

Subgroup #2

Default Standard

Development

Contaminated Sediments External Advisory Group

August 23, 2016

Sideboards

- CSEAG charter is to develop recommendations, not rules
- Act 21
- Legally defensible recommendations

Topics of Discussion

- Consensus Based Sediment Quality Guidelines (CBSQG)
- Water quality basis for default values?
- Specific Considerations:
 - Screening Level vs. Cleanup Goal
 - Background Classification – Urban vs. Rural
 - Detection Limits > Standards
 - What is clean?
- Next Steps

Consensus Based Sediment Quality Guidelines (CBSQG)



Consensus-Based Sediment Quality Guidelines

Recommendations for Use & Application

Interim Guidance

Developed by the
Contaminated Sediment Standing Team

December 2003

WT-732 2003



Water Quality Basis for Default Numbers

- NR 102 – Water Quality Standards for Wisconsin Surface Waters
- NR 103 – Water Quality Standards for Wetlands
- NR 104 – Uses and Designated Standards
- NR 105 – Surface Water Quality Criteria and Secondary Values for Toxic Substances
- NR 106 – Procedures for Calculating Water Quality Based Effluent Limitations for Point Source Discharges to Surface Waters

Contaminant Values Comparison Table

Metals

Constituent	CBSQGs for Sediment		Soil Values From DNR RSL Spreadsheet			EPA Region 5 Ecological Screening Levels		Washington State Standards	
	TEC (mg/kg dry wt)	PEC (mg/kg dry wt)	Non-industrial (mg/kg)	Industrial (mg/kg)	Groundwater Pathway (mg/kg)	R5 Sediment ESL (mg/kg)	R5 Soil ESL (mg/kg)	SCO (mg/kg)	CLS (mg/kg)
Antimony	2	25	31.3	409	0.542		0.142		
Arsenic	9.8	3	0.613	2.39	0.584	9.79	5.7	14	120
Cadmium	0.99	5	70	799	0.752	0.99	0.00222	2.1	5.4
Chromium	43	110				43.4	0.4	72	88
Copper	32	150	3,130	40,900	91.6	31.6	5.4	400	1,200
Iron	20,000	40,000	54,800	100,000					
Lead	36	130	400	800	27	35.8	0.0537	360	> 1,400
Manganese	460	1,100	1,830	22,900	39.1244				
Mercury	0.18	1.1	3.13	3.13	0.208	0.174	0.1	0.66	0.8
Nickel	23	49		19,800	13.0612	22.7	13.6	26	110
Silver	1.6	2.2	391	5,110	0.8491	0.5	4.04	0.57	1
Zinc	120	460	23,500	100,000		121	6.62	3,200	> 4,200

Green shaded areas are the most protective concentrations

NOTE: The Region 5 Ecological screening levels are one of several tools available through the Risk Assessment Information System (RAIS) housed by the University of Tennessee. The tool can be found at: https://rais.ornl.gov/tools/eco_search.php

Washington State Freshwater Clean Up Objectives Definitions:

Sediment Cleanup Objective (SCO). The sediment cleanup objective defines the goal for protection of human health and environment. This goal is expected to be achieved through a combination of cleanup actions and source control. The sediment cleanup objective is established in accordance with the requirements in WAC 173-204-506(e). If a risk-based concentration is below the natural background level or practical quantitation limit, then the sediment cleanup objective is established at a concentration equal to the practical quantitation limit or natural background, whichever is higher.

Cleanup Screening Level (CSL). The cleanup screening level is established in accordance with the requirements in WAC 173-204-560(4). If a risk-based concentration is below the regional background level or practical quantitation limit, then the cleanup screening level is established at a concentration equal to the practical quantitation limit or regional background, whichever is higher.

