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SUBJECT: POSITION PAPER ON GUIDANCE FOR ASSESSING ECOLOGICAL RISKS POSED BY CHEMICALS: SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT

Dear Mr. Kieling:

On September 8, 1999, our office received copies of the above referenced final draft position paper, which were transmitted to the U. S. Department of Energy by way of letter from James P. Bearzi, Hazardous and Radioactive Materials Bureau (HRMB) Chief, dated September 3, 1999. The letter invited comments on the final draft position paper within 30 days of receipt, and we are responding to this invitation with comments as provided below. We wish to express our thanks to HRMB for allowing us the opportunity to provide input on this important guidance document. We have disseminated this document to a number of Laboratory staff and contractors who work in programs potentially affected by the draft position paper. The comments below represent a compilation of their responses based on their review of the paper.

In general, guidance for the screening aspects in the document is consistent with approach the LANL ER is developing and using in consultation with your staff. We appreciate the opportunity offered in the guidance (p. 65 and elsewhere) to vary from the exact construct of the proposed approach as appropriate. However, our major concern is that the guidance is written such that detailed evaluations of habitat and wildlife as well as evaluations of assessment and measurement endpoints occur prior to the contaminant characterization and screening steps. It is our belief that detailed evaluation of habitat and endpoints is not appropriate for screening but becomes important once COPECs have been identified and further risk assessment is required.

Our comments on the Final Draft Position Paper Guidance for Assessing Ecological Risks Posed by Chemicals: Screening-Level Ecological Risk Assessment are as follows:

1. P. 6. "Prerequisites" states that site characterization must be sufficient to define nature and extent of contamination. This prerequisite diminishes the value of conducting a scoping and screening assessment. There are situations where the scoping assessment either identifies no complete exposure pathways or it identifies an obvious problem that requires mitigation. Delaying the scoping assessment until nature and extent have been defined seems an unnecessary delay in the decision process. For example, if interim measures are required, but neither scoping or screening can be done before extent has

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been adequately determined, such remedial activities may be delayed for an inordinate period of time.

2. P.12 Table 1 footnotes. 5% seems a rather small percentage to be important as a contributor to exposure. What is the basis for selecting this value?

3. P.14 Section 2.1. The level of ecological survey implied here is beyond screening and is really a potential part of the baseline risk assessments that are done at a later phase of the ERA process. The timing of this activity in the screening ERA process described here would place it before it is known if COCs exist at the site. It seems more appropriate to do habitat characterization measurements after screening in order to evaluate in the field indicators of habitat or ecosystem health.

4. P. 14 Section 2.1 Conduct Site Surveys. This section specifies a quality and quantity of information that is very difficult to acquire. The results of the survey are very likely to depend upon the proficiencies of the investigator. This means that the same site could be surveyed by several different competent investigators, (e.g. a mammalogist, an ornithologist, a botanist, and an invertebrate ecologist), who come up with widely divergent site descriptions. Consequently, the ecological risk screen is not reproducible. Furthermore, disagreements about the assessment results are likely to reflect differences in education among the assessors and the reviewers.

5. P. 14 Section 2.1. This section also seems in conflict with page 33, "Section 2.2.3 Identify Ecological Receptors." The second paragraph states, "Therefore the master lists should include species that, while not physically observed in the assessment area, occur in habitats that exist at or near the site and therefore could possibly be present at the site." The section goes on to include migratory species and known or suspected T & E species.

   It is suggested that a more effective and efficient approach may be to include an appendix to this document that lists the habitat types in New Mexico and the master species lists that are evidently available from sources listed in section 2.2.3 and the references in Appendix A. The field survey work in section 2.1 would then be a matter of identifying the relevant habitat types for the site and the relevant species to be considered in those habitats. This approach would give each screening assessment a common starting point.

   Appendix B gives a start for this alternative approach by providing "food webs for all the generic habitats in New Mexico," (p. 34, second paragraph).

   Additionally, if Section 2.1 stands as written, the fourth bullet is not a technique to conduct field surveys.

6. P. 15 Section 2.2 Characterize Exposure Setting and Contamination.
   Third paragraph: "Prior to the data evaluation process, site sampling investigation must be sufficient to delineate the nature and extent of contamination." The ecological scoping and screening methodology largely uses contaminant maximum values to determine whether a more sophisticated ecological risk assessment is warranted. Consequently, it is suggested that the process would be better served by developing a site-specific conceptual model for contaminant release and transport that identifies where the highest contaminant

concentrations are likely to be. Restricted sampling can be performed to estimate nature and maximum concentrations without defining extent. These data would be sufficient to support the screening assessment.

7. P. 17 second paragraph: "If concentrations of chemicals change significantly between different sampling events, it may be useful to keep the data separate and evaluate risks separately. Alternatively, the most recent sampling data could be used in the ecoscreen." This is another place where a conceptual model for contaminant release and transport is suggested. Variations in contaminant concentrations should be understandable and related to physical processes or changes in facility management in some way. This may only be qualitative for a screening assessment; (e.g. concentrations are lower at higher creek flows.) Otherwise, there is no context for the assessment results. The contaminant maximum values may represent a relatively benign condition or an extreme rare event worst case condition.

