

POLICY ISSUE

(Notation Vote)

May 18, 2006

SECY-06-0117

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations /RA/

SUBJECT: TERMINATION OF NUCLEAR REGULATORY COMMISSION LICENSE
FOR THE HERITAGE MINERALS INC. SITE IN MANCHESTER
TOWNSHIP, NEW JERSEY

PURPOSE:

To inform the Commission of the results of the staff's assessment of potential doses to the public from residual radioactive material remaining at the Heritage Minerals Inc. (HMI) site, and to obtain Commission approval to terminate the Nuclear Regulatory Commission (NRC) license and release the site for unrestricted use. This paper does not address any new resource implications.

SUMMARY:

The radiological criteria for license termination specified in 10 CFR Part 20, Subpart E, do not apply for certain licensees with NRC-approved Decommissioning Plans (DPs) that are in accordance with the Site Decommissioning Management Plan (SDMP) Action Plan criteria. This paper discusses the decommissioning and related staff actions for such a site. The HMI site meets the cleanup criteria in its approved DP, but the resultant dose is greater than the radiological unrestricted release criterion of 25 millirem/year (mrem/yr). The Commission directed the staff to obtain Commission approval prior to releasing grandfathered sites when, after completing decommissioning, the dose from residual radioactivity exceeds the unrestricted release provision. This paper describes the HMI site licensing and decommissioning history

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and presents the results of a staff dose assessment. Based on the licensee's completion of activities required by their approved DP, the staff recommends that the Commission approve termination of HMI's NRC license and release of the site for unrestricted use.

BACKGROUND:

The HMI site is a former minerals mining and processing facility, owned by HMI, which is located in Manchester Township, New Jersey within the Pine Barrens. The site, like the surrounding properties in Ocean County is flat with coastal sands. Although the site consists of almost 7000 acres, mining and processing operations took place on approximately 287 acres, and NRC-licensed areas comprised less than one acre. The facility was used from 1973-1989 for the mechanical processing of dredged native sand to extract titanium- and zirconium-bearing heavy minerals. The native sand also contains natural uranium and thorium, which were concentrated in the process waste tailings. In 1989, HMI began reprocessing the tailings to extract any remaining heavy minerals. The resultant waste tailings contained a concentration of uranium and thorium in excess of 0.05% by weight, exceeding the 10 CFR 40.13(a) unimportant quantity exemption for source material. HMI segregated the source material and applied for an NRC license.

Before the license was issued, reduced demand caused HMI to cease processing activities. The NRC license, issued in 1991, authorized possession of the stockpiled source material and decommissioning of the impacted areas of the site (specified as the two mill buildings and the ground beneath the stockpile). The ground between and surrounding the impacted areas contains diffuse thorium and uranium concentrations above background but below 0.05%, resulting from staging and regrading waste sands from previous (unlicensed) processing activities. This material remained exempt from NRC regulations. In 1992, HMI was designated a SDMP site.

When the "License Termination Rule" (LTR) was promulgated (10 CFR 20, Subpart E), it included a provision to address sites that had developed DPs and committed to meet SDMP Action Plan criteria. Section 10 CFR 20.1401(b)(3) grandfathered sites with DPs that were submitted to the NRC before August 20, 1998, and approved by August 20, 1999. In SECY-99-195, "Notation Vote on an Exemption for Decommissioning Management Program Sites with Decommissioning Plans Under Nuclear Regulatory Commission Review and Eligible for Grandfathering, Pursuant to 10 CFR 20.1401(b)(3)," July 19, 1999, the approval date was extended to August 20, 2000, for twelve sites, including the HMI site. Decommissioning of grandfathered sites is performed in accordance with the SDMP Action Plan (SECY-92-106), "Action Plan to Ensure Timely Remediation of Sites Listed in the Site Decommissioning Management Plan," April 3, 1992, under which cleanup criteria are based on residual contamination levels. Remediation is considered to be complete when the actions described in the approved DP are completed. In addition, Commission approval is required prior to releasing grandfathered sites when the dose from residual radioactivity after completing decommissioning exceeds the unrestricted release provision in the LTR (25 millirem per year (mrem/yr)).

In March 2005, HMI completed the decommissioning activities described in its approved DP, and requested termination of its NRC license. A staff dose assessment (Enclosure 1) of the NRC-licensed areas indicates that the resultant total effective dose equivalent (TEDE) to an average member of the critical group is greater than 25 mrem/yr. HMI has remediated its licensed areas to the contamination levels specified in its approved DP, which are the cleanup standards to which all licensees were held before promulgation of the LTR. These cleanup standards were not dose-based, but were considered to result in a dose less than 100 mrem/yr.

