

January 14, 2003

Mr. Timothy Knapp
Radiation Safety Officer
Cabot Corporation
County Line Road
P.O. Box 1608
Boyertown, PA 19512-1608

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ON THE LICENSE RENEWAL
APPLICATION FOR THE CABOT BOYERTOWN FACILITY, SMB-920 (L52461)

Cabot Performance Materials Corporation (CPM) electronically submitted seven files (letter with responses 1- 9 and Attachments A-F) to the U.S. Nuclear Regulatory Commission (NRC) on October 11, 2002, in response to the NRC request for additional information dated June 25, 2002. The NRC letter requested that a site decommissioning funding plan be provided for the license renewal application as required by regulation (10 CFR 40.36 (c)), and also recommended that you follow the guidance in NUREG-1727, Section 15. The CPM response in Attachment A - Decommissioning Cost Estimate, did not follow the guidance and did not provide adequate information for the NRC staff to complete its evaluation. The staff also determined that some of the assumptions and data for the 2002 estimate are incorrect and do not support the proposed cost estimate of \$5,886,000. This surety amount is particularly in question as the amount approved in 1996 (\$5,954,000) has never been increased to reflect inflation. Specific comments are enclosed and can be addressed as page changes to Attachment A.

In addition, other portions of the renewal application require that additional information be provided so that the NRC staff can complete its review. See the specific comments in the enclosure. If you have any questions, contact the NRC project manager, Elaine Brummett, at 301-415-6606 or by electronic mail at esb@nrc.gov. Please response to all the comments within 30 days or propose an alternate response time.

T. Knapp

2

In accordance with 10 CFR 2.790 of the NRC's Rules of Practice, a copy of this letter will be available electronically from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/reading-rm/ADAMS.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Daniel M. Gillen, Chief
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-6940
License No. SMB-920

Enclosure: Request for Additional Information

cc: B. Okoniewski, Cabot

T. Knapp

2

January 14, 2003

In accordance with 10 CFR 2.790 of the NRC's Rules of Practice, a copy of this letter will be available electronically from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/reading-rm/ADAMS.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Daniel M. Gillen, Chief
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-6940
License No. SMB-920

Enclosure: Request for Additional Information

cc: B. Okoniewski, Cabot

DISTRIBUTION: Accession No.: ML030140561
Docket No. 40-6940 FCFB r/f JKinneman, RI ACNW

C:\ORPCheckout\FileNET\ML030140561.wpd

OFC	FCFB	C	FCFB	C	FCFB		FCFB	
NAME	EBrummett		BGarrett		GJanosko		DGillen	
DATE	1/10/03		1/10/03		1/10/03		1/10/03	

OFFICIAL RECORD COPY

REQUEST FOR ADDITIONAL INFORMATION
ON THE CABOT LICENSE RENEWAL APPLICATION

ATTACHMENT A - DECOMMISSIONING COST ESTIMATE

1. Incorrect Assumptions

Discussion: The Cabot Performance Materials (CPM) cost estimate assumed that (1) all stored ore and ore filtercake have been removed by CPM; (2) all operating areas have been cleaned to remove loose ore dust and filtercake; and (3) the decontamination of slightly contaminated equipment will be performed by CPM. However, Appendix F, page F22, of NUREG-1727 states that a site-specific cost estimate should approximate all direct and indirect costs of decommissioning under routine facility conditions. For example, assume inventories of materials and wastes consistent with routine conditions over time and include the cost to decontaminate possible but uncertain contamination. Also, it should be assumed that all the work will be performed by an independent third party (contractor), not the licensee.

Request: In a revised list of costs, include those for: (1) the transportation and disposal of the volume or weight of filtercake and ore that will be allowed to accumulate on the site during 2002 - 2004 (until next surety update) ; (2) cleaning all areas of ore dust and filtercake; and (3) decontamination of equipment by a third party.

2. Format and Lack of Details

Discussion: The NRC staff must determine that any potential decommissioning activity is identified and that a cost estimation based on current third party regional rates is provided and referenced to allow NRC staff to confirm the cost. Some examples of the types of detailed information and the format needed to allow this determination are:

- a) Tables or charts should identify each area or type of equipment to be decontaminated (walls, floors, tanks, ductwork, trucks) and each type of work (radiation surveys, concrete scabbling, backhoe operation), including the work days or hours required and the labor or rental rate.
- b) The executive summary for the 2002 cost estimate said a 15 percent contingency was included, but it is not indicated on the cost summary, Table 5-1. NUREG-1727, Section 3.1.2.3 (page F26), indicates that a 25 percent contingency factor provides reasonable assurance that unforeseen circumstances that could increase decommissioning costs are allowed for. A lower contingency value must be justified or else a 10 percent value for overhead and profit for the third party should be included.

