Proposed changes to Level 3 source water classes

The existing Level 3 Rules use source water classes to determine treatment requirements for protozoa, and to determine source water monitoring for some determinands and parameters. We propose expanding the source water approach to make explicit the source water monitoring rules and bacteria and virus treatment rules that apply to each source water class. Four source water classes are proposed (including two interim classes).

- **Class A** is for groundwater abstracted from a depth of greater than 30 metres that is highly unlikely to be contaminated with bacteria, viruses or protozoa. Suppliers will not be required to have treatment barriers in place for these contaminants. although chlorine will need to be added at the treatment plant for residual disinfection.
- **Class A (Interim)** is source water that is likely to be class A, but the supplier has not yet undertaken the monitoring to demonstrate that the source water meets the necessary criteria to be classified as Class A.
- **Class B** is based on Class 1 source water in the existing Rules. It is for source waters where the risk of virus contamination has not been established. These source waters will not require a protozoa treatment barrier but will still require a bacteria and virus treatment barrier.
- **Class B (Interim)** is based on Interim Class 1 source water in the existing Rules. It is for source waters that are likely to be Class B but the supplier has not yet undertaken the monitoring to demonstrate that the source water meets the necessary criteria.
- **Class C** covers ground waters that have a low level of protozoa contamination risk. Class C is based on Class 2 in the existing Rules but has been expanded to include groundwater abstracted from greater than 30 metres (if it is not classified as Class A or Class B source water), roof collected water, and spring water that is not under the influence of surface water. Class C also includes Class D source water that has been reclassified as Class C where an assessment has demonstrated a low risk of protozoa contamination risk. Class C requires treatment barriers for protozoa (3-log treatment), bacteria and viruses.
- **Class D** is similar to Class 3 in the existing Rules. Class D is the default for surface waters and spring or shallow groundwater (<10m) that is considered higher risk. Class D requires treatment barriers for protozoa (4-log treatment), bacteria and viruses.

Question: Do you agree with expanding source water classes so that they apply to source water monitoring, bacterial and virus rules as well as protozoa rules?

Existing class	Existing requirement	Proposed class	Proposed requirement	Explanation	Question	Cost implications
N/A	N/A	Class A	(1) **Class A** is groundwater abstracted from a depth of greater than 30 metres below ground level (with depth measured from ground level to the top of the upper most screen), and abstracted via a sanitary bore head, that meets the following requirements: (a) the drinking water supplier must demonstrate that— (i) no *E. coli* or total coliforms has been detected from monitoring over the previous three years with 12 samples taken per year evenly spaced over the year; and (ii) an enteric viral indicator monitoring programme, including a written report prepared by an independent suitably qualified and experienced person, demonstrates that a health-outcome target of 1 enteric viral infection/10,000 people/year can be achieved and maintained for the supply: (b) an assessment must be undertaken immediately if any monitoring result	The proposed Class A is for groundwater abstracted from a depth of greater than 30 metres that is highly unlikely to be contaminated with bacteria, viruses or protozoa. Suppliers will not be required to have treatment barriers in place for these contaminants. This will allow suppliers to avoid the cost of installing UV disinfection or chlorine contact time infrastructure that is required where chlorine is used to control bacteria and viruses. Chlorine is still required to be added to these supplies to ensure that water distributed in a network contains residual chlorine. Rather than specifying a viral indicator with associated limits and monitoring frequencies in the Rules, we propose requiring suppliers to demonstrate via an enteric viral indicator monitoring programme that a health-outcome target of 1 enteric virus/10,000 people/year can be achieved and maintained for the supply. This proposed microbial health-outcome target is based on the United States Environmental Protection Agency (USEPA) target (of 1 enteric viral infection/10,000 people/year) which is considered internationally to be an acceptable annual risk for microbial infections attributable to drinking water.	Do you agree with the proposal that Class A source water will not require primary treatment for bacteria, viruses or protozoa (though they will still need to add chlorine to provide a residual)? Do you agree with the proposed requirement for an enteric viral monitoring programme to demonstrate a health-outcome target for viral risk can be met? Do you agree with the proposed health-outcome target of one enteric viral infection/10,000 people/year? Do you agree with the proposed requirement that an independent suitably qualified and experienced person must prepare a written report demonstrating that the health outcome target can be met and maintained for the supply?	There will be costs for suppliers to meet the requirements of the proposed viral indicator monitoring programme. However, there could also be significant costs savings depending on the specific circumstances of a supply, as suppliers will not need to install contact time infrastructure at their treatment plants.

