TO: Joint Committee on Drinking Water Treatment Units

FROM: Dr. Robert Powitz, Chair of the Joint Committee

DATE: February 12, 2024

SUBJECT: Proposed revisions to:
NSF/ANSI 42: *Drinking Water Treatment Units – Aesthetic Effects* (42i134r1)
NSF/ANSI 44: *Residential Cation Exchange Water Softeners* (44i56r1)
NSF/ANSI 53: *Drinking Water Treatment Units – Health Effects* (53i145r1)
NSF/ANSI 55: *Ultraviolet Microbiological Water Treatment Systems* (55i67r1)
NSF/ANSI 58: *Reverse Osmosis Drinking Water Treatment Systems* (58i99r1)
NSF/ANSI 62: *Drinking Water Distillation Systems* (62i49r1)
NSF/ANSI 244: *Supplemental Microbiological Water Treatment Systems – Filtration* (244i24)
NSF/ANSI 401: *Drinking Water Treatment Units – Emerging Compounds / Incidental Contaminants* (401i38r1)

Revision 1 of NSF/ANSI 42 issue 134, NSF/ANSI 44 issue 56, NSF/ANSI 53 issue 145, NSF/ANSI 55 issue 67, NSF/ANSI 58 issue 99, NSF/ANSI 62 issue 49, NSF/ANSI 244 issue 24, and NSF/ANSI 401 issue 38 is being forwarded to the Joint Committee for consideration. Please review the proposal and **submit your ballot by March 4, 2024** via the NSF Online Workspace <www.standards.nsf.org>.

Please review all ballot materials. When adding comments, please include the section number applicable to your comment and add all comments under one comment number whenever possible. If you need additional space, please use the attached blank comment template in the reference documents and upload online via the browse function.

Purpose

The proposed revisions update the values for maximum reporting limits and maximum effluent concentrations for ethylbenzene, toluene, and xylenes.

Background

At the 2019 DWTU Joint Committee annual meeting, it was agreed that the materials evaluation pass/fail criteria under NSF/ANSI/CAN 600 should be reviewed to determine if there are any contaminants with maximum contaminant levels (MCLs) / maximum acceptable concentration (MAC) levels lower than the current DWTU reduction claim pass/fail levels.

An issue paper (DWTU-2021-8) reported that upon review, six compounds were found to have reduction claims higher than the MCL/MAC. The issue paper requested feedback from the DWTU Joint Committee on whether the DWTU standards should be revised to meet the current MCL/MAC limits in NSF/ANSI/CAN 600 and if additional review should be conducted to determine potential impact on certified products.

A task group was formed, and the members determined that three of the six substances were outside the scope of the group. The three remaining substances (ethylbenzene, toluene, and xylenes) were deemed in scope and their respective maximum reporting limits and maximum effluent concentrations were discussed and updated.

The maximum reporting limits have been adjusted to reflect an order of magnitude lower than the updated Health Canada criteria for these analytes. Note that these are the analytical reporting limits for the analytes, not the evaluation criteria. All labs should be able to meet these requirements, which equate to 14, 6, and 9 µg/L, respectively, for ethylbenzene, toluene, and xylenes.

The maximum effluent concentrations for ethylbenzene, toluene, and xylenes have been updated to reflect the Health Canada levels published in NSF/ANSI/CAN 600. The maximum effluent concentration is equivalent to the Health Canada MAC.

Please refer to the issue paper (DWTU-2021-8) and the task group chair report under Referenced Items for additional background information.

If you have any questions about the technical content of the ballot, you may contact me in care of:

Dr. Robert Powitz
Chair, Joint Committee on Drinking Water Treatment Units
c/o Monica Milla
NSF Joint Committee Secretariat
(734) 214-6223
mmilla@nsf.org

[Note – The recommended changes to the standard which include the current text of the relevant section(s) indicate deletions by use of ~~strikeout~~ and additions by gray highlighting. Rationale statements are in *italics* and only used to add clarity; these statements will NOT be in the finished publication.]