DISCUSSION:

The HMI DP, approved in September 1999, committed to meet the SDMP Action Plan criteria, specifically, 5 picoCuries per gram (pCi/g) total thorium and 5 pCi/g total uranium. Primary decommissioning activities occurred between 1999 and 2001, and consisted of facility decontamination and shipment of the stockpiled waste. HMI submitted a Final Status Survey (FSS) report in November 2001.

An NRC confirmatory survey in December 2001 indicated that contamination remained on surfaces within the mill buildings and that pockets of source material (> 0.05% by weight concentration) existed both in the footprint of the former stockpile area and around the mill building pads. The pockets around the mill pads were outside the boundaries of the defined NRC-licensed areas. HMI contended that these were localized areas where non-licensed sands from past operations (1972-1989) had been regraded and/or staged, and enough had built up to exceed the unimportant quantity concentration. The sands surrounding the pockets also contain elevated concentrations of thorium and uranium, although not in amounts exceeding 0.05%. NRC staff agreed that the elevated samples were not from the waste stream covered by the license, and did not amend the HMI license to add the material in these soil locations. However, because the concentration of source material in several locations exceeded the unimportant quantity exemption, they were deemed by NRC staff to be "licensable." The NRC required that HMI remediate the pockets to meet the contamination levels specified in the DP. Based on the confirmatory survey, the site did not meet the approved criteria for unrestricted release. Further, the NRC identified an apparent violation of the Decommissioning Timeliness Rule 10 CFR 40.42(h)(1), because more than 24 months had passed since approval of the DP. Following a January 8, 2003, Predecisional Enforcement Conference related to this apparent violation, HMI committed to a plan and schedule for completion of site remediation.

Further decommissioning in April/May of 2003 involved demolition and decontamination of the mill buildings and equipment, and excavation of the source material pockets. A second NRC confirmatory survey in September 2003 confirmed that the mill pads met the decommissioning criteria, but identified additional pockets of source material. Following remediation of these pockets in December 2004/January 2005, HMI and NRC performed a walkover survey and did not identify any remaining licensed material onsite.

The NRC performed a dose assessment of the licensed areas (the mill pads and former stockpile area) to determine the potential dose impact from the remaining residual radioactivity.

The mill pads were modeled assuming reuse of the structures for residential occupancy. The highest resultant dose, assuming an individual is continuously on either pad for 75% of a year, is 1.6 mrem/year. The former stockpile area was modeled using two potential scenarios to remain consistent with the realistic scenarios approach discussed in SECY-03-0069, "Results of the License Termination Rule Analysis," May 2, 2003. The most likely reuse scenario for the HMI site is the construction of a suburban housing development, based on licensee documented intent and development trends for the surrounding area. A "Suburban Resident" scenario assumes an individual is impacted by direct radiation exposure, inhalation and ingestion of re-suspended soil, and ingestion of produce grown in a private garden. The highest resultant dose from this scenario is 40 mrem/year. The other scenario examined for the contaminated soil is the "Resident Farmer," which is impacted by all the factors affecting the Suburban Resident, with the addition of: contaminated irrigation and drinking water, ingestion of animals raised onsite using feed and water from potentially contaminated sources, ingestion of fish from a potentially contaminated pond, and ingestion of a greater amount of produce. Although a residential farm is deemed an unlikely future use for the HMI site, and the tightly bound thorium and uranium in the monazite sands is not likely to contaminate the groundwater, it was evaluated as a bounding scenario. The highest resulting dose in this case is 83 mrem/year.

The staff dose assessment only considered the exposure to the public from the residual radioactivity within the boundary of the NRC-licensed areas. The average concentration of thorium-232 (the greatest contributor to radiation exposure) within this area is 2.3 pCi/g. The soil outside the NRC-licensed areas contains measured thorium concentrations ranging from well below 1 pCi/g to greater than 44 pCi/g. Source material concentrations outside the NRC-licensed areas may exist up to just below 0.05%. The dose to the public from the elevated concentrations of natural thorium and natural uranium from past site operations is expected to exceed the calculated dose within the licensed area. Because this material originated from unlicensed activities, and never reached the defined concentration of source material, NRC did not require its remediation. Decommissioning of the remainder of the site falls under the jurisdiction of the State of New Jersey. HMI has provided the New Jersey Department of Environmental Protection (NJDEP) its proposed plan for remediation of the entire site to the state cleanup levels, based on 15 mrem/year TEDE.

