

European Commission Proposal for a Revised Drinking Water Directive:

Recommendations of Chemical Sub-Committee

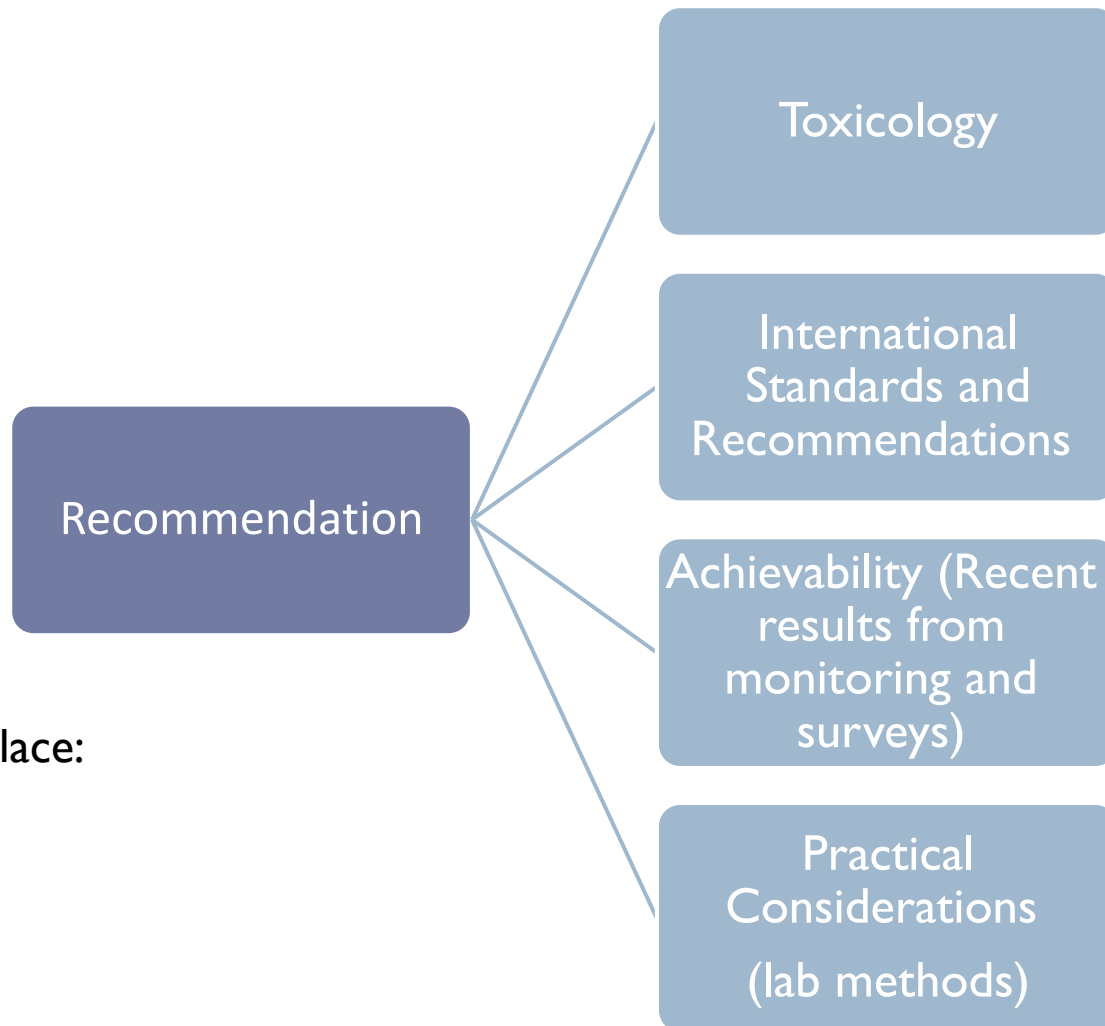
Drinking Water Advisory Committee
4/11/19

Overview of WHO Europe Recommendations on Chemical Parameters and EU Response

WHO: No change EU: Reduce	Lead	Uranium	New parameters
	Chromium (total)	Haloacetic acids (HAAs)	
WHO: Remove parameter EU: no change	Benzene	Bisphenol A	
	Cyanide	Microcystin-LR	
	1,2-Dichloroethane	Chlorite and chlorate	
	Mercury	Nonylphenol	
WHO: Increase EU: No change	Polycyclic aromatic hydrocarbons	Per- and polyfluoroalkyl substance	
	Boron	Beta-estradiol	
	Antimony		
	Selenium		



Chemical Sub – Committee: Considerations



Meetings took place:

Dec 2018

January 2019

April 2019

July 2019



Summary of European Commission Proposal and Chemical Sub-Committee Recommendations

