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December 11, 2008

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Mr. David Cobrain
Hazardous Waste Bureau
2905 Rodeo Park Dr. E/Bldg 1
Santa Fe, NM 87505

RE: Draft Technical Review of the Draft Report for the Risk Analysis, Communication, Evaluation, and Reduction at LANL Ranking Tool Methodology, Dated October 2008, Los Alamos National Laboratory.

Dear Mr. Cobrain:

Ms. Neelam Dhawan requested a technical review (via emails dated October 6 and 23, 2008) of the above-referenced Risk Analysis, Communication, Evaluation, and Reduction (RACER) ranking tool documentation and associated RACER model. The following attachment contains technical comments noted during this review.

A primary concern is how the RACER Ranking Model will be applied and how the data will be interpreted. In general, the model provides a broad analysis of various sites and can estimate a generalized risk and subsequent ranking for compared sites. However, the documentation of the model does not caveat any of these as broad assumptions nor does it discuss other potential factors/assumptions that may need to be evaluated when looking at the risk for a site. For example, size, location, accessibility, ecological risk, and cost are factors not considered in RACER that may drive risk management decisions. The documentation should include not only the ranking, but also guidance on how risk management decisions using data from a risk assessment may influence the importance or actual ranking of a site.

In addition, within RACER there are several deviations from standard risk assessment practice. It is essential that if this tool is intended for the public, any streamlining or simplification of the processes should be made very carefully and fully explained in the documentation. Otherwise, the tool will be of little use if the public can not duplicate (or at the least closely simulate) what the facility and State regulators are evaluating. I foresee potential regulatory difficulty arising from any inconsistency between what the regulators and public are evaluating.

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Comments should not be evaluated as a final work product.

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If you have any questions, please call me at (801) 451-2864 or contact me via email at paigewalton@msn.com.

Sincerely,

Paige Walton

Paige Walton
Senior Scientist, AQS

Enclosure

cc: Joel Workman, AQS (electronic)
Neelam Dhawan, NMED (electronic)

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Draft Technical Review of the Draft Report for the Risk Analysis, Communication, Evaluation, and Reduction at LANL Ranking Tool Methodology, Dated October 2008, Los Alamos National Laboratory and the Draft RACER Model

General Comments

1. Overall, it is unclear exactly how the Risk Analysis, Communication, Evaluation, and Reduction (RACER) Ranking Model will be applied and how the data will be interpreted. In general, the model provides a broad analysis of various sites and can estimate a generalized risk ranking for compared sites. However, the documentation of the model does not caveat any of these as broad assumptions nor does it discuss other potential factors/assumptions that may need to be evaluated when looking at the risk for a site. For example, size, location, accessibility, ecological risk, and cost are factors not considered in RACER that may drive risk management decisions. The documentation should include not only a discussion of the technical assumptions applied for ranking sites, but also guidance on how risk management decisions using data from a risk assessment may influence the importance or actual ranking of a site. This additional information is critical for the public to fully understand the limitations of the model, i.e. where broad assumptions have been made, and how the results of the tool are not stand-alone data to use for risk management decisions.

2. It is not clear how compounds without screening levels or without toxicity data will be addressed in the ranking tool. Please address whether surrogate toxicity data will be able to be used and if there is a way to enter a user-defined screening level.

Comments on the RACER Model

3. RACER incorporates Region 6 medium-specific screening levels (MMSLs) and Region 9 preliminary remediation goals (PRGs). It was not clear whether these data are actually the previously used MMSLs and PRGs or whether the data reflect the new Regional Screening Levels (RSLs). Please note that the new RSLs supersede the MMSLs and PRGs.

4. When working with the RACER model, there is a general comparison to screening levels. However, neither the RSLs nor the New Mexico Screening Levels incorporate all critical pathways that must be evaluated in a screening level risk assessment. The two primary exposure pathways not included in these screening levels are vapor intrusion and ingestion of home produce. In many cases, the vapor intrusion pathway may drive risks. Please clarify how RACER will be updated to include these pathways.

Comments on the RACER Ranking Tool Report

5. Figure 4 on page 9 shows the conceptual model of the vadose zone source for the current time frame. It is noted that there are no potential exposure pathways, as the underlying assumption is that the source is isolated from direct human contact and transport of volatile organic compounds (VOCs) to the surface is considered to be negligible. It is unclear how this assumption is conservative or even realistic. It is clearly possible for organics to be present in the vadose zone, but have not migrated to a deeper aquifer. The presence of an aquitard or other influencing factors such as fractured flow and

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the depth to the deep aquifer may have inhibited VOC migration, but would not limit the potential presence of VOCs in the vadose zone. A dominate pathway and often a risk driver is the inhalation of VOCs in indoor air (the vapor intrusion scenario). Typically the Johnson and Ettinger model for vapor intrusion is used to estimate concentrations of VOCs in indoor air. These concentrations are then applied to risk methodology for estimation of residential or industrial risk. Please discuss the validity of the assumptions that there are no exposure pathways for the vadoze zone in the current time frame. Also address how the RACER ranking system will account for the vapor intrusion scenario.

6. Figure 5 on page 10 presents the conceptual model of the vadose zone source for the future time frame. Similar to the above comment, the conceptual model does not address vapor intrusion. As previously stated, the inhalation of VOCs in indoor air often drives risk assessments. Exclusion of this pathway is inconsistent with both Environmental Protection Agency (EPA) and State guidance. The RACER ranking tool should be revised to address the vapor intrusion scenario for the vadose zone source for the future time.

