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February 4, 2011

U.S. Nuclear Regulatory Commission
Mail Stop O-16G4
Washington, DC 20555-0001

Re: In re Shieldalloy Metallurgical Corp. (License
Amendment Request for Decommissioning of the
Newfield, NJ Site)
Docket No. 40-7102-MLA

Dear Commission:

This office represents the State of New Jersey. Please accept this letter and the enclosed appendix in response to the NRC's January 3, 2011 Order in the above referenced matter.

The State of New Jersey recommends that the NRC return jurisdiction over the Shieldalloy facility. Returning jurisdiction to New Jersey is permissible as a matter of law and New Jersey intends to require Shieldalloy to decommission its facility in a manner that is protective of the public health and in compliance with New Jersey laws and regulations. New Jersey should have the opportunity to implement a consistent and comprehensive licensing



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and decommissioning program.

Point I

THE D.C. CIRCUIT COURT OF APPEALS DECISION PERMITS THE NRC TO TRANSFER AUTHORITY OVER SHIELDALLOY BACK TO NEW JERSEY.

1. Transferring Authority to New Jersey Does Not Interrupt an Ongoing Licensing Proceeding.

On November 9, 2010, the U.S. Court of Appeals for the D.C. Circuit reversed the NRC's decision to grant New Jersey authority over Shieldalloy. Shieldalloy Metallurgical Corp. v. NRC, 624 F.3d 489, 497 (D.C. Cir. 2010). The Court held that the NRC failed to adequately explain how the transfer of authority would not interfere with the processing of licensed activities or the processing of license applications. Id. at 495. The Court decision allows the NRC the opportunity to provide such an explanation if it seeks to grant New Jersey authority over Shieldalloy.

Transferring authority to New Jersey over the Shieldalloy decommissioning does not disrupt any ongoing licensing proceedings because Shieldalloy has had more than adequate opportunity to pursue decommissioning with the NRC. It was Shieldalloy's choice to delay the submission of its first decommissioning plan for four years, in violation of the Timeliness Rule, and then to pursue for eight years its onsite disposal plan despite its repeated failures to adequately address various legal and technical issues. If

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Shieldalloy had taken its decommissioning responsibilities seriously, the NRC would have approved Shieldalloy's decommissioning plan years ago for this non-complex decommissioning. See (A369,¹ Memorandum at 13) (describing the Shieldalloy decommissioning as "relatively low in comparative complexity" to other decommissioning sites).

The NRC has been stating for many years that onsite disposal may not be an option for Shieldalloy's facility, either because State or Federal custody of the site would be required or because the NRC would need to promulgate additional regulations. Shieldalloy simply ignored these obstacles and continued to submit one failed decommissioning plan after another as if these obstacles did not exist.

In 1993, the NRC reviewed Shieldalloy's conceptual onsite disposal plan and stated that it may eventually reject the plan because "it is inconsistent with NRC's requirements for decommissioning, which require that residual radioactivity be reduced to a level that permits release of the property for unrestricted use." 58 Fed. Reg. 62387, 62388 (Nov. 26, 1993).

In 1994, the NRC stated that for sites "containing large quantities of materials contaminated with low level radioactivity,"

¹"A" refers to the appendix submitted by the State of New Jersey.

onsite disposal may require the site to be placed "under the custody of a State or Federal agency." 59 Fed. Reg. 43200, 43217 (August 22, 1994).

In 1997, as part of its amended License Termination Rule, the NRC reiterated that "State and local government control or ownership, engineered barriers, and Federal ownership" would be required for sites containing large quantities of longer-lived nuclides. 62 Fed. Reg. 39058, 39070 (July 21, 1997).

Because neither New Jersey nor the Federal government had ever expressed a willingness to take custody of the Shieldalloy facility, it was unreasonable for Shieldalloy to expect that the NRC would approve the decommissioning. Shieldalloy disregarded this institutional control requirement in its first decommissioning plan and simply asserted that a governmental entity would take custody of the decommissioned site without actually obtaining any government's consent. (A459, Rev. 0 page 96). The plan was rejected, in part, for this reason. (A18).

In 1998, Shieldalloy ceased licensed operations. In re Shieldalloy, ASLBP No. 07-852-01-MLA-BD01 at 3. Although the NRC's Timeliness Rule requires licensees to inform the NRC that it has ceased licensed operations within 26 months of ceasing operations or within 2 months of deciding to cease principal activities, 10 C.F.R. §40.42(d), Shieldalloy waited until August 2001 to notify

the NRC, (A9-A11). Shieldalloy did not submit its first decommissioning plan until August 2002, four years after it ceased operations. (A12). As just mentioned, the NRC rejected the first decommissioning plan without even conducting a technical review. (A12).

On May 2, 2003, the NRC Staff issued SECY 03-0069, which again placed Shieldalloy on notice that its onsite disposal plan was not viable because additional regulations were required. The document recommended creating a new general license for long-term care for decommissioned sites containing a "higher hazard (above 100 mrem/yr dose cap)" or for "long-lived radionuclides such as uranium or thorium sites." (A58). However, SECY 03-0069 made very clear that this option would require rulemaking "to establish a new general license program and fee category." Id. Although the Commission approved this portion of SECY 03-0069 for purposes of issuing final guidance, the NRC has not initiated a rulemaking process to provide the new general license program. (A62). Because Shieldalloy's facility presents a higher hazard containing large quantities of both uranium-238 and thorium-232, both considered to be long-lived nuclides, (A460-A461), Shieldalloy was placed on notice that its onsite disposal plan would not be approved unless the NRC decided to promulgate new rules.

Because Shieldalloy's previous decommissioning plan was

completely deficient, on April 15, 2004, the NRC Staff issued the NRC Staff Interim Guidance for a Long-Term Control Possession Only License at the Shieldalloy Newfield Site, New Jersey. (A64).

In October 2005, Shieldalloy submitted its second decommissioning plan. (A88). The NRC found this plan to be deficient. (A91-A93). The NRC rejected the second plan, in part, because Shieldalloy failed to provide sufficient information regarding its site-specific dose modeling and its proposed institutional and engineered controls. (A91-A92). The NRC notified Shieldalloy of these same deficiencies in its first decommissioning plan. (A12).

On December 28, 2006, the NRC Staff issued its final guidance on the LTC license via an amendment to the guidance document titled NUREG-1757. 71 Fed. Reg. 78234 (December 28, 2006); (A498, NUREG-1757 vol. I page xiii). But NUREG-1757 provides that the LTC license "should not be considered a guaranteed option, but would be a last resort under the criteria in 10 CFR 20.1403(b)." (A501, NUREG-1757 vol. I page M-9).

In June 2006, Shieldalloy submitted its third decommissioning plan. This plan was so deficient that it required the NRC to issue a 73-part Request for Additional Information ("RAI"). (A305-A351). The RAI was required, in part, because Shieldalloy again failed to provide sufficient information regarding its site-specific dose

modeling, (A309-A322, RAIs # 3-18), its ALARA analysis, (A326-A344, RAIs # 27-42), and its proposed institutional and engineered controls, (A322-A326, A330, A342, A343, A345-A347, RAIs # 19-26 34, 60, 61, 66-68). The NRC noted these same deficiencies in Shieldalloy's first and second decommissioning plans. (A12; A91-A93).

On August 28, 2009, just days before the NRC signed the agreement transferring authority to New Jersey, (A388-A390); 74 Fed. Reg. 51882 (October 8, 2009), Shieldalloy submitted its fourth decommissioning plan to the NRC.

It was Shieldalloy's choice to continue to pursue one failed on-site disposal plan after another for a non-complex decommissioning. See (A369, Memorandum at 13). It was Shieldalloy's choice to continually fail to provide sufficient information in its decommissioning plans even though the NRC continually noted these deficiencies. Shieldalloy ignored the various legal impediments to approving the decommissioning plan. Shieldalloy is solely to blame for its failure to obtain an approved decommissioning plan over the last twelve years. As such, Shieldalloy has had more than adequate opportunity to pursue decommissioning with the NRC, and transferring authority to NJ will not unreasonably interfere with any ongoing licensing proceedings.

2. The NRC's History Regarding the Shieldalloy Decommissioning.

The D.C. Circuit Court stated that "the NRC had a long history of dialogue and cooperation regarding the" Shieldalloy decommissioning, a factor that might weigh against transferring authority to New Jersey. Shieldalloy, supra, 624 F.3d at 494-95. However, the NRC never promised that the onsite disposal would be approved. In fact, the NRC stated early and frequently during the decommissioning process that various obstacles exist to approving the onsite disposal.

As discussed above, in 1993, the NRC stated that Shieldalloy's conceptual onsite disposal plan may be unacceptable because "it is inconsistent with NRC's requirements for decommissioning, which require that residual radioactivity be reduced to a level that permits release of the property for unrestricted use." 58 Fed. Reg. at 62388.

In 1994, the NRC stated that onsite disposal of large quantities of long-lived nuclides may require the decommissioned site to be under the custody of a State or Federal agency. 59 Fed. Reg. at 43217. Because no governmental entity has ever expressed a desire to become a custodian of Shieldalloy's decommissioned site, Shieldalloy should not have expected its plan to be approved.

In 1997, the NRC amended the License Termination Rule to provide a restricted release option for decommissioning sites,

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which might be used for facilities seeking to conduct onsite disposal of its radioactive waste. 62 Fed. Reg. at 39059. However, the NRC reiterated its position that onsite disposal of large quantities of long-lived nuclides would require the decommissioned site to be under the custody of a State or Federal agency. 62 Fed. Reg. at 39070. The NRC also stated that the unrestricted release option would be the preferred option. 62 Fed. Reg. at 39059. Because no State or Federal agency have ever agreed to take custody of the decommissioned site and Shieldalloy's onsite disposal plans have utilized the less preferred restricted release option, Shieldalloy should not have expected its onsite disposal plan to be approved.

In 2003, the NRC discussed creating a new license for the purpose of creating another option for the onsite disposal of higher hazard, long-lived radionuclides. (A58). However, SECY 03-0069 made very clear that this option would require rulemaking "to establish a new general license program and fee category." Id. Although the Commission approved this portion of SECY 03-0069 for purposes of issuing final guidance, the NRC has not initiated a rulemaking process to provide the new general license program. (A62).

On April 15, 2004, the NRC Staff issued the NRC Staff Interim Guidance for a Long-Term Control Possession Only License at the

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Shieldalloy Newfield Site, New Jersey. (A64). The guidance was issued because Shieldalloy's previous decommissioning plan was completely deficient. The interim guidance was part of the NRC Staff's efforts to "continue to work with licensees who expressed an interest in the LTC license," to provide a discussion of key concepts related to the LTC license option and provide guidance in preparing sections of the decommissioning plan. (A64). However, the interim guidance never mentions that the NRC intended to promulgate rules that would provide the LTC license. Furthermore, this was only an interim guidance document, which meant that the guidance could have changed when the NRC issued final guidance to implement SECY 03-0069.

On December 28, 2006, the NRC Staff issued its final guidance on the LTC license via an amendment to the guidance document titled NUREG-1757. 71 Fed. Reg. at 78234; (A498, NUREG-1757 vol. I pages xiii). This amendment was based on the recommendations from SECY 03-0069. Id. While NUREG-1757 purported to provide a new license called a LTC license, (A500-A501, NUREG-1757 vol. 1 pages 17-65, M-9), it also states that the LTC license "should not be considered a guaranteed option, but would be a last resort under the criteria in 10 CFR 20.1403(b)." (A501, NUREG-1757 vol. I page M-9). NUREG-1757 also states: "Legally binding regulatory requirements are stated only in laws; NRC regulations; licenses, including technical

specifications; or orders, not in NUREG-series publications." (A497). NUREG-1757 also provides: "This NUREG is not a substitute for NRC regulations, and compliance with it is not required." (A499, NUREG-1757 vol. I page xvii). The U.S. Court of Appeals for the Third Circuit held that "a licensee is under no obligation to follow the guidance, and the NRC is also not required to grant a proposed license merely because a decommissioning plan follows the guidance in NUREG-1757." New Jersey v. United States NRC, 526 F.3d 98, 102 (3d Cir. 2008). It "has long been recognized in NRC practice and jurisprudence" that compliance with guidance documents is not required. In re Private Fuel Storage, LLC (Independent Spent Fuel Storage Installation), 57 N.R.C. 69, *34 (ASLB 2003).

Furthermore, the Supreme Court has held that "it is well settled that the Government may not be estopped on the same terms as any other litigant." Heckler v. Community Health Servs., 467 U.S. 51, 60, 104 S. Ct. 2218, 81 L. Ed. 2d 42 (1984). The Court has "reversed every finding of estoppel that [it has] reviewed" where the government is a defendant. Office of Personnel Management v. Richmond, 496 U.S. 414, 422, 110 S. Ct. 2465, 110 L. Ed. 2d 387 (1990). The Supreme Court has repeatedly held that the party must begin by satisfying the traditional estoppel criteria but then proceed one step farther by also demonstrating "affirmative misconduct" on the part of the government. Id. at 421. Government

carelessness is not tantamount to affirmative misbehavior. United States v. Ven-Fuel, Inc., 758 F.2d 741, 761 (1st Cir. 1985). Estoppel against the government arises in only "the most extreme circumstances." Dantran, Inc. v. United States DOL, 171 F.3d 58, 66 (1st Cir. Me. 1999).

The NRC cannot be estopped by any guidance or assistance provided by the NRC Staff to licensees. The Atomic Safety and Licensing Board Held:

In the course of applying and enforcing agency regulations, the NRC Staff may provide guidance to the regulated community. Boards -- being entirely independent of the Staff -- are not bound, however, to follow such guidance; they are bound only by the Commission's regulations and its adjudicatory precedents (which it issues in the course of conducting judicial-style review of our decisions, much as a higher court reviews a lower court's decisions).

In re Private Fuel Storage, LLC, supra, 57 N.R.C. at *35.

The First Circuit held that the NRC may not approve only a portion of a decommissioning plan--any approval must cover the entire plan. Citizens Awareness Network, Inc. v. NRC, 59 F.3d 284, 291-92 (1st Cir. 1995).

Thus, any representations made by the NRC Staff or its guidance documents during the course of the decommissioning cannot be viewed as an approval to any portion of Shieldalloy's decommissioning plan.

In any event, there can be no reasonable claim that the NRC

represented that it would approve Shieldalloy's onsite disposal plan. In fact, the NRC repeatedly rejected Shieldalloy's decommissioning plans as inadequate and stated that new regulations were required and/or that Federal or State custody of the decommissioned site was required before Shieldalloy's onsite disposal plan would be approved. 58 Fed. Reg. at 62388; 59 Fed. Reg. at 43217; 62 Fed. Reg. at 39070; A58, SECY 03-0069 at 28. Such regulations would have included providing the terms and conditions of a LTC license in a regulation, as required by 42 U.S.C. §§ 2232(a), 2333, and (altering the License Termination Rule to allow decommissioning without terminating the license. Shieldalloy cannot claim detrimental reliance. Shieldalloy decided to pursue onsite disposal regardless of the factual or legal obstacles to approval of such a plan at Newfield.

3. Concurrent Jurisdiction.

The D.C. Circuit Court asserted that the NRC's past practice allows concurrent jurisdiction. Shieldalloy, supra, 624 F.3d at 493-94. The Court cited the Oklahoma agreement that exempted a subclass of material. Id. But Oklahoma requested the exemption to its authority, not a licensee. Id. In this matter, New Jersey is not requesting an exemption to its authority. Since the D.C. Circuit issued its decision, a number of licensees in New Jersey

have been confused regarding whether New Jersey still has jurisdiction over them. To avoid any further confusion, the NRC should restore New Jersey's authority over Shieldalloy so it includes all licensees. A rational regulatory scheme would provide New Jersey with authority over each and every decommissioning facility so that New Jersey may implement a consistent and comprehensive decommissioning program.

4. New Jersey is Not Biased.

The D.C. Circuit Court cited New Jersey's participation in prior or concurrent regulatory proceedings as a factor that fails to give assurance that the licensing activities would be free from interference or interruption under New Jersey's authority. Shieldalloy, supra, 624 F.3d at 493-94. The Court stated that New Jersey "has been consistently hostile" to the Shieldalloy decommissioning proceedings. Id. at 495. However, New Jersey was neither biased nor hostile. Rather, New Jersey's participation in prior and concurrent regulatory proceedings were limited to raising legitimate factual, technical, and legal problems with Shieldalloy's proposed decommissioning plan. As discussed below, the Atomic Safety and Licensing Board, the NRC Staff, various NRC Commissioners and the U.S Environmental Protection Agency ("EPA") raised most of the same problems with Shieldalloy's decommissioning

plan as New Jersey.

It is important to note that Shieldalloy did not raise this bias argument to the Court, so the NRC and New Jersey did not address this issue in their briefs. The Court's own discussion of New Jersey's alleged bias is contradictory. The Court cited Shieldalloy's public comment that "New Jersey had challenged Shieldalloy's decommissioning process at every stage. This resistance, Shieldalloy contended, was incompatible with criterion 25's commitment to the uninterrupted processing of license applications.'" Id. at 493. However, the Court also stated that in the NRC's response: "the NRC staff aptly noted that New Jersey is entitled to take part in hearings on licensing actions and to petition for rulemaking, and that the state's exercises of those rights did not in themselves indicate the New Jersey plan's incompatibility with the federal regime under criterion 25." Id.

Prior to January 2007, New Jersey's involvement with the Shieldalloy decommissioning process was limited. On October 20, 1986, New Jersey sent the NRC a letter expressing concerns about offsite contamination from the licensed operations. (A1-A2). The letter simply sought "a thorough environmental survey" of the site to provide "adequate information on the environmental impact of the site." Id. The letter also warned of potential problems upon decommissioning if the NRC allows the waste to accumulate onsite.

Id.

Early in the Shieldalloy decommissioning process, the New Jersey Department of Environmental Protection ("NJDEP") offered to participate in meetings and conference calls regarding the decommissioning process for the limited purpose of providing technical information. In addition to providing information to the NRC and Shieldalloy during regular phone conferences, the NJDEP also participated in Shieldalloy's Site Specific Advisory Board ("SSAB") to provide public input on the decommissioning plan. An example of the information provided by the NJDEP included the proper methods for site specific leach testing--using collected rain water for leach testing, monitoring the pH, and oxidation reduction potential of leach testing water, and sampling under the slag pile. The NJDEP also arranged for the United States Geological Survey to provide a technical presentation to the NRC and Shieldalloy on the aquifer below the Shieldalloy facility. See (A420-A458). During its participation in this process, the NJDEP voiced technical concerns, but it never acquiesced to Shieldalloy's decommissioning plan.

In 2004, the NJDEP sent two letters expressing concern regarding Shieldalloy's proposed decommissioning plan and the NRC's application of the License Termination Rule. The first of these letters complained that the NRC was not adequately considering

public opposition to the onsite disposal and a public hearing to be held in Maryland would not allow local residents to express their concerns. (A78-A79). The letter also stated that onsite disposal under the License Termination Rule would not adequately protect the public health and safety. Id. The NRC should compare this proposed onsite disposal to the low level radioactive waste facility regulations at 10 C.F.R. Part 61 rather than the License Termination Rule. Id. The letter finally points out that the LTC license should not be used for the disposal of long-lived radioactive waste because the licensee may go into bankruptcy or other unforeseen business changes. Id.

The NJDEP's second letter, dated December 6, 2004, raised the concern that Shieldalloy's SSAB was not adequate to elicit public input as part of its decommissioning plan. (A80). The letter stated that Shieldalloy's SSAB did not comply with 10 C.F.R. §20.1403 because no chairperson was selected, there was no opportunity for discussion during the meetings, and Shieldalloy failed to provide sufficient information regarding its decommissioning plan to allow the public to provide adequate input. (A80). The letter also stated that Shieldalloy was considering dose modeling scenarios that were not conservative and the proposed institutional and engineering controls were not durable enough. (A81).

The NRC subsequently remedied the NJDEP's dose modeling

concerns by approving the NJDEP's regulations as part of its Agreement State application. The NJDEP's concerns regarding the proposed institutional and engineering controls were subsequently raised by NRC Commissioner Gregory B. Jaczko, (A384-A385), the NRC Staff, (A322-A326, A330, A342, A343, A345-A347), and the EPA, (A353, A355).

On November 17, 2006, the NRC Staff published a notice that it would initiate its technical review of Shieldalloy's third decommissioning plan. 71 Fed. Reg. 66986 (Nov. 17, 2006). The notice invited interested parties to request a hearing on the plan by January 16, 2007. Id. at 66986-87. New Jersey submitted a hearing request with 17 separate contentions, which asserted that the plan contained significant factual, technical, and legal flaws. (A130). In order to preserve its rights, New Jersey also filed a Petition for Rulemaking with the NRC (A94) and an appeal in the U.S. Court of Appeals for the Third Circuit (A462).

The Atomic Safety and Licensing Board reviewed the hearing requests submitted by New Jersey and other individuals and entities. The Board held that New Jersey was the only entity entitled to a hearing on the plan. (A259-A260, A263, Order at 17-18, 21). The Board held that New Jersey's contention #5, that Shieldalloy's decommissioning plan failed to conduct adequate dose modeling, had sufficient merit to warrant a hearing. (A263, Order

at 21). The Board held:

We entertain little difficulty in reaching the conclusion that Contention 5 is admissible in its entirety. In a word, New Jersey has provided adequate support for its insistence that the dose modeling provided in the DP is inadequate to determine the potential long-term impact that leaving the slag pile in situ might have upon those residing in the vicinity of the facility.

Id. In short, the Board found "little difficulty" in finding merit in New Jersey's technical contention on the decommissioning plan.

Id. Because it was clear that Shieldalloy's decommissioning plan would need significant revision, the Board stayed any decision on New Jersey's remaining contentions. (A266-A269, Order at 24-27).

In response to the third decommissioning plan, the NRC Staff issued a 73-part Request for Additional Information ("RAI"), which identified many of the same factual and technical flaws in the plan as was identified in New Jersey's hearing request. (A305-A351). The EPA also review the plan and found it to be "severely deficient." (A352). For example, the NRC Staff's RAI, the EPA, and New Jersey's hearing request stated that the plan was flawed and failed to provide sufficient information concerning the following:

- (1) potential leachate of radionuclides and other inorganic materials into the vadose and saturated zones, (A311, A319-A321, RAI ## 5, 17); (A356, EPA General Comment #11); (A139, A146, A197, Hearing Request Contentions ## 1, 2, 10);
- (2) the K_d value, (A321-A322, RAI #18); (A139, A146, Hearing

Request Contentions ## 1, 2);

- (3) the proposed cap, (A311, RAI #6); (A355, EPA General Comment #7); (A152, Hearing Request Contention #3);
- (4) characterizing the site, (A315-A316, RAI #10); (A354-A356, EPA letter General Comments #1, 3, 4, 5, 6, 9, 12); (A159, A197, A201, Hearing Request Contention ##4, 10, 11);
- (5) dose modeling, (A309, A319-A321, RAI #3, 17); (A354, EPA letter General Comment #2); (A164, Hearing Request Contention #5);
- (6) the ALARA analysis, (A313-A314, A326-A334, RAI ## 8, 27-42); (A183, Hearing Request Contention #7);
- (7) institutional controls, (A322-A326, A330, A342, A343, A345-A347, RAI ## 19-26 34, 60, 61, 66-68); (A353, A355, EPA letter page 2, General Comment #7); (A194, Hearing Request Contention #9); and
- (8) eliciting public comments, (A348, RAI #71), (A210, Hearing Request Contention #14);

New Jersey's hearing request, Petition for Rulemaking, and Third Circuit appeal asserted that Shieldalloy's decommissioning plan and the NUREG-1757 provided insufficient financial assurance based upon an erroneous discount rate. (A191, Hearing Request Contention #8); (A112-A115, Pet. for Rulemaking at 18-21); (A484-A485, Third Cir Brief at 49-50). The NRC agreed and withdrew the

discount rate section from NUREG-1757. 72 Fed. Reg. 46102, 46103 (Aug. 16, 2007). The EPA also raised this issue. (A355).

New Jersey's hearing request, Petition for Rulemaking, and Third Circuit appeal raised the problem that the decommissioning plan and the NUREG-1757 were flawed because they only provided modeling for radioactive doses for 1,000 years even though doses under the Shieldalloy plan are expected to peak after year 1,000. (A179, Hearing Request Contention #6); (A106-A107, Pet. for Rulemaking at 12-13, 17-18); (A478-A480, Third Cir. Brief at 43-45). The NRC itself stated that for long-lived nuclides, dose modeling beyond 1,000 years would be required. 62 Fed. Reg. at 39083 (Response F.7.3). Furthermore, the court in Nuclear Energy Inst. v. Environmental Prot. Agency, 373 F.3d 1251, 1273 (D.C. Cir. 2004), held that the NRC was required to conduct modeling for nuclear waste based on its peak dosage.

New Jersey's Hearing Request, Petition for Rulemaking, and Third Circuit appeal challenged the LTC License on legal grounds. (A203, A206, A216-AA226, Hearing Request Contentions ## 12, 13, 15, 16, 17); (A104-A128, Pet. for Rulemaking at 9-34); (A465-A478, Third Circuit Brief at 30-43). New Jersey asserted that the AEA, 42 U.S.C. §§ 2232(a), 2233, requires the NRC to promulgate regulations before providing the LTC License. (A206, A234, Hearing Request Contentions ## 13, 17); (A103-A105, Pet. for Rulemaking at 9-11;

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(A465-469, Third Circuit Brief at 30-34). As discussed above, the NRC has also repeatedly stated that additional regulations were required to approve the onsite disposal, unless the State or Federal government agree to take custody of the decommissioned facility. 58 Fed. Reg. at 62388; 59 Fed. Reg. at 43217; 62 Fed. Reg. at 39070; (A58, SECY 03-0069 page 28). NRC Commissioner Jaczko conceded in his dissent of an NRC Memorandum and Order that additional regulations were required before the NRC approves Shieldalloy's proposed on-site disposal plan. (A380-A382, Order pages 8-10). The majority did not deny that regulations were required but instead held that such issue was pending before the Atomic Safety and Licensing Board should render a decision before the Commission decides. (A379, Order page 7).

New Jersey also challenged the LTC license on the technical ground that the LTC license would lead to the creation of additional legacy sites in violation of the License Termination Rule's preference for unrestricted release and the NRC's own policies against the creation of legacy sites. (A203, A216, A218, Hearing Request Contentions ## 12, 15, 16); (A115-A128, Pet. for Rulemaking at 21-34); (A471-A478, Third Circuit Brief at 36-43). In issuing a decision in this matter, the NRC Commission reiterated its preference for conducting offsite disposal of radioactive waste to allow for unrestricted release. (A379, Order at 7). The NRC also

asked Shieldalloy to consider alternative options to the onsite disposal. (A239-A240). NRC Commissioner Jaczko stated in his dissent that Shieldalloy failed to adequately explore offsite disposal options for its waste. (A384-A385, Order at 12-13). Again, the majority did not deny this contention but waited to rule until the Atomic Safety and Licensing Board and the Board renders a decision on the issue. (A379, Order at 7). NUREG-1757 provides that the LTC license "should not be considered a guaranteed option, but would be a last resort under the criteria in 10 CFR 20.1403(b)." (A501, NUREG-1757 vol. I page M-9). The EPA also criticized the LTC license as proposed for Shieldalloy's site as not protective of human health and the environment. (A353, EPA letter page 2). The EPA also criticized Shieldalloy's failure to adequately consider alternative disposal plans. (A356, General Comment #8).

New Jersey sought to become an Agreement State because the 2005 Energy Policy Act (42 U.S.C. §§ 13201 et seq.) would have preempted New Jersey's long-standing regulation of naturally occurring and accelerator produced radioactive material ("NARM"). Axxx (R42 attachments 40 N.J.R. 5196(b) page 2). Because New Jersey wished to retain such authority, it sought Agreement State status. Id.

The regulations that New Jersey promulgated to implement its Agreement State authority also have options other than unrestricted

release. The regulations provide four options for decommissioning: unrestricted use, limited restricted use, restricted use, and alternative standards. N.J.A.C. 7:28-12.9. Under the first three options, the licensee is required to remediate radioactive contamination so that the soil concentration for radionuclides meet the concentration standards set forth in the tables at N.J.A.C. 7:28-12.9. Under the alternative standards option, the licensee is not required to meet the soil concentration levels under N.J.A.C. 7:28-12.9. Instead, the licensee is required to perform site specific computer dose modeling to ensure that the 15 millirem ("mrem") dose criteria is met. In addition, the licensee is required to perform such modeling to ensure that if all controls fail, radioactivity from the site will not cause a future on-site resident or worker to receive more than a 100 mrem dose of radiation in a given year.² N.J.A.C. 7:28-12.11(a)(1), (f)(2). Such dose modeling is not required if the licensee seeks to decommission using New Jersey's unrestricted use, limited restricted use, or restricted use options. N.J.A.C. 7:28-12.9(a), -12.10. Because Shieldalloy has not submitted a decommissioning plan under New Jersey's regulations, it is unclear the extent to which Shieldalloy would be required to dispose its radioactive waste offsite.

²N.J.A.C. 7:28-12.15 requires licensees to comply with the alternative remediation standards where they seek to bury radioactive materials without remediation.

New Jersey's regulation also provides for exemptions from any of its provisions as long as the exemption does not result in radiation exposures above permissible limits. N.J.A.C. 7:28-2.8. Shieldalloy has requested an exemption from various requirements and will receive an administrative hearing on the request in the Office of Administrative Law ("OAL"). (A418-A419).

Under the NJDEP's regulations, Shieldalloy would be entitled to an administrative hearing in the OAL on a licensing decision. N.J.A.C. 7:28-4.18. The OAL is independent of the NJDEP pursuant to its authorizing statute and adjudicates cases from many other state departments. N.J.S.A. 52:14F-1. After the OAL issues its Initial Decision, the NJDEP issues a final decision. The licensee has the right to appeal the final NJDEP decision to the NJ Superior Court, Appellate Division, an independent appellate court in the judiciary branch. N.J. Court Rule 2:2-3(a)(2). "In New Jersey, judicial review of administrative agency determinations has the support of a special constitutional provision (art. VI, sec. 5, para. 4) which largely immunizes it from legislative curbs." In re Senior Appeals Examiners, 60 N.J. 356, 363 (1972). New Jersey courts apply the same arbitrary, capricious, and unreasonable standard to agency actions as federal courts. See, e.g., N.J. State League of Municipalities v. Dep't of Cmty. Affairs, 158 N.J. 211, 222 (1999); R & R Mktg., L.L.C. v. Brown-Forman Corp., 158 N.J. 170, 175

(1999). Unless a regulation is struck down as arbitrary, capricious, or unreasonable, New Jersey administrative agencies are required to comply with their own regulations. County of Hudson v. Dep't of Corr., 152 N.J. 60, 70 (1997).

During the brief period that New Jersey had Agreement State authority over Shieldalloy, it utilized its authority judiciously. On October 8, 2009, New Jersey informed Shieldalloy that the fourth decommissioning plan submitted to the NRC did not comply with New Jersey regulations since the plan did not call for the termination of Shieldalloy's license. (A391). It directed Shieldalloy to submit a compliant plan by January 31, 2010. Id. New Jersey also offered to extend the submission deadline. (A399-A400).

On a routine inspection, NJDEP inspectors recently discovered a hole in the fence surrounding Shieldalloy's radioactive waste pile. (A402). Shieldalloy promptly repaired the hole. (A298). The NJDEP did not issue any penalties because Shieldalloy's response was acceptable.

The D.C. Circuit Court decision stated in dicta that New Jersey's participation in prior or concurrent regulatory proceedings might indicate interference with the licensing proceeding and that New Jersey "has been consistently hostile" to the Shieldalloy decommissioning proceedings. Shieldalloy, supra, 624 F.3d at 493-95. This dicta was issued without any party raising

this issue in briefs. It is very unlikely that the Court would render a future holding that New Jersey is somehow biased where such issue would be fully briefed with the facts discussed above which demonstrate that New Jersey acted reasonably in raising most of the same issues that also concerned two NRC Commissioners, the Atomic Safety and Licensing Board, the NRC Staff, and the EPA.

Furthermore, a court may not hold that a state is biased without any direct proof, especially in light of the states' sovereignty. The Constitution "specifically recognizes the States as sovereign entities." Alden v. Me., 527 U.S. 706, 713 (1999). Such sovereignty reserves to the states "a substantial portion of the Nation's primary sovereignty, together with the dignity and essential attributes inhering in that status." Id. at 714.

Courts have not found agency bias where the agency has simply been performing its statutory responsibilities. See, e.g. Navistar Int'l Transp. Corp. v. United States EPA, 941 F.2d 1339, 1360 (6th Cir. 1991); United States v. GM, 876 F.2d 1060, 1068-69 (1st Cir. 1989). Challengers to EPA enforcement actions have argued that where the EPA is considering a revision to an existing state implementation plan ("SIP"), the EPA should be barred from initiating an enforcement action under the current SIP because the EPA may have a bias or improper motive when reviewing the SIP revision. Id. At least two Circuit Courts have rejected such

arguments and held that bias or improper motive cannot be found where the agency was performing its statutory duties. Id.

Because New Jersey was raising legitimate concerns regarding Shieldalloy's decommissioning plans, many of which were also raised by NRC Commissioners, the NRC Staff, and the EPA, such concerns cannot be construed as showing bias or improper motive. Rather, it demonstrates that New Jersey was taking prudent measures to further the protection of its citizens' public safety and the environment.

5. Shieldalloy's Money Spent on the Decommissioning Plans.

The Court stated that the NRC failed to adequately respond to Shieldalloy's assertion that it has spent over \$2 million in 2007-2009 on preparing a decommissioning plan under the NRC's regulations, which would be wasted if New Jersey obtained authority. Shieldalloy, supra, 624 F.3d at 493. The NRC should respond by directing Shieldalloy to provide an itemized and certified statement of the decommissioning costs incurred. A mere assertion of costs incurred without a certified itemization should be rejected. See Instant Air Freight Co. v. C.F. Air Freight, Inc., 882 F.2d 797, 801-02 (3d Cir. 1989) (rejecting the assertion of irreparable harm, in part, because the company failed to support its assertions with any financial statements or projections).

Furthermore, our review of Shieldalloy's fourth decommissioning plan (1b) indicates that most of it would apply to a decommissioning under New Jersey's regulations with minimal revision. For example, the plan includes sections on Operational History, Facility Description, Radiological Status, Environmental Information, Project Management and Organization, Health & Safety Program, Environmental Monitoring and Control Program, Quality Assurance Program, Facility Radiological Surveys, and an Environmental Report. These sections are all applicable and may require only minimal revisions under New Jersey's regulations.

In any event, Shieldalloy cannot legitimately complain of costs incurred in seeking approval of its on-site disposal plans in light of its blatant violation of its obligations to submit an acceptable decommissioning plan and its disregard of the Timeliness Rule, 10 C.F.R. §40.42(d). Shieldalloy has failed to submit an acceptable decommissioning plan in twelve years. (A359, Memorandum at 3). Its years of dilatory submissions of woefully deficient decommissioning plans to the NRC are the cause for the time and expense which Shieldalloy complains. Shieldalloy has only itself to blame.

The NRC's Timeliness Rule requires licensees to inform the NRC that it has ceased licensed operations within 26 months of ceasing operations or within 2 months of deciding to cease principal

activities. 10 C.F.R. §40.42(d). The licensee is required to submit an acceptable decommissioning plan within 12 months of the notification. Id. Despite the fact that Shieldalloy ceased licensed operations in 1998, (A359, Memorandum at 3), it waited to notify the NRC of the cessation until August 2001, (A9-A11). Shieldalloy delayed submitting its first decommissioning plan until August 2002. (A12). Shieldalloy's first decommissioning plan was deficient. Id. The NRC rejected the plan, in part, because Shieldalloy failed to provide sufficient information regarding its site-specific dose modeling, its ALARA analysis, and its proposed institutional controls. Id.

Despite waiting over 2.5 years from the rejection letter to submit the second decommissioning plan, the second plan was also deficient. (A91-A93). The NRC rejected the second plan, in part, because Shieldalloy failed to provide sufficient information regarding its site-specific dose modeling and its proposed institutional and engineered controls. Id. The NRC notified Shieldalloy of these same deficiencies in the first decommissioning plan. (A12).

Shieldalloy submitted its third decommissioning plan in June 2006, (ADAMS ML061980092), but this plan was also deficient and required the NRC to issue a 73-part Request for Additional Information ("RAI"), (A305-A351). As discussed above, the RAI

pointed out that Shieldalloy again failed to provide sufficient information regarding its site-specific dose modeling, (A309-A322, RAIs # 3-18), its ALARA analysis, (A326-A344, RAIs # 27-42), and its proposed institutional and engineered controls, (A322-A326, A330, A342, A343, A345-A347, RAIs # 19-26 34, 60, 61, 66-68). The NRC noted these same deficiencies in Shieldalloy's first and second decommissioning plans. (A12, A91-A92).

The twelve years without an acceptable decommissioning plan is a clear violation of the intent and spirit of the Timeliness Rule. The Atomic Safety and Licensing Board agreed. (A369, Memorandum at 13). The Board found that Shieldalloy's failure to submit an acceptable decommissioning plan violated the spirit of the Timeliness Rule and place the safety of Newfield area residents at a continuing risk. Id. The Board noted that the decommissioning concerns "nothing more than a slag pile. As such, we would think that the [NRC] Staff inquiry here rates relatively low in comparative complexity among the numerous site decommissioning proposals it confronts." Id.

Shieldalloy cannot now complain of the time and expense incurred by its choice to continue to pursue one failed on-site disposal plan after another for a non-complex decommissioning.

Point II

THE ATOMIC ENERGY ACT DISFAVORS DUAL REGULATION.

Because the AEA disfavors dual regulation by different governmental entities, New Jersey's authority should include all source material licensees. See Illinois v. Kerr-McGee Chem. Corp., 677 F.2d 571, 580 (7th Cir. 1982). In Kerr-McGee, the court referenced the Senate report included in the legislative history to the AEA that recognized "the dangers of conflicting, overlapping, and inconsistent standards in different jurisdictions. . . ." Id. The court stated that the intent of the statute was to have radiation hazards regulated and licensed either by the NRC, or by the State, but not by both. Id. at 581.

Point III

SIGNIFICANT LEGAL OBSTACLES EXIST TO THE ONSITE DISPOSAL.

An additional reason for the NRC to transfer jurisdiction over Shieldalloy to New Jersey is because many significant legal obstacles stand in Shieldalloy's way to obtaining approval for the onsite disposal plan under the NRC's authority. The major legal hurdles follow.

First, the NRC would be required to alter the License Termination Rule to allow decommissioning without actually

terminating the license. See, e.g., 20 C.F.R. § 20.1403 (defining the term "Decommission" and providing the requirement of terminating the license); "Radiological Criteria for License Termination," 10 C.F.R. Part 20 Subpart E (emphasis added).

Second, the NRC would be required to promulgate a rule or regulation that sets forth the terms and conditions of the LTC license and the information required to be set forth in the license application. See 42 U.S.C. §§ 2232(a), 2233. The NRC so far has only provided the LTC license in a guidance document. (A500, NUREG-1757 vol. 1 at 17-65). Currently, the NRC regulations only provide licenses for the active use and possession of source material.³ 10 C.F.R. § 40.1(a). The regulations in this part also provide licenses for the disposal and long-term care and custody of byproduct⁴ and residual radioactive material.⁵ 10 C.F.R. § 40.1(a).

³Source material is defined as uranium or thorium or ores containing one or more of the foregoing materials above certain concentrations. 42 U.S.C. § 2014(z). Shieldalloy's radioactive waste is considered source material since it contains uranium and thorium. (SMC Decom. Plan, Rev 1, at xxii-xxiii).

⁴Byproduct material is defined in this Part as "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes." 10 C.F.R. § 40.4. Shieldalloy's radioactive waste is not considered byproduct material because it was processed for its ferrocolumbium, not for its source material. (SMC Decom. Plan, Rev 1, at xxii-xxiii).

⁵Residual radioactive material is defined in this Part as waste subject to the Uranium Mill Tailings Radiation Control Act of

However, the regulations in this part do not provide licenses for the disposal or long-term care and custody of source material. Shieldalloy's radioactive waste is considered source material.

NRC Commissioner Gregory B. Jaczko conceded in his dissent of an NRC Memorandum and Order that additional regulations were required before the NRC approves Shieldalloy's proposed on-site disposal plan. (A380). The majority did not deny that additional regulations were required but instead held that such issues were pending before the Atomic Safety and Licensing Board and the Board should render a decision before the Commission decides. (A379, Order at 7).

Third, the NRC would be required to conduct a programmatic Environmental Impact Statement ("EIS") of the LTC license program. Although the Third Circuit ruled against New Jersey on this issue, it lacked jurisdiction to make any substantive rulings. See New Jersey, supra, 526 F.3d at 104; Sinochem Int'l Co. v. Malay. Int'l Shipping Corp., 127 S. Ct. 1184, 1191 (2007). Furthermore, the Court's decision was not directly on point. The Court held that a programmatic EIS was not required because the NRC was not engaged in "segment[ing] the LTC license program into individual sites"

1978 ("UMTRCA"). 10 C.F.R. § 40.4. UMTRCA only applies to processing sites that sold uranium to the Federal government prior to January 1, 1971. 42 U.S.C. §§ 7911(6)(A), 7912(a). Shieldalloy did not extract uranium from ore at its Newfield site, but rather produced ferrocolumbium. (SMC Decom. Plan, Rev 1, at xxii-xxiii).

since Shieldalloy was the only facility applying for the license. New Jersey, supra, 526 F.3d at 103. However, New Jersey was making a different argument, that an agency is required to conduct a programmatic EIS where it proposes to alter a major federal program that significantly affects the quality of the human environment. Kleppe v. Sierra Club, 427 U.S. 390, 395-414 (1976); Public Citizen v. NRC, 940 F.2d 679, 685 (D.C. Cir. 1991). If the NRC intends to provide the LTC license for the onsite disposal of long-lived radioactive waste in lieu of State or Federal custody of a decommissioned site, such decision would alter a major federal program that affects the public safety and environment. A programmatic EIS would therefore be required.

CONCLUSION

For the reasons set forth above, the State of New Jersey recommends that the NRC return jurisdiction over the Shieldalloy facility.

Respectfully submitted,

PAULA T. DOW
ATTORNEY GENERAL OF NEW JERSEY

By: _____

/s/

Andrew Reese

Andrew D. Reese
Deputy Attorney General

February 4, 2011
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Enclosures: Appendix on Behalf of the State of New Jersey
Certification of Service

c.: Service List

In the Matter of)
)
SHIELDALLOY METALLURGICAL CORP.)
)
(License Amendment Request for)
Decommissioning the)
Newfield, New Jersey Facility)

Docket No. 40-7102-MLA

CERTIFICATION OF SERVICE

I hereby certify that copies of the enclosed Letter and Appendix on behalf of the state of New Jersey have been served upon the following by electronic mail on this date, followed by deposit of paper copies in the U.S. mail, first class, or overnight mail where noted by an asterisk.

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/s/ Andrew Reese
Andrew D. Reese

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
DOCKET NO. 40-7102-MLA

In the Matter of)
SHIELDALLOY METALLURGICAL CORP.)

(License Amendment Request for
Decommissioning of the Newfield)
New Jersey Site))

APPENDIX ON BEHALF OF THE STATE OF NEW JERSEY

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State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
BUREAU OF ENVIRONMENTAL RADIATION

CN 411
TRENTON, NEW JERSEY 08625
(609) 530-4001

October 20, 1986

W. T. Crow, Acting Chief
Uranium Field License Branch
Division of Fuel Cycle and Material Safety
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Crow:

The Bureau of Environmental Radiation (BER) appreciates the opportunity to provide input in the U.S. Nuclear Regulatory Commission's (NRC) license renewal process for Shieldalloy. The BER has regarded this site with some concern due to the nature of activities performed. As a result of its minerals processing activities, large quantities of ore and residues are stored onsite which have potential offsite consequences. Also, liquid discharge from the facility as well as surface runoff from the stored residue could enter the local stream.

It is our understanding that the NRC has requested Oak Ridge Associated Universities (ORAU) to perform an environmental survey of the Shieldalloy site. According to ORAU, this survey is scheduled for FY87. It is the Department of Environmental Protection's (DEP) position that a thorough environmental survey is crucial to provide the NRC, DEP and the facility operator with adequate information on the environmental impact of the site. DEP has analyzed some offsite water and sediment samples and found that they contained thorium and radium concentrations above normal background levels. These data are contained in Tables I and II. Consequently, BER would like to see the ORAU examine the potential offsite impact resulting from routine facility operations since there are a number of streams and private wells in the vicinity, as shown in Figure I. The survey also showed exposure levels at the facility fenceline were significantly above background levels, up to 800 uR/hr (Figure II). These highest fenceline values may have been reduced when the facility moved the storage piles away from the fenceline. With respect to other offsite impact, during a 1985 site visit by DEP, a representative of Shieldalloy stated that crushed ferrovanadium slag waste is transported offsite for subsequent use as road construction material (Attachment I).

Also of concern is the future impact of this facility, if and when licensed operations cease and the facility is released for unrestricted use. BER recommends that the NRC examine the ability of the licensee to decontaminate and decommission the site. This recommendation results from the Department's previous experience with other NRC sites in New Jersey which processed and stored large quantities of ore and residue.

Mr. W. T. Crow, Acting Chief
Page 2

October 20, 1986

The BER would like to see the license require annual reports summarizing environmental monitoring results and any significant activities which influence radiological conditions on or off the site. Environmental monitoring should include, at a minimum, quarterly surface and groundwater monitoring, soil sampling and sediment sampling at offsite locations above and below discharge areas, and routine fence line radon and external exposure evaluation as well as air particulate monitoring. Should the results of environmental monitoring demonstrate that the environment is adversely affected by the facility's operation, then appropriate measures should be taken by the licensee to reduce the impact and remediate the affected area.

Sincerely,



Eileen Hotte, Ph.D.
Bureau Chief

EH:JE:dag

Enclosures: Tables I, II
Figures I, II
Attachment I

c: J. Kinneman, NRC - Region I
J. Berger, ORAU

October 20, 1986

Table I: Gamma Ray Spectroscopy Results of Soil Samples
Collected on April 2, 1985 from the
Vicinity of Shieldalloy

<u>Sample Location</u>	<u>Ra-226 (pCi/g)^a</u>	<u>Th-232 (pCi/g)^b</u>
S-1: Offsite soil, 25-feet from fenceline just before trees	2.1 ± 0.2	6.6 ± 0.4
S-2: Offsite soil, 20-feet from fenceline, 100-feet from dead trees	1.9 ± 0.2	7.2 ± 0.4
S-3: Offsite soil, 75-feet from fenceline, 100-feet from dead trees	6.2 ± 0.4	23.3 ± 0.8
S-4: Offsite soil, 350-feet from fenceline, 250-feet from dead trees	2.0 ± 0.2	4.3 ± 0.4
S-5: Offsite soil, 30-feet from fenceline, 250-feet from Gate W sign	2.4 ± 0.2	8.2 ± 0.2
Ferrovandium pile 1	17.6 ± 0.5	29.7 ± 0.8
Ferrovandium pile 2	4.3 ± 0.4	3.2 ± 0.2

Explanation

- a: Ra-226 based on Bi-214 609 keV peak
b: Th-232 based on Tl-208 583 keV peak

(handwritten note)

Background at Shieldalloy
(0.2-0.9) (0.1-0.5) pCi/g

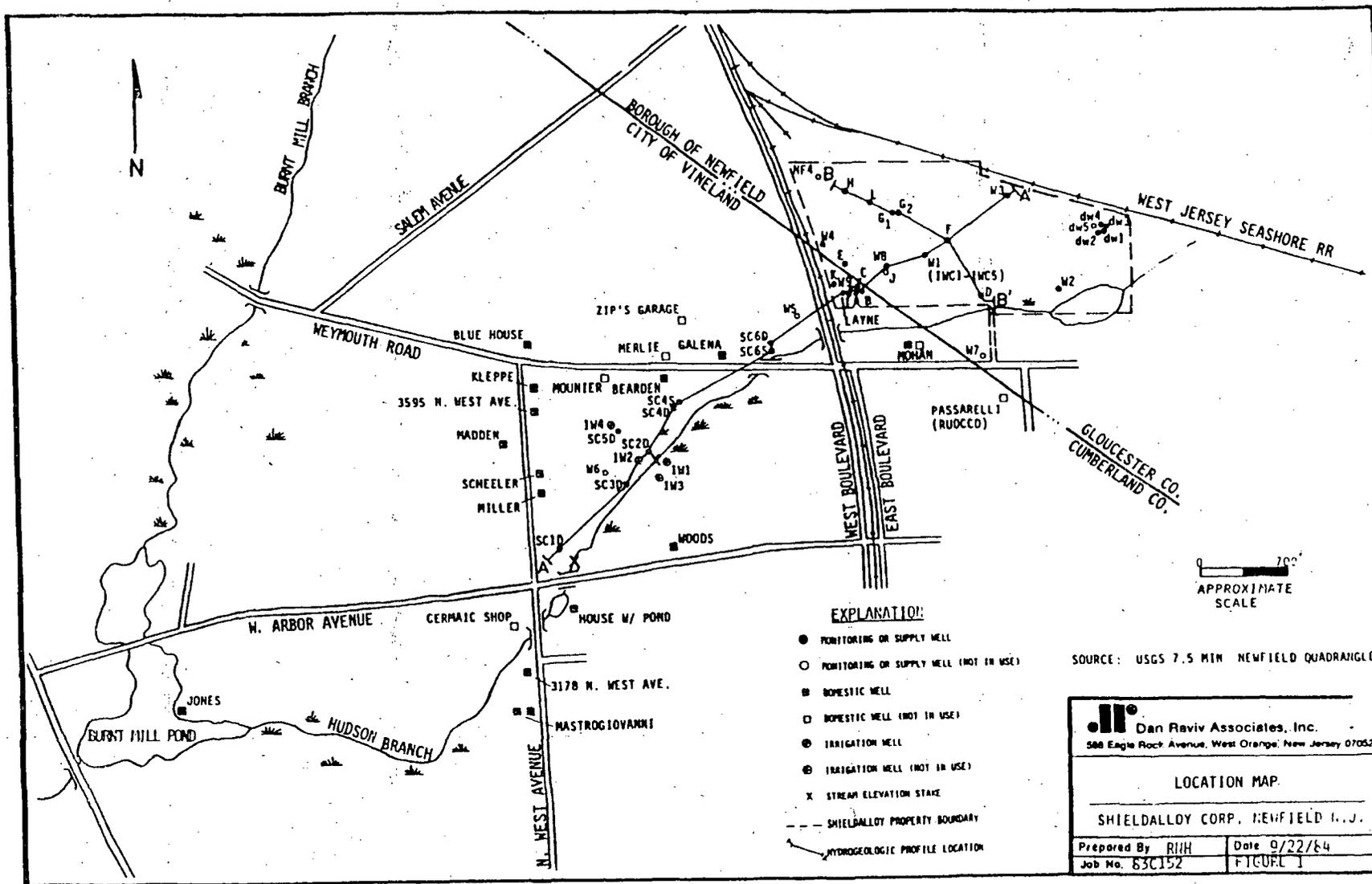
October 20, 1986

Table II: Water Samples from Shieldalloy

<u>Sample Location</u>	<u>Gross-Alpha (pCi/l)</u>	<u>Gross-Beta (pCi/l)</u>	<u>Ra-226 (pCi/l) by chemistry</u>	<u>Th-232 (pCi/l) by gamma spec</u>
W-1, Well 9	5.31 ± 2.83	8.68 ± 1.35	0.49 ± 0.18	26 ± 5
W-2, Layne Well	-2.40 ± 4.24	23.45 ± 2.93	--	21 ± 6
W-3, Facility Outfall	14.26 ± 5.03	273.93 ± 5.98*	1.78 ± 0.28	<5
W-4, H-Well	2.43 ± 1.59	15.17 ± 0.46	--	5 ± 3
W-5, DW-2	5.79 ± 0.98	4.37 ± 0.46	--	<12

*This water sample had significant K-40 concentration of 270 ± 60 pCi/l.

FIGURE I: Map of Area, Ident. Nearby Water Source





State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF ENVIRONMENTAL QUALITY

BUREAU OF RADIATION PROTECTION

380 SCOTCH ROAD, TRENTON, N. J. 08623

April 16, 1985

TO: Shieldalloy File
FROM: Duncan White
SUBJECT: April 2, 1985 Visit to Facility

BACKGROUND

On April 2, 1985, John Feeney, Bill Csaszar, and Duncan White inspected the Sheldalloy facility in Newfield. The visit was coordinated with a regular inspection by the NRC. Shieldalloy extracts various metals via a smelting process from ores (mainly pyroclor) shipped from Canada. Waste products from this manufacturing process are mainly different group of slags containing different impurities. This rock-like material is segregated by type and dumped on the rear portion of their property in piles. Waste water is treated in a series of filters and lagoons before discharge. The entire process takes place in one location.

Inspection of the facility revealed that the smelting process (Building 111) poses the greatest potential exposure to radioactive contamination during operation. Exposure rates up to 200 μ R/hr were measured in portions of this building. A great deal of dust is generated and is visibly seen from a distance.

Once the slag is removed from the building by dump truck, it is piled in the rear of the property as described above. The slag contains a roughly 50-50 mix of the ore and other ingredients. In 1984, approximately 1350 tons (2.7 million pounds) were processed which in turn generated approximately 1100 tons of slag. An estimate of the total ferro vanadium slag (largest slag pile) was approximately 100,000 tons (or approximately 50,000 yd^3 at a density of 2.5 gm/cc). Other slag piles include ferro-colombium, chrome, pyroclorite, ferro-boron and high purity ferro colombium.

New Jersey Is An Equal Opportunity Employer



SHIELDALLOY METALLURGICAL CORPORATION

DAVID R. SMITH
ENVIRONMENTAL MANAGER

WEST BOULEVARD
P.O. BOX 768
NEWFIELD, NJ 08344
TELEPHONE (609) 692-4200

August 27, 2001

Mr. Theodore S. Sherr, Chief
Licensing and International Safeguards Branch
Division of Fuel Cycle Safety and Safeguards, NMSS
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Re: Intent to Terminate Source Material License No. SMB-743

Dear Mr. Sherr:

Shieldalloy Metallurgical Corporation (SMC) has been issued License No. SMB-743 for the possession, use, storage, and disposal of source material at our Newfield, New Jersey facility. Condition 18 of that license states, in part, that if principle activities authorized by the license are not performed by July 1, 2001; SMC must notify the USNRC that it intends to begin the decommissioning process. Because principle activities have not been performed, and because SMC has been unable to identify viable alternative uses for the license, the purpose of this letter is to relay our intent to decontaminate and decommission all restricted areas, perform and document a final status survey demonstrating the release status of the site, and terminate License No. SMB-743 in compliance with License Condition 18.

As required in License Condition 18, as well as in Title 10, Code of Federal Regulations, Section 40.42(d), SMC will prepare and submit a site-wide decommissioning plan to the USNRC on or before September 1, 2002. Once USNRC concurrence with that plan is received, SMC will then limit all actions involving source material to those described therein. However, we will continue to control access to restricted areas until such time as License No. SMB-743 is terminated.

Prior to USNRC approval of the decommissioning plan, SMC will continue to implement all of the terms and conditions of License No. SMB-743. This includes the performance of routine surveillance and maintenance activities in restricted and unrestricted areas, as well as our ongoing efforts to reduce the number and size of existing restricted areas. However, as required in 10 CFR §40.42(g)(4)(i), the pending decommissioning plan will include a description of the radiological conditions of the site that are current as of the date of submittal.

40-7102
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NMSSOIPub
9A

Mr. Theodore S. Sherr, Chief
U. S. Nuclear Regulatory Commission
August 27, 2001
Page 2

Please call me at (856) 692-4200, extension 226, if I can answer any questions, or provide you with additional information on this or other matters. We look forward to working with the USNRC and other stakeholders as we proceed toward a technically-sound, legally-defensible, timely and efficient end to our operations involving licensable radioactive materials.

Sincerely,

A handwritten signature in black ink, appearing to read "David R. Smith". The signature is fluid and cursive, with the first name "David" being the most prominent.

David R. Smith
Radiation Safety Officer

cc: Nigel C. Morrison - SMC
Fran Gilmartin - SMC
Eric Jackson, Metallurg
Ellen Harmon, Esq.- Metallurg
Jay Silberg, Esq. - Shaw Pittman
Carol D. Berger - IEM
Julie Olivier - USNRC Licensing Section 2
Michael Raddatz - USNRC Licensing Section 2
Marie Miller - USNRC Region 1



SHIELDALLOY METALLURGICAL CORPORATION
WEST BOULEVARD · P.O. BOX 768
NEWFIELD, NJ 08344

Mr. Theodore S. Sherr, Chief
Licensing and International Safeguards Branch
Division of Fuel Cycle Safety and Safeguards, NMSS
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

February 28, 2003

Docket No. 04007102
Control No. 132074

License No. SMB-743

David R. Smith
Environmental Manager
Shieldalloy Metallurgical Corporation
Aluminum Products & Powders Division
12 West Boulevard
P.O. Box 768
Newfield, NJ 08344-0768

SUBJECT: REJECTION OF DECOMMISSIONING PLAN FOR THE NEWFIELD FACILITY
AND DENIAL OF THE EXEMPTION REQUEST TO POSTPONE INITIATION
OF DECOMMISSIONING PROCESS, CONTROL NO. 132074

Dear Mr. Smith:

On August 30, 2002, Shieldalloy Metallurgical Corporation (SMC) submitted its Decommissioning Plan (DP) for the Newfield Facility. SMC then submitted a letter dated November 15, 2002, which requested an exemption that NRC staff defer taking action on SMC's DP, while the NRC is reviewing its regulations and related guidance for restricted use license termination. These two documents were discussed during the January 9, 2003 telephone conference with you, Carol Berger (your consultant), Marie Miller (of my staff) and me along with the need to resubmit your application for the timely renewal of your NRC license.

Results of our review of the aforementioned documents and of our telephone conversation are provided below:

Decommissioning Plan Acceptance Review

The NRC staff conducted an acceptance review of your DP using the guidance contained in NUREG-1757, Vol.1, Consolidated NMSS Decommissioning Guidance, and NUREG-1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs. Based on this initial acceptance review, we determined that the DP does not contain sufficient information for us to continue a more detailed technical review. Additional information is required regarding such aspects of decommissioning as: your site-specific dose modeling, a quantitative site specific cost-benefit analysis to demonstrate that the proposed alternative is As Low As Reasonably Achievable (ALARA), specific institutional controls for restricted release, an agreement by a competent party to assume control of and responsibility for maintenance of the site, financial assurance, and advice from affected parties. This information is also needed to evaluate the adequacy of your Decommissioning Funding Plan as it relates to your DP.

We recommend that you develop a revised DP using the NRC staff's phased approach that would have you first focusing on resolving the deficiencies regarding institutional controls, financial assurance, engineering cell design concepts, and advice from affected parties with

D. Smith
Shieldalloy Metallurgical Corporation

respect to these issues, before revising the other portions of your DP. To facilitate your revision of the DP, we are enclosing the staff's preliminary comments on specific topics of your DP as identified in Enclosure 1. As a first step in this process, we suggest that you plan on meeting with us in March 2003, to discuss these deficiencies of your DP as submitted, as well as the phased approach. Based on this meeting, you should provide a schedule for submitting a revised DP.

Exemption Request

Regarding your exemption request, we find that you have not provided a sufficient basis for approval of your request. Although the NRC is reviewing its regulations and related guidance for restricted use, the 10 CFR Part 20 Subpart E, Radiological Criteria for License Termination and associated guidance documents remain applicable. While there could be changes, as with any regulation, the review process for a restricted release termination plan is lengthy and also dynamic. We need to balance the impact of possible changes against the need to prevent further delays to the decommissioning of the SMC Newfield site. We therefore are denying your exemption request. However, as discussed above, as you evaluate and develop your revised DP, we would be agreeable to having a technical meeting on issues associated with meeting the restricted release criteria or an alternative criteria and dose modeling.

Timely Renewal

The remaining licensing issue we discussed was our consideration of your submittal of the DP to be a renewal request. We require a license renewal application for the ongoing remediation activities being conducted under your extended license. Your application for renewal should address the current remediation activities, storage of license source material, and include your Final Status Survey Plan for the areas that you intend to request NRC to amend your license. We request that your application for timely renewal be submitted by April 30, 2003.

If you have any question regarding this matter, please contact Marie Miller of my staff at (610) 337-5205 or by e-mail at mtm1@nrc.gov. In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room (PDR) and will be accessible from the NRC Web site at <http://www.nrc.gov/reading-rm.html>.

Sincerely,

Original signed by Ronald R. Bellamy

Ronald R. Bellamy, Chief
Decommissioning and Laboratory Branch
Division of Nuclear Materials Safety

Enclosure:

1. NRC Staff Preliminary Comments on SMC Decommissioning Plan

D. Smith
Shieldalloy Metallurgical Corporation

cc w/enc.:

Jill Lipoti, Ph.D., Assistant Director, Radiation Protection Programs
Mark Winslow, Coordinator, RH&SP, U.S. EPA, Region 2
Loretta Williams, Resident, Newfield, NJ

D. Smith
Shieldalloy Metallurgical Corporation

Distribution w/enclosure:

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DATE	2/28/03		2/28/03		2/28/03			

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ENCLOSURE ONE

NRC STAFF PRELIMINARY COMMENTS ON SHIELDALLOY DECOMMISSIONING PLAN

DOSE MODELING

Section 5.2.2 Assessment Methodology assumes that the "agricultural farm family" scenario is applicable. It also states that RESRAD Version 6.2 was used, and that it takes into account the potential uses of the site and potential migration of radioactive materials through the environment over time through both natural processes and human activities. Section 5.2.3 describes the input parameters, which were listed in Tables 17.6 -17.13. The following information is needed to assess the adequacy of the exposure scenario and the dose modeling:

1. The exposure scenario includes a situation in which the deed restrictions and prohibition of building a residence near the storage pile fail, yet the cover and shape of the capped pile remain intact. Please provide a justification for how the cell has been designed to withstand erosion and other activities or an exposure scenario should also be included that erodes the cap through natural and human activities if the institutional controls and site maintenance were to fail.

2. The exposure scenario as stated eliminated the direct exposure pathway by placing the house 20 feet away from the contaminated area, and estimated an exposure of less than 10 microrem per hour above background. Please provide the basis for selecting a distance of 20 feet. In addition, provide a basis as to why exposure to direct gamma radiation from other plausible scenarios should not be considered. For example, the average member of the critical group could be the family farm member engaging in outdoor activities, such as tending to crops and livestock or recreational activities such as fishing in the on-site pond.

Please consider other exposure scenarios where there could be land activities on top of the engineered cell. For example, an exposure scenario to a worker providing maintenance on and near the cell, or an intruder scenario because of loss of institutional controls, resulting in an occupational re-use of the land over the cell. Comparison of the results for modeling these scenarios to the residential farming scenario should be included to demonstrate the reason for selecting the residential farming scenario as the bounding scenario.

3. An exposure scenario for other areas of the site where licensed materials were used is not addressed in the DP. The DP should address the dose contribution for the other portions of the site to meet the overall dose limits for the site.

4. The input parameters used in Shieldalloy's analysis are primarily the RESRAD default parameters. There was no sensitivity analysis to identify key parameters. Please provide the justification for the values used for key parameters for the Newfield site. Note that information determined based on past groundwater studies may be acceptable. NRC staff are available to discuss appropriate methods for performing sensitivity analyses.

5. The input parameters model an impermeable cover remaining intact and not affected by erosion or water runoff (water runoff coefficient to 100%). Yet, input parameters erode the contaminated slag pile over time. Provide or reference the basis for why the engineering cover

D. Smith
Shieldalloy Metallurgical Corporation

would remain in place. Also justify how the slag pile erodes with time, although the impermeable cover is not eroded.

6. The partition coefficients were changed based on a referenced source. Compare these K_d values to calculations of estimated travel times based on the uranium and thorium found in ground-water samples from wells near the existing slag piles. Also, explain the basis for inputting the ground water concentration as zero under the initial conditions.

DECOMMISSIONING ALTERNATIVES AND RATIONALE AND ALARA ANALYSIS

Section 6.2 states, in part, that the regulatory decision on the preferred decommissioning alternative for another facility with similar radioactive slag is equally applicable to the SMC's Newfield facility. However, site-specific factors and a thorough examination of other alternatives were not presented. Section 7 states that the estimated cost of off-site disposal was calculated to be approximately \$102-112 million versus about \$3.0 million for the on-site disposal options. Please elaborate on the other alternatives and explain the cost differences.

1. See 10 CFR 51.60 for the general requirements for a licensee's Environmental Report and NUREG-1748 for developing a site specific Environmental Report. SMC's report can reference other reports, as applicable, but must also describe site specific features that are different from the other referenced site where onsite disposal was considered an acceptable alternative. In particular, alternatives considered should address the summary of the impacts to the community, such as land use, property values, and environmental justice within a 4 mile radius of the center of the facility. Also, identify the potential impacts of the alternatives for the contaminated slag, soils and groundwater on the areas that are already impacted by the past hazardous chemical contamination, such as the ongoing groundwater treatment and offsite restricted well area.

2. Examine other conservative alternatives, such as offsite disposal to other facilities (compare cost factors per ton or cubic feet), and offsite disposal of the soils and bag-house dust and its impact of reduction on the source term. For example, leaching of thorium and uranium from the bag-house dust in comparison to the slag, and the cost-benefit of the action.

3. Develop and submit a site specific quantitative cost-benefit analysis to support the in-situ stabilization option as ALARA, since the chosen alternative is not the environmentally preferable alternative. The ALARA demonstration should be performed pursuant to Section 7 of NUREG-1727, NMSS Decommissioning Standard Review Plan.

RADIOACTIVE WASTE MANAGEMENT PROGRAM

Section 12.3 states that no solid or liquid mixed wastes are expected to be generated during the decommissioning process. However, a soil remediation plan is under review by EPA. Please state whether any mixed waste could be generated from remediation of these soils in areas impacted or potentially impacted by NRC regulated source material.

D. Smith
Shieldalloy Metallurgical Corporation

FINANCIAL ASSURANCE

Section 15.1 states that costs of implementing this plan is \$2,731,161 as shown in Table 17.14.

1. Please separate the cost of long term surveillance from the cost of site stabilization and cell construction.
2. The cost for site-stabilization and long term surveillance and maintenance of the cap, wildlife area and nature trails for 1000 years was estimated at \$781,300. Please show the cost for long-term care on a yearly basis and the method used to determine the total estimate (refer to NRC guidance to calculate this amount) assuming a duration of 1000 years. Also explain the assumptions used regarding the potential for requiring major repair of the cell (see comments regarding maintenance of the site).
3. Describe the financial assurance mechanism provided by the licensee or responsible party for an independent third party to carry out the necessary control and maintenance activities.
4. Address whether costs for additional remediation/recovery actions related to being an EPA National Priorities List site are assumed to be secured with the existing irrevocable stand-by letter of credit.

INSTITUTIONAL CONTROLS (IC)

Section 16.2 provides a summary of the variety of institutional controls that will be implemented.

1. Explain how the proposal for the institutional controls are legally enforceable, such as the authority to enforce and manner in which controls will be enforced. In its DP, SMC proposed the use of a deed notice after license termination while it remains the owner of the site. NRC staff is concerned because a deed notice is not a legally enforceable type of institutional control. Furthermore, SMC did not address enforceability of the institutional controls after transfer of ownership to some other government entity. Such institutional control plans must be agreed to and documented in the revised DP.
2. Identify whether there is an agreement by an independent third party to assume control of and responsibility for the maintenance of the site. Residual contamination at the SMC site will consist of uranium and thorium, both long-lived radionuclides requiring "more stringent" IC according to the LTR SOC. Although SMC proposed eventually transferring their site ownership to some local or state government entity, the DP did not discuss the capability or willingness by any government entity to accept this responsibility in perpetuity. SMC must also address the willingness of entities to accept the funds to be provided and that they are sufficient for control and maintenance as well as resolving concerns over long-term liability due to potential engineered cell/cap repair after transfer of ownership. Therefore, SMC has not demonstrated that its proposal is feasible.

D. Smith
Shieldalloy Metallurgical Corporation

ENGINEERED BARRIERS

Section 8.3 of the DP describes a design concept for the engineered cell and cap, with steep slopes and small top to preclude the potential for building a residence on top of the cell in the future and therefore, precluding the resident farmer scenario. The cell design concept also includes the use of a geotextile layer to limit infiltration.

1. The DP states that the cell has been designed to meet New Jersey (see executive summary) and NRC (see Section 8.3.3) requirements, that it is designed to last 1000 years, and will prevent future erosion. However, specific guidance documents are not referenced. Please do so.
2. No basis is provided for the cell lasting 1000 years or preventing future erosion, especially with steep 3/1 slopes. Furthermore, no basis is provided that the geotextile layer will last 1000 years or the affect on performance if it fails.
3. There is no discussion that the cell and cap have been designed not to rely on maintenance or to preclude major cell failure and major repair or partial replacement over the 1000 year time period. Reference to NRC's Part 40 Appendix A engineered cell cap design guidance for designing disposal cells within the objectives to last 1000 years with no reliance on maintenance may be useful to consider.

The above deficiencies are key concepts for the dose modeling scenario assumptions as well as key assumptions underlying the financial assurance/funding estimate and potential long-term financial liability concerns related to potential engineered cell failure and repair costs.

MAINTENANCE OF SITE

Section 16.3 describes maintenance of the perimeter of the property and the entire Storage Yard. It also states that when all plant operations cease, SMC intends the area would convert to a wildlife sanctuary.

1. Describe any detriments associated with the maintenance of the institutional controls. For example, discuss the potential for vegetation growth or presence of hazardous wildlife that could prevent the completion of quarterly maintenance inspections or impact the engineered cell, i.e., burrowing by animals.
2. Describe maintenance expected for the engineered cap and nature trails after SMC transfers title of the property. Include a discussion of the potential for and the cost of major repair or partial replacement of the engineered cell cap should the cap fail. Note the relationship to the degree of design robustness. For example, more robust design would result in lower reliance on maintenance and greater certainty that the cell cap will not fail and need periodic major and costly repair. A less robust design may need greater funds set aside for periodic major repairs.

D. Smith
Shieldalloy Metallurgical Corporation

OBTAINING PUBLIC ADVICE

Section 16.4 states what public advice will be solicited and that it will establish a Restoration Advisory Board (RAB). It also stated that meetings of the RAB will be held each quarter during the planning and implementation phase.

1. Because SMC with its RAB most likely will develop the mechanisms for soliciting public advice from the local parties, please outline in more detail what actions are planned or will be taken to establish an RAB. As stated in Section 4, the RAB should be meeting during the planning phase to provide valuable input. NRC recommends that a site specific advisory board (SSAB) or other effective methods be selected as soon as practical after the licensee notifies NRC of its intention to decommission and terminate the license. See NUREG-1757, Vol 1, Section 17.8 for additional guidance.
2. Describe the administrative support and access to licensee studies and analysis pertinent to the proposed decommissioning for the SSAB. Describe how the summary of the results of all collective discussions and reports by the SSAB will be made publicly available.
3. Although SMC indicated general plans for future interactions to seek advice from affected parties, the DP did not include the results of interactions as required. The advice from affected parties should have been part of the input that SMC used to prepare its DP.

POLICY ISSUE
(Notation Vote)

May 2, 2003

SECY-03-0069

FOR: The Commissioners
FROM: William D. Travers
Executive Director for Operations /RA/
SUBJECT: RESULTS OF THE LICENSE TERMINATION RULE ANALYSIS.

PURPOSE:

To provide the Commission with the results of the staff's analysis of issues associated with implementing the U.S. Nuclear Regulatory Commission's (NRC's) License Termination Rule (LTR). These results include evaluations of relevant information, recommended options to resolve each issue, recommended regulatory actions, and a schedule and resource estimate for completing the actions.

SUMMARY:

This paper provides the results of the Commission-directed analysis of LTR issues, with particular emphasis on resolving the restricted release and alternate criteria issue. The staff also evaluated other issues dealing with the relationship of the LTR release limits to other release limits, realistic exposure scenarios, measures to prevent future legacy sites, and intentional mixing. The staff proposes a variety of actions to address these issues including: 1) a rulemaking for measures to prevent future legacy sites; 2) revised guidance to support the rulemaking and to clarify restricted release, on-site burials, and realistic exposure scenarios; 3) revised inspection procedures and enforcement policy to enhance monitoring, reporting, and remediation to prevent future legacy sites; and 4) a Regulatory Issue Summary (RIS) to inform a wide range of stakeholders about the LTR analysis of each issue, Commission direction, and

CONTACT: Robert L. Johnson, NMSS/DWM
(301) 415-7282

actions planned to resolve each issue. Finally, during the staff's briefing to the Commission on March 3, 2003, the Commissioners expressed an interest in the reactor decommissioning process and lessons learned implementing this process. The staff will provide this information to the Commission in the annual status report on the decommissioning program.

BACKGROUND:

The staff experience with the LTR has revealed some important implementation issues impacting the decommissioning of sites. The Commission directed the staff, in a June 18, 2002, Staff Requirements Memorandum, SECY-01-0194, to conduct an analysis of LTR issues, with particular emphasis on resolving the restricted release and institutional control issues and thus making the LTR provisions for restricted release and alternate criteria more available for licensee use. On October 1, 2002, the staff provided the Commission with an initial analysis that described the scope of each issue and the staff's plans for evaluation (SECY-02-0177).

DISCUSSION:

1. Evaluation Process

The staff conducted the planned evaluations for the eight issues identified in SECY-02-0177 and identified one new issue and associated plans for future evaluations. The issues evaluated in the nine attachments are:

- Restricted release/alternate criteria and institutional controls (Attachment 1)
- Relationship between LTR release limits and other release limits
 - Unimportant quantities under 10 CFR 40.13(a) (Attachment 2)
 - Appropriateness of developing a separate uranium/thorium unrestricted release standard (Attachment 3)
 - On-site disposal under 10 CFR 20.2002 (Attachment 4)
 - Controlling the disposition of solid materials (Attachment 5)
- Realistic exposure scenarios (Attachment 6)
- Measures to prevent future legacy sites
 - Changes to financial assurance (Attachment 7)
 - Changes to licensee operations (Attachment 8)
- Appropriateness of allowing intentional mixing (new issue) (Attachment 9)

The staff's evaluations considered a wide range of relevant information and experience from other NRC programs and regulations, as well as external sources, such as the U.S. Environmental Protection Agency (EPA); U.S. Department of Energy (DOE); Agreement States; and National Research Council reports. Similarly, extensive coordination among NRC staff was conducted to gain further information and perspective, as well as to identify interrelationships among the individual issues.

The staff's evaluations also identified options to resolve the issues, evaluated their pros and cons, and used these results to recommend specific options. The full range of regulatory tools to implement the options was considered, including: rulemaking; guidance; inspection procedures; enforcement guidance; and informational tools such as a RIS.

2. Summary of Evaluation Results

Results for three of the nine issues are summarized below. These three issues are summarized in view of recent heightened Commission interest on these important topics. Detailed results for each of the nine issues are given in Attachments 1-9, and a combined set of recommendations for all the issues is provided in Attachment 10. The potential applicability of these recommendations to the existing and future decommissioning sites is shown in Attachment 11. Attachment 11 indicates that the recommendations for realistic scenarios, financial assurance, and to some extent restricted release, have the potential to provide significant benefit to the implementation of the LTR issues.

a. Restricted Release/Alternate Criteria and Institutional Controls

Institutional control requirements that are necessary for the viability of both the restricted release and alternate criteria provisions of the LTR (i.e., 10 CFR 20.1403 and 1404, respectively) have been difficult for licensees to implement, particularly for those sites contaminated with long-lived radionuclides such as uranium and thorium. Although only a few sites are considering restricted release at this time, resolving this issue, so that the restricted release provision is more viable, may allow decommissioning progress at these few sites. At this time no sites are considering license termination using alternate criteria.

The staff evaluated information and experience from other NRC regulations, EPA, DOE, Agreement States, National Research Council reports, and an American Society for Testing Materials (ASTM) standard, to gain insights about how others are addressing this issue. Key insights from these evaluations include: 1) many organizations recognize the potential for eventual failure of institutional controls, particularly over the long term; 2) appropriately selecting, implementing, monitoring, and enforcing institutional controls will help minimize or mitigate the potential for failure of institutional controls; 3) in some cases, an ongoing Federal role is critical to assure long-term effectiveness of institutional controls; and 4) flexibility is needed to implement institutional controls that address site-specific characteristics.

The staff evaluated several options, including those directed by the Commission, and offer several recommendations. Recommendations are made to clarify the LTR's risk-informed and graded approach for institutional controls and clarify how existing options can be used more effectively over long time periods. In addition, new options are recommended to involve NRC in long-term oversight, either with a monitoring and, if necessary, an enforcing role after license

termination, or with a possession-only specific license for the time period restrictions are needed. However, it should be noted that at the time the LTR was promulgated, license termination was expected to have finality and that absent significant threats to public health and safety, NRC would no longer have an oversight role at a terminated site. The staff believes the recommended options can be implemented by revising the existing guidance and informing licensees and stakeholders with a RIS.

These recommendations should result in the following outcomes: 1) in the near-term, make the restricted release provision more viable and available for licensee use by providing new options and clarifying the risk-informed and flexible graded approach to select options; 2) provide more effective restrictions that protect the public health and safety over the long-term; 3) become more consistent with EPA's approach and recommendations of the National Research Council and the ASTM Standard; 4) should increase public confidence and acceptance of restricted use under the LTR; and 5) allow productive reuse of some sites. All these outcomes will enhance the decommissioning of existing licensed sites. Although they could also pertain to future licensees, the potential for future licensees needing restricted release should be reduced by the recommendations for other LTR issues, including measures to prevent future legacy sites, on-site disposals, and more realistic exposure scenarios.

b. Realistic Exposure Scenarios

Staff and licensee experience implementing the LTR has raised questions about perceived unnecessary conservatism in dose assessments. One significant source of potential conservatism is with selecting post-license termination land use scenarios. This issue focuses on how to select and justify land use scenarios for the 1000-year dose assessment time period for both the unrestricted release cases and restricted release (assuming failure of institutional controls) and whether more realistic scenarios can result.

The staff evaluated NRC's existing guidance, licensee and staff experience using this guidance, case studies that have resulted in selecting more realistic scenarios, and approaches used by EPA. Two options were evaluated to achieve more realistic scenarios. One was to improve the implementation of the current approach and guidance by training and sharing with licensees more realistic case studies. The other option was to allow justification of scenarios based on reasonably foreseeable future land use, as opposed to defaulting to very conservative scenarios such as the resident farmer. The staff recommends the option of using reasonable foreseeable land use. This option includes identifying reasonably foreseeable land use scenarios that are likely within the foreseeable future (e.g., the next few decades and to possibly 100 years), considering advice from land use planners and stakeholders. This option would also identify less likely, alternate scenarios to the reasonably foreseeable scenarios, to understand the robustness of the analysis. Compliance would be based on a range of reasonably foreseeable scenarios, but evaluating less likely alternate scenarios would provide information to reach a risk-informed decision. This option is consistent with the LTR critical group concept. Therefore, the staff recommends implementing this option using revised guidance, staff training, sharing the approach with licensees, and a RIS. The outcome of this recommendation would be a clearer approach and guidance to implement dose assessment exposure scenarios that are more realistic and risk-informed. Application of this approach might also result in fewer restricted release sites and less costly cleanup to unrestricted release levels.

c. Financial Assurance Measures to Prevent Future Legacy Sites

A number of sites licensed before the financial assurance regulations were issued in 1988 now find that the full cost of decommissioning exceeds their projections and fund balances. Furthermore, staff experience applying the financial assurance regulations has resulted in many lessons-learned that can be applied to improve the regulations and reduce the risks to decommissioning financial assurance. Based on this experience, the staff focused on specific risks that could cause shortfalls in decommissioning funding including: 1) restricted release assumption causes underestimation of decommissioning costs; 2) operational indicators of increasing costs; 3) unavailability of funds in bankruptcy; 4) inadequate financial disclosure; 5) reaching assets after corporate reorganization; 6) investment losses reducing trust account balances; and 7) increased decommissioning cost due to accidental release.

For each of these funding risks, the staff evaluated options and made recommendations for both existing and future licensees. To resolve the risk of underestimating decommissioning costs, the staff recommends requiring a licensee to obtain NRC approval of the decommissioning funding plan and prepare a cost estimate assuming unrestricted release, unless the licensee can demonstrate its ability to meet the restricted release requirements. The staff also recommends using a risk-informed approach to identify high-risk operational indicators (e.g., spills, groundwater contamination, and facility modification) and requiring updates to decommissioning cost estimates and financial assurance coverage. New requirements are recommended for additional certification of financial statements; holding parent company and subsidiaries liable for decommissioning costs by license conditions and/or agreements; and for licensees to perform periodic evaluations of the impact of investment losses on their trust fund balances and sufficiency of financial assurance coverage. A new rulemaking and implementing new guidance are recommended actions. The outcome of these recommendations should be to effectively reduce funding risks that could cause shortfalls in decommissioning funding, thus minimizing the potential for future legacy sites.

3. Recommended Implementation Actions

The following four actions would implement the recommendations in Attachment 10.

1) **Rulemaking:** Conduct a new rulemaking to examine adding and revising requirements for: a) financial assurance and b) licensee monitoring, reporting, and remediation to reduce the potential for future legacy sites. This single rulemaking would consider the specific recommendations in both Attachments 7 and 8 if conducting a rulemaking is approved by the Commission.

2) **Guidance:** Develop new guidance to implement the above rulemaking and revise existing guidance to address options for restricted release, on site disposal, and selecting realistic land use scenarios. Guidance development would include an opportunity for public comment.

3) Inspection and enforcement guidance: Revise the existing inspection and enforcement guidance to enhance monitoring, reporting, and remediation to prevent future legacy sites.

4) RIS: Prepare a RIS to inform a wide range of stakeholders about the LTR analysis of each issue, Commission direction, and planned actions.

4. Overall Outcomes Expected from Recommendations

SECY-02-0177 identified desired outcomes, or objectives, for each LTR issue to help guide the evaluations. As a follow-up, each of NRC's Strategic Plan performance goals was considered in conducting evaluations and making recommendations. Detailed outcomes relative to NRC's four performance goals are given in Attachment 12.

In summary, the outcomes of the staff's recommendations affect both existing decommissioning sites and future decommissioning sites. Existing decommissioning sites can be either licensees currently in decommissioning or formerly terminated NRC licensed sites where more cleanup is needed. Within this group are complex sites, including those with long-lived radionuclides (e.g., uranium and thorium), that have difficulty decommissioning, for a variety of financial, technical, or programmatic reasons. These sites can be thought of as NRC "legacy" sites—those sites where past operating or financial events have created the existing problems that must now be overcome, in some way, to conduct sufficient cleanup and ultimately complete decommissioning and license termination. The staff's recommendations are also prospective and based on lessons learned from the existing licensees. These recommendations will affect both currently operating licensees, who will decommission in the future, and new future licensees.

For existing decommissioning sites, particularly the complex sites with long-lived radionuclides, many recommendations should facilitate decommissioning by addressing key challenges these sites must address. Consistent use of more realistic exposure scenarios could result in more economical decommissioning, while maintaining safety. Furthermore, this recommendation could also result in fewer sites that might need to use the restricted release or alternate criteria. For those few sites, however, that might still need to use the restricted release or alternate criteria provisions of the LTR, viable options for restricting site use are recommended. A clarification also is recommended to improve the understanding of the risk-informed graded approach for selecting institutional controls and the flexibility this approach provides to licensees. This approach clarifies the use of more conventional institutional controls, such as deed restrictions, for lower-risk sites and durable institutional controls to enhance the effectiveness of institutional controls for higher-risk sites.

For future decommissioning sites, specific measures are recommended for financial assurance, licensee operations and reporting, and on-site disposal, that should reduce or mitigate the potential for future "legacy" sites. These measures should also reduce the need for using the restricted release or alternate criteria provisions of the LTR. Together, these outcomes contribute to the Commission's preference for license termination, with unrestricted release, which results in the greatest opportunity to return the site to productive use.

Finally, many of the recommendations simply clarify and address questions about the relationship between the LTR criteria and criteria in other NRC regulations such as the unimportant quantities limit in 10 CFR 40.13(a); onsite disposals in 10 CFR 20.2002; and the current case-by-case limit used for controlling the disposition of solids materials.

5. General Schedule for Recommended Implementing Actions

The general schedule for the recommended actions is given below and is based on the assumption, for planning purposes, that the Commission's decision and direction for LTR follow-up actions will be received by September 30, 2003.

Commission paper on mixing	9/30/03
New rulemaking to prevent future legacy sites	
Rulemaking Plan	9/30/04
Proposed Rule	9/30/06
Final Rule	9/30/07
New guidance (supporting new rule)	
Draft	9/30/06
Final	9/30/07
Revised Guidance	
Draft	9/30/05
Final	9/30/06
Revised inspection/enforcement guidance	9/30/05
RIS	3/30/04

RECOMMENDATIONS:

The staff recommends that the Commission approve the options and issue-specific implementation actions in Attachment 10.

RESOURCES:

The LTR analysis and recommended follow-up actions are currently unbudgeted, but resource estimates for the fiscal years (FY) 2004 to 2006 will be addressed using the Planning, Budgeting, and Performance Management process during the development of the FY 2005 budget.

Total resources estimates are given below in full-time equivalents (FTEs) and thousands of dollars (\$K), and a resource breakdown given in Attachment 13.

FY 03:	1.0 FTE \$0K
FY 04:	1.0 FTE \$0K
FY 05:	3.0 FTE \$150K
FY 06:	2.0 FTE \$100K
FY 07:	1.0 FTE \$50K

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections. The staff plans on briefing the Advisory Committee on Nuclear Waste in May 2003.

/RA by Carl J. Paperiello Acting For/

William D. Travers
Executive Director
for Operations

Attachments:

1. "Results of Evaluations for the Restricted Release and Institutional Control Issue"
2. "Results of Evaluations for the Relationship between LTR Release Limits and the Unimportant Quantities Limit Under 10 CFR 40.13(a)"
3. "Results of Evaluations for Appropriateness of Developing a Separate Unrestricted Release Standard for Uranium and Thorium"
4. "Results of Evaluations for the Relationship between the LTR and On-Site Disposal under 10 CFR 20.2002"
5. "Results of Evaluations of the Relationship between the License Termination Rule and the Current Case-by-Case Approach for Controlling the Disposition of Solid Materials"
6. "Results of Evaluations for Realistic Exposure Scenarios"
7. "Results of Evaluations for Measures to Prevent Future Legacy Sites by Changes in Financial Assurance"
8. "Results of Evaluations for Measures to Prevent Future Legacy Sites by Changes in Licensee Operations"
9. "Planned Evaluations for Appropriateness of Allowing Intentional Mixing of Contaminated Soil under the License Termination Rule"
10. "Combined Set of Recommended Options and Implementation Actions for All Individual License Termination Rule Issues"
11. "Potential Applicability of License Termination Rule Issues to Existing Decommissioning Sites (SDMP, Complex, and Formerly Terminated Licensed Sites) and Future Decommissioning Sites"
12. "Major Outcomes of License Termination Rule Recommendations with Respect to NRC's Four Performance Goals"
13. "Breakdown of Resource Estimates for Recommended License Termination Rule Analysis Implementation Actions"

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Attachments: See Next Page

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ADAMS Accession No. ML030840302

* See Previous Concurrence

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EPAB		DCB		DCB		DCB		Tech ed		EPAB			
C McKenney att6*		T.Fredrichs att7*		J Shepherd att8*		D Widmayer att9*		E Kraus*		L Kokajko*			
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DCB		DWM		IMNS		NMSS		NMSS		STP		OGC	
L. Camper*		J Greeves*		C. Miller*		M Federline		M. Virgilio*		DSollenberger*		S Treby*	
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OCFO		NRR		OE		DEDMRS		EDO					
B.Ficks*						C Paperiello		W Travers					
04/04/03		04/21/03		04/23/03		05/02/03		05/02/03					

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RESULTS OF EVALUATIONS FOR
THE RESTRICTED RELEASE AND INSTITUTIONAL CONTROL ISSUE

1. BACKGROUND

The staff provided background and an initial analysis of the restricted release issue in SECY-02-0177. The issue was defined and planned evaluations were identified. This attachment provides the results of the staff's evaluations.

2. ISSUE DESCRIPTIONS AND DESIRED OUTCOMES

2.1 Issue: U. S. Nuclear Regulatory Commission (NRC) licensees have difficulties arranging the institutional controls required by the restricted release and alternate criteria provisions of the License Termination Rule (LTR) that ensure long-term effectiveness. Subissues include:

1) Government and Tribes are unwilling to accept transfer of ownership of private sites, because of long-term liability and funding concerns (e.g., potential future additional cleanup, potential failure of engineered barriers, and the ability to obtain funds given to the U. S. Treasury for future custodial activities).

2) Lack of identifying independent third parties to ensure long-term effectiveness of institutional controls and, if needed, to provide control and maintenance if the current owner/licensee abandons the site, goes bankrupt, or if a subsequent owner does not provide control and maintenance. Also, there is a concern over long-term continuity of an independent third party.

3) Difficulties establishing legally enforceable institutional controls involving various types of "deed restrictions" that ensure effectiveness over long periods of time and if property ownership changes.

4) Unclear and perceived limited flexibility of the existing LTR risk-informed, graded approach to institutional control requirements for providing degrees of effectiveness based on dose levels and radionuclide half-life. This includes the meaning of "enforceable" and the threshold for needing "durable" controls, as well as use of engineered barriers, role of independent third party, and degree of public involvement.

5) Selecting realistic exposure scenarios that appropriately consider institutional control effectiveness and radiological hazard. Note that this issue is addressed under the realistic exposure scenario issue in Attachment 6.

The above issues pertain to both the restricted release provisions in 10 CFR 20.1403 and the alternate criteria in 10 CFR 20.1404. One of the required conditions under 10 CFR 20.1404, is that a licensee "Has employed to the extent practical restrictions on site use according to the provisions of 10 CFR 20.1403 in minimizing exposures at the site."

2.2 Desired outcome: Make the restricted release and alternate criteria provisions of the LTR more available for NRC licensee use by identifying institutional control options and removing existing regulatory impediments (such as the issues identified above) currently associated with the institutional control requirements of both the restricted release and alternate criteria provisions of the LTR. Graded institutional control options should be based on radiological risk and time-frame that the institutional control must remain effective.

3. EVALUATIONS OF RELEVANT INFORMATION AND EXPERIENCE

This section summarizes the results of the staff's evaluations and provides insights that will be useful in evaluating the options in section 4 to resolve the issue.

3.1 U.S. Environmental Protection Agency

The staff reviewed key U. S. Environmental Protection Agency (EPA) guidance and met with EPA to discuss institutional control experience under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and The Resource Conservation and Recovery Act (RCRA). Based on this information, insights relevant to the LTR restricted release issues are summarized below.

Both short-term and long-term effectiveness of institutional controls have become a high priority in Superfund and RCRA programs. Because of the importance of institutional controls in selecting the overall remedy for a site, EPA has many roles. First, EPA develops guidance. Guidance has already been developed and is available for identifying, evaluating, and selecting institutional controls. This guidance describes types of institutional controls, examples, and limitations. In addition, criteria for evaluating controls are given. Some highlights from this guidance provide insights for the LTR analysis.

- 1) EPA allows use of proprietary or governmental institutional controls, but recognizes the weaknesses of these types of institutional controls, and that failure is possible. Therefore, EPA encourages layering of institutional controls (e.g., multiple types) to make them more effective over the necessary time period.
- 2) EPA considers EPA orders or permits as one type of institutional control that can be used, but these would have to be reissued when ownership changes. EPA orders or permits can be considered similar to an NRC license.
- 3) EPA considers that institutional controls should supplement engineering controls, and generally should not be used as the sole remedy.
- 4) Flexibility is needed for selecting appropriate institutional controls tailored for specific site needs, legal jurisdictions, and time periods.

In addition to the existing guidance, EPA released for public comment on February 19, 2003, draft guidance on monitoring and enforcing institutional controls. The staff's initial review noted that this guidance addresses ways to deal with issues that crosscut EPA's multiple programs. Extensive information is provided for issues associated with planning, implementing, monitoring, and enforcing institutional controls. Although much of this guidance provides

specific approaches or procedures applicable to EPA's multiple programs, some of the principles also are relevant to NRC's restricted release provision. Examples include: early and full life-cycle planning and cost estimating; early involvement by State and local governments and communities; rigorous periodic monitoring (e.g., Five-Year Review under CERCLA and community reviews) to ensure long-term effectiveness of institutional controls; and variability of enforcement tools, depending on the type of institutional control and jurisdiction. The staff will continue its review of this guidance to identify insights that could enhance the implementation of the LTR's restricted release provision.

EPA involvement with institutional controls extends beyond developing and issuing guidance. EPA also has an approval role for CERCLA and RCRA decision documents involving reliance on institutional controls. Regarding implementation, however, EPA turns over responsibility for institutional control effectiveness to the States after 10 years. Therefore, States have a statutory role for maintaining effective institutional controls. Similarly, EPA guidance on use of institutional controls when Federal agencies, other than EPA, transfer property to non-Federal users states that even if implementation of institutional controls is diligent, the ultimate responsibility for monitoring, maintaining, and enforcing institutional controls remains with the lead Federal agency.

Finally, EPA has an independent oversight, evaluation, and enforcement role. EPA conducts Five-Year Reviews under CERCLA as an independent evaluation to assure long-term effectiveness of a site's remedy, including institutional controls. If needed, appropriate actions can be taken. The Five-Year Review also applies to certain Federal facilities, where the Federal agency conducts the review and EPA approves the review. Under RCRA, EPA is just beginning to consider what it will do with the Thirty-Year Review and beyond.

In summary, it appears to the NRC staff, that EPA's overall approach to short- and long-term effectiveness of institutional controls involves the following principal elements:

- 1) EPA provides policy and guidance for evaluating, selecting, monitoring, and enforcing institutional controls;
- 2) Institutional controls supplement engineering controls;
- 3) Institutional controls are tailored to specific-site needs, using layering of multiple controls or using them in series to achieve the desired level and duration of effectiveness;
- 4) EPA approves decision documents that involve institutional controls;
- 5) Federal (for Federal facilities) or State governments have responsibility for effective implementation; and
- 6) EPA maintains independent oversight, including periodic comprehensive reevaluations to ensure effective implementation for the time period needed (e.g., Five-Year Reviews under CERCLA).

Overall, because of its approach, EPA relies on institutional control effectiveness and, therefore, does not require an assessment of potential safety consequences or use of dose "caps", assuming failure of institutional controls, as NRC requires in 10 CFR20.1403(e). Although different, these two approaches have the same goal of achieving protection. However, NRC's approach seeks finality, while EPA's approach does not, because of its continued oversight through the Five-Year Review process.

3.2 U.S. Department of Energy

3.2.1 Insights from Key DOE Long-Term Stewardship Documents Relevant to the Restricted Release Issue

The staff reviewed selected key U. S. Department of Energy (DOE) documents describing DOE's long-term stewardship program, including the January 2001 "Report to Congress on Long-Term Stewardship" (DOE/EM-0563), the October 2001 "Long-Term Stewardship Study" (DOE/EM-0604); a draft of DOE's Long-Term Stewardship Strategic Plan; and the August 2002 draft of "Long-Term Stewardship Science and Technology Roadmap." Furthermore, the staff has been monitoring DOE's program through contacts with DOE staff and attendance at various meetings. Based on this information, key insights relevant to the LTR restricted release issues are summarized below.

