

Letters from Cooperating Agencies



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
AIR AND RADIATION

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Office of Nuclear Materials Safety and Safeguards
United States Nuclear Regulatory Commission
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Dear Mr. Flanders:

The Environmental Protection Agency (EPA) appreciates the opportunity to serve as a cooperating agency in the review of the Draft Generic Environmental Impact Statement (DGEIS) prepared by NRC to support its upcoming rulemaking on controlling the disposition of solid materials. In particular, we appreciate NRC's desire for a review of those areas in which this action may intersect with EPA programs or authorities. Overall, we view our cooperating agency role with respect to the development of the DGEIS as consultative and our comments as advisory, with NRC retaining sole responsibility for selecting the regulatory approach and choosing among regulatory options. Therefore, while we have provided comments on the DGEIS, we are not expressing a preference regarding the alternatives discussed in the DGEIS.

For completeness, we are attaching our comments on various drafts of the DGEIS. We recognize that many of these comments have already been addressed. We may also choose to submit additional comments, both on the GEIS and the proposed rule, following publication of those documents. We would, however, like to highlight several general points:

1. Although NRC has identified a preferred alternative, the basis for this decision is unclear. The reader would be well-served by a detailed compilation of the reasons for preferring this alternative, whether based on technical analyses or NRC policy.
2. The document would benefit from more clarity in the description of the various alternatives, which solid materials are considered under each alternative, how the alternatives would need to be implemented, and particularly how the alternatives may relate to current regulation and practices.
3. The complexity of the technical analyses, with many details embedded in appendices or separate documents (some still in draft stages), will make it

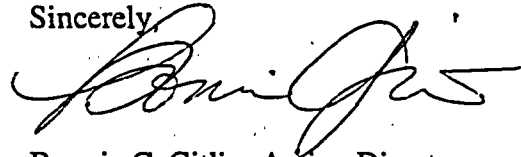
extremely difficult for non-experts to evaluate the assessments underlying the alternatives presented and their relative impacts. Given the level of interest in this topic from the general public, review of the document would be enhanced by a more transparent and simplified presentation of the technical analyses.

4. Many readers are likely to question the impact of the considered alternatives on other NRC policies and regulatory practices, such as those related to decommissioning. It would be useful for the NRC to clearly articulate its views of such issues, which may be appropriate for inclusion in either the GEIS or the Federal Register notice accompanying the regulatory proposal.

5. Readers may also have difficulty in relating some concepts of protectiveness to the alternatives. For example, it may be helpful to provide some perspective on the realistic or conservative nature of assumptions inherent in using collective dose to express the impacts of a standard based on exposures to individuals or applying radionuclide concentrations derived for unrestricted use to specified limited dispositions.

I hope these comments are useful. If you have questions or need further information, please call Adam Klinger at (202) 343-9378.

Sincerely,



Bonnie C. Gitlin, Acting Director
Radiation Protection Division
Office of Radiation and Indoor Air

EPA Comments on Revised Chapter 2
“Proposed Action and Alternatives”
Draft GEIS on Controlling the Disposition of Solid Materials
Draft dated 9/1/04

Comments on this revised chapter are primarily editorial in nature. The most significant conceptual comments relate to Section 2.4.5, "Dose Based Regulation on Limited Dispositions". As described in the document, this section represents a modification of the "conditional release" option, after the broader approach had been eliminated based on concerns about acceptability and tracking future generations of material uses. However, it seems to take a different approach to release criteria and is more limited in evaluation scope than the other alternatives without clearly explaining why. Further, the overall discussion is confusing and internally contradictory.

Individual comments are discussed by section below.

Section 2.0

Footnote 1: Suggest revising to read "...as an area to which *access* is limited...", unless this is a direct quote.

Section 2.3

First paragraph, last two sentences: Suggest revising first sentence to read "Materials considered by this rulemaking are described below". In last sentence, make "characterization" singular.

"Concrete": revise last sentence to read "sidewalks or equipment pedestals to building foundations."

"Metals": revise first sentence to read "...ferrous metals *expected to be* predominant."

"Soils": remove "In terms of quantities" from second sentence.

"Tools and Equipment": in last sentence, replace "those" with "items".

Section 2.4

Figure 2-1: correct the spelling of "dose" in second box under "Alternatives". Under "Variations" for last box on right, replace "Pre-approved use" with "Concrete in road beds" and "Re-use of tools and equipment" to be consistent with the discussion in the text.

Section 2.4.3

In the last sentence before 2.4.4, replace "they are" with "it is".

Section 2.4.5 Conceptual

As noted above, this section seems to take a completely different approach to releases for specific destinations, when compared to Section 2.4.3 (the common destination in both sections is landfill disposal). However, the description of release criteria here seems inconsistent from one paragraph to the next.

The fourth paragraph in this section lays out the basic premise: because NRC is unable to account for potential future generation exposures from released material, it is evaluating each "limited disposition" outlet against a 1 mrem/yr limit "as analyzed for the Unrestricted Release Alternative." This suggests that NRC is evaluating the most conservative scenario (unrestricted release) rather than each specific "limited disposition" scenario. This in itself is a departure from the approach used for the "EPA/State Regulated Disposal" alternative, in which the dose is evaluated for that specific management option. Further, by considering only the 1 mrem dose limit, this section departs further from the methodology already established for the other alternatives. Why not evaluate the same dose options considered under the Unrestricted Release and Landfill Disposal Alternatives (i.e., 0.03, 0.1, 10, IAEA standard, in addition to 1 mrem)?

Fifth paragraph: "...scope of the impacts from these material releases is within that which was defined in this GEIS..." This appears to mean that NRC wants to ensure that materials are in fact going only to these limited dispositions, or that unqualified (higher-activity) material is not being released. However, if evaluations are against unrestricted release criteria, there should be no possibility of higher impacts. If NRC is concerned about compliance with a release standard, should this concern also be raised in Section 2.4.3 (Landfill Disposal), where it would probably also be an issue? In this context, "that" needs to be clarified.

"Landfills": the fourth sentence reads "Licensees would need to demonstrate that doses for disposal of material into a RCRA Subtitle D facility are consistent with the individual dose criterion of 1 mrem/yr." This suggests that approval of this "limited disposition" option is not "as analyzed for the Unrestricted Release Alternative," which contradicts the fourth paragraph as cited above. NRC should clarify whether this "limited disposition" is actually the Landfill Disposal Alternative using the 1 mrem/yr dose limit. If so, that should be less restrictive (i.e., would allow higher concentrations) than the Unrestricted Release Alternative, as there will be some period of control, which may be particularly effective for shorter-lived radionuclides.

"Concrete in Road Beds": the second sentence cites scenarios examined under the Unrestricted Release Alternative that could be relevant to this disposition (workers processing concrete, public driving on roads). NRC needs to clarify the purpose of citing these particular scenarios. These are surely not the only scenarios examined, and if the basis of comparison is the Unrestricted Release Alternative, all scenarios have to be considered, not just those relevant to road bed construction. If these are in fact the scenarios that give the highest exposure, a statement to that effect would clarify this point. The next sentence, referring to "doses for recycling of concrete

into roadbed material", raises the same question as the preceding discussion of landfill disposal. Is the basis of comparison the Unrestricted Release Alternative, or is it the specific disposition under consideration?

"Case-specific approvals": the last sentence states that a "licensee could have to provide...a dose assessment for a case-specific disposition application." Again, the question of unrestricted vs. disposition-specific assessments should be clarified. Further, although "[i]t is expected that such applications would address end-uses for limited types and amounts of materials," NRC should consider whether it is creating the kind of open-ended conditional release environment it has attempted to avoid if such applications are not sufficiently "limited". Despite requiring "reasonable assurance that such materials are kept out of disposition paths not allowed", it seems that there would be the same problems with subsequent generation uses that raised concerns with a broader conditional release approach (if not, NRC should explain why there is the presumption of greater control over future uses for the "limited disposition" alternative). NRC should also clarify whether this process is also subject to the 1 mrem/yr limit. It would seem contradictory to exclude some uses from the generic analyses, presumably because they are publicly sensitive, more likely to cause exposures (at higher levels or to more people), or more difficult to control, and then allow case-specific releases for those very same uses when assessed against a higher dose limit.

Section 2.4.5 Editorial:

"Concrete in Road Beds": first sentence, "...could be recycled *into* roadbed material." Next sentence, replace "we" with "NRC".

Section 2.5.1:

EPA notes that NRC has been responsive to earlier comments and provided additional discussion of why it does not consider the ANSI standard appropriate for a dose-based clearance regulation. However, EPA also notes that the State of Texas recently issued a draft proposed rule for comment that included a 1 mrem/yr clearance standard based upon use of the ANSI standard. As Texas is an Agreement State, the compatibility of its program with NRC requirements could be affected if it issues a rule based on a standard that NRC expressly rejects. EPA suggests that it may be prudent for NRC to minimize the potential for such compatibility conflicts by taking steps to communicate its concerns over use of the ANSI standard to the Agreement States. In doing so, NRC need not state that it has eliminated the ANSI standard from consideration as a basis for its dose-based regulation.

Section 2.6:

First paragraph: the last sentence is awkward as well as confusing: "The time period of this analysis is 1,000 years, which is the time when potentially clearable materials from existing licensees would occur." This sounds as though NRC is suggesting that "existing licensees" will still be found in 1,000 years. Further, stating that "materials would...occur" gives the impression that they may appear

spontaneously. Perhaps this should read "when *impacts from* potentially..." Finally, there were references in the previous draft to much shorter times (the "period of proposed action" was on the order of 50 years, and some of the results referenced 250 years). Will all results now cover the 1,000 year period?

**U.S. Environmental Protection Agency
Office of Radiation and Indoor Air
Preliminary Comments on Draft Generic Environmental Impact Statement (DGEIS)
Controlling the Disposition of Solid Materials
December, 2004 Version**

The Environmental Protection Agency (EPA) appreciates the opportunity to offer the following preliminary comments in preparation for meetings between cooperating agencies and NRC management and staff on January 11-12, 2005.

1. The reliance on RS-G-1.7 raises some issues that appear not to be clearly described in the DGEIS. Of most importance is probably the dose basis for deriving the concentrations in that document. The DGEIS characterizes it as 1 mrem/yr, which is true for artificial radionuclides. However, the concentration for natural radionuclides is based on "the upper end of the worldwide distribution of activity concentrations in soil" and is evaluated against 100 mrem/yr (section 3.3). This results, for example, in radium concentrations more than 5 times EPA's cleanup standard of 5 pCi/g. The DGEIS does not appear to explain this fact.
2. The DGEIS is not clear about the inclusion of soils in the various Alternatives. The impression we have is that soil would be included in the Unrestricted Release and Regulated Disposal Alternatives, but not in the Limited Dispositions Alternative. Again, reference to RS-G-1.7 appears key, as page 2-9 (and ES-5) states that "the IAEA standard does not apply to soils." However, the standard itself makes distinction only between bulk (> 1 tonne) and non-bulk (< 1 tonne) quantities, not to the description of the material involved. Soils in smaller amounts would seem to be covered by the standard. If NRC deems soils to be not covered by RS-G-1.7, is the scope of the analyses under the Unrestricted Release and Regulated Disposal Alternatives different for the RS-G-1.7 option as opposed to the other dose-based options?
3. DOE's comments regarding the description of scenarios and reasons for excluding certain Alternatives are consistent with comments we have made previously. For example, page 3-7 states that only the use of concrete in roadbed was analyzed because that is the end-use of 85% of recycled concrete. Without knowing what uses the other 15% goes to, how can we tell whether roadbed construction is actually the limiting scenario? We also agree with the references to the "case by case" evaluations that are built in to the Limited Dispositions Alternative. As we commented earlier on the revised Chapter 2, it is not clear how this process would improve upon the existing process, which NRC is trying to replace, or whether it would result in approvals for use of higher-activity material in ways not covered by the "limited dispositions". Further, it is not clear why a similar process is not part of the Unrestricted Release Alternative (although for disposal, we recognize that 10 CFR 20.2002 fulfills that purpose).
4. A number of the results in Chapter 3 appear anomalous, particularly those connected with RS-G-1.7. In general, one would expect results for RS-G-1.7 to be comparable to those for the 1 mrem/yr option. However, this does not appear to be the case, and there is not a clear explanation of the differences between the two methods (some of this detail may be in appendices, but there should be clear recognition in the text that the reader will

question the reasons for the apparent discrepancies). For example, in Table 3-5, RS-G-1.7 releases more than twice the radioactivity as the 1 mrem/yr option, yet the dose to LLW disposal facility workers is also doubled. Why should the dose to those workers increase from an option that diverts more material away from those facilities? Further, in comparing Table 3-5 to Table 3-7, one finds that the dose to LLW facility workers when no material is released is only 34 person-rem. This must be the most limiting scenario. How can the RS-G-1.7 option result in higher doses (other options are within rounding errors)? As a final example, in Table 3-14 the RS-G-1.7 collective dose from medical centers is twice all other options shown, including the No Action Alternative.

5. Transportation impacts are based on vehicle miles traveled, regardless of cargo. It would seem that there is sufficient experience to evaluate transportation accident rates for radioactive or hazardous cargo separately from other types of shipments. Our understanding is that transporters of radioactive material must receive additional training and licensing, which may be reflected in lower accident rates. Applying this information (which may be difficult to obtain) would give some idea of the conservatisms involved in the current analysis, although it would necessitate partitioning shipments into released material (say, to a landfill) and material that continues to be regulated (LLW disposal).

6. We second the Massachusetts comment regarding rubblization and standards applicable to license termination or off-site release. NRC should clarify its position regarding leaving material on-site and the potential effects of the disposition effort on its policies.

7. In a related comment, RS-G-1.7 may not be appropriate for material with surface contamination only. For example, there are situations in which licensees break up surficially-contaminated concrete and mix it with "clean" concrete to meet the site's release criteria. How would the standard be applied to such bulk non-homogeneous material? If sufficiently crushed, would the residual be treated like soil?

8. The discussion of cost-benefit analysis raises questions regarding the release of equipment. The text on page 4-7 states that there are no estimates of the quantity of equipment released. If so, how can collective doses be calculated? How can costs and benefits be estimated?

