

**RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
ON THE CABOT LICENSE RENEWAL APPLICATION (14 January 2003)**

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.

Response: A revised Decommissioning Cost Estimate, dated July 11, 2003 has been developed and submitted. Costs were modified to account for third-party contractors performing all tasks, cleaning all areas of ore dust and presscake (filtercake), and transportation and disposal of the appropriate quantity of presscake. Appendix B of the revised document includes tables demonstrating the build-up of costs in support of a summary table that shows the final amount.

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:

- 1) 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.
- 2) 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.

Response: The tables in Appendix B of the revised cost estimate provide the requested unit costs, details of quantities and activities, and references. Three primary references listed below were used in determining current and appropriate unit rates for equipment rental, labor, expendables, and time estimates.

- ☐ Current quotes or existing contract rates of transportation and disposal charges acquired from brokers, transportation companies, and the licensed disposal sites that are currently acceptable to CSM,
- ☐ Fully burdened labor rates that have been quoted by Weston Solutions in competitive bids for similar work proposed in the past year, or
- ☐ Regional rates (fully burdened) for construction labor and equipment rental quoted in industry references, such as “RS Means Labor Rates for Construction Industry, 2002” for the Reading, PA region.

The contingency amount was left at 15% and the following justification for using a contingency factor less than 25% was provided in the Executive Summary and section 5.2.8 of the report.

- ☐ The approach to estimating costs is generally as would be performed by a contractor developing a construction bid. All labor is assumed to be performed by private contractors at rates that include at least a 10% profit margin.
- ☐ The estimate is detailed and conservative in many of its assumptions, thereby limiting the potential for omitting relevant expenses.
- ☐ The conditions at the site are well known, the site has no periods of unknown or uncontrolled operations, and the site owners/operators have generally complied with regulatory requirements. This limits uncertainty regarding contamination levels and site conditions.
- ☐ The quantities of licensed radioactive materials and the site areas where they are handled are small compared with many industrial operations such as uranium mills. This limits the potential for significant costs to be overlooked.

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 wastewater 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.

Response: Assumptions and inputs for the dose modeling that supports the cost estimate is described in sections 4.6, 4.7, and the related attachments of the revised cost estimate. Uranium and thorium chain equilibrium data and conclusions are provided in section 4.5 and related attachments of the revised cost estimate. The procedures used to estimate the areas requiring cleanup and to determine background levels at the site are provided in sections 4.1, 4.4, 5.1, and 5.2 of the revised cost estimate.

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.

Response: The statement that referred to mixed waste at the bottom of page two in the original cost estimate applied to the potential to develop mixed waste during decontamination activities, because wash water, solvents, and radioactive material can inadvertently (or sometimes unavoidably) be mixed during site activities, and mixed wastes can result if levels are significant. Mixed wastes are not generated during routine operations at the Boyertown plant, and are not expected to be generated during decommissioning activities. The statement was revised to read as follows in the current document:

“Cleanup and release activities will be conducted without generating any mixed wastes (chemical hazardous waste mixed with regulated quantities of radioactive material). This is reasonable because waste minimization processes will be employed, and the low levels of radiation at the site and the known characteristics of the materials handled are unlikely to result in a mixed waste.”

ATTACHMENT D – GROUNDWATER MONITORING WELLS

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.

Response: License condition 14 has been modified to specify that samples will be analyzed for natural uranium, radium-226, and radium-228.

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.

Response: When groundwater sample results are received, reviewed in a timely manner, and found to exceed CSM's administrative limits, appropriate CSM internal managers will be notified. Following management notification, the following sequential reviews will be completed in a timely manner. A close review of the analytical data will be performed to ensure that lower limits of detection and measurement sensitivities were adequate to determine that the applicable limit was actually exceeded. Then the laboratory will be contacted and asked to review their records for the specific analyses in question to determine if any flags had been noted, or unusual conditions identified in the relevant calibration or analytical processes. If a problem is noted that requires re-analysis, stored sample residues will be used to acquire the new data. If insufficient sample volume remains, a new sample will be acquired in the field and sent for analysis. CSM will request expedited analysis and delivery of data. Notification of CSM management and appropriate regulatory contacts will be made if limits are exceeded and results are verified in a repeat analysis or data from a second sample set.

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.

