CHAPTER ONE

MINIMUM LDR TREATMENT REQUIREMENTS FOR MEDIA UNDER PROPOSED §269.30 – PART 2: SETTING LDR TREATMENT STANDARDS

1.A SUPPORT FOR VARIOUS COMPONENTS OF THE PROPOSED APPROACH

1.A.1 Nonanalyzable Constituents

Several commenters support EPA's general approach of using treatment of analyzable constituents as a surrogate for treating nonanalyzable constituents.

- "Shell agrees with EPA that the few organic constituents that do not have analytical methods will probably be treated adequately by treating an analyzable organic surrogate constituent. In addition, the constituent of concern is usually a carcinogen or other common constituent that is easily analyzed or one for which a surrogate is available. In our remediation projects, we have never had a problem with identifying a proper constituent to target for treatment or a practical surrogate." (115)

Response: EPA appreciates and acknowledges the support.

- "It is appropriate not to propose treatment standards for nonanalyzable organic constituents found in hazardous contaminated media since treating the analyzable constituents to meet treatment standards should provide adequate treatment of any nonanalyzable constituents." (42)

Response: EPA appreciates and acknowledges the support.

- "We support EPA's proposal that treatment of analyzable constituents to meet their applicable standards provides adequate treatment for any nonanalyzable constituents. The alternative to specify a treatment technology for any nonanalyzable constituents would limit flexibility in selecting remedial alternatives." (35)

Response: EPA appreciates and acknowledges the support.

- "EPA has proposed that nonanalyzable organic constituents need not be treated *per se*, because treatment of surrogates should assure effective treatment of such constituents. EPA has solicited comments regarding the appropriateness of its surrogacy approach. 61 Fed. Reg. 18810/1.

  In contrast to EPA's approach, CMA believes such technical questions demonstrate why treatment determinations should be made on a site-specific and material-specific basis. Further, CMA does not believe treatment should be required for nonanalyzable constituents. Because such constituents are not analyzable, there may be no basis on which to conclude the constituents are present in concentrations posing any risk or warranting treatment. Imposing LDR treatment obligations on such constituents imposes treatment for treatment's sake. To the extent that EPA nevertheless requires treatment of nonanalyzable constituents,

CMA does agree that EPA's proposed surrogacy approach is a defensible and sensible alternative. Although CMA is unable to submit any data at this time, CMA believes the treatment of similar organic constituents for which analytic protocols exist will significantly reduce any potential risks or threats posed by nonanalyzable constituents.

For media contaminated solely by nonanalyzable constituents, EPA has proposed to require treatment by the methods applicable to the underlying wastes. EPA has solicited comment regarding whether different technologies should be allowed for treatment of media containing solely nonanalyzable constituents. 61 Fed. Reg. 18810/1.

If EPA requires treatment of nonanalyzable constituents in media which contain no analyzable constituents, CMA believes EPA should allow treatment by technologies other than those specified in the LDRs for the corresponding P or U list I chemicals. Additional technologies may be more appropriate on a site-specific or media-specific basis than those previously determined to be BDAT in an inapplicable context." (112)

Response: EPA appreciates CMA's support for the Agency's proposed approach to media contaminated with both analyzable and nonanalyzable constituents. EPA continues to believe that treatment of analyzable constituents will typically provide an appropriate surrogate for treatment of nonanalyzable constituents. Regarding treatment of soil contaminated only by nonanalyzable constituents, the Agency continues to believe that treatment should be by the method specified for the contaminating waste (usually a U or P listed waste), since no surrogate constituents would be available to assess treatment performance. In situations where, as CMA is concerned, the specified technology is not appropriate for any given hazardous contaminated soil, a facility owner/operator could apply for approval of an alternative treatment method under the provisions of 40 CFR 268.40.

- "EPA invites comment on the approach of not proposing treatment standards for non-analyzable organic constituents found in hazardous contaminated media when such media contains multiple organic hazardous constituents.

  Comment: For those organic constituents that are non-analyzable and contained in media contaminated with analyzable organic constituents, Ohio EPA does not oppose the approach of using analyzable constituents as an indicator of treatment for non-analyzable constituents. However, such an approach should only be implemented when the non-analyzable constituents and the analyzable constituents are of the same chemical class (which includes evaluation of structure and functional groups). This approach is somewhat similar in concept to the chemical class groupings used in the HWIR-process waste rule to establish exit concentrations for hazardous constituents that are non-analyzable." (L01)

Response: EPA appreciates Ohio EPA's support of the proposed approach to treatment of nonanalyzable constituents. Furthermore, the Agency agrees that, for analyzable constituent to serve as an appropriate surrogates for nonanalyzable constituents the analyzable constituents should generally be in the same chemical family. EPA notes, however, that in many some instances other constituents from a different chemical family or class may also serve as good surrogates to monitor the treatment of nonanalyzable constituents since they may enable to monitor the destruction or removal of the nonanalyzable constituent of concern. One example is ensuring the removal of a nonanalyzable constituent from a contaminated soil via thermal desorption by monitoring in the

contaminated soil a constituent amenable to analytical testing that it is also as difficult to treat as the nonanalyzable one (even if they are from another chemical family) provided these constituent is in sufficient concentrations to be measured prior and after treatment. Likewise, other chemical family constituents may serve as indicators for the destruction of the nonanalyzable constituent of concern for some chemicals may also serve this purpose.

- "EPA requests comment on whether media contaminated with non-analyzable hazardous constituents should be treated per the LDR universal treatment standards or should other technologies be allowed for treatment of these media.

  Comment: It is most appropriate to treat contaminated media that contain only non-analyzable constituent(s) in accordance with the LDR universal treatment standards specified in 40 CFR part 268 for the hazardous constituent(s) in question. However, it may be feasible to use other technologies for the treatment of media contaminated with non-analyzable hazardous constituents if the alternative technology is proven to effectively treat analyzable hazardous constituents, of the same chemical class as the nonanalyzable constituent, when contained in media." (L01)

Response: EPA appreciates and acknowledges the support.

1.A.2 Proposed Treatment Standards

Several commenters generally support the proposed treatment standards for contaminated media, arguing that Part 268 treatment standards and modified standards for soil are achievable and applicable.

- "The proposed treatment standard for hazardous contaminated media is acceptable." (L02)

Response: EPA acknowledges and appreciates the support.

- "The ETC generally supports the proposed treatment standards for contaminated media:
  - For hazardous media other than soils-like groundwater and sediments-the proposal would require treatment to meet the LDR treatment requirements applicable to the hazardous waste contained in the media.
  - For organics in soils the proposal would require treatment to reduce above the Bright Line constituent concentrations by 90%.
  - For metals in soils, the required 90% reduction would apply either to the total concentrations of metals (for technologies that remove metal constituents) or to concentrations of metals in the leachate (for solidification-type technologies).
  - For both organics and metals in soils, treatment would be "capped" at 10 times UTS and no treatment would be required beyond that point.

The ETC recognizes the unique characteristics of contaminated soil that affect treatment. Numerous members of the ETC apply a wide range of treatment technologies to contaminated soil. Over the last 10 years the ETC has commented extensively on treatment of contaminated soil in various LDR rulemaking initiatives. Most significantly, the ETC submitted substantial treatment data and a comprehensive review of numerous innovative treatment technologies for contaminated soil in our comments on EPA's proposed Phase 2 LDR regulations. See Comments of the Hazardous Waste Treatment Council in Docket Number F-92-CS2P-F, Phase II LDR Proposed Rule, 58 Federal Register 48092 (Sept. 13, 1993), which are incorporated herein by this reference.

As supported by the data submitted with these incorporated comments to the Phase II LDR rule, innovative treatment technologies are capable of treating wastes to both the UTS and to 10 x UTS. The data shows that 91% of the time innovative technologies are capable of meeting treatment standards at 10 x UTS. Furthermore, as noted by EPA (Page 18807/2), the l0xUTS standard received strong support from many commenters on the proposed Phase II LDR rule.

The ETC does not agree that allowing the Director to require more stringent LDR standards on a site-specific basis provides a sufficient safety net (Page 18807/3). Minimum treatment requirements should not be left to discretion. Otherwise, the Agency is leaving to chance whether a given state official will recognize that greater treatment for a given constituent is appropriate. RCRA § 3004(m)(l) requires best demonstrated available treatment, in order to provide for a consistent level of treatment of hazardous constituents for a particular type of waste. A discretionary standard is not one that reduces the hazards of the contaminants to the greatest extent achievable, and does not minimize the threat of exposure. Such a discretionary approach is unnecessary since the available treatment data from the Phase II LDR proposed rule clearly shows that a 10xUTS standard alone is achieved by a wide range of technologies commonly used in remediation of soil.

The ETC supports and agrees with EPA that for media other than soil, the Part 268 treatment standards are both achievable and applicable. Also, ample treatment capacity exists for these wastes, both in on-site applications as well as off-site commercial facilities." (88)

Response: EPA acknowledges and appreciates the support of the soil treatment standards. Furthermore, EPA agrees that, as discussed in more detail in the preamble to today's action, site-specific discretion to require a more stringent standards is not required to ensure that the new soil treatment standards meet the standard of 3004(m)(1). EPA notes that the standard of 3004(m)(1) is not, as the commenter asserted, "best demonstrated available treatment" but, instead, "those levels or methods of treatment, if any, which substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the wastes so that short-term. and long-term threats to human health and the environment are minimized."

Several commenters urge the Agency to maintain the LDR treatment standard of 90%/10 times the UTS as designated in the proposed HWIR-Media.

- "Although EPA recites the number of commenters supporting various of its proposed options, CMA believes sound public policy is based on the nature and quality of the comments and data, and not on the number of individuals supporting a given option. Thankfully, EPA agrees, and has proposed to adopt a 90% reduction standard capped at 10 x UTS. 61 Fed. Reg. 18807/2. Although CMA believes no generic standard should be adopted for the reasons set forth above, this option better assures EPA's generic proposal will be achievable at a greater number of the sites to which it will apply." (112)

Response: EPA acknowledges and appreciates the support.

- "EPA's proposal to set modified treatment standards for more highly contaminated materials at 90 percent reduction or 10 times the Universal Treatment Standard (UTS), whichever is less stringent, is encouraging. It is certainly a step in the right direction for EPA to set LDRs for contaminated media at ten times the UTS. A UTS standard for contaminated media would clearly be unachieveable, inflexible and costly. Moreover, it is beneficial for the Agency to allow treatment technologies other than incineration for remediation wastes. Alternative treatment technologies are less costly and pose less environmental risks than does incineration.

  While EPA's proposed LDR treatment requirements appear to have merit, API is uncertain whether or not adjustments are needed to the 90 percent reduction and/or ten times the UTS requirements. API is currently collecting and analyzing data to evaluate the technical feasibility of these proposed LDR requirements. API will share its analysis with the Agency once it is completed and requests that its analysis be incorporated into the docket for this rulemaking." (39)

Response: EPA acknowledges and appreciates the support.

- "Doe Run believes that as proposed, the HWIR-Media treatment standard is reasonable, and agrees with the Agency that the proposed treatment standards "reflect appropriate treatment technologies and strategies for environmental media, and the site-specific nature of cleanup activities more accurately." 61 Fed. Reg. 18806. However, Doe Run is concerned that in finalizing the HWIR-Media, the Agency may require treatment not only to the 90% reduction or 10 times the UTS standard, but also to UTS levels, based on the Toxicity Characteristic Leaching Procedure ("TCLP"). See 40 C.F.R. 68.41 (UTS Table)." (37)

- "Doe Run supports the concept of a risk-based approach for existing from the RCRA Subtitle C system, and urges the Agency to maintain the LDR treatment standard of 90%/10 times the UTS as designated in the proposed HWIR-Media. This will help to ensure that the HWIR-Media encourages and facilitates the removal and recycling of lead contained in soil by means of such minimal-risk treatment technologies as soil washing/leaching." (37)

Response: EPA acknowledges and appreciates the support.

One commenter supports EPA's decision to establish soil-specific LDR standards. Another comments that stabilization of lead contaminated soil will meet the proposed standard. [Also see Chapter 21 comments on lead.]

- "To the extent that EPA decides apply LDR requirements to remediation wastes, Asarco supports EPA's decision to establish soil-specific LDR standards that take into account the "distinct treatment issues" associated with contaminated soils. It is appropriate for EPA to consider media-specific factors, such as those associated with soils, in setting appropriate LDR levels that meet EPA's statutory responsibility under RCRA to set standards at levels that "minimize threats."" (75)

Response: EPA acknowledges and appreciates the support.

- "EPA requests comments as to whether the proposed HWIR-Media treatment standards for soils are achievable. TDS receives a significant quantity of characteristically hazardous lead contaminated soils which are stabilized to remove the characteristic. The regulatory level for the lead characteristic is 5.0 mg/l.

  The data in Table 3 show that stabilization of lead exceeding the 5.0 mg/l regulatory level readily reduces the lead to under 1 mg/l in the TCLP extract of the stabilized media. The % reduction in leachable lead exceeds 99%. TDS believes that stabilization of metal bearing wastes can easily meet the 90% standard." (25)

Response: EPA acknowledges and appreciates the support.

One commenter suggests that the 90% reduction/l0xUTS treatment standard for soil should be limited to soils managed under an approved RMP. {Also see Chapter 16 comments on RMPs.]

- "The 90% reduction/l0xUTS treatment standard proposed today for soil should be limited to soils managed under an approved RMP. Soil treatment standards should not be adjusted to account for the lack of State or Agency oversight. Hazardous debris should be subject to treatment standards similar to the standards in the proposed rule for contaminated media." (42)

Response: As discussed further in the preamble to today's action, based on further consideration of the issue and consideration of other comments, EPA is persuaded that the new soil treatment standards should be made available to all contaminated soil that is subject to LDRs and not limited to soils managed under a remedial action plan and has revised the final regulations accordingly.

Another suggested an approach for demonstrating whether the 90% reduction has been achieved.

- "Although EPA, on page 18816, states that they are in the process of developing guidance on how to sample, test, and analyze contaminated media, the proposed rule does not specify how the 90% reduction is to be demonstrated. Contaminated soils are frequently non-homogenous and typically exhibit a wide range of concentrations. It also is possible that some of the contaminants present are naturally occurring. DoD recommends that the 90% reduction standard be based on 90% of the highest known concentration subject to treatment. DoD also requests that when establishing baseline concentrations, generators not be required to sample above and beyond what is ordinarily used to establish the nature and extent of contamination (that is, generators should not be required to sample for the complete list of

underlying hazardous constituents in §268.48). This would not be an efficient use of remediation funds." (97)

Response: As discussed in the preamble to today's final rule, EPA continues to believe that, when establishing representative concentrations of hazardous constituents in soil from which the 90% reduction portion of the soil treatment standard should be measured, normal soil characterization techniques and procedures should be used. EPA further agrees that the types of soil sampling and site characterization typically conducted during remedial activities should be appropriate for identifying underlying hazardous constituents present in any given volume of contaminated soil. As discussed in the preamble to today's final rule, EPA is confident that sampling and analysis can be appropriately targeted to ensure that it is focused on appropriate hazardous constituents or classes of hazardous constituents and does not intend that sampling and analysis would routinely be required for the entire suite of universal treatment standard constituents.

Regarding naturally occurring hazardous constituents, in consideration of this and other comments, EPA has concluded that treatment to comply with the soil treatment standards should not be required if constituent concentrations fall below naturally occurring background concentrations, provided the soil will continue to be managed on site or in an area with similar natural background concentrations. If soil will be sent for land disposal off-site, compliance with the new soil treatment standards is required, since the Agency believes that natural background concentrations on-site will not automatically correspond to natural background concentrations at a remote land disposal facility. This issue is discussed in the preamble to today's final rule and in responses to more specific comments in section 1.A.4 of this document.

Another commenter suggested that voluntary cleanups also be able to utilize the 10 x UTS or 90% reduction standards.

- "In order to maximize the number of cleanups initiated nationwide, as much of the remediation program as possible should be self-implementing. Towards that end, parties interested in performing voluntary cleanups should be able to utilize the "10 x UTS or 90%" treatment standard to guide remedial efforts outside the scope of Subtitle C." (81)

Response: As discussed further in the preamble to today's action, EPA is persuaded that the new soil treatment standards should be available to all hazardous contaminated soil, including soil managed during voluntary cleanups, and has revised the final regulations accordingly.

1.A.3 Support for Scope of Wastes Subject to Treatment

Several commenters support EPA's decision to subject remediation waste to treatment only for those hazardous constituents (e.g., constituents of concern) that originated from the hazardous waste. [Also see Chapter 6 comments regarding contained-in determinations.]

- "The ETC also agrees with EPA's discussion of "Constituents Subject to Treatment" (Pages 18809-10). In particular, we agree that the underlying hazardous constituents must also be addressed for media contaminated with characteristic wastes or exhibiting a characteristic." (88)

Response: EPA acknowledges and appreciates the support.

- "**Testing of the contaminated media should be limited to the specific constituents that cause the waste contained in the media to be a listed waste, or that contribute to its characteristic of a hazardous waste.**

  CSI agrees with this focused approach, and would not like to see it expanded in the final rule. Appendix A to the proposed 40 CFR 269 includes many compounds for which testing would be expensive, if not impossible. The detection limits can be very low, and many constituents do not include Bright Line Numbers. " (44)

Response: Despite this support of the proposed approach, on further consideration, EPA was persuaded by other comments that it is prudent to apply the logic of the *Chemical Waste* court both to soil contaminated by listed hazardous waste and to soils which exhibit a characteristic of hazardous waste.

As the Agency explained in the 1990 proposal, contaminated soils are potentially contaminated with a wider range of hazardous constituents than process wastes -- in no small part because they generally reflect uncontrolled disposal settings. 58 FR at 48124 (September 14, 1993). Since this is the type of circumstance addressed in the *Chemical Waste* opinion (i.e., because they are generated by many different processes and under different circumstances, characteristic wastes can also contain a wide range of hazardous constituents), the Agency is persuaded that it is prudent to apply the logic of the *Chemical Waste* opinion and require treatment of all underlying hazardous constituents. See *Chemical Waste Management v. US EPA*, 976 F.2d at 16 - 18 (D.C. Cir 1992). Therefore, today's final rule requires that all contaminated soil subject to the LDRs be treated to achieve the soil treatment standards for each underlying hazardous constituent reasonably expected to be present in the soil when such constituents are initially found at concentrations greater than ten times the universal treatment standard. Characteristic soil must also be treated, in the case of TC soil, for the TC constituent and, in the case of ignitable, corrosive, or reactive soil, for the characteristic property.

As discussed further in the preamble to today's action, EPA is confident that sampling and analysis can be appropriately targeted to ensure that it is focused on appropriate hazardous constituents or classes of hazardous constituents and does not intend that sampling and analysis would routinely be required for the entire suite of universal treatment standard constituents. Other commenters support this approach.

- "TREATMENT REQUIREMENTS (40CFR269.30): It is appropriate to require hazardous contaminated media be treated for each UTS constituent that originated from the contaminating hazardous waste, and that is subject to the treatment standard for such hazardous waste as it was generated." (42)

Response: Despite this support of the proposed approach, on further consideration, EPA was persuaded by other comments that it is prudent to apply the logic of the *Chemical Waste* court both to soil contaminated by listed hazardous waste and to soils which exhibit a characteristic of hazardous waste.

As the Agency explained in the 1990 proposal, contaminated soils are potentially contaminated with a wider range of hazardous constituents than process wastes -- in no small part because they generally reflect uncontrolled disposal settings. 58 FR at 48124 (September 14, 1993). Since this is the type of circumstance addressed in the *Chemical Waste* opinion (i.e., because they are generated by many different processes and under different circumstances, characteristic wastes can also contain a wide range of hazardous constituents), the Agency is persuaded that it is prudent to apply the logic of the *Chemical Waste* opinion and require treatment of all underlying hazardous constituents. See *Chemical Waste Management v. US EPA*, 976 F.2d at 16 - 18 (D.C. Cir 1992). Therefore, today's final rule requires that all contaminated soil subject to the LDRs be treated to achieve the soil treatment standards for each underlying hazardous constituent reasonably expected to be present in the soil when such constituents are initially found at concentrations greater than ten times the universal treatment standard. Characteristic soil must also be treated, in the case of TC soil, for the TC constituent and, in the case of ignitable, corrosive, or reactive soil, for the characteristic property.

As discussed further in the preamble to today's action, EPA is confident that sampling and analysis can be appropriately targeted to ensure that it is focused on appropriate hazardous constituents or classes of hazardous constituents and does not intend that sampling and analysis would routinely be required for the entire suite of universal treatment standard constituents. Other commenters support this approach.

- "With respect to the LDR treatment standards proposed under the Bright Line Approach, Flying J supports the use of Part 261 Appendix VII constituents to make a "contained-in" determination. Flying J also supports the attachment of treatment standards to only those constituents for which treatment would have been required if the wastes were not contained in environmental media 61 Fed. Reg. 18809. The treatment standards should not attach to all potentially hazardous constituents. For instance, application of LDRs to all hazardous constituents would constitute over-regulation and would undermine the goal of reducing unnecessary Subtitle C regulation of remediation wastes. Flying J also concurs with the Agency's longstanding policy that in cases where the origin of the contaminants is unknown, the lead agency may assume that contaminants in the media did not originate from listed hazardous wastes. Flying J urges EPA to retain this aspect of the proposal in the final rule." (66)

Response: Despite this support of the proposed approach, on further consideration, EPA was persuaded by other comments that it is prudent to apply the logic of the *Chemical Waste* court both to soil contaminated by listed hazardous waste and to soils which exhibit a characteristic of hazardous waste.

As the Agency explained in the 1990 proposal, contaminated soils are potentially contaminated with a wider range of hazardous constituents than process wastes -- in no small part because they generally reflect uncontrolled disposal settings. 58 FR at 48124 (September 14, 1993). Since this is the type of circumstance addressed in the *Chemical Waste* opinion (i.e., because they are generated by many different processes and under different circumstances, characteristic wastes can also contain a wide range of hazardous constituents), the Agency is persuaded that it is prudent to apply the logic of the *Chemical Waste* opinion and require treatment of all underlying hazardous constituents. See *Chemical Waste Management v. US EPA*, 976 F.2d at 16 - 18 (D.C. Cir 1992). Therefore, today's final rule requires that all contaminated soil subject to the LDRs be treated to achieve the soil

treatment standards for each underlying hazardous constituent reasonably expected to be present in the soil when such constituents are initially found at concentrations greater than ten times the universal treatment standard. Characteristic soil must also be treated, in the case of TC soil, for the TC constituent and, in the case of ignitable, corrosive, or reactive soil, for the characteristic property.

As discussed further in the preamble to today's action, EPA is confident that sampling and analysis can be appropriately targeted to ensure that it is focused on appropriate hazardous constituents or classes of hazardous constituents and does not intend that sampling and analysis would routinely be required for the entire suite of universal treatment standard constituents. Other commenters support this approach.

Regarding EPA's longstanding policy about the origin of wastes or contaminants, EPA has retained the presumption that, when information is not available one may presume contamination did not originate from listed hazardous waste. EPA has also retained the latest application of this policy -- when information is not available one may presume contamination did not originate from untreated restricted waste placed after the effective date of the applicable land disposal restrictions.

- "Section 269.30(a) - © -- Minimum LDR Treatment Requirements For Media

  If EPA nevertheless imposes the LDRs on contaminated media, USWAG supports the Agency's proposal that, where information on the placement of the hazardous waste is unavailable or inconclusive, EPA would allow generators to presume that the contaminated media does not contain hazardous waste that was spilled after the effective date of the LDRs. 61 Fed. Reg. at 18805. As the Agency notes, a facility is likely to be aware of any significant spills that occurred after the effective date of the LDRs, and therefore, any contamination for which such documentation is not readily available is likely to have been spilled prior to the effective date of the LDRs.

  Moreover, the Agency's proposed approach to determining whether the LDRs apply is consistent with the approach taken by the Agency in determining whether hazardous waste requirements apply to wastes generated at CERCLA sites. See Policy for Superfund Compliance with the RCRA Land Disposal Restrictions, U.S. EPA, OSWER Dir. No. 9347.1-02, Apr. 17, 1989. Under the CERCLA guidelines, if the owner or operator cannot determine after a good faith effort that the contamination is not derived from hazardous waste, they are not required to manage the media as hazardous waste. USWAG supports the Agency's proposal to adopt a similar approach for contaminated media." (59)

Response: EPA acknowledges and appreciates the support. The Agency's longstanding policy that, when information is not available, one may presume contamination did not originate from listed hazardous waste and the latest application of this policy -- when information is not available one may presume contamination did not originate from untreated restricted waste placed after the effective date of the applicable land disposal restrictions -- has been retained in the final rule.

- "Shell agrees that the focus of remediations should be on constituents of concern and not on the artificial distinction of a "listed" or "characteristic" waste. A flexible remediation system cannot be developed if the source and classification of the waste in the media is the focus.

Note: Many of the inherent management problems created by RCRA are related to the question of the source of the media contamination. The so called "mixture rule" has created numerous situations of over-regulation and over-reaction because of the creation of a large amount of regulated material which in fact represented no increase in risk to human health or the environment." (115)

Response: This comment does not seem to address a land disposal restriction treatment standard issue. However, EPA's approach to constituents subject to treatment seems consistent with this thinking. In the final regulation, EPA is requiring treatment for each underlying hazardous constituent reasonably expected to be present in contaminated soil when such constituents are initially found at concentrations greater than ten time the UTS whether soil is contaminated by listed waste or exhibits a characteristic of hazardous waste.

- "EPA requests comment on the scope of constituents subject to treatment for hazardous contaminated media, i.e., media with constituent levels above the BL. TDS generally supports EPA's approach with regard to soils, that of requiring treatment for each UTS constituent present at concentrations greater than 10 times UTS. TDS also supports EPA's approach with regard to media exhibiting a characteristic, that of requiring treatment for the characteristic, and for all underlying constituents exceeding 10 times UTS." (25)

Response: Despite this support of the proposed approach, on further consideration, EPA was persuaded by other comments that it is prudent to apply the logic of the *Chemical Waste* court both to soil contaminated by listed hazardous waste and to soils which exhibit a characteristic of hazardous waste.

As the Agency explained in the 1990 proposal, contaminated soils are potentially contaminated with a wider range of hazardous constituents than process wastes -- in no small part because they generally reflect uncontrolled disposal settings. 58 FR at 48124 (September 14, 1993). Since this is the type of circumstance addressed in the *Chemical Waste* opinion (i.e., because they are generated by many different processes and under different circumstances, characteristic wastes can also contain a wide range of hazardous constituents), the Agency is persuaded that it is prudent to apply the logic of the *Chemical Waste* opinion and require treatment of all underlying hazardous constituents. See *Chemical Waste Management v. US EPA*, 976 F.2d at 16 - 18 (D.C. Cir 1992). Therefore, today's final rule requires that all contaminated soil subject to the LDRs be treated to achieve the soil treatment standards for each underlying hazardous constituent reasonably expected to be present in the soil when such constituents are initially found at concentrations greater than ten times the universal treatment standard. Characteristic soil must also be treated, in the case of TC soil, for the TC constituent and, in the case of ignitable, corrosive, or reactive soil, for the characteristic property.

As discussed further in the preamble to today's action, EPA is confident that sampling and analysis can be appropriately targeted to ensure that it is focused on appropriate hazardous constituents or classes of hazardous constituents and does not intend that sampling and analysis would routinely be required for the entire suite of universal treatment standard constituents. Other commenters support this approach.

- "Merck supports the Agency's position on hazardous waste determination and land disposal restriction application in the following citation: "[I]f information is not available or

inconclusive, facility owner/operators may generally assume that the material contaminating the media were not hazardous wastes. Similarly, if environmental media were determined to be contaminated by hazardous waste, but if information on the dates of placement is unavailable or inconclusive, facility owner/operator may, in most cases assume the waste were placed before the effective date." 61 *FR* 18805." (109)

Response: EPA acknowledges and appreciates the support. The Agency's longstanding policy that, when information is not available, one may presume contamination did not originate from listed hazardous waste and the latest application of this policy -- when information is not available one may presume contamination did not originate from untreated restricted waste placed after the effective date of the applicable land disposal restrictions -- has been retained in the final rule.

- "CMA strongly supports EPA's proposal to presume, in the absence of conclusive information to the contrary, that environmental media have not been contaminated with hazardous wastes, and that any contamination by hazardous wastes occurred before the effective date of any potentially applicable LDR prohibition. 61 Fed. Reg. 18805/2. CMA also supports EPA's belief that good housekeeping requirements and existing reporting requirements under various statutes will routinely supply conclusive information, if contamination resulted from disposal after the effective date of an applicable LDR prohibition. *Id.* at 18805/3. Nonetheless, EPA solicits comments regarding whether there are any other assumptions, records, or standards of evaluation to ensure complete and proper identification of media contaminated with hazardous wastes disposed after an applicable LDR prohibition date." (112)

Response: EPA acknowledges and appreciates the support. The Agency's longstanding policy that, when information is not available, one may presume contamination did not originate from listed hazardous waste and the latest application of this policy -- when information is not available one may presume contamination did not originate from untreated restricted waste placed after the effective date of the applicable land disposal restrictions -- has been retained in the final rule.

Conversely, another commenter notes that the BDAT list used in setting treatment standards would be a more accurate and comprehensive characterization of waste than the Appendix VII list.

- "The ETC does not support applying treatment standards only to constituents above the Bright Line. In particular, given EPA's proposed definition of "Bright Line constituents," many hazardous constituents not on Appendix VII but present as hazardous constituents in the waste and BDAT constituents under Part 268, would escape treatment. As discussed elsewhere in these comments, the BDAT list used in setting treatment standards is a more accurate and comprehensive characterization of the waste than the Appendix VII list. Because of the issues and problems discussed on page 18809/3, EPA must make the definition of "Bright Line constituent" at least as comprehensive as the BDAT constituent list under the LDRs." (88)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher-and lower-risk contaminated media, including contaminated soil. The soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that

are reasonably expected to be present in any given volume of contaminated soil when such constituents are found at initial concentrations greater than ten times the UTS. If, in the future, the Agency takes action to establish a bright line, it will address comments regarding the relationship between bright line constituents and underlying hazardous constituents, as necessary.

Commenters requested that the rule clarify that if the generator is not able to determine the date at which placement occurred, the date is assumed to precede the effective date of the applicable LDR requirements.

- "The proposed language does not codify EPA's policy with respect to media where the generator is unable to determine the time of placement of the waste contaminating the media. The language should indicate that if the generator is unable to determine the date at which placement occurred, the date is assumed to precede the effective date of the applicable LDR requirements." (35)

Response: EPA does not, at this time, believe it is necessary to promulgate explicit regulations on the Agency's longstanding policy regarding the use of information to determine the origin or dates of contamination. EPA's policy on use of information to determine whether contamination was caused by hazardous waste is not in regulation and this has not, to EPA's knowledge, unduly hampered implementation of this policy.

- "CMA does not believe it is possible to specify a generic protocol to assure all relevant information which may exist is collected and evaluated. Nor does CMA believe it appropriate for remediation managers or others to be required to undertake painstaking collection and analysis of historical documentation and/or interview individuals familiar with historic operations. This is particularly true if such materials are not within the possession of the site owner, and the individuals are not current employees of the site owner. Thus, even though CMA supports EPA's efforts to develop standards to assure better identification, CMA believes EPA should create a "safe harbor" provision for such identification decisions. In particular, CMA believes EPA should adopt a standard requiring a reasonable investigation of readily accessible information, where reasonableness is determined by the subjective, good faith belief of the person conducting the inquiry." (112)

Response: EPA does not, at this time, believe it is necessary to promulgate explicit regulations on the Agency's longstanding policy regarding the use of information to determine the origin or dates of contamination. EPA's policy on use of information to determine whether contamination was caused by hazardous waste is not in regulation and this has not, to EPA's knowledge, unduly hampered implementation of this policy.

1.A.4 Comments on Treatment to Background versus UTS

Several commenters presented their thoughts on treatment to background versus UTS levels for naturally occurring contaminants.

- "EPA solicited comment regarding whether to evaluate concentrations of constituents in contaminated media to background levels of naturally occurring contaminants when identifying constituents subject to treatment. 61 Fed. Reg. 18809/3. CMA emphatically

agrees with this approach, if it is understood the purpose of such evaluation is to avoid requiring treatment below naturally occurring background levels. Scarce remediation resources certainly should not be wasted reducing risks from contaminated media below the already low naturally occurring risk levels. Similarly, EPA should not require evaluation to determine if constituents exist in excess of background levels which are not otherwise subject to treatment pursuant to the protocols described above." (112)

Response: In consideration of this and other comments, EPA has concluded that treatment to comply with the soil treatment standards should not be required if constituent concentrations fall below naturally occurring background concentrations, provided the soil will continue to be managed on site or in an area with similar natural background concentrations. If soil will be sent for land disposal off-site, compliance with the new soil treatment standards is required, since the Agency believes that natural background concentrations on-site will not automatically correspond to natural background concentrations at a remote land disposal facility.

The Agency notes that natural background concentrations are constituent concentrations that are present in environmental media which has not been influenced by human activities or releases. Since these constituent concentrations are present absent human influence and EPA has determined that soil (like other environmental media) is not, of itself, a waste EPA is not convinced the Agency would have the authority to require compliance with LDR treatment standards when constituent concentrations fall below background concentrations even if it felt compelled to do so. (Of course, such constituents could be regulated as hazardous constituents under cleanup authorities, including RCRA corrective action and other authorities.)

Since background concentrations may vary across geographic areas, and to ensure that the LDR soil treatment standards will only be capped at background where appropriate, EPA will require that individuals who wish to cap LDR treatment at natural background concentrations apply for and receive an LDR treatment variance. EPA will presume that when the soil treatment standards would require treatment to concentrations that are less than natural background, such a variance will be appropriate, based on the finding that it is inappropriate, for contaminated soil, to require treatment to concentrations less than natural background concentrations.

- "For contaminated media above the bright line levels, the media should be treated for the listed waste constituents contained therein as well as any characteristic wastes or underlying constituents. The underlying constituents, however, should only be subject to treatment to background levels when the constituent is naturally occurring in the media." (72)

Response: In consideration of this and other comments, EPA has concluded that treatment to comply with the new soil treatment standards will not be required if constituent concentrations fall below naturally occurring background concentrations, provided the soil will continue to be managed on site or in an area with similar natural background concentrations. If soil will be sent for land disposal off-site, compliance with the new soil treatment standards is required, since the Agency believes that natural background concentrations on-site will not automatically correspond to natural background concentrations at a remote land disposal facility.

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these constituent concentrations are present absent human influence and EPA has determined that soil (like other environmental media) is not, of itself, a waste EPA is not convinced the Agency would have the authority to require compliance with LDR treatment standards when constituent concentrations fall below background concentrations even if it felt compelled to do so. (Of course, such constituents could be regulated as hazardous constituents under cleanup authorities, including RCRA corrective action and other authorities.)

Since background concentrations may vary across geographic areas and to ensure that the LDR soil treatment standards will only be capped at background where appropriate, EPA will require that individuals who wish to cap LDR treatment at natural background concentrations apply for and receive an LDR treatment variance. EPA will presume that when the soil treatment standards would require treatment to concentrations that are less than natural background, such a variance will be appropriate, based on the finding that it is inappropriate, for contaminated soil, to require treatment to concentrations less than natural background concentrations.