**U.S. Environmental Protection Agency
Office of Radiation and Indoor Air
Comments on Draft Generic Environmental Impact Statement (DGEIS)
Controlling the Disposition of Solid Materials
February 9, 2004 version**

GENERAL COMMENTS:

1. Discussion of Alternatives: Recognizing the complexity of the alternatives and analyses involved, we recommend greater clarity to ensure that the reader can follow exactly which alternative is under discussion at any place in the document. For example, in Chapter 3, the discussion of the exposure pathways for the No Action and Unrestricted Use Alternatives are combined. This makes sense, as they are likely to include the same activities, if not the same levels of those activities. In Chapter 4, however, results for alternatives and scenarios are continually mixed in ways that make the discussion less clear.

For example, in Section 4.3.2, the last sentence of the first paragraph states "Radiological impacts for the No Action Alternative and the Unrestricted Use Alternative are discussed in separate sections because of the differences in the collective dose results for the two Alternatives." Section 4.3.2.1 focuses on the No Action Alternative. However, Tables 4-13 through 4-15 provide steel and concrete dose results for both the No Action and Unrestricted Use Alternatives, so that the "differences in the collective dose results" are not apparent. The presentation is further confused by the use of first-year and 30-year collective dose estimates for 1,000 tons of material, without providing the rationale for either, other than as an illustration of the relative doses from various end uses (e.g., why 30 years instead of the period of the Proposed Action (45-50 years), or the 250 years also mentioned in this section as a period for analysis?). The discussion under the heading "Non-Licensed Facility Worker Collective Dose," in which these tables occur, focuses on the fact that the collective dose results from General Public end uses are dominant. The next heading, "General Public Collective Dose," is a single paragraph focusing on steel. The reference is to Table 4-16, which gives the collective dose for all materials released from nuclear reactors for the No Action Alternative. Over what time period are these doses incurred? 1, 30, 50, 250 years?

There also needs to be more explanation/illustration of the concepts of "material specific" and "material independent" analyses in Section 4.1.3. While they are not that complicated, it appears that applying these concepts would have a significant effect on the amount of material that could be released under the various Alternatives. A clearly illustrated example would help the reader keep these concepts straight and understand the differences.

2. ANSI Standard: More detailed explanation on the differences between the 1 mrem/yr option and the ANSI standard is needed. Footnote 1 of the draft GEIS Chapter on the Collective Dose Report appears to be the most lengthy discussion. What scenarios and methodologies were used to develop the ANSI standard so that it "does not model 'clearance' dose properly"? Why does it not apply to soils intended for agricultural use? Does it apply to other soils? Most important, what can explain the radical difference in cost-benefit shown in Table 6-3? NRC's 1 mrem level

shows several hundred million dollar benefits, while the ANSI standard shows costs of the same magnitude.

3. Collective Dose: The concept of applying an individual dose criterion, but analyzing it using collective dose, is unclear and difficult to grasp. It appears that the "collective dose" begins with the dose to the average member of a critical group and is then propagated somehow to the larger population. Are there estimates of the number of such critical groups? Where are the details of the critical groups described (e.g., size, lifestyle)? This information may be in the Collective Dose Report, but there should be a clear reference in the GEIS (the proposed summary chapter does not address this part of the methodology).

It is likely that released materials will end up outside the system of regulatory control. That is to say, once a solid material has been "released," there can no longer be a reliance on compliance enforcement activities to ensure that anticipated dose limits are not being exceeded. This assurance must then rely on the modeling and measurement activities performed in support of the NRC's rule authorizing such releases. It appears that NRC is using the calculation of collective dose as a means of determining the health consequences to the population from various scenarios. The technical work presented in the Collective Dose Report seems appropriate as a means of estimating population health effects. However, there does not appear to be a method for determining that individual dose limits will not be exceeded.

The problem comes down to the question of attributable risk versus individual risk. EPA generally regulates solid waste so that the risk to a reasonably maximally exposed (RME) individual (hypothetical) is deemed acceptable. In this approach, the size of the population at risk is irrelevant if the risk to any supposed RME receptor is too high. The collective dose approach, on the other hand, appears to rely only on the total population dose (and resulting risk) as a means of determining the acceptability of a practice. For example, suppose ten thousand people live near a Superfund site that is giving them each a $10 \text{ E-}3$ risk (exceeding the upper bound of EPA's risk range by an order of magnitude). A collective dose approach would say that the impact to this population would be the same as to a similar population of 100,000 people each receiving a $10 \text{ E-}4$ risk. On the other hand, an individual dose limit approach would say the 10,000 people were unacceptably exposed whereas the 100,000 people might not need to have their doses reduced.

NRC needs to be more explicit about the role of the collective dose analysis and how it relates to its various proposed individual dose standards. NRC also needs to clarify what is meant by this standard as a release standard. Does the release standard represent a level that cannot be exceeded? If the release standard is 1 millirem, is it acceptable that the rare individual gets 3, 5 or even 10 millirem if the population average is consistently well below the product of the release standard (1 millirem in this case) x the total number of people exposed to the released material? If not, what mechanism is there to ensure that individuals are not exposed to levels that would exceed acceptable ranges of dose or risk? NRC needs to make sure that people understand the type of standard it is creating, its basis and how it will be used.

4. Evaluation of Doses from Alternatives: Two aspects of the exposure assessment that should

be discussed in more detail are the selection of end uses and the selection of exposure pathways or receptors for each end use. These are most significant for the No Action and Unrestricted Use Alternatives.

Although focusing on the most frequent use of cleared material is a sensible approach to assess potential doses, that approach is always open to criticism if other, less frequent uses, result in higher doses (presumably to smaller numbers of affected individuals or groups). For example, more attention should be given to the uses of concrete for other than road construction. It may not be sufficient to say that the primary use (85%, according to page 3-16) is the only one that should be evaluated. It may be that higher doses could result from one of the other uses cited (e.g., sidewalk construction, roofing materials, landscaping). For example, sidewalks or plazas at a local park could expose people who spend more time there (e.g., eating lunch) than would a driver on an interstate highway.

In the pathway or receptor selection, for the road construction end use, is the potential variation in dose for different types of roads considered? Is there a difference between a local road in a residential subdivision and an interstate highway? What is the significance of different traffic speeds, or sitting in traffic for extended periods of time? In that analysis, some attention should be given to exposures incurred by someone other than the driver, through the pathways outlined in Chapter 3. In the case of a local road, it is not uncommon for children to play in the street. Road erosion over a period of years could also make radionuclides more available to surrounding populations and present potential pathways of exposure through ground or surface waters. Differences in construction practices for local roads and highways may affect their longevity.

As another example, use of contaminated steel in bridges may be the common usage, but is it possible that contaminated steel finding its way into bed frames would give a higher dose to someone sleeping on that bed every night for 20 years? To avoid the criticism about ignoring less frequent uses that give higher doses, the assessments should demonstrate that these uses do not give higher individual doses or provide an explicit rationale for not weighing such uses as heavily as the more common usages in the clearance decision making.

5. Characterization of Candidate Materials: Readers of the GEIS are likely to express interest in having the potentially cleared material characterized by radionuclide, in addition to estimates of total activity. We find that members of the general public are often most concerned about certain radionuclides (e.g., Pu). If this material is present in the Collective Dose Report, it should be clearly referenced in the GEIS.

6. Envirocare as presumed destination for all material destined for LLRW Disposal: Waste considered for disposal in LLRW facilities are assumed to go to Envirocare because "very little of the solid material would be eligible for disposal at these sites." (Pg. 2-8) But, for example, wouldn't waste from Atlantic Compact States – states with an appreciable number of commercial reactors – be eligible to go to Barnwell after 2008? Is it really a matter of eligibility or are assumptions also being made about the relative economics of these two facilities. If so, such assumptions should be clarified. Not clear, whether the Northwest compact states would have similar issues with respect to the Richland facility.

SPECIFIC COMMENTS:

Acronyms, Abbreviations, and Terms:

DNAPL, LNAPL: give the full term, not a description (definition could go in Glossary).

POTW: Publicly Owned Treatment Works (not Facility)

Chapter 1: Purpose and Need

Editorial (and throughout): use consistent format when citing the Federal Register (underline or italics), when citing reports (italics or quotes), when citing "U.S." or "US" (see Appendix F), "titled" vs. "entitled".

Page 1-3, first full paragraph: ensure that (c) replaces copyright symbol.

Page 1-3, second paragraph: consistency in referring to "no, or very small amounts of" (compare to page 1-4, first paragraph, "very low amounts of, or no")

Page 1-4, second paragraph: "Federal Register Notice" (neither underlined nor italicized)

Page 1-5, first paragraph, sixth sentence: "...although it does not currently..."

Page 1-5, second paragraph, first sentence: "NRC's goal in preparing this Draft..."

Page 1-5, last bullet: should other pollutants be discussed in evaluating transportation as they are for processing, as noted in the bullet on Air Quality on page 1-6 ("other priority air pollutants")? It appears from Appendix F (page F-8 and Tables F-2 and F-3) that some consideration is being given to truck emissions. Both the "Transportation" and "Air Quality" bullets should be clear about including truck emissions. Suggest revising last sentence under "Transportation" to read "credible accident and terrorist scenarios."

Page 1-6, bullet on "Irreversible and Irrecoverable Commitment of Resources", is there consideration of management in energy recovery facilities rather than incineration?

Page 1-6, bullet on "Cost-Benefit Analysis", expand to summarize the scope of the analyses, e.g., "summarizes the environmental and economic costs and benefits of NRC's current approach to solid materials management (baseline), as well as three alternative "nationally consistent" approaches, involving six categories of solid materials (steel, concrete, copper, aluminum, trash, and soil) generated by six types of NRC-licensed industrial facilities."

Page 1-7, third paragraph: although it is in the Glossary, should provide a brief definition for this first use of "Agreement State". Even "see Glossary" would remind the reader that there is a Glossary.

Chapter 2: Proposed Action and Alternatives

Page 2-2, last bullet at top: remove comma before parenthetical

Page 2-2, Alternative 4: perhaps this should read "EPA/State Regulated Landfills", as the Subtitle D program is primarily a State responsibility. Unlike the Subtitle C program, EPA does not delegate Subtitle D authority to the States. This would parallel the term "NRC/AS" in Alternative 5.

Page 2-2, Alternative 5: as this is the first use of the phrase "NRC/AS", should clarify that "AS" means "Agreement State" (now done on page 2-8).

Page 2-3, second paragraph: Spell out and define "EC" and "IAEA".

Page 2-3, section 2.3 heading: Suggest changing to "Four Alternatives Studied in Detail". Note

that it may be somewhat confusing to the reader to see the Alternatives presented in different forms, as on page 6-1, where the “material specific” and “material independent” variations are broken out, as well as the “landfill” and “incineration” variations.

Page 2-4, first paragraph: give title of Appendix I, which does not exist in current draft.

Page 2-4, next to last paragraph, clarify that the dose-based criterion does not vary based on the “specific end use of the materials”; rather, one or more limiting end uses were identified and analyzed, such that exposures for other end uses would be below the reference dose. In the last sentence, spelling of “radionuclide”.

Page 2-4, footnote 4: this is the first use of the term “clearance”. Our understanding is that NRC wants to move away from the use of this term (preferring “disposition” or “control” or even “release” of “solid materials”), yet it is used repeatedly. See for example page 2-6 (three uses).

Page 2-5, paragraph below bullets: should copper be included in the last sentence? Provide a brief discussion of how these materials were selected; in particular, explain why other materials commonly found in demolition debris were not included in the analyses. Such materials include glass, rubber (e.g., floor coverings), wood, asphalt, brick, other metals (e.g., tin), and textiles (e.g., carpeting, roofing/wall felt). See EPA’s website on construction and demolition debris:

<http://www.epa.gov/tribalmw/thirds/recandd.htm> and
www.epa.gov/epaoswer/hazwaste/sqg/c&d-rpt.pdf.

Page 2-5, last paragraph: “dose level” in second sentence should not be hyphenated.

Page 2-5, footnote 5: ANSI standard is 13.12, not 12.12.

Page 2-6, top paragraph (and throughout): “Unrestricted Use Alternative” should be capitalized consistently. Some later sections refer to “Unrestrictive Use”.

Page 2-7, dose options: list 0.1 before 1.0. Need to explain better why 0.03 is equivalent to zero.

Page 2-7, next to last paragraph, last sentence: prefer listing of EPA ANPR as page 65120 of FR, where the notice actually begins. See also Reference 19.

Page 2-10, next to last paragraph: since the Subtitle C option is dropped, why does there need to be detailed discussion of available volumes and facilities?

Page 2-12, Table 2-1: The explanation on the following pages needs to be more clear. In particular, the impact on LLW facilities for the alternatives should be explained further. At what point does the impact change from “small” to “moderate” to “large”? From page 2-14, 8 to 10 percent of remaining Envirocare capacity is “moderate” and 85 percent is “large”. The definitions on page 2-12 include terms such as “alter noticeably” and “destabilize”. What do these mean in terms of disposal capacity? What is the “resource” that is being “destabilized”?

Page 2-14, bottom line: spelling of “dose”

Section 2.5: this section summarizes various impacts and cost-benefit results, yet up to this point there has been no discussion of the time period over which these impacts are estimated. Are these annual impacts? This feeds into the general comments related to the more detailed presentation of results, in which several time periods are discussed.

Figures 2-1 through 2-12: can these figures be combined in some way to reduce repetition?

Chapter 3: Affected Environment

Page 3-2, first paragraph: next to last sentence is repetitive: “*On site disposal of...could be left on site...*”

Page 3-2, paragraph above 3.1.2, second sentence has two periods.

Page 3-3: second paragraph refers to 360 mrem as average background, fourth paragraph cites 300 mrem in United States. If first reference is global average, it should be stated so.

Page 3-5, first paragraph: second sentence, footnote numbers should appear outside quotes. Next to last sentence, consistency of commas inside or outside quotes.

Page 3-6, bullets: this information might be better presented in a table. In last bullet, spell out "SDMP" (note on page 3-9 refers to change of terminology). Which category includes ISFSIs? They are discussed separately in Section 3.1.3.5.

Page 3-11, last sentence above 3.2 needs a period.

Page 3-16, first paragraph: second sentence needs a period. In the third sentence, suggest moving the last clause to before the colon ("USGS allocated these applications into three general categories for the purposes of developing a material flow analysis:"). Fourth sentence, add a comma before "9 percent is used". Last sentence, remove comma from parenthetical after "landscaping".

