WATER SERVICES
ASSOCIATION OF AUSTRALIA

1 March 2021

Mr Neil Savery
Chief Executive Officer
Australian Building Codes Board
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Canberra ACT 2601
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Dear Mr Savery

LEAD IN PLUMBING PRODUCTS IN CONTACT WITH DRINKING WATER

Thank you for the opportunity to provide a submission to the *Lead in plumbing products in contact with drinking water – Consultation Regulation Impact Statement 2020* (the RIS).

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry in Australia. Our members include all the water utilities supplying water and wastewater services to over 24 million residential customers and many of Australia's largest industrial and commercial enterprises. WSAA facilitates collaboration, knowledge sharing, networking and cooperation within the urban water industry. The collegiate approach of its members has led to industry wide advances on national water issues.

We consulted with our water utility members around Australia and their feedback is summarised in this submission.

The Australian Drinking Water Guidelines and Australian Standards set out the conditions to ensure plumbing materials are safe so that drinking water does not have unacceptable levels of metals, including copper and lead. As identified by the Regulation Impact Statement, water utilities monitor these levels regularly to confirm that the treatment and systems and safeguards are working as they should. Across most of Australia, the water utility's responsibility ends at the point of supply – the customer's water meter.

Meters should be included in the scope

In our view water meters should be included in the scope of this review. As the ABCB notes, water utilities have evidence of issues with lead leaching from water meters. There is also no specified limit on the per cent of lead in a water meter because it is not covered under AS/NZ3565.1 or AS/NZS4020. AS/NZS3688 does however have a limit of per cent of lead for fittings.

Our members report many instances of confusion about ownership of meters. The location of the meter can contribute to this.

In addition to known issues with lead leaching from water meters, we note the continual increase in smart meters on water networks and customer properties going forward. The understanding of the lead content and leaching from these meters is currently unknown.

We prefer Option 2 to limit lead content for products in contact with drinking water provided that low lead plumbing products results in lower levels of lead introduced to drinking water

Option 2 reduces lead in products in contact with drinking water. However, it must first be determined that reducing the lead level in plumbing products reduces the level of lead in drinking water. Page 61 of the RIS suggests that the reverse is true and low lead plumbing products can introduce more lead into drinking water than the higher leaded products.

Assuming lower lead content products will achieve lower lead levels in drinking water, in our view Option 2 provides the most achievable solutions that can be readily implemented on a national platform. However, enforcement of the required changes is also important to ensure high lead content components are not missed when incorporated into larger products that have an overall low lead content.

Further, in our view Option 2 should be combined with the Alternative Regulatory Option to change the testing requirements for lead in AS/NZS4020.

We support a 5-year transition period

In our view a 5-year transition period is preferable as it would allow for additional research on the effectiveness of low lead/lead free products in reducing lead leaching to be undertaken. As recognised in this paper, studies and conclusions to date are limited.

However, in our view making changes to the testing requirements in AS/NZS4020 to improve Quality Assurance / Quality Control should be delivered more quickly.

Consider a maximum weighted lead content of 0.25% for all water industry infrastructure

We propose the same criteria for plumbing products should apply to Network Utility Operators (NUO) infrastructure, and therefore a maximum weighted lead content of 0.25% for plumbing products should be considered for NUO infrastructure products. In many cases the same products are used in both systems. It is considered unlikely that the adoption of a maximum weighted lead content for NUO infrastructure products would lead to widespread material changes to existing infrastructure products.

We provide our full response to the consultation questions included in the RIS in Attachment A, additional comments on the RIS are provided at Attachment B.

I would be happy to discuss our submission further on 0417 211 319 and adam.lovell@wsaa.asn.au

Kind regards

Adam Lovell
Executive Director
Water Services Association of Australia

Attachment 1: Consultation Questions

1. Is the scope of products listed above appropriate?

No, in our view water meters should be included. Further there is an opportunity to consider a maximum weighted lead content of 0.25% for all water industry infrastructure (ie, including Network Utility Operators infrastructure).

Water meters

In our view water meters should be included in the scope of this review. As the ABCB notes, water utilities have evidence of issues with lead leaching from water meters. There is also no specified limit on the per cent of lead in a water meter because it is not covered under AS/NZ3565.1 or AS/NZS4020. AS/NZS3688 does however have a limit of per cent of lead for fittings.

Our members report many instances of confusion about ownership of meters. The location of the meter can contribute to this.