- "…. the ETC does not agree with evaluating "naturally occurring" hazardous constituents, and discounting these in LDR treatment of media. Instead, any constituent present above UTS levels must be subject to treatment. In most sites, it is difficult to define what is naturally occurring background. A uniform program based on UTS is objective, uniform, protective, and easily implemented." (88)

Response: EPA appreciates the comment; however, we are persuaded by other comments and believe that when contaminated soils will be managed on-site treatment should be capped at natural background concentrations.

The Agency notes that natural background concentrations are constituent concentrations that are present in environmental media which has not been influenced by human activities or releases. Since these constituent concentrations are present absent human influence and EPA has determined that soil (like other environmental media) is not, of itself, a waste EPA is not convinced the Agency would have the authority to require compliance with LDR treatment standards when constituent concentrations fall below background concentrations even if it felt compelled to do so. (Of course, such constituents could be regulated as hazardous constituents under cleanup authorities, including RCRA corrective action and other authorities.)

- "Westinghouse supports EPA's proposal that LDR treatment standards be met for those regulated constituents associated with the listed waste contaminating media as identified in ¤268.40. However, treatment should not be required below background concentration levels of any naturally occurring hazardous constituent concentrations. In the event any naturally occurring constituents were subject to LDR treatment standards, the treatment levels for those constituents should be capped at the background concentration levels for the site." (35)

Response: In consideration of this and other comments, EPA has concluded that treatment to comply with the new soil treatment standards will not be required if constituent concentrations fall below naturally occurring background concentrations provided the soil will continue to be managed on site or in an area with similar natural background concentrations. If soil will be sent for land disposal off-site, compliance with the new soil treatment standards is required, since the Agency believes that

natural background concentrations on-site will not automatically correspond to natural background concentrations at a remote land disposal facility.

The Agency notes that natural background concentrations are constituent concentrations that are present in environmental media which has not been influenced by human activities or releases. Since these constituent concentrations are present absent human influence and EPA has determined that soil (like other environmental media) is not, of itself, a waste EPA is not convinced the Agency would have the authority to require compliance with LDR treatment standards when constituent concentrations fall below background concentrations even if it felt compelled to do so. (Of course, such constituents could be regulated as hazardous constituents under cleanup authorities, including RCRA corrective action and other authorities.)

Since background concentrations may vary across geographic areas and to ensure that the LDR soil treatment standards will only be capped at background where appropriate, EPA will require that individuals who wish to cap LDR treatment at natural background concentrations apply for and receive an LDR treatment variance. EPA will presume that when the soil treatment standards would require treatment to concentrations that are less than natural background, such a variance will be appropriate, based on the finding that it is inappropriate, for contaminated soil, to require treatment to concentrations less than natural background concentrations.

1.B. GENERAL COMMENTS IN OPPOSITION TO THE PROPOSED APPROACH

1.B.1 Application of LDRs to Nonhazardous Contaminated Media is Not Justified

Several commenters indicate that media that has been determined not to contain hazardous waste (i.e., nonhazardous media contaminated in concentrations below the bright line) should not be subject to LDRs. [Also See Chapter 5 comments on the definition of nonhazardous contaminated media.] At least one commenter requests clarification of a contradiction in applicable requirements: in one section, media are excluded from Subpart C requirements if the media have been determined not to contain hazardous waste, however in another section, the proposal states that media with nonhazardous wastes are still subject to Subpart C.

- "In its discussion of the LDRs, EPA appears to take a convoluted approach to avoid the *Chem Waste* decision even though it does not apply. As the Agency recognizes, "the land disposal restrictions apply only to hazardous wastes". 61 Fed. Reg. 18804; *see also Chem. Waste*, 976 F. 2d at 13-14. If soil or groundwater is determined to not contain hazardous waste, then the media is never hazardous and not subject to the LDRs. Indeed, page 18806 of the preamble states, "if contaminated environmental media are determined not to contain solid or hazardous waste (i.e., it's just media) it would not be subject to any RCRA Subtitle C standard, including LDRs." If EPA adopts the "contained-in" approach, then EPA should clarify that media that has been determined to not contain hazardous waste are not subject to the LDRs. Any other conclusion is contrary to the plain language of RCRA, EPA's own interpretations of the statute, and judicial interpretations of RCRA." (39)

Response: As discussed further in the preamble to today's rule, determinations that contaminated soil no longer contain hazardous waste (or no longer exhibit a characteristic of hazardous waste) may result in the soil not being subject to LDRs in two circumstances.

First, in the case of soil contaminated by hazardous wastes placed prior to the effective date of any applicable land disposal prohibition, a determination that the soil does not contain hazardous waste (or exhibit a characteristic of hazardous waste) cuts off all RCRA subtitle C requirements that apply to hazardous waste (including LDRs) provided the determination is made at the same time the soil is first managed (i.e., generated). This is because contaminated soil, of itself, is not a hazardous waste -- it may only be regulated as hazardous waste if it is determined to contain hazardous waste (or exhibit a characteristic of hazardous waste). In the case of soil contaminated by hazardous waste placed prior to the effective date of any applicable LDR prohibition, since the contaminating hazardous waste was not subject to LDR, the only point at which it is possible to determine that a hazardous waste is prohibited is at the point of generation of the soil. Thus, if the soil is not considered to contain a hazardous waste at that point, there is no hazardous waste to which the prohibition can attach.

Second, in the case of soil that either is subject to RCRA subtitle C hazardous waste management requirements because it was determined to contain hazardous waste (or exhibit a characteristic of hazardous waste) when first managed (i.e., generated) or that is subject to LDRs because it was contaminated by untreated listed prohibited hazardous waste placed after the effective date of an applicable LDR (i.e., illegally placed), a contained-in determination may cap technology-based LDR treatment standards provided it is combined with a site-specific, risk-based minimize threat determination. EPA believes it will often be possible to combine contained-in determinations with site-specific, risk-based minimize threat determinations because the Agency's guidance on how contained-in determinations should be made is consistent with the requirements for site-specific, risk-based minimize threat determinations. These issues are discussed in detail in the preamble to today's rule.

EPA appreciates the commenters' concerns regarding application of the *Chem Waste* decision to contaminated soil. However, as discussed in detail in the proposal, EPA believes that although the *Chem Waste* court did not speak to contaminated media specifically, the Agency must apply the *Chem Waste* logic -- that a duty to comply with LDRs attaches to hazardous waste when it is first generated and elimination of the instance of "hazardousness" does not, necessarily, fulfil the statutory land disposal restriction treatment standard -- to contaminated soil. See *Chemical Waste Management v. EPA*, 976 F.2d 2 and 22 (D.C. Cir 1992), *cert. denied*, 113 S.Ct. 1961 (1993). This means, once LDRs attach to any given hazardous waste (or to contaminated soil that contains hazardous waste or exhibits a characteristic of hazardous waste), the LDR treatment standards, or an alternative treatment standard approved through a variance process, must be met before the waste (or soil) can be land disposed.

As discussed in detail in the preamble to today's final rule, the Agency is not able, at this time, to find that all contained-in determinations will automatically equate to minimize threat determinations, and thus satisfy LDRs. This is, primarily, because, as discussed in the preamble to today's final rule, the Agency has chosen, at this time, not to codify substantive requirements or procedures for contained-in determinations, but, instead, to allow the policy to continue to be implemented on a site-by-site basis by EPA regions and authorized states using Agency guidance. In situations where, on a site-by-site basis, a contained-in determination is found to minimize threats, EPA has provided a specific mechanism to allow these determinations to cap LDR treatment. The so called, site-specific, risk-based minimize threat variance is discussed in detail in the preamble to today's final rule.

- "If a bright line is needed at all (see discussion below in Section 2.5), AOGA supports coordinating the bright line and LDR determinations so that constituents with concentrations below the bright line would not be subject to LDR treatment requirements, while constituents with concentrations above the bright line would be subject to LDR treatment when applicable. If the implementing agency chooses to set contained-in levels below the bright line due to site-specific conditions, the contained-in numbers could become the "new" bright line numbers for that site, and LDR treatment would be required for constituents with concentrations above the new bright line. Further, AOGA supports use of an automatic exemption from the LDR requirements if all constituents are below the-bright line and the media have been determined to no longer contain hazardous wastes." (33)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present in contaminated soil when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the new soil treatment standards and contained-in determinations, as necessary, at that time.

- At §269.30(b), media are excluded from the requirements of Subpart C-Treatment Requirements if the media have been determined not to contain hazardous wastes prior to removal from the land (pursuant to §269.4). However, at §269.30(a)(2), media that have been determined to no longer contain hazardous wastes (pursuant to §269.4) are explicitly included as materials subject to Subpart C. El Paso requests clarification of this contradiction in applicable requirements." (6)

Response: The "contradiction" reference by the commenter was likely based on confusion regarding the regulatory language. Under EPA's approach in the final regulations, it remains that, generally, contaminated soil which is determined not to contain hazardous wastes when it is first removed from the land is not subject to the LDR treatment standards; contaminated soil that is determined not to contain hazardous waste after it is removed from the land (i.e., does contain hazardous waste when first removed from the land) must comply with applicable LDR treatment standards prior to land disposal. The exception is soil that was contaminated by listed prohibited hazardous waste that was placed (or spilled) after the effective date of applicable LDR prohibitions. In this case, the prohibition from the listed hazardous waste continues to apply any contaminated soil.

EPA appreciates the commenters' concerns regarding application of the *Chem Waste* decision to contaminated soil. However, as discussed in detail in the proposal, EPA believes that although the *Chem Waste* court did not speak to contaminated media specifically, the Agency must apply the *Chem Waste* logic -- that a duty to comply with LDRs attaches to hazardous waste when it is first generated and elimination of the instance of "hazardousness" does not, necessarily, fulfil the statutory land disposal restriction treatment standard -- to contaminated soil. See *Chemical Waste Management v. EPA*, 976 F.2d 2 and 22 (D.C. Cir 1992), *cert. denied*, 113 S.Ct. 1961 (1993). This means, once LDRs attach to any given hazardous waste (or to contaminated soil that contains hazardous waste or exhibits a characteristic of hazardous waste), the LDR treatment standards, or an

alternative treatment standard approved through a variance process, must be met before the waste (or soil) can be land disposed. As discussed in detail in the preamble to today's final rule, the Agency is not able, at this time, to find that all contained-in determinations will automatically equate to minimize threat determinations, and thus satisfy LDRs. This is, primarily, because, as discussed in the preamble to today's final rule, the Agency has chosen, at this time, not to codify substantive requirements or procedures for contained-in determinations, but, instead, to allow the policy to continue to be implemented on a site-by-site basis by EPA regions and authorized states using Agency guidance. In situations where, on a site-by-site basis, a contained-in determination is found to minimize threats, EPA has provided a specific mechanism to allow these determinations to cap LDR treatment. The so called, site-specific, risk-based minimize threat variance and LDR applicability and it's relationship to the contained-in policy are discussed in detail in the preamble to today's final rule.

- **"EPA should not require treatment of constituents present in concentrations below Bright Line benchmark levels**

  EPA solicited comment regarding whether to modify its proposed requirements, which would require treatment of all constituents subject to treatment without regard to whether such constituents are present in concentrations above or below Bright Line benchmark values. 61 Fed. Reg. 18809/3. Again, CMA does not support application of LDRs to any remediation waste, and does not support the Bright Line concept. If EPA intends to adopt the Bright Line and to apply the modified LDRs to all constituents subject to treatment, CMA urges EPA not to require treatment of constituents present in concentrations below the Bright Line benchmarks. EPA's proposal would not require treatment of other contaminated media containing the same concentrations of hazardous constituents if no other constituents were present in concentrations exceeding the benchmarks. Applying such treatment will create a dual approach to the Bright Line levels for such constituents, and will require treatment for treatment's sake. If treatment of such constituents is needed to protect human health and the environment, it can be imposed by Directors of remediation programs on a site-specific basis, without imposing an inflexible and inappropriate requirement." (112)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present in contaminated soil when such constituents are found at initial concentrations greater than ten times the UTS. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards and constituents subject to treatment, as necessary, at that time.

- "The modified LDR treatment requirements remain an impediment because, despite modifications, they will still apply to contaminated media. Under the proposed rule, the LDRs attach, following the effective date of applicable LDR prohibitions, on the date the wastes are placed in the ground. LDRs should not apply at any point to media that are not considered hazardous waste before, during, or after treatment. Moreover, having LDRs apply to wastes in a remediation setting only serves as a disincentive to cleanup. It should be

noted that in instances where EPA determines that contaminated media falls below the Bright Line, the Agency has proposed that it can and will presumably apply a media treatment variance to the material. *Id.* at 18806, 18809. If such is the case, API urges EPA to include its presumption for LDR variances in the regulatory language of the rule rather than simply stating it in the preamble in order to assure those conducting cleanups that EPA will provide such a variance if, for example, the entity conducts the cleanup in good faith. What the proposal means is that waste not subject to LDRs when placed in the ground is exempt from the LDRs retrospectively, as should be the case. However, what if the waste is moved at some point in the future? Will the same regulations apply 50 or 100 years from now? Will that waste still be exempt from the LDRs, or will it then become subject to the LDRs as environmental media that is subject to the LDRs because it is removed from the land and placed into a land disposal unit? For these reasons, LDRs should not attach to contaminated media that is either considered non-hazardous or is below the Bright Line." (39)

Response: Many commenters expressed the concern that application of LDRs to remediation waste, including contaminated soil, was overly complex and would present impediments to remediation. The majority of these commenters suggested that EPA simply exempt the majority of remediation wastes, including contaminated soil, from a duty to comply with LDRs.

The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, as discussed in the preamble to today's rulemaking, the Agency is not, at this time, taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all hazardous remediation waste to exit large portions of the RCRA Subtitle C system. The Agency continues to believe that legislative action is needed to address the application of RCRA Subtitle C regulations, especially LDRs, to hazardous remediation waste. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste.

Regarding the complexity associated with determining when one has a duty to comply with LDRs for contaminated soil, the Agency has re-formatted the regulations on LDR applicability into an easier to read table. This table is discussed in detail in the preamble to today's final rule. The Agency cannot guarantee that the current regulations (or underlying statute) will not change in the next fifty to one hundred years, it can only offer assurances as to the correct reading of current requirements.

- "The FACA also agreed that there should be no generic requirements for media below any Bright Line. EPA's proposed approach would potentially subject significant amounts of media below the Bright Line, even those that are determined to not longer contain hazardous waste, to overly stringent generic LDR treatment requirements which remedial technologies will be unable to achieve." (117)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, it will address concerns regarding the relationship of the bright line to the soil treatment standards, as necessary, at that time.

Concerns that the soil treatment standards are overly stringent and unable to be achieved by remedial technologies are addressed in section B.6 of today’s response to comments document and in the preamble to today’s final rule.

- "We again note that EPA's proposed Bright Line approach fails to meet one of the central agreements arrived at by FACA members; that media with concentrations below the Bright Line (be they characteristic or containing hazardous waste) should not be subject to subtitle C. EPA's approach would not only use a "fuzzy line", where otherwise hazardous media would all remain hazardous below the Bright Line absent an affirmative determination via contained-in, for some unknown volume of media LDR treatment standards would continue to apply even after tie media was determined to no longer contain hazardous waste. We urge the Agency in the strongest possible terms to address this egregious flaw in the Bright Line approach. The Agency should adopt the Unitary approach. If it chooses not to the Bright Line must be truly bright, with an automatic presumption that media no longer contains hazardous waste below the Bright Line, and a presumption of minimized that for formerly hazardous media below the Bright Line. The treatability group concept may be a viable way of achieving this end." (117)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, it will address concerns regarding the relationship of the bright line to the new soil treatment standards and to media treatment variances, as necessary, at that time.

EPA notes that, under today’s action (as under the HWIR-Media proposal) contaminated soils are considered a new treatability group, eligible for specific land disposal restriction treatment standards (i.e., the soil treatment standards promulgated today).

Regarding the suggestion that EPA adopt the Unitary approach, as discussed in the preamble to today’s rulemaking, the Agency is not, at this time, taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all hazardous remediation waste to exit large portions of the RCRA Subtitle C system. The Agency continues to believe that legislative action is needed to address the application of RCRA Subtitle C regulations, especially LDRs, to hazardous remediation waste. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no

legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste.

- "In the preamble to the proposed rule, EPA asserts that it believes it is required by RCRA to impose the land disposal restrictions ("LDRs") on below-the-Bright Line media that are contaminated with hazardous wastes that were spilled into the media after the effective date of the LDRs for that waste. 61 Fed. Reg. at 18804-05. The Agency has expressed a similar belief about wastes that would be excluded from Subtitle C under the Unitary Approach. Id. at 18835. In both cases, the Agency has misread the statute.

  According to the preamble, the Agency believes it must apply the LDRs to these wastes because at some point in the past LDRs "attached" to the wastes in the media. Id. However, the notion of LDR "attachment" is not found in the statute, but rather was created by EPA in the "Third-Third" rule when the Agency was seeking a justification for requiring some characteristic wastes to be treated below the characteristic level. See 55 Fed. Reg. 22520, 22652-53 (June 1, 1990). In that context, EPA took the position that, because the wastes were hazardous as generated, the LDRs "attached" at the point of generation and the Agency could require whatever treatment was necessary to minimize threats to human health and the environment (as required by RCRA section 3004(m)), even if doing so required treatment below the characteristic level. Id. Importantly, in that same rulemaking the Agency stated that this principle did not necessarily mean that the LDRs would automatically apply to wastes excluded from the statutory or regulatory definitions of hazardous waste. Id. at 22660. Specifically, the Agency stated that, "[t]hese provisions [i.e., statutory or regulatory exclusions from the definition of hazardous waste] can override the LDR point of generation evaluation to keep wastes from being prohibited and subject to a dilution prohibition or treatment standard." Id.

  In Chemical Waste Management, Inc. v. EPA, 976 F.2d 2, 14 (D.C. Cir. 1992), cert. denied, 113 S. Ct. 1961 (1993) ("CWM"), the D.C. Circuit upheld the Agency's interpretation on the ground that it was "based on a permissible construction of the statute," (quoting Chevron USA, Inc. v. NRDC, 467 U.S. 837, 843 (1984)). The court did not hold that EPA's interpretation was required by the statute or that the Agency must apply the same rationale in all circumstances. Instead it merely upheld the Agency's interpretation as permissible under the deferential Chevron Step 2 standard. Similarly, when the court invalidated certain of the Third-Third treatment standards, it did so on the basis that the promulgated standards were inconsistent with EPA's interpretation of the statute. 976 F.2d at 17 ("In view of EPA's position that treatment pursuant to section 3004(m) requires . .. . To conform to its own reading of section 3004(m) the Agency . . .) (emphasis added). Because the CWM court merely upheld the Agency's interpretation of RCRA under the deferential Chevron standard and applied the Agency's interpretation to the treatment standards at issue, it is circular for the Agency now to maintain that this view of the statute is mandated by the decision in CWM.

EPA's present position is flatly contradicted by the D.C. Circuit Court's subsequent decision in Horsehead Resource Development Co., Inc. v. Browner, 16 F.3d 1246 (D.C. Cir.), cert. denied, 115 S. Ct. 72 (1994). In Horsehead, the court rejected an argument that RCRA "requires the EPA unstintingly to regulate hazardous wastes under Subtitle C," and upheld EPA's determination that combustion residues from the co-burning of hazardous wastes and fossil fuels in certain combustion devices were included within the scope of the Bevill Amendment exclusion from hazardous waste regulation and thus also were excluded from the LDRs. Id. at 1261.

The circumstances addressed by the court in Horsehead are much closer to the remediation waste situation being considered by EPA in this rulemaking than was the management of process wastes in surface impoundments addressed by the CWM Court. Under the regulations upheld by the court in Horsehead, materials that are hazardous waste exit the Subtitle C system, including the LDRs, if the wastes are combusted in a Bevill device and the residuals meet the Agency's "significantly affected" test (40 C.F.R. § 266.12). The court deferred to EPA's determination that these material are no longer "hazardous waste" and therefore that the LDRs no longer apply. Thus, the court explicitly rejected the argument that every waste that is hazardous when generated must meet LDR treatment standards, regardless of its subsequent history. EPA has taken the same position with regard to other exclusions, such as the domestic sewage exclusion (55 Fed. Reg. at 22660) and EPA's LDR regulations explicitly contemplate that some wastes will exit the Subtitle C system, including the LDRs, after the point of generation. 40 C.F.R. § 268.7(a)(6) (record keeping requirements for wastes excluded from the LDRs after the point of generation).

Moreover, as even the Agency acknowledges, adherence to the "attachment" principle leads to absurd results. First, it creates an arbitrary distinction between media that are contaminated with wastes spilled before and after specific dates, regardless of the level of hazardous constituents present. Thus, media containing low levels of hazardous constituents spilled after the effective date of an LDR prohibition may be subject to the LDRs, while more heavily contaminated media from an earlier spill would not be. There is no evidence Congress intended such an arbitrary and illogical result, and it clearly serves no environmental purpose.

In addition, imposition of the LDRs on below-the-Bright Line media imposes additional costs and burdens on cleanups, in direct conflict with the primary purpose of this rulemaking, which is to eliminate existing disincentives to undertaking site remediation. First, even if the media are ultimately not subject to the LDRs, the proposed regulation would require the generator to make a good faith effort to document the date of the contamination. 61 Fed. Reg. at 18805. Such a requirement causes delay and expense for no environmental purpose.

Second, imposition of the LDRs can distort the remedy selection process, forcing the site owners to choose less environmentally protective remediation options to avoid the burdens imposed by the LDRs. Id. at 18812-13. There is no environmental justification for putting site owners in this position. Rather, the Agency should exercise its authority to determine that contaminated media that are not regulated as hazardous waste are not subject to the LDRs.

Accordingly, EPA has ample authority to determine that remediation waste, including media contaminated with material that was a hazardous waste when spilled, is not a hazardous waste when remediated, and that the LDRs simply do not apply to this material. Specifically, the Agency has the authority to determine that the policy rationale behind the Agency's conclusion in the Third-Third rule that the LDRs should "attach" at the point of generation is simply inapplicable to remediation waste and that the policy rationale behind this rulemaking, i.e., that Subtitle C regulatory burdens on contaminated media should be reduced or removed in order to encourage site remediations, justifies a different approach to treatment of contaminated media. This conclusion applies whether EPA adopts either the Bright Line or Unitary Approach to regulating remediation waste.

Recognizing the tension between the "attachment" principle and the purpose of this rulemaking, the Agency has requested comment on whether it could utilize the "change in treatability group" concept to justify exclusion of contaminated media from the LDRs on the grounds that excavation of the media constitutes a new point of generation. 61 Fed. Reg. at 18813. USWAG supports this proposal. EPA developed the "change in treatability group" principle in the Third-Third rulemaking to determine whether characteristic hazardous wastes are subject to the LDRs. 55 Fed. Reg. at 22661-62. Under this principle, which was not challenged in the CWM litigation, a characteristic waste is subject to the LDRs only if the waste itself, or a residual from management of the waste, in the same treatability group (i.e., wastewater or nonwastewater) is land disposed. Id. A residual of a different treatability group is subject to the LDRs only if it itself exhibits a characteristic. Id. In adopting this principle, the Agency recognized that a change in treatability group is such a fundamental change in the form of the waste that it constitutes a new point of generation.

EPA has proposed to extend this principle to contaminated media by recognizing environmental media as a new point of generation and therefore subject to the LDRs only if the contaminated media constitute hazardous waste as generated. As demonstrated above, there is no question that EPA has the legal authority to take this position. Nothing in RCRA specifies when a material becomes a hazardous waste or when it ceases to be a hazardous waste, and the statute gives the Agency broad discretion to define what materials are (and are not) hazardous waste. See RCRA §§ 3001(a)-(b), 42 U.S.C. §§ 6903(5), 6921(a)- (b). This authority was explicitly recognized by the D.C. Circuit in Horsehead. Contaminated media are at least as different in form from the wastes with which they are contaminated as wastewater and nonwastewater treatment residuals are different from each other. Therefore, it is entirely reasonable for the Agency to determine that contaminated media represent a new point of generation under the change in treatability group principle. Because excavation of the media then constitutes a new point of generation, it would be appropriate at that point to make a determination whether the media were hazardous waste, based on the criteria adopted in this rulemaking.

Moreover, the Agency's authority over contaminated media arises not from the statutory definition of "hazardous waste," but from the "contained-in principle," an Agency interpretation of its own rules. See Chemical Waste Management, Inc. v. EPA, 869 F.2d 1526, 1539 (D.C. Cir. 1989). Because the statute does not speak to how LDRs apply to contaminated media that are generated in a site remediation and the LDR attachment theory is not expressly required by the Act, the Agency has broad discretion to reconcile its policies

in these two areas in light of its experience in implementing the statute. See, e.g., Chevron U.S.A., Inc. v. NRDC, 467 U.S. 837, 844-45 (1984). Thus, the Agency may determine that contaminated media that are not regulated as hazardous waste are not subject to the LDRs." (59)

Response: The Agency is not, at this time, taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all hazardous remediation waste to exit large portions of the RCRA Subtitle C system. The Agency continues to believe that legislative action is needed to address the application of RCRA Subtitle C regulations, especially LDRs, to hazardous remediation waste. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste.

EPA notes that, under today's action (as under the HWIR-Media proposal) contaminated soils are considered a new treatability group, eligible for specific land disposal restriction treatment standards (i.e., the soil treatment standards promulgated today). However, EPA does not, at this time, believe this change in treatability group automatically cuts off LDRs. Therefore, in the case of soil that is determined to contain listed hazardous waste or exhibit a characteristic of hazardous waste LDRs apply. Similarly, soil contaminated by listed prohibited hazardous waste is also subject to LDRs. As discussed in detail in the preamble to today's final rule, this is because land disposal prohibitions attach at that point a hazardous waste is generated and continue to apply until the point at which threats poised by land disposal of the waste are minimized. Chemical Waste Management v. EPA, 976 F.2d at 13, 14 and 24. Consequently, in the case of listed hazardous waste land disposed after the effective date of an applicable land disposal prohibition (i.e., illegally land disposed or accidentally spilled), the prohibition has already attached to the waste and continues to apply to any soil contaminated by the waste. As discussed in detail in the proposal, although the *Chem Waste* court did not speak to contaminated media specifically, EPA believes that it is prudent to apply this logic to contaminated soil.

As also discussed in detail in the preamble to today's final rule, the Agency is not able, at this time, to find that all contained-in determinations will automatically equate to minimize threat determinations, and thus satisfy LDRs. This is, primarily, because, as discussed in the preamble to today's final rule, the Agency has chosen, at this time, not to codify substantive requirements or procedures for contained-in determinations, but, instead, to allow the policy to continue to be implemented on a site-by-site basis by EPA regions and authorized states using Agency guidance. In situations where, on a site-by-site basis, a contained-in determination is found to minimize threats, EPA has provided a specific mechanism to allow these determinations to cap LDR treatment. The so called, site-specific, risk-based minimize threat variance and LDR applicability and it's relationship to the contained-in policy are discussed in detail in the preamble to today's final rule.

Regarding the assertion that the Agency's application of the logic of the *Chemical Waste* opinion to contaminated soil is not compelled by statute, the Agency has never presented this approach as

compelled. Rather, the Agency has concluded that, based on our reading of the *Chemical Waste* opinion, it is prudent to apply the logic of the opinion to contaminated soil. This issue is discussed in detail in the preamble to today's final rule. Furthermore, the Agency notes that the *Chemical Waste* court, at times, seemed to indicate that such an approach is needed under RCRA Section 3004(m). See, *Chemical Waste Management v. EPA* 976 F.2d at 13 and 14, note 3 and note 10. Regarding the assertion that EPA should, instead, inform its conclusions about application of LDRs to contaminated soil using the *Horsehead* opinion, the Agency notes that, in Horsehead, the court was addressing a situation where another statutory exclusion or exemption was at play. See *Horsehead Resource Development Co., Inc. v. Browner*, 16 f.3d at 1261. EPA is not aware of such an exclusion or exemption for hazardous waste (or contaminated soil) generated during remediation. On the contrary, statutory language seems to expressly contemplate application of LDRs to these materials. See, RCRA Sections 3004(d)(3) and (e)(3).

- "Page 1.1, the last paragraph states that if the contaminated media is excluded from the Subtitle C regulatory framework, what statutory authority exists for EPA to require any specific technology, handling, standard, etc." (73)

Response: As discussed in detail in the proposal, EPA believes that although the *Chem Waste* court did not speak to contaminated media specifically, the Agency must apply the *Chem Waste* logic -- that a duty to comply with LDRs attaches to hazardous waste when it is first generated and elimination of the instance of "hazardousness" does not, necessarily, fulfil the statutory obligation under RCRA Section 3004(m)(1) to minimize threats to human health and the environment -- to contaminated soil. See *Chemical Waste Management v. EPA*, 976 F. 2d 2 at 22 (D.C. Cir 1992), *cert. denied*, 113 S.Ct. 1961 (1993).

As discussed in detail in the preamble to today's final rule, the Agency is not able, at this time, to find that all contained-in determinations will automatically equate to minimize threat determinations, and thus satisfy LDRs. This is, primarily, because, as discussed in the preamble to today's final rule, the Agency has chosen, at this time, not to codify substantive requirements or procedures for contained-in determinations, but, instead, to allow the policy to continue to be implemented on a site-by-site basis by EPA regions and authorized states using Agency guidance. In situations where, on a site-by-site basis, a contained-in determination is found to minimize threats, EPA has provided a specific mechanism to allow these determinations to cap LDR treatment. The so called, site-specific, risk-based minimize threat variance is discussed in detail in the preamble to today's final rule.

The Agency continues to believe that legislative action to address issues associated with application of RCRA requirements to remediation wastes, including contaminated soil, is needed and will continue to participate in discussions of potential legislative solutions.

- "EPA's joint application of the "contained-in" theory and the LDR regulations creates another legal concern. EPA's approach applies LDR standards at the point at which the material first "contains" a hazardous waste. Thus, EPA states that even if contaminated media no longer contain a hazardous waste, the media might still have to meet more stringent LDR standards. In a sense, EPA has proceeded in a fashion similar to how the Agency approaches characteristic waste. The waste is brought into the LDR system at the point of generation. Thus, even if the waste no longer exhibits a characteristic, it must still be treated to reach BDAT levels. However, the situation EPA is faced with in the proposed

approach is quite different. Once the material no longer “contains” a hazardous waste, there is no justification for requiring further treatment of the remedial material. The LDR regulations require the treatment of hazardous waste. Section 3004(m) states that EPA must specify levels or methods of treatment which substantially reduce the likelihood of migration of hazardous constituents from the waste..." Clearly, if the media no longer “contains" a hazardous waste, there is no legal rationale for applying any additional LDR controls." (107)

Response: As discussed in detail in the proposal, EPA believes that although the *Chem Waste* court did not speak to contaminated media specifically, the Agency must apply the *Chem Waste* logic -- that a duty to comply with LDRs attaches to hazardous waste when it is first generated and elimination of the instance of “hazardousness” does not, necessarily, fulfil the statutory obligation under RCRA Section 3004(m)(1) to minimize threats to human health and the environment -- to contaminated soil. This means, once LDRs attach to any given hazardous waste (or to contaminated soil that is initially determined to contain hazardous waste or exhibit a characteristic of hazardous waste), the LDR treatment standards, or an alternative treatment standard approved through a variance process, must be met before the waste (or soil) can be land disposed. See *Chemical Waste Management v. EPA*, 976 F. 2d 2 at 22 (D.C. Cir 1992), *cert. denied*, 113 S.Ct. 1961 (1993).

As discussed in detail in the preamble to today’s final rule, the Agency is not able, at this time, to find that all contained-in determinations will automatically equate to minimize threat determinations, and thus satisfy LDRs. This is, primarily, because, as discussed in the preamble to today’s final rule, the Agency has chosen, at this time, not to codify substantive requirements or procedures for contained-in determinations, but, instead, to allow the policy to continue to be implemented on a site-by-site basis by EPA regions and authorized states using Agency guidance. In situations where, on a site-by-site basis, a contained-in determination is found to minimize threats, EPA has provided a specific mechanism to allow these determinations to cap LDR treatment. The so called, site-specific, risk-based minimize threat variance is discussed in detail in the preamble to today’s final rule.

The Agency continues to believe that legislative action to address issues associated with application of RCRA requirements to remediation wastes, including contaminated soil, is needed and will continue to participate in discussions of potential legislative solutions.

- "If the HWIR media rule is promulgated as proposed, with bright-line levels which are to be used to determine whether the media is hazardous or poses a threat to the environment or human health, the LDR standards should not apply to media that falls below the line. This media can essentially be determined through the HWIR media process to be non-hazardous. LDR applicability would constitute costly redundancy and essentially "over treatment" of media." (72)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes

action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the new soil treatment standards, as necessary, at that time.

- "Media Determined Not to "Contain" Hazardous Waste Should Not Be Subject to LDRs - If the Agency adopts the Bright Line "contained in" approach, EPA should clarify that media that has been determined not to contain hazardous waste ("contained out") are not subject to LDRs." (49)

Response: As discussed further in the preamble to today's rule, determinations that contaminated soil no longer contain hazardous waste (or no longer exhibit a characteristic of hazardous waste) may result in the soil not being subject to LDRs in two circumstances.

First, in the case of soil contaminated by hazardous wastes placed before the effective date of any applicable land disposal prohibition, a determination that the soil does not contain hazardous waste (or exhibit a characteristic of hazardous waste) cuts off all RCRA subtitle C requirements that apply to hazardous waste (including LDRs) provided the determination is made at the same time the soil is first managed (i.e., generated). This is because contaminated soil, of itself, is not a hazardous waste -- it may only be regulated as hazardous waste if it is determined to contain hazardous waste (or exhibit a characteristic of hazardous waste). In the case of soil contaminated by hazardous waste placed prior to the effective date of any applicable LDR prohibition, since the contaminating hazardous waste was not subject to LDR, there is no LDR prohibition to carry through to (i.e., attach to) the soil.

Second, in the case of soil that is subject to RCRA subtitle C hazardous waste management requirements because it was determined to contain hazardous waste (or exhibit a characteristic of hazardous waste) when first managed (i.e., generated) or that is subject to LDRs because it was contaminated by untreated listed prohibited hazardous waste placed after the effective date of an applicable LDR (i.e., illegally placed), a contained-in determination may cap technology-based LDR treatment standards provided it is combined with a site-specific, risk-based minimize threat determination. EPA believes it will often be possible to combine contained-in determinations with site-specific, risk-based minimize threat determinations because the Agency's guidance on how contained-in determinations should be made is consistent with the requirements for site-specific, risk-based minimize threat determinations. This issue is discussed in detail in the preamble to today's final rule.