- 1) DOE documents describe many challenging long-term stewardship issues and DOE's approaches to address them for its sites. DOE considers that many of these challenges are also relevant to other governmental and private entities engaged in cleanup and long-term stewardship.
- 2) The following issues identified by DOE are also important to implementing restricted release under the LTR.
 - a) Ensuring continued effectiveness for long periods of time and if property ownership changes;
 - b) Developing a process for meaningful stakeholder/public involvement;
 - c) Ensuring long-term public access to information and outreach efforts; and
 - d) Providing reliable and sufficient funding.
- 3) DOE documents describe the scope of DOE's extensive and diverse long-term stewardship responsibilities and supporting technical capabilities. These documents demonstrate DOE's existing and future capability to provide stewardship for as many as 200 sites contaminated with radioactivity. In addition to DOE mission related sites, DOE already takes stewardship responsibility for sites from other agencies such as uranium mill tailings sites from NRC licensees under Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA); Formerly Utilized Sites Remedial Action Program sites from the U.S. Army Corps of Engineers; and one NWPA 151(c) site from an NRC licensee. Currently, DOE conducts long-term stewardship activities at 34 sites.

4) DOE's long-term stewardship activities are impacted by multiple and sometimes overlapping regulatory authorities, including: CERCLA; RCRA; UMTRCA; and State environmental laws and regulations.

5) In addition to DOE's existing extensive programmatic and technical capabilities, DOE also is conducting studies to significantly enhance its future capabilities. The draft Long-Term Stewardship Science and Technology Roadmap is an ongoing effort being developed to aid DOE in identifying and implementing knowledge and tools that will enhance the performance and reduce the costs at DOE's long-term stewardship sites. The draft Roadmap was compiled by Idaho National Engineering and Environmental Laboratory using an interdisciplinary team from industry, academia, Federal and State regulators, stakeholder groups, DOE national laboratories, DOE site contractors, and other Federal agencies.

The draft Roadmap effort systematically identifies gaps in existing long-term stewardship capabilities and recommends research and development that can address these gaps. Long-term stewardship is described as a system with many interrelated and interacting components. Four functions are identified for the long-term stewardship system (contain, monitor, communicate, and manage) and capabilities are identified to fulfill each function. For each capability, enhancements and research are recommended to address deficiencies or make improvements in existing long-term stewardship capabilities. Examples of recommended areas of research include: site modeling tools; engineered systems for contaminant containment; sensor and sensor systems for site monitoring; preservation and communication of site information; site-community relations; and effective and survivable land use controls.

Of particular interest to the LTR restricted release issue are the following two recommendations made to DOE for enhancing effective and survivable land use controls. The first recommendation consists of identifying potential legal strategies; assessing established agreements, and developing draft alternative legal instruments. The second recommendation is to provide archive options for maintaining land use control information for future generations.

3.2.2 Status of Potential DOE Changes to Long-Term Stewardship Policy and Management

The staff summarized DOE's consideration of potential changes to its Long-Term Stewardship Program in both SECY-02-0008 and SECY-02-0177, including the transfer of its stewardship responsibilities to the U. S. Department of the Interior (DOI) or another Federal land management agency. However, subsequent to status reports, DOE recently proposed a separate new DOE office (not under the Office of Environmental Management) that would include long-term stewardship rather than continuing to seek a transfer of its stewardship responsibilities to another Federal agency. This new Office of Legacy Management was announced and included in the President's fiscal year 2004 budget submitted to Congress in February 2003.

Under this proposal, DOE would maintain its current long-term stewardship responsibilities within this new office and give it greater visibility and responsibility. If approved by Congress, DOE's unique Federal long-term stewardship and technical capability for sites with radioactive

waste, noted above in section 3.2.1, will likely increase in the future as the DOE sites are remediated and transferred into long-term stewardship.

3.3 ECOS Long-Term Stewardship Interagency Cooperative Efforts

In 2001 the Environmental Council of States (ECOS) established a Long-Term Stewardship Subcommittee, which is a cooperative effort to share information among Federal, State, and Tribal organizations with a responsibility or interest in long-term stewardship.

NRC was invited to become involved with the subcommittee and attended the August 2002 workshop. During this meeting, status reports were presented by Federal agencies (DOE, EPA, U. S. Department of Defense (DOD), DOI, U. S. Department of Agriculture, General Services Administration, and NRC) regarding their institutional control programs and issues. Workshop attendees also reviewed a draft Long-Term Stewardship Agreement on shared principles that will be eventually signed by EPA, DOE, DOI, DOD, and ECOS.

Insights relevant to the restricted release issue include the following.

- 1) A continued NRC monitoring and involvement, as appropriate, with the ECOS Long-Term Stewardship Subcommittee provides an efficient mechanism to maintain awareness and exchange current information about issues and evolving solutions among other Federal agencies and States.
- 2) A draft Agreement gives useful guidance on long-term stewardship principles such as sustainability of institutional controls, roles, funding, and stakeholder involvement.
- 3) The Guardian Trust Pilot, sponsored by EPA, DOD, and the Commonwealth of Pennsylvania, was briefed to ECOS Subcommittee as an example of potential solutions to common long-term stewardship issues. The Pilot could offer a range of long-term stewardship services such as site surveillance, maintenance, groundwater monitoring, fund management, information management, and public outreach. This pilot project appears to be the best example of a private form of an "independent third party" option. However, the pilot is far from being available for use and may not have funding to complete. Thus, completion for use in Pennsylvania is doubtful and wider application to other States or agencies is even more uncertain, at this time.

3.4 Agreement States

3.4.1 Agreement State Implementation of the LTR

Information about the implementation of the LTR by Agreement States has been obtained through the following three efforts. First, the Office of State and Tribal Programs requested information from Agreement States in December 2001 about the status of implementing the LTR. The status has been periodically updated. As of December 5, 2002, responses from Agreement States indicated that most Agreement States have adopted a compatible rule. Of the 32 Agreement State Programs, 25 have adopted an equivalent LTR; 3 have adopted a more restrictive LTR; and 4 have not adopted the LTR. One State (Ohio) uses a decommissioning possession-only license in lieu of the institutional control requirement in the

LTR (see section 3.4.2). A second State (Wisconsin), which is in the process of becoming an Agreement State, has adopted the Ohio model for a possession-only license in its application to become an Agreement State.

Second, the staff obtained the results of an informal Internet inquiry of Agreement States conducted by the State of California in June 2002. California used RADRAP, the electronic bulletin board for Agreement States, to ask the Agreement States if a restricted release site has been approved and, if so, what restrictions were imposed and if deed restrictions were used. Only five states responded to California's request and none of the five States has approved a restricted release. One of these States also commented that once a license is terminated, there is no way of enforcing any restrictions.

Third, during the December 2002 monthly call with the Organization of Agreement States (OAS), the staff provided an overview of the LTR Analysis, including reference to the background on the issues in SECY-02-0177 and the staff's plans to provide a Commission paper in April 2003. The staff also asked if any Agreement States had experience with the restricted release provisions of the LTR or if any Agreement States were considering the possession-only license, like Ohio.

The initial responses in the monthly call did not identify any other Agreement States that were considering restricted release. In addition, the OAS summarized the LTR Analysis discussion in the formal notes of the monthly call, which were provided to all Agreement States. Agreement States with any restricted release or possession only license experience were asked to contact the NRC staff. To date, no Agreement States have contacted the staff.

3.4.2 State of Ohio

The staff reviewed the State of Ohio's decommissioning regulation, a Commission paper that evaluated Ohio's regulation and possession-only license, and the Commission's Staff Requirements Memorandum approving the staff's recommendations. The staff also discussed implementation of the decommissioning possession-only license regulation with the Chief of the Bureau of Radiation Protection of the Ohio Department of Health.

Insights relevant to the LTR restricted release issues are as follows.

- 1) Based on the staff's evaluation and recommendation in SECY-98-209, the Commission found Ohio's possession-only license approach compatible with the LTR. Ohio became an Agreement State in 1999.
- 2) Although Ohio implemented the possession-only license in its decommissioning regulations to be consistent with State law, Ohio also believes a license is more protective than deed restrictions, especially for sites with long-lived radionuclides.
- 3) Ohio also considers a license to be more efficient, because it knows how to use a license and is unfamiliar with establishing and enforcing institutional controls.
- 4) Ohio plans on implementing the possession-only license by first issuing a decommissioning possession-only license when it approves a licensee

decommissioning plan. When decommissioning activities are completed, these conditions are removed from the license, leaving only the conditions for the possession only part of the license, such as specific restrictions on site access and use.

5) Ohio currently plans on using the license for only the Shieldalloy Metallurgical Corporation (SMC) site in Cambridge, Ohio. SMC also has an NRC license for a decommissioning site in Newfield, New Jersey.

Based on the above efforts, the staff concludes that Ohio is the only Agreement State with a possession-only license provision at this time, and no other Agreement States have used restricted release. Finally, the staff understands that Wisconsin has included the possession-only license in its application to become an Agreement State.

3.5 NRC Decommissioning Program Sites Considering Restricted Release

The staff reviewed and updated the status of complex decommissioning sites currently considering restricted release and summarized the current status below. This information is significant to the LTR Analysis of the restricted release issue because it provides the current context of sites that might be affected by the staff's recommended options.

On October 1, 2002, the staff identified in SECY-02-0177, four licensed decommissioning sites considering restricted release: 1) SCA Services Inc. (SCA), Michigan; 2) SMC, New Jersey; 3) Jefferson Proving Ground (JPG), Indiana; and 4) Sequoyah Fuels, Oklahoma. In addition, the staff projected the potential for five future licensed sites that are currently operating that could consider restricted release, because of the high volume of long-lived radionuclides each possess.

Changes have occurred subsequent to SECY-02-0177. At this time, two licensed decommissioning sites, SCA and SMC, are continuing to evaluate the restricted release option. A third site, the formerly licensed AAR site in Michigan, is a new site that is considering restricted release. A fourth site, JPG is considering continuing its agreement with other Federal agencies for institutional controls as part of its plans for site security and radiological surveys, but may use an NRC possession-only license until technology is available to characterize the unexploded ordnance on the site. Sequoyah Fuels is no longer seeking restricted release under the LTR because it is now decommissioning under Part 40 Appendix A.

Other decommissioning sites that might consider restricted release in the future are West Valley in New York and Safety Light in Pennsylvania. Another potential future need for institutional controls could include monitoring and maintenance of concrete structures, should the power reactor entombment option be developed.

Residual contamination at the decommissioning sites considering restricted release, at this time, all contain long-lived radionuclides (uranium or thorium). Therefore, for these sites, permanent (1000 year) institutional controls are necessary. This is similar to what is required under UMTRCA for permanent DOE long-term stewardship for uranium mill tailings sites.

The following sections summarize the current status of institutional controls at the four sites currently considering institutional controls for restricting future site use.

3.5.1 AAR, Michigan

The Commission directed the staff, in SRM-SECY-01-0194, to consider creative options that would make restricted release more available to a site, using AAR, a formerly licensed site, as a pilot for consideration of alternative approaches. The staff met with AAR representatives in an October 29, 2002 public meeting to discuss decommissioning options for the site, including the possibility of a restricted release. During the meeting, AAR presented the results of its recent dose analyses, completed to support its proposal for unrestricted release of the eastern portion of the site and a restricted release of the western portion of the site. The staff gave an overview of restricted release LTR requirements and options. AAR discussed its current thinking to enter into a settlement agreement with the NRC on the restrictions and controls needed for restricted release. The agreement would include using a deed restriction that would outline the restrictions on the site, such as prohibiting farming and developing residential properties on the site; the deed restriction would transfer to each subsequent owner of the property through the deed. The agreement and restrictive covenant legally would allow NRC or local and State governments to monitor and enforce the restrictions. The staff is currently working with AAR to resolve issues with the dose analyses. After resolution of those issues, the staff will continue to discuss with AAR the possibility of establishing a settlement agreement (including restrictive covenant) between AAR and NRC. Once AAR submits its plans, the staff would complete its review and inform the Commission of its results and any policy issues that result from AAR's proposal.

The approach being considered is significant to the LTR analysis because it tests one of the staff's options evaluated in section 4.2.1.2 for NRC to monitor and enforce after license termination using a legal agreement for sites with a low-dose hazard (i.e., less than 100 mrem/yr dose assuming failure of institutional controls) but long-duration hazard from thorium contamination. Interacting with AAR and evaluating potential approaches has been a useful pilot as the Commission directed in SRM-SECY-01-0194.

3.5.2 SCA Services, Michigan

The decommissioning plan for the SCA site is currently scheduled for submittal in September 2003. The staff has previously met with SCA to discuss preparation of the decommissioning plan and use of institutional controls appropriate for the thorium contamination in an existing capped land fill on the site. Most recently, SCA participated by teleconference in the October 2002 AAR public meeting, where NRC staff discussed the LTR restricted release requirements and options. Subsequently, the staff discussed with SCA the current status for selecting institutional controls. These interactions are part of the staff's current approach for pre-decommissioning plan consultations and the phased review for institutional controls.

SCA is currently evaluating both the unrestricted and restricted release options, based on dose assessment results and supporting data. Its evaluations of restricted release have included discussions with the State of Michigan regarding a State role in institutional controls because of the adjoining decommissioning site owned by the State (Michigan Department of Natural Resources) and the State Game Area and Federal Wildlife Refuge surrounding much of the SCA site. No commitment has been obtained from the State at this time. SCA will also need institutional controls for the hazardous chemicals also in the capped landfill on the site. Short term controls are being considered under the State's RCRA program.

This site is important to the LTR analysis because it is an example of seeking some form of a State role for long-term institutional controls to restrict future site use for long-lived radionuclide contamination (thorium) within an existing capped landfill that also contains hazardous chemicals under the State's RCRA program.

3.5.3 SMC, New Jersey

The decommissioning plan for the SMC site was submitted in August 2002. Shieldalloy representatives attended the October 2002 AAR meeting where NRC staff discussed the LTR restricted release requirements and options. The staff has completed an acceptance review of the decommissioning plan and has rejected the plan because of deficiencies with the proposed institutional controls, independent third party, financial assurance amount for control and maintenance of the engineered cell cap, and early documentation of advice received from affected parties.

One aspect of SMC's proposal was to transfer the site in the future, after operations had ended to a local or State government, for use as a park. However, the decommissioning plan did not provide any documentation that the government entities identified were considering or had committed to the transfer of the property or had indicated their willingness and capability to monitor and enforce the long-term control and conduct the necessary maintenance.

SMC also submitted a November 15, 2002, letter to NRC requesting deferral of NRC action on the decommissioning plan pending the staff's April 2003 Commission paper with the results of the LTR Analysis, so that SMC could consider the other options for restricting use that might be recommended by the staff to the Commission. SMC has informally expressed its interest in the option for a possession only license similar to its other site in Cambridge, Ohio.

The staff has rejected SMC's deferral request and plans on meeting with SMC to discuss the decommissioning plan deficiencies, and revising the decommissioning plan, using the staff's phased approach. For this site, the phased approach would consist of meetings to discuss and seek agreement on the licensee's approach to institutional controls and financial assurance before the licensee conducts the work needed to address the deficiencies identified by the staff and resubmit a revised decommissioning plan. During these meetings the staff plans on describing options for restricted release that the staff has recommended to the Commission, with the understanding that the Commission has not yet approved them. This approach allows SMC work to continue and not be delayed by the Commission's decision in response to the staff's April 2003 LTR Analysis Commission paper.

3.5.4 JPG, Indiana

The revised decommissioning plan for JPG was submitted in June 2002. The Department of the Army, which owns the site, proposed restricting site use with an Agreement with the U.S. Air Force and the U.S. Fish and Wildlife Service. The JPG approach to institutional controls appears acceptable. However, in a February 4, 2003, letter to NRC, the Department of the Army stated that the unexploded ordnance on-site that is co-mingled with the licensed material (depleted uranium) would prevent the collection of site-specific data that may be required by NRC to validate the off-site transport models. As a result, the Department of the Army requested an alternative schedule for submittal of a decommissioning plan and proposed that a

license amendment be negotiated with NRC that would create a 5-year renewable possession-only license for an indefinite time period. Under this proposal the institutional controls would be part of the site security and radiation control programs until the license is eventually terminated. The staff prepared a Commission paper (SECY-03-0031) that describes the licensee's proposal and the staff's agreement with the approach.

The JPG experience is useful to the LTR Analysis because it illustrates an acceptable way to establish institutional controls on Federally owned sites using documented agreements among Federal agencies. This successful example has limited value to NRC because there are no other Federally owned NRC licensed sites. It does, however, illustrate the potential use of a possession-only license for a complex decommissioning site, although the primary reason is to maintain land use controls until technology becomes available in the future to address the unexploded ordnance.

3.6 Other NRC Programs

3.6.1 Part 40, Appendix A, "Criteria Relating to the Operations of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material from Ores Processed Primarily for their Source Material Content"

Part 40, Appendix A, provides a regulatory framework for a robust and reliable long-term care system consisting of the following elements:

- 1) Federal government (DOE) ownership, monitoring, and maintenance, in perpetuity. (Note that under UMTRCA, the State where the site is located has the right of first refusal to become the long-term custodian, and DOE, or another agency designated by the President, must assume that role if the State defers);
- 2) DOE provides long-term custodial care under an NRC general license, with no license termination;
- 3) NRC oversight of the long-term custodian;
- 4) DOE's long-term custodial care supplements engineered barriers which are designed with the objective of lasting for up to 1000 years to the extent reasonably achievable, and in any case for at least 200 years without reliance on active maintenance. UMTRCA and Appendix A make clear that the reclamation design should be such that ongoing maintenance will not be required; and
- 5) Most sites are in isolated locations.

Other general insights from implementing the general license program for long-term care under Part 40, Appendix A, that are important to the LTR Analysis include:

- 1) UMTRCA required NRC to license the long-term custodial care of uranium mill tailings sites;

2) NRC implemented this statutory requirement by selecting a general license approach, which was implemented by a rulemaking. The Regulatory Analysis for this rulemaking concluded that either a general license applicable for all sites or a separate specific licenses for each site would have the same end result, but that the general license would be most efficient for this case because of the expectation that there would be one licensee (DOE) eventually, for all UMTRCA Title I and Title II sites;

3) DOE is required to prepare a long-term surveillance plan and submit it to NRC for approval, before license termination of the specific license. This plan provides the specific conditions that DOE would use to implement its long-term custodial duties at the site under the general license. Additional guidance for the LTR could be developed based on the NRC and DOE guidance and experience using these plans.

4) DOE is required to submit an annual report to NRC, that describes the status of each site under a general license. The annual report is the instrument NRC uses to efficiently monitor DOE activities and site conditions.

5) DOE and NRC have over 10 years of experience implementing the general license program, including developing and reviewing: cost estimates of long-term care; engineered controls; and site-specific long-term surveillance plans. NRC also conducts inspections or observes DOE inspections of the sites.

Recently, the staff made recommendations (SECY-02-0183) that the Commission approved (SRM-SECY-02-0183) with respect to using institutional controls on private property adjacent to the Western Nuclear Inc. site in Wyoming. The following insights from these decisions are important to the LTR restricted release issue.

1) Institutional controls can be used for off-site private properties as an alternative to DOE ownership required by Part 40, Appendix A, but only if properties cannot be purchased;

2) Institutional controls consisted of an easement that would be written to give DOE access to monitor and a restrictive covenant that would be written to give DOE authority to enforce restrictions;

3) These institutional controls are acceptable because the Federal government--DOE--has agreed to monitor, enforce, and provide the "durability", because of DOE's presence and statutory long-term care role at the adjacent site.

4) This approach for the Western Nuclear Inc. site, approved by the Commission, is somewhat similar to the staff's recommended option in section 4.2.1 for NRC monitoring and enforcement after license termination using a legal agreement. Under this LTR-recommended option, the institutional controls, such as a restrictive covenant, would be written to include NRC monitoring and enforcement, as could be done with DOE for the Western Nuclear Inc. site.

3.6.2 10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste"

Part 61 includes provisions that address institutional controls for low-level waste disposal sites. Major concepts of Part 61 that are important to the LTR Analysis are given below.

1) The inadvertent intruder in the future is protected from waste by institutional controls for up to 100 years for Classes A and B wastes that will decay in 100 years to acceptable hazard levels. The waste concentration provides protection after that time. For Class C waste, protection is provided by both institutional controls for up to 100 years and engineering measures, either by greater depth of disposal or engineered intruder barriers designed to remain effective for 500 years. Beyond 500 years, protection is provided by the waste concentration.

2) Part 61 requires that disposal only be on land owned by the Federal or State government. A licensee would operate the facility and eventually transfer the license after site closure, stabilization, and post-closure observation to the Government owner, who would then be responsible for institutional controls. Thus, the license continues through the institutional control phase for the Federal or State government owners and would be terminated at the end of the phase. There could be earlier license termination if a transfer were to DOE; because NRC lacks regulatory authority over DOE for this specific activity. Note that DOE is not obligated to take a Part 61 site from a State.

3) Part 61 describes institutional control activities as including: 1) environmental monitoring; 2) periodic surveillance; 3) minor custodial care; and 4) administration of funds.

4) The period of institutional controls is determined by the Commission, but institutional controls cannot be relied upon for more than 100 years after transfer of control to the Government owner.

5) The Commission would approve the funding arrangement between the licensee and Government owner. Sufficient funds will be available to cover the costs of monitoring and any required maintenance during the institutional control period.

6) Active maintenance is acceptable for only the 100-year institutional control period. Thus, engineered intruder barriers would need to be designed to last 500 years without active maintenance.

3.6.3 10 CFR Part 63, "Disposal of High-Level Radioactive Wastes in a Geologic Repository at Yucca Mountain, Nevada"

Part 63 includes provisions that address institutional controls and assessment of future human intrusion for a geologic repository at Yucca Mountain.

A major concept regarding institutional controls for a geologic repository is in the following statements from 10 CFR 63.102(k):

Active and passive institutional controls will be maintained over the Yucca Mountain site, and are expected to reduce significantly, but not eliminate, the potential for human activity that could inadvertently cause or accelerate the release of radioactive material.

However, because it is not possible to make scientifically sound forecasts of the long-term reliability of institutional controls, it is not appropriate to include consideration of human intrusion into a fully risk-based performance assessment for purposes of evaluating the ability of the geologic repository to achieve the performance objective at 63.113(b). Hence, human intrusion is addressed in a stylized manner....

Another important concept of geologic repository institutional controls is that the Energy Policy Act gave DOE responsibility for long-term control of the Yucca Mountain site after termination of the NRC license, without a continuing NRC role. Accordingly, Part 63 provides a provision for license termination after permanent closure of the geologic repository, during which time DOE would be responsible for institutional controls. Another provision requires DOE to submit, for NRC approval, a plan for control of all its future activities, after license termination, that could impact safety and performance of the repository. Although, eventual license termination for a geologic repository is anticipated by the regulations, it should be clearly understood that this approach resulted from a statutory mandate and relies on permanent Federal control by DOE and prior approval of DOE's plans for active and passive controls by NRC before license termination.

3.6.4 West Valley Policy Statement

In February 2002 the Commission issued the final policy statement for decommissioning criteria for the West Valley Demonstration Project. This policy statement approved the LTR as the decommissioning criteria for West Valley. Some concepts in the policy statement and NRC's response to comments that are summarized below are related to the LTR Analysis of the restricted release issue.

1) The policy statement recognizes that a flexible approach to decommissioning is needed for West Valley. For example, the Commission would consider an exemption allowing higher limits for doses on a failure of institutional controls if it can be rigorously demonstrated that the protection for future generations can be reasonably assured through more robust engineered barriers and/or increased long-term monitoring and maintenance.

2) If the NRC license cannot be terminated in a manner that provides reasonable assurance of adequate protection, then the appropriate action may be to require a long-term or even a perpetual license for a portion of the site until, if, and when possible, an acceptable alternative is developed to permit license termination. If a long-term or perpetual license is necessary, the Commission's intent is for that portion of the site to be decontaminated in the interim to the extent technically and/or economically feasible.

Some of the NRC responses to comments on the LTR guidance as it relates to West Valley are important to be aware of for the LTR Analysis and are summarized below.

1) The LTR and guidance are not prescriptive as to the criteria for acceptability of site-specific institutional controls or engineered barriers because of the wide range of residual radioactive contamination encountered at decommissioning sites licensed by NRC.

2) The Commission views engineered barriers referred to in the Statement of Considerations of the LTR as distinct and separate from institutional controls. The response clarifies NRC's view on the terms institutional controls, engineered barriers, and physical controls.

3.7 National Research Council Report on "Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites"

In 2000, the National Research Council's Board on Radioactive Waste Management published a report entitled "Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites."

The report describes a conceptual approach and specific measures and factors as they apply to the management of DOE waste sites and the challenges DOE faces in post-remediation site management.

In the staff's view, many of the issues discussed in this report are shared by other remediation programs that implement restrictions on future land use, including NRC's LTR analysis of the restricted release issue.

Therefore, the staff has summarized the following key points, from this extensive report, that might provide insights to help understand and resolve NRC's restricted release issues.

1) The Board's report concludes that there is no convincing evidence that institutional controls and other stewardship measures are reliable--the likelihood of their failure is relatively high. The report also refers to its earlier report, in 1995, entitled "Technical Bases for Yucca Mountain Standards," by noting one of the conclusions, namely that although institutional controls cannot be relied on to protect a repository against intrusion, they should be used as an added measure of protection.

2) To address the challenge of fallibility, the Board's report provides a broad range of advice. The report first establishes a general conceptual approach, to planning and decision-making, that would address the potential for failure and uncertainty. This approach is a framework to be applied on a site-specific level.

3) More specific advice is also provided by identifying criteria for designing an institutional management system including, for example: 1) layering of institutional controls to provide defense in depth; 2) redundancy that provides more than one organization to be responsible for controls; 3) stability through time; 4) periodic reevaluation of effectiveness; and 5) flexibility to tailor controls to site needs and correct and redirect.

4) Key activities of a comprehensive long-term stewardship program are also discussed: a) legal and physical restrictions on use; b) oversight and enforcement; c) information management; d) dissemination of information over time; e) periodic comprehensive reevaluations (e.g., EPA's Five-Year Reviews under CERCLA); and f) monitoring new emerging technologies to identify opportunities for more effective remediation.

5) The report also notes that the extensiveness and intensity of controls, monitoring, and enforcement should directly correlate with the severity of the risk to potential users of the site.

6) The important role of stakeholders is also addressed, including the view that external groups and interested citizens should retain the right of oversight and influence over organizations responsible for the site.

7) Primary weaknesses of institutional controls are discussed that help identify the nature of the problem and suggest solutions. Many weaknesses of institutional controls concern the fallibility of memory and susceptibility of present-day intentions to future political and economic pressures. Furthermore, the Board's report indicates that the viability over time of restrictions is likely to be especially questionable in cases where contamination levels are not high enough to prohibit all public access but not low enough to permit unrestricted use.

8) Measures to overcome deficiencies are noted in the report, such as: a) periodic evaluations can reduce or even eliminate some of the negative impacts of technical and institutional limitations; b) stable funding for monitoring and maintenance; c) oversight by the public (e.g., including public use of the site, such as a park).

9) Finally, one of the Board's conclusions of particular interest to the LTR Analysis is that oversight and enforcement if carried out with continuous vigilance, should help compensate for deficiencies in institutional controls.

3.8 ASTM Standard Guide for Use of Activity and Use Limitations

In July 2000, the American Society for Testing Materials (ASTM) published "Standard Guide for Use of Activity and Use Limitations, Including Institutional and Engineering Controls." Guidance is provided for selecting and implementing activity and use limitations (i.e., physical controls and institutional controls) for Federal, State, Tribal, and local remediation programs using a risk-based approach. The risk-based approach means using results of site-specific risk assessments. The general view is given that the greater the risk of exposure over a long period of time, the greater the need to use institutional controls that will be effective over the time period needed.

A selection process and criteria are described to evaluate appropriate types of institutional controls, which are similar to those in EPA guidance. Types of institutional controls and related advantages and disadvantages are described.

Some key insights important to NRC's restricted release issues are given below.

- 1) Activity and use limitations should be considered early and as an integral part of remedial action selection.
- 2) The potential for institutional control failure is recognized and, therefore, use of multiple institutional controls (i.e., layering) is encouraged to increase effectiveness.

3) Differences in State real estate laws result in differing degrees of effectiveness and long-term reliability of institutional controls. Certain legal doctrines may limit long-term enforceability. Therefore, there is a need for flexibility in tailoring institutional controls to the site and jurisdictional characteristics.

4) Institutional controls often supplement engineering controls, but engineering controls need monitoring and enforcement, through institutional controls, to remain effective.

5) The issue of enforceability is discussed, including the wide range of enforceability associated with the different types of institutional controls. The importance of considering both specific State property law and limitations on long-term enforceability is discussed. The need for an enforcer to monitor compliance and take legal action if necessary is discussed. This is critical because legal instruments do not enforce themselves. Thus, identifying a willing and able entity to monitor and enforce is critical to long-term reliability of institutional controls.

3.9 ISCORS Statement of Policy on Use of Institutional Controls

The ISCORS subcommittee on risk harmonization recently agreed to develop a set of institutional control principles. The draft is being prepared and will be eventually adopted by ISCORS.

4. EVALUATION OF OPTIONS

The staff identified and evaluated the following options to resolve the institutional control issues necessary for the viability of the restricted release and alternate criteria provisions of the LTR. These options are applicable to both existing and future licensees. However, the need for using the restricted release and alternate criteria provisions could be reduced for future licensees if the recommendations are implemented for other LTR issues for measures to prevent future legacy sites and more realistic exposure scenarios.

4.1 LTR Clarification Options

4.1.1 Clarify the LTR Risk-Informed, Graded Approach for Restricting Use.

The existing restricted release requirements of the LTR in 10 CFR 20.1403, discussions in the LTR "Statement of Considerations", and the decommissioning guidance (NUREG-1757, September 2002) provide a basis for a risk-informed graded approach for using institutional controls to restrict site use. However, this approach can be clarified and more completely explained in revised guidance to improve both understanding and use by licensees and the staff. This clarification applies to the restrictions that would be used for license termination with restricted release under 10 CFR 20.1403 or for license termination with the alternate criteria in 10 CFR 20.1404.

The clarification would address the following two parts of the risk-informed graded approach: 1) general risk framework and grades of institutional controls; and 2) specific grades of institutional controls determined by site-specific factors that could affect overall risk to public

health and safety. Each of these two parts of the graded approach is summarized below, and revised guidance could provide further details and examples.

1) General risk framework and grades of institutional controls.

The general risk framework can be defined by the hazard level and likelihood of hazard occurrence. This framework is summarized in Table 1 and discussed below.

The hazard level is established in the LTR (10 CFR 20.1403 (e)(ii)) as the dose level of 100 mrem/yr., calculated without institutional controls restricting site use. This dose level is the public dose limit. The LTR also defines the general grades of controls: sites below the 100 mrem/yr dose level require legally enforceable institutional controls and sites above the 100 mrem/yr dose level require both legally enforceable and durable institutional controls. Thus, the LTR requires that institutional controls provide more reliable or sustainable protection over the time period needed (i.e., durable) for sites that could exceed the public dose limit, assuming no restrictions. As noted below the "Statement of Considerations" also provides for durable controls for long-lived radionuclides regardless of the dose limit.

The likelihood of hazard occurrence can be simply defined by the hazard duration based on the half-life of the radionuclide contamination. Longer durations associated with longer half-lives, increase the likelihood of institutional control failure and hazard occurrence. The 100-year time period can be used as a simple way to define the likelihood of hazard occurrence. This approach is derived from discussions in section B.3.3 of the LTR "Statement of Considerations" about the durability of institutional controls and the 100-year time period. This section notes that short-lived nuclides, such as Cobalt-60 or Cesium-137 (half-lives 5.3 and 30 years respectively), would decay to unrestricted use levels in about 10 to 60 years, and, therefore, fall below the 100-year period. Discussions in section B.3.3 also note that "In a limited number of cases, in particular those involving large quantities of uranium and thorium contamination, the presence of long-lived nuclides at decommissioning sites will continue the potential for radiation exposure beyond the 100-year period. More stringent institutional controls will be required in these situations...." Thus, in the staff's view, the longer the duration of the hazard, the greater the likelihood of institutional controls failing and, therefore, the need for using controls that are more reliable and sustainable for the duration of the hazard (i.e. durable). The 100-year time limit is reinforced by the low-level waste disposal regulations, in 10 CFR 61.7, that require institutional controls for up to 100 years, which is described as a time period that would allow Class A and Class B low-level waste to decay to a level that will present an acceptable hazard to an intruder. For the above reasons, the staff could consider using 100 years to generally separate lower likelihood from higher likelihood of hazard occurrence.

Grades of institutional controls are not discussed in the LTR and the LTR does not define the term "durable" institutional controls as used in 10 CFR 20.1403 (e)(ii). However, section 3.3 of the LTR "Statement of Considerations" gives some insight by discussing the durability of institutional controls and noting that more stringent controls will be required for exposures beyond the 100-year period, "such as legally enforceable deed restrictions and/or control backed up by State or local government control or

ownership, engineered barriers, and Federal ownership, as appropriate." Consistent with the LTR and "Statement of Considerations", NUREG-1757 indicates that institutional controls should be durable for sites exceeding the 100 mrem per year calculated dose, but less than the 500 mrem per year dose and for sites with long-lived radionuclides. The controls should be expected to last as long as they are needed. Thus, the staff believes that durable institutional controls would be needed for sites with a hazard level above the 100 mrem/yr value, or sites with a higher likelihood of hazard occurrence (i.e., hazard duration of greater than 100 years).

Based on these discussions, the staff could define two general grades of institutional controls: a) legally enforceable and b) durable and legally enforceable. The first grade of legally enforceable could use conventional institutional controls that are enforceable, such as a restrictive covenant. Examples of durable and legally enforceable institutional controls might include: a) layering of legally enforceable institutional controls that includes a government control (e.g., deed restrictions giving authority to Federal or State governments for monitoring and corrective action); b) State or Federal ownership and control; c) legally enforceable institutional controls monitored and enforced by NRC (new recommended option); and d) NRC possession-only specific license (new recommended option). Table 1 summarizes the grades and gives examples. It should be noted that for long-lived isotopes with doses closer to 25 mrem/yr, special consideration may be warranted, such as relying only on deed restrictions backed up by zoning, based on the language of the "Statement of Considerations."

2) Specific grades of institutional controls.

Specific grading of controls can be selected within the two general grades defined above. This approach recognizes that the site-specific factors affecting risk are highly variable from site to site. As a result specific grading recognizes the need for flexibility to tailor institutional controls to achieve the desired effectiveness. Specific grading involves evaluating and balancing numerous site-specific factors such as: a) physical characteristics of the site that limit future land use; b) land uses that could be adverse and therefore should be prohibited; c) land uses that are acceptable and could result in productive reuse of the site; d) dose assessment results (including low probability, alternate land use scenarios); e) engineered barriers and related maintenance; f) cost of monitoring controls and maintenance used as the basis for financial assurance; g) jurisdictional limitations on enforceability and long-term effectiveness of institutional controls; and h) advice from affected parties, such as local governments and the public. Particular attention might be needed to evaluate and tailor the durable institutional controls for specific sites that are well below the 100 mrem/yr value (lower hazard) but have long-lived radionuclides.

It is important to note that the few decommissioning sites considering restricted release at this time have either uranium or thorium contamination or both, and thus, may need some form of durable institutional controls, based on the duration of hazard.

Finally, the risk-informed graded approach can be implemented by the staff in its existing phased review of restricted release decommissioning plans and interactions with licensees. The phased review focuses on resolving institutional control and

financial assurance approaches first, so that the restricted release option is feasible before extensive staff effort is expended on detailed technical reviews of the decommissioning plan or development of an environmental impact statement.

Pros:

Provides clearer guidance to licensees and staff regarding the options and flexibility available under the existing risk-informed graded approach of the LTR.

Resolves the perception that Federal ownership is the only acceptable option to the staff.

Flexibility and tailoring institutional controls for site-specific factors is consistent with EPA guidance that defines criteria to use in evaluating and selecting appropriate institutional controls. It is also consistent with recommendations in the ASTM Standard and the National Research Council report on long-term institutional management, both summarized in sections 3.7 and 3.8.

Cons:

Additional, unbudgeted resources are needed to revise guidance.

4.1.2 Emphasize the Availability of the Option for Restricting Use after License Termination with Layered and Redundant Institutional Controls Together with an Independent Third Party that is also Responsible for One of the Institutional Controls.

Use layered (i.e., multiple) institutional controls to provide redundancy or backup if one of the controls fails (e.g., a restrictive covenant backed by local government land use zoning).

In addition to the institutional controls, implement the LTR requirement for an independent third party by clarifying that an independent third party needs to be independent from the owner, but may be an entity responsible for the institutional control. This option clarifies that a local or State government responsible for a zoning control could also agree to be responsible for monitoring the controls and assuming control of the site and maintenance in the event the owner cannot. In agreeing to the third party role, governments would need to agree that the financial assurance provided for future maintenance and repair of the site and engineered controls are sufficient. This agreement on sufficiency of funding is important to resolve concerns regarding future financial liability. This option, while efficient, could be viewed as less effective than an a third party that is fully independent from parties responsible for the institutional controls because a government entity would be monitoring itself.

This option is a variation on option 2(a) in Attachment 1 of SECY-02-0177, where the staff planned on evaluating redundant institutional controls without the independent third-party oversight. The staff's evaluation resulted in concluding that some type of third-party oversight of institutional controls is necessary to have assurance of continued effectiveness. This is needed even in the short-term because of the likelihood of ownership changes over the next few decades. Option 2(a) would require a rule change, which the staff does not consider warranted.

This option could be used for lower hazard level (less than 100 mrem/yr cap) or shorter-duration sites.

Pros:

Redundancy of controls accounts for potential failure and compensates for a less than fully independent third party. The remaining uncertainty may be acceptable for low-hazard and short-duration sites.

Simplest and most efficient to use and could be easier to identify an independent third party who already has a responsibility for an institutional control.

Could be enforced by courts and local government

Could be a viable way to address the independent third party for some cases and resolve the issue of institutional controls remaining effective over time and as ownership changes.

Cons:

Reduced independence of the third party could result in a conflict of interest when the third party is both responsible for the institutional control and the oversight of the institutional control. For example, if a local government with zoning responsibility over a site were pressured politically or by business interests to change zoning, there would not be another party independent from the local government to question the change and raise safety concerns.

Could reduce public confidence by giving the appearance of being less protective and not maintaining safety.

4.2 New Options to Restrict Site Use

4.2.1 Add a New Option for Restricting Use by NRC Monitoring and Enforcing Institutional Controls after License Termination.

NRC could monitor and enforce institutional controls after license termination by using either authority under 10 CFR 20.1401(c) or legal agreement. These two approaches are described below. Under this option NRC would make the institutional control "durable" by providing Federal Government independent oversight, including five-year rechecks, if needed. This is one of the new options that the Commission directed the staff to consider in SRM-SECY-01-0194. NRC oversight could be "graded" and could vary from simple review of owner certification letters to periodic site inspections of land use and institutional controls.

Institutional controls implemented by the licensee would need to specifically authorize NRC access to the site to periodically inspect and conduct five-year rechecks, if needed. A standby trust could be established before license termination for the purpose of providing maintenance through a trustee if the owner cannot and because NRC, as a regulator, cannot conduct maintenance activities. Such a standby trust would be similar to what has been done for some

uranium mill tailings sites under 10 CFR Part 40, Appendix A, to use if the licensee goes bankrupt. If this occurs, NRC would activate the standby trust and select a trustee to continue the site monitoring and maintenance that had been done by the owner/licensee using funds from the financial assurance instrument, which would be separate from the standby trust.

The financial assurance required by 10 CFR 20.1403 would need to be established and the owner (previous licensee) and its successor owners through a deed restriction, would need to agree to pay NRC annually for the activities NRC conducts. Another alternative would be to provide a single payment at the time of license termination, like UMTRCA sites, which NRC would need to recover through its appropriation request.

4.2.1.1 NRC Monitoring and Enforcement Under the Regulations (10 CFR 20.1401(c)) if there is a Significant Threat

Licensees would select and implement enforceable institutional controls consistent with existing NRC guidance, but NRC would act as the independent third party to monitor and enforce the controls under existing LTR provision 10 CFR 20.1401(c).

The LTR general provision under 10 CFR 20.1401(c) provides for the following potential future NRC action after license termination: "... the Commission will require additional cleanup only if based on new information, it determines that the criteria of this subpart were not met and residual activity remaining at the site could result in significant threat to public health and safety." This provision could include NRC monitoring to identify new information such as failure of institutional controls or adverse changes in land use. Monitoring could include the owner agreeing, as a condition to license termination and included in a deed restriction, to provide in response to an NRC request, a letter certifying effectiveness of controls as a simple way to notify NRC and local governments. By including the obligation to respond to NRC periodic requests in the deed restriction, future owners would be required to provide NRC information about the site. In addition, NRC could seek to have the local government agree to provide an annual letter reporting on effectiveness of controls.

Such new information could then be evaluated to determine if the changes could result in the LTR criteria no longer being met and, if not met, could result in a significant threat to public health and safety. The term "significant threat" is not defined in the LTR. In fact, the Commission in the "Statement of Considerations" for the LTR specifically declined to define the term. One could argue that a "significant threat" might be as high as 500 mrem/yr since the LTR allows restrictions to fail at that level under 10 CFR 20.1403(e)(2). The staff could use a dose estimate above the public dose limit of 100 mrem/year as a "trigger" level to further evaluate the specific circumstances to determine if there is a significant threat and what corrective actions might be needed.

NRC could enforce the continued effectiveness of the restrictions by taking the following approach. If NRC were to determine that the new information could result in a significant safety threat, NRC could require additional cleanup, as stated in 10 CFR 20.1401(c), if the adverse land use were not changed and if effective institutional controls were not reimplemented.

The licensee would need to establish sufficient financial assurance that includes the long-term cost of NRC (acting as an independent third party) monitoring and other actions, as required

under the LTR [10 CFR 20.1403(c)]. The licensee, as part of license termination, and its successors through a deed restriction, would need to agree to pay NRC annually for the activities NRC conducted, or provide a single payment at the time of license termination, like UMTRCA sites, which NRC would need to recover through its appropriation request.

This option would be considered one type of a durable institutional control.

Pros:

Allows license termination and finality as envisioned under the LTR, but NRC remains involved to some degree.

Removes the NRC license "stigma" from the site, which could be important for future property value and sale. However, the restrictions and NRC monitoring may discourage future purchasers.

Some licensees may prefer license termination.

Allows NRC monitoring to identify new information, but only enforce if there is a significant safety threat.

Resolves the independent third party issue.

Resolves the institutional control long-term reliability issues by NRC monitoring and taking action to reimplement institutional controls if necessary, over time.

More consistent with EPA's approach for five-year reviews, including evaluating the effectiveness of institutional controls.

Cons:

The "Statement of Considerations" did not envision a periodic monitoring role for the NRC after license termination. However, there is nothing in the LTR that precludes it, provided that licensable material remains at the site.

Annual reporting and fees may be difficult to secure from future owners.

If a system is needed to monitor terminated sites because of the potential impact on public health and safety, one could argue that the site is not appropriate for license termination. Rather, a possession-only license may be more appropriate.

The option has not been implemented before by NRC or legally tested.

The deed restriction is dependent on the law of the site's jurisdiction and may not be viable in all states.

Could not be used for the lower hazard (e.g., less than 100 mrem/yr dose cap sites) because they would not present a significant safety threat under 10 CFR 20.1401(c).

No definition of significant threat to safety; guidance may need to be developed

Although NRC costs could be minimal for monitoring simple sites with institutional controls; increased costs could be needed if NRC had to take some action or if the owner reporting fails.

If the owner and future owners do not provide information to the NRC, NRC may need to enforce the restrictions and may need to conduct periodic inspections instead.

Funds received annually from the owner for NRC activities or a single payment would go to the U.S. Treasury, and NRC would need to recover these funds through the appropriation process (similar to what DOE currently does for UMTRCA sites making a payment to the U.S. Treasury).

4.2.1.2. NRC monitoring and enforcement under a legal agreement

NRC would monitor and enforce under legal agreements or authority written into institutional controls, similar to the approach under consideration for use with AAR, summarized in section 3.5.1. This option is essentially the same as the option under 4.2.1.1, but based on a legal agreement and deed restriction rather than the regulation (10 CFR 20.1401(c)).

Monitoring could include the owner agreeing, as a condition to license termination and included in a deed restriction, to provide a response annually or at other frequency to an NRC request for certifying effectiveness of controls as a simple way to notify NRC and local governments. By including this obligation in the deed restriction, future owners would be required to also provide a response.

The licensee would need to establish sufficient financial assurance for the long-term cost of NRC (acting as an independent third party) monitoring and other actions, as required under the LTR (10 CFR 20.1403(c)). The licensee, as part of license termination, would need to agree to pay NRC annually for the activities NRC conducted, or provide a single payment at the time of license termination, like UMTRCA sites, which NRC would need to recover through its appropriation request.

This option could be used for any site.

Pros:

Allows license termination and finality as envisioned under the LTR, but NRC remains to a limited degree.

Some licensees may prefer license termination.

Removes the NRC license "stigma" from the site, which could be important for future property value and sale. However, the restrictions and NRC monitoring may discourage future purchasers.

Resolves the independent third party issue by NRC becoming the third party.

Resolves the institutional control long-term reliability issues by NRC monitoring and taking action to reimplement institutional controls if necessary over time.

A somewhat similar approach was approved by the Commission for the Western Nuclear Inc. site, where authority could be written into institutional controls for DOE to monitor and enforce controls on the private property adjacent to the site.

Cons:

The "Statement of Considerations" did not envision a periodic monitoring role for the NRC after license termination. However, there is nothing in the LTR that precludes it, provided that licenseable material remains at the site.

This has never been implemented by NRC or legally tested.

Annual reporting and fees may be difficult to secure from future owners.

If a system is needed to monitor terminated sites because of the potential impact on public health and safety, one could argue that the site is not appropriate for license termination. Rather, a possession-only license may be more appropriate.

The deed restriction is dependent on the law of the site's jurisdiction and may not be viable in all states.

Although NRC costs could be minimal for monitoring simple sites with institutional controls, increased costs could be needed if NRC must take some corrective action.

Funds received annually from the owner for NRC activities, or received as a single payment, would go to the U.S. Treasury, and NRC would need to recover these funds through the appropriation process (similar to UMTRCA sites making a payment to the U.S. Treasury).

4.2.2 Add a new option for restricting use by an NRC possession-only specific license after completion of remediation.

This option would involve amending the existing specific license for decommissioning to a possession-only specific license, after completing remediation and after LTR dose criteria are met. For such sites, the possession-only license acts as an institutional control to maintain the restrictions necessary to meet the LTR criteria.

For this option, all the requirements of 10 CFR 20.1403, other than institutional controls, would be required, including the public participation provisions and financial assurance. Financial assurance would, for this case, be based on a cost estimate for NRC monitoring and inspection fees, and any maintenance costs.

New license conditions for land use restrictions, monitoring, maintenance, reporting, and financial assurance would be specified in the possession-only license. A Long-Term Care Plan implemented under the possession-only license could provide the detailed plans for restrictions,

monitoring, reporting, and maintenance similar to the Long-Term Surveillance Plans under 10 CFR Part 40, Appendix A. The possession-only license is the type of institutional control, similar to EPA's orders or permits, that provide the necessary restrictions on access or future land use. NRC would monitor, inspect, and enforce under the license authority.

If site ownership changes in the future, the possession-only license would need to be transferred before ownership passes. Therefore, an independent third party is not needed. However, a standby trust would need to be established, similar to what has been done for some uranium mill tailings sites under Part 40, Appendix A, because of the potential for the licensee to go bankrupt or out of business. If this occurs, NRC would activate the standby trust and select a trustee to continue the site monitoring and maintenance that had been done by the owner/licensee, using funds from the financial assurance instrument.

At the end of the period of restricted site use, the possession-only license could be terminated; however, for long-lived radionuclides, the license would likely be permanent, but periodically renewable (e.g., every five years). The Timeliness Rule has been met with completion of remediation and compliance with the LTR dose criteria.

This option could be used for any restricted release site that is unable to establish acceptable institutional controls using other available options.

No rulemaking is needed to implement this option; it can be implemented with revisions to existing guidance for decommissioning and use of possession-only license. Environmental reviews, which may include an environmental impact statement, would need to be done for the license amendment establishing the possession-only license. An opportunity for a hearing would be provided as part of the amendment process.

Pros:

This option addresses the concern of some that the Federal government, which allowed a site to be contaminated through its license authorization and termination actions, should not leave long-term protection up to other parties.

Provides viable and immediately available option that could be selected by licensees currently preparing their decommissioning plans and thereby avoid potential delays.

Provides licensees with the ultimate solution to the LTR requirement for legally enforceable institutional controls or durable institutional controls if no other acceptable options are available. This option would resolve all restricted release issues.

This is the most effective monitoring and enforcement tool available to NRC for short- or long- term use that NRC knows how to use. Avoids the legal complexity and uncertainty of establishing enforceable institutional controls that will be effective over long-time periods.

Gives flexibility for other solutions for restricted use to evolve and possibly become available in the future, such as DOE ownership under NWPA 151(b) or the Guardian Trust Pilot for an independent third party.

No rulemaking needed to implement; can implement with revisions to existing guidance for decommissioning and use of possession-only license.

NRC's licensing oversight of the few complex decommissioning sites could be combined with the existing NRC oversight of over 20 uranium recovery sites required by UMTRCA. Thus, there is an existing statutory NRC mission and well-established program to provide regulatory oversight in perpetuity for as many as 40 sites that are very similar to the complex decommissioning sites and would require about the same type of monitoring.

Similar to EPA, State of Ohio, and NRC, under UMTRCA/Part 40 Appendix approaches, for a government entity to remain in an oversight role to ensure long-term effectiveness of institutional controls.

This approach should increase public confidence because this option would be more protective of future generations because of continuous Federal government involvement. This approach is also consistent with EPA's approach to continued oversight.

Staff and Commission reviewed and found the Ohio possession-only license approach more stringent than the LTR, but because this approach did not create a significant regulatory conflict, it was determined to be compatible with NRC's program.

Most cost effective option for a few sites.

Low-cost NRC monitoring that could use an annual letter of certification or registration.

NRC resources would be fee recoverable from the licensee.

Cons:

Concerns could be raised about lack of finality and departure from the LTR goal of license termination and no further NRC role. However, this approach may be only needed for rare cases to resolve existing decommissioning sites. Furthermore, it should not be a precedent for future sites because many of the staff's other recommendations in this paper will minimize future legacy sites that might need restricted release.

NRC licensing oversight for some sites could be permanent because the current sites considering restricted release are sites with uranium and thorium contamination. Although this NRC role was not envisioned under the LTR, it is similar to the existing statutory role under UMTRCA for permanent NRC oversight of DOE's long-term stewardship of Title I and II uranium recovery sites. Therefore, such a permanent oversight role for long-term stewardship is not a new role for NRC, as an agency.

A licensee could object to concept and fees over the long-term, including the license "stigma". On the other hand, this option would only be used if the licensee selected it because it was unable to arrange other institutional controls or third party oversight under the LTR.

4.2.3 Add a new option for restricting use by an NRC general license after completion of remediation.

This option would involve terminating the existing specific license after completing remediation and after LTR dose criteria are met and issuing a new general license for long-term care. The Commission directed the staff to evaluate a general license option. The general license would be a type of institutional control, similar to EPA's orders or permits, that provides the necessary restrictions on future use. Required environmental reviews, advice from affected parties, and financial assurance would continue.

This option could be used for sites with a higher hazard (above 100 mrem/yr dose cap), longer duration (e.g., long-lived radionuclides such as uranium or thorium sites), or if a site cannot establish other types of acceptable institutional controls.

A Long-Term Care Plan implemented under the general license could provide the site-specific conditions for restrictions, monitoring, and maintenance similar to the Long-Term Surveillance Plans under 10 CFR Part 40, Appendix A. Reporting requirements could also be included in the general license, such as a periodic registration process; an annual report similar to the current approach used under 10 CFR Part 40, Appendix A, for uranium recovery sites; or an annual letter certifying effectiveness of restrictions and results of monitoring and maintenance. However, unlike the 10 CFR Part 40, Appendix A approach, where the general licensee will only be the Federal government, the general licensee for this option will be private entities who might change over time and may not understand that they are a licensee.

A rulemaking would be needed to establish a new general license program and fee category.

Pros:

Except for the cost of rulemaking and the associated time to complete the rule, this option has the same pros as the possession-only specific license.

Cost of NRC monitoring would be fee-recoverable from the licensee thru a new fee category.

Cons:

No advantage over the possession-only license option.

Requires new rulemaking to establish the general license program and fee category.

The time need to complete a new rulemaking (2-3 years) would further delay the decommissioning schedules for some licensees that are currently preparing their decommissioning plans and seeking viable options for institutional controls.

Rulemaking would not be cost-effective for a few sites.

It is not clear that NRC could require prior approvals of a change in ownership under the general license.

4.2.4 Continue to monitor the DOE long-term stewardship program changes and reevaluate the potential for restricting use through future site transfers to DOE under NHPA 151(b).

Revised DOE policy and program changes have been recently settled by including the new Office of Legacy Management in the President's budget for Congressional approval. Therefore, continued NRC monitoring both at the staff and senior management level may be useful to determine if and when NRC might again discuss potential transfer of a few sites to DOE under NHPA Section 151(b). NRC could also be supportive of DOE's new office in communications with Congress.

Pros:

DOE has unique and extensive stewardship capability for as many as 200 future sites, that will require a mission and supporting infrastructure to last in perpetuity. Thus, DOE ownership continues to be a highly effective Federal solution that would resolve the institutional control and third party issues.

Transfer of privately owned sites to DOE is already authorized under NHPA Section 151(b) and could provide another viable option for durable institutional controls, if DOE agrees.

Under the expanded and enhanced long-term commitment to long-term stewardship by DOE's new Office of Legacy Management, there might be an opportunity to reconsider, at an appropriate time, transfer of NRC licensed sites to DOE.

Cons:

There is uncertainty in Congressional approval of DOE's new office.

There is continued uncertainty about DOE's willingness to accept NRC licensed sites.

4.2.3 Remove dose cap requirements for sites with Federal ownership or control.

For sites that could be Federally owned or under Federal control, including NRC licensing, do not assume failure of the Federal government, and therefore, the dose cap requirements of the LTR assuming failure of institutional controls would not apply.

Pros:

Could make restricted release more available for a site that could not meet the 500 mrem/yr dose cap.

Could result in less cleanup and lower cost to licensee.

Similar to EPA's approach, which does not assume failure of institutional controls, because of its overall approach to effectiveness, including EPA's ongoing role to conduct Five-Year Reviews (see section 3.1).

Cons:

Would require rulemaking to change, or an exemption.

Likely would reduce public confidence because of removing an existing LTR dose requirement and the appearance of becoming less protective of future generations.

Removes the dose cap, which is the tool currently used to implement the risk-informed and graded approach to institutional controls.

Reduces long-term protection of future generations by removing the dose caps, which limits the dose consequences should the Federal government controls fail.

5. RECOMMENDATIONS

The recommended options and recommended implementation actions to resolve this issue are provided below.

1.1 Clarify the existing risk-informed, graded approach for restricting use. Implement with revised guidance and a RIS.

1.2 Emphasize the availability of the option of restricting use with layered and redundant institutional controls together with an independent third party that is also responsible for one of the institutional controls. Implement with revised guidance and a RIS.

1.3 Add a new option for restricting use by NRC monitoring and enforcement of institutional controls after license termination using either the regulation or legal agreement. Implement with revised guidance (that includes a model restrictive covenant) and a RIS.

1.4 Add a new option for restricting use by an NRC possession-only specific license. Implement with revised guidance and a RIS.

Note that the staff plans on continuing to monitor DOE's Long Term Stewardship Program changes and reevaluate the potential for restricting use through future site transfers to DOE under NWPA 151(b).

Note that the staff plans on continuing to monitor and participate, where beneficial to the staff, with cooperative, interagency activities to share information and develop solution to long-term stewardship/institutional controls issues (e.g., ECOS Long-Term Stewardship Subcommittee, DOE Long-Term Stewardship Roadmap development).

Note that the staff will continue to explore with licensees the use of the recommended approaches for restricted release, pending the Commission's deliberations. The staff will inform the Commission if a licensee is willing to adopt any of these approaches. In addition, if the Commission approves one or more of the options, the staff will seek to implement the option(s) in advance of the RIS and guidance if it will further the decommissioning process.

TABLE 1. NRC'S RISK-INFORMED GRADED APPROACH FOR INSTITUTIONAL CONTROLS TO RESTRICT SITE USE

<p>Lower Risk</p> <p>Lower Hazard Level (25-100 mrem/year)</p> <p>Shorter Hazard Duration– Lower Likelihood</p> <p>Shorter Half-Life (less than 100 years)</p>	<p>Higher Risk</p> <p>Higher Hazard Level (100-500 mrem/year)</p> <p>Longer Hazard Duration– Higher Likelihood</p> <p>Longer Half-Life (greater than 100 years)¹</p>
<p><u>General Grade</u></p> <p>Legally enforceable institutional controls</p> <p><u>Specific Grade</u></p> <p>Tailor specific type of institutional controls and land use restrictions to site-specific circumstances</p> <p><u>Examples</u></p> <p>Single conventional “deed restriction” such as a restrictive covenant (less control)</p> <p>Layered/redundant controls such as restrictive covenant, deed notice, and State registry (more control)</p>	<p><u>General Grade</u></p> <p>Durable and legally enforceable institutional controls</p> <p><u>Specific Grade</u></p> <p>Tailor specific type of institutional controls and land use restrictions to site-specific circumstances</p> <p><u>Examples</u></p> <p>Layered/redundant controls that includes a State government control (less durable)</p> <p>Conventional institutional control with NRC monitoring and enforcement after license termination using legal agreement (less durable)</p> <p>Conventional institutional control with NRC monitoring and enforcement after license termination using regulatory authority under 10 CFR 20. 1401(c) (more durable)</p> <p>State or Federal government ownership and control (NWPA 151(b)) (most durable)</p>

¹ It may be appropriate to treat sites with longer half-live contamination but doses close to 25 mrem/yr as “Lower Risk” sites.

November 17, 2003

MEMORANDUM TO: William D. Travers
Executive Director for Operations

FROM: Annette L. Vietti-Cook, Secretary /RA/

SUBJECT: STAFF REQUIREMENTS - SECY-03-0069 - RESULTS OF THE
LICENSE TERMINATION RULE ANALYSIS

The Commission has approved the options and issue-specific implementation actions identified in SECY-03-0069 subject to the comments provided below.

1. The Commission has approved the staff's recommendations for restricted release and institutional control as described in attachment 1. The staff should gather comments on the recommended actions from the public, Agreement States, licensees and any other interested stakeholders and share the results with the Commission before issuing final guidance.
2. The Commission has approved the staff's recommendations for on-site disposal under 10 CFR 20.2002 as described in attachment 4. The guidance should be published in a Regulatory Issue Summary in such a manner that allows for public input and comment. Also, the staff should add a third option to allow that if the material to be disposed on site is mainly short lived activity which will significantly decay in a few years, then the staff could approve on-site disposal with a maximum dose rate of 25 mrem/year without requiring additional financial assurance for license termination so long as the likelihood of creating a legacy site is low. For example, this option would assume that license termination is not imminent.
3. The Commission has approved the staff's recommendation for controlling the disposition of solid materials as described in attachment 5 and the resources applied to the development of the proposed Regulatory Issues Summary should be constrained. When developing the Regulatory Issue Summary to address this recommendation, the staff will need to provide some additional detail, not contained in the paper, which describes the conservatism in the license termination analysis related to off-site release of the material after license termination and how it may be possible to reduce some of the conservatism and still retain adequate assurance of protection of public health and safety with the unrestricted release of the material.
4. The Commission has approved the staff's recommendation for use of realistic exposure scenarios as described in attachment 6.
5. The Commission has approved the staff's recommendations for changes in financial assurance as described in attachment 7. Changes in financial assurance requirements

must be carefully coordinated among NRR, NMSS, and OGC to ensure there are consistent standards being applied across the Agency. The staff should develop options for existing licensees to develop a decommissioning funding plan based on restricted release only if they can reasonably demonstrate that restricted release is viable for the site. For new licensees, the preferred decommissioning plan should be for unrestricted release but the final regulations should allow for the potential of restricted release in the event of unusual circumstances (i.e., a major incident resulting in a significant environmental impact) or a determination that the facility is needed in the national interest. With respect to the unavailability of funds in bankruptcy where financial assurance is provided by a parent company or through self-guarantee, the staff will need to document more than just a general concern to justify significant regulatory changes in this area. Any regulatory change to address investment loss in trust account balances must be carefully worded so that it focuses on long-term market changes and not short-term changes or seasonal adjustments. Public comments in this area will be important to properly focus the regulation so that it does not cause unnecessary recalculations of funds needed for decommissioning but will trigger action when appropriate.

6. The Commission has not objected to the staff developing a proposed rule related to property damage coverage for accidental release and publishing it for public comment, but the Commission intends to reserve final judgement on this issue until after review of the public comments.
7. The Commission has approved the staff's recommendation related to changes in licensee operations as described in attachment 8. However, in addition to incorporating risk-informed approaches, the staff should ensure that they are performance-based. The staff will have to be very careful when crafting the guidance documents so that it is clear to the licensees and to the staff how much characterization information is enough. The staff should only ask for limited information. Licensees should not be required to submit the equivalent of a full scale MARSSIM survey every year.

cc: Chairman Diaz
Commissioner McGaffigan
Commissioner Merrifield
OGC
CFO
OCA
OIG
OPA
Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)
PDR

April 15, 2004

**NRC STAFF INTERIM GUIDANCE FOR A
LONG-TERM CONTROL POSSESSION ONLY LICENSE AT THE
SHIELDALLOY NEWFIELD SITE, NEW JERSEY**

INTRODUCTION AND BACKGROUND

The U.S. Nuclear Regulatory Commission (NRC) staff recommended to the Commission in SECY-03-0069 the possession-only specific license for long-term control as one option for resolving the License Termination Rule (LTR) institutional control issue at sites where restricted use or alternate criteria could be used. This new type of possession-only license is referred to in this guidance as a long-term control (LTC) license to clearly distinguish it from the NRC's existing possession only licenses for storage. Attachment 1 of SECY-03-0069 provides a description and evaluation of the staff's recommended option of possession-only license for long-term control. On November 17, 2003, the Commission approved this LTR recommendation (SRM-SECY-03-0069).

The staff also noted in SECY-03-0069 that it would continue to work with licensees who expressed an interest in the LTC license and would inform the Commission of the licensee's interest. Following discussions with the staff, Shieldalloy Metallurgical Corporation (SMC) informed the staff that it has decided to use the LTC license and will prepare a revised decommissioning plan to incorporate this approach. The Commission has been informed of SMC's intent to use the LTC license.

The purpose of this "interim" guidance is to provide SMC with: 1) a discussion of key concepts of the new LTC license option and 2) specific guidance for preparing sections of the decommissioning plan related to the LTC license. This interim guidance is based on both existing guidance in the NMSS Consolidated Decommissioning Guidance (NUREG-1757), additional details for the LTC license based on Attachment 1 of SECY-03-0069, and the Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites under Title II of the Uranium Mill Tailings Radiation Control Act of 1978 (NUREG-1620, Rev. 1). The staff expects that lessons learned from this project will be useful for eventually preparing draft regulatory guidance for public comment as approved by the Commission in SRM-SECY-03-0069. The draft guidance would be finalized as a revision to the NMSS Consolidated Decommissioning Guidance in NUREG-1757.

Enclosure

KEY CONCEPTS

Purpose of LTC License

The primary purpose of NRC's LTC license is to provide the legally enforceable and durable institutional controls required by 10 CFR 20.1403(b) to ensure the long-term protection of the public health, safety, and the environment.

The conditions written in the LTC license would specify the necessary controls to limit site access and land use that the licensee must monitor and maintain and that NRC would inspect and enforce, if necessary. The LTC license would also specify other required long-term control activities to be conducted by the licensee such as surveillance, maintenance, reporting, records retention, and stakeholder involvement (see guidance below). Detailed plans to implement the LTC license conditions would be given in a Long-Term Control and Maintenance Plan that the licensee would prepare and NRC would approve during decommissioning and before the LTC license is put in place.

Roles and Responsibilities

The licensee has the primary responsibility for long-term protection of the public health, safety, and the environment by implementing and then maintaining the effectiveness of the controls required by the LTC license. The licensee would maintain the required site access and land use controls, as well as engineered barriers, using periodic surveillance, maintenance, and monitoring, if needed. The licensee would also provide annual reports to NRC, the State, and local governments. Finally, licensing records would be maintained by the licensee.

NRC is responsible for assuring that the licensee's controls and maintenance remain effective by conducting oversight reviews, making periodic inspections, conducting five-year license renewals, issuing a new LTC license when ownership changes in the future, enforcing the license, if needed, and maintaining licensing records for the duration of the LTC license.

Oversight reviews could include reviewing licensee annual reports and other reports (e.g., corrective action reports or requests for NRC approval of the sale of the site) and obtaining advice from stakeholders. NRC's inspection role might include an annual inspection for the first five years and then once every five years thereafter as part of the license renewal process. Periodic inspections might also be needed to address specific adverse events, allegations, and licensee corrective actions. NRC inspections could involve seeking advice and information from stakeholders. A license renewal process would also be conducted every five years, considering licensee reports, NRC inspections, and stakeholder advice. License renewal is a regulatory mechanism to evaluate the sustainability of the LTC license over the long term including: effectiveness of site access and land use controls, licensee performance, new site information, and sufficiency of funding. These evaluations could result in revised license conditions necessary to ensure long-term effectiveness of controls. Enforcement actions may be taken if the conditions of the license are not met.

Stakeholders have a role under the LTR during the licensee's preparation of the decommissioning plan for a restricted use site. For these sites, the licensee is required by 10 CFR 20.1403 (d) to seek advice from such affected parties regarding a number of matters,

including the plans for enforceable institutional controls, sufficient financial assurance, and undue burdens on the local community or other affected parties. The licensee shall document in the decommissioning plan how the advice was sought and incorporated, as appropriate, following analysis of that advice. Similarly, under 10 CFR 20.1405, NRC shall notify and solicit comments from affected parties upon receipt of the decommissioning plan.

In addition to the State and EPA, some other stakeholders may have an ongoing interest in the site after decommissioning has been completed and the LTC license is in place. From time to time, it might be appropriate to schedule public meetings, such as during the five-year license renewal process, to obtain information about the site and to maintain a local awareness of the site and the restrictions on site access and use.

Requirements for Licensees Proposing Restricted Use with the LTC License. The decommissioning goal for a site proposing the LTC license is the same as any other decommissioning site proposing restricted use--safe site decommissioning that complies with the LTR. However, for such sites, the license is not terminated after remediation, it is only amended to become an LTC license. Nevertheless, a licensee proposing to use the LTC license needs to comply with all the criteria of 10 CFR 20.1403, even though the license will not be terminated. These restricted use requirements for licensees are:

10 CFR 1403(a): Eligibility for restricted use (ALARA or public/environmental harm)

10 CFR 1403(b): Legally enforceable institutional controls and 25mrem/yr dose criterion

10 CFR 1403(c): Sufficient financial assurance for control and maintenance

10 CFR 1403(d): Submit a decommissioning plan or a license termination plan for restricted use and include how advice from affected parties has been sought and incorporated

10 CFR 1403(e): 100 and 500 mrem/yr dose "cap" requirements if institutional controls were no longer in effect

However, the institutional control requirements would be met with the LTC license conditions.

In addition, because the NRC license would be amended and not terminated, other NRC requirements for NRC licensees would continue, such as record keeping.

Eligibility for Restricted Release and the LTR License Option

In the Statements of Consideration for the LTR, the Commission noted that it allows restricted use as an appropriate method of decommissioning while maintaining the philosophy that "... in general, termination of a license for unrestricted use is preferable because it requires no additional precautions or limitations on use of the site after licensing control ceases, in particular for those sites with long-lived nuclides."

As a result, sites considering restricted use must first comply with the existing "eligibility" requirements of 10 CFR 20.1403(a) that further reductions in residual radioactivity to comply

with unrestricted use criteria would result in net public or environmental harm or are not being made because the levels associated with restrictions are as low as reasonably achievable (ALARA).

In addition, consistent with SECY-03-0069, the use of the LTC license option would be an acceptable option if:

- a. Durable institutional controls are required because the site is considered higher risk under the staff's graded approach to institutional controls in SECY-03-0069 (see below), and
- b. The licensee can demonstrate to NRC satisfaction, that it was unable to establish other types of acceptable institutional controls and independent third party arrangements (e.g., letter from the State rejecting responsibility for ownership, control, or independent third party oversight).

Maintaining Ownership of the Site and Minimizing the Size of the Restricted Area

The LTC license approach for SMC would maintain the current license boundaries with restrictions on access and use for selected portions of the site as necessary to meet restricted use criteria. Other portions of the site could have no restrictions on access and use and could be used for industrial applications consistent with local zoning constraints. The only restriction on these portions of the site would be to: 1) conduct confirmatory groundwater monitoring and 2) prohibit the sale separately from the restricted use portion containing the residual contamination. Maintaining ownership of the complete site will help ensure confirmatory monitoring over the long-term. It will also help ensure sustainability of owner/licensee controls, and thus protection of public health and safety, over the long-term.

The staff considers that minimizing the size of the restricted use area would contribute to demonstrating ALARA. It would also result in a smaller area to control, which may make access limitations like fencing and surveillance simpler and more effective as compared to a much larger area.

Risk-Informed, Graded Approach to Institutional Controls.

Using the NRC LTC license is a way to provide the enforceable "durable" institutional controls required under 10 CFR 20.1403 (e), if needed, because a Federal regulatory entity provides the long-term oversight and enforcement. Generally, durable institutional controls are justified under the staff's risk-informed, graded approach recommended in the LTR Analysis if the site is considered a higher risk site due to either: 1) the longer hazard duration from the long-lived radionuclides (uranium and thorium) in the residual contamination or 2) a calculated dose above 100 mrem/yr when assuming no institutional controls.

For the SMC site, durable institutional controls would be necessary, at least, because of the long hazard duration (long-lived, uranium and thorium contamination). The hazard level will be determined by the calculated dose assuming no institutional controls and will complete the understanding of total risk at the site. This hazard level will help tailor the stringency of the

controls specified in the LTC license and NRC's oversight actions. Additional tailoring could be based on how controls and engineered barriers might fail and site conditions.

Flexibility for Potential Reuse of Material

The time period for the LTC license can be flexible. The LTC license is not necessarily permanent, but would be as long as needed to protect public health and safety and the environment based on the half life of the nuclides and other factors. For example, at the SMC site, if reuse of the slag becomes viable, the licensee could submit a license amendment request and decommissioning plan for NRC approval. After NRC approval and license amendment for decommissioning, the material could be removed for reuse and the decommissioning license terminated with unrestricted release. Thus, potential reuse would not be precluded by the LTC license.

Transfer of control/ownership and deed notice.

Transfers of site ownership are expected over the long-term, and the new owner(s) will need to become the licensee and provide the controls as specified in the conditions of the LTC license. Thus, the required control and maintenance under the LTC license would continue to be effective over the long-term even when ownership transfers as a condition of the license. The licensee must notify NRC of a potential sale and obtain NRC prior approval of the new owner by amending the license prior to the effective date of the sale of the licensed property. The prospective owner must become an NRC licensee effective at the time of the sale. The licensee also must establish and maintain/re-record a deed notice, approved by NRC, as a condition of the license. This will provide additional assurance that potential future owners will be informed that an NRC LTC license is required as well as the conditions of the license.

Sufficient Financial Assurance and Trust.

The licensee must establish a trust and place sufficient funds into it to produce annual income that is sufficient to cover the (1) annual average costs of licensee surveillance, control, radiological monitoring of surface and groundwater if needed, and routine maintenance, (2) NRC oversight costs, and (3) trustee fees and expenses. The licensee should assume 1 % return on investment (consistent with 10 CFR Part 40, Appendix A). The NRC would be the beneficiary of the trust. The licensee would request, and the trustee would pay, in accordance with the instrument, for the costs of surveillance, control, maintenance, and NRC oversight costs, most likely on an annual basis. Because the fund would produce income sufficient to hire a contractor to perform the surveillance and control tasks, the licensee could hire a contractor to perform the duties, and be reimbursed for the full cost, rather than performing the work itself.

In the event the licensee does not perform its duties, NRC could take enforcement action, as necessary, to ensure that control activities are maintained. Alternatively, the trustee could be directed by NRC to provide funds to a contractor to work on behalf of the licensee. NRC could seek a court to appoint a custodial trustee to continue the long-term control activities using funds from the trust in the event that no licensee exists.

NRC Fees for LTC Oversight Activities

No annual fees (10 CFR Part 171) are required for the LTC license. However, fees for NRC services would be recovered (10 CFR Part 170). Therefore, the licensee would be charged for NRC activities during the year, expected to be review of one annual report, annual inspections during the first five years, license renewal activities every five years, enforcement actions if needed, and responses to events and licensee corrective actions as needed. For initial planning purposes at the SMC site, the licensee should assume an NRC fee of \$10,000 for one report review and one inspection each year. Also assume a fee of \$20,000 once every five years for the five-year license renewal, expanded inspection, and report review.

Engineered Barriers

If engineered barriers (e.g., disposal cell and cover) are used, their contribution to compliance should be evaluated as well as their ability to remain effective over the 1000 year compliance time period such that the applicable dose criteria with and without institutional controls are met. Although the licensee will conduct surveillance and routine maintenance of the site (e.g., fence or sign repair), ongoing active maintenance and repair of the engineered barrier should not be relied upon to maintain the effectiveness of the engineered barrier under the LTC license conditions. Consistent with this approach, NRC's guidance in NUREG-1757, Vol 2, Section 3.5, encourages licensees to design robust engineered barriers to mitigate potential future failures, simplify long-term control and minimize the extent of routine maintenance and associated costs, especially for long-lived radionuclides. The design needs to take into account the potential for barrier degradation over time.

The staff's preferred approach is for licensees to design a robust engineered barrier with an erosion control cover that is consistent with the NRC's guidance entitled Design of Erosion Protection for Long-Term Stabilization in NUREG-1623 and section 3.4, Design of Erosion Protection, in NUREG-1620, Rev. 1. Although NUREG-1623 was developed initially for use at uranium mill tailings sites, Section 1, Introduction on page 1 of NUREG-1623 indicates that the guidance can be applied to other sites as well, including decommissioning sites (e.g., Site Decommissioning Management Plan sites). This guidance contains specific criteria to meet the 1,000-year longevity requirement without the use of active maintenance. Although this requirement pertains to uranium mill tailings sites, and there is not a similar requirement under 10 CFR 20.1403 for decommissioning sites, NRC prefers this approach because it is the simplest and most effective way to demonstrate long-term erosion protection with no reliance on ongoing active maintenance. Furthermore, this approach has a well documented technical basis for acceptable methods to achieve long-term protection and over a decade of design, construction, and oversight experience.

Dose Assessments.

Dose assessments for restricted use sites must have doses calculated for two cases: 1) with the controls assumed to be in place and 2) assuming institutional controls are not in effect. This also applies to a site when an LTC license is proposed. In conducting dose assessments, the licensee should identify more realistic exposure scenarios assuming past, present, and reasonably foreseeable (i.e., a few decades and possibly up to 100 years) land use as described in Attachment 6 of SECY-03-0069 and approved by the Commission. No

institutional controls also assumes no maintenance and no repair of engineered barriers, if used, and, as a result, how the engineered barrier might degrade over time, for example, due to erosion or biointrusion.

If SMC proposes that a portion of its site should be unrestricted use, then the total dose from all portions of the site must meet the applicable dose criteria. Therefore, dose assessments for both restricted and unrestricted use portions of the site must also take into consideration the impact of the other portion of the site--impacts of the restricted use portion on the unrestricted use portion (e.g., the potential for future contaminated groundwater to migrate into the unrestricted area) and impacts of the unrestricted portion on the restricted use portion.

Finality of Decommissioning Decisions

NRC recognizes the importance of the finality of its decommissioning decisions. Under 10 CFR 20. 1401(c), the Commission could require additional cleanup in the future only if based on new information, it determines that the criteria in the LTR were not met and residual activity remaining at the site could result in significant threat to public health and safety. This requirement also would apply to a site with the LTC license and may be particularly important to potential future owners/licensees who may be concerned about future liabilities should they purchase the site.

Long-Term Record Retention and Availability

The licensee will be required to maintain those decommissioning records, which are necessary for maintaining effective long-term protection. In addition, new LTC records must be maintained for the duration of the LTC license. The purpose of record keeping is to support those licensee LTC activities necessary for effective long-term protection. In the event of ownership and license transfer in the future, there are existing NRC requirements for records transfer to ensure that important records remain available.

In addition, NRC intends to continue maintaining the LTC licensing records in the same docket file used for operations and decommissioning. This approach should result in a continuous and completely documented history of the site operations, decommissioning, and long-term control available in a single file that will improve the efficiency and effectiveness of future search and retrieval of site information. These records are expected to be available to the public in the future. Finally, NRC currently maintains the site decommissioning data base, which includes restricted use sites. This publically available data base provides Internet access to general site information about all NRC decommissioned sites.

NRC recognizes that maintaining records and making them publically available over the long term is one of the important elements to ensure protection for long periods of time so that knowledge of the site will not be forgotten. Retention of duplicate records in different locations by the licensee and NRC enhances long-term record retention.

Content of the LTC possession only license and LTC plan

LTC license conditions specify requirements for: prohibited site access and land use, permitted site access and land use, physical controls (fences, signs, monuments), surveillance,

groundwater monitoring (if needed), corrective actions, maintenance, reporting, records retention and availability.

The LTC Plan provides site information and implementation activities and procedures for each license condition (similar to the Long-Term Surveillance Plan for uranium mill tailings sites required by 10 CFR Part 40, Appendix A. See Appendix D of NUREG-1620, Rev. 1 for guidance). The LTC Plan would include the following information:

Legal description and ownership of the land

Final condition of the site, residual contamination, engineered barriers, and physical controls

LTC license conditions and implementing activities and procedures

INFORMATION TO BE SUBMITTED IN THE DECOMMISSIONING PLAN

Specific guidance on the information to be submitted in the DP for institutional controls, site maintenance, and financial assurance from the NMSS Consolidated Decommissioning Guidance (NUREG-1757, Vol. 1, Rev. 1 and Vol. 3) is provided below. This existing guidance has been supplemented with new draft guidance on the use of the LTC license for institutional controls and site maintenance. The additional new guidance for the LTC license is shown in **bold**.

Existing guidance in NUREG-1757 for eligibility demonstration, obtaining public advice, and dose modeling and ALARA demonstration, and use of engineered barriers (Section 3.5 of NUREG-1757, Vol 2) are sufficient if the LTC license term and concept are specified as the institutional control. However, a new section has been added (17.7.3.2.2) that indicates where the information on engineered barriers should be located in the DP.

17.7.3.2 Institutional Controls and Engineered Barriers

17.7.3.2.1 Institutional Controls

The information supplied by the licensee should be sufficient to allow the staff to fully understand what institutional controls the licensee plans to use or has provided for the site and the manner in which these institutional controls will limit doses to the average member of the critical group to 0.25 mSv/y (25 mrem/y). The staff's review should verify that the following information is included in the description of institutional controls that the licensee plans to use or has provided for the site:

Location and Type of Institutional Controls

- **Location and description of the general type of institutional controls and the basis for selection using NRC's risk-informed graded approach in Attachment 1 of the LTR Analysis in SECY-03-0069. Using this approach, determine if the restricted area of the SMC site is a lower or higher risk**

area and the general type of institutional controls that are needed. Consider both hazard duration based on the half-life of nuclides in the contamination as well as hazard level (i.e., less than or greater than 100 mrem/yr) based on dose assessments assuming no controls. This approach might result in identifying unrestricted use areas where no institutional controls are required, and restricted use areas using either legally enforceable institutional controls or durable and legally enforceable institutional controls.

- A demonstration that the size of the restricted use area has been minimized. The staff considers that minimizing the size of the restricted use area would contribute to demonstrating ALARA for sites that are considering partitioning the site into unrestricted and restricted use portions. It would also result in a smaller area to control, which may make access limitations like fencing and surveillance simpler and thus more effective, compared to a much larger area.

However, for a site like the SMC site where partitioning could be used, single ownership of both the unrestricted and restricted use portions of the existing site should be maintained under the LTC license.

- A description of the **specific type** of legally enforceable institutional control(s) and an explanation of how the institutional control is a legally enforceable mechanism;

State that SMC would use two specific types of institutional controls. First, that the NRC LTC license is considered to be a specific type of legally enforceable and durable institutional control. Second, describe the licensee's responsibility to put in place and maintain a deed notice that notifies potential landowners of the LTC license requirement and the conditions of the LTC license.

Restrictions and Controls Implemented by Licensee

- A description of the restrictions on present and future landowners;

Describe the access and land use restrictions based on the dose assessments assuming no controls. Identify specific access and land use scenarios that could lead to non-compliance with the dose criteria of the LTR and therefore should be prohibited (e.g., farming, construction of a residence, excavation into the cell for any purpose, or groundwater use).

Also indicate what access and land use that might be permitted (e.g., industrial, recreational, or wildlife conservation area).

Describe what restrictions on land use would be needed to maintain effective engineered barrier performance (e.g., prohibit excavation of the

cell cap and removal of cell cap material or contaminated material) as well as permitted access and land use.

Describe the licensee's activities to restrict/control access and land use, including fences, signs, monuments, and periodic surveillance (e.g., annual site surveillance and adverse event surveillance). All of the above should be conditions in the LTC license. Recognize that the licensee will need to prepare a Long-Term Control Plan that will describe the details of how the licensee will implement the LTC license conditions.

- A discussion of the durability of the institutional control(s);

Note that NRC considers the LTC license along with the deed notice to be a durable institutional control.

Duration of the LTC License

- A description of the duration of the institutional control(s), the basis for the duration, the conditions that will end the institutional control(s) and the activities that will be undertaken to end the institutional control(s);

Discuss that the duration of the LTC license will be permanent for the SMC site based on the long-half life of the uranium and thorium contamination. However, the license would be renewed in five-year increments.

Records Retention and Availability

- A description of the records pertaining to the institutional controls, how and where they will be maintained, and how the public will have access to the records.

Identify both historical and new records to be retained under the LTC license by the licensee that are necessary for the licensee to provide effective long-term protection. This includes the Decommissioning Plan, Final Status Survey Report, LTC license, Long-Term Control Plan, and all correspondence under the LTC license.

Identify the location and methods used for retention of records by the licensee.

Note that NRC will retain all licensing records as part of its Agency record keeping system and that these records will be available to the public in the future as they are today.

Detriments and Benefits from the LTC License

- A description of any detriments associated with the maintenance of the institutional control(s);

Describe any detriments to using the LTC license. For example, describe potential impacts on sale of property or value of property due to the NRC license "stigma" or perceptions that NRC could potentially requiring further cleanup in the future (i.e., finality). Detriments might also be a result of restricted use of the land, independent of the type of legal instrument used (LTC license). Include stakeholder inputs, if provided.

17.7.3.2.2 Engineered Barriers

- Include the information on engineered barriers using the guidance in Section 3.5 of NUREG-1757, Vol 2.

17.7.3.3 Site Maintenance

Licensee Maintenance, Control, and Monitoring Program

- A description of the site maintenance and control program and the basis for concluding that the program is adequate to control and maintain the site.

Describe the general maintenance and control activities that should be required as conditions of the LTC license, such as visual surveillance and routine maintenance of physical controls and engineered barriers (e.g., fence repair, cutting grass, or removing vegetation).

Describe radiological monitoring of surface or groundwater, if such monitoring is needed to verify dose modeling results of potential radionuclide contamination in surface or groundwater. Include location and frequency of sampling, duration of monitoring, and supporting justifications.

Reference the Long Term Control Plan that will be prepared by the licensee that will give the detailed activities and procedures to implement the license conditions.

Demonstrate that the design of any engineered barriers are sufficiently robust so that ongoing active maintenance or periodic repair necessary to maintain the effectiveness of the engineered barrier is not needed. For example, the design objective should be to preclude the occurrence and need for repair of deep gullies in the erosion protection cap that could exposes residual contamination. Similarly, the cover design (thickness and material) that might be needed for shielding of the residual contamination should be designed to preclude erosion that might reduce

its thickness and shielding effectiveness and not rely on repairs to restore the cover thickness. Note that an acceptable erosion cover design would be one that is consistent with NRC's guidance for erosion protection in NUREG-1620, Rev. 1 and NUREG-1623.

- A demonstration that an appropriately qualified entity has been provided to control and maintain the site.

Under the LTC license, the entity could be the licensee or a contractor to the licensee. Discuss the qualifications of the personnel that are necessary to conduct the planned LTC activities.

- A description of the arrangement or contract with the entity charged with carrying out the actions necessary to maintain control at the site.

This applies if the licensee plans on using a contractor.

- A demonstration that the contract or arrangement will remain in effect for as long as feasible, and include provisions for renewing or replacing the contract.
- A description of the plans for corrective actions that may be undertaken in the event the **site maintenance and control program fails**; and

Identify reasonably foreseeable events (e.g., forced entry through fences or disruption of cap material) that could cause a failure of access and land use controls. Describe the corrective actions the licensee would take and requirements that NRC would be notified of the events and planned corrective actions.

- **A description of licensee reporting to NRC and State and local officials, including an annual report and event corrective actions reports, as needed. The annual report should describe licensee surveillance and routine maintenance. Event corrective action reports would identify the adverse event that occurred and the licensee's planned corrective actions. Follow up reports would summarize the results of the corrective actions taken and an analysis of lessons learned from the event and plans to prevent similar future events from occurring.**

NRC Oversight and Enforcement

- A description of the entities enforcing, and their authority to enforce, the institutional control(s);

Identify that NRC will have jurisdiction for oversight of licensee activities and can take enforcement actions, if needed, under its licensing authority from the AEA.

The following three bullets are not applicable because there would be no third party under the LTC license. NRC's general role under the LTC license is to assure that the controls are maintained and remain protective over time. Also note that NRC activities would include review, inspection, license renewal, and enforcement.

- A description of the activities that the entity with the authority to enforce the institutional controls may undertake to enforce the institutional controls;
- A description of the manner in which independent oversight of the entity charged with maintaining the site will be conducted and what entity will conduct the oversight.
- A description of the periodic site inspections that will be performed by the third party, including the frequency of the inspections.
- A description of the manner in which the entity with the authority to enforce the institutional control(s) will be replaced if that entity is no longer willing or able to enforce the institutional control(s) (this may not be needed for Federal or State entities);

Not applicable under an NRC LTC License.

Sufficient Financial Assurance

The basis for financial assurance for a LTC license should be a combination of methods from 10 CFR 40.36, 10 CFR 20.1403, and NUREG-1757, Vol. 3.

10 CFR 40.36 provides for submission and approval by the NRC of the financial instruments used for financial assurance. It further provides for adjusting the cost estimate and funding levels every three years, which will provide a feedback of actual cost experience into the cost estimate. It specifies the methods by which financial assurance must be provided. However, the scope of 10 CFR 40.36 is limited to decommissioning financial assurance for licenses which authorize "possession and use" of more than 10 mCi of source material in a readily discernible form. A LTC license does not necessarily authorize "use". Nor is the LTC licensed facility expected to require "decommissioning" in the traditional sense. Therefore, selected provisions of 10 CFR 40.36 should be included as license conditions in the LTC license, to provide financial assurance for long-term control.

10 CFR 20.1403 provides for sufficient funding to enable an independent contractor to perform the surveillance and control tasks. In practice, this would require adding contractor overhead and profit to the cost of performing the tasks. Because 10 CFR 20.1403 applies only to termination of a license, its provisions should be included as a license condition in the LTC license.

NUREG-1757, Vol. 3 contains guidance on performing the cost estimate for site control and maintenance. Once the amount is estimated, the licensee must provide sufficient funds to produce an annual average income that covers the annual surveillance, control, and maintenance/repair costs, NRC fees, and trustee expenses. By analogy to uranium mill tailings funds, a 1% rate of return may be used by the licensee to determine the minimum funding level. This rate would contribute to the LTR requirement for sufficient funds for a site with long half-life radionuclides needing control over a long time period. It is also justified because the current licensee responsible for the contamination should fund the long-term control so that no additional costs will be passed on to future site owners/licensees.

The cost estimate should include funds for at least the following licensee activities:

- site surveillance of access and land use restrictions
- routine maintenance
- radiological monitoring of surface and groundwater, if needed
- reporting
- records retention.

The cost estimate should also assume the following NRC oversight fees:

- a fee of \$10,000 for one inspection and one report each year
- \$20,000 every five years for five year license renewal, inspection, and report.

Finally, the estimate should include reasonable trustee fees and expenses.

NUREG-1757 Vol. 3 provides for contingency factor of 25% to be added to the cost estimate. This contingency should be retained to buffer against potential market losses, and to provide for unexpected costs. If the contingency proves insufficient, the licensee should be required to add funds to the trust. As a matter of fairness, particularly in light of the long term existence of the fund, if the balance substantially exceeds the amount needed to produce sufficient annual income, a provision, to return excess funds to the licensee with NRC's approval, should be included in the trust.



State of New Jersey

Department of Environmental Protection
PO Box 402
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James E. McGreevey
Governor

Bradley M. Cambel
Commissioner
Tel. # (609) 292-2882
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June 25, 2004

Honorable Nils J. Diaz
Chairman, Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Chairman Diaz:

I am writing to express my deep concern regarding the US Nuclear Regulatory Commission's (NRC) intent to pursue a Long Term Control (LTC), possession only, license for Shieldalloy Metallurgical Corporation (SMC).

The April 15, 2004 "NRC Interim Guidance for a Long-Term Control Possession Only License at the Shieldalloy Newfield Site" states that "The staff expects that lessons learned from this project will be useful for eventually preparing draft regulatory guidance for public comment..." In effect, the NRC is proposing to use New Jersey as a testing ground for an untried and possibly ill-conceived NRC policy.

That experiment would essentially create a low-level radioactive waste disposal facility in New Jersey. Just a short time ago, New Jersey worked very hard to interest a community within the state in becoming a volunteer host for a low-level radioactive waste site. Even large monetary incentives were not enough to persuade any community to host such a site. I do not believe that our residents will be any more willing to accept a low-level radioactive waste site in the guise of an LTC site arriving through the back door.

The NRC has announced a "public meeting" on the proposed LTC on June 29 in Rockville, Maryland. On behalf of the public who will be interested and affected by your decisions in this matter, I ask that the location be changed to Newfield or some nearby location to allow them to participate in the meeting. Participation by telephone conference is not a true substitute for enabling residents to be present when a regulatory agency and its licensee are discussing leaving a large pile of radioactive material in a residential neighborhood for an unspecified time period.

The SMC site is home to some 28,000 cubic meters cubic yards of radioactively contaminated ferrocolumbian slag and 20,000 cubic meters of baghouse dust. Smaller piles of soils and debris bring the total volume of radioactively contaminated materials to 57,000 cubic meters. This large an amount of material should be disposed of in an environmentally responsible manner, not left for an indeterminate time, possibly even for future generations.

The volume and physical characteristics of the material raise concerns regarding the stabilization of the material when it is consolidated. An environmentally robust monitoring program will be

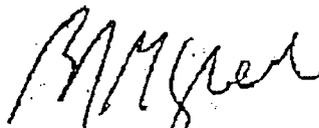
needed to ensure that chemical and radiological contaminants do not migrate off site. The very general discussion of monitoring requirements contained in the interim guidance do not engender a feeling of confidence that the public health and the environment will be properly protected.

The NRC is also proposing to allow much greater exposure to radiation if all controls at the site fail than would be allowed under New Jersey's rules. The NRC would permit an "all controls fail" annual effective dose equivalent of 500 millirem per year while New Jersey's is 100 millirem per year. I strongly believe that the State's more stringent standard is necessary to protect public health and the environment.

There are human and social factors to be considered when delaying the decommissioning of radiologically contaminated sites. Safety practices may decline as a result of the attrition of key personnel. Management interest in an LTC site will be less than if the site were in operating or in active decommissioning. Bankruptcy, corporate takeover or other unforeseen business changes could negatively impact safety at an LTC site. We do not see these concerns as adequately addressed in the guidance document.

I look forward to your actions to address our concerns.

Sincerely,



Bradley M. Campbell
Commissioner



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Richard J. Codey
Acting Governor

Bradley M. Campbell
Commissioner

December 6, 2004

Samuel J. Collins, Regional Administrator
US Nuclear Regulatory Commission Region 1
King of Prussia, PA 19406-1415

Dear Mr. Collins:

I am writing to express my concern regarding the way in which the "decommissioning" of the Shieldalloy Metallurgic Corporation (SMC) site is proceeding. This time we have concerns about how meetings of the Site Specific Advisory Board (SSAB) should be conducted and what is expected of the members.

According to Nuclear Regulatory Commission (NRC) regulations at 10 CFR 20.1403, Criteria for license termination under restricted conditions, the licensee should seek advice from the members of the SSAB on various aspects of the proposed institutional controls and financial assurance. The representative of SMC stated this objective clearly, and members were encouraged to bring up any other issues they felt should be addressed.

However, it is the way in which these meetings are being conducted that concerns us. According to Volume 1 of the Consolidated NMSS Decommissioning Guidance (NUREG 1757), the SSAB should select a chairperson and adopt a charter. This was never done. Instead SMC's legal counsel conducts the meetings and drives the agenda. Members of the SSAB are encouraged to ask questions, but there has been no opportunity for members to discuss issues among themselves.

The most recent meeting of the SSAB was conducted on November 5, 2004 with several members of the public in attendance. Included in the packet of material was a form to be completed by SSAB members, which I have enclosed for your review. This form follows the letter of the NRC regulations, however we believe insufficient information was provided to SSAB members to allow them to complete it. The cover page to this form states that this will be considered the SSAB input and be included in the site wide decommissioning plan. How can these questions be answered without the decommissioning plan, the dose assessment, the ALARA analysis, or any documentation on financial assurance?

Of particular note is the question of scenarios that are being assessed. Based on an October 7, 2004 letter from David Smith of SMC to Kenneth Kalman of Headquarters, which summarized the key issues of two conference calls that were held on September 23, 2004 (to which we were

not invited), the NRC has agreed to intruder scenarios that are less than reasonably conservative (hunters, recreationalists, and casual visitors). We believe that two realistic but justifiable exposure scenarios should include a person who builds a home next to the pile upon failure of the institutional and engineering controls, and a person who builds a home where the slag is used as fill under and around the house. We believe that the latter scenario is certainly realistic, given the fact that it was done by SMC at this site, even having full knowledge of the radioactive content of the material.

Also included in this letter is the NRC's interpretation of *all controls fail*. Apparently "all controls fail" means only institutional controls fail. The NRC states that engineering controls may or may not fail once institutional controls fail, or their effectiveness may degrade over time. Since we know this material will be present in perpetuity, the Department believes it is safe to assume that eventually there will be neither institutional nor engineering controls present. We understand that sometimes a degradation of engineering controls may be considered more conservative because erosion usually occurs irregularly and may form gullies that allow contamination to be channeled and concentrated at a particular location, referred to as the "bathtub effect". According to SMC, the type of material present at the site is not readily soluble, so this type of degradation of engineering controls would not be considered conservative in our view. The Department believes that all scenarios should be assessed based on the failure of both institutional and engineering controls.

We have also learned that the NRC allowed SMC to use a draft Environmental Impact Statement from the SMC facility in Cambridge, Ohio for their ALARA analysis. While it is true the licensed material is the same, the site-specific factors such as land use are totally different.

Finally, there is no evidence currently available that will ensure the institutional or engineering controls proposed will be effective in perpetuity, or will last even 1000 years. Indeed, NRC's own regulations at 10 CFR 61.59 state that institutional controls may not be relied on for more than 100 years.

I believe that the NRC's willingness to entertain the long-term control license option sets a dangerous precedence and should be reconsidered. The NRC has allowed SMC to accumulate this waste with no regard for its disposition for years. The NRC needs to use its regulatory authority to resolve the problem now without placing a perpetual burden on the citizens of Newfield.

Sincerely,



Jill Lipoti, Ph.D.,
Assistant Director

Enclosure

SITE SPECIFIC ADVISORY BOARD

Shieldalloy Metallurgical Corporation

Input Form

NJDEP's responses:

1. Do the institutional controls proposed by Shieldalloy Metallurgical Corporation (SMC) provide reasonable assurance that an average member of the public will not incur a radiation dose in excess of 25 millirem Total Effective Dose Equivalent (TEDE)?

