

January 19, 2001

Mr. Ben Baker
Project Manager
The Dow Chemical Company
9008 Bldg. Office 154
4520 E. Ashman
Midland, MI 48674

SUBJECT: REQUEST TO REMOVE TH-230 FROM THE REMEDIATION PLAN FOR THE
BAY CITY SITE (TAC L60463)

Dear Mrr. Baker:

I am responding to your request of October 22, 1999, to amend your license to remove Thorium-230 (Th-230) from the approved remediation plan for the Bay City, MI, site. As discussed in more detail in the enclosure, we have concluded that the information provided to date does not support the requested action. Should you decide to supply additional information to support this request, we request that you do so within 60 days of the date of this letter.

If you have any questions concerning this response, please contact Mr. Sam Nalluswami of my staff at (301) 415-6694.

Sincerely,

/RA/

Larry W. Camper, Chief
Decommissioning Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Enclosure: Analysis of Request

Docket No.: 040-00017
License No.: STB-527

cc: D. Minnar, MDEQ
Dow Dist. List

ANALYSIS OF DOW AMENDMENT REQUEST DATED OCTOBER 22, 1999, TO REMOVE TH-230 FROM THE REMEDIATION PLAN FOR THE BAY CITY SITE

1. INTRODUCTION

In a letter dated October 22, 1999, the Dow Chemical Company (DCC) forwarded a license amendment request to remove Thorium-230 (Th-230) from its approved remediation plan and apply the unrestricted release criteria for natural thorium contained in Option 1 of the Branch Technical Position (BTP) entitled *Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations* (46 FR 52601, October 23, 1981). In a letter dated December 27, 1999, the U.S. Nuclear Regulatory Commission (NRC) staff informed DCC of the successful completion of the staff's acceptance review. In addition, this letter documented an agreement for DCC to obtain 10 to 15 additional soil samples from hot spots and provide the results to the NRC for review. The letter noted that this information was needed for the technical review to proceed. The additional data was initially submitted by e-mail on February 24, 2000, and subsequently in a letter dated November 17, 2000.

2. BACKGROUND

The radiological release criteria were included in License Amendment No. 7 which was approved and forwarded to DCC on July 21, 1997. Section 6.1.1 of the environmental assessment (EA), which accompanied the license amendment, documents the soil release criteria. The EA documents the adjustments needed, and the bases for these adjustments, to the BTP Option 1 criteria for thorium because of the presence of Th-230. A copy of the EA is attached for reference.

Because the remediation plan was submitted prior to August 20, 1998, and approved by the NRC staff prior to August 20, 1999, the plan complied with the requirements of 10 CFR 20.1401(b) for use of release criteria contained in the Site Decommissioning Management Plan (SDMP) Action Plan of April 16, 1992 (57 FR 13389). The SDMP Action Plan criteria includes Option 1 of the BTP.

3. EVALUATION

The licensee's request and supporting information do not take issue with any of the findings in the EA. Rather, the licensee's request appears to be based on its assertion that its license "...was for ²³²Th metal, for use in the production of magnesium-thorium alloying process, and at no time was Uranium or ²³⁰Th ever used in this process." The licensee apparently references uranium because Th-230 is a natural decay product of the uranium-238 decay chain and is not a decay product of Th-232. Therefore, the concentration of Th-230 is independent of the Th-232 concentration.

Contrary to the licensee's assertion, throughout the history of the license, the licensed material was simply "thorium". Consistent with Atomic Energy Commission/NRC licensing practice for source material, the license addressed possession and use only in units of mass/weight. Furthermore, the licensee has not supplied any information to support its position that Th-230

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was not used nor has it explained, given this position, the reason for the elevated Th-230 levels at the Bay City site. Therefore, lacking additional information, this position can not be accepted.

While possession and use were regulated on a mass/weight basis, decommissioning criteria are radiological in nature. Isotopes which may be insignificant in terms of mass may become important in a radiological assessment. Th-230 is such an isotope.

Because the licensee has not demonstrated that Th-230 was not licensed, it is necessary to examine the radiological impact of Th-230 on the Option 1 limit. The framework for analyzing this impact is contained in Section 6.1.1 of the aforementioned EA. Table 1 on page 4 of the EA illustrates this impact. If it could be demonstrated that the Th-230 concentrations are sufficiently small (e.g., average concentrations \ll 4 pCi/g), it could be argued that the presence of Th-230 can be ignored. It is for this reason that the "hot spot" data was requested in the acceptance review letter dated December 27, 1999.

The licensee's amendment request provides data to demonstrate that the average radioactivity concentration ratio of Th-232 :Th-230 ranges from 1:3 to 1:1. The data submitted by DCC on November 27, 2000, has an average ratio of approximately 1:3. Using the table in the EA, a 1:3 ratio results in allowable Th-232 and Th-228 concentrations of 2.9 pCi/g (vs 5 pCi/g under Option 1). Even at the ratio of 1:1, the allowable Th-232 and Th-228 concentrations are reduced to 4.1 pCi/g. Because of the magnitude of these reductions, the presence of Th-230 can not be ignored.

SUMMARY

Unless DCC can demonstrate that Th-230 was not, and should not have been, licensed material, the foregoing analysis demonstrates that the impact of Th-230 in determining allowable radiological concentrations of Th-232 and Th-228 is such that Th-230 can not be ignored.

Attachment: EA for Amendment 7

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Sincerely,
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Enclosure: Analysis of Request

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cc: D. Minnar, MDEQ
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