EPA appreciates the commenters' concerns regarding application of the *Chem Waste* decision to contaminated soil. However, as discussed in detail in the proposal, EPA believes that although the *Chem Waste* court did not speak to contaminated media specifically, the Agency must apply the *Chem Waste* logic -- that a duty to comply with LDRs attaches to hazardous waste when it is first generated and elimination of the instance of "hazardousness" does not, necessarily, fulfil the statutory obligation under RCRA Section 3004(m)(1) to minimize threats to human health and the environment -- to contaminated soil. This means, once LDRs attach to any given hazardous waste (or to contaminated soil that is determined to contain hazardous waste or exhibit a characteristic of hazardous waste), the LDR treatment standards, or an alternative treatment standard approved through a variance process, must be met before the waste (or soil) can be land disposed. See *Chemical Waste Management v. EPA*, 976 F.2d 2 and 22 (D.C. Cir 1992), *cert. denied*, 113 S.Ct. 1961 (1993). As discussed in detail in the preamble to today's final rule, the Agency is not able, at

this time, to find that all contained-in determinations will automatically equate to minimize threat determinations, and thus satisfy LDRs. This is, primarily, because, as discussed in the preamble to today's final rule, the Agency has chosen, at this time, not to codify substantive requirements or procedures for contained-in determinations, but, instead, to allow the policy to continue to be implemented on a site-by-site basis by EPA regions and authorized states using Agency guidance. In situations where, on a site-by-site basis, a contained-in determination is found to minimize threats, EPA has provided a specific mechanism to allow these determinations to cap LDR treatment. The so called, site-specific, risk-based minimize threat variance is discussed in detail in the preamble to today's final rule.

- "In spite of the fact that the Land Disposal Restriction (LDR) program was initially crafted to address as-generated wastes, in the Harmonized Approach the Agency is proposing to perpetuate the use of these requirements for remediation wastes as well. The proposed rule implies that waste materials that are below published Bright Line values could still be subject to subsequent LDR requirements. Kodak believes that the complex LDR management standards and costs imposed on the regulated community for such materials would not justify the minimal environmental benefits of such a program. Without a clear exemption from LDR standards, implementation of the proposed rule is made much more complicated which will result in the exemption not being embraced by the regulated community. Kodak believes that the proposed rule should explicitly state that the HWIR exemption from RCRA Subtitle C would also eliminate any obligation under the existing RCRA LDR program. Again, this fits better with the Unitary Approach since under that approach remediation wastes would be exempted as generated/excavated, never accruing LDR applicability." (65)

Response: Many commenters expressed the concern that application of LDRs to remediation waste, including contaminated soil, was overly complex and would present impediments to remediation. The majority of these commenters, like this person, suggested that EPA simply exempt the majority of remediation wastes, including contaminated soil, from a duty to comply with LDRs.

The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, as discussed in the preamble to today's rulemaking, the Agency is not, at this time, taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all hazardous remediation waste to exit large portions of the RCRA Subtitle C system. The Agency continues to believe that legislative action to address the application of RCRA Subtitle C regulations, especially LDRs, to hazardous remediation waste is needed. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste.

Regarding the "bright line," EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the new soil treatment standards, as necessary, at that time.

- "The IEPA believes that the Land Disposal Restrictions (LDRS) should not apply to waste that falls below the bright line provided that the approved RMP allows the waste to be managed as non-hazardous (Subtitle C exempt)." (143)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil, or the portion of the HWIR-Media proposal that would have codified the "contained-in" policy to allow for determinations that certain media do not or no longer contain hazardous waste. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line or to codify the contained-in policy, EPA will address concerns regarding the relationship of the bright line to the new soil treatment standards and the contained-in policy at that time.

Implementation of the current contained-in policy is unaffected by today's rulemaking. As discussed in detail in the preamble to today's final rule, the Agency is not able, at this time, to find that all contained-in determinations will automatically equate to minimize threat determinations, and thus satisfy LDRs. This is, primarily, because, as discussed in the preamble to today's final rule, the Agency has chosen, at this time, not to codify substantive requirements or procedures for contained-in determinations, but, instead, to allow the policy to continue to be implemented on a site-by-site basis by EPA regions and authorized states using Agency guidance. In situations where, on a site-by-site basis, a contained-in determination is found to minimize threats, EPA has provided a specific mechanism to allow these determinations to cap LDR treatment. The so called, site-specific, risk-based minimize threat variance is discussed in detail in the preamble to today's final rule.

- "The Agency has solicited comments regarding how it should address environmental media with all constituent concentrations below the Bright Line benchmarks. 61 Fed. Reg. 18813/1. We strongly recommend that remediation wastes - or environmental media - with all constituents below the Bright Line benchmarks should be subject only to site-specific requirements for remedial action plans. They should not be subjected to superimposed RCRA Subtitle requirements. Further, there should be no connection between the time of placement and the applicability of LDRs. EPA possesses adequate authority to assure that the time of placement has no bearing on treatment requirements." (112)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated

media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards, as necessary, at that time.

Regarding the connection between time of hazardous waste placement and land disposal restriction treatment requirements, the Agency disagrees with the commenter's assertion that the two are not related. As discussed in detail in the HWIR-Media proposal and in the preamble to today's final rule, in situations where untreated prohibited listed hazardous waste is placed after the effective date of the applicable land disposal prohibition (i.e., illegally placed), the duty to comply with LDRs that was attached to the listed waste passes automatically to any soil contaminated by the waste, regardless of whether the soil is determined not to contain hazardous waste or exhibit a characteristic of hazardous waste. The Agency believes this reading is compelled by the *Chem Waste* court which found that a duty to comply with LDRs attaches to hazardous waste when it is first generated and elimination of the instance of "hazardousness" does not, necessarily, fulfil RCRA Section 3004(m) requirement that threats to human health and the environment be minimized. This means, once LDRs attach to any given hazardous waste (or to contaminated soil that is determined to contain hazardous waste or exhibit a characteristic of hazardous waste), the LDR treatment standards, or an alternative treatment standard approved through a variance process, must be met before the waste (or soil) can be land disposed. See *Chemical Waste Management v. EPA*, 976 F.2d 2 and 22 (D.C. Cir 1992), *cert. denied*, 113 S.Ct. 1961 (1993).

- "No Analysis / Treatment Requirement for Wastes Below the Bright Line - HWIR- Media should not set specific cleanup standards for wastes below the Bright Line. Rather, states should be given maximum opportunity to oversee such determinations on a site specific basis." (49)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards, as necessary, at that time.

EPA notes that the soil treatment standards, like any LDR treatment standard, are not substitutes for, and should not be construed as, cleanup standards.

A few commenters support allowing Media Treatment Variances for wastes below the Bright Line. [Also see Chapter 12 comments on media treatment variances.]

- "Under the Bright Line proposal, once a waste is determined to contain concentrations of one constituent above the line, all constituents would have to be treated to meet the generic technology-based LDR standards -- even those that fall below the Bright Line numbers. See

61 Fed. Reg. at 18,809. EPA has suggested that it could revise this proposal to allow site-specific minimized threat Media Treatment Variances for constituents in such wastes that fall below the line. 61 Fed. Reg. at 18,810. This would exempt below-the-line constituents and would require compliance with the generic treatment standards only for constituents that have initial concentrations above the line. A.G.A agrees that this is a good solution and urges EPA to revise the proposed rule accordingly." (83)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards, as necessary, at that time.

Regarding media treatment variances, in order to reduce the likelihood that application of the nationally applicable, technology-based treatment standards to contaminated soil will result in treatment beyond the point at which treats to human health and the environment are minimized EPA is promulgating the site-specific, risk-based minimize threat variance discussed in the proposal. This new variance will allow approval of an alternative land disposal restriction treatment standard based on a site-specific determination that threats to human health and the environment are minimized concentrations of hazardous constituents greater (i.e. higher) than those specified in the soil treatment standards. It will be available, as appropriate, for all contaminated soil, regardless of the initial concentrations of hazardous constituents, and is discussed in detail in the preamble to today's final rule.

- "The Agency is interested in comments that address environmental media with all constituent concentrations below the Bright Line and if these media should be subject to the generic LDR treatment standards.

  Comment: The general purpose of the LDR universal treatment standards contained in 40 CFR part 268 is to treat hazardous wastes to eliminate as much of the uncertainty as possible associated with the land disposal of such wastes. This is accomplished by reducing the hazardous constituent concentration in the waste using a technology-based waste treatment approach. This same protective element of reducing as much of the hazard as possible prior to land disposal should also be applied to all hazardous contaminated media with all constituent concentrations below the bright line values. This requirement is not viewed as burdensome since the Director has the flexibility to grant a Media Treatment Variance from the generic LDR treatment standard if the standard is unattainable or inappropriate. An exception to this approach is contaminated media that has been determined by the overseeing authority to be a non-hazardous contaminated media. This media should not be subject to the generic LDR treatment standards since there is evidence of de minimis risk." (L01)

Response: The commenter makes two points: (1) it is appropriate to apply LDRs to contaminated soil with constituent concentrations below the so called "bright line;" and, (2) it is not appropriate to apply LDRs to soil determined not to contain hazardous waste.

Regarding the "bright line," EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards, as necessary, at that time.

Regarding the relationship of "contained-in" determinations to LDR treatment requirements, as discussed further in the preamble to today's rule, determinations that contaminated soil no longer contain hazardous waste (or no longer exhibit a characteristic of hazardous waste) may result in the soil not being subject to LDRs in two circumstances.

First, in the case of soil contaminated by hazardous wastes placed prior to the effective date of any applicable land disposal prohibition, a determination that the soil does not contain hazardous waste (or exhibit a characteristic of hazardous waste) cuts off all RCRA subtitle C requirements that apply to hazardous waste (including LDRs) provided the determination is made at the same time the soil is first managed (i.e., generated). This is because contaminated soil, of itself, is not a hazardous waste -- it may only be regulated as hazardous waste if it is determined to contain hazardous waste (or exhibit a characteristic of hazardous waste). In the case of soil contaminated by hazardous waste placed prior to the effective date of any applicable LDR prohibition, since the contaminating hazardous waste was not subject to LDR, there is no LDR prohibition to carry through to (i.e., attach to) the soil.

Second, in the case of soil that is subject to RCRA subtitle C hazardous waste management requirements because it was determined to contain hazardous waste (or exhibit a characteristic of hazardous waste) when initially managed (i.e., generated) or that is subject to LDRs because it was contaminated by untreated listed prohibited hazardous waste placed after the effective date of an applicable LDR (i.e., illegally placed), a contained-in determination may cap technology-based LDR treatment standards provided it is combined with a site-specific, risk-based minimize threat determination. EPA believes it will often be possible to combine contained-in determinations with site-specific, risk-based minimize threat determinations because the Agency's guidance on how contained-in determinations should be made is consistent with the requirements for site-specific, risk-based minimize threat determinations. This issue is discussed in detail in the preamble to today's proposal.

- "The Unitary approach avoids these arbitrary constructs, and would allow overseeing agencies to implement the management standards, including treatment, that were appropriate for remediation wastes on a site-specific basis. However, if the Agency moves forward with the Bright Line approach we encourage an approach to constituents subject to treatment that is implementable and provides some meaningful reform. In this regard we would concur with the proposed approach to soils containing listed wastes (treatment for those constituents

which form the basis for listing and are present at greater than ten times the UTS). While there is no compelling practical rationale for addressing characteristic soils differently, within the regulatory box EPA is attempting to construct we recognize that treatment would be conceptually be required for all UTS constituents. However, we fully support in this context the concept of Media Treatment Variances for constituents present at less than Bright Line concentrations. In fact, given that characteristic media will be present at many remediation sites and the resource intensive nature of most variance processes we would encourage the Agency to make such a variance a presumption. This would at least avoid some of the artificial encumbrance of the Bright Line approach. The need to treat sediments should be decided on a case-by-case basis, with treatment either to the new LDRs or via a variance. As discussed above, treatment of groundwater should be defeated to the treatment requirements of the Clean Water Act to avoid imposing duplicative and conflicting requirements, with the flexible ability to exempt groundwater *from* subtitle C *to permit* reinjection as part of an in situ remedy." (117)

Response: Regarding the bright line, EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards, as necessary, at that time.

Regarding constituents subject to treatment, despite this support of the proposed approach, on further consideration, EPA was persuaded by other comments that it is prudent to apply the logic of the *Chemical Waste* court both to soil contaminated by listed hazardous waste and to soils which exhibit a characteristic of hazardous waste.

As the Agency explained in the 1990 proposal, contaminated soils are potentially contaminated with a wider range of hazardous constituents than process wastes -- in no small part because they generally reflect uncontrolled disposal settings. 58 FR at 48124 (September 14, 1993). Since this is the type of circumstance addressed in the *Chemical Waste* opinion (i.e. characteristic wastes could also contain a wide variety of hazardous constituents, since characteristic wastes are generated by a variety of sources and under a variety of circumstances), the Agency is persuaded that it is prudent to apply the logic of the *Chemical Waste* opinion and require treatment of all underlying hazardous constituents. See *Chemical Waste Management v. US EPA*, 976 F.2d at 16 - 18 (D.C. Cir 1992). Therefore, today's final rule requires that all contaminated soil subject to the LDRs be treated to achieve the soil treatment standards for each underlying hazardous constituent reasonably expected to be present in the soil when such constituents are initially found at concentrations greater than ten times the universal treatment standard. Characteristic soil must also be treated, in the case of TC soil, for the TC constituent and, in the case of ignitable, corrosive, or reactive soil, for the characteristic property.

As discussed further in the preamble to today's action, EPA is confident that sampling and analysis can be appropriately targeted to ensure that it is focused on appropriate hazardous constituents or classes of hazardous constituents and does not intend that sampling and analysis would routinely be

required for the entire suite of universal treatment standard constituents. Other commenters support this approach.

Regarding media treatment variances, the Agency is going forward a site-specific, risk-based media treatment variance, as discussed in the proposal. Like the soil treatment standards, the variance will be available, as appropriate, for all contaminated soil. This new variance will allow approval of an alternative land disposal restriction treatment standard based on a site-specific determination that threats to human health and the environment are minimized concentrations of hazardous constituents greater (i.e. higher) than those specified in the new soil treatment standards. It is discussed in detail in the preamble to today's rulemaking. Since the Agency is not, at this time, taking action to establish a "bright line," it is not establishing a presumption that site-specific, risk-based media treatment variances are appropriate for contaminated soil with all constituent concentrations below the bright line. If, in the future, EPA takes action to establish a bright line, the Agency will address the relationship of the bright line to site-specific, risk-based minimize threat variances, as necessary, at that time.

Regarding contaminated sediments and ground water, EPA is not, at this time, taking action on the portions of the HWIR-Media proposal that would have addressed contaminated sediments or ground water. If EPA takes such action in the future, it will address these comments as necessary at that time.

1.B.2 Application of LDRs to Any Remediation Waste is Overly Complex and Not Justified

As noted in Section 2.F, many commenters support the Unitary Approach, because it eliminates the attachment of LDRs to all remediation waste, including contaminated media, and does not require contained-in determinations. Some argue that the Unitary Approach better represents FACA discussions on the LDRs, as well as EPA's objectives for the proposed rule. [Also see Section 2.F comments in support of the Unitary Approach, as well as comments in Chapter 5 on the definition of media and remediation waste.] Commenters also argue that Minimum Technology Requirements (MTRs) and LDRs are applicable to process waste, not remediation waste; EPA's decision to trust state regulators to establish site-specific, risk-based treatment standards for below Bright Line media should apply equally to above Bright Line media (i.e., that LDRs need not apply to any contaminated media); EPA's overall approach to establishing treatment levels is overly complex and creates too many separate, unharmonized regulatory regimes; and application of the LDRs discourages voluntary cleanups.

- "The second policy objective states that requirements for management of contaminated media should be flexible and should reflect actual media cleanup site conditions and characteristics of the contaminated media. Mandating LDR treatment requirements is certainly not the way to accomplish this policy objective. Applying LDR treatment requirements or more specifically using them as a baseline will, in many cases, result in nothing so much as treatment for treatment's sake. The implementing agency, the generator, and the local community are in the best position to understand the waste, the site, and the possibilities and limitations of treatment. That fact needs to be both understood and respected in these rules.

LDR treatment requirements are based on proven technology for process waste and should not be applied to treatment of media because they are not proven for media. It is not known if they are even achievable. Finally, since EPA has not proven whether the technology is achievable or appropriate for media and because EPA has not identified any technologies or treatment standards for media, EPA should not be applying treatment standards appropriate for process wastes to remediation wastes. By using as-generated waste standards as a baseline for this rule, that is exactly what the agency is doing." (109)

Response: Many commenters expressed the concern that application of LDRs to remediation waste, including contaminated soil, was overly complex and would present impediments to remediation. The majority of these commenters suggested that EPA simply exempt the majority of remediation wastes, including contaminated soil, from a duty to comply with LDRs.

The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. For this reason, EPA believes adoption of treatment standards for contaminated soils represents a reasonable accommodation between the requirement to treat materials subject to the LDRs before they are land disposed, and the special needs of encouraging properly-conducted remediations.

Regarding the achieveability of the soil treatment standards, as discussed further in the preamble and Background Document to today's action the Agency believes that the soil treatment standards can be reliably achieved using a variety of demonstrated remediation technologies, such as, depending on the exact nature of the soil and contaminants in question, biological treatment, thermal desorption, and dechlorination. This is despite the fact that the 10xUTS component of the soil treatment standards is based, as the commenter noted, on an extrapolation of the existing LDR treatment standards. If the soil treatment standards are shown, because of site- and waste-specific conditions, to be unachieveable (using an application of one of the model technologies on which the standards are based) or inappropriate for any given contaminated soil, a land disposal restriction treatment variance is available under current regulations at 40 CFR 268.44(h).

- "EPA claims that its proposed approach to LDR's and treatment requirements is "consistent with the recommendations of the FACA Committee". As a member of that committee DuPont must protest this characterization as grossly inaccurate. In fact, the committee agreed that LDRs should not apply to any contaminated media, and also agreed that any mandatory treatment should be compatible with existing innovative remedial technologies. The Agency's proposed approach is consistent with neither of these agreements." (117)

Response: EPA regrets that some members of the FACA committee believe EPA mischaracterized the results of the FACA process.

- "For precisely the same reasons, EPA has simultaneously proposed here to remove the application of LDRs from media containing constituents not exceeding Bright Line benchmark levels, and for *all* media subject to the Unitary or Hybrid Approaches. Under the Bright Line approach, a Director may determine a media contaminated with hazardous waste disposed before the effective date of an applicable LDR prohibition does not contain hazardous waste and need not comply with LDRs (when subsequently disposed subject to requirements specified in an RMP). In contrast, soils containing hazardous waste formerly containing hazardous waste disposed subsequent to an applicable prohibition date, must meet revised generic or site-specific LDR standards, respectively. Sediment, ground water, non-media hazardous remediation wastes, debris or mixtures of these materials and soil where the soil does not predominate, are subject to application of existing LDR treatment standards derived for application to wastes generated from industrial processes, and not from remediation activities.

  Given the policies EPA articulates in the current proposal, EPA presumably would choose to remove the application of LDRs from all remediation wastes if it were to acknowledge legal authority exists to do so. As discussed above, ample legal authority *does exist*, even under a Bright Line approach. In fact, EPA specifically proposes to exclude such materials from application of LDRs under the Unitary and Hybrid Approaches. EPA also proposes to exclude *all* remediation wastes, not just media, from application of the LDRs under whatever approach it adopts, when such media is managed in remediation piles. EPA justifies this aspect of its proposal by arguing such management is temporary and is excluded from the definition of land disposal in section 3004(k). CMA strongly encourages EPA to acknowledge its broad legal authority, and to exempt *all* remediation wastes from application of LDRs, under whichever of the instant proposals EPA ultimately adopts, and not just when managed in remediation piles." (112)

Response: EPA is not, at this time, taking action on the portions of the HWIR-Media proposal that would have created a system to allow large volumes of hazardous remediation waste to exit the RCRA Subtitle C system.

The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current

practice of applying the treatment standards developed for pure industrial hazardous waste. For this reason, EPA believes adoption of treatment standards for contaminated soils represents a reasonable accommodation between the requirement to treat materials subject to the LDRs before they are land disposed, and the special needs of encouraging properly-conducted remediations.

- "Minimum Technology Requirements ("MTRs") and LDRs should not be applied to the management of remediation wastes as MTRs and LDRs are designed for application to process-generated hazardous waste. Treatment of remediation wastes, which vary in their treatability due to physical and chemical heterogeneity, should be determined based upon site-specific characteristics and should not have to conform to the limited treatment techniques allowed by MTRs and LDRs. Further, temporary handling of remediation wastes should be allowed in order to accommodate the implementation of the most effective remedy and should not be limited by LDRs." (66)

Response: The commenter makes three assertions: (1) LDRs (and MTRs) should not apply to remediation waste, including contaminated soil; (2) treatment of remediation wastes including contaminated soils should not have to conform to the limited techniques allowed by LDRs (and MTRs); and (3) temporary handling of remediation waste, including contaminated soil, should not be limited by LDRs.

Regarding whether LDRs or MTRs should apply to contaminated soils, the Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. For this reason, EPA believes adoption of treatment standards for contaminated soils represents a reasonable accommodation between the requirement to treat materials subject to the LDRs before they are land disposed, and the special needs of encouraging properly-conducted remediations.

Regarding the concern that application of LDRs would limit the techniques allowed for treatment of hazardous contaminated soil, as discussed further in the preamble to today's final rule, the Agency believes that the soil treatment standards can be achieved using a variety of demonstrated, non-combustion, remediation technologies such as, depending on the exact nature of the soil and contaminants in question: biological treatment, thermal desorption, and dechlorination. If the soil treatment standards are shown, because of site- and waste-specific conditions, to be unachieveable (i.e. cannot be achieved using a properly operated treatment technology on which the treatment standards are based) or inappropriate for any given contaminated soil, a land disposal restriction treatment variance is available under current regulations at 40 CFR 268.44(h).

Regarding temporary handling of contaminated soils, EPA is not, at this time, going forward with the elements of the HWIR-Media proposal that addressed temporary handling of contaminated soils and other remediation wastes. Under current regulations, this temporary handling can be approved using the provisions for corrective action management units and corrective action temporary units. Under current regulations, remediation wastes -- including contaminated soils -- are not required to meet LDR treatment standards prior to being placed into a corrective action management unit or temporary unit.

- "Section 269.30(d) - (h) -- Minimum LDR Treatment Requirements For Media

  EPA has proposed to require compliance with the LDRs for all media containing constituents above-the-Bright Line that are managed in a land disposal unit and for media with constituents below-the-Bright Line that at one time contained a hazardous waste that was spilled after the effective date of the LDRs. As discussed above, USWAG believes that EPA has the authority to exclude these media from the LDRs and should exercise that authority.

  For above-the-Bright Line contaminated soil subject to the LDRs, EPA has proposed a numerical treatment standard of the less stringent of 10 times the universal treatment standard ("UTS") or 90 percent reduction of hazardous constituents. This standard can be made more stringent on a site-specific basis if necessary to protect human health or the environment or the media can be granted a variance for a less stringent standard. For below-the-Bright Line media, treatment standards would be established in the RMP on a site-specific basis.

  USWAG agrees with EPA that the LDR treatment standards for process wastes are generally inapplicable to contaminated media, and USWAG supports the proposal to develop LDR treatment standards (if applicable) for below-the-Bright Line media on a site-specific basis through the RMP. Moreover, USWAG sees no reason why the same approach should not be extended to above-the-Bright Line media. As the Agency has repeatedly recognized, contaminated sites and contaminated media are highly heterogeneous and the treatment methods applicable to process wastes are either inappropriate for or less effective with contaminated media. Id. at 18807. The Agency has recognized this fact by proposing an alternative numerical standard for above-the-Bright Line media of 10 times the UTS or 90 percent reduction.

  While this standard is certainly preferable to the UTS, USWAG believes that the Agency should give generators the option of utilizing either the generic numerical standard or developing a site-specific risk-based treatment standard. A risk-based treatment standard is preferable to the proposed technology-based standard because it allows treatment to be tailored to the risks actually posed by the media as managed, thereby ensuring that resources are not wasted in treatment that is not necessary to ensure adequate protection for human health and the environment. Moreover, a risk-based approach is consistent with the basic philosophy of the HWIR-media proposal, which is to move away from the mechanical application of technology-based standards to a system that more closely tailors regulatory standards to the actual risks posed by the regulated materials.

A technology-based standard tends to be a moving target, moving steadily downward as treatment and analytical technologies improve. Thus, such standards rapidly lead to treatment for treatment's sake. A risk-based standard, on the other hand, allows the generator to tailor the management of the regulated material to the actual risks posed by the material taking into account the nature of the material, the potential routes of exposure, and the risks posed by alternative treatment standards. Accordingly, the Agency should give generators the option of developing, with the implementing agency's approval, site-specific risk-based standards for above-the-Bright Line media." (59)

Response: EPA appreciates the support of land disposal treatment standards specifically tailored for hazardous contaminated soil.

Regarding the availability of the new soil treatment standards, EPA agrees with the commenter and has, in the final rule, made the new soil treatment standards available for all hazardous contaminated soils.

Regarding the concern that application of national, technology-based, LDR treatment standards to contaminated soil will, in certain circumstances, result in treatment beyond the point at which threats to human health and the environment are minimized and the suggestion that EPA allow treatment standards for remediation waste to be developed based on risk, EPA agrees that generally risk-based LDR treatment standards would be preferable to technology-based standards. However, the Agency has, to date, been unable to develop risk-based standards that could be applied at a national level largely because of the wide variety of site-specific physical and chemical compositions encountered in the field and the uncertainties involved in evaluating long-term threats to both humans and the environment posed by land disposal of prohibited wastes. In order to minimize the likelihood that the technology-based standards for contaminated soil will result in treatment to a point beyond that at which threats to human health and the environment are minimized, the Agency has provided an opportunity for a treatment variance, which could be used, on a site-specific basis to cap the technology-based treatment standards. The Agency believes these determinations are possible, during remediations, on a site-specific basis because, during remediations experts and field personnel typically gather detailed site-specific information on risks posed by specific hazardous constituents or combinations of hazardous constituents, potential direct and indirect exposure routes, risk pathways, and human and environmental receptors. Through application of this information overseeing Agencies can, on a site-specific basis, eliminate many of the long-term uncertainties associated with land disposal and, therefore, make appropriate risk-based decisions regarding the extent of treatment needed to minimize short- and long-term threats. This so called “site-specific minimize threat treatment variance” will be available to all contaminated soils. The new treatment variance is discussed in detail in the preamble to today’s action.

- "Under the proposed rule, EPA would establish generic, technology-based treatment standards for hazardous contaminated media above the Bright Line values and a presumption for site specific LDR treatment variances for media below Bright Line values. For hazardous contaminated media (other than soils), the proposed rule would require treatment to meet the LDR treatment standard applicable to the hazardous wastes contained in the media. For hazardous contaminated soils, the proposed rule would establish new soil specific LDR standards requiring 90 percent reduction in the initial concentrations of constituents subject to treatment at a cap at 10 times the universal treatment standards

("UTS"). The proposed alternative treatment levels for soils could provide needed regulatory relief at certain remediations. However, EPA's overall approach on treatment levels is overly complex and creates too many separate regulatory regimes that are not harmonized. The same rationale supporting EPA's decision to trust state regulators to establish site-specific treatment standards for below Bright Line media applies equally to above Bright Line media. In both cases, the extent of treatment should be determined solely by the actual risk at a specific site." (76, 77)

Response: EPA appreciates the support of the soil treatment standards.

Regarding the suggestion that EPA establish LDR treatment standards based on risk rather than the performance of specific technologies, EPA agrees that generally risk-based LDR treatment standards would be preferable to technology-based standards. However, the Agency has, to date, been unable to develop risk-based standards that could be applied at a national level largely because of the wide variety of site-specific physical and chemical compositions encountered in the field and the uncertainties involved in evaluating long-term threats to human and the environment posed by land disposal of prohibited hazardous waste (or hazardous contaminated soil). In order to reduce the likelihood that the technology-based standards for contaminated soil will result in treatment to a point beyond that at which threats to human health and the environment are minimized, the Agency has provided an opportunity for a treatment variance, which could be used, on a site-specific basis to cap the technology-based treatment standards. The Agency believes these determinations are possible, during remediation, on a site-specific basis because, during remediations, experts and field personnel typically gather detailed site-specific information on risks posed by specific hazardous constituents or combinations of hazardous constituents, potential direct and indirect exposure routes, risk pathways, and human and environmental receptors. Through application of this information overseeing Agencies can, on a site-specific basis, eliminate many of the long-term uncertainties associated with land disposal and, therefore, make appropriate risk-based decisions regarding the extent of treatment needed to minimize short- and long-term threats. This so called “site-specific minimize threat treatment variance” will be available to all contaminated soils. The treatment variance is discussed in detail in the preamble to today’s action.

- "EPA acknowledges that despite the arguments of some in favor of uniform national LDR treatment standards, site-specific flexibility is warranted in determining treatment requirements that should apply to contaminated media. See 61 Fed. Reg. at 18786. Nonetheless, for above bright line media, EPA has proposed the uniform imposition of the technology-based LDR approach used for process wastes (albeit somewhat modified for contaminated soils). In doing so, the Agency has failed to articulate a clear and convincing reason why above bright line media should be subject to generic national technology-based standards while requirements for below bright line media should be determined on a site-specific basis, particularly where the former framework could result in the need to attain lower levels of the same hazardous constituent in treatment residuals than the latter framework despite the fact that the same site risks are being addressed in both cases.

  To a certain extent, EPA has recognized that technology-based treatment standards may be ill-suited for purposes of achieving site remediation objectives.[12] Consequently, the proposed rule would allow the overseeing agency to specify more stringent soil treatment standards for above bright line media based on site-specific factors, i.e., based on the threats

posed by management of material at the site. See proposed 40 C.F.R. 269.32. Curiously, while acknowledging the fact that site-specific factors may require more treatment to satisfy the "minimize threat" standard of RCRA than that provided by EPA's modified technology-based standards, the Agency fails to recognize fully the evident corollary: it is also entirely possible that site-specific conditions may lead the overseeing agency to conclude that less treatment is warranted than that resulting from EPA's technology-based standards.[13] Simply put, to the extent contaminated media remain classified as hazardous waste, it is the very site-specific risk assessment nature of remediation activities that warrants a risk-based treatment standard approach to the "minimize threat" standard of RCRA's LDR program.

12. Indeed, it is questionable whether they are even lawful in a site-specific remediation context. The D.C. Circuit has cautioned that technology-based standards are not legally permissible beyond the point at which there is a threat to human health or the environment. HWTC v. EPA, 886 F.2d 355, 361-64 (D.C. cir. 1989), cert. denied, 111 S. Ct. 139 (1990). In remediations approved and overseen by EPA Regions and states, the overseeing agency typically makes a site-specific determination as to what concentrations of a hazardous constituent constitute a threat to human health or the environment that warrants attention. Indeed, EPA itself has acknowledged that has a general rule, cleanup to health-based standards through implementation of an approved remedy in the context of an agency overseen cleanup can be presumed to minimize threats even when the remedy involves placement (or replacement) of contaminated media that does not meet the generic technology-based LDR "treatment standards." 61 Fed. Reg. at 18812. Requiring technology-based treatment to below those health-based standards simply is not needed to address threats to human health.

In the final analysis, the same rationale that argues in favor of a site-specific approach to treatment requirements for below bright line media applied. equally to above bright line media. In both cases, it is the desire to encourage treatment remedies and innovative technologies - and the assurance that protective treatment requirements will be imposed and overseen by regulatory agencies on a site-specific basis - that warrant a flexible approach to such requirements.[14] Moreover, in both cases, the extent of treatment required should be predicated on the risk presented by operation of the treatment technology and by the treatment residual, not by focusing, as EPA has, on the putative "relative risk" posed by the media before treatment.[15]" (79)

Response: The commenter suggests that, instead of establishing nationally applicable LDR treatment standards, the Agency allow treatment standards to be developed entirely on a site-by-site basis, considering risk. At this time, the Agency has rejected the site-by-site approach. RCRA Section 3004(m) requires EPA to promulgate, "levels or methods of treatment, if any. . .." Although 3004(m) could be implemented in many ways, at this time, EPA believes the most appropriate way to satisfy this RCRA Section 3004(m) mandate is to establish technology-based, nationally applicable treatment standards, including standards tailored for contaminated soil. Among other things, a national standard assures a basic measure of consistency in determining the level of performance at which a technology-based standard can be found to minimize threats posed by land disposal.

However, because EPA realizes that technology-based nationally applicable treatment standards, because of site- and waste-specific characteristics, are sometimes not achievable or are inappropriate, EPA has long provided for variances under these circumstances. In addition, because the Agency believes that, during remediation, EPA and authorized states are in the position to make site-specific risk-based minimize threat determinations, the Agency is also providing a variance, for contaminated soils if, on a case-by-case basis, it is determined that the technology-based treatment standard would require treatment beyond the point at which threats are minimized, as discussed above and in the preamble to today's rule.

- "In general, LDR requirements should not be applicable to media. Land Disposal Restrictions were developed to be applicable only to wastes destined for land disposal. Unlike process wastes, contaminated ground water or surface water would be treated during the cleanup. The cleanup is not designed to containerize and dispose of the treated water in any landfills. Likewise, when the soil is treated to an acceptable regulatory level, it should be allowed to return to the remedial site where it was excavated. Presumably, the soil cleanup standard was developed to treat soil so it can be left at the remedial site. The cleanup standard was not developed to treat soil destined for land disposal. Furthermore, stabilized soil may be disposed of in a Subtitle D landfill without causing additional risk to human health and the environment." (96)

Response: The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste.

The Agency has provided an opportunity for a site-specific, risk-based treatment variance, which could be used, on a site-specific basis to cap the technology-based treatment standards when it is determined that threats to human health and the environment are minimized with less treatment than the technology-based treatment standards would require. The Agency believes these determinations are possible, because, during remediation experts and field personnel typically gather detailed site-specific information on risks posed by specific hazardous constituents or combinations of hazardous constituents, potential direct and indirect exposure routes, risk pathways, and human and environmental receptors. Through application of this information overseeing Agencies can, on a site-specific basis, eliminate many of the long-term uncertainties associated with land disposal and, therefore, make appropriate risk-based decisions regarding the extent of treatment needed to minimize short- and long-term threats. This so called "site-specific minimize threat treatment variance" will be available to all contaminated soils. The treatment variance is discussed in detail in the preamble to today's action.

- "The proposed rule, of course, provides no relief from the current LDRs for waste-like contaminated materials or contaminated debris, because these 2 classes of remediation materials are completely excluded from the proposal.

  The proposal provides the option for relief from current LDRs for media contaminated at levels below the Bright Line, provided the waste which contaminated the media was placed before the effective data of the applicable LDRs. However, this option requires a contained-in determination by the Director and requires that the contained-in determination be made before the contaminated media is removed from the land.

  Media contaminated at levels below the Bright Line by waste that was placed after the effective date of the applicable LDRs remains subject to the LDRs. This is the case, even if the Director makes a contained-in determination that the media no longer contains hazardous waste and, therefore, is no longer subject to other RCRA regulations. In this case, however, the proposal states that there will be a presumption for site specific treatment variances.

  All media contaminated at levels above the Bright Line would be subject to LDRs and would not be eligible for contained-in determinations. (As indicated above, media above the Bright Line would not necessarily present any greater risk than media below the Bright Line, in light of the arbitrary caps and sometimes distorted assumptions used to develop the Bright Line.) The proposed rule would establish new soil LDR standards for this media. The alternative LDRs would be a generic requirement to treat the soils until applicable constituents were reduced by 90% or to 10 times the Universal Treatment Standard. This generic treatment standard would apply without regard to whether even the existing level of constituents presented any risk at the site. Furthermore, the Agency is not confident that remediation technologies exist which can meet this standard for contaminated soils. Groundwater contaminated with constituents above the Bright Line would be provided no relief from existing LDRs.