The New Jersey Department of Environmental Protection (NJDEP) does not have sufficient information on which to base a response. The characterization of the slag and baghouse dust pile was not provided to the Site Specific Advisory Board (SSAB), nor was the engineering design of the cap.

2. Do you believe the institutional controls will be enforceable?

No. There has been no demonstration that the institutional controls proposed will be enforceable for the time period necessary, basically in perpetuity. The United States Nuclear Regulatory Commission's (USNRC) own regulations under 10 CFR Part 61.59 state that institutional controls may not be relied on for more than 100 years.

3. Do you believe the institutional controls will not impose undue burdens on the local community or other affected parties?

No. The institutional controls may well prevent the development of the rest of the SMC site, as well as surrounding properties. The NJDEP believes this presents an undue burden on the local and neighboring communities.

4. Do you believe SMC can provide sufficient financial assurance to enable an independent third party to assume responsibility for control and maintenance of the site?

No. SMC appears to be downsizing this operation. There is no value to the property with the slag pile present, only liability, possibly in the hundreds of millions of dollars. It appears that SMC is seeking the Long Term Control (LTC) option only to continue operating the facility for as long as SMC can profit from it. If SMC can not profit from this operation, abandonment of all radioactively contaminated materials appears likely.

Also, SMC states that it currently has posted \$5 million dollars in financial assurance for addressing the USNRC regulated materials on the site. This amount was not posted in accordance with 10 CFR 20.1403(c) for license termination under restricted conditions, but rather in accordance with paragraph 16 of the March 26, 1997 Bankruptcy Settlement Agreement. This amount was posted as a "Predetermined Cost" in bankruptcy negotiations based on licensing issues relevant at that time and was not based on SMC's

and USNRC's current proposal for a LTC license. It is impossible for NJDEP to know if this amount will be sufficient for the current proposal since very few details have been made available to the SSAB.

5. In its decommissioning plan, SMC must present an assessment of the radiation dose potential associated with its planned decommissioning option for the following population groups: (1) on-site workers that do not have access to the capped area; (2) on-site workers that perform routine maintenance and inspection of the capped area; (3) trespassers; and (4) the nearest off-site resident. Are there other population groups that you think should be included in the dose assessment process?

Yes. According to the October 7, 2004 letter to Kenneth Kalman of the USNRC from SMC, the trespasser scenario means recreational, casual visitors, or hunters. While NJDEP agrees that the resident farmer scenario is not realistic because a house cannot be placed directly on top of the slag pile, we believe that a more conservative realistic scenario should be assessed, namely a future resident who uses crushed slag as fill under a house. We believe this is certainly realistic, given the fact that it was done by SMC at this site, even having full knowledge of the radioactive content of the material. NJDEP also believes that the nearest resident scenario should assume that the house is built next to the slag pile and that the engineering controls degrade and completely fail over time (see Comment No. 6 under Additional Concerns, below).

Additional Concerns:

1. NJDEP is on record with the USNRC opposing the issuance of the first Long Term Control license in the country based on both administrative and technical concerns. Please refer to the attached letter dated June 25, 2004 from NJDEP Commissioner Bradley M. Campbell, to USNRC Chairman Nils J. Diaz for details. The information that has been provided to the SSAB to date has not changed NJDEP's position regarding issuance of a Long Term Control license to SMC.

2. The statement made by SMC at the November 5, 2004 Site Specific Advisory Board meeting that one of the reasons SMC does not consider disposal of the slag pile a viable option is because of liability issues, such as the possibility that the material would have to be sent back to Newfield from Envirocare of Utah. Subsequent to the meeting, NJDEP spoke with Envirocare of Utah, who explained that this requirement is just an extension of the USNRC "cradle-to-grave" policy. Every generator of radioactive waste is responsible for the waste that it generates forever. This is a standard part of the contract that every Envirocare client must sign before they will accept the waste. NJDEP has dealt with numerous cleanups across the State with responsible parties ranging from private companies to the United States government. This issue has never been brought up as a reason to abandon disposal as an option.

3. The SSAB does not seem to be functioning as the regulatory framework suggests. Namely, NUREG 1757, Volume 1, Chapter 17 states that the SSAB should elect a

chairperson and adopt a charter and operating procedure. This was not done. The minutes of previous meetings reflect that SMC or its representatives have driven the discussion. Basic radiation protection principles were discussed at two SSAB meetings (which were necessary), but little discussion on specifics of the dose assessments or financial assurance was presented. According to NUREG 1757 the licensee is supposed to provide the SSAB with licensee studies and analyses that are pertinent to the decommissioning. The SSAB does not have the dose assessment or the 1996 Draft Environmental Impact Statement for the SMC site in Cambridge, OH that is supposed to contain the ALARA analysis that the USNRC is allowing to be used at this site. The SSAB should also have been provided with the thermoluminescent dosimeter (TLD) data from the fence line near the slag pile. This would at least provide a point of reference when discussing regulatory dose limits. The SSAB has no documentation on financial assurance, only the total amount that SMC says is available. The work of the SSAB cannot be considered complete until these documents are distributed and a discussion is held among the members.

4. The cover page to this Input Form states that the form must be completed by November 30 in order for the SSAB input to be captured in the site-wide decommissioning plan. It then states that these concerns will be addressed in the Decommissioning Plan. Is this the final input on the question of institutional controls and financial assurance? If it is going to be included in the decommissioning plan then we assume this is the input that the USNRC is going to evaluate against their regulations. NJDEP believes that the SSAB should work to provide a consensus opinion to SMC. It is difficult for this to happen based on the way the SSAB meetings are currently being conducted.

5. When discussing institutional controls at the SSAB, SMC states that the controls will need to be relied on for 1000 years. This seems inappropriate given the half-life of the material that will be remaining at the site and the exposure rates when the engineering controls fail.

6. A copy of SMC's October 7, 2004 letter to Kenneth Kalman of the USNRC was provided to SSAB members at the November 5, 2004 meeting. NJDEP has concerns regarding item number 3 under Dose Modeling. The USNRC is allowing SMC to assume that engineering controls may or may not fail once institutional controls fail, or their effectiveness may degrade over time. Since we know this material will be present in perpetuity, NJDEP believes it is safe to assume that eventually there will be neither institutional nor engineering controls present. We understand that sometimes a degradation of engineering controls may be considered more conservative because erosion usually occurs irregularly, which may focus the flow and allow contamination to be channeled and concentrated at a particular location, referred to as the "bathtub effect." According to SMC, the type of material present at this site is not readily soluble, so this type of degradation of engineering controls would not be considered conservative in our view. NJDEP believes that all scenarios should be assessed based on the failure of both institutional and engineering controls.



SHIELDALLOY METALLURGICAL CORPORATION

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October 24, 2005

Kenneth L. Kalman
Decommissioning Branch
Division of Waste Management
Office of Nuclear Materials Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Revision 1 to the Decommissioning Plan for the Newfield Facility (License No. SMB-743, Control No. 132074)

Dear Mr. Kalman:

Shieldalloy Metallurgical Corporation ("SMC") hereby submits Revision 1 of its Decommissioning Plan ("DP") to the U.S. Nuclear Regulatory Commission ("NRC") for its review and approval. Revision 1 addresses the comments set forth in the NRC letter to SMC dated February 28, 2003 as well as additional guidance provided by the NRC following submission of the DP.

SMC holds source material license SMB-743 from the U.S. Nuclear Regulatory Commission ("NRC") for its facility in Newfield, NJ. The principle activity authorized by the license was metallurgical operations with ore containing source material to produce iron-based alloys. On August 27, 2001, SMC notified NRC that principle activity under the license had ceased. On August 30, 2002, SMC submitted a DP to the NRC.

Revision 1 to the DP is part of an evolving process over the last fifteen years to address the decommissioning of this site. On April 7, 1993, SMC submitted to the NRC a conceptual decommissioning plan as a supplement to its application for license renewal. On November 26, 1993, the NRC published a notice of its intent to prepare an Environmental Impact Statement for decommissioning associated with the license that included addressing on-site stabilization of the slag containing source material that results from licensed metallurgical operations. The NRC renewed the license in October 1997. For the last decade, SMC and NRC have maintained a productive dialog on the most efficient and cost-effective method of achieving the regulatory objectives for decommissioning this site. For example, on May 15, 2004, the NRC provided SMC with guidance on long-term control ("LTC") licensing for use in preparing the DP revision. Appendix 19.1 to Revision 1 identifies where previous NRC comments are addressed.

Kenneth L. Kalman
USNRC-NMSS-DWMEP-DD-MD
October 24, 2005
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NRC guidance on restricted release is evolving. For example, in 2004, NRC issued generic guidance in NUREG-1757, *Consolidated NMSS Decommissioning Guidance*. On September 29, 2005, the NRC issued a draft supplement to NUREG-1757 identifying anticipated changes specific to applications for restricted release and requesting comments by December 30, 2005. SMC has prepared Revision 1 to the DP to the maximum extent possible consistent with the NRC guidance. Considering that the NRC guidance has been and continues to evolve in this area, SMC anticipates continuing discussion with the NRC during the review process on implementing restricted release regulatory objectives.

Pursuant to 10 C.F.R. § 40.36(d), SMC must provide a description of the method for assuring funds for decommissioning. The estimated cost of the work described in the DP, including a 25% contingency factor, is about \$5.2 million. As discussed in Chapter 15 of the DP, financial assurance mechanisms in excess of this amount and associated supporting documentation have been provided previously.

Because License Amendment 8, issued on November 6, 2002, incorporated the DP as an authorized use of SMB-743, this letter does not request a license amendment at this time. SMC intends to request a license amendment reflecting the changed end-state of the facility once NRC completes its safety and environmental reviews of the DP.

If you have any questions regarding the referred matter, please do not hesitate to contact me at (856) 692-4201 extension 226 or via e-mail at dsmith@shieldalloy.com

Sincerely,



David R. Smith,
Radiation Safety Officer

cc:

w encl:

Joe Diegel - SMC
Carol D. Berger, CHP - IEM, Inc.
Jean Oliva, PE - TRC
Jay E. Silber, Esq. - Pillsbury Winthrop Shaw Pittman LLP.
Marjorie McLaughlin - NRC Region I

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Borough of Newfield Public Library
Borough of Newfield

w/o encl: Eric Jackson - SMC
Charles L. Harp, Esq. - Archer & Greiner
Bill R. Thomas, CHP - IEM, Inc.
Daniel Gillen - USNRC - HQ
Marie Miller - USNRC Region I
J. Lieberman, Esq. - Talisman
J. Greeves, PE - Talisman
Carol Stopper, PE - TRC

January 26, 2006

David R. Smith
Environmental Manager
Shieldalloy Metallurgical Corporation
Aluminum Products & Powders Division
14 West Boulevard, P.O. Box 768
Newfield, NJ 08344-0768

SUBJECT: REJECTION OF THE REVISION 1 TO THE DECOMMISSIONING PLAN FOR
THE NEWFIELD FACILITY (TAC NO. L52094)

Dear Mr. Smith:

By letter dated October 24, 2005 (ML053190212), Shieldalloy Metallurgical Corporation (SMC) submitted Rev. 1 of the Decommissioning Plan (DP) for the Newfield Facility, with supporting documents. On October 31, 2005, the U.S. Nuclear Regulatory Commission (NRC) staff began its 90-day expanded acceptance review of the DP in accordance with NUREG-1757 (Consolidated NMSS Decommissioning Guidance), Vol. 1, Section 5.3. The purpose of an expanded acceptance review is to determine if there is enough information in the DP, and, if the level of detail appears to be adequate, for the NRC staff to perform a detailed technical review.

In addition, the expanded acceptance review included a limited technical review. This technical review focused on those areas which experience has shown to have the potential for significant technical deficiencies (dose modeling, surface water hydrology and erosion protection, institutional controls, and financial assurance). The NRC staff used the guidance in NUREG-1757 and the May 15, 2004, interim guidance for a long-term control (LTC) license at the SMC site for conducting the review to identify technical deficiencies that could significantly impact the progress of the detailed technical review. Deficiencies identified by our review are enclosed.

NRC is not accepting SMC's DP for the Newfield Facility at this time due to these deficiencies. Acceptance at this time would likely require multiple rounds of requests for additional information (RAIs) from the NRC staff to resolve the deficiencies. To date, the NRC staff has provided the May 15, 2004, interim guidance to SMC regarding the use of a LTC license for long-term control as well as guidance on dose assessment, engineered barriers, and financial assurance. We have held open-to-the-public meetings and teleconferences with SMC to discuss various issues regarding the DP. We also used a phased approach whereby NRC staff reviewed and provided comments to SMC on draft chapters of the DP. We are particularly concerned that, regardless of these additional measures that have been taken to enable SMC to submit an acceptable DP, we have identified several areas where multiple rounds of RAI's will be necessary to provide us with the information needed to complete a technical review of the DP. Furthermore, there appears to have been a general disregard for the interim guidance provided by NRC so that SMC could address restricted use/institutional control issues and resubmit a high quality DP.

D. Smith

- 2 -

Based on the above, we believe that SMC management should meet with NRC management to discuss the path forward for the Newfield Facility, including the schedule for initiation of decommissioning at the site. Please contact Ken Kalman, of my staff, at (301) 415-6664 to arrange this meeting.

Please direct any questions concerning your request to me at (301) 415-7295.

Sincerely,

/RA/

Daniel Gillen, Deputy Director
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

Enclosure:
NRC Comments

Docket No.: 04007102
License No: SMB-743

cc:
Eric Jackson, President
Jill Lipoti, Ph.D., NJ DEP
Donna Gaffigan, NJ DEP
Trevor Anderson, US EPA
L. Williams, Newfield Resident
T. Ragone, Newfield Resident

D. Smith

- 2 -

Based on the above, we believe that SMC management should meet with NRC management to discuss the path forward for the Newfield Facility, including the schedule for initiation of decommissioning at the site. Please contact Ken Kalman, of my staff, at (301) 415-6664 to arrange this meeting.

Please direct any questions concerning your request to me at (301) 415-7295.

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/RA/

Daniel Gillen, Deputy Director
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
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Enclosure:
NRC Comments

Docket No.: 04007102
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cc:
Eric Jackson, President
Jill Lipoti, Ph.D., NJ DEP
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Trevor Anderson, US EPA
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DATE	1/18/06	1/20/06	1/20/06	1/25/06	1/26/06

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SIGNIFICANT DEFICIENCIES NOTED
IN THE NRC STAFF'S LIMITED TECHNICAL REVIEW
OF SHIELDALLOY METALLURGICAL CORPORATION'S
DECOMMISSIONING PLAN FOR THE NEWFIELD FACILITY

Dose Modeling

During numerous meetings with SMC, the NRC staff stressed the importance of identifying and justifying the chosen value for parameters determined to be important to the estimated dose. For most of the scenarios evaluated for the restricted area, assuming that institutional controls fail, key parameters are not identified. For example, in Chapter 17, SMC discussed how parameter values were derived, but no justification was provided. In fact, some significantly important parameters (e.g., shielding factor) are not even included in the list.

It should be noted that the greatest expected risk associated with the site is expected to be associated with the radioactivity in the controlled area once controls have failed. However, more discussion is provided for chosen parameter values for situations at the site where the radiological risk is expected to be much less (e.g., scenarios associated with unrestricted release). In some of these situations, the justification for chosen parameter values is minimal. For example, for the industrial scenario, SMC noted that the fraction of time spent outdoors and the shielding factor are two of the most sensitive parameters. However, the reference cited as a basis for the chosen value for the fraction of time spent outdoors would suggest that the selected value is likely to result in a lower than actual dose. The value selected for the shielding factor is not even listed. In other cases, a reference is cited. However, it is not clear how the chosen value was derived from the reference (e.g., the fraction of the time that a trespasser is assumed to spend at the site in the unrestricted release area) or the basis for selecting the value (e.g., why it is considered to be either acceptable or conservative).

In considering multiple land-use scenarios, SMC needs to provide more information used in defining the scenarios and developing appropriate exposure pathways. For example, the justification for excluding the groundwater as an exposure pathway is lacking in that it amounts to assuming that the current water supply will always be available. During our June 14, 2005, telephone conference, NRC staff advised SMC to evaluate the potential impacts associated with including the groundwater pathway before attempting to justify its exclusion. This comment was also reiterated in our June 24, 2005, letter to SMC (ML051680544). It is not clear if this was done in the DP.

SMC was also advised to consider a scenario of a recreational user being exposed to a previously excavated portion of the pile when the land-use restriction fails. However, there is no discussion of this scenario in the DP.

Surface water hydrology and erosion protection

SMC failed to produce sufficient information showing that it met the regulatory requirements regarding the use of engineered barriers. (For one acceptable approach, see Guidance in NUREG-1623). Many of the technical analyses were incorrect and incomplete relative to surface water hydrology and design of erosion protection. For example, the Probable Maximum Precipitation and resulting Probable Maximum Flood runoff rates were incorrectly determined. The determinations of actual runoff velocities, relative to the permissible velocities, were not appropriate, based on inappropriate use of Manning's 'n' value, rainfall intensity, slope lengths, and flow concentration factors. Insufficient information was provided to address the flow velocities on the top slopes as well as the likely need for rock to be placed on the side slopes and on the toe of the side slopes.

Restricted Use/Institutional Controls

Chapter 16 on restricted use includes very limited information about the proposed use of the long-term control (LTC) possession-only license and a supporting deed notice. Although the proposed LTC license could resolve one of the most significant issues that caused rejection of the first DP, SMC did not provide important information about the LTC approach and restricting future site use that was described in NRC's interim guidance developed for this site and discussed with SMC. Major areas with either missing or insufficient information include:

Eligibility for the LTC license option, including a demonstration that SMC was unable to arrange other types of institutional controls and independent third party arrangements, such as a letter from the State rejecting responsibility for ownership, control, or independent third party oversight (interim guidance, p. 4);

Although restrictions were simply listed, there was no justification given based on risk insights from dose assessments, such as specific access and land use scenarios that could lead to non-compliance with the dose criteria (interim guidance, p. 9);

Detriments to using the LTC license including stakeholder input (interim guidance, p. 11); and

Demonstration that the engineered cap has been designed to be sufficiently robust to remain effective even assuming loss of monitoring and maintenance (interim guidance, p. 11) (see also comment above on erosion control).

NRC recognizes that SMC proposes to release the unrestricted use portion of the site rather than maintain it with the restricted use portion under the LTC license. This approach is inconsistent with NRC's interim guidance developed for this site, and there may be benefit in further exploring this issue. NRC notes that SMC justified its position in response to the Site-Specific Advisory Board (SSAB) comments on this question, stating its position is based on sufficient financial assurance to pay for long-term monitoring and maintenance of the restricted area. NRC's interim guidance developed

for this site and draft guidance in NUREG-1757 Supplement 1 were written to provide both protection and beneficial reuse of the total site. Both guidance documents explain that the LTC license would specify safe, and therefore, permitted uses of all parts of the site so there would be no uncertainty regarding safe use of the site by parties interested in leasing or purchasing the site in the future. Thus, there might be no restrictions on future use for the majority of the site area outside of the restricted area with the disposal cell. To help resolve this issue, SMC should describe the potential for reuse of the site as a whole under the LTC license. SMC should work with the SSAB to clearly discuss the pros and cons of this approach given in the NRC's draft guidance on page II-57, to ensure common understanding, as well as to identify how the whole site could be reused under the LTC license, real or perceived barriers to reuse, and, ways to resolve these barriers. SMC should also discuss how site ownership of the restricted use portion of the site would be sustained over the long-term, if it were separate from the rest of the site, to avoid gaps in ownership, and control, and to minimize NRC's active involvement to take actions if there is a gap. SMC should further explore both approaches with the SSAB and provide this additional information for NRC review.

Although SMC provided information on use of institutional controls that it received from the SSAB, NRC recognizes that there was a general concern that not enough information was provided to the SSAB. SMC should take this opportunity to enhance its interactions with the SSAB, as it noted in responses to the SSAB input.

Financial Assurance

The staff is concerned that SMC did not provide sufficient rationale for its alternative approach to meet the regulatory requirements for financial assurance. Specifically, SMC assumes a greater return on investment (ROI) than appears appropriate for the long-term surveillance and monitoring fund. The NRC's interim guidance (which represents one approach for meeting the regulations) applies a 1% ROI for the LTC license. However SMC used a 3% ROI. The higher ROI assumed by SMC reduces the amount placed in trust to cover long-term surveillance and monitoring costs, which increases the potential for inadequate funding in the event a string of losses occurs in the funds investments. Also, SMC did not specify whether it would include a 25% contingency in the long-term surveillance and monitoring fund.

The tables of decommissioning costs do not present sufficient detail to permit the NRC to assess the adequacy of the cost. The unit costs combine labor, material, equipment, and overhead and profit costs. NUREG-1757, Vol. 3 and the interim guidance developed for this site asks the licensee to present the cost elements separately.

The NRC staff also notes that the DP did not include a Certification Statement or an originally signed financial instrument to cover the decommissioning costs. The Certification is required as an affirmation that financial assurance has been provided, even though the licensee plans to pay for decommissioning out of operating funds. The Certification and originally signed financial instrument will be required before final approval of the DP.

UNITED STATES NUCLEAR REGULATORY COMMISSION

IN RE PETITION FOR RULEMAKING on)
NUREG-1757, pursuant to 10 C.F.R.)
§ 2.802(a))

IN RE PETITION FOR A STAY ON ANY)
ACTION ON THE SHIELD ALLOY METAL)
CORPORATION DECOMMISSIONING PLAN)
(Docket No. 04007102), pursuant)
to 10 C.F.R. § 2.802(d))

Submitted by:

State of New Jersey,
Department of Environmental Protection

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Andrew D. Reese
Kenneth W. Elwell
Deputy Attorneys General
On the Petitions

The New Jersey Department of Environmental Protection ("NJDEP") files this petition for rulemaking pursuant to 10 C.F.R. § 2.802(a) seeking to rescind the portion of the finalized NUREG-1757, Consolidated Decommissioning Guidance, which sets forth the Long Term Control ("LTC") license, the legal agreement and restrictive covenant ("LA/RC"), the 1000 year dose modeling, the ALARA analysis, and the financial assurance. The revisions to the first two volumes of NUREG-1757 were finalized on or about October 27, 2006. The NJDEP is also filing a separate petition for a hearing seeking rescind these NUREG-1757 provisions.

Because Shieldalloy Metallurgical Corporation (License No. SMB-743) ("Shieldalloy") has submitted a decommissioning plan (Docket No. 04007102) ("DP") that relies upon NUREG-1757, NJDEP requests a formal stay of any action on the DP until the petitions are adjudged. 1757. See 10 C.F.R. § 2.802(d).

- I. 10 C.F.R. § 2.802(c)(1): "Set forth a general solution to the problem or the substance or text of any proposed regulation or amendment, or specify the regulation which is to be revoked or amended."

NJDEP requests NRC to rescind the portion of NUREG-1757 which pertains to the LTC license, the LA/RC, the 1000 year dose

modeling, the ALARA analysis, and the financial assurance. Revisions to the first two volumes of NUREG-1757 were finalized on or about October 27, 2006.

A detailed explanation of the defects of NUREG-1757 and proposed remedies are provided in Section III below. Stated briefly, the LTC license and the LA/RC provided in NUREG-1757 does not adequately protect the public health and safety from decommissioning facilities that conduct onsite disposal of long-lived nuclides under the License Termination Rule ("LTR"), 10 C.F.R. Part 20, Subpart E. Also, NUREG-1757 fails to comply with various statutes, regulations, and NRC policies.

To remedy these defects NRC should rescind the portion of NUREG-1757 which provides for the LTC license and the LA/RC. Goodman Dec. ¶¶ passim.

II. 10 C.F.R. § 2.802(c)(2): "State clearly and concisely the petitioner's grounds for and interest in the action requested."

NJDEP files this petition for rulemaking so that NRC rescinds the portion of NUREG-1757 regarding the LTC license, the LA/RC, the 1000 year dose modeling, the ALARA analysis, and the financial assurance. Each of NJDEP's contentions are discussed in detail in Section III below. These contentions include, first, NUREG-1757

violates the Low-Level Radioactive Waste Policy Act ("LLRWPA") and Atomic Energy Act ("AEA") by failing to protect the public health and safety. See 42 U.S.C. § 2021b(7); 42 U.S.C. §§ 2012(d), 2013(d), 2022(f)(3), (referring to § 2022(b)(2)), 2099, 2111(b)(1)(A), 2113(b)(1)(A), 2114(a)(1), 2201(b). Second, the NRC violated the AEA by providing in a guidance document a new license called the LTC license, setting the terms and conditions of the LTC license, and setting forth the information an applicant for a license is required to submit for the LTC license. See 42 U.S.C. §§ 2232(a), 2233. Third, NUREG-1757 conflicts with a number of regulations duly promulgated by the NRC. Fourth, NRC was required to conduct an Environmental Impact Statement ("EIS") prior to issuing NUREG-1757. See 42 U.S.C. § 4332(2)(C). Fifth, NUREG-1757 is arbitrary and capricious by violating a number of NRC policies.

An agency action that has the effect of changing a regulation or other existing law entitles a person to a hearing on that action. Citizens Awareness Network v. NRC, 59 F.3d 284, 295-96 (1st Cir. 1995). In Citizens Awareness, the court was construing the language of the AEA which provides "in any proceeding for the issuance or modification of rules and regulations dealing with the activities of licensees, . . . the Commission shall grant a hearing upon the request of any person" 42 U.S.C. § 2239(a)(1)(A). In this case, NJDEP is entitled to petition the NRC to rescind the LTC license, the LA/RC, the 1000 year dose modeling, the ALARA

analysis, and the financial assurance provisions of NUREG-1757 under 10 C.F.R. 2.802(a), which provides that "any interested person may petition the Commission to issue, amend or rescind any regulation." As discussed below in Points 3-7, the provisions of NUREG-1757 regarding the LTC license, the LA/RC, the 1000 year dose modeling, the ALARA analysis, and the financial assurance have the effect of changing the LTR. Furthermore, as discussed below in Point 2, the LTC license provisions of NUREG-1757 should have been promulgated as a rule or regulation under the AEA. See 42 U.S.C. §§ 2232(a), 2233. Therefore, NJDEP is entitled to petition the NRC to rescind these NUREG-1757 provisions.

NJDEP has an interest in rescinding the NUREG-1757 provisions because this guidance document has been utilized by Shieldalloy in developing their DP for their facility in Newfield, New Jersey. NRC Staff relied on NUREG-1757 for determining that the DP is sufficient for the technical review to begin. Exh. A. A State has standing in a proceeding that involves a "facility located within [the State's] boundaries." 10 C.F.R. § 2.309(d)(2)(i). Thus, when a State advises the NRC that a proceeding involves a facility within its borders, the NRC "shall not require a further demonstration of standing." Id. § 2.309(d)(2)(ii).

III. 10 C.F.R. § 2.802(c)(3): "Include a statement in support of the petition which shall set forth the specific issues involved, the petitioner's views or arguments with respect to those issues, relevant technical, scientific or other data involved . . . and such other pertinent information.

Point 1

NUREG-1757 FAILS TO ADEQUATELY PROTECT THE PUBLIC SAFETY AND HEALTH FOR MATERIALS CONTAINING LONG LIVED NUCLIDES.

The NUREG-1757 provisions regarding the LTC license, LA/RC, the 1000 year dose modeling, the ALARA analysis, and the financial assurance violate the LLRWPA and the AEA by failing to require the permanent isolation of low-level radioactive waste or protect the public health and safety. NRC should therefore rescind these provisions in NUREG-1757.

The LLRWPA requires the "the permanent isolation of low-level radioactive waste pursuant to the requirements established by the Nuclear Regulatory Commission under applicable laws, or by an agreement State if such isolation occurs in such agreement State." 42 U.S.C. § 2021b(7). Thus, the LLRWPA requires the "permanent isolation" of low-level radioactive waste.

Furthermore, NRC's paramount responsibility, as required by the AEA, is to regulate radiological material in a manner that protects the public health and safety. 42 U.S.C. §§ 2012(d),

2013(d), 2022(f)(3), (referring to § 2022(b)(2)), 2099, 2111(b)(1)(A), 2113(b)(1)(A), 2114(a)(1), 2201(b).

NUREG-1757 does not require the federal or State government to take ownership of the land where the decommissioning takes place. NUREG-1757 admits that sites containing long-lived nuclides require federal or State ownership for adequate institutional controls. NUREG-1757 vol. 1 page 13-3. However, NUREG-1757 goes on to state that "[i]f a licensee cannot establish acceptable institutional controls or independent third party arrangements, the licensee may propose one of the two new options involving NRC: an NRC long-term control (LTC) license or an NRC legal agreement and restrictive covenant (LA/RC)." NUREG-1757 vol. 1 page 17-65. Thus, NUREG-1757 provides a LTC license or LA/RC in lieu of federal or State ownership of the decommissioned facility. While NUREG-1757 claims that the durable institutional controls of a LTC license and LA/RC should last indefinitely, it is self-evident that a corporation or an independent third party trustee will not endure for the time period necessary for long-lived nuclides.

In the case of Shieldalloy, their radioactive waste contains thorium-232, which has a half-life of over 14 billion years, and uranium-238, which has a half-life of over 4 billion years. Goodman Dec. ¶ 2. Neither Shieldalloy nor a private third party trustee can be expected to endure in perpetuity to enforce the LTC license or

LA/RC. Therefore, NRC should rescind the LTC license and LA/RC provisions of NUREG-1757.

The minimum protective measures required by NUREG-1757 are not adequate for long-lived nuclides. NUREG-1757 only requires dose modeling assessments for 1,000 years, regardless of the duration of the radioactive hazard. NUREG-1757 vol. 1 pages 17-87 to 17-88. This time period is inadequate for long-lived nuclides that remain a threat to the public health and safety beyond the 1000 year time frames. Goodman Dec. ¶ 3.

10 C.F.R. § 20.1401(d) requires an applicant for decommissioning to calculate the peak annual total effective dose equivalent ("TEDE") to the average member of the critical group expected within the first 1000 years after decommissioning. However, this provision is intended to only apply to short-lived nuclides. 62 Fed. Reg. 39058, 39083 (July 21, 1997) (Response F.7.3). Short-lived nuclides are defined as having half-lives between 5.3 and 30 years and which would decay to unrestricted dose levels in about 10-60 years. Id. at 39069. For long-lived nuclides, future calculations beyond 1000 years would be required. Id. at 39083.

NRC admits that the emphasis of 10 C.F.R. Part 20 is for the protection of the public and workers from "imminent exposures" to excessive radiation, "not projected long-term exposures." SECY-03-0069 attachment 8 page 2. The NRC further admits that protecting

the public health from long-term exposures would require additional rulemaking. Id.

With regards to onsite disposal by facilities that continue operating at the site under a license, NRC Staff admitted that there exists "uncertainties associated with the burial performance and potential releases of contamination, transport of contamination in the subsurface environment, cleanup costs of subsurface contamination, and future disposal costs." SECY-06-0143 page 5. These releases and transport of contamination occur even in cases where the materials are disposed onsite for a limited period of time and then disposed offsite under the LTR. Id.

The problems of contamination and transport of contamination related to disposals that remain onsite for a limited period of time is even more applicable to onsite disposals of long-lived nuclides that remain onsite in perpetuity pursuant to the LTR. Goodman Dec. ¶ 5. It is reasonable to assume that facilities disposing long-lived nuclides onsite under the LTC or LA/RC are more likely to release and transport contamination over the thousands, millions, or billions of years that long-lived nuclides remain a radioactive hazard. Id. Thus, NRC should promulgate a rule which prohibits the onsite disposal of long-lived nuclides under the LTR.

NRC should thus rescind the LTC license, LA/RC, the 1000 year dose modeling, the ALARA analysis, and the financial assurance

provisions of NUREG-1757 to protect the public health and safety and to ensure the isolation of low-level radioactive waste.

Point 2

THE NRC IS REQUIRED TO UTILIZE RULES AND REGULATIONS WHEN ISSUING OR AMENDING A LICENSE OR WHEN ESTABLISHING THE TERMS AND CONDITIONS OF A LICENSE.

The NRC is required to promulgate rules or regulations when setting forth the information an applicant for a license is required to submit or when the NRC establishes the form and conditions of a license. The NRC may not use guidance documents, such as NUREG-1757, in taking these actions. NRC should therefore rescind the LTC license provisions of NUREG-1757.

The AEA provides as follows:

Each application for a license hereunder shall be in writing and shall specifically state such information as the Commission, by rule or regulation, may determine to be necessary to decide such of the technical and financial qualifications of the applicant, the character of the applicant, the citizenship of the applicant, or any other qualifications of the applicant as the Commission may deem appropriate for the license.

42 U.S.C. § 2232(a) (emphasis added). The AEA also provides the following: "Each license shall be in such form and contain such terms and conditions as the Commission may, by rule or regulation,

prescribe to effectuate the provisions of this chapter." 42 U.S.C. § 2233 (emphasis added).

The AEA also requires the NRC to promulgate regulations or rules regarding the disposal of byproduct material. Environmental Defense Fund v. U.S. N.R.C., 902 F.2d 785, 789-90 (10th Cir. 1990). The AEA provides: "Not later than 6 months after the date on which the Administrator promulgates final standards pursuant to subsection (b) of this section, the Commission shall, after notice and opportunity for public comment, amend the October 3 regulations, and adopt such modifications, as the Commission deems necessary to conform to such final standards of the Administrator." 42 U.S.C. § 2022(f)(3). The referenced subsection (b) requires the EPA to promulgate regulations concerning the protection of the public health, safety and the environment from radiological and nonradiological hazards associated with the possession, transfer, and disposal of byproduct material. Id. § 2022(b)(1). The U.S. Court of Appeals for the Tenth Circuit held that this provision of the AEA requires the NRC to promulgate rules or regulations regarding the disposal of byproduct material. Environmental Defense Fund, 902 F.2d at 789-90.

A rule or regulation imposes rights and obligations on a person or entity. Texaco, Inc. v. Federal Power Com., 412 F.2d 740, 744 (3d Cir. 1969). A rule or regulation creates a binding standard on an agency and the regulated public. Cabais v. Egger,

690 F.2d 234, 237 (D.C. Cir. 1982); Guadamuz v. Bowen, 859 F.2d 762, 767 (9th Cir. 1988).

In contrast, NUREG-1757 explicitly states that it is a guidance document that does not establish a binding norm. NUREG-1757, Vol. 1, page xvii ("This NUREG is not a substitute for NRC regulations, and compliance with it is not required."). However, NRC violated the AEA by creating a new license called LTC license though a guidance document. NUREG-1757 vol. 1 page 17-65. NUREG-1757 impermissibly provides various terms and conditions that an LTC license would provide. NUREG-1757 vol. 1 pages 17-65 to 17-66, 17-79 to 17-80. Furthermore, NUREG-1757 sets forth guidance on the information that an applicant should submit in an application for a LTC license. NUREG-1757 vol. 1 pages 17-71 to 17-82; vol. 2 pages 2-4 to 2-15. Also, NUREG-1757 applies to the disposal of byproduct material at a decommissioned facility. NUREG-1757 vols. 1 and 2 page xv.

In light of the AEA's requirement to promulgate rules and regulations that set forth the information required to be submitted by a license applicant, 42 U.S.C. § 2232(a), that set forth the form, terms and conditions of its licenses, 42 U.S.C. § 2233, and regarding the disposal of byproduct material, 42 U.S.C. § 2022(f)(3), NRC should rescind the LTC license provisions of NUREG-1757.

Point 3

NUREG-1757 CONFLICTS WITH THE REGULATIONS
CONCERNING THE TEDE MODELING REQUIRED BY
APPLICANTS FOR DECOMMISSIONING FACILITIES.

NUREG-1757's allowance for dose assessments for 1000 years, regardless of the duration of the radioactive hazard, violates the LTR. Therefore, NRC should rescind the dose assessment provisions of NURE-1757.

NUREG-1757 allows dose assessments for 1000 years, regardless of the duration of the radioactive hazard. NUREG-1757 vol. 1 pages 17-87 to 17-88. 10 C.F.R. § 20.1401(d) requires an applicant for decommissioning to calculate the peak annual TEDE to the average member of the critical group expected within the first 1000 years after decommissioning. However, this provision is intended to only apply to short-lived nuclides. 62 Fed. Reg. at 39083 (Response F.7.3). Short-lived nuclides are defined as having half-lives between 5.3 and 30 years and which would decay to unrestricted dose levels in about 10-60 years. Id. at 39069. For long-lived nuclides, future calculations beyond 1000 years would be valuable. Id. at 39083. Thus, the intent of 10 C.F.R. § 20.1401(d) is to actually require longer dose assessments depending on the duration of the nuclides.

NUREG-1757 allows dose assessments for 1000 years, regardless of the duration of the radiological hazard, and therefore it conflicts with 10 C.F.R. § 20.1401(d)'s requirement to provide for a dose assessment that corresponds to the length of time that the materials in question remain a radiological hazard. NRC should thus rescind the NUREG-1757 provisions regarding dose modeling.

Point 4

NUREG-1757 CONFLICTS WITH THE REGULATIONS
REGARDING TERMINATION OF THE LICENSE UPON
DECOMMISSIONING.

NUREG-1757 violates the regulatory provisions relating to termination of the license upon decommissioning by allowing facilities to substitute a LTC license or LA/RC for State or Federal ownership of the disposal site for sites containing long-lived nuclides. NRC should therefore rescind the LTC license provisions of NUREG-1757.

NUREG-1757 provides that the LTC license would be used to satisfy the LTR requirement for legally enforceable and durable institutional controls in any case where the Federal or State government is unwilling to take ownership of the site. NUREG-1757 vol. 1 page 17-67. The LTC license is available regardless of the nature or duration of the radioactive hazard. Id. "If complex monitoring or maintenance activities are needed at a restricted use

site, the LTC license could be an appropriate institutional control option (compared to the LA/RC)." Id. page 17-66.

The regulations define "decommission" as follows:

to remove a facility or site safely from service and reduce residual radioactivity to a level that permits --

- (1) Release of the property for unrestricted use and termination of the license; or
- (2) Release of the property under restricted conditions and termination of the license.

10 C.F.R. §§ 20.1003, 30.4, 40.4, 50.2, 70.4, 72.3 (emphasis added).

Under the LTR, termination of the license under unrestricted use occurs when, among other factors, residual radioactivity results in a "TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year." 10 C.F.R. § 20.1402. License termination under restricted use occurs when, among other factors, "Residual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either -- (1) 100 mrem (1 mSv) per year; or (2) 500 mrem (5 mSv) per year provided that the licensee--" 10 C.F.R. § 20.1403(e).

Under NUREG-1757, the TEDE is measured based upon a 1000 year modeling, regardless of the duration of the radiological hazard. It is possible that a total effective dose equivalent ("TEDE") of less than 500 mrem/y could occur at 1000 years, but then peak of greater than 500 mrem/y may occur in the time period after 1000 years. Goodman Dec. ¶ 3. As discussed in Points 1 and 3, these provisions of NUREG-1757 violate the AEA, the LLRWPA, and the LTR. Dose modeling should be required for the entire duration of the radiological hazard. Goodman Dec. ¶ 3.

If a facility proposes to permanently decommission and conduct onsite disposal of long-lived nuclides using the LTC license as the institutional controls, the dose modeling should assume that the engineering controls completely fail because a LTC licensee cannot be expected to maintain the engineering controls as long as the duration of the radiological hazard.

In cases where long-lived nuclides are disposed onsite under restricted use and the engineering and institutional controls completely fail, in certain cases, it is reasonable to believe that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group would exceed 500 mrem per year.

The conflict between the LTR and NUREG-1757's LTC license for long-lived nuclides is admitted by NRC in the following statement:

"NRC licensing oversight for some sites could be permanent because the current sites considering restricted release are sites with uranium and thorium contamination. Although this NRC role was not envisioned under the LTR" SECY-03-0069 page 27.

Thus, NUREG-1757 violates the LTR because it allows the applicant to use the LTC license if the Federal or State government declines to take ownership of the onsite disposal, regardless of the nature or duration of the radioactive waste. In certain cases where a LTC license is utilized for long-lived nuclides, the site may not be able to reduce residual radioactivity to a level that permits license termination as required by 10 C.F.R. § 20.1403(e). NRC should therefore rescind the LTC license provisions of NUREG-1757.

Point 5

NUREG-1757 CONFLICTS WITH THE REGULATIONS
REQUIRING AN ALARA ANALYSIS FOR
DECOMMISSIONING SITES.

For sites that are being decommissioned, the regulations require residual radioactivity to be reduced to levels that are as

low as reasonably achievable ("ALARA"). 10 C.F.R. §§ 20.1402, 20.1403(a), 20.1404(a)(3). ALARA is defined as

making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

10 C.F.R. § 20.1003.

NUREG-1757 circumvents the ALARA analysis required by 10 C.F.R. §§ 20.1402, 20.1403(a), and 20.1404(a)(3). Specifically, NUREG-1757 states: "the Commission recognized that requiring absolute proof that institutional controls would endure over long periods of time would be difficult, and the Commission did not intend to require this of licensees. Rather, the Statement of Considerations explained that institutional controls should be established with the objective of lasting 1000 years." NUREG-1757 vol. 1 page M-23.

However, NUREG-1757's mandate that modeling the durability of institutional controls beyond 1000 years is not required because of the difficulty involved is in direct conflict with the analysis required by ALARA regulations. The ALARA regulations require NRC to consider whether the technology exists to keep radiation exposure as far below the dose limits as possible. 10 C.F.R. § 20.1003. The ALARA regulations require NRC to consider the economics of

improvements in relation to the state of technology and the benefits to the public health and safety, and other societal and socioeconomic considerations. Id. To consider each of these factors, a case-by-case analysis of each decommissioning plan must be undertaken to consider the nature and longevity of the particular radioactive material, the current technology available to protect the public for the duration of the radiological hazard, and other societal and socioeconomic considerations that are unique to the area where the decommissioning is proposed to take place. Id. NUREG-1757 circumvents these required considerations by simply setting an arbitrary time period required for institutional controls to endure, regardless of the longevity of the radiological hazard, the state of technology regarding the hazard, or other societal and socioeconomic considerations unique to the location of the proposed decommissioning.

NUREG-1757 fails to require the effects of inflation in conducting the ALARA analysis. If the effects of inflation are considered, the ALARA analysis would need to consider the additional money that is required to be set aside today to maintain the site over the necessary duration of time. Burke Dec. ¶ 3. Furthermore, NUREG-1757 allows a high discount rate of 7% over the next 100 years. Id. ¶ 4. Because it is very difficult to predict the discount rate over 100 years, NUREG-1757 should require the more conservative discount rate of 3%. Id. NRC may already

acknowledge that predicting future discount rates is difficult over long periods of time because NUREG-1757 uses a 3% discount rate for the time period beyond 100 years. Id. A more conservative rate should be used to ensure sufficient funds are available during the entire time period that the radiological hazard continues in order to conduct the required maintenance and control over the site. Id.

NUREG-1757 therefore violates the ALARA regulations. See 10 C.F.R. §§ 20.1003, 20.1402, 20.1403(a), 20.1404(a)(3). NRC should therefore rescind the ALARA provisions of NUREG-1757.

Point 6

NUREG-1757 CONFLICTS WITH THE REGULATIONS
REQUIRING SUFFICIENT FINANCIAL ASSURANCE.

NUREG-1757 conflicts with the regulations requiring sufficient financial assurance because NUREG-1757 fails to consider the effects of inflation and provides a discount rate that is too high.

The regulations require the applicant seeking to terminate the license under restricted conditions to provide "sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site." 10 C.F.R. § 20.1403. NUREG-1757 admits that for long-lived nuclides, control and maintenance of a disposal site will be in perpetuity. NUREG-1757 vol. 1 page 13-3.

However, NUREG-1757's provisions regarding financial assurance fail to require applicants to take into consideration the effects of inflation. NUREG-1757 vol. 1 § 15.2. If the effects of inflation are considered, the applicant would need to post additional financial assurance to control and maintain the site over time since any money posted today will be reduced over time by the effects of inflation. Burke Dec. ¶ 3. Furthermore, NUREG-1757's allowance of a discount rate of 7% over the next 100 years is too high. Id. ¶ 4. Because it is very difficult to predict the discount rate over 100 years, NUREG-1757 should require the more

conservative discount rate of 3%. Id. NRC may already acknowledge that predicting future discount rates is difficult over long periods of time because NUREG-1757 uses a 3% discount rate for the time period beyond 100 years. Id. As discussed above, a more conservative rate should be used to ensure sufficient funds are available during the entire time period that the radiological hazard continues in order to conduct the required maintenance and control over the site. Id.

Thus, NRC should rescind the financial assurance provisions of NUREG-1757.

Point 7

NUREG-1757 CONFLICTS WITH THE REGULATIONS
REGARDING THE RADIOLOGICAL CRITERIA FOR
UNRESTRICTED AND RESTRICTED USE.

NUREG-1757 conflicts with the intent of the LTR, 20 C.F.R. §§ 20.1402, 20.1403, because NUREG-1757 encourages restricted use decommissioning where the facilities contain long-lived nuclides.

The intent of the decommissioning regulations is to limit the release of sites containing long-lived nuclides to unrestricted release. 62 Fed. Reg. at 39069 (Response B.3.2). The NRC stated: "termination of a license for unrestricted use is preferable because it requires no additional precautions or limitations on use

of the site after licensing control ceases, in particular for those sites with long-lived nuclides." Id.

Short-lived nuclides include radioactive materials where the half-lives are between 5.3 and 30 years and which would decay to unrestricted dose levels in about 10-60 years. 62 Fed. Reg. at 39069. Such short-lived nuclides can be safely secured under restricted release through the use of institutional control. Id.

NUREG-1757 makes it easier for decommissioning facilities to conduct onsite disposal of radioactive materials containing long-lived nuclides under restricted release. Goodman Dec. ¶ 4. NUREG-1757 makes it easier to decommission by providing a LTC license or LA/RC for sites containing long-lived nuclides where the Federal or State government is not willing to take ownership or control of the site. Id. Also, NUREG-1757 allows dose assessment modeling for 1000 years, regardless of the duration of the radioactive hazard. Id. This may create a greater number of decommissioned facilities with onsite disposals of long-lived radioactive waste under restricted release throughout the country. Id.

Because NUREG-1757 encourages restricted release of the property for materials with long-lived nuclides, NUREG-1757 conflicts with the regulatory intent of the LTR. NRC should therefore rescind NUREG-1757 provisions regarding the LTC license, the LA/RC, and the 1000 year dose modeling.

Point 8

NRC WAS REQUIRED TO CONDUCT AN ENVIRONMENTAL
IMPACT STATEMENT PRIOR TO ISSUING NUREG-1757.

The National Environmental Policy Act ("NEPA") requires federal agencies to conduct an environmental impact statement ("EIS") for any "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). NRC should therefore rescind the NUREG-1757 provisions regarding the LTC license, the LA/RC, the 1000 year dose modeling, the ALARA analysis, and the financial assurance because it failed to conduct an EIS.

10 C.F.R. 51.22(a) allows the NRC to categorically exclude an action from the requirements of NEPA where the "proposed action belongs to a category of actions which the Commission, by rule or regulation, has declared to be a categorical exclusion, after first finding that the category of actions does not individually or cumulatively have a significant effect on the human environment."

NRC has exempted from NEPA any amendments to Part 20 of the regulations where they relate to procedures for filing and reviewing applications for licenses or permits, recordkeeping requirements, reporting requirements, and actions on petitions for rulemaking relating to these amendments. 10 C.F.R. 51.22(c)(3).

NRC's issuance of NUREG-1757 is clearly a major Federal action that significantly affects the quality of the human environment. As discussed in Points 1 and 9, NUREG-1757 is a major policy reversal that allows waste sites containing long-lived nuclides to be controlled and maintained by private entities. NUREG-1757 may allow these waste sites to propagate throughout the country with a resulting increase in the risk to the public health and environment. Thus, an EIS is required for NUREG-1757.

NRC's issuance of NUREG-1757 does not fall within the exemptions for amendments to Part 20 of the regulations since it does not relate to procedures for filing and reviewing applications for licenses or permits, recordkeeping requirements, reporting requirements, or actions on petitions for rulemaking. See 10 C.F.R. 51.22(c)(3).

NRC conducted a Generic EIS prior to adopting the onsite disposal option under the LTR. NUREG-1496; 62 Fed. Reg. at 39060. Because NUREG-1757 alters the regulations upon which the Generic EIS was conducted, as described in Points 3 through 7 of this Petition, NRC should conduct another EIS for NUREG-1757.

The U.S. Court of Appeals for the Ninth Circuit held that the NRC is required to consider a terrorist attack in its EIS. San Luis Obispo Mothers for Peace v. N.R.C., 449 F.3d 1016, 1028-35 (9th Cir. 2006).

NRC should therefore rescind the NUREG-1757 provisions regarding the LTC license, the LA/RC, the 1000 year dose modeling, the ALARA analysis, and the financial assurance because it failed to conduct an EIS.

Point 9

NUREG-1757 WILL ENCOURAGE THE CREATION OF LEGACY SITES THROUGHOUT THE COUNTRY, IN DIRECT VIOLATION OF NRC POLICIES.

NUREG-1757 will create additional legacy sites throughout the country by making it easier to obtain approval for the restricted release option for long-lived nuclides without adequate protection to the public health. Goodman Dec. ¶¶ 4, 5. However, this result is in direct contradiction to settled NRC policy to prevent future legacy sites. SECY-03-0069 Attach. 4 page 3; SECY-06-0143 pages 5 to 7. NUREG-1757's conflict with settled NRC policy is arbitrary and capricious.

While agencies may reverse settled policy, such reversals must have a rational basis and may not be arbitrary and capricious. Citizens Awareness Network v. NRC, 59 F.3d 284, 291 (1st Cir. 1995). Furthermore, the reversal must be accompanied by some reasoning to indicate that the reversal is not arbitrary and capricious. Id.

NRC has continually reasserted its policy to prevent future legacy sites. SECY-03-0069 Attach. 4 page 3; SECY-06-0143 pages 5 to 7. A legacy site is defined as "[a]n existing decommissioning site that is complex and difficult to decommission for a variety of financial, technical, or programmatic reasons." NUREG-1757 vol. 1 page xxxii.

On May 2, 2003, the NRC issued SECY-03-0069, which discussed its policy of preventing legacy sites. The NRC stated in SECY-03-0069 that the restricted releases under a dose criterion of 1 millisievert per year ("mSv/yr") (100 mrem/yr) gives the licensee the most flexibility to conduct onsite disposals. SECY-03-0069 Attach. 4 page 3. While NRC stated that such option could lead to additional legacy sites, requiring additional financial assurance would help ensure remediation of the onsite disposal to comply with the dose restrictions when the facility decides to decommission under the LTR. Id.

On July 5, 2006, NRC revisited the problem of legacy sites in SECY-06-0143. In this latest document, NRC stressed that allowing a dose criterion of 1 mSv/yr (100 mrem/yr) and requiring additional financial assurance could still lead to the creation of additional legacy sites. SECY-06-0143 page 5. The NRC reasoned that the amount of additional financial assurance required may likely be underestimated "because of uncertainties associated with the burial performance and potential releases of contamination, transport of

contamination in the subsurface environment, cleanup costs of subsurface contamination, and future disposal costs." Id. The NRC therefore recommended finalizing decommissioning guidance and to conduct rulemaking to only allow onsite disposals resulting in doses no greater than a few millirem per year. Id. page 5 to 6. NRC may approve higher dose criteria based on the following considerations: (a) time of potential dose impacts based on half-life of the material; (b) mobility of the material to be disposed; (c) additional financial assurance; and (d) other aspects that ensure that the facility will not become a future legacy site. Id. page 5.

The NRC is currently developing a rule and associated guidance to prevent future legacy sites for onsite disposals. Id. at 6.

This NRC policy regarding legacy sites was discussed in the context of onsite disposals for facilities that continued to operate under a license. Id. page 3. After the onsite disposal, these facilities would continue to operate until they decide to decommission the entire site subject to the LTR. Id. The NRC concluded that for the limited time that passed between the onsite disposal and the facility-wide decommissioning, uncertainties still exist for the burial performance and potential releases of contamination, transport of contamination in the subsurface environment, cleanup costs of subsurface contamination, and future disposal costs. Id. page 5. Such concerns are warranted to a much

greater extent for facilities disposing long-lived nuclides onsite under the LTR that remain hazardous in perpetuity. Goodman Dec. ¶ 5. In the case of LTR onsite disposals containing long-lived nuclides, it is more likely that controls will eventually fail and cause the release of contamination thereby posing a hazard to the public. Goodman Dec. ¶¶ 4, 5. Such is the case at the Shieldalloy site where some of the radionuclides contained in the radioactive waste are thorium-232, which has a half-life of over 14 billion years, and uranium-238, which has a half-life of over 4 billion years. Goodman Dec. ¶ 2.

Although NRC policy of preventing legacy sites for onsite disposals is clear, NUREG-1757 directly contradicts this policy by allowing the creation of additional legacy sites under the LTR. NUREG-1757 will create additional legacy sites by making it easier for facilities to permanently dispose of radioactive materials containing long-lived nuclides in a number of ways. Goodman Dec. ¶ 4. First, NUREG-1757 allows the durable institutional control requirement to be met by the issuance of the LTC license or LA/RC for sites containing long-lived nuclides where the Federal or State government is not willing to take ownership or control of the site. See NUREG-1757 vol. 1 pages 17-65 to 67. NUREG-1757 admits that the LTC license will be issued for sites where complex monitoring or maintenance activities, including maintenance of an engineered barrier or continued monitoring of groundwater or radiological

hazards, are needed at a restricted use site. NUREG-1757 vol. 1 page 17-66.

Second, NUREG-1757 allows for dose assessments of 1,000 years, regardless of the duration of the radioactive hazard. NUREG-1757 vol. 1 pages 17-87 to 17-88. 1,000 year dose modeling is not adequate for long-lived nuclides. Goodman Dec. ¶ 3. The 1000 year time frame for dose assessment is clearly not appropriate for materials that have a half-life of billions of years. Id.

Third, by limiting the analysis to these time periods, regardless of the radioactive half-life of the materials, facilities will now have greater flexibility to choose the onsite disposal and restricted release option. Goodman Dec. ¶ 5. NRC admits that the restricted releases under a dose criterion of 1 mSv/yr (100 mrem/yr) gives the licensee the most flexibility to conduct onsite disposals. SECY-03-0069 Attach. 4 page 3.

Fourth, NUREG-1757 underestimates the amount of financial assurance required by a licensee, thereby making permanent onsite disposal upon decommissioning under NUREG-1757 more attractive to licensees. NUREG-1757 claims that the licensee must provide sufficient financial assurance so that the licensee funds the long-term control of the site with no additional costs being passed on to a future site owner/licensee, even where a site contains long-lived nuclides. NUREG-1757 vol. 1 pages 15-2 and 17-82. However, this reliance on financial assurance ignores the NRC conclusions

that the amount of additional financial assurance required may likely be underestimated "because of uncertainties associated with the burial performance and potential releases of contamination, transport of contamination in the subsurface environment, cleanup costs of subsurface contamination, and future disposal costs." SECY-0600143 page 5. These conclusions were made regarding onsite disposal by licensed facilities that would continue operating at the site and may be subject to future remediation when the facilities decide to permanently decommission their entire site and terminate their license. Id. NRC concluded that uncertainties associated with the burial performance and potential releases of contamination and transport of contamination in the subsurface environment existed for the limited time periods that facilities continued to operate. Id.

Furthermore, NUREG-1757 fails to require adequate financial assurance because it ignores the effects of inflation. Burke Dec. ¶ 3. Money set aside today will gradually be reduced by the effects of inflation. Id. If the effects of inflation are considered, the applicant would be required to post greater financial assurance. Id. Furthermore, the longer the period of time is required to maintain financial assurance, the greater the underestimation of the amount of financial assurance will be. Id.

The problems of contamination and transport of contamination related to disposals that remain onsite for a limited period of

time is even more applicable to onsite disposals of long-lived nuclides that remain onsite in perpetuity pursuant to the LTR. Goodman Dec. ¶ 5. Facilities disposing long-lived nuclides onsite under the LTR or LA/RC are more likely to release and transport contamination over the thousands, millions, or billions of years that long-lived nuclides remain a radioactive hazard. Id. It is therefore arbitrary and capricious for NRC to conclude that adequate financial assurance can be provided for long-lived nuclides where controls are required in perpetuity (as is the case in Shieldalloy) even though NRC admits that underestimation of the financial assurance is a problem for sites that are decommissioned for a limited period of time.

NRC admitted that "uncertainties" existed regarding contamination and transport of contamination for onsite disposal for facilities that continue to operate, even under current NRC regulations. SECY-06-0143 page 5. NRC therefore recommended the promulgation of a new rule. Id. at 6. NRC further admits that the emphasis of 10 C.F.R. Part 20 is for the protection of the public and workers from "imminent exposures" to excessive radiation, "not projected long-term exposures." SECY-03-0069. Such concerns are warranted to a much greater extent for facilities disposing long-lived nuclides onsite under the LTR since it is reasonable to assume that facilities disposing long-lived nuclides onsite under the LTR have a higher likelihood of releasing and transporting

contamination over the thousands, millions, or billions of years that long-lived nuclides remain a radioactive hazard. Goodman Dec.

¶ 5.

It is therefore arbitrary and capricious for NRC to be concerned about releases and transport of contamination from onsite disposal at facilities that continue to operate under a license while NRC ignores the even greater likelihood of releases and transport of contamination from onsite disposals that remain a radiological hazard in perpetuity when facilities decommission under the LTR. See Citizens Awareness Network, 59 F.3d at 291. NRC should therefore rescind the NUREG-1757 provisions regarding the LTC license, LA/RC, the 1000 year dose modeling, the ALARA analysis, and the financial assurance.

Point 10

NUREG-1757 CONTRADICTS ITS OWN TERMS BY FAILING TO REQUIRE ADEQUATE INSTITUTIONAL CONTROLS FOR LONG-LIVED NUCLIDES.

Chapter 13 of NUREG-1757 requires durable controls that last into perpetuity for long-lived nuclides. However, chapter 17 of NUREG-1757 permits the LA/RC or LTC license to constitute the necessary durable controls. The LA/RC and LTC license cannot be

expected to endure into perpetuity. Such a direct contradiction within NUREG-1757 is certainly without rational basis and is therefore arbitrary and capricious. See Citizens Awareness Network, 59 F.3d at 291.

Durable institutional controls are defined as "[a] legally enforceable mechanism for restricting land uses to meet the radiological criteria for license termination (10 CFR 20, Subpart E). Durable institutional controls are reliable and sustainable for the time period needed." NUREG-1757 vol. 1 page xxix. NUREG-1757 states that durable institutional controls are required for long-lived nuclides, such as materials containing uranium. Id. page 13-3. For these radioactive materials, Chapter 13 of NUREG-1757 states that institutional controls must be "durable, meaning they must be expected to last in perpetuity. State and Federal Agencies are examples of such acceptable organizations." Id.

However, chapter 17 of NUREG-1757 goes on to contradict chapter 13 by allowing durable controls that cannot be expected to last in perpetuity. Rather, chapter 17 states that the LTC license or the LA/RC would be used to satisfy the LTR requirement for "legally enforceable and durable institutional controls" in cases where the Federal or State government is unwilling to take ownership of the site. NUREG-1757 vol. 1 pages 17-65 to 67.

However, the LTC license and LA/RC would not be able to last in perpetuity as an institutional control. Both options rely upon

legal restrictions on the use of the property. NUREG-1757 vol. 1 pages 17-65 to 67. However, a private corporation cannot be expected to exist in perpetuity to enforce the legal restrictions. Although the licensee is required to enter into a trustee agreement with an independent third-party and to provide that financial assurance is available to the trustee to carry out responsibilities for any necessary control and maintenance of the site, NUREG-1757 vol. 1 page 17-82, such entities will likely cease to exist within the time period that long-lived nuclides remain a radioactive hazard. Indeed, chapter 17 of NUREG-1757 discusses at length the restrictions placed on the use of the property, but it fails to consider how these restrictions would be enforced if the entity owning the property ceases to exist. See NUREG-1757 vol. 1 pages 17-76 to 17-77. Furthermore, as discussed in Points 6 and 9, the estimated financial assurance will likely be underestimated.

Thus, the LTC license and LA/RC are not adequate durable controls for long-lived nuclides. The materials at issue in the Shieldalloy decommissioning site will remain a radioactive hazard for billions of years. Goodman Dec. ¶ 2. This is precisely why chapter 13 of NUREG-1757 requires durable institutional controls to last in perpetuity, such as Federal or State ownership, page 13-3. NRC should rescind the LTC license and LA/RC provisions of NUREG-1757.

CONCLUSION

In light of the preceding, the NJDEP respectfully requests NRC to rescind the NUREG-1757 provisions regarding the LTC license, the LA/RC, the 1000 year dose modeling, the ALARA analysis, and the financial assurance

Respectfully submitted,

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Dated: 12/22/06

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UNITED STATES NUCLEAR REGULATORY COMMISSION

Docket No. 04007102

IN RE PETITION FOR A HEARING on)
the SHIELDALLOY METALLURGICAL)
CORP. DECOMMISSIONING PLAN,)
pursuant to 10 C.F.R. § 2.309)
and 42 U.S.C. § 2239(a)(1))
(A))

PETITION FOR A HEARING
PART I OF III

Technical Contentions

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The New Jersey Department of Environmental Protection ("NJDEP") files this petition for a hearing pursuant to 10 C.F.R. § 2.309 and 42 U.S.C. § 2239(a)(1)(A) seeking a hearing on the decommissioning plan (Docket No. 04007102) ("DP") that was submitted by Shieldalloy Metallurgical Corporation (License No. SMB-743) ("Shieldalloy"). The NJDEP respectfully requests NRC to grant a hearing because Shieldalloy's proposed decommissioning of radioactive waste that will remain a radiological hazard for billions of years will not protect the public health and safety. Furthermore, the Long Term Control ("LTC") license sought by Shieldalloy is not permitted by law.

A State has standing in a proceeding that involves a "facility located within [the State's] boundaries." 10 C.F.R. § 2.309(d)(2)(i). Thus, when a State advises the NRC that a proceeding involves a facility within its borders, the NRC "shall not require a further demonstration of standing." Id. § 2.309(d)(2)(ii).

Contention 1

THE SOIL ON WHICH SHIELDALLOY PROPOSES TO SITE
THE RADIOACTIVE WASTE WILL ALLOW RADIONUCLIDES
TO CONTAMINATE THE GROUNDWATER.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

Shieldalloy proposes to conduct onsite disposal of its radioactive waste on native soil without any protective liner. However, disposal of Radioactive waste should not be conducted in this area because the radionuclides will easily infiltrate the relatively thin layer of soil (the vadose zone) and enter the underlying groundwater. Malusis Report¹ page 4.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The LLRWPA requires "the permanent isolation of low-level radioactive waste pursuant to the requirements established by the Nuclear Regulatory Commission under applicable laws, or by an agreement State if such isolation occurs in such agreement State." 42 U.S.C. § 2021b(7). Thus, the LLRWPA requires the "permanent isolation" of radioactive waste.

Furthermore, NRC's paramount responsibility, as required by the AEA, is to regulate radiological material in a manner that protects the public health and safety. 42 U.S.C. §§ 2012(d), 2013(d), 2022(f)(3), (referring to § 2022(b)(2)), 2099,

¹"Malusis Report" refers to the letter sent by Michael Malusis to Kenneth Elwell dated January 16, 2007.

2111(b)(1)(A), 2113(b)(1)(A), 2114(a)(1), 2201(b). The Supreme Court held that "[the] Commission's prime area of concern in the licensing context, . . . is national security, public health, and safety." Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190, 207 (1983).

The License Termination Rule ("LTR") requires the TEDE from residual radioactivity to not exceed either 100 mrem per year or 500 mrem per year, under certain circumstances, assuming that institutional controls fail. 10 C.F.R. § 20.1403(e). The LTR also requires the TEDE to be as low as reasonably achievable. Id.

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP that proposes to conduct onsite disposal of its radioactive waste on native soil.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

NRC must determine whether the proposed onsite disposal is sufficient to maintain the required dose criteria for the duration of the radiological hazard. See 10 C.F.R. § 20.1403. NRC must also determine whether the cap is sufficient to protect the public health and safety and will permanently isolate the Radioactive waste. 42 U.S.C. §§ 2012(d), 2013(d), 2022(f)(3), (referring to § 2022(b)(2)), 2099, 2111(b)(1)(A), 2113(b)(1)(A); 2114(a)(1), 2021b(7).

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

The DP proposes to dispose the Radioactive waste on native soil. However, the vadose zone in this area is relatively thin (2.5 meters) and consists of fine to coarse sand and gravel deposits, followed by a saturated zone layer consisting primarily of coarse sand with little to trace silt. Malusis Report page 4. The DP estimates the saturated hydraulic conductivity of the native vadose zone material at 0.017 m/yr (5.4×10^{-8} cm/s). DP rev. 1a page 39. However, this reported value is a gross underestimate, i.e., the value is representative of a clay-rich soil and is not remotely representative of a relatively clean sand/gravel layer. Malusis Report page 4. The true saturated hydraulic conductivity of this layer likely ranges between 10^{-1} and 10^{-3} cm/s based on the reported texture. Id. As a result, water that infiltrates through the waste material will also infiltrate easily through the vadose zone and into the underlying saturated zone, carrying those contaminants that leach from the waste mass. Id.

The hydraulic conductivity of the saturated zone is estimated at 16,000 m/yr (i.e., 0.05 cm/s), DP rev. 1a page 79, which is consistent with that expected for a coarse sand aquifer, Malusis Report page 4. These hydraulic properties, in addition to the relatively thin vadose zone layer and the absence of an

engineered liner system beneath the waste, are not favorable for long-term protection of the groundwater pathway. Id.; Gaffigan Dec.

¶ 11.

The DP appears to justify the onsite disposal under these conditions upon the ability of the vadose zone and saturated zone soils to provide attenuation (i.e., adsorption) of the radionuclides, since the distribution coefficients (K_d) assigned to the vadose zone and saturated zone layers are the same as those assigned to the waste material itself. Malusis Report page 4 (citing DP rev. 1a Table 17.5). Yet, Shieldalloy failed to perform any sorption tests to verify that the underlying soil formations exhibit adsorption capacity for the contaminants of concern. Malusis Report page 4. Moreover, the underlying soils consist primarily of sand, gravel, and little to trace silt. DP rev o Env't'l Report Page 3-13. As a result, the vadose zone and saturated zone materials are largely inert (i.e., do not participate in ion exchange reactions) and may provide little, if any, attenuation of inorganic contaminants (both radioactive and non-radioactive species) that leach from the waste mass. Malusis Report page 4; Spayd Report page 2. In this case, K_d would be close to zero. Malusis Report page 4. The lack of attenuation capacity is an additional concern regarding the long-term protectiveness of the groundwater. Id.

The DP excludes consideration of the groundwater on the basis that it is presently contaminated. DP § 5.2.2.2.4. This area is a relatively populated area. The DP fails to consider that current municipal supply wells are located less than one mile from the site and draw water from the same aquifer that Shieldalloy has contaminated. The wells are located upgradient of the site, but the presence of large volume irrigate wells in the immediate area, in conjunction with the constant pumping of the municipal wells, makes transport of the contamination towards and into the potable wells a real possibility. Gaffigan Dec. ¶ 18. SMC's consultant, TRC Environmental Company, has entered into an oversight document with the NJDEP to remediate the chemical contamination in the ground water, soil, sediment and soil. Id. TRC's goal is to remediate the ground water as quickly as possible, potentially within 20 years. Id.

Finally, Shieldalloy should have considered contamination of the Hudson Branch stream since it is fed by groundwater discharge in times of no or low precipitation. Malusis Report page 5; Spayd Report page 3. The stream flows through portions of the Shieldalloy facility and continues through residential and agricultural areas. DP rev o Env't'l Report page 3-17.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

The DP estimates the saturated hydraulic conductivity of the native vadose zone material at 0.017 m/yr (5.4×10^{-8} cm/s). DP rev. 1a page 39. However, this reported value is a gross underestimate, i.e., the value is representative of a clay-rich soil and is not remotely representative of a relatively clean sand/gravel layer. Malusis Report page 4. The true saturated hydraulic conductivity of this layer likely ranges between 10^{-1} and 10^{-3} cm/s based on the reported texture. Id. As a result, water that infiltrates through the waste material will also infiltrate easily through the vadose zone and into the underlying saturated zone, carrying those contaminants that leach from the waste mass. Id.

The DP appears to justify the onsite disposal under these conditions upon the ability of the vadose zone and saturated zone soils to provide attenuation (i.e., adsorption) of the radionuclides, since the distribution coefficients (K_d) assigned to the vadose zone and saturated zone layers are the same as those assigned to the waste material itself. Malusis Report page 4 (citing DP rev. 1a Table 17.5). Yet, Shieldalloy failed to perform any sorption tests to verify that the underlying soil formations exhibit adsorption capacity for the contaminants of concern. Id. Moreover, the underlying soils consist primarily of sand, gravel, and little to trace silt. DP rev o Envt'l Report Page 3-13. As a result, the vadose zone and saturated zone materials are largely

inert (i.e., do not participate in ion exchange reactions) and may provide little, if any, attenuation of inorganic contaminants (both radioactive and non-radioactive species) that leach from the waste mass. Id. In this case, K_d would be close to zero. Malusis Report page 4.

The DP excludes consideration of the groundwater on the basis that it is presently contaminated. DP § 5.2.2.2.4. This area is a relatively populated area. The DP fails to consider that current municipal supply wells are located less than one mile from the site and draw water from the same aquifer that Shieldalloy has contaminated. The wells are located upgradient of the site, but the presence of large volume irrigate wells in the immediate area, in conjunction with the constant pumping of the municipal wells, makes transport of the contamination towards and into the potable wells a real possibility. Gaffigan Dec. ¶ 18. SMC's consultant, TRC Environmental Company, has entered into an oversight document with the NJDEP to remediate the chemical contamination in the ground water, soil, sediment and soil. Id. TRC's goal is to remediate the ground water as quickly as possible, potentially within 20 years. Id.

Finally, Shieldalloy should have considered contamination of the Hudson Branch stream since it is fed by groundwater discharge in times of no or low precipitation. Malusis Report page 5; Spayd Report page 3. The stream flows through portions of the

Shieldalloy facility and continues through residential and agricultural areas. DP rev o Envt'l Report page 3-17.

Because the Radioactive waste will likely leach contaminants, see Contention 2, and because the proposed cap will likely allow water infiltration, see Contention 3, the DP should be rejected because of the likelihood of groundwater contamination. Malusis Report pages 4-9.

Contention 2

THE DP FAILS TO ACKNOWLEDGE THE LEACHABILITY OF RADIONUCLIDES FROM THE SLAG DESPITE SHIELDALLOY'S OWN TESTS SHOWING THAT THE RADIOACTIVE WASTE WILL LEACH RADIONUCLIDES FROM RAINWATER.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

The DP instead places heavy reliance on the argument that the Radioactive waste will resist leaching contaminants. Malusis Report page 5. However, Shieldalloy's own tests show that the Radioactive waste does leach contaminants. Id. page 6. Furthermore, because of the volume of Radioactive waste and the fact that no tests were performed on the baghouse dust, more tests should have been completed. Id. Also, the type of tests actually conducted may not provide an accurate representation of long-term leaching behavior, which should be required in this case because of the long half lives of the materials. Id.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The LLRWPA requires the "permanent isolation" of low-level radioactive waste. Furthermore, NRC's paramount responsibility, as required by the AEA, is to regulate radiological material in a manner that protects the public health and safety. Pac. Gas & Elec., 461 U.S. at 207.

The LTR requires the TEDE from residual radioactivity to not exceed either 100 mrem per year or 500 mrem per year, under certain circumstances, assuming that institutional controls fail. 10 C.F.R. § 20.1403(e). The LTR also requires the TEDE to be as low as reasonably achievable. Id.

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP that relies upon the argument that the materials will resist leachability. DP rev. 1a page 41.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

NRC must determine whether the proposed onsite disposal is sufficient to meet the required dose criteria for the duration of the radiological hazard. See 10 C.F.R. § 20.1403. NRC must also determine whether the cap is sufficient to protect the public health and safety and will permanently isolate the Radioactive

waste. 42 U.S.C. §§ 2012(d), 2013(d), 2022(f)(3), (referring to § 2022(b)(2)), 2099, 2111(b)(1)(A), 2113(b)(1)(A), 2114(a)(1), 2021b(7). The DP relies heavily on their argument that the materials resist leaching. DP rev. 1a page 41.

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

In each of the TCLP tests, the combined concentration of leached radium isotopes (i.e., Ra-226 and Ra-228 combined) easily exceeded the Maximum Contaminant Level (MCL) of 5 pCi/L established in the National Primary Drinking Water Regulations. Malusis Report page 6. The combined radium concentration in the leachant from the TCLP test on the slag was 6,660 pCi/L (more than 1,000 times the MCL), and the combined radium concentrations in the leachant from the two TCLP tests on the baghouse dust were 32.6 pCi/L and 19.39 pCi/L. Id. In addition, the EP Toxicity tests performed on the ferrocolumbium slag samples in 1987 indicate that the slag releases barium (Ba) at concentrations in excess of the drinking water MCL of 2 mg/L. Leached Ba concentrations from the two slag samples were 14 and 23 mg/L. Id.

While it is acknowledged that the population would not be directly exposed to undiluted leachate, the above results are sufficient to cause concern regarding potential degradation of the groundwater due to release of contaminants from the waste. There

are some significant overall limitations associated with the leaching tests that also warrant consideration. Id. First, no tests appear to have been conducted on the baghouse dust to evaluate the potential for leaching of non-radioactive contaminants (e.g., heavy metals) despite the fact that the baghouse dust represents approximately 20% of the radioactive waste volume to be disposed. Id. The contaminated soils and building materials were not analyzed for leachability of radionuclides. Gaffigan Dec. ¶ 13. Also TCLP leachate for the slag and baghouse dust was only analyzed for radionuclides. Id. The leachate should have also been analyzed for chemical contaminants pursuant to RCRA to determine if they are hazardous waste and possibly banned from land disposal. Id. Even if the results are below the limits for hazardous waste classification, the TCLP results will indicate if any of the materials are contaminated with metals or other contaminants that may be leachable and present a continuing source of ground water contamination. Id.

Second, the number of leaching tests performed is insufficient to assess potential variability in the leaching behavior of the waste materials and establish statistical confidence that the test results are representative of the waste mass as a whole. Malusis Report page 6. Only three samples of slag (for more than 30,000 cubic meters of a variety of slags) and two samples of baghouse dust (for more than 13,000 cubic meters of

dust) were subjected to TCLP and subsequent radionuclide analysis. Gaffigan Dec. ¶ 15.

Third, the leached concentrations reported may not represent equilibrium conditions. Id. The standard test durations for the TCLP and EP Toxicity tests are 18 and 24 hours, respectively. Id. No demonstration apparently has been performed to verify that these testing durations are sufficient to allow equilibrium conditions to be established between the liquid and solid phases (i.e., to allow the leaching process to reach completion). Id. Longer extraction times would result in higher leached concentrations if equilibrium had not been established in these tests. Id. Finally, tests such as the TCLP and EP Toxicity tests are single extraction tests and, alone, may not provide an accurate representation of long-term leaching behavior. Id.

Regarding test duration, a similar concern exists for the short-term batch tests used to determine K_d values for the waste mass. Id. pages 6 to 7.

Furthermore, the referenced report by Dave Raviv Associates in footnote 34 contains radiological analyses that do not conform to the requirements of reporting of radiological environmental data. Goodman Report² page 3. For example, the minimum detectable activities ("MDAs") should be reported for each analysis. Id. The

²"Goodman Report" refers to the memo from Jenny Goodman to Donna Gaffigan dated January 16, 2007.

MDAs for gross alpha and gross beta are not always below the requirements in the Environmental Protection Agency's Safe Drinking Water regulations. (40 CFR 141.25(c) (1) and (2)). The uranium concentrations reported are above that which would be expected in this area of the state. Goodman Report page 3. The concentration of uranium in the Kirkwood-Cohansy aquifer is typically 0.03 micrograms per liter (ug/L) according to the US Geological Geological Survey. Id. Uranium-238 concentrations in the report (Appendix 19.2) are three orders of magnitude above that level.³ Id. Thus, the statement in the plan that the radionuclides are bound tightly to the slag and will not leach into the groundwater, is not supported by SMC's own groundwater data. Id.

As discussed above in Contention 1, radionuclides will easily infiltrate the relatively thin layer of the vadose zone. As discussed below in Contention 3, the cap will allow rainwater infiltration. Because the Radioactive waste will leach contaminants, the proposed disposal will likely cause groundwater contamination. Malusis Report pages 4-9.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

The DP states that the materials will resist leachability. DP rev. 1a page 41. However, in each of the TCLP

³ The mass concentration of total uranium is obtained by dividing the activity concentration of Uranium-238 (in picocuries per liter) by 0.3365.

tests, the combined concentration of leached radium isotopes (i.e., Ra-226 and Ra-228 combined) easily exceeded the Maximum Contaminant Level (MCL) of 5 pCi/L established in the National Primary Drinking Water Regulations. Malusis Report page 6; Gaffigan ¶ 16. The combined radium concentration in the leachant from the TCLP test on the slag was 6,660 pCi/L (more than 1,000 times the MCL), and the combined radium concentrations in the leachant from the two TCLP tests on the baghouse dust were 32.6 pCi/L and 19.39 pCi/L. Malusis Report page 6. In addition, the EP Toxicity tests performed on the ferrocolumbium slag samples in 1987 indicate that the slag releases barium (Ba) at concentrations in excess of the drinking water MCL of 2 mg/L. Leached Ba concentrations from the two slag samples were 14 and 23 mg/L. Id. While it is acknowledged that the population would not be directly exposed to undiluted leachate, the above results are sufficient to cause concern regarding potential degradation of the groundwater due to release of contaminants from the waste.

Contention 3

SHIELDALLOY'S CAP DESIGN IS FATALLY FLAWED
BECAUSE IT WILL ALLOW RAINWATER TO EASILY
INFILTRATE THE RADIOACTIVE WASTE.

10 C.F.R. § 2.309(f)(1) Provide a specific statement of the issue of law or fact to be raised or controverted.

The proposed cover system consisting of soil and crushed

stone is not protective of the public health because it will allow rainwater infiltration. Malusis Report pages 7 to 8.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The LLRWPA requires the "permanent isolation" of low-level radioactive waste. Furthermore, NRC's paramount responsibility, as required by the AEA, is to regulate radiological material in a manner that protects the public health and safety. Pac. Gas & Elec., 461 U.S. at 207.

The LTR requires the TEDE from residual radioactivity to not exceed either 100 mrem per year or 500 mrem per year, under certain circumstances, assuming that institutional controls fail. 10 C.F.R. § 20.1403(e). The LTR also requires the TEDE to be as low as reasonably achievable. Id.

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP that proposes a LTC restricted use disposal design.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

NRC must determine whether the proposed onsite disposal is sufficient to maintain the required dose criteria for the duration of the radiological hazard. See 10 C.F.R. § 20.1403. NRC

must also determine whether the cap is sufficient to protect the public health and safety and will permanently isolate the Radioactive waste. 42 U.S.C. §§ 2012(d), 2013(d), 2022(f)(3), (referring to § 2022(b)(2)), 2099, 2111(b)(1)(A), 2113(b)(1)(A), 2114(a)(1), 2021b(7).

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

The DP states that the cover "is designed to prevent rainwater infiltration into the consolidated material." DP rev. 1a page 41. However, this statement does not appear to have been justified to any reasonable extent. Malusis Report page 7. For example, a considerable amount of analysis has been performed to demonstrate that the crushed rock surface will provide long-term protection against erosive forces. Id. However, erosion protection is not sufficient to prevent infiltration and subsequent release of contaminants into the subsurface. Id. The plan currently appears to be devoid of consideration regarding the hydraulic performance of the cover. Id. No specifications have been provided for the index properties (i.e., grain size distribution, Atterberg limits, activity, etc.) and hydraulic conductivity of the soil layer, no evaluation of candidate borrow sources has been documented, and no specifications for placement of the soil layer are included. Id. In addition, no justification is provided for the use of a surface

runoff coefficient as high as 0.8 (i.e., 80 % of the precipitation runs off) or an evapotranspiration rate of 24 inches per year for a cover with a crushed rock surface and no vegetation. Id.; Spayd Report pages 1-2. Surface runoff likely will be a negligible component of the water balance for this cover. Malusis Report page 7.

NRC staff stated at the public meeting held in Newfield on December 5, 2006 that the barrier will be design to allow rainwater infiltration. Gaffigan Dec. ¶ 11. However, such a cap is not protective of the public health, especially when considering the leachability of the radioactive waste and ease of which the radionuclides will infiltrate the relatively thin layer of soil (the vadose zone) and enter the underlying groundwater. Malusis Report pages 4-9.

In addition to the above, other considerations such as slope stability, soil development, and root intrusion do not appear to have been considered in this plan. Id. Slope stability is a potential concern in the short- and long-term due to the proposed 3:1 side slopes, the lack of information provided regarding the cover soil requirements and the potential for at least a portion of the cover to be inundated based on the PMF scenario. Id.

Soil development and root intrusion have been shown to be problematic in UMT CRA-type covers such as that proposed in this plan and have the potential to cause an increase in hydraulic

conductivity of a soil cover by several orders of magnitude over the long term. Id. Soil development and root intrusion has been a common problem to landfills located in New Jersey. Disbrow Dec. ¶ 2.

Vegetation rooted in contaminated materials may contain elevated levels of uranium, thorium, radon, and radium. Exh. B page 2.

The climate of southern New Jersey is not favorable to the long-term isolation of the waste. Malusis Report page 8. Long-term hydrologic isolation of buried wastes at arid and semi-arid sites is favorable because of the relatively low precipitation, high potential evapotranspiration, and thick unsaturated soils. Id. However, these conditions are not present at the Newfield site. Id.

NUREG-1757 Vol.2, Section 3.5.3 states that a parametric or component sensitivity analysis should be provided to identify how much degradation of the engineered barrier would result. However, the DP fails to perform this analysis. Goodman Report page 2.

SMC did not provide natural analogs for the effectiveness of their engineered barrier. Id. NUREG-1757 uses Native American Mounds to demonstrate erosional stability, but states that the ability of the mounds to limit infiltration is unknown. Vol. 2 pages 3-14 to 3-15.

The DP contains conflicting information regarding the cap. Revision 1a states that a geomembrane liner will be used in the cap. DP rev. 1a pages 38, 64, 73, 74, note 184. Revision 1a states that a runoff coefficient of 1 is used with a geomembrane. DP rev. 1a page 73. Revision 1 of the DP states that the geomembrane is used to divert surface water, DP rev. 1 page 37 note 92, pages 60-61, limit the impact of burrowing animals, DP rev. 1 page 158, and is an integral part of the engineered barrier, DP rev. 1 pages 166, 177. However, the June 30, 2006 transmittal letter accompanying revision 1a of the DP states that the geomembrane has been removed. Page 7.

As discussed above in Contention 1, radionuclides will easily infiltrate the relatively thin layer of the vadose zone. As discussed be in Contention 2, Shieldalloy's own testing has found that the waste will will leach contaminants. Because the proposed cap will likely cause rainwater infiltration, groundwater contamination will also be likely where the waste will remain a radioactive hazard for billions of years. Malusis Report pages 4-9; Goodman Dec.⁴ ¶ 2. In contrast, Shieldalloy contaminated the groundwater at the facility with chromium, trichloroethene and other contaminants during in a mere 50 years. Gaffigan Dec. ¶ 11.

⁴"Goodman Dec." refers to the Declaration of Jennifer Goodman, which is attached to the Goodman Report.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

The DP states that the cover "is designed to prevent rainwater infiltration into the consolidated material." DP rev. 1a page 41. However, this statement does not appear to have been justified to any reasonable extent. Malusis Report page 7. The plan currently appears to be devoid of consideration regarding the hydraulic performance of the cover. Id. No specifications have been provided for the index properties (i.e., grain size distribution, Atterberg limits, activity, etc.) and hydraulic conductivity of the soil layer, no evaluation of candidate borrow sources has been documented, and no specifications for placement of the soil layer are included. Id. In addition, no justification is provided for the use of a surface runoff coefficient as high as 0.8 (i.e., 80 % of the precipitation runs off) or an evapotranspiration rate of 24 inches per year for a cover with a crushed rock surface and no vegetation. Id.; Spayd pages 1-2. Surface runoff likely will be a negligible component of the water balance for this cover. Malusis Report page 7.

In addition to the above, other considerations such as slope stability, soil development, and root intrusion do not appear to have been considered in this plan. Id. Slope stability is a potential concern in the short- and long-term due to the proposed 3:1 side slopes, the lack of information provided regarding the

cover soil requirements and the potential for at least a portion of the cover to be inundated based on the PMF scenario. Id. Soil development and root intrusion have been shown to be problematic in UMCRA-type covers such as that proposed in this plan (e.g., see and have the potential to cause an increase in hydraulic conductivity of a soil cover by several orders of magnitude over the long term. Id. Soil development and root intrusion has been a common problem to landfills located in New Jersey. Disbrow Dec. ¶ 2.

Contention 4

BECAUSE SHIELDALLOY HAS FAILED TO FULLY CHARACTERIZE ITS FACILITY FOR RADIONUCLIDE CONTAMINATION, IT HAS FAILED TO PRESENT SUFFICIENT INFORMATION TO ASSESS WHETHER PORTIONS OF THE SITE MEET THE DOSE CRITERIA UNDER THE LICENSE TERMINATION RULE.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

The DP contends that the facility is fully characterized for radionuclide contamination. DP rev. 1 Chapter 4. However, the characterization that was submitted (IT April, 1992 "Assessment of Environmental Radiological Conditions at the Newfield Facility") is not adequate. Goodman Report pages 3 to 5. Shieldalloy should be required to fully characterize the facility before it submits a DP so NRC can ensure that the site is classified correctly for the

final status survey so that it can be determined if the site is fully remediated and complies with the LTR.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

NUREG-1757 requires the final status survey to be submitted with the DP to allow the NRC to determine whether the survey is adequate for demonstrating compliance with the radiological criteria for license termination. Vol. 1 page 15-9. Shieldalloy has failed to conduct a full characterization survey of its facility. Exh. M.

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP pursuant to the LTR.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

NRC is required to review the final status survey as part of the DP to determine if the facility will meet the radiological criteria in the LTR. NUREG-1757 Vol. 1 page 15-9

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

The site has not been fully characterized to determine the levels of radioactivity above background. Goodman Report page 1. The soil samples were sporadic and the EPA protocol for further analysis of water samples was not followed properly. Id. The laboratory data was either not present, or had problems, like not meeting the required minimum detectable activities (MDA). Id. For example, there is no indication if soil samples were sealed for 21 days prior to analysis in order to reach secular equilibrium. Id. This could bias all the soil results low. Without adequate and full characterization of the site, the NRC and NJDEP cannot determine if any portion of the site meets the dose criterion for unrestricted use. Id.

Given the fact that SMC confirms that the Hudson branch is in need of remediation, other areas of the site should be sampled to ensure that radionuclides did not migrate from the areas that were licensed. Goodman report page 3.

SMC states definitively that the only areas within the SMC property lines where residual radioactivity exists in surface soils, other than the Storage Yard, are the concrete pads that housed the former AAF and Flex-Klean Baghouses, D-111 and D-102/112. DP rev. 1 page 28. This statement is premature considering there has been no final status survey of the property. Goodman Report § 4.4.2. We believe that in addition to Class 1 survey units, Class 2 and Class 3 survey units are imperative

considering the site has never been fully characterized and considering it is unknown where slag was used on site. Id.

The scale drawing and map of soil and water sampling results in Appendix B of the Environmental Report (Appendix 19.9 of the Plan) shows contamination above background levels in the Hudson's Branch and outside the fence line, to the north of the storage yard, and in areas where licensed material was never stored or used. These areas need to be addressed in the final status survey of the site prior to the license amendment. Goodman Report § 4.4.2.

There does not appear to be an accurate accounting of the locations of where slag may have been used as fill. Goodman Report § 4.5. There is not an accurate assessment of whether or not the slag was radioactive. Id. Considering this uncertain history, the entire site should be included in a final status survey. Id.

The DP states that subsurface radioactivity may be present at the site where slag was used as fill. DP rev. 1 page 29. While the DP states that these areas have not been well-characterized, it states that "they would have a nominal radionuclide content." Id. Pages 29-30. However, multiplying out the assumptions of the quantity of radioactive material that may be present as fill slag yields a concentration that is three orders of magnitude above New Jersey's cleanup standards, which would not be considered a nominal radionuclide content. Goodman Report § 4.5.

Sections 4.2.1 to 4.2.3, 4.4.1, and 4.5 to 4.7 of Goodman's

Report provide other DP deficiencies associated with the failure to properly characterize the site.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

Chapter 4 of the DP purports to adequately describe the radiological status of the facility. However, the site has not been fully characterized to determine the levels of radioactivity above background. Goodman Report page 1. The previous section of this Petition describes the various deficiencies in Chapter 4 of the DP and sets forth the various ways in which the site was not fully characterized.

SMC states definitively that the only areas within the SMC property lines where residual radioactivity exists in surface soils, other than the Storage Yard, are the concrete pads that housed the former AAF and Flex-Klean Baghouses, D-111 and D-102/112. DP rev. 1 page 28. This statement is premature considering there has been no final status survey of the property. Goodman Report § 4.4.2. We believe that in addition to Class 1 survey units, Class 2 and Class 3 survey units are imperative considering the site has never been fully characterized and considering it is unknown where slag was used on site. Id.

The DP states that subsurface radioactivity may be present at the site where slag was used as fill. DP rev. 1 page 29. While the

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Contention 5

THE DP OBTAINS INACCURATE DOSE MODELING RESULTS BY IGNORING THE LIKELY SCENARIO OF GROUNDWATER CONTAMINATION AND IGNORING OTHER REASONABLE ASSUMPTIONS.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

DP fails to assume likely scenarios in its modeling, such as contamination of groundwater. If this likely scenario is modeled, the radioactive doses would exceed the limits established by the License Termination Rule ("LTR"). See 10 C.F.R. § 20.1403(e). The DP also fails to assume other reasonable scenarios, which would further raise the radioactive doses.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The LTR requires residual radioactivity at the site to be reduced "so that if the institutional controls were no longer in

effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either (1) 100 mrem (1 mSv) per year; or (2) 500 mrem (5 mSv)" under certain circumstances. 10 C.F.R. § 20.1403(e).

The DP completely excludes the likely scenario of radionuclides contaminating the groundwater. Goodman Report § 5.2.2:2.4. If this pathway is included in the modeling, with more reasonable parameters used for this type of cap, a TEDE of 1,718 mrem/yr at 800 years would result. Goodman Report page 11. This dose level is not protective of human health and exceeds the 500 mrem limit in the LTR. Id. Furthermore, the DP excludes other reasonable scenarios that would raise the TEDE even higher. Id. Pages 6 to 11.

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP seeking to decommission its facility under the LTR. The LTR requires an applicant to ensure that the TEDE from residual radioactivity meet various criteria. 10 C.F.R. 20.1403. Thus, modeling must use accurate assumptions to ensure that the TEDE meets the criteria. However, the DP fails to use realistic assumptions.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

NRC must determine whether modeling will accurately ensure that the dose criteria in the LTR are met. See 10 C.F.R. § 20.1403.

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

The DP completely excludes the likely scenario of radionuclides contaminating the groundwater. Goodman Report § 5.2.2.2.4. The DP states that groundwater below the Shieldalloy facility is contaminated and not likely to be ingested by anyone. DP § 5.2.2.2.4. SMC therefore excludes the drinking water pathway from its modeling. Id. However, the aquifer beneath the SMC site is classified as a Class IIA aquifer which means it can be used as potable water with treatment. Goodman Report § 5.2.2.2.4. Treatment is considered a control that will fail. Id. Current municipal supply wells are located less than one mile from the site and draw water from the same aquifer that Shieldalloy has contaminated. Gaffigan Dec. 18. Shieldalloy has been operating a treatment system on site to remediate the groundwater that was contaminated by Shieldalloy.

Id. SMC's consultant, TRC Environmental Company, has entered into an oversight document with the NJDEP to remediate the chemical contamination in the ground water, soil, sediment and soil. Id. TRC's goal is to remediate the ground water as quickly as possible, potentially within 20 years. Id. The DP states that RESRAD supports the position that a suburban resident does not drink groundwater. DP rev. 1a page 61 note 157. The RESRAD Manual states that in an EPA study (U.S. Environmental Protection Agency, 1994, *Radiation Site Cleanup Regulations: Technical Support Document for the Development of Radionuclide Cleanup Levels for Soil*, review draft, Office of Radiation and Indoor Air, Washington, D.C.), an on-site well is assumed for drinking in the suburban resident scenario. Goodman Report page 8. Therefore, SMC must include the drinking water pathway in its all controls fail analysis. Gaffigan Dec. ¶ 19; Goodman Report § 5.2.2.2.4; Malusis Report page 5; Spayd Report page 3.

The DP also excludes other reasonable exposure scenarios from its modeling. Farming up to the property boundary and on the unrestricted portion of the property should be considered since the DP states that the property will be subdivided for unrestricted release, DP vol 1 page 154 note 102. Goodman Report page 6.

The DP assumes that the hypothetical resident lives 1000 feet from the pile. DP rev. 1a page 60 note 156. However, because a portion of the property will be released for unrestricted use,

and because a resident currently resides only 100 feet from the property, the modeling should assume a family living on the unrestricted portion of the property. Goodman Report §§ 5.3.1, 5.3.3.2. Also, it is unreasonable to assume that municipal water will be available in the foreseeable future. Id. § 5.3.3.2. It is also reasonable to assume that the family grows a garden and consumes produce from it. Id. Since 10 C.F.R. § 20.1403(e) requires the assumption that institutional controls will fail, and since the materials will remain a radioactive hazard in perpetuity, the modeling should assume that the radioactive slag will be exposed. Id. § 5.3.3. In sum, all pathways should be used for this scenario, namely direct radiation exposure, particulate inhalation, direct soil ingestion, crop ingestion, and drinking water ingestion. Goodman Report page 8.

The DP states the suburban resident scenario is unlikely because of the lack of available space to construct a house and parking and because the majority of the area surrounding the Storage Yard is assigned for natural resource damage mitigation. DP rev. 1a page 61. However, since a resident currently lives 100 feet from the property, DP rev. 1 § 1.2, there is no basis to claim that a resident scenario is unlikely. Furthermore, institutional controls will likely fail while the materials remain a radioactive hazard in perpetuity. Goodman Report § 5.1. Therefore, the natural resource limitation must also be assumed to fail. Id. page 8.

The amount of time a suburban resident assumed by the DP to spend at the site is not conservative. Id. The US Environmental Protection Agency's Exposure Factors Handbook⁵ recommends 16.4 hours per day for time indoors. Id. The RESRAD Manual uses 50% of the time spent indoors. Id. There is no recommendation for how many days per year, but the average number of vacation days taken in the US is 13. Id. The standard days per year for a resident is typically 350. Id. The values listed, 240 days for 8 hours per day are not justified. Id. That means the resident is away from home for 4 months out of the year. Id.

The engineered cap and slag may be an ideal source for construction material. Id. Page 6. In fact, Shieldalloy used the slag material as fill for a road and underneath a building knowing full well that this material was radioactive. DP rev. 1 pages 27, 29. Therefore, this scenario should be modeled. Goodman Report page 6.

The DP states that an all controls fail scenario is being modeled. DP rev. 1a page 34, line 20. However, the DP is actually modeling only a slight degradation of controls. Goodman Report § 5.1. Modeling needs to be performed assuming that the engineered controls completely degrade since the materials will remain a radioactive hazard into perpetuity. Id.

⁵ Exposure Factors Handbook Volume III, Activity Factors, US Environmental Protection Agency, EAP/600/P-95/002Fc, August, 1997.