In addition to known issues with lead leaching from water meters, we note the continual increase in smart meters on water networks and customer properties going forward. The understanding of the lead content and leaching from these meters is currently unknown.

Comments on Network Utility Operators infrastructure

The RIS excludes Network Utility Operators (NUO) infrastructure from the scope of the review on the basis that there is no evidence to indicate high levels of lead leaching from the NUO network. This may be because the surface area of copper alloys in contact with drinking water in the NUO products as a proportion of the total surface area of materials in contact with drinking water is much less than for the plumbing network.

We propose the same criteria for plumbing products should apply to Network Utility Operators (NUO) infrastructure, and therefore a maximum weighted lead content of 0.25% for plumbing products should be considered for NUO infrastructure products. In many cases the same products are used in both systems. It is considered unlikely that the adoption of a maximum weighted lead content for NUO infrastructure products would lead to widespread material changes to existing infrastructure products.

The only burden to industry would be to require a determination of the maximum weighted lead content as part of the AS/NZS 4020 testing regime. Where a product does contain greater than a weighted lead content of 0.25% it would be difficult to argue that a change to the material composition should not be undertaken.

2. Do you agree with the description of the nature of the problem?

In general, yes. We have provided specific feedback in Attachment 2.

As described by the RIS, the nature of the problem relates to plumbing products containing lead being in contact with drinking water. This results in a risk of lead leaching into the drinking water supply at higher levels than permitted by Australian and international standards, with potential health consequences when drinking water is consumed. The nature of the problem contains three elements which include the:

1. Inclusion of lead to assist in the manufacturing of plumbing products
2. Mechanisms of short-term and long-term release through surface films and dezincification of lead into drinking water from leaded plumbing, and
3. Health consequences of drinking water containing lead and its impact on the population when consumed.

3. Are there any other characteristics of the nature of the problem which should be described?

We have provided specific feedback in Attachment 2.

4. Are you aware of any studies on the occurrence of lead leaching into Australian drinking water from within the premises?

We are not aware of any additional studies. In many cases water utilities contributed to the studies cited in the RIS.

5. Do you have data on the extent lead levels in drinking water exceed 10 µg/L?

No. In many cases water utilities contributed to the studies cited in the RIS.

6. Do you agree with the description of the extent of the problem?

In general, yes. We have provided specific feedback in Attachment 2.

7. Do you have data on the frequency of elevated blood lead levels in Australia?

No.

8. Do you have any other information or data that may assist in describing the extent of the problem?

No. In many cases water utilities contributed to the studies cited in the RIS.

9. Are there any other feasible options to address the problem?

No comments.

10. Do you agree with the alternative regulatory option (changes to the current testing requirements) being discontinued as a feasible option?

No. In light of the reported limitations of AS/NZS4020, there is merit in further investigating improvements to the regulatory standards for testing.

Amendments to AS/NZS4020 to test products under conditions reflecting the range of variables affecting drinking water in Australia should be considered. That is, against different types of water (e.g. chlorinated, varying pH, temperature, total dissolved solids (TDS), alkalinity) There would be benefits for such testing on the other metals in the suite of elements analysed - the benefits of this testing would extend also to understanding if the different water chemistries affected all of the listed metals, not just lead.

One South East Queensland water utility independently tested four fittings, and two out of the four did not comply with AS/NZS4020. One of those did not comply with AS/NZS3688. Could consider a minimum Quality Assurance / Quality Control testing requirement. For example, every batch of x number needs to be tested for % lead, and every batch of y number needs to be tested to AS/NZS4020.

11. Are you aware of any health consequences associated with using substitutes for lead in the manufacture of plumbing products in contact with drinking water?

No, however, health impacts associated with metal substitutes should be considered and investigated to ensure they present a lower health risk than lead. Also, additional research is required to investigate why low lead fittings can result in higher lead leaching than standard brass fittings as highlighted in page 61 of the RIS.

Reducing lead in fittings leads to more complex machining. Manufacturers are likely to look to lead alternatives to maintain similar machinability. Lead replacements may not always be silicon or bismuth (e.g. selenium) and may present similar toxicity/health impacts as lead itself. There may also be the possibility of the introduction of new contaminants, such as microplastics.

In our view, options to mitigate the risk of increasing exposure to other toxic materials used as lead replacements must be considered.

12. Do you have any comments on the factors that influence product selection?

For metal substitutes, manufacturers will select products to maintain machinability and remain cost competitive.