NRC staff has held numerous discussions with NJDEP staff regarding the licensing and decommissioning of the HMI site. The NJDEP has disagreed with NRC's licensing of only the source material and the plant structures and affected equipment. The State's position is that NRC should extend its jurisdiction over the whole site, and require that this entire area be remediated. The NJDEP also commented that the NRC dose assessment did not consider the dose impact from the material outside the boundaries of the NRC-licensed areas. The NRC staff maintains that NRC jurisdiction at the HMI site only extends to the waste and soil that contained concentrations that met or exceeded the 0.05% by weight definition of source material and the impacted equipment and structures. Earlier operations at the site also concentrated the native natural thorium and natural uranium in the soil, but not to levels that meet the definition of source material. The elevated thorium and uranium concentrations in this soil would exist at the site even if HMI had not concentrated source material and been required

to obtain an NRC license for a portion of the site. The remaining material at the HMI site falls under State jurisdiction.

The staff considered a NJDEP suggestion that NRC maintain oversight of the HMI site until the entire property has been remediated to the state cleanup standards. This would require holding the NRC license in abeyance until all decommissioning required by NJDEP at the site is complete. The NJDEP stated a concern that source material exceeding 0.05% by weight, and therefore, requiring a NRC license, may be discovered in subsurface areas during cleanup of the remainder of the site. The staff considers this to be an unlikely possibility based on the results of both NRC and licensee surveys of the areas around the former mill buildings and the remainder of the site impacted by mining operations. The staff concluded in its final walkover survey that all licensable material has been removed from the site. To address the state-regulated radioactive material, HMI submitted a site remediation plan to NJDEP that would use large scale soil mixing of the entire affected site. HMI indicated to the staff that this process may require several years to complete (the site may be remediated in sections). The staff concludes that requiring HMI to maintain its NRC license for this length of time, when there is no regulatory, public health, or safety-significant basis to do so, would constitute an undue burden.

HMI maintains that the dose from material in the NRC-licensed portion of the site does not exceed the LTR. The licensee provided its own analysis indicating that the dose from the residual radioactivity within these areas does not exceed 25 mrem/year. The NRC staff reviewed this analysis and provided a response to the comments and dose assessment received from HMI. While the NRC staff did not agree with all of HMI's dose assessment modeling input parameters, the NRC staff determined that HMI met the applicable cleanup criteria, i.e., SDMP criteria, established for this site, as described above.

The NRC staff has coordinated with the U.S. Environmental Protection Agency (EPA), Region 2 office on the current radiological status and proposed NRC actions regarding the HMI site. EPA acknowledged the staff's plan, and requested copies of the NRC Inspection Report and final dose assessment, as well as notification of the proposed public meeting in Manchester Township prior to license termination. The NRC staff provided copies of the NRC inspection report, which included the final dose assessment, to EPA Region 2 and to Manchester Township.

HMI was required to meet the grandfathered provisions of the LTR and was not required to meet the dose criterion of the LTR. HMI was required to comply with the decommissioning activities described in their approved DP, which met the license termination criteria in effect at that time. The staff has concluded that HMI has completed these activities. Additionally, the NRC dose assessment of this area indicates that the public dose limit of 100 mrem/yr, specified in 10 CFR 20.1301, will not be exceeded. The enclosed draft Environmental Assessment and *Federal Register Notice* provide the technical basis for the action and the Finding of No Significant Impact (Enclosures 2 and 3). A draft letter terminating the HMI license and positioning the open enforcement action is provided as Enclosure 4.

COMMITMENTS:

Listed below are the actions or activities committed to by the staff in this paper.

1. Publish in the *Federal Register* a Finding of No Significant Impact with respect to the proposed termination of the HMI license, and make the Environmental Assessment (EA) publicly available.
2. Announce and conduct a public meeting in the local vicinity to inform interested stakeholders of the results of the EA and Staff Dose Assessment that support the NRC staff plans to terminate the NRC license at the HMI site.
3. Meet with NJDEP to discuss the Commission's decision on this paper and planned next actions, in recognition of the State's concerns regarding this site.
4. Issue a letter terminating the NRC license and document the disposition of the open enforcement action regarding the timeliness of the decommissioning.

Commitment Nos. 1 and 4 are necessary activities for the termination of the HMI license. The staff proposes Commitment No. 2 due to past interest in site remediation from the state and local community. The staff proposes Commitment No. 3 to continue to coordinate with the State.

RECOMMENDATION:

The staff recommends that the Commission:

Approve, the recommended termination of HMI's NRC license and release the site for unrestricted use.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections.

/William F. Kane Acting For/

Luis A. Reyes
Executive Director
for Operations

The Commissioners

7

Enclosures:

1. NRC Dose Assessment of HMI site (ML06060003)
2. HMI Draft Environmental Assessment
3. HMI Draft *Federal Register Notice*
4. Proposed Letter Terminating HMI License

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ML060800027

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ENCLOSURE 1:

**Dose Assessment for Unrestricted Future Use Scenarios
Following License Termination of the Heritage Minerals,
Incorporated, Site in Lakehurst, NJ**

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