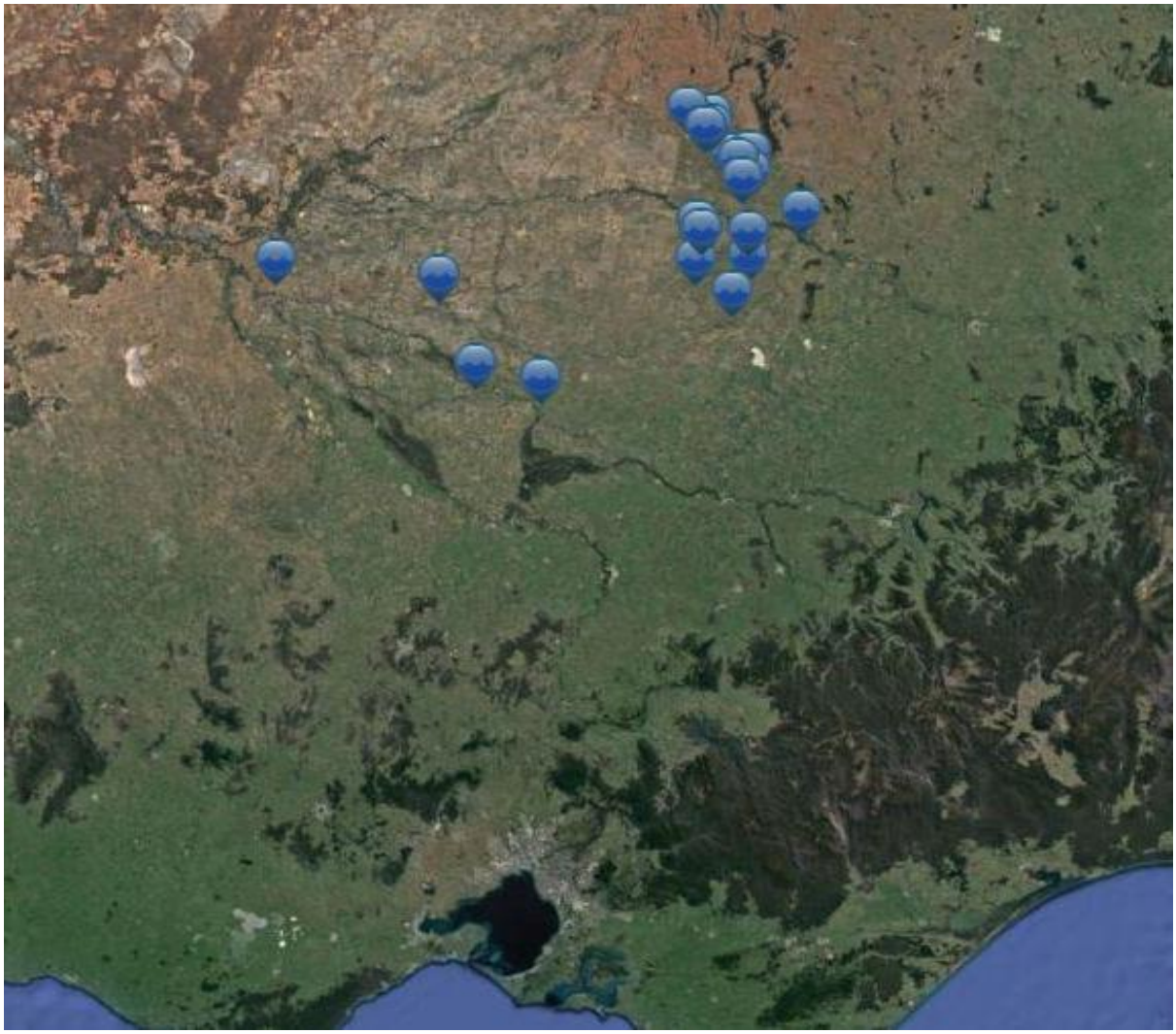
2011 Australian Drinking Water Guideline: 40µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	1µg/L	2.8µg/L	4.6µg/L	8µg/L

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/thiobencarb/	**23**

Highest Levels Detected

Waterway:	**1994 Oct-Dec Mirrool Creek (NSW) ~4µg/L *(18)*** **1993 Nov Willbriggie Irrigation Area (NSW) ~3µg/L *(18)*** **1992-3 Willbriggie Irrigation Area drain (NSW) 3µg/L *(18)*** **1994 Oct Coleambally Irrigation Area (NSW) 2.7µg/L *(18)*** **1994 Nov Murrumbidgee Irrigation Area (NSW) 2.4µg/L *(18)***
Water Supply:	
Other Notes:	**All detections in the Murrumbidgee River Catchment – Willbriggie and Coleambally Irrigation Areas and creeks downstream of irrigation areas. Detected in 2012 in Box Creek (NSW) at 1µg/L *(126)*.**



Thiobencarb closely corresponds to rice growing regions in the Murrumbidgee River catchtment.