For consumer product selection (leaded brass vs low lead/lead free alternatives), the answer is that in reality the people at risk (e.g. household individuals) currently have little choice in product selection as that decision in most cases sits with the builder or plumber. To remain cost competitive, builders and plumbers are likely to buy the best value product provided it is compliant with the code.

13. Are there any other unintended consequences not considered relevant to implementing Option 2?

The RIS (page 61) reports that higher levels of lead have been found to leach from low lead plumbing products when compared to higher leaded products and these findings are consistent with US reports which found some lead-free products still leached high concentrations of lead. While the RIS states this unintended consequence is counter intuitive with the objectives of the changes to plumbing products with lower lead content, it raises the requirement to ensure the implementation of Option 2 will result in improved water quality including through lower

levels of lead in drinking water as well as considering the health impacts associated with any other metals or substances used to substitute lead in low lead plumbing products.

Any increase in costs in manufacture and alloys will likely be passed on to the end-purchaser. If the cost variance between compliant and non-compliant products widens (e.g. due to low-lead products being more expensive), then this may increase the temptation for installers to source non-compliant materials sourced from overseas in preference to compliant products in order to save costs.

14. What is your preferred option and why?

Option 2: Require all products in contact with drinking water to contain 0.25% or less lead content.

However, we support Option 2 on the condition the use of low lead plumbing products achieves meaningfully lower lead levels in drinking water compared to lead levels from the use of current leaded plumbing products. There is some risk that lower lead content plumbing products may not result in decreased lead levels in drinking water.

The RIS (page 61) states that the Australian Water Quality Centre found higher levels of lead leaching from low lead plumbing products when compared to higher leaded products and that these findings are consistent with US reports which found some lead-free products still leached high concentrations of lead. While the RIS stated these findings are associated with the finishing of products after manufacture and continued testing and certification of plumbing products in contact with drinking water by accredited testing laboratories to ensure adequate rinsing processes are reflected in the certification process is required, we request additional research is undertaken to fully determine that low lead plumbing products will deliver the required decrease in lead levels in drinking water prior to implementing Option 2. That is, the ABCB investigate why low lead fittings can result in higher lead leaching than standard plumbing products in order to ensure appropriate controls are implemented to result in lower lead levels long term. Note that compliance with the upper lead limit stated in AS4020 is not considered sufficient to demonstrate this (as could be inferred in the text on page 61) as there are a great number of products that release far less lead into drinking water than the upper allowable limit in AS 4020.

While our preference is for Option 2, in our view, Option 2 should be combined with the Alternative Regulatory Option to change the testing requirements for lead in AS/NZS4020.

Assuming the objective of Option 2 in reducing lead in plumbing products in contact with drinking water results in lower lead levels in drinking water, in our view Option 2 provides the most achievable solutions that can be readily implemented on a national platform. However, enforcement of the required changes is also important to ensure high lead content products are not missed through incorporation into large products.

If ABCB goes ahead with Option 2, the most practical method of achieving the outcome would be to make an amendment to AS/NZS4020 requiring a product to contain a maximum weighted lead content of 0.25%. The PCA and relevant product standards already require compliance to AS/NZS4020 for products in contact with drinking water so the inclusion of a maximum weighted lead content of 0.25% into AS/NZS 4020 would avoid the need to amend any other documents.

Another implementation option is to ban the sale of any products in Australia that do not meet the regulatory standard due to health risk are banned, assisting with the transition. This has been the case for leaded fuel, so the aim should be for plumbing products as well.

Considering the other options:

- Option 1 (maintaining the status quo) must not be supported. We acknowledge that the current allowable level of lead in plumbing products needs to be reduced.
- Option 3 (industry-lead labelling scheme) puts the choice responsibility on the consumer ('buyer beware' approach). This may not be ethical unless thorough explanation of the risk is given to consumers (similar to smoking warning ads, images on packets, etc). Additionally, for the majority of in-house components (with the exception of tapware) consumers normally 'inherit' what the builder and/or plumber installed and have little say in the choice for plumbing products (copper, poly, brass, steel).

15. Do you agree that a transition period is required?

Yes.

16. If yes, if a 3-year or 5-year transition period preferred?

In our view a 5-year transition period is preferable as it would allow for additional research on the effectiveness of low lead/lead free products in reducing lead leaching to be undertaken. As recognised in this paper, studies and conclusions to date are limited.