	European Commission Proposal	Chemical sub-committee proposal
Lead	Reduce	Reduce
Chromium (total)	Reduce	No change (based on WHO)
Benzene	No change	No change
Cyanide	No change	No change
1,2-Dichloroethane	No change	No change
Mercury	No change	No change
Polycyclic aromatic hydrocarbons	No change	No change
Boron	No change	No change
Antimony	No change	No change
Selenium	No change	Increase (based on WHO)
Uranium	New parameter	
Haloacetic acids (HAAs)	New parameter	Pilot Survey
Chlorite and chlorate	New parameter	Update values
Bisphenol A	New parameter	No change
Nonylphenol	New parameter	No change
Per- and polyfluoroalkyl substance	New parameter	Pilot Survey
Beta-estradiol	New parameter	No change
Microcystin-LR	New parameter	No change (exists in standards)

Lead in Drinking Water

WHO Europe	EU Proposal	Chemical Sub-Committee
Maintain current value of 10 µg/l	Reduce value to 5 µg/l 10 years after the entry into force of the Directive	Reduce value to 5 µg/l 1 year after change to Standard 5452 requiring 0.25% lead content



Feasibility –

	Not Detected	Less than 2 – µg/L	Between 2 – 5 µg/L	Between 5 – 10 µg/L	Above Standard
Water Source (2009-2018)	97.3 %	2.3%	0.4%	0.1%	0
Public Supply System (2009-2018) *	93.7%	2.0%	2.9%	1.0%	0.4%
Educational Institutions (2018)	93%	5%		2.0%	0.4%

* ~ for 150 communities, no results between 2013 – 2018



Potential Problems in Implementation

- Based on results from Standards Institution (2018): there are many tested products with lead leaching above 5 $\mu\text{g}/\text{l}$



ריכוז עופרת (ppb)	מוצר
5.6	ברז
6.9	מערכת סינון
9.1	מערכת סינון
8.1	שסתום כדורי
7.1	צנרת מתכתית
8.4	צנרת ואביזרים
9.5	מערכת צנרת פלסטית
7.7	ברז
6.9	אביזר עכביש
5.1	פורק לחץ
9.2	התקן למערכת מים



Potential Problems in Implementation

- Standard 5452 requiring 0.25% lead in products in contact in drinking water: enters into force for metal products in March 2020
- This new requirement doesn't apply to existing buildings, problems with oversight
- Sub committee recommended to reduce standard to 5 $\mu\text{g}/\text{l}$ **only after** new 5452 requirement comes into force
- 5 $\mu\text{g}/\text{l}$ is strict compared to EPA (15 $\mu\text{g}/\text{l}$) and current EU (10 $\mu\text{g}/\text{l}$), combined with strict approach to products in contact with water (0.25%, not implemented in the EU)



Chromium in Drinking Water

WHO Europe	EU Proposal	Chemical Sub-Committee
Maintain current value of 50 µg/l	Reduce the value by 50 % to 25 µg/l 10 years after the entry into force of the Directive	Maintain current value of 50 µg/l



Feasibility

	Not Detected	Less than 5	Between 5 -25 µg/L	Between 25 –50 µg/L	Above Standard
Water Source (2009-2018)	54.9%	28.1%	16.7%	0.1%	0.2%
Public Supply System (2009-2018) *	94.3%	3.4%	2.3%	0	0



Basis for Recommendation: Toxicology

- ▶ Chromium VI is carcinogenic to humans by inhalation
- ▶ Epidemiologic evidence of cancer, elevated oxidative stress, DNA damage in people exposed to Cr(VI) in drinking water

	Value
Health Canada, 2016	50 µg/liter
EU, 2017	25 µg/L in 10 yrs
WHO Europe, 2017	Under review by WHO 50 µg/L
WHO, 2019	50 µg/L
EPA, 1991	100 µg/l (raised from 50 µg/l in 1991)
State Of California	50 µg/L (total)



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	Mercury
	Polycyclic aromatic hydrocarbons
WHO: Increase EU: No change	Boron
	Antimony
	Selenium



Benzene



	Israel µg/L	EU current µg/L	EPA Standard µg/L	EU Compliance Rate 2011-2013	Basis for Standard (According to EPA and WHO Europe)
Benzene	5	1.0	5	99.9%	Anemia; decrease in blood platelets; increased risk of cancer Based on cancer risk extrapolation (Group 1 carcinogen)

Results in Israel: Detected in 5 / 1136 sources, mostly near Gas Stations (0.2-0.3 µg/L)

Sub – committee recommendation:

Not to remove from standards, required testing only 1 per 5 years (תדירות ניטור א')

There is potential contamination from Gas Stations



Mercury

	Israel µg/L	EU current µg/L	EPA Standard µg/L	EU Compliance Rate 2011-2013	Basis for Standard (According to EPA and WHO Europe)
Mercury	1.0	1.0	2.0	99.98	Kidney damage Updated guideline value by WHO guideline value for inorganic mercury of 6 µg/L

Results in Israel: Detected in 22/ 1072 sources (0.1 – 0.4 µg/L)

Sub – committee recommendation:

