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LETTER AND COMMENTS REGARDING DRAFT LEAD MODELING AT DEFENSE,  
REUTILIZATION AND MARKETING OFFICE IMPACT AREA TECHNICAL MEMORANDUM  
NSY PORTSMOUTH ME  
8/15/1998  
LEPAGE ENVIRONMENTAL SERVICES

# Lepage Environmental Services, Inc.

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August 15, 1998

Peter Vandermark  
Seacoast Anti-Pollution League  
P. O. Box 1136  
Portsmouth, New Hampshire 03802

Subject: Review of Draft IEUBK Lead Modeling at DRMO Impact Area Technical Memorandum

Dear Mr. Vandermark:

As you requested, we are transmitting comments to the Seacoast Anti-Pollution League (SAPL) concerning the Navy's Technical Memorandum describing the Integrated Exposure Uptake Biokinetic (IEUBK) Lead Modeling at the Defense Reutilization and Marketing Office (DRMO) Impact Area. Although the Technical Memorandum is dated April 6, 1998, the cover letter from Brown and Root Environmental is dated July 15, 1998. The memorandum summarizes the results of an evaluation of lead detected in soil samples at the so-called DRMO Impact Area, which includes Quarters S, N, and 68. The following comments are based on Dr. David Brown's input.

**General Comment.** The document concludes in paragraph 3 section 6.1 page 4 that "The 1998 IEUBK results ... are well within acceptable levels (at least 95% of the population has blood lead levels below 10 ug/dl)." This conclusion is based on data reported in Table 2 and Attachment B. More information is needed before accepting this conclusion.

1. The finding reported in Table 2 row 4, that the percent of the population below 10 ug/dl is 95.85%, (column 7 row 4) is based on a 95% Upper Confidence Limit (UCL) soil /dust concentration of 316 ug/g and an air concentration of 0.00691 ug/cubic meter. The soil/dust calculation is partially based on soil lead levels at the surface and partially on levels one foot or more below the surface (Attachment C). The average value of surface lead levels is 340 ug/g with 95%UCL exceeding 400 ug/g. The average measured levels of lead in the air are 0.0497 ug/cubic meter, (Table 1) compared with 0.00691 UCL used in the model (Table 2 row 4 column 5). Therefore, as shown on Table 3 for air levels, these differences could mean that less than 95% of the estimated blood lead levels would be below 10 ug/dl. What is the justification for combining surface and deeper soil data? Why weren't actual air concentrations, rather than estimates, used? The model should be rerun using surface soil data only.
2. Although the average soil lead level is higher for surface soil samples (340 ug/g) than for the overall sample set (253 ug/g) in Attachment C, both values are below the level of 500 ug/g widely

used to guide cleanup for residential soil. Do the background lead exposures or the average childhood blood levels in Kittery indicate that there is a lead problem?

3. In cases where other routes of exposure are present, a model is used to compensate for the higher blood lead exposures from background. In this case, EPA and other health agencies recommend that the acceptable level is less than 10 ug/dl for 95% of the population. Mean soil lead levels are used as inputs to the model unless the sample size is small in which case the upper confidence level of the mean is used. The models are sensitive to selection of default values, background air levels, time playing out-of-doors, etc. Since background lead levels for non-exposed children in the United States are 2-4 ug/dl, the model should be run to show that outcomes without soil exposure are near this range. If the estimated levels are too low, it means that the default values are not correct. We recommend the report include a non-exposed soil run of the model to determine whether the default values are realistic.

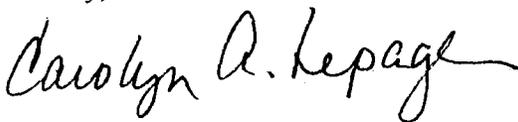
4. The last paragraph in Section 6.1 notes that using maximum concentrations, the blood levels estimated are in excess of acceptable results but that results using the 95%UCL are not. This conclusion does not offer much comfort. There are a limited number of soil lead levels from the surface (a dozen) all of which are under the 500 ug/g level except for the one high value. Has the site been adequately sampled?

5. Paragraph 6.2 also bases a conclusion on the maximum value. The 95% UCL is a more appropriate basis for the conclusion.

6. Finally, even if the findings from these models were to indicate a level in the non-acceptable range, a decision to attempt a time-critical removal action should be considered carefully because of the risks of exposure during removal may exceed the benefits.

If you have any questions regarding the comments above, please give me a call at 207-777-1049.

Sincerely,



Carolyn A. Lepage, C.G.  
President

cc: Iver McLeod, Department of Environmental Protection  
Meghan Cassidy, Environmental Protection Agency  
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