Page 3-15, third bullet needs a semicolon

Page 3-17, Tables 3-2 and 3-3: Notes a, b, c are not reflected in the tables. In Table 3-3 (Concrete), note b refers to steel scrap at EAF mills. Should that note be for Table 3-2, or is there a similar one for concrete?

Page 3-22, Table 3-6, note a is not reflected in the table.

Page 3-23, Table 3-8, note a is not reflected in the table.

Page 3-24, last sentence under Trash: spelling of "for" and "...disposal of the all of the..."

Page 3-24, note about truck drivers: if previous analyses have been done, need to ensure that the assumptions are consistent with the GEIS, particularly the assumption that all disposal takes place at Envirocare (length of trip would be significant).

Page 3-25, Section 3.2.5.1: explain why the No Action and Unrestricted Use Alternatives are considered together.

Page 3-25, last paragraph: suggest rearranging this paragraph to eliminate redundancy, e.g., "The only end use of recycled concrete analyzed in this Draft GEIS is its use for road construction. The affected General Public groups for the No Action and Unrestricted Use Alternatives were identified for this end use and potential collective dose based on driving on roads containing recycled material. Road bed construction was selected as the single end use based on research..." (remainder of existing paragraph).

Page 3-26, Table 3-10: does "fraction of material" indicate that 38.5% of the roadbed consists of recycled concrete material?

Page 3-27, Table 3-11: it is not clear what "occupancy" refers to, or what the units are. If it is included as an "exposure duration" parameter, the units should be person-hours per year. Does this mean that a person spends only 1.78 hours per year in the automobile, or 1.78 sleeping in bed? If it is not an "exposure duration" parameter, what are the units? The average number of people in an automobile, or office building, or bed, or ship? Further, explain the "individual" and "integrated" columns. If the "integrated" exposure duration considers the number of "individuals" who would be exposed through the various end uses, why is the "integrated" duration for the slag cement basement end use an order of magnitude smaller than the "individual" duration?

Page 3-29, third paragraph: consistency in use of quotes (single, double, none).

Page 3-30, second paragraph, add a comma in the second sentence between GEIS and NRC.

Page 3-31, Table 3-13: explain the "No Dose" category. Does that include disposal?

Page 3-33, first paragraph, next to last sentence: perhaps “would preclude” is too categorical, and “designed to prevent” might be better.

Page 3-34, next to last paragraph, extra comma in last sentence. In next paragraph, remove “(transportation accidents)” as redundant.

Page 3-37, last paragraph, first sentence needs a period.

Page 3-38, first paragraph, need comma after “e.g.” (three occurrences). POTW is “Works”, not “Facility”.

Page 3-39, paragraph before 3.4.3: explain that “quality factor” translates energy (e.g., rad) into dose (e.g., rem) and why a value of 1 is conservative. The sentence needs a period.

Page 3-39, last paragraph: first sentence has two periods. In second sentence, replace comma with “and” between “discharges” and “industrial”.

Page 3-40, Table 3-14: should Category (iv) be removed, since Subtitle C is not among the Alternatives?

Page 3-41: why are these definitions given in detail here rather than in the Glossary? They could be summarized here. In the definition of “Storm water discharge...”, quoted definitions include the phrase “this section” in three places, referring to the CFR section. In last sentence above (i), add “that” between “facilities” and “are”.

Page 3-42: in (vi), should it read “including but not limited to...”? In (ix), spell out “mgd”. In (x), replace semicolon at end with period.

Page 3-42: first sentence under 3.4.3.2, add comma between “141” and “the”.

Page 3-43, section 3.4.3.3: what does this have to do with CEQ?

Page 3-43, third paragraph: add comma after “i.e.” in last sentence.

Page 3-43, last paragraph, delete second use of “aggregate for” in first sentence.

Page 3-48, second paragraph, spelling of “may” in first sentence.

Page 3-48, third paragraph, remove period after “Arthur”.

Page 3-48, last paragraph: suggest revising this paragraph to clarify the time frame for these projections. What is the significance of 2 million tons? Page 3-47 says 40 million tons are recycled annually, with less than 200,000 tons from commercial nuclear reactor facilities. Is the reference to 2 million tons projecting a decade’s worth of recycling from nuclear facilities? What is the significance of a decade (the use of the phrase “coming decades” is not sufficient to explain this)?

Page 3-49, second paragraph, remove the semicolon after “facility” (see also page 3-55). Does the last sentence conflict with earlier statements about “significant” runoff flows being “precluded by NPDES controls” (see pages 3-45 and 3-47)?

Page 3-49, third paragraph: spell out “BOS”.

Page 3-49, fourth paragraph, fifth sentence: clarify what is meant by “precipitation to hydrate residual lime”. Is this “precipitation” as in rainfall, or “precipitation” as a chemical treatment process?

Page 3-50: TCLP is Toxicity Characteristic Leaching Procedure (not Protocol), so “test” is redundant (later in paragraph as well). Should this be in the list of abbreviations?

Page 3-51, last paragraph, is there a stray period in the third from last sentence?

Page 3-53, Table 3-20, need a space before “enters” in last entry.

Page 3-54, Table 3-21, headings “EAF Dust Secondary Processing” and “Steel residue disposal” need to be underlined (the second also needs consistent capitalization, as does Table 3-20).

Page 3-62, last sentence under “Trash” has two periods.

Page 3-63, first paragraph, add a comma after "i.e."

Page 3-63, last paragraph, should be "pH".

Page 3-65, last paragraph, remove extra space before period in first sentence.

Page 3-66, last paragraph, remove period before parenthetical in last sentence.

Page 3-69, discussion of Non Licensed-Facility Worker Exposure (for the NRC/AS Alternative): what is really considered in this analysis? Page 3-24 states that "[t]here are no Non Licensed-Facility Workers involved in the NRC/AS-Licensed Disposal Facility Alternative other than truck drivers..." Why, then, are "activities associated with the handling of materials at the licensee facility site, and placement and storage of the materials at the licensed disposal facility" addressed here? Further, "water-related potential...exposures are limited to contact with leachate or runoff water." Why are truck drivers expected to have such contact?

Page 3-72, next to last paragraph, first sentence, period should be after parenthetical.

Page 3-72, last paragraph is repetitive, suggest deleting either first or third sentence.

Page 3-76, Table 3-35, FR citation for Subtitle D should just be 2227. The note is numbered, which is inconsistent with previous tables (using letters to designate notes).

Page 3-78, Table 3-36, alignment is inconsistent with previous tables (e.g., Table 3-11).

Page 3-79, Table 3-37, font for notes is inconsistent with previous tables.

Page 3-82, Table 3-38, first column, remove period after "aluminum".

Page 3-94, first paragraph, first sentence is redundant ("EPA regulated landfills Subtitle D landfills").

Page 3-94, second paragraph: since the Subtitle C Alternative "has been removed from consideration", why is it discussed in such detail?

Page 3-94, another reference for Subtitle D management is the "2003 Directory & Atlas of Solid Waste Disposal Facilities" (<http://wasteinfo.com/products/diratlas.htm>).

Page 3-96, Table 3-40, the note (asterisk) is not reflected in table.

Page 3-97, why is section 3.6.1.2 included?

Page 3-98, Table 3-43: if this table is to be included, it should be organized by state or company. Enviro-safe of Ohio is included twice. Should Enviro-care of Utah be mentioned, even though it is not strictly a Subtitle C facility (it has mixed waste capability)? The table needs further updating.

Page 3-99, Table 3-44: using Table 3-43 as the reference, there should be 4 landfills in the South.

Page 3-101, first paragraph, add a colon after "3-46".

Chapter 4: Environmental Consequences

Page 4-2, first paragraph: suggest stating the activities that would be released for recycling and sent for disposal along with the volumes. Capitalization of "Unrestricted Use Alternative" (and other Alternatives) needs to be consistent throughout the document.

Page 4-2, first sentence under 4.1.2, remove period after "4-1".

Page 4-3, last paragraph: discussion of "material specific" and "material independent" needs to be more clear, possibly with examples. For example, explain why the masses of steel and trash are lower for the material specific scenario (because concrete is the limiting material for radionuclide concentrations). In the last sentence, should "material-specific" be "material-independent"? In that sentence, "approximately 90 percent" should be "greater than 99 percent".

Page 4-4, Table 4-2 (and following tables): what are the units of mass (or activity) for these tables? Units should be consistent to the extent possible. Over what time period are these values

calculated?

Page 4-8, Table 4-6: what is signified by "Fe" and "RCA" in this table?

Page 4-9, Table 4-7: the difference between the 1 mrem/yr option and the ANSI 13.12 option should be explained here, as the results are an order of magnitude different for activity and about a factor of two different for mass. Why are there not similar tables for concrete and steel? Is there no expectation for decommissioning of licensees other than commercial reactors?

Page 4-10: this section begins using the phrase "Non-Licensed Facility Workers", which is inconsistent with previous sections ("Non Licensed-Facility Workers"). The distinction is whether it is the worker or the facility that is licensed.

Page 4-10, last paragraph: capitalize "General" in third sentence and add a space before "mrem/year" in last sentence.

Page 4-11, first paragraph, capitalization of "Facility".

Page 4-11, third paragraph: the last sentence is redundant with footnote 1.

Page 4-12, second paragraph, last sentence, remove extra space before "Disposal".

Page 4-13, first paragraph, first sentence, period should be placed after parenthetical.

Page 4-13, second paragraph, spelling of "Envirocare". Remove stray period in last sentence.

Page 4-14, second paragraph, extra period in first sentence. In last sentence, should be "3-9".

Page 4-14, third paragraph, first sentence, "methodology...is summarized". Last sentence refers to Section 4.2.2.5, which does not exist. There are numerous later references to Sections 4.2.x that are nonexistent. Have sections been renumbered from earlier drafts (perhaps these should be 4.3.x)?

Page 4-14, last paragraph, second sentence should read "Figure 4-1 also..." Insert a comma after "however" in second sentence.

Page 4-15, Figure 4-1, title should be more apparent. It looks like part of the diagram.

Page 4-17, Figure 4-2, spelling of "RR Ballast" (on right side of diagram).

Page 4-20, references to Sections 4.2.2.1 and 4.2.2.2 probably should be 4.3.2.1 and 4.3.2.2.

Page 4-22, last paragraph, first sentence: "estimated by estimating" is redundant. Insert "and" before "subtracting".

Page 4-24, second and third paragraphs: why does this description refer to the No Action and Unrestricted Use Alternatives when page 4-20 says the results are in "separate sections"? Should this heading be "Non-Licensed Facility [Non Licensed-Facility?] Worker and General Public Collective Dose", since it also discusses the General Public? What is the significance of the "first-year collective dose"?

Page 4-25, second sentence, revise to read "The collective dose..."

Page 4-26, Tables 4-14 and 4-15: why are these in units of person-Sv, instead of person-rem, like previous and later tables?

Page 4-27, Table 4-16: for the reader to make the connection between this table and Tables 4-14 and 4-15, there needs to be a clear correlation of the mass and time represented in Table 4-16.

The reader can't easily tell whether the numbers match up. Also, by including both No Action and Unrestricted Use in Tables 4-14 and 4-15, the reader can't tell how the Unrestricted Use Alternative is included in these tables, and at which dose option. Looking at Tables 4-16 and 4-17, it looks as though No Action steel falls between 1 and 10 mrem/yr, while concrete falls between 0.03 and 0.1 mrem/yr.

Page 4-28, second paragraph, first sentence: replace "and" with "in" ("...Workers involved in activities for..."). Remove period at end of parenthetical.

Page 4-33, last paragraph: why use person-Sv here, instead of person-rem?

Page 4-37, first paragraph, fourth sentence: insert "with" before "solid".

Page 4-38, Table 4-21, why are steel and concrete not broken out? Does the "trash from other licensees" mean trash from all the different categories of facilities, or is trash also included in the individual categories (e.g., large medical centers)? Why is there not a table similar to Table 4-1 for these categories (mass and activity)?

Page 4-39, third paragraph, third sentence: revise to simplify explanation ("for each option within each Alternative based on the dose limit for each option under each Alternative"). Insert a comma after "concrete" in the parenthetical.

Page 4-40, first paragraph, next to last sentence states that "[t]he methodology for calculating the mean distances is described in Section 4.2." It is not, and it's not clear where this description can be found.

Page 4-41, first paragraph, last sentence: should the fatal accident rate be $6.12E-08$ per mile? It may be easier for the reader to grasp if presented on a per million mile basis (0.0612 fatal accidents per million miles). Railcar accident rates later on this page are given per billion miles traveled.

Page 4-41, second paragraph: clarify that the railcar calculation is provided only for assessment of accidents, since all collective dose estimates assumed transportation by truck.

Page 4-42, last sentence, replace "an" with "are".

Page 4-43, Tables 4-24 through 4-28, should the last column read "Accident Fatalities" to be consistent with title? Why are there separate tables for the Unrestricted Use Alternative dose options and only one for the EPA-Regulated Alternative?

Page 4-46, first sentence, "from for".

Page 4-46, these headings ("Truck Transportation" and "Railcar Transportation") are not clearly distinguishable from the earlier discussion. Perhaps a "Summary" Section 4.4.3 is in order.

Page 4-47, first paragraph, fourth sentence needs a period.

Page 4-47, last paragraph, first sentence, suggest simplifying to read "Each Alternative begins..." Third sentence, delete "under each Alternative".

Page 4-48, second paragraph, revise to read "The following sections..." Radiological impacts are in Section 4.3.

Page 4-48, third paragraph, last sentence, add a comma after "i.e.".

Page 4-49, last paragraph, second sentence: should this be 2.5 million metric tons? Is this annual generation? Clarify that "release" is based on screening.

Page 4-50, Table 4-31, clarify "high pH". Add "pH =" to entries under Steel Scrap Recycling.

Page 4-51, discussion of aluminum and copper: introducing a new phrase "over the period of the Proposed Action". Need to define that period (by the discussion of relative amounts of copper generation and release, the period is 10 years at most, if all copper is released - is that possible?). Simplify the term "temporal scaling factor as for steel" (also on page 4-52). Are these also metric tons?