  The Agency could not have proposed a more complicated scheme for application of LDRs to contaminated media. A site with waste-like material and contaminated soil, groundwater and debris could conceivably be subject to LDRs applicable in 7 or 8 different ways.

  The above requirements would create great complexity in any remediation undertaking and they bare no relationship to the risks created by a site. The LDRs should be set aside for all remediation wastes, media and debris, as would be done under the Unitary Approach. The treatment standard must be one based on site-specific risks because each site is unique." (134)

Response: Many commenters expressed concern that application of LDRs to remediation wastes, including contaminated soils, was overly complex and would impede remediations. The majority of these commenters, like this person, advised that the Agency either exempt remediation waste entirely from a duty to comply with LDRs or, if compliance with LDRs were required, to allow treatment standards to be developed on a site-specific basis instead of promulgating national treatment standards.

The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. Furthermore, to address specific concerns that the proposed regulations governing LDR applicability to contaminated soil were too difficult to understand or apply, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

Regarding the associated concern that application of LDRs would limit the techniques allowed for treatment of hazardous contaminated soil, as discussed further in the preamble to today's action the Agency believes that the soil treatment standards may be reliably achieved using a variety of demonstrated, non-combustion, remediation technologies such as, depending on the exact nature of the soil and contaminants in question: biological treatment, thermal desorption, and dechlorination. If the soil treatment standards are shown, because of site- and waste-specific conditions, to be unachieveable (i.e. cannot be achieved using a properly operated treatment technology on which the treatment standards are based) or inappropriate for any given contaminated soil, a land disposal restriction treatment variance is available under current regulations at 40 CFR 268.44(h).

In addition, as noted in the preamble, technology-based standards have the virtue of providing an objective measure of performance and thus removing as much of the usual uncertainty associated with predictive decisions regarding protectiveness of land disposal. Notwithstanding this comment, EPA sees nothing that makes this logic inapplicable to contaminated soils.

Regarding the suggestion that EPA allow treatment standards to be developed entirely on a site-by-site basis, absent a national baseline, to date, the Agency has rejected this approach. RCRA Section 3004(m) requires EPA to promulgate, "levels or methods of treatment, if any. . .." Although 3004(m) could be implemented in many ways, at this time, EPA believes the most appropriate way to satisfy this RCRA Section 3004(m) mandate is to establish technology-based, nationally applicable treatment standards, including standards tailored for contaminated soil. Among other things, a national standard assures a basic measure of consistency in determining the level of performance at which a technology-based standard can be found to minimize threats posed by land disposal. However, because EPA realizes that technology-based nationally applicable treatment standards, because of site- and waste-specific characteristics, are sometimes not achievable or are inappropriate, EPA has long provided for variances under these circumstances. In addition, because the Agency

believes that, during remediation, EPA and authorized states are in the position to make site-specific risk-based minimize threat determinations, the Agency is also providing a variance, for contaminated soils if, on a case-by-case basis, it is determined that the technology-based treatment standard would require treatment beyond the point at which threats are minimized, as discussed above and in the preamble to today's rule.

- "Determining whether or not LDRs apply and, if so, which treatment standards are relevant is exceedingly complicated and will defer the cleanup of sites, much as the current regulatory regime does. Most of these complexities are further discussed in the sections that follow and could be easily resolved if the Agency were to promulgate the Unitary Approach." (26)

Response: A number of commenters expressed concern that the regulations governing LDR applicability to contaminated soil were too difficult to understand or apply. To address these concerns, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

Regarding the suggestion that EPA adopt the Unitary approach, as discussed in the preamble to today's rulemaking, the Agency is not, at this time, taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all hazardous remediation waste to exit large portions of the RCRA Subtitle C system. The Agency continues to believe that legislative action is needed to address the application of RCRA Subtitle C regulations, especially LDRs, to hazardous remediation waste. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste.

- "EPA has proposed an extremely complex set of provisions applying the LDRs to both hazardous and non-hazardous contaminated media. First, because contaminated media above the Bright Line are not exempt from Subtitle C requirements, under EPA's proposal, the LDRs will apply to media contaminated by hazardous wastes contain hazardous constituents above the Bright Line. Second, for media contaminated by hazardous wastes below the Bright Line, the proposed rule will apply the LDRs to the contaminated media based on when the wastes were land disposed and if the media are "removed from the land." *See* proposed 40 C.F.R. § 269.30(a); 61 Fed. Reg. 18804-08.

  If the wastes were land disposed after the effective date of the applicable land disposal prohibitions, LDRs attached to the media when it was placed on the land. The proposal also appears to require the media be treated according to LDR treatment standards when it is removed from the land, even if the media is determined no longer to contain the wastes. *Id.;*

but see 61 Fed. Reg. 18806 n.20. However, if the wastes were land disposed prior to the effective date of the applicable land disposal prohibitions and the facility obtains a "contained-out" determination before the media are removed from the land, then the media will be relieved from the LDR treatment standards. *See* proposed 40 C.F.R. § 269.30(a), (b)." (112)

Response: A number of commenters expressed concern that the regulations governing LDR applicability to contaminated soil were too difficult to understand or apply. To address these concerns, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

Although this commenter asserted confusion as to the proposed regulations on applicability, EPA notes that the summary submitted with the comment (above) correctly summarizes LDR applicability to contaminated soil under the proposal (and the final rule as well).

- "The Bright Line approach would create numerous categories of waste, each with differing management regimes and treatment requirements (see table 1). For each of these differing waste types there would be differing treatment requirements. As part of EPA's proposed approach to LDRs, for many of these different waste types one would have to determine whether the contaminating hazardous waste entered the environment before or after LDRs were effective for that particular waste. Some media would be subject to process waste LDRs, some to ostensibly media-specific LDRs and some to no LDR requirements. Some LDR requirements would attach based on concentrations, some on the physical nature of the media (sediment vs. soil) and some on chronology (when the contaminating hazardous waste entered the media, regardless of whether the media still contained the waste). We note that none of these determinations is in any way related to the actual potential risk presented by the waste or its management, but are simply artificial regulatory constructs.

  The Agency's proposed approach to LDRs is a cogent example of the needless complexity and limitations imposed by the use of the contained-in basis for HWIR and the resulting Bright Line approach. They add tremendous complexity and non-productive regulatory decision steps to the process, without any commensurate risk related benefits, and perpetuate RCRA's regulation of remediation waste based on their pedigree, not their character and potential risk.

  EPA's proposed approach to determining LDR applicability is complex, administratively burdensome and entirely unrelated to risk

  In the preamble, EPA suggests the following decision making approach for making "good faith effort[s] to determine whether media were contaminated by hazardous waste and ascertain the dates of placement".

The Agency believes that by using available site and waste-specific information such as manifests, vouchers, bills of lading, sales and inventory records, storage records, sampling and analysis reports, accident reports, site investigation reports, spill reports, inspection reports and logs, and enforcement orders and permits, facility owner/operators would typically be able to make these determinations.

Keep in mind that many Corrective Action sites have in excess of 100 solid waste management units where such determinations might have to be made, and that the determination will decide to what degree potential reform under HWIR would be limited on a site-specific basis.

Such an evaluation for multiple constituents at multiple units would constitute a major study effort in its own right, entirely unrelated to potential risks and site specific determinations of remedial and waste management needs. While EPA's policy statement that the general presumption will be that the contaminating materials are not hazardous waste, and that, if hazardous, they entered the environment prior to the effective dates of the LDRs is welcome, it is not sufficient. Clearly, the proposed approach to addressing LDRs, driven by the contained-in Bright Line approach, will add tremendous complexity to remediation waste management decisions and serve largely to limit the degree to which disincentives to remediation are removed." (117)

Response: The commenter raises two concerns. First, that application of LDRs to remediation waste, including contaminated media, is overly complex and burdensome. Second, that it will be prohibitively difficult to apply information to determine if LDRs apply to any given contaminated media.

The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. Furthermore, to address specific concerns that the proposed regulations governing LDR applicability to contaminated soil were too difficult to understand or apply, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

Regarding the difficulty of using information on the types of waste present and the dates of waste disposal to determine whether a duty to comply with LDRs applies, EPA is not persuaded that the idea that generators may apply their knowledge of the types of wastes that were placed at their site and the dates of waste placement would constitute a "major study in its own right." EPA has consistently used and encouraged reliance on generator knowledge to determine whether hazardous wastes are present at Superfund sites and has not seen it add unduly to the time or cost associated with Superfund remediation. Current regulations require that generators and hazardous waste management facilities keep records to document the type of hazardous waste they generate, whether and when the waste was treated to meet applicable land disposal restriction treatment standards, and the dates and locations of the wastes ultimate disposition. In addition, as noted in the preamble to the proposed rule, EPA continues to believe that it will be the exceptional circumstance where generators will know, or will reasonably presume, that any given contaminated medium was contaminated by hazardous waste placed after the effective date of the applicable land disposal restriction. This is because, generally the contamination of environmental media by hazardous waste after the effective date of the applicable land disposal restriction would involve a violation of LDRs, subject to substantial fines and penalties including criminal sanctions.

- "Application of the LDRs to remediation wastes under this proposal is particularly onerous. First, one has to determine whether contaminated media are hazardous or nonhazardous. Then, a determination must be made as to whether or not the hazardous waste contaminating the media (1) was prohibited from land disposal at the time it first contaminated the media or (2) is prohibited from land disposal when the media are excavated. Further, for nonhazardous contaminated media, if the contaminating waste was not prohibited at the time it first came into contact with the media, the excavated contaminated media would be exempt from LDR treatment standards. Thus, contaminated media deemed nonhazardous under this proposal may or may not be subject to LDR. For hazardous groundwater and surface water, as well as sediment, §268.40 LDR treatment standards apply, but for hazardous soil, modified LDR treatment standards apply.

  The modified standards include treatment of any hazardous soil that contains constituents at a level greater than 10 times the UTS concentrations. Soils that are characteristic hazardous waste because of ignitability, corrosivity or reactivity would have to be treated to deactivate the characteristic, as well as reduce the concentrations of any other constituents subject to treatment in the soil by 90 percent (but not less than 10 times the UTS values). Soil that is TC hazardous would have to be treated to reduce the concentrations of the TC constituent and any other constituents subject to treatment in the soil by 90 percent (but not less than 10 times the UTS values). Finally, soils contaminated with listed wastes would have to be treated to reduce the concentrations of all constituents subject to treatment in the soil by 90 percent (but not less than 10 times the UTS values).

  The LDR approach taken in this proposal will more than cancel out any workable provisions, in Eastman's opinion. Because of its complexity, many sites needing cleanup will remain as is. The Unitary Approach, however, is straightforward in terms of LDR, and will promote the cleanup of sites through the application of easily understood regulations." (26)

Response: The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to

efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. Furthermore, to address specific concerns that the proposed regulations governing LDR applicability to contaminated soil were too difficult to understand or apply, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

- "Further, EPA has not carefully drafted many of its proposed regulations. EPA's proposed requirements in section 269.30(a) and (b) appear to apply the proposed LDR requirements to materials which are removed from the land, without regard to whether they are subsequently disposed of on the land. Further, in proposing to apply the LDR regulations to some materials determined not to contain hazardous waste, EPA has adopted the awkward construction of referring to "the waste contaminating the media." Because the prohibitions of Part 268 apply to waste and not to media, EPA attempts to treat the media as if it continues to contain the waste notwithstanding the proposed determination in the RMP. The common understanding of the terms, however, creates an internal contradiction that is avoided only by casting aside English in favor of RCRA-ese.

  Such confusing and unnecessary language results from adopting a confusing and unnecessary approach. EPA has described its legal authority which would allow it to avoid "carrying through" LDR treatment standards from previously disposed wastes to contaminated media. 61 Fed. Reg. 18835. However, if EPA chooses as a matter of policy to adopt its preferred approach, it may state its regulations in clear English. The requirements apply: (1) To all remediation media destined for land disposal which contain a hazardous waste; and (2) to all remediation media destined for land disposal which have received a regulatory determination under an RMP that the media no longer contain a hazardous waste, and but for that determination would be considered to contain a hazardous waste disposed of on the land after the effective date of an applicable LDR prohibition." (112)

Response: The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is

forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. Furthermore, to address specific concerns that the proposed regulations governing LDR applicability to contaminated soil were too difficult to understand or apply, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

In addition, EPA has clarified the final regulations to ensure that generators are explicitly informed that, in all cases, a duty to comply with LDRs attaches only to contaminated soil that is destined for land disposal.

- "Determining whether or not LDRs apply and to which media they apply is too complex and onerous under the Bright Line Approach. This part of the proposal alone will assure the continued delay in cleanups." (26)

Response: A number of commenters expressed concern that the regulations governing LDR applicability to contaminated soil were too difficult to understand or apply. To address these concerns, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

- "**1. The LDR applicability issue is another example of why an all-remediation waste, non-bright-line approach based on a contingent management legal theory is necessary.**

  EPA describes in the HWIR-Media preamble the information necessary to determine if LDRs apply to a particular contaminated medium:

  > [I]n order to determine if a given environmental medium must comply with LDRs one must know the origin of the material contaminating the medium (i.e., hazardous waste or not hazardous waste), the date(s) the material was placed (i.e., before or after the effective date of the applicable land disposal prohibition), and whether or not the medium still contains hazardous waste (i.e., contained-in decision or not). 61 Fed. Reg. 18,805.

Of course, to presage this series of decisions, one must have first decided if he or she is dealing with "sludgy dirt" or "dirty sludge." As noted earlier in section III.C.1. of the comments, all of this confusion and complexity can be eliminated through application of EPA's contingent management authority to promulgate the Unitary Approach such that LDRs would not attach to the remediation waste in the first instance.

2. The Project objects to the proposed treatment requirements as unnecessary, arbitrary, and likely to create further impediments to voluntary commencement of remediation activities.

As an initial matter, the Project questions whether the FACA came to agreement that "higher risk media should be subject to generic national standards." 61 Fed. Reg. 18,806. An arbitrary, technology-based treatment standard is unrelated to protection of human health and the environment. Furthermore, EPA has not shown that the specified reductions are either achievable or appropriate for remediation wastes. Last, such generic standards discourage use of innovative technologies and constitute a further disincentive to commencement of early remediation activities. We urge EPA to abandon the mandatory treatment concept entirely and leave it to the States to make risk-based remedial decisions on a site-specific basis.

3. The Project objects to technology-based treatment standards as counterproductive in a remediation context.

Technology-based (or technology-forcing) treatment standards may arguably be appropriate for newly-generated wastes as yet another disincentive to their generation in the first instance. See 61 Fed. Reg. 18,806. However, they are completely out of place in a remediation context, where the goal should be to encourage "generation" of remediation wastes to the extent necessary to reduce actual threats to human health or the environment. Technology or treatment for its own sake may provide no additional environmental protection while adding burdensome regulatory requirements that would be a further disincentive to early remediation. For this reason, we urge EPA to abandon the arbitrary mandatory treatment approach." (55)

Response: The commenter raises two concerns: (1) application of LDRs to hazardous remediation waste is overly complex and will create impediments to efficient and aggressive remedial actions; and, (2) technology-based treatment standards are inappropriate in the remedial context. As a remedy to both these concerns, the commenter suggests that treatment decision for hazardous remediation waste be deferred to the states to determine on a site-by-site basis.

The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional

regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. Furthermore, to address specific concerns that the proposed regulations governing LDR applicability to contaminated soil were too difficult to understand or apply, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

Regarding the associated concern that application of technology-based LDRs would limit the techniques allowed for treatment of hazardous contaminated soil, as discussed further in the preamble to today's action the Agency believes that the soil treatment standards may be reliably achieved using a variety of demonstrated, non-combustion, remediation technologies such as, depending on the exact nature of the soil and contaminants in question: biological treatment, thermal desorption, and dechlorination. If the soil treatment standards are shown, because of site- and waste-specific conditions, to be unachieveable (i.e. cannot be achieved using a properly operated treatment technology on which the treatment standards are based) or inappropriate for any given contaminated soil, a land disposal restriction treatment variance is available under current regulations at 40 CFR 268.44(h). In addition, as noted in the preamble, technology-based standards have the virtue of providing an objective measure of performance and thus removing as much of the usual uncertainty associated with predictive decisions regarding protectiveness of land disposal. Notwithstanding this comment, EPA sees nothing that makes this logic inapplicable to contaminated soils.

Regarding the suggestion that EPA allow treatment standards to be developed entirely on a site-by-site basis, absent a national baseline, to date, the Agency has rejected this approach. RCRA Section 3004(m) requires EPA to promulgate, "levels or methods of treatment, if any. . .." Although 3004(m) could be implemented in many ways, at this time, EPA believes the most appropriate way to satisfy this RCRA Section 3004(m) mandate is to establish technology-based, nationally applicable treatment standards, including standards tailored for contaminated soil. Among other things, a national standard assures a basic measure of consistency in determining the level of performance at which a technology-based standard can be found to minimize threats posed by land disposal. However, because EPA realizes that technology-based nationally applicable treatment standards, because of site- and waste-specific characteristics, are sometimes not achievable or are inappropriate, EPA has long provided for variances under these circumstances. In addition, because the Agency believes that, during remediation, EPA and authorized states are in the position to make site-specific risk-based minimize threat determinations, the Agency is also providing a variance, for contaminated soils if, on a case-by-case basis, it is determined that the technology-based treatment standard would require treatment beyond the point at which threats are minimized, as discussed above and in the preamble to today's rule.

- "EPA's proposed LDR requirements for contaminated media are neither necessary nor technically sound. The LDR requirements were written to address hazardous wastes from ongoing manufacturing operations. In the remediation context, LDR requirements are

significant impediments to reasonable, site-specific, risk-based remedial action decisions. Currently the LDR treatment standards dictate, to a large extent, how contaminated media is to be managed without regard to site-specific conditions. Large quantities of soil and groundwater are frequently sent off-site for costly treatment, when in fact they may be better and more efficiently managed on-site.

The Agency recognizes this dilemma and attempts to address it under the Bright-Line Approach by proposing alternative treatment standards for soils that are above the Bright Line. SOCMA considers this proposal to be both confusing and unsound.

For instance, the proposal requires that if any constituent in a remedial waste is at a concentration above the Bright Line, then all constituents in the waste will be required to be treated to a 90 % reduction. This could be particularly costly if the same treatment method cannot be used for all constituents. Further, application of this concept to complicated mixtures, as are often present at waste sites, could be quite confusing. For instance, a waste could contain 20 constituents but only one could be at a concentration above the Bright Line. The others could all fall at concentrations below the Bright Line, and some could fall near the practical quantification limit (PQL). If the entire waste were treated to a 90% reduction, the concentration of some of the materials may fall below the PQL. They could even fall below the mean detection limit (BMDL). It would be impossible to demonstrate a 90% reduction if some of the treated constituents fall below the PQL or the BMDL.

The delays in, and avoidance of, cleanups caused by both the current and the proposed LDR regulations could be avoided if the Agency promulgated the Unitary Approach. This would allow the owners and operators of the contaminated site, the overseeing authority, and the community to make reasonable, site-specific, risk-based remedial action decisions to address the management and appropriate level of treatment for remediation wastes." (86)

Response: The commenter raises two concerns: (1) that LDR requirements present significant impediments to cleanups (especially when a treatment train might be needed) and (2) that the relationship of LDR requirements to the “bright line” is complicated and raises many implementation difficulties. To remedy both these concerns, the commenter suggests that EPA defer decisions about LDR treatment requirements to site-specific, risk-based determinations.

Regarding the concern that LDRs present significant impediments to cleanups, the Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying

the treatment standards developed for pure industrial hazardous waste. Furthermore, to address

were too difficult to understand or apply, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil.

ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will

Regarding the relationship of the bright line to LDR treatment standards, EPA is not, at this time going forward with a bright line approach to comprehensive regulatory reform for remediation waste

reform. If, in the future, EPA takes action to establish a bright line to distinguish between higher and lower risk contaminated media, EPA will address the relationship of the bright line to soil treatment

In addition, as noted in the preamble, technology-based standards have the virtue of providing an objective measure of performance and thus removing as much of the usual uncertainty associated

EPA sees nothing that makes this logic inapplicable to contaminated soils.

Regarding the suggestion that EPA allow treatment standards to be developed entirely on a site-by-

3004(m) requires EPA to promulgate, "levels or methods of treatment, if any. . .." Although 3004(m) could be implemented in many ways, at this time, EPA believes the most appropriate way to

treatment standards, including standards tailored for contaminated soil. Among other things, a national standard assures a basic measure of consistency in determining the level of performance at

However, because EPA realizes that technology-based nationally applicable treatment standards, because of site- and waste-specific characteristics, are sometimes not achievable or are inappropriate,

believes that, during remediation, EPA and authorized states are in the position to make site-specific risk-based minimize threat determinations, the Agency is also providing a variance, for contaminated

require treatment beyond the point at which threats are minimized, as discussed above and in the preamble to today's rule.

[Note 1 -- add something on 90% after figure out sampling approach.]

called, treatment trains), EPA believes there is nothing, ___ __, inappropriate about applying multiple

technologies are needed, the most common example being where soil is contaminated with high

application of a treatment train is not appropriate, for example, treatment of relatively low

metals. In this situation, as EPA noted in the recent treatment variance rule, a treatment variance may be appropriate. See 62 FR at 64505 (Dec. 5, 1997).

- "The entire discussion regarding the applicability of Land Disposal Restrictions (LDR) for Hazardous Soils is confusing, complex, and very likely to be unenforceable. Further, the most qualified LDR expert will have great difficulty explaining the circumstances where LDRs do not attach to environmental media and when LDRs do attach. For example, at facilities that lost interim status on November 8, 1995, do the LDRs attach to sludges in the unclosed, unlined surface impoundments that continue to receive non-hazardous wastewater after that date?" (41)

Response: A number of commenters expressed concern that the regulations governing LDR applicability to contaminated soil were too difficult to understand or apply. To address these concerns, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

Regarding the applicability of LDR treatment standards to sludges in unclosed, unlined surface impoundments at facilities that lost interim status on November 8, 1995 when those impoundments continued to receive non-hazardous waste water, without more precise information (e.g., did the impoundment formerly receive hazardous waste) the Agency can not make a determination.

One commenter urges EPA to clarify that the rule structure does not require an in-depth determination of when the media was land disposed. They understand it to mean that it depends on whether the medium, prior to removal, has been granted a Bright Line contained-out determination in an approved RMP, and whether such contained-out determination resulted from the rare circumstances of the inadvertent spill of a hazardous waste or the illegal disposal of a hazardous waste.

- "The proposed rules at 40 C.F.R. 269.30 and the preamble discussion of those rules beginning on page 18804 are extremely confusing and unduly complex. The issue of when the waste was land disposed, i.e., before or after the date of the LDR prohibition for that waste, seems to be irrelevant in almost all cases. The agency's "retroactivity principal" is all that is needed to establish appropriate rules for LDR treatment.

  Specifically, it is our understanding that the LDR rules would apply as follows:

  1. A medium that contains hazardous waste constituents at or above the Bright Line levels when it is removed from the ground would have to meet applicable LDR treatment standards prior to land disposal.

  2. A medium that contains hazardous waste constituents below the Bright Line levels when it is removed from the ground and that has been determined not to contain hazardous waste under an approved remediation management plan (RMP)

would not be subject to LDR treatment standards, with two exceptions: First, the LDR treatment standards would have to be met if the medium was contaminated by an accidental spill of a hazardous waste that had constituent concentrations at or above the Bright Line levels when the spill occurred. Second, the LDR treatment standards would apply if the medium contains a hazardous waste that was subject to an LDR prohibition when it was land disposed but the waste did not meet the applicable LDR treatment standards at that time. In other words, the waste was illegally disposed because it failed to meet the applicable LDR treatment requirements. In these cases, despite the fact that medium is below contained-out levels, it would have to be further treated to LDR treatment standards, if such standards are not already met.

If our understanding is correct, the rule structure does not require an in-depth determination of when the media was land disposed. It merely depends on whether the medium, prior to removal, has been granted a Bright Line contained-out determination in an approved RMP, and whether such contained-out determination resulted from the rare circumstances of the inadvertent spill of a hazardous waste or the illegal disposal of a hazardous waste. We urge EPA to clarify the LDR rules as noted above and remove the unnecessary complexity in these rules that involve issues of when the waste was disposed of in relation to its LDR prohibitions." (82)

Response: The commenter's understanding of the proposed regulations on LDR applicability is correct. Note though, that, because of concerns over implementation difficulties and other issues EPA is not, at this time, going forward with the bright line or any of the other comprehensive approaches to remediation waste reform discussed in the HWIR-Media proposal. Since the ability to apply for and receive a contained-in determination under current policy (as discussed in the preamble to the final rule) is not affected by this decision, the calculation as to whether or not a duty to comply with LDR treatment standards for any given contaminated soil is essentially the same. However, the contained-in decision under existing policy (as discussed in the preamble to the final rule) would generally govern rather than the type of bright-line, remediation management plan, contained-in decision proposed.

A number of commenters, like this person, expressed concern that the regulations governing LDR applicability to contaminated soil were too difficult to understand or apply. To address these concerns, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

A few commenters state that the proposed rule will produce a disincentive to emergency response to spills, particularly to spills of commercial products on the P and U lists.

- "As for the strong LDR disincentives which would remain under the Bright Line proposal, EPA has previously acknowledged that applying the LDRs to remediation wastes produces exactly the opposite of the desired result - a "strong incentive to leave hazardous waste and

contaminated media in place." 61 Fed. Reg. 18782. This contrasts with the situation involving as-generated wastes, where the burdens of the LDR program "encouraged many

Id. Media which became

appear to be ineligible for the relaxed LDR requirements applicable to media determined to no longer contain hazardous waste, regardless of their concentrations relative to the Bright

anticipated for the rule, i.e., its applicability to spills - - particularly to spills of commercial products on the P and U lists.

dichloride on the ground inside its Louisiana plant a few years ago. Liquid was picked up immediately and contaminated soil was excavated over the course of the next few days.

as the required LDR treatment, all of the soil was ultimately incinerated and the soil residue from the incinerator was placed in a Subtitle C landfill. Because of the incinerator capacity

soil. Since propylene dichloride is a volatile liquid, most of the contaminant evaporated before incineration took place and none of it survived incineration. A better technology

back into the hole from which it originated. In fact, incineration was not necessary, and because of the resulting delay, incineration provided little or no environmental benefit at

wholly unnecessary.

While we hope no such spills ever occur in the future, they undoubtedly will. Under the

determine what areas of soil were never contaminated with the spilled product and thus are not subject to the LDRs. Such data are needed to determine the scope of contamination, and

LDR requirements which might be specified by site-specific variance in an RMP, or to delineate areas subject to Subtitle C requirements which qualify for the generic, modified

We had hoped this proposal would have been structured such that appropriate action could be taken when such spills occur, rather than continued blind adherence to rules created for

Apart from the added cost and delay involved in the spill cleanup example just noted, the proposed Bright Line approach will prove problematic in still other ways. In the typical spill

risks to human health and the environment; the issue is the cost involved and the potential waste of scarce remediation resources due to overly prescriptive regulatory controls. In the

legal compulsion driving cleanup forward, and the facility owner faces a web of incentives and disincentives in deciding whether, when, and how to initiate remediation activities.

slowly, or will not even begin." (112)

Response: A number of commenters expressed concern about application of LDR treatment standards to soil contaminated by spills of prohibited hazardous waste. These commenters typically asserted that application of LDRs to such soils would delay remediation and unnecessarily increase spill response costs.

First, the Agency assures commenters that whether or not contaminated soil is subject to LDRs, the existing exemptions governing spill response continue to apply. This means that, under 40 CFR 264.1(g)(8) immediate response activities are not required to meet RCRA hazardous waste management requirements. Similarly, accidental spilling of hazardous waste (or commercial chemical products) is not placement, and therefore does not (automatically) create a land based unit subject to RCRA requirements or constitute a violation of LDR requirements. See, 45 FR 76626 (Nov. 19, 1980), issuing clarifying regulations at 40 CFR 264.10(g) to provide that hazardous waste treatment and storage activities undertaken in immediate response to an accidental spill are exempt from the 40 CFR Part 264 and 265 regulations governing treatment and storage and do not require permits and Sept. 29, 1986 memo from J. Winston Porter (EPA Assistant Administrator) to Fred Hansen interpreting the 40 CFR 264.10(g) regulations; also see, 55 FR at 30808 - 30809 (July 27, 1990) "a one-time spill of hazardous waste would not be considered a solid waste management unit."

Following initial spill response activities, soil contaminated by spills of prohibited listed hazardous waste, including soil contaminated by spills of commercial chemical products which are hazardous wastes when they are discarded, is, however, subject to LDRs. As discussed in detail in the preamble to today's final rule, this is because land disposal prohibitions attach at that point a hazardous waste is generated and continue to apply until the point at which threats poised by land disposal of the waste are minimized. Chemical Waste Management v. EPA, 976 F.2d at 13, 14 and 24. Consequently, in the case of listed hazardous waste land disposed after the effective date of an applicable land disposal prohibition (i.e., illegally land disposed or accidentally spilled), the prohibition has already attached to the waste and continues to apply to any soil contaminated by the waste.

Regarding the concern that LDRs present significant impediments to cleanups, the Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. For example, in the commenter's case, the waste could be treated to a 90 % reduction which EPA's data shows should be achievable using steam stripping. A contained-out determination could classify the treated soil as no longer containing hazardous waste, or a risk-based variance could be pursued. The

hazardous waste at all, since it never would have been abandoned (see initial language of 261.33).

> "Media that became contaminated with waste placed after the date for which LDR was finalized for that waste are ineligible to be handled as contaminated media regardless of their

> stands in the way of one the more significant benefits of the HWIR Media Rule, i.e., the applicability of the rule to spills, particularly of spills of commercial products on the P and U

> By way of example, The Dow Chemical Company spilled a rail car of propylene dichloride on the ground inside its Louisiana plant a few years ago. Liquid was picked up immediately

> the product was a spill of a U listed commercial product with incineration as the required LDR treatment, all of the soil was ultimately incinerated and the soil residue form the

> Because of incinerator capacity and the volume of soil involved, it took more than a year to complete the incineration of the soil. Since the material is a volatile liquid, most of the

> incineration. A better technology would have been to strip the soil capturing the volatile and then put the resulting soil back into the hole it came from.

> environmental practice. Subtitle C landfilling of the soil residue from the incinerator was even more foolish. While we hope that no more such spills occur, they undoubtedly will.

> such spills occur, rather than continue with blind application of rules created for process wastes.

> after the date of the LDR requirements for that waste, is that it makes it necessary for one to try and determine when each and every waste entered the environment. While this seems like

> areas where wastes were handled during a period overlapping the applicable LDR effective date. This could include many of the types of areas needing remediation such as permitted

> remove any application of the effective LDR date and to assure that all remediation wastes (or contaminated media) are subject to the same rules." (93)

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spill response costs.

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264.1(g)(8) immediate response activities are not required to meet RCRA hazardous waste management requirements. Similarly, accidental spilling of hazardous waste (or commercial chemical products) is not placement, and therefore does not (automatically) create a land based unit subject to RCRA requirements or constitute a violation of LDR requirements. See, 45 FR 76626 (Nov. 19, 1980), issuing clarifying regulations at 40 CFR 264.10(g) to provide that hazardous waste treatment and storage activities undertaken in immediate response to an accidental spill are exempt from the 40 CFR Part 264 and 265 regulations governing treatment and storage and do not require permits and Sept. 29, 1986 memo from J. Winston Porter (EPA Assistant Administrator) to Fred Hansen interpreting the 40 CFR 264.10(g) regulations; also see, 55 FR at 30808 - 30809 (July 27, 1990) "a one-time spill of hazardous waste would not be considered a solid waste management unit."

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- "One of the significant unintended disincentives of the proposed approach to LDRs is in the area of emergency responses to spills. While much of industry has made tremendous strides in spill prevention, accidental events can and do still occur. Many raw materials spills can impart P or U codes to media. The greatest need immediately following a spill is generally to remove the greatest amount of contaminant and contaminated media as practicable, before it can spread significantly. Traditionally RCRA has been an impediment to such rapid response, as the generated material has been classified as hazardous and on-site storage/treatment becomes impracticable, with off-site management of large volumes of material economically prohibitive. HWIR would do little to remove that impediment. For new spills the most concentrated material (that you most wish to remove) would remain hazardous and all of the media would remain subject to technology based LDRs (which

attach based on pedigree and date of contamination, not risk). The Unitary approach would obviate this impediment by allowing an overseeing Agency to quickly issue a RAP (perhaps a generic RAP for spill response) to allow rapid, site specific response to a spill without the impediments of LDRs or RCRA storage requirements." (117)

Response: A number of commenters expressed concern about application of LDR treatment standards to soil contaminated by spills of prohibited hazardous waste. These commenters typically asserted that application of LDRs to such soils would delay remediation and unnecessarily increase spill response costs.

First, the Agency assures commenters that whether or not contaminated soil is subject to LDRs, the existing exemptions governing spill response continue to apply. This means that, under 40 CFR 264.1(g)(8) immediate response activities are not required to meet RCRA hazardous waste management requirements. Similarly, accidental spilling of hazardous waste (or commercial chemical products) is not placement, and therefore does not (automatically) create a land based unit subject to RCRA requirements or constitute a violation of LDR requirements. See, 45 FR 76626 (Nov. 19, 1980), issuing clarifying regulations at 40 CFR 264.10(g) to provide that hazardous waste treatment and storage activities undertaken in immediate response to an accidental spill are exempt from the 40 CFR Part 264 and 265 regulations governing treatment and storage and do not require permits and Sept. 29, 1986 memo from J. Winston Porter (EPA Assistant Administrator) to Fred Hansen interpreting the 40 CFR 264.10(g) regulations; also see, 55 FR at 30808 - 30809 (July 27, 1990) “a one-time spill of hazardous waste would not be considered a solid waste management unit.”

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Regarding the concern that LDRs present significant impediments to cleanups, the Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004 (d)(3) and (e) (3). The Agency continues to believe that legislative action is needed to address application of RCRA Subtitle C requirements, especially LDRs, to remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste.

A few commenters indicate that the proposed rule eliminates flexibility when excavation is involved.

- "One of the principal goals of this proposed rule is to achieve a net environmental benefit by facilitating the cleanup of as many contaminated sites as possible. EPA has also recognized numerous preamble discussions that certain of the RCRA Subtitle C provisions actually create disincentives to cleanup and create a preference for leaving waste in place. In certain instances, it is not clear how the proposed regulations will relieve these disincentives due to their restrictive nature.

  EPA suggested that media remediation sites that are overseen by a regulatory authority are being allowed a great deal of flexibility in managing the units. However, several provisions of the proposed rule effectively eliminate flexibility when excavation is involved.