The DP fails to take into account exposure from direct contact with the uncovered pile. DP rev. 1a § 5.5.10. However, as discussed above, contact with the uncovered pile when institutional controls fail is a reasonable scenario.

The Microshield runs neglected to take into account all the progeny associated with uranium and thorium. Goodman Report § 5.5.9. Because the uranium and thorium in the slag are in equilibrium with their associated decay products, and because most of them are gamma emitters, all of these decay products should be included in the source term. Id. Using the same geometries as SMC for the shape of the source and the distance from the source, the exposure rates are two orders of magnitude higher than shown in Appendix 19.5. Id.

The DP states that modeling to predict future doses has been derived from "previously completed radiological assessments of the residual radioactivity at the Newfield site." DP rev. 1a § 5.2.1. However, the lateral and vertical extent of contamination has never been determined. Exh. M. Accurate dose modeling of radionuclide contamination into the groundwater cannot be conducted without determining the vertical extent of the contamination. Goodman Report § 5.2.1. Also, without a determination of the lateral extent of the contamination, contamination above the established cleanup levels could be missed in the final status survey. Id.

The DP derives the source term using the weighted averages of the concentrations of material in the storage yard. DP Table 17.7. This would make sense if the material were capable of being blended together. Goodman Report § 5.2.1.2. However, the concentration in the slag will not change even if other, less concentrated material is placed near it. Id. If the slag were uncovered, as would be the case in an all controls fail scenario, it is reasonable to assume that the receptor would be exposed to the higher concentration, not the derived concentration. Id. Thus, the Derived Source Term should use the concentration of the slag. Id.

The fence should be assumed to fail since the waste will remain a radioactive hazard into perpetuity. Goodman Report page 7.

The DP includes erroneous assumptions that affects the dose modeling. Goodman Report § 5.4.3.3. For example, it is stated that the saturated hydraulic conductivity was measured for the native sand material at the site as 2,000 m/y. DP rev. 1a page 77. However, SMC uses 0.017 m/y for the saturated hydraulic conductivity of the unsaturated zone (which is the native sand layer). Id. Page 79. Also, Table 17.5 lists the K_d of Radium as 50, which is much lower than the RESRAD default, but this is not even mentioned in the text. Goodman Report § 5.4.3.3. This seems to contradict the statement that the slag is essentially insoluble even under the most extreme in-situ conditions that might

reasonably be encountered. Id. A site-specific K_d was not determined for the baghouse dust or the contaminated soil. Id.; Spayd Report page 2. This will be important when the drinking water pathway is included in the analysis. Id.

The DP inputs a parameter of 0.004 for the hydraulic gradient of the saturated zone, as shown in Appendix A and B and referenced in the April 1992 Remedial Investigation Technical Report. Spayd Report Page 2. However, measurement of the hydraulic gradient of the saturated zone in the 1992 Report show the gradient at the site to be 0.002, one half the gradient used in RESRAD. Id. The Ground Water Modeling Memo also uses the 0.002 hydraulic gradient value. Id. Therefore, the hydraulic gradient of the saturated zone used in RESRAD is not correct and should be changed to 0.002. Id. NJDEP modeling found that using the lower value of 0.002 increases the doses.

Sections 5.1, 5.2.2.2.1 to 5.2.2.2.3, 5.3, 5.3.3.1 to 5.3.3.4, 5.5.1, 5.5.11 of Goodman's Report provide other DP deficiencies associated with the dose modeling. Page 3 of Spayd's Report also provide DP deficiencies.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

The DP completely excludes the likely scenario of radionuclides contaminating the groundwater. Goodman Report § 5.2.2.2.4. The DP states that groundwater below the Shieldalloy

facility is contaminated and not likely to be ingested by anyone. DP § 5.2.2.2.4. SMC therefore excludes the drinking water pathway from its modeling. Id. However, the aquifer beneath the SMC site is classified as a Class IIA aquifer which means it can be used as potable water with treatment. Goodman Report § 5.2.2.2.4. Treatment is considered a control that will fail. Id. Shieldalloy has been operating a treatment system on site to remediate the groundwater that was contaminated by Shieldalloy. Gaffigan Dec. ¶ 17. SMC's consultant, TRC Environmental Company, has entered into an oversight document with the NJDEP to remediate the chemical contamination in the ground water, soil, sediment and soil. Id. TRC's goal is to remediate the ground water as quickly as possible, potentially within 20 years. Id. Because the radiological hazard from these materials will remain in perpetuity, Goodman Dec. ¶ 2, Shieldalloy's dismissal of the groundwater pathway because of present contamination is not warranted. Malusis Report page 5; Goodman Report § 5.2.2.2.4; Gaffigan Dec. ¶ 19; Spayd Report page 3. Therefore, SMC must include the drinking water pathway in its all controls fail analysis. Id.

The DP states that RESRAD supports the position that a suburban resident does not drink groundwater. DP rev. 1a page 61 note 157. However, the RESRAD Manual states that in an EPA study (U.S. Environmental Protection Agency, 1994, *Radiation Site Cleanup Regulations: Technical Support Document for the Development of*

Radionuclide Cleanup Levels for Soil, review draft, Office of Radiation and Indoor Air, Washington, D.C.), an on-site well is assumed for drinking in the suburban resident scenario. Goodman Report page 8.

The DP also excludes other reasonable exposure scenarios from its modeling. Farming up to the property boundary and on the unrestricted portion of the property should be considered since the DP states that the property will be subdivided for unrestricted release, DP vol 1 page 154 note 102. Goodman Report page 6.

The DP assumes that the hypothetical resident lives 1000 feet from the pile. DP rev. 1a page 60 note 156. However, because a portion of the property will be released for unrestricted use, and because a resident currently resides only 100 feet from the property, the modeling should assume a family living on the unrestricted portion of the property. Goodman Report §§ 5.3.1, 5.3.3.2. Also, it is unreasonable to assume that municipal water will be available in the foreseeable future. Id. § 5.3.3.2. It is also reasonable to assume that the family grows a garden and consumes produce from it. Id. Since 10 C.F.R. § 20.1403(e) requires the assumption that institutional controls will fail, and since the materials will remain a radioactive hazard in perpetuity, the modeling should assume that the radioactive slag will be exposed. Id. § 5.3.3. In sum, all pathways should be used for this scenario, namely direct radiation exposure, particulate inhalation, direct

soil ingestion, crop ingestion, radon, and drinking water ingestion. Goodman Report page 8.

The DP states the suburban resident scenario is unlikely because of the lack of available space to construct a house and parking and because the majority of the area surrounding the Storage Yard is assigned for natural resource damage mitigation. DP rev. 1a page 61. However, since a resident currently lives 100 feet from the property, DP rev. 1 § 1.2, there is no basis to claim that a resident scenario is unlikely. Furthermore, institutional controls will likely fail while the materials remain a radioactive hazard in perpetuity. Goodman Report § 5.1. Therefore, the natural resource limitation must also be assumed to fail. Id. page 8.

The amount of time a suburban resident assumed by the DP to spend at the site is not conservative. Id. The US Environmental Protection Agency's Exposure Factors Handbook⁶ recommends 16.4 hours per day for time indoors. Id. The RESRAD Manual uses 50% of the time spent indoors. Id. There is no recommendation for how many days per year, but the average number of vacation days taken in the US is 13. Id. The standard days per year for a resident is typically 350. Id. The values listed, 240 days for 8 hours per day are not justified. Id. That means the resident is away from home for 4 months out of the year. Id.

⁶ Exposure Factors Handbook Volume III, Activity Factors, US Environmental Protection Agency, EAP/600/P-95/002Fc, August, 1997.

The DP fails to model excavation of the engineered cap and slag. Id. Page 6. However, these materials may be an ideal source for construction material. Id. In fact, Shieldalloy used the slag material as fill for a road and underneath a building knowing full well that this material was radioactive. DP rev. 1 pages 27, 29. Therefore, this scenario should be modeled. Goodman Report page 6.

The DP states that an all controls fail scenario is being modeled. DP rev. 1a page 34, line 20. However, the DP is actually modeling only a slight degradation of controls. Goodman Report § 5.1. Modeling needs to be performed assuming that the engineered controls completely degrade since the materials will remain a radioactive hazard into perpetuity. Id.

The DP fails to take into account exposure from direct contact with the uncovered pile. DP rev. 1a § 5.5.10. However, as discussed above, contact with the uncovered pile when institutional controls fail is a reasonable scenario.

The Microshield runs neglected to take into account all the progeny associated with uranium and thorium. Goodman Report § 5.5.9. Because the uranium and thorium in the slag are in equilibrium with their associated decay products, and because most of them are gamma emitters, all of these decay products should be included in the source term. Id. Using the same geometries as SMC for the shape of the source and the distance from the source, the exposure rates are two orders of magnitude higher than shown in

Appendix 19.5. Id.

The DP states that modeling to predict future doses has been derived from "previously completed radiological assessments of the residual radioactivity at the Newfield site." DP rev. 1a § 5.2.1. However, the lateral and vertical extent of contamination has never been determined. Exh. M. Accurate dose modeling of radionuclide contamination into the groundwater cannot be conducted without determining the vertical extent of the contamination. Goodman Report § 5.2.1. Also, without a determination of the lateral extent of the contamination, contamination above the established cleanup levels could be missed in the final status survey. Id.

The DP derives the source term using the weighted averages of the concentrations of material in the storage yard. DP Table 17.7. This would make sense if the material were capable of being blended together. Goodman Report § 5.2.1.2. However, the concentration in the slag will not change even if other, less concentrated material is placed near it. Id. Goodman Report § 5.2.1.2. If the slag were uncovered, as would be the case in an all controls fail scenario, it is reasonable to assume that the receptor would be exposed to the higher concentration, not the derived concentration. Id. Thus, the Derived Source Term should use the concentration of the slag. Id.

The fence should be assumed to fail since the waste will remain a radioactive hazard into perpetuity. Goodman Report page 7.

The DP includes erroneous assumptions that affects the dose modeling. Goodman Report § 5.4.3.3. For example, it is stated that the saturated hydraulic conductivity was measured for the native sand material at the site as 2,000 m/y. DP rev. 1a page 77. However, SMC uses 0.017 m/y for the saturated hydraulic conductivity of the unsaturated zone (which is the native sand layer). Id. Page 79. Also, Table 17.5 lists the K_d of Radium as 50, which is much lower than the RESRAD default, but this is not even mentioned in the text. Goodman Report § 5.4.3.3. This seems to contradict the statement that the slag is essentially insoluble even under the most extreme in-situ conditions that might reasonably be encountered. Id. A site-specific K_d was not determined for the baghouse dust or the contaminated soil. Id.; Spayd Report page 2. This will be important when the drinking water pathway is included in the analysis. Id.

The DP inputs a parameter of 0.004 for the hydraulic gradient of the saturated zone, as shown in Appendix A and B and referenced in the April 1992 Remedial Investigation Technical Report. Spayd Report Page 2. However, measurement of the hydraulic gradient of the saturated zone in the 1992 Report show the gradient at the site to be 0.002, one half the gradient used in RESRAD. Id. The Ground Water Modeling Memo also uses the 0.002 hydraulic gradient value. Id. Therefore, the hydraulic gradient of the saturated zone used in RESRAD is not correct and should be changed.

to 0.002. Id. NJDEP modeling found that using the lower value of 0.002 increases the doses.

Sections 5.1, 5.2.2.2.1 to 5.2.2.2.3, 5.3, 5.3.3.1 to 5.3.3.4, 5.5.1, 5.5.11 of Goodman's Report provide other DP deficiencies associated with the dose modeling. Page 3 of Spayd's Report also provide DP deficiencies.

Contention 6

THE 1000 YEAR MODELING CONDUCTED BY SHIELDALLOY FAILS TO ADEQUATELY PROTECT THE PUBLIC SAFETY AND HEALTH BECAUSE THE WASTE WILL REMAIN A RADIOACTIVE HAZARD FOR BILLIONS OF YEARS.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

The DP's modeling for only 1000 years violates the Low-Level Radioactive Waste Policy Act ("LLRWPA"), the Atomic Energy Act ("AEA"), and the License Termination Rule ("LTR") by failing to require the permanent isolation of low-level radioactive waste or protect the public health and safety.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The LLRWPA requires "the permanent isolation of low-level radioactive waste pursuant to the requirements established by the Nuclear Regulatory Commission under applicable laws, or by an agreement State if such isolation occurs in such agreement State." 42 U.S.C. § 2021b(7). Thus, the LLRWPA requires the "permanent isolation" of low-level radioactive waste.

Furthermore, NRC's paramount responsibility, as required by the AEA, is to regulate radiological material in a manner that protects the public health and safety. 42 U.S.C. §§ 2012(d), 2013(d), 2022(f)(3), (referring to § 2022(b)(2)), 2099, 2111(b)(1)(A), 2113(b)(1)(A), 2114(a)(1), 2201(b). The Supreme Court held that "[the] Commission's prime area of concern in the licensing context, . . . is national security, public health, and safety." Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190, 207 (1983).

The LTR requires an applicant for decommissioning to calculate the peak annual TEDE to the average member of the critical group expected within the first 1000 years after decommissioning. 10 C.F.R. § 20.1401(d). However, this provision is intended to only apply to short-lived nuclides. 62 Fed. Reg. at 39083 (Response F.7.3). Short-lived nuclides are defined as having half-lives between 5.3 and 30 years and which would decay to unrestricted dose levels in about 10-60 years. Id. at 39069. For long-lived nuclides, future calculations beyond 1000 years would be valuable. Id. at 39083. Thus, the intent of 10 C.F.R. § 20.1401(d) is to actually require longer dose assessments depending on the duration of the nuclides.

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP that relies upon modeling the TEDE from residual radioactivity for only 1000 years. However, the materials sought to be disposed at the facility have a half-

life of billions of years. Goodman Dec. 2.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

NRC must determine whether the 1000 year modeling is sufficient to determine whether the onsite disposal will be safe and protective of the public health even though the half-life of the nuclides is billions of years.

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

The DP only conducts dose modeling assessments for 1,000 years, even though the radiological hazard from the waste will endure for billions of years. The 1000 year modeling is inadequate for this particular waste. Goodman Dec. ¶ 3.

NUREG-1757 uses Native American Mounds to demonstrate erosional stability, but states that the ability of the mounds to limit infiltration is unknown. Vol. 2 pages 3-14 to 3-15. It goes on to state that archaeologists have dated the mounds by excavating bones and artifacts from the mounds and determining the age of the object or the data of its burial. Id. However, these examples demonstrate that human excavation of an engineered barrier is reasonably foreseeable thousands of years later. Goodman Report page 2.

The DP states that it is "extremely unlikely" that institutional controls and physical controls would fail. DP rev. 1 page xxiv. However, the Shieldalloy waste will remain a radioactive hazard for billions of years. Goodman Dec. ¶ 2. If a LTC license is utilized for institutional controls, it is self-evident that neither Shieldalloy nor a private third party trustee can be expected to endure in perpetuity to enforce maintain the institutional controls required by the LTC license.

The DP states that the greatest annual dose occurs past 1000 years. DP rev. 1a page 75. Since the material will still be a radioactive hazard, this dose should be considered. Goodman Report § 5.4.3.2.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

The DP only conducts dose modeling assessments for 1,000 years, even though the radiological hazard from the waste will endure for billions of years. The 1000 year modeling is inadequate for this particular waste. Goodman Dec. ¶ 3.

NUREG-1757 uses Native American Mounds to demonstrate erosional stability, but states that the ability of the mounds to limit infiltration is unknown. Vol. 2 pages 3-14 to 3-15. It goes on to state that archaeologists have dated the mounds by excavating bones and artifacts from the mounds and determining the age of the

object or the data of its burial. Id. However, these examples demonstrate that human excavation of an engineered barrier is reasonably foreseeable thousands of years later. Goodman Report page 2.

The DP states that it is "extremely unlikely" that institutional controls and physical controls would fail. DP rev. 1 page xxiv. However, the Shieldalloy waste will remain a radioactive hazard for billions of years. Goodman Dec. ¶ 2. If a LTC license is utilized for institutional controls, it is self-evident that neither Shieldalloy nor a private third party trustee can be expected to endure in perpetuity to enforce maintain the institutional controls required by the LTC license.

The DP states that the greatest annual dose occurs past 1000 years: DP rev. 1a page 75. Since the material will still be a radioactive hazard, this dose should be considered. Goodman Report § 5.4.3.2.

Contention 7

SHIELDALLOY HAS FAILED TO DEMONSTRATE THAT OFFSITE DISPOSAL WILL CAUSE NET PUBLIC OR ENVIRONMENTAL HARM OR THAT RESIDUAL RADIOACTIVITY FROM ONSITE DISPOSAL IS AS LOW AS REASONABLY ACHIEVABLE ("ALARA").

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

Shieldalloy did not address the question of whether

offsite disposal of its radioactive waste will cause net public or environmental harm by disposing the waste offsite at a licensed facility rather than disposing the materials onsite. Goodman Report page 15. Furthermore, Shieldalloy has failed to conduct an ALARA analysis. Id. Therefore, Shieldalloy has not demonstrated that the proposed onsite disposal will reduce residual radioactivity to levels that are ALARA.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The LTR provides:

A site will be considered acceptable for license termination under restricted conditions if:

(a) The licensee can demonstrate that further reductions in residual radioactivity necessary to comply with the provisions of § 20.1402 would result in net public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA.

10 C.F.R. § 20.1403.

Shieldalloy has not addressed the question in the DP of

whether greater public or environmental harm will result if it disposes the materials offsite at a licensed facility. Goodman Report page 15. Furthermore, Shieldalloy has failed to conduct an ALARA analysis. Id. Therefore, Shieldalloy has not demonstrated that the proposed onsite disposal will reduce residual radioactivity to levels that are ALARA.

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP that proposes to conduct onsite disposal of its radioactive waste and to decommission the property. The LTR requires the licensee to demonstrate that "reductions in residual radioactivity necessary to comply with the provisions of § 20.1402 would result in net public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA." 10 C.F.R. § 20.1403(a).

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

NRC must determine whether Shieldalloy has demonstrated that "reductions in residual radioactivity necessary to comply with the provisions of § 20.1402 would result in net public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA." 10 C.F.R. § 20.1403(a).

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

An ALARA analysis requires the licensee to demonstrate that "further reductions in residual radioactivity . . . were not being made because the residual levels associated with restricted conditions are ALARA." 10 C.F.R. § 20.1403(a). Thus, ALARA requires the applicant to consider both the costs and benefits of reducing residual radioactivity.

The DP fails to conduct an ALARA analysis because it only considers the costs of reducing residual radioactivity. Goodman Report page 11. An ALARA analysis is required to also consider the benefits, including the collective dose averted. NUREG-1757 vol. 2 page N-2. The DP fails to consider any benefit. Goodman Report page 11.

In order for the averted dose to be calculated, the drinking water pathway must be included for each alternative since groundwater contamination is likely if the DP is implemented: Goodman Report page 12; see also Contentions 1, 2, 3, and 5 above. Since the material will remain radioactive in perpetuity, the length of time for modeling should be increased past 1000 years. Goodman Report page 12.

The costs considered by the DP for offsite disposal are

higher than was actually quoted by the disposal facility. The DP considers a cost of \$62,864,543. DP Table 17.15. However, Energy Solutions has repeatedly quoted a price of \$33 million for a turnkey operation. Exh. A. Adding a 25% contingency required by the NRC brings it to \$41,250,000.

The DP does not address the question of whether offsite disposal of its radioactive waste will cause net public or environmental harm by disposing the waste offsite at a licensed facility rather than disposing the materials onsite. Goodman Report page 15.

The whole discussion of radiation risks is misleading. The author discusses chronic exposures and acute exposures without explaining the difference and the different health effects. Goodman Report page 12. The author's discussion of radiation effects would lead one to believe that the material at SMC is harmless. DP § 7.2.1. The Health Physics position paper actually states that the risks of health effects below 5-10 rem (which includes occupational and environmental exposures), are either too small to be observed or are nonexistent. Goodman Report page 12. The paper goes on to state that "the possibility that health effects might occur at small doses should not be entirely discounted. Id. The Health Physics Society also recognizes the practical advantages of the linear, no-threshold hypothesis to the practice of radiation protection. Id. Nonetheless, risk assessment at low doses should

focus on establishing a range of health outcomes in the dose range of interest and acknowledge the possibility of zero health effects." Id.

Furthermore, the Committee to Assess Health Risks from Exposure to Low Levels of Ionizing Radiation recently released the Biological Effects of Ionizing Radiation (BEIR) VII report. Id. The BEIR VII committee concluded that current scientific evidence is consistent with the hypothesis that there is a linear dose-response relationship between exposure to ionizing radiation and the development of radiation-induced solid cancers in humans. Id. This conclusion is based on many facts (contrary to the statement made in the DP that this conclusion is not supported with facts). Id. For example, the committee stated that there is compelling support for the linearity view of how cancers form. Id. Studies in radiation biology show that "a single radiation track (resulting in the lowest exposure possible) traversing the nucleus of an appropriate target cell has a low but finite probability of damaging the cells' DNA. Id. Subsets of this damage, such as ionization "spurs" that can cause multiple damage in a short length of DNA, may be difficult for the cell to repair or may be repaired incorrectly. Id. The committee has concluded that there is no compelling evidence to indicate a dose threshold below which the

risk of tumor induction is zero."⁷ Id. The explanation of radiation risks in the DP would lead one to believe that the radioactive material at SMC is harmless. Id. The current scientific evidence does not support this view. Id.

The benefits of unrestricted use versus restricted use should include the Regulatory Costs Avoided (NUREG 1757, Vol. 2, p. N-6). Included in these costs are additional licensing fees to develop an EIS and costs associated with public meetings, to name a few. Because NRC has already held two public meetings and started the EIS process, these costs can not now be avoided. The NRC has violated its own guidance by conducting these meetings and starting the EIS process without first determining if the site complies with the requirements in 10 CFR 20.1403(a). Goodman Report pages 1 to 2. The DP should include the costs associated with two years of NRC review of the DP. Creation of a new disposal site at the SMC facility in Newfield will require the additional expenditure of human resources and funds to regulate and maintain an additional disposal facility in perpetuity. These costs should be considered in the DP.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

The DP fails to conduct an ALARA analysis because it only

⁷ Health Risks from Exposure to Low Levels of Ionizing Radiation, BEIR VII Phase 2, National Research Council, National Academies Press, Washington, D.C., 2006.

considers the costs of reducing residual activity. Goodman Report page 11. An ALARA analysis is required to also consider the benefits, including the collective dose averted. NUREG-1757 vol. 2 page N-2. The DP fails to consider any benefit. Goodman Report page 11.

In order for the averted dose to be calculated, the drinking water pathway must be included for each alternative since groundwater contamination is likely if the DP is implemented. Goodman Report page 12; see also Contentions 1, 2, 3, and 5 above. Since the material will remain radioactive in perpetuity, the length of time for modeling should be increased past 1000 years. Goodman Report page 12.

The costs considered by the DP for offsite disposal are higher than was actually quoted by the disposal facility. The DP considers a cost of \$62,864,543. DP Table 17.15. However, Energy Solutions has repeatedly quoted a price of \$33 million for a turnkey operation. Exh. A. Adding a 25% contingency required by the NRC brings it to \$41,250,000.

The DP does not address the question of whether offsite disposal of its radioactive waste will cause net public or environmental harm by disposing the waste offsite at a licensed facility rather than disposing the materials onsite. Goodman Report page 15.

The whole discussion of radiation risks is misleading.

The author discusses chronic exposures and acute exposures without explaining the difference and the different health effects. Goodman Report page 12. The author attributes the statement that no effect has ever been observed at levels below 5,000 mrem delivered over a one year period to the Health Physics Society. DP § 7.2.1. However, the current scientific evidence does not support this view. Goodman Report page 12.

Contention 8

THE SMC DP FAILS TO PROVIDE SUFFICIENT FINANCIAL ASSURANCE.

10 C.F.R. §2.309(f) (i) Provide a specific statement of the issue of law or fact.

The SMC DP fails to provide sufficient financial assurance in the proposed selected long term control license (LTC) alternative.

10 C.F.R. §2.309(f) (ii) Provide a brief explanation of the basis for the contention.

The regulations require an applicant seeking restricted use license termination to provide "sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site. 10 C.F.R.

§20.1403(c).

10 C.F.R. §2.309(f)(iii) Demonstrate that the issue raised is within the scope of the proceeding.

SMC has submitted a DP which proposes and selects a LTC restricted use alternative which must meet the requirements of 10 C.F.R. §1403.

10 C.F.R. §2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

For the NRC to make a determination on the proposed selected LTC alternative in the DP it must determine whether the financial assurance requirements of 10 C.F.R. §1403(C) have been met.

10 C.F.R. §2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which petitioner intends to rely at hearing, together with reference to the specific sources and documents on which requestor/petitioner intends to rely to support its position on the issue.

The LTC alternative will create a disposal site with a very long-lived radionuclides. Financial assurance must be sufficient to ensure that sufficient funds are available during the entire time period that the radiological hazard continues in order to conduct required survey, maintenance, license and inspection and trust expenses.

The DP fails to require sufficient financial assurance and fails to require an adequate ALARA analysis because it fails to consider inflation. Over the past 50 years inflation has dramatically increased the cost of goods and services. Failure to consider the effect of inflation on all costs to maintain the disposal site and comply with license and record keeping obligations dramatically undermines the sufficiency of the financial assurance amount posted at the time of establishment of the disposal facility. This is particularly true at a disposal facility which is to be maintained in perpetuity, and is also true notwithstanding the 25% contingency included in the Table 17.14 Cost Estimate for the LTC Alternative.

The Table 17.14 Cost Estimate in the DP for the LTC Alternative does not provide sufficient funds for remedial action, should that be required. In the event that radioactive contaminants are found at some future date to be escaping the cap into groundwater, for example, it is very unlikely that the amount of financial assurance provided for would be sufficient to fund recovery and treatment of contaminated groundwater along with modification of the cap to prevent continuing contamination. The annual amount allocated to "cap maintenance" is a mere \$7,440.00. The amount set aside for annual cap maintenance is only half of the \$14,376 set aside for annual paperwork review and a site inspection by the NRC once every five years by the NRC. Additionally, in the

event that SMC defaults on its obligation to operate and maintain the disposal site over its perpetual existence, a contractor would have to be hired by the NRC to maintain the disposal facility. Such a contractor will require a profit to maintain the disposal facility. The Table 17.14 Cost Estimate for the LTC Alternative does not provide sufficient funding to support a cost plus profit arrangement and therefore does not establish sufficient financial assurance. Burke Declaration ¶ 2 to 5.

10 C.F.R. §2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of fact.

SMC's DP asserts that the amount of financial assurance proposed for the LTC alternative is adequate.

Contention 9

THE SMC DP MISSTATES EXISTING SITE USE
RESTRICTIONS AND THEREFORE MISCHARACTERIZES
THE SITE AND EXPOSURE SCENARIOS

10 C.F.R. §2.309(f)(i) Provide a specific statement of the issue of law or fact.

The SMC DP misstates existing site use restrictions and therefore mischaracterizes the site and exposure scenarios.

10 C.F.R. §2.309(f)(ii) Provide a brief explanation of the basis for the contention.

A proposed restricted use decommissioning must demonstrate that the DP will meet the regulatory criteria for restricted use including the existence of institutional controls and exposure scenarios that provide reasonable assurance that exposure to radiation will not exceed the 25 mrem per year limit.

10 C.F.R. §2.309(f)(iii) Demonstrate that the issue raised is within the scope of the proceeding.

The SMC DP proposed and selects a restricted use alternative which must meet the requirements of 10 C.F.R. 1403.

10 C.F.R. §2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

For the NRC to make a determination on the proposed selected LTC alternative in the DP it must determine whether the TEDE requirement of 10 C.F.R. §1403 will be met.

10 C.F.R. §2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which petitioner intends to rely at hearing, together with reference to the specific sources and documents on which requestor/petitioner intends to rely to support its position on the issue.

In the discussion on page 41 of the DP about the reasonably likely foreseeable future use (100 years) scenarios for the site it is stated that there are existing site use restrictions due to natural resource restoration and potential future residential use restrictions due to chemically contaminated soil.

The DP also mentions the proximity of the Pinelands National Reserve, states that these restrictions will result in a land buffer to prevent construction in close proximity to the engineered barrier. SMC uses these assumptions in the dose assessment to limit the evaluation to non-residential exposure scenarios. The DP (page 89) also asserts that future residential use of the site will be prohibited by soil contamination levels. This approach is erroneous since these land use restrictions are only institutional controls that are considered to disappear under an "all controls fail" scenario. Gaffigan Dec. ¶ 8.

Nor have final decisions been made with respect to the nature and extent of cleanup of chemical contamination at the facility and whether some or all of the Newfield site will be restricted in use after chemical cleanup. Gaffigan Dec. ¶ 9. It is important to note that with properly managed engineering and institutional controls of areas with residual chemical contamination, no future use of the facility, including residential, is precluded. Id. It is therefore erroneous for SMC to suggest in the DP that chemical contamination precludes future residential use of the facility. Id. Foreseeable future use evaluation by SMC in the DP must include residential use. Id.

10 C.F.R. §2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of fact.

SMC's DP misstates existing site use restrictions.

Contention 10

THE SMC DP PROPOSES A LTC DISPOSAL DESIGN WHICH IS NOT PROTECTIVE OF GROUNDWATER OR HEALTH.

10 C.F.R. §2.309(f)(1) Provide a specific statement of the issue of law or fact.

The SMC DP proposes a LTC restricted use disposal design which is not protective of groundwater or health.

10 C.F.R. §2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The Atomic Energy Act, 42 U.S.C. 2012(D), 2201(B), and NRC regulations, 10 C.F.R. 1403, require that a restricted use decommissioning proposal be protective of health and the environment and that reductions in residential radioactivity be as low as reasonably achievable. The proposed selected LTC alternative does not meet those requirements.

10 C.F.R. §2.309(f)(iii) Demonstrate that the issue raised is within the scope of the proceeding.

SMC has submitted a DP which proposes and selects a LTC restricted use alternative which must meet the requirements of 10 C.F. R. §1403.

10 C.F.R. §2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

For the NRC to make a determination on the proposed selected LTC alternative in the DP it must determine whether the requirements of 10 C.F.R. §1403 have been met.

10 C.F.R. §2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which petitioner intends to rely at hearing, together with reference to the specific sources and documents on which requestor/petitioner intends to rely to support its position on the issue.

In chapter 5 of the DP (Dose Modeling) SMC improperly excludes the evaluation of groundwater as an exposure pathway on the basis that: the engineered barrier (cap) is designed to prevent rainwater infiltration; TCLP results show the slag will not leach radioactivity; groundwater is already contaminated with chemicals and is not a potable supply; it is unreasonable to assume that future site use would include an on-site drinking water well when a municipal water supply is near.

The assumptions in the DP are either incorrect or unsupported. The DP is contradictory in its discussion of the engineered barrier. In some sections the DP states that a geomembrane will be present to prevent water infiltration through the buried materials and in others the absence of such a membrane is noted. Also, at the public meeting held in Newfield on December 5, 2006, the NRC staff stated that the engineered barrier will be designed to allow rainwater infiltration. A permeable engineered barrier allows for the potential leaching of contaminants from the buried materials directly into the ground water. No liner is proposed beneath the contaminated material, and the material sites on the native sandy and very permeable soil.

The slags and baghouse dust were submitted to the

Toxicity Characteristic Leachability Procedure (TCLP) in 2005. The resulting "leachate" was then analyzed for radionuclides only, with the results presented in Appendix 19.4 of the DP. There are many problems with this analysis, including

- a. failure to analyze radioactively contaminated soils and building materials which will be buried under the engineered barrier;
- b. failure to analyze samples of materials which will be buried to determine if they are hazardous waste and banned for land disposal;
- c. failure to submit a sufficient number of samples to TCLP and subsequent radionuclide analysis to be representative of the materials to be disposed of under the engineered barrier;
- d. analytical results indicate that radium may leach from the slag and the DP is contradictory whether radionuclides will leach from the slag (e.g. DP pages 27 and 30).

Groundwater should not be eliminated or excluded in the DP as an exposure pathway. SMC's DP states that the groundwater at the facility is already contaminated and suggests it should therefore essentially be DISREGARDED as not worthy of protection from contamination by the proposed permanent radioactive waste

disposal pile. SMC has for 27 years operated a treatment system on site to remediate groundwater contamination caused by SMC. SMC's consultant, TRC Environmental Company, has entered into an oversight document with the NJDEP to remediate the chemical contamination in the ground water, soil, sediment and soil. TRC's goal is to remediate the ground water potable standard as quickly as possible, potentially within 20 years. It is incorrect to conclude that just because the groundwater is already contaminated it should be excluded as an exposure pathway and should not be protected against further contamination or should not be considered to be a potable source for the next 1000 years.

SMC's DP fails to mention that the current municipal supply wells are located less than one mile from the site and draw water from the same aquifer that SMC has contaminated. The wells are located upgradient of the site, but the presence of large volume irrigation wells in the immediate area, in conjunction with the constant pumping of the municipal wells, makes transport of the contamination towards and into the potable wells a real possibility over the next 1000 years. In addition, SMC is located in the New Jersey Coastal Plain Sole Source Aquifer and as such there are obvious limits to alternative water supplies. (see <http://www.epa.gov/region02/water/aquifer/coast/coastpln.htm#I19>). Protection of this resource is critical yet the DP fails to properly and fully consider and evaluate groundwater protection and

future use. Gaffigan Declaration ¶ 19.

10 C.F.R. §2.309(f) (vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of fact.

SMC's DP asserts on page 100 that the proposed selected LTC alternative is designed to prevent groundwater impact and that the groundwater exposure pathway need not be considered in dose modelling. The DP does not support this assertion.

Contention 11

**RESIDUAL RADIOACTIVITY FROM SMC'S OPERATIONS
IN SURFACE WATER AND SEDIMENT IS NOT
ADEQUATELY ADDRESSED IN THE DP.**

10 C.F.R. §2.309(f) (i) Provide a specific statement of the issue of law or fact.

Residual radioactivity from SMC's operations in surface water and sediment is not adequately addressed in the DP.

10 C.F.R. §2.309(f) (ii) Provide a brief explanation of the basis for the contention.

The Atomic Energy Act, 42 U.S.C. 2012(D), 2201(B), and NRC regulations, 10 C.F.R. 1403, require that a DP be protective of health and the environment and reductions and residual radioactivity be as low as reasonably achievable. The DP does not meet those requirements.

10 C.F.R. §2.309(f) (iii) Demonstrate that the issue raised is within the scope of the proceeding.

SMC has submitted a DP which proposes and selects a LTC

restricted use alternative which fails to address radioactivity identified in the DP in sediment and/or surface water.

10 C.F.R. §2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding

For the NRC to make a determination on the proposed selected LTC alternative in the DP the NRC must determine whether it is protective of health and the environment.

10 C.F.R. §2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which petitioner intends to rely at hearing, together with reference to the specific sources and documents on which requestor/petitioner intends to rely to support its position on the issue.

Residual radioactivity has been identified in the Hudson's Branch as indicated in the DP Executive Summary and Appendix 19.9, Environmental Report. The data referenced is from a 1992 report which concluded that the radioactivity detected in the Hudson's Branch water and sediments is not significantly different from background. It does not appear that sampling of the stream has been conducted since 1991. Existing sediment and/or surface water contamination does not appear to be adequately addressed in the DP. Gaffigan Declaration ¶ 19.

10 C.F.R. §2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of fact.

SMC's DP fails to address sediment and/or surface water contamination identified in the DP.

Contention 12

THE LTC LICENSE SOUGHT BY SHIELDALLOY FAILS TO ADEQUATELY PROTECT THE PUBLIC SAFETY AND HEALTH FOR MATERIALS CONTAINING LONG LIVED NUCLIDES.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

The LTC license violates the Low-Level Radioactive Waste Policy Act ("LLRWPA"), the Atomic Energy Act ("AEA"), and the intent of the LTR.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The LLRWPA requires "the permanent isolation of low-level radioactive waste pursuant to the requirements established by the Nuclear Regulatory Commission under applicable laws, or by an agreement State if such isolation occurs in such agreement State." 42 U.S.C. § 2021b(7). Thus, the LLRWPA requires the "permanent isolation" of low-level radioactive waste.

Furthermore, NRC's paramount responsibility, as required by the AEA, is to regulate radiological material in a manner that protects the public health and safety. 42 U.S.C. §§ 2012(d), 2013(d), 2022(f)(3), (referring to § 2022(b)(2)), 2099, 2111(b)(1)(A), 2113(b)(1)(A), 2114(a)(1), 2201(b). The Supreme Court held that "[the] Commission's prime area of concern in the licensing context, . . . is national security, public health, and safety." Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190, 207 (1983)

The intent of the decommissioning regulations is to limit the release of sites containing long-lived nuclides to unrestricted release. 62 Fed. Reg. at 39069 (Response B.3.2). The NRC stated: "termination of a license for unrestricted use is preferable because it requires no additional precautions or limitations on use of the site after licensing control ceases, in particular for those sites with long-lived nuclides." Id. Short-lived nuclides include radioactive materials where the half-lives are between 5.3 and 30 years and which would decay to unrestricted dose levels in about 10-60 years. 62 Fed. Reg. at 39069. Such short-lived nuclides can be safely secured under restricted release through the use of institutional control. Id.

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP that is seeking to decommission under restricted release using the LTC license for institutional controls.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

NRC must determine whether the LTC license proposed in the DP will provide adequate institutional controls to permanently isolate the low-level radioactive waste and protect the public health and safety.

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely

at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

Shieldalloy radioactive waste contains thorium-232, which has a half-life of over 14 billion years, and uranium-238, which has a half-life of over 4 billion years. Goodman Dec. ¶ 2. It is self-evident that neither Shieldalloy nor a private third party trustee can be expected to endure in perpetuity to enforce the LTC license.

With regards to onsite disposal by facilities that continue operating at the site under a license, NRC Staff admitted that there exists "uncertainties associated with the burial performance and potential releases of contamination, transport of contamination in the subsurface environment, cleanup costs of subsurface contamination, and future disposal costs." SECY-06-0143 page 5. These releases and transport of contamination occur even in cases where the materials are disposed onsite for a limited period of time and then disposed offsite under the LTR. Id.

The problems of contamination and transport of contamination related to disposals that remain onsite for a limited period of time is even more applicable to onsite disposals of long-lived nuclides that remain onsite in perpetuity pursuant to the LTR. Goodman Dec. ¶ 5. Facilities disposing long-lived nuclides onsite under the LTC license have a much higher likelihood of releasing and transporting contamination over the thousands,

millions, or billions of years that long-lived nuclides remain a radioactive hazard. Id.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

The DP states that it is unlikely that all controls will fail when utilizing the LTC license. DP rev. 1a page 31. However, the NJDEP asserts that it is self-evident that all controls will fail since neither Shieldalloy nor and independent third-party trustee can be expected to endure for the billions of years that the waste remains a radiological hazard.

Contention 13

THE DP CONFLICTS WITH THE REGULATIONS REGARDING TERMINATION OF THE LICENSE UPON DECOMMISSIONING.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

The DP seeks to amend Shieldalloy's current license to a LTC license upon decommissioning. DP rev. 1 page 155. However, amending its current license upon decommissioning would violate the regulatory provisions requiring termination of the license upon decommissioning.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis

for the contention.

The DP provides that the LTC license would be used to satisfy the LTR requirement for enforceable institutional controls over the site. DP rev 1 page 155.

The regulations define "decommission" as follows:

to remove a facility or site safely from service and reduce residual radioactivity to a level that permits -

(1) Release of the property for unrestricted use and termination of the license; or

(2) Release of the property under restricted conditions and termination of the license.

10 C.F.R. §§ 20.1003, 30.4, 40.4, 50.2, 70.4, 72.3
(emphasis added).

Under the LTR, termination of the license under unrestricted use occurs when, among other factors, residual radioactivity results in a "TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year."

10 C.F.R. § 20.1402. License termination under restricted use occurs when, among other factors, "[r]esidual radioactivity at the site has been reduced so that if the institutional controls were no longer in effect, there is reasonable assurance that the TEDE from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either -- (1) 100 mrem (1 mSv) per

year; or (2) 500 mrem (5 mSv) per year provided that the licensee--
... " 10 C.F.R. § 20.1403(e).

The DP models the TEDE based upon a 1000 year modeling, regardless of the duration of the radiological hazard. Furthermore, as discussed in greater detail in Contention 5, when realistic assumptions are used, including the dose contributions from the drinking water pathway, but even excluding the gamma exposure pathway, modeling indicates a TEDE of 1,718 mrem per year at year 800. Goodman Dec. 11. Thus, because the TEDE from residual radioactivity distinguishable from background to the average member of the critical group exceeds 500 mrem, residual radioactivity has not been reduced to permit termination of the license.

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP that seeks a LTC license upon decommissioning for the institutional controls.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

The NRC must determine whether the proposed decommissioning and issuance of the LTC license would violate the LTR by failing to reduce residual radioactivity to a level that permits license termination as required by 10 C.F.R. § 20.1403(e).

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely

at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

The DP measures the TEDE from residual radioactivity based upon a 1000 year modeling, even though the radiological hazard will endure for billions of years. Goodman Dec. ¶ 2. As discussed in Contention 1, the 1000 year modeling in this case violates the AEA, the LLRWPA, and the LTR. Dose modeling should be required for the entire duration of the radiological hazard. Goodman Dec. ¶ 3.

As discussed in greater detail in Contention 5, when realistic assumptions are used, including the dose contributions from the drinking water pathway, but even excluding the gamma exposure pathway, modeling indicates a TEDE of 1,718 mrem per year at year 800. Goodman Dec. 11.

The conflict between the LTR and the LTC license for long-lived nuclides is admitted by NRC in the following statement: "NRC licensing oversight for some sites could be permanent because the current sites considering restricted release are sites with uranium and thorium contamination. Although this NRC role was not envisioned under the LTR" SECY-03-0069 page 27.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

The DP states that the TEDE from residual radioactivity

will not exceed 100 mrem assuming that institutional controls fail and engineering controls degrade gradually. DP rev. 1 section 5.5. However, NJDEP's modeling finds that the TEDE would be 1,718 mrem/yr at 800 years. Goodman Report page 11.

Contention 14

SHIELDALLOY FAILED TO ADEQUATELY ELICIT OR CONSIDER PUBLIC INPUT ON THE DECOMMISSIONING PROPOSAL.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

The DP failed to consider public input through the Site Specific Advisory Board. Furthermore, the DP fails to consider the strong and nearly universal public opposition to the DP.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The LTR requires licensees proposing to decommission using the restricted use option to "seek advice from such affected parties regarding . . . the proposed decommissioning," including whether the proposed institutional controls "[w]ill not impose undue burdens on the local community or other affected parties" and whether adequate financial assurance will be provided. 10 C.F.R. § 20.1403(d)(1). The licensee is also required to provide "[a]n opportunity for a comprehensive, collective discussion on the

issues by the participants represented." Id. § 20.1403(d)(2)(ii).

The DP must then demonstrate "how the advice of individuals and institutions in the community who may be affected by the decommissioning has been sought and incorporated, as appropriate, following analysis of that advice." 10 C.F.R. § 20.1403(d).

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

The LTR requires Shieldalloy to elicit public advice on the decommissioning plan and requires the advice to be incorporated into the DP. 10 C.F.R. § 20.1403(d). Shieldalloy has failed to adequately elicit public advice or to incorporate it into the DP. Gaffigan Dec. ¶¶ 3-7.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

In reviewing the DP, NRC must determine whether Shieldalloy complied with 10 C.F.R. § 20.1403(d) by adequately eliciting and incorporating public advice into the decommissioning proposal.

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and

documents on which the requestor/petitioner intends to rely to support its position on the issue.

Shieldalloy failed to adequately elicit public advice on their decommissioning plan. Shieldalloy convened four meetings of a Site Specific Advisory Board ("SSAB"). However, the SSAB failed to adequately elicit public advice on the proposed decommissioning. Gaffigan Dec. ¶ 4. The SSAB never selected a chairperson or adopted a charter or operating procedures. Id. Instead, Shieldalloy's legal counsel conducted the meetings by simply advancing Shieldalloy's arguments in support of the decommissioning. Id. Members of the SSAB were encouraged to ask questions during the meetings, but there was never an opportunity for members to discuss their own issues among themselves without the direction of Shieldalloy. Id.

Shieldalloy failed to provide sufficient information to the SSAB members in order to provide advice on certain issues. Id. ¶ 5. For example, the members could not provide advice on whether the proposed institutional controls would assure that an average member of the public would not incur a radiation dose in excess of 25 millirem Total Effective Dose Equivalent (TEDE). Id. Shieldalloy failed to provide sufficient information to provide advice on this issue, such as the characterization of the slag and baghouse dust or the engineering design of the engineered cap. Id.

Also, Shieldalloy failed to provide sufficient information to the SSAB members in order to provide advice on

whether the \$5 million financial assurance would be adequate to enable an independent third party to assume responsibility for control and maintenance of the site. Id. ¶ 6. Shieldalloy did not provide information regarding the engineering design of the proposed barrier. Id.

The DP fails to acknowledge the strong public opposition to the proposed onsite disposal. Elected officials from the local municipalities, the county, and State and Federal offices have staunchly opposed the DP. Exhs. E to L. The NJDEP and other SSAB members (besides Shieldalloy's counsel) were unanimous in opposing the DP. Id. ¶ 7. These office holders and SSAB members have been unanimous in advising Shieldalloy that institutional controls would not be enforceable for the billions of years that the waste remains a radioactive hazard. Id. The NJDEP and members from the public were unanimous in advising that the institutional controls would impose undue burdens on the local community. Id. However, the only time that the DP cites public advice is when it states that the "public strongly support[s]" the provisions of the DP concerning the financial assurance, the LTC license, and the sale of portions of the land that will be released for unrestricted use. DP rev. 1 page 154, note 102. Thus, the DP clearly fails to incorporate the public outcry against the proposed onsite disposal.

Furthermore, where public opposition actually is acknowledged by the DP, the DP still fails to adequately address

the particular opposition. For example, the SSAB advised that the institutional controls proposed will not be enforceable for the time period required, in perpetuity. Gaffican Dec. ¶ 7. The DP responds that it is reasonable to assume that the Federal government will remain in perpetuity to enforce the provisions of the LTC license to require institutional controls. DP rev. 1 page 164. However, the DP fails to acknowledge that it will be Shieldalloy or a private trustee that will be the licensee who owns the site that would have the responsibility to enforce the institutional controls into perpetuity. It is self-evident that a private company cannot be expected to endure into perpetuity to enforce the provisions of a LTC license. Although the Federal government may have the power to enforce environmental permits into perpetuity, it is self-evident that the licensee will eventually cease to exist and the Federal government will have no entity to which to enforce the LTC license. Furthermore, the DP fails to acknowledge that institutional and engineering controls will completely fail if the \$5 million proposed for financial assurance is not sufficient last into perpetuity.

Also, while the DP acknowledges the SSAB comment that the institutional controls may prevent the development of the surrounding area and thus impose an undue burden, DP rev. 1 page 166-67, the DP fails to adequately address this comment. The DP simply responds that there will be no restrictions on the portion

of the property that would be released for restricted use. However, it is self-evident that people do not wish to live or work near a low-level radioactive waste site. See, e.g., Report to the Governor: Disposal Options Report, (1999), <http://www.nj.gov/dep/rpp/llrw/download/disposal.pdf>. The DP thus fails to address the fact that the onsite disposal will have an undue economic impact on the local community.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

As discussed in the previous section, Shieldalloy failed to adequately elicit public advice on their decommissioning plan because there was never an opportunity for the SSAB members to discuss their problems with the DP. Gaffigan Dec. ¶ 4. However, the DP states that the first two SSAB meetings "were spent discussing the decommissioning plans." DP rev. 1 page 161.

Shieldalloy failed to provide sufficient information to comment on the TEDE limit or the proposed financial assurance. Gaffigan Dec. ¶¶ 5, 6. However, the DP disputes this contention. DP rev. 1 page 161.

Also as addressed in the previous section, the DP fails to address the public opposition against the onsite disposal or the particular issues raised by the SSAB. Gaffigan Dec. ¶ 7; Exhs. E to L. The DP actually states that the "public strongly support [s]" the provisions of the DP concerning the financial assurance, the LTC

license, and the sale of portions of the land that will be released for unrestricted use. DP rev. 1 page 154, note 102. Yet, the public has asserted its strong opposition to the onsite disposal. Gaffigan Dec. ¶ 7; Exhs. E to L.

Contention 15

THE LTC LICENSE SOUGHT BY SHIELDALLOY
CONFLICTS WITH THE REGULATIONS REGARDING THE
RADIOLOGICAL CRITERIA FOR UNRESTRICTED AND
RESTRICTED USE.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

The LTC license sought by Shieldalloy conflicts with the intent of the LTR, 20 C.F.R. §§ 20.1402, 20.1403, because Shieldalloy is seeking to conduct onsite disposal of long-lived nuclides.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The intent of the decommissioning regulations is to limit the release of sites containing long-lived nuclides to unrestricted release. 62 Fed. Reg. at 39069 (Response B.3.2). The NRC stated: "termination of a license for unrestricted use is preferable because it requires no additional precautions or limitations on use of the site after licensing control ceases, in particular for those sites with long-lived nuclides." Id.

Short-lived nuclides include radioactive materials where

the half-lives are between 5.3 and 30 years and which would decay to unrestricted dose levels in about 10-60 years. 62 Fed. Reg. at 39069. Such short-lived nuclides can be safely secured under restricted release through the use of institutional control. Id. 10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP that seeks to decommission under restricted release by conducting onsite disposal of radioactive waste containing long-lived nuclides. Shieldalloy is seeking the LTC license upon decommissioning to constitute the institutional controls.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

The NRC must determine whether issuing the LTC license to Shieldalloy, which would constitute the institutional controls for the onsite disposal of long-lived nuclides, would violate the LTR.

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

The LTC license makes it easier for decommissioning facilities to conduct onsite disposal of radioactive materials containing long-lived nuclides under restricted release. Goodman

Dec. ¶ 4. The LTC license allows a facility to conduct onsite disposal of long-lived nuclides where the Federal or State government is not willing to take ownership or control of the site. Id. This will create a greater number of decommissioned facilities with onsite disposals of long-lived radioactive waste under restricted release throughout the country. Id. Additional disposal sites multiply the number of locations which present a risk to public health and the environment, and require the additional expenditure of human resources and funds to regulate and maintain an additional disposal facilities.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

NRC believes that NUREG-1757 complies with the LTR. NRC Response to Comment 2.4.3. (Document # ML062370521).

Contention 16

THE LTC LICENSE VIOLATES NRC POLICIES BY PROMOTING THE CREATION OF LEGACY SITES.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

The LTC license will create additional legacy sites throughout the country by making it easier to obtain approval for the restricted release option for long-lived nuclides without

adequate protection to the public health. Goodman Dec. ¶¶ 4, 5. However, this result is in direct contradiction to settled NRC policy to prevent future legacy sites. SECY-03-0069 Attach. 4 page 3; SECY-06-0143 pages 5 to 7. The LTC license is in conflict with settled NRC policy and is therefore arbitrary and capricious.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

While agencies may reverse settled policy, such reversals must have a rational basis and may not be arbitrary and capricious. Citizens Awareness Network v. NRC, 59 F.3d 284, 291 (1st Cir. 1995). Furthermore, the reversal must be accompanied by some reasoning to indicate that the reversal is not arbitrary and capricious. Id.

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP that seeks to decommission under restricted release using the LTC license for institutional controls.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

NRC must demonstrate a rational basis for its violation of policy and demonstrate that issuing a LTC license to SMC is not arbitrary and capricious.

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and

documents on which the requestor/petitioner intends to rely to support its position on the issue.

NRC has continually reasserted its policy to prevent future legacy sites. SECY-03-0069 Attach. 4 page 3; SECY-06-0143 pages 5 to 7. A legacy site is defined as "[a]n existing decommissioning site that is complex and difficult to decommission for a variety of financial, technical, or programmatic reasons." NUREG-1757 vol. 1 page xxxii.

On May 2, 2003, the NRC issued SECY-03-0069, which discussed its policy of preventing legacy sites. The NRC stated in SECY-03-0069 that the restricted releases under a dose criterion of 1 millisievert per year ("mSv/yr") (100 mrem/yr) gives the licensee the most flexibility to conduct onsite disposals. SECY-03-0069 Attach. 4 page 3. While NRC stated that such option could lead to additional legacy sites, requiring additional financial assurance would help ensure remediation of the onsite disposal to comply with the dose restrictions when the facility decides to decommission under the LTR. Id.

On July 5, 2006, NRC revisited the problem of legacy sites in SECY-06-0143. In this latest document, NRC stressed that allowing a dose criterion of 1 mSv/yr (100 mrem/yr) and requiring additional financial assurance could still lead to the creation of additional legacy sites. SECY-06-0143 page 5. The NRC reasoned that the amount of additional financial assurance required may likely be underestimated "because of uncertainties associated with the burial

performance and potential releases of contamination, transport of contamination in the subsurface environment, cleanup costs of subsurface contamination, and future disposal costs." Id. The NRC therefore recommended finalizing decommissioning guidance and to conduct rulemaking to only allow onsite disposals resulting in doses no greater than a few millirem per year. Id. page 5 to 6. NRC may approve higher dose criteria based on the following considerations: (a) time of potential dose impacts based on half-lives of the material; (b) mobility of the material to be disposed; (c) additional financial assurance; and (d) other aspects that ensure that the facility will not become a future legacy site. Id. page 5.

The NRC is currently developing a rule and associated guidance to prevent future legacy sites for onsite disposals. Id. at 6.

This NRC policy regarding legacy sites was discussed in the context of onsite disposals for facilities that continued to operate under a license. Id. page 3. After the onsite disposal, these facilities would continue to operate until they decide to decommission the entire site subject to the LTR. Id. The NRC concluded that for the limited time that passed between the onsite disposal and the facility-wide decommissioning, uncertainties still exist for the burial performance and potential releases of contamination, transport of contamination in the subsurface

environment, cleanup costs of subsurface contamination, and future disposal costs. Id. page 5. Such concerns are warranted to a much greater extent for facilities disposing long-lived nuclides onsite under the LTR that remain hazardous in perpetuity. Goodman Dec. ¶ 5. In the case of LTR onsite disposals containing long-lived nuclides, it is more likely that controls will eventually fail and cause the release of contamination thereby posing a hazard to the public. Goodman Dec. ¶¶ 4, 5. Such is the case at the Shieldalloy site where some of the radionuclides contained in the radioactive waste at Shieldalloy are thorium-232, which has a half-life of over 14 billion years, and uranium-238, which has a half-life of over 4 billion years. Goodman Dec. ¶¶ 2, 4, 5.

Although NRC policy of preventing legacy sites for onsite disposals is clear, NUREG-1757 directly contradicts this policy by allowing the creation of additional legacy sites under the LTR. NUREG-1757 will create additional legacy sites by making it easier for facilities to permanently dispose of radioactive materials containing long-lived nuclides in a number of ways. Goodman Dec. ¶ 4. First, NUREG-1757 allows the durable institutional control requirement to be met by the issuance of the LTC license or the LA/RC for sites containing long-lived nuclides where the Federal or State government is not willing to take ownership or control of the site. See NUREG-1757 vol. 1 pages 17-65 to 67. NUREG-1757 admits that the LTC license will be issued for sites where complex

monitoring or maintenance activities, including maintenance of an engineered barrier or continued monitoring of groundwater or radiological hazards, are needed at a restricted use site. NUREG-1757 vol. 1 page 17-66.

Second, NUREG-1757 allows for dose assessments of 1,000 years, regardless of the duration of the radioactive hazard. NUREG-1757 vol. 1 pages 17-87 to 17-88. 1,000 year dose modeling is not adequate for long-lived nuclides. Goodman Dec. ¶ 3. The 1000 year time frame for dose assessment is clearly not appropriate for materials that have a half-life of billions of years. Goodman Dec. ¶ 3.

Third, by limiting the analysis to these time periods, regardless of the radioactive half-life of the materials, facilities will now have greater flexibility to choose the onsite disposal and restricted release option. Goodman Dec. ¶ 4. NRC admits that the restricted releases under a dose criterion of 1 mSv/yr (100 mrem/yr) gives the licensee the most flexibility to conduct onsite disposals. SECY-03-0069 Attach. 4 page 3.

Fourth, NUREG-1757 underestimates the amount of financial assurance required by a licensee, thereby making permanent onsite disposal upon decommissioning under NUREG-1757 more attractive to licensees. NUREG-1757 claims that the licensee must provide sufficient financial assurance so that the licensee funds the long-term control of the site with no additional costs being passed on.

to a future site owner/licensee, even where a site contains long-lived nuclides. NUREG-1757 vol. 1 pages 15-2 and 17-82. However, this reliance on financial assurance ignores the NRC conclusions that the amount of additional financial assurance required may likely be underestimated "because of uncertainties associated with the burial performance and potential releases of contamination, transport of contamination in the subsurface environment, cleanup costs of subsurface contamination, and future disposal costs." SECY-0600143 page 5. These conclusions were made regarding onsite disposal by licensed facilities that would continue operating at the site and may be subject to future remediation when the facilities decide to permanently decommission their entire site and terminate their license. Id. NRC concluded that uncertainties associated with the burial performance and potential releases of contamination and transport of contamination in the subsurface environment existed for the limited time periods that facilities continued to operate. Id.

Furthermore, NUREG-1757 fails to require adequate financial assurance because it ignores the effects of inflation. Burke Dec. ¶ 3. Money set aside today will gradually be reduced by the effects of inflation. Id. If the effects of inflation are considered, the applicant would be required to post greater financial assurance. Id. Furthermore, the longer the period of time is required to maintain financial assurance, the greater the

underestimation of the amount of financial assurance will be. Id.

The problems of contamination and transport of contamination related to disposals that remain onsite for a limited period of time is even more applicable to onsite disposals of long-lived nuclides that remain onsite in perpetuity pursuant to the LTR. Goodman Dec. ¶ 5. Facilities disposing long-lived nuclides onsite under the LTC or LA/RC are more likely to release and transport contamination over the thousands, millions, or billions of years that long-lived nuclides remain a radioactive hazard. Id. It is therefore arbitrary and capricious for NRC to conclude that adequate financial assurance can be provided for long-lived nuclides where controls are required in perpetuity (as is the case in Shieldalloy) even though NRC admits that underestimation of the financial assurance is a problem for sites that are decommissioned for a limited period of time.

NRC admitted that "uncertainties" existed regarding contamination and transport of contamination for onsite disposal for facilities that continue to operate, even under current NRC regulations. SECY-06-0143 page 5. NRC therefore recommended the promulgation of a new rule. Id. at 6. NRC further admits that the emphasis of 10 C.F.R. Part 20 is for the protection of the public and workers from "imminent exposures" to excessive radiation, "not projected long-term exposures." SECY-03-0069. Such concerns are warranted to a much greater extent for facilities disposing long-

lived nuclides onsite under the LTR since it is reasonable to assume that facilities disposing long-lived nuclides onsite under the LTR have a higher likelihood of releasing and transporting contamination over the thousands, millions, or billions of years that long-lived nuclides remain a radioactive hazard. Goodman Dec.

¶ 5.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

NRC issued NUREG-1757, which provides for the LTC license, despite its policy against the creation of legacy sites.

See SECY-06-0143.

UNITED STATES NUCLEAR REGULATORY COMMISSION

Docket No. 04007102

IN RE PETITION FOR A HEARING on)
the SHIELDALLOY METALLURGICAL)
CORP. DECOMMISSIONING PLAN,)
pursuant to 10 C.F.R. § 2.309)
and 42 U.S.C. § 2239(a)(1))
(A))

PETITION FOR A HEARING
PART II OF III

Environmental Contentions

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UNITED STATES NUCLEAR REGULATORY COMMISSION

Docket No. 04007102

IN RE PETITION FOR A HEARING on)
the SHIELDALLOY METALLURGICAL)
CORP. DECOMMISSIONING PLAN,)
pursuant to 10 C.F.R. § 2.309)
and 42 U.S.C. § 2239(a) (1))
(A))

PETITION FOR A HEARING
PART III OF III

Miscellaneous Contention

Submitted by:

State of New Jersey,
Department of Environmental Protection

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Contention 17

THE NRC MAY NOT ISSUE A LTC LICENSE UNTIL IT PROMULGATES RULES AND REGULATIONS TO ESTABLISH ITS TERMS AND CONDITIONS.

10 C.F.R. § 2.309(f)(i) Provide a specific statement of the issue of law or fact to be raised or controverted.

The NRC is required to promulgate rules or regulations when setting forth the information an applicant for a license is required to submit or when the NRC establishes the form and conditions of a license pursuant to the AEA. 42 U.S.C. §§ 2022(f)(3) 2232(a), 2233.

10 C.F.R. § 2.309(f)(ii) Provide a brief explanation of the basis for the contention.

The AEA provides as follows:

Each application for a license hereunder shall be in writing and shall specifically state such information as the Commission, by rule or regulation, may determine to be necessary to decide such of the technical and financial qualifications of the applicant, the character of the applicant, the citizenship of the applicant, or any other qualifications of the applicant as the Commission may deem appropriate for the license.

42 U.S.C. § 2232(a) (emphasis added). The AEA also provides the following: "Each license shall be in such form and contain such terms and conditions as the Commission may, by rule or regulation, prescribe to effectuate the provisions of this chapter." 42 U.S.C. § 2233 (emphasis added).

The AEA also requires the NRC to promulgate regulations or rules regarding the disposal of byproduct material. Environmental Defense Fund v. U.S. N.R.C., 902 F.2d 785, 789-90 (10th Cir. 1990). The AEA provides: "Not later than 6 months after the date on which the Administrator promulgates final standards pursuant to subsection (b) of this section, the Commission shall, after notice and opportunity for public comment, amend the October 3 regulations, and adopt such modifications, as the Commission deems necessary to conform to such final standards of the Administrator." 42 U.S.C. § 2022(f)(3). The referenced subsection (b) requires the EPA to promulgate regulations concerning the protection of the public health, safety and the environment from radiological and nonradiological hazards associated with the possession, transfer, and disposal of byproduct material. Id. § 2022(b)(1). The U.S. Court of Appeals for the Tenth Circuit held that this provision of the AEA requires the NRC to promulgate rules or regulations regarding the disposal of byproduct material. Environmental Defense Fund, 902 F.2d at 789-90.

A rule or regulation imposes rights and obligations on a person or entity. Texaco, Inc. v. Federal Power Com., 412 F.2d 740, 744 (3d Cir. 1969). A rule or regulation creates a binding standard on an agency and the regulated public. Cabais v. Egger, 690 F.2d 234, 237 (D.C. Cir. 1982); Guadamuz v. Bowen, 859 F.2d 762, 767 (9th Cir. 1988).

10 C.F.R. § 2.309(f)(iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding.

Shieldalloy has submitted a DP that seeks a LTC license upon decommissioning. DP rev. 1 page xxv.

10 C.F.R. § 2.309(f)(iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding.

For NRC to review the DP, it must determine whether it is permitted by the AEA to issue a LTC license despite the existence of an applicable rule or regulation.

10 C.F.R. § 2.309(f)(v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue.

NUREG-1757 states that it is a guidance document that does not establish a binding norm. NUREG-1757, Vol. 1, page xvii ("This NUREG is not a substitute for NRC regulations, and compliance with it is not required."). However, NUREG-1757 provides a new license called LTC license though a guidance document. NUREG-1757 vol. 1 page 17-65. NUREG-1757 provides various terms and conditions that an LTC license would provide. NUREG-1757 vol. 1 pages 17-65 to 17-66, 17-79 to 17-80. Furthermore, NUREG-1757 sets forth guidance on the information that an applicant should submit in an application for a LTC license. NUREG-1757 vol. 1 pages 17-71 to 17-82; vol. 2 pages 2-4 to 2-15. Also, NUREG-1757 applies to the

disposal of byproduct material at a decommissioned facility. NUREG-1757 vols. 1 and 2 page xv.

10 C.F.R. § 2.309(f)(vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

NRC believes that NUREG-1757 does not require rulemaking because the changes are within the scope of the LTR requirements.

NRC Response to Comment 2.4.3. (Document # ML062370521).

CONCLUSION

In light of the preceding, the NJDEP respectfully requests NRC to grant a hearing regarding on the DP because Shieldalloy's proposed decommissioning will not protect the public health and safety and the LTC license sought by Shieldalloy will violate the law. A hearing should be granted because a genuine dispute exists regarding these issues.

Respectfully submitted,

STUART RABNER
ATTORNEY GENERAL OF NEW JERSEY

Dated: 1/16/07

By: *Andrew Reese*

ANDREW D. REESE
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COMMISSIONER

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

February 22, 2007

DOCKETED
USNRC

February 22, 2007 (3:55pm)

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

SERVED February 22, 2007

Eric E. Jackson, President
Shieldalloy Metallurgical Corporation
435 Devon Park Drive
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Wayne, PA 19087

Dear Mr. Jackson:

Thank you very much for taking the time to present information to me regarding your facility in Newfield, New Jersey, and the tour of the facility. I found the tour very informative. I understood you to say during your presentation that you believed the "Settlement Agreement of Environmental Claims and Issues By and Between Debtors and the United States of America and the State of New Jersey," was a binding document in which the NRC had agreed both that the slag pile could be left onsite, and that the cost to the company of decommissioning would not exceed 5 million dollars. This statement has been widely repeated in the press as well.

Since returning to my office, I have reviewed the settlement agreement, which is Appendix K of your decommissioning plan. I do not agree with your characterization of the content of the settlement agreement. I would particularly commend to you the following paragraphs.

A. "Shieldalloy and the United States have agreed that for purposes of determining financial assurance only, the dollar amounts assigned to each of the Environmental Projects are as follows: . . . NRC Slag Pile Remediation 5.0." Page 19, Paragraph 14.

B. "It is agreed and understood that the Predetermined Costs as identified in paragraph 14 of this Settlement Agreement in no way constitute a cap or limitation on Shieldalloy's continuing obligations to comply with state and federal environmental laws or with the NJ ACO." Page 34, Paragraph 40.

C. "Nothing in this Settlement Agreement shall release Shieldalloy or a subsequent owner or operator of the Newfield or Cambridge sites from complying with applicable state and federal environmental laws." Page 35, Paragraph 43.

D. "Nothing in this Settlement Agreement shall be construed to affect the NRC's regulatory authority over the Newfield site or the Cambridge site, including, but not limited to, the NRC's authority relating to the decommissioning of the Sites, and the NRC's authority to require Shieldalloy to post separate financial assurance, above and beyond the amounts set forth in this Settlement Agreement." Page 37-38, Paragraph 50.

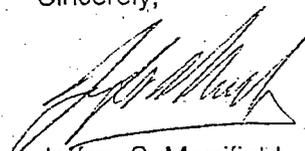
The NRC currently has before it your proposed decommissioning plan. The NRC will, in accordance with its regulatory responsibilities, review the plan and determine whether or not it is acceptable.

E. Jackson

-2-

Finally, as I stated during my visit, I would encourage further dialogue between your staff and the other interested parties to determine if there are other options, in addition to onsite decommissioning, that may be able to resolve the final cleanup and reuse of this site in a cost effective way.

Sincerely,



Jeffrey S. Merrifield

cc: Parties to the Proceeding
Congressman Frank A. LoBiondo
Congressman Robert E. Andrews
Senator Robert Menendez
Senator Frank R. Lautenberg

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)

SHIELDALLOY METALLURGICAL CORP.)

(License Amendment Request for)
Decommissioning the)
Newfield, New Jersey Facility))

Docket No. 40-7102-MLA

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing LETTER FROM COMMISSIONER JEFFREY S. MERRIFIELD TO ERIC E. JACKSON, PRESIDENT, SHIELDALLOY METALLURGICAL CORPORATION, have been served upon the following persons by electronic mail this date, followed by deposit of paper copies in the U.S. mail, first class, and NRC internal mail on 02/23/2007.

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Docket No. 40-7102-MLA
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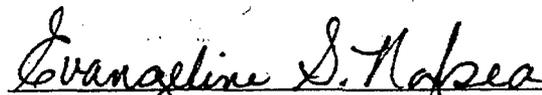
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Office of the Secretary of the Commission

Dated at Rockville, Maryland
this 22nd day of February 2007

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Alan S. Rosenthal, Chairman
Dr. Richard E. Wardwell
Dr. William H. Reed

In the Matter of

SHIELDALLOY METALLURGICAL CORP.

(Licensing Amendment Request for
Decommissioning of the Newfield, New Jersey
Facility)

Docket No. 40-7102-MLA

ASLBP No. 07-852-01-MLA-BD01

March 28, 2007

MEMORANDUM AND ORDER
(Ruling on Hearing Requests)

This proceeding had its genesis in the publication of a notice in the Federal Register to the effect that the Commission was considering the issuance of an amendment to Source Material License No. SMB-743 that had been issued to the ShieldAlloy Metallurgical Corporation [Licensee]. If granted, the amendment will authorize, in accordance with a submitted plan, the decommissioning of the Licensee's facility where the licensed activities had been conducted. The site is located in the Borough of Newfield, Gloucester County, New Jersey. The notice provided the customary opportunity for persons whose interest might be affected by the proceeding to file a written request for a hearing on the proposed amendment. 71 Fed. Reg. 66,986 (Nov. 17, 2006).

In response to the notice, hearing requests were filed by or on behalf of a number of governmental entities within the State of New Jersey: the New Jersey State Department of Environmental Protection [New Jersey]; Gloucester County; nearby Cumberland County; and the

Borough of Newfield. In addition, a joint request was received from three members of the New Jersey State Legislature (Fred H. Madden, David R. Mayer, and Paul Moriarity) and two such requests were submitted by private citizens (Loretta Williams and Terry Ragone, the latter said to be acting in a representational capacity on behalf of Newfield residents). Responses to each hearing request were filed by the Licensee and the NRC Staff. New Jersey alone submitted a reply to those responses.

Upon consideration of the filings before us, and for the reasons set forth below, solely the New Jersey request is being granted. Each of the others is being denied as not satisfying the requirements of the applicable provisions of the Commission's Rules of Practice. Despite the denial of their requests, however, as will be seen, the two counties and the borough will be entitled to participate as non-parties in any hearing ultimately held on issues raised by New Jersey.

Subject to reconsideration at the behest of one or more of the parties, we have additionally decided to defer all further proceedings in this matter to await the completion of the NRC Staff's safety and environmental review of the tendered decommissioning plan and the issuance of the documents reflecting the results of that review. That deferral includes threshold consideration of all of New Jersey's contentions other than the one that we have found to provide a sufficient basis for the grant of its hearing request.

BACKGROUND

As explained in the Federal Register notice, supra, the Licensee has been conducting smelting and alloy production at its Newfield site since 1940. Among other things, during an extended period ending in June 1998, the facility processed pyrochlore, a concentrated ore

containing columbium (niobium), to produce ferrocolumbium, an additive/conditioner used in the production of speciality steel and super alloy additives.

Because pyrochlore contains more than 0.05 percent by weight uranium and thorium, it is subject to NRC regulation as a source material. See 10 C.F.R. § 40.4. Accordingly, the Licensee sought and obtained license No. SMB-743 that entitled it to ship, to receive, to possess, and to store such material.

In August 2001, the Licensee advised the Commission that it had ceased using source material and intended to decommission the Newfield facility. As a consequence of this development, the license was later amended in November 2002 to authorize only decommissioning activities. In October 2005, the Licensee submitted its initial decommissioning plan (DP), which proposed the use of a possession-only license for long-term control of the site. According to the Federal Register notice, that plan was rejected by the NRC Staff. A revised DP, submitted on June 30, 2006, was, however, found acceptable by the Staff for the purpose of initiating the technical review of the plan that will eventually produce both a safety evaluation report (SER) and an environmental impact statement (EIS).

In broad outline, although not discussed in the notice, the revised DP now under NRC Staff review addresses principally an accumulation on the Newfield site of 18,000 cubic meters of slag and 15,000 cubic meters of baghouse dust, all of which contains uranium and thorium. It appears that the plan contemplates that the contaminated material will be maintained in a pile on eight acres within the facility's storage yard. The pile is to be graded and shaped and then covered with an engineered barrier consisting principally of native soil and rocks. Long-term maintenance and monitoring of this restricted area would be performed by the Licensee under conditions imposed by the NRC Staff. The remainder of the site would be released for unrestricted public use.

THE HEARING REQUEST REQUIREMENTS

As customary, the opportunity for hearing provided in the Federal Register was accompanied by a specific reference to the provisions of the Commission's Rules of Practice respecting the required content of hearing requests in proceedings such as this one. As the Commission and its licensing boards have made quite clear, full compliance with the dictates of these provisions is a condition precedent to the grant of such a request.¹

To begin with, the hearing requestor must demonstrate the existence of the requisite standing to raise questions regarding the acceptability of the particular proposal at hand. To that end, the Rules require that the requestor set forth, inter alia, his or her interest in the proceeding, as well as the possible effect that any order or decision entered therein might have upon that interest. 10 C.F.R. § 2.309(d)(1). In that regard, the Commission has long applied the test that is employed in the federal courts in resolving standing issues – i.e., the requestor must allege “a concrete and particularized injury that is fairly traceable to the challenged action and is likely to be redressed by a favorable decision.” Cleveland Electric Illuminating Co. (Perry Nuclear Power Plant, Unit 1), CLI-93-21, 38 NRC 87, 92 (1993) (citing Lujan v. Defenders of Wildlife, 504 U.S. 555, 561 (1992)). In addition, the claimed injury must be arguably within the zone of interests protected by the governing statute (here either the Atomic Energy Act of 1954, 42 U.S.C. §§ 2011 et seq.; or the National Environmental Policy Act, 42 U.S.C. §§ 4321 et seq.). See ibid.

It is not enough, however, that the requestor satisfy the standing requirement. In order to obtain a grant of the sought hearing, the request must also advance at least one contention that

¹ See Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation), CLI-99-10, 49 NRC 318, 325 (1999); Arizona Pub. Serv. Co. (Palo Verde Nuclear Generating Station, Units 1, 2, and 3), CLI-91-12, 34 NRC 149, 155-56 (1991).

meets the admissibility standard set forth in 10 C.F.R. § 2.309(f)(1). See 10 C.F.R. § 2.309(a). That standard requires the requestor to provide, with regard to every contention sought to be admitted, (1) a specific statement of the issue of law or fact to be raised; (2) a brief explanation of the basis for the contention; (3) a demonstration that the issue raised in the contention is within the scope of the proceeding; (4) a demonstration that the issue raised in the contention is material to the findings that the NRC must make to support the action that is involved in the proceeding; (5) a concise statement of the alleged facts or expert opinions that support the requestor's position; and (6) sufficient information to show that a genuine dispute exists on a material issue of law or fact, including, among other things, references to specific portions of the application that the requestor disputes. 10 C.F.R. § 2.309(f)(1)(i)-(vi).

In the case of governmental entities, however, status as a party is not a condition precedent to participation in NRC adjudicatory proceedings. By virtue of 10 C.F.R. § 2.315(c), an interested state or political subdivision thereof that has not become a party to the proceeding must be accorded a reasonable opportunity to participate, through a single representative, in the hearing of one or more of the admitted contentions. It may introduce evidence; interrogate witnesses in circumstances where cross-examination by the parties is allowed; advise the Commission without being required to take a position on any issue; file proposed findings where such are allowed; and seek Commission review on admitted contentions.

ANALYSIS

A. With the foregoing regulatory requirements in mind, we now turn to consider seriatim the several hearing requests to determine whether (1) the requisite standing has been established in accordance with 10 C.F.R. § 2.309(d); and (2) whether there has been advanced at least one admissible contention meeting the requirements of 10 C.F.R. § 2.309(f)(1).

1. Gloucester County

Given that the facility is located within its boundaries, Gloucester County's standing is beyond cavil. Its hearing request sets forth four separate contentions; each is addressed in turn below.²

Contention 1

"Permitting [the Licensee] to Facilitate their DP Plan would have profoundly negative economic implications for the residents and businesses of Newfield, the surroun[ding] areas and the County of Gloucester."

Gloucester Hearing Request at 3.

Gloucester asserts that property values will decrease because "it is extremely dangerous and undesirable to reside near a facility storing hazardous radioactive material," and, as a result, businesses will lose revenue and potential businesses will choose not to begin operations in the area. Id. at 4. To support this thesis, Gloucester cites a yet-to-be prepared expert report by Allen Black, Special Appraiser for the firm Todd & Black, Inc., that assertedly will demonstrate the DP's "severe and detrimental economic consequences to the residents and businesses of the Township of Newfield and the surrounding areas." Id. at 5. Additionally, Gloucester references the statement of Sue Mavilla, a Newfield resident, claiming that "she moved to Newfield 30 years ago from Northern New Jersey to escape the refineries present there," as evidence that other residents and businesses might relocate to escape potential dangers presented by the Licensee's site. Ibid.

At issue at this stage in the proceeding is the Licensee's DP and its accompanying environmental review documents. As the Licensee and the Staff point out,³ however, the

² See Gloucester County Board of Chosen Freeholders Request for Hearing and Petition to Intervene (Jan. 11, 2007) [hereinafter Gloucester Hearing Request].

³ See NRC Staff's Response to Request for Hearing by Gloucester County Board of
(continued...)

contention fails to identify the portions of the Licensee's DP deemed to be inadequate. Although it is true that the DP must address economic considerations, a contention that seeks to raise issues in that sphere must "include references to specific portions of the [DP] that the petitioner disputes" in order to demonstrate a genuine dispute. 10 C.F.R. § 2.309(f)(1)(vi). Accordingly, Gloucester's first contention is inadmissible.

Contention 2

"Approving [the Licensee's] Decommissioning Plan would have a detrimental effect on the health and safety of the residents of Newfield, the surrounding areas and the County of Gloucester."

Gloucester Hearing Request at 5.

As the basis for its second contention addressing health and safety concerns, Gloucester states that the "hazardous radioactive waste [the Licensee] proposes to store at their Newfield site is extremely dangerous and causes severe and life threatening illnesses." Id. at 6. To support this claim, Gloucester points to the statements made at a December 12, 2006, public information session by members of the public who reside near the Licensee's facility, describing instances of cancer and tumors in their neighborhoods and families. See id. at 7. According to the hearing request, these statements describe a high rate of cancer and tumors in the area surrounding the Licensee's facility and provide the required support for its contention. See ibid.

We agree with the Licensee and the Staff that, in common with the first contention, this contention does not controvert the DP.⁴ Without specific references to alleged inadequacies in the Licensee's analysis regarding the health and safety concerns raised in the contention,

³(...continued)

Chosen Freeholders (Feb. 5, 2007) at 5 [hereinafter Staff Answer to Gloucester]; Shieldalloy's Answer to Request for Hearing and Petition to Intervene of Gloucester County Board of Chosen Freeholders (Feb. 6, 2007) at 13 [hereinafter Licensee Answer to Gloucester].

⁴ See Licensee Answer to Gloucester at 15; Staff Answer to Gloucester at 7-8.

Gloucester's challenge falls short of demonstrating a genuine dispute of law or fact, as required by 10 C.F.R. § 2.309(f)(1)(vi), and is therefore inadmissible.

Contention 3

"The interests of environmental justice require the NRC to deny [the Licensee's] DP and mandate the removal of the radioactive material from the Newfield, New Jersey Site."

Gloucester Hearing Request at 8.

Invoking the "interests of environmental justice," Gloucester's third contention focuses on the adequacy of the DP's provisions in the realm of financial assurance. The contention maintains that the Licensee's estimated costs improperly exclude several items and, therefore, the Licensee has not provided sufficient financial assurance to the taxpayers in the event that it should be required to declare bankruptcy. See *ibid.* In this connection, Gloucester claims that the DP is inadequate because it "only provides for monitoring the site for 1,000 years despite the fact the radioactive material will not break down for possibly billions of years." Id. at 9. To support the contention, Gloucester refers to statements made by the former mayor of the Borough of Newfield, Richard W. Westergaard, at the December 12, 2006, information session, listing an assortment of alleged costs the Licensee failed to consider, including the costs of sampling surface and ground water, security monitoring, cap and fence repair and replacement, the impact on property values, and the costs associated with groundwater clean-up. See *ibid.*

Although initially characterized as an environmental justice contention, as seen Gloucester raises exclusively financial concerns. Starting with the statements of Mayor Westergaard offered as support for the contention, we agree with the Licensee and the Staff that the allegations of unaccounted costs are no more than "bare assertions" and fail to provide the required supporting facts or expert opinion. See 10 C.F.R. § 2.309(f)(1)(v); *Fansteel, Inc.* (Muskogee, Oklahoma Site), CLI-03-13, 58 NRC 195, 203 (2003).

Contention 4

"The NRC's review of [the Licensee's] decommissioning plan under the NRC's long-term storage license program is an improper and prejudicial application of its regulatory authority in that the NRC's long-term storage license program was not meant to cover manufacturing activities like SMC, which could open the door for countless abandoned radioactive waste piles like SMC across the country. Nor was the NRC's long-term storage license regulation intended to give waste generators the right to handle or manage their waste (or abandon it, as the case may be) in a fashion different or less environmentally protective from other waste generators across the country."

Gloucester Hearing Request at 10.

Unlike its other three contentions, Gloucester's fourth contention does not attempt to address the contention admissibility factors in 10 C.F.R. § 2.309(f)(1); rather, it appears simply to voice an objection to the NRC's Long Term Control (LTC) license option and its application to the Licensee's facility.⁵ As observed by the Licensee and the Staff,⁶ Gloucester has failed to provide any support for its claims that the LTC license option is inapplicable or impermissible in this case; rather, it merely asserts, without more, that it is "improper." Because no legal authority or other support is cited to bolster its claims regarding the purpose and scope of the LTC license option, the contention is inadmissible. See 10 C.F.R. § 2.309(f)(1)(v).

It thus appears that none of Gloucester's contentions meets the admissibility standards.

Accordingly, its hearing request must be denied.

2. Borough of Newfield

The facility also being within its boundaries, the Borough of Newfield likewise has the requisite standing. In its hearing request, Newfield claims that the Licensee has failed to comply

⁵ See Staff Requirements - SECY-06-0143 - Stakeholder Comments and Path Forward on Decommissioning Guidance to Address License Termination Rule Analysis Issues (Sept. 19, 2006), ADAMS Accession No. ML062620515.

⁶ See Staff Answer to Gloucester at 11; Licensee Answer to Gloucester at 20.

with a Consent Order entered into by the Licensee and the New Jersey Department of Environmental Protection.⁷ As a result, it is said, the Licensee "has placed the Borough and its residents at significant risk for continued environmental harm which will cause significant health, safety and welfare concerns to the Borough's residents and will otherwise significantly impact upon property values and the ability to use over seventy (70) acres of property available within the Borough." Newfield Hearing Request at 2.

~~We agree with the Licensee and Staff that the issue of compliance with the State~~ Consent Order is beyond the scope of this proceeding.⁸ The "Notice of Consideration of Amendment Request for Decommissioning for Shieldalloy Metallurgical Corporation, Newfield, NJ and Opportunity to Request a Hearing," 71 Fed. Reg. at 66,986, defines that scope, which is limited to whether the Licensee's DP complies with the Atomic Energy Act, the National Environmental Policy Act, and the NRC's regulations. Accordingly, the Newfield hearing request must be denied for want of an admissible contention. See 10 C.F.R. § 2.309(f)(1)(iii). If the facility has in fact not complied with the Consent Order, the remedy is to seek enforcement by New Jersey Department of Environmental Protection.

3. Cumberland County

In its hearing request, Cumberland County asserts that one of its boundaries is immediately adjacent to the Licensee's site and that the County lies downgrade and downwind

⁷ See Request for Hearing of the Borough of Newfield (Jan. 16, 2007) [hereinafter Newfield Hearing Request].

⁸ See Shieldalloy's Answer to Hearing Request of Borough of Newfield (Feb. 13, 2007) at 3; NRC Staff's Response to Request for Hearing by the Borough of Newfield (Feb. 12, 2007) at 6.

from the facility.⁹ Continuing, it claims to have “taken a position consistent with that of Gloucester County and the New Jersey Department of Environmental Protection,” in that it believes that the DP poses a threat to the health, safety, and welfare of the general public. Cumberland Hearing Request at 1. Further, Cumberland states that it intends to “rely on the expertise of the New Jersey Department of Environmental Protection with respect to these issues and the purpose of this correspondence is to make sure that the process does not continue to ignore the needs of the citizens of Cumberland County and the State of New Jersey.” Id. at 2.

As noted by the Staff, Cumberland’s filing appears to be a statement of support for the hearing request filed by New Jersey and an expression of interest and concern in the proceeding, rather than a formal petition to intervene in this proceeding.¹⁰ Given the understandable absence of any challenge to its standing, we nonetheless treat the filing as a formal hearing request on behalf of the County. So regarded, we agree with the Licensee and the Staff that Cumberland has failed to proffer a specific contention meeting the admissibility requirements outlined in 10 C.F.R. § 2.309(f)(1). Its hearing request must therefore be denied. See 10 C.F.R. § 2.309(f)(1)(i).

⁹ See Request For Hearing By Cumberland County (Jan. 16, 2007) at 1 [hereinafter Cumberland Hearing Request].

¹⁰ See NRC Staff’s Response to Request for Hearing by Cumberland County (Feb. 12, 2007) at 2-3.

4. New Jersey State Senator Madden, Assemblymen Mayer & Moriarty

In their joint hearing request,¹¹ New Jersey State Senator Fred H. Madden, Assemblyman David R. Mayer, and Assemblyman Paul Moriarty (State Legislators) assert, in what appears to be an attempted demonstration of standing, that, "as representatives of the residents of the Newfield and surrounding areas, [they] have a sincere concern regarding the large quantities of radioactive contaminated waste remaining at the ShieldAlloy site." State Legislators' Hearing Request at 1. What then follows is a discussion of general concerns with regard to the Licensee's site and the DP, including concerns related to possible economic, environmental, and public health and safety harms. See id. at 1-2.

Although it is clearly established in the Commission's regulations and case law that a state or local governmental body has standing to intervene in a proceeding for a facility that is located within its boundaries, the same does not hold true for individual legislators wishing to participate as a party on behalf of unnamed constituents. Rather, as noted by both the Licensee and the Staff, licensing boards have consistently ruled that one does not acquire standing as a consequence of being a member of a legislative tribunal. See Babcock & Wilcox (Apollo, Pennsylvania Fuel Fabrication Facility), LBP-92-35, 36 NRC 355, 358 n.9 (1992); Combustion Engineering, Inc. (Hematite Fuel Fabrication Facility), LBP-89-23, 30 NRC 140, 145 (1989); General Electric Co. (GE Test Reactor, Vallecitos Nuclear Center), LBP-79-28, 10 NRC 578, 582-83 (1979). In this instance, none of the legislators has attempted to demonstrate standing on any other basis and, thus, their hearing request must be denied. See 10 C.F.R. § 2.309(a).

¹¹ See Request from New Jersey State Senator Fred H. Madden, Assemblyman David R. Mayer, and Assemblyman Paul Moriarty for a Hearing (Jan. 12, 2007) [hereinafter State Legislators' Hearing Request].

5. Loretta Williams

At the outset of her hearing request, Ms. Williams states that she lives "within a few blocks of the Shieldalloy Metallurgical Corporation in [the] 1.7 square mile community" of Newfield.¹² Moving on, she lists multiple grievances with the DP including: the adequacy of the DP's cost estimates; unaccounted economic, environmental, and health and safety risks; security risks and costs associated with the storage of radioactive waste at the site; the accuracy of the licensee's solubility testing and analysis; the application of the NRC's dose criterion regulations; and the Licensee's cost analysis regarding the possible off-site disposal of radioactive waste as an alternative to the procedure proposed in the DP. See Williams Hearing Request at 1-2.

The proximity of Ms. Williams' residence to the Licensee's facility satisfies the standing requirement. The question thus is whether her hearing request also satisfies the contention requirements. On this score, Ms. Williams alleges that the Licensee's proposal poses numerous threats to the health and safety of Newfield residents and to the surrounding environment. What is missing, however, is a demonstration that she might, through expert opinion or factual development, connect the alleged threats to specific aspects of the Licensee's DP. Where Ms. Williams does mention the Licensee's DP, she does not address, with specific references to the Licensee's analyses, how she intends to demonstrate that the DP is flawed. As the Commission has stressed on numerous occasions, "the contention rule is strict by

¹² See Request for a Hearing Submitted by Loretta Williams (Jan. 3, 2007) at 1 [hereinafter Williams Hearing Request].

design”¹³ and does “not permit the filing of a vague, unparticularized contention, unsupported by affidavit, expert, or documentary support.”¹⁴

Although a certain amount of latitude might appropriately be extended to pro se litigants such as Ms. Williams, there nonetheless must be a substantial endeavor to meet the clear regulatory requirement that a hearing request provide a “specific statement of the issue of law or fact to be raised or controverted,” together with a concise statement of the alleged facts or expert opinion supporting the contention and specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue. See 10 C.F.R. § 2.309(f)(1)(i), (v). Such an endeavor falling far short in this instance, Ms. Williams’ hearing request must be denied.

6. Terry Ragone

Included in Ms. Ragone’s hearing request is a statement regarding her standing to participate in this proceeding and a section labeled “Contentions.”¹⁵ The latter catalogues grievances associated with the alleged “unusual precedent of establishing a low level radioactive waste site in a densely populated area,” allegations “that the dump site will inevitably cause economic hardship,” and opposition voiced by the Borough of Newfield in the form of a Borough resolution. Ragone Hearing Request at 1-2.

¹³ Dominion Nuclear Connecticut, Inc. (Millstone Nuclear Power Station, Units 2 and 3), CLI-01-24, 54 NRC 349, 358 (2001); Exelon Generation Co., LLC (Early Site Permit for Clinton ESP site), CLI-05-29, 62 NRC 801, 808 (2005).

¹⁴ North Atlantic Energy Service Corp. (Seabrook Station, Unit 1), CLI-99-6, 49 NRC 201, 219 (1999) (citation and internal quotation marks omitted).

¹⁵ See Hearing Request from Terry Ragone (Jan. 15, 2007) at 1 [hereinafter Ragone Hearing Request].

As noted by both the Staff and the Licensee, it is difficult to identify any specific contention in the request or to determine what, if any, specific aspects of the DP Ms. Ragone seeks to challenge.¹⁶ Her statements do not identify any portion of the DP that contravenes a statutory provision or NRC regulation and, therefore, she fails to provide sufficient information to demonstrate that a genuine dispute exists on a material issue of fact or law. See 10 C.F.R. § 2.309(f)(1)(vi). Further, absent from the request is any form of factual information, documentary evidence, or expert opinions to support its claims. See 10 C.F.R. § 2.309(f)(1)(v).

While it is true that, at the time contentions are filed, a petitioner is not required to have developed the entire factual record on which it intends to rely at a hearing, even in the case of a pro se litigant some level of factual or expert support must be furnished. Accordingly, although Ms. Ragone has established her standing as an individual, the conclusion is required that her hearing request is devoid of an admissible contention and thus must be denied.¹⁷

7. State of New Jersey

In common with that of the counties and borough, New Jersey's standing is readily apparent. We thus turn to its contentions.

a. New Jersey's Contentions

The New Jersey hearing request is divided into three parts, with "Technical Contentions" in Part I, "Environmental Contentions" in Part II, and a "Miscellaneous Contention" in Part III.¹⁸

¹⁶ See Shieldalloy's Answer to Hearing Request of Terry Ragone (Feb. 5, 2007) at 3; NRC Staff Response to Hearing Request from Terry Ragone (Feb. 9, 2007) at 5.

¹⁷ Given the failure to proffer an admissible contention, we need not address here the question as to whether Ms. Ragone has demonstrated standing in a representational capacity on behalf of "The Newfield Residents."

¹⁸ State of New Jersey Department of Environmental Protection Petition for Hearing the
(continued...)

As the sixteen contentions presented in Part I are identical to those advanced in Part II, we will refer only to the ones in Parts I and III. See New Jersey Hearing Request at 1-89, 178-82.

New Jersey sets forth multiple contentions challenging the DP with respect to the technical analyses performed by the Licensee, essentially arguing that the DP has not demonstrated compliance with the relevant statutory and regulatory standards, including those prescribed in 10 C.F.R. § 20.1403. The contentions include challenges to the analyses performed regarding the proposed disposal design and siting, the dose modeling results, the exclusion of certain exposure pathways, and the DP's dose modeling time-frame. Also advanced are challenges to the adequacy of the DP's site characterization, the Licensee's satisfaction of financial assurance requirements, and the Licensee's consideration of public input on the DP. To support these contentions, New Jersey provides the declarations and supporting statements of various purported experts in relevant fields.

In addition to challenges to the Licensee's technical analyses, New Jersey proffers numerous contentions addressing the legality of the regulatory avenues relied on in the submission of the Licensee's DP. Specifically, it questions the role of the License Termination Rule's restricted use provisions,¹⁹ the use of the Long Term Control-Possession Only License, and the Commission's decommissioning regulations generally.²⁰

¹⁸(...continued)

Shieldalloy Metallurgical Corporation (License No. SMB-743) Decommissioning Plan (Jan. 16, 2007) [hereinafter New Jersey Hearing Request].

¹⁹ See 10 C.F.R. § 20.1403; 62 Fed. Reg. 39,058 (July 21, 1997).

²⁰ See generally 10 C.F.R. Part 20, Subpart E.

In response, both the Licensee and the Staff acknowledge that New Jersey has standing to participate in this proceeding.²¹ The Licensee asserts, however, that none of New Jersey's seventeen proffered contentions satisfies the admissibility standards set forth in 10 C.F.R. § 2.309(f)(1).²² For its part, the Staff would have it that eight of New Jersey's contentions are admissible, in whole or in part, and contests the admission of the remaining nine contentions.²³

b. Contention 5

As previously noted, if (as here) the requisite standing has been established, under the terms of the Rules of Practice a hearing request must be granted upon a determination that it contains at least one admissible contention. With that in mind, we have elected to consider first New Jersey's Contention 5, which reads as follows:

"The DP obtains inaccurate dose modeling results by ignoring the likely scenario of groundwater contamination and ignoring other reasonable assumptions."

New Jersey Hearing Request at 27.

As the basis for this contention, New Jersey points to 10 C.F.R. § 20.1403(e) and the regulation's requirement that "the TEDE [Total Effective Dose Equivalent] from residual radioactivity distinguishable from background to the average member of the critical group is as low as reasonably achievable and would not exceed either (1) 100 mrem (1 mSv) per year; or (2) 500 mrem (5 mSv) under certain circumstances." Id. at 28 (citation omitted). According to New Jersey, the inclusion of the "likely scenario of radionuclides contaminating the groundwater" in the dose modeling results in a dose level that exceeds the TEDE limit in the regulation. Ibid.

²¹ See Shieldalloy's Answer to Petition for Hearing of State of New Jersey Department of Environmental Protection (Feb. 12, 2007) at 3 [hereinafter Licensee Response to New Jersey]; NRC Staff's Response to Request for a Hearing by New Jersey Department of Environmental Protection (Feb. 12, 2007) at 3 [hereinafter Staff Response to New Jersey].

²² See Licensee Response to New Jersey at 13.

²³ See Staff Response to New Jersey at 5.

Additionally, New Jersey insists that the DP improperly excludes other reasonable exposure scenarios, including resident farmer and suburban resident scenarios. See id. at 30-32. According to New Jersey, at some future time individuals might take up residence on currently restricted land and receive increased radiation exposure from activities associated with farming and the occupation of land in close proximity to the facility. Further, it takes issue with the DP's "all controls fail" dose modeling. See id. at 32. Here, New Jersey asserts that the Licensee has failed to perform adequate dose modeling for scenarios in which all engineered and institutional controls degrade or fail.

As support for the contention, New Jersey relies on the accompanying declaration and report of Jennifer Goodman, a research scientist with the Bureau of Environmental Radiation at the New Jersey Department of Environmental Protection.²⁴ The Goodman Report identifies numerous alleged deficiencies in the DP. In particular, with respect to the substance of Contention 5, it challenges the DP's treatment of groundwater exposure pathways and assumptions made in the dose modeling. Additionally, New Jersey cites declarations and/or reports filed by: Donna Gaffigan, Case Manager with the New Jersey Department of Environmental Protection, discussing groundwater exposure; Steven E. Spayd, Research Hydrogeologist & Supervising Geologist, Bureau of Water Resources, New Jersey Department of Environmental Protection, discussing dose modeling and the groundwater pathway; and Michael A. Malusis, Assistant Professor, Department of Civil and Environmental Engineering, Bucknell University, Lewisburg, PA, discussing groundwater pathway.