Request: Provide a cost estimate that accounts for all anticipated decommissioning activities, (including transport, handling, and disposal of any mixed waste on site) and that contains unit costs for each type of activity based on current regional rates for labor, lab tests, and rental of equipment (radiation technician, uranium analysis, backhoe, truck, etc.). Reference the source of these cost estimates such as bills for recent analytical work, or the RS Means book of building construction cost data.

Enclosure

3. Cleanup Area/Volume

Discussion: The Boyertown site will need to meet the 25 mrem/yr limit (10 CFR 20.1402) for unrestricted use. Attachment A mentioned that dose modeling had been done to determine cleanup limits for uranium and thorium in soil and surface activity, but no information was provided so that NRC staff could determine if these values were appropriately determined. Also, the soil background levels for uranium, thorium, and radium (if radium will be used as a surrogate for scanning) were not provided. Also, there was no indication if uranium (U-238) and thorium (Th-232) progeny could be out of equilibrium in some media, such as the waste water sludge, and therefore might need to be addressed in the areas of cleanup. In addition, procedures for determining the size of contaminated areas were not discussed adequately so the staff could not determine that the area and volume estimates were reasonable.

Request: Provide the assumptions and input for the dose modeling. Provide uranium and thorium chain equilibrium data (or the chemical basis for assuming equilibrium) in the licensed material and waste, and a cleanup limit for any chain progeny that may significantly contribute to the dose from residual licensed materials. Also, summarize the procedures used to estimate the areas requiring cleanup, including background levels.

4. Filtercake (Mixed Waste) Disposal

Discussion: At the bottom of page 2 of Attachment A, it states that there is a potential to generate mixed waste, but the estimate does not include any costs associated with mixed waste handling or disposal. Also, Inspection Report 98-001 (March 2, 1999) noted on page A-19 that a considerable amount of solid waste contaminated with uranium and thorium as well as hydrofluoric acid is stored in a bin of the Mausoleum (bulk storage). In addition, Section 3.10 of Attachment A indicates that sending the filtercake (source material) stored in the bulk storage bins to a Utah uranium mill for processing is half as expensive as disposal at a radioactive waste disposal site. Based on the proposed revision to License Condition 15, the NRC staff will not review the decommissioning cost estimate again for 2 years (October 2004), and this disposal cost item is important.

Request: Although an annual average value can be used in the cost estimate, indicate the expected number of shipments and the total amount of filtercake or other mixed waste to be disposed of from late 2002 through late 2004. Also, indicate the current (late 2002) cost per ton to dispose of this filtercake, and if any disposal contracts are in place.

ATTACHMENT D - GROUNDWATER MONITORING WELLS

These requests are based on the review of reports submitted by the licensee, NRC licensing documents, and a site visit and meeting held on November 20, 2002.

5. Potentiometric Surface Map

Discussion: Only generalized information on the ground-water flow system at the site has been provided (see references). The flow pathways and the potential receptors associated with

those pathways are needed to evaluate the human health and environmental exposures from a potential release from the licensed site operations.

Request: Provide a potentiometric surface map of the shallowest monitored ground-water system for the entire site, depicting ground-water flow direction(s) and the elevation of the potentiometric surface. This map should include the well locations used to measure the ground-water elevations and the locations where licensed materials are processed and stored, along with the proposed background and monitoring well locations for the bulk storage area.

6. Well Construction Information

Discussion: The licensee proposes to change the monitoring locations for the NRC licensed activities. There may have also been some changes in other monitoring programs at the site since the previous license renewal. Current information is needed to complete the Environmental Assessment for the license renewal.

Request: Provide the following data for all wells at the facility. These wells should also be depicted on the potentiometric map.

Summary of Wells at the Cabot Facility					
Well Number	Date Constructed	Total Depth (feet)	Well Material ¹	Screened Interval (feet) ²	Purpose ³

¹ Material used to construct the well casing (e.g. Carbon Steel, PVC)
² Indicate whether well is screened or open hole intervals.
³ Water supply, quality monitoring PADEP, quality monitoring NRC, water level only

7. Travel Time

Discussion: The licensee indicated a desire to change the monitoring locations for the bulk storage area from those currently in the license. The potential travel time to the new monitoring locations is needed to determine the appropriateness of the proposed locations.

