

Non-Military Radium Site Conditions and Evaluation of Options

Evaluation of Options for U.S. Nuclear Regulatory Commission Involvement with Ongoing Remediation under the U.S. Environmental Protection Agency Brownfields Program

There are three options for the U.S. Nuclear Regulatory Commission (NRC) involvement with the ongoing remediation of the sites in the Brownfields Program: 1) enter into a Memorandum of Understanding (MOU) with the U.S. Environmental Protection Agency (EPA) and a separate site specific agreement with the State or local government entity involved in Brownfields oversight, as appropriate, under which the NRC would assume a monitoring role, 2) treat these sites the same as those not in the Brownfields Program, or 3) let site remediation activities proceed under the Brownfields process with no NRC involvement. All three options are discussed below.

The staff recommends that the Commission approve a “monitoring” approach for sites undergoing remediation through the Brownfields Program. This approach is similar to the approach approved by the Commission for the cleanup of military sites contaminated with radium. A “stay informed” approach under an MOU was approved by the Commission for the NRC’s involvement in the remediation of any U.S. Department of Defense (DoD) site with unlicensed Atomic Energy Act (AEA) material through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and with EPA regulatory oversight (SRM-SECY-14-0082). In accordance with the MOU, the NRC uses a monitoring approach where the NRC provides limited oversight through site observations, independent dose assessments, and confirmatory surveys for DoD remediation under the CERCLA process at sites without EPA oversight. The EPA’s limited oversight role under the Brownfields remediation process is not the same as the more significant regulatory oversight role the EPA exercises during DoD remediation under the CERCLA process. Therefore, due to the EPA’s more limited oversight role at Brownfields sites compared to CERCLA sites, the staff recommends the use of a monitoring approach for sites undergoing remediation through the Brownfields Program to assure consistent Federal oversight.

Evaluation of Options Regarding NRC’s Involvement at Sites under the EPA Brownfields Program

Option 1: The NRC monitors the ongoing Brownfields Program remediation under an MOU with EPA and a separate site specific agreement with the State or local government entity involved in Brownfields oversight, as appropriate.

Under this option, the NRC would monitor remediation activities under the Brownfields Program through an MOU with the EPA and a separate site specific agreement with the State or local government entity involved in Brownfields oversight, as appropriate. This MOU would be signed by the Office of Nuclear Material Safety and Safeguards Office Director, or designee, as appropriate. The NRC would work cooperatively with the involved site owner through a letter of forbearance. Monitoring could include document reviews, site observations, independent dose assessments, and confirmatory surveys to ensure that the NRC’s 25 millirem per year (mrem/yr) dose criteria under Title 10 of the *Code of the Federal Regulations* (10 CFR) § 20.1402 and 10 CFR § 20.1403 are not exceeded. The NRC would coordinate its monitoring activities and

survey results with the State or local government, as appropriate. Prior to the site being released, the site owner would need to successfully demonstrate to the NRC that the cleanup level does not exceed 25 mrem/yr. If the Brownfields Cooperative Agreement between EPA and the site owner expires without the site owner having successfully demonstrated that doses do not exceed the 25 mrem/yr dose criteria, then the NRC would treat this site similar to other sites with historical radium contamination.

- Pros:
 - This approach is similar to the current Commission-directed policy of using a monitoring approach with respect to DoD remediation of military radium sites under the NRC-DoD MOU.
 - This approach is a cooperative way to work with the EPA as well as State and local governments under the Brownfields Program while using EPA funding to achieve the goal of site remediation that is acceptable to all parties.
 - This approach is consistent with the approach outlined by the NRC in the Naturally-Occurring or Accelerator-Produced Radioactive Material (NARM) Rule Statements of Consideration (SOC).
 - This approach allows the NRC to retain the ability to consider licensing the site if the cleanup does not meet the NRC's 25 mrem/yr dose criterion.
 - This approach avoids duplicative or conflicting cleanup requirements.
 - This approach avoids possible confusion from the involvement of two regulatory agencies.
 - The State and local governments would have the benefit of NRC experience with this approach.

- Cons:
 - This approach could create the perception that the NRC is relying on the EPA as well as State and local governments instead of taking responsibility to resolve the issue with non-military radium contamination.
 - This approach would require NRC action if remediation results do not meet NRC standards or if funds are insufficient to complete cleanup of the entire site.
 - For each site entering into the Brownfields Program that is located in a different locality, this approach would require the NRC to coordinate separately with that EPA region and State and local government, as appropriate.

Option 2: Do not rely on the Brownfields Program and treat all the sites the same.

This option would require site owners to work directly with the NRC and potentially apply for and receive an NRC license to continue remediation.

- Pros:
 - This approach is consistent with the NRC's approach for decommissioning of other sites with historical radium contamination, i.e., non-Brownfields radium sites.
 - This approach would use NRC's decommissioning process for the remediation.

- Cons:
 - This approach would disrupt EPA-funded cleanups and could require the site owners to find an alternate source of funding to complete the remediation.
 - The NRC could be viewed negatively by the community as well as local and State governments for disrupting an ongoing process that has taken time and effort to establish.
 - This approach may create conflicting clean-up standards and dual regulation.