  1. EPA has proposed the Bright Line values at a risk level of 10^{-3}, but allows the overseeing agency to determine that remediation wastes with constituents below the Bright Line levels still contain a hazardous waste. It's unlikely that the agency overseeing a remediation unit which has media contaminated with a hazardous waste and which has site-specific cleanup numbers below the 10^{-3} level, would be willing to agree that the media no longer contains a hazardous waste at the 10^{-3} level. Once excavation begins, LDR requirements may be triggered. Therefore, at some remediation sites there will be two sets of "cleanup" numbers that will have to be met. One set is the site-specific risk-based cleanup number for each constituent and the other is the LDR standard for each constituent subject to treatment. (Potentially there is a third set to be met - the contained-in levels which could be different from the LDR standards and the cleanup levels but which must be met so that MTRs are not triggered in land-based disposal units. For further discussion, see the comment on approval of RMPs.) It's possible in such situations for the LDR standard of 90% reduction capped by 10X UTS to be lower than the risk-based cleanup standard. In these instances, just excavating the waste will trigger the LDR requirements could still provide a significant disincentive to remove wastes from the unit and an incentive to attempt to meet the cleanup levels while treating wastes in-situ. However, with the strict applicability of the LDR standards being triggered by removal from the land [see proposed ¤269.30 (a)], it would be difficult to meet a cleanup standard for a unit without any Removal from the land, thus practically assuring the dual sets of standards.

  It is suggested that LDR treatment standards be capped by the cleanup standard for the site (and that the cleanup standard also represent the contained-in level such that replacement of the cleaned up media would not trigger MTRs). The cleanup standard should represent the minimum threat level, which should enable capping the LDR treatment standard. This is similar to the approach taken in the recently proposed HWIR for process waste. In that rule, EPA proposed minimized threat levels which could be used as alternatives for meeting the LDR standards when the LDR standards were below the exemption level for RCRA wastes. These minimized threat levels were basically caps on the technology-based LDR standards which were lower in some cases than the risk-based exemption levels.

  2. If a company undertakes an interim action to remove the immediate threats to the environment by removing source material, it appears that Removal from the land may occur, thus triggering the LDR requirements for anything removed from the land (including wastes

placed into a remediation pile). Since interim actions are not designed as final remedies, and often remove drums, sludges, etc. while proposing to leave potentially contaminated soil in place for later cleanup, it is overly restrictive to trigger LDR requirements for any remediation waste removed from the land. For instance, to remove drums out of a unit, soils need to be removed and stockpiled (i.e., placed into a remediation pile) to reach the drums. It appears that the RMP could be used to facilitate the action. However, it doesn't appear that there is sufficient flexibility in proposed ¤269.30 to allow soils to be replaced without meeting LDR standards.

To remedy this situation, several alternatives exist:

- Alter the scope in Section 269.1 to indicate that actions that do not represent a final remedy are not within the scope of Part 269.

- Alter the wording of Section 269.30 to indicate that treatment standards apply to final remedies and not to interim remedies or interim actions.

- Alter Section 269.31 to allow a media treatment variance for interim remedies." (35)

Response: The commenter raises two issues. First, concern that the technology-based soil treatment standards may, in some cases, prompt treatment beyond site-specific, risk-based cleanup levels and will otherwise reduce flexibility during remediations; to remedy this concern the commenter suggests that LDR treatment requirements be capped at site-specific, risk-based cleanup levels. Second, concern that application of LDRs to contained soil managed during interim actions will be overly stringent in the context of a subsequent final remedy; to remedy this concern the commenter suggests that interim actions be exempted from LDR treatment requirements or granted treatment variances.

Regarding the suggestion that EPA allow site-specific, risk-based cleanup levels to cap LDR treatment requirements, the Agency agrees that, in certain circumstances this is appropriate. The Agency has provided an opportunity for a site-specific, risk-based treatment variance, which could be used, on a site-specific basis to cap the technology-based treatment standards when it is determined that threats to human health and the environment are minimized with less treatment than the technology-based treatment standards would require. The Agency believes these determinations are possible, because, during remediation experts and field personnel typically gather detailed site-specific information on risks posed by specific hazardous constituents or combinations of hazardous constituents, potential direct and indirect exposure routes, risk pathways, and human and environmental receptors. Through application of this information overseeing Agencies can, on a site-specific basis, eliminate many of the long-term uncertainties associated with land disposal and, therefore, make appropriate risk-based decisions regarding the extent of treatment needed to minimize short- and long-term threats. This so called “site-specific minimize threat treatment variance” will be available to all contaminated soils. The treatment variance is discussed in detail in the preamble to today’s action.

Regarding the concern that application of the soil treatment standards during interim actions would be inappropriate, the Agency notes that existing opportunities to manage remediation waste in a way that doesn’t trigger LDRs, such as the area of contamination policy and corrective action

management units, are not affected by today's rulemaking and remain available. In addition, as the commenter suggests, when appropriate, LDR treatment variances are available during interim actions. The Agency is not persuaded that, even if a statutory basis existed for the distinction, interim actions should be categorically exempted for LDR requirements. Simply put, such actions can continue to involve land disposal of hazardous wastes (i.e. the contaminated soils), and categorically exempting such wastes from LDR requirements could fail to carry out the central statutory object that threats posed by land disposal of hazardous wastes be minimized before land disposal can occur.

- "**p. 18785, col. 3 and 18786, col. 1 -- EPA states that the prescriptive standards of current prevention-oriented regulations under RCRA can create disincentives for environmental cleanups. Therefore, one of the policy objectives of the proposed HWIR-media rule is to modify existing RCRA Subtitle C requirements to create a more flexible and common-sense regulatory system for management of contaminated media.**

  DOE believes that in certain instances the proposed HWIR-media rule provisions may act to hinder, rather than further, the above-stated policy objective. In particular, it is unclear whether the proposed regulations would act to notably lessen the disincentives to cleanup or provide significant relief from LDR treatment standards for excavated media. DOE is mindful that EPA is proposing alternative LDR treatment standards for contaminated media that are intended to reduce the burden of compliance with LDRs. Nevertheless, DOE believes the continued applicability of LDR treatment standards to remediation wastes will be a disincentive to cleanups involving excavation and treatment. Two examples are provided below.

  a. EPA explains in the preamble that LDR treatment standards will attach to certain media unless a determination is made that the media no longer contain hazardous waste (i.e., a contained-in determination is made) prior to removal of the media from the land [p. 18805, col. 1]. EPA proposes, however, to prohibit media exhibiting concentrations of contaminants in excess of proposed Bright Line values from being eligible for contained-in determinations. Further, the proposed rule gives responsible States and EPA Regions discretion to set contaminant levels defining whether media no longer contain hazardous waste at values lower than such Bright Line values.

  The HWIR-media preamble does not discuss the relationship between acceptable levels for making contained-in determinations and site-specific media cleanup standards. In fact, EPA emphasizes that the Bright Line values identified in the proposal (which the Agency views as generally acceptable levels for determining that media no longer contain hazardous waste [p. 18795, col. 3]) are not designed as cleanup levels [p. 18789, col. 2]. DOE notes, however, that it would be difficult for a responsible regulatory agency to explain why media that exceed site-specific cleanup levels could be said to no longer contain hazardous waste. Therefore, DOE believes that the values for making contained-in determinations will most often be set equal to site-specific media cleanup levels. This being the case, very small volumes of media are likely to qualify for exemption from LDR treatment standards as a result of contained-in determinations made prior to excavation. Hence, it appears that most excavated media at remediation sites will be required not only to meet site-specific media

cleanup standards, but also to comply with LDR treatment requirements (or obtain a treatment variance) before being returned to the land. Further, unless a "minimize threat" determination is made pursuant to RCRA '3004(m) regarding the treatment applied, treated media (or media subject to a variance) will presumably be required to be managed in a land disposal facility that meets 40 CFR Part 264 minimum technological requirements (MTRs) [*see* Specific Comment V.D, item 2]. In such situations, DOE submits that because of the applicability of the LDR treatment requirements, a significant disincentive to remedies involving excavation remains. The Department is mindful that EPA has proposed alternative LDR treatment standards for contaminated media that are intended to reduce the burden of compliance in such circumstances. Notwithstanding, it seems possible that the proposed alternative standards for hazardous soils (i.e., 90% concentration reduction capped by 10 times the Universal Treatment Standards) could be lower than the site-specific (risk-based) media cleanup standards. As a result, even the proposed alternative LDR treatment standards may not provide any notable relief to remove the disincentive created by LDR applicability itself. To address these concerns (i.e., if EPA decides not to adopt a final HWIR-media rule based on an approach that would exempt remediation-generated media from RCRA Subtitle C regulation, including LDR requirements), DOE suggests the following as a possible way to address LDR requirements so as to provide sufficient relief to remove the disincentive to excavation remedies created by LDR applicability. LDR treatment standards for media could be capped at each site by the site-specific cleanup standards. Also, the site-specific cleanup levels could be mandated as the site-specific "minimize threat" levels, as well as the levels at which media should be determined to no longer contain hazardous waste. In this way, one uniform set of standards would apply at each site, and once the site-specific media cleanup standards were met, treated media could be returned to the land without being managed in units requiring compliance with MTRs.

b. If a company undertakes an action to remove the immediate threats to the environment by removing the source of contamination material (i.e., performs an interim action), it appears that a removal from the land may occur in such an action, thus triggering the LDR requirements for anything removed from the land (including wastes placed into a remediation pile). Since interim actions are not designed as final remedies, and often remove drums, sludges, etc. while proposing to leave potentially contaminated soil in place for later cleanup, it seems overly restrictive to trigger LDR requirements for any contaminated media removed from the land on an interim basis. For instance, just to dig drums out of a unit, soils need to be removed and stockpiled (i.e., placed into a remediation pile) to reach the drums. It appears from the way the proposed regulations are structured, this would be done with Agency oversight, in most instances, and thus would/could use the RMP to facilitate the action. However, it doesn't appear that there is sufficient flexibility built into the proposed 40 CFR 269.30 to allow such soils to be replaced on an interim basis without meeting LDR standards in these types of actions (unless the excavated area associated with the interim action can itself be designated a remediation pile).

To remedy this situation, several alternatives exist:

-- Modify the wording of proposed 40 CFR 264.554 (Remediation piles) to specifically provide that an area where media have been excavated for the purpose of completing an interim action could be designated as a remediation pile into which

only those media excavated during the interim action could be replaced. Such a remediation pile would be required to be managed in accordance with the provisions of a RMP approved under the provisions of 40 CFR 269, Subpart D (Remediation Management Plans) until a final remedy addressing the area has been completed.

-- Modify the wording of proposed 40 CFR 269.30 to indicate that the LDR treatment standards apply to final remedies but not to interim remedies or interim actions. This is DOE's preferred alternative.

-- Modify proposed 40 CFR 269.31 to allow/strongly suggest that a media treatment variance is appropriate for interim remedies and interim actions.

p. 18786, col. 2 -- EPA states as its final policy objective that the regulations should be easy to understand.

DOE observes that after EPA states its policy objective that the regulations should be easy to understand, the next section of the preamble (i.e., section IV.A, p. 18786, col. 3) presents a somewhat confusing discussion of the applicability of the LDR program to both hazardous and non-hazardous contaminated media. DOE suggests that a graphic diagram be provided to visually show the decision tree for determining the correct application of the LDR requirements to particular categories of contaminated media. This would assist the regulated community in better understanding of the LDR applicability and issues when attempting to determine the compliant path forward." (60)

Response: The commenter raises three issues. First, concern that the technology-based soil treatment standards may, in some cases, prompt treatment beyond site-specific, risk-based cleanup levels and will otherwise reduce flexibility during remediations; to remedy this concern the commenter suggests that LDR treatment requirements be capped at site-specific, risk-based cleanup levels. Second, concern that application of LDRs to contained soil managed during interim actions will be overly stringent in the context of a subsequent final remedy; to remedy this concern the commenter suggests that interim actions be exempted from LDR treatment requirements or granted treatment variances. Third, concern that the regulations governing LDR applicability are confusing and difficult to understand.

Regarding the suggestion that EPA allow site-specific, risk-based cleanup levels to cap LDR treatment requirements, the Agency agrees that, in certain circumstances this is appropriate. The Agency has provided an opportunity for a site-specific, risk-based treatment variance, which could be used, on a site-specific basis to cap the technology-based treatment standards when it is determined that threats to human health and the environment are minimized with less treatment than the technology-based treatment standards would require. The Agency believes these determinations are possible, because, during remediation experts and field personnel typically gather detailed site-specific information on risks posed by specific hazardous constituents or combinations of hazardous constituents, potential direct and indirect exposure routes, risk pathways, and human and environmental receptors. Through application of this information overseeing Agencies can, on a site-specific basis, eliminate many of the long-term uncertainties associated with land disposal and, therefore, make appropriate risk-based decisions regarding the extent of treatment needed to minimize short- and long-term threats. This so called "site-specific minimize threat treatment

variance" will be available to all contaminated soils. The treatment variance is discussed in detail in the preamble to today's action.

Regarding the concern that application of the soil treatment standards during interim actions would be inappropriate, the Agency notes that existing opportunities to manage remediation waste in a way that doesn't trigger LDRs, such as the area of contamination policy and corrective action management units, are not affected by today's rulemaking and remain available. In addition, as the commenter suggests, when appropriate, LDR treatment variances are available during interim actions. The Agency is not persuaded that, even if a statutory basis existed for the distinction, interim actions should be categorically exempted for LDR requirements.

Regarding the complexity of decisions regarding LDR applicability, EPA shares many commenter's concerns over complexities associated with application of LDRs to contaminated soil -- and remediation waste more generally. At this time, the Agency is not taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all remediation waste to exit large portions of the RCRA Subtitle C system. As discussed in the preamble to today's action, the Agency continues to believe that legislative action of the application of RCRA Subtitle C regulations, especially LDRs, to remediation waste is needed. If legislative action is forthcoming, EPA will likely re-examine application of LDRs to contaminated soil -- and remediation waste more generally -- at that time. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soil or other remediation wastes. In the meantime, EPA has revised today's regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that contaminated soils are treated appropriately.

One commenter asks EPA to reaffirm that facilities may continue to undertake routine excavation activities without being subject to Subtitle C.

- "At an active chemical manufacturing plant, contaminated media are frequently handled as a result of routine excavation and construction work involving, among other things, curbs and gutters, utilities, underground pipe, and new process construction. These activities often require excavation of soil, placement of the soil next to the area of the excavation, completion of the repair or installation work, and replacement of most, if not all, of the soil back in the hole. When contaminated media are excavated and may contain hazardous waste, it has been our practice to seek state concurrence in a protocol for handling the contaminated soil. These protocols typically may involve placing a polyethylene liner on the ground prior to creating the pile and placing a similar liner over the pile as a cover at the end of the day.

  It is important that EPA affirm that facilities may continue to undertake routine excavation activities as described above without being subject to Subtitle C. These are common, every day occurrences that should not be complicated and delayed by Subtitle C standards." (82)

Response: EPA confirms that the area of contamination policy, under which individuals may consolidate wastes within certain widely dispersed areas of contamination and conduct normal earthmoving and grading activities is not affected by today's rulemaking. Additional information on the area of contamination policy may be found in the EPA guidance memorandum, "Use of the Area of Contamination (AOC) Concept During RCRA Cleanups," March 13, 1996, available in the docket for today's rulemaking and electronically, over the Internet at www.epa.gov\correctiveaction.

One commenter recommends that EPA define "removed from the land" to clarify that the Area of Concern (AOC) concept remains valid and that this rules does not prevent soils from being excavated and moved around within the AOC without triggering LDRs.

- "On pages 18786 and 18804 through 18805, EPA explains when the LDR requirements will attach to media determined to contain hazardous waste. EPA proposes in §269.30 that LDRs attach when media is "removed from the land".

  DoD recommends that EPA define "removed from the land" to clarify that, with respect to remediation wastes at CERCLA sites (as opposed to RCRA sites), the Area of Concern (AOC) concept remains valid and that this rules does not prevent soils from being excavated and moved around within the AOC without triggering LDRs. Maintenance of the AOC concept is discussed on page 18839, middle column, second paragraph, but is not reflected in 269. This issue will be particularly significant when addressing management of investigation-derived waste (IDW). Media generated during sampling activities at CERCLA sites should not have to meet LDRs prior to replacement provided they never left the AOC.

  Additionally, it is requested that "removed from the land" be defined as being "physically removed from the ground and moved outside of the solid waste management unit or area of contamination" such as to extend the AOC concept to RCRA sites as well as CERCLA sites. This is needed because in order to make a convincing argument that media no longer contains hazardous waste, it must be sampled. Unless defined otherwise, the act of sampling removes waste from the land thereby attaching LDRs. Resultantly, even though there is no physical difference between the unexcavated media and the IDW generated, the unexcavated media may qualify for designation as non-hazardous contaminated media thus avoiding LDRs, but LDRs would still attach to the IDW which was the basis for the non-hazardous designation.

  Defining "removed from the land" would facilitate ex-situ treatment and would result in media being managed as outlined below:

  -- LDRs would not attach unless waste is removed from the AOC/SWMU or placed into a separate RCRA unit and redeposited back on site;

  -- The Remediation Management Plan, as currently proposed, would still be used in lieu of a permit to address the remediation; and

  -- The proposed LDR treatment standards for media (90%/10 times the Universal Treatment Standard) (UTS)) would apply whenever LDRs are applicable.

If "removed from the land" is defined as mentioned above, CERCLA remedial action and RCRA remedial actions would be conducted similarly except for permitting requirements, and the goal of facilitating ex-situ treatment of RCRA wastes would be accomplished.

The remediation would be conducted as follows:

-- For on-site activities LDRs would not attach unless placed into a RCRA unit (thus providing an incentive for ex situ treatment). If waste is treated in a RCRA unit, however, most likely the technology should be capable to satisfying the LDR treatment requirements anyway such that triggering of LDRs wouldn't be an issue.

-- For on-site activities which do not involve placement into a RCRA unit, LDRs would not be triggered but waste would be treated to whatever cleanup standard is protective for the site.

-- And finally, for off-site activities, the reduced LDR treatment standard of 90% reduction or 10 times UTS would apply.

DoD also requests that EPA further clarify the attachment of LDRs to contaminated media in terms of what type of data would be required as proof that the LDRs did or did not apply. For example, how would EPA's binary approach apply to the following scenario: a leaking UST holding spent perchloroethylene (F002) was determined to be the source of contaminated soil at a site. During the characterization of the site, it is determined that soil near the tank contain perchloroethylene above the bright line concentration. However, soil further away from the UST contains perchloroethylene at levels below the proposed bright line concentrations. Assume that the site is a large quantity generator and the UST released the spent solvent after November 8, 1986. How would the LDRs apply to the soils containing varying concentrations of perchloroethylene if the contaminated soils were excavated for treatment and disposal? In addition, what type of data would be required to prove when LDRs applied or did not?

Furthermore, if an approved CAMU existed at the site, would the owner or operator be allowed to dispose of contaminated media (with perchloroethylene above the bright line concentrations) in the existing CAMU without complying with applicable LDRs?" (97)

Response: EPA confirms that the area of contamination policy which allows individuals to consolidate waste and conduct certain other activities, such as normal earthmoving and grading activities, within widely dispersed areas of contamination, is not affected by today's rulemaking. The Agency is not persuaded, however, that a definition of "removed from the land" is necessary in this context. The Agency believes the area of contamination policy and its limitations are well and clearly defined and that further regulatory language would not improve program implementation. For more information on the area of contamination policy, commenters can see 55 FR 8758 - 8760, March 8, 1990 and EPA's recent guidance on the AOC policy, "Use of the Area of Contamination (AOC) Concept During RCRA Cleanups," March 13, 1996, available in the docket for today's rulemaking and electronically, over the Internet at www.epa.gov\correctiveaction. The Agency notes that the area of contamination policy applies to both RCRA and CERCLA sites.

Regarding the hypothetical example of soil contaminated by leaks from a hazardous waste storage tank, assuming that the untreated hazardous waste was the source of all the soil contamination, LDRs automatically apply to the contaminated soil. As discussed in detail in the preamble to today's final rule, this is because land disposal prohibitions attach at that point a hazardous waste is generated and continue to apply until the point at which threats poised by land disposal of the waste are minimized. *Chemical Waste Management v. EPA*, 976 F.2d at 13, 14 and 24. Consequently, in the case of listed hazardous waste land disposed after the effective date of an applicable land disposal prohibition (i.e., illegally land disposed or accidentally spilled), the prohibition has already attached to the waste and continues to apply to any soil contaminated by the waste.

Regarding corrective action management units, EPA confirms that corrective action management units remain available for appropriate on-site management of hazardous remediation waste. Compliance with otherwise applicable land disposal restrictions is not automatically required for hazardous remediation waste -- including contaminated soils -- placed into an approved CAMU.

One commenter asks for clarification on whether confirmation sampling is required before removal.

- "A related question is whether the LDR standards would apply to potentially hazardous soils if they are not sampled and shown to be below contained out levels until after they are removed but before additional treatment. The state's contained-out determination does not require confirmation sampling before removal, whereas proposed 40 C.F.R. 269.30(a)(2) and (b) seem to require sampling (or at least evaluation) prior to removal." (124)

Response: Sampling to determine whether any given volume of contaminated soil contains hazardous waste or exhibits a characteristic of hazardous waste should be conducted when contaminated soil is first generated. EPA recognizes that this may involve some excavation and staging of soil in the area of contamination in order to facilitate representative sampling activities. It is not necessary for the sampling and analysis to be completed before any contaminated soil (except the initial sample volume) is removed from the land, provided the soil stays within the area of contamination. Note that, not all management of contaminated soil is considered "generation" for purposes of RCRA. For example, consolidating soil within an area of contaminated is not considered "generation."

One commenter believes EPA should evaluate methods of eliminating routes and points of exposure, in addition, to the reduction of toxicity by the method of treatment to LDR standards.

- "Under the proposed rule certain contaminated media, which does not include other remediation wastes (e.g. existing sludges, debris), containing listed or characteristic hazardous waste could be managed in Remediation Piles. Remediation piles are available to temporarily store and treat hazardous contaminated media without triggering Land Disposal Restriction or Minimum Technology Requirements provided that a Remediation Management Plan has been approved by the agency having authority. The proposed rule reminds the reader that LDRs may still attach to contaminated media containing hazardous waste concentrations less than a specific constituent's bright-line concentration. The proposed rule appears to favor treatment without any mention of removing pathways of exposure.

The contaminated media, if properly managed (e.g. stabilized or contained) in a manner which prevents or minimizes routes of exposure, should not be required to be treated strictly due to an arbitrary regulatory mandate which dictates treatment only because the hazardous waste constituent exceeds a certain concentration. Risk is a function of toxicity and exposure. P&U believes EPA should evaluate methods of eliminating routes and points of exposure, in addition, to the reduction of toxicity by the method of treatment. The merits of reducing or eliminating exposure should also be weighed in comparison to treatment to reduce toxicity when reducing risk of all remediation wastes (e.g. existing sludges, contaminated media).

The requirement to always treat hazardous contaminated media or other remediation waste which attach LDRs appears arbitrary. P&U believes, in addition to the statutory LDR treatment standard for "as-generated" wastes, that even the modified generic LDR treatment standard may often be technically infeasible and cost-ineffective when compared to stabilization initiatives that contain or institutionally control points or routes of exposure of the remediation wastes. The modified generic LDR treatment standards require a treatment method to reduce the concentration of hazardous waste constituent subject to treatment by a minimum of 90%. The minimum treatment requirement for soil is capped at ten times the Universal Treatment Standard. Even with the modified generic LDR treatment standard, the only effective method of treatment for many remediation wastes will be combustion. Currently the proposed Media Treatment Variance does not allow an option for no treatment if threats of exposure are minimized or eliminated." (95)

Response: The commenter raises two issues: (1) application of LDRs to remediation waste is arbitrary and will unnecessarily delay and add cost to cleanups and (2) that treatment decisions should consider exposure controls.

Regarding the application of LDRs to remediation waste, including contaminated soil, the Agency shares concerns that application of LDRs to hazardous remediation waste, including contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004(d)(3) and (d)(3). The Agency continues to believe that legislative action is needed to address application of LDRs to hazardous remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soils. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. Furthermore, to address specific concerns that the proposed regulations governing LDR applicability for contaminated soil were too difficult to understand or apply, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDRs applies to any given contaminated soil can now be ascertained by applying information about the soil in question to an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that contaminated soils are treated appropriately.

Regarding the consideration of exposure controls, consistent with the rest of the land disposal restriction program, decisions about LDR compliance for contaminated soil cannot be based on the potential safety of land disposal units or engineered structure such as liners, caps. slurry walls or any other practice occurring after land disposal. The D.C. Circuit's holding in the American Petroleum Inst. case in 906 F. 2d (among other sources) stands for this proposition. The Agency notes that, since LDRs apply only to prohibited hazardous wastes (or contaminated soil) that are land disposed, it is unlikely that remedies which rely entirely on capping or containment in place would trigger a duty to comply with LDRs.

- "The Director should have the discretion to specify less stringent as well as more stringent treatment and management standards for wastes above the bright line." (108)

Response: EPA is not, at this time, taking action on the portions of the HWIR-Media proposal that would have established a "bright line" or given EPA and authorized states the discretion to specify more stringent LDR treatment standards for contaminated soil with constituent concentrations that are above bright line values.

1.B.3 "RCRA Lite" Treatment Standards are Arbitrary and Capricious and Create Uncertainty

- "EPA'S "RCRA-LITE" LDR TREATMENT STANDARDS FOR HAZARDOUS CONTAMINATED MEDIA ARE ARBITRARY AND CAPRICIOUS AND SHOULD BE REPLACED WITH RISK-BASED LDRs

  As alternative treatment standards for hazardous contaminated media, EPA is proposing that the media be treated to either (1) remove 90% of the hazardous constituent concentration; or (2) achieve treatment levels of 10 x UTS. 61 Fed. Reg. 18806. EPA has developed this standard to give some relief from the stringent LDRs that would apply absent EPA's initiative. These RCRA-lite standards will not achieve a useful purpose as proposed. Beazer believes that the requirement to remove 90% of the hazardous constituent concentration or to reach 10 x UTS, whichever is higher, will not provide any relief to generators of hazardous media, especially media containing PAHs. With regard to the first alternative, Beazer's experience and research has shown that 90% reductions in constituents have generally not been achieved in the short-term. Under the second alternative, EPA is relying upon the UTS developed for the treatment of process wastes and multiplying those UTS by a factor of 10 to compensate for the inherent difficulty in treating media, without providing any rationale for how it selected this multiplier. Beazer believes that using a multiplier of 10 results in treatment levels that are overly conservative and that will not in many cases be achieved in the field using any technology but incineration. Indeed, it is Beazer's experience that a factor of 10 will not be adequate to accommodate the difficulties inherent in treating impacted soils. Beazer has repeatedly advised EPA that impacted soils typically exhibit chemical and physical properties which are markedly different than as-generated process wastes. For example, soils are less homogeneous in particle size distribution, moisture content, Ph and other physical and chemical characteristics than are process wastes. Soils also typically

contain significantly lower constituent concentrations. A factor of 10 will not compensate for these differences.[1]

It should be remembered that the UTS were derived solely from technological performance standards for process wastes. 59 Fed. Reg. 48041 (September 19, 1994). Not only do the UTS not consider technological performance standards for media, the UTS do not consider the reduced risk associated with the disposal of these constituents in Subtitle C landfills or landfills at RCRA corrective action sites. Even though EPA has consistently expressed its preference for risk-based levels that represent minimized threat levels, 58 Fed. Reg. 48095, with the exception of a handful of risk-based LDRs proposed under the HWIR-Process rule, EPA has routinely proposed technology-based standards as UTS, the levels of which far exceed the standard set by the statute for LDRs (i.e., to "minimize threats"). 42 U.S.C. 6924(m)(1). Had EPA considered the potential risk to the environment from the disposal of hazardous waste in a regulated landfill, the resultant UTS levels would have been much higher.

Finally, Beazer's experience shows that by setting the proposed hazardous media treatment levels at the UTS multiplied by a factor of 10, EPA will arbitrarily limit the use of innovative technologies even though it has been shown that acceptable risks exist at far greater constituent concentrations.

RECOMMENDATION:

Beazer recommends that the Agency utilize a risk-based approach in setting treatment standards for above the "Bright Line" hazardous media.[2] In almost all cases, EPA or the state agency will be utilizing such an approach to set cleanup levels at the site. Any effort by EPA to establish treatment standards which are lower than the risk-based cleanup levels would be arbitrary and would result in needless expense and effort with no corresponding environmental benefit. Beazer suggests that EPA omit § 269.30(f) and amend § 269.30(e) to read:

> 269.30(e) For remediation wastes, treatment must achieve site-specific risk-based levels established with concurrence of the overseeing agency;" (34)

Response: As stated in today's preamble, EPA does not believe that the soil treatment standards are arbitrary or capricious. Furthermore, EPA strongly believes that the soil treatment standards can be reliably achieved using: biological treatment, chemical extraction, dechlorination, soil washing, stabilization, thermal desorption, or combinations of two or more of these technologies. (EPA 1998a, EPA 1998d.) As noted in the Phase IV final rule preamble, EPA has based the treatment

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[1] It is noteworthy that EPA has explicitly recognized that the 10 x UTS standard for PAHs is inappropriate. 61 Fed. Reg. 18811. Beazer agrees with EPA and further believes that the 90% reduction is only achievable (like the 10 x UTS) by utilizing incineration.

[2] Beazer's recommendation assumes for argument's sake that EPA is not adopting the Unitary Approach.

standard on non-combustion technologies. Of course, since soil treatment is generally matrix dependent, the exact treatment technology which might be applied to any given contaminated soil will depend on the specific properties of the soil and the hazardous constituents of concern. (EPA1998a, EPA 1998d, EPA1994, EPA 1993a.)

With respect to the SDB, EPA collected over 6,000 paired data points describing the treatment of various hazardous soils. In response to an outgrwoth of the comments, EPA has retained 2,143 paired non-combustion data points to set today's treatment standards. EPA believes that these 2,143 paired non-combustion data points are reasonably sufficient to adequately describe the treatment of metal, organics, and multiple metal and organic contaminants that are frequently found at different type of sites, including both Superfund and RCRA sites. (EPA1998a, EPA 1998b, EPA 1998c, EPA 1998d, and EPA 1994.) In addition, these include hard-to-treat constituents where PCPs or PAHs found in high concentrations at wood preserving sites, which were treated to achieve today's standards using non-combustible technologies. For example, see corroborative data in pages 3-11, 3-12, 3-19, 3-21, and 3-41 in EPA 1998a. In addition, SDB has treatment data on soils with varying textures including top soils, silty/loam soils, and clay soils. (EPA1998a) Furthermore, EPA has a number of bench and pilot studies on the treatment of contaminated soils from wood preserving, petroleum refining, and electroplating sites, which contain a wide range of constituents such as polynuclear aromatic, phenolic, chlorinated organics, spent solvents, creosote, and metals. (EPA 1998a) These constituents are found at other RCRA and Superfund sites. (EPA 1997a)

As a result, the pooled bench, pilot, and full scale non-combustion data in the SDB can be reasonably expected to depict what the various treatment technologies can achieve for other hazardous soils managed under CERCLA and RCRA. Non-combustion techno-logies will behave better on a given range or class of organic and metal constituents and a range of soil textures or soil characteristics as demonstrated in the SDB and the general literature. (EPA 1998a) More recent, full-scale data examined by the Agency corroborates our conclusion that the soil treatment standards can be reliably achieved using a variety of non-incineration remediation technologies including wood preserving sites.[3] (EPA 1998a, EPA 1998d, EPA 1997a.) In particular, EPA has determined that ex-situ applications of non-combustion technologies are more amenable to optimiazation

[3] These data consist of many full -scale treatment studies conducted at Superfund sites. Many of the ex-situ remediation studies met the soil treatment objectives sought by their Record of Decision. Such treatment objective, in many instances, also met the proposed treatment limit of 10 times UTS for soils or the 90 % reduction in the concentration of hazardous contaminants prior to disposal. See 1997 studies: (1) Remediation Case Studies: Bioremediation and Vitrification, July 1997, EPA 542-R-97-008 or PB97-177554; (2) Remediation Case Studies: Soil Vapor Extraction and Other In Situ Technologies, July 1997, EPA 542-R-97-009 or NTIS PB97-177562; (3) Analysis of Selected Enhancements for Soil Vapor Extraction, September 1997, EPA-542-R-97-007. See 1995 studies: (1) Abstracts of Remediation Case Studies, EPA-542-R-95-001, March 1995; (2) Remedia-tion Case Studies: Thermal Desorption, Soil Washing, and In situ Vitrification, EPA- 542-R-95-005 or NTIS: PB95-182945, March 1995; (3) Remediation Case Studies: Soil Vapor Extraction , EPA-542-R-95-004 or NTIS: PB95-182937, March 1995; (4) Remediation Case Studies: Bio remediation, EPA-542-R-95-002 or NTIS: PB95-182911, March 1995; and (5) Remediation Case Studies: Groundwater Treatment, EPA-542-R-95-003 or NTIS: PB95-182929, March 1995.

and that hazardous soils can be submitted to physical/ chemical separa-tion processes that enable soil homogenization. (EPA 1998d and EPA 1994.)

EPA concurs with commenter that soils are different from as generated wastes and that soil deserve a separate set of treatment standards. This is one of the key premises behind today's final rule.

Today's treatment standards are not based on the performance of combustion techno-logies, nor is EPA relying on BDAT protocols. The EPA has examined a broad spectrum of non-combustion treatment technologies (9 non-combustion technology clusters) demonstrated to remediate hazardous soils. (See EPA 1998a, EPA 1998c, and EPA 1998d). Also, EPA has been persuaded by arguments that a departure from the BDAT model for establishing LDR treatment standards is necessary to allow greater use of non- combustion technologies and EPA is doing so in today's Phase IV final rule. Also, the commenter is correct that the treatment standards do not consider risk reduction occurring in land disposal units. To do so would be illegal. See API v. EPA, 906 F.2d , 726, 734- 36 holding that section 3004 (m) requires that threats be minimized before land disposal occurs. This issue is long-settled and is not repopened here. The EPA has examined the available non-combustion treatment performance data within the context of what treat-ment levels of performance are demonstrated for as difficult-to-treat clusters of chemical family analytes or chemical treatability groups by the various technology studies in the soil data base (EPA 1998a, EPA 1998d, EPA 1993a.) For instance, the treatment of an admixture of organic constituents in hazardous soils via air/steam stripping is often an appropriate treatment for volatile hazardous constituents. The technology often attains an inferior performance, however, with regard to the removal of many semi-volatile and non-volatile organics (EPA1998a). However, EPA believes that by adding another appropriate treatment step to the steam stripped soils, the concentrations of semivolatile and non- semivolatile organics can attain the treatment limits. (EPA 1998a)

Furthermore, in this rulemaking, given the variability of hazardous soils (in terms of soil textures, concentrations and numbers of hazardous constituents and soil matrices), plus the special considerations of facilitating treatment during remediations, the Agency is adopting treatment standards from the zone of reasonable values which could be permissibly selected based upon the performance data. Thus, the data are not being used so much to establish a precise performance level as to confirm the typical achievability of the promulgated standards, i.e., ten times UTS or 90% reduction.

However, if a soil treatment standard proves unachievable for a particular soil matrix using one technology on which the standard is based, and that one technology or appropriate technology train is well designed and operated, then a treatment variance could be issued under the unachievable prong of the 40 CFR §268.44 (h). There is no requirement that the soil be treated by combustion to achieve the treatment standard.

Regarding the commenters recommendation concerning setting treatment standards for above the "Bright Line", the Agency, after further consideration and review of comments, has decided to not establish a "bright line" to distinguish between higher- and lower-risk media. The Agency believes that because the outcome of a site-specific, risk-based minimize threat variance – alternative, site-specific LDR treatment standard based on risk – will be the same regardless of the initial concentrations of hazardous constituents. If, in the future, the Agency takes action to establish a bright line, it will address the relationship of a bright line to site-specific minimize threat variances.