NSF/ANSI 42:

Drinking Water Treatment Units — Aesthetic Effects

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4 Materials

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Table 4.3
Extraction testing parameters (volatiles)

Analyte	CAS number	Maximum reporting limit (RL) (mg/L)	U.S. EPA Method(s)
⋮			
ethylbenzene	100-41-4	~~0.07~~ 0.014	524.2, 524.3
⋮			
toluene	108-88-3	~~0.1~~ 0.006	524.2, 524.3
xylenes (total) o-xylene ~~or 1,2-xylene~~ p-xylene m-xylene	 95-47-6 106-42-3 108-38-3	~~0.1~~ 0.009	524.2, 524.3
⋮			

⋮

<u>Rationale</u>: The maximum reporting limits have been adjusted to reflect an order of magnitude lower than the updated Health Canada criteria for these analytes. Note that these are the analytical reporting limits for the analytes, not the evaluation criteria. All labs should be able to meet these requirements, which equate to 14, 6, and 9 µg/L.

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NSF/ANSI 44:

Residential Cation Exchange Water Softeners

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4 Materials

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Table 4.3
Extraction testing parameters (volatiles)

Analyte	CAS number	Maximum reporting limit (RL) (mg/L)	U.S. EPA Method(s)
⋮			
ethylbenzene	100-41-4	~~0.07~~ 0.014	524.2, 524.3
⋮			
toluene	108-88-3	~~0.1~~ 0.006	524.2, 524.3
xylenes (total) o-xylene~~ or 1,2-xylene,~~ ~~m~~p-xylene~~,~~ ~~p~~m-xylene	95-47-6 106-42-3 108-38-3	~~0.1~~ 0.009	524.2, 524.3
⋮			

⋮

***Rationale*: The maximum reporting limits have been adjusted to reflect an order of magnitude lower than the updated Health Canada criteria for these analytes. Note that these are the analytical reporting limits for the analytes, not the evaluation criteria. All labs should be able to meet these requirements, which equate to 14, 6, and 9 µg/L.**

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NSF/ANSI 53:

Drinking Water Treatment Units — Health Effects

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4 Materials

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Table 4.3
Extraction testing parameters (volatiles)

Analyte	CAS number	Maximum reporting limit (RL) (mg/L)	U.S. EPA Method(s)
⋮			
ethylbenzene	100-41-4	~~0.07~~ 0.014	524.2, 524.3
⋮			
toluene	108-88-3	~~0.1~~ 0.006	524.2, 524.3
xylenes (total) o-xylene ~~or 1,2-xylene~~ p-xylene m-xylene	 95-47-6 106-42-3 108-38-3	~~0.1~~ 0.009	524.2, 524.3
⋮			

⋮

<u>Rationale</u>: The maximum reporting limits have been adjusted to reflect an order of magnitude lower than the updated Health Canada criteria for these analytes. Note that these are the analytical reporting limits for the analytes, not the evaluation criteria. All labs should be able to meet these requirements, which equate to 14, 6, and 9 µg/L.

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7 Elective performance claims – Test methods

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7.2 Chemical reduction claims

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Table 7.1
Chemical reduction requirements

Substance	Individual influent sample point limits[a] (mg/L)	Average influent challenge[b] (mg/L)	Maximum effluent concentration (mg/L)	U.S. EPA Method(s)[c,d]
⋮				
ethylbenzene	2.1 ± 30%	2.1 ± 10%	~~0.7~~ 0.14	502.2, 524.2, 524.3
⋮				
toluene	3.0 ± 30%	3.0 ± 10%	~~1~~ 0.06	502.2, 524.2, 524.3
⋮				
xylenes (includes): o-xylene p-xylene m-xylene	30 ± 30%	30 ± 10%	~~10~~ 0.09 (total)	502.2, 524.2, 524.3
⋮				

⋮

***Rationale*: The evaluation criteria for these substances have been updated to reflect the Health Canada levels published in NSF/ANSI/CAN 600. The maximum effluent concentration is equivalent to the Health Canada MAC.**

