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LETTER REGARDING UNIVERSITY OF FLORIDA COMMENTS ON DEVELOPMENT OF ECOLOGICALLY-BASED REMEDIATION GOALS FOR LEAD AND POLYCYCLIC AROMATIC HYDROCARBONS IN SOIL AT SITE 15 NAS CECIL FIELD FL
4/17/2001
UNIVERSITY OF FLORIDA

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April 17, 2001

Ligia Mora-Applegate
Bureau of Waste Cleanup
Florida Department of Environmental Protection
Room 471A, Twin Towers Office Building
2600 Blair Stone Rd.
Tallahassee, FL 32399

Dear Ms. Mora-Applegate:

We have reviewed at your request the March 30, 2001 report "Development of Ecologically-based Remediation Goals for Lead and PAHs in Soil Site 15, Blue 10 Ordinance Disposal Area, Naval Air Station Cecil Field, Jacksonville, Florida" prepared by Tetra Tech NUS. The document presents revised assessment and measurement endpoints, and a working plan for the field activities proposed for Site 15. Briefly, the document proposes generating Preliminary Remediation Goals (PRGs) for lead and PAHs based on the results of 14-day earthworm toxicity tests, and on the calculation of soil lead concentrations protective of birds and mammals. The document also proposes to measure diversity and abundance of soil invertebrates along gradients of lead and PAH concentrations. We have also received response to our comments sent to you in January 29, 2001, and to comments made by the USEPA Environmental Response Team.

In a January 29, 2001 letter we expressed concern about the uncertainty associated with developing PRGs for soil invertebrates based only on earthworm mortality. At that time, we suggested including community endpoints in order to determine directly a concentration with little or no adverse effect on diversity and abundance of soil invertebrates at Site 15. The document under review now proposes to evaluate potential effects to soil invertebrates through earthworm acute toxicity tests, and also by measuring soil invertebrate diversity and abundance. We are pleased that community endpoints have been added, but are unclear how the information will be used. In their response to U.S. EPA comments on the preceding plan, TetraTech states that the community endpoints will be used as part of a "lines of evidence approach" to assess risks. Apparently that doesn't extend to using this information for development of PRGs. According to the revised plan, PRGs protective of soil invertebrates will be based exclusively on the No Observed Effect Concentration (NOEC) and Lowest Observed Effect Concentration (LOEC) calculated from the 14-day earthworm survival tests. This begs the question of what will be done if PRGs from the 14-day earthworm study conflict with results from community endpoint

assessment? That is, what will happen if the concentrations at the PRG appear to produce community effects? We suggest that under these circumstances, community endpoint data should be considered for PRG development. This is based on our previously expressed concern for the relevance of earthworm toxicity tests at this particular site. In making this recommendation, we acknowledge that deriving PRGs from population and community studies may in some cases not be possible due to the inherent large variability of these systems. On the other hand, the closeness of the sampling sites suggests that only microhabitat characteristics may be expected to be of significance. To allow for the possibility of generating PRGs from community endpoints, the site sampling procedure must be extended to record habitat variables such as vegetative cover, amount of duff, soil pH, etc. The data should be formally analyzed by generating three indices: abundance, or total number of individuals; diversity, or total number of genera represented; and biomass, or mass of the invertebrate sample collected. Then, these data can be analyzed in a manner similar to that proposed for the earthworm data, using the habitat variables as independent variables in a stepwise regression analysis.

The previous document considered plants as assessment endpoints, while the current version does not. We found no explanation for this change in the present document. In responses to comments, TetraTech states that Section 2.4.1 would be modified to explain why plants were dropped as an assessment endpoint. This change has not been made. The only discussion of plants in this section is as a pathway of exposure for herbivorous organisms, which is a different subject. If a management decision has been made to exclude an assessment of potential phytotoxicity from the risk assessment, this needs to be clearly addressed up front in the document, not in a section on exposure pathways.

Other points:

1. The document states that soil samples to be used in the earthworm tests and the invertebrate studies will include the first three inches of soil and the lower one-inch of duff. This procedure differs from the one used in the collection of soil samples to delineate lead levels at the site, which were based on soil only. Will PRGs developed from these toxicity tests be expressed based on concentrations in the soil portion of the sample or soil and duff combined? This has important implications in terms of comparing PRGs back to concentration data that currently exist for mineral soil only.

2. As mentioned in previous communications, the use of acute mortality may not be the most sensitive endpoint for lead toxicity to earthworms. The use of other earthworm tests that measure more relevant endpoints, such as growth, would likely minimize the uncertainty of using earthworm tests for this site.

3. The document repeatedly states that if soil samples have less than 197 mg/kg lead, no further analysis will be conducted. We agree with this decision. However, we think that, in order to ensure that the full range of concentrations is assessed for

bioassays, the reference site should be selected to have soil lead concentration within the background range (i.e., below 197 mg/kg).

4. Invertebrate surveys should identify invertebrates to the level of genera. We suggest using a smaller mesh size (1/8 inch) to collect insects such as ants, which are expected to be abundant and are known to be preyed upon by mockingbirds and other wildlife.

5. We do not agree with the adjustment made to the soil ingestion rate of the woodcock to be used for the mockingbird. This procedure assumes that the only route of soil ingestion is through eating earthworms. A look at soil ingestion estimates of non-vermivorous species clearly shows this is not the case. For example, data presented in Beyer *et al.* (1994) show that soil ingestion for wild turkeys is 9.4%. Although much larger, the wild turkey lives on a habitat similar to that of Site 15, and forages like the mockingbird, by visually locating prey in the soil litter and then capturing it with its beak.

We look forward to continue assisting you in this project. Please do not hesitate to contact us if you have any questions.

Sincerely,

Hugo G. Ochoa, D.V.M., Ph.D.

Stephen M. Roberts, Ph.D.