			(including from source water rules monitoring) indicates that— (i) *E. coli* or total coliforms have been detected; or (ii) enteric viral indicators have been detected at a level that demonstrates that the health-outcome target of 1 enteric viral infection/10,000 people/year cannot be achieved; or (iii) the integrity of the groundwater has been compromised: (c) The assessment must— (i) determine the likely cause; and (ii) identify any actions that need to be taken to protect public health; and (iii) include an investigative sampling programme based on the sampling requirements in Class A (Interim) (a) for the determinand not met and any other determinands deemed appropriate. (iv) determine whether the source water still meets the criteria for Class A or reassessment is required to determine the appropriate source water class.	Due to the importance of this monitoring programme, we propose requiring an independent suitably qualified and experienced person to prepare the monitoring programme. See the **Discussion Document** for more information about the proposed Class A source water.		
N/A	N/A	Class A (Interim)	(2) If a drinking water supplier does not have the required monitoring data to demonstrate that source water is Class A, **Class A (Interim)** status can be applied to achieve Class A status by meeting the following requirements: (a) the drinking water supplier must demonstrate that, after 52 weeks,— (i) no *E. coli* or total coliforms have been detected after consecutive daily monitoring for 36 days, followed by weekly monitoring for the remainder of the 52 weeks; and (ii) an enteric viral indicator monitoring programme, including a written report prepared by an independent suitably qualified and experienced person, demonstrates that a health-outcome target of 1 enteric viral infection/10,000 people/year can be	The proposed Class A (Interim) is for source water that is likely to be Class A, but the supplier has not yet undertaken the monitoring to demonstrate that the source water meets the necessary criteria to be classified as Class A. Class A (interim) set outs the requirements a supplier must meet to apply Class A. These requirements are based on existing requirements for Interim Class 1 but have been expanded to also require a supplier to demonstrate that the groundwater is highly unlikely to be contaminated with viruses. Class A (interim) also sets out the assessment a supplier must undertake if any monitoring results indicates potential contamination or the groundwater source has been compromised. The timeframe of 24 months to establish Class A status comes from existing requirements for Interim Class 1.	Do you agree with the proposed criteria included in Class A (Interim) to establish Class A source water? Do you agree with the 24-month timeframe for establishing Class A source water?	The requirements for *E. coli* and total coliform monitoring are the same as existing requirements for Interim Class 1. There will be some one-off costs to meet the requirements of the proposed enteric viral indicator monitoring programme. We anticipate that a supplier would only use Class A (Interim) status if there was significant cost savings due to avoiding the cost of installing C.t infrastructure.

			achieved and maintained for the supply: (b) an assessment must be undertaken immediately if any monitoring result (including from source water rules monitoring) indicates that— (i) *E. coli* or total coliforms have been detected; or (ii) enteric viral indicators have been detected at a level that demonstrates that the health-outcome target of 1 enteric viral infection/10,000 people/year cannot be achieved; or (iii) the integrity of the groundwater has been compromised: (c) the assessment must— (i) determine the likely cause; and (ii) identify any actions that need to be taken to protect public health; and (iii) include an investigative sampling programme based on the sampling requirements in rule 8(1)(a) for the determinand not met and any other determinands deemed appropriate: (d) if Class A status cannot be established within 24 months of being classified as a Class A (Interim) source, the source water must be classified as Class B or Class C.	Representative sampling may be used to determine Class A and Class A (Interim) source water (see proposed section 7 and rule **S3.AB.2**.		
Class 1 – Protozoa barrier not required.	***Criteria*** Groundwater sources (bore water) that draw water from a depth of more than 30 metres below ground level (with depth measured from ground level to the top of the upper most screen) and via a sanitary bore head in which *E. coli* and total coliforms have not been detected over a period of three years (monthly samples with a maximum of 45 days between samples). If a groundwater source has demonstrated Class 1 status but any result for *E. coli* or total coliforms is positive, the	Class B	(3) **Class B** is groundwater abstracted from a depth of greater than 30 metres below ground level (with depth measured from ground level to the top of the upper most screen) and abstracted via a sanitary bore head that meets the following requirements: (a) the drinking water supplier must demonstrate that no *E. coli* or total coliforms has been detected from monitoring over the previous three years with 12 samples taken per year evenly spaced over the year: (b) an assessment must be undertaken immediately if any monitoring result	The proposed Class B is based on Class 1 source water in the existing Rules. It is for source waters where the risk of virus contamination has not been established. These source waters will not require a protozoa treatment barrier but will require a bacteria and virus treatment barrier. Chlorine will still be required to be added at the treatment plant for residual disinfection purposes. Class B also sets out the assessment a supplier must undertake if any monitoring results indicates potential contamination or the groundwater source has been compromised. Representative sampling may be used to determine Class B and Class B (Interim) source water (see proposed rule 7 and **S3.AB.2**).	Do you agree with the proposed criteria for demonstrating Class B source water?	The requirements for *E. coli* and total coliform monitoring are the same as existing Class 1 requirements.

