

October 27, 2000

Mr. Paul J. Kurzanski  
Director Environmental Remediation  
CSX Transportation  
500 Water St. - J275  
Jacksonville, FL 32202-4423

Dear Mr. Kurzanski:

This is in response to your letter dated September 13, 2000, which enclosed a RESRAD Modeling Report (the Report) for the CSX Transportation site in Livonia, Michigan, prepared by ARCADIS Geraghty & Miller (ARCADIS). You requested NRC to confirm in writing that this site meets the dose exposure standard of 25 millirem per year, and to make a final closure determination for the site.

We have reviewed the Report and have found that further information or clarification is needed on several items, as discussed below. Pending resolution of these issues, NRC cannot make a final closure determination, as you and we both desire.

#### Background

We believe this site can be described as generally free of residual radioactive contamination, with a few small areas of low-level contamination by radioactive thorium. The Report seems to confirm this; hundreds of direct radiation readings, taken on a tight (approximately 5 foot) grid pattern, disclose no sizeable areas of elevated direct radiation readings.

Therefore, the evaluation of potential dose consequences depends on accurately determining the amount of residual radioactivity actually contained in the few small areas of contamination.

#### Issues

##### Survey Technique

The Report does not make clear whether a 100% scan survey was done. We understood from a 1999 telephone exchange (when ARCADIS contacted NRC to inquire about expanding the soil sampling to make it more "representative"), that such a scan survey had been performed. This is important to developing confidence that all areas of contamination were found.

**Please confirm whether the grid-based direct radiation readings were in addition to a 100% scan survey, or whether they constitute the only direct readings taken.** If they constitute the only direct radiation readings, some further assessment of the potential number and size of undetected contaminated areas will be needed, to provide some upper bound as an input to potential dose implications.

### Survey Results

The Report identified the survey instrument as a Victoreen Model 190 meter fitted with a GM probe, Model RP-1. There are three issues here, as follows.

(1) Our experience has been that GM probes are not optimum for field surveying to detect small radiation variations above background - they usually cannot discern variations from background smaller than about 10 microRoentgens per hour ( $\mu\text{R/h}$ ). Concentrations of thorium in soil generating 10  $\mu\text{R/h}$  above background may exceed the dose release criterion of 25 mrem/yr. **Please confirm the identity and performance capability of the instrument(s) used.**

(2) The data displayed in Figure 5 of the Report appears as expected for a large number of "background" readings (i.e. all basically the same reading), in that a normal distribution occurs about a mean. The apparent mean, however, is about 12-13  $\mu\text{R/h}$ , which is above the "background" we would expect (6-9  $\mu\text{R/h}$ ) in the area of this site. This suggests the readings may be only instrument "noise," or there may be some bias or systematic error in reading the output. **Please address the validity of the apparent "background" readings displayed in Figure 5.**

(3) In the few areas where elevated direct radiation readings were detected, the readings were similar (within a factor of two or three), but the soil analyses from the same areas varied by more than a factor of twenty. This suggests the soil may not represent the source of the direct reading, perhaps because the "hot spot" was missed in sampling, or the contamination is sub-surface. **Please address the inconsistency between direct readings and associated soil analyses.**

### Dose Assessment

The NRC criteria for release of properties for unrestricted use are based on potential radiation exposure above background from residual radioactive materials. The RESRAD runs provided in the Report are apparently based entirely on ten soil samples collected at random across the site. Thus, these RESRAD runs appear to establish potential exposures due to uncontaminated soil (background), not due to residual contamination above background. Soil samples from the elevated areas should also be included in the dose evaluation, especially if they are considered representative of the actual contamination [see item (3) above].

NRC must base a closure determination on assessment of the radiation exposure consequences above background. **Please address how information about residual contamination above background affects future potential dose at this site.**

The above items were discussed with Mr. Gary Blinckiewicz of ARCADIS on October 20, 2000. As also discussed, we are providing a copy of this letter to Mr. Blinckiewicz.

At our discretion, NRC may choose to perform independent confirmatory inspection and measurements at the site prior to a final closure determination.

The results of the analyses of all four samples from "elevated" areas of direct radiation readings show thorium concentrations below 116 pCi/g. This is the concentration equivalent to 0.05 percent by weight, defined as an "unimportant quantity" in NRC regulations, which any person may receive, possess, use, transfer or deliver without an NRC license. The Commission is currently considering a revision to the regulation (10 CFR 40.13) such that any person may also "dispose" of unimportant quantities of source material. Should this revision be approved, CSX Transportation would have the option in the future of removing the contaminated soil for routine disposal, rather than disposal to an NRC-licensed burial site.

Should you have any questions regarding this matter, you may contact me at (630) 829-9615.

Sincerely,

*/RA by W. Snell acting for/*

Bruce L. Jorgensen, Chief  
Decommissioning Branch

cc: G. Blinckiewicz, ARCADIS Geraghty & Miller

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