Response: Notifications and reports to the NRC will be as described in License Condition 14. After verification that limits have been exceeded, and notifications have been made, CSM will enlist the aid of their hydrology experts, either on-staff or under contract, to evaluate the potential impact of the apparent release of material that could have resulted in the levels that have been detected. A graded approach will be taken to the response depending upon the severity of the potential impacts, and the following text describes the range of follow-up actions that can be employed as contingencies. First, additional sampling of existing wells on-site and in nearby down gradient locations can be initiated. Second, sampling frequencies can be increased for wells in the affected area so that conditions are tracked on a shorter time frame and trends can be more easily and quickly determined. To further support determinations of the potential impacts and corrective actions, hydrologists can perform fate and transport modeling to determine the areas of expected migration, maximum contaminant levels expected, health impacts to be averted, and supplemental monitoring well locations to be established. Incremental status reports need to be developed and submitted to CSM management and regulatory agencies as the magnitude of the problem becomes known and alternatives for corrective action are developed and considered. Input and feedback from hydrology experts, management, and regulatory agencies need to be part of the decision process. Finally, CSM may need to develop a written plan for corrective actions to ensure that the involved parties know and agree on the actions that are chosen for mitigation and remediation.

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.

Response: The "Review of the Bioassay Program at the Cabot Supermetals, Incorporated Boyertown, Pennsylvania Plant" was revised (dated June 9, 2003) and submitted with this reply to the NRC's Request for Additional Information. The requested information is provided in sections 4, 5, and 6 of the revised document.

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.

Response: The assumption of a stable 60:40 ratio was appropriate for the majority of the time the plant has been in operation, and for the range of data that spanned several years. However, when recent data for a narrow one-year period were reviewed the ratio was different. The sources of ore have changed slightly over time, and the quality of the ore has degraded in recent years as the higher-grade ores were consumed according to CSM's Director of Operations, John Kimmel. The newer uranium to thorium ratio is expected to be more appropriate for the lower grade ores. A statistical analysis of the isotopic ratios in ores received in 2001 (more than 200 shipments) and a calculation of the derived air concentration (DAC) for isotopic mixtures using conservative assumptions is described in section 2 of the "Review of the Occupational Air Sampling Program at the Cabot Super Metals, Incorporated Boyertown, Pennsylvania Plant" that was revised June 9, 2003 and submitted with this reply to the NRC's Request for Additional Information.

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.

Response: The thorium doping operation is a recently developed activity that uses thorium nitrate in quantities that can be acquired under the supplier's general license. This activity is described in the review of the air-sampling program because it was important to address the potential for inhalation of radioactive material in the doping room and to consider listing the small quantities of thorium nitrate in the site license. The facility and activity are described in section 2.8 of the revised air sampling program review. The potential worker exposures are evaluated and recommendations for air monitoring and respiratory protection are also provided.

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.

Response: Text has been added to section 2.7 of the document to describe the types of samples, and the procedures for collecting and counting them.

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.

Response: An extensive explanation of the process for calculating the mixture DACs has been added to the revised document in sections 2.3 thru 2.6.

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.

Response: The request to use a dust cyclone has been abandoned, as explained in paragraph 5 of section 1 in the revised air-sampling program review.

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.

Response: Data on particle sizes are not available for the site. The revised air sampling program review incorporates particle size assumptions as noted throughout the document that are consistent with applicable NRC guidance documents or ICRP recommendations.

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.

Response: All of the information required by Regulatory Guide 3.67 to be in the Emergency Plan has existed in various plant documents. In order to more easily demonstrate compliance with the NRC guidance, the Emergency Plan will be revised during its routine review in 2003 to incorporate all of the items listed above. The revised document will be completed and in use by September 30, 2003.

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.

Response: There have been significant changes in the management structure at CSM since 1999, when some of the environmental and effluent measurements seem to have been overlooked. The current management team has demonstrated its commitment to fully supporting the radiation

safety programs through direct involvement in the ALARA Committee and direct interaction with the RSO. The RSO has established back-up systems by which his responsibilities are covered when he is not on-site and he is accessible to his staff for direct communication. License Condition 20 documents that CSM is committed to ensuring the RSO duties are assigned and carried out at all times by a qualified individual, and to implementing a system for back-up, on-call support to ensure coverage during any lapse in the RSO's support.

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.

Response: The Building 73 Spencer Vacuum system upgrades were completed in the spring of 2003. These upgrades include a complete evaluation of the efficiency of the system, addition of roof ports at each classifier, side ports at the Hapman drive unit and torrit baghouse, and additional pickup points inside the building. In addition to the system upgrades, several vacuum attachments were purchased to aid in the vacuuming of the work areas and avoid clogging of the system. To date the system has been operating without incident.

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.

- 1) 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.
- 2) 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.
- 3) 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.

- 4) 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
- 5) 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.
- 6) 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.

Response: A response to each of the six items is provided and number respectively below.