²⁴ See New Jersey Hearing Request at 29. Ms. Goodman also supplied a resume describing her relevant technical qualifications.

c. Responses to Contention 5

The Staff does not oppose the admission of Contention 5 to the extent that New Jersey challenges the DP's dose modeling for its failure to take into account certain exposure pathways and thus its underestimation of the peak annual TEDE.²⁵ The Staff does not, however, support the wholesale admission of the contention. First, it insists that NRC regulations do not require the Licensee to consider an "all controls fail" scenario in its dose modeling. See Staff Response to New Jersey at 10. Second, with respect to the "resident farmer scenario," the Staff claims that New Jersey has provided nothing more than a bare assertion that the Licensee should have addressed that scenario. Ibid.

As is the case with nearly all of the proffered contentions, the Licensee claims that Contention 5 fails to satisfy the requirements of 10 C.F.R. § 2.309(f)(1)(vi). Turning first to the assertion that the DP's dose modeling improperly excludes the groundwater pathway, the Licensee maintains that New Jersey's expert, Ms. Goodman, fails to address the DP's discussion "as to why groundwater need not be considered in the dose modeling" and, in particular, "ignores the fact that the groundwater is not potable because it is heavily contaminated with toxic chemicals." Licensee Response to New Jersey at 46. Further, the Licensee maintains that the contention and Ms. Goodman's supporting report do not address site-specific groundwater modeling performed by the Licensee that purportedly demonstrates that, even if the pathway was considered, there would be no significant radiological impact. See id. at 47. The Licensee would have it that, without addressing the DP's stated reasons for

²⁵ See Staff Response to New Jersey at 9-10. The Staff notes that Contention 5 presents arguments related to dose modeling and, in that respect, is closely related to the arguments presented in Contentions 9 and 10. Accordingly, the Staff addresses all three related contentions in combination and recommends that the Board do the same by consolidating the contentions.

excluding groundwater as a pathway in its dose modeling, the contention cannot establish a genuine dispute and does not raise a litigable issue.

The Licensee further insists that the contention's claims regarding the farming and resident scenarios similarly fail to raise genuine disputes. See id. at 48. Specifically, it claims that the contention does not address the DP's assertions that the Licensee will "retain the [] site, both restricted and unrestricted portions, for industrial use" and that the site will be restricted from residential use independent of its radiological status. Ibid. Moreover, with respect to each assertion advanced in support of a particular contention, the Licensee addresses the factual documentation and/or expert opinion offered by New Jersey and attempts to demonstrate that the assertion is nonetheless without merit. See id. at 49-57.

d. New Jersey's Reply

With respect to Licensee's assertions that groundwater pathways need not be modeled because there are no drinking water wells within the restricted area and the water is not potable due to non-radioactive contamination, New Jersey responds that "there is no reason to believe" that in the distant future "wells will not be used in the vicinity of the facility for drinking water."²⁶

New Jersey further notes that the Licensee, as directed in the Consent Order, is currently conducting groundwater remediation for the non-radioactive contamination with the end goal of removing restrictions on the water's use. New Jersey Reply to Licensee at 11. Responding to the Licensee's claims that it ignored the DP's site-specific groundwater modeling, New Jersey asserts that the modeling was not discussed because there was "insufficient information to evaluate it." Id. at 11-12.

²⁶ New Jersey Department of Environmental Protection's Reply to the Answer of Shieldalloy (Feb. 27, 2007) at 11 [hereinafter New Jersey Reply to Licensee].

Respecting the Licensee's insistence that farming encroachment is not likely due to land-use restrictions that exist with regard to the facility site, New Jersey points out that 10 C.F.R. § 20.1403(e) prescribes radiation standards that must be met against the possibility that, at some future time, such institutional controls will no longer be in effect. Id. at 12-13. In this regard, New Jersey would have it that, over the course of "a billion years," it is possible that the site will be inhabited by a resident farmer or suburban resident. Ibid. The remainder of its reply to the Licensee is devoted to addressing the dose modeling and technical challenges lodged by the Licensee in its answer.

As the Staff did not oppose the admission of Contention 5 in its entirety, New Jersey responded only to its claims regarding the "all controls fail" and "resident farmer" scenarios and, in that regard, repeats the argument it supplied in response to the Licensee.²⁷ Specifically, New Jersey cites 10 C.F.R. § 20.1403(e) and maintains that the regulation requires consideration of the "all controls fail" scenario. See New Jersey Reply to Staff at 4. It insists that, contrary to the claims of the Staff, it has supported sufficiently its claims with respect to these two scenarios by relying upon the LTR, the expert report of Jennifer Goodman, and facts available from the DP and other public sources. See id. at 5-6.

e. Board's Ruling

We entertain little difficulty in reaching the conclusion that Contention 5 is admissible in its entirety. In a word, New Jersey has provided adequate support for its insistence that the dose modeling provided in the DP is inadequate to determine the potential long-term impact that leaving the slag pile in situ might have upon those residing in the vicinity of the facility.

²⁷ See New Jersey Department of Environmental Protection's Reply to the Response of NRC Staff (Feb. 27, 2007) at 3-6 [hereinafter New Jersey Reply to Staff].

We are unimpressed with the Licensee's insistence that groundwater need not be considered in the dose modeling because it is currently contaminated with toxic chemicals. As New Jersey cogently observes in response, there is no assurance that this situation will remain for the duration of the lengthy period that the slag pile will continue to represent a radioactive hazard. In any event, as noted in paragraph 17 of the Gaffigan Declaration without contradiction, the Licensee is currently engaged in groundwater remediation for these non-radioactive contaminants that is mandated by a Consent-Order that it had signed.²⁸

Notwithstanding that fact, it will be open to the Licensee to attempt to establish, by way of a motion for summary disposition or at an evidentiary hearing, that the possibility of the groundwater serving as drinking water over the relevant period is so remote that it can appropriately be entirely dismissed. At this preliminary stage, however, such a dismissal is plainly impermissible.

What that leaves for consideration is the admissibility of so much of Contention 5 as challenges the exclusion in the DP of the resident farmer/suburban resident and "all controls fail" exposure scenarios. Contrary to the insistence of both the Licensee and NRC Staff, we are satisfied that New Jersey has offered enough to support those challenges at this very early stage of the proceeding. Whether they will be found meritorious when the evidentiary stage is reached is of no present moment.

To begin with, insofar as concerns the possibility offered by New Jersey of a resident planting a vegetable garden and consuming its produce, the environs of the Borough of Newfield are hardly to be equated with the urban environment that marks the five boroughs of New York City some distance to the north. Moreover, we are told by New Jersey, again without

²⁸ See New Jersey Hearing Request at 36, Declaration of Donna L. Gaffigan (Jan. 16, 2007) ¶ 17.

contradiction, that there is currently someone residing within very close proximity of the Licensee's property. Our attention has also been called to the disclosure in the Licensee's Environmental Report to the effect that there are farms located within a one-mile radius of the facility.²⁹ That being so, and given the length of time that the slag pile might continue to represent a radioactive hazard, there would seem to be at least a reasonable possibility that, at a future date, there might be some exposure to the hazard on the part of one engaged in activities falling within the bounds of the resident farmer/suburban resident scenario. If, however, in justification of the DP's failure to address such a scenario, the Licensee has compelling reasons why such a possibility may be entirely ruled out, it will have the opportunity to present that showing once the merits of the contention are reached.

With respect to the "all controls fail" scenario, it might well be that, as the NRC Staff asserts, there is no specific Commission requirement that such a scenario be included in the DP. New Jersey points, however, to the regulatory provision requiring an assumption that institutional controls will fail. See 10 C.F.R. § 20.1403(e). As it sees it, given that required assumption, it is not unreasonable to indulge in the additional assumption that, over the course of the lifetime of the radiological hazard, the engineered barriers will fail. Although the matter might not be free from all doubt, we believe that there is sufficient reason to allow the inclusion of this scenario within the ambit of what is being accepted as Contention 5. This issue will, of course, be open to further exploration when the proceeding reaches the merits stage.

B. It follows from the foregoing that, its standing not being in serious question and at least one of its contentions having been found to meet the standard for admissibility imposed by

²⁹ See Shieldalloy Decommissioning Plan, Environmental Report, Appendix 19.9, § 3.0, Fig. 3-3, ADAMS Accession No. ML053330384.

Section 2.309(f) of the Rules of Practice, by virtue of Section 2.309(a) of those Rules the New Jersey hearing request must be granted. By the same token, given their failure to satisfy both the standing and the contention requirements, all of the other hearing requests must be denied.

In the case of the two counties and the borough, this does not mean, however, that they are precluded from participation in the evidentiary hearing that will ultimately be held in light of the grant of the New Jersey request. As earlier noted (see p. 5, supra), governmental entities (including counties and municipalities) are accorded by 10 C.F.R. § 2.315(c) the right to participate in adjudicatory proceedings such as this one without having to obtain party status. Indeed, it might well be concluded that, should they choose to invoke that right through the required designated representative, the counties and borough will assume a status preferable in some respects to that of a party. For, once again, the section explicitly authorizes the participating governmental entity to introduce evidence and to conduct such cross-examination as might be allowed to the parties, all without being obliged to take a position on the issues under consideration. In addition, as also seen, they enjoy the same entitlement possessed by the parties to file proposed findings and to seek Commission review of Board determinations.

It remains to be seen, of course, whether the counties and borough will desire to invoke the Section 2.315(c) entitlement to participate in the proceeding as a non-party. They might well be content simply to rely upon New Jersey to pursue their concerns, given the likelihood that, through its Department of Environmental Protection, the State has greater resources at its disposal for ventilating those concerns.

C. What is left for consideration is whether we need or should go forward at this juncture with a consideration of the admissibility of New Jersey's other contentions. As we read the Rules of Practice, there is no requirement that we do so. All that is mandated is that, within

45 days of the filing of the last pleading (here the February 27, 2007, New Jersey Reply to the Licensee and NRC Staff), the Board issue its decision on each hearing request before it. See 10 C.F.R. § 2.309(i). In this instance, insofar as the New Jersey request is concerned, that mandate has been met by our determination today that the request must be granted on the strength of its standing and the contention that we have found admissible. Insofar as the express terms of the Rules of Practice are concerned, it is left to us to decide whether, in the totality of circumstances, it is best to rule now on the admissibility of the balance of the New Jersey's contentions or, instead, to defer a ruling on them until a later date.

In another recent decommissioning proceeding, a licensing board addressed the same question. Its answer was that, having granted the hearing request there-involved on the strength of one admissible contention, it was appropriate, "in the interest of the economical use of [the board's] resources," to defer consideration of the remaining contentions pending the Staff's completion of its technical review of the proposal under scrutiny and its issuance of the SER and EIS or EA. See U.S. Army (Jefferson Proving Ground Site), LBP-06-06, 63 NRC 167, 185-86 (2006). Its rationale was this (ibid):

It seems quite possible, if not probable, that, upon its examination of the documents issued by the Staff at the end of the technical review, the Petitioner will find reason to alter in at least some respects the tack that it has taken in the challenge to the [Licensee's] proposal that is contained in the hearing request. For one thing, Petitioner might well find that some of the concerns that have been set forth in the request have been fully resolved. At the same time, it might determine, on the basis of the disclosures in the technical review documents, that there is cause to seek leave to amend one or more existing contentions or to add new ones. Any such endeavor would, of course, have to comply with the provisions of the Rules of Practice governing the submission of late contentions.

As it turned out, the Army Board's forecast of subsequent events proved to be on target. See LBP-06-27, 64 NRC __ (slip op.) (Dec. 20, 2006). And it seems patent to us that the same analysis applies in full measure to the case of New Jersey's challenges to the decommissioning

plan that is in issue here. There is no aspect of that plan that is set in stone and it is scarcely inconceivable that, whether as the result of the Staff's review or independent of it, the DP might undergo significant revision that would have a decided impact upon the New Jersey contentions now on the table.

In this connection, this Board and the parties to the proceeding have formally been made aware of a letter sent by an NRC Commissioner to the Licensee's President following the former's recent visit to the Newfield site.³⁰ In the letter, the Commissioner reiterated a suggestion, made at the time of a site visit, that there be further dialogue between the Licensee's staff and other interested parties to determine whether there might be "other options, in addition to onsite decommissioning," that might allow the "reuse of the site in a cost effective way."³¹

We do not presume to speculate on what might be the outcome of that suggestion. It does, however, indicate a belief on the part of at least one Commissioner of this agency that there is reason to explore possible alternatives to the onsite storage of the slag that has raised so many concerns on the part of New Jersey and others. And, presumably, the NRC Staff will conduct such an exploration in the technical review associated with this decommissioning case, including its activities in discharging its obligation under the National Environmental Policy Act. Thus, there is at least a considerable measure of current uncertainty as to whether, at the end of

³⁰ Letter from Jeffery S. Merrifield to Eric E. Jackson (Feb. 22, 2007), ADAMS Accession No. ML070530666. The text of the letter was provided by the Office of the NRC Secretary to all those on the service list for the proceeding including this Board.

³¹ Id. at 2.

the day, the decommissioning of the Licensee's site will take the form that is contemplated by the DP now in hand.³²

In short, all things considered, it seems to make good sense to follow here the course that was adopted in the Army proceeding. In addition to the withholding of action on the remainder of New Jersey's contentions, all further action in the proceeding would be deferred to await the Staff's completion of its safety and environmental review. (The deferral would embrace all obligations imposed by the Rules of Practice upon the grant of a hearing request such as that of New Jersey here). Once the Staff had released the SER and EIS reflecting the results of that review, an order would issue providing New Jersey a reasonable opportunity to withdraw, to amend, or to supplement its existing contentions based upon the disclosures in those documents and in conformity with the provisions of the Rules of Practice concerned with the submission of new contentions. Following a ruling on all remaining contentions, the proceeding would move forward.

³² The NRC Staff recently published a notice in the Federal Register to the effect that it has under consideration a decommissioning plan submitted by the Whittaker Corporation, a source material licensee, for its site in Pennsylvania. 72 Fed. Reg. 13,310 (Mar. 21, 2007). According to the notice, that licensee's operations on the site in the extraction of rare earth metals had resulted in the accumulation of "slag by products containing thorium and uranium." Id. at 13,311. The submitted DP calls for the release of the entire site for unrestricted use following "the excavation of the waste slag, [the] processing of the excavated material in order to separate the radioactive material from the soil, and [the] shipping [of] the radioactive material to a licensed disposal site." Ibid.

We do not know whether such an option might be available with regard to the Newfield slag of concern in this proceeding. It could well be that, because of composition differences or for some other reason, it might not be feasible. We refer to the Whittaker proposal only as further evidence that there well might be more than one way of dealing with a particular accumulation of radioactive wastes so as to assure the public health and safety and the protection of the environment. In the course of its technical review of any decommissioning plan associated with such waste, the Staff necessarily will be examining any and all feasible alternatives that might serve better the achievement of those objectives.

On this score, based upon the filings to date, a few words of caution appear appropriate with regard to any future contentions and the responses thereto. First, contrary to New Jersey's apparent belief (see p. 16, supra), it has long been the rule that Commission regulations are not open to challenge in NRC adjudicatory proceedings. See 10 C.F.R. § 2.335(a); Philadelphia Electric Co. (Peach Bottom Atomic Power Station, Units 2 and 3), ALAB-216, 8 AEC 13, 20-21 & n.33, aff'd in part on other grounds, CLI-74-32, 8 AEC 217 (1974).

Second, New Jersey's reliance in several of its contentions upon the Low-Level Radioactive Waste Policy Act of 1985 (LLRWPA), 42 U.S.C. §§ 2021b, et seq., is misplaced. That Act does not broadly require, as New Jersey would have it, "the permanent isolation of low-level radioactive waste." Insofar as here relevant, it states simply that "[e]ach State shall be responsible for providing, either by itself or in cooperation with other States, for the disposal of – (A) low-level radioactive waste generated within the State." 42 U.S.C. § 2021c(a)(1)(emphasis added). "Disposal" is defined generally by the Act as meaning the "permanent isolation of low-level radioactive waste pursuant to the requirements established by the Nuclear Regulatory Commission under applicable laws." 42 U.S.C. § 2021b(7). As directed by the Act, the NRC has set forth regulatory requirements in 10 C.F.R. Part 61 that implement the LLRWPA's mandate and further define terms contained in the Act. Although New Jersey acknowledges Part 61's implementing regulations, it ignores the Commission's clear statement in that part limiting regulation to waste "received from other persons." 10 C.F.R. § 61.1(a). There is no question that this Licensee does not intend to become a facility for the permanent isolation of wastes received from other persons.

For its part, a substantial portion of the Licensee's response to New Jersey's contentions is not addressed to whether the contentions meet the admissibility standards set forth in 10 C.F.R. § 2.309(f)(1) but, rather, seeks to challenge them as lacking merit. Given that Licensee's

counsel have long been involved in NRC adjudicatory proceedings, they should be fully aware that such claims must await either motions for summary disposition under 10 C.F.R. § 2.1205 or an evidentiary hearing.³³ We trust that this fact will be given recognition in any future Licensee filings directed to contention admissibility.

D. We perceive no reason why a deferral of the consideration of the balance of New Jersey's contentions might prejudice the legitimate interests of New Jersey, the Licensee, or the Staff as parties going forward in this proceeding. Indeed, it appears to us that it should serve to further those interests, given the bearing that the fruits of the technical review indisputably might have on the issues to be litigated at an evidentiary hearing. Nonetheless, it is possible that we have overlooked some consideration that, in view of one or more of those parties, might cast doubt upon the acceptability of the course we propose to follow. Accordingly, the deferral that we are now ordering will be subject to the filing of a timely motion for reconsideration in accord with 10 C.F.R. § 2.323(e).

For the foregoing reasons, (1) the hearing request of the New Jersey Department of Environmental Protection is granted; and (2) all other hearing requests are denied.

Notwithstanding the denial of their requests, in accordance with the provisions of 10 C.F.R. § 2.315(c), upon notifying the Board, Gloucester and Cumberland Counties and the Borough of Newfield may, if so inclined, participate in any further proceedings in this matter through a designated representative.

³³ Indeed, if anything, addressing the merits in an opposition to a hearing request can be counterproductive in that it serves to reinforce the requestor's insistence that a genuine dispute exists with respect to the substance of the contention in issue.

Moreover, subject to reconsideration at the behest of New Jersey, the Licensee and/or the NRC Staff, all additional proceedings (including but not limited to the submission of the hearing file, 10 C.F.R. § 2.1203, and mandatory disclosures, 10 C.F.R. § 2.336) are hereby deferred pending the completion of the Staff's safety and environmental review and further order of this Board.

Finally, as to those individuals and entities whose hearing requests have been denied, in accordance with 10 C.F.R. § 2.311(a), any appeal to the Commission must be taken within ten (10) days after service of this memorandum and order. In accordance with that same provision, the Licensee is entitled to appeal the grant of the New Jersey Hearing Request within a like time period.

It is so ORDERED

THE ATOMIC SAFETY
AND LICENSING BOARD

/RA/

Alan S. Rosenthal, Chairman
ADMINISTRATIVE JUDGE

/RA/

Dr. Richard E. Wardwell
ADMINISTRATIVE JUDGE

/RA/

Dr. William H. Reed
ADMINISTRATIVE JUDGE

Rockville, Maryland
March 28, 2007

Copies of this Memorandum and Order were sent this date by Internet electronic mail transmission to counsel or other representative for (1) the Licensee, (2) the NRC Staff, and (3) each hearing requestor that has provided for email service.

July 5, 2007

Mr. David R. Smith
Environmental Manager
Shieldalloy Metallurgical Corporation
Aluminum Products & Powders Division
14 West Boulevard
P. O. Box 768
Newfield, NJ 08344-0768

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR SAFETY REVIEW OF
PROPOSED DECOMMISSIONING PLAN FOR SHIELDALLOY
METALLURGICAL CORPORATION, NEWFIELD, NEW JERSEY

Dear Mr. Smith:

The U.S. Nuclear Regulatory Commission (NRC) staff is conducting its detailed safety review of Shieldalloy Metallurgical Corporation's (SMC's) proposed Decommissioning Plan (DP), Revision 1, for the Newfield, New Jersey site that was submitted on October 24, 2005, and supplemented on June 30, 2006. Based on its review of SMC's DP, as supplemented, and previously submitted site-specific information, the NRC staff requires additional information to support its evaluation of the potential safety impacts of SMC's proposed decommissioning approach described in the DP. The requested information is identified in the enclosure to this letter. In addition to providing the information in the enclosure, SMC should also update its cost estimate to account for any changes that result from addressing the NRC staff's request for additional information (RAI).

Although our process typically requests responses to RAIs within 30 days we recognize that some of the RAIs will require environmental sampling and laboratory work that cannot be completed within a 30-day period. Therefore, we are requesting that you provide your response within 120 days of the date of this letter.

I want to emphasize that timely completion of our safety review is dependent on SMC providing complete and high quality responses to all of the enclosed safety-related RAIs, as well as providing followup responses to the environmental RAIs that were transmitted to you on March 19, 2007. In that regard, our practice is to initiate only one round of RAIs. We have implemented this practice to avoid the cost, in terms of time and resources, of multiple RAIs. If the additional information you provide is insufficient for the NRC staff to complete its Safety Evaluation Report and Environmental Impact Statement, the staff may suspend or terminate its review of your DP.

D. Smith

2

The NRC staff is available to meet with you to discuss any questions that you may have regarding the enclosed RAIs. If you have any other questions concerning this letter, please contact Ken Kalman, at (301) 415-6664, or via email at klk@nrc.gov.

Sincerely,

/RA/

Keith I. McConnell, Deputy Director
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 40-7102
License No.: SMB-743

Enclosure: Request for Additional
Information

cc: Shieldalloy Distribution List (w/o encl)

D. Smith

2

The NRC staff is available to meet with you to discuss any questions that you may have regarding the enclosed RAs. If you have any other questions concerning this letter, please contact Ken Kalman, at (301) 415-6664, or via email at klk@nrc.gov.

Sincerely,

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Docket No.: 40-7102
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Enclosure: Request for Additional
Information

cc: Shieldalloy Distribution List (w/o encl)

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Request for Additional Information

Shieldalloy Metallurgical Corporation Decommissioning Plan Docket No. 04007102

The U.S. Nuclear Regulatory Commission (NRC) staff is conducting its safety review of Shieldalloy Metallurgical Corporation's (SMC's) proposed plan for decommissioning its Newfield, New Jersey site. SMC submitted a Decommissioning Plan (DP) (Rev. 1) on October 24, 2005, and a Supplement to the DP (Rev. 1a), on June 30, 2006. Based on NRC staff review of these reports and previously submitted information, the NRC staff is requesting the following additional information to support its evaluation of the potential safety impacts of SMC's proposed DP.

- 1. (Section 3.6.2) Update the data on surface water flow in the Hudson Branch at and near the site to account for the impact of site decommissioning activities and other changes on this flow.**

Basis:

Surface water flow in the Hudson Branch is an important parameter impacting the interrelationship of groundwater and surface water at this site. Vol. III of the DP (Rev. 1) (the Environmental Report) (ER) (page 3-20) states that a surface water inventory of Hudson Branch was performed from 1993 to 1995. However, decommissioning and other activities at the site could have impacted the onsite surface water drainage and discharge outlets to the Hudson Branch. Thus, the surface water inventory should be updated to account for any changes that the previous activities may have had on the Hudson Branch stream flow. If SMC believes that an update is not needed, then it should justify why this is not necessary.

Path Forward:

SMC should update the stream flow inventory of the Hudson Branch, or provide a justification for why an update is not necessary.

SMC should tabulate the most recent surface water withdrawals that have occurred since the 1990 to 1999 values listed in Figure 3-13 of the ER and summarized on page 3-26 of the ER.

Enclosure

2. **(Section 3.7.2) Update the data in Table 3-4 of the ER, on the existing monitoring wells (both onsite and offsite) for the SMC site.**

Basis:

SMC has evaluated groundwater analytical results in over 50 wells during the past 15 to 20 years. However, the status of these wells for future radiological monitoring should be addressed. SMC should update the data in Table 3-4 of the ER (Monitoring/Extraction Well Construction Details) to provide the following additional well statistics: well location (legal location or referenced to a figure), well ownership, well status (active, damaged, or abandoned), hydro stratigraphic unit screened, and well type (monitoring, private, municipal, industrial, or irrigation). The well statistics in Table 3-4 of the ER should be updated so that future and past sampling and radiological analysis can be adequately evaluated.

Path Forward:

SMC should provide the updated well statistics mentioned above for the wells listed in Table 3-4 of the ER. SMC should also indicate which existing figure(s) displays all of these wells or provide a new figure that shows all wells.

3. **(Section 3.7.7) SMC should provide the input data, other pertinent model procedures, and model results for the groundwater flow and transport modeling performed using the MODFLOW-SURFACT model referenced in Appendix D of the DP (Rev. 1a).**

Basis:

The NRC staff must independently evaluate the groundwater flow and transport modeling to provide assurance that the model results and procedures are appropriate for the physical system at this site.

Path Forward:

The model results should include the calibration model run and the simulation scenario run in which the engineered barrier for the slag pile fails, radionuclides leach from the slag pile into the groundwater, and a well about 100 feet down gradient of the Storage Yard provides groundwater for a residential use. SMC should provide electronic versions (CD or DVD) of the input data, model procedures, and aforementioned model results of its groundwater flow and transport modeling using the MODFLOW-SURFACT model.

4. (Section 3.7.8) SMC should provide the existing radiological data for the SMC site from the 1990's to the present for all onsite, and offsite groundwater, surface water, and stream sediment monitoring sites.

Basis:

The NRC staff must evaluate the impact of site-generated radionuclides on the groundwater, surface water, and stream sediment to understand existing and potential fate and transport of site-generated radionuclides at the SMC site. Furthermore, SMC has not demonstrated whether site-generated radionuclides have moved offsite. Data on the aforementioned parameters are essential for the NRC staff to assess whether these radionuclides have migrated offsite.

The radiological data for the site's groundwater (the 2004 and 2005 sampling events in the ER) do not contain an adequate number of samples up gradient or down gradient (with respect to groundwater flow) of the slag pile area to characterize the radiological conditions.

Path Forward:

Provide a tabular summary of all groundwater, surface water, and stream sediment investigations conducted at the site. SMC should provide all existing radiological data for this site from the 1990's to the present for all upgradient (including background), onsite, and downgradient groundwater, surface water, and stream sediment monitoring sites. Provide those data not previously transmitted to the NRC for radiological characterization.

SMC should provide an updated figure delineating the location of all groundwater, surface water, and stream sediment monitoring sites from the 1990s to the present. The figure should include background, upgradient, onsite, and downgradient sampling locations.

If the existing data for these parameters are not adequate for characterization, then SMC should develop additional upgradient, onsite, and downgradient groundwater monitoring sites to collect the radiological data.

SMC should list its sampling and analytical procedures, minimum detectable concentrations, and uncertainty for all radiological analyses performed on the above requested water and sediment samples.

SMC should summarize how the measured characterization data support the volume estimates of radioactive materials accumulated in the Storage Yard and in other areas (such as the T12 Tank and the sediments in the Hudson Branch), and the estimated labor and waste disposal volumes required for the proposed action.

5. **(Section 3.7.8) An evaluation of potential leachate (radionuclides and other inorganic materials) movement from the consolidated radioactive materials (slag and baghouse dust) to the saturated zone (Upper Cohansey sands) needs to be provided for current and future conditions.**

Basis:

The NRC staff is unable to adequately assess the potential dose to humans and the impact on the environment without an understanding of the potential for leaching of radionuclides from the consolidated radioactive materials into the vadose and saturated zones.

Path Forward:

SMC should perform an evaluation of current and potential leachate generated from the consolidated radioactive materials. This evaluation should include the current and potential leachate transport through the vadose zone into the saturated zone with site developed/estimated hydraulic conductivities (K) and distribution coefficients (Kd).

The evaluation of current and potential leachate generated by the proposed action should consider all types of accumulated materials including the various types of slag, baghouse dust, building rubble, and soil.

6. **(Section 5.2.2.2.1) SMC should indicate the volume and type of soil that will be used in the engineered barrier that will overlie the consolidated radionuclide-bearing materials in the Storage Yard.**

Basis:

The NRC staff will need the volume and type of soil used in the engineered barrier to evaluate both runoff and evapotranspiration from the cap.

Path Forward:

SMC should identify the volume and type of soil that will be used in the engineered barrier and its appropriate soil parameters that impact runoff and evapotranspiration from the cap.

7. **(Section 4.4) Provide bases for the radionuclide concentrations for materials to be consolidated into the restricted area cell.**

Basis:

Descriptions of the radionuclide concentrations proposed for consolidation in the engineered cell in the restricted area are needed to support the dose assessments for the restricted area. Based on the information provided in the DP (Rev. 1 and Rev. 1a), SMC has not provided a sufficient basis for the radionuclide concentrations for these materials. Without support for this information, the NRC staff cannot conclude that the dose assessments are acceptable.

Section 5.2.1.2 of the DP (Rev. 1a) discusses the restricted area source term to be used in the dose assessments. This section refers to Section 4.4 and Table 17.7 of the DP (Rev. 1) for radionuclide content of the various materials to be consolidated in the restricted area.

Generally, Section 4.4 does not provide references for the statements about radionuclide content of the materials to be consolidated. Section 4.4.1 does include footnote 54, which briefly describes that the radionuclide concentrations for materials formerly in the haul road were estimated to be 18 pCi/g for each of the uranium and thorium series, based on exposure rates relative to exposure rates for the ferrocolumbium slag. Details of this calculation were not provided.

Table 17.7 summarizes radionuclide concentrations for three materials: slag, baghouse dust, and radioactive soil, and provides a derived source term to represent the combination of materials proposed for consolidation in the restricted area cell. Table 17.7 provides references, given in footnotes 167–171. Footnote 167 cites the 1992 characterization report (IT 1992a). However, the NRC staff was unable to find information describing radionuclide concentrations in the slag, baghouse dust, or the excavated haul road soils that are now stockpiled in the Storage Yard in that characterization report.

Footnote 168, related to the slag material, refers to a written communication from Integrated Environmental Management (IEM) to SMC (Berger 1994). This document is a report of the radiological analysis of seven samples of ferrocolumbium slag. The document includes a table of concentrations estimated from gamma spectroscopy analyses of different progeny of the uranium and thorium decay series, with average values from the different progeny measurements. The average values are those SMC has used in Table 17.7 of the DP (Rev. 1); however, SMC has not justified that all measurements were equal in quality. In particular, from examining the measurement results for Bi-214 and Pb-214, the NRC staff has concerns that the samples may not have been sealed or fully equilibrated before the gamma spectroscopy was performed. The results for these two radionuclides are substantially lower than the Ra-226 results, indicating possible disequilibrium. The TI-208 measurements for the thorium series may also be affected (the average adjusted TI-208 measurement is lower than the Th-232 and Th-228 measurements). In addition, the sample locations are not described. Thus SMC has not demonstrated that the averages of the seven sample results are representative of the slag, which is the most radioactive source in the Storage Yard.

Footnote 169, related to the baghouse dust, refers to a 1992 SMC ER (SMC 1992). Table 6 of this ER provides information on the mass of thorium and uranium contained in slags and the baghouse dust (called the "lime pile"). The NRC staff has two concerns. First, the mass values were converted into equivalent activity concentrations of Th-232 and U-238. These activity concentrations differ substantially from the values reported in Table 17.7 of the DP (Rev. 1). In particular, the 1992 ER values indicate a much higher concentration of Th-232 than of U-238, which differs from the values provided in Table 17.7 of the DP (Rev. 1). Second, the 1992 ER data are not supported with any references, so the basis of the information is unknown.

In its April 24, 2007, response to the NRC staff request for additional information, SMC provided additional information on radionuclide concentrations in the baghouse dust material. An ORISE report (1997) and a letter from IEM (Berger 1995) indicate radionuclide concentrations substantially different from that provided in Table 17.7 of the DP (Rev. 1).

Footnote 170, related to the radioactive soil, refers to a final status survey of the haul road (IEM 1999). The materials of concern are radioactive soils from the haul road, that were removed and transferred to a pile in the Storage Yard. No information on radionuclide concentrations in the soils that were scraped from the haul road and moved to the Storage Yard could be located in this document (IEM 1999).

Footnote 171 relates to the derived source term that is intended to represent all material proposed for consolidation in the restricted area cell. This footnote states that the derived source term values were calculated from the concentrations in the slag, baghouse dust, and soil, weighted by the masses of the three components. Masses for 12 areas of radioactive materials are provided in Table 17.1 of the DP (Rev. 1). It is unclear to the NRC staff which type of material (i.e., slag, baghouse dust, or radioactive soil) is assumed for some of these areas. The DP (Rev. 1) does not fully describe how the weighted average concentrations for the derived source term was determined.

To summarize, based on the above inconsistencies, lack of supporting data, and lack of transparent calculations, the radionuclide concentrations used for the derived source term of the materials proposed for consolidation in the restricted area cell are insufficiently supported for use in the dose assessments.

Path Forward:

Provide a detailed discussion of the development of the radionuclide concentrations used for the derived source term of the materials proposed for consolidation in the restricted area cell. Supporting measurement data should be provided.

8. (Section 4.4 and Table 17.1) Provide bases for the volumes of materials proposed for consolidation into the restricted area cell.

Basis:

The volumes of materials proposed for consolidation in the engineered cell in the restricted area should be described to support the dose assessments for the restricted area (in part, the volumes are used to develop the "derived source term" or average source term concentrations). The volume of materials are also needed to support the cost estimates for alternatives and to support the cost-benefit analysis and ALARA evaluation. Based on the information in the DP (Rev. 1 and Rev. 1a), SMC has not provided a sufficient basis for the volumes for these materials. Without support for this information, the NRC staff cannot conclude that the dose assessments and ALARA evaluations are acceptable.

Section 5.2.2.2 of the DP (Rev. 1a) discusses the contaminated zone layer of the proposed cell in the restricted area, including the total volume of 65,800 m³. This section refers to Table 17.1 of the DP (Rev. 1) for volumes of the various materials to be consolidated in the restricted area (that make up the total). Table 17.1 does not reference the source for this volume information.

In addition, Section 4.4.1 of the DP (Rev. 1) discusses volumes of ferrocolumbium slag, baghouse dust, and soil excavated during the haul road remediation. Though there is not a clear one-to-one correspondence between these materials and the areas described in Table 17.1, the volumes are inconsistent.

Path Forward:

Provide a detailed discussion of the volume estimates developed for the materials proposed for consolidation in the restricted area cell. Supporting measurement data should be provided, as appropriate.

- 9. (Chapters 4 and 5) Provide a complete discussion about radiological contamination in the Hudson Branch, and how the radiological criteria are or will be met.**

Basis:

The status of radiological contamination in the Hudson Branch has not been sufficiently described for the NRC staff to be able to conclude that the radiological criteria will be met.

Section 4.4 of the DP (Rev. 1) indicates that residual radioactivity was identified in the Hudson Branch watershed in the late 1980s. It is stated that a radiological risk assessment for the Hudson Branch (IT 1992b) showed that the radionuclide concentrations presented an insignificant risk to members of the public. The staff notes, however, that SMC needs to demonstrate that the radiological criteria for unrestricted use (the Hudson Branch is located in the proposed unrestricted use area of the site) have been met. In addition, the staff notes that the risk assessment indicated that the concentrations of contaminants were based on conditions as they existed in 1991 and that the effect of future (i.e., post-1991) releases were not considered. For the characterization to be applicable, it needs to relate to current and future conditions in the Hudson Branch.

Section 4.4 of the DP (Rev 1.) also refers to the ER (Appendix 19.9 of the DP (Rev 1.)) for additional data on soil sampling. The ER contains, in Maps 6, 7, and 8 of Appendix B, locations and results of soil, sediment, and surface water sampling for U-238, Th-238, and Ra-226. These maps show elevated concentrations compared to background.

Section 4.6 of the DP (Rev. 1) states that surface water collected from the vicinity of the site does not exhibit concentrations elevated above background. The citation for this statement is the Remedial Investigation (RI) report (TRC 1992). However, the RI report

does not contain information on radiological constituents; it only addresses non-radiological contaminants. In addition, the NRC staff notes that the statement (that surface water did not exhibit concentrations elevated above background) appears inconsistent with data in the ER maps [which were taken from the 1992 site characterization report (IT 1992a)], which shows concentrations of U-238, Th-232, and Ra-226 in surface water in or around the Hudson Branch that appear to be elevated above background concentrations.

Section 3.11.1.2 of the ER (Appendix 19.9 of the DP (Rev 1.)) discusses radionuclide concentrations in the Hudson Branch. This section of the ER refers to the 1992 Characterization report (IT 1992a), and states that the characterization report concluded "that the presence of uranium and thorium plus progeny in the sediment samples do not contribute significantly to the ambient background exposure rate in the area." The NRC staff could not find such a conclusion in the IT characterization report (IT 1992a).

The licensee has not demonstrated that the residual radioactivity in the Hudson Branch is acceptable under the dose criteria of the LTR (i.e., 25 mrem/year and ALARA for unrestricted use).

In summary, the information presented in the DP regarding sediment and surface water contamination in the Hudson Branch appears dated, is inconsistent, and is not well supported.

Path Forward:

If the licensee intends no remediation in the Hudson Branch, then SMC should provide a detailed discussion of the residual radioactivity in the Hudson Branch and the basis for concluding that the existing conditions are within the radiological criteria for unrestricted use (i.e., 25 mrem/year and ALARA). Supporting measurement data should be provided.

If the licensee intends to perform radiological remediation in the Hudson Branch, then SMC should describe the planned remediation, and should demonstrate that the remediation will achieve the radiological criteria for unrestricted use (i.e., 25 mrem/year and ALARA). Supporting measurement data should be provided.

10. **(Section 4.5) Describe the remedial characterization data that will be needed to evaluate residual radioactivity in soils that have not been identified or sufficiently characterized.**

Basis:

Section 4.5 of the DP (Rev. 1) discusses the possible subsurface residual radioactivity that may exist on the site, indicating that slag may have been used as fill at a number of locations throughout the site. This section discusses two such areas, the southwest fence line and the T12 Tank Area, however, the NRC staff could not find a figure in the DP that outlines the locations of these areas. The DP neither describes any plan for remediating these areas, nor provides a plan for determining if remediation is needed or if the current concentrations would meet the dose criteria for unrestricted use.

Footnote 65 of the DP (Rev. 1) states that these areas will be addressed during the site-wide final status survey. This is not sufficient for the NRC staff because a final status survey is designed to demonstrate that areas meet the dose criteria, not to locate areas of contamination nor to evaluate the extent of contamination and the need for remediation. The NRC staff notes that Section 14.1 of the DP (Rev. 1) discusses characterization surveys, but that section does not describe any additional planned characterization work.

The NRC staff is also concerned that SMC mentions the existence of possible subsurface contamination in a number of locations; however, no information on plans to either locate or evaluate areas other than the two described above have been discussed. The NRC staff recognizes that all contamination requiring remediation may be identified before remediation begins. However, characterization should be sufficient to bound the range of contamination present at the sites. Without further plans in this regard, the NRC staff is unable to conclude that SMC will be successful in identifying all radioactive material on the site that could require remediation to meet the unrestricted use criteria.

Path Forward:

SMC should identify additional locations where residual radioactivity exists and evaluate the data needed for those areas (including the two areas already identified) to determine if they meet the dose criteria for unrestricted use or if remediation would be necessary.

In addition, the licensee should describe the locations of the southwest fence line and the T12 Tank Area, including the use of figures or maps, as appropriate.

11. (Section 5) Provide additional input for the responses to the Environmental RAIs (Numbers 7 through 14) that were submitted on March 19, 2007.

Basis:

SMC noted that it will be providing additional input for many of the dose analysis RAIs at a later date. It is stated that this input will be included along with the response to RAI No. 11. However, some of the NRC staff questions were not answered, and it's unclear if SMC will be providing a response to those RAIs at a later date. For example, for RAI No. 9, staff asked for SMC to provide the approach used to identify sensitive parameters, but no description was provided. For the action to be taken related to RAI No. 9, SMC does not state whether it will be providing a response to this question at a later date.

Path Forward:

Provide complete responses to each of the questions that NRC staff transmitted on March 19, 2007.

12. (Section 5) Identify the category for each type of scenario analyzed.

Basis:

SMC based its compliance scenario(s) on reasonably foreseeable land use. NRC guidance (NUREG-1757, Vol. 2) recommends that the licensee identify what land uses are less likely but plausible (i.e. not for compliance but to provide insights) and evaluate scenarios consistent with these less likely but plausible land uses when choosing the reasonably foreseeable land use. SMC has identified and evaluated various scenarios but does not provide a clear distinction between those that are considered reasonably foreseeable and used for compliance and those that are less likely but plausible and presented for information purposes. SMC uses various terms for describing the types of scenarios such as, reasonable, possible although not likely, unlikely and applicable. Using terminology consistent with NRC guidance would allow staff to clearly understand the intended category for each scenario.

Path Forward:

Clearly identify each scenario analyzed according to the terminology provided in Table 5.1 of NUREG-1757, Vol. 2.

13. (Section 5.3) Provide additional support for assumptions made regarding the receptor location.

Basis:

In determining what are considered reasonably foreseeable land uses of the site, SMC needs to provide additional support to bolster its assumptions. Specifically, SMC makes assumptions about the unlikelihood of residential and farming encroachment, but doesn't relate this to how the existing surrounding land-use has or has not changed over time. SMC's basis for why encroachment of residential and/or farming will not occur is reliance on the long-term control (LTC) license. The LTC license applies only to the restricted area. Therefore, staff does not see how the LTC license would prevent encroachment outside of and up to the fence line of the restricted area. The NRC staff also questions the validity of this assumption considering that there is evidence of residences being built in the area. Also, according to Figure 3-2 of Vol. III of the DP (Rev. 1), a portion of the SMC site is considered a suburban planning area and the remainder of the site as a rural/environmental sensitive planning area. Further, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) restrictions related to soil contamination do not provide a strong basis for preventing future construction after soil remediation is complete.

It is also unclear why it is appropriate to assume that a residence will not be located closer to the engineered barrier than 1000 feet away from the restricted boundary¹

¹SMC's Supplement to the DP (Rev. 1a) assumes that the hypothetical resident is to be located 1000 feet from the boundary of the restricted area; however, the Microshield analysis seems to reflect an assumption that the receptor is 1000 feet from the pile. In addition, Section 1.2 of the DP (Rev. 1) states that the nearest off-site resident is located 100 feet from the property. This statement contradicts the assumption that was made in the dose assessment.

(Section 5.3.3.2), especially in light of the fact that part of the site will be released for unrestricted use. Under the controls-fail scenario, no discussion is provided as to why a residence could not be located within the boundaries of the restricted area, even if the residence is not assumed to be located on top of the engineered barrier. Based on Figure 18.6, which shows the planned layout of the engineered barrier following decommissioning, there appears to be more than an acre of available land within the restricted area. Further, no discussion or explanation is provided as to why an industrial worker will only be located outside of the restricted area. This assumption is questionable, especially if access controls to the restricted area fail.

Path Forward:

Provide a map that identifies the location of the CERCLA well restriction area. Provide a map that identifies the location of the nearest residence relative to the SMC site, and correct the DP, as appropriate. Justify the assumed location of the residence and industrial worker in relation to the proposed engineered barrier, in light of potential uses of the site, failure of access controls to the restricted area, and given current surrounding land-use trends. Alternatively, re-evaluate the potential doses for these scenarios considering a closer location relative to the proposed engineered barrier, including one within the restricted area when controls fail.

14. (Section 5.3) Provide additional information on agricultural uses in the area.

Basis:

SMC does not analyze a resident farmer scenario but does not justify its exclusion as a plausible scenario. Section 3 of Vol. III of the DP (Rev. 1) explains that several acres of land in Gloucester County and Cumberland County are used for agricultural purposes, and it states that prime and unique farmlands (based on soil type) were identified in the vicinity of the SMC facility. Figure 1.1 of Vol. III shows farmland that is owned by SMC. However, uses for this farmland are not explained. In response to RAI No. 11 of the March 19, 2007, Environmental RAIs, SMC mentions anticipated continued agricultural use of the surrounding area. SMC needs to provide justification for excluding the resident farmer scenario.

Path Forward:

Identify farms or agricultural activities occurring within the vicinity of the SMC site and give their proximity to the site. Specifically, explain whether the farmlands in the area are used for cattle grazing. Identify what crops, if any, are grown on the adjacent farmlands. Provide details (i.e. type of agricultural activities and location) on the type of agricultural activities that SMC references in the aforementioned RAI responses. Explain any other future plans for agricultural activities in the area. Provide justification for excluding the resident farmer scenario or include a resident farmer scenario in the dose analysis. The justification should explain how potential uses of the site differ from current agricultural land use trends in the region.

15. (Section 5.3.3.1) Clarify the discrepancy regarding the cover erosion rate under the controls-fail scenario.

Basis:

In Section 5.3.3.1 of the DP (Rev. 1a), SMC assumes that the cover will be maintained and does not erode while institutional controls are in place. This statement is inconsistent with the corresponding scenario, which is analyzed under the conditions when controls fail.

Path Forward:

Revise the statement regarding the cover erosion rate for the recreational scenario when controls fail. Explain whether SMC assumes that this cover will or will not erode. In addition, provide a basis for this assumption given the proposed cover design and performance of that design over 1000 years.

- 16. (Section 5.3.3.3) Justify exclusion of the ingestion and inhalation pathways for the excavation scenario.**

Basis:

In Section 5.3.3.3 of the DP (Rev. 1a), SMC states that slag is hard and difficult to chip or pulverize, which eliminates the potential for ingestion or inhalation of radioactive materials. However, soil and baghouse dust will also be a part of the slag pile matrix which allows for the potential for ingestion or inhalation of radioactive materials.

Path Forward:

Provide stronger justification for the elimination of the ingestion and inhalation pathway for the excavation scenario or include these pathways in the analysis.

- 17. (Section 5.4.3.3) Provide appropriate characterization of the radioactive solids, slag, baghouse dust, and soil, to support a source term for the performance assessment model.**

Basis:

The slag at the SMC site is a result of a thermoelectric process to extract niobium and tantalum from ore for use as additives in steelmaking. Characterization of slags resulting from similar extraction processes on similar ores at other sites in the eastern U.S. suggest that they are generally composed of relatively exotic minerals in a glassy matrix. NUREG-1703 (Veblen et al., 2004), entitled "Characterization of Radioactive Slags," describes material from these other decommissioning sites where niobium and tantalum were extracted from ores likely similar to those used at SMC. The radionuclides at these other sites were distributed variably in some of the crystalline and glass phases that constitute the slags. Some of the crystalline phases appear to be refractory, i.e. weather resistant, while other phases could be more susceptible to weathering. Glass, for example, generally, weathers to clays. The weathering process can result in the release of radionuclides dissolved in the various phases. The slag at

the SMC site has not been adequately characterized to constrain its performance as a source term.

Various standardized methods have been used to determine the radionuclide release rate from the slag, the slag leachability or solubility-limited concentration of radionuclides in groundwater in contact with the slag at SMC. For example, in 1991 and 1992, the slag was analyzed using the American National Standards Institute/American Nuclear Society Standard (ANSI) 16.1-1986 (letters from Rieman to Fawaz). The DP (Rev. 1) mentions that a sample of slag was analyzed using EPA's Toxicity Characteristic Leaching Procedure (TCLP) 13.1. Three slag samples were also analyzed using ASTM D4319. However, application of the results of each of these standardized methods to constrain the performance of the slag as a source term suffers from the non-site-specific physical and chemical aspects of the methods.

For example, the ANSI 16.1 test involves the leaching of a cylinder of dimensions specified by the standard method. However, leaching of the slag is most likely surface-area dependent. Over the regulatory period, weathering of the slag could result in an increase in surface area. The surface area effect on leachability is uncertain.

SMC applied the TCLP to several slag samples to determine leachability. It is unclear how the results of those leaching procedures were used in the performance assessment. TCLP is a relatively aggressive procedure, but its non-site-specific chemistry makes application of its results uncertain. The licensee recognizes the unique physical and chemical characteristics of the slag as evidenced in the September 16, 2005, letter from Carol Berger to David Smith (Appendix 19.4) which states that "While default distribution coefficients are available as part of the code's supporting database, the unusual physical and chemical characteristics of the slag and baghouse dust were thought to present actual distribution coefficients that differ significantly from the defaults." The code that is referred to is RESRAD.

SMC modeled the site performance with RESRAD. One abstraction method to describe a source term in RESRAD involves using K_d values of the contaminated zone. SMC used the ASTM D4319 standardized procedure to determine the K_d values of the slag and baghouse dust. Distribution coefficients describe the ratio of the concentration of radioelements on the solids to the concentration in the coexisting liquids when the processes controlling the distribution are sorption and desorption. However, if the slag at SMC is similar to those described in NUREG-1703, the radionuclides are most likely dissolved in the phases of the slag. Consequently, applying a distribution coefficient, K_d , to describe the partitioning of radionuclides between the solids and the coexisting groundwater, is inappropriate. The ASTM D4319 analytical method describes contacting uncontaminated granular material with groundwater traced with a radionuclide of concern for no more than 14 days. Using radioactive slag and uncontaminated groundwater would be inconsistent with this procedure, especially if the processes affecting radionuclide partitioning are not sorption-desorption.

Instead of characterizing the isotopic composition of the slag in the DP, SMC assumes secular equilibria among the decay progeny. This assumption is intended to maximize the concentration of contaminants in the source term for the performance assessment. However, maximum concentrations in the source term do not necessarily lead to conservative estimates of dose to the receptor when multiple exposure pathways are

expected. Valuable information on leachability may be obtainable by analysis of the isotopes of the decay series. For example, Ra-228 is a decay product of Th-232. With a half-life of 5.76 yrs, Ra-228, in a 20 year-old undisturbed slag, should approach secular equilibrium with the Th-232 parent. If this is not the case, then leaching would be suggested over the time period since the slag has been stored. NUREG/CR-6632, Solubility and Leaching in Site Decommissioning Management Plan (SDMP) Slags (Felmy et al., 2002), describes an example where isotopic analyses of slag from another decommissioning site in the eastern U.S. showed progeny that were not in secular equilibrium with the Ra-226 parent. The authors suggested that the material was porous enough that gaseous Rn-222, the first decay product of Ra-226, had time to escape, (half-life 3.3 days), before itself decaying to solid Po-218. At another site described in this study no disequilibria was evident, suggesting this material was less permeable.

The leachability of the slag over the 1000-year regulatory period is uncertain. As the slag weathers, physical degradation and mineral alteration could affect the leach rate or release of radionuclides. An increase in surface area could result in higher release rates as the surfaces dissolve or possibly lower rates due to increased sorption sites. NUREG/CR-6632 (Felmy et al., 2002) also demonstrated that Th solubility increased significantly at low pH values. Whether low pH could occur within the regulatory period at SMC is uncertain.

Path Forward:

Characterize the stored materials to estimate the leachability of the slag and baghouse dust. This would include an analysis of the existing radionuclides, parents and decay products, to determine the extent of secular equilibrium. Also, SMC should identify in which phases in the slag the radionuclides are contained. This information would help to justify the leaching mechanism responsible for release of the radionuclides. Sampling should capture the variability of material types (e.g. slag, baghouse dust, radioactive concrete, and radioactive soils). Leaching/solubility procedures should include determining the effects of surface area/particle size, experiment duration, and range of future water chemistries on radionuclide concentrations in the groundwater.

18. **(Section 5.4.3.3) Provide adequate characterization of sorption parameters for use in the performance assessment.**

Basis:

Table 17.5 lists Kd values for actinium, protactinium, lead, radium, thorium, and uranium in the contaminated zone, unsaturated zone, and the saturated zone. It is noted that for actinium and protactinium, different Kd values are provided for the saturated zone compared to the contaminated and unsaturated zones. The source for these values was Sheppard and Thibault 1990. The lead values are the same for all three zones with the source being RESRAD default (Yu et al., 2001). On the other hand, the partition coefficients for radium, thorium and uranium are site-specific, determined by laboratory analysis. These site-specific parameters do not vary for the different zones.

Given that SMC chose Kd values for some of the radionuclides that depend on the zones in which they are located, it seems inconsistent that the site-specific measurements would not also show a zone dependency. This may be a result of limited sampling.

The Kd values associated with the slags are large. Large Kd values for the soil underlying the contaminated zone is not demonstrated. By assuming large Kd values, the leached radionuclides can be stored on the solids, reducing the exposure to the receptor.

Path Forward:

Determine the Kd values for each of the zones to be used in the performance assessment or explain why the values in the DP are adequate.

19. **(Appendix E) SMC should provide information regarding riprap gradations, riprap durability, and quality assurance procedures for rock production and placement.**

Basis:

Staff review of the DP (Rev. 1 and Rev. 1a) indicates that little or no information is provided regarding the gradations, durability, and quality assurance procedures that will be used for the side slope rock and the apron rock. Riprap gradation information is needed to determine if the gradations meet minimum criteria for size and uniformity. The gradation information should be provided for staff review and approval prior to production of the rock. Examples of acceptable gradations may be found in NUREG-1623 and NUREG-1757.

Additional information is needed to assess the durability of the proposed rock. SMC should select a rock source, perform durability testing using the tests suggested in NUREG-1623 and NUREG-1757, perform petrographic examination(s), and provide the data for staff review.

Path Forward:

Provide additional information regarding the quality assurance (QA) programs, quality control (QC) programs, testing procedures, and inspection procedures that will be used during construction to confirm rock gradations, rock layer thicknesses, and rock quality. The information should include the specific tests and the frequency of testing. General guidance may be found in NUREG-1623 and NUREG-1757.

SMC should select a rock source and indicate the quarry and source that will be used. As discussed above, SMC should provide detailed information and test data regarding gradations, durability, and QA/QC procedures that will be used for the selected rock source. If there is significant variability in the rock source at the quarry, SMC should provide additional information regarding the QA/QC programs that will be implemented at the quarry to assure consistency in rock production.

20. (Sections 5.2.2.2.1, 5.3.3, and 5.4.3.2) Correct the statements related to the use of a geomembrane in the engineered barrier

Basis:

In the DP (Rev. 1a), SMC has indicated in drawings that the geomembrane has been eliminated from the engineered barrier design. However, Section 5.2.2.2.1, Section 5.3.3, and Section 5.4.3.2 of the same DP still refer to a geomembrane.

Path Forward:

Correct these and any other inconsistencies in the DP so the entire document reflects the latest design information.

21. (Section 5.3) Correct discussion in the DP regarding the engineered barrier and its relation to the groundwater pathway considerations.

Basis:

Section 5.3 of the DP (Rev. 1), Exposure Scenarios, indicates that one reason for excluding the groundwater pathway is that the engineered barrier is designed to prevent rainwater infiltration into the radioactive material. This is not the case, as the engineered barrier no longer includes a geomembrane in its design, and SMC has not yet identified and characterized the soil cover material.

Path Forward:

Clarify and correct statements made regarding the engineered barrier and its relation to the groundwater pathway considerations of the dose assessment.

22. (Sections 5.4.3.2 and 8.3): Provide an appropriate and complete engineered barrier design and degradation analysis.

Basis:

A complete and accurate assessment of the performance of the engineered barrier system must be provided. To determine compliance with Subpart E for restricted use, an analysis is required of: 1) the contribution of the engineered barrier system toward compliance with the criteria of 10 CFR 20.1403 with institutional controls in place (25 mrem/yr dose); and 2) the contribution of the engineered barrier system toward compliance with the criteria of 10 CFR 20.1403 assuming loss of institutional controls and maintenance such that the barrier may degrade over time (100 mrem/yr dose). NUREG-1757, Vol. 2, Section 3.5.3, provides guidance on the elements that should be provided to support the assessment of the performance of the engineered barriers, including the degradation mechanisms and real-world conditions expected for the barriers (see RAIs on dose assessment and scenarios).

Path Forward:

Provide an analysis of the impact of the range of disruption/degradation mechanisms and scenarios, and either a comparison of those impacts to the non-conformance level of degradation or a comparison of the resulting doses to the 10 CFR 20.1403 dose criteria. In this analysis, include the engineered barrier geotechnical degradation mechanisms of slope stability, settlement, liquefaction, freeze/thaw, and root penetration, particularly under the loss-of-control conditions. Figure 18.8 of the DP (Rev. 1) shows vegetation on the cover surface. Identify the type of seed mixes to be used and provide a planting schematic that shows the type and location of vegetation that would be planted on the engineered barrier.

23. Evaluate the effect of additional leach test results on the engineered barrier design.

Basis:

SMC's engineered barrier design in the DP (Rev. 1), including the absence of engineered elements to limit infiltration, is based in part on the assumption that there will be insignificant leaching to affect performance. However, this risk-informed basis for the existing cover design is not clearly described. As a result, questions and concerns are raised about the lack of an infiltration barrier, geomembrane, or liner. Furthermore, there is insufficient evidence to support the assumption of no leaching and future leach testing is needed.

Path Forward:

Evaluate the effect of additional slag and baghouse dust leach testing results on dose assessments, and, if necessary for compliance, revise the engineered barrier design and related monitoring and maintenance as appropriate. This reevaluation could result in the potential need for added elements to the cover design to reduce potential leaching and transport of radionuclides, such as an infiltration layer to reduce infiltration or a composite rock/vegetative cover to increase evapotranspiration, or both. To risk-inform the design process and evaluate uncertainties in long-term natural processes and engineered barrier performance, consider conducting sensitivity analyses of a range of assumptions for leaching, infiltration, evapotranspiration, cover degradation, and other factors to demonstrate the significance of these key factors and design elements on compliance with the dose criteria. Use the results from these analyses to describe the risk-informed basis for the engineered barrier design.

Furthermore, if the engineered barrier cover design is revised, the proposed long-term monitoring and maintenance activities and annual costs may also need revision along with the trust fund amount.

24. (Sections 5.4.3.2 and 5.4.3.3) Explain or correct inconsistencies in assumptions for material properties.

Basis:

Page 77 of the DP (Rev. 1a), indicates that native site soils have a measured hydraulic conductivity of 6.4×10^{-3} cm/sec. However, on page 79, the DP (Rev. 1a) indicates that native materials have a hydraulic conductivity of 5.4×10^{-8} cm/sec.

Page 74 of the DP (Rev. 1a), indicates that cover densities were assumed based on density of site material, yet in other sections, the DP indicates SMC's plans to use unidentified off-site materials.

Path Forward:

Explain or correct the apparent inconsistencies in the dose assessment assumptions for hydraulic conductivity and density of cover materials and sub-soils. Identify the source for the off-site materials.

25. (Section 8.3) Provide information related to the final design, construction, monitoring, and maintenance of the engineered barrier.

Basis:

Section 8.3 of the DP (Rev. 1) indicates that a "final design and specification for the engineered barrier" will be provided in a subsequent submission after the DP has been approved. This same section provides a long list of information, analyses, and plans that SMC will include in this future, post-DP-approval submission. Lacking this information, a typical statement provided at this time in the DP is, "Soil material for the engineered barrier will be secured from a certified off-site source, and will be of appropriate grain size and quality to be stable." Much of the information planned for the future submission is necessary for the scenario analysis of the dose assessment, and thus is needed to enable a complete review of the DP. Further, in opposition to the SMC intention to submit monitoring and maintenance plans after DP approval, Section 17.7.4 of NUREG-1757, Vol. 1, indicates that site maintenance and long-term monitoring information needs to be provided in the DP. The specifics are necessary at this time to provide a solid basis for revising the projected costs for monitoring and maintenance provided in Table 17.14 of the DP (Rev. 1).

Path Forward:

Provide more specific and detailed information on the engineered barrier design, sequence of engineered barrier construction activities, monitoring, and maintenance as itemized in the list in Section 8.3, page 95. Include engineered barrier design details, geotechnical characterization and testing of materials, QA and QC plans for construction, the Operation and Maintenance Plan, information on post-closure monitoring, and revisions to the current surveillance and monitoring costs (Table 17.14) once the actual monitoring and maintenance has been identified. Supporting

information should include schematics and cross sections of the restricted area cell/engineered barrier. Provide a description of the equipment (for example, bulldozers and front-end loaders) that will be used for constructing the engineered barrier and plans for survey and decontamination of the equipment.

26. **(Section 8.3) Additional information and analyses should be provided if SMC intends to use rounded rock for erosion protection.**

Basis:

Based on discussions during the on-site technical meeting, SMC indicated that rounded rock may be used for erosion protection at this site. However, the method used to calculate rock sizes (Abt-Johnson Method in NUREG-1623) is based on the use of angular rock. If rounded rock is used, the rock may need to be about 40% larger.

Path Forward:

SMC should select a rock source as soon as possible. If rounded rock will be used, SMC should discuss the effects on the required size of the rock.

27. **(Sections 7 and 16) Eligibility criteria of 10 CFR 20.1403(a): Demonstrate clearly what method SMC is using to show compliance with 10 CFR 20.1403(a), the eligibility requirements for use of restricted use.**

Basis:

The NRC regulation in 10 CFR 20.1403(a), which the staff often refers to as the eligibility requirements for restricted use decommissioning, provides two options for demonstrating eligibility. For eligibility, the licensee may demonstrate that further reductions in residual radioactivity to comply with the unrestricted use criteria either: (1) would result in net public or environmental harm; or (2) were not being made because the residual levels associated with restricted conditions are ALARA. In the DP, the licensee has stated that the proposed approach is ALARA (Rev. 1, Section 7), and (Rev. 1a; Section 16.1) and has also stated that "further reductions in radioactivity at the site, such as that associated with the LT Alternative [i.e., license termination for unrestricted use], would result in net public harm." The licensee has not clearly demonstrated either of these two options, and it is unclear which option (or whether both options) is intended.

Path Forward:

To demonstrate compliance with 10 CFR 20.1403(a), clarify which of the two options (or both) is intended to demonstrate compliance: that further reductions in residual radioactivity to comply with the unrestricted use criteria: (1) would result in net public or environmental harm; or (2) were not being made because the residual levels associated with restricted conditions are ALARA.

28. **(Section 7) Eligibility criteria of 10 CFR 20.1403(a): If asserting net public or environmental harm, then demonstrate net harm.**

Basis:

Section N.2 of NUREG-1757 (Vol. 2, Rev. 1), provides guidance on demonstrating net public or environmental harm. The calculation of net public or environmental harm is a special case of a general cost-benefit comparison that calculates net harm by comparing benefits to the cost of doses, injuries, and fatalities incurred. The calculation does not consider the monetary cost of performing remediation. In the DP (Rev. 1), the licensee has calculated net harm, without the cost of remediation.

Path Forward:

If the licensee asserts net public or environmental harm as the basis for compliance with 10 CFR 20.1403(a), then the licensee must demonstrate that there is net harm, and the public or environmental benefits must be compared to detriments, without including the cost of the action in the equation.

29. **(Section 7) Eligibility criteria of 10 CFR 20.1403(a): If asserting ALARA for the eligibility requirements, then incremental changes to the proposed restricted use approach should be evaluated.**

Basis:

Appendix N of NUREG-1757, Vol. 2, provides guidance on performing ALARA analyses for decommissioning. In typical ALARA analyses, incremental changes in the approach, which would reduce doses, are evaluated to determine if the changes are ALARA. This could be thought of as fine tuning the approach, from the ALARA perspective. The DP does not provide any consideration of incremental changes to the proposed restricted use approach.

Path Forward:

Include, as part of the ALARA analysis, consideration of incremental changes to the proposed restricted use approach. If the licensee believes there are no such incremental changes to evaluate, the licensee should provide a justification.

30. **(Section 7) Eligibility criteria of 10 CFR 20.1403(a): If asserting ALARA for the eligibility requirements, benefits and detriments should be compared.**

Basis:

Appendix N of NUREG-1757, Vol. 2, provides guidance on performing ALARA analyses for decommissioning. An ALARA analysis should compare costs (detriments) with benefits to determine if the costs are reasonable for the benefits provided. Table N.1 of Appendix N lists some of the benefits and detriments that may be applicable. The primary (but not the only) benefit is generally the collective dose averted in the future.

The NRC staff notes that SMC has considered the doses *incurred* for each alternative to be costs, rather than evaluating averted doses as benefits. This approach makes it difficult to understand the benefits potentially achieved for the costs of a given alternative.

Path Forward:

For the ALARA analysis, the licensee should compare benefits to detriments or costs. The licensee should evaluate the doses *averted* as a benefit of each alternative.

31. **(Section 7) Eligibility criteria of 10 CFR 20.1403(a): Address minimal incremental actions necessary to achieve unrestricted use.**

Basis:

Based on the wording of 10 CFR 20.1403(a), the NRC staff considers that the demonstration of compliance should evaluate incremental measures that could be taken to comply with the unrestricted use criteria. In the DP, the licensee evaluated an "LT" (license termination under unrestricted use conditions) alternative, which assumes removal and offsite disposal of all residual radioactive materials in the Storage Yard. The licensee has not demonstrated that complete removal and offsite disposal is necessary to achieve the unrestricted use criteria. If the amount of remediation work is overestimated, then the cost of the LT alternative would also be overestimated, which would bias the net harm or ALARA comparison away from the unrestricted use option. Thus, the unrestricted use option considered should be an option with minimal incremental remedial actions to achieve the unrestricted use criteria.

Path Forward:

Whether using either the net public or environmental harm option or the ALARA option, the licensee should either evaluate what minimal incremental actions or measures (compared to the proposed action) would be necessary to meet the unrestricted use criteria, or demonstrate that the LT alternative provides the minimum further reduction in residual radioactivity and dose necessary to meet the unrestricted use criteria.

32. **(Section 7) Eligibility criteria of 10 CFR 20.1403(a): The licensee's eligibility ALARA analysis should address other societal and socioeconomic considerations.**

Basis:

The NRC regulations, in 10 CFR 20.1403(a) and 20.1403(e) require residual radioactivity be ALARA. The regulations define ALARA (§20.1003) as follows:

"ALARA (acronym for "as low as is reasonably achievable") means making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements

in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest."

Based on the definition, ALARA must take into account improvements relative to other societal and socioeconomic considerations. The Statements of Considerations for the LTR (62FR39069, July 21, 1997) state:

"To support a request for restricted use, a licensee would perform an ALARA analysis of the risks and benefits of all viable alternatives and include consideration of any detriments. This could include estimated fatalities from transportation accidents that might occur as the result of transport of wastes from cleanup activities, and societal and socioeconomic considerations such as the potential value to the community of unrestricted use of the land."

Guidance in NUREG-1757, Vol. 2, Rev. 1, Section N.1.1, discusses that licensees should account for benefits including changes in land values, aesthetics, and the reduction in public opposition to decommissioning activities the licensee is pursuing. The guidance in Section N.1.1 also states that some benefits can be difficult to quantify; the NRC staff does not require that all benefits be quantified.

The licensee did qualitatively address changes in land value due to restrictions on use, and regulatory costs, but other factors have not been addressed in the ALARA evaluation. In Section 16.5.4 of the DP (Rev. 1a), the licensee describes input obtained from seeking public advice from the site-specific advisory board (SSAB). Part of the advice was that detriments include preventing development of the rest of the site and surrounding properties, concerns about not being able to sub-divide the property, and concerns about property values and rateables. These detriments identified by the public are societal and socioeconomic considerations, and thus should be addressed in the ALARA evaluation.

Path Forward:

SMC's eligibility analysis, for compliance with 10 CFR-20.1403(a), needs to more fully discuss the costs and benefits of the proposed action, and of alternatives to the proposed action. In the eligibility analysis, SMC should include societal and socioeconomic considerations, including the undue burdens identified by the SSAB, considerations identified in the Statements of Consideration for the LTR, and the considerations identified in the NRC staff guidance (NUREG-1757). The licensee should quantify benefits and costs that can reasonably be quantified, to allow better comparison between alternatives. Alternative decommissioning activities such as removal of the radioactive material may produce a societal benefit of reduction in public opposition, which may be difficult to quantify. One approach that would be acceptable to the NRC staff is for the licensee to determine the bases of the public opposition, and to quantify those bases (e.g., quantification of the benefit of avoiding impact on property values versus costs of removing the contaminated material). For other benefits or costs that cannot be

quantified, the licensee should discuss the benefit or cost and should indicate that it cannot quantify that aspect.

- 33. (Section 7) Eligibility criteria of 10 CFR 20.1403(a): Provide justification for concluding that sale to, and disposal of slag at, the International Uranium Corporation (IUC) uranium mill is not a viable decommissioning option.**

Basis:

In the environmental RAIs dated March 19, 2007, the NRC staff asked SMC to provide feasibility analysis calculations and reports that were prepared to examine the economic potential of selling slag material to a uranium mill and/or extracting uranium from the slag. In its responses to the RAIs, dated April 24, 2007, SMC provided correspondence related to discussions with the IUC uranium mill about selling slag material to IUC for uranium extraction. In its responses, SMC concludes that the sale of and disposal of slag at IUC would not be a viable decommissioning option. However, SMC did not provide any supporting information for that conclusion. In the correspondence that SMC provided, there was documentation of SMC's inquiry to IUC, but no documentation of a response from IUC.

Path Forward:

Provide documentation to support the conclusion about the non-feasibility of sending the slag to IUC for uranium extraction.

- 34. (Section 7 and 16) ALARA analysis under 10 CFR 20.1403(e): Provide an ALARA evaluation of the residual radioactivity under conditions of institutional controls no longer in effect, to demonstrate compliance with 10 CFR 20.1403(e).**

Basis:

NRC regulation 10 CFR 20.1403(e) requires that residual radioactivity be reduced such that the dose for conditions when institutional controls are no longer in effect will be ALARA. Chapter 7 of the DP (Rev. 1) and Chapter 16 of the DP (Rev. 1a) discuss ALARA, but do not provide an ALARA discussion of doses for the condition when institutional controls are no longer in effect.

Path Forward:

Provide a demonstration of compliance for §20.1403(e), ALARA for conditions when institutional controls are no longer in effect. This demonstration should evaluate potential incremental changes to the proposed approach and their impact on doses for conditions when institutional controls are no longer in effect.

- 35. (Section 7) Calculations of costs and benefits for eligibility and ALARA analyses: Calculate doses or dose averted over the 1000-year compliance period.**

Basis:

In Section 7.2.1.2 of the DP (Rev. 1), SMC calculates the collective dose to members of the public over a single lifetime of exposure, that is, 70 years. The compliance period for the dose criteria of the LTR is 1000 years (see 10 CFR 20.1401(d)). Thus, for soil contamination, doses for ALARA evaluations should be calculated over 1000 years.

Path Forward:

For the eligibility and ALARA analyses, the licensee should either calculate doses or doses averted over the 1000-year dose compliance period or justify the alternative used. See NUREG-1757, Section N.1.2.

- 36. (Section 7) Calculations of costs and benefits for eligibility and ALARA analyses: For changes in land values, consider land use over the 1000-year compliance period.**

Basis:

In Section 7.3.8 of the DP (Rev. 1), SMC discusses changes in land values. In the discussion for the LT alternative, SMC indicates that the existing soil contaminant levels (presumably, the nonradiological contaminants) will likely prevent future residential use of the unrestricted area of the site. While this may be valid for some length of time, SMC is working to complete remediation of the nonradiological contamination of the site. Thus, at some time in the future, it is reasonable that the nonradiological contamination would be reduced such that residential use might be plausible. The compliance period for the LTR is 1000 years, and this time frame should be considered for changes in land values.

Path Forward:

For evaluating changes in land values, the licensee should consider the reasonably foreseeable land uses over the 1000-year compliance period and discuss the status of non-radiological, investigations at the soil site. The licensee should either include evaluation of land uses foreseeable after nonradiological contaminants have been substantially reduced or justify that nonradiological contaminants will not be reduced sufficiently for residential land use.

- 37. (Section 7) Calculations of costs and benefits for eligibility and ALARA analyses: Provide a comparison among alternatives of all costs and benefits evaluated.**

Basis:

Some of the costs and benefits that SMC has evaluated for the eligibility and ALARA requirements are not quantified in the DP (Rev. 1). In particular, SMC has provided only qualitative discussions of licensing and regulatory costs (Section 7.3.7), change in land values (Section 7.3.8), and environmental impacts (Section 7.3.9). While qualitative evaluations can be acceptable, the licensee has not compared the costs and benefits for all alternatives.

Path Forward:

The licensee needs to compare all the costs and benefits among the alternatives, to complete the eligibility and ALARA analyses. In particular, for costs or benefits that have not been quantified, SMC should still provide sufficient discussion to qualitatively compare the alternatives.

38. **(Section 7) Calculations of costs and benefits for eligibility and ALARA analyses: Provide an evaluation using zero discount rate or with a sensitivity analysis of the discount rate for the present worth calculations for the value of future doses.**

Basis:

In Section 7.3.6 of the DP (Rev. 1), SMC calculates the cost of the radiological risks, and applies a discount rate of 3% to calculate the present worth of the future doses. Based on the very long half life of the residual radioactivity at the SMC site, the NRC staff is concerned that use of this discount rate essentially eliminates any value in doses averted in the later years of the compliance period.

The NRC staff guidance on use of discount rates is provided in NUREG-1757, Vol. 2, Section N.5. That guidance refers to NUREG/BR-0058 ("Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission), the most recent version of which is Vol. 4, dated September 2004. Section 4.3.5 of NUREG/BR-0058 indicates that for certain regulatory actions, such as those involving decommissioning and waste disposal, special considerations arise when considering benefits and costs across generations. That section indicates that the analysis should be supplemented with an explicit discussion of intergenerational concerns. This could be done by performing the analysis based on costs and impacts at the time they are incurred, with no present worth conversion, or by performing a sensitivity analysis using lower discount rates.

Path Forward:

The licensee should include some method for analyzing the intergenerational concerns, by including an analysis with no discounting or with a sensitivity analysis of the discount rate. (The NRC staff acknowledges, that as it currently stands, the DP (Rev. 1) is somewhat unclear about whether discounting is applied. The calculations of Section 7.3.6 include use of a 3% discount rate. However, it appears that the costs of the doses included in the Table in Section 7.4 do not include any discounting.)

39. **(Section 7) Calculations of costs and benefits for eligibility and ALARA analyses: Correct the use of the formula and recalculate the results for present worth in the eligibility and ALARA analyses.**

Basis:

In Section 7.3.6 of the DP (Rev. 1), SMC calculates the cost of the radiological risks, and applies a discount rate to calculate the present worth of the future doses. In these

calculations, the NRC staff finds acceptable the use of equation N-2 in Appendix N of NUREG-1757, Vol. 2. This equation essentially calculates the present worth as the product of the number of people exposed, the annual dose or dose averted, and the discounting function. In the calculations SMC performed in Section 7.3.6 of the DP (Rev. 1), it appears that rather than using annual dose, a cumulative dose, over 70 years or 30 years, was used. This approach incorrectly calculates present worth.

Path Forward:

If SMC continues to use a discount rate to calculate the present worth of future doses, the calculation should be corrected.

- 40. (Section 7) Calculations of costs and benefits for eligibility and ALARA analyses: For doses to members of the public after decommissioning, use more site-specific, unbiased analyses for the dose assessments.**

Basis:

Some of the dose calculations for the eligibility and ALARA analyses of Chapter 7 of the DP (Rev. 1) use the regulatory limit as the dose expected for that alternative. This approach is in contrast to SMC's use of site-specific analyses for the dose assessments used to demonstrate compliance with the dose criteria. Use of the generic values, rather than site-specific values may bias the results of the ALARA analyses. Appendix N of NUREG-1757, Vol. 2, recommends that ALARA analyses use unbiased dose estimates.

Path Forward:

The licensee should either use more site-specific, unbiased dose estimates for the ALARA analyses or demonstrate why the values used do not inappropriately bias the results of the eligibility and ALARA analyses.

- 41. (Section 7) Calculations of costs and benefits for eligibility and ALARA analyses: Correct inconsistencies in the eligibility and ALARA analyses.**

Basis:

As noted elsewhere, the DP (Rev. 1) has inconsistently used discount rates. As a result, the dollar values attributed for the three alternatives are inconsistent amongst Section 7.3.6, the table in Section 7.4, and Table 17.9 of the DP (Rev. 1). In addition, the dollar value of doses has been used inconsistently. In some cases, a value of \$20,000 per person-rem is used, while in other cases, a value of \$2,000 per person-rem is used.

Path Forward:

The licensee should either be consistent in the eligibility and ALARA analyses, or should justify the inconsistencies.

42. (Section 7) Calculations of costs and benefits for eligibility and ALARA analyses: Provide more complete justification for the analysis of rail accidents.

Basis:

The licensee discusses rail transportation accidents and risks in Section 7.2.3 of the DP (Rev. 1). The NRC staff has two concerns with the assessment of rail accident fatality risk for the LT (unrestricted use license termination) alternative. First, SMC has used a fatality risk coefficient of 2.3×10^{-7} (units were not provided in the DP). The reference for the risk coefficient is data from 2004 from the Federal Railroad Administration (FRA), as detailed in footnote 187 of the DP (Rev. 1). The NRC staff downloaded the rail safety data from 2004 (FRA 2007), but the overall fatality risk coefficient does not appear consistent with the value used by SMC.

Second, it appears to the NRC staff that SMC has incorrectly used the railroad fatality data. Based on how SMC applies the fatality risk coefficient, the units appear to be fatalities per rail car mile. However, the FRA describes the units used for reporting fatalities as per train-mile, and defines train and train-mile in its guide to preparing accident reports (FRA 2003). If the fatality coefficient is multiplied by the number of rail car miles rather than train-miles, the expected fatalities would be overestimated.

Path Forward:

The licensee should provide additional details on and justification for the rail fatality risk coefficient used in the eligibility and ALARA analyses. If appropriate, the licensee should revise the calculation to correctly apply the risk coefficient.

43. (Section 9.2) SMC should provide information on how Radiation Work Permits (RWPs) are developed, reviewed, and implemented.

Basis:

Radioactive material work procedures/practices (such as RWPs) are developed, reviewed, implemented, and managed so that the licensee's proposed health and safety program complies with the regulatory requirements of 10 CFR Parts 19 and 20, and is adequate to protect workers from ionizing radiation during decommissioning activities (see NUREG-1757, Section 17.2.5).

The DP (Rev. 1) states that details of how individuals performing procedures in the RWP will be informed of those procedures, will be provided to NRC by the decommissioning contractor before start up of on-site work. This information should be included in the DP rather than before start up of on-site work.

Path Forward:

Provide information about how radioactive material work procedures/practices (such as RWPs) will be developed, reviewed, implemented, and managed to comply with the regulatory requirements and protect workers from ionizing radiation during decommissioning activities.

- 44. (Section 9.3) Provide information to describe responsibilities, authorities and minimum qualification of all positions listed in Figure 18.10.**

Basis:

The NRC staff needs to determine whether individuals performing the various project management and safety functions are qualified for these functions. SMC did not provide this information for anyone below the Site Health & Safety Officer on Figure 18.10. In addition, SMC did not provide NRC with the qualifications of any newly hired employees or replacements for the positions noted on Figure 18.10.

Path Forward:

SMC should submit information regarding responsibilities and authorities and minimum qualifications of all positions listed in Figure 18.10. SMC also should describe how it will provide NRC with the qualifications of any newly hired employees or replacements for these positions.

- 45. (Section 9.3) Provide information regarding the authority to stop work.**

Basis:

Information should be sufficient to allow the NRC staff to understand the relationship between the various organizational units within the decommissioning organization (such as remedial activities and health and safety units), including the responsibilities and authority to revise or stop work. In reviewing Section 9.3 of the DP (Rev. 1), it appears that the only positions with authority to stop work are the Radiation Safety Officer and the Site Health & Safety Officer. The NRC staff believes that the Quality Assurance Officer (QAO) should also be able to stop work.

Path Forward:

SMC should describe which positions have the authority to stop work and under what conditions. If the QAO does not have the authority to stop work, provide an explanation for this position.

46. **(Section 9.3.1) The Radiation Safety Officer (RSO) needs to meet more stringent requirements than those described in the DP.**

Basis:

The DP (Rev. 1) description of qualifications of the RSO position is deficient in meeting the criteria described in NUREG-1757. The RSO needs to have at least 1 year of health physics experience and the specialized knowledge described in the Evaluation Findings of NUREG-1757, Section 17.2.3.1.

Path Forward:

SMC should revise the DP (Rev. 1) description of its qualifications for the RSO.

47. **(Sections 9.4.2 and 9.4.3) SMC should provide information on how it will determine qualifications of its general employees and radiation workers.**

Basis:

Information needs to be provided to document that the licensee has the personnel resources to safely conduct and manage the decommissioning of its facility. DP (Rev. 1) Sections 9.4.2 (General Employee Training) and 9.4.3 (Radiation Worker Training) rely on self-graded exams to test employee proficiency.

Path Forward:

SMC should identify who will have authority over the general employees and the radiation workers, and how those in authority will determine the qualifications of the general employees and radiation workers.

48. **(Section 13) The DP does not discuss the revision of quality assurance (QA) documents.**

Basis:

Information needs to be provided regarding SMC's procedures to ensure that changes to documents are reviewed and approved by the same organizations as those that performed the initial review and approval, or by other qualified responsible organizations delegated by SMC. The procedures should ensure that documents are available at the location where the activity will be performed prior to commencing work. Furthermore, procedures should be established to ensure that obsolete or superseded documents are removed and replaced by applicable revisions in work areas in a timely manner.

Path Forward:

SMC should address how its QA documents will be revised. In addition, SMC should explain how its process for revising the documents will be as rigorous as the process used to develop them.

49. (Section 13.1) There appear to be inconsistencies in the titles and functions of personnel.

Basis:

The QA program should have adequate controls in place to support the decommissioning activities. Furthermore, the licensee's description of its organizational structure should be such to document that persons and organizations performing quality affecting activities have sufficient authority and freedom to identify quality problems, provide solutions, and verify that solutions have been implemented. The authority and duties of persons and organizations performing functions related to meeting the performance objectives must be clearly established and delineated in writing, including both the performing functions of attaining the requisite quality of work (quality achieving) and the assurance functions of verifying the attainment of quality (quality assuring). Designated QA personnel should be sufficiently free from direct pressures resulting from cost and schedule, have the responsibility, delineated in writing, to stop unsatisfactory work, and control further processing or delivery of nonconforming material.

Section 13.1 of the DP (Rev. 1) refers to the "Project Manager" and the "Decommissioning Project Manager". Are these positions the same? Only the Project Manager appears on the Organization Chart provided in Figure 18.10. Similarly, reference is made to the QAO yet Section 13.1.1 refers to a Quality Assurance Manager.

Furthermore, as evidenced by the Organization Chart provided in Figure 18.10, it appears that the QAO reports directly to the Decommissioning Contractor. The NRC staff is concerned that this position in the organization may not give the QAO the necessary independence. Also, the QAO should have stop work authority. According to the DP (Rev. 1), it appears that only the SMC Radiation Safety Officer and the Site Health & Safety Officer have the authority for stop work decisions.

Path Forward:

Be consistent in terminology, and correct Figure 18.10 to reflect the actual organization. Explain how the QAO will be afforded sufficient authority and freedom to identify quality problems, provide solutions, stop work, and verify that solutions have been implemented. Explain whether the QAO is a contractor or an SMC employee. It must be clear that quality is the responsibility of SMC, not the contractor.

50. (Section 13.1) Overall control and authority rests with the licensee.

Basis:

The licensee needs to have adequate controls in place to support the decommissioning activities. Major delegations of work should be fully described, and in each case, organizational responsibilities and methods for control of the work by the applicant should be described, including how responsibility for delegated work is to be retained and exercised.

The licensee and its contractors should evaluate the performance of work delegated to other organizations, including audits/surveillances of the contractor's QA programs and audits/surveillances of subcontractors, consultants, and vendors furnishing equipment or services to the applicant or its contractors. The frequency and method of this evaluation should be specified.

However, Section 13.1 of the DP (Rev. 1) states that ultimate responsibility for implementing the elements of the QA Program rests with the Decommissioning Project Manager. Elsewhere, Section 13.1 of DP (Rev. 1) states that overall control and authority for radiation protection will rest with the Project Manager. These and similar statements should be revised as the overall control and authority always rests with the licensee.

Path Forward:

SMC should revise its organizational structure so that overall control and authority rests with the licensee. Major delegations of work should be fully described and in each case, organizational responsibilities and methods for control of the work by the applicant should be described, including how responsibility for delegated work is to be retained and exercised.

51. **(Section 13.1) The DP refers to the use of a summary of the Decommissioning Contractor's corporate QA policy rather than the licensee's corporate QA Policy.**

Basis:

As previously noted, overall control and authority rests with the licensee. Therefore, the corporate QA policy should be that of the licensee.

Path Forward:

Pursuant to NUREG-1757, Section 17.6.2, the licensee should submit a summary of the licensee's corporate QA policy.

52. **(Section 13.2) The DP is inconsistent with NRC's policies in stating that the Quality Assurance Program Plan (QAPP) will be provided to the NRC for review and acceptance.**

Basis:

There is no need to submit the QAPP for NRC review and acceptance. The NRC staff does not review and approve QAPPs. However, the NRC staff does review the overall QA program to assure that adequate controls are in place to perform decommissioning activities. NRC inspectors review and evaluate implementation of the QA procedures during inspection of the site.

Path Forward:

SMC should explain how it will develop, implement and revise its QAPP and demonstrate that revisions to the QAPP will be made with the same rigor as the original development of the QAPP. Furthermore, the frequency and method of revisions to the QAPP should be specified.

53. (Section 13.2.3) The DP states that the off-site laboratory will be responsible for assuring that all appropriate laboratory personnel are thoroughly familiar with the QAPP.

Basis:

It is not necessary for the off-site laboratory personnel to be thoroughly familiar with the QAPP. Use of a chain-of-custody process would be acceptable to the NRC staff.

Path Forward:

Shieldalloy should consider whether to hold the off-site laboratory responsible for being thoroughly familiar with Shieldalloy's QAPP or use a chain-of-custody process. If SMC opts to use the chain-of-custody process, it should be described including responsibilities of the individuals involved.

54. (Section 13.4) The DP discusses control of Measuring and Test Equipment but does not provide a summary of Measuring and Test Equipment that will be used during decommissioning activities.

Basis:

Pursuant to NUREG-1757, Section 17.6.4, the information supplied by the licensee should be sufficient to allow the staff to fully understand the methods and procedures that the licensee will use to ensure that only accurate and calibrated test and measurement equipment will be used during the decommissioning project.

Path Forward:

The description of the test and measurement equipment QA program should include: a summary of the test and measurement equipment used in the program; a description of how and at what frequency the equipment will be calibrated; a description of the daily calibration checks that will be performed on each piece of test or measurement equipment; and a description of the documentation that will be maintained to demonstrate that only properly calibrated and maintained equipment was used during the decommissioning.

55. (Section 14) Submit final status survey plan.

Basis:

Section 14.3.2 of the DP (Rev. 1) states that a final status survey plan (FSSP) will be prepared using guidance in NUREG-1757 and in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), NUREG-1575. The licensee has included some general plans in the DP, but details are generally not provided. The NRC staff cannot complete its review until the FSSP is provided. Based on the information submitted in Chapter 14 of the DP (Rev. 1), the NRC staff has initial concerns described in the following RAIs.

Path Forward:

The licensee should submit the FSSP.

56. (Section 14) Justify the approach for determinations of area classification for final status surveys.

Basis:

Section 14.3.4 and Figure 18.11 of the DP (Rev. 1) describe the classification of areas for the final status surveys, generally using the MARSSIM designations. The NRC staff is concerned with the approach presented. Section 14.3.4 states that the classifications for the site and surrounding areas are based on current radiological information. Yet it appears to the NRC staff that radiological information is not yet available for all survey units. The DP (Rev. 1) does not describe the individual survey units; Figure 18.11 is not detailed enough to describe the actual survey units, and does not clearly describe the bounds of the expected FSS. The staff suggests that historical site assessment information (historical operational information and measurement data) should be used in determining area classifications. In addition, Section 14.3.4 states that all areas that are not Class 1 or Class 2 areas will be designated Class 3. This is opposite to the usual MARSSIM approach, which is to assume that all areas are Class 1, unless there is information to demonstrate otherwise (see the MARSSIM, Section 4.4).

Path Forward:

The licensee should either provide additional justification for its approach to determining area classifications, or should consider modifying the approach. The licensee should use all available information (including historical and current radiological information) to determine area classifications.

57. (Section 14) Provide justification for statements about adequacy of characterization.

Basis:

Section 14.1 of the DP (Rev. 1) contains conclusions about the adequacy of characterization surveys, some of which are not supported in the DP. The characterization appears to be based primarily on the 1991 survey by IT Corporation. That study did not cover all areas of the site and surrounding area. Section 14.1.5 of the DP (Rev. 1) discusses unimpacted areas, but the DP does not show any areas considered to be unimpacted.

Section 14.1.6 of the DP (Rev. 1) states that information from characterization and other surveys confirms that no significant quantities of residual radioactivity have migrated past the restricted areas. However, the DP describes areas of contamination that are outside of the restricted areas shown in Figure 18.2. Also, results of the 1991 characterization indicate some contamination outside the site boundaries, including on the north side of the Storage Yard and in and along the Hudson Branch on the south side of the site. The NRC staff believes that these areas have not yet been adequately characterized to demonstrate the absence of significant contamination.

Section 14.1.6 also states that all areas of the Newfield facility have been surveyed or sampled as part of the 1991 characterization effort, routine surveillance efforts, or as part of a facility-specific decommissioning effort. This is not supported in the DP.

Path Forward:

If the licensee is relying on statements or conclusions about the adequacy of characterization efforts, it should support those statements by explaining how and when these areas were characterized and why that was sufficient. If, instead, the licensee plans further characterization of certain areas prior to the Final Status Survey (FSS), then the licensee should indicate this.

58. (Section 14) Provide complete plans for final status surveys of buildings.

Basis:

Section 14.3.2 of the DP (Rev. 1) indicates that building surfaces will be surveyed as part of the FSS, and Derived Concentration Guideline Limits (DCGL) for building surfaces are discussed (here and in Table 17.11). However, most of the rest of Section 14.3 does not mention the FSS for building surfaces. Section 14.3.6 only discusses survey unit size for outdoor soil survey units and Section 14.3.11 only discusses survey and sampling for soils.

In addition, it appears that the minimum detectable concentrations (MDCs) for surface scanning measurements, given in Table 17.12 of the DP (Rev. 1), are inconsistent with the proposed DCGLs for building surfaces. From Table 17.11 of the DP (Rev. 1), the proposed gross alpha DCGL (accounting for uranium and thorium decay series) is 9 dpm/100 cm². Per MARSSIM guidance, the scan MDCs should usually be as low as (or lower than) the DCGL, the scan MDC is 100 dpm/100 cm² according to Table 17.12.

Path Forward:

The licensee should provide a FSS Plan that addresses building surface surveys. The licensee should justify adequacy of the MDCs, relative to the DCGLs for building surfaces.

59. (Section 14) Clarify the applicability of the proposed criteria for release of materials and equipment.

Basis:

Section 14.2.1 of the DP (Rev. 1) describes release surveys for materials and equipment used during decommissioning. The criteria proposed are intended for materials that are only contaminated superficially. However, the licensee has not indicated that the approach and criteria are to be used only for surface-contaminated materials and equipment. The NRC staff notes that in Section 8.1 of the DP (Rev. 1), SMC proposed release of portions of concrete pads. Such concrete may be volumetrically contaminated.

Path Forward:

The licensee should clarify that the criteria will only be applied to surface-contaminated materials. If the licensee intends to release materials or equipment that becomes volumetrically contaminated, the licensee should describe and justify criteria to be used.

60. (Section 15) Update the cost estimate for decommissioning and the amount of funding necessary for the long-term control and maintenance fund.

Basis:

The license needs to make adequate arrangements to ensure that the site will be maintained in accordance with the proposed institutional controls.

Path Forward:

To the extent that costs to meet the conditions of the LTC license may change in response to the RAIs transmitted here, update the cost estimate for decommissioning and the amount of funding necessary for the long-term control and maintenance fund. The update should include changes that affect cost such as changes in the volume of material proposed for consolidation in the cell, changes in cap construction, and changes in long-term monitoring and maintenance.

61. (Section 16.3.1) Update the status of the State's response regarding the State government role in providing a durable institutional control or independent third party arrangement.

Basis:

NRC recognizes that on May 24, 2006, SMC forwarded a letter to the State of New Jersey formally asking if the State would accept responsibility for ownership, control or independent third-party oversight of the Newfield site. The State requested information about these roles from NRC, and NRC provided a response in an October 11, 2006, letter. The State also requested financial disclosure information from SMC in letters dated January 25, 2006, and August 3, 2006. SMC responded to the State in a letter dated May 31, 2007. It is not yet clear how the State will respond. However, NRC will proceed under the assumption that the State will not accept a role. This assumption is based on the written record that documents the State's apparent objection to the restricted use alternative in general and to the LTC license as a legal mechanism to provide institutional controls. This assumption is also based on the following statement made by the State representative and member of the SSAB during the September 21, 2005, SSAB meeting: "They put out the plan without asking first whether or not we would be interested in working with it. And after we saw the revision of the original document, no, we're not interested in overseeing it." Finally, NRC does not know when or even if the State might provide its decision based on the following quote from a State official attending the December 6, 2006, NRC public meeting, "the State has not determined if it will accept the material at Shieldalloy for ownership control or third party oversight. So we don't believe that the NRC can accept a decommissioning plan if the State has not made a decision."

Path Forward:

SMC should revise Section 16.3.1 of the DP (Rev. 1) to describe the status of its request and indicate that it will continue to propose the LTC license option based on the record summarized above that indicates the State of New Jersey is likely to reject a role. However, SMC should continue its communications with the State and provide NRC with the State's response when it is received. The DP should also explain that the State's response is not part of the initial eligibility requirement for restricted use under 10 CFR 20.1403(a), as stated in the State's April 5, 2007, letter. The State's response is part of NRC's institutional control selection process described in the decommissioning guidance and as such is not a regulatory requirement. In that regard, if no response from the state is received prior to the amendment for the LTC license, NRC will interact with the State to determine if it will accept the oversight role. Note that the discussion of selecting institutional controls and the LTC license should be presented in Section 16.3.1 and not in Section 16.2, "Eligibility Demonstration".

62. **(Section 16.3.1) Clarify the basis for not selecting a local government role with durable institutional control or independent third party arrangements.**

Basis:

The DP (Rev. 1a) incorrectly states that NRC rejected the Borough of Newfield as a durable institutional control (page 23, Appendix H). NRC rejected the SMC proposal in DP (Rev. 0) for institutional controls because it simply stated that SMC would eventually transfer their site ownership to some local or state government entity, and no discussion or commitment was given regarding the capability or willingness by any government entity to accept institutional control responsibility in perpetuity. However, NRC's guidance on the graded approach in NUREG-1757 identifies that State or Federal government ownership or control would be appropriate rather than a local government when durable institutional controls are necessary, such as for sites with long-lived radionuclides.

Path Forward:

Revise Section 16.3.1 of the DP (Rev. 1) to reflect the discussion above and correct the record.

63. **(Section 16.3.1) Correct the discussion in the DP that NRC has agreed to issue the LTC license as part of the overall approval of the DP.**

Basis:

In Section 16.3.1 of the DP (Rev. 1a), SMC states that "The USNRC has agreed to issue the LTC license as part of the overall approval of this Decommissioning Plan." This statement is unclear and could be misunderstood. NRC did not agree to issue the LTC license at the time of DP approval. NRC agreed that SMC could propose the LTC license as a legally enforceable and durable institutional control in its revised DP. NRC's interim guidance for SMC and the guidance in NUREG-1757 clearly indicate that the license would be amended (not issued) to become the LTC license after decommissioning activities are completed and approved by NRC. These activities would include construction of the restricted area cell and cover, the final status survey report that confirms compliance with the dose criteria of the LTR, and submittal/approval of the Long-Term Control Plan. Therefore, at the time NRC would approve a DP, the future use of the LTC license would be conditionally approved pending completion and approval of the activities noted above. This general approach is consistent with the discussion of schedules in Section 8.5 of the DP (Rev. 1).