Leave as תדירות ניטור ה'



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	Mercury
	Polycyclic aromatic hydrocarbons
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	Selenium



Boron



WHO Europe	EU Proposal	Chemical Sub-Committee
Increase from 1 to 2.4 mg/l	No Change	Not relevant since maximum concentration of boron in desalinated water based on agricultural consideration

Rationale:

- WHO Europe: current standard is excessively precautionary, a barrier that impacts on introduction....of desalination in Member States
- Adverse effects on reproduction in animal studies at very high doses
- EPA Long Term Health Advisory for children is 2.0 mg/L

Antimony

WHO Europe	EU Proposal	Chemical Sub-Committee
Increase from 5 to 20 µg/l	No change	No change
Rationale: Measured levels in groundwater are low (up to 1/3 of the current standard)		



Selenium

WHO Europe	EU Proposal	Chemical Sub-Committee
Increase from 10 to 40 µg/l	No Change	Increase from 10 to 40 µg/l

Rationale:

- Essential element for humans.
- Food is principle source of exposure to selenium for the general population.
- Concern is low selenium intake.
- 40 µg/L based on an allocation of 20% of the upper tolerable intake (400 µg/day).
- Increasing standard may enable use of additional drinking water sources (**28 water sources in 2018 with selenium concentrations above current standard**)



Uranium

WHO Europe	EU Proposal	Chemical Sub-Committee
New (30 µg/l)	New (30 µg/l)	

- Committee has not developed recommendation
 - Important to evaluate impact on total radioactivity standard
 - Need to evaluate toxicological evidence



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	Antimony		
	Selenium		



Haloacetic Acids

WHO Europe	EU Proposal	Chemical Sub-Committee
80 µg/L sum of nine representative haloacetic acids	80 µg/L sum of nine representative haloacetic acids	Conduct pilot survey
<ul style="list-style-type: none">• Insufficient data on HAAs in surface water in Israel• Sufficient evidence of carcinogenicity for several haloacetic acids (dichloroacetic acid (DCA), dibromoacetic acid (DBA), bromochloroacetic acid (BCA), and bromodichloroacetic acid (BDCA))• Regulated by US EPA, Health Canada, EU (impending)		



Chlorite and Chlorate

WHO Europe	EU Proposal	Chemical Sub-Committee
0.7 mg/L chlorite 0.7 mg/L chlorate	0.25 mg/L chlorite 0.25 mg/L chlorate	Change from total of 1 mg/L to 0.7 mg/L chlorite 0.7 mg/L chlorate

Rationale:

- Concern that reduction in standard will result in increased use of chlorine and increase exposure to chlorine by products (trihalomethanes)
- Data from MEKOROT show that a standard of 0.25 mg/L or 0.3 mg/L for chlorate is not feasible

Bisphenol A



WHO Europe	EU Proposal	Chemical Sub-Committee
0.1 µg/L	0.1 µg/L	No standard
Rationale: <ul style="list-style-type: none">• Water is very minor source of exposure bisphenol A (relative to diet and other sources)• Surface water potentially impacted by sewage discharge is not main source of drinking water• Few international and US state recommendations for standard• WHO Europe recommendation is not risk based		



Beta-estradiol

WHO Europe	EU Proposal	Chemical Sub-Committee
0.001 µg/L	0.001 µg/L	No standard
<p>Rationale:</p> <ul style="list-style-type: none">• Surface water potentially impacted by sewage discharge is not main source of drinking water• Few international and US state recommendations for standard• WHO Europe recommendation is not risk based		



Nonylphenol

WHO Europe	EU Proposal	Chemical Sub-Committee
0.3 µg/L	0.3 µg/L	No standard
<p>Rationale:</p> <ul style="list-style-type: none">• Surface water potentially impacted by sewage discharge is not main source of drinking water• Few international and US state recommendations for standard• WHO Europe recommendation is not risk based		



Per- and polyfluoroalkyl substance



WHO Europe	EU Proposal	Chemical Sub-Committee
perfluorooctanesulfonic acid (PFOS) = 0.4 µg/l perfluorooctanoic acid (PFOA) = 4 µg/l	0.1 µg/l for individual PFAS and 0.5 µg/l for PFASs in total	Conduct pilot survey
<p>Rationale:</p> <ul style="list-style-type: none">• Found in drinking water in many countries• Water can be important source of exposure• Epidemiological evidence showing adverse health effects from drinking water exposure• Israel has many military bases with potential use• Many international and US state recommendations for maximum level in drinking water• MOH laboratories do not currently analyze these contaminants		

Summary of Recommended Changes to Israel Drinking Water Standards

Chemical	Chemical sub-committee proposal
Lead	Reduce value to 5 µg/L (March 2021?)
Selenium	Increase value
Chlorite and chlorate	Update values
Haloacetic acids (HAAs)	Pilot Survey
Per- and polyfluoroalkyl substance	Pilot Survey