Page 4-51, last sentence has an extra period.

Page 4-52, second paragraph, third sentence has an extra period. In the last sentence, suggest replacing "exceed" with "are larger than".

Page 4-53, third paragraph refers to Section 4.6. The correct reference appears to be 4.7.

Page 4-54, first paragraph, first partial sentence, "the these materials".

Page 4-54, second paragraph, third sentence refers to total amount of generated material shown in

Table 4-6. Clarify that this table refers only to commercial nuclear reactor facilities, not all "licensed facilities". Next sentence refers again to Section 4.2.

Page 4-54, third paragraph needs a reference to Table 4-7 (other licensed facilities). Next to last sentence needs a period.

Page 4-55, first full paragraph, second sentence needs a period.

Page 4-55, third paragraph suggests that concrete will only come from commercial reactor sites. There should be some statement as to why other licensee sites will not generate significant amounts of steel and concrete when they decommission. See comment on Table 4-7 above.

Page 4-57, last paragraph, first sentence, "break up" should be two words.

Page 4-58, first paragraph, second sentence, remove period from parenthetical.

Page 4-60, first paragraph, second sentence, insert a comma before "an average". This sentence also needs a verb. Fifth sentence, does EPA "recommend" furnace types?

Page 4-60, last paragraph, second sentence, insert a comma before "the incremental".

Page 4-61, third sentence, insert a comma before "the emissions impacts".

Page 4-62, Table 4-38, the number for Tons steel recycled under No Action needs another digit. The Unrestricted Use number for Emissions assuming 2 melts needs another decimal digit. Actual emissions for 1999 needs units.

Page 4-64, first paragraph refers to Table 3-37 as giving emission factors in grams per horsepower-hour. It does not.

Page 4-64, Table 4-40, entries are inconsistent in use of significant digits. CO entry for crushing equipment needs to have the comma moved.

Page 4-64, last paragraph, first sentence, period should be outside parenthetical.

Page 4-65, first paragraph, next to last sentence, insert "than" before "transported 198 miles".

Page 4-65, last paragraph, third sentence, replace "that" with "the".

Page 4-66, last sentence, insert a space before "10 mrem/year".

Page 4-68, Table 4-42, under Activity, insert a space in "10 mrem" and insert "/yr" after "mrem". Capitalization needs to be consistent with 0.03 mrem option.

Page 4-69, first paragraph refers again to Table 3-37. Verify that this is the correct table.

Page 4-69, second paragraph refers to Table 4-42 as emissions from incineration. Should this be Table 4-41? Table 4-42 is for equipment emissions.

Page 4-69, heading for 4.7 should be all caps for consistency.

Page 4-69, last paragraph, fourth and last sentence, why is Subtitle C included here?

Page 4-71, second paragraph, first sentence, capitalize "Subtitle". In the last sentence, suggest simplifying to read "Existing capacity of Subtitle D landfills would be adequate for disposal of all the materials released under this Alternative."

Page 4-71, Section 4.7.1.2 should be removed as it is no longer under consideration.

Page 4-72, last paragraph, capitalize "Agreement State" in the first sentence.

Page 4-73, last paragraph contains two references to "NRC's website" as the source of information. Suggest finding a more specific reference. Further, at one time Barnwell refused waste from North Carolina because of compact issues. Is this still the case? Legal suits against North Carolina are still in process. The sixth sentence needs a period. Suggest citing the number of power reactors in the Atlantic Compact, as is done for the Northwest and Rocky Mountain Compacts.

Page 4-74, last paragraph, first sentence, remove extra comma.

Page 4-75, first sentence, remove period after "8.5".

Page 4-75, first full paragraph, first sentence, remove extra comma.

Page 4-75, last paragraph, second sentence, insert comma before "the existing LLW". Remove stray period before last sentence.

Page 4-76, last paragraph, first sentence, insert comma before "copper".

Chapter 6: Cost-Benefit Analysis

Page 6-1, second paragraph: clarify that costs and benefits are relative to the No Action Alternative. Also clarify time frame for analysis. Next to last sentence refers to "attributes" with no previous use or definition of the term (until page 6-3).

Page 6-1, bullets: first and second bullets, should be "incurs" (not "incur"). Need to be consistent throughout with previous chapters in capitalizing "Alternative" and using the same terms ("Unrestrictive Use" and "LLW Disposal" are not consistent).

Page 6-2, first paragraph after bullets, capitalize "GEIS".

Page 6-3, bullets: simplify first bullet, e.g., "Air emissions could be affected by the number of vehicle miles traveled as well as the relative production of new versus recycled material (e.g., steel, copper, aluminum)." Is air the only environmental consideration? Ground water and surface water are prominent transport pathways for several Alternatives. The next three bullets use the term "cleared" or "clearance" several times (see comment for page 2-4, footnote 4).

Page 6-4, fourth bullet: change "memorandums" to "memoranda" and capitalize "Agreement States". Clarify the parenthetical: Does "this excludes" mean "there are no additional government costs for" government facilities that are generators of waste? If DOE and DoD facilities are included in the analyses (as it seems they must be if they are covered by some of the attributes most applicable to waste generators), where are the tables summarizing the mass and activities of the waste that could be released under the various Alternatives from these facilities?

Page 6-5, there is an extra space at the beginning of the last paragraph and footnote 5 needs a period.

Page 6-6, first paragraph, footnote 6 has already been cited as footnote 1. Spell out "OMB" and provide a reference.

Page 6-6, second paragraph, Unrestricted Use is referred to as "unrestricted release".

Page 6-6, Table 6-2, why are copper and aluminum not listed in this table? It appears to be a generic table of disposition possibilities under the Alternatives.

Page 6-6, last paragraph, clarify that "uncleared" waste is sent for disposal at an LLW facility.

Page 6-7, first paragraph refers to Section 4.6 (should be 4.7).

Page 6-7, next to last paragraph, last sentence, spelling of "dose".

Page 6-7, last paragraph, change "are" to "is".

Page 6-8, Table 6-3, explain the reason for the dramatic differences between the 1 mrem/yr dose option and the ANSI 13.12 option, which is nominally 1 mrem/yr. Note that OMB considers a rule "economically significant" under Executive Order 12866 if annual effects are greater than \$100 million; by this criterion, the 50-year 7% discounted net cost of \$1.583 billion for LLW disposal at the "no dose limit" is equivalent to \$114.7 million in average annualized net cost (using a 50-year 7% annualization multiplier of 0.07246), which would qualify as "economically significant". Suggest also including a table of non-discounted (0%) impacts, in addition to 7% and 3%. A 3% rate is often used to depict impacts <30 years, and 0% is used to depict impacts >30 years. For example, EPA's "Guidelines for Preparing Economic Analyses" (September

2000) recommends using a 2% to 3% discount rate for “intragenerational impacts”, and a 0.5% to 3% rate for “intergenerational impacts”. See

<http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html> for more information.

Page 6-8, last bullet, fifth sentence, should be “benefits arise”. See also page F-29.

Page 6-9, second bullet, add a comma after “unrestrictive use alternative” (Unrestricted Use).

Page 6-9, third bullet, “industry” should be lower case.

Page 6-9, last bullet, after “Other Considerations” replace period with dash.

Page 6-11, Table 6-5, note 1 still refers to a 7 percent discount rate.

Chapter 8: References

General: suggest distinguishing further among references from same source in same year, e.g., EPA 2003, EPA 2003a, etc.

Reference 48, remove extra period.

References 69, 70, 77, insert periods after title and at end of citation.

Reference 75, insert space in “Vol. 2” and add comma before page number.

Reference 86, insert period at end.

Appendix A (if this can be edited): Scoping Summary Report

Page 2, last paragraph, need close quote on document title.

Page 4, second paragraph, second sentence, insert comma after “Others”. Last sentence is repetitive.

Page 7, “Other studies”, under (f), spelling of “bear”. (g) has a stray close parentheses.

Page 28, middle heading, spelling of “disadvantages”.

Appendix D: Dose Assessments

Page D-4, third paragraph, fifth sentence: is there a reference to support this statement (risks are reduced if doses are spread out), particularly if a “great deal” of data exists? Some comments refer to data and studies supporting the idea that low doses are more harmful (i.e., carry higher risks) than previously believed.

Page D-5, second paragraph, does this statement that “cancer risk per unit dose varies [not vary] as a function of...dose rate received...” contradict the statement on D-4 in the previous comment?

Page D-6, Tables 1 and 2, why are these in units of Sv and Bq, instead of Rem and Ci?

Page D-8, reference for “UN 1988” is referred to as “UNSCEAR” in the text.

Appendix E: Radiological Assessments for Clearance

General: spellings of certain words are English (e.g., aluminium, vapour). The appendix uses units of Sv throughout.

Page E-2, first paragraph, second sentence, remove “in”.

Page E-2, last paragraph, fifth sentence, remove “in”.

Page E-3, last paragraph, fifth sentence, remove period after “Figure 1” (and “Figure 2”, “Table 1”, etc.).

Page E-4, Figures 1 and 2, titles need to be more clearly associated with figures. Figure 2 has a "Figure 6" label that should be removed.

Appendix F: Cost-Benefit Analysis Methodology and Results

General: In addition to presenting cost/benefit results on an average annualized basis (see Tables F-11 to F-26), can material quantities be expressed in a similar way (with standardized units such as tons/year)? This would allow an expression of the variation in materials from different types of facilities at different points in their lifetimes (e.g., operating period vs. decommissioning). Such projected variation could also be compared to the annual intake rates for the different Alternatives (e.g., landfill disposal, incineration) to estimate annual percentage increase. In addition, much of this material could be moved to Chapter 6, as it contains fundamental information about the 18 cost/benefit "attribute" categories, as well as discussion of methodology, which may be appropriate for the main body of the report rather than relatively hidden in the appendix.

Page F-3, second paragraph refers to "Exhibit 1" (should be "Figure" to be consistent).

Page F-3, footnote 2, second sentence, add apostrophe to "licensee's".

Page F-4, first sentence, remove "NRC's regulation analysis guidance" and parentheses (NUREG/BR-0184 has already been defined in footnote 1). Third sentence, should be "costs".

Page F-4, footnote 4 is identical to footnote 1.

Page F-6, last paragraph: aren't the "baseline's benefits or costs" considered equal to zero? Using the phrase "benefits or cost" is misleading, since benefits or cost can only be determined relative to the baseline. Further, this explanation that net costs are positive while net benefits are negative is the opposite of the way results are presented in Chapter 6 and could be confusing.

Page F-7, fourth paragraph, last sentence, remove extra "s" from "Sections". The reference to Sections 2.1.1 through 2.1.5 is incorrect (not clear where correct sections are - Chapter 3?).

Page F-8, footnote 5: does the steel industry consider scrap cleared under Reg Guide 1.86 to be radiation-contaminated? The question, then, is how will the dose-based levels compare to RG 1.86.

Page F-10, second paragraph, last sentence needs some clarification. Assuming that the 1 ton increase is from scrap "generated by this rule", it appears the 0.5 ton decrease in steel quantity involves scrap not "generated by this rule", i.e., scrap from other than licensees. Is that correct?

Page F-10, last paragraph, first sentence, suggest inserting "virgin steel" before "using" in parenthetical.

Page F-11, consistency of format between text and footnotes: "US" vs. "U.S."

Page F-12, Table F-5, provide a more detailed reference for the Integrated Planning Model.

Page F-12, second paragraph, explain the 1990 Pace University Study.

Page F-15, footnote 18: it appears that there is some question about the way the Collective Dose report is evaluating the No Action Alternative. There should be no guesswork about how two related pieces of this analyses were developed. See also footnote 33.

Page F-18, footnote 20 uses DOE disposal costs at Envirocare as the reference cost. The possibility that the prices negotiated by DOE are affected by the volumes of waste generated by DOE (relative to industry), and expectations of continued future generation, should be considered.

Page F-28, footnote 51 is identical to footnote 1.

Page F-29, summary of results should explain why certain years have no cost or benefit relative to the baseline, particularly when there is a significant difference from other Alternatives. Some statements have been made earlier, such as the expectation that survey costs at a generator will be similar for all options (except possibly for the LLW Disposal Alternative). For example, why are there net costs under Industry Implementation for two years (2003-2004), no net cost or benefit for 9 years, then net costs again? This pattern seems to hold regardless of Alternative or dose option.

Appendix G: Current NRC Approach

Page G-1, third paragraph, second sentence, change "their" to "its" and "are" to "is".

Page G-2, second paragraph, first sentence, insert comma before "e.g." in parenthetical.

Page G-4, first paragraph, capitalize "Nuclear" in title. Does the Branch Technical Position have a title? Date?

Page G-4, first bullet needs a period.

Appendix H: Glossary of Terms

Consider adding terms: "Clearance"; "Effective Dose"; "Quality Factor"; "Thermal Neutron".

Under "Gas Centrifuge", "UR6" should be "UF6".

Combine "Spent (depleted) fuel" and "Spent nuclear fuel".

"Transuranic Waste" - refer to definition of 100 nCi/g.

GEIS Chapter on Collective Dose Report:

General: Headings and numbering of sections should be made consistent with DGEIS. This appears to be intended as an executive summary for the collective dose report.

Page 1, first paragraph: has ADAMS been previously defined? In the last sentence, the wording is curious if this chapter will in fact be part of the GEIS ("in support of a Draft...").

Page 1, footnote 1 relates to the general comment regarding the need for further explanation of the ANSI standard and how it compares to the 1 mrem/year option under consideration.

Page 2, item 3 should read "Subtitle D". Note that there is a distinction made here that is not accurate (and that does not appear to have been explicitly made in the remainder of the DGEIS).

Both municipal solid waste and industrial solid waste landfills fall under Subtitle D of RCRA.

There are explicit standards that apply to municipal landfills (40 CFR part 258), which may be what is referred to as the "Subpart D regulations" that industrial landfills "are not required to comply with". Regulations in 40 CFR part 257 relate to industrial landfills (and waste). Fifth sentence needs a period. The sixth sentence is confusing because of the different meanings of the term "restrict" (the "restriction" to disposal eliminates some pathways considered for "unrestricted" release, so the release criteria are less "restrictive" - but what can be "less restrictive" than "unrestricted"?). Suggest revising to present the outcome in terms of "greater amounts of material can be released" rather than "less restrictive criteria". The eighth sentence seems to suggest that NUREG-1640 evaluates municipal and industrial landfills differently. Is that correct? If not, what is the distinction in how the radionuclide concentrations were derived? Next to last sentence needs a period.