8. P. 23 'Chemicals that are infrequently detected.' Statistical sampling designs for nature and maximum values, for nature and extent, and for hotspots are substantially different. So much so that using data from either of the first two designs to identify hotspots typically does not work. Again, the physical system conceptual model would be a major asset to deciding if hot spots are likely to be an issue.

   The example regarding soils and groundwater appears unclear. Are the soils actually the media with frequently detected contaminants?

9. P. 29 Section 2.2.2. It is suggested that this section might be placed in the scoping discussion earlier in the document.

10. P. 30 Section 2.2.2.2. BISON-M also provides natural history information and references for a variety of terrestrial species.

11. P. 32 Table 2. This table implies that virtually all habitat, including backyards (habitat for songbirds) is considered sensitive by the State. Therefore, it does not gain the decision maker resolution of the relative importance of various habitats to fish and wildlife and to natural resource trustees managing them.

12. P. 36 Section 2.4. Formal development of assessment and measurement endpoints at this stage of the ERA seems out of place. Again, it precedes contaminant investigation and screening when it would more correctly be a follow up to screening to begin higher levels of assessment. In screening, we select TRVs derived from NOAELs for a variety of effects (endpoints) that are more dependent on information available in the literature than on formal development of these endpoints.

13. P. 36 last paragraph. The first sentence incorrectly identifies guilds as endpoints. The assessment endpoints are qualities of populations within guilds that influence the sustainability of the population and therefore the qualities are of value to us in evaluating the consequences of presence of residual contamination.

14. P. 38 Sec. 2.5.2. It is useful to note here that surrogate receptors (and later that surrogate test species) are often used because life history information for the actual species present is missing or limited (and TRV information is very limited for free ranging wildlife). Surrogates should have as similar life history parameters as possible to the species that they nominally represent.

15. P. 39 second paragraph. It is suggested that "statistically supported average such as the 95 percent upper confidence limit," be replaced with "statistically derived value such as the 95 percent upper confidence limit."

16. P. 39 Hot spot analysis is not defined nor is hot spot. Use of a UCL is allowed only if the contamination is homogeneous.

17. P. 40 last paragraph. There is a contradiction here with previous statements (e.g., p. 39) that unfiltered samples should be used to estimate exposure point concentrations for aquatic measurement receptors.

18. P. 40 3.1.1. An alternative to using filtered samples for assessing the contaminant effects upon aquatic communities is to use unfiltered sample results and then discuss the consequences of the sample preparation in the uncertainty analysis. Otherwise, this guidance essentially requires that screening site investigations collect and analyze both filtered and unfiltered samples. This seems like an unnecessary cost impact at the screening assessment level of investigation.

19. P. 41 Section 3.1.2. The equation here is somewhat confusing. Should it not read: $DD = (IR_F \cdot \sum C_F \cdot P_F \cdot F_F) + \sum IR_M \cdot C_M \cdot P_M$?

20. P. 42 Section 3.1.2.1. It should be noted here that bioconcentration factors are relevant to soil-terrestrial plant relationships as well.

21. P. 46 Section 3.1.2.3.1. The text refers to Log K_{ow} and the FCM equation uses K_{ow}. This may be an error, or it may require further explanation.

22. P. 47-48. The basis for using FCM derived for fish for terrestrial wildlife is unsupported. The mechanisms by which bioaccumulation occurs in fish versus terrestrial wildlife are not the same.

23. P. 61 Section 3.2.2. There needs to be some discussion here on how TRVs are selected and which TRVs serve as the criteria for the ESQ comparison; because TRVs vary across receptors some may be limiting the decisions at a given site and others may not.

24. P. 64 Section 4.2. Because TRVs are based on NOAELs or derived NOAELs, ESQ = 1 is indicative of no likely effect. Therefore, the decision rule should be if ESQ>1 or >0.3, then contaminant is carried forward. There needs to be some clarification here on the number of significant figures appropriate for making these comparisons. Also, it is not clear how the 0.3 was derived. Discussion of the derivation of 0.3 decision criterion and of the uncertainties associated with synergisms and antagonisms of multiple-chemical exposure

would be appropriate here. In addition here, it is not clear whether the 0.3 criterion applies if the sum of ESQs for the limiting receptor is 1 or less.

25. P.67. Please clarify the value of calculating COPEC concentrations for each trophic level.

26. Appendix C. This is not really a table of assessment endpoints, but rather a table defining guilds, representative receptors, ecological attributes of the guilds. It is a tool for selecting relevant receptors.

27. Appendix D. Some of these species are not relevant to New Mexico habitats. The marsh rice rat westward distribution stops in eastern Texas. *Peromyscus polionotus* (oldfield mouse) extends from the Southeast coast to eastern Mississippi. The white-footed mouse is *Peromyscus leucopus*, which extends into New Mexico. The salt marsh harvest mouse is restricted to the estuarine marshes of San Francisco Bay. The specific name of the long-tailed weasel should be *Mustela frenata*. NMED should consider customizing this document to more closely reflect the environments of New Mexico.

28. Appendix F. The basis for calculating BCFs from abiotic media to wildlife is unsupported. In EPA 1999b, the derivation is given as being from measurements of transfer of contaminants from feed to cattle tissue. The transfer mechanism from soil and water to tissue would be quite different than for transfer mechanisms from food.

We thank you for the opportunity to provide these comments and hope that you will find them helpful.

Sincerely,

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