Path Forward:

Revise the statement in Section 16.3.1 to be consistent with Section 8.5 and the NRC guidance on the LTC license as summarized above.

64. (Section 16.3.1) Correct the statements regarding NRC terminating the LTC license.

Basis:

Section 16.3.1 of the DP (Rev. 1a) states that "In the event of SMC default in the terms and conditions of the LTC license, the USNRC has the authority to terminate the license, assume control of the funds held in trust, and contract the services of a third party to implement the license requirements." This statement is unclear and could be misunderstood.

Path Forward:

Section 16.3.1 should be revised as follows: "Under the LTC license, SMC would be legally required to remain in compliance with the conditions of the license and, as with any licensee, take the necessary corrective actions if they are not in compliance." Furthermore, NRC could take a variety of actions, including enforcement, to correct compliance problems.

65. (Section 16.3.1) Clarify the purpose of the proposed deed notice.

Basis:

In Section 16.3.1, a deed notice is proposed as a secondary means of ensuring institutional controls by prohibiting listed uses and notifying future owners of the LTC license and restrictions on the land. NRC guidance only envisions the deed notice as a secondary institutional control for the single purpose to notify future landowners of the restricted area under a NRC LTC license. Therefore, the deed notice is not recognized by NRC as a legally enforceable method of restricting future land use. NRC relies on the LTC license for this purpose.

Path Forward:

SMC has two options. First, Section 16.3.1 could be revised to discuss the purpose of the deed notice as described above and in NRC's guidance (note that footnote 97 of Section 5.3 provides a better discussion of the deed notice and LTC license than Section 16.3.1). Second, SMC could describe why it believes the deed notice is a legally enforceable institutional control that can restrict future site use, in addition to simply informing future owners of NRC's LTC license.

66. (Section 16.3.1) Identification of institutional controls and their role in compliance.

Basis:

Section 5 of the DP (Rev. 1) appears to take credit for restrictions associated with

existing institutional controls, including the natural resources conservation area adjacent to the restricted area. However, these types of institutional controls are not identified or described in Section 16.3.1 of the DP (Rev. 1) on institutional controls. Therefore, the DP is unclear regarding these institutional controls and their role in compliance.

Path Forward:

Clarify the discussion in Section 16.3.1 to indicate the existing institutional controls and their role, if any, in demonstrating compliance.

67. (Section 16.3.1) The discussion of prohibited and permitted uses of the restricted area is scattered and unclear.

Basis:

Section 16.3.1 discusses prohibited and permitted uses under the deed notice, but no prohibited and permitted uses are discussed under the LTC license which is the primary institutional control. Furthermore, Section 16.3.2, identifies some other uses of the restricted area that would be restricted, such as excavation and drilling.

Path Forward:

Section 16.3.1 should be revised to provide one clear and comprehensive discussion of both prohibited and permitted uses based on the risk insights from dose assessments and analyses of human processes that could disrupt the performance of the engineered barrier. It should be clear that both prohibited and permitted uses should eventually be incorporated into the LTC license, LTC Plan, and be provided for information in the deed notice. For permitted uses, the licensee should reference dose assessment results as a basis for demonstrating that the hours per year that workers would need for inspection and maintenance will be safe and thus permitted. These results could also be used for concluding that inspections by others, such as NRC or the State will also be safe, and therefore permitted.

68. (Section 16.3.2) Clarify the use of barricades to restrict access to the restricted area.

Basis:

Section 16.3.2 identifies activities to control access including fencing, warning signs along the fence line and all access points (gates). Section 16.4 also identifies maintaining the barricading of roads that surround or approach the restricted area.

Path Forward:

Further discuss the purpose, extent, and method proposed for barricading the restricted area, including the roads. If major excavation that requires use of heavy equipment is considered an adverse disruptive human process, the design of the engineered barriers should discourage the potential for future excavation of the cover with heavy equipment.

Describe the barricade materials such as very large sized durable rock that may be low maintenance and not need replacement, or concrete that could need maintenance and replacement.

69. (Section 16.4) Long-term monitoring plans in Section 16.4 are incomplete and no risk-informed basis is given.

Basis:

To ensure a complete long-term monitoring plan, NRC's decommissioning guidance describes a risk-informed process that would result in a sound basis for the long-term monitoring activities. This process includes a systematic identification of disruptive processes that could lead to non-compliance with NRC's dose criteria and then an analysis of each process to identify the type of monitoring, detection of indicators or precursors of disruptive processes, location and frequency.

Path Forward:

Reevaluate the monitoring activities in the DP using the process described above and in NRC's decommissioning guidance. Revise the discussion of monitoring activities based on this evaluation, and describe the basis for the monitoring identified. Consider long-term monitoring of: groundwater contamination; slag and baghouse weathering and leaching; settlement of the cover and disruption of the shielding and erosion cover. The LTC plan that would eventually be proposed after decommissioning activities are completed should identify the detailed procedures.

Revise the cost estimates in Section 15.1 of the DP (Rev. 1) to reflect the revised long-term monitoring plan as described in the DP (Rev. 1).

70. (Section 16.4) Long-term maintenance plans in Section 16.4 are incomplete and no risk-informed basis is given.

Basis:

To ensure a complete long-term maintenance plan, NRC's decommissioning guidance describes a risk-informed process that would result in a sound basis for the long-term maintenance activities. This process includes a systematic identification of disruptive processes that could lead to non-compliance with NRC's dose criteria and then an analysis of each process and planned monitoring to identify the type of maintenance/corrective actions that would be conducted.

Section 16.4, page 158 of the DP (Rev. 1) briefly notes that the engineered barrier was designed to perform even if maintenance does not take place. However, this brief statement does not provide an understanding of how the engineered barrier was designed to accomplish this and that NRC's decommissioning guidance describes how to design robust erosion barriers that would not need active ongoing maintenance. This regulatory approach is consistent with the approach required by the Uranium Mill Tailings Radiation Control Act and implemented by NRC for erosion covers at uranium mill tailing impoundments.

Path Forward:

Reevaluate the maintenance activities in the DP using the process described above and in NRC's decommissioning guidance. Revise the maintenance activities based on this evaluation, and describe the basis for the maintenance identified. Consider long-term maintenance of the following actions: cover settlement, disruption of the shielding and erosion cover, and the duration of maintenance.

Revise the cost estimates in Section 15.1 of the DP (Rev. 1) for the revised long-term maintenance plans.

Add a discussion of the robust design of the erosion barrier and how the design provides the basis for no ongoing active maintenance or periodic repair.

- 71. (Section 16) An opportunity should be provided for continued SSAB meetings to inform the SSAB of changes that might result from the NRC RAIs.**

Basis:

SMC's response to NRC Issue No. 18 in the June 30, 2006 letter on SSAB interactions, identified an action to be taken to schedule a follow-on meeting with the SSAB as soon as there is sufficient SSAB interest. Additional information will be available from the SMC response to NRC RAIs. Therefore, as a matter of good practice SMC should keep the SSAB informed if there is SSAB interest. NRC recognizes that some members of the SSAB will continue to provide their input as part of the EIS and hearing processes.

Path Forward:

As a follow-on to NRC issue No. 18 and as a matter of good practice, SMC should determine if there is interest in future SSAB meetings to keep the SSAB informed. SMC could discuss the NRC RAIs related to the four questions and its responses. SMC and the SSAB may also want to discuss other topics for general information and background for the four questions.

- 72. (Section 16.5) Provide a response to the SSAB, local community, and other affected parties that explains the reasons why SMC believes it cannot select the removal alternative.**

Basis:

The SSAB members, local community, and State officials have strongly expressed their opposition to SMC's proposed alternative to leave accumulated materials in place and to restrict future site use with an NRC LTC license. They also have identified what they believe are undue burdens that would result from this alternative. NRC recognizes that a licensee can propose its preferred decommissioning alternative for NRC review and that for restricted use sites, it must also seek advice from the affected parties on four questions related to the use of institutional controls and sufficient financial assurance. While licensees are not required to follow or incorporate the advice of the affected parties, they are required by 10 CFR 20.1403 (d) to incorporate, as appropriate, following

analysis of that advice. The evaluation of SSAB advice in Section 16.5.4 of the DP (Rev. 1) identified and evaluated numerous issues and three undue burdens identified by the SSAB. While the SMC evaluations addressed the specific issues and burdens, the evaluations did not provide insight on why SMC continues to propose the LTC alternative even after evaluating the undue burdens and the continued strong opposition by the SSAB and community. NRC's guidance states that a licensee should describe its reasons for not incorporating the advice provided by the affected parties. It would be insightful and useful to understand what reasons are preventing SMC from proposing the removal alternative. Although limited funding has been generally discussed, specific funding limitations and supporting evidence should be documented.

Path Forward:

Discuss the reasons why the removal alternative is not feasible for SMC and provide evidence that documents the reasons. Include a discussion of obstacles to removal for reuse and removal for disposal. For example, if applicable, include a thorough discussion and evidence of insufficient funds for disposal, considering all potential sources of funds such as funds available to SMC, as well as funds which some parties might assume could be available from the SMC holding company and disposal options, such as partial removal of radioactive material, potential disposal at facilities other than EnergySolutions.

73. (Section 16) No identification or description of the total system, its elements and contribution to protection was provided.

Basis:

As noted in NUREG-1757, Sections 17.7.1 and 17.7.3, the NRC staff needs to understand what total system of controls SMC plans to use or has provided for, and the manner in which these controls contribute to protection.

Path Forward:

Use NRC's decommissioning guidance to prepare a description of the total system of controls used to provide protection, its elements, and the purpose and contribution to protection of each element. SMC should provide a discussion that could enhance the NRC staff's understanding of its proposed alternative and help affected parties understand how SMC believes all the elements of their total system work together to provide sustained protection.

MINOR ISSUES / TYPOGRAPHICAL ERRORS

1. In many places in the DP, SMC discusses quantities of thorium and/or uranium. In some cases, the description is unclear as to whether total thorium (or total uranium) is being described, or whether a particular isotope (e.g., Th-232 or U-238) is described. For example, Section 4.4 of the DP (Rev. 1) discusses "23 curies each of uranium and thorium" in the slag and baghouse dust, while the top portion of Table 17.7 of the DP (Rev. 1) reports concentrations of "thorium series," "uranium series," and "actinium series." "Thorium," in Section 4.4 of the DP (Rev. 1), could refer to total thorium, natural thorium, or just Th-232.

"Thorium series," in Table 17.7 of the DP (Rev. 1), could refer to natural thorium (i.e., Th-232 plus Th-228) or to Th-232 (with the assumption that all progeny are also present in equilibrium). SMC should be clear and precise, so that the intended meaning is unambiguous.

2. Section 4.5 of the DP (Rev. 1), first paragraph refers to Figure 18.11 for the location of all deposits, but this is an incorrect figure reference.

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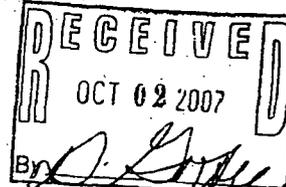


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2
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NEW YORK, NY 10007-1866

SEP 28 2007

Ms. Rebecca Tadesse, Chief
Materials Decommission Branch
Division of Waste Management and
Environmental Protection
United States Nuclear Regulatory Commission
M.S. 8F5
11545 Rockville Pike
Rockville, MD 20852



Subject: Shieldalloy Metallurgical Corporation's
Decommissioning Plan for Newfield, NJ Site

Dear Ms. Tadesse:

This letter is written to inform you that the United States Environmental Protection Agency (EPA) has completed its review of the October 2006 Decommissioning Plan (DP) for the Shieldalloy Metallurgical Corporation (SMC) facility located in Newfield, New Jersey.

EPA's comments on the DP are enclosed. Based on EPA's review, we find that the sampling program performed by Shieldalloy Metallurgical Corporation (SMC) in support of the DP is severely deficient and failed to characterize the extent of radiological waste as well as potential mixed wastes located throughout the site. Areas of significant concern requiring additional characterization include Storage Yard wastes, surface and subsurface soils both on and off of the plant property, underground discharge lines, surface water, sediment, and groundwater. Any decision regarding the remediation of radioactive material at the site can only be made based on a complete characterization of the nature and extent of the radiological contamination found at the site. Therefore, SMC must collect and analyze significant additional data, as outlined in the attached comments, prior to a final decision on the decommissioning of this facility.

Further, since the current risk assessment is based on incomplete site characterization of the radiological contamination, SMC must conduct an appropriate risk assessment after the site characterization is complete. In addition, the risk assessment must address significant exposure pathways which

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inhalation of radon decay products in indoor air due to the use of site groundwater, and ingestion of site groundwater and homegrown produce. Additional comments on SMC's risk assessment are attached.

Based on our review of the DP, EPA is concerned that the Long Term Control (LTC) option proposed by SMC in the DP, if implemented, may not be protective of human health and the environment and may not be the best option for addressing the radioactive waste materials found on the facility. Based on the limited data presented in the DP, EPA cannot support the LTC option. EPA believes that the method of decommissioning of the SMC facility may have a significant impact on the Superfund portion of the site and the surrounding communities.

In your March 6, 2007 letter to Mr. Walter Mugdan, of EPA, you indicated that you would like to meet with the EPA to discuss our assessment of the DP. This letter was forwarded to me, as the Superfund Division is the lead division for review of the DP. My technical staff would be happy to meet with your technical staff to go over the enclosed comments upon your request.

If you should have any questions regarding the above, please contact me at (212) 637-4420, or have your staff contact Mr. Trevor Anderson, of my staff, at (212) 637-4425.

Sincerely,



Carole Petersen, Chief
New Jersey Remediation Branch

Enclosure

cc: Donna-Gaffigan, NJDEP

EPA's Comment on the Draft Decommissioning Plan for Shieldalloy Metallurgical Corporation, Newfield, New Jersey.

General Comments

1. Overall, EPA considers the proposed Decommissioning Plan (DP) to be inadequate. A decision regarding the remediation of radioactive material at the site can only be made based on a complete characterization of the nature and extent of contamination. The sampling program performed by Shieldalloy Metallurgical Corporation (SMC) is severely deficient and failed to characterize the extent of radiological and potential mixed wastes in the Storage Yard, surface and subsurface soils, underground discharge lines, surface water, sediment, groundwater and areas off of the plant property which appear to be impacted. Further, based on the information provided in the DP, there are significant data gaps pertaining to the radiological characterization of both the shallow and deep groundwater. Problems with the data include: poor data quality control; lack of analysis for all radiological parameters in all sampling events; and insufficient number of samples and sampling locations, specifically, from locations downgradient and cross-gradient of the Storage Yard, processing buildings, and effluent discharge lines.
2. Because of the significant lack of characterization of site contaminants, the risk evaluation performed and the development and analysis of remedial alternatives cannot be supported. The developed risk assessment scenarios were not only deficient and based on incomplete data, they failed to address potentially and very significant exposure pathways such as the inhalation of radon decay products in indoor air due to the use of site groundwater, and ingestion of site groundwater and homegrown produce.
3. For unknown reasons, many of the reports of previous investigations conducted by SMC's contractors were not included in the DP. EPA will need to review all of these reports. Such reports include, in part, the radiological characterization of the processing buildings and Haul Road, certain outdoor radiological investigations (e.g., gamma surveys and background surveys), and the radiological assessment of the Hudson Branch.
4. The DP indicates that greater than 99% of radioactivity remained in the slag and the baghouse dust after processing of raw material. Given the amount of radioactivity that SMC processed (approximately 50 curies), even one-tenth percent (0.5 curie) could have a noticeable impact on groundwater contamination if such levels had remained in liquids during the chromium extraction activities and then migrated to groundwater. The radiological site groundwater investigations performed by SMC were poorly done in both the deep and shallow groundwater. It will be necessary to re-sample existing wells and to install a number of additional wells downgradient and crossgradient of the processing buildings and the Storage Yard for the analyses of radiological parameters. Groundwater sampling for radiological parameters should also be performed within the chemical contaminant plume currently being addressed under a Superfund Record of Decision.

5. To date, SMC has not performed subsurface soil investigations, and has not addressed any underground structures such as drains and discharge lines. The potential presence of non-radiological contamination mixed with radioactivity within these underground discharge lines could constitute a mixed waste issue. It is also possible that soils in the vicinity of the discharge lines could be impacted due to potential deterioration in the discharge lines. Although it is clear from work done under the Superfund program at the site that there are non-radiological contaminants at elevated levels in site soils, there is no mention of this in the DP. SMC is currently storing radiologically contaminated materials and equipment in the Storage Yard. Such equipment is mingled with High Ratio slag and D111 Flex Kleen Bags and D116 Polishing Compound. A determination must be made, based on sampling, as to whether site soils and/or other waste on the site constitute mixed waste.
6. Some of the off-site sediment and surface water sample concentrations of radiological contaminants, in excess of the limits stated in 40CFR192 and the Safe Drinking Water Act, have been identified along the Hudson Branch during previous investigations performed by SMC. SMC stated in their DP that off-site contamination will not be addressed in their future decommissioning activities. This is inappropriate. Only a small portion of the Hudson Branch has been sampled by SMC and the extent of radiological contamination in the Hudson Branch has not been determined. The radiologically impacted Hudson Branch passes through a 19.8 acre farmland parcel which is located approximately 2,000 feet southwest of the SMC site property and has recently been acquired by SMC. Contamination on the farmland parcel and within the Hudson Branch must be fully characterized.
7. The SMC proposed Trust Fund for the Proposed Long Term Control (LTC) program appears severely inadequate to support the LTC alternative. The current estimated amount for the LTC alternative is \$5,172,507. This amount only accounts for basic environmental monitoring and minimal maintenance needs. Necessary and important monitoring requirements such as groundwater monitoring downgradient and cross-gradient of the engineered barrier and monitoring of potential moisture build-up within the engineered barrier, due to moisture percolating via the soil beneath the waste pile, are not included in the environmental monitoring program for the LTC alternative. The radioactive waste currently, and under the proposed LTC alternative, sits directly over the soil without a liner to prevent any potential leaching of radioactivity into groundwater. If this alternative were selected, it would require extensive and regular groundwater monitoring to assure that groundwater was not impacted. Further, moisture build-up within the engineered barrier due to percolation via the soil beneath the radioactive waste is a plausible event. Such build-up of moisture within the engineered barrier could adversely impact the integrity of the engineered cap and aid in increasing the potential for radioactivity to leach into groundwater, and would need to be monitored. Additional funding would be required for such sampling over the long-term. It is noted that the maximum half-life of the site-related radionuclides is 14 billion years.

8. The evaluations of alternatives under the "Controls Fail/No Maintenance" scenarios presented in the DP are not comprehensive and were not properly performed. The evaluations are inappropriately biased in favor of the LTC alternative particularly with respect to aspects such as dose modeling, modeling radioactivity leaching to groundwater and associated water resources, and the impact on the surrounding community.
9. SMC cannot propose any portion of the property for unrestricted use unless the current radiological conditions are fully characterized and portions of the site are then shown to have no unacceptable levels of radiological, as well as non-radiological contamination in surface and subsurface soils.
10. The baghouse dust appears to be improperly staged in the Storage Yard. The baghouse dust must be contained to prevent its migration via airborne dust and water run-on/run-off.
11. The groundwater flow contouring (piezometric survey) is too limited and requires expansion to include areas downgradient and cross-gradient of the processing buildings and the Storage Yard. Shallow groundwater monitoring in the area east/southeast of the Storage Yard is also necessary as the groundwater flow in that area could potentially be in the east/southeast radial direction.
12. The NRC License SMB-743 allowed SMC to store licensed source material. This licensed source material is any material that contains greater than 0.05% by weight uranium and thorium radionuclides, which in this case would be the pyrochlore ore and the ferrocolumbium slag. During the course of SMC's operations at the site, very significant volumes, of materials which were radiologically contaminated, but may not meet the definition of source material (non-source materials), such as site soils and equipment, were placed in the Storage Yard, along with the slag. As part of the proposed LTC alternative presented in the DP, SMC plans to consolidate additional radiologically contaminated materials remaining on the plant property into the Storage Yard and place a cap over all of this material. Further, prior to further characterization of waste to be capped under the LTC alternative, it is not clear if significant levels of non-radiological contaminants are mixed in with this waste, such as chromium. Since source material, non-source material and mixed waste all exhibit different characteristics, it is not clear that a capping remedy would be appropriate for all of this waste. An appropriate remedy, or remedies, for this different waste cannot be determined until full characterization of all waste material is completed.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

Alan S. Rosenthal, Chairman
Dr. Richard E. Wardwell
Dr. William Reed

In the Matter of

SHIELDALLOY METALLURGICAL CORP.

(Licensing Amendment Request for
Decommissioning of the Newfield, New Jersey
Facility)

Docket No. 40-7102-MLA

ASLBP No. 07-852-01-MLA-BD01

June 2, 2008

MEMORANDUM

(Bringing Matter of Concern to Commission's Attention)

I. INTRODUCTION

Before this Licensing Board is a proceeding involving the decommissioning of an industrial site on which radioactive material is present in sufficient quantities to be of concern to the State in which that site is located. It now is a full decade since the termination in 1998 of the activity generating that material under the auspices of an NRC license. Despite that lengthy period, it appears that this proceeding will remain in a state of suspension for at least another 14 months to await the completion of the NRC Staff's review of the safety and environmental aspects of the licensee's most recently submitted decommissioning plan—a review that commenced more than one and a half years ago. In short, it likely will be at least late 2009 or early 2010 before the concerned State will obtain a hearing on its Board-admitted contention that the submitted plan does not provide adequate protection to its citizenry. In the meantime, not even a portion of the protective measures contemplated by the challenged plan are in place.

Although the Board deems this state of affairs to be unacceptable, it is not empowered to involve itself to any extent in the manner in which the Staff conducts its review of decommissioning plans, including the matter of the degree of urgency that the Staff might attach to conducting and completing the technical review of such plans once in its hands. Moreover, it does not appear that there is much that can be done at this juncture to accelerate the date upon which the concerned State will get its hearing on the challenged decommissioning plan.

Nonetheless, the Board believes that it has the responsibility to direct the current situation to the attention of the Commission, which does exercise oversight authority over the manner in which the Staff carries out its functions.

In this regard, we have reason to conclude that what has transpired to date in this case is not susceptible of being brushed aside as simply an aberration that is not reflective of what might be expected in the Staff's treatment of other site decommissioning matters. As will also be discussed below, there is a second case that has received the now-and-again attention of first a presiding officer and then a licensing board ever since early 2000. Although the licensed activity there involved terminated in 1994, it currently is a virtual certainty that there will not be a viable decommissioning plan submitted to the Staff any earlier than 2011—some 17 years thereafter. It can be said that the lion's share of this extreme delay might appropriately be placed at the doorstep of the licensee. The inescapable fact remains, however, that, at the very least, the Staff has countenanced in that matter a situation that will leave the citizens in the area surrounding the activity site in doubt for close to two decades regarding what measures will ultimately be taken for their protection. In common with the existing situation in the proceeding now before this Board, that hardly seems consistent with the intent underlying the Commission regulation (10 C.F.R. § 40.42) concerned with the decommissioning of sites on which licensed activities have terminated.

II. HISTORY

A. Shieldalloy Decommissioning Proceeding. The site at issue here is owned and operated by Shieldalloy Metallurgical Corporation ("Shieldalloy") located in the Borough of Newfield, Gloucester County, New Jersey. During an extended period beginning in 1940 and ending in June 1998, the facility among other things processed pyrochlore, a concentrated ore containing columbium (niogium), to produce ferrocolumbium, an additive used in the production of specialty steel and super alloy materials. Containing more than 0.05 percent by weight uranium and thorium, pyrochlore is subject to NRC regulation as a radioactive source material.¹ Accordingly, Shieldalloy sought and obtained license No. SMB-743 that entitled it to ship, to receive, to possess, and to store such material.

The decommissioning plan at issue is addressed to a substantial pile of slag and baghouse dust that contains a quantity of radioactive material and is currently present at Shieldalloy's Newfield site.² It proposes to retain the pile on an eight-acre parcel within the storage yard at the Newfield site. The primary decommissioning activity contemplated by the plan includes the grading and shaping of the pile, which would then be covered with an engineered barrier consisting principally of native soil and rocks. Long term maintenance and monitoring of this restricted area would then be conducted under NRC Staff supervision.

This proceeding was initiated by the publication of a notice in the Federal Register to the effect that the Commission was considering the issuance of an amendment to Shieldalloy's

¹ See 10 C.F.R. § 40.4.

² The revised decommissioning plan now under NRC Staff review addresses principally an accumulation on the Newfield site of 18,000 cubic meters of slag and 15,000 cubic meters of baghouse dust, all of which contains uranium and thorium. Shieldalloy Metallurgical Corp. (Licensing Amendment Request for Decommissioning of the Newfield, New Jersey Facility), LBP-07-05, 65 NRC 341, 344 (2007).

Source Material License.³ In response to the notice, hearing requests were filed by, or on behalf of, a number of individuals and entities, among them, the New Jersey Department of Environmental Protection (New Jersey). Determining it fulfilled the requirements needed to meet the standards imposed by 10 C.F.R. § 2.309(f), this Board granted New Jersey's hearing request in March 2007.⁴ That grant was based upon the Board's determination that New Jersey had standing and had advanced at least one admissible contention to the effect that the proposed decommissioning would not sufficiently protect the area surrounding the Newfield site from unacceptable environmental harm.⁵

According to the November 2006 Federal Register notice, Shieldalloy had advised the Commission in August 2001 that it ceased using radioactive source material and intended to decommission the Newfield facility.⁶ Consequently, the Commission had amended the license in November 2002 to authorize only decommissioning activities. Again, according to the notice, Shieldalloy submitted its initial decommissioning plan on October 21, 2005, which proposed the use of a possession-only license for long-term control of the site. This plan was subsequently rejected by the NRC Staff by letter dated January 26, 2006. A revised decommissioning plan,

³ Notice of Consideration of Amendment Request for Decommissioning for Shieldalloy Metallurgical Corporation, Newfield, NJ and Opportunity to Request a Hearing, 71 Fed. Reg. 66,986 (Nov. 17, 2006).

⁴ See LBP-07-05, 65 NRC at 341.

⁵ Id. at 357-58. Having found acceptable one of New Jersey's contentions, the Board went on to consider whether it should determine at that time the viability of its other contentions. It decided against doing so. Its reason was that there appeared to be a substantial possibility, if not probability, that, as a result of the NRC Staff's technical review, the decommissioning plan would undergo significant alterations that might render many, if not most, of New Jersey's current contentions either academic or in need of major revision. Shieldalloy, LBP-07-05, 65 NRC at 360-61. The Board additionally determined that further proceedings on the adequacy of the decommissioning plan should await the completion of the NRC Staff's technical review. Id. at 359-60. The Commission declined to disturb the Board's decision. See CLI-07-20, 65 NRC 499, 501-02 (2007).

⁶ 71 Fed. Reg. at 66,986. The Federal Register notice also stated, however, that ferroalloy production at the Newfield site ceased in June 1998. Id.

submitted on June 30, 2006, was found acceptable by the NRC Staff for the purpose of initiating technical review of the plan that would eventually produce both a safety evaluation report (SER) and an environmental impact statement (EIS).⁷

As a follow-up to its contention admissibility determination, the Board issued an order directing the NRC Staff to file bimonthly status reports, with the first due on June 8, 2007. The reports were to contain both "(1) a brief statement regarding the then status of the technical review; and (2) the Staff's then best estimate as to the completion date of the review and the release of the documents associated with it."⁸ For its part, the Commission thereafter issued an order on its own in which it further directed that additional filings be made with the Board by the same date. Specifically, Shieldalloy was to disclose in its filing the status of its decommissioning plan, as well as "any relevant developments such as fundamental shifts in [its] approach to decommissioning the site."⁹

On June 7, 2007, the Board received filings from the Staff and Shieldalloy in compliance with the Commission's directive. On the matter of when the technical review might be completed and the associated documents issued, the Staff indicated that its best estimates were the following: issuance of a final SER in January 2008; publication of a draft EIS in March 2008; and issuance of a final EIS in October 2008.¹⁰

The Staff has since filed a total of six status reports, with three of them noting slippage in the forecasted schedule. On the basis of the last report, filed this April, it now appears that the final EIS will not surface any earlier than August 2009, if then.¹¹ In that report, the Staff

⁷ Id.

⁸ See Licensing Board Order (Directing the Filing of Status Reports) at 2 (May 8, 2007) (unpublished).

⁹ See Shieldalloy, CLI-07-20, 65 NRC at 501-02.

¹⁰ See NRC Staff's First Status Report at 1-2 (June 8, 2007).

¹¹ See NRC Staff's Sixth Status Report at 2 (Apr. 11, 2008).

indicated that, to provide a full response to the Requests for Additional Information, or "RAIs", Shieldalloy "intends to conduct additional leachability tests on slag and baghouse dust from the Newfield site."¹²

Taking into account the required response times for the current decommissioning plan revision, the schedule now reflects a slippage of nearly one year from that projected in the Staff's initial status report to the Commission and the Board. It thus appeared that it would be more than eleven years after the 1998 termination of the licensed activity before there might be a consideration on the merits of New Jersey's already-admitted contention that the decommissioning plan is not adequate to prevent unacceptable environmental harm. This prompted the Board to hold an April 28 telephone conference with the parties to obtain an explanation as to the nature of Shieldalloy's latest proposed revision to its decommissioning plan, and to be informed as to the reasons why the revision will require more than a year to factor into the technical review. The Board additionally desired to explore with counsel the current measures designed to avoid or at least ameliorate any environmental impacts of the amassed slag and baghouse dust at the Newfield site.

Still further, the Board was concerned that the substantial delay in both the submittal and approval of the decommissioning plan might involve a violation of the NRC regulation, 10 C.F.R. § 40.42, addressing the obligations of a licensee once a licensed activity has terminated.¹³ This concern stemmed from the fact that, according to the Federal Register notice, Shieldalloy's initial decommissioning plan had been submitted to Staff in 2005—nearly seven years after its ferroalloy production ceased in 1998.¹⁴

¹² Id. at 1-2.

¹³ See discussion infra p. 11.

¹⁴ 71 Fed. Reg. at 66,986.

During the April 28 telephone conference, two things became apparent. First, contrary to the background statement in the Federal Register notice, a decommissioning plan had been submitted to the Staff considerably earlier than 2005.¹⁵ Further, interaction between Shieldalloy and the Staff had taken place in the years leading up to and following submittal of its initial decommissioning plan.¹⁶ This revelation led the Board to request detailed written accounts from the Staff and Shieldalloy of precisely what had transpired between 1998 and the submittal of the supposedly revised decommissioning plan in 2005.¹⁷

Second, it became clear to this Board that no interim protective measures have been put in place at the Newfield site. The pile of slag and baghouse dust remains as it was when Shieldalloy notified the NRC that its production activities had ceased.¹⁸ The central issue in this proceeding is the adequacy of the proposed engineering barrier. During the telephone conference, New Jersey reiterated its concern regarding the inadequacy of Shieldalloy's proposed cap, also stating that "interim measures should be taken" before the decommissioning plan is approved "to prevent the contamination that [is] occurring right now" to the surrounding environment.¹⁹

On May 8, 2008, in response to the Board's directive, the Staff filed a summary of actions, and Shieldalloy filed a chronology of events, both relevant to the decommissioning of

¹⁵ Official Transcript [Tr.] at 9-10, 12.

¹⁶ Id. at 16.

¹⁷ Id. at 33-34.

¹⁸ Id. at 19 (Mr. Travieso-Diaz: "One of the features of the decommissioning plan is to provide a very hefty layer of rock cover, and an impervious membrane . . . on top of [the slag and baghouse dust] once the decommissioning plan gets approved. Right now, there is no cover."). See also id. at 21.

¹⁹ Id. at 45.

the Newfield facility.²⁰ These documents provide a detailed account of events as portrayed by each party and are readily available to the Commission and the public alike through the NRC's Agencywide Documents Access and Management System (ADAMS).²¹

In sum, the parties' submittals portray that Shieldalloy's operations ceased in 1998 with the decommissioning of the facility except for the continuing presence of the slag and baghouse dust at issue here.²² Shieldalloy thereafter sought to find a market for these waste materials, meanwhile notifying the Staff of its efforts.²³ From 1998 to 2001, the Staff permitted Shieldalloy to delay development of a decommissioning plan and to continue the pursuit of a slag and baghouse dust market. When, after two years that endeavor proved unavailing, Shieldalloy requested, and was granted, an additional year by the Staff to locate a buyer for the slag and baghouse dust.²⁴ In 2001, Shieldalloy expressed to the Staff its intention to terminate its license and was granted another year to prepare a decommissioning plan; this decommissioning plan (denominated Rev. 0) was submitted in August 2002—more than four years after operations had ceased at the Newfield facility.²⁵ The August 2002 decommissioning plan was then rejected for its presumption that the State of New Jersey would assume an oversight role for the decommissioning of the site.²⁶

²⁰ NRC Staff's Summary of Actions Relevant to Decommissioning Shieldalloy's Newfield Facility (May 8, 2008) [hereinafter Staff's Submittal]; Shieldalloy's Submittal Regarding Chronology of Events Related to the Decommissioning of the Newfield, NJ Facility (May 8, 2008) [hereinafter Shieldalloy's Submittal].

²¹ Staff's Submittal (ADAMS Accession No. ML081360527); Shieldalloy's Submittal (ADAMS Accession No. ML081350612). Documents available in ADAMS may be accessed on NRC's public website at <http://www.nrc.gov/reading-rm/adams/web-based.html>.

²² Staff's Submittal at 4.

²³ Shieldalloy's Submittal at 5; Staff's Submittal at 4.

²⁴ Staff's Submittal at 4-5.

²⁵ *Id.* at 6.

²⁶ Shieldalloy's Submittal at 6.

From 2002 to 2005, Shieldalloy and the Staff pursued multiple approaches for a restricted license termination with enforceable institutional controls. In October 2005, Shieldalloy submitted a new decommissioning plan (denominated Rev. 1). As with the 2002 plan, it was summarily rejected; this time for deficiencies in dose modeling, surface water hydrology, and erosion protection.²⁷ These deficiencies were purportedly corrected with the submittal of the decommissioning plan (Rev. 1a) on June 30, 2006.²⁸ The Board now understands that further delays are occurring as Shieldalloy addresses deficiencies in this latest revision that was docketed by the Staff in late 2006.²⁹

B. U.S. Army Decommissioning Proceeding. In recent years, there has been only one other adjudicatory proceeding involving the decommissioning of a facility at which the terminated activity carried out under an NRC materials license had left on site a quantity of radioactive material. The proceeding's history up to the present time is fully chronicled in a recent Licensing Board decision.³⁰ It is not necessary to rehearse here the detailed account contained in that decision. For present purposes, the following summary should suffice.

For a period of ten years commencing in 1984, under the auspices of a NRC materials license the Department of the Army conducted accuracy testing of depleted uranium (DU) tank

²⁷ Staff's Submittal at 8.

²⁸ Id. at 9.

²⁹ The Staff in its submittal also indicates that while reviewing Shieldalloy's decommissioning plan, it has taken into account public comments on Rev. 1a, most notably New Jersey's 228 comments and the United States Environmental Protection Agency's 283 distinct comments. Staff's submittal at 11.

In its latest submittal to the Board, Shieldalloy suggested that a substantial portion of the delay was attributed to New Jersey. New Jersey filed a response in defense of these allegations, which is also available publicly in ADAMS. New Jersey Department of Environmental Protection's Reply to the NRC Staff and Shieldalloy Submissions Regarding the Chronology of Decommissioning Events (May 15, 2006) (ADAMS Accession No. ML081440776).

³⁰ U.S. Army (Jefferson Proving Ground Site), LBP-08-04, 67 NRC ____ (Feb. 28, 2008) (slip op. at 1-11).

penetration rounds at its Jefferson Proving Ground (JPG) site in Indiana: In 1999, some five years after the testing came to a permanent halt, the Army submitted a decommissioning plan to the NRC Staff that purportedly addressed the accumulation of DU munitions that remained on the JPG site. In response to the customary Federal Register notice of opportunity for hearing, a local organization filed a hearing request challenging the plan.³¹ In 2000, that request was granted.³²

More than eight years have now elapsed since the initiation of that proceeding. Yet, not only has there been no resolution of the issues raised by the intervening organization, there is not even a decommissioning plan currently on the table for consideration by either the NRC Staff or a licensing board.

To begin with, both the 1999 decommissioning plan and a revised one submitted in 2001 were withdrawn by the Army, the second in favor of an application in 2003 for a five-year renewable possession-only license (POLA). Then, before the NRC Staff had completed its evaluation of that submission, the POLA application itself was withdrawn and replaced by an Army request in mid-2005 for an alternate schedule amendment to the materials license that would give it an additional five years to complete a site characterization of the JPG site. Thereupon, a new decommissioning plan, incorporating the site characterization, would be submitted to the Staff and presumably be subject to challenge before a licensing board.

The alternate schedule proposal was accepted by the Staff and last February approved by the licensing board over the objections of the intervenor to some features of the methodology the Army intends to employ in carrying out the site characterization.³³ The proposal calls for the submission of a decommissioning plan by 2011. Thus, it will likely be some 17 years after the

³¹ Notice of Consideration of Amendment Request for U.S. Army Jefferson Proving Ground Site in Madison, Indiana, and Opportunity for a Hearing, 64 Fed. Reg. 70,294 (Dec. 16, 1999).

³² U.S. Army (Jefferson Proving Ground Site), LBP-00-9, 51 NRC 159 (2000).

³³ See Army, LBP-08-04, 67 NRC at __ (slip op. at 57).

testing activity was permanently terminated before the decommissioning plan for the JPG site will next undergo Staff scrutiny.

Moreover, even if the then plan meets with Staff approval, it well might be contested as insufficient by the local organization that has been involved in this matter over the course of more than eight years. In the event of such a contest, it could be another year or two before there is a final determination regarding the measures, if any, that must be taken to ensure that the public health and safety and the environment are not adversely affected by the DU munitions remaining on the JPG site.

III. DISCUSSION

A. The Commission's regulations are most specific with regard to the obligations of the holder of an NRC materials license once either (1) a decision has been reached to cease permanently the principal activities conducted under the aegis of the license; or (2) no such activities have been conducted for a period of 24 months. In such circumstances, the licensee must provide written notification to the NRC Staff within 60 days and, additionally, either (1) begin decommissioning of the site so that the building or outside area is suitable for release in accordance with NRC requirements; or (2) submit a decommissioning plan to the Staff within 12 months of the notification.³⁴

Implicit in those requirements would appear to be a recognition that, once a licensed activity has come to an end, the decommissioning of the site should proceed with dispatch to ensure that all measures required to ensure the public health and safety and to protect the environment are seasonably taken.³⁵ Granted, section 40.42(d) does not establish a time

³⁴ See 10 C.F.R. § 40.42(d).

³⁵ See *Timeliness in Decommissioning of Materials Facilities*, 59 Fed. Reg. 36,026, 36,026 (July 15, 1994) (the timeliness in decommissioning rule incorporated into section 40.42 "is intended to reduce the potential risk to public health and the environment from radioactive material remaining for long periods of time at such facilities after licensed activities have ceased.").

period within which the Staff must make its ultimate determination regarding what decommissioning activities might be necessary in order to provide such assurance and protection. Obviously, what the Staff review will entail in a particular case will be largely dependent upon the complexity of the safety and environmental issues presented in that case. That said, however, it is reasonable to read into the section a contemplation that, upon being apprised of the termination of a licensed activity, the Staff will deem its duty to include seeing to it that all decommissioning issues are approached and resolved as expeditiously as possible. Indeed, is not that the justifiable expectation of those persons who are located in close enough proximity to the site to have legitimate concerns regarding the radioactive materials that remain on site?

In that regard, it often will be in the economic interest of a licensee to put off as long as possible implementing expensive remediation measures, whether determined necessary by the NRC Staff or by a licensing board, in its consideration of an intervenor's challenge to a submitted decommissioning plan.³⁶ Given that financial reality, it seems to us that there might be a particular obligation on the part of the Staff to insist that the licensee not merely comply strictly with the provisions of section 40.42(d) but, as well, do whatever is thereafter required of it in a sufficiently timely fashion to ensure no unnecessary delay in the accomplishment of site decommissioning.

B. 1. As previously summarized in this memorandum, in submittals provided at our direction, Shieldalloy and the NRC Staff provided full accounts of what has transpired on the decommissioning front since 1998. In addition, New Jersey responded in writing to the Shieldalloy charge that the State bears most of the responsibility for the current state of affairs.³⁷

³⁶ Although we are not prepared to conclude that such a consideration played a part in Shieldalloy's conduct since it terminated the licensed activity a decade ago, the fact remains that it is faced with at least the possibility of being ordered at day's end to do much more by way of site remediation than it now proposes.

³⁷ See supra note 29.

We do not intend to freight this memorandum with a close analysis of the content of the several submissions.³⁸ It is enough to note that we have failed to discern in the submissions of either Shieldalloy or the Staff a sense of anything even remotely approaching urgency with regard to the resolution of the decommissioning issues on the table.

As a consequence, ten years after the licensed activity ceased, there remains on Shieldalloy's Newfield site a large slag pile containing radioactive material. Acting on behalf of its citizens, New Jersey maintains, among other things, that the passage of rainwater through the pile will produce unacceptable groundwater contamination. In that connection, it disputes the adequacy of Shieldalloy's proposal to cap the pile with nothing more than native soil and rock. The validity of that proposal apparently will now not receive a Staff determination for over another year (if not still longer). In the meanwhile, as has been the case for the past decade, the pile will not even have the assertedly inadequate cover called for in the challenged decommissioning plan, or some type of alternate cover, to reduce ongoing impacts.

~~We think it beyond cavil that the residents of the Newfield area who might possibly be~~ affected by contaminated groundwater were entitled to greater consideration. And, while acknowledging the importance of the Staff taking the time necessary to ensure that the conclusion reached on the issues raised by New Jersey (and any others that occur to it on its own) are fully informed ones, it is worth noting that what is involved here is nothing more than a slag pile. As such, we would think that the Staff inquiry here rates relatively low in comparative complexity among the numerous site decommissioning proposals it confronts.

B. 2. With respect to the JPG decommissioning situation is, it is now some 14 years since the Army terminated the munitions testing on the site. Yet, no decision has been reached regarding what measures are to be taken to ensure that the DU munitions amassed on site do not present an undue radiological safety or environmental threat. Still more to the point, there is

³⁸ As previously noted, supra note 21, the submissions are available for inspection on ADAMS.

not even a decommissioning plan currently on the table. Instead, as matters now stand, it likely will be at least 2011—some 17 years after the licensed activity came to an end—before the Staff will have in hand a decommissioning plan that might possibly meet with its approval (and that of a licensing board if challenged).

As we have seen, this state of affairs is the product of the Army having waited five years to file its initial decommissioning plan (in seeming violation of Section 40.42(d)) and then, over a period of several years, having changed directions several times. If the Staff had any concern with the erratic course that the Army pursued up to and including its application for an additional five years to come up with yet another decommissioning plan, that concern certainly was not made known. To the contrary, for all appearances, the Staff has seen no problem with the residents of the JPG site area being kept in the dark for conceivably as long as two decades with regard to what (if anything) the Army will be required to do to remediate the site.

IV. CONCLUSION

As this Board sees it, the history of these two decommissioning proceedings speaks for itself. It remains at least possible, of course, that it is not the universally held and applied belief of the NRC Staff that it is appropriate to have decommissioning issues remain unresolved for well over a decade. Nonetheless, there seems to be a substantial possibility that these proceedings do not stand alone as representatives of a more than casual attitude on the Staff's part with regard to the decommissioning of sites on which radioactive materials remain as a potential threat to public health and safety and to the environment.

Given that licensing boards lack the authority themselves to oversee the Staff's performance of its regulatory responsibilities (apart from compliance with the dictates of the National Environmental Policy Act), we are not empowered to inquire further into the matter, let alone to order some corrective measures. Thus, as noted in the introduction to this Memorandum, the sole course available to us is a referral of the matter to the Commission for its consideration.

To avoid any possible misunderstanding, we wish to make it clear that nothing that has been said above should be taken as a criticism of anything that the NRC Staff has substantively done in the course of its technical review in either case. Our concern is exclusively with the pace, and therefore not at all with the content, of the Staff's review. Additionally, we are not suggesting that there are steps that might be taken at this point to accelerate materially decommissioning in the specific proceedings discussed herein. In the totality of the present circumstances, that might well be beyond achievement. (The Commission might, however, wish to make clear to the Staff that it will look with disfavor upon any further slippage in either the August 2009 completion of the Shieldalloy technical review or the Army's submission by 2011 of a new decommissioning plan for the JPG site.) Our primary interest is, instead, in the avoidance of like-protracted delay in the resolution of issues arising in future decommissioning endeavors. Once again, those living in the vicinity of the sites being decommissioned are owed no less.

THE ATOMIC SAFETY
AND LICENSING BOARD*

/RA/

Alan S. Rosenthal, Chairman
ADMINISTRATIVE JUDGE

/RA/

Dr. Richard E. Wardwell
ADMINISTRATIVE JUDGE

/RA/

Dr. William Reed
ADMINISTRATIVE JUDGE

Rockville, Maryland
June 2, 2008

* Copies of this Memorandum were sent by e-mail transmission on this date to counsel for (1) Licensee Shieldalloy Metallurgical Corp.; (2) Intervenor New Jersey Dept. of Environmental Protection; and (3) the NRC Staff. In addition, as a courtesy, copies will be informally provided to the service list in the Army proceeding.

Decommissioning Plan (Revision 1a).³ More recently, the Board issued a Memorandum bringing certain issues to the Commission's attention.⁴ Both the licensee and the NRC Staff sought leave from the Commission to respond to the Board's Memorandum.⁵ The Commission allowed any party to respond.⁶ The NRC Staff, the licensee, and New Jersey submitted briefs to the Commission.⁷

The Board's Memorandum raised essentially two concerns. The Board's initial concern was the extraordinarily slow pace of this proceeding. Originally, the Staff estimated that it would issue a final Safety Evaluation Report (SER) in January 2008, a Draft Environmental Impact Statement (DEIS) in March 2008, and a Final Environmental Impact Statement (FEIS) in October 2008.⁸ According to the Staff's latest estimates, the DEIS will not be issued until October 2009, and the final SER and FEIS not until December 2009 and July 2010, respectively.⁹ Given the circumstances, a hearing on the adequacy of Shieldalloy's Decommissioning Plan would not be held until well over 3 years after the Board granted New Jersey's hearing request, and over a decade since

³ LBP-07-5, 65 NRC 341, 353-59 (2007). The Board admitted one contention, and deferred consideration of New Jersey's other contentions pending completion of the Staff's safety and environmental review. See *id.* at 359-62.

⁴ See Memorandum (Bringing Matter of Concern to Commission's Attention), LBP-08-08, 67 NRC ____ (slip op. June 2, 2008)(Board Memorandum).

⁵ *Shieldalloy's Unopposed Motion for Leave to File a Response to Licensing Board's Memorandum (Bringing Matter of Concern to Commission's Attention)*(June 10, 2008); *NRC Staff's Motion for Leave to Respond to LBP-08-08* (June 12, 2008).

⁶ See Order (June 18, 2008)(unpublished).

⁷ *NRC Staff's Response to LBP-08-08* (July 3, 2008)(Staff Response); *Shieldalloy's Response to Licensing Board's 'Memorandum (Bringing Matter of Concern to Commission's Attention)'*(July 3, 2008)(Shieldalloy Response); *State of New Jersey's Reply to the July 3, 2008 NRC Staff and Shieldalloy Submissions to the Commission* (July 10, 2008)(New Jersey Reply).

⁸ See Board Memorandum, slip op. at 5.

⁹ See *NRC Staff's Tenth Status Report* (December 5, 2008).

Shieldalloy ceased manufacturing operations (in 1998).¹⁰ The current delay stems at least partially from Shieldalloy's intention to submit another revision of its Decommissioning Plan, to address many of the issues raised by the Staff in Requests for Additional Information (RAIs) transmitted in July 2007.¹¹

The Board also expressed concern over whether there are adequate protective measures in place to protect nearby residents.¹² Recognizing its lack of authority to oversee or "inquire further" into the Staff's performance of its regulatory oversight responsibilities, or to "order some [interim] corrective measures," if any are called for, the Board referred its concerns to the Commission.¹³

Addressing the Board's Memorandum, the Staff responds that Shieldalloy already has "certain protective measures in place at the Newfield site that are essentially the same as those contemplated by the [Decommissioning Plan]."¹⁴ These include security and access control measures, and a radiation monitoring program. The Staff also states that Shieldalloy has built a berm on the south side of the storage area at the Newfield site, to assure that rainwater runoff will not transport baghouse dust outside the

¹⁰ See Board Memorandum, slip op. at 1, 6-8.

¹¹ See Board Memorandum, slip op. at 9; Staff Response at 12-15. As the Staff explains, a significant issue has been determining proper leach rate testing and sampling protocols to assess the leachability of slag and baghouse dust at the Newfield site. See Staff Response at 14-15. In its Ninth Status Report, the Staff indicated that Shieldalloy finalized its leach rate testing protocol in September 2008, and plans to take more than 50 additional samples from the nine slag and baghouse dust piles at the site. See *NRC Staff's Ninth Status Report* (Oct. 10, 2008) at 2.

Prior to accepting for technical review Shieldalloy's Decommissioning Plan Revision 1a, the Staff had rejected for docketing other earlier-submitted decommissioning plans for the Newfield site. The Staff rejected Revision 0 (submitted August 2002) and Revision 1 (submitted October 2005). See Board Memorandum, slip op. at 8-9.

¹² See *id.*, slip op. at 6-7, 11-12, 13.

¹³ *Id.*, slip op. at 14.

¹⁴ Staff Response at 15.

storage area.¹⁵ The Staff stresses that there is "no evidence of any violation or potentially hazardous condition that would support ordering Shieldalloy to implement an engineered barrier [cover over the slag and baghouse dust] as an interim protective measure."¹⁶ The Staff further stresses that it "continues to monitor and inspect the site," and that recent "inspections have not revealed any current threat to public health or safety associated with the Newfield site."¹⁷

Based upon the information provided to us, we have no reason to conclude that there are ongoing violations of NRC health and safety standards at the Newfield site. We note, further, that New Jersey concurs in the Staff's assessment that an interim protective barrier over the slag and baghouse dust at the site "may prolong and complicate decommissioning."¹⁸

New Jersey, however, urges the Staff (and Shieldalloy) to consider whether other interim measures are warranted to prevent any "contamination until the final decommissioning is completed."¹⁹ In particular, New Jersey raises a concern about the Hudson Branch Creek, located near the Newfield facility. New Jersey claims, for example, that sampling results from the creek's surface water and soil sediment show elevated levels of uranium-238, thorium-232, and radium-226.²⁰ New Jersey requests an adequate characterization of this contamination, an investigation into the source of

¹⁵ *Id.* at 17.

¹⁶ *Id.* at 18.

¹⁷ *Id.* at 6.

¹⁸ New Jersey Reply at 8.

¹⁹ *See id.*

²⁰ *See id.* at 7, and attached Exhibit 2 at 1-3.

contamination, a plan to prevent any ongoing contamination (if there is any), and remediation of existing contamination.²¹

While the Staff's brief does not address the Hudson Branch contamination, the Commission is aware that the Staff has issued Requests for Additional Information, calling on Shieldalloy to provide additional characterization data and other information on the contamination.²² Apparently, the Staff has not yet resolved whether the NRC (or New Jersey) has jurisdiction over the radiological contamination in the Hudson Branch.²³ The NRC will assert jurisdiction if the contamination is attributable to Shieldalloy or another NRC licensee.²⁴ After reviewing Shieldalloy's responses and information from other sources, the Staff will determine whether the NRC has jurisdiction over the radiological contamination and, if so, whether and to what extent the contamination requires remediation.²⁵ We expect that the Staff will timely and thoroughly address these questions.

In addressing the creek contamination, New Jersey also refers to the berm constructed on the south side of the storage area as an interim protective measure. Because the berm "does not surround the entire pile" of materials, New Jersey seeks additional characterization of the soil and any surface water outside the fence-line, to assure that runoff to the north, east, and west sides of the pile does not pose an offsite

²¹ New Jersey Reply at 9.

²² See, e.g., Letter from Keith McConnell, NRC, to Ms. Patricia Gardner, New Jersey Department of Environmental Protection (Aug. 18, 2008)(McConnell Letter)(ADAMS ML082040537); Request for Additional Information, Cover Letter (July 5, 2007)(ADAMS ML071640267)(Cover Letter), and attached RAIs (ADAMS ML071640287) at 7-8.

²³ See McConnell Letter at 1.

²⁴ See *id.* at 2.

²⁵ See *id.*

contamination concern.²⁶ New Jersey states that there are materials other than slag, such as construction debris and contaminated soil, "that could potentially leave the site via runoff."²⁷ Whether additional data are needed regarding the effectiveness of the existing berm to deter potential offsite migration is a matter that the Staff should discuss with Shieldalloy and New Jersey.

We acknowledge the Board's concern with the extraordinary lag of time between Shieldalloy's cessation of operations and this adjudicatory proceeding on a decommissioning plan, and the continuing delays since the proceeding began. The Board made "clear" that it had no "criticism of anything that the NRC Staff has substantively done in the course of its technical review,"²⁸ and we likewise discern no failure in the Staff's technical review, which must consider and resolve all relevant safety and environmental issues. The Staff appears to be conducting a detailed, careful review, but to complete its review needs and has requested much additional information from Shieldalloy. We expect Shieldalloy to respond promptly and accurately to Staff inquiries. The Staff has advised Shieldalloy that the Staff may suspend or terminate its review of the Decommissioning Plan if Shieldalloy fails to provide "complete and high-quality responses."²⁹

We also expect that, absent compelling circumstances, the Staff will accord sufficient priority and devote sufficient resources to meeting its current estimated safety and environmental review schedule. If in the course of its review, the Staff finds that any additional interim protective measures at the site are warranted, we expect it will take prompt appropriate action.

²⁶ New Jersey Reply at 7.

²⁷ *Id.*

²⁸ Board Memorandum at 15.

²⁹ See Cover Letter at 1.

Commissioner Jaczko, in his dissent, echoes the Board's concern with the delays in decommissioning the Newfield facility – a concern that we share. We also agree, as espoused in the dissent, that unrestricted release is the preferable method for terminating radioactive materials licenses.³⁰ But we differ with the dissent in that it addresses a generic matter that was not raised by the Board's Memorandum and offers a position on a question that is premature to address here. Many of the issues raised in the dissent are currently pending before the Board and may be dealt with in the context of the Board's adjudication, if appropriate, with the benefit of full briefing by the parties.

IT IS SO ORDERED.

For the Commission

(NRC SEAL)

/RA/

Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 27th day of January 2009.

³⁰ See NUREG-1757, Vol. 1, Rev. 2, Consolidated Decommissioning Guidance; Decommissioning Process for Materials Licensees (Sept. 2006) at M-1.

Commissioner Jaczko, dissenting:

I dissent from the Commission's Memorandum and Order. It is our job to make sure Shieldalloy fully cleans up this site. For two reasons, I think we may not be headed in the right direction to make sure this happens in a reasonable time. First, I believe that part of the generic guidance on decommissioning in NUREG-1757, with respect to long-term institutional control under 10 C.F.R. § 20.1403, is flawed and should be reconsidered. Should Shieldalloy follow that guidance and the Commission then find that it has to revise or withdraw it, significant delay in decommissioning the site could result. To avoid this result, the Commission could revisit that guidance now. Second, I am not convinced that the potential to achieve unrestricted release of Shieldalloy's Newfield site has been adequately explored. The following explains each of these two points in detail.

With respect to the generic guidance in NUREG-1757, the part of the guidance that applies the requirements in 10 C.F.R. Part 20 governing restricted release and in 10 C.F.R. § 40.42 governing license termination seems to me inconsistent with the text and intent of the regulations. See NUREG-1757, Vol. 1, Rev. 2, Consolidated Decommissioning Guidance; Decommissioning Process for Materials Licensees (Sept. 2006) (NUREG-1757). Specifically, the current guidance regarding the "possession only license/long term control" (POL/LTC) option appears to me logically flawed, and I believe we should generically revisit this guidance. In addition, if this flawed guidance is applied at Shieldalloy's Newfield site, significant additional delay to decommissioning this site could result. We would be remiss if did not act now to eliminate this potential source of additional delay.

The regulations that are the basis for my concern are as follows: In short, § 40.42(c) provides that, with respect to possession, a Part 40 license, such as that held by Shieldalloy, continues in effect after expiration until decommissioning is completed.

During that time, a licensee must limit actions to those related to decommissioning and control access to restricted areas until they are suitable for release. Simply stated, the licensee must meet Part 20 with respect to the materials remaining on the site.

Further, to decommission the site under Part 20, the licensee must meet the standards in § 20.1402 for unrestricted release of the site, *i.e.*, the amount of radioactive material left on the site is not dangerous, or the licensee must satisfy § 20.1403 or § 20.1404. Under § 20.1403, the site will be considered for restricted release if further reductions in residual radioactivity necessary to comply with the provisions of § 20.1402 would result in net public or environmental harm or need not be made because residual levels associated with the restricted conditions are as low as reasonably achievable (ALARA). Whether a site is suitable for unrestricted or restricted release, however, the license is terminated upon the completion of decommissioning in accordance with Part 20. Neither the licensee nor the NRC retains any continuing obligation or jurisdiction, respectively, with respect to the site, unless new information shows that the Part 20 criteria were not met and the residual radioactivity remaining on the site could result in a significant threat to public health and safety. See 10 C.F.R. § 20.1401(c); NUREG-1757, Appendix M at M-2 to M-3. The license is terminated even if the licensee decommissions the site in accordance with alternate decommissioning criteria pursuant to § 20.1404.

In contrast to the regulations described above, all of which are directed to license termination, the guidance in NUREG-1757 introduces the concept of a "new type of possession-only license [that] is referred to in this guidance as a long-term control (LTC) license[.]" NUREG-1757, Appendix M, M.3 at M-9. Such an LTC license (or possession-only license, POL) could remain outstanding indefinitely. See *id.* at M-14 ("The LTC license is not necessarily permanent"). Nowhere is such an LTC license

mentioned or even hinted at in the License Termination Rule in Part 20, or in the rule on the timeliness of decommissioning (as applicable in this proceeding, § 40.42).

In my view, issuance of an LTC license defeats the purpose of Subpart E of Part 20, "Radiological Criteria for License Termination." Moreover, there is no need to issue such a license, because the expired license held by the licensee continues to exist in accordance with § 40.42, and *already* requires the licensee to provide "institutional control" over the site in accordance with § 40.42(c) and Part 20. Under this existing license, the NRC can require any action that it might require under the LTC license.

In my view, we should just require licensees to comply with Part 20 so that their sites may be released (with or without restrictions) and their licenses terminated. If a particular licensee is unable to do so, then we should refer the site to some other governmental agency with the authority to clean it up or request legislation from Congress to address the situation. Depending on the circumstances, a "safe storage" option during which the licensee accumulates funds for site cleanup might also be an option. In the interim until the licensee or some other agency actually cleans up the site, of course, the licensee will control access and otherwise provide adequate protection to the public health and safety with respect to the materials remaining on site by satisfying Part 20 under its existing, though expired, license.

With respect to Shieldalloy's Newfield site, I offer no opinion on whether or not Shieldalloy can or will satisfy the requirements of § 20.1403 for restricted release, or on the adequacy of its proposed decommissioning plan in light of the current generic guidance in NUREG-1757. Should the Commission decide to request the staff to reexamine that generic guidance regarding restricted release and changes result, Shieldalloy will of course need to consider those changes, and may need to make conforming changes to its proposed decommissioning plan.

With respect to the second point, whether the potential to achieve unrestricted release of Shieldalloy's Newfield site has been adequately explored, I first note the purpose of 10 C.F.R. § 40.42, which governs the expiration and termination of licenses and decommissioning of source material sites, such as the Newfield site. The purpose of the rule in which the current form of that section was promulgated was to "require timely decontamination and decommissioning by nuclear material licensees."

"Timeliness in Decommissioning of Materials Facilities," 59 Fed. Reg. 36,026 (July 15, 1994) (Timeliness Rule SOC). As the Timeliness Rule SOC states, "[t]he rule is intended to reduce the potential risk to public health and the environment from radioactive material remaining for long periods of time at [materials] facilities after licensed activities have ceased." *Id.*

In general, I agree with the Licensing Board in its opinion in LBP-08-08 that the decommissioning of the Shieldalloy Newfield site is taking an unduly long time. As the Board has pointed out, licensed activities at the Newfield site ceased in 1998, and the decommissioning process began then. I also recognize, as the staff notes, that numerous areas of the Newfield site have already been decommissioned. NRC Staff's Response To LBP-08-08 at 6 (July 3, 2008). Nonetheless, slag and "baghouse dust" accumulated on an eight-acre portion of the Newfield site, among other things, remain to be decommissioned. *Id.*

Much of the delay in addressing this slag and baghouse dust and completing the decommissioning of this site can be attributed to the licensee's inadequate proposals for decommissioning. As the Board indicated, decommissioning this site would seem to be a simple matter of removing waste offsite for disposal. It only becomes complicated when the licensee seeks to dispose of the waste onsite, with all the attendant characterization work and analyses necessary to show that such a proposal satisfies

Part 20. Our implementation of our decommissioning rules at the Newfield site has resulted in radioactive material remaining at the Newfield site for a prolonged time.

The preferred path for decommissioning in Part 20 is to achieve unrestricted release of a site. The rule states:

A site will be considered acceptable for license termination under restricted conditions if:

- (a) The licensee can demonstrate that *further* reductions in residual radioactivity necessary to comply with the provisions of § 20.1402 would result in net public or environmental harm or were not being made because the residual levels associated with restricted conditions are ALARA.

10 C.F.R. § 20.1403 (emphasis added). Section 20.1403 presumes that contaminated material has been removed offsite until the stated criteria are met, thus, offsite disposal is the first option. See *a/so*, "Radiological Criteria for License Termination," 62 Fed. Reg. 39,058, 39,065 (July 21, 1997). In the rulemaking promulgating this section, the Commission stated that it was taking "[a] tiered approach of unrestricted use and allowing restricted use if certain conditions are met[.]" *Id.* Moreover, § 40.42 is written in terms of "releasing" buildings or areas in accordance with NRC criteria. See, *e.g.*, 10 C.F.R. § 40.42(d).

Licensees do not get to choose between restricted and unrestricted release to suit their own purposes. Rather, the licensee should demonstrate that it will follow the "tiered" approach to decommissioning described above, and that release of the site will be restricted only if one or more of the conditions in § 20.1403(a) is met. The

unavailability of funding for decommissioning adequate to achieve unrestricted release of a site is not one of the conditions specified in § 20.1403(a). If none of the § 20.1403 conditions is met and funding is inadequate to achieve unrestricted release of the Newfield site, some other course of action, such as referral of the site to another agency for cleanup or licensee control and maintenance of the site until additional funds are accumulated, may be necessary. After all, if Shieldalloy invested the \$8 million dollars it has in remaining funds, it can reasonably be assumed that those funds would eventually reach the \$33 million dollar price tag envisioned in the application as necessary to remove the waste from the site. Even assuming only a 2% real rate of return (interest rate minus inflation), the \$8 million would grow to \$30 million in roughly 60 years. While that might be a longer time-frame than some would prefer, it is far shorter than a plan to leave the waste on site permanently.

In view of the above, the agency should be sure to explore all options for achieving unrestricted release of the entire Newfield site. Since it seems to me that we have not yet done so, I would have ordered the parties to provide us briefs on what efforts have been made to achieve unrestricted release of the site. After considering those briefs, we could have then provided direction to the Staff, if necessary. (I would not have requested the parties' views on whether the criteria in § 20.1403 justifying restricted release are met, as this issue will likely be the subject of the litigation pending before the Board, and is not yet ripe for us to consider.)

In sum, I believe we would be remiss in not directing the staff to explore all options aimed at achieving unrestricted release of the entire Newfield site. Because I believe the staff's current direction in entertaining the possibility of restricted release of the site is problematic with respect to long-term institutional control, and it seems to me that offsite disposal of some portion of the waste currently onsite might be accomplished, I would take a different approach.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)
)
SHIELDALLOY METALLURGICAL CORP.)
)
(License Amendment Request for)
Decommissioning the)
Newfield, New Jersey Facility))

Docket No. 40-7102-MLA

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing COMMISSION MEMORANDUM AND ORDER (CLI-09-01) have been served upon the following persons by electronic mail this date, followed by deposit of paper copies in the U.S. mail, first class, and NRC internal mail.

Office of Commission Appellate
Adjudication
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: ocaamail@nrc.gov

Administrative Judge
Alan S. Rosenthal, Chair
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: rsnthl@verizon.net

Administrative Judge
Richard E. Wardwell
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: richard.wardwell@nrc.gov

Administrative Judge
William Reed
Atomic Safety and Licensing Board Panel
Mail Stop - T-3 F23
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: whrcville@earthlink.net

Catherine, Marco, Esq.
Michael J. Clark, Esq.
Office of the General Counsel
Mail Stop - O-15 D21
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: catherine.marco@nrc.gov;
michael.clark@nrc.gov

Jay E. Silberg, Esq.
Matias F. Travieso-Diaz, Esq.
Robert B. Haemer, Esq.
Pillsbury Winthrop Shaw Pittman LLP
2300 N Street, N.W.
Washington, DC 20037-1128
E-mail: jay.silberg@pillsburylaw.com;
matias.travieso-diaz@pillsburylaw.com;
robert.haemer@pillsburylaw.com

Docket No. 40-7102-MLA
COMMISSION MEMORANDUM AND ORDER (CLI-09-01)

Stuart Rabner, Esq.
Attorney General of New Jersey
Andrew D. Reese, Esq.
Kenneth Elwell, Esq.
Deputy Attorneys General
New Jersey Office of the Attorney General
Department of Law and Public Safety
Division of Law
25 Market Street
P.O. Box 093
Trenton, NJ 08625-0093
E-mail: andrew.reese@dol.lps.state.nj.us
kenneth.elwell@dol.lps.state.nj.us

David R. Smith, Radiation Safety Officer
Shieldalloy Metallurgical Corporation
12 West Boulevard
P.O. Box 768
Newfield, NJ 08344-0768

[Original signed by Christine M. Pierpoint]

Office of the Secretary of the Commission

Dated at Rockville, Maryland
this 27th day of January 2009



SHIELDALLOY METALLURGICAL CORPORATION

35 S. W. Boulevard
P. O. Box 768
Newfield, NJ 08344 U.S.A.

Telephone: 856-697-6501
FAX: 856-697-6515

August 28, 2009

10 C.F.R. § 40.42

40-7102

Document Control Desk
Director, Office of Federal and State Materials
and Environmental Management Programs
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Shieldalloy Metallurgical Corporation, Source Material License No. SMB-743
Revised Decommissioning Plan for the Newfield Facility, Newfield, New Jersey

Gentlemen:

Pursuant to 10 C.F.R. §§ 40.42(d) and (g)(2), Shieldalloy Metallurgical Corporation ("SMC"), holder of the above referenced license, submits its revised "Decommissioning Plan for the Newfield Facility," Rev. 1b ("DP Rev. 1b") for the decommissioning of SMC's Newfield, New Jersey licensed facility. Although incorporating significant portions of earlier revisions, DP Rev. 1b replaces in their entirety all previous versions of SMC's proposed decommissioning plan for the facility.

DP Rev. 1b is based on, and implements, the restricted release approach set forth in 10 C.F.R. §20.1403 and the guidance in "Consolidated Decommissioning Guidance: Decommissioning Process for Materials Licensees" (NUREG-1757, Volume 1, Revision 2) (September 2006) ("NUREG-1757"). After decommissioning is complete, it envisions the issuance of a Long Term Control ("LTC") license for the facility in accordance with the guidance in Appendix M of NUREG-1757.

The enclosed DP Rev. 1b incorporates the results of nearly three years of technical discussions between SMC and the Nuclear Regulatory Commission Staff ("Staff"), significant additional research and investigations to support the assumptions made in earlier revisions of the plan, and the responses to four formal rounds of Staff requests for additional information ("RAIs") plus two sets of follow-up RAIs, encompassing a total of well over two hundred RAIs. All of these interactions have been open to all interested parties. SMC hopes and expects that such an extensive exchange with the Staff will result in the expeditious docketing and review of DP Rev. 1b.

Once DP Rev. 1b has been docketed, SMC looks forward to continuing its productive and open dialogue with the Staff on the decommissioning of the Newfield facility so as to fully protect the public health and safety, while at the same time carrying out the decommissioning process in the most efficient and cost-effective manner. In accordance

11609 2940 269

Swins Review
Complete

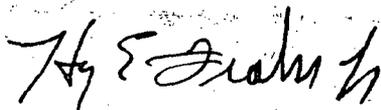
NM5501

Document Control Desk
August 28, 2009
Page 2

with 10 C.F.R. § 40.42(d), SMC stands ready to promptly begin the decommissioning process for the Newfield facility upon the approval of the DP.

If you have any questions concerning DP Rev. 1b, please feel free to contact me (740-435-4646) or SMC's Technical Director David White (614 599-9582).

Sincerely,



Hoy E. Frakes, Jr.
President

Enclosure

cc (with enclosure):

John J. Hayes, USNRC-FSME-DWMEP-DURLD - 1
John Kinneman, Division of Nuclear Materials Safety, USNRC Region 1 - CD
David White, SMC - CD
Barbara Flowers, SMC - 4 and CD
David Smith, SMC - CD
Jean Oliva, TRC - 1 and CD
Carol D. Berger, IEM - 1 and CD
Jay E. Silberg, Pillsbury Winthrop Shaw Pittman LLP - CD
Matias F. Travieso-Diaz, Pillsbury Winthrop Shaw Pittman LLP - 1 and CD
Robert B. Haemer, Pillsbury Winthrop Shaw Pittman LLP - CD
Dennis J. Krumholz, Riker, Danzig, Scherer, Hyland & Perretti LLP - CD
Steven Senior, Danzig, Scherer, Hyland & Perretti LLP - CD
Alan S. Rosenthal, Chair, ASLB Panel - CD
Richard E. Wardwell, Judge, ASLB Panel - CD
William Reed, Judge, ASLB Panel - CD
Stuart Rabner, Esq., Attorney General of New Jersey - CD
Michael J. Clark, Esq., Counsel for the NRC Staff - CD
Nancy Wittenberg, Assistant Commissioner, NJDEP - CD
Mark Roberts, USNRC Region I - CD
~~Allen Pette~~, USNRC HQ - CD *Christianne Ridge*
Newfield Public Library - 1
Newfield Borough Hall - 1

Document Control Desk

August 28, 2009

Page 3

cc (without enclosure):

Hon. Gregory B. Jaczko, Chairman, USNRC

Hon. Dale E. Klein, Commissioner, USNRC

Hon. Kristine L. Svinicki, Commissioner, USNRC



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Environmental Radiation
PO Box 415
Trenton, New Jersey 08625-0424
Phone (609) 984-5400
Fax (609) 984-5595

JON S. CORZINE
Governor

MARK N. MAURIELLO
Acting Commissioner

October 8, 2009

Hoy Frakes, President
Shieldalloy Metallurgical Corporation
60790 Southgate Rd.
Cambridge, OH 43725-9414

Dear Mr. Frakes:

As you know, as of September 30, 2009, the State of New Jersey assumed regulatory authority for your source material license (SMB-743) at the Newfield facility. The US Nuclear Regulatory Commission (NRC) has transferred their files to us, including Rev. 1b of your Decommissioning Plan (DP).

Upon review, we have determined that Rev. 1b does not meet the Department's regulations. Therefore, Shieldalloy Metallurgical Corporation (SMC) is required to submit a revised DP, which complies with N.J.A.C. 7:28-58.1 (10 CFR 40 incorporated by reference) and N.J.A.C. 7:28-12.1 *et seq.*, which would result in license termination.

Because the NRC accepted the current DP as meeting the timeliness provisions in 10 CFR 40.42, the Department has determined that SMC will remain in compliance if a revised DP is submitted by January 31, 2010. The revised DP shall include, but not be limited to the elements listed in 10 CFR 40.42(g)(4), including a detailed cost estimate and plan for assuring the availability of adequate funds for completion of decommissioning as provided in 10 CFR 40.36.

If you have any questions, please contact Jenny Goodman at (609) 984-5498.

Sincerely,

Patricia Gardner, Manager
Bureau of Environmental Radiation



October 26, 2009

BD09-0016

Andrew Reese, Deputy Attorney General
New Jersey Division of Law
25 Market Street
P.O. Box 112
Trenton, NJ 08625-0112

Subject: Confirmation of Proposal for Site Cleanup and Off-Site Disposal at the Shieldalloy Metallurgical Corporation Site in Newfield, New Jersey

Dear Mr. Reese:

Pursuant to your request, attached is EnergySolutions previous written offer to remove the radioactive waste from the slag piles at the Shieldalloy Metallurgical Corporation (SMC) Site (Site) in Newfield, New Jersey. The offer specifically included all services to perform removal, transportation, and disposition of the waste on a turnkey basis. The waste will be directly loaded into covered railcars on the project site.

EnergySolutions price included a mobilization fee to cover fixed startup costs associated with refurbishing the railway and installation of required infrastructure. The price to remove, transport, and dispose of the waste was provided on per railcar basis due to the varying estimates on waste volume that result from a lower cleanup criteria. EnergySolutions price offered in the September 24, 2008 letter is valid with an annual escalation of five percent. For example, assuming 100,000 tons of waste are removed from the site and shipped for disposal in 2010, EnergySolutions price to perform the scope of work is approximately \$45 million. This estimate is based on 1,000 railcar shipments plus the one time mobilization fee to cover startup costs and railway refurbishment. The estimate does not include final site decommissioning and any contingency required by regulatory agencies.

After learning more about the site, EnergySolutions believes in an alternative approach that assures public health and safety while significantly reducing the cleanup costs. We believe our alternative approach merits immediate consideration from New Jersey Department of Environmental Protection as our observations suggest differing viewpoints on cost, safety, and long term environmental considerations at the Site have prevented reclamation thus far.

The Shieldalloy Site slag contains over 95 percent of the radioactivity and therefore removal of the slag will result in a significant risk reduction at the Site. Other materials at the Site are much lower in concentration and do not pose health or safety concerns given the future industrial use of the Site. By removing 95 percent of the radioactivity, EnergySolutions estimates that the project costs could be less than \$28 million. EnergySolutions would then release the site for future industrial use using proven regulatory and technical guidance that secures future industrial benefit at the Site. This approach would be subject to discussions and regulatory approval by the State of New Jersey.

We appreciate the opportunity to assist the State of New Jersey in the cleanup of the Shieldalloy Site. Please contact me at (303) 882-1901 if you have any questions or require further clarification.

Sincerely,

Christopher J. Massey
Sr. Vice President, Commercial BD

423 West 300 South, Suite #200 • Salt Lake City, Utah 84101
801.649.2000 • Fax 801.413.5649 • www.energysolutions.com

ATTACHMENT

**September 24, 2008 Pricing Letter from EnergySolutions to
Ecology and Environment, Inc./U.S. Nuclear Regulatory Commission**



September 24, 2008

Ms. Jacquelyn C. Gillings
Ecology and Environment, Inc.
368 Pleasant View Drive
Lancaster, NY 14086

Re: Update to Proposal for Site Cleanup and Off-Site Disposal – SMC

Ref: Proposal for Site Cleanup and Off-Site Disposal, Rafati to Smith, Oct 9, 2006

Dear Ms. Gillings,

Pursuant to Ecology and Environment Inc. (E&E) recent request on behalf of the Nuclear Regulatory Commission (NRC) for an updated and publicly available price letter for the radioactive slag, dirt, and ash (Subject Material) at the Shieldalloy Metallurgical Corporation (SMC) Site in Newfield, New Jersey, we are providing the following information for your consideration.

EnergySolutions has reviewed SMC's Decommissioning Plan (Revision 1a, dated June 30, 2006) and has determined the Subject Material is acceptable at EnergySolutions licensed low level radioactive waste disposal facility. Further, EnergySolutions possesses the infrastructure and experience necessary to complete remediation of the Subject Material in a safe, efficient, and economical manner on a turnkey basis.

EnergySolutions price and scope exhaustively includes all services necessary to perform the remediation, transportation, and disposition the Subject Material including but not limited to, establishing site security, use of EnergySolutions approved radioactive material handling procedures, NRC mobile license, any and all permits and fees including consultation with New Jersey officials and the public, all excavation, labor and health physics oversight, upgrading rail infrastructure, rail equipment, transportation, and disposal. That means the piles as they sit right now will be gone without any additional cost or third party contractor involvement.

Our safety and environmental stewardship record is second to none. EnergySolutions safely and efficiently manages over 500,000 tons of radioactive waste annually. Recently, EnergySolutions surpassed three million man hours without a lost time work incident. In order to protect the Newfield community, EnergySolutions will utilize an

EnergySolutions Inc.
423 West 300 South, Suite 200
Salt Lake City, Utah 84101
(801) 649-2000



environmental barrier at the site, will not crush or otherwise pulverize any of the Subject Material prior to transport, and will utilize lidded IP-1 gondola railcars for transportation purposes. A photo of the lidded railcars is attached hereto. Our environmental protection barrier will be constructed for temporary use during the project consistent with standard industrial practices in order to protect against airborne particle migration. After use, the barrier will be loaded into the railcars and shipped for disposal in the same manner as the Subject Material.

The current transportation route of choice takes the railcars from Newfield on a direct course West through Pennsylvania, to Chicago, and finally on to Clive, Utah. A map is attached for your easy reference. EnergySolutions average load out rate will be ten railcars per working day, five days per week, and ten hours per day with an average twenty-two full time employees. Railcars will depart SMC ten at a time and would likely travel all the way to Clive in the same manner. In the event the project proceeds uninterrupted with support from the various regulatory agencies our current operational plan indicates a start to finish duration of six to seven months. This plan includes installation of weigh scales, rail upgrades, mobilization, and demobilization. Unanticipated regulatory delays and/or force majeure events generally extend a project's duration by an amount of time equal to the event.

Based from information supplied to EnergySolutions by E&E, we understand two scenarios exist for calculating the total tonnage of Subject Material. Total tonnage ranges from 89,000 tons on the low end, to 130,000 tons on the high end. EnergySolutions price is offered such that once our mobilization fee is paid, the fixed costs are covered, and SMC may direct EnergySolutions to remediate any quantity of tonnage it deems appropriate.

- | | | |
|----|---|-------------------------|
| A. | One time mobilization fee | \$2,800,000.00 |
| | <ul style="list-style-type: none">• The mobilization fee covers startup costs including refurbishing railway and installation of required infrastructure. | |
| B. | Subject Material cleanup, transportation, and disposal | \$39,605.00 per railcar |
| | <ul style="list-style-type: none">• Includes all aforementioned services necessary to achieve disposal | |

Note: Based from actual density measurements as performed by SMC at the request of EnergySolutions, the "as is" density of slag material is 110 pounds per cubic foot. The "as is" density of soil is assumed to be consistent because soil is largely commingled with slag. These considerations yield an in place mass of 79,000 tons on the low end and 99,000 tons on the high end which creates a material difference in the quantity of required railcars. The "as is" mass is the relevant measurement methodology because it

EnergySolutions Inc.
423 West 300 South, Suite 200
Salt Lake City, Utah 84101
(801) 649-2000



ultimately determines the required quantity of railcars. In this case, railcars will be weight limited rather than volume limited at 105 tons net waste weight per railcar.

In submitting pricing EnergySolutions assumes there have been no material changes to the infrastructure at the site since our letter dated October 9, 2006. Additionally, that the project would commence within one year from the date of this letter and the price of oil does not exceed \$110.00 per barrel. As you are aware, the cost of remedial activities never goes down, it only goes up, as such we are willing to update our price as needed.

As mentioned above, our proposal exhaustively includes all activities necessary to achieve the end state criteria inclusive of our rigorous safety and environmental protection programs. We employ a robust interactive open book policy when dealing with the various regulatory agencies and the public. As always, our customer, in this case SMC, is a welcome source of input and generally acts in an oversight role. Customer oversight generally consists of a single project manager whom intermittently surveys operational progress and reviews a weekly project status report.

This letter may be provided to interested parties requesting a clear understanding of the cost. We appreciate the opportunity to be of service to SMC, E&E, and the NRC. In the event you have any questions or require further clarification please don't hesitate to contact me.

Sincerely,

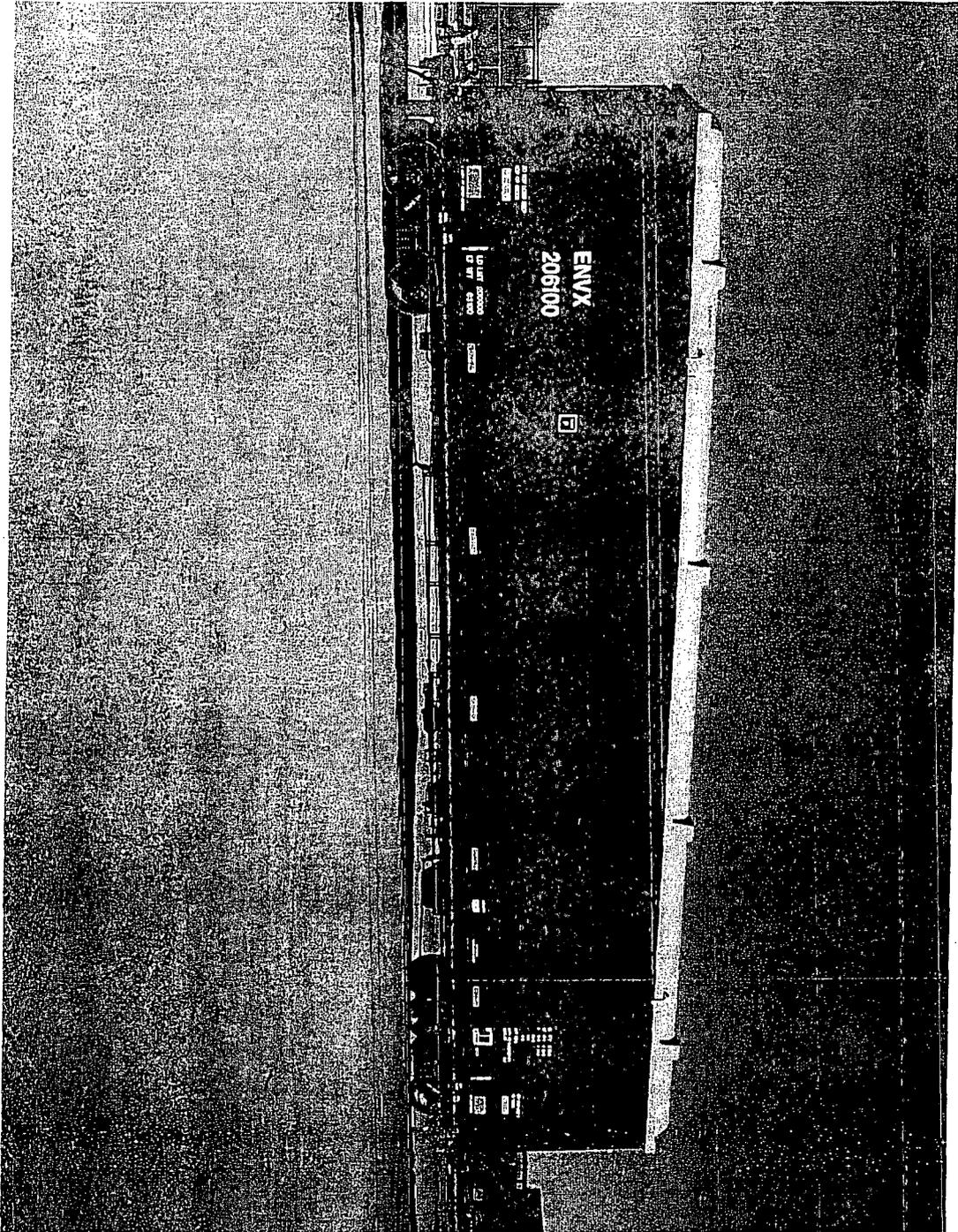
A handwritten signature in black ink, appearing to read "Bryan Melchior".

Bryan Melchior
Vice President
EnergySolutions, Inc.

EnergySolutions Inc.
423 West 300 South, Suite 200
Salt Lake City, Utah 84101
(801) 649-2000

ENERGYSOLUTIONS

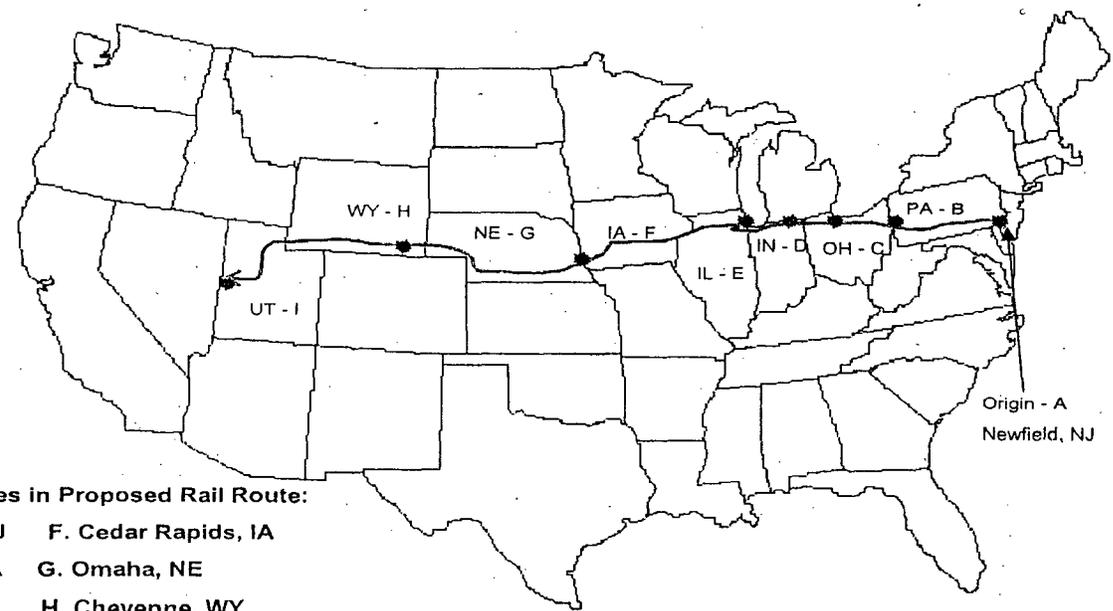
LIDDED GONDOLA RAILCAR



EnergySolutions Inc.
423 West 300 South, Suite 200
Salt Lake City, Utah 84101
(801) 649-2000

SHIELD ALLOY – NEWFIELD, NJ Gondola Railcar Shipments Typical Rail Route

ENERGYSOLUTIONS
TRANSPORTATION ROUTE



Major Communities in Proposed Rail Route:

- A. Newfield, NJ
- B. Conway, PA
- C. Willard, OH
- D. Elkhart, IN
- E. Chicago, IL
- F. Cedar Rapids, IA
- G. Omaha, NE
- H. Cheyenne, WY
- I. Clive, UT

EnergySolutions Inc.
423 West 300 South, Suite 200
Salt Lake City, Utah 84101
(801) 649-2000



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Environmental Safety and Health

P.O. Box 424

Trenton, New Jersey 08625-0424

Phone: (609) 633-7964

Fax: (609) 777-1330

JON S. CORZINE
Governor

MARK N. MAURIELLO
Acting Commissioner

December 11, 2009

Dennis J. Krumholz, Partner
Riker Danzig, Scherer, Hyland, Perretti, LLP
Headquarters Plaza
One Speedwell Avenue
Morristown, NJ 07962-1981

Dear Mr. Krumholz:

Assistant Commissioner Wittenberg has asked me to respond to your letter of November 18, 2009, in which you represent the interests of our licensee, Shieldalloy Metallurgical Corporation (SMC). In your letter, you request that the Department either grant SMC 1) an exemption from the requirements of N.J.A.C. 7:28-12 and 58, or 2) a stay of the requirement to prepare and submit a decommissioning plan (DP) compliant with Subchapters 12 and 58 until the litigation commenced by SMC with respect to this matter in the federal and state courts is completed.

We have reviewed the information provided in your letter and have determined that the Department cannot support your exemption request. N.J.A.C. 7:28-2.8 requires the applicant to demonstrate hardship or compelling need and the Department to determine that the exemption will not result in any exposure to radiation in excess of the limits permitted by Subchapter 6, Standards for the Protection Against Radiation. SMC has not demonstrated hardship or a compelling need for the exemption. Because the decommissioning plan relies on engineering controls and requires a long term control license (something that our regulations do not allow), we have determined that the dose limits in Subchapter 6 would not be met if all controls failed, particularly if slag or baghouse dust were used as fill for constructing a house. Your request for an exemption pursuant to N.J.A.C. 7:28-2.8 is hereby denied.

Regarding the stay request, SMC has very recently filed suit in three separate forums concerning decommissioning of the Newfield site. That is litigation which could continue for years, particularly if SMC chooses to pursue appeals. The time of the stay would not be within the Department's control. In order to protect public health, safety and the environment, the Department cannot agree to an open ended stay and considers it advisable and necessary to advance the decommissioning process. However, we understand that the decommissioning plan will need significant revisions and as such, we

hereby offer to extend the date for submitting a DP which is compliant with N.J.A.C. 7:28-12 and 58 until July 31, 2010.

If the company considers itself to be aggrieved by the Department's denial of the exemption request, you may request a hearing before the Office of Administrative Law (OAL) by filing a hearing request with the Commissioner of the Department of Environmental Protection to contest the denial. Your hearing request will be considered by the Department. It must be received by the Department within 20 days of your receipt of this letter and sent to:

Office of Legal Affairs
ATTENTION: Adjudicatory Hearing Requests
Department of Environmental Protection
401 East State Street
PO Box 402
Trenton New Jersey 08625-0402

Your hearing request must include the following:

1. your name, address and telephone number;
2. a statement of the legal authority and jurisdiction under which the hearing request is made;
3. a brief and clear statement of the specific facts describing the Department decision being appealed;
4. a statement of all facts alleged to be at issue and their relevance to the Department's decision, as well as any legal issues associated with the alleged facts at issue.

Please contact the Department no later than December 23, 2009, if you agree to accept the offer of an extension of time for submission of a decommissioning plan compliant with New Jersey's regulations.

Sincerely yours,



Jill Lipoti, Ph.D.
Director



*Paul B
BER*

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF LEGAL AFFAIRS
P.O. Box 402
Trenton, NJ 08625-0402
TEL: # (609) 292-0716
FAX # (609) 984-3488

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Acting Commissioner

February 24, 2010

Dennis J. Krumholz, Esq.
Riker Danzig Scherer Hyland & Perretti, LLP
Headquarters Plaza
One Speedwell Avenue
Morristown, NJ 07962

Re: SHIELDALLOY METALLURGICAL CORPORATION

Dear Mr. Krumholz:

The Department of Environmental Protection has completed its review of your request, dated 12/29/2009, for an adjudicatory hearing regarding the above-captioned matter and hereby grants the request.

A Deputy Attorney General will be assigned to represent the Department and the matter will be transmitted to the Office of Administrative Law. You will receive a notice of Filing from the Office of Administrative Law informing you of the next step in the process.

The referral of this matter to the Office of Administrative Law does not constitute a waiver of the Department's right to limit the introduction or consideration in the hearing at the Office of Administrative Law of any defenses or issues which are inappropriately raised.

Sincerely,

Leslie W. Ledogar, Esq.
Legal Specialist
Office of Legal Affairs

c: Jill Lipoti

FEB 25 2010



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CHRIS CHRISTIE
Governor

Radiation Protection Programs
P.O. Box 415
Trenton, NJ 08625-0415

BOB MARTIN
Commissioner

KIM GUADAGNO
Lt. Governor

CERTIFIED MAIL/RRR: 7008 1140 0000 1426 4264

Attention: David White
SHIELDALLOY METALLURGICAL CORP
PO Box 768,
Newfield, NJ 08344

NOTICE OF VIOLATION

EA ID #: PEA100001 - 517488
Program Interest (PI) Identifying #: 517488
Location: 12 S West Blvd, Vineland City, NJ 08344
Persons interviewed: Barbara Flowers and David Smith

On March 24, 2010 an inspection was conducted at your facility by Jenny Goodman and Bill Cszasz of the Department of Environmental Protection's Bureau of Environmental Radiation. This **NOTICE** is issued based on facts observed by or known to the Department's representative issuing this **NOTICE**, to warn you that a violation of the Radiation Protection Act (N.J.S.A. Title 26:2D) and/or the Radiation Protection Code (N.J.A.C. Title 7 Chapter 28) has been found.

DESCRIPTION OF VIOLATIONS – Violations with citation(s) to the specific Rules issued under the above Statutes:

Requirement: Pursuant to N.J.A.C. 7:28-2.4, no person shall cause, suffer, allow or permit any source of radiation to remain unattended and accessible to unauthorized use.

Description of Noncompliance: The investigation disclosed that you permitted a source or sources of radiation to remain unattended and accessible to unauthorized use. Specifically, a hole was observed in the fence whereby a small person could gain access to the slag pile. In addition, several other areas of the fence that were repaired utilized pliable wire that the inspector demonstrated could be easily taken off without the use of tools, thus allowing access.

PURPOSE OF THIS NOTICE - This is intended to serve as a **NOTICE** to you, to warn you of the above violations, in order to provide you with an opportunity to voluntarily investigate the matter and, take corrective action to address the identified violation. This **NOTICE** does not

constitute a formal enforcement order, a final agency action or a final legal determination that a violation has occurred. Therefore, this **NOTICE** may not be appealed or contested.

Neither the issuance of this **NOTICE** nor any corrective actions taken by you to address the violation cited precludes the State of New Jersey, nor any of its agencies, from initiating future enforcement action (including issuance of a formal enforcement order and the assessment of penalties) with respect to the violations listed above or for any other violations. In the event the Department determines to pursue future formal enforcement action, you will then be provided with an opportunity to appeal or contest such action.

RESPONDING TO THIS NOTICE – Voluntary corrective actions taken in response to this **NOTICE** can affect the Department's determination on the need for or severity of any potential future enforcement action in this matter. The Department may consider any voluntary actions you take in response to this **NOTICE**, within thirty (30) days of receipt, as part of its determination on whether to initiate future formal enforcement action for this matter and on the amount of any penalty that may be assessed in future enforcement actions. Responses should describe the corrective actions taken to achieve compliance and include the following statement:

"I certify that I am authorized to represent and serve as signatory on behalf of the person to whom this NOV is issued. I also certify under penalty of law that the information provided in this document is true, accurate, and complete. I am aware that there are significant civil and criminal penalties, including fines or imprisonment or both, for submitting false, inaccurate, or incomplete information."

IF YOU HAVE QUESTIONS REGARDING THIS NOTICE, the actions recommended, or if you would like to describe actions taken to address the identified violations, please contact the Department representative issuing this **NOTICE**:

Issued by: Jenny Goodman

Jenny Goodman
Signature

Date: 6/7/10

Supervisor: Patricia Gardner, Manager, Bureau of Environmental Radiation

Patricia Gardner
Signature

Date: 6/8/10



SHIELDALLOY METALLURGICAL CORPORATION

35 S. W. Boulevard
P. O. Box 768
Newfield, NJ 08344 U.S.A.

Telephone: 856-697-6501
FAX: 856-697-6515

June 23, 2010

CERTIFIED MAIL No. 7004-1350-0004 -7293-4319

Jenny Goodman
New Jersey Department of Environmental Protection
Radiation Protection Programs
P.O. Box 415
Trenton, NJ 08625-0415

Re: Response to Notice of Violation dated June 8, 2010; License No. RAD100002-517488

Dear Ms. Goodman:

On June 10, 2010, Shieldalloy Metallurgical Corporation (SMC), holder of License No. RAD100002-517488, received a Notice of Violation (Notice) from the New Jersey Department of Environmental Protection (NJDEP). The purpose of this letter is to respond to the Notice and to advise you of the actions that SMC implemented immediately upon the discovery of the issue raised in the Notice. Enclosed is a restatement of the issue, SMC's response and the corrective steps that were taken to remedy the situation and avoid a repeat occurrence.