	groundwater source must assume Interim Class 1 status.		(including from source water rules monitoring) indicates that— (i) *E. coli* or total coliforms have been detected; or (ii) the integrity of the groundwater has been compromised: (c) the assessment must— (i) determine the likely cause; and (ii) identify any actions that need to be taken to protect public health; and (iii) include an investigative sampling programme based on the sampling requirements in (a) for the determinand not met and any other determinands deemed appropriate; and (iv) determine whether the source water still meets the criteria for Class B or reassessment is required to determine the appropriate source water class.			
Interim Class 1	If a drinking water supplier intends to demonstrate Class 1 status for a groundwater source (bore water) but does not have the required *E. coli* or total coliforms data, they may demonstrate Interim Class 1 status by monitoring *E. coli* and total coliforms in bore water 30 daily for 36 days, and then weekly until 52 weeks of data has accrued with no *E. coli* or total coliforms detected. If any sample for *E. coli* or total coliforms is positive, the process must begin again until 52 weeks of data has accrued with negative results. If Class 1 category cannot be established within 24 months of beginning sampling, the water source must be classified as Class 2.	Class B (Interim)	(4) If a drinking water supplier does not have the required monitoring data to demonstrate Class B source water, **Class B (Interim)** status can be applied to achieve Class B status by meeting the following requirements: (a) the drinking water supplier must demonstrate that, after 52 weeks, no *E. coli* or total coliforms have been detected after consecutive daily monitoring for 36 days, followed by weekly monitoring for the remainder of the 52 week period: (b) an assessment must be undertaken immediately if any monitoring result (including from source water rules monitoring) indicates that— (i) *E. coli* or total coliforms have been detected; or (ii) the integrity of the groundwater has been compromised: (c) the assessment must— (i) determine the likely cause; and (ii) identify any actions that need to be taken to protect public health; and	The proposed Class B (interim) is for source water that is likely to be classified as Class B but the supplier has not yet undertaken the monitoring to demonstrate that the source water meets the criteria necessary for Class B. Class B (interim) sets out the requirements a supplier would need to meet to demonstrate Class B water if data has not already been collected. These requirements are based on existing requirements for Interim Class 1. It also sets out the assessment a supplier must undertake if any monitoring results indicates potential contamination or the groundwater source has been compromised. The timeframe of 24 months to establish Class B status comes from existing requirements for Interim Class 1. We are also proposing that an assessment must be undertaken immediately for Class A, Interim Class A, Class B and Interim Class B if any monitoring result (including from source water rules monitoring) indicates potential contamination of the groundwater source or the groundwater source has been compromised.	Do you agree with the proposed criteria included in Class B (Interim) for establishing Class B source water? Do you agree with the 24-month timeframe for establishing Class B status? Do you agree with the proposed assessments for Class A, Class A (Interim), Class B and Class B (Interim) source water if any monitoring result indicates potential contamination or the groundwater source has been compromised?	The requirements for *E. coli* and total coliform monitoring are the same as existing Interim Class 1 requirements.

