



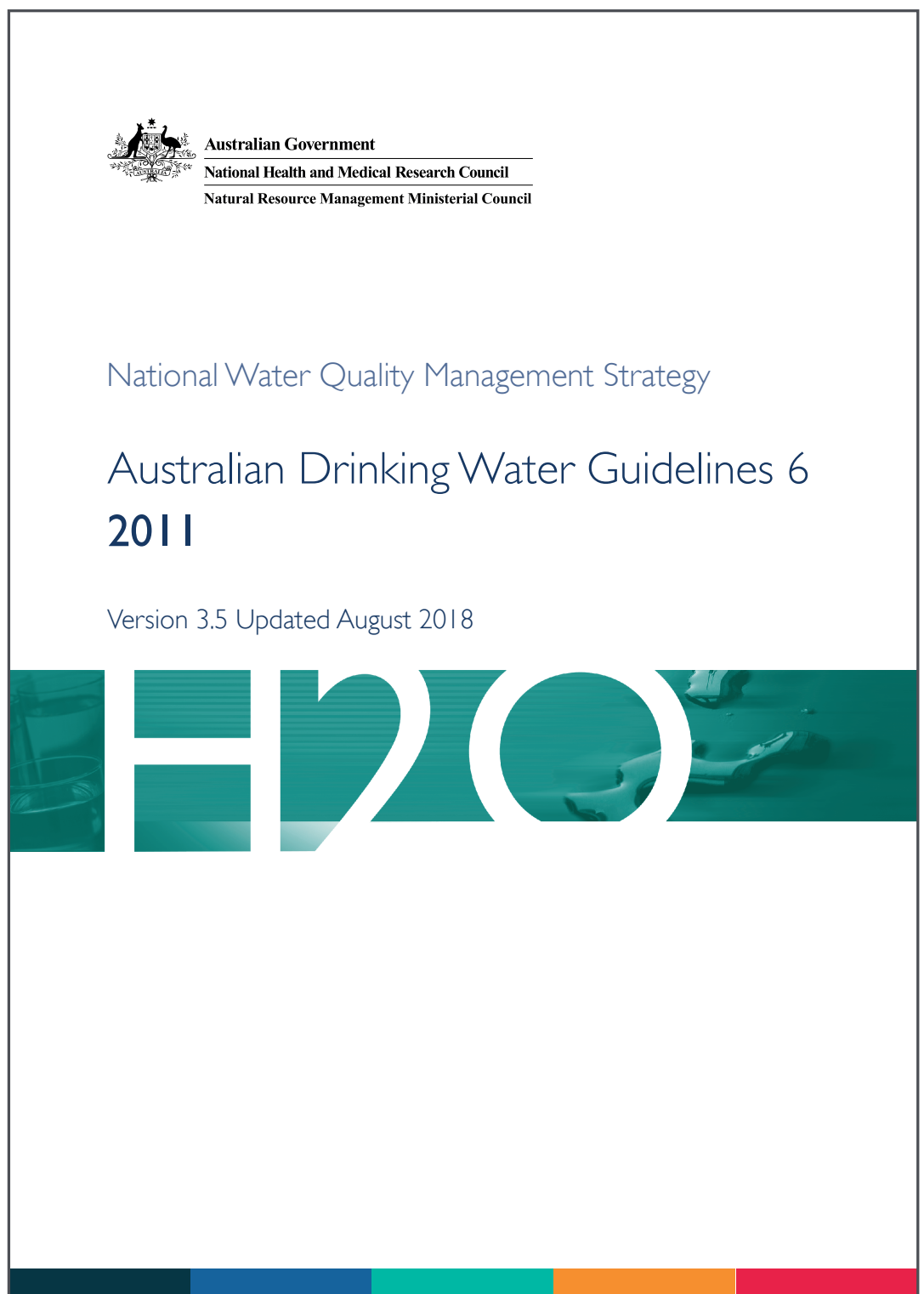
Review of guidance on radiological quality of Australian drinking water: Alignment of the Australian Drinking Water Guidelines with international guidance

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Summary

ARPANSA has reviewed the Australian Drinking Water Guidelines relating to the radiological quality of drinking water. No change has been made to the recommended screening levels of 0.5 Bq/L for gross alpha and 0.5 Bq/L gross beta (corrected for potassium-40) and there is no change to the 1 mSv/year reference value.

A specific dose criteria of 0.3 mSv/year has been introduced replacing the operational dose level of 0.5 mSv/year. Above the specific dose criteria of 0.3 mSv/year, optimisation should be considered. The review has updated the information and terminology so that it reflects current best practice.



Reason for review

Publication of the *Guide for Radiation Protection in Existing Exposures Situations* (RPS G-2) (ARPANSA, 2017) included specific guidance on the implementation of Australia’s radiation protection measures due to radionuclides of natural origin in commodities and bulk materials including food and water.

As part of ARPANSA’s implementation of ARPANSA RPS G-2 the recommendation was made to the National Health and Medical Research council (NHMRC) that the radiological aspects within the Australian Drinking Water Guidelines (ADWG) undergo a review.

ARPANSA offered to commit the resources required to undertake the review identifying the need for additional information, particularly with respect to:

- screening of water supplies
- assessment of dose to the critical population groups
- occurrence and levels of naturally occurring radionuclides in groundwater
- need for clarification, amendment and correction of existing information
- basis for 1 mSv/year and an explanation of the IDC (indicative dose criterion) as applied by the WHO.

The review

The ICRP recommend setting a value for a dose constraint at below the 1 mSv/year reference level and that a value of no more than 0.3 mSv/year would be appropriate.

In both the ADWG and the WHO GDWQ further analysis and calculation of dose is only required when screening values are exceeded.

Ground water supplies that exceed the screening level in Australia tend to have elevated levels of radium. Table 1: Application of the screening values, compares calculated doses based on respective screening levels in the ADWG and WHO GDWQ when screening levels are assumed to be due to radium.

The screening levels for gross alpha and gross beta, in Australia, have been set to meet the 0.3 mSv/year dose criteria.

The ADWG 0.3 mSv/year specific dose criteria was formerly a 0.5 mSv/year dose constraint. The change has been made on the basis of recommendations within ICRP Publication 82.

Drinking waters that meet the screening values for gross alpha and gross beta can also be expected to meet the specific dose criteria of 0.3 mSv/year.

0.3 mSv/year specific dose criteria

Updates to information and terminology with respect to system of radiation protection

Health effects - move away from the use of tissue reactions in describing low level exposure health effects

Improved referencing

Australian context and values (where available)

	Australian Drinking Water Guidelines	WHO Guide to Drinking Water Quality	The calculated dose has been generated using the ICRP dose per unit intake coefficients assuming all gross alpha activity is due to radium-226 and all gross beta activity is due to radium-228. A consumption rate for the average adult of two litres per day is assumed. NS – Not specified
Screen value gross alpha Bq/L	0.5	0.5	
Screen value gross beta Bq/L	0.5	1.0	
Calculated dose attributed to Radium-226 and Radium-228 mSv/year	0.3	0.6	
Dose criterion mSv/year	0.3	0.1	
Percentage by which the WHO Individual Dose Criterion may be exceeded	20	500	
Reference level mSv/year	1	NS	

Table 1: Application of screening values: Comparison of the Australian Drinking Guidelines and the WHO Guide to Drinking Water Quality

What next?

The updated documents are currently under review by the Water Quality Advisory Committee and the National Health and Medical Research Council (NHMRC). The review process ensures that the developed guidelines meet the NHMRC Standards for Guidelines.

Once this process has been undertaken the draft documents will be available for a period of public consultation.