The commenter is in error that EPA has stated in the HWIR media proposal that EPA was uncertain that non-combustion technologies were able to attain the proposed treatment limits for hazardous soil. In the 61 FR 18807/3, preamble, EPA stated the following:

> "...Thus, the Agency believes that technology-based treatment standards for contaminated soils should not rely exclusively on incineration or HTMR will be appropriate. (See 55 FR 8666, 8760-8761, (Marach 9, 1990) and 58 FR 48092, 48125, (September 14, 1993)). While the Agency believes that soil is, in most cases, most appropriately treated using non-combustion technologies other than combustion; data gathered for the Phase II Soil proposal do not demonstrate conclusively that the Universal Treatment Standards can be met using technologies other than combustion; therefore, EPA is proposing the alternative soil treatment standards discussed today at treatment levels somewhat above UTS levels."

This statement clearly states that EPA was uncertain if the available teatment performance data on hazardous soils treated by non-combustion could be interpreted to support a decision that the existing combustion based treatment limits (for nonwastewaters forms) in the 40 CFR section 268.48 can be met by non-combustion technologies.

References:

EPA 1998a, Soil Data Analysis:Analysis of Treatability Data for Contaminated Soil Treatment Technologies, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFFF)**

EPA 1998b, memorandum titled:"Derivation of Treatment Achievability Results for Organic Functional Groups and Types of Compounds," April 1998. from José E. Labiosa and Rita Chow of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFFF.)**

EPA 1998c, memorandum titled:"Additional Information on Treatability of Contaminated Soils as Discussed in Section VII.B.8. of Phase IV Final Rule Preamble," April 1998, from José E. Labiosa and Rita Chow of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFFF.)**

EPA 1998d, Amemorandum titled: "Extrapolation of Treatment Performance Data in the Soil Data Base Among Hazardous Constituents in Contaminated Soils and Other Implementation," April 1998, from José E. Labiosa of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFFF.)**

EPA 1997a, October 1997, Treatment Technology Performance and Cost Data for Remediation of Wood Preserving Sites, Office of Research and Development, Washington, D.C., 20460. (**EPA/ 625/R-97/009**)

EPA 1994, October 1994, Remediation Technologies: Screening Matrix and Reference Guide, Second Edition, Department of Defense/EPA Environmental Technology Council, (EPA 542/B-94/013 or **NTIS: PB 95-104 182**)

EPA 1993a, August 1993, Final/Proposed Best Demonstrated Available Technology (BDAT) Background Document for Hazardous Soil, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase II, Document Number CS2P-S0599)**

Regarding application of LDRs to contaminated soil more generally, the Agency shares concerns that application of LDRs to hazardous remediation waste, including contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004(d)(3) and (d)(3). The Agency continues to believe that legislative action is needed to address application of LDRs to hazardous remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soils. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. Furthermore, to address specific concerns that the proposed regulations governing LDR applicability for contaminated soil were too difficult to understand or apply, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDRs applies to any given contaminated soil can now be ascertained by applying information about the soil in question to an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that contaminated soils are treated appropriately.

In addition, as noted in the preamble, technology-based standards have the virtue of providing an objective measure of performance and thus removing as much of the usual uncertainty associated with predictive decisions regarding protectiveness of land disposal. Notwithstanding this comment, EPA sees nothing that makes this logic inapplicable to contaminated soils.

Regarding the suggestion that EPA allow treatment standards to be developed entirely on a site-by-site basis, absent a national baseline, to date, the Agency has rejected this approach. RCRA Section 3004(m) requires EPA to promulgate, "levels or methods of treatment, if any. . .." Although 3004(m) could be implemented in many ways, at this time, EPA believes the most appropriate way to

satisfy this RCRA Section 3004(m) mandate is to establish technology-based, nationally applicable treatment standards, including standards tailored for contaminated soil. Among other things, a national standard assures a basic measure of consistency in determining the level of performance at which a technology-based standard can be found to minimize threats posed by land disposal. However, because EPA realizes that technology-based nationally applicable treatment standards, because of site- and waste-specific characteristics, are sometimes not achievable or are inappropriate, EPA has long provided for variances under these circumstances. In addition, because the Agency believes that, during remediation, EPA and authorized states are in the position to make site-specific risk-based minimize threat determinations, the Agency is also providing a variance, for contaminated soils if, on a case-by-case basis, it is determined that the technology-based treatment standard would require treatment beyond the point at which threats are minimized, as discussed above and in the preamble to today's rule.

Regarding the suggestion that EPA based LDR treatment standards, in part, on consideration of the "potential risk to the environment from the disposal of hazardous waste in a regulated landfill," and the suggestion that this would result in higher universal treatment standards, the Agency believes the law on consideration of post-land-disposal controls is clear. The law, of course, is that threats must be minimized before land disposal occurs. API, 906 F.2d 726 (D.C. Cir. 1990). Relying on engineered barriers to assure safety of land disposal perpetuates the very inherent uncertainties that led Congress to adopt the pretreatment feature of the land ban.

EPA, unfortunately, has not had time to carefully evaluate new data submitted by this commenter. This data was requested in November 1997 and received on March 13, 1998, less than one month before the soil treatment standards were scheduled to be promulgated. The Agency continues to emphasize that it believes, based on analysis of data in the record for this rulemaking, that the soil treatment standards can be routinely achieved in contaminated soils, including hard to treat soils, using non-combustion technologies. In situations where a well-designed, well-operated application of one of the model technologies on which the soil treatment standards are based fails to achieve the standards, a treatment variance is available. See 40 CFR 268.44(h).

- "Under the proposed rule, if the overseeing agency determines that the 90 percent or 10 times the UTS treatment standards do not minimize threats, it can specify even more stringent soil treatment standards. There is absolutely no floor limiting the level at which these alternative LDR requirements are set, which is a significant barrier to regulated entities initiating cleanup. Further, if these requirements are not met, the regulated entity must re-treat the waste, which can be extremely expensive for the marginal gain in environmental protectiveness.

  For example, a pilot test may indicate that a technology can reduce contaminants in wastes at a remediation site to 10 times UTS. However, when the remedy is applied on a full scale, laboratory analysis may show that the remedy is reducing the wastes to only 11 times UTS. In this case, would the owner/operator be required to re-treat these wastes?, Alternatively, but even more troubling, what happens if the treated wastes are not uniform, with some treated wastes above 10 times UTS, and some at or below 10 times UTS? In this scenario, the regulator and the regulated entity must again complete the tedious, resource-intensive exercise of segregating wastes into different classifications, much as described in Section IV.C.1 of these comments.

Although it is true that EPA may grant treatment variances in such instances, or where a waste is below the Bright Line but still "contains" hazardous constituents, regulated entities should not be subject to the uncertainty of not knowing whether they will be able to gain a variance after going to great extremes to treat their waste. Further, it is unclear what wastes will be eligible for treatment variances, and what the variance will be based on -concentration of constituents or other factors? There is no rational relation between such a treatment standard and potential risks being addressed at sites. Therefore, EPA must provide flexibility in situations where a good-faith effort to attain the treatment standard falls a bit short so that additional costly treatment for a marginal reduction in concentrations is not required." (39)

Response: EPA is not, at this time, taking action on the portions of the HWIR-Media proposal that would have established a "bright line" or given EPA and authorized states the discretion to specify more stringent LDR treatment standards for contaminated soil with constituent concentrations that are above bright line values.

The also commenter expresses concern that, in some cases, treatment technologies will not perform as anticipated and suggests that EPA provided flexibility in situations where a good-faith effort to attain the soil treatment standard falls a bit short. EPA agrees and believes this flexibility is already provided through the treatment variance process. In situations where a well-designed, well-operated application of one of the model technologies on which the soil treatment standards was based was applied and, nonetheless, the soil treatment standard not achieved, the generator would be eligible for a variance based on the finding that the technology-based treatment standard was unachieveable in that particular soil. See 40 CFR 268.44(h). While the commenter seems to express some discomfort with the treatment variance process, EPA is not persuaded that another approach is needed. As discussed in the preamble to today's final rule, the treatment variance process is flexible and can easily be integrated into remedial activities. With regard to the commenter's concern regarding overly stringent technology-based standards, the final standard provides for a site-specific risk-based variance in cases where a treatment standard is more stringent than the level at which threats to human health and the environment are minimized.

1.B.4 Bright Line Constituents do Not Equal Constituents Subject to Treatment

Several commenters argue that "Bright Line constituents" are not equivalent to "constituents subject to treatment" under LDRs. Some argue that LDRs should only apply to constituents with concentrations greater than the Bright Line.

- "As proposed, the LDRs would apply to contaminated media (whether it is above or below the bright line) if:

  • The hazardous waste which contaminates the media was land-disposed after the effective date of the applicable land disposal prohibition for that waste, or

  • The wastes were land-disposed before the effective date of applicable land disposal prohibition. In this case, LDRs would attach to the media when the media are removed from the land, unless the media have been determined not to contain hazardous waste before removal.

To determine applicability of the LDR provisions to contaminated media under the new HWIR-Media Rule proposal, an owner/operator or agency would need to know:

• The origin of the material contaminating the media;

• The date(s) the material was placed on the land relative to applicable land disposal restrictions (before or after the effective dates); and

• Whether the media still contain hazardous waste (i.e., whether there has been a "contained-in" decision).

Although the proposed rule provides some assumptions that can be used in the absence of this data, the burden of investigation of historic practices and the associated lack of clear regulatory requirements during such an investigation increase regulatory complexity without a corresponding increase in protection of human health or the environment. From a common-sense standpoint, the date of disposal of a waste in media (before or after the LDR effective date) has little to do with whether or not a remedial technology will be protective. Placing this additional investigative burden and regulatory complexity on owners/operators and the implementing agencies diverts resources from real cleanup efforts.

Another regulatory complexity with little corresponding protective value is the fact that LDRs could continue to be applicable to media even when all constituents are below the bright line and the media has been determined to no longer "contain" hazardous waste. This would occur when waste was placed on the land after the effective date of the LDRs or when media were actively managed before the "contained-in" decision was made. Although these wastes may be subject to reduced LDR treatment standards if a treatment variance was granted, there would still be a burden on the site owners/operators and the implementing agency to go through a detailed regulatory assessment for each constituent to determine applicability of the LDR requirements, before such a variance is granted.

The bright line constituents and the constituents subject to treatment under the LDRs are different. Since criteria (and even procedures) for this determination are not yet well-established, EPA cannot find that this level will minimize threats; EPA has established a risk-based variance in final rule which could be combined with contained in, however although these wastes may be subject to reduced LDR treatment standards if a treatment variance was granted, there would still be a burden on the site owners/operators and the implementing agency to go through a detailed regulatory assessment for each constituent to determine applicability of the LDR requirements, before such a variance is granted.

The bright line constituents and the constituents subject to treatment under the LDRs are different. Contaminated media with at least one constituent concentration over the bright line would be ineligible for an exemption from hazardous waste management requirements. That media would then be subject to requirements for hazardous contaminated media including the LDR treatment requirements for constituents with concentrations above and below the bright line. Again. this approach unrealistically complicates the process of determining which regulatory requirements apply to contaminated media." (33)

Response: The commenter raises four issues: (1) determining whether LDRs apply to any given contaminated soil is too complicated; (2) the date of placement of contaminating waste should not bear on whether LDRs apply; (3) it will be too onerous and complicated to obtain treatment variances for soil that has been determined no longer to contain hazardous waste but is still subject to LDRs; and (4) it is unreasonable and too difficult to implement an approach where "bright line" constituents and constituents subject to treatment are different.

Regarding application of LDRs to contaminated soil, the Agency shares concerns that application of LDRs to hazardous remediation waste, including contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, the current statute seems to compel application of LDRs to contaminated media, including soils. See RCRA Sections 3004(d)(3) and (d)(3). The Agency continues to believe that legislative action is needed to address application of LDRs to hazardous remediation waste, including contaminated soil. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soils. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste. Furthermore, to address specific concerns that the proposed regulations governing LDR applicability for contaminated soil were too difficult to understand or apply, EPA has revised the final regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDRs applies to any given contaminated soil can now be ascertained by applying information about the soil in question to an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that contaminated soils are treated appropriately.

Regarding the connection between time of hazardous waste placement and land disposal restriction treatment requirements, the Agency disagrees with the commenter's assertion that the two are not related. As discussed in detail in the HWIR-Media proposal and in the preamble to today's Action, in situations where untreated prohibited listed hazardous waste is placed after the effective date of the applicable land disposal prohibition (i.e., often illegally placed), the duty to comply with LDRs that was attached to the listed waste continues to apply to soil contaminated with the waste, regardless of whether the soil is determined not to contain hazardous waste.. The Agency believes this reading is compelled by the *Chem Waste* court which found that a duty to comply with LDRs attaches to hazardous waste when it is first generated and elimination of the regulatory indicia of "hazardousness" does not, necessarily, fulfil RCRA Section 3004(m) requirement that threats to human health and the environment be minimized before land disposal can occur. This means, once LDRs attach to any given hazardous waste (or to contaminated soil that is initially determined to contain hazardous waste or to exhibit a characteristic of hazardous waste), the LDR treatment standards, or an alternative treatment standard approved through a variance process, must be met before the waste (or soil) can be land disposed. See *Chemical Waste Management v. EPA*, 976 F.2d 2, 22 (D.C. Cir 1992), *cert. denied*, 113 S.Ct. 1961 (1993).

Regarding LDR treatment variances, EPA is not, at this time, persuaded that they will be too onerous or complicated to obtain for a number of reasons. First, EPA believes most individuals who manage

hazardous contaminated soil will appropriately achieve the soil treatments standards using commonly employed, non-combustion, remedial technologies and thus not need or desire a variance. Second, LDR treatment variances under 268.44(h) may be approved using non-rulemaking procedures, this means they can be combined with any of the number of approvals that are typically needed during a cleanup action. For example, a site-specific treatment variance could be approved in concert with a particular remedy. EPA believes this would be especially appropriate, and efficient, when the alternative LDR treatment standards established through a variance is at the same concentrations as site-specific, risk-based cleanup levels. The Agency believes that, since site-specific LDR treatment variances can be approved using non-rulemaking procedures, there will be ample opportunity (and flexibility) to integrate their approval with other cleanup processes. Third, in situations where an individual believed that applying for a site-specific variance would be overly "time consuming and expensive" they would be under no obligation to make an application. Guidance on the process used to apply for and review site-specific LDR treatment variances is provided in the January 8, 1997 EPA guidance memorandum "Use of Site-Specific Land Disposal Restriction Treatability Variances Under 40 CFR 264.44(h) During Cleanups."

Regarding the relationship of constituents subject to treatment to the "bright line," EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. This eliminates many of the ambiguities raised by the commenter. The soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. EPA believes using the 10xUTS limit as the indicator of when treatment is required is reasonable given that it can be easily measured; if constituent concentrations are below 10xUTS, soil would be in compliance with the soil treatment standards, so no treatment would be necessary to comply with LDRs. The Agency believes it is necessary to require treatment for all underlying hazardous constituents reasonably expected to be present, as discussed in the preamble, to conform with the opinion of the D.C. Circuit in *Chemical Waste Management v. EPA*. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the new soil treatment standards, as necessary, at that time.

- "Similarly, EPA proposes in the HWIR Media Rule that media contaminated above the Bright Line be treated, not only for the constituent exceeding the Bright Line standard, but to the LDR treatment standards for all other hazardous constituents derived from the hazardous waste source, a requirement EPA was careful not to impose upon the CERCLA program, whether or not individual constituents exceed a Bright Line level or are present at which poses any human health or environmental risk at all. In the case of soil, EPA states, "For contaminated soil, treatment would be required for each constituent subject to treatment with concentrations greater than 10 times the Universal Treatment Standard. " This results in the imposition of a significantly stricter treatment standard for individual constituents than the standard required for the primary constituent of concern, even when incidental constituents are present at levels well below any site-specific human health or environmental risk." (113)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. This eliminates many of the ambiguities raised by the

commenter. The soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. EPA believes using the 10xUTS limit as the indicator of when treatment is required is reasonable given that it can be easily measured; if constituent concentrations are below 10xUTS, soil would be in compliance with the soil treatment standards, so no treatment would be necessary to comply with LDRs. The Agency believes it is necessary to require treatment for all underlying hazardous constituents reasonably expected to be present, as discussed in the preamble, to conform with the opinion of the D.C. Circuit in *Chemical Waste Management v. EPA*. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the new soil treatment standards, as necessary, at that time.

- "Another confusing aspect to this proposed regulation relates to the difference between "Bright Line constituents" and "constituents subject to treatment". According to the proposal,

  > "For contaminated soil, treatment would be required for each constituent subject to treatment with concentrations greater than 10 times the UTS....
  >
  > > ...the Bright Line does not define the applicability of LDR treatment requirements or the constituents subject to treatment in media subject to LDRs. Contaminated environmental media that contains one or more hazardous constituents at greater than Bright Line concentrations would be ineligible for a contained-in decision and would become subject to the requirements for hazardous contaminated media, including LDR treatment requirements. Once subject to LDR treatment requirements, contaminated media would have to be treated to the generic, technology-based treatment standards for all constituents subject to treatment, including those below the Bright Line. (61 FR 18809)"

  Without conducting an exhaustive comparison, it appears that a significant proportion of the Bright Line concentrations are greater than the UTS by at least a factor of 100. Thus, many contaminants in soils with concentrations significantly below Bright Line values will probably be required to be treated to meet the requirements set forth in the proposed rule. These requirements could necessitate the use of multiple treatment technologies to achieve treatment standards for each constituent subject to treatment. For example, soil with lead concentrations exceeding the Bright Line concentration and volatile organic compound concentrations below the Bright Line but above 10 times the UTS, would need to be treated for both lead and volatiles. Solidification would address the lead component but not the volatiles; bioremediation, thermal treatment or air stripping would need to considered to treat the volatile component. Such a dual treatment strategy would greatly increase the remediation costs. In another example, a soil containing lead and volatiles in concentrations below Bright Line concentrations but above 10 times the UTS would not necessarily require treatment using the alternative LDR standards. It is inconsistent to require treatment of volatiles in the first example but not in the second example. Even though the Bright Line concentrations were developed to identify highly contaminated soil requiring treatment, the

proposed rule as written, severely limits the ability to use these concentrations in any meaningful manner. The proposed rule would be greatly simplified and remediation costs would be reduced without adversely impacting health or the environment if the constituents subject to treatment are those constituents that have initial concentrations above bright line concentrations." (40)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. This eliminates many of the ambiguities raised by the commenter. The soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. EPA believes using the 10xUTS limit as the indicator of when treatment is required is reasonable given that it can be easily measured; if constituent concentrations are below 10xUTS, soil would be in compliance with the soil treatment standards, so no treatment would be necessary to comply with LDRs. The Agency believes it is necessary to require treatment for all underlying hazardous constituents reasonably expected to be present, as discussed in the preamble, to conform with the opinion of the D.C. Circuit in *Chemical Waste Management v. EPA*. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the new soil treatment standards, as necessary, at that time. EPA also does not consider it per se unreasonable that treatment might require one technology to treat metals and another to treat organic constituents. Both types of constituents, of course, can be hazardous. A per se rule that only one type of treatment be conducted would not comport with the requirement that threats posed by all hazardous constituents be minimized. The Agency notes that, in the situation where a treatment train, as discussed in the comment, would be necessary to achieve the soil treatment standards, the generator may be eligible for an LDR treatment variance based on an argument that the technology-based national treatment standard is environmentally inappropriate. See 40 CFR 268.44(h). For example, as noted in the Dec. 5 treatment variance rule, requiring treatment of wastes with low levels of non-volatile organic constituents whose mobility is further reduced as a result of treatment for metals would potentially be inappropriate.

- "EPA solicited comment regarding whether to make all constituents present in the contaminated media above UTS levels (or above 10 x UTS levels for soils) subject to treatment. 61 Fed. Reg. 18809/3. CMA emphatically disagrees with this suggestion. Again, this would require treatment of an excessive number of constituents and thus would discourage, rather than promote remediation. It would also waste innumerable analytic resources if media must be analyzed for the presence of all possible constituents." (112)

Response: Despite this support of the proposed approach, on further consideration, EPA was persuaded by other comments that it is prudent to apply the logic of the *Chemical Waste* court both to soil contaminated by listed hazardous waste and to soils which exhibit a characteristic of hazardous waste.

As the Agency explained in the 1990 proposal, contaminated soils are potentially contaminated with a wider range of hazardous constituents than process wastes -- in no small part because they generally reflect uncontrolled disposal settings. 58 FR at 48124 (September 14, 1993). Since this is

the type of circumstance addressed in the *Chemical Waste* opinion, the Agency is persuaded that it is prudent to apply the logic of the *Chemical Waste* opinion and require treatment of all underlying hazardous constituents. See *Chemical Waste Management v. US EPA*, 976 F.2d at 16 - 18 (D.C. Cir 1992). Therefore, today's final rule requires that all contaminated soil subject to the LDRs be treated to achieve the soil treatment standards for each underlying hazardous constituent reasonably expected to be present in the soil when such constituents are initially found at concentrations greater than ten times the universal treatment standard. Characteristic soil must also be treated, in the case of TC soil, for the TC constituent and, in the case of ignitable, corrosive, or reactive soil, for the characteristic property.

As discussed further in the preamble to today's action, EPA is confident that sampling and analysis can be appropriately targeted to ensure that it is focused on appropriate hazardous constituents or classes of hazardous constituents and does not intend that sampling and analysis would routinely be required for the entire suite of universal treatment standard constituents. Other commenters support this approach.

- "The complexity of the Agency's proposed approach to constituents subject to treatment further illustrates the flaws of the Bright Line approach, tethered as it is to subtitle C by the contained-in concept. In addition to the varying treatment requirements based solely upon regulatory classification, as discussed above, EPA would apply those varying requirements to varying constituents, again based solely on arbitrary regulatory classification. Thus, some media (sediments, groundwater) would be treated to existing LDRs for all constituents present above the UTS, some soil (that which contains or in some cases formerly contained a listed waste) would be treated to the new LDRs for those constituents for which the contaminated waste is listed and which are present at concentrations exceeding 10 times the UTS, and soil exhibiting a characteristic would be treated to the new LDRs for every UTS constituent. These increasing layers of complexity and differential standards utterly unrelated to risk potential are a testament to the flaws of the Bright Line approach. We also suspect that such an approach will be unmanageably complex for States and EPA to implement, and the default will be to assume all media contains hazardous waste and to require treatment for all constituents in all contaminated media, so as to avoid the mind boggling regulatory maze that will otherwise result. This, of course, would further erode the already limited reform offered by the Bright Line approach." (117)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the new soil treatment standards, as necessary, at that time.

EPA is also not, at this time, taking action on the portions of the HWIR-Media proposal that would have provided opportunities for some or all remediation waste (e.g., sediments, ground water) to exit the RCRA Subtitle C system. If, in the future, EPA takes such action it will address comments on

the relationship of LDRs for other remediation waste to LDRs for contaminated soil, as necessary, at that time.

- "EPA requests comment on the approach that contaminated environmental media containing one or more hazardous constituents at concentrations greater than Bright Line concentrations would be ineligible for a contained-in decision and would become subject to the requirements for hazardous contaminated media, including LDR requirements. Westinghouse does not support this approach. Triggering the requirements to meet LDR standards for all constituents, even those constituents below the Bright Line values, when a media has one or more constituents above the Bright Line is overly restrictive. As an alternative, only those constituents that are above the Bright Line value should be subject to LDR requirements." (35)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the new soil treatment standards, as necessary, at that time.

- "When a remediation wastes has hazardous constituents for which it was listed both above and below the bright line, LDR requirements should only apply to those constituents above the bright line." (108)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the new soil treatment standards, as necessary, at that time.

- "Page 18809, column 3, second paragraph, in regards to the constituents subject to treatment we believe that all constituents present above UTS standards should be subject to treatment. Also, in regards to background, it would be appropriate to compare inorganic concentrations with background concentrations of the inorganic constituents as there are some geographic areas where inorganic concentrations might be expected to be naturally elevated." (41)

Response: Regarding constituents subject to treatment, EPA was persuaded by this comment and for this, and other reasons, has modified the final rules to require that both soil contaminated by listed waste and soil that exhibits a characteristic of hazardous waste be treated for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the UTS. As discussed further in the preamble to today's action, EPA is confident that sampling and analysis can be appropriately targeted to ensure that it is focused on appropriate hazardous constituents or classes of hazardous constituents and does

not intend that sampling and analysis would routinely be required for the entire suite of universal treatment standard constituents.

Regarding background concentrations, in consideration of this and other comments, EPA has concluded that treatment to comply with the soil treatment standards should not be required if constituent concentrations fall below naturally occurring background concentrations, provided the soil will continue to be managed on site or in an area with similar natural background concentrations. If soil will be sent for land disposal off-site, compliance with the new soil treatment standards is required, since the Agency believes that natural background concentrations on-site will not automatically correspond to natural background concentrations at a remote land disposal facility.

The Agency notes that natural background concentrations are constituent concentrations that are present in environmental media which has not been influenced by human activities or releases. Since these constituent concentrations are present absent human influence and EPA has determined that soil (like other environmental media) is not, of itself, a waste EPA is not convinced the Agency would have the authority to require compliance with LDR treatment standards when constituent concentrations fall below background concentrations even if it felt compelled to do so. (Of course, such constituents could be regulated as hazardous constituents under cleanup authorities, including RCRA corrective action and other authorities.)

Since background concentrations may vary across geographic areas, and to ensure that the LDR soil treatment standards will only be capped at background where appropriate, EPA will require that individuals who wish to cap LDR treatment at natural background concentrations apply for and receive an LDR treatment variance. EPA will presume that when the soil treatment standards would require treatment to concentrations that are less than natural background, such a variance will be appropriate, based on the finding that it is inappropriate, for contaminated soil, to require treatment to concentrations less than natural background concentrations.

- "Page 18809, column 3, paragraph 2 states that "Under today's proposal, the Bright Line does not define the applicability of LDR treatment requirements or the constituents subject to treatment in media subject to the LDRs." The proposed rule does not emphasize this point strongly enough, and should include language expressly forbidding such use of Bright Line levels." (41)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards, as necessary, at that time.

The Agency continues to emphasize that, like the proposed bright line concentrations, the technology-based LDR soil treatment standards are not and should not be considered surrogates for site-specific, risk-based soil cleanup levels.

- "**<u>p. 18809, cols. 2 and 3</u> -- EPA explains that for contaminated media other than soil, treatment would be required for each constituent subject to treatment having concentrations in the media in excess of Universal Treatment Standards (UTS). For contaminated soil, treatment would be required for each constituent subject to treatment having concentrations in the soil that exceed 10 times the UTS. In the case of media that exhibit a characteristic, the Agency explains that treatment would be required for the characteristic constituent (in the case of TC wastes) or the characteristic property (in the case of ignitable, reactive, or corrosive wastes) and for all underlying hazardous constituents listed in 40 CFR 268.48 "Table UTS -- Universal Treatment Standards" that are present and of concern in the media. The Agency specifically requests comments on the scope of constituents that should be subject to treatment under the proposed HWIR-media rule. As an example of a possible restriction of scope, EPA asks whether background concentrations of naturally occurring hazardous constituents should be explicitly evaluated when identifying constituents that would be subject to treatment.**

  DOE believes it is not necessary to require treatment of every constituent subject to treatment that exceeds UTS in contaminated media other than soils, or exceeds 10 times UTS in contaminated soils. Instead, DOE would support an approach that would account for background concentrations of naturally occurring hazardous constituents when considering whether non-soil contaminated media contain concentrations of hazardous constituents that exceed UTS and whether soil contains concentrations of hazardous constituents that exceed 10 times the UTS. Additionally, DOE would support an approach that would account for background concentrations of naturally occurring hazardous constituents when determining whether any media exhibits a hazardous characteristic, thus subjecting it (upon excavation) to LDR treatment standards. The Department suggests that to account for background concentrations, LDR treatment standards for media could be capped at the background concentration levels for the site where the media is generated.

  In the case of soils that exhibit a hazardous characteristic, DOE is concerned that the LDR treatment requirements named by EPA (i.e., removal of the characteristic, plus treatment of underlying hazardous constituents to meet the UTS) will be a disincentive in certain situations to remedial actions involving excavation and treatment. Therefore, the Department encourages EPA to adopt an approach (such as accounting for naturally occurring hazardous constituents when testing for hazardous characteristics) that will reasonably ensure that, if soils generated during remedial actions are found to exhibit a hazardous characteristic, it is not the result of naturally occurring hazardous constituents." (60)

Response: In consideration of this and other comments, EPA has concluded that treatment to comply with the soil treatment standards should not be required if constituent concentrations fall below naturally occurring background concentrations, provided the soil will continue to be managed on site or in an area with similar natural background concentrations. If soil will be sent for land disposal off-site, compliance with the new soil treatment standards is required, since the Agency believes that natural background concentrations on-site will not automatically correspond to natural background concentrations at a remote land disposal facility.

The Agency notes that natural background concentrations are constituent concentrations that are present in environmental media which has not been influenced by human activities or releases. Since these constituent concentrations are present absent human influence and EPA has determined that soil (like other environmental media) is not, of itself, a waste but may be regulated as hazardous waste under RCRA only when it contains (or contained) waste, it would be anomalous to require treatment under the LDR provisions when the soil could not be distinguished from the rest of the soil at a site.

Since background concentrations may vary across geographic areas, and to ensure that the LDR soil treatment standards will only be capped at background where appropriate, EPA will require that individuals who wish to cap LDR treatment at natural background concentrations apply for and receive an LDR treatment variance. EPA will presume that when the soil treatment standards would require treatment to concentrations that are less than natural background, such a variance will be appropriate, based on the finding that it is inappropriate, for contaminated soil, to require treatment to concentrations less than natural background concentrations.

- "For soil above the bright line contaminated by listed hazardous wastes, EPA proposes that the treatment standards apply to each hazardous constituent originating from the wastes that is subject to a treatment standard for the waste, and is present at concentrations above the treatment standard. However, in the case of soil exhibiting a hazardous waste characteristic, EPA proposes requiring treatment for the constituents triggering the characteristic designation, all constituents regulated under the treatment standards present above the treatment standards. See 61 FR 18809.

  Significantly, the proposed approach for characteristic soil is consistent with the underlying principles of the land disposal restrictions program and the third third litigation, and should be extended to media contaminated with listed waste. Once the media is deemed subject to treatment, it should be subject to treatment that is effective for the toxic constituents in it that are present in excess of applicable treatment standards. There is no legitimate technical or environmental policy rationale for completely disregarding some toxic constituents in media contaminated with listed wastes, or requiring less comprehensive treatment for media contaminated with listed wastes than media exhibiting a hazardous waste characteristic.

  EPA's rationale of linking the application of treatment standards to only those constituents originating from the listed hazardous waste appears to be a misguided jurisdictional argument. EPA argues that the duty to treat should apply to only those constituents for which treatment would have been required if the wastes were not in the media. See 61 FR.18809. However, as a matter of law, sufficient jurisdiction over the "contained-in" media is triggered by a finding that at least one constituent originating from the waste is present above bright line levels. once jurisdiction is established, the relevant question under the LDR program is how best to structure the treatment to satisfy the statutory policy of reducing the toxicity and mobility of hazardous constituents present in the media prior to land disposal. The Agency should recognize in this context as well that media treatment requires a tailored approach which addresses the potential for the mixture of listed waste and other materials. Just as the treatment standards themselves are to be modified to address this phenomenon, so too must the relevant constituents of concern.

As a practical matter, the linkage of treatment requirements to the origin of particular constituents will present unnecessary problems for regulatory officials and responsible parties. Much time, expense, and effort will be wasted investigating the origin of each constituent in the media at many sites, if the origin of the constituent determines the applicability of treatment standards. This money and effort is better spent on designing and performing effective treatment of the media.

And in some cases, after a substantial expenditure of resources, available information may be inconclusive. Accordingly, investigating the pedigree of each hazardous constituent in contaminated media for the purpose of applying treatment requirements is hardly consistent with the objective of speeding cleanups articulated by EPA for this rulemaking." (L03)

Response: EPA was persuaded by this comment and for this, and other reasons, has modified the final rules to require that both soil contaminated by listed waste and soil that exhibits a characteristic of hazardous waste be treated for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the UTS. As discussed further in the preamble to today's action, EPA is confident that sampling and analysis can be appropriately targeted to ensure that it is focused on appropriate hazardous constituents or classes of hazardous constituents and does not intend that sampling and analysis would routinely be required for the entire suite of universal treatment standard constituents.

1.B.5 LDR Treatment Standards Are Not Workable for Non-Soil Media

Several commenters state that LDR treatment standards for non-soil media (e.g., water and sediment) are unworkable.

- "EPA has requested comments regarding whether the current LDR treatment standards are appropriate for "non-soil" hazardous contaminated media (e.g. groundwater or sediment), or are otherwise compatible with the remediation context in which they will be applied. 61 Fed. Reg. 18807/2. The Agency also requests comments regarding whether its proposed, modified LDR treatment standards are achievable using technologies appropriate at remediation sites. *Id.*

  CMA strongly believes the existing LDR treatment standards are inappropriate for non-soil media contaminated with hazardous waste. In most cases, such standards were developed based on application of excessive and costly incineration technologies for organics and high temperature metal recovery technologies for metals. Alternative technologies are more appropriate and efficient. Such alternatives may also provide greater environmental benefits, by more promptly remediating significant risks, by eliminating the cross-media transfer of pollutants, and by reducing energy consumption. Evidence of these benefits is abundant in the existing records of decision which have been adopted under CERCLA, particularly those approved in recent years. EPA should add those records of decision to the rulemaking docket, if only by reference." (112)

Response: EPA is not in this rulemaking taking action on the portions of the HWIR-Media proposal that would have addressed LDR issues in non-soil media such as ground water and sediments. If, in

the future, EPA takes action on this portion of the proposal, it will address these commenter, as necessary, at that time.

1.B.6 90% Reduction or 10xUTS is Unreasonable

One commenter argued that LDR standards should not be modified for various contaminated media.

Several commenters indicate that the 90% reduction or 10x UTS levels is unreasonable. Some commenters mention that the standards are arbitrary have not been demonstrated to be achievable in practice for any remediation waste. Commenters are also concerned that application of these revised LDRs will hinder the development of innovative treatment technologies. [See Chapter 16 comments on innovative treatment technologies under RMPs.]

- "There is insufficient justification for altering the LDR requirements for those wastes to which LDRs attach. The LDRs do not vary for different wastes containing the same constituent; why should they be allowed to vary for media?" (41)

Response: EPA is not persuaded that it is inappropriate to establish specific LDR treatment standards for contaminated soil. Soil is a considerably different matrix from process wastes (necessitating a different treatment standards where treatment standards are based on the performance of matrix-dependent technologies), and treatment by combustion (a matrix independent technology) is often inappropriate, as explained in the preamble. Thus, as discussed further in the preamble to today's action, EPA continues to believe that distinct treatability issues associated with the soil matrix and distinctions posed by the remediation context under which most contaminated soils are managed are adequate to justify classification of soil as a new treatability group, eligible for specific land disposal restriction treatment standards.