			(iii) include an investigative sampling programme based on the sampling requirements in rule 8(3)(a) for the determinand not met and any other determinands deemed appropriate: (d) if Class B status cannot be established within 24 months of being classified as a Class B (Interim) source, the source water must be classified as Class C.			
Class 2 – Protozoa barrier – 3 log	***Criteria*** Groundwater sources that draw water from a depth of between 30 metres and 10 metres below ground level (with depth measured from ground level to the top of the upper most screen).	Class C	(5) **Class C** is— (a) groundwater abstracted from a depth of greater than 10m below ground level including groundwater abstracted from greater than 30m that is not class A or B (with depth measured from ground level to the top of the upper most screen); or (b) roof collected water; or (c) spring water that is not under the influence of surface water; or (d) Class D surface water, spring water or groundwater (abstracted from a depth of less than 10m) that has a low level of protozoa contamination risk based on an assessment carried out at least every five years and recorded in a written report set out in the source water risk management plan prepared by a suitably qualified and experienced person.	The proposed Class C covers groundwater that have a low level of protozoa contamination risk. Class C is based on Class 2 in the existing Rules but has been expanded to include groundwater abstracted from greater than 30 metres (if it is not classified as Class A or Class B source water), roof collected water, and spring water that is not under the influence of surface water. Class C also includes Class D source water that has been reclassified as Class C where an assessment has demonstrated a low risk of protozoa contamination risk. This assessment needs to be repeated at least every 5 years to account for potential changes in catchment risks and requires a written report from a suitably qualified and experienced person. Class C requires supplies to have a protozoa treatment barrier (3-log treatment) and bacteria and virus treatment barrier. Chlorine will need to be added at the treatment plant for residual disinfection purposes.	Do you agree with the criteria for Class C source water? Do you agree that an assessment to reclassify a Class D source water to Class C should only be undertaken by a suitably qualified and experienced person?	Class C closely matches the existing Class 4 but will have small costs for some suppliers with the change to requiring a suitably qualified and experienced person to undertake the assessment to reassign from Class D to Class C.
Class 4 – Protozoa Barrier – 3 log	***Criteria*** Drinking water supplies that require a minimum protozoa treatment barrier of 4-log may reduce the level of protozoa treatment to a minimum of 3-log if the source water risk management plan for the supply provides evidence that the source water has a low risk of protozoa contamination.					
Class 3 – Protozoa Barrier – 4 log	***Criteria*** Groundwater sources that draw water from a depth of less than 10 metres below ground level (with depth measured from ground level to the top of the upper most screen), groundwater sources that draw water from a depth of 10 or more metres below ground level without a sanitary bore head, spring water sources and surface water sources	Class D	(6) **Class D** is— (a) surface water that is not Class C; or (b) spring water that is not Class C; or (c) groundwater that is not Class A, Class A (Interim), Class B, Class B (Interim) or Class C.	The proposed class D is similar to the current Class 3 status. Class D is the default class for surface waters and spring or shallow groundwater (<10m) that is considered higher risk. Class D requires a protozoa treatment barrier (4-log treatment) and a bacteria and virus treatment barrier. Chlorine will need to be added at the treatment plant for residual disinfection purposes.	Do you agree with the criteria for Class D source water?	Class D closely matches the existing Class 3 but will have small costs for a few supplies that are no longer permitted to use representative sampling for this class of source water.