By my signature below, I certify that I am authorized to represent and serve as signatory on behalf of the party to whom the Notice was issued. I also certify under penalty of law that the information provided in this response is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including fines or imprisonment or both, for submitting false, inaccurate or incomplete information.

SMC disagrees that it allowed a radiation source to become accessible to unauthorized use. Nonetheless, we will continue our efforts to ensure that NJDEP regulations and license requirements are followed at our facility. If you have any questions, please contact me at (856) 697-6531 or SMC's President, Mr. Hoy Frakes, at (740) 435-4646.

Sincerely,

David R. Smith,
Radiation Safety Officer

cc (w/attach): H. Frakes
D. White
B. Flowers
P. Bradway
License File

Shieldalloy Metallurgical Corporation
License No. 100002-517488

RESPONSE TO NOTICE OF VIOLATION
(Received June 10, 2010)

Restatement of the Issue Raised in the Notice:

N.J.A.C. 7:28-2.4 states that no person shall cause, suffer, allow or permit any source of radiation to remain unattended and accessible to unauthorized use. An inspection of SMC's Newfield, New Jersey facility on March 24, 2010 disclosed that SMC permitted a source or sources of radiation to remain unattended and accessible to unauthorized use. Specifically, a hole was observed in the fence whereby a small person could gain access to the slag pile. In addition, several other areas of the fence that were repaired utilized pliable wire that the inspector demonstrated could be easily taken off without the use of tools, thus allowing access.

Response to the Notice:

Title 10, Code of Federal Regulations, Section 20.1003 defines a Restricted Area as "an area, access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials." SMC's inventory of licensed radioactivity is located in the Storage Yard on the eastern portion of the property. The entirety of the Storage Yard is designated as a "restricted area".

The primary physical method used to deter or delay unauthorized access into the Restricted Area (i.e., limiting access to only those personnel, vehicles and materials required to perform authorized duties) is the presence of a seven-foot high (approximate) chain link fence topped with six strands of barbed wire that completely surrounds the Storage Yard. Access into the Restricted Area is channeled through two locked gates (North and South Gates) equipped with ingress/egress logs. It is company practice to check the entirety of the fence for penetrations on a periodic basis (i.e., approximately monthly), with repairs completed if identified. The fence and this routine inspection procedure was considered to be an acceptable access control method by the U. S. Nuclear Regulatory Commission (former licensing agency) for at least the past 15 years.

The gate logs show that on March 16, 2010, a routine perimeter check was performed.¹ At that time, no penetrations through or damage to the fence were noted.

On March 24, 2010, another inspection of the fence was performed, this time in the company of a representative of the NJDEP. This inspection revealed damage to the fence (through the apparent use of wire cutters) that was not present at the time of the March 16th perimeter check. It was this damage, located on the northern property line between Monitoring Stations 5 and 6 and at a height of about 2.5 feet above the ground, that caused the NJDEP to issue the Notice.

Attachment A contains a photograph of the fence showing the damage noted on March 24, 2010.² The breach measures less than one (1) foot in any dimension. While it is hypothetically possible for a very small person to pass through a breach of this size, such an attempt would likely result in injury to the person and torn clothing from the sharp edges of the cut links. Further, such a small person would need to cut the fence closer

¹ The gate logs are maintained at the Newfield site and are available for regulatory inspection.

² Please note that the digital date setting on the camera used to take the photographs in Attachment A was not correct, thus the date stamps on the individual photos are incorrect.

to the ground, in order to crawl through the opening rather than climb up to the elevated height at which the damage occurred.

Even if the person were to persist through the opening and gain access to the Storage Yard, he/she would likely find nothing of interest. Even if the small person wished to remove something from the Storage Yard, only trivial volumes (i.e., on the order of 100's of grams) could pass through the small-diameter opening.

It is also important to note the absence of evidence that access to the Storage Yard was actually achieved. That is, there were no footprints inside the Restricted Area and no torn clothing on the cut fence strands. There is also no evidence that any licensed material was removed from the Storage Yard.

For these reasons, the Storage Yard and its contents cannot have been considered to be reasonably accessible to unauthorized use even considering the existence of the breach. The fence around the Restricted Area clearly served its intended purpose and deterred access to unauthorized users. Therefore, SMC disputes that the damage observed on March 24, 2010 during the NJDEP inspection represents a violation of N.J.A.C. 7:28-2.4. Nonetheless, corrective actions to repair the damage were implemented immediately upon its discovery, as noted below:

Corrective Steps Taken to Remedy the Issue:

The damage to the Storage Yard fence that took place some time between March 16 and March 24, 2010 was a highly unusual occurrence. Nevertheless, SMC instituted the following corrective actions immediately following the inspection on March 24th and completed them that same day:

- The breached portion of the fence was fully repaired (see Attachment A for a photograph of the repaired section).
- Wires that previously repaired small areas or sections of the fence were replaced and trimmed to prevent their removal without the use of tools.
- The Borough police department was notified of the damage to the fence.

Steps Taken to Avoid Reoccurrence:

SMC immediately implemented the following measures to further reinforce the ability of the perimeter fence to prevent access to the Restricted Area:

- A gate that permits access to the Storage Yard from the southern border of the SMC property was reinforced (see Attachment A for "before" and "after" photographs).
- The frequency of the routine inspections of the perimeter fence was increased to weekly.
- An interim "Slag Storage Yard Inspection Checklist" was developed to further document the condition of the Restricted Area at the time of each weekly inspection. Attachment B contains examples of completed checklists.

In addition, the following actions were also taken or are underway:

- Radiation Safety Procedure No. RSP-008, "Instrumentation and Surveillance" is being revised to incorporate the more aggressive inspection requirements.

- The number of "Caution - Radioactive Material" signs around the perimeter of the Restricted Area is being increased to improve the visibility of the postings from greater distances.
- It was also noted during the SMC's investigation that six (6) of the 16 environmental monitoring dosimeters attached at various locations on the Storage Yard fence were missing. New and sturdier mounting stations for the dosimeters were installed just inside of the fence line such that the dosimeters will be out of reach for unauthorized removal.

ATTACHMENT A
Photographs

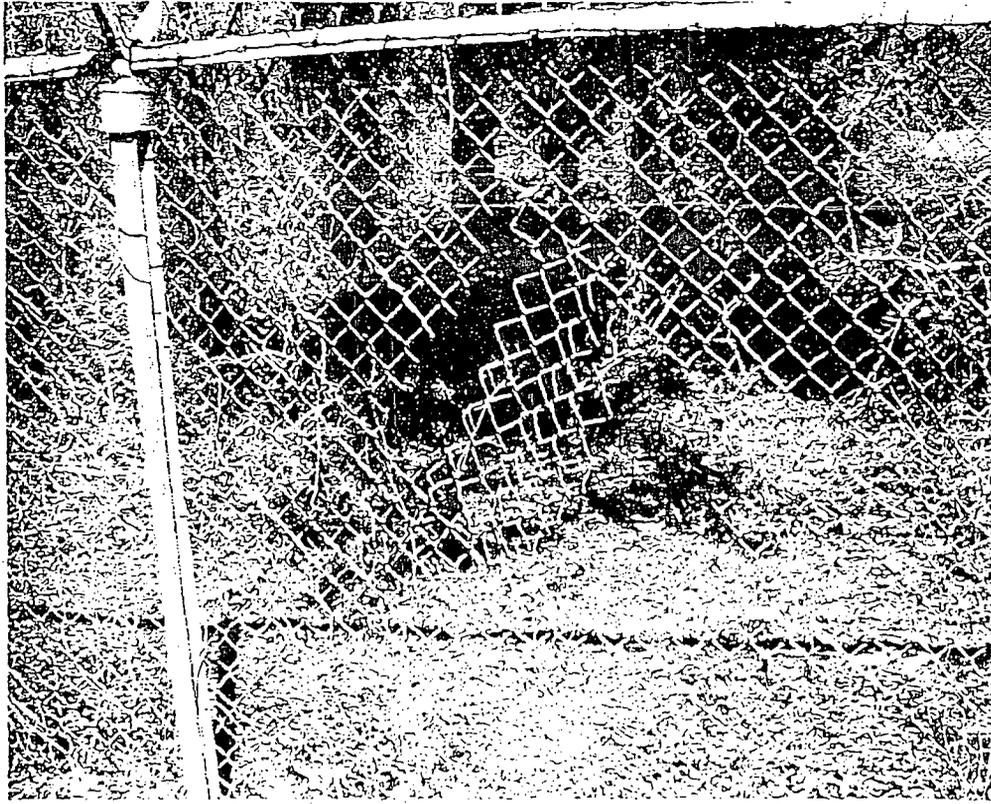


Figure 1 - Damage to the Storage Yard perimeter fence - March 24, 2010



Figure 2 - Repaired portion of fence - March 24, 2010 (date stamp on photograph is incorrect)



Figure 3 - Wire tie wall for protection - penetration of repair - showing elongated ends - March 24, 2010



Figure 4 - Elongated wire ties - March 24, 2010 date stamp on photograph is incorrect - 304a

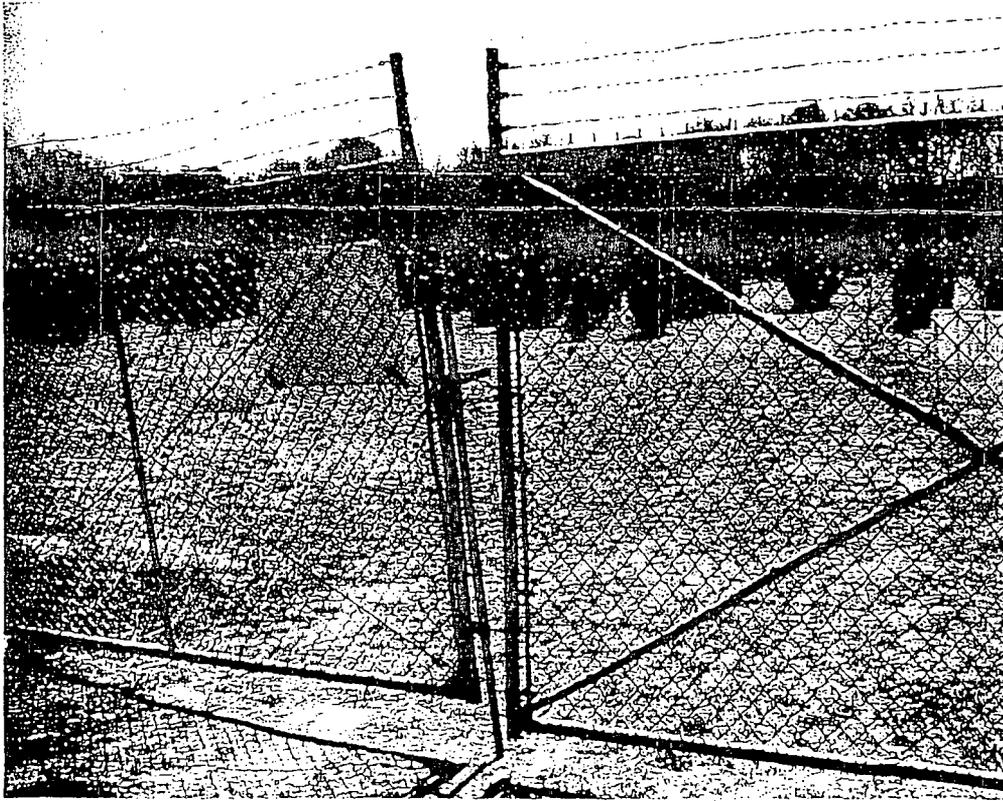


Figure 5 - South fence line gate prior to reinforcement

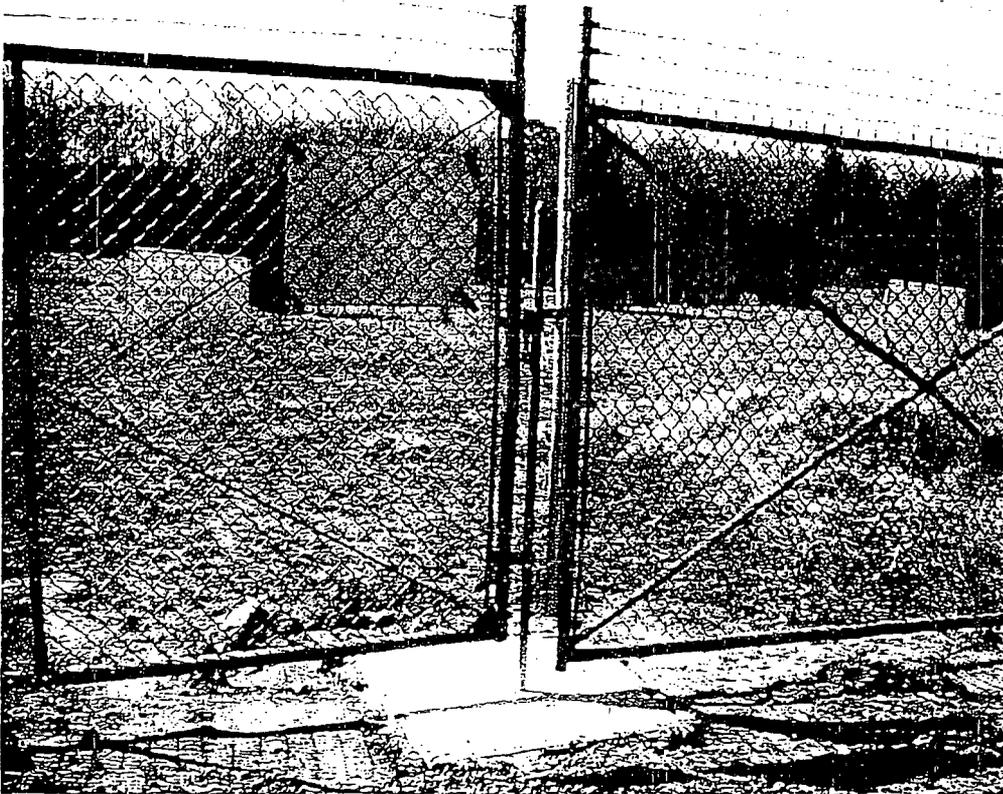


Figure 6 - South fence line gate after reinforcement.

ATTACHMENT B
Example "Slag Storage Yard Inspection Checklist"



SHIELDALLOY METALLURGICAL

SLAG STORAGE YARD INSPECTION CHECKLIST

Date: 5/14/2010 Time: 7:15 AM

Inspected By: [Signature]

Gates

	Yes	No	Comment
Logbooks in place?	✓		
Locks found secure?	✓		
Are gates stable?	✓		
Minimum space at base (< 6")	✓		
Are signs visible/ legible?	✓		
Any signs of tampering?		✓	

Fence Line

307a-

	Yes	No	Comment
Clear of trees/limbs?	✓		
Barbed Wire Intact/good shape/ corroded?	✓		
TLD badges secured?	✓		
Does fence have any holes, cuts, breaches?		✓	
Any signs of tampering?		✓	
Is fence attached to the poles?	✓		
Are signs in good condition? Visible/legible	✓		

Environmental Issues

	Yes	No	Comment
Any storm damage to fence line?		✓	
Noticeable erosion?		✓	
Foliage under control?	✓		
Are there any obstructions in the walkways?		✓	
Note flooding or water conditions	✓		Southeast corner
Are there any unauthorize visitors?		✓	

Conduct inspection weekly varying the day and time. Carry camera to document conditions on inspection

Stored on T drive \Security\Slag Storage Yard Inspection Checklist



SHIELDALLOY METALLURGICAL

SLAG STORAGE YARD INSPECTION CHECKLIST

Date: 5/3/10 Time: 1036 AM Inspected By: [Signature]

Gates

Table with 4 columns: Yes, No, Comment. Rows include Logbooks in place?, Locks found secure?, Are gates stable?, Minimum space at base (< 6"), Are signs visible/ legible?, Any signs of tampering?

Fence Line

Table with 4 columns: Yes, No, Comment. Rows include Clear of trees/limbs?, Barbed Wire intact/good shape/ corroded?, TLD badges secured?, Does fence have any holes, cuts, breaches?, Any signs of tampering?, Is fence attached to the poles?, Are signs in good condition? Visible/legible

Environmental Issues

Table with 4 columns: Yes, No, Comment. Rows include Any storm damage to fence line?, Noticeable erosion?, Foliage under control?, Are there any obstructions in the walkways?, Note flooding or water conditions, Are there any unauthorize visitors?

Conduct inspection weekly varying the day and time. Carry camera to document conditions on inspection.

Stored on T drive \Security\Slag Storage Yard Inspection Checklist



SHIELDALLOY METALLURGICAL

SLAG STORAGE YARD INSPECTION CHECKLIST

Date: 4/28/10 Time: 1:12 PM Inspected By: [Signature]

Gates

Table with 4 columns: Question, Yes, No, Comment. Rows include Logbooks in place, Locks found secure, Are gates stable, Minimum space at base (< 6"), Are signs visible/ legible, Any signs of tampering?

Fence Line

Table with 4 columns: Question, Yes, No, Comment. Rows include Clear of trees/limbs, Barbed Wire intact/good shape/ corroded, TLD badges secured, Does fence have any holes, cuts, breeches, Any signs of tampering, Is fence attached to the poles, Are signs in good condition? Visible/legible

Environmental Issues

Table with 4 columns: Question, Yes, No, Comment. Rows include Any storm damage to fence line, Noticeable erosion, Foliage under control, Are there any obstructions in the walkways, Note flooding or water conditions, Are there any unauthorize visitors?

Conduct inspection weekly varying the day and time. Carry camera to document conditions on inspection.

Stored on T drive \Security\Slag Storage Yard Inspection Checklist

Y



State of New Jersey
OFFICE OF ADMINISTRATIVE LAW
P.O. Box 049
Trenton, NJ 08625-0049

OAL Docket No.: EER 12532-2010 S

Agency Ref. No.: n/a

Transmitting Agency: Environmental Regulation

Filing Date: November 15, 2010

NJDEP/Radiation Protection Program vs. Shiedalloy Metallurgical Corporation

Nature of proceeding:

Appeal of a(n) Denial of an Exemption Request.

Notice of
Filing

This case was received by the Office of Administrative Law (OAL) on the above filing date and given the docket number above. You will receive another notice informing you of the date and location of the hearing. Please refer to the docket number in any correspondence and have the docket number available if you call the OAL at 609-689-4028.

The rules controlling the hearing, including discovery, motions, and other pre-hearing and post-hearing procedures, are found in N.J.A.C. 1:1-1 et. seq. These rules can be accessed through a link on the Office of Administrative Law's website: www.state.nj.us/oal. (see the "Rules" section under the Rules tab). Additional information about the hearing process is also on the website. (see the "Hearing" section under the Hearing tab).

Parties may represent themselves, may be represented by an attorney, or in some cases, may be represented by qualified nonlawyers. The standards for nonlawyer representation are in N.J.A.C. 1:1-5.4 et. seq. Nonlawyer representatives must submit a Notice of appearance/application on an OAL form at least 10 days before the hearing. Forms are available from the OAL clerk or on the OAL website (see "Notice of Appearance/Application under the Forms tab).

November 19, 2010
Date

Deputy Clerk, OAL



State of New Jersey
OFFICE OF ADMINISTRATIVE LAW
P.O. Box 049
Trenton, NJ 08625-0049

SERVICE LIST
OAL DOCKET NO. EER 12532-2010 S

Janis E. Hoagland
Director, NJDEP/Office of Legal Affairs
PO Box 402
401 East State Street
Trenton, NJ 08625

Dennis J. Krumholz, Esq.
Riker, Danzig, Scherer, Hyland &
Perretti, LLP
One Speedwell Ave.
Morristown, NJ 07962

Andrew Reese, DAG
Division of Law
PO Box 093
Trenton, NJ 08625-0093

**GEOCHEMISTRY OF RADIUM ISOTOPE
OCCURRENCE IN WATER OF THE
KIRKWOOD-COHANSEY AQUIFER
SYSTEM, NORTH ATLANTIC COASTAL
PLAIN**

**Zoltan Szabo
USGS NJ Water Science Center**



Radionuclide Decay Series

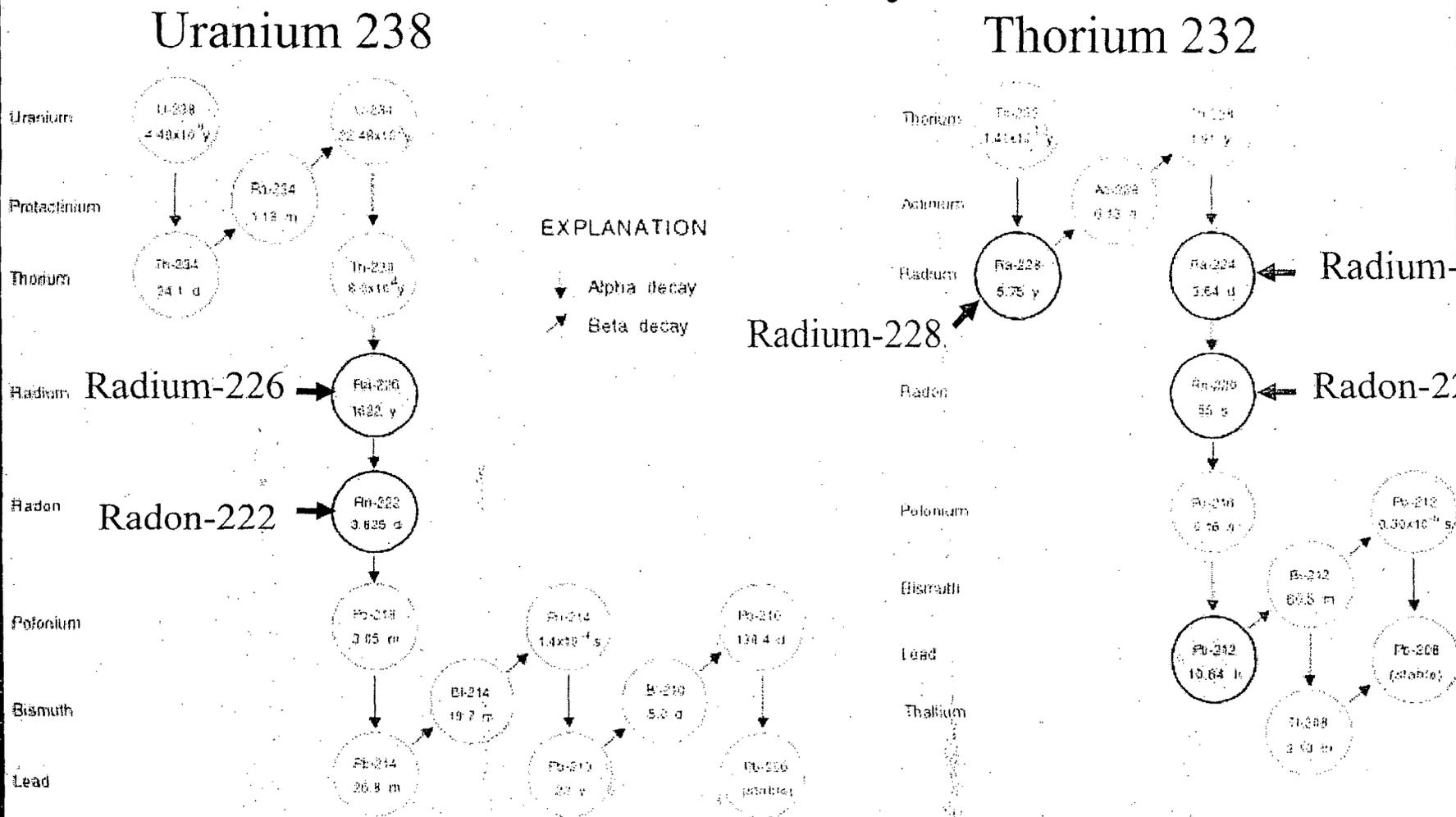


Figure 1. Diagram showing uranium-238 and thorium-232 radioactive decay series. (Radionuclides of interest in this study are shaded). [Times shown are half-lives: y, years; d, days; h, hours; m, minutes; s, seconds] (From Hall and others, 1985)

Gross alpha = many individual isotope contributions!

MAJOR CONCLUSIONS OF NATIONAL RADIUM STUDY

- 1. Greatest frequency of high Ra occurs primarily in sandstone and sand aquifers in acidic regions of the Coastal Plain AND in reducing conditions in the Midwest/Central US.**
- 2. Ra relates to ACID & REDUCING conditions in the eastern & Midwestern/Central US more so than geologic occurrence of radionuclides in bedrock.**
- 3. Ra-224 in EASTERN US occurs where other Ra isotopes are present, especially Ra-228. Mobilization mechanism not understood there. Maybe recoil?**

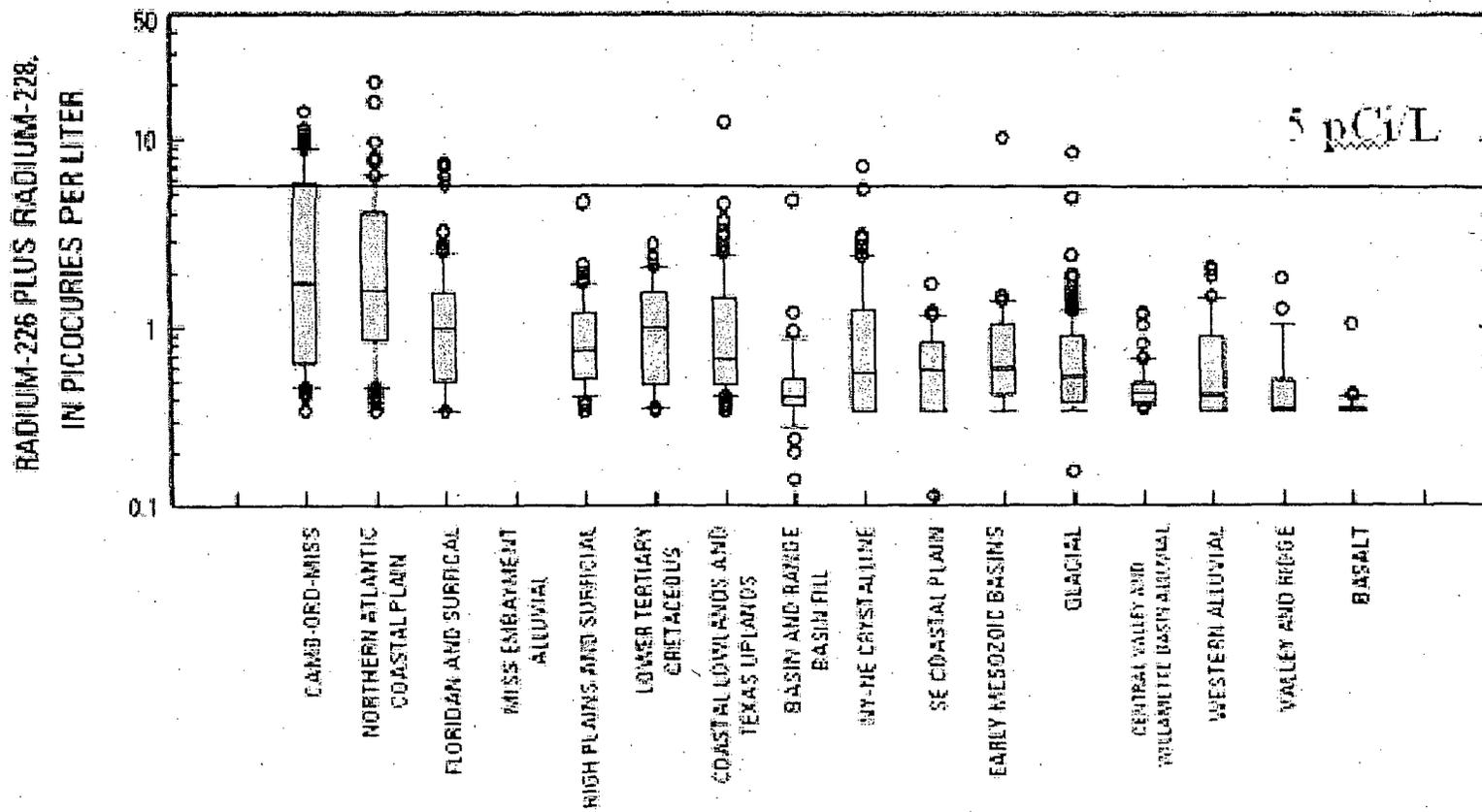
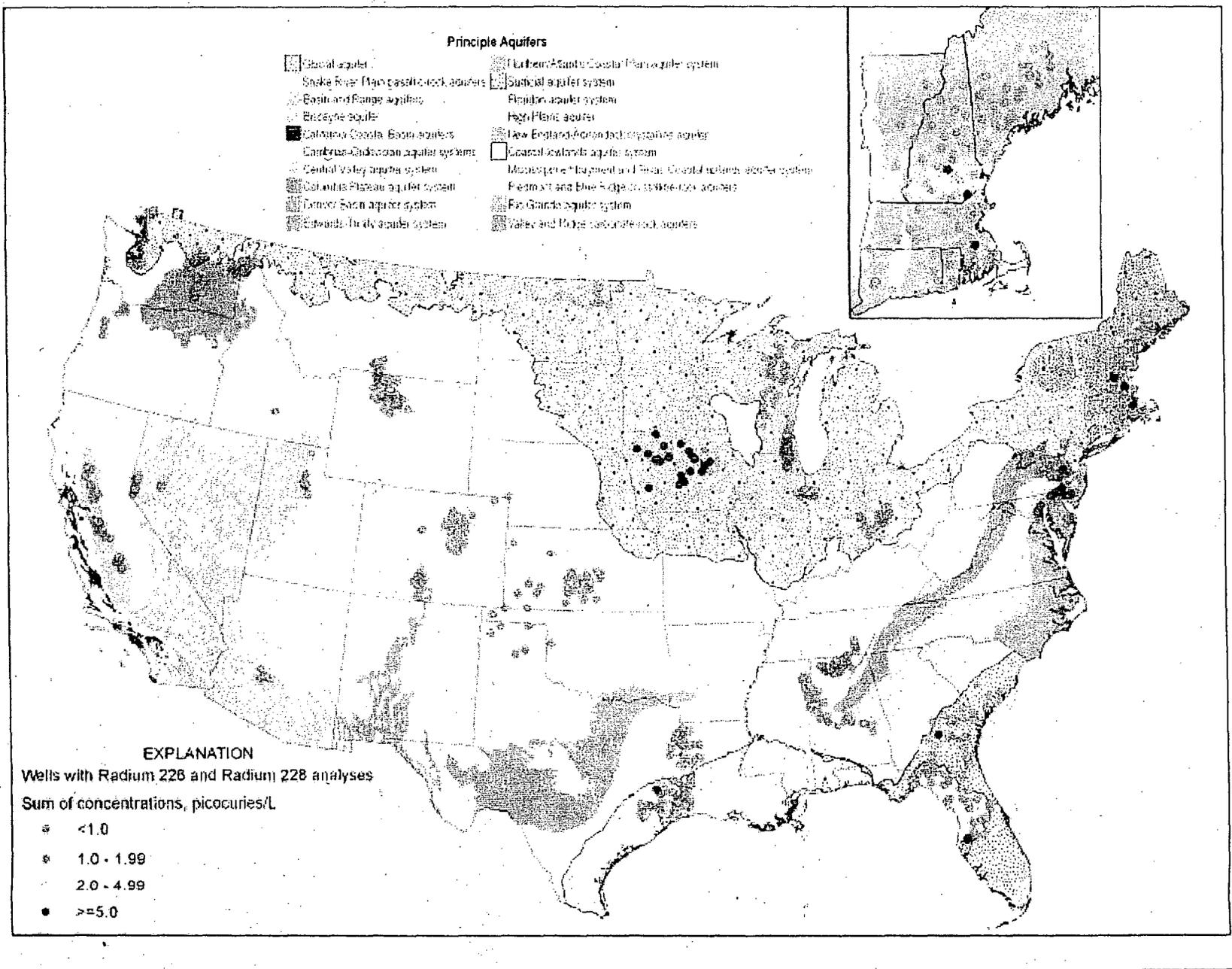


Figure . Radium isotope concentration distribution by aquifer geology.

F5. Note: In the journal article, PA's are ordered by median Ra-226 since that isotope has the most data. (Szabo et al., in review)



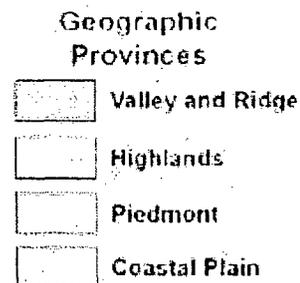
F 4

Note: Aquifers are consolidated for convenience sake

NJ Private
well test act
Data:
Widespread
Occurrence
Of high
Radioactivity
Especially in
NJ
Coastal Plain
(Louis 2008)

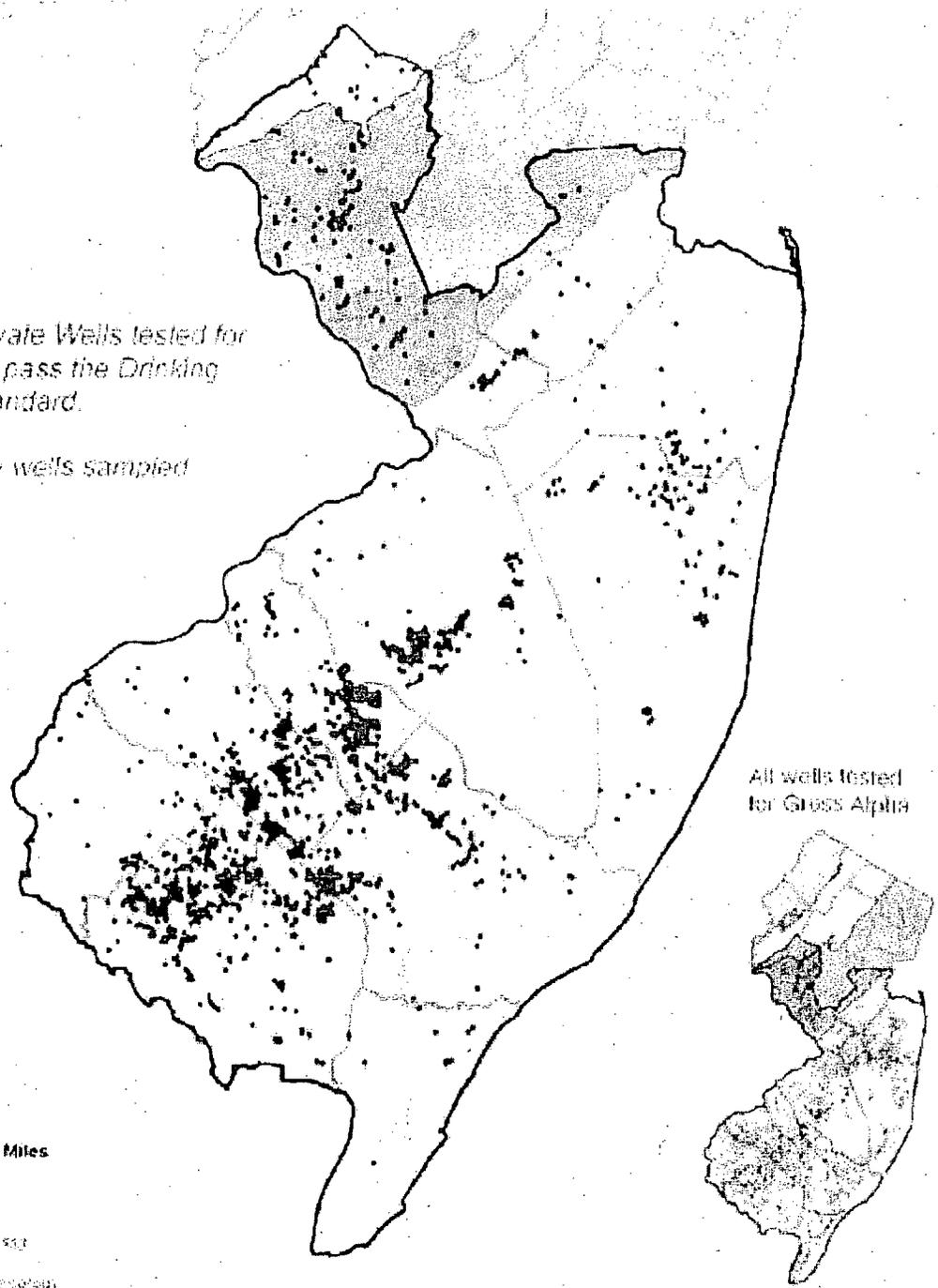
2,209 of the 22,904 Private Wells tested for
Gross Alpha failed to pass the Drinking
Water Standard.

That is 9.6% of the wells sampled



0 12.5 25 Miles

NJ State Plane Projection, NAD 1983
December 2007
Division of Science, Research, & Technology

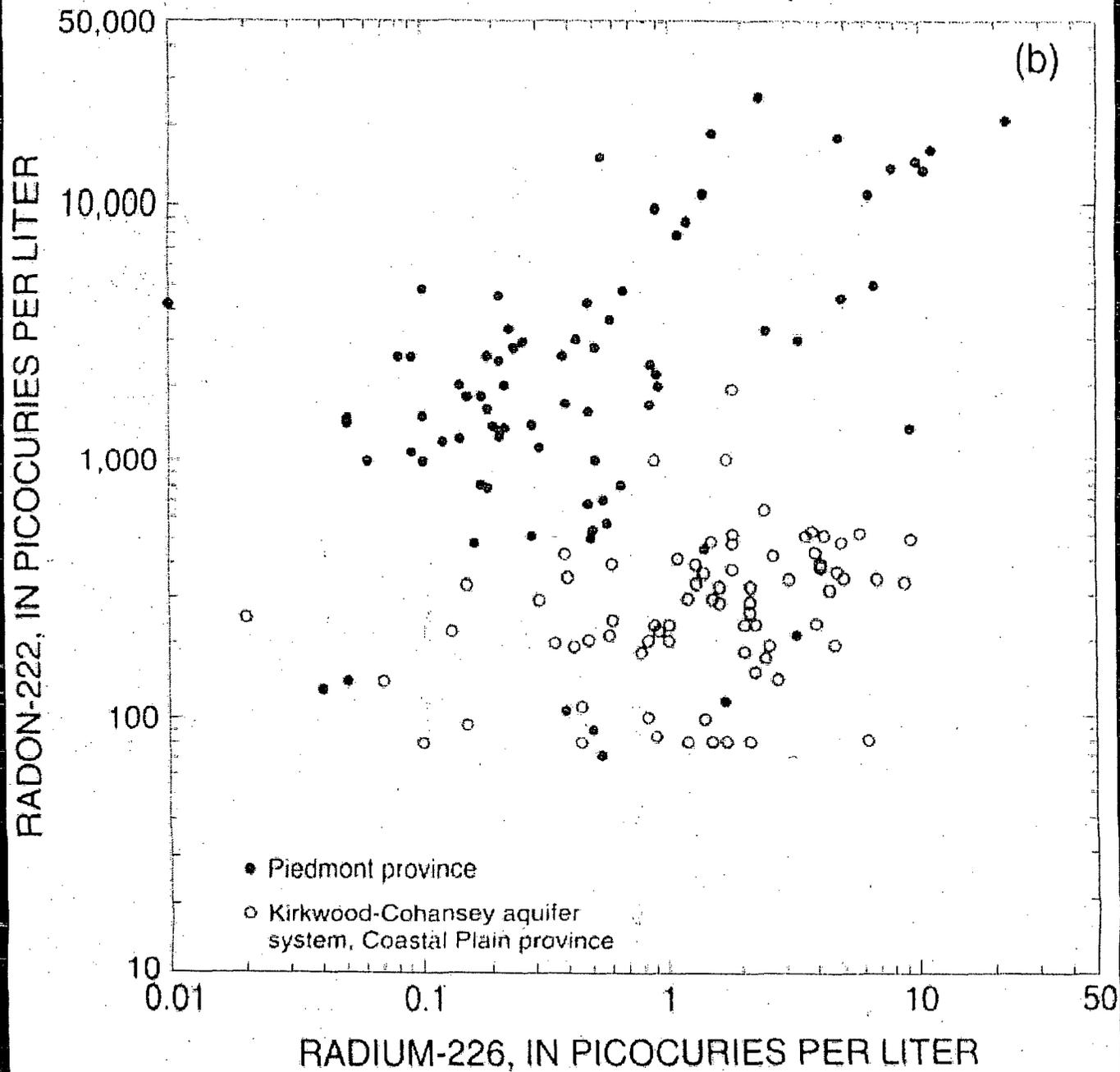


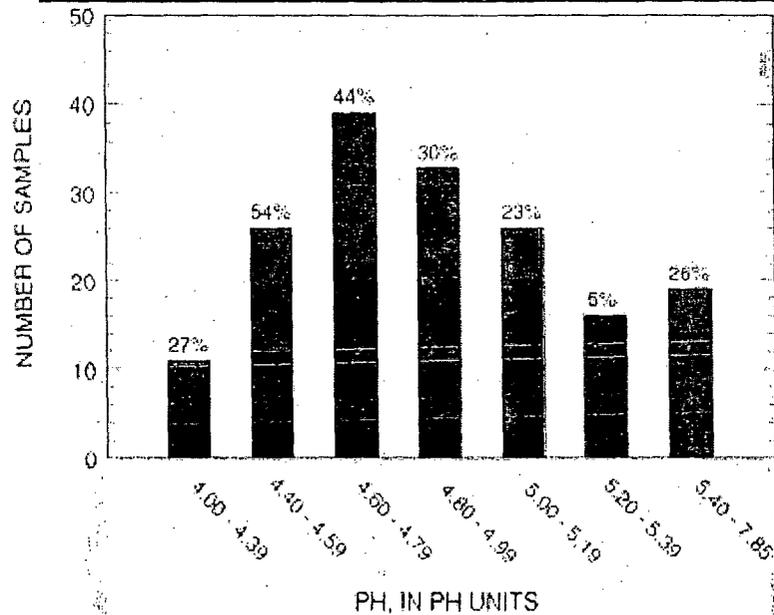
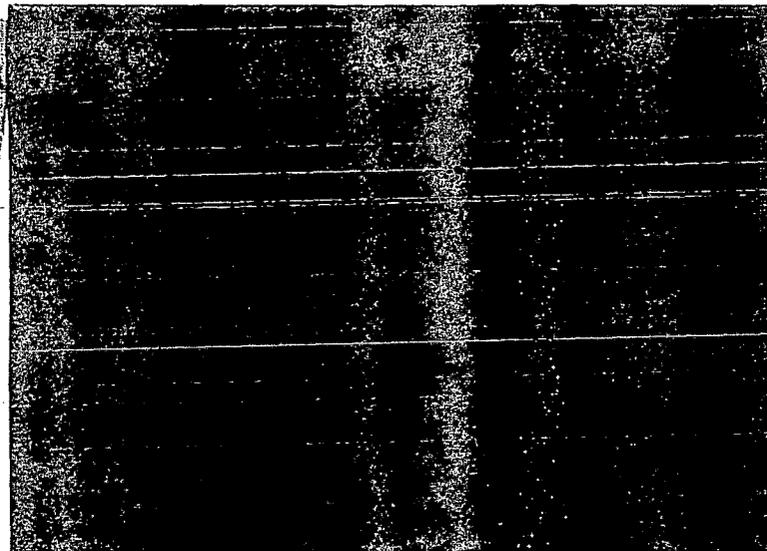
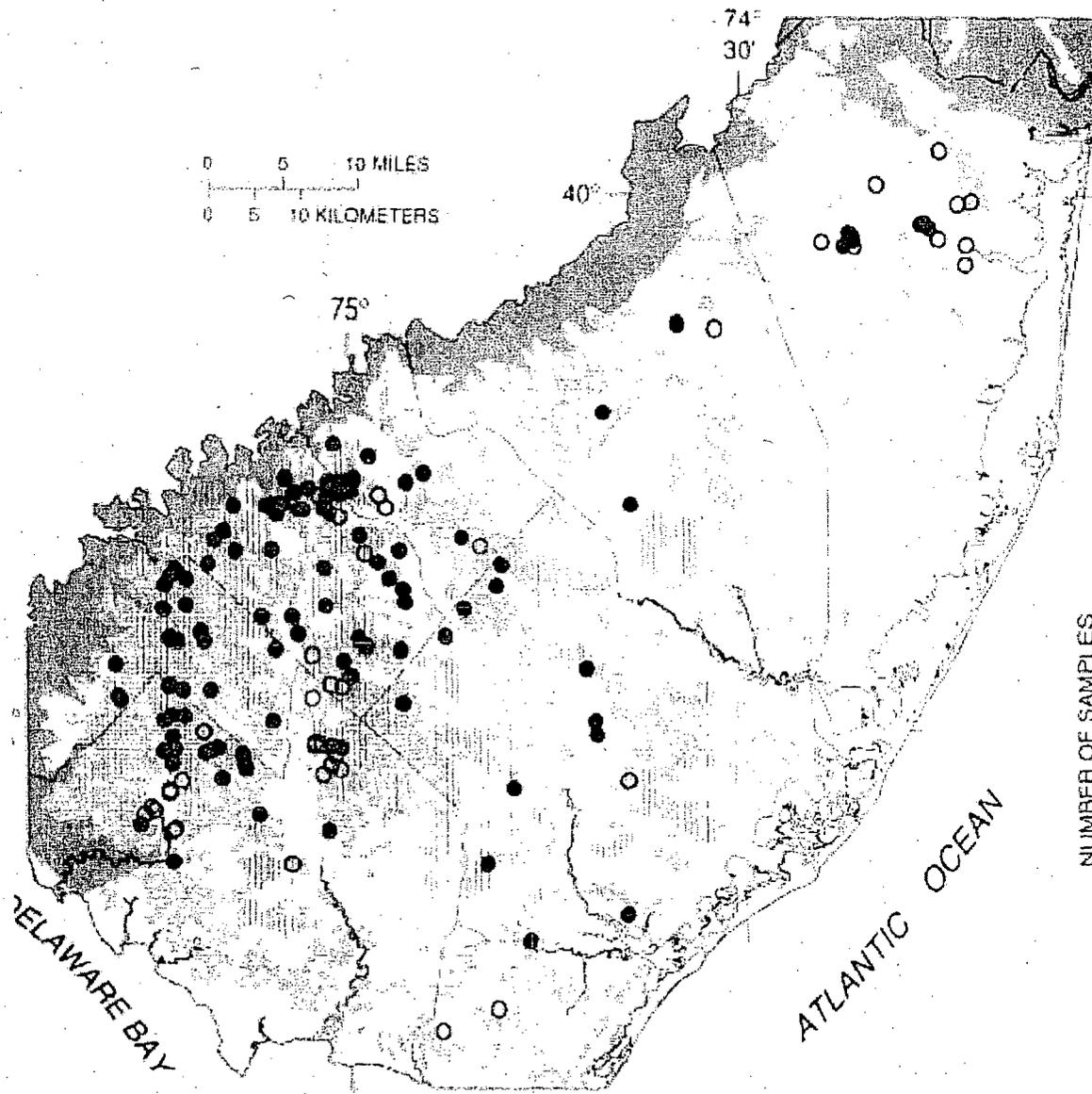
All wells tested
for Gross Alpha



Areal gamma surveys indicate NJ Coastal Plain, where supply wells with High Ra (red dots) are found, have low soil radioactivity

Radium =
Coastal Plain





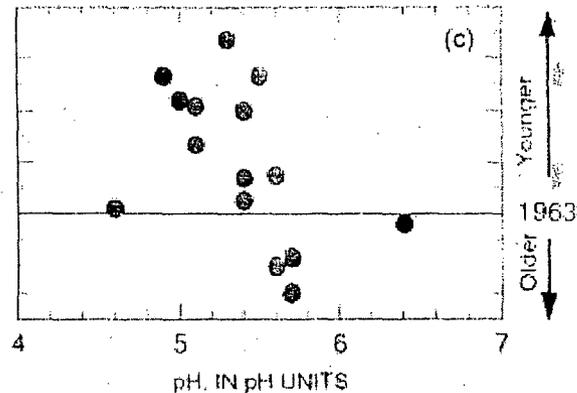
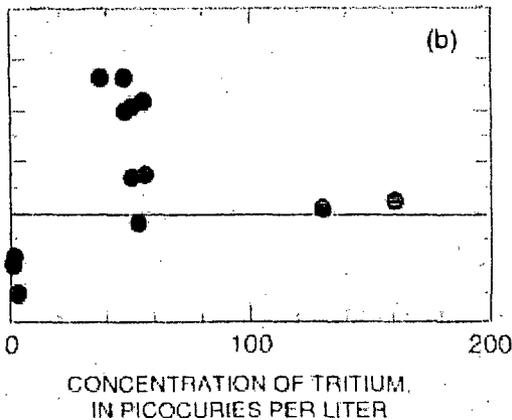
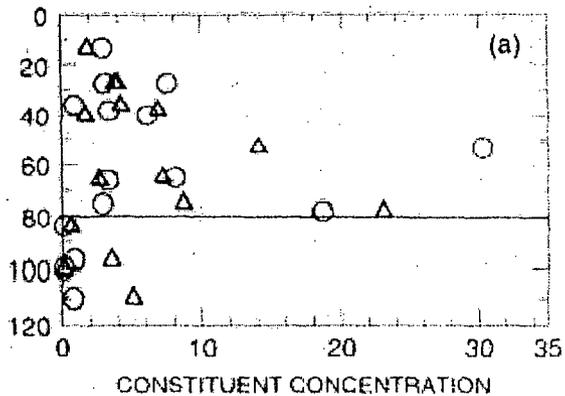
PH, IN PH UNITS

EXPLANATION

-  Number of samples in which the concentration of total radium was greater than 5 picocuries per liter
-  Number of samples in which the concentration of total radium was less than 5 picocuries per liter
- 54% Percentage of total number of samples in each range in which the concentration of total radium was greater than 5 picocuries per liter

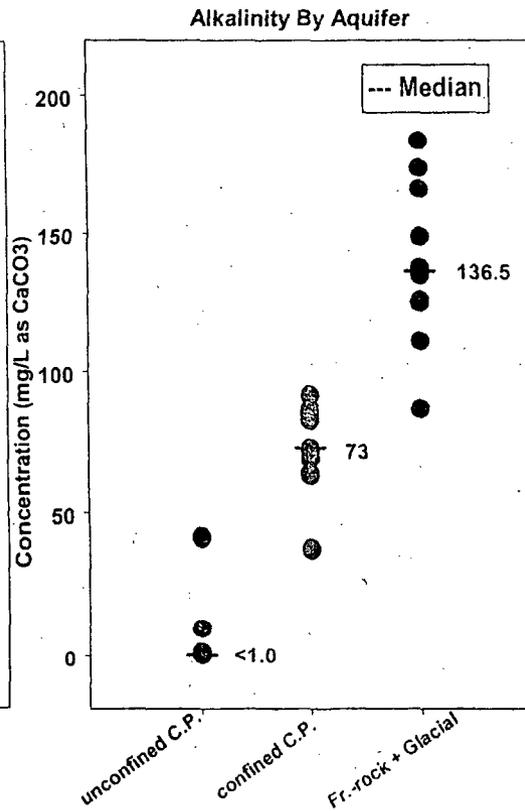
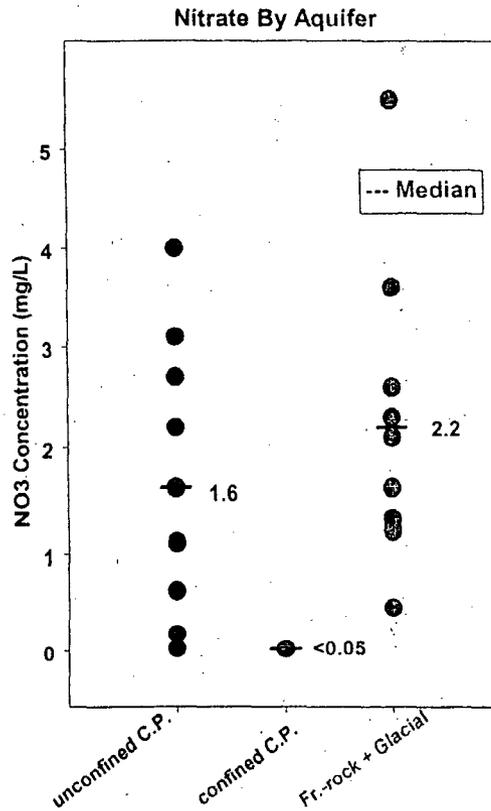
Ra and pH data, Kirkwood Cohansey

DEPTH OF WELL, IN FEET
BELOW LAND SURFACE



- EXPLANATION
- Concentration of total radium, in picocuries per liter
 - △ Concentration of $\text{NO}_2 + \text{NO}_3$, in milligrams per liter as N
 - Approximate depth of ground water recharged in about 1963

NACP: Hydrogen Ions in Water Increase Radium Mobility at Shallow Depths

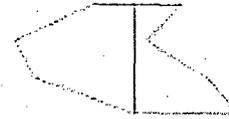


Stiff diagrams
 Showing change in
 Water chemistry and
 Ra concentration
 In vertical profile,
 Kirkwood-Cohansey
 Aquifer, NJ Coastal
 Plain

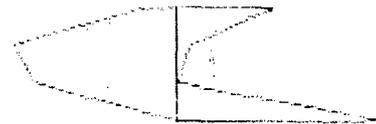
MILLIEQUIVALENTS PER LITER



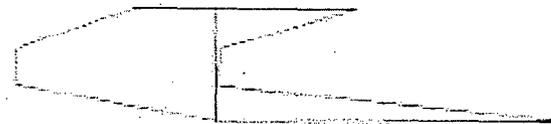
Well 11-696
 (Depth 13 feet;
 $Ra_T = 3.0$)



Well 11-692
 (Depth 38 feet;
 $Ra_T = 3.45$)



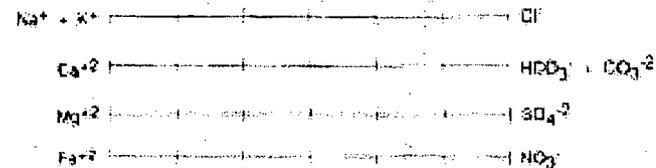
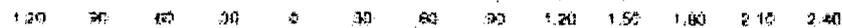
Well 11-700
 (Depth 53 feet;
 $Ra_T = 30.3$)



Well 11-693
 (Depth 78 feet;
 $Ra_T = 18.6$)



Well 11-694
 (Depth 115 feet;
 $Ra_T = 1.44$)



Geochemical
Mass balance
For water chemistry
Evolution,
Kirkwood-Cohansey
Aquifer, NJ Coastal
Plain.
Multiple nutrient
Loading scenarios
Tested

Table 8. Net amount of constituents added to, or removed from, an initial solution of soil water of median composition from well-drained Evesham and Lakewood soils in a non-agricultural area to obtain the composition of ground water from well 11-693 located in an agricultural area, Kirkwood-Cohansey aquifer system, southwestern Coastal Plain, New Jersey; actual pH and calculated pH when nitrogen is added in various forms; and mass balance of hydrogen ions when nitrogen is added as ammonia

[mmol/L, millimoles per liter; +, constituent dissolved; -, constituent precipitated]

Constituent	Initial solution (median composition of water from well- drained Lakewood and Evesham soils in non- agricultural area) (mmol/L)	Final solution (composition of water from well 11-693 in the Kirkwood-Cohansey aquifer system in an agricultural area) (mmol/L)	Net amount of constituent added to, or removed from, the initial solution to derive the composition of the final solution, and probable source (mmol/L)
Ca	0.018	0.449	+ 3.2600, O ₂ gas (soil gas)
Mg	.021	.453	+ 1.6300, NH ₃ (fertilizer)
C	1.353	2.144	+ .1785, CO ₂ gas (soil gas)
N	.015	1.645	+ .1495, calcite (lime)
Na	.057	.287	+ .2815, dolomite (lime)
K	.010	.084	+ .0640, K-feldspar (weathering)
Cl	.108	.649	+ .1505, MgCl ₂ (salt)
Si	.031	.153	+ .0100, KCl (potash salt)
Al	.020	.014	+ .2300, NaCl (salt) - .0350, kaolinite (weathering)

Actual and calculated pH

Actual pH of initial solution is 4.1.

Calculated pH of final solution when no N is added with lime is 6.6.

Calculated pH of final solution when N is added as NaNO₃ with lime is 6.6.

Calculated pH of final solution when N is added as NH₃ with lime is 3.7.

Actual pH of final solution is 4.5.

Mass balance of hydrogen ions per liter, well 11-693

Hydrogen-ion production

Nitrification 1.630 mmol/L x 1H⁺ = + 1.630
Kaolinite precipitation .003 mmol/L x 6H⁺ = + .018

Total hydrogen-ion production +1.648

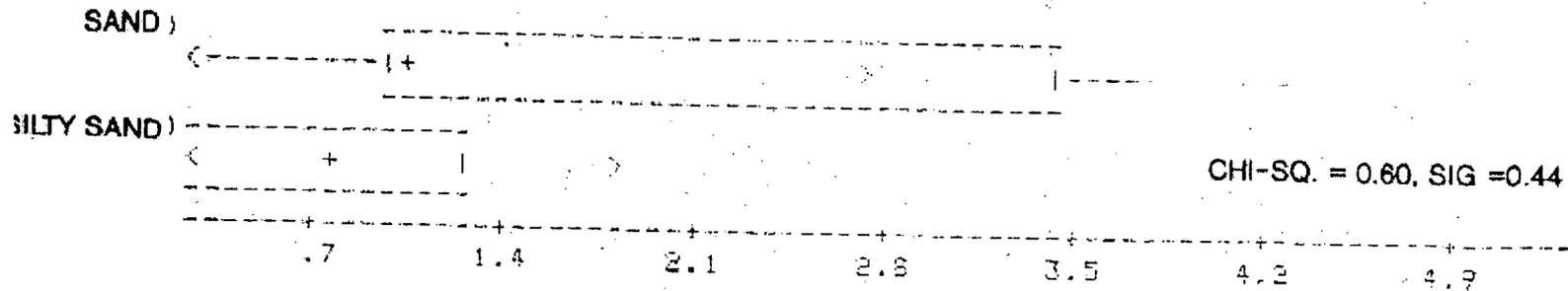
Hydrogen-ion consumption

Calcite dissolution 0.1495 mmol/L x 1H⁺ = -.1495
Dolomite dissolution .2815 mmol/L x 2H⁺ = -.5630
Bicarbonate consumption .7125 mmol/L x 1H⁺ = -.7125
K-feldspar weathering to kaolinite .064 mmol/L x 2H⁺ = -.1280

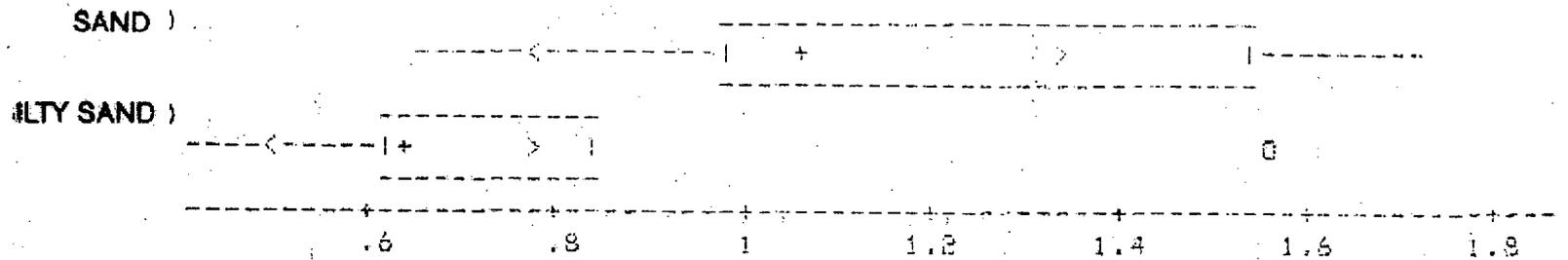
Total hydrogen-ion consumption -1.5530

Net balance for solution +0.095 mmol H⁺/L.

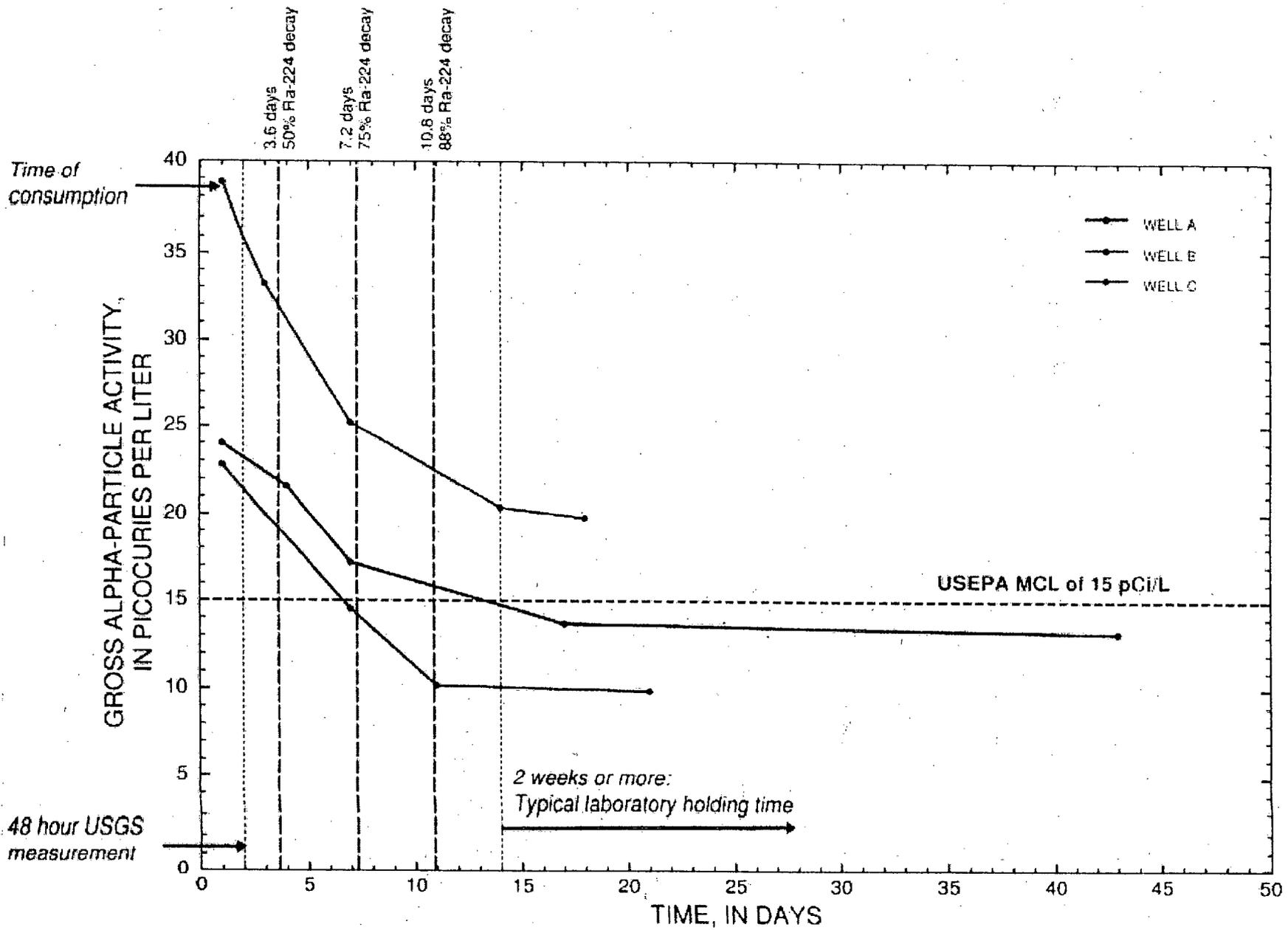
Boxplot of RADIUM-228/RADIUM-226, DISSOLVED
Grouped by LITH



Boxplot of RADIUM-228/RADIUM-226, SEDIMENT
Grouped by LITH

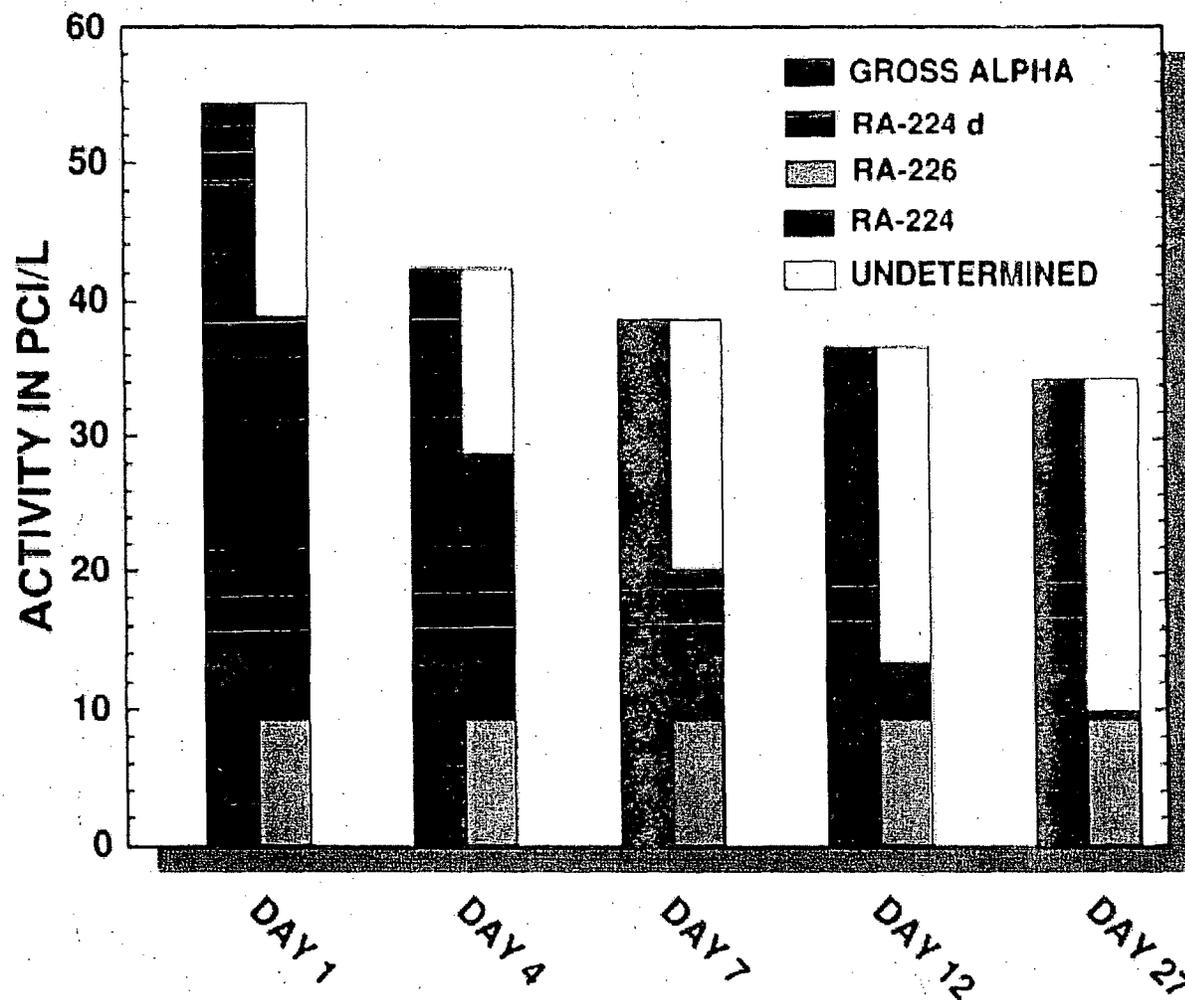


Ra isotope ratios in aquifer materials relate to those in water



Decline of gross alpha-particle activity through time in samples from selected public-supply wells, southern New Jersey, 1997.

Ra-224
Major
Component
In water.
Aquifer
Materials
Only possible
source



Change in components of gross alpha-particle activity through time, southern New Jersey

$$K_d = \frac{\text{Mass of Adsorbate Sorbed}}{\text{Mass of Adsorbate in Solution}} = \frac{A_1}{C_1}$$

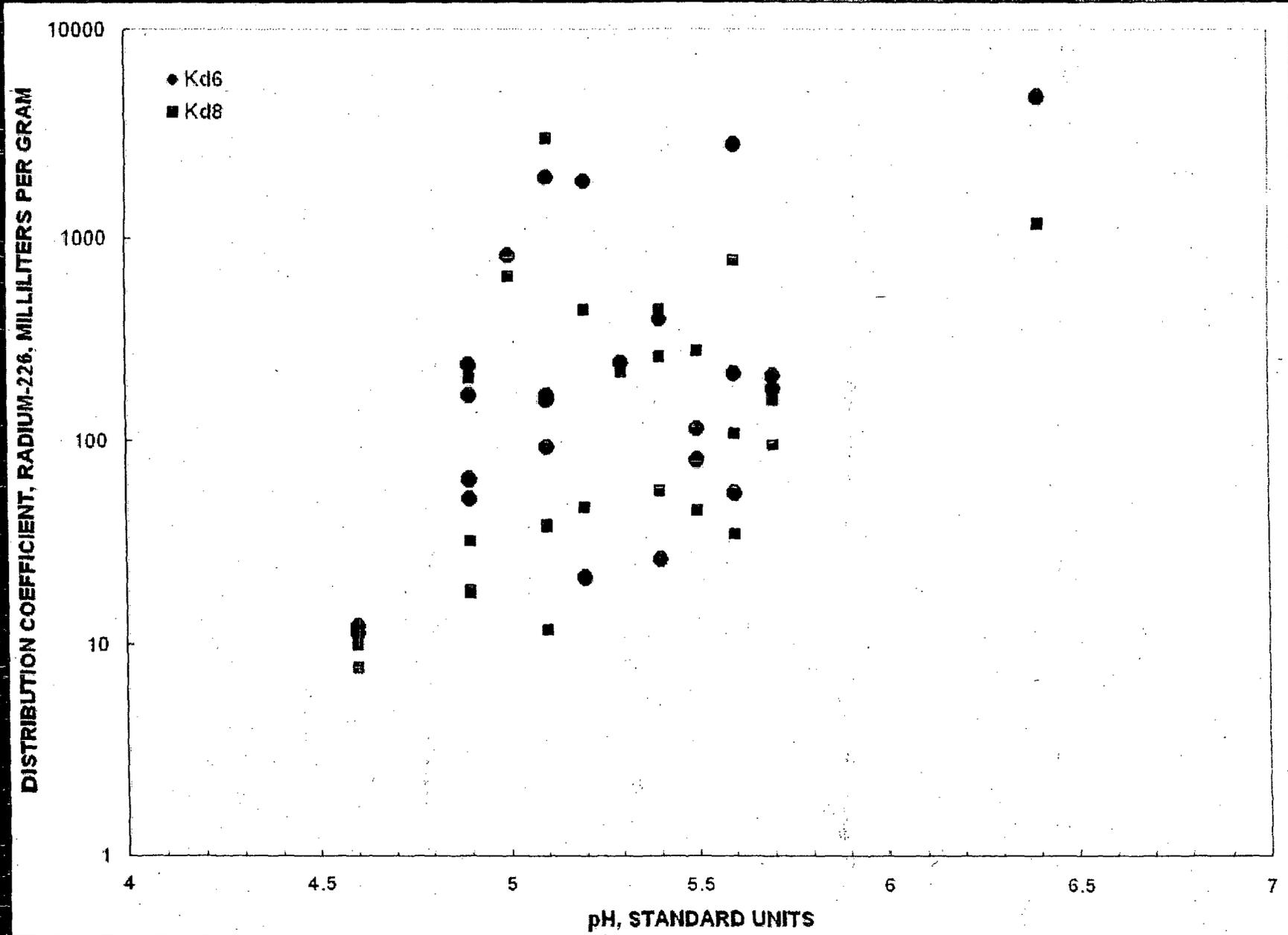
where A_1 = free or unoccupied surface adsorption sites

C_1 = total dissolved adsorbate remaining in solution at equilibrium

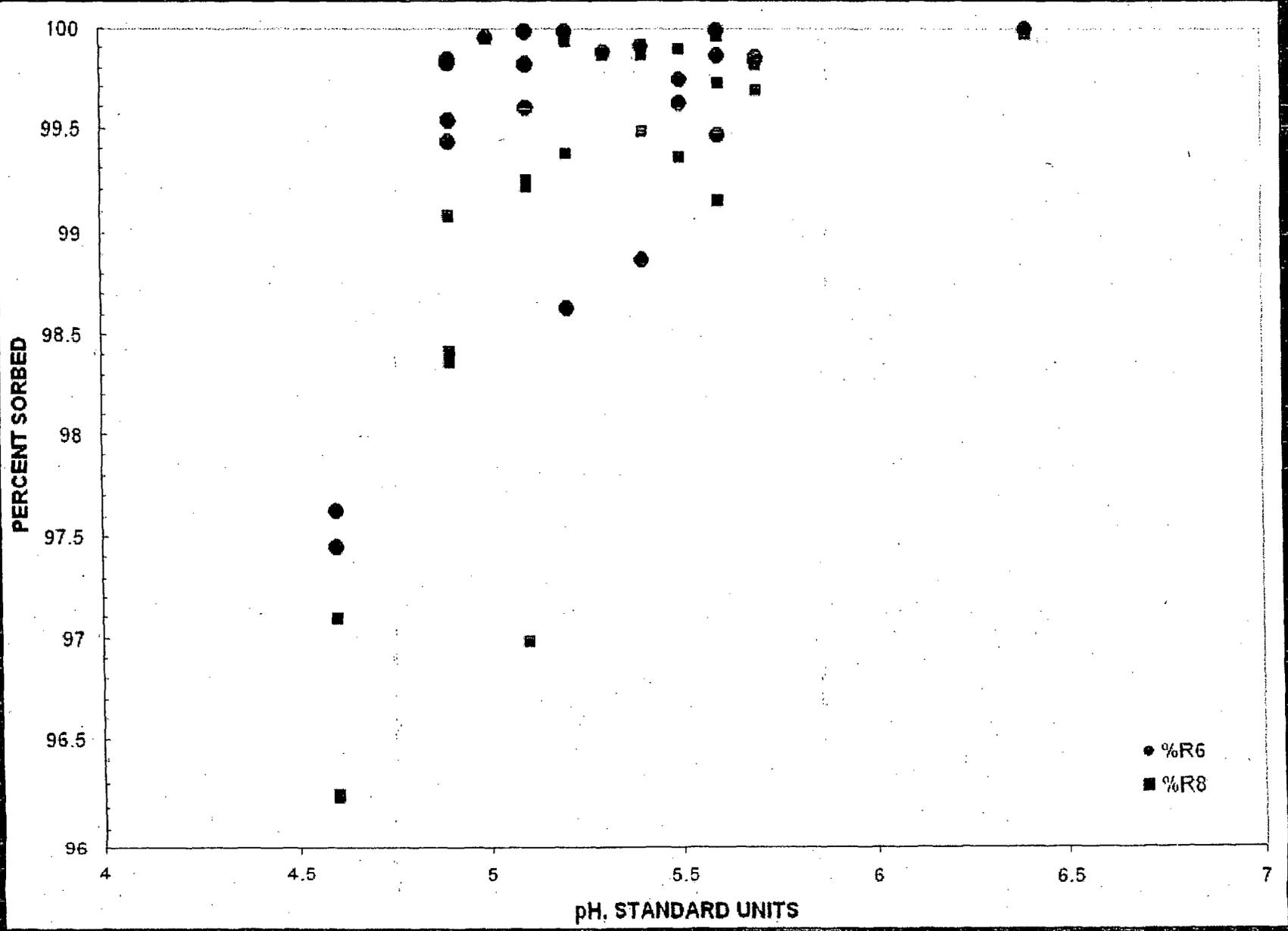
A_2 = amount of adsorbate on the solid at equilibrium.

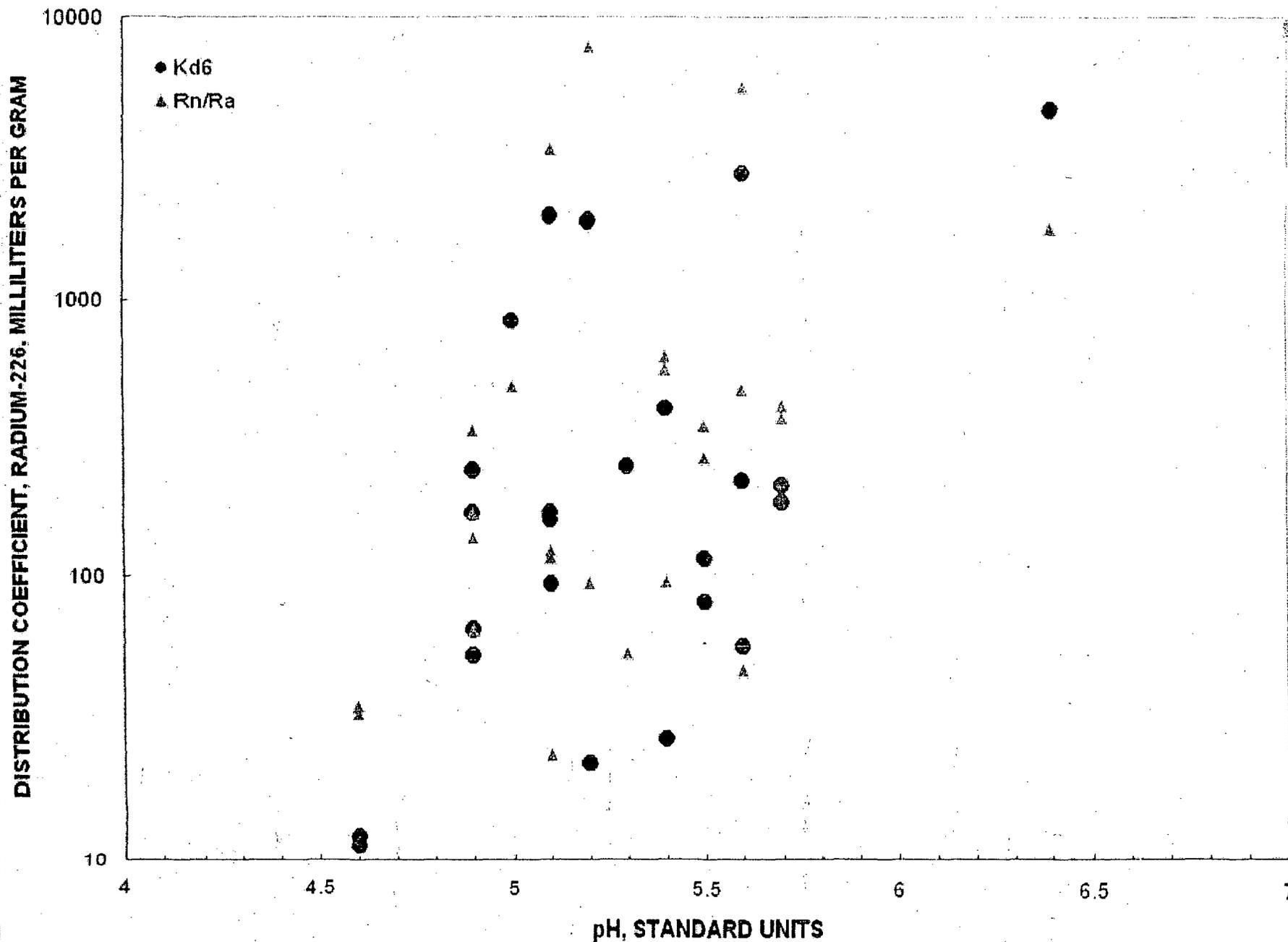
Table 5.27. Radium K_d values (ml/g) measured by Serne (1974) for sandy, arid soil samples from Utah.

Soil Sample	Final pH	K_d (ml/g)
Soil I	7.9-8.0	354 ± 15
Soil II	7.6-7.7	289 ± 7
Soil III	7.8-7.9	467 ± 15
Soil IV	7.6-7.8	214 ± 15

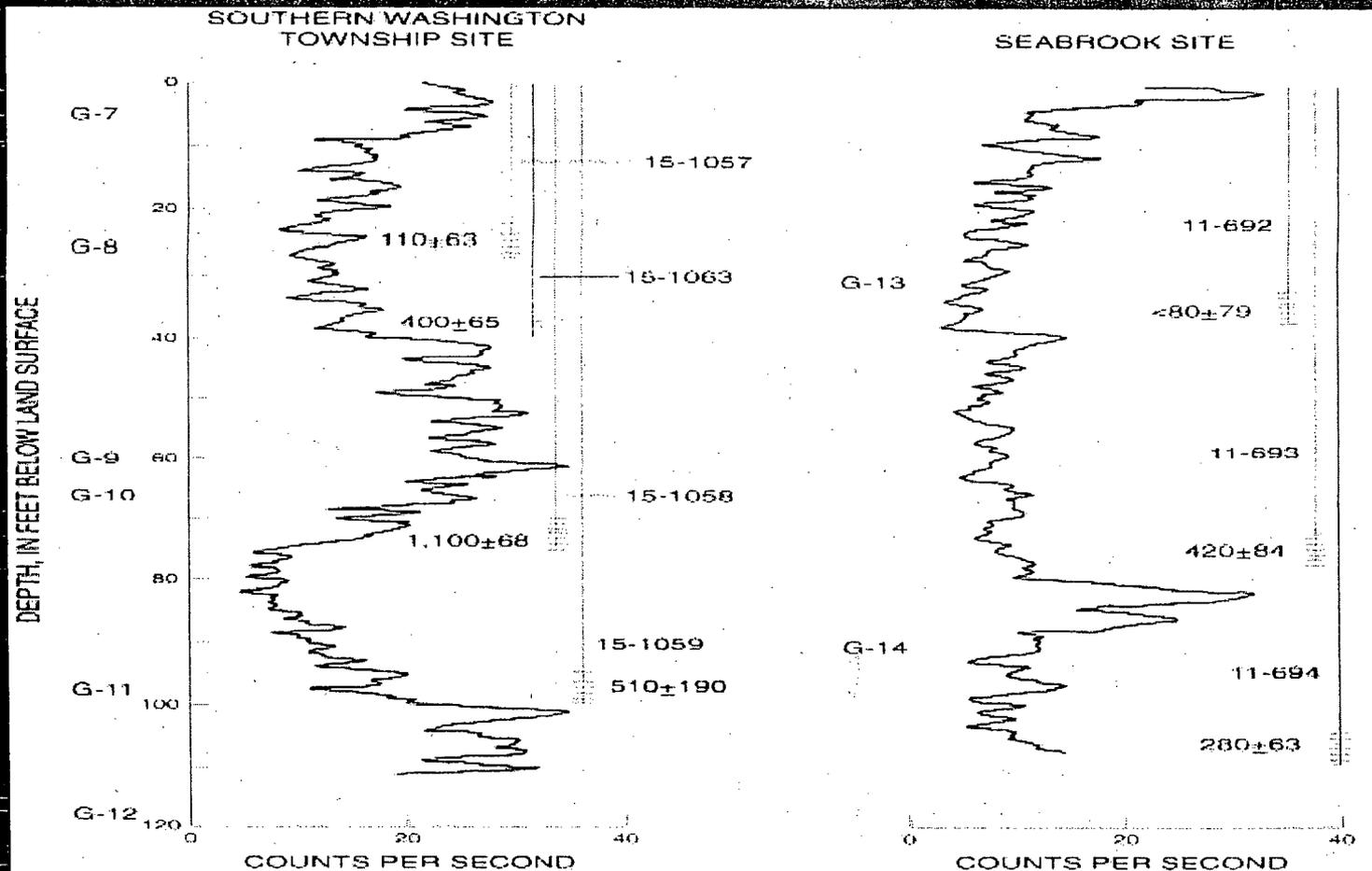


Kd, Ra226, 11-4500; Kd, Ra228, 7.6-3000. Most are near 100-200. Strong pH effect. Data= co-located field and sediment sample. Draft.





Kd, Ra226 compared to Rn222/Ra226 ratio. Values are similar.



EXPLANATION

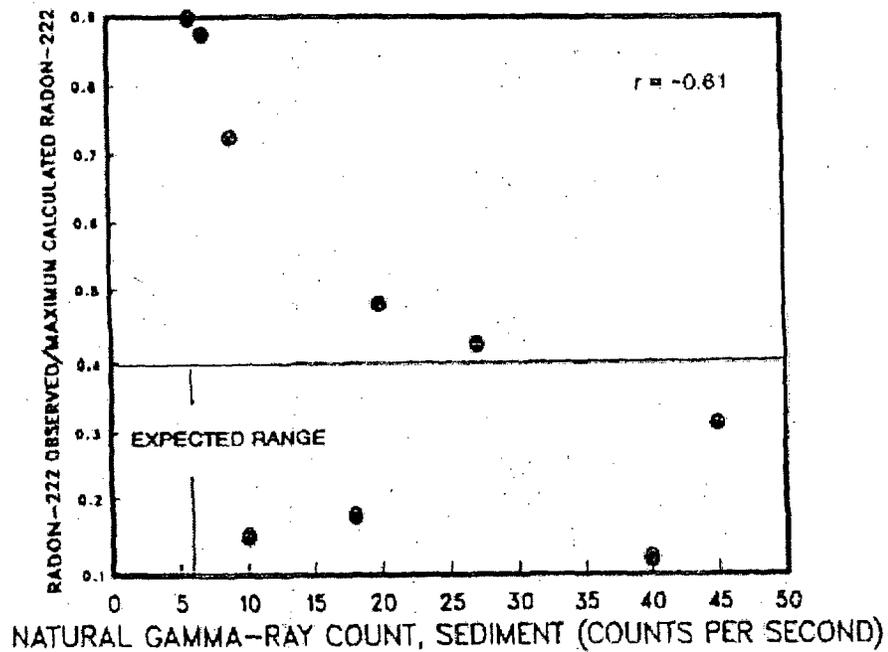
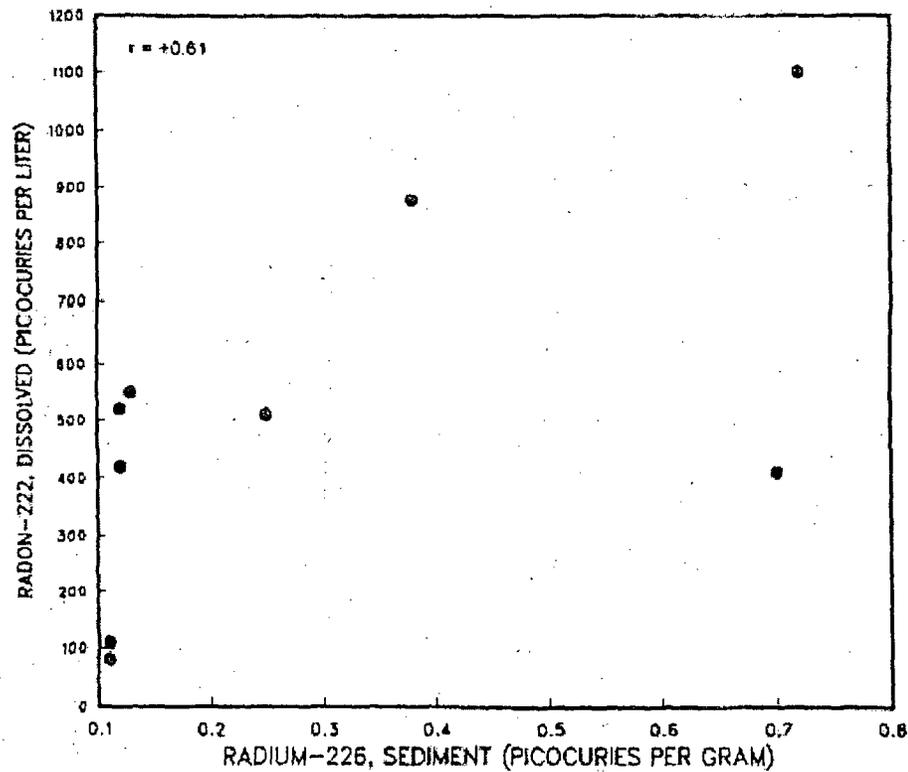
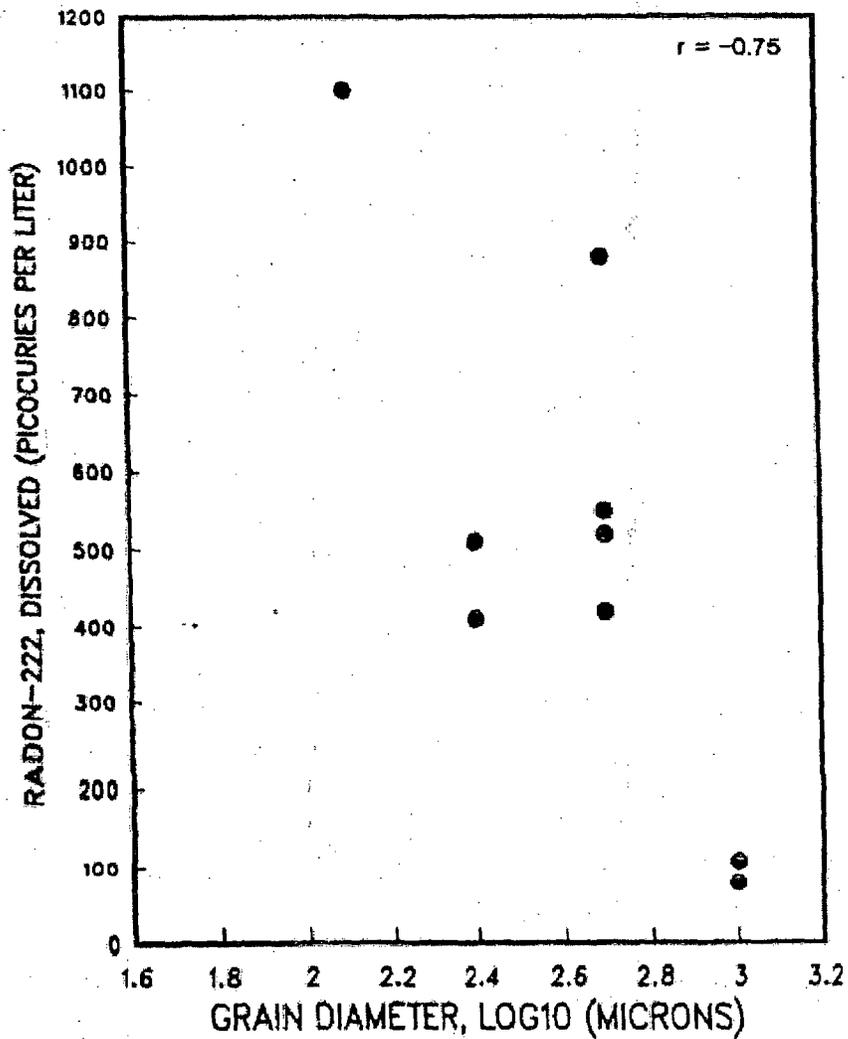
- 11-694 Well number, screened interval, and radon-222 concentration, in picocuries per liter
- 110±63
- G-12 Location and number of sediment sample collected for gamma-spectral analysis

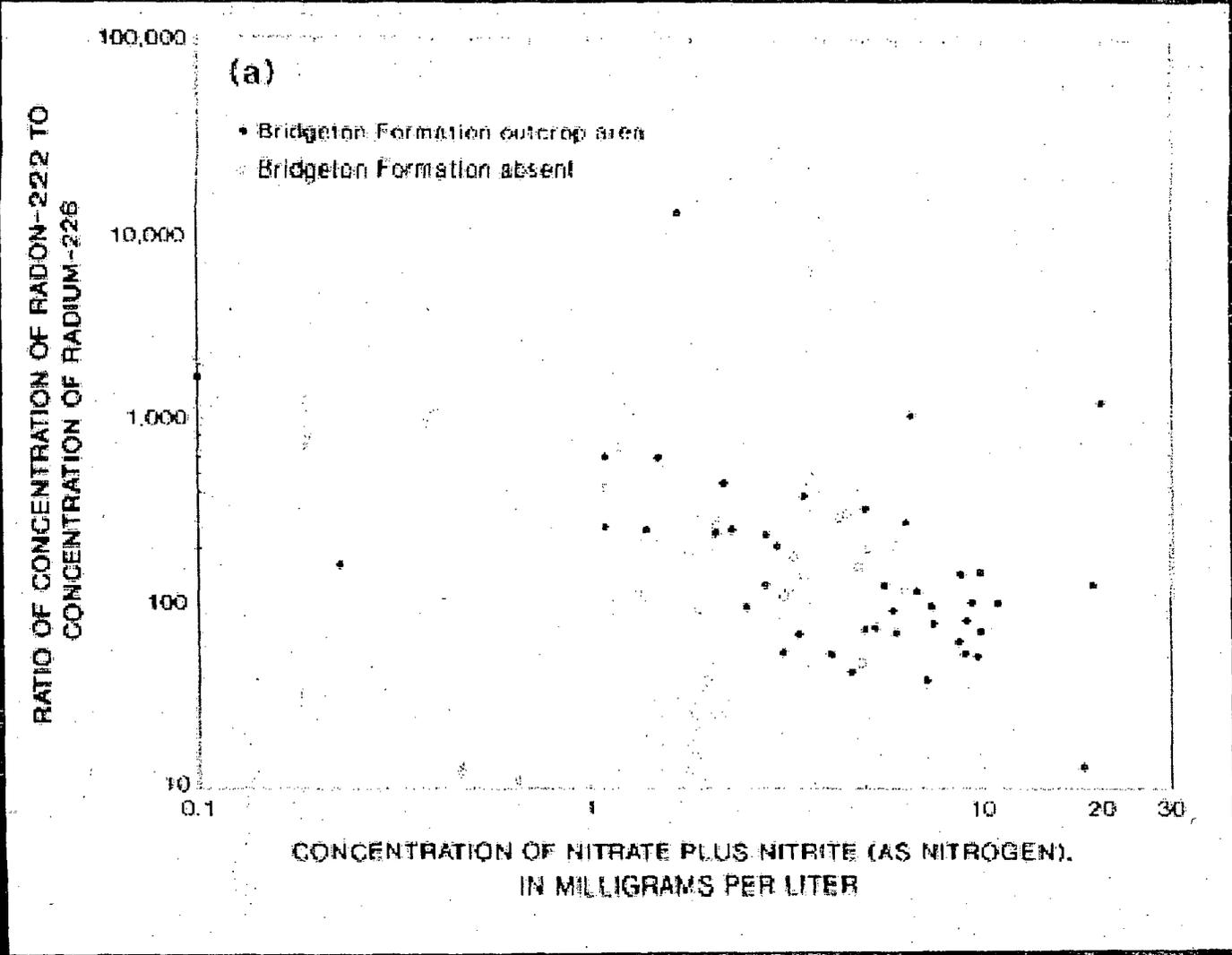
Gamma-ray activity



Gamma logs of the Kirkwood-Cohansey aquifer system at five nested-observation-well sites in southwestern New Jersey, screened intervals, location of sediment samples collected for gamma-spectral analysis, and dissolved radon-222 concentrations, 1991.