- "With respect to the generic modified LDRs proposed for contaminated media, CMA observes the following. Considering EPA's LDR program was crafted only to assess the treatability of as-generated process wastes, it is curious EPA seeks in the Bright Line approach to maintain the proposition that a uniform set of LDR requirements can be fitted to remediation wastes. While the Agency notes the 10 x UTS or the 90% removal LDR requirement for remediation wastes is a relaxed standard, the plain and simple truth is these standards have not been demonstrated to be achievable in practice for any remediation waste, much less for all remediation wastes. CMA believes that where these standards are achievable for soil, for example, they frequently will be achievable only through the use of incineration - the very technology often inappropriately required under current law by the existing Part 268 BDAT standards!

  EPA cannot justify the failure to evaluate achievability for large classes of material. Implied by recognizing this limitation, EPA has proposed to authorized site-specific variances where 90% of BDAT or 10 x UTS cannot be achieved. Providing variances, however, is not an adequate substitute for obtaining the required data. Further, EPA is simultaneously proposing to authorize Directors to impose *more* stringent LDR requirements in RMPs based on site-specific factors, if determined necessary to minimize threats under section

3004(m). 61 Fed. Reg. 18807. Such an approach simply adds yet *another* unnecessary layer of complexity to arrive at the same desired result. Under the proposed Unitary Approach, on the other hand, such site-specific treatment decisions may be made solely on the basis of a protective remedial determination, unencumbered by the regulatory complexity and disincentives associated with application of the LDRs." (112)

Response: The Agency concluded that the soil treatment standards can be reliably achieved using: biotreatment, chemical extraction, dechlorination, soil washing, stabilization and thermal desorption (depending on the hazardous constituents involved). (EPA 1998a, EPA 1998b, EPA 1998c, and EPA 1998d.) Of course, since soil treatment is generally matrix dependent, the exact treatment technology which might be applied to any given contaminated soil will depend on the specific properties of the soil and the hazardous constituents of concern. However, the Agency finds that the standards typically can be achieved by at least one of the demonstrated technologies, even in the case of hard-to-treat hazardous constituents such as dioxins and furans, polychlorinated biphenyls, and polynuclear aromatics. (EPA 1998a, EPA 1998b, and EPA 1998c)

The commenter believes that EPA's proposed treatment standards for hazardous soils have not yet been demonstrated for any soils in practice. The commenter emphasizes further that to the extent that if the proposed limits of 10 times UTS or a 90 % reduction are achieved , it can only be done by incineration.

EPA disagrees.

First, the treatment data supporting the proposed rule clearly show and support EPA's determination that several non-combustion technologies can meet the proposed limits for organic and metal constituents found in hazardous soils, or 10 x UTS levels, or the 90% reduction in the total or leachable concentration of hazardous constituents present in hazardous soils. (See preamble in Phase IV final rule, EPA 1998a, EPA 1998 b, EPA 1998c, and EPA 1998d). For instance, EPA collected over 6,000 paired data points describing the treatment of various hazardous soils. In response to an outgrowth of the comments, EPA has retained 2,143 paired non-combustion data points to set today's treatment standards. EPA believes that these 2,143 paired non-combustion data points are reasonably sufficient to adequately describe the treatment of metal, organics, and multiple metal and organic contaminants that are frequently found at different type of sites, including both Superfund and RCRA sites. (EPA1998a, EPA 1998b, EPA 1998c, EPA 1998d, and EPA 1994.) For instance, the SDB has treatment data on soils with varying textures including top soils, silty/loam soils, and clay soils. (EPA 1998a) Furthermore, EPA has a number of bench and pilot studies on the treatment of contaminated soils from wood preserving, petroleum refining, and electroplating sites, which contain a wide range of constituents in high concentrations such as polynuclear aromatic, phenolic, chlorinated organics, spent solvents, creosote, and metals. (EPA 1998a) These constituents are found at other RCRA and Superfund sites. (EPA1993a)

Second, full-scale data on non-combustion technologies, published in 1995 and 1997,
show that ex-situ chemical and energy intensive remediation technologies applied to Superfund sites can be engineered and optimized, generally, to meet pre-designed remediation treatment objectives. In many instances, ex-situ processes were able to meet a 90 % reduction of hazardous constituents in soils or the 10 times UTS limit. (EPA 1998a) EPA refers to these data as the Superfund full scale 1995 and 1997 data studies.[4]

Third, other pilot- and full-scale data supporting the development of Superfund Presumptive Remedy guidance documents for wood preserving sites also support EPA's proposed treatment standards. In particular, thermal desorption was able to meet the concentrations and concentration reduction levels established by this rule. (EPA 1993b, EPA 1995a, EPA 1997a)

This is an expected result since ex-situ soil remediation technologies such as stabilization, soil washing, dechlorination, and chemical extraction are more amenable to optimization. One way to optimize these technologies is to rely on physical and chemical technologies that enable the chemical/physical treatment of soil properties or the homogenization of soils. (EPA 1998d, EPA 1994).

Another argument emphasized by the commenter is that a treatability variance process is cumbersome and that it poses an additional hurdles for facilities seeking to remediate soils. EPA is not persuaded by this argument. The remediation of soils often is preceeded by several feasibility studies in order to assess the levels of hazards to the human health and the environment that can be reduced by the use of one or various remediation management scenarios.

If non-combustion treatment remedies are properly designed and implemented, such feasibility studies may enable the overseeing agency to evaluate the capabilities of the proposed treatment remedies and to determine whether or not the treatment objectives set by today's rule can be met. It has been EPA's experience under the Corrective Action Program and Superfund, that well designed and implemented feasibility studies can assist EPA to asses the merits for granting a treatability variance. To the extent such treatability variance is warranted, EPA may use

[4] These data consist of many full -scale treatment studies conducted at Superfund sites. Many of the ex-situ remediation studies met the soil treatment objectives sought by their Record of Decision. Such treatment objective, in many instances, also met the proposed treatment limit of 10 times UTS for soils or the 90 % reduction in the concentration of hazardous contaminants prior to disposal. See 1997 studies: (1) Remediation Case Studies: Bioremediation and Vitrification, July 1997, EPA 542-R-97-008 or PB97-177554; (2) Remediation Case Studies: Soil Vapor Extraction and Other In Situ Technologies, July 1997, EPA 542-R-97-009 or NTIS PB97-177562; (3) Analysis of Selected Enhancements for Soil Vapor Extraction, September 1997, EPA-542-R-97-007. See 1995 studies: (1) Abstracts of Remediation Case Studies, EPA-542-R-95-001, March 1995; (2) Remedia-tion Case Studies: Thermal Desorption, Soil Washing, and In situ Vitrification, EPA- 542-R-95-005 or NTIS: PB95-182945, March 1995; (3) Remediation Case Studies: Soil Vapor Extraction , EPA-542-R-95-004 or NTIS: PB95-182937, March 1995; (4) Remediation Case Studies: Bio remediation, EPA-542-R-95-002 or NTIS: PB95-182911, March 1995; and (5) Remediation Case Studies: Groundwater Treatment, EPA-542-R-95-003 or NTIS: PB95-182929, March 1995.

authorities under 268.44 (h) to set, instead, a treatment variance alternative. Facilities are expected, however, to demonstrate to EPA why the promulgated limits are inappropriate or why a particular treatment technology or train of technologies reflecting proper operation of the treatment technologies on which the treatment standards are based may be unable to meet the treatment standards promulgated today. EPA does not expect there to be a need for treatment variances except in isolated instances.

The commenter was also questioning the merits of EPA's proposed Bright Line levels and the proposed provisions that may enable an overseeing agency to impose more stringent requirements. However, based on further consideration and consideration of comments, the Agency is persuaded that a site-specific minimize threat variance should be available to all contaminated soils. The Agency believes this is proper because the outcome of a site-specific, risk-based minimize threat variance -- alternative, site-specific LDR treatment standards based on risk -- will be the same regardless of the initial concentrations of hazardous constituents. In any case, the Agency is not at this time, taking action on the portion of the April 29, 1996 proposal that would have established a "bright line" to distinguish between higher- and lower-risk media.

References:

EPA 1998a, Soil Data Analysis: Analysis of Treatability Data for Contaminated Soil Treatment Technologies, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF)**

EPA 1998b, memorandum titled:"Derivation of Treatment Achievability Results for Organic Functional Groups and Types of Compounds," April 1998. from José E. Labiosa and Rita Chow of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF.)**

EPA 1998c, memorandum titled:"Additional Information on Treatability of Contaminated Soils as Discussed in Section VII.B.8. of Phase IV Final Rule Preamble," April 1998, from José E. Labiosa and Rita Chow of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF.)**

EPA 1998d, Amemorandum titled: "Extrapolation of Treatment Performance Data in the Soil Data Base Among Hazardous Constituents in Contaminated Soils and Other Implementation," April 1998, from José E. Labiosa of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF.)**

EPA 1997a, October 1997, Treatment Technology Performance and Cost Data for Remediation of Wood Preserving Sites, Office of Research and Development, Washington, D.C., 20460. (**EPA/ 625/R-97/009**)

EPA 1994, October 1994, Remediation Technologies: Screening Matrix and Reference Guide, Second Edition, Department of Defense/EPA Environmental Technology Council,

(EPA 542/B-94/013 or **NTIS: PB 95-104 182**)

EPA 1993a, August 1993, Final/Proposed Best Demonstrated Available Technology (BDAT) Background Document for Hazardous Soil, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase II, Document Number CS2P-S0599)**

EPA 1993b, March 1993, Technology Selection Guide for Wood Treater Sites, OSWER Directive 9360.0-46FS or EPA 540-F-93-020, Office of Solid Waste and Emergency Response, Washington, D.C.

EPA 1995a, November 1995, Presumptive Remedies for Soils, Sediments, and Sludges at Wood Treater Sites, OSWER Directive 9200.5-162, EPA 540/R-95/128, or NTIS: PB 95-963410.

- "The proposed Bright Line approach does not directly address the legal authority - -contingent management -- that EPA recognizes to exist in its discussion of the Unitary Approach. EPA therefore attempts to fight LDR disincentives in the Bright Line proposal with both hands tied behind its back. To minimize the problems of LDRs for contaminated soils (and possibly sediments), EPA again proposes a generic rule that contemplates subsequent site-specific determinations. It appears to do so in order to provide a legal justification for application of the generic rule to particular situations. The generic rule is thus an unnecessary and inadequately explained construct that should be abandoned.

  In particular, EPA proposes to establish for soils a new, generic set of LDRs, set by reference to a 90% removal rate or 10 x UTS. CMA agrees with EPA that treatment of contaminated soil poses technical problems that generally were not considered when the Part 268 BDAT standards were developed and promulgated. CMA remains concerned, however, that the current proposal has not been adequately explained and may not be routinely achievable for soils in practice.

  EPA admits that in proposing these alternative LDRs, it "did not use its normal approach of setting technology-based LDR standards." 61 Fed. Reg. 18807. Moreover, EPA does not claim that these standards represent BDAT in any sense; they have not been shown to be the "best" or to be "demonstrated" or to be "achievable" in the real world of managing remediation wastes. Nor, does EPA claim that these standards satisfy section 3004(m)'s narrative requirement to minimize threats, or that they represent risk-based approaches to minimizing threats. Instead, EPA contemplates providing discretion to Directors to impose additional treatment standards if necessary to reach minimize threat levels, and to provide variances if the proposed levels cannot be achieved in practice. No standards are provided for such determinations, beyond the statutory requirements. Of greatest concern, no consideration is given to excluding soils, other media, and other remediation wastes entirely from the burdensome requirements and disincentives created by EPA's earlier decisions to promote BDAT-based LDRs without determining risk-based floors.

  Such regulatory proposals are wholly unnecessary. The bases for removing LDRs are ultimately grounded on wholly defensible legal theories that avoid any of the limitations driving EPA's proposal. In particular, LDRs may be found inapplicable to remediation

wastes based on integration with other statutes (e.g., CERCLA, state cleanup programs), consideration of remediation wastes as newly generated waste, or even EPA's own policy argument that RCRA may require such flexibility to avoid counterproductive results caused by strict application of statutory provisions. 61 Fed. Reg. 18830. EPA thus should not adopt this proposal, but should adopt the Unitary Approach of excluding all remediation wastes from LDR requirements. If EPA does adopt the proposed approach, however, it should explain more clearly and provide an opportunity to comment on its basis for specifying the generic BDAT values, the legal authority on which its decision is based, and its reasons for rejecting broader regulatory relief." (112)

Response: The commenter is asking EPA to abandon its proposal calling for the establishment of treatment standards that rely on the performance of treatment technologies as opposed to risk based considerations that could be advocated under a "continency management approach" under the Unitary proposal. The commenters has also raised various concerns regarding the basis of the treatment standard, its legal justification, and questions EPA's assessment that the treatment standards can be reached by noncombustion technologies. Finally, the commenter objects to portions of the proposal that could allow Directors of regulatory agencies to impose additional treatment requirements under specific site conditions. The commenter believes that the only way EPA can reconcile the remediation of hazardous media under RCRA and other statues is to abandon the LDR altogether and to promulgate instead the Unitary approach.

EPA has given consideration to these comments and the concerns of other commenters. Regarding the "bright line" approach, the Agency, after further consideration and consideration of comments, has decided to not take action on the portion of the April 29, 1996, proposal that would establish a "bright line" to distinguish between higher- and lower-risk media. The Agency is persuaded that a site-specific minimize threat variance should be available to all contaminated soils. EPA believes this is proper because the outcome of a site-specific, risk-based minimize threat variance -- alternative, site-specific LDR treatment standards based on risk -- will be the same regardless of the initial concentrations of hazardous constituents.

EPA disagrees that the treatment standards stand outside the structure and confines of Section 3004(m). First, the standards reflect performance of best technologies for treating soils. Second, these standards -- as technology-based standards are based on performance of best technologies for treating soils -- minimize threats posed by land disposal of the soils. HWTC III, 886F.2d at 362-65. Finally, EPA expects most decisions on soil treatment to be made pursuant to the general standards, not through variances.

EPA is not persuaded by comments emphasizing that the treatment limits are impractical or unachieveable.

First, the treatment data supporting the proposed rule clearly show and support EPA's determination that several non-combustion technologies can meet the

proposed limits for organic and metal constituents found in hazardous soils, 10 x UTS levels, or the 90% reduction in the total or leachable concentration of hazardous constituents present in hazardous soils. (See preamble in Phase IV final rule, EPA 1998a, EPA 1998 b, EPA 1998c, and EPA 1998d). For instance, EPA collected over 6,000 paired data points describing the treatment of various hazardous soils. In response to an outgrowth of the comments, EPA has retained 2,143 paired non-combustion data points to set today's treatment standards. EPA believes that these 2,143 paired non-combustion data points are reasonably sufficient to adequately describe the treatment of metal, organics, and multiple metal and organic contaminants that are frequently found at different type of sites, including both Superfund and RCRA sites. (EPA1998a, EPA 1998b, EPA 1998c, EPA 1998d, and EPA 1994.) For instance, the SDB has treatment data on soils with varying textures including top soils, silty/loam soils, and clay soils. (EPA 1998a) Furthermore, EPA has a number of bench and pilot studies on the treatment of contaminated soils from wood preserving, petroleum refining, and electroplating sites, which contain a wide range of constituents such as polynuclear aromatic, phenolic, chlorinated organics, spent solvents, creosote, and metals. (EPA 1998a) These constituents are found at other RCRA and Superfund sites. (EPA 1993a)

Second, full-scale data on non-combustion technologies, published in 1995 and 1997, show that ex-situ chemical and energy intensive remediation technologies applied to Superfund sites can be engineered and optimized, generally, to meet pre-designed remediation treatment objectives. In many instances, ex-situ processes were able to meet a 90 % reduction of hazardous constituents in soils or the 10 times UTS limit. (EPA 1998a) EPA refers to these data as the Superfund full scale 1995 and 1997 data studies.[5]

Third, other pilot- and full-scale data supporting the development of Superfund Presumptive Remedy guidance documents for wood preserving sites also support EPA's proposed treatment standards. In particular, thermal desorption was able to meet concen-trations and concentration reduction levels that are congruent with the treatment limits established by this rule. (EPA 1993b, EPA 1995a, and EPA 1997a)

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[5] These data consist of many full -scale treatment studies conducted at Superfund sites. Many of the ex-situ remediation studies met the soil treatment objectives sought by their Record of Decision. Such treatment objective, in many instances, also met the proposed treatment limit of 10 times UTS for soils or the 90 % reduction in the concentration of hazardous contaminants prior to disposal. See 1997 studies: (1) Remediation Case Studies: Bioremediation and Vitrification, July 1997, EPA 542-R-97-008 or PB97-177554; (2) Remediation Case Studies: Soil Vapor Extraction and Other In Situ Technologies, July 1997, EPA 542-R-97-009 or NTIS PB97-177562; (3) Analysis of Selected Enhancements for Soil Vapor Extraction, September 1997, EPA-542-R-97-007. See 1995 studies: (1) Abstracts of Remediation Case Studies, EPA-542-R-95-001, March 1995; (2) Remedia-tion Case Studies: Thermal Desorption, Soil Washing, and In situ Vitrification, EPA- 542-R-95-005 or NTIS: PB95-182945, March 1995; (3) Remediation Case Studies: Soil Vapor Extraction , EPA-542-R-95-004 or NTIS: PB95-182937, March 1995; (4) Remediation Case Studies: Bio remediation, EPA-542-R-95-002 or NTIS: PB95-182911, March 1995; and (5) Remediation Case Studies: Groundwater Treatment, EPA-542-R-95-003 or NTIS: PB95-182929, March 1995.

This is an expected result since ex-situ soil remediation technologies such as stabiliza-
tion, soil washing, dechlorination, and chemical extraction are more amenable to optimi-
zation. (EPA 1994) One way to optimize these technologies is to rely on physical and chemical technologies that enable the chemical/physical treatment of soil properties or the homogenization of soils. (EPA 1998d, EPA 1994).

The commenter believes that LDRs may be found inapplicable to remediation wastes based on integration with other statutes (e.g., CERCLA, state cleanup programs), consideration of remediation wastes as newly generated waste, or even EPA's own policy argument that RCRA may require such flexibility to avoid counterproductive results caused by strict application of statutory provisions. 61 Fed. Reg. 18830. The commenter concludes that as a result of this statutory conflicts, EPA should not adopt this proposal, but instead, should adopt the Unitary Approach of excluding all remediation wastes from LDR requirements. EPA fails to see how these arguments address the specific statutory provision applying LDR standards to hazardous soils from remediation. RCRA section 3004 (d) (3) and (e) (3). Nor does the Agency see the basis for a wholesale finding that threats to human health and the environment posed by land disposal of these contaminated soils is invariably minimized if no treatment occurs -- a strongly possible consequence of the commenters' approach. Integration of RCRA and other statutes is, of course, a legitimate goal, but not if core values of RCRA, such as the requirement that hazardous wastes be treated before land disposal, are ignored. 976 F. 2d at 23, 25. EPA believes the final rule provides a means of integrating the remediation statutes with LDR by modifying the treatment requirements so that they do not create perverse incentives not to treat, but at the same time leaving in place a treatment regime providing a measure of objectivity that threats really will be minimized. The Agency has also promulgated a risk-based variance that can cap treatment if it can be demonstrated that threats posed by disposal of the waste will in fact be minimized, based on the circumstances at the particular site and the circumstances of the particular contaminated soil.

The commenter was also questioning the merits of EPA's proposed Bright Line levels and the proposed provisions that may enable an overseeing agency to impose more stringent requirements. However, based on further consideration and consideration of comments, the Agency is persuaded that a site-specific minimize threat variance should be available to all contaminated soils. The Agency believes this is proper because the outcome of a site-specific, risk-based minimize threat variance -- alternative, site-specific LDR treatment standards based on risk -- will be the same regardless of the initial concentrations of hazardous constituents. In any case, the Agency is not at this time, taking action on the portion of the April 29, 1996 proposal that would have established a "bright line" to distinguish between higher- and lower-risk media.

Finally, the commenter asked EPA to clarify its legal and technical rationale behind "the

generic BDAT values" being promulgated by this rule. EPA notes that these particular comments are addressed in the preamble of today's Phase IV final rule. Also, the analysis of the available non-combustion data and other corroborative data can be found in EPA 1998a, EPA 1998c, and EPA 1998d.

References:

EPA 1998a, Soil Data Analysis: Analysis of Treatability Data for Contaminated Soil Treatment Technologies, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF)**

EPA 1998b, memorandum titled:"Derivation of Treatment Achievability Results for Organic Functional Groups and Types of Compounds," April 1998. from José E. Labiosa and Rita Chow of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF.)**

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EPA 1993a, August 1993, Final/Proposed Best Demonstrated Available Technology (BDAT) Background Document for Hazardous Soil, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase II, Document Number CS2P-S0599)**

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EPA 1995a, November 1995, Presumptive Remedies for Soils, Sediments, and Sludges at Wood Treater Sites, OSWER Directive 9200.5-162, EPA 540/R-95/128, or NTIS: PB 95-963410.

- "CMA also strongly believes that the proposed, modified, LDR treatment standards for contaminated soils are not routinely achievable, using even inappropriate incineration or high temperature metal recovery technologies. CMA applauds EPA for recognizing this is a serious issue requiring the development of additional data, and for accepting that non-combustion technologies are generally more appropriate than combustion technologies for remediation of contaminated soils. 61 Fed. Reg. 18807/1. Nonetheless, EPA has proposed to adopt a generic 90% reduction standard (measured as total concentrations in regard to organics and as total concentrations for removal technologies and leachate concentrations for solidification technologies in regard to metals), capped at 10 x UTS. Yet EPA simultaneously acknowledges that soil matrices and varying contaminant levels may preclude achievement of target treatment standards in practice. 61 Fed. Reg. 18807/3.

  EPA admits it has not conducted its normal statistical modeling procedure to establish LDR treatment standards, requiring an adequate "demonstration" which it can operate at required levels. Again, the complexity of EPA's proposed approach is unnecessary, and will create, rather than remove disincentives to remediation.

  The proposal to authorize Directors to impose additional LDR treatment standards is wholly unnecessary. Directors must already approve management requirements for remediation wastes which are protective of human health and the environment, and thus may require any additional treatment necessary. In contrast, if Directors must review each RMP to determine if the proposed treatment complies with section 3004(m), EPA's proposed 90% reduction requirement serves no purpose and is indefensible as a generic requirement. Further, it will preclude Directors from determining - without processing a separate variance request -- that the 90% reduction requirement is inapt." (112)

Response: The commentor is in error that EPA has stated in the HWIR media proposal that EPA was uncertain that non-combustion technologies were able to attain the proposed treatment limits for hazardous soil. I the 61 FR 18807/3, preamble, EPA stated the following:

> "...Thus, the Agency believes that technology-based treatment standards for contaminated soils should not rely exclusively on incineration or HTMR
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> and
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> that, in many cases, innovative technologies (i.e. non-combustion)
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> technologies will be appropriate. (See 55 FR 8666, 8760-8761, (March 9, 1990)
> and 58 FR 48092, 48125, (September 14, 1993)). While the Agency believes
> that soil is,
>
> in most cases, most appropriately treated using non-combustion
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> technologies
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> other than combustion; data gathered for the Phase II Soil proposal do not demonstrate conclusively that the Universal Treatment Standards can be
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> met

using technologies other than combustion; therefore, EPA is proposing the alternative soil treatment standards discussed today at treatment levels somewhat above UTS levels."

This statement clearly states that EPA was uncertain if the available treatment performance data on hazardous soils treated by non-combustion could be interpreted to support a decision that the existing combustion based treatment limits (for nonwastewaters forms) in the 40 CFR § 268.48 can be met by non-combustion technologies.

EPA disagrees with the commenter's statement that EPA has failed to demonstrate that the proposed treatment standards can be routinely achieved by non-combustion techno-logies. EPA has shown the standards in final are achievable by demonstrated and available treatment technologies.

First, the treatment data supporting the proposed rule clearly show and support EPA's determination that several non-combustion technologies can meet the proposed limits for organic and metal constituents found in hazardous soils, or 10 x UTS levels, or the 90% reduction in the total or leachable concentration of hazardous constituents present in hazardous soils. (See preamble in Phase IV final rule, EPA 1998a, EPA 1998 b, EPA 1998c, and EPA 1998d). For instance, EPA collected over 6,000 paired data points describing the treatment of various hazardous soils. In response to an outgrowth of the comments, EPA has retained 2,143 paired non-combustion data points to set today's treatment standards. EPA believes that these 2,143 paired non-combustion data points are reasonably sufficient to adequately des-cribe the treatment of metal, organics, and multiple metal and organic contaminants that are frequently found at different type of sites, including both Superfund and RCRA sites. (EPA1998a, EPA 1998b, EPA 1998c, EPA 1998d, and EPA 1994.) For instance, the SDB has treatment data on soils with varying textures including top soils, silty/loam soils, and clay soils. (EPA 1998a) Furthermore, EPA has a number of bench and pilot studies on the treatment of contaminated soils from wood preserving, petroleum refining, and electroplating sites, which contain a wide range of constituents such as polynuclear aromatic, phenolic, chlorinated organics, spent solvents, creosote, and metals. (EPA 1998a) These constituents are found at other RCRA and Superfund sites. (EPA 1993a)

Second, full-scale data on non-combustion technologies, published in 1995 and 1997, show that ex-situ chemical and energy intensive remediation technologies applied to Superfund sites can be engineered and optimized, generally, to meet pre-designed remediation treatment objectives. In many instances, ex-situ processes were able to meet a 90 % reduction of hazardous constituents in soils or the 10 times UTS limit.

(EPA 1998a) EPA refers to these data as the Superfund full scale 1995 and 1997 data studies.[6]

Third, other pilot- and full-scale data supporting the development of Superfund Presumptive Remedy guidance documents for wood preserving sites also support EPA's proposed treatment standards. In particular, thermal desorption was able to meet concentrations and concentration reduction levels that are congruent with the treatment limits established by this rule. (EPA 1993b, EPA 1995a, and EPA 1997a)

This is an expected result since ex-situ soil remediation technologies such as stabiliza-

tion, soil washing, dechlorination, and chemical extraction are more amenable to optimi-

zation. (EPA 1994) One way to optimize these technologies is to rely on physical and chemical technologies that enable the chemical/physical treatment of soil properties or the homogenization of soils. (EPA 1998d, EPA 1994, and 1995 and 1997 Superfund full scale ex-situ studies on biotreatment and thermal desorption.)

Furthermore, in this rulemaking, given the variability of hazardous soils (in terms of soil textures, concentrations and numbers of hazardous constituents and soil matrices), plus the special considerations of facilitating treatment during remediation, the Agency is adopting treatment standards from the zone of reasonable values which could be per-

missibly selected based upon the performance data. Thus, the data are not being used so

much to establish a precise performance level as to confirm the typical achievability of the promulgated standards, i.e., ten times UTS or 90% reduction. It is therefore reasonable and appropriate to regard bench and pilot scale treatment test data as indicative of what levels of treatment that technology, when operated at full scale, would yield.

The final rule no longer includes this provision. However, if the technology based standards in this rule are inadequate to minimize threats on particlar containers. Then stricter standards can be imposed pursuant to general remediation authorities.

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[6] These data consist of many full -scale treatment studies conducted at Superfund sites. Many of the ex-situ remediation studies met the soil treatment objectives sought by their Record of Decision. Such treatment objective, in many instances, also met the proposed treatment limit of 10 times UTS for soils or the 90 % reduction in the concentration of hazardous contaminants prior to disposal. See 1997 studies: (1) Remediation Case Studies: Bioremediation and Vitrification, July 1997, EPA 542-R-97-008 or PB97-177554; (2) Remediation Case Studies: Soil Vapor Extraction and Other In Situ Technologies, July 1997, EPA 542-R-97-009 or NTIS PB97-177562; (3) Analysis of Selected Enhancements for Soil Vapor Extraction, September 1997, EPA-542-R-97-007. See 1995 studies: (1) Abstracts of Remediation Case Studies, EPA-542-R-95-001, March 1995; (2) Remedia-tion Case Studies: Thermal Desorption, Soil Washing, and In situ Vitrification, EPA- 542-R-95-005 or NTIS: PB95-182945, March 1995; (3) Remediation Case Studies: Soil Vapor Extraction , EPA-542-R-95-004 or NTIS: PB95-182937, March 1995; (4) Remediation Case Studies: Bio remediation, EPA-542-R-95-002 or NTIS: PB95-182911, March 1995; and (5) Remediation Case Studies: Groundwater Treatment, EPA-542-R-95-003 or NTIS: PB95-182929, March 1995.

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EPA 1993a, August 1993, Final/Proposed Best Demonstrated Available Technology (BDAT) Background Document for Hazardous Soil, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase II, Document Number CS2P-S0599)**

EPA 1993b, March 1993, Technology Selection Guide for Wood Treater Sites, OSWER Directive 9360.0-46FS or EPA 540-F-93-020, Office of Solid Waste and Emergency Response, Washington, D.C.

- "In the proposed rule, the treatment requirements for contaminated media is 90% reduction in total constituent concentration or to a floor of 10 x UTS, for soil. For soils that exhibit the characteristic of ignitability, corrosivity, or reactivity, the treatment requirement is deactivation technologies and addressing the underlying constituents. For media other than soil, treatment is outlined in Part 268 treatment standards for each constituent subject to treatment.

These modified treatment requirements, while on their face less stringent than the current LDR treatment standards, still require the owner/operator to attain concentration levels that may not be achievable at all and if achievable, are so only by using technologies that in many cases may be inappropriate for remediation wastes, e.g., incineration of sediment or waste waters containing only trace contaminants, when other technologies might be more appropriate or more cost effective relative to risk.

EPA did not specify the rationale for choosing these treatment standards and even goes on to say that "land disposal treatment standards for 'as-generated' wastes are not generally appropriate for contaminated environmental media" 61 *FR* 18806. It is beyond reason then why the Agency insists on force fitting LDR treatment standards developed for process wastes to apply to remediation wastes. Merck suggests that the Agency leave treatment decisions to the RMP manager after an identification of any risk to human health or the environment has been made." (109)

Response: The commenter is asking EPA to abandon its proposal that would establish treatment standards that rely on the performance of treatment technologies as opposed to risk based considerations that could be advocated under a "contingent management approach" under the Unitary proposal. The commenter has also raised various concerns regarding the basis of the treatment standard, its legal justification, and questions EPA's assessment that the treatment standards can be reached by non-combustion technologies. The commenter believes that the only way to achieve the proposed treatment standards for hazardous soils is by incineration.

EPA is not persuaded by these comments.

First, the treatment data supporting the proposed rule clearly show and support EPA's determination that several non-combustion technologies can meet the proposed limits for organic and metal constituents found in hazardous soils, or 10 x UTS levels, or the 90% reduction in the total or leachable concentration of hazardous constituents present in hazardous soils. (See preamble in Phase IV final rule, EPA 1998a, EPA 1998 b, EPA 1998c, and EPA 1998d). For instance, EPA collected over 6,000 paired data points describing the treatment of various hazardous soils. In response to an outgrowth of the comments, EPA has retained 2,143 paired non-combustion data points to set today's treatment standards. EPA believes that these 2,143 paired non-combustion data points are reasonably sufficient to adequately describe the treatment of metal, organics, and multiple metal and organic contaminants that are frequently found at different type of sites, including both Superfund and RCRA sites. (EPA1998a, EPA 1998b, EPA 1998c, EPA 1998d, and EPA 1994.) For instance, the SDB has treatment data on soils

with varying textures including top soils, silty/loam soils, and clay soils. (EPA 1998a) Furthermore, EPA has a number of bench and pilot studies on the treatment of contaminated soils from wood preserving, petroleum refining, and electroplating sites, which contain a wide range of constituents such as polynuclear aromatic, phenolic, chlorinated organics, spent solvents, creosote, and metals. (EPA 1998a) These constituents are found at other RCRA and Superfund sites. (EPA 1993a)

Second, full-scale data on non-combustion technologies, published in 1995 and 1997, show that ex-situ chemical and energy intensive remediation technologies applied to Superfund sites can be engineered and optimized, generally, to meet pre-designed remediation treatment objectives. In many instances, ex-situ processes were able to meet a 90 % reduction of hazardous constituents in soils or the 10 times UTS limit. (EPA 1998a) EPA refers to these data as the Superfund full scale 1995 and 1997 data studies.[7]

Third, other pilot- and full-scale data supporting the development of Superfund Presumptive Remedy guidance documents for wood preserving sites also support EPA's proposed treatment standards. In particular, thermal desorption was able to meet concentrations and concentration reduction levels that are congruent with the treatment limits established by this rule. (EPA 1993b, EPA 1995a, and EPA 1997a)

This is an expected result since ex-situ soil remediation technologies such asstabilization, soil washing, dechlorination, and chemical extraction are more amenable to optimization. (EPA 1994) One way to optimize these technologies is to rely on physical and chemical technologies that enable the chemical/physical treatment of soil properties or the homogenization of soils. (EPA 1998d, EPA 1994, and 1995 Superfund full scale ex-situ studies on biotreatment and thermal desorption.)

Finally, the commenter asks EPA to clarify its rationale on how the EPA arrived to the proposed treatment standards for hazardous media. Presumably, the commenter

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[7] These data consist of many full -scale treatment studies conducted at Superfund sites. Many of the ex-situ remediation studies met the soil treatment objectives sought by their Record of Decision. Such treatment objective, in many instances, also met the proposed treatment limit of 10 times UTS for soils or the 90 % reduction in the concentration of hazardous contaminants prior to disposal. See 1997 studies: (1) Remediation Case Studies: Bioremediation and Vitrification, July 1997, EPA 542-R-97-008 or PB97-177554; (2) Remediation Case Studies: Soil Vapor Extraction and Other In Situ Technologies, July 1997, EPA 542-R-97-009 or NTIS PB97-177562; (3) Analysis of Selected Enhancements for Soil Vapor Extraction, September 1997, EPA-542-R-97-007. See 1995 studies: (1) Abstracts of Remediation Case Studies, EPA-542-R-95-001, March 1995; (2) Remedia-tion Case Studies: Thermal Desorption, Soil Washing, and In situ Vitrification, EPA- 542-R-95-005 or NTIS: PB95-182945, March 1995; (3) Remediation Case Studies: Soil Vapor Extraction , EPA-542-R-95-004 or NTIS: PB95-182937, March 1995; (4) Remediation Case Studies: Bio remediation, EPA-542-R-95-002 or NTIS: PB95-182911, March 1995; and (5) Remediation Case Studies: Groundwater Treatment, EPA-542-R-95-003 or NTIS: PB95-182929, March 1995.

refers to the treatment standards proposed for sediments and groundwater since the proposed treatment standards for hazardous soils are broadly explained in the proposal and in the LDR's Phase 2 rule (see 61 FR (18804-18818), April 29, 1996, and 58 FR (48122-48154), September 14, 1993, respectively). EPA's rationale to promulgate the propsoed treatment standards for hazardous soils is explained in the preamble of this rule (Phase IV, Section VII.8 ,(Hazardous Soils)) and the following references: EPA 1998a, EPA1998b, EPA 1998c, and EPA 1998d. The commenter points out a concern that by applying the existing UTS treatment limits in the 40 CFR 268.48 to other hazardous remediation media such as sediments and groundwaters, EPA will compel the combustion of groundwaters and sediments. In particular, the commenter feels that these treatment limits are inappropriate to these other remediation media since these hazardous streams contain "low" to "minute" concentrations of hazardous pollutants.