Representative sampling and sanitary boreheads

Existing rule number	Existing requirement	Proposed rule	Proposed requirement	Explanation	Cost implications
4.9.1 S3 Source Water Protozoa Log Credit Treatment Requirements **Class 1** **Footnote 29**	Samples can be from individual bores or water combined from up to six bores if the water is from the same aquifer and has similar characteristics.	**7 Representative sampling**	**9 Representative sampling** (1) For the purpose of the level 3 source water rules, **representative sampling** means the sampling of one bore that is representative of two or more bores that access the same aquifer. (2) Representative sampling must meet the following requirements— (a) the drinking water supplier can demonstrate that the bore that is sampled is representative of the bores that are not sampled; and (b) the representative nature of the sampled bore is re-established at least every five years or after significant seismic activity; and (c) the assessment and reassessments are undertaken by a suitably qualified and experienced person and recorded in writing.	The proposed definition of representative sampling consolidates information and footnotes on when representative sampling is allowed and is set out in rule 7. This definition is connected to rule **S3.AB.2** which sets out where representative sampling can be used if the sampling meets the requirements for representative sampling in rule 7. Representative sampling relates to sampling of multiple bores accessing the same aquifer. It is intended to reduce the sampling burden for suppliers, enabling them to consider a sample from one bore as representative of many if the sampled bore can be demonstrated to be representative of the unsampled bores. We also propose removing the existing limit of six bores as specific source water characteristics may allow representative sampling to include more than six bores. The Authority will have the power to audit supplier decisions about use of representative sampling.	There will be a small increase in costs for a fewsupplies that will no longer be able to use representative sampling for their class of source water
4.9.1 S3 Source Water Protozoa Log Credit Treatment Requirements **Interim Class 1** **Footnote 30**	Samples can be from individual bores or water combined from up to six bores if the water is from the same aquifer and has similar characteristics.				
Table 16. Source Water Monitoring Determinands **Footnote 34**	Where multiple bores access the same aquifer, one bore can be sampled to provide results that are representative of a number of bores if the water supplier can demonstrate that the bore that is sampled is representative of the bores that are not sampled. The representative nature of the sampled bore must be reestablished every five years or after significant seismic activity.				
Table 17. S3 Class 1, Class 2 and Class 3 Groundwater Source Monitoring Determinands **Footnote 37**	Where multiple bores access the same aquifer, one bore can be sampled to provide results that are representative of a number of bores if the water supplier can demonstrate that the bore that is sampled is representative of the bores that are not sampled.				

4.9.2 S3 Sanitary Bore Head Requirements	A bore head is considered a sanitary bore head if it meets all of the following criteria: 1. The bore head is installed above ground. 2. The bore is installed in an area of ground that is not below the surrounding ground level such that ponding could occur around the bore head during rainfall. 3. The annulus of the casing is sealed taking account of the formation that the bore has been installed in, to prevent the ingress of surface water via the outside of the casing and the bore is grouted below ground to an appropriate depth. 4. A concrete apron is installed around the bore head, extending a minimum of one metre in all directions from the casing and sloping away from the casing so that any water on the ground surface is carried away from the bore. 5. All apertures into the bore (for cables etc) are sealed and watertight to prevent access from water and vermin-proofed to prevent access by small animals etc. 6. All air vents and any other apertures that are not watertight must be screened to prevent access by small animals, face downwards, and be elevated at least 0.5 metres above the surrounding ground level. 7. Reasonable security measures are in place to protect the bore head from unauthorised access or interference. 8. If the bore head is in an area where farm animals are present, it must be fenced to exclude those animals from an area extending at least five metres in all directions from the bore head. 9. A mechanism prevents backflow at the bore head. 10. The bore head is inspected monthly for damage or defects and records kept of all inspections for at least five years.		**10 Requirements for a sanitary bore head** A bore head is a sanitary bore head for the purpose of Level 3 Rules Modules if all the following criteria are met: (a) the bore head is installed above ground: (b) the bore is installed in an area of ground that is not below the surrounding ground level such that ponding could occur around the bore head during rainfall: (c) the annulus of the casing is sealed, taking into account the formation that the bore has been installed in, to prevent the ingress of surface water via the outside of the casing and the bore is grouted below ground to an appropriate depth: (d) a concrete apron is installed around the bore head, extending a satisfactory distance in all directions from the casing and sloping away from the casing so that any water on the ground surface is carried away from the bore: (e) all openings into the bore (for cables etc) are sealed and watertight to prevent access from water and vermin-proofed to prevent access by small animals etc: (f) all air vents and any other openings that are not watertight must be screened to prevent access by small animals, face downwards, and be elevated at least 0.5 metres above the surrounding ground level: (g) reasonable security measures are in place to protect the bore head from unauthorised access or interference: (h) if the bore head is in an area where livestock are present, it must be fenced to exclude those animals from an area extending at least five metres from the bore head: (i) a mechanism prevents backflow at the bore head: (j) the bore head is inspected monthly for damage or defects and records kept of all inspections for at least five years.	This proposed change simplifies the formatting and wording of this rule. Sanitary bore head requirements are set out in Rule 9.	N/A