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Thiometon

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline: 4µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Thiram

Dithiocarbamate Fungicide

2011 Australian Drinking Water Guideline: 7µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Toltrazuril

Antiprotozoal Agent

2011 Australian Drinking Water Guideline: 4µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Trans-Chlordane

Organochlorine Insecticide

2011 Australian Drinking Water Guideline:				
2000 ANZECC Ecological Guideline:	**99%**	**95%**	**90%**	**80%**

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=trans+chlordane	**10**

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Detections in sediment in 4 wetlands in Melbourne suburbs (*17*). Also detected in the Swan/Canning River catchment in Western Australia *(50)* and Gold Coast *(*143).**

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Triadimefon

Azole Fungicide

2011 Australian Drinking Water Guideline: 90µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=triadimefon	2

Highest Levels Detected

Waterway:	
Water Supply:	**2009/10 Upper Yarra River 0.012µg/L** *(21)*
Other Notes:	**Also detected in Merri Creek (Vic) stormwater in December 2009** *(17).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Pesticide: Triadimenol

Azole Breakdown Product/Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=triadimenol	8

Highest Levels Detected

Waterway:	2013-14 Swanbank Power Station (Qld) 0.1µg/L *(36)* 20/4/10 Cherry Lake Altona (Vic) 0.016µg/L *(17)* 21/4/10 Endeavour Hills (Vic) 0.004µg/L *(17)* 29/4/10 Cala Street Ponds (Vic) 0.004µg/L *(17)* 28/4/10 Sharps Road Keilor (Vic) 0.002µg/L *(17)*
Water Supply:	10/12/09 Starvation Creek Reservoir (Vic) 0.004µg/L *(17)* 2009/10 Upper Yarra River (Vic) 0.002µg/L *(21)*
Other Notes:	Also detected in sediment in Deep Creek Westernport (Vic) 2012 *(102).* *(*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Triallate

Thiocarbamate Herbicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=triallate	2

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	**Detected in Swan River Catchment Western Australia July/August 2007** *(50)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Trichlorfon

Organophosphorus Insecticide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=trichlorfon	2

Highest Levels Detected

Waterway:	
Water Supply:	**2009/10 Upper Yarra Catchment 0.006µg/L** *(21)*
Other Notes:	**Also detected in sediment at Donnelly's Creek in 2010 at 3µg/kg** *(17)*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Triclopyr

Chloropyridinyl Herbicide

2011 Australian Drinking Water Guideline: 20µg/L

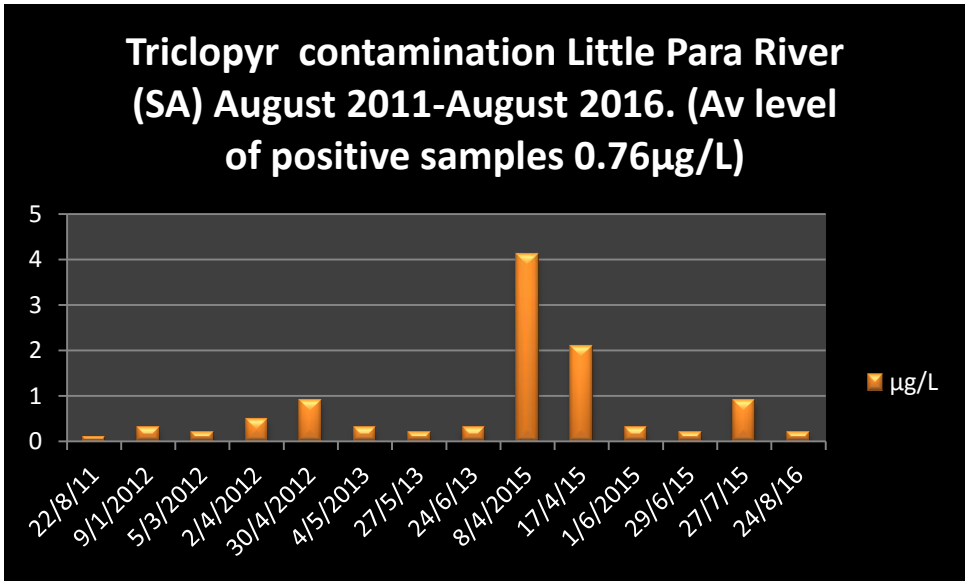
2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/chemicals/triclopyr/	75