7. For the source definition (page 10), the exposure point concentration (EPC) is simplified and defaults to the arithmetic and geometric mean. This is inconsistent with both EPA and State practice. While it is noted that the user may also use EPA's ProUCL software (Singh et al. 2004), which defines the upper 95th percentile of the mean value based on the best fit of the sample population to a distribution, this is only an option and not the default. The concern is that the public most likely will use the default scenario, resulting in use of EPCs that will not be consistent with EPCs derived and used by either the facility or the State. While this may be a simplifying assumption for purposes of model development, it is counter to general risk practice. It is unclear how discrepancies in EPCs could drive public comment and confusion when comparing their own derived EPCs with the facility and State EPCs. It is strongly recommended that the default EPC be revised to be based on ProUCL's calculation of a distribution-based 95% estimate of the upper confidence level (UCL) of the mean.

8. The discussion on page 13 for suspension indicates that the suspension model used in the ranking tool is derived from the model for suspension developed by Cowherd et al. (1985) and implemented in EPA's soil screening guidance (EPA 1996). Several changes have been made in how inhalation of fugitive dust is estimated since the 1996 EPA Soil Screening Guidance, provided in the updated 2002 version of this guidance. Specifically, significant changes in methodology have been derived for calculating a construction-specific particulate emission factor (PEF). PEFs calculated using the 2002 methodology for the construction worker result in significantly more conservative non-carcinogenic inhalation screening levels. In addition, the new RSLs and the New Mexico Screening Levels reflect construction worker screening data based upon the 2002 algorithms. There should be continuity between RACER and the Federal or State screening levels. In reviewing the discussion of the suspension modeling provided in Appendix C, it does not appear that the algorithms for the construction worker, as presented in 2002, were applied. Resulting in an underestimation of risk for the construction worker. The model must be revised to reflect the methodology presented in the 2002 Soil Screening Guidance for derivation of a construction-worker specific PEF.

9. On page 17, the exposure pathways for the resident include inhalation of VOCs in indoor air. It is not clear from the documentation how this pathway has been incorporated into RACER. In reviewing the flux equations provided in Appendix D, it appears that only estimates of VOCs to ground surface and from tap water to indoor air are quantified. Please clarify how indoor air via vapor intrusion is evaluated.

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10. The hiker scenario on page 18 does not take into account accidental exposure to contaminated surface water. While this exposure route may not be applicable for all hiker scenarios in the Los Alamos area, there are canyons and areas where there is contaminated surface water and there exists a complete exposure pathway for the recreational user. While it is noted that the hiker scenario is modeled after Los Alamos National Laboratory's (LANL) document "Technical Approach for Calculating Recreational Soil Screening Levels for Chemicals," the screening levels developed in this document are only for exposure to contamination soil. On a site-specific basis, additional analyses, besides comparison of site concentrations to the recreational screening levels, may be required. The RACER document should include a discussion of how this scenario only addresses contaminants in soil and that there are other potential exposure pathways for a hiker that may need to be addressed on a site-specific basis. Include a discussion of exposure to contaminated surface water, to include streams, seeps, and springs.

11. It is unclear how or if individual comparisons of site concentrations to background will be conducted. The discussion of background on page 26 appears to only include a comparison of the cumulative background health impacts to the cumulative health impacts at the site. Will the model provide data to allow individual comparisons of data to background? For example, arsenic is often a problem, as screening levels (Regional or State) are below LANL's representative background concentration for arsenic. Therefore, a comparison of site data to background for arsenic is important to evaluate whether there is significance between site data and background. Without this comparison, the overall health risks may be skewed. Please provide a comprehensive and detailed discussion of exactly how background data will be incorporated into the ranking tool. In addition, discuss whether it will be possible to use site attribution to remove inorganics reflective of natural background concentrations.

12. The discussion of non-detects on page 27 only shows how a weighted average of non-detects can be calculated. The documentation does not address how non-detects will be handled for determination of the EPCs. Clarify how non-detects will be included in determination of the EPCs.

13. There are several comments regarding the exposure factors presented in Appendix H as follows:

    a. An exposure duration of one year is assumed for all scenarios. Typically an industrial scenario is based on an exposure duration of 25 years while the resident 30 years. It is not clear whether this simplifying assumption is used to rank risk over a single period of time? Since the exposure assumption is counter to common risk assumptions, additional clarification of why this exposure duration is appropriate for ranking purposes only. In addition, the documentation should be explicit in stating that these exposure durations are not appropriate for calculation of residential or industrial risks.

    b. Table H-4. The soil ingestion rate for the resident is listed as 5E-5 kg/day (5 mg/day). One of the goals of the RACER tool is for comparison against Federal and State screening levels. As such, there should be consistency with respect to basic

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assumptions like exposure parameters. Both the Regional (and previously the Region 6 MMSLs and Region 9 PRGs) and the New Mexico screening levels apply a soil ingestion rate of 100 mg/day for an adult resident (200 mg/kg for a child). It is suggested that the residential soil ingestion rate be updated for consistency with Federal and State guidance.

c. There should be an additional breakout discussion of the industrial worker. The outdoor worker presented is not consistent with either an industrial or construction scenario as defined in either Federal or State screening levels. It is suggested that the outdoor worker be redefined as two individual receptors: an industrial and a construction. It is recommended that exposure parameters for both receptors be consistent with New Mexico Screening Levels.

d. The exposure parameters for the hiker should be consistent with assumptions applied, as approved by the State, in LANL's Technical Approach for Calculating Recreational Soil Screening Levels for Chemicals (2007).

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