However, in our view making changes to the testing requirements in AS/NZS4020 to improve Quality Assurance / Quality Control should be delivered more quickly.

Attachment 2: Improvements to the document

Section	Page	Text	Comments
General	5 73 74	Wetted surface area definition	The wetted surface area is defined on Page 5, Page 73 and Page 74 as "calculated by the sum of diameter (D) in contact with water" which is further defined on page 74 as "the length of the pipe or fitting in contact with drinking water multiplied by its diameter". This definition is not correct for determining the surface area of a cylindrical pipe and there is no guidance for calculation of non-cylindrical shapes such as valves and fittings. In our view, an example of how the wetted surface area of copper alloy components within a valve or fitting should be described.
Introduction	8	People can be exposed to lead from ingestion of airborne dust, water, food and soil. The most common source of lead in drinking water is caused by lead leaching from plumbing products from within the premises.	Need to be clear that this is a US reference, does not necessarily apply to Australia. A lot of exposure to lead in Australia was through paints and soils. For example, some areas in the Hunter Valley and as we have seen in the news recently Port Pirie associated with the lead smelter.
Introduction	8	Paragraph starting 'To mitigate the risk… drinking water is routinely tested… Such intervention is effective…'	This implies that the testing is the intervention that resulted in Australian drinking water ranking in the top 15% for water quality. In terms of lead, it is not the testing but the use of low lead content materials in utilities that has resulted in this outcome. Further, water utilities are responsible for water quality delivered to the meter, and any water utility action mitigates the quality of water to the meter. Many of the lead issues we are aware of in Australia arise from plumbing fixtures and fittings in the home.
Introduction	8	Hence, where lead is present in drinking water in qualities above that permitted by AS/NZS 4020, the likely cause is plumbing products in contact with drinking water from the property.	We note that AS4020 only requires testing every 5 years, and does not include % lead in products, AS4020 is therefore not very reliable at ensuring low lead products. 'Likely cause': consider revising language to be clear that this would be a contributor but not the sole source.
Problem: Nature of the problem	13	The list of exclusions: Recycled water systems.	We note that recycled water systems (dual pipe reuse systems or dual reticulation systems) in general use the same plumbing products as drinking water systems (both in water utility networks and residential properties). Products should be not excluded from scope if they fit into this category and are used as drinking water fittings.
Problem:	15		Redlands City Council have had issues with lead leaching from Water Meters which are more than 2 years old. Levels of lead are > 10 ug/L when a sample is taken directly from the water meter.

Section	Page	Text	Comments
Long-term lead release			
Cases of lead leaching into drinking water in Australia: Water Meters	21	While water meters are not covered by the Plumbing Code of Australia and do not need Watermark Certification, they are expected to comply with AS/NZS 4020 in Queensland.	We note that suppliers test one meter every 5 years (as per AS4020) and there is no limit on the % of lead allowed in the metal, so AS4020 is not going to provide much assurance of low lead levels in products.
Extent of the problem	33	Second dot point 'The extent to which lead is leached into drinking water from point of discharge plumbing fittings and fixtures…'	Need to include ***point of discharge*** in definitions. Add 'to': The extent to which lead is leached into drinking water from point of discharge ***to*** plumbing fittings and fixtures…
Extent of the problem Number of products installed in Australia	33	Table 1	Add water meters to Table 1: Annual sales data of leaded copper alloy plumbing products in contact with drinking water.
Health impacts of lead in drinking water Adults	37		What would be the impact of blood lead levels assuming levels are just below the LOR of 1 ug/L say 0.99 mg/L 100% of the time?
Health impacts of lead in drinking water Conclusions on blood lead levels	39	Table 4	For non-occupational exposure, appears to be a significant increase over time. Does this equate to statistically significant increase/trend? If so, should make that statement.

Section	Page	Text	Comments
Summary of the nature and extent of the problem	44	This trend is likely to continue in the absence of any additional regulatory interventions.	What is the evidence for this statement?
Substitutes for lead	58	From a health perspective, silicon and bismuth present less risk when compared to lead.	What is the evidence for this statement? Are we certain about the long-term health exposure effects?
Conclusion	68	Further regulatory intervention aimed at reducing lead exposure from drinking water will not be immediate and exposure from drinking water is expected to gradually fall, as existing plumbing products in contact with drinking water are replaced by new products over time.	Need that regulatory oversight, or this trend will not fall on its own accord.