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7.2.5 Volatile organic chemical (VOC) reduction – Surrogate organic chemical testing

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Table 7.6
Organic chemicals included by surrogate testing

Chemical	Drinking water regulatory level[a] (MCL/MAC) (mg/L)	Influent challenge concentration[b] (mg/L)	Chemical reduction percent	Maximum product water concentration (mg/L)
⋮				
ethylbenzene	~~0.7~~ 0.14	0.088	> 99	0.001[c]
⋮				
toluene	~~1~~ 0.06	0.078	> 99	0.001[c]
⋮				
xylenes(includes): o-xylene p-xylene m-xylene	~~10~~ 0.09 (total)	0.070	> 99	0.001[c]
⋮				

⋮

<u>Rationale</u>: The evaluation criteria for these substances have been updated to reflect the Health Canada levels published in NSF/ANSI/CAN 600. The drinking water regulatory level is the Health Canada MAC.

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8 Instruction and information

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8.4 Performance data sheet

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Table 8.1
Performance data sheet reduction claims

Substance	Influent challenge concentration (mg/L)	Maximum permissible product water concentration (mg/L)
⋮		
ethylbenzene	2.1 ± 10%	~~0.7~~ 0.14
⋮		
toluene	3.0 ± 10%	~~1~~0.06
⋮		
xylenes (includes): o-xylene p-xylene m-xylene	30 ± 10%	~~10.0~~ 0.09 (total)
⋮		

⋮

<u>Rationale</u>: The evaluation criteria for these substances have been updated to reflect the Health Canada levels published in NSF/ANSI/CAN 600. The maximum permissible product water concentration is equivalent to the Health Canada MAC.

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NSF/ANSI 55:

Ultraviolet Microbiological Water Treatment Systems

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4 Materials

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Table 4.3
Extraction testing parameters (volatiles)

Analyte	CAS number	Maximum reporting limit (RL) (mg/L)	U.S. EPA Method(s)
⋮			
ethylbenzene	100-41-4	~~0.07~~ 0.014	524.2, 524.3
⋮			
toluene	108-88-3	~~0.1~~ 0.006	524.2, 524.3
xylenes (total) o-xylene~~ or 1,2-xylene,~~ ~~m~~p-xylene~~,~~ ~~p~~m-xylene	 95-47-6 106-42-3 108-38-3	~~0.1~~ 0.009	524.2, 524.3
⋮			

⋮

<u>Rationale</u>: The maximum reporting limits have been adjusted to reflect an order of magnitude lower than the updated Health Canada criteria for these analytes. Note that these are the analytical reporting limits for the analytes, not the evaluation criteria. All labs should be able to meet these requirements, which equate to 14, 6, and 9 µg/L.

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NSF/ANSI 58:

Reverse Osmosis Drinking Water Treatment Systems

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4 Materials

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Table 4.3
Extraction testing parameters (volatiles)

Analyte	CAS number	Maximum reporting limit (RL) (mg/L)	U.S. EPA Method(s)
⋮			
ethylbenzene	100-41-4	~~0.07~~ 0.014	524.2, 524.3
⋮			
toluene	108-88-3	~~0.1~~ 0.006	524.2, 524.3
xylenes (total) o-xylene ~~or 1,2-xylene~~ p-xylene m-xylene	 95-47-6 106-42-3 108-38-3	~~0.1~~ 0.009	524.2, 524.3
⋮			

⋮

<u>Rationale</u>: The maximum reporting limits have been adjusted to reflect an order of magnitude lower than the updated Health Canada criteria for these analytes. Note that these are the analytical reporting limits for the analytes, not the evaluation criteria. All labs should be able to meet these requirements, which equate to 14, 6, and 9 µg/L.