Highest Levels Detected

Waterway:	2013-14 Swanbank Power Station (Qld) 37µg/L *(36)* 1997 January Moil Drain Darwin (NT) 34µg/L *(144)* 2014 April Riddells Creek (Vic) 2.9µg/L *(88)* 2014 April Jacksons Creek (Vic) 2.9µg/L *(88)* 1989 December Brunswick River (WA) 0.6µg/L *(61)*
Water Supply:	20/8/07 Wingcaribee Filtration Plant (NSW) 80µg/L *(146)* 8/4/15 Little Para River (SA) 4.1µg/L *(136)* 17/4/15 Little Para River (SA) 2.1µg/L *(136)* 17/12/13 Western Creek (Tas) 2.07µg/L *(5)* 3/1/12 Kersbrook (SA) 1µg/L *(44)* 17/6/13 Kersbrook (SA) 1µg/L *(44)*
Other Notes:	**Possibly the 12th most commonly detected pesticide in Australian waterways.** Widely detected along south of Brisibane (Qld) in NSW, Victoria, Tasmania and South Australia.

Triclopyr is often used to kill Blackberries which can infest the banks of waterways.


Triclopyr contamination Little Para River (SA) August 2011-August 2016. (Av level of positive samples 0.76µg/L)
5
4
3
2
1
0
22/8/11
9/1/2012
5/3/2012
2/4/2012
30/4/2012
4/5/2013
27/5/13
24/6/13
8/4/2015
17/4/15
1/6/2015
29/6/15
27/7/15
24/8/16
µg/L

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Trifloxystrobin

Strobin Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=trifloxystrobin	11

Highest Levels Detected

Waterway:	
Water Supply:	2008 Sheep Station Creek (Vic) 0.73µg/L *(21)* 2008 Woori Yallock Creek (Vic) 0.16µg/L *(21)* 2008 Cockatoo Creek (Vic) 0.15µg/L *(21)* 2008 Shepherd Creek (Vic) 0.03µg/L *(21)* 2008 McCrae Creek (Vic) 0.006µg/L *(21)* 10/12/09 Little Yarra River (Vic) 0.002µg/L *(17)*
Other Notes:	Also detected in 2010 in sediment in three wetlands in suburban Melbourne *(17).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Trifluralin

2,6-Dinitroaniline Herbicide

2011 Australian Drinking Water Guideline: 90µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%
	2.6µg/L	4.4µg/L	6µg/L	9µg/L

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=trifluralin	17

Highest Levels Detected

Waterway:	2010 March Murrumbidgee Irrigation Area (Fivebough Swamp by-pass drain - NSW) 0.186µg/L *(139)* 2009 June Murrumbidgee Irrigation Area (Mirrool Creek at McNamara Road) 0.114µg/L *(145)* 2009 June Murrumbidgee Irrigation Area (Main Drain J Upstream of Warburn Escape) 0.063µg/L *(145)* 2009 June Murrumbidgee Irrigation Area 0.05µg/L (Bray"s Dam Diversions and Bywash) *(145)* 2009 June Murrumbidgee Irrigation Area (Lake Wyangan Causeway) 0.046µg/L *(145)*
Water Supply:	26/5/16 Little Para River (SA) 0.39µg/L *(136)*
Other Notes:	Also detected in the Gwydir River basin *(132)* (NSW) in the 1990s, the Johnstone River (Qld) in 2011 *(137)* and stormwater in the Swan River catchment (WA) *(50).*

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Vernolate

Thiocarbamate Herbicide

2011 Australian Drinking Water Guideline: 40µg/L

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map:	

Highest Levels Detected

Waterway:	
Water Supply:	
Other Notes:	

Pesticides Detections in Australian Waterways

Overview Report 2016

Friends of the Earth Australia

Pesticide: Vinclozolin

Dicarboximide Fungicide

2011 Australian Drinking Water Guideline:

2000 ANZECC Ecological Guideline:	99%	95%	90%	80%

Number of water locations highlighted on Australian Pesticide Map: https://pesticides.australianmap.net/?s=vinclozolin	3

Highest Levels Detected

Waterway:	1986 Unspecifed Reservoir (SA) 0.02µg/L *(6)*
Water Supply:	1986/7 Cox Creek (SA) 0.33µg/L *(64)* 1986/7 Mt Lofty Golf Course (SA) 0.05µg/L *(64)* 1986/7 Gore Creek (SA) 0.03µg/L *(64)* 1986 Unspecifed Reservoir (SA) 0.01µg/L *(6)*
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