Page 2, item 4, suggest adding "or Agreement State" before "licensed".

Page 2, last paragraph: this document uses the term "ferrous metal" throughout, while the DGEIS simply refers to "steel" (see also "carbon steel" on page 13). Why is soil not included? Soil is certainly addressed by the DGEIS.

Page 3, top paragraph, delete extra space before period in last sentence.

Page 3, first paragraph below bullets, fifth sentence, insert "a" before "valid" and insert comma before "value". Last sentence, delete "the use of".

Page 3, last paragraph, fifth sentence: this sounds as though people decide whether to use an end-product based on its radioactive content. Suggest clarifying that the term "end-product" refers to a specific item, not a product line (e.g., a car as opposed to the generic category of cars), and that as the concentration in any one product item goes down, the overall activity is distributed among many more product items (hence the use and potential exposure by more individuals).

Page 4, third paragraph, first sentence, delete comma after "emphasized that".

Page 4, fourth paragraph, first sentence, change "different than" to "different from". In the third sentence, remove reference to "we" (last sentence also) and change "the mean of the" to "those mean values of the".

Page 5, fifth paragraph, use of abbreviation "t" for metric tons is not consistent with DGEIS.

Page 5, last paragraph, insert "n" at end of "give". How is the "radionuclide contamination" signified in the curves (activity, dpm, surface, volumetric)?

Page 6, paragraph below bullets suggests that material was characterized generically for content of different radionuclides. Was the potential variation and uncertainty taken into account? How much confidence is there that materials do not vary in such a way as to result in larger doses than expected?

Page 6, third paragraph, what are referred to here as "regulatory alternatives" are "dose options" in the DGEIS. It would be best not to use the word "alternative" in such different ways.

Page 6, last paragraph, suggest inserting "collective dose" before "report". Generally, need to be clear that this is not part of the collective dose report, but of the DGEIS.

Page 6, footnote 4, how were normalized doses derived for trash (again, note the reference to "this report" - the collective dose report?).

Page 7, this discussion of decontamination seems a bit inconsistent with the DGEIS. It makes sense that most of the mass, if not activity, is found in materials that are only slightly contaminated, and that incremental activity should be larger than incremental mass as the reference dose increases. However, there are statements in the DGEIS to the effect that decontamination can be expected to achieve a reduction of a factor of 10, which suggests that there is some subset of material that can be decontaminated to just meet the release criteria (rather than "very little, if any, radioactivity" remaining because "decontamination is a destructive process").

Page 10, second paragraph, why are BWRs not addressed as well? In the second sentence, clarify "incremental radioactivity". Does it refer to total activity or concentration? If the mass is much smaller, but the total activity is 7% larger, the concentration must be significantly larger.

Page 10, fourth paragraph, third sentence, provide examples of "chemically-similar elements".

Page 10, last paragraph, reference to "this report".

Page 11, first paragraph, second and third sentences, suggest combining and removing "was made. This upper-bound estimate".

Page 11, third paragraph, units of kt and Bq are not consistent with the rest of the DGEIS.

Page 11, last paragraph, sixth sentence, should make clear that the relative contributions of all scenarios were increased, not just the ones that don't contribute much.

Page 13, third paragraph, first sentence, add "s" at end of "radionuclide".

Page 15-16, Figures 3-5, explain the notation on the figures. Do the section numbers refer to the collective dose report?

Page 17, second paragraph below equations, last sentence, the reference should be clarified. Is "1995" part of the title of the document?

Page 17, next paragraph, spell out "MCNP". Do section numbers correspond to the collective dose report?

Page 18, top, notation for ingestion dose conversion factor is similar to that for external exposure. Perhaps the notation can be made more distinct.

Page 18, second paragraph, third sentence, change "is" to "are". In the fourth sentence, remove "what was done was".

Page 18, last paragraph, second sentence, change "are" to "is".

Page 19, first paragraph, last sentence, revise reference to "our analysis".

Page 19, last paragraph, revise reference to "the enclosed Excel data files".

Page 20, second paragraph, second sentence has an extra period. Reverse "equivalent" and "the".

Page 20, Table 1.2, terminology under "GEIS" is not consistent with the actual document (Unrestricted Use, EPA-Regulated Disposal, NRC/AS-Licensed LLW Disposal, etc.). Why is Case D not included in the collective dose report terminology?

Exposures From Multiple Sources:

Page 1, second paragraph, last sentence refers to "iron" and "steel". The main DGEIS refers only to steel.

Page 2, eighth sentence of the paragraph, change "does" to "do". Clarify that restrictive scenarios do not include copper for volumetrically-contaminated materials, since the next sentence states that copper is a restricting material for surface contamination. Remove period from "Table 1" (and throughout after citing tables, figures, or sections).

Page 3, first paragraph, last sentence, delete "actually occurring".

Page 3, second paragraph, first sentence, delete "of".

Page 3, third paragraph, last sentence, insert a space after "e.g.,".

Page 5, last two sentence, remove "s" from end of "millions".

Page 5, footnote 1 needs clarification on the "fractions". Suggest revising third and fourth sentences to read "From NUREG-1640, 50% of iron castings are used for the auto and truck industry, and 20% of all scrap is used for casting." Add a reference to the statement that all scrap cleared would be one-thousandth of total scrap used in a year (there is some discussion in the main body of the DGEIS). Over what period does this consider "all the scrap that could potentially be cleared from the nuclear industry"? Show the calculation to reach the one-ten-thousandth conclusion ($0.001 \times 0.5 \times 0.2$).

**NAVAL REACTORS
A JOINT NAVY DOE PROGRAM**

21 January 2005

Luis
Dear Mr. Reyes,

Last week the NRC staff held a meeting among representatives of the Agencies cooperating in the NRC's Draft Generic Environmental Impact Statement (GEIS) on Controlling the Disposition of Solid Materials. Enclosed is a copy of the Naval Reactors letter objecting to the proposed alternative in this Draft GEIS which would, with few exceptions, prohibit unrestricted release of any solid material originating in restricted or impacted areas of NRC licensees.

Naval Reactors has worked for decades to maintain a radiologically clean workplace so that people and materials do not become radiologically contaminated. This proposed alternative takes a big step backwards in penalizing NRC licensees that run a similarly clean operation. Furthermore, the Draft GEIS provides no health or safety justification that would warrant selection of this preferred alternative.

The proposed regulation will not prevent introduction of radiologically clean materials meeting stringent international standards from entering commerce. The rest of the world has rational limits, and through world trade, the U.S. will use this material. Also, the Navy under our separate regulatory authority has been safely recycling large quantities of nonradioactive materials from decommissioned nuclear powered ships for decades. We have safely demonstrated that when strict standards and modern analysis techniques are used, what counts is not where a material comes from, but whether or not it is radioactive.

I would encourage you and the Commissioners to reconsider your preferred alternative.

Tom Beckett

T. H. Beckett
Deputy Director
Naval Nuclear Propulsion Program

Mr. Luis A. Reyes
Executive Director for Operations
U.S. Nuclear Regulatory Commission

**NAVAL REACTORS
A JOINT NAVY DOE PROGRAM**

21 January 2005

Mr. Scott W. Moore
Chief, Rulemaking and Guidance Branch
Division of Industrial and Medical Nuclear Safety
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission

The purpose of this letter is to provide comments from the Naval Nuclear Propulsion Program on the Draft Generic Environmental Impact Statement (GEIS) Controlling the Disposition of Solid Materials. The Naval Nuclear Propulsion Program is a joint Department of Energy/Navy Program that is responsible for the operation and regulation of 103 nuclear reactors, a number equal to the number of power reactors regulated by the NRC. Our personnel participated in the recent review of the Draft GEIS by participating agencies in this GEIS process.

The Naval Nuclear Propulsion Program strongly disagrees with NRC's preliminary selection of the Limited Disposition alternative as the preferred alternative in this GEIS. Under this alternative, with a few relatively minor exceptions, all solid material removed from licensee's restricted areas or impacted areas would require disposal at a landfill even if the material met internationally recognized standards for release for unrestricted use. The lengthy analysis provided in the Draft GEIS demonstrated no significant health or safety benefit resulting from this alternative compared to other alternatives such as allowing unrestricted use or recycling of materials meeting stringent internationally accepted standards. Furthermore, the application of this rule to all solid material leaving restricted areas or impacted areas would include much material that would have been exposed to a gamma radiation field only, which physically cannot induce radioactivity in material.

Under the independent regulatory authority of the Naval Nuclear Propulsion Program, the U.S. Navy has for many decades been releasing for unrestricted use nonradioactive material used in association with Naval Nuclear Propulsion Plants. Our Program has always made great efforts in the design, operation, maintenance, and inactivation of Naval nuclear-powered ships to control radioactivity at the source. Our nuclear fuel and plant

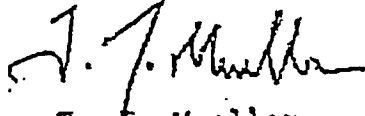
design keeps radioactivity associated with these propulsion plants within limited areas. In our maintenance and operating procedures, we ensure that radioactivity is not spread when we open these systems. This longstanding practice of controlling radioactivity at the source not only results in more capable and effective warships, but it also has the significant benefit of allowing our people and their equipment to routinely come into direct contact with our nuclear propulsion plants without wearing any protective clothing or becoming radioactively contaminated. With appropriate and careful controls, our Program has released such nonradioactive items for unrestricted use.

The most prominent and successful example of this process is the Navy's decommissioned nuclear-powered ship recycling program. This program has been in place since 1986 and was the subject of Environmental Impact Statements in 1984 and 1996. Under this program, defueled reactor compartments and associated radioactive piping are removed from nuclear-powered ships for disposal as radioactive waste. Nearly all of the remainder of the ships is released for unrestricted use and recycling following extensive confirmatory surveys. Due to the Navy's successful efforts at containing radioactivity at the source, these recycled sections of the ship include portions of the nuclear propulsion plant such as the secondary steam piping, propulsion and electricity generating turbines, and condensers. According to the Draft GEIS, analogous components in NRC-licensed nuclear power plants would be in the restricted area and precluded from unrestricted release regardless of whether they were actually radioactive or not.

The Navy's program of recycling decommissioned nuclear-powered ships has become a model for the rest of the world. Over 400,000 tons of recyclable material from 108 nuclear-powered ships have been recycled for productive use. There have been no problems with inappropriate material released for recycling, and this material has been accepted into both the U.S. and international scrap recycling markets. This recycling program is ongoing and will continue into the future for the Navy's current and future nuclear-powered ships.

While the Navy's release of material for unrestricted use both in our ship recycling program and our normal operations has proceeded under our Program's independent authority, it is highly desirable that our activities be carried out under requirements comparable to and in concert with those of the NRC.

This would not be the case if the preferred alternative identified in the Draft GEIS were adopted by NRC. For this reason, the Naval Nuclear Propulsion Program urges NRC to reconsider its preferred alternative.



T. J. Mueller
Director, Nuclear Technology Division
Naval Nuclear Propulsion Program

Copy to:

Jack Strosnider, NRC Nuclear Material Safety and Safeguards
James Dyer, NRC Nuclear Reactor Regulation
Paul Lohaus, NRC State and Tribal Programs
Carl Paperiello, NRC Nuclear Regulatory Research



Department of Energy
Washington, DC 20585

April 5, 2005

Mr. Scott Flanders
Director
Environmental and Performance Assessment Directorate
Division of Waste Management and Environmental Protection
Office of Nuclear Material Safety and Safeguards
Nuclear Regulatory Commission, Mailstop T7J-8
Washington, DC 20555-0001

Dear Mr. Flanders:

Enclosed please find the U.S. Department of Energy (DOE) staff comments on the Nuclear Regulatory Commission's (NRC) Draft Report for Comment, *Generic Environmental Impact Statement: Controlling the Disposition of Solid Materials* (GEIS), NUREG-1812 dated December 2004. We understand that the NRC Draft GEIS is in support of a regulation being considered by the NRC to control the disposition of solid materials that originate in restricted or impacted areas of NRC/Agreement-State licensed facilities, and have no, or very small amounts of, radioactivity resulting from licensed operations.

I am sending this letter, to document for the record, the Department of Energy staff comments previously provided in response to the NRC letter dated December 2, 2004 (Phyllis Sobel, NRC; to Stephen Domotor, DOE) requesting our review of the NRC GEIS. The comments also take into account information presented by NRC staff and management at a meeting of Cooperating Agency representatives you hosted on January 11-12, 2005.

The enclosed comments were developed by my office and include input from staff representing several DOE offices. However, they are not necessarily reflective of all comments that might result from a DOE-complex-wide review. Although the DOE staff comments are provided on the material in the GEIS and the briefing in the context of the draft NRC staff preferred alternative, we emphasize that DOE has not yet indicated a preference for any of the alternatives analyzed in the GEIS.

We look forward to continued coordination with you in DOE's role as a cooperating agency to NRC regarding your considerations in proposing to amend NRC regulations to provide radiological criteria for controlling the disposition of solid materials. Please contact me or Mr. Stephen Domotor of my staff (202-586-0871) with questions concerning these comments and with additional information concerning the NRC's path forward on this initiative.

Sincerely,

A handwritten signature in black ink, appearing to read 'A. Wallo', written in a cursive style.

Andrew Wallo
Director
Office of Air, Water and Radiation Protection
Policy and Guidance

Enclosure

**Draft staff comments on NUREG 1812
Draft Generic Environmental Impact Statement
Controlling the Disposition of Solid Materials, December 2004**

The following reflects the position of Department of Energy staff who have reviewed the subject GEIS draft. It based on the GEIS and in part, on information provided to DOE staff during a January 11 and 12, 2005 meeting between NRC staff and representatives of the GEIS cooperating agencies. The summary of DOE staff position was developed by the staff from the DOE Office of Air, Water and Radiation Protection Policy and Guidance.

DOE Staff Position:

The Department of Energy has not yet indicated a preference for any of the alternatives in the GEIS. The Department is in the process of completing more thorough reviews of the GEIS dose and cost estimates to support the formulation of a Department position. The following is summarizes current staff views based on an initial review of the draft GEIS.