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7 Elective performance claims – Test methods

7.1 Chemical reduction claims

7.1.1 Volatile organic chemical (VOC) reduction claims

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Table 7.1
Organic chemicals included by surrogate testing

Chemical	U.S. EPA MCL (mg/L) (ppm)	Influent challenge concentration [a] (mg/L) (ppm)	Chemical reduction percent	Maximum product water concentration (mg/L)
⋮				
ethylbenzene	~~0.7~~ 0.14	0.088	> 99	0.001 [b]
⋮				
toluene	~~1.0~~ 0.06	0.078	> 99	0.001 [b]
⋮				
xylenes ~~(total)~~ (includes): o-xylene p-xylene m-xylene	~~10~~ 0.09 (total)	0.070	> 99	0.001 [b]
⋮				

⋮

<u>Rationale</u>: The evaluation criteria for these substances have been updated to reflect the Health Canada levels published in NSF/ANSI/CAN 600. The U.S. EPA MCL is equivalent to the Health Canada MAC.

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NSF/ANSI 62:

Drinking Water Distillation Systems

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4 Materials

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Table 4.3
Extraction testing parameters (volatiles)

Analyte	CAS number	Maximum reporting limit (RL) (mg/L)	U.S. EPA Method(s)
⋮			
ethylbenzene	100-41-4	~~0.07~~ 0.014	524.2, 524.3
⋮			
toluene	108-88-3	~~0.1~~ 0.006	524.2, 524.3
xylenes (total) o-xylene ~~or 1,2-xylene,~~ ~~m~~p-xylene~~,~~ ~~p~~m-xylene	 95-47-6 106-42-3 108-38-3	~~0.1~~ 0.009	524.2, 524.3
⋮			

⋮

***Rationale*: The maximum reporting limits have been adjusted to reflect an order of magnitude lower than the updated Health Canada criteria for these analytes. Note that these are the analytical reporting limits for the analytes, not the evaluation criteria. All labs should be able to meet these requirements, which equate to 14, 6, and 9 µg/L.**

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NSF/ANSI 244:

Supplemental Microbiological Water Treatment Systems – Filtration

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4 Materials

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Table 4.3
Extraction testing parameters (volatiles)

Analyte	CAS number	Maximum reporting limit (RL) (mg/L)	U.S. EPA Method(s)
⋮			
ethylbenzene	100-41-4	~~0.07~~ 0.014	524.2, 524.3
⋮			
toluene	108-88-3	~~0.1~~ 0.006	524.2, 524.3
xylenes (total) o-xylene~~ or 1,2-xylene,~~ ~~m~~p-xylene~~,~~ ~~p~~m-xylene	 95-47-6 106-42-3 108-38-3	~~0.1~~ 0.009	524.2, 524.3
⋮			

⋮

<u>Rationale</u>: The maximum reporting limits have been adjusted to reflect an order of magnitude lower than the updated Health Canada criteria for these analytes. Note that these are the analytical reporting limits for the analytes, not the evaluation criteria. All labs should be able to meet these requirements, which equate to 14, 6, and 9 µg/L.

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NSF/ANSI 401:

Drinking Water Treatment Units - Emerging Compounds / Incidental Contaminants

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4 Materials

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Table 4.3
Extraction testing parameters (volatiles)

Analyte	CAS number	Maximum reporting limit (RL) (mg/L)	U.S. EPA Method(s)
⋮			
ethylbenzene	100-41-4	~~0.07~~ 0.014	524.2, 524.3
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toluene	108-88-3	~~0.1~~ 0.006	524.2, 524.3
xylenes (total) o-xylene~~ or 1,2-xylene,~~ ~~m~~p-xylene~~,~~ ~~p~~m-xylene	 95-47-6 106-42-3 108-38-3	~~0.1~~ 0.009	524.2, 524.3
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<u>Rationale</u>: The maximum reporting limits have been adjusted to reflect an order of magnitude lower than the updated Health Canada criteria for these analytes. Note that these are the analytical reporting limits for the analytes, not the evaluation criteria. All labs should be able to meet these requirements, which equate to 14, 6, and 9 µg/L.

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