Request: Provide a calculation of potential travel time from the bulk storage area to each monitoring well, based on the flow gradients from the potentiometric map and the measured or estimated hydraulic conductivity of the Brunswick formation.

8. Constituents to be Monitored

Discussion: The licensee currently committed to monitoring many radiological constituents that may not be in the licensed material (see License Condition 14 C). This potentially adds confusion for reporting exceedances and NRC inspection.

Request: Provide a list of constituents and the associated concentration (action) limits appropriate for detecting a potential release from the bulk storage area.

9. Determination of an Exceedance

Discussion: False positive monitoring results can cause inappropriate notifications of releases of licensed material. Other licensees with extensive ground-water detection monitoring programs have committed to performing confirmatory sampling to verify that potential exceedances are indeed due to the release of licensed material, and not the result of aberrations in sample handling, laboratory analyses, or natural seasonal fluctuations in ground-water quality.

Request: Provide a description of the procedure CPM will follow to verify that a measured potential exceedance of a ground-water action limit is valid.

10. Actions Following an Exceedance

Discussion: Once an exceedance has been identified as valid, specific planned actions should start. These planned actions, (e.g., additional monitoring, fate and transport modeling, additional site characterization, or initiating corrective actions) should be based on reasonable contingencies that appropriately represent the potential risks and consequences of various release scenarios.

Request: Provide a description of the notifications, reports, and subsequent investigations or actions that will be made if a measured exceedance of a ground-water action limit is verified.

ATTACHMENT E - BIOASSAY PROGRAM

11. Bioassay

Discussion: In Attachment E, Table 2 provides a number for the intake that corresponds to 40 DAC-hours for the given activity ratio. Table 3 provides a number for the airborne concentrations in the mixture corresponding to the 1 DAC.

Request: Describe the assumptions and input parameters (intake rates, retention fractions, etc.) used in the calculations to facilitate our evaluation of the data.

ATTACHMENT F - OCCUPATIONAL AIR SAMPLING PROGRAM

12. U/Th Ratio

Discussion: During past inspections, CPM's RSO has indicated that the 60:40 ratio of uranium to thorium in the ore was fairly stable and consistent. In Table 6, the ratio is 75:25.

Request: Explain why the ratio is different, and if the past assumption of a stable ratio has been inappropriate.

13. Thorium Doping

Discussion: The mention of "thorium doping activities" on page 14 of Attachment F, is apparently the first mention of such activities in a CPM submittal (page A-9 of the October 23, 2001, Inspection Report, notes that 100 g of thorium is added once a month to tantalum powder). Data are needed for evaluation of Section 2.9 of Attachment F.

Request: Describe those activities and indicate what concentrations and physical forms of thorium are used, what pathways exist for exposure, and what controls are in place.

14. Sample Counting

Discussion: Data from area and breathing zone air samples are provided in Tables 7, 8, and 9 of Attachment F but lack supporting information.

Request: Provide additional information regarding how and where samples were taken, and how they were counted (types of instruments, how samples were handled, etc.) to facilitate our understanding of the data.

15. Sum of Fractions

Discussion: In Table 6 of Attachment F, for the sum of the fractions calculation for the mixture DAC, some isotopes were not considered. For the uranium chain, the 7.6 alphas include Rn-222 and Po-218, but they are not included in the calculations. For the thorium chain, the 5.7 alphas do not include Ra-228 and Ac-228, but their DACs are included in the calculation.

Request: Indicate why isotopes are included or excluded in each instance.

16. Dust Cyclone

Discussion: Section 2.7 of Attachment F contains an informal request to use a dust cyclone (GS-3 model) on personal air samplers. More information is needed to evaluate the justification for use of this type of sampler system.

Request: Provide a clear explanation of what is happening at the site to support use of a dust cyclone with the air samplers.

17. Air Particle Size

Discussion: The use of the sampling results in Attachment F completely ignores the dose contribution from the larger particles, without justification.

Request: Indicate what assumptions are employed (larger particles exhaled, larger particles trapped in nasal passages, larger particles cleared quickly from lungs), and what evidence support these assumptions. If data are not available to adequately characterize the particle

sizes distribution at the site and support the assumptions in the report, CPM should consider a particle size study as suggested in Regulatory Guide 8.9.