- 1) Tin slag was last received as feed material prior to the time that the current RSO was employed, and no record was found that specified a time at which tin slag processing was discontinued. However, it likely occurred in the mid 1990's between the time the last license renewal application was submitted (1993) and the hire date for the RSO. No significant impact to the radiation protection programs would be expected based on this change for the following reasons: a) no significant change in monitoring results have been noticed during or after the period when tin slag was used; b) no significant concentrations of radioactive material have been detected in occupational or environmental measurements, so health and safety impacts have been negligible during both periods; and c) prior evaluations of feed materials have not indicated enough difference in the radioactive characteristics in the slag and the ores to require developing separate factors, DACs, or limits for the two sources.
- 2) The ALARA committee is required to meet annually, but may meet more frequently.
- 3) The weekly frequency was a misstatement and likely applied to the frequency of area air samples. When they are used, lapel samplers are operated only for the duration of the worker's shift, primarily because work involving potential airborne radioactive material usually proceeds intermittently through a week. The Occupational Air Sampling Program Review document provides justification for using area air samplers for routine monitoring, and using lapel samplers only for special conditions such as tasks that require development of a radiation work permit.
- 4) License Condition 14 is modified as in the attached list of license conditions to read that administrative limits are set at 30% and 80% of the Part 20 Appendix B values for Level 1 and Level 2 corrective actions, respectively. These revised administrative limits are justified because the site maintains an extensive history of monitoring results without significantly exceeding limits such that NRC-notification was

required, and because internal action levels at 30 and 80 per cent of the regulatory limits are reasonable commonly applied in industry.

- 5) The new process safety information (PSI) document control system was completed and operational as of June 30, 2003.
- 6) The ore warehouse continues to be used when handling licensed material. The licensee is committed to notifying the NRC compliance with License Condition 17 for any changes in operations or facilities, and in compliance with Part 40.42(d) for facilities that are no longer used for handling licensed material.

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.

**Conditions for License SMB-920 Renewal
Cabot Supermetals, July 15, 2003**

Items 6, 7, and 8.

Natural uranium and thorium / any form / 400 tons as elemental uranium and thorium

Sealed sources: strontium-90 / electroplated metal / 5 uCi total activity
 thorium-230 / electroplated metal / 5 uCi total activity
 natural uranium / metal / 5 nCi total activity
 radium-226 / metal / 5 uCi total activity

Condition 9. Authorized place of use: The licensee's facility at County Line Road, Boyertown, Pennsylvania.

Condition 10. Authorized use: Receipt, possession, and processing at the Boyertown, Pennsylvania facility in accordance with the statements, representations, and conditions specified in the licensee's renewal application dated March 29, 2002; and supplements dated September 27, 2002; March 27, 2003; June 30, 2003, and July 15, 2003.

Condition 11. The licensee shall document all ALARA Committee recommendations proposed in each meeting for achieving ALARA in radiation protection. A copy of the recommendations shall be provided to the General Manager.

Condition 12. Deleted by Amendment 1, June 1997.

Condition 13. Release of equipment, facilities, or packages to the unrestricted area or to uncontrolled areas on-site shall be in accordance with applicable NRC guidance, including the "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," dated April 1993.

Condition 14. The licensee shall collect the following samples at the Boyertown site on a quarterly frequency and analyze for natural uranium, radium-226 and radium-228.

- a) Effluent at Outfall 001.
- b) Upstream and downstream water samples (relative to Outfall 001) of West Swamp Creek.
- c) Groundwater samples from Monitoring Wells MW-3, 4, 95-01, 95-03, 95-04, 97-06, and Production Well 2 identified in Figure 1 of the license renewal application submittal dated March 26, 2003.
- d) Sediment samples from upstream and downstream of Outfall 001 in West Swamp Creek.

If the concentration of a radionuclide specified in the licensee's monitoring plans exceeds 30 percent of the corresponding value in Table II, the licensee shall implement a Level 1 response that consists of internal notification of management and investigation of potential causes of elevated readings. If the concentration of a radionuclide specified in the licensee's monitoring plans exceeds 80 percent of the corresponding value in Table II, the licensee shall implement a

Level 2 response that consists of Level 1 actions, implementing timely corrective actions to minimize the potential to exceed the regulatory limits, and reporting the incident to the Administrator, Region I, of the U.S. Nuclear Regulatory Commission, within 30 days after the analysis is received by the licensee.

The licensee shall maintain a record of all monitoring results obtained in accordance with this license condition for a minimum of five years.

Condition 15. Every two years starting June 30, 2003, the licensee shall evaluate the estimated decommissioning and closure cost estimate and the financial surety arrangements, if accomplished by a third party for all existing operations and any planned expansions or operational changes for the upcoming year. Such costs include all cited activities and groundwater restoration, as well as off-site disposal of materials contaminated in excess of release limits. Along with each proposed revision or update of the surety, the licensee shall submit supporting documentation showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation, maintenance of a minimum 15% contingency, changes in engineering plans, activities performed, and any other conditions affecting estimated costs for site closure.

