LDWSF
12.3.55 v1

Fresh Water sediment quality Criteria

Approach.

A. Water Quality Criteria

1. derived from toxicological data from sediment-free bioassays on nektonic organisms
   a. assume that no increased body burden from contact with or ingestion of, sediment.
   b. benthic organisms –
2. Relies on existing Tox water quality criteria to assess acceptable levels in interstitial waters.

B. Sediment-Water Equilibrium Partitioning Approach.

1. Exchange among sediment, interstitial water, overlying water.
2. Compound-specific partition coefficients. –

Bolton, H.S., R.W. Brocker, B.W. Vigon, J.A. Scanlon, S.L. Clark, May 10, 1985.
National Perspective on Sediment Quality.
Prepared for. U.S.E.P.A., Office of Criteria and Standards. by Battelle, Washington Environmental Program Office, 2030 M. St. NW. Washington, D.C. 20036 EPA Contract No. 68-01-6986.

Lyman, W.J., A.E. Glazer, J.H. Ong, S.F. Coons, Nov 1986.
An Overview of Sediment Quality in the United States,
Prepared for. Monitoring and Data Support Division, Office of Water Regulations & Standards, U.S.E.P.A. Wash, D.C.
EPA Contract # 68-01-6951

USEPA SF
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HARDNESS = 34.25 MG/L $CaCO_3$ AVERAGE.

WATER QUALITY CRITERIA FOR METALS IN FRESH WATER.

Cu $e^{(.9422[\ln(\text{HARDNESS})]-1.464)}$

$e^{(.9422[\ln 34.25]-1.464)}$ = 6.46 µg/L Acute (1HR)

Cu (ACUTE) $e^{(0.8545[\ln(\text{HARDNESS})]-1.465}$ = 4.73 µg/L CHRONIC (4 DAY –)

Pb. $e^{(1.273[\ln(h)]-1.460)}$ = 20.87 µg/L ACUTE.

$e^{(1.273[\ln(h)]-4.705)}$ = 0.81 µg/L CHRONIC.

Hg 2.4 µg/L ACUTE

.012 µg/L CHRONIC.

Zn $e^{(.8473[\ln(h)]+.8604)}$ = 47.20 µg/l. ACUTE.

$e^{(.8473[\ln(h)]+.7614)}$ = 42.75 µg/l. CHRONIC.

As III 360 µg/l – ACUTE

190 µg/l. CHRONIC

As V 850 µg/l LOEL

48 µg/l. LOEL.

Cd. $e^{(1.128[\ln(h)]-3.828)}$ = 1.17 µg/l. ACUTE

$e^{(.7852[\ln(h)]-3.490)}$ 0.49 µg/l. CHRONIC.

Ni. $e^{(.8460[\ln(h)]+3.3612)}$ = 572.89 µg/l. ACUTE.

$e^{(.8460[\ln(h)]+1.1645)}$ = 63.69 µg/l. CHRONIC

Cr VI 16 ACUTE

11 CHRONIC.

Fe

1 mg/l. CHRONIC.

Water quality criteria for metals Albright, Marguis.

Marine Power - Significance of Elutriate metals analysis:

Arsenic exceeds the threshold value for sediment metals levels.
Cadmium exceeds the median concentration.
Copper exceeds threshold and maximum concentration found.
Iron - no worry.
Lead. exceeds threshold and 95th percentile concentration.
Zinc exceeds threshold and 95th percentile concentration.

~~National Perspective on Water Quality~~
~~Bolton et al,~~

Bolton, H.S., Breteler, R.J., Vigor, B.W., Scanlon, J.A. and Clark (S.L.), 1985. National Perspective on Sediment Quality. Prep for. U.S. E.P.A. Battelle Washington Environmental Program Office, Washington, DC. 20036. E.P.A. Contract No: 68-01-6486

Threshold values derived from the sediment-water partitioning approach are based on average of 4% total organic carbon.
Chronic values are selected.
If 1-2% TOC were used for sediment, more sites would have been noted as being above threshold concentrations.

Evaluation of Dredged Material Disposal Alternatives for U.S. Navy Homeport at Everett, Wa. - [AC & E.]

"The estimated release of contaminants in the dissolved form during dredging is negligible.
Estimated mass release was 2% for clamshell and 1% for hydraulic dredging (cutter head).

CAD disposal.
Standard elutriate testing indicated that contaminant release in dissolved form during placement of the contaminated material was below reference water ~~contamination~~ concentration or criteria for most parameters.

Compare standard elutriate test with background concentrations and water quality criteria. —

Contaminants will remain tightly bound to the sediment, so the most important element in evaluating a decision is settling velocity of entrained sediment. Elutriate tests as well as composite sediment and site water samples should be evaluated. —

Triplicate analysis for samples.