SAFETY ISSUES

18. Emergency Plan

A review of the CPM emergency plan by NRC staff on November 20, 2002, indicated that not all of the relevant recommendations of Regulatory Guide 3.67 (Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities, 1992) were addressed.

The revised emergency plan should include:

- a) a description of the licensed activities at the facility; the facility, including sites of potential emergency significance (gas lines, chemical tanks, electrical transformers and underground cables); and the general area including population centers, routes for emergency equipment access or for evacuation, locations of fire stations, hospitals, etc.
- b) a description and classification of each type of radioactive materials accident for which actions may be needed to prevent or minimize exposure of persons offsite. Accidents should be classified as an alert if release of radioactive material could occur, but the release is not expected to require a response by offsite organizations (see 10 CFR 40.4).
- c) identification of the organizational group(s) assigned to the functional areas of emergency activity (see list on page 9 of the regulatory guide).
- d) identification of principal governmental agencies or organizations that have responsibilities for radiological or other hazardous material emergencies at the facility.
- e) use of protective equipment and supplies; contamination control measures; and emergency radiation protection program (monitoring, decontamination, medical treatment), by reference if separate documents.
- f) a description of maintenance of emergency preparedness capability (means to up-date the emergency plan, training, drills, audits, and the availability of the plan to staff).
- g) a description of the assignment of responsibility for reporting and recording incidents that led to a plant emergency (including the cause and corrective actions taken), and maintaining records of preparedness assurance.
- h) information to demonstrate compliance with Title III of the Superfund Amendments and Reauthorization Act of 1986, "Emergency Planning and Community Right-to-Know Act of 1986," with respect to any hazardous materials at the plant site.
- i) a contact list of phone numbers including those for NRC Region I, NRC Headquarters project manager, and NRC Operations Center.

19. Radiation Safety Officer

Discussion: The footnote to Tables 5, 6, 7, and 8, from CPM's response 3 to the June request for additional information (RAI), states that no data was available for gross alpha and gross beta measurements (stream, sediment, and ground water) for two quarters in 1999, due to the departure of the Radiation Safety Officer (RSO) and the difficulty in acquiring a replacement. The licensee is expected to have an RSO available when needed and to provide the required monitoring data. If arrangements for an RSO are not adequate, a license condition will require appropriate on site personnel.

Request: Indicate what steps have been taken to prevent a detriment to human health and safety or to the environment when the RSO leaves or is unavailable.

20. Waste Water Sludge Release

Discussion: CPM has a release limit of 10 pCi/g uranium plus thorium for the waste water sludge that is delivered to a municipal landfill. Current NRC policy is that released license material should not create a potential exposure of greater than 25 mrem/yr.

Request: Indicate the potential dose to current and future users of the landfill from the released sludge, including the uranium and thorium progeny.

21. Building 73 Vacuum System

Discussion: The October 23, 2001, inspection report mentioned that the RSO was pursuing improvements to the vacuum system in Building 73. The improvements would reduce the amount of material that is re-suspended after cleaning the building. Any planned/significant changes to the facility operations must be considered in the staff's evaluation of potential safety impacts due to continued site activities.

Request: Provide documentation concerning the 2001 planned improvements to the vacuum system in Building 73 and when the changes were made. If the changes have not been made, indicate why.

22. Site Operations

CPM provided some information on site operations in the submittal of October 17, 2002. However, clarification on the following points is needed to complete the NRC evaluation.

- a) Page 4 of the submittal states that ore and tin slag are processed at the facility, but in discussions on November 20, 2002, the RSO stated that slag is no longer processed. Indicate when the use of slag was discontinued and if there are any health and safety impacts (e.g., higher uranium or thorium content of feed material) to this change in feed material.
- b) Page 7 states that the ALARA committee meets at least once a year, but page 11 says it meets at least once a quarter. Indicate the minimum number of ALARA committee meetings per year.