Department staff is concerned that there is not sufficient risk-based justification for the NRC staff's proposed preferred alternative. Based on its review, DOE staff believes that NRC's analyses does not provide a compelling basis for selecting the "limited disposition" alternative over the base case (No Action) alternative or one or more of the dose-based unrestricted release alternatives.

Additional clarification is also needed in the GEIS that the 1 mrem/y criterion selected is not a bright line between safe and unsafe relative to other dose criteria evaluated in the GEIS and used in other rulemakings, guidance, and recommendations by international scientific organizations. There should be flexibility for consideration of dose criteria other than 1 mrem/y in the case-by-case process described in the staff preferred alternative of the GEIS.

Rationale for Staff Position on "Preferred Alternative":

The GEIS indicates that there are no significant health and safety impacts associated with any of the alternatives and, although DOE is still evaluating the cost assessment, the GEIS data indicates no significant differences between the three alternatives. Further, there was insufficient discussion on the impact of the proposed preferred alternative and the "disposal only" alternatives on pollution prevention programs and goals. This attribute could be a significant discriminator between the base-case and unrestricted use alternatives and the limited disposition and two disposal only alternatives.

The GEIS indicated that the NRC is proceeding with the rule making based partly to respond to NAS recommendations for a more transparent and risk-based process and, although the current case-by-case approach (No Action Alternative) was working, to address several disadvantages of the current process including:

- lack of a consistent criteria for controlling solid material
- no guidance for controlling volumetrically contaminated material

- greater sensitivity of new detectors can detect levels lower than detectors previously used for non-detection-based releases
- additional time and resources required to evaluate and implement the various case-by-case approaches.

It is not clear from the GEIS how the preferred alternative is significantly more transparent or risk-based or that it does not have many of the same disadvantages as the current approach given that, under the preferred alternative, a large portion of released material may be and, in many cases, can only be released through a case-by-case process.

General Concerns:

Although as noted, we see no compelling reason for selecting the preferred alternative over other options, we also have concerns with the complexity and lack of flexibility in the preferred alternative and the possibility of it being considered a precedent for defining safe or acceptable doses in general. The 1 mrem/y criterion is not a bright line between safe and unsafe and there should be flexibility for case-by-case application of other dose criterion. There is no discussion on how the proposed preferred alternative relates to other similar radiation rules and guidance and how they make up part of an integrated radiation protection system.

For example, the preferred alternative may be compared by some to the 10 CFR Part 20 license termination standards in subpart E which allows 25 mrem/y (after ALARA process). Similarly, the preferred alternative could inappropriately be used as a benchmark for the protective action guides that might be used to control or release property following a radiological emergency. It may not be in the best interest of public welfare to use the SG-R-1.7 values or the 1 mrem/y-based criterion for controlling property during an emergency. Dedicating emergency response resources to controlling property at levels that are on the order of 0.3% of normal background radiation could actually increase risks in other areas. In general, the International Atomic Energy Agency established the SG-R-1.7 levels for unrestricted release (or rather levels that require no radiological control). In the Commission Staff preferred alternative, the values are being made more restrictive and are only being applied for restricted release. The GEIS does not indicate why the Commission staff is choosing to be more restrictive than suggested necessary in SG-R-1.7. Therefore, DOE staff believes the GEIS needs to provide more perspective on the proposed alternative. It should more clearly discuss the limitations and scope explaining why the alternative and its criteria are not appropriate for other applications. It should note that the 1 mrem/y criterion is not a bright line between safe and unsafe but rather the point of departure or screen value or goal for this specific application. The preferred alternative should recognize that other dose criterion may be justified on a case-by-case basis if it meets 10 CFR Part 20 protective requirements and is determined to be as low as is reasonably achievable. Flexibility in the dose criterion should be included in all alternatives whether it be for unrestricted release, limited disposition or disposal only.

As structured, the preferred alternative would restrict recycling of any property taken into or used in a restricted area, whether or not it is radiologically impacted. There should be a process for clearing uncontaminated material for recycling.



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March 7, 2005

Phyllis Sobel, Ph.D.
Nuclear Regulatory Commission
TWFN, Mail Stop: 7 J8
11545 Rockville Pike
Rockville, Maryland 20852-2738

**RE: Comments on 4th Preliminary draft GEIS
on Controlling the Disposition of Solid
Materials**

Dear Dr. Sobel:

Clearly, a lot of good work has been done on the draft Generic Environmental Impact Statement (DGEIS). However, as it currently reads, the DGEIS appears premature; inconsistent with other NRC regulations; lacks harmonization with international standards; and are not scientifically justified. Hence, more time is needed to transform the DGEIS to support its Proposed Action or to change the Proposed Action to reflect the data and analysis.

Premature

It is not appropriate to put forward a draft GEIS until all supporting research and reports have been published peer-reviewed accepted by the public, industry, and the Agreement States (AS). Examples of some of the reports that need to be reviewed include:

- A. "Collective Doses Associated with Clearance of Material From NRC/Agreement State-Licensed Facilities" by SC & A, Inc. Last available as a draft in September 2003.
- B. Documents/reports that support IAEA RS-G-1.7, "Application of the Concepts of Exclusion, Exemption and Clearance," August 2004.

At this time it is not possible to review the draft FRN without reviewing the GEIS-dependent document of the SC & A, Inc. and, a determination that documentation publication for IAEA RS-

G 1.7 will be transparent and acceptable. The NRC needs to slow down the DGEIS effort until all reports are publicly available, reviewed and accepted by the public, industry, and the AS.

Inconsistent with other NRC regulations

The Proposed Action will allow solid materials which have no, or very small amounts of, residual radioactivity resulting from licensed operations to be released into the environment and/or public and no longer be under regulatory control - this is a prospective 'how clean is clean' (clean) standard. While it is understood, that prospective 'clean' standard will be more restrictive than the retrospective 'clean' standard (i.e., License Termination (LT), cleanup after a dirty bomb, etc.) whereby the dose criterion are one mrem/yr and 25 mrem/yr respectively, a problem arises when the NRC does not apply these standards evenly.

Currently, licensees wishing to bury waste on-site need to apply to the NRC under 10 CFR 20.2002 and adhere to a 1 mrem/yr standard. But, as soon as the licensee initiates termination and starts decommissioning, the waste can be buried on-site using the retrospective standard of 25 mrem/yr. This unevenly application of these standards does not make sense. Burial of waste on-site and off-site need to be held to the same standard not only when the NRC feels like it. Thus, the scope of the Proposed Action needs to be changed to include both on-site and off-site limited dispositions.

Also, the next owner/tenant may dig up and use the contaminated solid materials as they see fit. This is an unforeseen problem, because license termination was never intended to include on-site disposal of waste (and using the retrospective dose criterion of the LTR). License termination was for whole intact buildings and the land - not rubblized buildings and redistribution of radioactive contaminated on-site landfills.

With regards to the above inconsistent application of the LT rule (LTR) and Limited Disposition Standard (LDS), the NRC needs to:

- A. demonstrate that potential materials (e.g., soil, rubble) that could be removed from a site after license termination will not result in doses greater than 1 mrem/yr,
- B. better define what the LTR includes. It is hard to swallow that intentionally disposing waste material (i.e., rubble) on-site was part of the LTR. The LTR is a retrospective clean up standard while disposal of contaminated waste material is to be held to a prospective clean standard (i.e., intentionally introduced into the environment and/or public), and,
- C. restrict on-site burial of rubblized building, landfills material, etc. to the LDS requirements. [Note that, most NPP sites could never qualify as a RCRA subtitle D landfill because they sit close to rivers, lakes and oceans, whereby the distance to the groundwater is relatively small and the leach rates would be too great because of lack of a liner or equivalent. Hence, site specific dose modeling will be required whereby the dose from waste be held to the prospective standard of 1 mrem/yr of the 25 mrem/yr allowed under LTR.]

Furthermore, it is unclear why the disposition of solid material's dose criterion is proposed to be less than NRC's gaseous (5 mrem/yr) and liquid effluent (3 mrem/yr) standards and the EPA's drinking water standard (4 mrem/yr). It appears the justification is that a smaller dose criterion is better, and it is consistent with NCRP, ICRP, IAEA, HPS, etc. define as a negligible dose. If so, then perhaps this is the time to harmonize these prospective release standards all down to one mrem/yr, or it is time to better explain why one mrem/yr for disposition of solid materials is ok while 3 mrem/yr from liquid effluents is equally ok, etc.

Perhaps a logical and compromising solution would be for a Limited Disposition dose criterion of 3 to 5 mrem/yr (per NUREG 1640) and an Unrestricted Releases to be 1 mrem/yr (per IAEA RS-G-1.7 values). Processing requests for disposals using dose criterion of 3 to 5 mrem/yr are already permitted by the NRC under an CFR 20.2002 application and leaves open the 1 mrem/yr dose criterion for unrestricted releases which is consistent with IAEA RS-G-1.7 recommendations. Another justification for the above proposal is the level of certainty of the dose models and their corresponding doses; destination of the solid materials under the Limited Dispositions is better defined and has higher degree of certainty than will solid material under the Unrestricted Releases where the material could end up anywhere

Lacks Harmonization with International Standards & Not Scientifically Justifiable (and other Notes) Per the DGEIS

Page xvii, Alternatives Eliminated from Detailed Study, Line 28, DGEIS

1. States that Conditional Uses, such as, "concrete use in road fill" were eliminated from detailed study, but the preliminary recommendation includes "concrete use in road beds." What's the difference? Is this a misprint? Furthermore, it is unclear why "concrete use in road beds" is included in the preliminary recommendations, because the concrete may ultimately be reused and/or recycled into unforeseen consumer products, which should eliminate it from consideration.
2. Also troubling about this section, is that the entire alternative of Conditional Use was eliminated from detailed study because the material may ultimately be reused and/or recycled into products not authorized under the Conditional Use Alternative (i.e., unforeseen), and the Conditional Use Alternative would allow a greater amount of activity than the Limited Disposition Alternative, which are based on Unrestricted Use Alternative (based on 1 mrem/yr.)

Neither of the above two explanations is acceptable. First, the Conditional Use dose scenarios should take into account the worst thing that could solid material could be reused for and/or recycled into. Logic dictates that whatever this secondary item and/or use will be, it will result in a smaller dose than the original material especially if it is recycled. Secondly, allowing more activity to be released under the Conditional Use Alternative, some would argue, is the desire goal. If more activity available for release is

not desired, then why was the Conditional Use Alternative not assigned the values of the Unrestricted Use Alternative (based on 1 mrem/yr for normalization purposes)?

Hence, it is unclear why a generic process with generic release concentrations could not be formulated. All the factors used to eliminate the Alternative Use Alternative need to be stated in this section as well as section 2.5.

Page xvi, Limited Dispositions, DGEIS

1. The reasons for the use of IAEA RS-G 1.7 concentrations limits for Limited Dispositions supports the use of these values for the other Alternative scenarios, as noted above, such as Conditional Use and the Unrestricted Release Alternatives. Because, as stated on lines 32-35, "these materials could end up in dispositions, including reuse and recycling into other products, given that the licensees [will] have no administrative controls over materials once they leave the site."; this reason is used to disqualify the Conditional Use Alternative and assisted on marginalizing the Unrestricted Use Alternative.

If the use of IAEA RS-G-1.7 values is ok for Limited Dispositions, because the material may end up in consumer products, then these values (or equivalent values of NUREG 1640) are also acceptable for all the Alternatives. In other words, why is 1 mrem/yr from Limited Dispositions treated differently than 1 mrem/yr from Unrestricted Releases or 1 mrem/yr from Conditional Uses? One mrem/yr is one mrem/yr is one mrem/yr, regardless of where it comes from. Or, more to the point, why is the DGEIS selecting an Alternative based upon public perceptions?

Page xxiv, Staff Assessment & Preliminary Recommendations, DGEIS

All the reasons against unrestricted releases (page xxiv, lines 33-36) are not valid. Concerns that risks associated with unrestricted releases are avoidable and involuntary, and potential of doses from multiple sources is true for all the Alternatives. Moreover, section 3.8, on Cumulative Impacts states that "the likelihood of . . . multiple concurrent exposures becomes vanishingly small as the number of potential concurrent scenarios increases." This correctly implies that doses from multiple sources is a very small (especially when compared to the public dose limit of 100 mrem/yr.)

Furthermore, the Unrestricted Release alternative assumes that all the material will be recycled - this does not realistic, in fact, it is overly conservative. Also, the transportation traveled under the Unrestricted Release alternative appears to be greatly exaggerated. Much unrestricted releases will end up at the local transfer station and / or municipal landfills which are much closer in distance than a Subtitle D landfill. Using the above two assumptions appears to be a biased attempt to raise the collective doses to the Unrestricted Release alternative, thus removing it from consideration.

Furthermore, the concern that "any dose increases cancer risk," though valid in the LNT-

sphere of regulation formulation, it is not valid according to the HPS, ICRP, NRC, IAEA, and this DGEIS; one mrem/yr is negligible. And, again, one mrem/yr from Unrestricted Release is equivalent to Limited Disposition's one mrem/yr, etc.; this DGEIS cannot simultaneously cite that one mrem/yr from one Alternative (e.g., Unrestricted Releases, Conditional Use, etc.) poses more risk (i.e., dose) than another Alternative.

The concern that Unrestricted Releases would not be accurately measured and tracked is moot - tracking could be addressed in the DGEIS and measurements are addressed during inspections. But, the point of the DGEIS is to release solid materials from regulatory control because the risk from the material is negligible; hence, material tracking is not a disposition prerequisite nor is confirmatory measurements out of the question.

Thus, it appears that the DGEIS is not Process Driven, but rather it is public perception driven.

Pages xviii & xxiv, Socio-Economic Issues, DGEIS

The steel and concrete industry's concerns appear to be socio-economic issues, which are not addressed, according to the DGEIS (page xviii, line 13). But, then later (page xxiv, lines 37-39), it appears that some socio-economic issues were qualitatively addressed. Thus, it appears that socio-economic issues are not addressed evenly across all the alternatives. Socio-economic issues either need to be analyzed in full (detail) or they leave out the Metal and Concrete industry concerns.

