



# Test results for nitrate in water in REMS communities: 2012-14; 2018-20; 2021

The Remote Essential and Municipal Services (REMS) program currently maintains and upgrades water infrastructure in 137 remote Aboriginal communities. Groundwater is the water source for these communities. Groundwater can often contain chemical elements and compounds. One compound sometimes found is nitrate, usually as a result of the natural process of underground plant decay.

Elevated levels of nitrate in drinking water can present a health risk for some people. Most at risk are very young, bottle-fed infants. The risk arises if water containing elevated level of nitrate is used to mix the baby formula. However, the WA Department of Health advises that to date, no illness has been attributed to drinking water with elevated levels of nitrate in Western Australia.

Our testing regime for 89 communities is as follows:

- monthly microbiological testing of reticulated (tap) water;
- six monthly chemical testing of reticulated water; and
- six monthly chemical and bacteriological testing of groundwater bores (untreated water).

In 48 very small communities we test chemical and physical indicators annually including for nitrate.

Of these 137 communities:

- none have a level of nitrate that is above the ADWG value for adults, children and infants more than three months old (100mg/L).
- 15 are affected by a level of nitrate in drinking water that exceeds the Australian Drinking Water Guidelines (ADWG) value for infants less than three months old that are bottle-fed (50mg/L). 122 communities are not affected.

**Table 1** below shows the 15 communities where nitrate testing of reticulated water exceeded the level set for infants less than three months age (50mg/L). The table shows the number of times this occurred. To avoid the risk of harm to these infants, free bottled water is supplied to households and the health clinic in these communities, for use in mixing baby formula.

Among these 15 communities, Kiwirrkurra is having a new water treatment plant constructed to reduce nitrate to a safe level for these infants and at Warburton the new plant is constructed and being brought into operation during early 2022.

**Tables 2.1 and 2.2** shows six communities that have had elevated levels of nitrate and where a water treatment plant has been installed to remediate this. The water produced by these plants is below the ADWG value for infants less than three months old who are bottle-fed. In other words, the household tap water is safe for these infants.

In three communities this potable water is available from any household tap and in three communities the potable water is available only from a dedicated and well-marked 'third pipe/third tap' in each household.

However, for extra assurance in these six communities, free bottled water is recommended and provided for bottle-fed infants less than three months old, because there is no redundancy (back-up) in the rare event that the water treatment plant was to have an outage.

Further information from the Department of Health about nitrate in water is available [here](#).


**Table 1****Nitrate test results exceeding the ADWG level for infants less than three months old**

<div>KEY</div> <div>GOLD: Goldfields</div> <div>KIMB: Kimberley</div> <div>PILB: Pilbara</div> <div>MIDW: Mid-West</div>			Chemical testing			
			(number of test results above ADWG levels)			
						
			Nitrate			
			(50 mg/L)			
Region	Community	Community Size <sup>1</sup>	1 July 2012 to 30 June 2014	1 July 2018 to 30 June 2020	1 July 2020 to 30 June 2021	Comment
GOLD	Blackstone	Large	19	9	2	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.
GOLD	Mulga Queen	Small	1	14	11	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.
GOLD	Tjirrkarli	Small	0	2	0	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.
GOLD	Tjukurla	Small	0	3	9	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.
GOLD	Warnam	Large	6	21	12	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.
GOLD	Warburton	Large	8	24	12	New \$3m reverse osmosis water treatment plant being brought into operation during early 2022 to reduce nitrate levels.
GOLD	Wingellina	Large	5	20	12	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.

<sup>1</sup> Community Size: "Very small" means less than five houses; or less than 30 people; or not permanently occupied.


"Small" means between 5 and 39 houses (indicative population estimate of 30 to 199 people).

"Large" means between 40 and 200 houses (indicative population estimate of more than 200 people).