Option 3: Let site remediation activities proceed under the Brownfields Program with no NRC involvement.

- Pros:
 - This approach reduces NRC resource expenditures.
- Cons:
 - This approach relies completely on EPA as well as State and local government oversight, which may not be equivalent to NRC oversight or adequate to meet AEA standards.
 - This approach could create uncertainty about liability for future owners because current owners might be concerned about the potential for the NRC to reopen the completed Brownfields remediation.
 - This approach could create the perception that the NRC is not taking responsibility for sites under its jurisdiction.

For all three options, the NRC would regulate contractors under an NRC or Agreement State service provider license to ensure controls are in place to restrict public access to the site and to ensure that remediation activities are conducted safely. The staff would apply the Commission's decision on NRC involvement with the Brownfields Program to existing sites, like the Waterbury Clock Company site.

Evaluation of Options for Interim Controls and Remediation at Historic Non-Military Radium Sites not involved in the Brownfields Program

Background

The primary issue addressed in this discussion is how to ensure controls and remediation applicable to the range of conditions expected for the sites. The NRC contemplated how to deal with unlicensed sites in the SOCs for the NARM rule (72 *Federal Register* 55,864; October 1, 2007):

NRC does not intend to require non-licensed owners of properties that may be contaminated with radium-226 to obtain licenses. If contamination is discovered at a non-licensed person's facility, such as contaminated buildings or grounds, the NRC will work with the facility owner to perform decommissioning of the site. If the site presents a significant threat to the public health and safety, the NRC may order the owner to obtain a license and to perform decommissioning of the site.

The staff evaluated two options: 1) taking a risk-informed, graded approach to license sites only when more significant levels of contamination are present, or 2) licensing all sites with contamination. Both options are discussed below.

The staff recommends that the Commission approve a graded approach whereby doses greater than the public dose limit of 100 mrem/yr would be a threshold for NRC staff to consider licensing a site. The NRC staff does not consider this 100 mrem/yr limit to indicate a significant threat or concern with respect to public health and safety, rather, the staff considers sites above that threshold to represent a greater concern when compared to sites with lower doses. Site owner cooperation would also be a factor in determining the appropriate approach (i.e., licensing or using a letter of forbearance).

Detailed Evaluation of Options Regarding Controls and Remediation

Option 1. Use a risk-informed, graded approach.

The NRC staff would work with the site owner to ensure site cleanup, and where the owners are cooperative, the staff would not require the owners to obtain a license. A letter of forbearance with an unlicensed owner could be used for privately-owned residences, small businesses, or non-profit organizations where the owners are generally cooperative and agree to controls and remediation consistent with the NRC decommissioning dose requirement of 25 mrem/yr for unrestricted use.¹ The NRC would work with the site owners to develop a decommissioning schedule for the site that would balance protection of public health and safety with the owner's financial ability to fund site remediation. For sites remediated under this option, the owner would use NRC or Agreement State service provider licensees to conduct remediation consistent with NRC's requirements and guidance. As discussed above, NRC staff would consider licensing a site where recorded doses are above 100 mrem/yr. The NRC staff would not require remediation at sites with doses that currently meet the NRC's criterion for unrestricted use (i.e., less than 25 mrem/yr).

- **Doses less than 25 mrem/yr:** No controls or remediation are necessary and no further NRC actions are required; an NRC letter to the owner would document the NRC's finding in this regard.
- **Doses greater than 25 mrem/yr but less than 100 mrem/yr:** Remediation may be required; letter of forbearance to the site owner would document that the owner agrees to remediate the site consistent with NRC requirements; the NRC would discuss radiation protection controls on a site-specific basis; licensing would be pursued if the site owner does not agree to remediation.
- **Doses greater than the 100 mrem/yr:** Consider licensing to require both controls and remediation.
- Pros:
 - This graded approach is flexible and provides options for the range of contamination that may be encountered at the different sites.

¹ As discussed in the Commission paper, pursuit of restricted release or alternative decommissioning criteria may be appropriate in certain circumstances and would be evaluated on a case-by-case basis.

- This approach is generally consistent with the SOCs discussion in the NARM Rule about not licensing historic sites.
- This approach would allow cleanup to the NRC's decommissioning requirements.
- This approach is generally in alignment with the NRC's activities under the Formerly Licensed Sites Program.

- Cons:
 - This approach is inconsistent with the NRC's typical decommissioning approach of licensing sites.
 - Although this approach would not relinquish any NRC authority, it likely would be more cumbersome to monitor and enforce the agreed-upon controls and remediation.

Option 2: Licensing for all sites

The NRC staff would issue licenses for all of the sites with doses above 25 mrem/yr and require immediate controls and the eventual remediation of the site.

- Pros:
 - This approach is consistent with NRC regulations.
 - Under this approach, enforcement of the interim controls and remediation activities would be more straightforward.

- Cons:
 - Site owners may not have adequate funds, and licensing would not contribute to completing remediation.
 - Forced licensing would only add to the challenges of working cooperatively with the site owner.
 - This approach is inconsistent with the SOCs in the NARM Rule.