

March 21, 2003

Mr. Wayne Reiber
Manager, Environmental Assessment and Remediation
Cabot Corporation
157 Concord Road
P.O. Box 7001
Billerica, MA 01821-7001

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING THE CABOT-
READING SITE DECOMMISSIONING PLAN AND RADIOLOGICAL
ASSESSMENT

Dear Mr. Reiber,

This letter is in response to your additional information submittal of November 2002, for the Cabot Reading, Pennsylvania, site. In the Decommissioning Plan (DP), Radiological Assessment (RA) and the November 2002 additional information, Cabot proposes to remove the Reading Site from Cabot license SMC-1562 in accordance with 10 CFR Part 20, Subpart E. In the DP and RA, Cabot proposes that the site be released for unrestricted use (§20.1402).

As discussed in our technical meeting on January 29, 2003, the NRC staff has determined that additional information is necessary to complete its review of Cabot's DP and RA. Additional information is required in three general areas; source term in eroded conditions, site characterization, and As Low As is Reasonably Achievable (ALARA) good practices. NRC staff notes that the resolution to these three questions may be interrelated, depending upon the approach taken by Cabot.

Source Term:

- 1) In calculating the subsurface average concentration used for the dose assessment, Cabot used a volumetric average of the entire contaminated layer in the slag pile, approximately 16 feet in depth. NRC staff considers that the bounding scenario for dose modeling is a trespasser to the site in eroded conditions. In this scenario, the trespasser's exposure would be primarily from the exposed material in the surface layer in the eroded condition. The bounding dose would occur when the exposed layer average concentration is at the maximum expected value over the 1000 year evaluation period. The information provided in the DP and RA is insufficient to demonstrate that the volumetric average used in the analysis would conservatively bound the average concentration of the exposed layer in eroded conditions. In particular, NRC staff is concerned that the soil and other materials layered on top of the pile may be preferentially eroded, leaving more stable large pieces of waste slag in the top layer,

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resulting in a higher average concentration in the exposed surface layer. Cabot should provide more detailed analysis of anticipated effects of erosion on the slag pile. The analysis should be sufficient to subsequently develop an average concentration for eroded conditions, based on the anticipated eroded condition of the pile, and based on the mechanisms of exposure to a trespasser to the residual radioactivity. Dose modeling then would be based on the highest average surface layer concentration over the next 1000 years.

Additionally, Cabot's consideration of erosion at the Reading site should take into consideration the existing conditions at the site. It appears that the thickness of the overburden material may vary, as NRC staff noted several discrete pieces of slag at the surface during a recent site visit.

NRC staff notes that guidance (NUREG-1727, Standard Review Plan, Appendix E) for subsurface residual radioactivity recommends averaging radionuclide concentrations over a 1 meter thickness, based on expected mixing under an excavation scenario. However, at the Cabot Reading site, the excavation scenario is not considered bounding. Cabot should base its averaging methodology (i.e. layer thickness for dose modeling) on exposure conditions for the trespasser scenario under eroded conditions.

Additionally, staff notes that NRC has recently published guidance on erosion mechanisms which may be helpful, NUREG-1623, "Design of Erosion Protection for Long-Term Stabilization", issued in September 2002. While this guidance is not directly applicable to the situation at the Cabot-Reading site, it may be helpful in identifying general principles, concepts and recent developments in the field of erosion familiar to NRC staff. A copy is enclosed.

Site Characterization:

- 2) NRC staff has reviewed the site characterization data, site historical information, site characterization standards methods, and draft studies in consideration of the split spoon sampling method used to characterize the site. NRC staff considers that there is significant uncertainty in the sampling method's ability to obtain representative samples from large blocks of slag buried in an unconsolidated pile of sand, gravel and other fill material. Previous responses to this question did not reflect the fact that much of the contaminated waste slag appears to be in large blocks, which have been identified in historical site file photographs, excavated during slag characterization work, and observed during a recent site visit. NRC staff notes this uncertainty could be addressed in a number of different ways, especially since the radiological constituency of the slag itself is well documented. For example, the licensee could assume a conservatively thick layer of slag to develop a source term for the slag layer, or perhaps conduct non-invasive surveys to identify the depth and thickness of the slag layer. If physical sampling of the material is necessary, test pit trenching could be performed. The licensee should ensure that any additional characterization is performed to refine the source term consistent with the expected eroded condition of the pile, and appropriate concentration averaging, as discussed in question 1.

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ALARA

- 3) During the recent site visit, a limited visual and radiation survey identified several large pieces of radiologically contaminated slag at the surface on the slope of the slag pile. It appears to the NRC staff that the radiologically contaminated slag at the surface on the pile can be readily identified through visual and radiation surveys and that this surface slag might easily be removed.

The License Termination Rule (at 10 CFR 20.1402) includes a criterion that residual radioactivity has been reduced to levels that are "As Low As Is Reasonably Achievable" (ALARA). The definition of ALARA in Part 20 indicates that economic, societal and socioeconomic, and other considerations be taken into account in determining what is reasonable.

NRC staff has reviewed the ALARA cost-benefit analysis provided in the RA, but notes that the analysis did not take into account other considerations, such as good practices, particularly with respect to large blocks of slag recently discovered at the site.

NRC staff believes Cabot should address the good practice aspects of ALARA by describing how licensed material left on the surface is consistent with ALARA good practices, or by considering possible ALARA actions at the site. Possible ALARA actions for the easily identifiable radiologically contaminated surface slag on the slope would include removal, relocation, and/or use of erosion control barriers. The licensee may address this issue by (1) responding to this RAI to address the ALARA concerns, (2) submitting a revised DP that discusses ALARA; (3) submitting to NRC the licensee's ALARA Committee report, as required in license condition 14 discussing how the issue will be resolved, or (4) including a discussion of how ALARA was addressed in a final status survey report, although no final status survey currently is envisioned. In each case, prior to license termination, the NRC staff will review and consider the ALARA evaluation and implementation actions, if any. The NRC review will be documented as part of the decommissioning Safety Evaluation Report for the site. The licensee should note that the current license does not allow any decommissioning activities to be performed; if actions are proposed, the license may need to be amended to allow such actions.

W. Reiber

Please contact me at (301) 415-6721, if you have any questions.

Sincerely,

/RA/

Theodore B. Smith, Project Manager
Decommissioning Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No.: 40-9027
License No.: SMC-1562

Enclosure: as stated

cc: Cabot Reading Site Mailing List

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