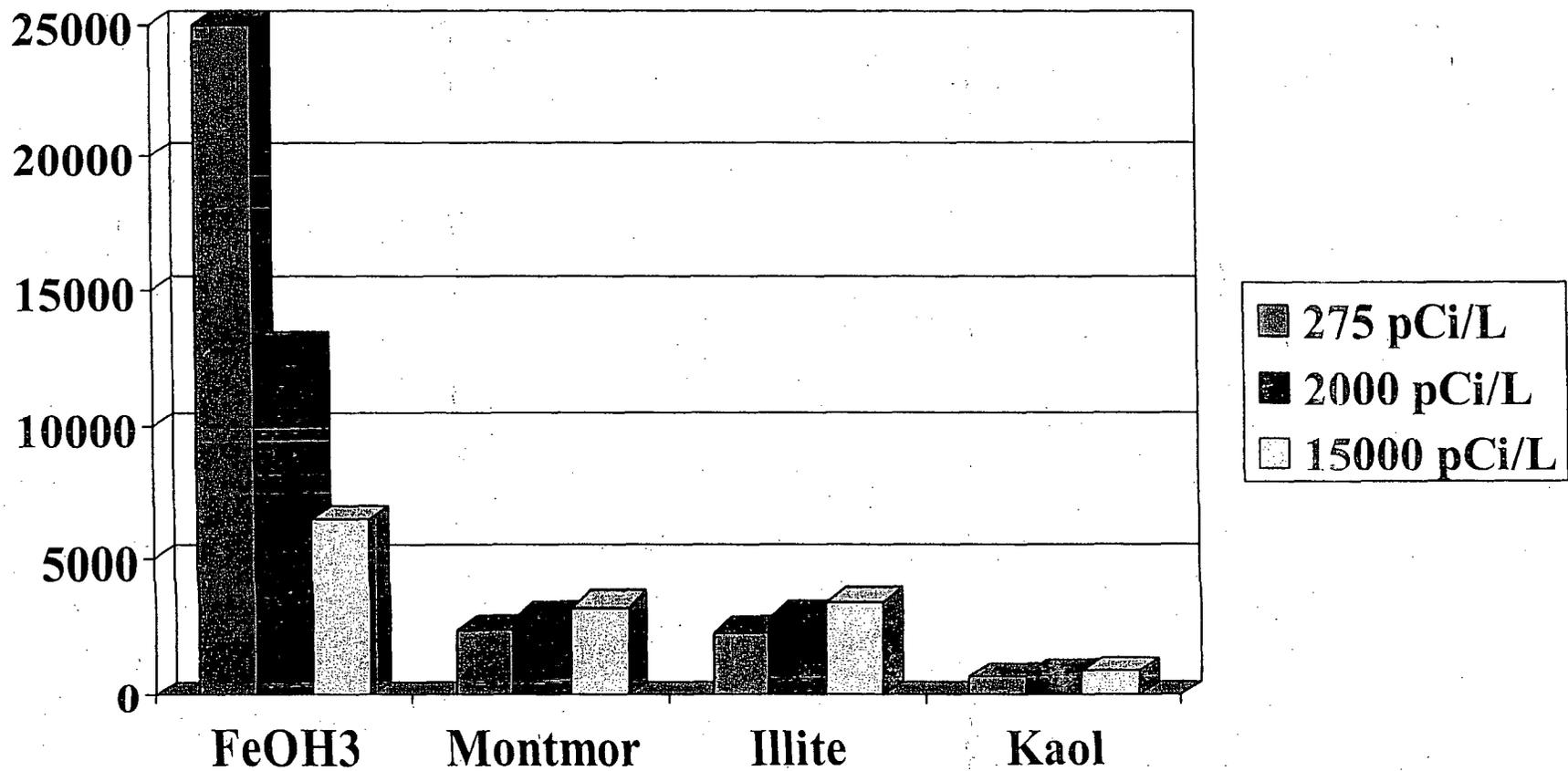
$$R_{n,w} = R_{a,s}D_{s(1-p/p)e} + R_{a,w}$$



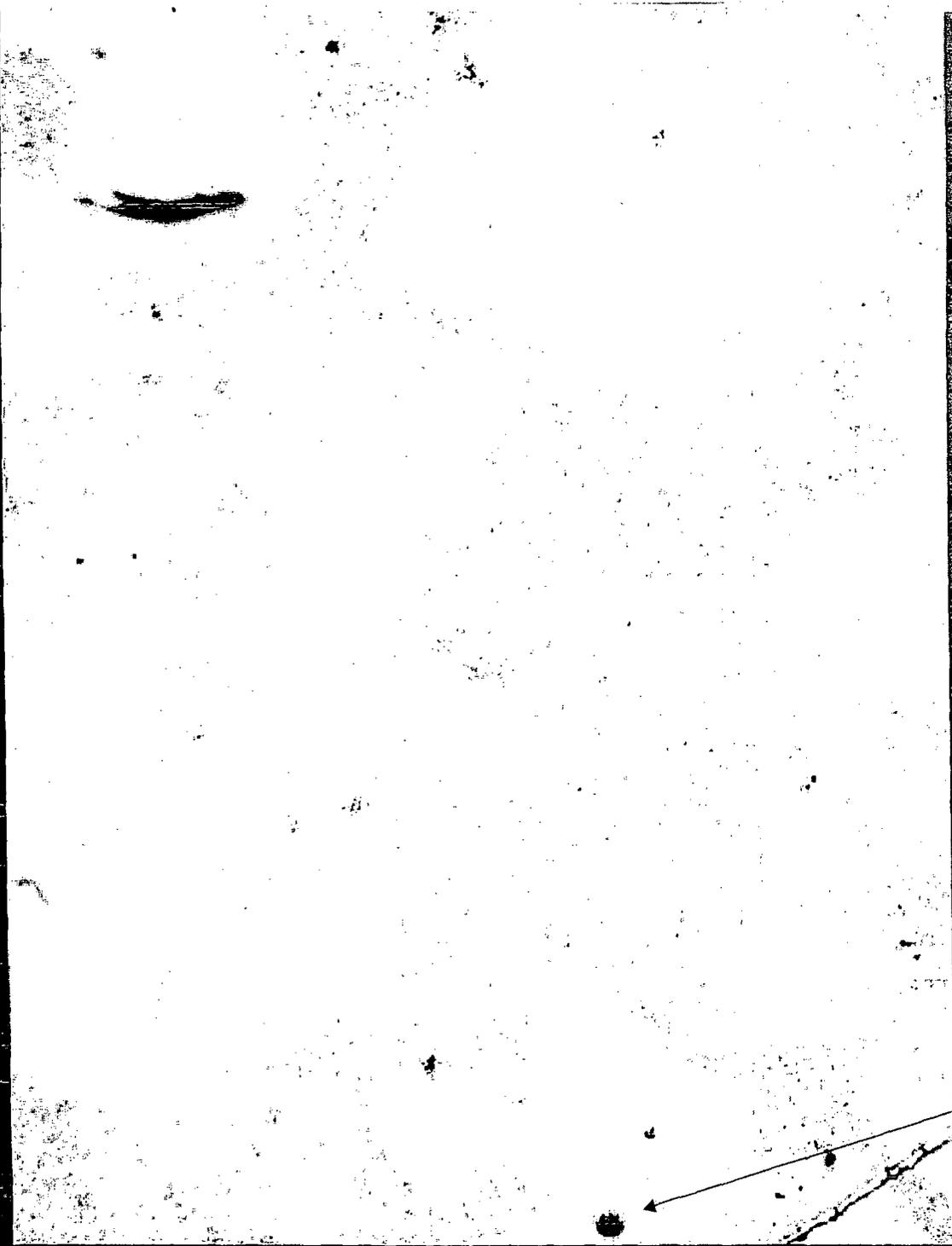


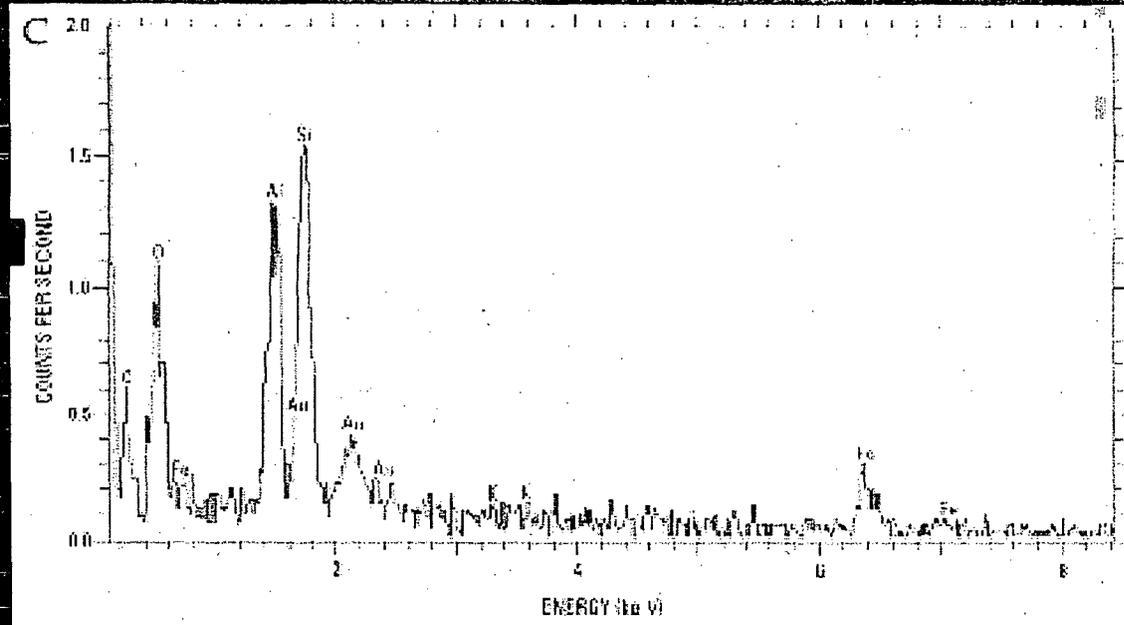
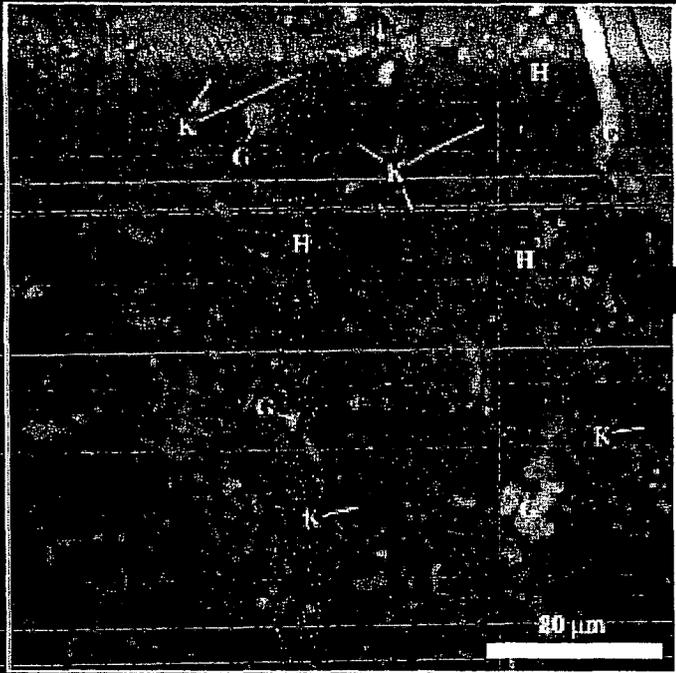
Rn/Ra ratio consistent with geochemical control of Ra occurrence

Ra distribution coefficients per g sorbent (Ames et al., 1983)



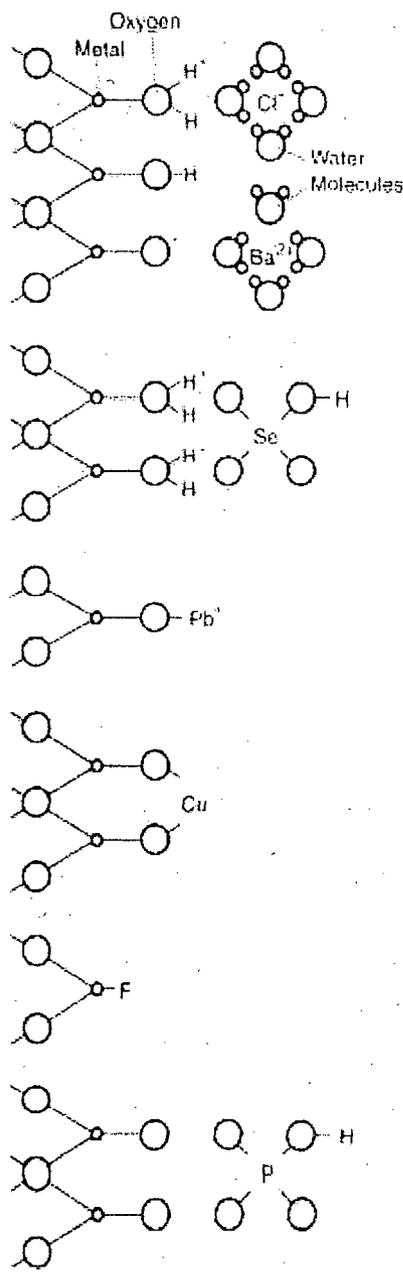
Fission track
Radiography of
Iron-stained
Aquifer sediment





SEM photo of Kaolinite, Halloysite, Goethite grain-coating Mixture in surficial Bridgeton Formation near Vineland, NJ. EXAFS of halloysite shows AL, SI, Fe mixture. (Reilly et al., 2009)

Field data points
 To weakly bound
 Outer-sphere complexes
 For Ra sorption
 Leaching experiments
 Mobilized Ra
 Easily with gentle
 Extractants.



OTHER EXAMPLES

I^- , Br^- , NO_3^- , ClO_4^-

Na^+ , K^+ , Ca^{2+} , Mg^{2+}

CrO_4^{2-} , CO_3^{2-}

Divalent Transition
Metal Ions

Divalent Transition
Metal Ions

OH^-

SeO_3^{2-} , AsO_4^{3-}

Outer-Sphere
Complexes

Monodentate

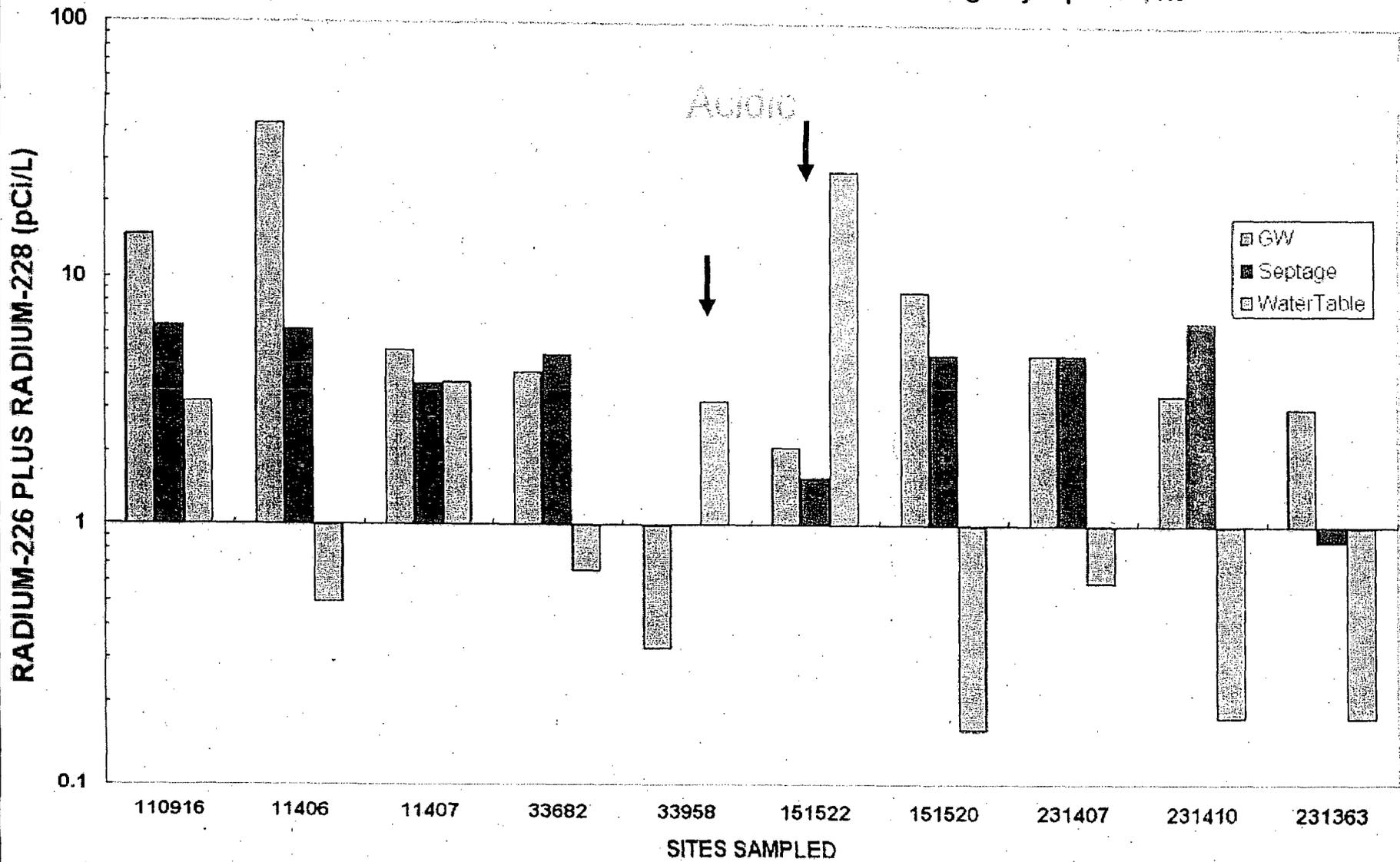
Bidentate

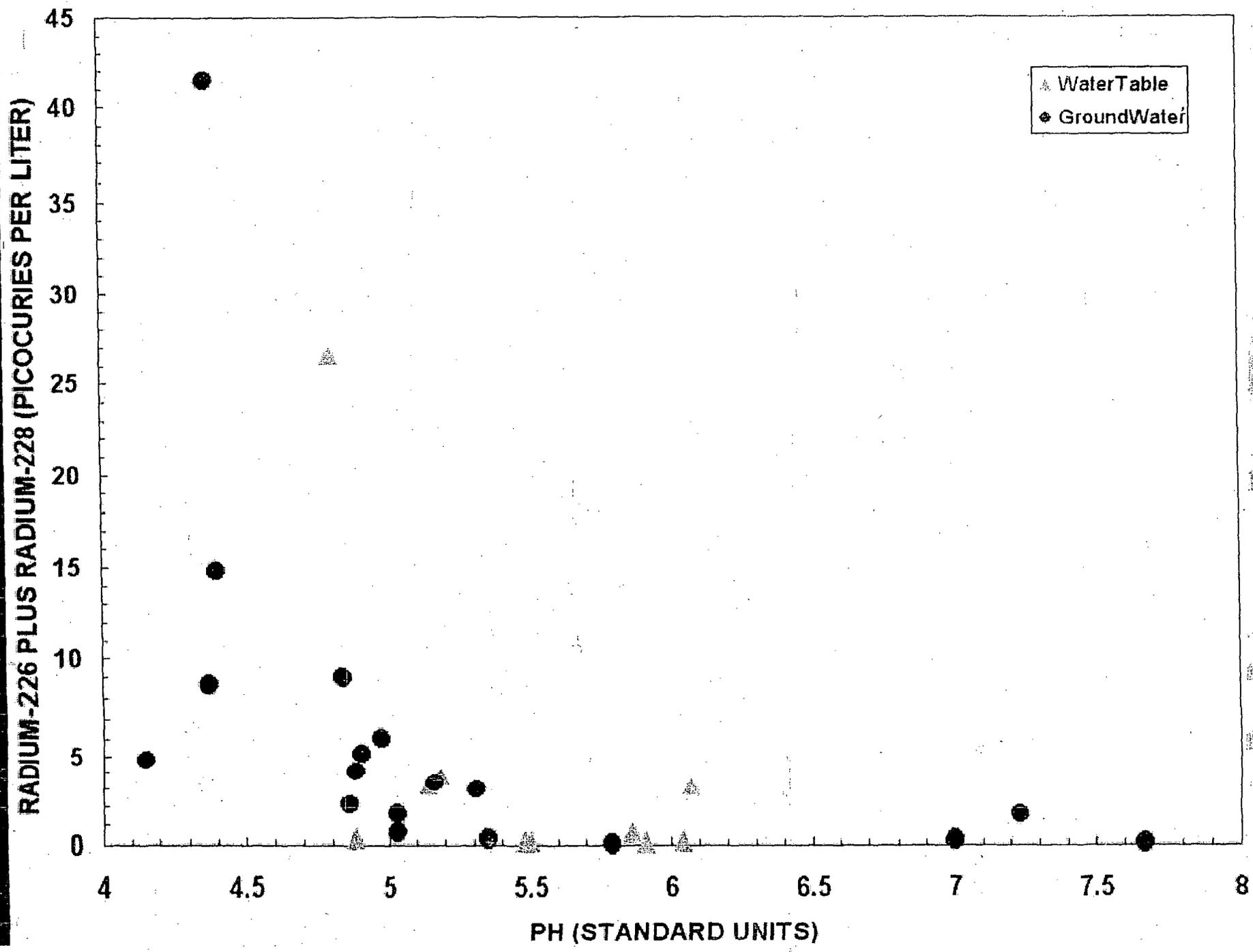
Inner-Sphere
Surface Complexes

Mononuclear

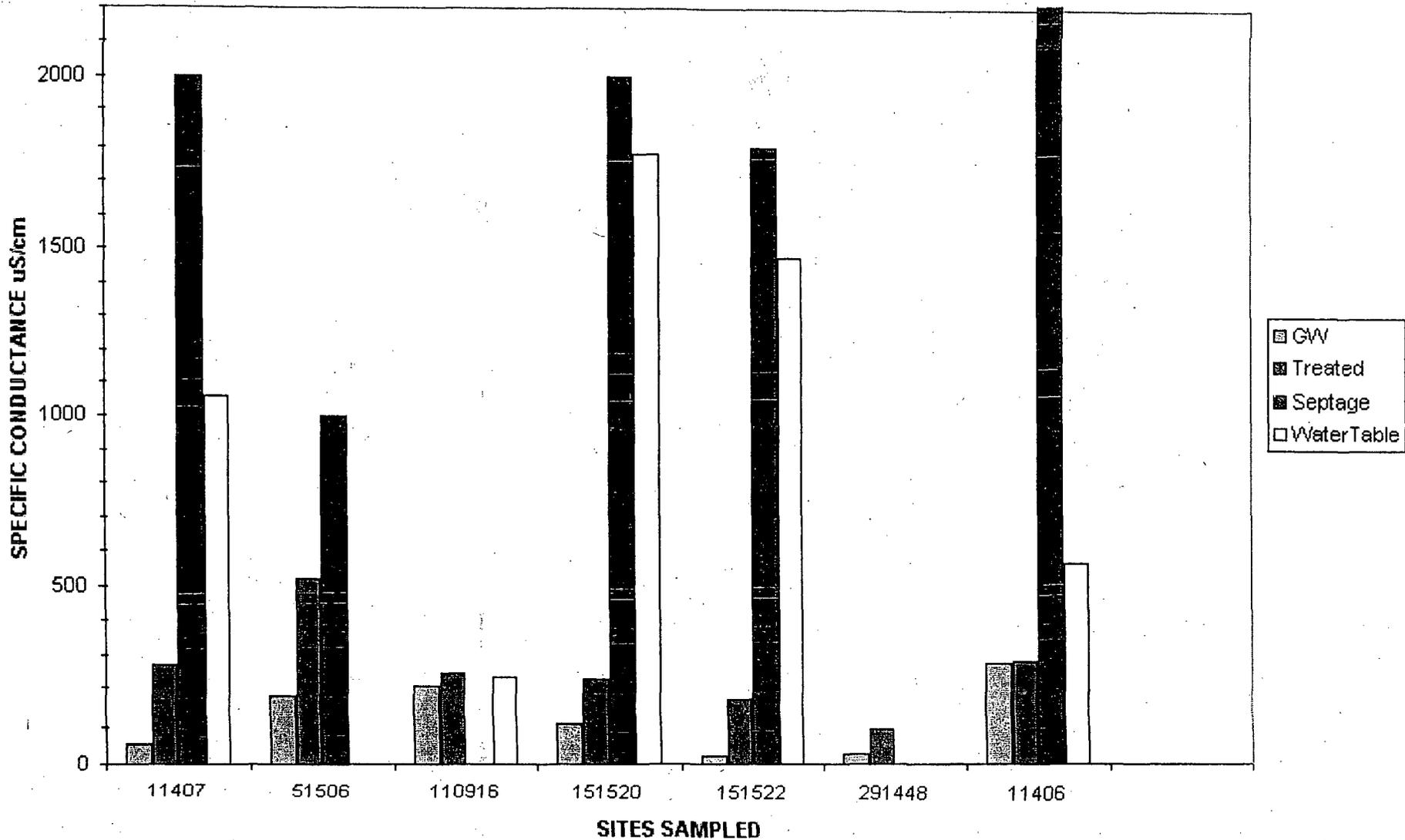
Binuclear

Radium-226 plus Radium-228, by media,
sites from Kirkwood-Cohansey and Potomac-Raritan-Magothy aquifers, NJ





SPECIFIC CONDUCTANCE $\mu\text{S}/\text{cm}$



SC, Cl used for septic effluent mass balance estimates. Ra sequestered at $\text{pH} > 5.3$ & DESORBED at $\text{pH} < 5.3$. Szabo et al., in press.

$$N_{atm} = (He/Ne)_{atm} = 0.288 \text{ for air excess}$$

$$R_{atm} = ({}^3He/{}^4He)_{atm} = 1.384 \times 10^{-6} \text{ for air excess } (R_a)$$

$$R_{ter} = ({}^3He/{}^4He)_{ter} = 2 \times 10^{-8} \text{ for radiogenic helium } (R_{rad})$$

$$= 1 \times 10^{-5} \text{ for mantle helium } (R_{man})$$

$$Ne_m = Ne_{eq} + Ne_{atm}$$

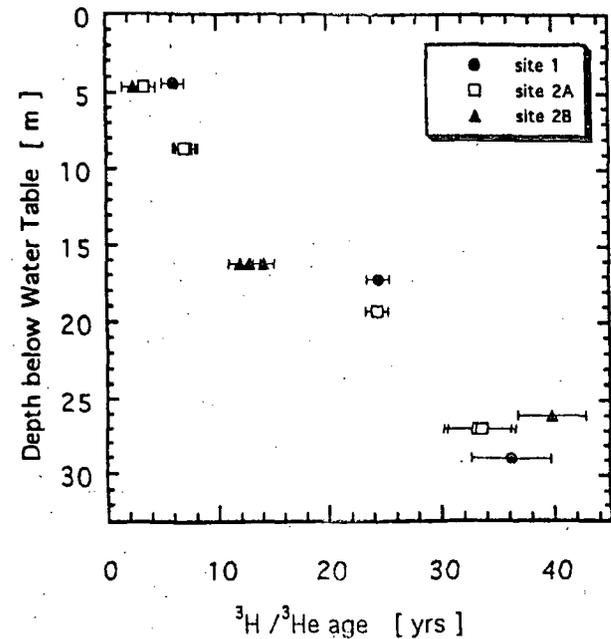
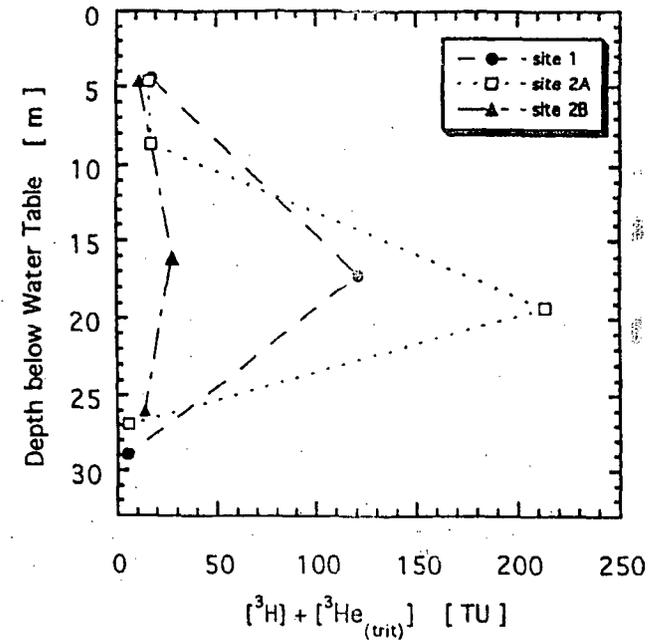
$${}^4He_m = {}^4He_{eq} + N_{atm} \cdot Ne_{atm} + {}^4He_{ter}$$

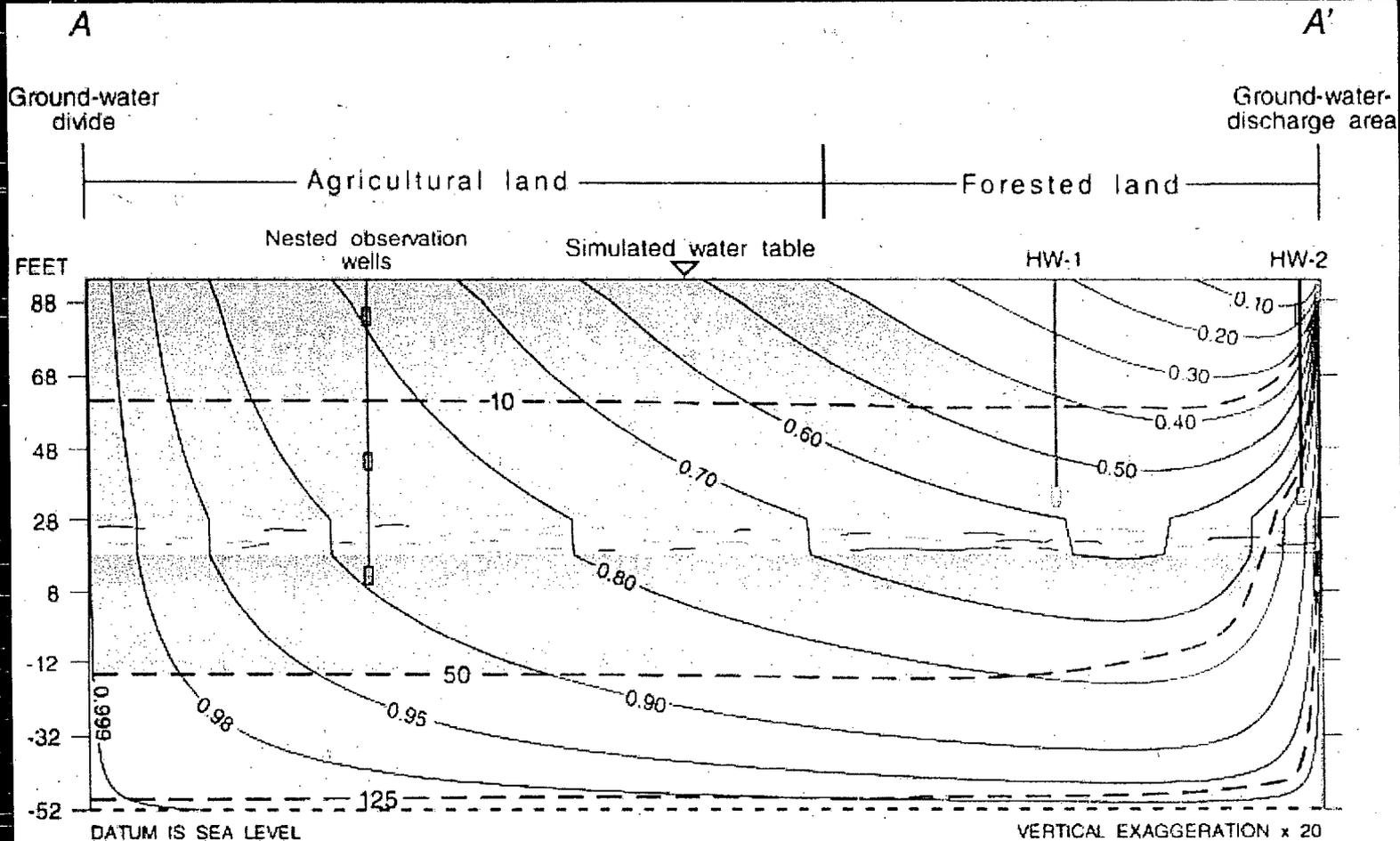
$${}^3He_m = R_{eq} \cdot {}^4He_{eq} + R_{atm} \cdot N_{atm} \cdot Ne_{atm} + R_{ter} \cdot {}^4He_{ter} + {}^3He_{tri}$$

$${}^3He_{tri} = {}^4He_m \cdot (R_m - R_{ter}) - {}^4He_{eq} \cdot (R_{eq} - R_{ter}) - N_{atm} \cdot (Ne_m - Ne_{eq}) \cdot (R_{atm} - R_{ter})$$

$$\tau = \frac{1}{\lambda} \cdot \ln \left(1 + \frac{{}^3He_{tri}}{{}^3H_m} \right)$$

${}^3H/{}^3He$ has been used to
 “age-date” or determine
 Residence time of waters in
 Kirkwood-Cohansey aquifer
 (Szabo et al., 1996)





EXPLANATION



AREA OF SILT LAYER WITHIN THE KIRKWOOD-COHANSEY AQUIFER SYSTEM



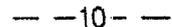
ZONE OF AQUIFER IN WHICH WATER IS LIKELY TO CONTAIN ELEVATED CONCENTRATIONS OF RADIUM AND NITRATE



LOCATION OF HYPOTHETICAL WELL OR WELL NEST AND SCREENED INTERVAL



0.80 STREAM LINE--Shows the simulated path of ground-water flow



10 LINE OF EQUAL TRAVEL TIME--Number is simulated age of ground water, in years. Interval is variable

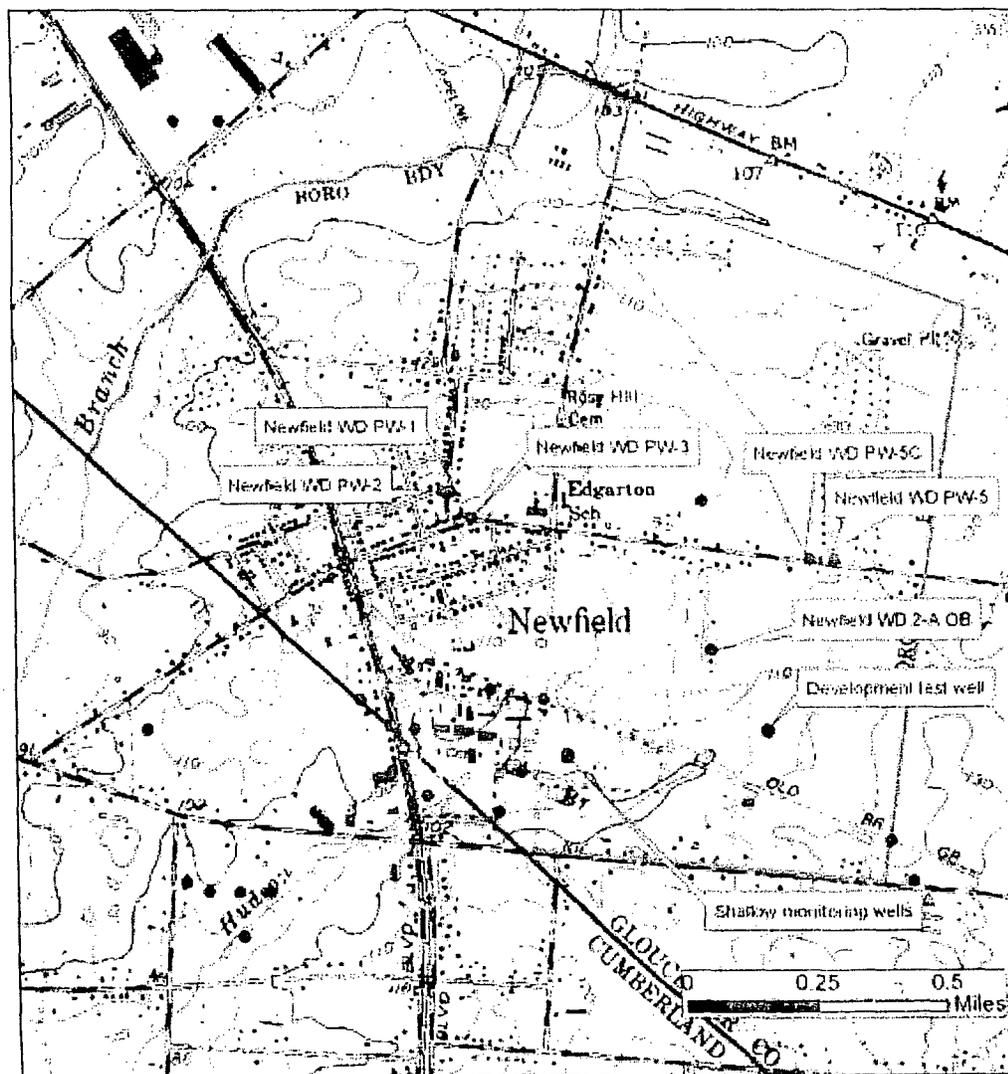


BASE OF KIRKWOOD-COHANSEY AQUIFER SYSTEM



SCREENED INTERVAL--Shows the location of the nested-observation-well screen

Surficial flow
Rapidly towards
Streams?

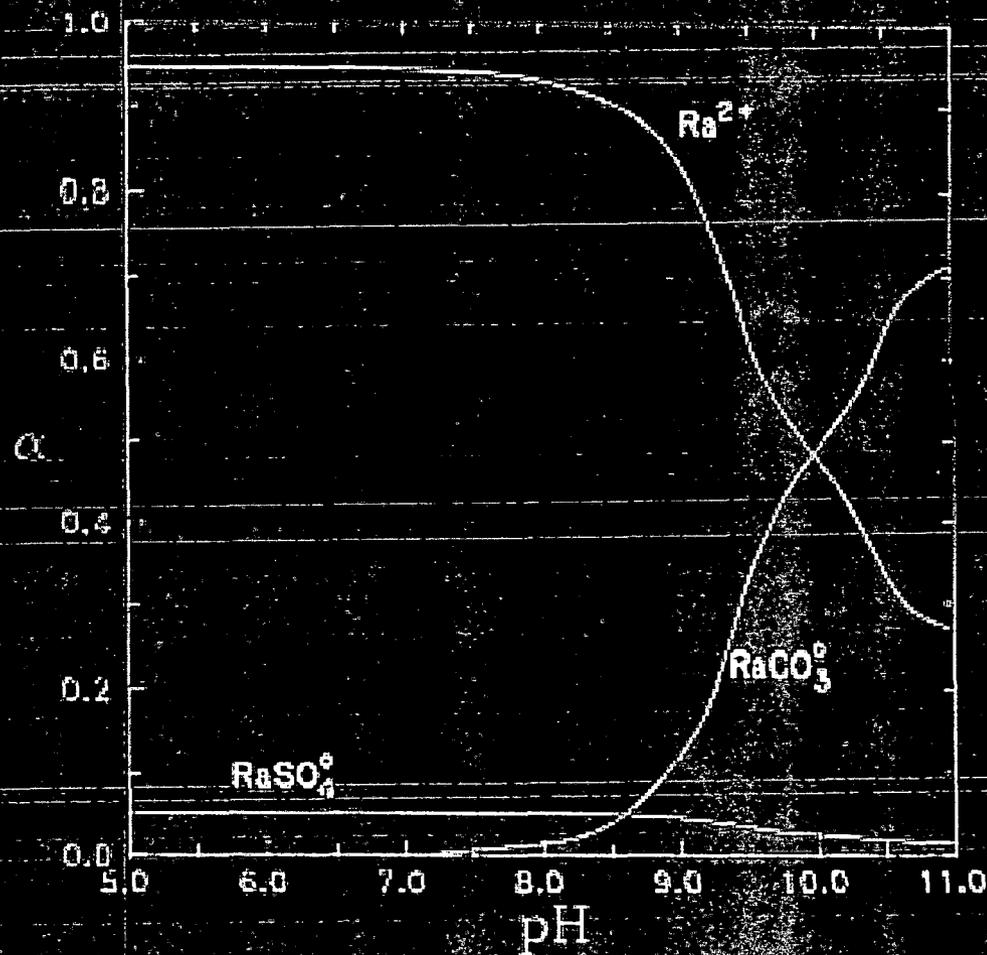


Explanation

- Wells in USGS database
- Monitoring/test well
- SMC property line
- Approximate boundary of abandoned landfill

Figure 1. Location of Shieldalloy Metallurgical Corp (SMC) and locations and depths of existing wells

$\Sigma \text{CO}_3 = 0.01\text{M}$ $\Sigma \text{SO}_4 = 0.0001\text{M}$



Ra

BaSO_4 Coprecipitation, Dissolved Alkaline Earth Elements, Cation Exchange Capacity, Clay Minerals, Ionic Strength, Iron-/Aluminum-Oxide Minerals, Organic Matter, pH

CONCLUSIONS

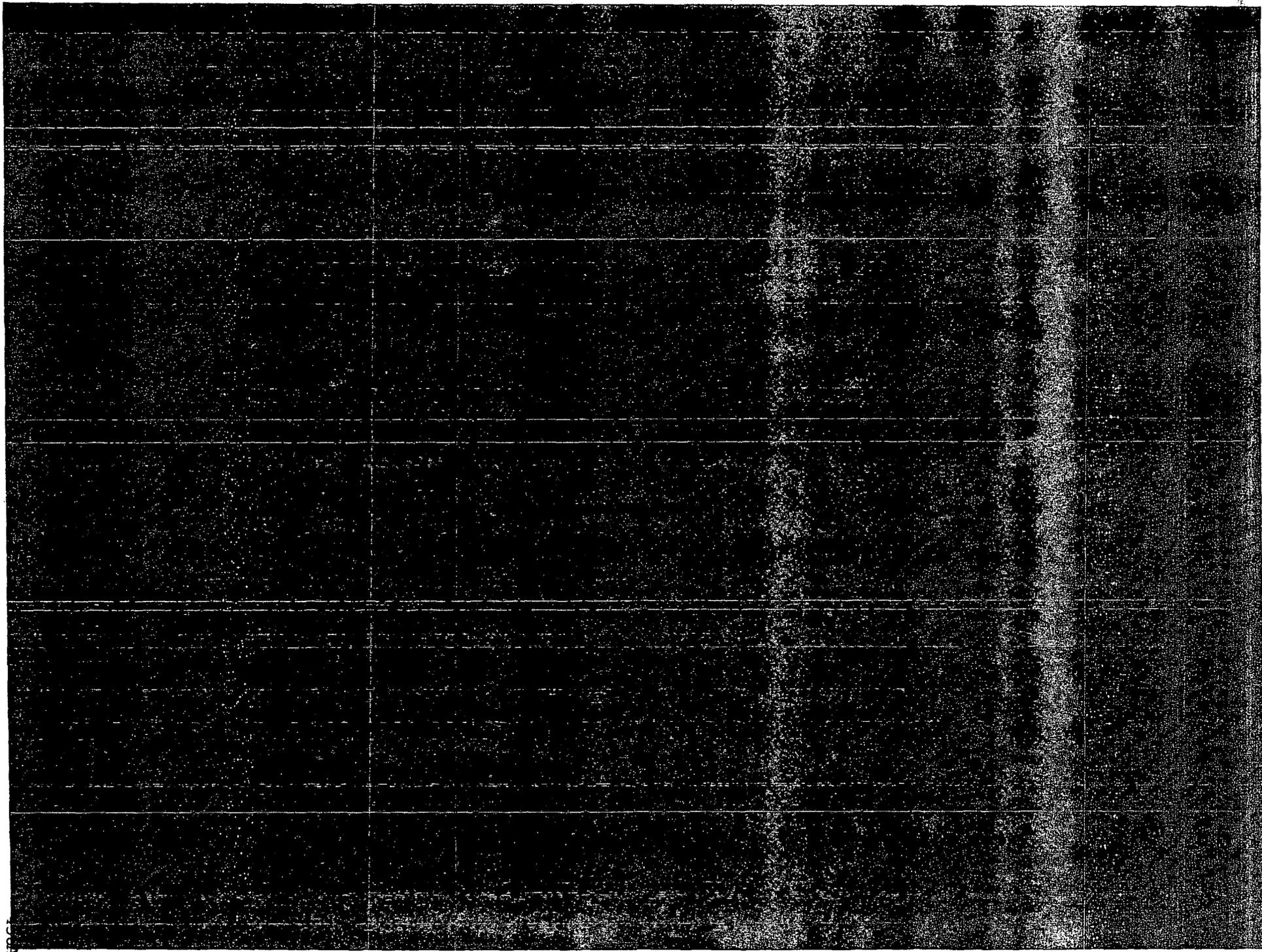
Concentrations of combined radium at elevated levels were found to co-occur with some more commonly analyzed for contaminants as well as some physical properties of the sampled water that are also considered generally undesirable traits, most importantly, low pH (acidic water) and high dissolved solids (mineralized water) and nitrate concentrations (acidic and mineralized).

Hypothetical Chemical Reactions by which Hydrogen Ions in Water Increase Radium Mobility

Ion-exchange, desorption reactions:



- Ra is preferentially removed from solid. (K_d often < 100)
- Hydrogen ion is a master variable that exerts significant control over these reactions (solubility spikes $\text{pH} < 5.3$).
- Hydrogen ions + high concentrations of other cations preferentially remove Ra from solid, though septic effluent studies indicate pH is most critical variable.



1 ensure compliance with the terms of the permit, as appropriate. If violations of the
2 permit conditions are identified, SMC retains the right to suspend the site activities
3 of the individuals until appropriate corrective action is taken. SMC will conduct a
4 formal review of the effectiveness of any permits and the effectiveness of the land
5 use controls every two (2) years.

6 • Records of visitors to the site will be prepared and maintained by SMC. SMC will
7 also maintain a record of its review of the effectiveness of these controls for the
8 duration of its ownership of the property.

9 SMC intends to retain title to the property until such time as all remaining plant operations cease.
10 At that time, SMC intends to turn portions of the property over to the Borough of Newfield, to
11 Gloucester County, or to the State of New Jersey, along with all funds designated for long-term
12 (1000-year) maintenance of the restricted release areas as a wildlife sanctuary. The final decision(s)
13 on the title recipient and areas to be transferred will be made prior to license termination.

14 **16.3 Maintenance**

15 SMC will patrol and inspect the perimeter of the property and the entire area of the former Storage
16 Yard at least once per quarter. These inspections will be documented to show the inspection date,
17 the inspector, and the location of any damage identified during the inspection. SMC will repair any
18 damage, maintain all necessary roads, road shoulders, low water crossings, bridges, nature trails, and
19 culverts and provide access control signs at specified locations. In addition, SMC will maintain the
20 barricading and marking of all roads surrounding or approaching the former Storage Yard.

21 **16.4 Obtaining Public Advice**

22 SMC will solicit local input as it plans and implements its cleanup and management of the residual
23 radioactivity at the site. SMC will establish a Restoration Advisory Board (RAB) as a voluntary
24 advisory group. The RAB members include individuals from state and county regulatory agencies,
25 as well as residents from the county. All of the RAB meetings will be open to the public, and SMC
26 will solicit comments from the general public in addition to the RAB members at the RAB meetings.
27 Meeting minutes are documented and included in the SMC Administrative Record. It is anticipated
28 that the meetings of the RAB will be held each quarter during the planning and implementation phase.
29 After this decommissioning plan is implemented and the license is terminated by the USNRC, the
30 RAB will meet at least once per year.

31 The meetings will discuss the three aspects of the proposed SMC institutional controls that are
32 identified in 10 CFR 20. 1403(d), specifically:

- 33 • Whether the institutional controls provide reasonable assurance that the license
34 termination criterion (TEDE) from residual radioactivity will be met;
- 35 • Whether the institutional controls will be enforceable;

Storage Yard Radioactivity Concentrations (by Area)

Area 1	Th	Ra	U
Mean (pCi/g)	2.81	1.52	4.93
Std. Dev (pCi/g)	1.63	0.66	3.47
Variance (pCi/g)	2.67	0.43	12.06
n	20.00	20.00	16.00
Median (pCi/g)	2.56	1.33	4.56
High (pCi/g)	7.17	2.80	10.70
Low (pCi/g)	0.68	0.58	0.45
Geo. Mean (pCi/g)	2.37	1.38	3.32

Area 4	Th	Ra	U
Mean (pCi/g)	450.47	177.82	246.33
Std. Dev (pCi/g)	333.64	154.10	167.16
Variance (pCi/g)	111314.08	23746.44	27942.17
n	68.00	65.00	62.00
Median (pCi/g)	406.50	132.00	237.47
High (pCi/g)	1500.00	820.00	820.00
Low (pCi/g)	0.50	0.50	0.80
Geo. Mean (pCi/g)	252.76	89.87	146.34

Area 7	Th	Ra	U
Mean (pCi/g)	185.40	132.00	101.87
Std. Dev (pCi/g)	179.60	5.00	101.41
Variance (pCi/g)	32256.16	25.00	10283.79
n	2.00	2.00	2.00
Median (pCi/g)	185.40	132.00	101.87
High (pCi/g)	365.00	137.00	203.28
Low (pCi/g)	5.80	127.00	0.46
Geo. Mean (pCi/g)	46.01	131.91	9.69

Hudson Branch	Th	Ra	U
Mean (pCi/g)	3.88	4.48	2.39
Std. Dev (pCi/g)	6.04	8.80	2.70
Variance (pCi/g)	36.52	77.36	7.31
n	156.00	165.00	160.00
Median (pCi/g)	2.27	1.10	1.38
High (pCi/g)	48.40	77.00	17.40
Low (pCi/g)	0.06	0.09	0.17
Geo. Mean (pCi/g)	2.39	1.60	1.63

Area 2	Th	Ra	U
Mean (pCi/g)	3.49	1.92	2.85
Std. Dev (pCi/g)	3.16	1.81	1.72
Variance (pCi/g)	9.98	3.26	2.96
n	19.00	19.00	19.00
Median (pCi/g)	2.02	1.08	2.11
High (pCi/g)	12.40	7.97	7.13
Low (pCi/g)	0.36	0.40	0.33
Geo. Mean (pCi/g)	2.38	1.40	2.37

Area 5	Th	Ra	U
Mean (pCi/g)	27.00	23.58	10.51
Std. Dev (pCi/g)	22.82	50.46	13.86
Variance (pCi/g)	520.56	2546.32	192.01
n	20.00	20.00	16.00
Median (pCi/g)	22.80	12.50	6.27
High (pCi/g)	98.70	240.00	58.60
Low (pCi/g)	1.69	1.20	0.66
Geo. Mean (pCi/g)	17.82	9.62	5.14

Area 8	Th	Ra	U
Mean (pCi/g)	38.43	22.39	15.80
Std. Dev (pCi/g)	27.42	15.46	7.82
Variance (pCi/g)	751.80	238.87	61.09
n	29.00	14.00	29.00
Median (pCi/g)	37.40	20.95	15.58
High (pCi/g)	128.70	67.00	34.00
Low (pCi/g)	1.10	5.20	1.04
Geo. Mean (pCi/g)	27.38	17.57	13.21

SW Fenceline	Th	Ra	U
Mean (pCi/g)	14.10	5.31	7.33
Std. Dev (pCi/g)	5.38	1.33	5.32
Variance (pCi/g)	28.90	1.78	28.35
n	4.00	4.00	3.00
Median (pCi/g)	13.41	5.33	8.48
High (pCi/g)	21.30	7.04	13.20
Low (pCi/g)	8.27	3.54	0.31
Geo. Mean (pCi/g)	13.06	5.13	3.26

Area 3	Th	Ra	U
Mean (pCi/g)	417.33	264.00	240.79
Std. Dev (pCi/g)	36.94	20.61	23.66
Variance (pCi/g)	1364.22	424.67	559.62
n	3.00	3.00	3.00
Median (pCi/g)	412.00	260.00	243.54
High (pCi/g)	465.00	291.00	268.29
Low (pCi/g)	375.00	241.00	210.54
Geo. Mean (pCi/g)	415.71	263.21	239.61

Area 6	Th	Ra	U
Mean (pCi/g)	836.53	185.06	144.38
Std. Dev (pCi/g)	598.95	270.31	126.80
Variance (pCi/g)	358350.94	73067.66	16028.09
n	23.00	23.00	23.00
Median (pCi/g)	767.00	92.20	104.94
High (pCi/g)	2120.00	1340.00	547.80
Low (pCi/g)	18.00	9.87	4.92
Geo. Mean (pCi/g)	512.48	108.14	82.76

Area 9	Th	Ra	U
Mean (pCi/g)	50.40	60.35	22.74
Std. Dev (pCi/g)	38.05	34.86	11.28
Variance (pCi/g)	1447.92	1214.97	127.16
n	5.00	5.00	5.00
Median (pCi/g)	37.90	60.20	24.62
High (pCi/g)	117.00	108.00	38.61
Low (pCi/g)	6.90	1.25	5.12
Geo. Mean (pCi/g)	34.87	32.19	18.77

All Areas**	Th-232	Ra-226	U-238
Mean	277.62	103.12	114.89

**Excludes Hudson Branch

**Storage Yard Description
(Physical Estimates)**

Area	Contents	By Area			
		Volume (m3)	Volume Percent	Mass (kg)	Mass Percent
1	Excavated soil from the former vanadium slag laydown area	11,000	17.4%	22,059,820	18.9%
2	Excavated soil from the demolition of bldg. D111	800	1.3%	1,286,693	1.1%
3	CANAL (crushed slag from Area 4)	2,300	3.6%	6,064,154	5.2%
4	FeCb slag from the electric arc process	23,000	36.4%	51,449,580	44.0%
5A	FeCb slag from the electric arc process	4,900	7.8%	4,458,963	3.8%
5B	Concrete from the demolition of bldg. D111	3,900	6.2%	3,527,971	3.0%
6	FeCb slag from the aluminothermic process	1,500	2.4%	3,429,972	2.9%
7	Combination of Area 4, 6 and 8 materials (assumed to be all slag for material estimating purposes)	800	1.3%	1,592,487	1.4%
8	Baghouse Dust	10,000	15.8%	15,924,870	13.6%
9	Combination of Area 4 and 8 materials (assumed to be all baghouse dust for material estimating purposes)	3,100	4.9%	7,104,942	6.1%
Other	Excavated soil from elsewhere on site	1,900	3.0%	191	0.0%
Totals:		63,200	100%	116,899,643	100%

UNITED STATES COURT OF APPEAL FOR THE THIRD CIRCUIT
DOCKET NOS. 06-5140, 07-1559 AND 07-1756

STATE OF NEW JERSEY,)	
)	PETITION FOR REVIEW
)	OF THE FINAL ISSUANCE
Petitioner,)	OF NUREG-1757 BY THE
)	UNITED STATES NUCLEAR
v.)	REGULATORY COMMISSION
)	
UNITED STATES NUCLEAR REGULATORY)	
COMMISSION and UNITED STATES)	
OF AMERICA,)	
)	
Respondents.)	

BRIEF ON BEHALF OF PETITIONER, STATE OF NEW JERSEY

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LEGAL ARGUMENT

POINT I

THIS COURT SHOULD DIRECT THE NRC TO RESCIND
THE LTC LICENSE BECAUSE THE NRC FAILED TO
CONDUCT RULEMAKING. 30

POINT II

THE AMENDED PORTION OF NUREG-1757 CONCERNING
THE LTC LICENSE, THE LA/RC, THE 1,000-YEAR
MODELING, AND THE 1,000-YEAR INVESTMENT RATE
IS ARBITRARY AND CAPRICIOUS. 34

A. The LTC License and Legal Agreement and

Restricted Covenant ("LA/RC"), as Institutional Controls for the Onsite Disposal of Waste Containing Long-Lived Nuclides, are Arbitrary and Capricious. 36

E. The 1,000-Year Modeling is Arbitrary and Capricious for waste that will Remain a Radiological Hazard Well After 1,000 Years. 43

C. NUREG-1757's Arbitrary and Capricious Use of a Discount Rate Over 1,000 Years Renders Future Generations Valueless in Determining Whether to Further Reduce Residual Radioactivity for a Decommissioning Site. 45

D. NUREG-1757's Provisions Regarding Financial Assurance are Arbitrary and Capricious because it Fails to Provide Sufficient Funds to Maintain a Decommissioning Site Containing Long-Lived Nuclides. 49

POINT III

THE NRC VIOLATED THE NATIONAL ENVIRONMENTAL POLICY ACT WHEN IT FAILED TO CONDUCT AN ENVIRONMENTAL IMPACT STATEMENT FOR THE COMPLETELY NEW LTC LICENSE AND FOR CERTAIN OTHER PROVISIONS OF NUREG-1757. 50

POINT IV

THE NJDEP IS ENTITLED TO A HEARING BEFORE THE NRC ON NUREG-1757. 58

CONCLUSION. 60

LEGAL ARGUMENT

Point I

THIS COURT SHOULD DIRECT THE NRC TO RESCIND THE LTC LICENSE BECAUSE THE NRC FAILED TO CONDUCT RULEMAKING.

The NRC is required to promulgate rules or regulations when setting forth the information an applicant for a license is required to submit or when the NRC establishes the form and conditions of a license. The NRC may not use guidance documents, such as NUREG-1757, in taking these actions. The NRC should therefore be required to rescind the LTC license provisions of NUREG-1757. The standard of review is whether the agency action is "not in accordance with law." Dep't of Env'tl. Conservation v. EPA, 540 U.S. 461, 496-97 (2004).

The AEA provides as follows:

Each application for a license hereunder shall be in writing and shall specifically state such information as the Commission, by rule or regulation, may determine to be necessary to decide such of the technical and financial qualifications of the applicant, the character of the applicant, the citizenship of the applicant, or any other qualifications of the applicant as the Commission may deem appropriate for the license.

42 U.S.C. § 2232(a) (emphasis added). The AEA also provides the following: "Each license shall be in such form and contain such terms and conditions as the Commission may, by rule or regulation, prescribe to effectuate the provisions of this chapter." 42 U.S.C.

§ 2233 (emphasis added).

A rule or regulation imposes rights and obligations on a person or entity. Texaco, Inc. v. Federal Power Com., 412 F.2d 740, 744 (3d Cir. 1969). A rule or regulation creates a binding standard on an agency and the regulated public. Cabais v. Egger, 690 F.2d 234, 237 (D.C. Cir. 1982); Guadamuz v. Bowen, 859 F.2d 762, 767 (9th Cir. 1988).

In contrast, NUREG-1757 explicitly states that it is a guidance document that does not establish a binding norm. (NUREG-1757, vol. 1, page xvii, A73 ("This NUREG is not a substitute for NRC regulations, and compliance with it is not required.")). The NRC violated the AEA by creating a new license called LTC license through a guidance document, which enables licensees to apply for and receive an LTC license. Id. page 17-65, A227. NUREG-1757 impermissibly provides various terms and conditions that a LTC license would provide. Id. pages 17-65 to 17-66, 17-79 to 17-80, A227-A228, A241-A242. Furthermore, NUREG-1757 sets forth guidance on the information that an applicant should submit in an application for a LTC license. Id. pages 17-71 to 17-82, A233-A244; vol. 2 pages 2-4 to 2-15.

As discussed above, the LTC license is a major policy reversal for the NRC. Formerly, a decommissioning facility with radioactive waste that presents a long-term hazard could either dispose of the waste at a licensed waste disposal facility or the

decommissioning facility could conduct onsite disposal if the Federal or State government was willing to take control and ownership of the site. 62 Fed. Reg. at 39088, 39070 (Response to comment B.3.3); NUREG-1727, pages 16.5 n.2, 16.6, 16.11, A357, A358, A363. However, the NRC made this major policy reversal by simply slipping the LTC license into an amendment to an existing guidance document and posting the revised guidance document on its website at www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757.

The NRC made this major policy reversal without any rational analysis. As discussed above, NRC Staff's analysis of the LTC license is contradictory and irreconcilable. For example, with regard to the institutional controls required by the LTR for properties released under restricted conditions, NRC Staff's analysis in SECY-03-0069 reiterated the NRC's previous policies: "more stringent controls will be required for exposures beyond the 100-year period, such as legally enforceable deed restrictions and/or control backed up by State or local government control or ownership." (SECY 03-0069, Attachment 1, Pages 18 to 19, A507-A508). The document further stated that "[t]he controls should be expected to last as long as they are needed." Id. at 19, A508. The document states that higher-hazard materials or long-lived nuclides require more durable institutional controls. Id. at 31, A520. The most durable institutional controls are stated to be

Federal or State ownership and control of the site. Id. In contrast to these pronouncements, SECY-03-0069 also states that a new recommended option, the possession-only license, may be utilized in lieu of Federal or State ownership and control for sites containing long-lived nuclides. Id. at 25, A514. SECY-03-0069 states that "for long-lived radionuclides, the license would likely be permanent." Id. at 26, A515. SECY-06-0143, which contained NRC Staff's response to stakeholder comments to SECY-03-0069, contained similar irreconcilable contradictions as were contained in SECY-03-0069.

Because the NRC failed to conduct the required rulemaking before offering the LTC license, the NRC insulated itself from obvious public health and safety concerns. The NRC proposed the LTC license to constitute the institutional controls for onsite disposals of radioactive waste that present a long-term hazard. (NUREG-1757 vol. 1 pages 17-65 to 67, A227-A229). The LTC license would require the licensee, a private entity, to maintain engineered controls, fencing, signs, and access restrictions for as long as the radiological hazard exists, which in some cases would be forever. Id. It is self-evident that a private entity cannot be expected to endure for millions and even billions of years to maintain the requirements of the LTC license, and any financial assurance posted upon the decommissioning will not endure to maintain the decommissioned site to perpetuity. It is also self-

evident that an applicant should be required to conduct modeling for the duration that the site will remain a radioactive risk. See Nuclear Energy Inst. v. Environmental Prot. Agency, 373 F.3d 1251, 1273 (D.C. Cir. 2004). Because the NRC failed to conduct rulemaking, it only received twelve public comments on the LTC license. (Public Comments, A410-A457; SECY-06-0143, Enclosure 1, A538).

In light of the AEA's requirement to promulgate rules and regulations that set forth the information required to be submitted by a license applicant, 42 U.S.C. § 2232(a), and rules and regulations that set forth the form, terms and conditions of its licenses, 42 U.S.C. § 2233, the NRC should be required to rescind the LTC license provisions of NUREG-1757.

Point II

THE AMENDED PORTION OF NUREG-1757 CONCERNING THE LTC LICENSE, THE LA/RC, THE 1,000-YEAR MODELING, AND THE 1,000-YEAR INVESTMENT RATE IS ARBITRARY AND CAPRICIOUS.

Courts must set aside agency action, findings or conclusions that are arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law. 5 U.S.C. § 706(2)(a). The arbitrary and capricious standard requires a searching inquiry into the facts to determine whether the agency action was based on a consideration of the relevant factors and determine that there

has been no clear error of judgment. Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402, 413-14, 416 (1971).

An agency rule will be arbitrary and capricious if the agency entirely fails to consider an important aspect of a problem, offers an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it cannot be ascribed to a difference in view or the product of agency expertise. Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983); NVE Inc. v. HHS, 436 F.3d 182, 190 (3d Cir. 2006) (stating standard elements and that reversal is appropriate where the administrative action is irrational or not based on relevant factors).

Unexplained inconsistency in action taken by the agency can be considered an arbitrary and capricious change from agency practice. Alaska Dep't of Env'tl. Conservation, 540 U.S. at 497 (2004). A sudden or unexplained change or a change that does not take account of legitimate reliance on prior interpretation may be considered arbitrary and capricious or an abuse of discretion. Smiley v. Citibank (S.D.), N.A., 517 U.S. 735, 740-41 (1996). An unexplained inconsistency was found by the Third Circuit to be arbitrary and capricious in Prometheus Radio Project v. FCC, 373 F.3d 372, 389-90 (3d Cir. 2004) (FCC found to have acted arbitrarily in replacing existing limits on media ownership with single set of limits and agency assumptions of market share were

unreasonable). The court said "an agency that departs from its 'former views' is 'obliged to supply a reasoned analysis for the change beyond that which may be required when an agency does not act in the first instance' in order to survive judicial scrutiny under the APA." Id. at 390.

A. The LTC License and Legal Agreement and Restricted Covenant ("LA/RC"), as Institutional Controls for the Onsite Disposal of Waste Containing Long-Lived Nuclides, are Arbitrary and Capricious.

By issuing the LTC license and legal agreement and restricted covenant ("LA/RC"), the NRC changed long-standing policy that previously required governmental control and ownership over radioactive waste sites containing long-lived nuclides. The NRC made this change without conducting rulemaking, and instead, slipped changes into a guidance document titled NUREG-1757 and posted it on its website. Furthermore, NRC's history leading up to NUREG-1757 is fraught with inconsistencies. By allowing the LTC license or LA/RC in lieu of government ownership and control for sites containing long-lived nuclides, the NRC assumes that a private entity subject to one of these instruments can endure to maintain an engineered barrier and site restrictions to protect the public health and safety to perpetuity. The NRC's actions here are clearly arbitrary and capricious.

The LTR requires "legally enforceable institutional

controls that provide reasonable assurance that the TEDE [Total Effective Dose Equivalent] from residual radioactivity distinguishable from background to the average member of the critical group will not exceed" a specified level. 10 C.F.R. § 20.1403(b). NUREG-1757 provides new institutional controls for long-lived nuclides, the LTC license and the LA/RC, which would require the instrument holder to maintain site restrictions and engineered barriers. (NUREG-1757 vol. 1 page 17-65, A227.) NUREG-1757 allows a LTC license or a LA/RC to constitute the durable institutional controls in cases where the licensee could not arrange for State or Federal ownership and control of the site. (NUREG-1757 vol. 1 pages 17-65 to 67, A227-A229).

The NRC acted arbitrarily and capriciously by providing the LTC license and LA/RC as options for the institutional controls for long-lived nuclides. It is self-evident that a private entity will not endure for the thousands, millions, or billions of years, the amount of time that certain materials remain a radioactive hazard, to enforce and maintain the institutional controls required by the LTC license or the LA/RC. The only institutional control that can possibly endure over these long time frames is Federal or State ownership and control over the site. Although the LTR requires financial assurance, 10 C.F.R. 20.1403(c), it is also self-evident that an amount of financial assurance posted today cannot be expected to provide a continuous flow of funds over

thousands, millions, or billions of years into the future to maintain site restrictions and engineered barriers. By providing the LTC license for long-lived nuclides, NRC failed to comply with its mandate to protect the public health and safety. See 42 U.S.C. §§ 2012(d), 2013(d), 2099, 2201(b).

Prior to the introduction of the LTC license and the LA/RC, Federal or State ownership and control was expected to constitute the institutional control for long-lived nuclides. See 62 Fed. Reg. at 39070 (Response to comment B.3.3); SECY-02-0008 at 2-3, A467-A468; NUREG-1727 at 16.5 n.2, 16.6, 16.11, A357, A358, A363). This policy was consistent with the requirement of Federal or State ownership and control of the site for disposal facilities that are licensed to accept low-level radioactive waste from other persons, 10 C.F.R. §61.59(a), high-level radioactive waste disposal facilities, 42 U.S.C. §10131(a)(4), (a)(5), and uranium and thorium recovery facilities, 42 U.S.C. §2113(b)(1)(A).

In September 2005, the NRC committed a complete reversal in policy and practice without any rulemaking or rational analysis when it proposed to allow decommissioning facilities to leave their long-lived nuclides without Federal or State control and ownership of the site. It was then that the NRC issued Draft Supplement 1 to NUREG-1757, which proposed the LTC license and LA/RC. (NUREG-1757 vol. 1 page 17-65, A227). Because the NRC made this major policy change without any rulemaking, the NRC received only twelve public

nuclear fuel may not occur until hundreds of thousands of years after disposal, id. at 1267, and because the compliance assessment should be based on the nuclear waste's peak dosage, the court required that the assessment period be one million years, id. at 1273. The court cited that one of the goals in establishing a compliance assessment is "consistent policies for managing various kinds of long-lived, hazardous materials." Id. at 1267.

This Court should therefore require the NRC to rescind the 1,000-year modeling provisions in NUREG-1757 and require modeling consistent with the particular duration of the hazard posed by the radioactive material which is to be disposed of.

C. NUREG-1757's Arbitrary and Capricious Use of a Discount Rate Over 1,000 Years Renders Future Generations Valueless in Determining Whether to Further Reduce Residual Radioactivity for a Decommissioning Site.

The LTR requires decommissioning facilities to demonstrate that residual radioactivity will be reduced to levels that are as low as reasonably achievable ("ALARA"). 10 C.F.R. §§ 20.1402, 20.1403(a). The LTR defines ALARA as

making every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and

safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

10 C.F.R. §20.1003.

NUREG-1757 instructs facilities to conduct the ALARA analysis by comparing the monetary value of averted radiation doses in the future from disposing radioactive materials offsite with the monetary value of the costs of removing the materials. (NUREG-1757 vol. 2 page N-15, A323). Thus, a particular level of radioactive waste removal only needs to be undertaken if its benefits exceed the costs. Id. NUREG-1757 uses \$2,000 for each rem averted for each person in the future. Id. at N-4, N-15, N-16, A312, A323, A324. However, this cost-benefit analysis is particularly troubling because NUREG-1757 discounts the dollar amount of future doses averted by 7% for each year during the first 100 years and 3% for each year thereafter to compare the present costs of removing radioactive material. Id. at N-4, A312.

"Discounting is a procedure developed by economists in order to evaluate investments that produce future income. The case for discounting begins with the observation that \$100 received today is worth more than \$100 received next year, even in the absence of inflation" because the money received today can begin accruing interest if it is invested. Frank Ackerman and Lisa Heinzerling, Pricing the Priceless: Cost-Benefit Analysis of Environmental Protection, 150 U. Pa. L. Rev. 1553, 1559 (2002).

However, when a discount rate is applied to benefits far into the future, the discount rate model begins to break down. "At a discount rate of five percent, for example, the death of a billion people 500 years from now becomes less serious than the death of one person today." Id. at 1571. "[A] discount rate equal to 5% or more and a time horizon of 100 years or more leads to a present value of 0. Thus any benefit cost analysis comparing present costs with benefits to future generations of more than 100 years will never pass a cost-benefit test." Neill, H. and Neill, R. Perspectives on Radioactive Waste Disposal: A Consideration of Economic Efficiency & Intergenerational Equity page 6 (WM'03 Conference, February 23-27, 2003), A768.

Thus, NUREG-1757's use of such high discount rates for long-lived nuclides, 7% over the first 100 years and 3% thereafter, renders the health and safety and future generations inconsequential and effectively bypasses the LTR requirement that residual radioactivity be ALARA. See 10 C.F.R. §§ 20.1402, 20.1403(a). Use of these discount rates for waste containing long-lived nuclides will skew the ALARA analysis in favor of on-site disposal. Economists generally agree that a discount rate should not be applied over long-time frames. See, e.g., Neill, pages 6, 8 (A768, 770) (Based on a survey of twenty preeminent economists, develops a sliding-scale discount rate which declines to 0% for environmental effects beyond 300 years.); Ackerman and Heinzerling,

150 U. Pa. L. Rev. at 1570-73; Martin Weitzman, Gamma Discounting, 91 Am. Econ. Rev. 260, 261 (March 2001). (Based on a survey of 2,160 economists, develops a sliding-scale discount rate which declines to 0% for environmental effects beyond 300 years.). Thus, NRC's use of the discount rate renders the ALARA analysis meaningless after just 100 years and therefore circumvents the LTR's requirement to "mak[e] every reasonable effort to maintain exposures to radiation as far below the dose limits in this part as is practical." 10 C.F.R. §20.1003. Ignoring the public health and safety benefits of reducing radiation after just 100 years also violates the AEA. See 42 U.S.C. §§ 2012(d), 2013(d), 2099, 2201(b).

Furthermore, the NRC failed to provide any rationale for these high discount rates. The NRC should be prohibited from allowing use of the discount rate over such long-time periods. See Natural Resources Defense Council v. Herrington, 768 F.2d 1355, 1413-14 (D.C. Cir. 1985) (overturning the Department of Energy's use of a discount rate because it failed to present a sufficient justification for the rate used).

D. NUREG-1757's Provisions Regarding Financial Assurance are Arbitrary and Capricious because it Fails to Provide Sufficient Funds to Maintain a Decommissioning Site Containing Long-Lived Nuclides.

NUREG-1757's provisions concerning financial assurance are arbitrary and capricious and violate the LTR's requirement for applicants seeking restricted release decommissioning to post "sufficient financial assurance to enable an independent third party, including a governmental custodian of a site, to assume and carry out responsibilities for any necessary control and maintenance of the site." See 10 C.F.R. § 20.1403(c).

NUREG-1757 allows applicants seeking the restricted release option to assume a 1% rate of return on the financial assurance, even for sites containing long-lived nuclides. (NUREG-1757 vol. 1 page 17-82, A244).

It is self-evident that an investment rate should not be assumed over long time frames. Whereas it is reasonable to use an investment rate in the short-term because an investment can obtain predictable returns and maintenance costs for a decommissioned site are more certain, these factors are less predictable over the course of 1,000 years. A fixed amount of financial assurance posted today cannot provide a constant source of money to perpetuity to maintain site restrictions and engineered barriers at a decommissioned site containing long-lived radioactive waste. Thus, NUREG-1757 violates 10 C.F.R. § 20.1403(c) and the AEA's mandate to

protect the public health and safety by failing require an adequate level of financial assurance for long-lived nuclidies. See 42 U.S.C. §§ 2012(d), 2013(d), 2099, 2201(b).

The NRC failed to give any justification for using a 1% investment rate, except to analogize to the 1% investment rate allowed for uranium mill tailings sites. (NUREG-1757 vol. 1 page 17-82, A244.) However, the NRC also failed to give any justification for the tailings sites. See 45 Fed. Reg. 65521 (Oct. 3, 1980). The NRC has not provided an explanation for how this assumption of a 1% rate of return will meet the regulatory requirement of 10 C.F.R. 20.1403(c) that there be sufficient funds to allow a third party to step in and assume control and maintenance responsibilities. This Court should therefore require the NRC to rescind use of the investment rate for financial assurance.

Point III

THE NRC VIOLATED THE NATIONAL ENVIRONMENTAL POLICY ACT WHEN IT FAILED TO CONDUCT AN ENVIRONMENTAL IMPACT STATEMENT FOR THE COMPLETELY NEW LTC LICENSE AND FOR CERTAIN OTHER PROVISIONS OF NUREG-1757.

The National Environmental Policy Act ("NEPA") requires all federal agencies to prepare a detailed EIS for any proposed major federal action significantly affecting the quality of the human environment. 42 U.S.C. § 4332(1)(C). To demonstrate that an

action will significantly affect the quality of the human environment, the plaintiff must allege facts which, if true, show that the proposed project may significantly degrade some human environmental factor. Sierra Club v. US Forest Service, 843 F.2d 1190, 1193 (9th Cir. 1988). "If substantial questions are raised whether a project may have a significant effect upon the human environment, an EIS must be prepared." Id. (quoting Foundation for North American Wild Sheep v. U.S. Dep't of Agriculture, 681 F.2d 1172, 1177-78 (9th Cir. 1982)).

Normally, when the NRC plans to issue a license amendment or take some other form of regulatory action that requires NEPA compliance, it will conduct an environmental analysis ("EA") stating that there is no significant impact of the proposed action or conduct an EIS reviewing the impact of the proposed action and listing alternatives. 10 C.F.R. §§ 51.20, 51.21. When considering a licensee's request to decommission, the NRC prepares a supplemental EIS for the post-operating license stage or an EA updating the prior environmental review for the facility. 10 C.F.R. §51.95(b). Thus, at a minimum, pursuant to its own NEPA procedures, the NRC should have conducted an EA for its proposed action establishing the LTC license to determine whether there was a significant impact from its action and demonstrate that it considered alternatives. The NRC's own regulations require it to consider the environmental effects of the proposed action; the

impacts of alternatives to the proposed action and alternatives available for reducing or avoiding adverse environmental effects. 10 C.F.R. § 51.71(d); Limerick Ecology Action, supra, 869 F.2d at 725. The standard of review is whether the agency's decision not to conduct an EIS is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." DOT v. Pub. Citizen, 541 U.S. 752, 763 (2004).

The effects of NUREG-1757 represent a marked change in policy and practice for the NRC that has raised substantial questions as to the nature and effect of the new licensing program. (See Part II(A) above). NUREG-1757 involves the first program to allow the long-term disposal of long-lived radioactive waste without government control and ownership of the site at decentralized locations throughout the country. This new program certainly presents uncertain and unknown risks. See id. NUREG-1757 makes it easier for licensees to leave their long-lived radioactive waste at the facility upon decommissioning, which will have cumulative impacts at the various potential sites. (Goodman Dec. ¶ 4, A779-A780. See also Point II(A) above). Therefore, the LTC license guidance significantly affects the human environment, and an EIS should have been prepared.

The NRC's determination that the creation of the LTC license did not require preparation of an EIS was unreasonable. In judging reasonableness, the court must look at whether the agency's

decision was "fully informed and well-considered." Vermont Yankee Nuclear Power Corp. v. National Resources Defense Council, Inc., 435 U.S. 519, 558 (1978). The only role of the court is to insure that the agency took a "hard look" at the environmental consequences of its actions. Kleppe v. Sierra Club, 427 U.S. 390, 410 n.21 (1976). Rather than taking a hard look at the consequences of this program, the NRC took only a cursory look. The NRC's failure to prepare an EIS was arbitrary and capricious and unreasonable. See Nevada v. Dept. of Energy, 457 F.3d 78, 87-88 (D.C. Cir. 2006) (citing Marsh v. Or. Natural Res. Council, 490 U.S. 360, 376 (1989)) (APA's arbitrary and capricious standard applies to a NEPA challenge).

The NRC purportedly will conduct site-specific environmental analyses when licensees proceed under NUREG-1757 to decommission their facilities. However, the NRC cannot avoid the requirements of NEPA by segmenting the LTC license program into individual sites. See, e.g., Sierra Club, supra, 843 F.2d at 1193 (Forest Service's decision not to prepare an EIS for nine timber sales contracts was found to be unreasonable where the environmental assessments it had prepared for individual contracts did not discuss the factors to determine whether the action significantly affects the human environment). "Segmentation of a large or cumulative project into smaller components in order to avoid designating the project a major federal action has been held

to be unlawful." Susquehanna Valley Alliance v. Three Mile Island Nuclear Reactor, 619 F.2d 231, 240 (3rd Cir. 1980) (footnote and citations omitted).

The NRC failed to analyze and set forth a detailed statement of the environmental impacts of the agency's decision to create an entirely new license for long term storage of radioactive waste as required by NEPA. Specifically, the generic environmental impact statement prepared before implementation of the LTC license did not consider the environmental impacts of permanent disposal of long-lived nuclides at various widespread locations. Nor did it consider the overall effect of allowing such storage without the previously required institutional controls, including federal or state ownership of the property. Scientific analysis of important questions such as whether the type of radioactive materials to be covered by the LTC license should be stored collectively or individually, and whether the materials might be more safely stored under geographic or climate conditions found in certain regions of the country, is precluded by the ad hoc approach taken by the NRC. If the NRC is permitted to rely solely on site-specific environmental analyses, many critical environmental impacts, such as the effect of contamination of groundwater and soil at multiple sites as opposed to concentration in just one site, will be ignored and possible alternatives will not be considered. The alternative that should be considered is requiring waste to be disposed at the

waste disposal facilities currently licensed by The NRC. The broader economies of scale for costs and risks should be considered along with the relative convenience of administering only a few larger sites. Moreover, the risk to public safety as well as the risk to the environment posed by terrorist attack are greatly increased with dispersed disposal facilities rather than a centralized site. See, e.g., San Luis Obispo Mothers for Peace, supra, 449 F.3d at 1035 (consideration of the environmental consequences of terrorist attacks is required under NEPA).

The NRC failed to evaluate the cumulative impact of licensing facilities all over the country to store long-lived nuclides which will remain radioactive for literally billions of years. The extent and severity of these cumulative effects should not be the subject of speculation. "The purpose of an EIS is to obviate the need for such speculation by insuring that available data are gathered and analyzed prior to the implementation of the proposed action." Sierra Club, supra, 843 F.2d at 1195. In this case, the NRC should prepare a programmatic EIS to reflect the "broad environmental consequences attendant upon [its] wide-ranging federal program" which is "likely to generate disparate yet related impacts." Nevada v. Dept. of Energy, 457 F.3d 78, 91-92 (D.C. Cir. 2006).⁵ A programmatic EIS should be required where actions are

⁵ This "tiering approach" requires an agency to prepare a programmatic EIS and subsequent site-specific environmental analyses. 40 C.F.R. § 1508.28 (quoted in Nevada, 457 F.3d at

"'connected,' 'cumulative,' or 'sufficiently similar' that a programmatic EIS is 'the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions.'" Id. at 92 (quoting 40 C.F.R. §1508.25(a)). See also Natural Resources Defense Council v. NRC, 539 F.2d 824, 844-45 (2d Cir. 1976) (viewing cumulative environmental impact of interim licensing decisions as a whole, plutonium utilization licenses represented commitment of resources to widespread program and constituted major federal action under NEPA). A programmatic EIS is the only way for the NRC to adequately assess the combined and cumulative environmental impacts of the LTC license program and consider alternatives to the program. By relying solely on site-specific evaluations, the NRC neglects the impact of the program as a whole. The NRC should therefore be required to assess the cumulative impact of NUREG-1757, just as it considered the cumulative impact of allowing restricted release under the LTR in 1997 through its generic environmental impact statement. See 62 Fed. Reg. at 39069 (Section B.3.2).

There is little in the record in this case to support the NRC's decision to implement the long-term control license program, which presents far reaching and potentially adverse environmental consequences from establishing long term nuclear waste disposal sites at disparate locations without an EIS.

90).

Having failed to show that it adequately considered and disclosed the environmental impacts of its actions and that its decision was not arbitrary and capricious, the NRC's implementation of the LTC license guidance should be remanded for such consideration. Id. (citing Balt. Gas & Elect. Co. v. NRDC, 462 U.S. 87, 97-98 (1983)).

Point IV

THE STATE OF NEW JERSEY IS ENTITLED TO A HEARING BEFORE THE NRC ON NUREG-1757.

The NRC's January 12, 2007 Order denied the State's request for a hearing on NUREG-1757 on the ground that NUREG-1757 is non-binding guidance, not a rule or regulation dealing with the activities of licensees.⁶ (A327-A331). The Commission's denial of a hearing should be reversed.

The AEA provides that "in any proceeding for the issuance or modification of rules and regulations dealing with the activities of licensees, . . . the Commission shall grant a hearing upon the request of any person" 42 U.S.C. § 2239(a)(1)(A). An agency action that has the effect of changing a regulation or other existing law entitles a person to a hearing on that action. Citizens Awareness Network, supra, 59 F.3d at 292-93. In Citizens Awareness, the court held that the NRC's policy shift involving an interpretation of an ambiguous regulation required the NRC to grant a hearing pursuant to 42 U.S.C. § 2239(a)(1)(A). 59 F.3d at 292-93. The standard of review is whether the agency action is "not in accordance with law." Alaska Dep't of Env'tl. Conservation v. EPA, 540 U.S. 461 (2004).

⁶The NRC's other ground for denying a hearing, that the State might intervene in the Shieldalloy decommissioning proceeding, has been addressed at length in the State's Brief in Opposition to the pending Motion to Dismiss.

Because NUREG-1757 makes available a completely new license (See Parts I and II(A)) and it provides new standards for decommissioning facilities concerning modeling (See Part II(B)), and financial assurance (See Part II(D)), NUREG-1757 clearly alters existing the NRC regulations and policies dealing with the activities of licensees. The NRC therefore improperly denied the State's request for a hearing on NUREG-1757. (See NRC Hearing denial, A327-A331).

CONCLUSION

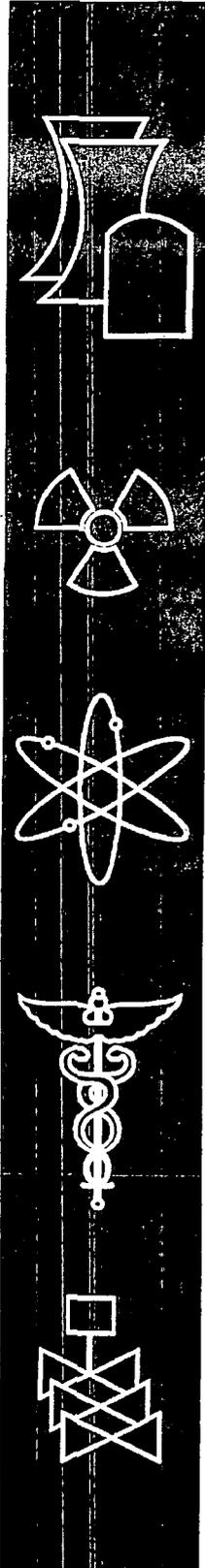
The State of New Jersey respectfully requests that the Court require the NRC to rescind the LTC license on the basis that rules or regulations are required before providing a new license. New Jersey also requests the Court to require the NRC to rescind provisions of NUREG-1757 concerning the LTC license, LA/RC, 1,000-year modeling, and use of discount rates for the ALARA analysis and investment rates for financial assurance on the basis that they are arbitrary and capricious and they violate the AEA. Because the NRC failed to conduct an EIS prior to implementing the Long Term Control license, this Court should require the NRC to rescind the Long Term Control license until the agency meets NEPA requirements. Finally, the NRC should be required to grant New Jersey's request for a hearing on NUREG-1757.

Respectfully submitted,

ANNE MILGRAM
ATTORNEY GENERAL OF NEW JERSEY

Dated: July 3, 2007

By: /s/ Andrew D. Reese
Deputy Attorney General



Consolidated Decommissioning Guidance

Decommissioning Process for Materials Licensees

Final Report

**U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards
Washington, DC 20555-0001**



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Non-NRC Reference Material

Documents available from public and special technical libraries include all open literature items, such as books, journal articles, and transactions, *Federal Register* notices, Federal and State legislation, and congressional reports. Such documents as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings may be purchased from their sponsoring organization.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at—

The NRC Technical Library
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852-2738

These standards are available in the library for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from—

American National Standards Institute
11 West 42nd Street
New York, NY 10036-8002
www.ansi.org
212-642-4900

Legally binding regulatory requirements are stated only in laws; NRC regulations; licenses, including technical specifications; or orders, not in NUREG-series publications. The views expressed in contractor-prepared publications in this series are not necessarily those of the NRC.

The NUREG series comprises (1) technical and administrative reports and books prepared by the staff (NUREG-XXXX) or agency contractors (NUREG/CR-XXXX), (2) proceedings of conferences (NUREG/CP-XXXX), (3) reports resulting from international agreements (NUREG/IA-XXXX), (4) brochures (NUREG/BR-XXXX), and (5) compilations of legal decisions and orders of the Commission and Atomic and Safety Licensing Boards and of Directors' decisions under Section 2.206 of NRC's regulations (NUREG-0750).

FOREWORD

NRC staff suggests that licensees contact NRC or the appropriate Agreement State authority to assure understanding of what actions should be taken to initiate and complete decommissioning at facilities.

In September 2003, U.S. Nuclear Regulatory Commission (NRC) staff in the Office of Nuclear Material Safety and Safeguards (NMSS)¹ consolidated and updated the policies and guidance of its decommissioning program in a three-volume NUREG series, NUREG-1757, "Consolidated Decommissioning Guidance." This NUREG series provides guidance on: planning and implementing license termination under the NRC's License Termination Rule (LTR), in the Code of Federal Regulations (CFR), Title 10, Part 20, Subpart E; complying with the radiological criteria for license termination; and complying with the requirements for financial assurance and recordkeeping for decommissioning and timeliness in decommissioning of materials facilities. The staff periodically updates NUREG-1757, so that it reflects current NRC decommissioning policy.

In September 2005, the staff issued, for public comment, draft Supplement 1 to NUREG-1757, which contained proposed updates to the three volumes of NUREG-1757. Draft Supplement 1 included new and revised decommissioning guidance that addresses some of the LTR implementation issues, which were analyzed by the staff in two Commission papers (SECY-03-0069, *Results of the LTR Analysis*; and SECY-04-0035, *Results of the LTR Analysis of the Use of Intentional Mixing of Contaminated Soil*). These issues include restricted use and institutional controls, onsite disposal of radioactive materials under 10 CFR 20.2002, selection and justification of exposure scenarios based on reasonably foreseeable future land use (realistic scenarios), intentional mixing of contaminated soil, and removal of material after license termination. The staff also developed new and revised guidance on other issues, including engineered barriers.

The staff received stakeholder comments on Draft Supplement 1 and prepared responses to these comments. The stakeholder comments are located on NRC's decommissioning Web site, at <http://www.nrc.gov/what-we-do/regulatory/decommissioning/reg-guides-comm.html>, and the NRC staff responses are located on the same Web site and also in the Agencywide Documents Access and Management System at ML062370521. Supplement 1 has not been finalized as a separate document; instead, updated sections from Supplement 1 have been placed into the appropriate locations in revisions of Volumes 1 and 2 of NUREG-1757. The staff plans to revise Volume 3 of this NUREG series at a later date, and that revision will incorporate the Supplement 1 guidance that is related to Volume 3.

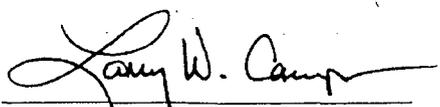
¹ As of September 2006, NRC is planning to reorganize NMSS and the Office of State and Tribal Programs (STP) to create two new offices: the Office of Federal and State Materials and Environmental Management Programs, which will focus on materials programs; and the new NMSS, which will focus on fuel cycle programs. This reorganization is scheduled to take effect on October 1, 2006. This document contains references to NMSS and STP. These references will be updated in future revisions of this document.

Table 3. Summary of Major Changes to Volume 1, Revision 2

Subject	Affected Sections
Restricted Use and Institutional Controls	Section 17.7 Section 17.8 Appendix M
Onsite Disposal of Radioactive Materials under 10 CFR 20.2002	NEW Section 15.12
Intentional Mixing of Contaminated Soil	NEW Section 15.13 Section 17.1.3
Removal of Material after License Termination	NEW Section 15.11.1
Other Issues and Changes	Section 5.2

NUREG-1757 is intended for use by applicants, licensees, NRC license reviewers, and other NRC personnel. It is also available to Agreement States and the public.

This NUREG is not a substitute for NRC regulations, and compliance with it is not required. The NUREG describes approaches that are acceptable to NRC staff. However, methods and solutions different than those in this NUREG will be acceptable, if they provide a basis for concluding that the decommissioning actions are in compliance with NRC regulations.



Larry W. Camper, Director
Division of Waste Management and Environmental Protection
Office of Nuclear Material Safety and Safeguards

and are based on duration and magnitude of the hazard. This approach is flexible and uses risk insights from dose assessments to tailor site-specific restrictions and engineered barriers that would prevent potential disruptive land uses or natural processes important to compliance with the dose criteria. Appendix M also describes how institutional controls combine with other elements, such as engineered barriers, to form a total system to sustain protection.

If a licensee cannot establish acceptable institutional controls or independent third party arrangements, the licensee may propose one of the two new options involving NRC: an NRC long-term control (LTC) license or an NRC legal agreement and restrictive covenant (LA/RC). Both of these options are described in Appendix M of this Volume and are summarized below. These options are new types of legally enforceable and durable institutional controls established by Commission policy (see SECY-03-0069). These options are not for the purpose of storage of radioactive materials; they are to serve as an institutional control mechanism for restricted use decommissioning. These options should not be considered a guaranteed option for decommissioning, but would be used as a last resort for those sites that could not decommission to unrestricted use levels and could not arrange for other institutional controls. Therefore, these options should not encourage or lead to the proliferation of restricted use sites. In addition, for both of these options, all the restricted use requirements of the LTR must be met, to ensure protection of the public health and safety. Furthermore, NRC is taking measures to prevent future decommissioning problem sites (including reducing the number of future restricted use sites) by considering changes to financial assurance requirements and licensee operations, as described in SECY-03-0069 and RIS-2004-08.

The LTC license option is a possession-only license that would be used to satisfy the LTR requirement for legally enforceable and durable (if needed) institutional controls. The conditions of the LTC license would require the licensee to maintain restrictions on site use and any necessary monitoring, maintenance, and reporting. NRC would use inspections and enforcement, if needed, to assure that the licensee's controls and other activities are effective.

The LA/RC option is a combination of a legal agreement and restrictive covenant that provides a legally enforceable and durable institutional control, with the NRC having an oversight role. Under the LA/RC option, the current licensee or site owner and NRC enter into a legal agreement on the restrictions and controls needed for license termination under restricted conditions. The legal agreement includes using a restrictive covenant, which outlines the restrictions on site use and any necessary maintenance, monitoring, or reporting. In accordance with the legal agreement, the licensee or site owner is required to record the restrictive covenant with the appropriate recordation body in the jurisdiction where the site is located, before the site is released under restricted conditions.

It is noted that the LA/RC option has not been implemented by the NRC or legally tested, and NRC's ability to enforce the LA/RC depends on the laws of the jurisdiction where the site is located. Therefore, the licensee must demonstrate that the LA/RC is a legally enforceable institutional control in the jurisdiction where the site is located.

M.3 LONG-TERM CONTROL LICENSE OPTION

NRC staff recommended to the Commission, in SECY-03-0069, that a new type of possession-only specific license for long-term control be established as one option for resolving the LTR institutional control issue at sites where restricted use or alternate criteria could be used. This option should not be considered a guaranteed option, but would be used as a last resort (see Section 17.7 of this volume). This new type of possession-only license is referred to in this guidance as a long-term control (LTC) license to clearly distinguish it from the NRC's existing possession-only licenses for storage. The existing possession-only license is typically used at NRC licensed sites in the operating or decommissioning phases. In contrast, the LTC license is for use as an institutional control in the long-term control phase after completion of decommissioning. A licensee may propose use of an LTC license only if the licensee cannot otherwise establish acceptable institutional controls or independent third party arrangements. Attachment 1 of SECY-03-0069 provides a description and evaluation of the staff's recommended option of possession-only license for long-term control. On November 17, 2003, the Commission approved this LTR recommendation (SRM-SECY-03-0069).

M.3.1 PURPOSE OF LTC LICENSE

The primary purpose of NRC's LTC license is to provide the legally enforceable and durable institutional controls required by 10 CFR 20.1403(b) to ensure the long-term protection of the public health, safety, and the environment. Therefore, the LTC license is for long-term control of a restricted use site after decommissioning is completed. The LTC license is not for the purpose of storage of radioactive materials. It also should not be considered a guaranteed option, but would be a last resort under the criteria in 10 CFR 20.1403(b). With use of an LTC license, the licensee must still meet all the restricted use requirements of the LTR, to ensure protection of the public health and safety.

The conditions of the LTC license would specify the necessary controls to limit site access and land use that the licensee must monitor and maintain and that NRC would inspect and enforce, if necessary. The LTC license also would specify other required long-term control activities to be conducted by the licensee, such as surveillance, maintenance, reporting, records retention, and stakeholder involvement (see guidance below). Detailed plans to implement the LTC license conditions would be given in a Long-Term Control and Maintenance Plan that the licensee would prepare and NRC would approve during decommissioning and before the LTC license is established.

M.3.2 ROLES AND RESPONSIBILITIES

The licensee has the primary responsibility for long-term protection of the public health, safety, and the environment by implementing and then maintaining the effectiveness of the controls required by the LTC license. The licensee would maintain the required site access and land use controls, as well as engineered barriers, using periodic surveillance, maintenance, and

RAS L-251



CHRIS CHRISTIE
Governor

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ROBERT M. HANNA
Director

February 4, 2011

Andrew L. Bates, Acting Secretary
U.S. Nuclear Regulatory Commission
Office of the Secretary
Washington, DC 20555-0001

Re: In re Shieldalloy Metallurgical Corp. (License
Amendment Request for Decommissioning of the
Newfield, NJ Site)
Docket No. 40-7102-MLA

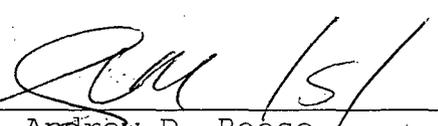
Dear Secretary Bates:

Enclosed please find six copies of the State of New Jersey's letter in response to the NRC's January 3, 2011 Order in the above referenced matter, appendix and certification of service. Electronic versions have been filed.

Respectfully submitted,

PAULA T. DOW
ATTORNEY GENERAL OF NEW JERSEY

By:


Andrew D. Reese
Deputy Attorney General

Enc.

