

4242 RF 92

Memorandum

AUG 12 11 08 AM '92

ACTION	
DIST	LTR ENC
BENJAMIN, A.	
BERMAN, H.S.	
BRADY, J.A.	
BRANCH, D.B.	
CARNIVAL, G.J.	
COPP, R.D.	
CORDOVA, R.C.	
DAVIS, J.G.	
EVERED, J.E.	
FERRERA, D.W.	
GOODWIN, R.	
HANNI, B.J.	
HEALY, T.J.	
HILBIG, J.G.	
IOEKER, E.H.	
KERSH, J.M.	X
KIRBY, W.A.	
KRIEG, D.	
KUESTER, A.W.	
LEE, E.M.	X
MARX, G.E.	
MORGAN, R.V.	
PIZZUTO, V.M.	
POTTER, G.L.	
SANDLIN, N.B.	
SATTERWHITE, D.G.	
SCHUBERT, A.I.	
SHEPLER, R.L.	
SULLIVAN, M.T.	
SWANSON, E.R.	
TAN, K.G.	
VANSON, R.B.	
WILSON, J.M.	
ZANE, J.O.	

WMED:GSH:8527

EG&G
ROCKY FLATS PLANT
CORRESPONDENCE CONTROL

Comments on Interim Guidance on Interpretation and Implementation of Aquatic Life Criteria for Metals

Lois Thompson, Office of Environmental Guidance, ^{EH}EM-232, HQ

Following are comments the Rocky Flats Office has on the interim guidance for evaluating and modifying aquatic life criteria for metals.

The Environmental Protection Agency (EPA) has presented three approaches for implementing aquatic life criteria for metals, measuring attainment of such criteria, and determining the need for water quality-based controls. These approaches specifically are:

- 1) Measure total recoverable (TREC) metals in ambient waters, and compare those measurements to national or state-wide criteria;
- 2) Measure dissolved (DIS) metals in ambient waters, and compare those measurements to criteria appropriate for the dissolved metal;
- 3) Measure the toxicity of a pollutant in the site water, compare that value to its toxicity in laboratory water, and determine the water-effect ratio. The water-effect ratio is then used in an adjustment to obtain a site-specific metals value.

The possible effects of each approach are discussed below.

Approach 1

- Commonly, toxicity data publications record LC₅₀ or EC₅₀ results in the form of dissolved metals, although there is also considerable data on TREC. EPA suggested determining an adjustment factor for converting TREC to DIS. This could be useful in determining the cause of toxicity for a given sample by comparison with literature information, but EPA has not yet determined what the conversion factors are. This approach could be favorable.
- The TREC alone provides the strictest method of metal concentration determination because it includes the dissolved and particulate fraction. It may, therefore, over-estimate the toxicity of a sample.

Approach 2

- EPA emphasizes the importance of ultra-clean laboratories, labware, and reagents in determining dissolved metal concentrations. This may allow considerable room for error because of the possibility of laboratory contamination given the low detection limits.
- The DIS method may not allow for the toxic effects of particulates if they exist for both whole effluent toxicity test species.

DOCUMENT CLASSIFICATION
REVIEW WAIVER PER
CLASSIFICATION OFFICE

CORRES CONTROL	x	y
TRAFFIC		

Reviewed for Addressee
Corres. Control RFP

8-12-92 *Ci*

DATE BY

Ltr. #

- Again, toxicity data publications report results in terms of dissolved metals. Using a uniform approach would allow correlation of site results with literature values.

Approach 3:

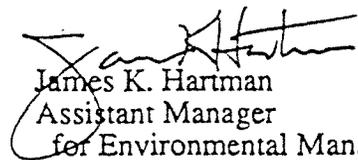
- The water-effect ratio balances the different buffering capacities of the reconstituted laboratory test water with those of the receiving stream water. This allows for a site-specific evaluation of the water at the time of sampling, which includes periods of low and high flow. By allowing for an adjustment of metals criteria using the water-effect ratio, it is likely that metals standards may currently be set too strictly. The Rocky Flats Plant has noticed that total organics have an effect in decreasing toxicity for some locations.
- The site sample pollutant LC₅₀ is site-specific, and one year of quarterly or monthly samples would need to be taken at each site to determine the site-specific standard. This amount of sampling could be expensive, depending on the number of sites that need to be sampled.

Approach 2 and 3 Combined:

- The chemical, physical, and biological make-up of many site waters varies over the seasons, and an estimation of the dissolved metals by interpreting the TREC values may not be representative of the true value.
- The empirical formula could be helpful in using literature values of TREC or DIS metals data.

Overall, the Rocky Flats Office recommends that an implementation of the water-effect ratio based on TREC metals would provide a reasonable representation of metal toxicity to the ecosystem, and allow for a more defensible position than the use of DIS metals and the water-effect ratio.

If you have any questions concerning these comments, please contact me or Tom Lukow of my staff at (303) 966-4561.


James K. Hartman
Assistant Manager
for Environmental Management

cc:
T. Lukow, WMED, RFO
M. Van Der Puy, EMB, RFO
J. Dion, EMB, RFO
F. Hobbs, SWD, EG&G
H. Wolaver, SWD, EG&G