<b>KEY</b> GOLD: Goldfields KIMB: Kimberley PILB: Pilbara MIDW: Mid-West			Chemical testing (number of test results above ADWG levels)			
			 <b>Nitrate (50 mg/L)</b>			
Region	Community	Community Size <sup>1</sup>	1 July 2012 to 30 June 2014	1 July 2018 to 30 June 2020	1 July 2020 to 30 June 2021	Comment
KIMB	Mulan	Large	1	1	0	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.
KIMB	Pandanus Park	Small	19	26	13	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.
PILB	Kiwirrkurra	Small	NA	NA	4	Water treatment plant under construction to remediate elevated level of uranium and fluoride and elevated level of nitrate for bottle-fed infants less than three months age. Bottled water provided for all persons including infants due to fluoride level.
PILB	Kunawarritji	Small	20	22	12	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.
PILB	Wandanooka (Kardaloo)	V small	0	0	1	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.
MIDW	Burringurrah	Large	26	23	11	Bottled water provided for bottle-fed infants less than three months old. Bottled water provided for all persons from February 2022 due to elevated level of uranium.
MIDW	Kutkabubba	V small	26	23	11	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.
MIDW	Yulga Jinna	Small	1	4	7	Bottled water provided for bottle-fed infants less than three months old. Water suitable for all other infants and persons.

**Table 2.1****Communities where nitrate test levels are safe but bottled water still used for infants**

There are three communities for which drinking water (from any household tap) is below the ADWG threshold for infants less than three months old. However bottled water is recommended and provided due to the unavailability of N-1 redundancy (back-up) in the rare event the water treatment plant has an outage. Outages can be caused by events such as a loss of power.

<b>KEY</b> GOLD: Goldfields KIMB: Kimberley PILB: Pilbara MIDW: Mid-West			Chemical testing (number of test results above ADWG levels)			
			 <b>Nitrate (50 mg/L)</b>			
Region	Community	Community Size <sup>2</sup>	1 July 2012 to 30 June 2014	1 July 2018 to 30 June 2020	1 July 2020 to 30 June 2021	Comment
GOLD	Cosmo Newberry	Small	20	1	0	Water from treatment plant is suitable for infants less than three months old but bottled water is recommended and provided
GOLD	Jameson	Large	21	29	1	Water from treatment plant is suitable for infants less than three months old but bottled water is recommended and provided. A single instance of 58mg/L was detected during April 2021.
PILB	Jigalong	Large	24	0	0	Water from treatment plant is suitable for infants less than three months old but bottled water is recommended and provided.


<sup>2</sup> Community Size: "Very small" means less than five houses; or less than 30 people; or not permanently occupied.

"Small" means between 5 and 39 houses (indicative population estimate of 30 to 199 people).

"Large" means between 40 and 200 houses (indicative population estimate of more than 200 people).

**Table 2.2****Communities where nitrate test levels are safe but bottled water still used for infants**

There are three communities for which potable water from a 'third-pipe, third-tap' household supply is below the ADWG threshold for infants less than three months old. However bottled water is recommended and provided due to the unavailability of N-1 redundancy (back-up) in the rare event the water treatment plant has an outage. Outages can be caused by events such as a loss of power.

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			<div></div> <div>Nitrate (50 mg/L)</div>				
Region	Community	Community Size <sup>3</sup>	1 July 2012 to 30 June 2014	1 July 2018 to 30 June 2020	Non potable water 1 July 2020 to 30 June 2021	Potable water 1 July 2020 to 30 June 2021	Comment
GOLD	Mt Margaret	Small	19	25	12	0	Potable water from treatment plant (via household third pipe/third tap) is suitable for infants less than three months old but bottled water is recommended and provided
GOLD	Patjarr	Small	26	22	12	0	Potable water from treatment plant (via household third pipe/third tap) is suitable for infants less than three months old but bottled water is recommended and provided
GOLD	Tjuntjuntjarra	Small	6	2	0	0	Potable water from treatment plant (via household third pipe/third tap) is suitable for infants less than three months old but bottled water is recommended and provided.

<sup>3</sup> Community Size: "Very small" means less than five houses; or less than 30 people; or not permanently occupied.

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