In addition, the above industries already screen-out and do not accept radioactive contaminated materials. It appears this will continue, regardless of this DGEIS and associated rule-making. Thus, it does not make sense that "consumers could choose not to purchase items made from material recycled from licensed facilities," when the industries will not be accepting radioactive contaminated material in the first place. Not accepting the material is an industry business decision which should not affect this DGEIS. These industries are firm on this issue.

The above industries may soften their stance if the NRC worked with the EPA to start an initiative, under Section 6602 (b) of the Pollution Prevention Act of 1990, to purchase and use radioactive contaminated steel (i.e., inadvertent source melt) and concrete in the construction and retrofitting of government buildings. If this never materializes or fails, the material can be sold to another country that will accept it, under IAEA RS-G-1.7.

Page xix & xx, Transportation, DGEIS

The average number of miles to the closest Subtitle D landfill is stated as 100 miles. But this assumes that all these facilities will accept the material and that licensee will always choose the closest landfill - these are not good assumptions. It's interesting to note that

the DGEIS takes into account the LLW "foreseeable future actions" landscape - only the Utah will be available - but does not take into account the "foreseeable future actions" of the Subtitle D landfills (i.e., the number and locations of landfills that will accept "solid material.") This analysis needs to be performed and may have a cascading effect on the number of fatalities; the cost/benefit analysis; and, result in the Subtitle D landfills requiring an "Irreversible and Irretrievable Commitment of Resources" analysis (i.e., Subtitle D capacity used up.) In addition, the siting of new Subtitle D landfills may become difficult because finding publically acceptable locations may become burdensome - this needs to be included in the cost / benefit analysis of the Alternatives.

Analysis, DGEIS

In the comparison of the five Alternatives and their impacts, it appears that the concentrations and quantities used were not the same. Invariable, the Limited Disposition Alternative employs the use of IAEA RS-G-1.7 concentration limit's recommendations while the other Alternative employ scenario specific concentration limits; this does not appear appropriate. A table should be developed to show comparison of the impacts if all the alternatives used IAEA RS-G-1.7.

Page, xxiv - xxvi, Preliminary Recommendations, DGEIS

The choice of using IAEA RS-G-1.7 values for the Limited Disposition Alternative is not inconsistent with its scope; is unjustified overly conservative; will not result in efficiency for licensees and regulators; and may result in increased costs to businesses in the United States as noted below:

1. Create inconsistency with international guidelines, because the U.S. will use IAEA RS-G-1.7 values for Limited Disposition while the rest of the world will use the values for Unrestricted Release. Thus, imported materials (e.g., steel) inadvertently imported - containing IAEA RS-G-1.7 concentrations - into the U.S. will have to be disposed in Subtitle D landfill, while the rest of the world will be making products (most likely non-consumer products)
2. Nullifies the DGEIS, NRCP, ICRP, HPS, IAEA recommendation that 1 mrem/yr is negligible because burying concentrations of solid materials at IAEA RS-G-1.7 concentrations will result in doses much less than 1 mrem/yr. This sends a bad message to licensees and the public - that 1 mrem/yr is really not ok. The NRC needs to meet this head-on because these types of dispositions have been occurring for decades under current NRC guidelines. Burial of solid materials using IAEA values is a step backwards from what is the NRC has done for years and most licensees will opt for case-by-case basis (See below.)
3. Ensure that licensees will still opt for applying for the time and resource consuming case-by-case application process because these case-by-case applications will invariably result

in larger concentrations and quantities eligible for disposition. Financially, a licensee will spend a little money up front to formulate and submit a 10 CFR 20.2002 application to save a lot of money in the end (i.e., disposal costs). Thus, generic Limited Disposition using IAEA values will not result in a more efficient licensing actions than current method because no licensee will take advantage of it. (Note that the NRC has been doing these for years under 10 CFR 20.2002 and frequently apply a dose criterions greater than 1 mrem/yr.)

4. Increase the cost of doing business internationally. International stakeholder (i.e., compatibility associated problems) cost/benefit analysis needs to be assessed due to their inability to import and make items containing small concentrations of radioactive material.

Conclusion

The NRC needs to better meeting the public perceptions head-on that radioactive material have been released to public, landfills and for recycling for years under RG 1.86 and NUREG 1556. Many anti-nuclear entities have framed this issue as “de-regulating” radioactive contaminated material, when in fact, this effort is just to generically codify what has been in effect for years. The NRC needs to better frame this issue.

We feel that there should be, in the least, a 1 mrem/yr dose criterion codified in the regulations; hence this effort should be continued. But, more time is needed to allow the supporting reports and documents to be digested and accepted by the public, industry and the Agreement States (AS); to either transform the rulemaking to support the current Proposed Action of the DGEIS or to change the Proposed Action to reflect the data and analysis of the DGEIS; to make the Proposed Actions consistent with current and future NRC regulations; and, be in harmony with international standards.

The latter two points could be solved by allowing the proposed Limited Dispositions alternative to use the gas and liquids dose criterion for NPP of 3 to 5 mrem/yr, based on NUREG 1640, and allow Unrestricted Releases, based on IAEA RS-G-1.7, of solid materials that are not likely to be recycled into consumer products.

Overall, the DGEIS still suffers from the abrupt change in focus from Unrestricted Use to the Limited Disposition Alternative. Also, the staff's preliminary recommendations are not well supported because the DGEIS is missing data and/or analysis, and relies too heavily on public perception.

Respectively Submitted,

Michael Whalen, CHP
OAS & CRCPD Cooperating Agency

Representative
Massachusetts Radiation Control Program

cc CRCPD
 OAS

Letters from Agreement States

TEXAS DEPARTMENT OF STATE HEALTH SERVICES

EDUARDO J. SANCHEZ, M.D., M.P.H.
COMMISSIONER

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February 23, 2005

Ms. Kim Karcagi
Office of State and Tribal Programs
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Ms. Karcagi:

The agency provides the following comments concerning draft proposed Title 10, Code of Federal Regulations, Part 20, relating to Radiological Criteria for Controlling the Disposition of Solid Materials (STP-05-008).

1. The compatibility level for Agreement States isn't set yet; therefore, we have no comments regarding compatibility at this time.
2. It appears that the 1 mrem/yr standard that NRC is using to release material (to a limited number of disposition options) is well below the level necessary to protect public health and the environment. Early input has shown that "there is no technical reason for this rule" and that it is being written with such a low release standard to appease the steel industry's concern about public perception.
3. The specifics of what the materials become when NRC releases them needs to be addressed. For example, do they become EPA-regulated solid waste? If so, at what point? How will enforcement work (which agency does it; do they regulate the disposal facility or the NRC licensee) if something goes wrong after the material is no longer regulated under AEA?
4. The draft proposed rule doesn't include the ability to survey material for non-detectable activity to be released.
5. The Navy has indicated a strong concern that they'll no longer be able to cut ships up, survey the parts, put them in to a radioactive pile and a non radioactive pile and sell the non radioactive pile for recycle as scrap. They've already decommissioned about 114 vessels this way and have another 100 or so to do. The agency agrees that this could be a potential issue.
6. Early input has shown that using the concentration is easier to comply with the amendment rather than having to do modeling to meet the dose based standards.

Ms. Kim Karcagi
United States Nuclear Regulatory Commission
February 23, 2005
Page 2

7. The DOE has indicated that the amendment would be taking away the option of declaring something clean and then recycling. They felt that it made doing pollution prevention efforts on materials from within a restricted area impossible. In Texas, historically we have allowed licensees to decontaminate to specified limits in order to release for unrestricted use. The agency is concerned that this amendment could eliminate this option. For example, subcontractors wouldn't be able to bring equipment in, do their job, survey and/or decontaminate and then take their equipment to the next job site.
8. Early input has shown that this amendment would encourage folks to stockpile low-contaminated material until license termination at which point the 25 mrem/yr standard would apply.

If you have any questions, please feel free to contact me or Monica Perez at 512-834-6688 or Cindy.Cardwell@dshs.state.tx.us or Monica.Perez@dshs.state.tx.us.

Sincerely,

Cynthia C. Cardwell, Manager
Radiation Policy/Standards/Quality Assurance Group
Department of State Health Services

**WASHINGTON STATE (WDOH) COMMENTS ON NRC PROPOSED RULE:
RADIOLOGICAL CRITERIA FOR CONTROLLING THE DISPOSITION OF SOLID
MATERIALS (STP-05-008)**

- The proposed rule pertains to residual radioactivity resulting from licensed operations AND which originate in restricted or impacted areas of NRC (and, as a matter of compatibility, Agreement State) licensed facilities. It does not directly apply to US DOE or DOD facilities although ultimately it will affect them. For example, the Navy recycles thousands of tons of metal from its naval ship decommissioning activities.

The NRC proposal will restrict solid waste disposal to only certain limited disposition paths. The current practice of releasing solid material from licensed facilities based on survey instrument capabilities will not be allowed. There are no provisions for releasing materials that are arguably “not radioactive” yet must be disposed via one of the “limited allowed disposition paths” simply because they were in a restricted area or in the newly defined “impacted area”. This is despite the acknowledgement that NRC’s current approach “is sufficiently protective of public health that it does not need immediate revamping”.

The proposed regulation makes all release criteria for NRC licensee effluents and wastes dose based. The proposed dose criterion is set at 1 mRem/yr, 1/100 of the public doses limit in NRC’s 10CFR20 Part 20. The 1 mRem/yr dose criterion is smaller than standards and design objectives set by NRC, EPA and WDOH for other specific media being released from licensed facilities. The economic consequences of this more restrictive dose criterion are not adequately explained.

Agency	Task	Limit (mRem/yr)	Regulation
NRC	Solid materials	1	10CFR20 (proposed)
NRC	Liquid effluent from power reactors	3	10CFR50 App I
EPA	Drinking Water	4	40CFR141
NRC	Gaseous effluent from power reactors	5	10CFR50 App I
EPA	Clean Air	10	40CFR61
WDOH	Hanford Guide for Radiological Cleanup	15	WDOH-320-015
NRC	License termination of facilities	25	10CFR20.1403
NRC	Liquid, air, sewer effluent release	50	10CFR20TableII
NRC	Public exposure	100	10CFR20

The NRC believes there is ample EPA/State regulated landfill capacity to accept the material that have residual radioactivity that is below the 1mrem/yr criteria. That assume these landfills will accept the material. It is clear that they do not have to. The consequences of not having this space available are not adequately discussed. It is possible that the volume of bulk metal, soil and soil-like material could be substantial and disposal into a landfill may not be feasible.

While the NRC proposes to allow the licensee to petition for alternate disposal under certain conditions, the NRC also notes that recyclers have expressed some doubt about the ability to keep this recycled material separate as required. There is further concern that the case specific approach for soil and soil-like materials would be hampered by the wide variability of soil behavior and general soil uses. Acceptable radionuclide concentrations are not necessarily conservative for the range of possible dispositions of soil.

We believe the following added burdens are not adequately addressed:

1. Licensees who must maintain records for disposition of re-use materials have little or no control over what happens to materials deposited in the landfill or once delivered to a recycler. Our auditing adherence to the new rule will be performance-based as far as the licensee is concerned but will NRC and Agreement State staff be inspecting landfills and recyclers to actually confirm that the rule is met.
2. Licensees, regulators, landfill operators and recyclers will need adequate instrumentation that allows specific radionuclide assessments. While the disposal criteria is dose-based (1 mrem/yr), the disposal really requires pCi/g activity determinations. Landfill operators and recyclers should also have adequately trained staff for protection of the public health and worker safety.
3. Licensees will need some sort of working agreement with landfill operators that the slightly contaminated waste that is disposed within the landfill will not leave the landfill and end up recycled. This should not be a problem for RCRA C landfills but there is some responsibility of the licensee to make sure their waste stays put.
4. Licensees may find that landfill operators refuse to accept waste. There is no obligation that landfills accept waste.
5. Licensees that want to dispose of bulk metal are likewise burdened in that they will have to have some assurance that the metal will not be made into consumer goods.
6. Recyclers will need to make sure that no material with residual contamination finds its way into new consumer products. Recycling streams will have to be kept separate. We believe a recycler of "residually contaminated radioactive material" will need to be licensed.
7. Licensees that want to dispose of soil and soil-like materials need a case specific review if the material is to go anywhere but into a RCRA C landfill. The dose-criterion remains 1 mrem/yr in order for materials to be considered for disposal. The licensee is at the mercy of the dose assessment scenario when applying for alternate disposal. For instance, our Hanford Cleanup guide uses a rural-residential scenario and has an acceptance limit of 15 mrem/yr. For many radionuclides, the concentration of residual radionuclide concentration allowed using the Hanford Guide is more restrictive than the concentration given in the proposed rule when both sets of concentrations are scaled to 1 mrem/yr. This disconnect illustrates the importance of scenario development.

8. Regulators are going to need to make assessments on whether material with residual contamination was appropriately disposed of. There are no mandatory reports. The assessments are performance-based and may require additional monitoring at recyclers and re-use endpoints. Further, regulators are going to have to determine that no treated process materials were disposed under this rule.
9. Regulatory Guide 1.86 criteria (or similar criteria) has been successfully used for decades by industry and regulatory agencies, for unrestricted release of essentially non-radioactive materials presenting minimal or no exposure risk. Both public & licensee confidence in reasonable radiation safety regulations are essential. We must protect health & safety without unnecessary and imbalanced regulatory burden caused by insisting that non-radioactive items be disposed as radioactive waste.
10. The 1 millirem per year dose criteria is unclear; is that 1 mrem total per licensee per year for all wastes, or is it per item (per box, per drum, per truckload, per landfill, per day)?
11. What effect does this proposed rule have on decay-in-storage? This material was most likely from a restricted area. If a survey says the material is indistinguishable from background can it still be considered non-radioactive and disposed as currently done? There may be still more than ~ 0 dpm in the waste container per activity decay calculations.

Bottom line, our concern is that despite all the years that this has been studied by NRC, it appears that there are still significant concerns that have not been fully addressed. We should not rush to implement even a modest regulatory ratcheting when the full extent of the burden is unknown. As previously noted, the current standards and regulations "is sufficiently protective of public health". Above all, we need to keep in mind that "the potential radiological hazards of these materials are so low that their exemption from continued regulation is deemed warranted and because funds unnecessarily spent on controlling trivial risks in one sector are not available for application to the control of 'real' risks elsewhere."