The amended financial surety instrument (e.g., letter of credit) incorporating the revised decommissioning cost shall be provided to the NRC within 60 days of the NRC's approval of the new surety amount. The surety instrument shall not be changed without NRC approval.

The required original signed documents will be sent to:

c/o Document Control Desk, Chief, Fuel Cycle Facilities Branch, Division of Fuel Cycle Safety and Safeguards, Mailstop T8-A33, U.S. Nuclear Regulatory Commission, 11545 Rockville Pike, Rockville, MD 20852-2738.

Condition 16. In accordance with the provisions of 10 CFR 40.14, "Specific Exemptions" and notwithstanding the requirements of 10 CFR 40.5, "Communications," the licensee is hereby authorized to submit electronically any communication or report concerning the regulations in Part 40 and any application filed under these regulations.

Condition 17. The licensee may, subject to conditions specified in this condition and without obtaining a license amendment pursuant to 10 CFR 40.44, make changes in the facility, make changes in the procedures, and conduct test or experiments not described in the license application.

The licensee shall obtain a license amendment prior to implementing a change, test, or experiment that would result in the following, as previously evaluated in the license application referenced in Condition 10:

- a) Any appreciable increase in the frequency of occurrence of an accident;
- b) Any appreciable increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety;
- c) Any appreciable increase in the consequences of an accident;

- d) Any appreciable increase in the consequences of a malfunction of an SSC;
- e) A significant departure from the method of operation described in the license application (as updated); or
- f) Create a possibility of an accident different than previously evaluated in the license application referenced in Condition 10, or
- g) Create a possibility of a malfunction of an SSC with a different result than previously evaluated in the license application referenced in Condition 10.

The licensee's Safety and Environmental Review Panel (SERP) shall make determinations concerning the above considerations. The SERP shall consist of the following individuals, at a minimum: one member with expertise in management (e.g., the Plant Manager) who is responsible for financial approval for changes; one member with expertise in operations and/or construction (e.g., the Chemicals Area Supervisor) who is responsible for implementing any operational changes; and the radiation safety officer (RSO) or equivalent, who is responsible for assuring changes conform to radiation safety and environmental requirements. Additional members may be included in the SERP as appropriate, to address technical aspects such as groundwater, hydrology, surface-water hydrology, specific earth sciences, and other technical disciplines. Temporary members or permanent members, other than the three above-specified individuals, may be consultants.

The SERP shall maintain records of any changes made pursuant to this condition. These records shall include written safety and environmental evaluations made by the SERP that provide the bases for determining changes are in compliance with the requirements of this condition. Such records will be available for review by the NRC upon inspection.

Condition 18. All written notices and reports to NRC required under this license shall be addressed: c/o Document Control Desk, Fuel Cycle Licensing Branch Chief, Mail Stop T8-A33, Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Materials Safety and Safeguards, U. S. Nuclear Regulatory Commission, 11545 Rockville Pike, Two White Flint North, Rockville, MD 20852-2738.

Incident and event notifications, which require telephone notification under 10 CFR 20.2202 and 10 CFR 40.60, shall be made to the NRC Operations Center at (301) 816-5100.

Condition 19. The licensee shall submit a Final Decommissioning Plan to the NRC at least 6 months prior to the planned commencement of decommissioning of the processing facility.

Condition 20. The licensee shall ensure that the duties of the Radiation Safety Officer (RSO) are assigned to and carried out by a responsible, qualified individual at all times during plant operation. The licensee may define and implement a system to provide back-up, on-call support for the RSO to ensure that lapses in coverage do not occur.

Condition 21. The licensee will maintain documentation of unplanned releases of source materials and related process chemicals. Documented information shall include, but not be

limited to: date, volume, total radionuclide inventory released, radiological survey and sample results, corrective actions, results of post remediation surveys (if taken), and a map showing the spill location and the impacted area. Documentation will be retained by the RSO for review by the NRC upon inspection.

The licensee will evaluate the consequences of the spill or incident/event against 10 CFR 20, Subpart “M,” and 10 CFR 40.60 reporting criteria and report to the NRC Operations Center as required. If the licensee is required to report any incident, spill, or leak of source materials or process chemicals that has a significant radiological impact on the environment to State or Federal Agencies other than the NRC, a notification shall be made to the NRC Headquarters Project Manager (PM) by telephone or electronic mail (e-mail) within 48 hours of the determination of reportability. A follow-up written report will be provided if required by the NRC Headquarters PM.