State Comparison Table

State Comparison Table

	Wisconsin ¹	Minnesota ²	New York ³	Ohio ⁴	Washington ^{5,6}
Basis	<p>Numerical Values called sediment quality guidelines (SQGs)</p> <p>Based on MacDonald et al. (2000)⁷ for most. Also CCME (1999)⁸, Ontario Guidelines (Persaud, et al., 1993)⁹ and NOAA (Long and Morgan 1991)¹⁰</p> <p>Benthic Effects based. Not for bioaccumulation or food chain.</p> <p>3 values for each chemical: TEC, MEC and PEC</p>	<p>Numerical Values called sediment quality targets (SQTs)</p> <p>Based on MacDonald et al. (2000) for most. Also CCME (1999), and NYSDEC (1999)¹¹.</p> <p>Benthic Effects based. Not for bioaccumulation or food chain.</p> <p>2 values for each chemical: Level I SQT = TEC Level II SQT = PEC</p>	<p>Numerical Values called sediment guidance values (SGVs)</p> <p>Effects based and bioaccumulation based SGVs.</p> <p>For nonpolar organic contaminants, use the EPA equilibrium partitioning procedures</p> <p>For metals, adopted MacDonald et al. (2000) TEC and PEC Values</p> <p>For total PCBs, NYDEC has their own SGVs</p>	<p>Numerical Values</p> <p>Recommends MacDonald et al. (2000), U.S. EPA Region V Ecological Screening Levels¹², Ohio EPA Sediment Reference Values¹³ or U.S. EPA Region IX values for residential soil (for human health)¹⁴.</p> <p>Benthic effects and/or human health considered, depending on the potential exposure.</p> <p>After screening, for data that exceeds the SQGs, Ohio uses EPA procedures for equilibrium partitioning benchmarks.</p> <p>Not for bioaccumulation.</p>	<p>Numerical and narrative sediment standards. The only state with promulgated standards.</p> <p>Calculated sediment quality values (SQVs) from large datasets in Washington, Oregon and Idaho</p> <p>Updated in 2010 to reflect information from a larger geographic area. Large data analysis effort. Over 600 stations with combinations of bulk chemistry and bioassays used to develop.</p> <p>Effects based SQVs for benthic organisms.</p>
Chemicals included	18 PAH, 12 metals, total PCB, pesticides and other compounds (see excel table for full listing).	13 PAH, 8 metals, total PAH, total PCB and 10 pesticides	SGVs for 9 metals and 61 organic compounds including total PAH, total PCB, pesticides, etc.	Does not list chemicals specifically for screening, but rather refers back to the available SQGs listed above. ESBs evaluated for 34 PAHs and metals.	<p>SQVs for 10 metals, 21 organic chemicals, including total PAH, total PCBs, pesticides, etc.</p> <p>2 SQVs for bulk petroleum hydrocarbons.</p> <p>Also includes ammonia and total sulfides.</p>
How Used?	<p>Part of tiered assessment framework</p> <p>Assess sediment quality for dredging projects</p> <p>Screening for benthic effects and bioavailability potential (ecological).</p>	<p>Designing monitoring programs</p> <p>Identify, rank and prioritize sediment associated contaminants</p> <p>Evaluate spatial patterns</p>	<p>For screening, classification and assessment of sediments only to determine if sediments are having an effect on aquatic life.</p> <p>3 classifications of sediments Class A: low risk (<TEC)</p>	<p>Used for making sediment management decisions</p> <p>Three tiered process:</p> <ol style="list-style-type: none"> 1. Screening to determine chemicals of concern 2. Evaluation of COCs for 	<p>Setting standards for sediment quality (numeric and narrative)</p> <p>Apply standards to reduce pollutant discharges</p> <p>Provide a decision process for</p>

Considerations

- Screening Level vs. Cleanup Goal
- Background Classification – Urban vs. Rural
- Detection Limits > Standards
- What is clean?

Next Steps

- End Product(s)/Deliverable(s)
- Volunteer Assignments
- Next meeting for Subgroup #2
 - Date: September 19, 2016
 - Time: 10:30 – 11:45
 - Location: DNR Office, GEF 2, Room 513
101 South Webster, Madison, WI

Electronic meeting invitation to be sent in the near future.