From: **Joe Thorley** joe@poissonconsulting.ca
Subject: Fwd: Guideline updates
Date: January 13, 2015 at 13:12
To:

Here are the updates for the guidelines:

A) Missing:

1) Cadmium:

Guideline Type/Equation	British Columbia WQG (µg/L Cd) for Dissolved Cadmium at Varying Water Hardness				
	Lower Bound[A]	50 mg/L $CaCO_3$	180 mg/L $CaCO_3$	320 mg/L $CaCO_3$	Upper Bound[B,C]
Short-Term Maximum WQG					
$WQG_{Short\text{-}term} = e^{[1.03 * \ln(Hss) - 5.274]}$	0.0380	0.288	1.08	1.95	2.80
Long-Term Average WQG					
$WQG_{Long\text{-}term} = e^{[0.736 * \ln(Hss) - 4.943]}$	0.0176	0.127	0.326	0.457[3]	0.457

[A] The lower bound for the short-term maximum guideline is 7 mg/L $CaCO_3$; the lower bound for the long-term average guideline is 3.4 mg/L $CaCO_3$.

[B] The upper bound for the short-term maximum guideline is 455 mg/L $CaCO_3$; the upper bound for the long-term average guideline is 285 mg/L $CaCO_3$.

[C] When water hardness is greater than the upper bound (i.e., highest water hardness tested), a site-specific assessment may be required.

2) 17α-ethinylestradiol (EE2):

30-day average: 0.5 ng/L
Maximum: 0.75 ng/L

3) Iron:

Maximum: 1 mg/L total iron
0.35 mg/L dissolved iron

B) Updated:

1) Fluoride:

Marine
Maximum: total fluoride concentration of marine waters should not exceed 1.5 mg/L (Anon, 1973; and Anon, 1968).

Freshwater
Maximum: The total fluoride concentration of fresh waters should not exceed 0.4 mg/L when hardness is 10 mg/L otherwise use the equation: LC_{50}fluoride = -51.73 + 92.57 Log_{10} (Hardness) and multiply by 0.01 (Angelovic *et al.*, 1961b; Anon, 1973; and Pimental and Bulkley, 1983a) for other hardness levels.

2) Microbiological (for now use only the recreational microbiological guidelines below)

i) Recreational water quality in freshwater:

≤200 *E. coli* /100 mL (geometric mean of a minimum of 5 samples); ≤400 *E. coli* /100 mL (single sample maximum concentration).

Calculation of the geometric mean concentration should be based on a minimum of five samples, collected at times and sites so as to provide representative information on the water quality likely to be encountered by users. Further action should be initiated if either of these guideline values is exceeded. Minimum action should consist of immediate resampling of the site(s). In addition, a swimming advisory may be issued should the responsible authority identify that the area is not suitable for recreational water use.

ii) Recreational water quality in marine water:

For marine recreational waters used for primary contact activities, the guideline values are as follows:

- Geometric mean concentration (minimum of five samples): ≤ 35 *enterococci*/100 mL
- Single-sample maximum concentration: ≤ 70 enterococci/100 mL

Calculation of the geometric mean concentration should be based on a minimum of five samples, collected at appropriate times and sites to provide representative information on the water quality likely to be encountered by users. Further action should be initiated if either of these guideline values is exceeded. Minimum action should consist of immediate resampling of the site (or sites). In addition, a swimming advisory may be issued should the responsible authority identify that the area is not suitable for recreational water use.

3) Nitrate

Freshwater:
30-day average: 3 mg/L
Maximum: 32.8

Marine:
30-day average: 3.7 mg/L

4) Selenium

Se-T	Drinking Water	Static	Water Column	Maximum	1 sample at any time	0.01	mg/L
Se-T	Aquatic Life	Static	Water Column	Average	5 samples in 30 days	0.002	mg/L
Se-T	Irrigation	Static	Water Column	Maximum	1 sample at any time	0.01	mg/L
Se-T	Wildlife	Static	Water Column	Average	5 samples in 30 days	0.02	mg/L

5) Sulphate

The approved 30-day average (minimum of 5 evenly-spaced samples collected in 30 days) water quality guidelines to protect aquatic life in BC for sulphate are:

Water hardness* (mg/L)	Sulphate guideline (mg/L)
Very Soft (0-30)	128
Soft to moderately soft (31-75)	218
Moderately soft/hard to hard (76-180)	309
Very hard (181-250)	429
>250	Need to determine based on site water**

Water hardness categories adapted from the CCME.

** Toxicity tests on the early stage rainbow trout were only conducted up to a water hardness of 250 mg/L. Natural background concentrations of water hardness in BC are generally much lower than 250 mg/L. It is recommended that additional toxicity testing on several species is required if natural background water hardness is greater than 250 mg/L. Organisms exposed to higher concentrations of water hardness in combination with sulphate may experience

ısmotic stress.