- c) Page 12 indicates that lapel personnel samplers are used on a weekly basis. However, in conversation, the RSO indicated such samplers are changed every shift (8 hours). Indicate when use of lapel samplers resumed and how often they are changed and analyzed.
- d) Page 18 provides wording for License Condition 14 that differs from the current license in stating an action level of 1 percent of the Part 20 Appendix B values instead of 5 percent. CPM should provide a separate submittal of all proposed license condition changes that are to be part of the license renewal, with the basis for such changes.
- e) Page 25 states that the licensee has committed to developing a process safety information document control system. Indicate when that control system should be functional.
- f) Any changes since the 1996 license renewal or any impending changes associated with licensed material, with a potential health and safety impact, should be discussed. If the ore warehouse is no longer used for licensed material, CPM should comply with 10 CFR 40.42(d) by notifying the NRC.

ENVIRONMENTAL ISSUES

23. Climatic Conditions

Discussion: The CPM response 2 to the June RAI did not provide information adequate for the evaluation of potential impacts to licensed site activities due to adverse extreme climatic conditions such as a tornado, flood, or earthquake.

Request: Provide information on what adverse climatic conditions can be expected at the site and the plans or measures that have been or will be taken to mitigate potential impacts on the control of radioactive and hazardous materials.

24. Cultural and Historic Resources

Discussion: The staff must confirm that measures are in place to protect cultural and historic resources (see Section 106 of the National Historic Preservation Act) at the licensed facility. A standard license condition requiring work stoppage and notification of NRC if any such resources are encountered is under consideration for the CPM license.

Request: The licensee should provide an update on any activities related to identification of potential cultural and historic resources and procedures in place to protect such resources.

25. Water Use

Discussion: The staff must consider current and future water uses in the area for the evaluation of potential health and environmental impacts. The land use survey provided by CPM as response 4 on October 11, 2002, indicated that a subdivision was under construction 2 miles southeast of the facility, but there was no mention of potential impacts.

Request: Provide an update for the current and future water uses (surface and ground water) in the area that are relevant to the evaluation of potential impacts of continued facility operation, including any significant changes that were not addressed since the last license renewal.

26. Improvements to Control of Licensed Material

Discussion: CPM's response 3 to the June RAI only states that in the summer of 2002, the storage bins' project to redirect sheet run off was completed. Information to assist the NRC to conclude that the environment is being adequately protected from the source material should be documented.

Request: Provide details on the 2002 project for the filtercake storage bins and any other control improvements since 1996 not previously mentioned, and indicate the effectiveness of such changes.

27. Threatened and Endangered Species

Discussion: To comply with Section 7 of the Endangered Species Act, NRC staff must ensure that the licensing action is not likely to jeopardize the continued existence of any endangered or threatened species or their habitat. A site survey of candidate, threatened, and endangered species (both State and Federal) is suggested, if one has not been performed in the last 5 years.

Request: Indicate potential impacts of facility operation to any protected species and how such impacts will be avoided or mitigated.

REFERENCES AND DOCUMENTS REVIEWED

Cabot Corporation, License Renewal Application for SMB-920 and SMC-1562. NUDOCS Number 9403180094, dated March 16, 1994.

Cabot Corporation, License Renewal Application for SMB-920, ADAMS Accession Number ML022840402, April 3, 2002.

Cabot Corporation, Response Attachment D - Technical Basis for the Location and Screen Interval of Groundwater Monitoring Wells at Cabot Performance Minerals Corporation Boyertown, Pennsylvania Plant. ADAMS Accession Number ML023300367, August 9, 2002.

Cabot Corporation, Responses to Cabot Corporation Request for Additional Information, Renewal of NRC Source Material License SM-920. ADAMS Accession Number ML022840395, October 11, 2002.

U.S. Nuclear Regulatory Commission Materials License SMB-920, Amendment 5. Authorize the Use of Electronic Information Exchange. ADAMS Accession Number ML020650003, March 6, 2002.

U.S. Nuclear Regulatory Commission Materials License SMB-920, Amendment 1. Change Investigation Action Level of Groundwater Samples. NUDOCS Numbers 9706270307 (Amendment) 970630020 (SER), June 25, 1997.

U.S. Nuclear Regulatory Commission, Environmental Assessment for Renewal of Source Material License No. 40-6940 Cabot Performance Materials Cabot Corporation Boyertown, Pennsylvania. NUDOCS Number 9610020004, and ADAMS Accession Number ML023310542, September 1996.

U.S. Nuclear Regulatory Commission, Inspection Report 040-06940/98-01, NUDOCS Number 9903110160, March 2, 1999.

U.S. Nuclear Regulatory Commission, Inspection Report 04006940/2001001, ADAMS Accession Number ML012970344, October 23, 2001.