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February 23, 2005

Kim Karcagi
U.S. Nuclear Regulatory Commission
TWFN
11545 Rockville Pike
Rockville, Maryland 20852-2738

RE: Combined Rulemaking & DGEIS comments

Dear Kim:

A lot of good work has been done on the draft Generic Environmental Impact Statement (DGEIS) and concurrent Rule-making. Please find attached comments that may be useful in finalizing the DGEIS and rule-making.

As they currently read, the DGEIS and the draft rule-making are premature; inconsistent with other NRC regulations; lacks harmonization with international standards; and are not scientifically justified. Hence, more time is needed to transform the DGEIS and concurrent rule-making to support the current Proposed Action or to change the Proposed Action to reflect the data and analysis.

Premature

It is not appropriate to put forward a rule-making until all the supporting research and reports have been published and peer-reviewed. The entire rule-making may collapse without prior public acceptance many of the supporting documents, such as:

A. "Collective Doses Associated with Clearance of Material From NRC/Agreement State-

Licensed Facilities” by SC & A, Inc. Last available as a draft in September 2003.

- B. NUREG 1812, “Generic Environmental Impact Statement for Controlling the Disposition of Solid Materials” (GEIS). Last available as a draft in February 2005.
- C. Documents/reports that support IAEA RS-G-1.7, “Application of the Concepts of Exclusion, Exemption and Clearance,” August 2004.

At this time it is not possible to review the draft rule-making without the reviewing the GEIS and the recommendations made therein; the GEIS-dependent document of the SC & A, Inc.; and, a determination that documentation publication for IAEA RS-G 1.7 will be transparent and acceptable. Hence, the NRC needs to slow down the Rule Making effort until all their ducks are in a row.

Inconsistent with other NRC regulations

The Proposed Action will allow solid materials which have no, or very small amounts of, residual radioactivity resulting from licensed operations - this is a prospective ‘clean’ standard. This prospective standard effort will result in tables of radionuclide concentrations a licensee may use to intentionally release solid materials to the environment and/or public and have the solid material no longer be under regulatory control. Additionally, it is understood that by its very nature, prospective standards are more restrictive than the retrospective ‘clean’ standards (i.e., License Termination (LT), cleanup after a dirty bomb, etc.); hence, the proposed prospective dose criterion is 1 mrem/yr while the LT cleanup standard is 25 mrem/yr.

But, currently, the NRC does not apply these standards evenly.

Currently, licensees wishing to bury waste on-site need to apply to the NRC under 10 CFR 20.2002 and adhere to a 1 mrem/yr standard. But, as soon as the licensee initiates termination and starts decommissioning, waste can be buried on-site using the retrospective standard of 25 mrem/yr. This subtle switch is not congruent

NRC’s unofficial policy of applying the retrospective ‘clean’ standard when allowing on-site burial of contaminated solid materials (e.g., concrete, etc.) needs to be changed. All intentional burial (i.e., dispositions) of radioactive material must be held to the same prospective standard, not only when the NRC feels like it. Thus, the scope of the Proposed Action needs to be changed to include intentional dispositions of solid materials on-site as well as off-site.

Furthermore, because all NPP’s are near body of waters, they should not be allowed to apply the generic disposition limits of IAEA RS-G 1.7 because the scenario used in NUREG 1640 for concrete disposition assumes the EPA input parameters need to cite a subtitle D landfill (i.e., “Input Parameter Values for the Industrial D Tier 1 Tool.”) But, NPP’s do not have liners, are not a Subtitle D facility, and could never be classified as such. Hence, all on-site burials will be needed to be evaluated on a case-by-case basis.

With regards to inconsistency application of the LT rule (LTR) and Limited Disposition Standard (LDS), the NRC needs to:

- A. demonstrate that potential materials (e.g., soil, rubble) that could be removed from a site after license termination will not result in doses greater than 1 mrem/yr,
- B. better define what the LTR includes. We find it hard to swallow that intentionally disposing waste material (i.e., rubble) on-site was part of the LTR. The LTR is a retrospective clean up standard while disposal of contaminated waste material is to be held to a prospective clean standard (i.e., intentionally introduced into the environment and/or public), and,
- C. restrict rubbleization and burial on-site of radioactive contaminated solid materials (especially concrete) to the LDS requirements. Note that, most NPP sites could never qualify as an RCRA subtitle D landfill because they sit close to rivers, lakes and oceans, whereby the distance to the groundwater is relatively small and the leach rates would be too great because of lack of a liner or equivalent. Hence, site specific dose modeling are to be required whereby the dose from waste (i.e., radioactive contaminated rubble) be held to the prospective standard, thus, constitute 1 mrem/yr of the 25 mrem/yr allowed under LTR.

Page 1-7, line 31, of the DGEIS states that "Solid materials remaining on-site at facilities after license termination are subject to existing NRC regulations that would not be changed by the Proposed Actions." What regulations are meant here? After license termination, the next tenant may dig up and use the contaminated solid materials as they see fit. This is an unforeseen problem, because license termination was never intended to include prospectively disposed waste. License termination was for land and structures - intact whole building and landscape (i.e., soils).

It is unclear why the disposition of solid material's dose criterion is proposed to be less than the gaseous and liquid effluent standards of the NRC, and the drinking water standard of the EPA. It appears the justification is that a smaller dose criterion is better. If so, then this is the time to harmonize these prospective release standards all down to one mrem/yr, or time to better explain why one mrem/yr for disposition of solid materials is ok while 3 mrem/yr from liquid effluents is equally ok, etc.

Lacks Harmonization with International Standards &
Not Scientifically Justifiable (and other Notes) Per the DGEIS

Many of the following comments refer to the DGEIS, but similar statements are in the Rulemaking also. As noted above without an acceptable DGEIS, the rule-making should not occur.

Page xiv, Purpose and Scope, Line 28, DGEIS

It is unclear why the Proposed Action does not include guidance for 'surficially' contaminated materials. Especially, since the NRC current guidance is a surficially contamination guidance (i.e., Reg. Guide 1.86.); and NUREG 1640 has methods for converting volumetrical limits into surficial limits. Furthermore, when surficial limits are shown, they are only guidance (NUREG 1813) while the volumetrical limits are in regulations. It needs to be explained why surficial limits are in guidance while volumetric limits are proposed to be in the regulations.

Page xvii, Alternatives Eliminated from Detailed Study, Line 28, DGEIS

1. States that Conditional Uses, such as, "concrete use in road fill" were eliminated from detailed study, but the preliminary recommendation includes "concrete use in road beds." What's the difference? Is this a misprint? Furthermore, it is unclear why "concrete use in road beds" is included in the preliminary recommendations, because the concrete may ultimately be reused and/or recycled into unforeseen consumer products, which should eliminate it from consideration.
2. Also troubling about this section, is that the entire alternative of Conditional Use was eliminated from detailed study because the material may ultimately be reused and/or recycled into products not authorized under the Conditional Use Alternative (i.e., unforeseen), and the Conditional Use Alternative would allow a greater amount of activity than the Limited Disposition Alternative, which are based on Unrestricted Use Alternative (based on 1 mrem/yr.)

Neither of the above two explanations is acceptable. First, the Conditional Use dose scenarios should take into account the worst thing that could solid material could be re-used for and/or recycled into. Logic dictates that whatever this secondary item and/or use will be, it will result in a smaller dose than the original material especially if it is recycled. Secondly, allowing more activity to be released under the Conditional Use Alternative, some would argue, is a good thing. If more activity available for release is not desired, then why was the Conditional Use Alternative not assigned the values of the Unrestricted Use Alternative (based on 1 mrem/yr for normalization purposes)?

Hence, it is unclear why a generic process with generic release concentrations could not be formulated. All the factors used to eliminate the Alternative Use Alternative need to be stated in this section as well as section 2.5.

Page xvi, Limited Dispositions, DGEIS

1. The reasons for the use of IAEA RS-G 1.7 concentrations limits for Limited Dispositions supports the use of these values for the other Alternative scenarios, as noted above, such as Conditional Use and the Unrestricted Release Alternatives. Because, as stated on lines 32-35, "these materials could end up in dispositions, including reuse and recycling into

other products, given that the licensees [will] have no administrative controls over materials once they leave the site.”; this reason is used to disqualify the Conditional Use Alternative and assisted on marginalizing the Unrestricted Use Alternative.

If the use of IAEA RG-S-1.7 values is ok for Limited Dispositions, because the material may end up in consumer products, then these values (or equivalent values of NUREG 1640) are also acceptable for all the Alternatives. In other words, why is 1 mrem/yr from Limited Dispositions treated differently than 1 mrem/yr from Unrestricted Releases or 1 mrem/yr from Conditional Uses? One mrem/yr is one mrem/yr is one mrem/yr, regardless of where it comes from. Or, more to the point, why is the DGEIS selecting an Alternative based upon public perceptions?

Page xxiv, Staff Assessment & Preliminary Recommendations, DGEIS

All the reasons against unrestricted releases (page xxiv, lines 33-36) are not valid. Concerns that risks associated with unrestricted releases are avoidable and involuntary, and potential of doses from multiple sources is true for all the Alternatives. Moreover, section 3.8, on Cumulative Impacts states that “the likelihood of . . . multiple concurrent exposures becomes vanishingly small as the number of potential concurrent scenarios increases.” This correctly implies that doses from multiple sources is a very small (especially when compared to the public dose limit of 100 mrem/yr.)

Furthermore, the concern that “any dose increases cancer risk,” though valid in the LNT-sphere of regulation formulation, it is not valid according to the HPS, ICRP, NRC, IAEA, and this DGEIS; one mrem/yr is negligible. And, again, one mrem/yr from Unrestricted Release is equivalent to Limited Disposition’s one mrem/yr, etc.; this DGEIS cannot simultaneously cite that one mrem/yr from one Alternative (e.g., Unrestricted Releases, Conditional Use, etc.) poses more risk (i.e., dose) than another Alternative.

The concern that Unrestricted Releases would not be accurately measured and tracked is moot - tracking could be addressed in the DGEIS and measurements are addressed during inspections. But, the point of the DGEIS is to release solid materials from regulatory control because the risk from the material is negligible; hence, material tracking is not a disposition prerequisite nor is confirmatory measurements out of the question.

Thus, it appears that the DGEIS is not Process Driven, but rather it is public perception driven.

Pages xviii & xxiv, Socio-Economic Issues, DGEIS

The steel and concrete industry’s concerns appear to be socio-economic issues, which are not addressed, according to the DGEIS (page xviii, line 13). But, then later (page xxiv, lines 37-39), it appears that some socio-economics issues were qualitatively addressed.

Thus, it appears that socio-economic issues are not addressed evenly across all the alternatives. Socio-economic issues either need to be analyzed in full (detail) or they leave out the Metal and Concrete industry concerns.

In addition, the above industries already screen-out and do not accept radioactive contaminated materials. It appears this will continue, regardless of this DGEIS and associated rule-making. Thus, it does not make sense that "consumers could choose not to purchase items made from material recycled from licensed facilities," when the industries will not be accepting radioactive contaminated material in the first place. Not accepting the material is an industry business decision which should not affect this DGEIS. These industries are firm on this issue.

The above industries may soften their stance if the NRC worked with the EPA to start an initiative, under Section 6602 (b) of the Pollution Prevention Act of 1990, to purchase and use radioactive contaminated steel (i.e., inadvertent source melt) and concrete in the construction and retrofitting of government buildings. If this never materializes or fails, the material can be sold to another country that will accept it, under IAEA RG-S-1.7.

Page xix & xx, Transportation, DGEIS

The average number of miles to the closest Subtitle D landfill is stated as 100 miles. But this assumes that all these facilities will accept the material and that licensee will always choose the closest landfill - these are not good assumptions. It's interesting to note that the DGEIS takes into account the LLW "foreseeable future actions" landscape - only the Utah will be available - but does not take into account the "foreseeable future actions" of the Subtitle D landfills (i.e., the number and locations of landfills that will accept "solid material.") This analysis needs to be performed and may have a cascading effect on the number of fatalities; the cost/benefit analysis; and, result in the Subtitle D landfills requiring an "Irreversible and Irrecoverable Commitment of Resources" analysis (i.e., Subtitle D capacity used up.) In addition, the siting of new Subtitle D landfills may become difficult because finding publically acceptable locations may become burdensome - this needs to be included in the cost / benefit analysis of the Alternatives.

Analysis, DGEIS

In the comparison of the five Alternatives and their impacts, it appears that the concentrations and quantities used were not the same. Invariable, the Limited Disposition Alternative employs the use of IAEA RG-S-1.7 concentration limit's recommendations while the other Alternative employ scenario specific concentration limits; this does not appear appropriate. A table should be developed to show comparison of the impacts if all the alternatives used IAEA RG-S-1.7.

Page, xxiv - xxvi, Preliminary Recommendations, DGEIS

The chose of using IAEA RG-S-7 values for the Limited Disposition Alternative is not justified, because it will:

1. Create inconsistency with international guidelines, because the U.S. will use IAEA RG-S-1.7 values for Limited Disposition while the rest of the world will use the values for Unrestricted Release. Undoubtably this will cause international trade and transportation issues similar to the days before the U.S. finally adopted the IAEA transportation guidelines.
2. Nullifies the DGEIS, NRCP, ICRP, HPS, IAEA recommendation that 1 mrem/yr is negligible because burying concentrations of solid materials at IAEA RG-S-1.7 concentrations will result in doses much less than 1 mrem/yr. This sends a bad message to licensees and the public.
3. Ensure that licensees will still opt for applying for the time and resource consuming case-specific application process because these applications will result in larger concentrations and quantities to be eligible for disposition.
4. Increase the cost of doing business internationally. International stakeholder (i.e., compatibility associated problems) cost/benefit analysis needs to be assessed.

Overall, the DGEIS (and the draft Rulemaking) still suffer from the abrupt change in focus from Unrestricted Use to the Limited Disposition Alternative. Also, the staff's preliminary recommendations are not well supported because the DGEIS is missing data and/or analysis, and relies too heavily on public perception.

If you have any questions regarding this letter, please call me at (617) 427-2944 x2020.

Sincerely,



Michael P. Whalen Jr., CHP

Senior Health Physicist
Massachusetts Radiation Control Program