It appears that the commenter's concerns reflected the fact that treatment standards for wastewater forms of hazardous wastes in the 40 CFR 268.40 were based in the past on the concentrations of organics measured in incineration scrubber waters. EPA believes that the concerns raised by the commenter are already addressed within the context of the Phase II final rule which switched all the treatment standards applicable to waste-water forms of hazardous wastes from combustion to treatment standards that are based on the treatment performance of physical, chemical, and biological treatment technologies that routinely treat industrial wastewaters. (EPA 1993d)

It has been EPA experience at Superfund and RCRA Corrective Action program that hazardous leachate (F039), hazardous sediments, and other hazardous groundwaters can routinely be treated in wastewater treatment processes that support the treatment standards for wastewater forms of hazardous wastes in the 40 CFR 268.48. (See EPA 1993d for a discussion of treatment processes supporting the treatment standards applicable to wastewater forms of LDR hazardous wastes and EPA 1994 describing treatment technologies that can be applied to groundwaters and sediments.) For instance, groundwaters have been treated in optimized wastewater treatment trains that meet effluent standards that allow the discharge of wastewaters into navigable waters or Publicly Owned Treatment Works (POTWs). (EPA 1994) None of the commenters have submitted treatment data that can support this commenter's (likewise unsupported) contention that the treatment standards for hazardous constituents in wastewater forms of hazardous wastes are inappropriate for sediments and groundwaters.

Further, nonwastewater forms derived from the treatment of industrial wastewater treatment process as well as from the treatment of any remediation activity regulated under RCRA, CERCLA, or TSCA authorities are often required to undergo additional treatment prior to land disposal. This is an expected result since many of the wastewater treatment processes applied to hazardous sediments and groundwaters are physical and chemical processes that shift contaminants from the

treated media to a sludge or a more concentrated liquid stream. These concentrated hazardous streams or remediation wastes can still pose a risk to the human health and the environment upon disposal. Because these concentrated streams are often sent offsite to undergo further treatment prior to land disposal (EPA 1994), EPA believes, therefore, that it is appropriate to apply 40 CFR §268.48 treatment standards to these wastes.

References:

EPA 1998a, Soil Data Analysis: Soil Treatability Analysis of Treatability Data for Contaminated Soil Treatment Technologies, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF)**

EPA 1998b, memorandum titled:"Derivation of Treatment Achievability Results for Organic Functional Groups and Types of Compounds," April 1998. from José E. Labiosa and Rita Chow of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF.)**

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EPA 1993c, April 1993, Final Best Demonstrated Available Technology (BDAT) Background Document for Universal Standards, Volume A: Universal Standards for Nonwastewater Forms of Listed Hazardous Wastes, Office of Solid Waste, Washington, D.C. 20460

EPA 1993d, April 1993, Final Best Demonstrated Available Technology (BDAT) Background Document for Universal Standards, Volume B: Universal Standards for Wastewater Forms of Listed Hazardous Wastes, Office of Solid Waste, Washington, D.C. 20460

- "EPA's proposed LDR standards for soil are unrepresentative of the abilities of common remedial technologies, and few non-thermal technologies will be capable of achieving the proposed standards. This will serve to further impede the application of innovative technologies and will simply reinforce many of the current impediments to remediation. EPA's proposed LDRs rely on an extremely thin database of technology performance, with the vast majority of the data arising from unrepresentative small-scale tests provided by vendors. This limited data set was then analyzed on an unrepresentative constituent by-constituent basis, ignoring the fact that remedial matrices contain multiple contaminants, requiring simultaneous treatment, and the differing efficiencies for different matrices and constituents typical of innovative technologies.

  The data and their analysis simply do not support a conclusion that 90% reductions in contaminant concentrations/10 times the UTS are routinely achievable by treatment technologies other than incineration. Many of the very technologies EPA is attempting to promote simply will not achieve this overly stringent level of treatment across the wide range of matrices and contaminant types commonly found in remediation wastes. We also note that there is no rational relation between such a treatment standard and potential risks being addressed at sites.

  The Agency's lack of solid treatability data reflects both the relative youth of many of these technologies and the existing regulatory barriers to their application. The proposed 90% treatment standard will only further inhibit, rather than promote, these technologies. and will continue to force the use of combustion for many remediation wastes.

  A detailed evaluation of the proposed treatment standards is provided in Section V. of these comments." (117)

Response: The commenter believes that EPA's proposed treatment standards for hazardous soils have not yet been demonstrated for any soils in practice. In fact, the commenter believes EPA's data base is not adequate to support the establishment of the proposed treatment standards for soils. This is because the commenter believes that EPA's performance data do not reflect the treatment of complex soil matrices. The commenter emphasizes further that to the extent that the proposed limits of 10 times UTS or a 90 % reduction are achieved , it can only be done by incineration.

EPA is not persuaded by these comments.

First, the treatment data supporting the proposed rule clearly show and support EPA's determination that several non-combustion technologies can meet the proposed limits for organic and metal constituents found in hazardous soils, or 10 x UTS levels, or the 90% reduction in the total or leachable concentration of hazardous constituents present in hazardous soils. (See preamble in Phase IV final rule, EPA 1998a, EPA 1998 b, EPA 1998c, and EPA 1998d). For instance, EPA collected over 6,000 paired data points describing the treatment of various hazardous soils. In response to an outgrowth of the comments, EPA has retained 2,143 paired non-combustion data points to set today's treatment standards. EPA believes that these 2,143 paired non-combustion data points are reasonably sufficient to adequately describe the treatment of metal, organics, and multiple metal and organic contaminants that are frequently found at different type of sites, including both Superfund and RCRA sites. (EPA1998a, EPA 1998b, EPA 1998c, EPA 1998d, and EPA 1994.) For instance, the SDB has treatment data on soils with varying textures including top soils, silty/loam soils, and clay soils. (EPA 1998a) Furthermore, EPA has a number of bench and pilot studies on the treatment of contaminated soils from wood preserving, petroleum refining, and electroplating sites, which contain a wide range of constituents such as polynuclear aromatic, phenolic, chlorinated organics, spent solvents, creosote, and metals. (EPA 1998a) These constituents are found at other RCRA and Superfund sites. (EPA 1993a)

Second, full-scale data on non-combustion technologies, published in 1995 and 1997, show that ex-situ chemical and energy intensive remediation technologies applied to Superfund sites can be engineered and optimized, generally, to meet pre-designed remediation treatment objectives. In many instances, ex-situ processes were able to meet a 90 % reduction of hazardous constituents in soils or the 10 times UTS limit. (EPA 1998a) EPA refers to these data as the Superfund full-scale 1995 and 1997 data studies.[8]

Third, other pilot- and full-scale data supporting the development of Superfund Presumptive Remedy guidance documents for wood preserving sites also support EPA's proposed treatment standards. In particular, thermal desorption was able to meet

[8] These data consist of many full -scale treatment studies conducted at Superfund sites. Many of the ex-situ remediation studies met the soil treatment objectives sought by their Record of Decision. Such treatment objective, in many instances, also met the proposed treatment limit of 10 times UTS for soils or the 90 % reduction in the concentration of hazardous contaminants prior to disposal. See 1997 studies: (1) Remediation Case Studies: Bioremediation and Vitrification, July 1997, EPA 542-R-97-008 or PB97-177554; (2) Remediation Case Studies: Soil Vapor Extraction and Other In Situ Technologies, July 1997, EPA 542-R-97-009 or NTIS PB97-177562; (3) Analysis of Selected Enhancements for Soil Vapor Extraction, September 1997, EPA-542-R-97-007. See 1995 studies: (1) Abstracts of Remediation Case Studies, EPA-542-R-95-001, March 1995; (2) Remedia-tion Case Studies: Thermal Desorption, Soil Washing, and In situ Vitrification, EPA- 542-R-95-005 or NTIS: PB95-182945, March 1995; (3) Remediation Case Studies: Soil Vapor Extraction , EPA-542-R-95-004 or NTIS: PB95-182937, March 1995; (4) Remediation Case Studies: Bio remediation, EPA-542-R-95-002 or NTIS: PB95-182911, March 1995; and (5) Remediation Case Studies: Groundwater Treatment, EPA-542-R-95-003 or NTIS: PB95-182929, March 1995.

concentrations and concentration reduction levels that are congruent with the treatment limits established by this rule. (EPA 1998a, EPA 1993b, EPA 1995a, and EPA 1997a)

This is an expected result since ex-situ soil remediation technologies such as stabiliza-tion, soil washing, dechlorination, and chemical extraction are more amenable to optimi-zation. (EPA 1994) One way to optimize these technologies is to rely on physical and chemical technologies that enable the chemical/physical treatment of soil properties or the homogenization of soils. (EPA 1998d, EPA 1994, and 1995 Superfund full-scale ex-situ studies on biotreatment and thermal desorption.)

Furthermore, in this rulemaking, given the variability of hazardous soils (in terms of soil textures, concentrations and numbers of hazardous constituents and soil matrices), plus the special considerations of facilitating treatment during remediation, the Agency is adopting treatment standards from the zone of reasonable values which could be permissibly selected based upon the performance data. Thus, the data are not being used so much to establish a precise performance level as to confirm the typical achievability of the promulgated standards, i.e., ten times UTS or 90% reduction.
Also, EPA is not persuaded by the arguments emphasizing that "innovative technologies", hereby referred to as non-combustion technologies, are still in their infancy. There is a wealth of information describing the field experience with operation of non-combustion technologies that span over the past nine to thirteen years. [9] In fact, engineering feasibility studies are an integral part of remediation activities that facilitates the reduction of uncertainties with regard to the feasability of designing full-scale operations of one, two, or more non-combustion treatment trains that are capable of meeting the treatment standards established today. For instance, a wealth of literature has been published on the operation, design, and field implementation of these non-combustion technologies (EPA 1998d and the Administrative Record for Best Management Practices); and many universities teach courses today on the operation and design of soil remediation technologies. Clearly, the availability of do-how and know-how is an instrumental asset for facilities to reduce uncertainties with the design, operation, and implementation of noncombustion technology trains. Adequate site characterization of contaminant, soil texture distributions (profiles), and other soil characteristics can enable the use of sound engineering principles and process engieneering to advert or managed potential soil matrix interferences and thus, meet the treatment objectives set by today's standards. (EPA1998d, see Chapter 2 in EPA 1994, and 1995 and 1997 Superfund remediation studies of full-scale ex-situ processes.)

Further, contrary to the commenter's presumption that the standards will inhibit the use of non-combustion technologies (referred by the commneter as "innovative

[9] See pages 9 through 21 document titled: Innovative Treatment Technologies Annual Status Report (eight Edition), November 1996, EPA, Washington, DC 20460. (EPA 542-R-96-010.)

technologies"), EPA believes that a treatment standard expressed as 10 times UTS or a 90% reduction will foster greater use of non-combustion technologies. For example, one likely impact of today's treatment standard is to foster greater use of combined treatment trains that can boost the ability to bioreactors to decontaminate hazardous soils in shorter times or greater performance rates. (1995 and 1997 Superfund studies and EPA 1994.) Other examples of conceptual/innovative non-combustion technologies that are likely to be fostered; but are not limited to: chemical extraction, thermal dehalogenation processes, and electro kinetics treatment systems described in EPA 1991.

References:

EPA 1998a, Soil Data Analysis: Soil Treatability Analysis of Treatability Data for Contaminated Soil Treatment Technologies, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF)**

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EPA 1991, November 1991, The Superfund Innovative Technology Evaluation Program: Technology Profiles, Fourth Edition, Office of Solid Waste and Emergency Repsonse and Office of Research and Developement, Washingtn, D.C., EPA 540/5-91/008 or NTIS: PB92-224294.

- "Although we have consistently advocated a site-specific risk-based approach to setting treatment goals, EPA has requested comment on its proposed technology-based standard. embodied in the Bright Line approach. We note that in the FACA deliberations one goal of any treatment: requirement was assurance that the use of effective innovative technologies would not be excluded from application but would, in fact be promoted. We have numerous concerns regarding EPA's proposed 90% reduction standard for higher level material, and have expressed such concerns throughout the HWIR deliberations. We note that the "areas of agreement" among the stakeholders recorded by EPA at the July 21, 1993 Roundtable meeting referred to treatment requirements. of either an unspecified percent reduction (because participants did not agree that 90% was appropriate) or specified technologies with best management practices. In our judgment, the concept of specified technologies was abandoned by EPA without rigorous evaluation. The 90% reduction value that EPA is pursuing emanated from the since set aside effort to generate soil LDR BDATs. That effort relied upon an extremely thin database on technology performance, with the vast majority of the data arising from unrepresentative small-scale tests provided by vendors This limited dare set was then analyzed on an unrepresentative constituent-by-constituent basis that ignores the reality that remedial matrices contain multiple contaminants requiring simultaneous treatment, and the differing efficiencies for different matrices and constituents typical of innovative technologies.

  The data and their analysis simply do not support a conclusion that 90% reductions in contaminant concentrations are routinely achievable by treatment technologies other than incineration. Many of the very technologies EPA is attempting to promote simply will not achieve this overly stringent level of treatment across the wide range of matrices and contaminant types commonly found in remediation wastes.

  We also note that there is no rational relation between such a treatment standard and potential risks being addressed at sites. In that regard, we point out that in the proposed rule the Agency proposes that more stringent treatment requirements (than the 90%/lOxUTS standard) may be required if the overseeing Agency determines that such further treatment is necessary to meet the Agency's remedial objectives for the site. While we have no quarrel with such a concept, it is entirely inappropriate to include such an approach in HWIR without a concomitant provision that authorizes the overseeing Agency to require less stringent treatment requirements if the remedial objectives for the site warrant such a result. Otherwise, HWIR will lead to the absurd result that overseeing agencies can set treatment requirements for lower level wastes by taking site-specific cleanup objectives into account while not being able to do so for higher level materials at the same site.

The Agency's lack of solid treatability data reflects both the relative youth of many of these technologies and the current regulatory barriers to their application. The proposed 90% treatment standard will only further inhibit, rather than promote, these technologies, and will continue to force the use of combustion for many remediation wastes.

If EPA pursues a Bright Line approach we encourage the Agency to structure the rule in a manner that promotes innovative technologies. Several options are available. In one option, the implementing agency would require the person implementing the remediation waste management to perform an evaluation of the need for treatment for materials above the Bright Line. This would be a risk-based evaluation following appropriate criteria for such evaluations. This approach would ensure a deliberate consideration of the need for and appropriate degree of treatment that would be part of the RAP process and subject to public review and comment.

An additional option includes the application of specified technologies (as agreed to by the FACA). We have previously articulated an approach to fostering innovative technologies and developing a more robust treatability database through the use of specified technologies employing best management practices. EPA would also need to provide greater flexibility in situations where a good faith effort to reach the treatment standard falls slightly short so that additional costly treatment for a marginal reduction in concentrations is not required. We note that the FACA agreed on this point as well. Specifying that treatment standards apply only to those constituents exceeding the Bright Line would also be important to ensure the appropriate application of technologies." (117)

Response: The commenter indicates that EPA relied upon an extremely thin database on technology performance, with the vast majority of the data arising from unrepresentative small-scale tests provided by vendors. The commenter is also concerned that a constituent by constituent analysis may fail to address site specific complexities that may arise from the presence of multiple constituents at a site.

These concerns are addressed in the background documents supporting today's final rule (EPA 1998a, EPA 1998b, EPA 1998c, and EPA 1998d). EPA agrees that a constituent-by-constituent approach may be inappropriate. However, a constituent-by-constituent approach was not used as the stand alone method to arrive to the 90 % reduction or 10 times UTS treatment limit. In the proposed Phase II rule, EPA also grouped hazardous constituents into distinctive treatability groups (see discussions of treatment performance attained by clusters of BDAT hazardous constituents in Chapter 4 of EPA 1993a and contaminated soil and debris functional treatability groups in Table 5.3 of Chapter 5 in EPA 1993a). EPA has improved its discussion of treatability groups and the transfer-ability of the available data to other hazardous constituents/treatability groups that lack treatment data in the soil data base. (See EPA 1998a, EPA 1998b, EPA 1998c, and EPA 1998d.)

EPA is not persuaded by the comments that the treatment standards are not achievable or that these treatment standrads shall not be finalized because of the available limited treatment data on the performance of full-scale operations of a few

non-combustion technologies (refered to the commentor as "innovative technologies").

First, the treatment data supporting the proposed rule clearly show and support EPA's determination that several non-combustion technologies can meet the proposed limits for organic and metal constituents found in hazardous soils, or 10 x UTS levels, or the 90% reduction in the total or leachable concentration of hazardous constituents present in hazardous soils. (See preamble in Phase IV final rule, EPA 1998a, EPA 1998 b, EPA1998c, and EPA 1998d). For instance, EPA collected over 6,000 paired data points describing the treatment of various hazardous soils. In response to an outgrowth of the comments, EPA has retained 2,143 paired non-combustion data points to set today's treatment standards. EPA believes that these 2,143 paired non-combustion data points are reasonably sufficient to adequately des-cribe the treatment of metal, organics, and multiple metal and organic contaminants that are frequently found at different type of sites, including both Superfund and RCRA sites. (EPA1998a, EPA 1998b, EPA 1998c, EPA 1998d, and EPA 1994.) For instance, the SDB has treatment data on soils with varying textures including top soils, silty/loam soils, and clay soils. (EPA 1998a) Furthermore, EPA has a number of bench and pilot studies on the treatment of contaminated soils from wood preserving, petroleum refining, and electroplating sites, which contain a wide range of constituents such as polynuclear aromatic, phenolic, chlorinated organics, spent solvents, creosote, and metals. (EPA 1998a) These constituents are found at other RCRA and Superfund sites. (EPA 1993a)

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Third, other pilot- and full-scale data supporting the development of Superfund Presumptive Remedy guidance documents for wood preserving sites also support

[10] These data consist of many full -scale treatment studies conducted at Superfund sites. Many of the ex-situ remediation studies met the soil treatment objectives sought by their Record of Decision. Such treatment objective, in many instances, also met the proposed treatment limit of 10 times UTS for soils or the 90 % reduction in the concentration of hazardous contaminants prior to disposal. See 1997 studies: (1) Remediation Case Studies: Bioremediation and Vitrification, July 1997, EPA 542-R-97-008 or PB97-177554; (2) Remediation Case Studies: Soil Vapor Extraction and Other In Situ Technologies, July 1997, EPA 542-R-97-009 or NTIS PB97-177562; (3) Analysis of Selected Enhancements for Soil Vapor Extraction, September 1997, EPA-542-R-97-007. See 1995 studies: (1) Abstracts of Remediation Case Studies, EPA-542-R-95-001, March 1995; (2) Remedia-tion Case Studies: Thermal Desorption, Soil Washing, and In situ Vitrification, EPA- 542-R-95-005 or NTIS: PB95-182945, March 1995; (3) Remediation Case Studies: Soil Vapor Extraction , EPA-542-R-95-004 or NTIS: PB95-182937, March 1995; (4) Remediation Case Studies: Bio remediation, EPA-542-R-95-002 or NTIS: PB95-182911, March 1995; and (5) Remediation Case Studies: Groundwater Treatment, EPA-542-R-95-003 or NTIS: PB95-182929, March 1995.

EPA's proposed treatment standards. In particular, thermal desorption was able to meet concentrations and concentration reduction levels that are congruent with the treatment limits established by this rule. (EPA 1993b, EPA 1995a, and EPA 1997a)

This is an expected result since ex-situ soil remediation technologies such as stabiliza-

tion, soil washing, dechlorination, and chemical extraction are more amenable to optimi-

zation. (EPA 1994) One way to optimize these technologies is to rely on physical and chemical technologies that enable the chemical/physical treatment of soil properties or the homogenization of soils. (EPA 1998d, EPA 1994, and 1995 Superfund full-scale

ex-situ studies on biotreatment and thermal desorption.)

Further, the establishment of treatment standards under 3004(m) does not compel EPA to establish treatment levels that are achievable by all or many technologies. This is because HSWA directs EPA to emphasize treatment levels that substantially reduce the mobility or toxicity of hazardous constituents prior to disposal such that the short- and long-term threats to the human health and the environment are minimized. EPA believes that by requiring a 90 % reduction or 10 times the UTS treatment limits in the 40 CFR §268.48, the provisions of 3004(m) are met. Although EPA agrees with most commenters that risk based limits are also valid constructs of 3004(m), and provided that such limits can be established with the requisite certainty that threats to human health and the environment are minimized, EPA believes that technology based limits are also appropriate and valid constructs to regulate the disposal of soils contaminated with hazardous wastes since such standards provide an objective measure of determining that threats are indeed being reduced (normally to the limit of a technology reasonably applied to the waste) so as to substantially reduce hazardous constituent mobility or concentration. EPA has long indicated that its preference would be to establish a complete set of risk-based land disposal treatment standards at levels that minimize short and long-term threats to human health and the environment. However, the difficulties involved in establishing risk-based standards on a nationwide basis are formidable due in large part to the wide variety of site-specific physical and chemical compositions encountered in the field and the uncertainties involved in evaluating long-term threats posed by land disposal. The final rule, however, consistent with the commenter's suggestion, contains a site-specific risk-based variance which can cap treatment standards.

However, if a soil treatment standard proves unachievable for a particular soil matrix using one, two, or more technologies on which the standard is based, and that one technology or appropriate technology train is properly designed and operated, then a treatment variance could be issued under the unachievable prong of the 40 CFR §268.44 (h). There is no requirement that the soil be treated by combustion to achieve the treatment standard.

The commenter emphasizes use of innovative treatment technologies employing best management practices. EPA is in agreement with this comment and have acted very proactively to complete the Best Management Practices (BMPs) for Soil Treatment Technologies guidance document (EPA530-R-97-007) in May 1997. All non-combustion treatment technologies that are currently used for soil treatment have been included in that guidance. The document also has kept provision for use of BMPs by future innovative/ non- combustion technologies by listing key features of each technology groups.

References:

EPA 1998a, Soil Data Analysis: Soil Treatability Analysis of Treatability Data for Contaminated Soil Treatment Technologies, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF)**

EPA 1998b, memorandum titled:"Derivation of Treatment Achievability Results for Organic Functional Groups and Types of Compounds," April 1998. from José E. Labiosa and Rita Chow of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF.)**

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EPA 1998d, Memorandum titled: "Extrapolation of Treatment Performance Data in the Soil Data Base Among Hazardous Constituents in Contaminated Soils and Other Implementation," April 1998, from José E. Labiosa of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF.)**

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EPA 1994, October 1994, Remediation Technologies: Screening Matrix and Reference Guide, Second Edition, Department of Defense/EPA Environmental Technology Council, (EPA 542/B-94/013 or **NTIS: PB 95-104 182**)

EPA 1993a, August 1993, Final/Proposed Best Demonstrated Available Technology (BDAT) Background Document for Hazardous Soil, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase II, Document Number CS2P-S0599)**

EPA 1993b, March 1993, Technology Selection Guide for Wood Treater Sites, OSWER Directive 9360.0-46FS or EPA 540-F-93-020, Office of Solid Waste and Emergency Response, Washington, D.C.

- "EPA's proposed LDR treatment standards are badly flawed, and few remedial technologies would be able to meet them on real contaminated media. Both the data used for the analysis and the manner in which the data was analyzed were flawed, with the result that the LDRs simply do not reflect the technological capabilities of common remedial technologies. These proposed standards will only serve to reinforce the status quo of excessive, costly treatment unrelated to risk.

  EPA developed its proposed soil treatment goals based upon the Agency's very limited innovative technology data for soils, the Soil Treatability Database (SID), which contains a total of 295 tests for 9 technologies. The data base contains 2540 data pairs for 80 constituents, or an average of 31 data pairs per constituent per technology. Each data pair consists of a pre-and post-treatment concentration for a given constituent. EPA then extended this limited data for 80 constituents to 932 constituents.

  In addition to the limited amount of data in the data base, the vast majority of it was derived from unrepresentative small scale tests. Eighty five percent (85%) of the tests in the database were performed on samples smaller than 1000 kg (or less than 5 drums) of soil, with fully 40% of the tests performed on less than 1 kg (1 quart) of soil. EPA recommends minimum treatability sample sizes on the order of 1,000-5,000 kg (treatability sample exclusion volume expansion proposal). Very little of the data in the STD derives from tests on such volumes, rather the majority is from tests performed in beakers on a lab bench. We also note that most of EPA's data derived from technology vendors, who often report their best results on individual constituents from multiple tests, rather than actual performance on multiple constituents from a representative test.

  Soil is a highly heterogeneous medium, such that such small samples are unrepresentative. This heterogeneity occurs both in the physical form of the soil (e.g. the relative proportions of gravel, sand, silt and clay, as well as organic matter and other soil components) and in the distribution of contaminants (often influenced by the physical characteristics of the soil). Thus, the small samples that form the basis of the STD are unrepresentative of actual contaminated soil, such that the testing data cannot be legitimately extrapolated.

  Further, bench and pilot scale tests, which form the virtual totality of the database, are unrepresentative of both treatment technology process variability and scale up performance. As a result, the performance of these small scale tests on unrepresentative samples of soil result in a database that provides no sound technical basis for establishing the expected performance of these treatment technologies in the real world.

  The final flaw in EPA's development of soil treatment goals was the analysis of the data base on a constituent by constituent basis. In essence, the Agency would extract all data pairs for a given constituent for all technologies tested from the data base. This data, naturally reflecting a range of treatment effectiveness related to the soil types and technologies tested (though unlikely reflecting actual technology performance) was then plotted with the number of data points on one axis and the post treatment concentration on the other. EPA indicates that for most constituents these curves generally described an "S" form. EPA then selected

the flexion point on the curve as representative of the ability of the technologies to treat the constituent.

This technique has several significant flaws. We have already discussed the lack of representativeness of the data in the first instance. In addition, the data analysis approach ignores the fact that contaminated media almost always contain an array of contaminants across several contaminant classes (e.g. volatile and semi-volatile organic materials, metals). Each technology has (often widely) varying degrees of efficiency for different constituents. As a result, while a given technology might be able to achieve EPA's specified treatment goals for a given constituent in a given soil type, it is highly unlikely that the technology could uniformly achieve the treatment goal for all of the constituents in the normal range of soil types.

For example, soil Bio remediation may show very high removals for volatile aromatic hydrocarbons in sandy soils, lesser removals for semi-volatile aromatic hydrocarbons and varying removals for chlorinated hydrocarbons. While the treatment might be sufficient to protect human health and the environment, it would not likely meet the stringent goals EPA has proposed for all constituents and all soils. In fact, we have very strong concerns that innovative technologies will seldom meet the stringent proposed treatment goals for all of the different constituents in soil. This suggests that only very aggressive technologies with uniformly high removals across constituent classes, such as incineration, will achieve the proposed treatment goals on many soils. Such an approach appears inconsistent with several of EPA's policy goals, including promoting the use of innovative technologies in HWIR, "reducing reliance on thermal technologies and promoting risk based remedial solutions in the Corrective Action program.

We believe that the Agency's proposed approach will simply perpetuate the current LDR impediments which the Agency expresses clearly in the preamble;

> "In proposing the NCP, EPA discussed the effect that LDRs can have on CERCLA decision making. For wastes potentially subject to the LDRs, essentially only two options will generally be available -- treatment to BDAT standards, or containment (including containment of wastes treated in situ). The range of treatment technologies between these two extremes that may be practical and cost-effective, and yield highly protective environmental results, would not be available to decision makers. In some cases, given only these two remedial choices, decision makers may be pressured to select containment remedies that offer less permanence than treatment options that might otherwise be selected if the LDRs were not applicable (54 FR 41566, 41568, (October 10, 1989)."

c. Treatment decisions should be site-specific and risk-based

We firmly believe that treatment needs should be established on a site-by-site basis and should be a risk-based decision, just as are other remedial decisions made every day by the programs that would oversee HWIR implementation. A one-size-fits-all technology based standard, particularly one as flawed as this, simply has no place in a remedial context. This

is particularly striking in light of EPA's stated desire to make the RCRA Corrective Action program a risk based remedial program.

d. DuPont offers two alternate treatment requirement approaches

We think this is yet another sound argument for EPA's adoption of the Unitary approach to the HWIR rulemaking. However, if the Agency continues to pursue a Bright Line approach we recommend two options for addressing treatment. In the first option, the implementing Agency would require the person implementing the remediation waste management to perform an evaluation of the need for treatment for materials above the Bright Line. This would be a risk-based evaluation following criteria established by the Agency for such evaluations. This approach would ensure a deliberate consideration of the need for and appropriate degree of treatment that would be part of the RAP process and subject to public review and comment

A second, and in our view less appropriate, option, would be for EPA to specify treatment for materials above the Bright Line not as a concentration goal but rather require that specified innovative technologies be applied. This would allow innovative technologies to be used, would not run afoul of the problems detailed above, and would provide EPA with real world data on the performance of these technologies." (117)

Response: The commenter questions the validity of the soil treatability database for setting the treatment goals, objects to the proposed methodology in setting the treatment standards, and finally proposed two alternatives to the promulgation of technology based treatment standards within the context of a Bright line model.

EPA is not persuaded by the comments that the treatment standards are not achievable or that these treatment standrads shall not be finalized because of the available limited treatment data on the performance of full-scale operations of a few non-combustion technologies (refered to the commentor as “innovative technologies”).

Below are the responses to the issues raised by the commenter:

Validity of the Treatability Data Base

1. Description of the soil data base.

The treatment data supporting the proposed rule clearly show and support EPA’s determination that several non-combustion technologies can meet the proposed limits for organic and metal constituents found in hazardous soils, or 10 x UTS levels, or the 90% reduction in the total or leachable concentration of hazardous constituents present in hazardous soils. (See preamble in Phase IV final rule, EPA 1998a, EPA 1998 b, EPA 1998c, and EPA 1998d). For instance, EPA collected over 6,000 paired data points describing the treatment of various hazardous soils. In response to an outgrowth of the comments, EPA has retained 2,143 paired non-combustion data points to set today’s treatment standards. EPA believes that these

2,143 paired non-combustion data points are reasonably to adequately describe the treatment of metal, organics, and multiple metal and organic contaminants that are frequently found at different type of sites, including both Superfund and RCRA sites. (EPA1998a, EPA 1998b, EPA 1998c, EPA 1998d, and EPA 1994.) SeeEPA 1998a for more detailed information on the number of data points per technology and scale of each treatability studies, number of constituents treated, multi-contaminants per study, and the soil textures in the soild data base.

For instance, the SDB has treatment data on soils with varying textures including top soils, silty/loam soils, and clay soils. (EPA 1998a) Furthermore, EPA has a number of bench and pilot studies on the treatment of contaminated soils from wood preserving, petroleum refining, and electroplating sites, which contain a wide range of constituents such as polynuclear aromatic, phenolic, chlorinated organics, spent solvents, creosote, and metals. (EPA 1998a) These constituents are found at other RCRA and Superfund sites. (EPA 1993a)

2. Scale of the treatability studies.

The commenter opposes the proposed scale that designate treatability studies as bench-, pilot-, or full-scale operation. The commenter feels, generally, that sample size classifica-tion in the soil data base shall conform, presumably, to sample sizes within the context of the RCRA treatability exclusion. EPA addresses these comments in the Phase IV preamble of today's final rule, under Section VII(8).

EPA shares the concerns of the commenter that there are some uncertainties with regard to the proposed transfer of becnhc- and pilot-scale opeartions to full-scale operations. EPA believes, however, that these uncertainties are already addressed within the proposed and adopted screening and quality assurance/quality control protocol and methodology to sort out data that may be appropriate for rulemaking. (see EPA1993a and EPA 1998d)). For instance, EPA eliminated from rulemaking consideration any operating data that resulted from atypical full-scale operations. EPA excluded many bench- and pilot- scale biological treatment studies that underwent excessive aeration since these practice may not be reflective of full-scale operations. In any case, the extrapolation of performance data from feasabilities studies to the scale up of full-scale operations relies on empirical correlations and inferences from bench-/pilot-scale studies along with engineering judgments on the validity of the attained results. As commonly done by many process engineering practictioners, EPA has compared the treatment performance ranges demonstrated by various treatment studies in the data base to other corroborative data in the published literature (see, for example, Chapter 3 in

EPA 1998d). EPA has found that the average treatment performance ranges in the soil data base are congruent with those in the general literature. As a result, EPA is promulgating the proposed treatment limits for hazardous soils.

3. Available full-scale treatment performance data for non-combustion technologies show that the standards are generally achievable.

Full-scale data on non-combustion technologies, published in 1995 and 1997, show that ex-situ chemical and energy intensive remediation technologies applied to Superfund sites can be engineered and optimized, generally, to meet pre-designed remediation treatment objectives. In many instances, ex-situ processes were able to meet a 90 % reduction of hazardous constituents in soils or the 10 times UTS limit. (EPA 1998a) EPA refers to these data as the Superfund full scale 1995 and 1997 data studies.[11]

Other pilot- and full-scale data supporting the development of Superfund Presumptive Remedy guidance documents for wood preserving sites also support EPA's proposed treatment standards. In particular, thermal desorption was able to meet concentrations and concentration reduction levels that are congruent (i.e., achieve) with the treatment limits established by this rule, even for soils heavily contain with hard-to-treat hazardous constituent (e.g., PCP and PCBs). (EPA 1993b, EPA 1995a, EPA 1997a, and corroborative data in Chapter 3 of EPA 1998a)

This is an expected result since ex-situ soil remediation technologies such as stabiliza- tion, soil washing, dechlorination, and chemical extraction are more amenable to optimi- zation. (EPA 1994) One way to optimize these technologies is to rely on physical and or chemical technologies that enable the chemical/physical treatment of soil properties scale the homogenization of soils. (EPA 1998d, EPA 1994, and 1995 Superfund full- ex-situ studies on biotreatment and thermal desorption.)

4. How soil variabilty is being addressed in the Soil Data Base

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[11] These data consist of many full -scale treatment studies conducted at Superfund sites. Many of the ex-situ remediation studies met the soil treatment objectives sought by their Record of Decision. Such treatment objective, in many instances, also met the proposed treatment limit of 10 times UTS for soils or the 90 % reduction in the concentration of hazardous contaminants prior to disposal. See 1997 studies: (1) Remediation Case Studies: Bioremediation and Vitrification, July 1997, EPA 542-R-97-008 or PB97-177554; (2) Remediation Case Studies: Soil Vapor Extraction and Other In Situ Technologies, July 1997, EPA 542-R-97-009 or NTIS PB97-177562; (3) Analysis of Selected Enhancements for Soil Vapor Extraction, September 1997, EPA-542-R-97-007. See 1995 studies: (1) Abstracts of Remediation Case Studies, EPA-542-R-95-001, March 1995; (2) Remedia-tion Case Studies: Thermal Desorption, Soil Washing, and In situ Vitrification, EPA- 542-R-95-005 or NTIS: PB95-182945, March 1995; (3) Remediation Case Studies: Soil Vapor Extraction , EPA-542-R-95-004 or NTIS: PB95-182937, March 1995; (4) Remediation Case Studies: Bio remediation, EPA-542-R-95-002 or NTIS: PB95-182911, March 1995; and (5) Remediation Case Studies: Groundwater Treatment, EPA-542-R-95-003 or NTIS: PB95-182929, March 1995.

EPA agrees with the commenter that soils are inherently variable in their physical and chemical characteristics. Usually, the variability is much greater vertically than horizontally, resulting from the soil variability in the process that originally formed the soils. The soil variability, in turn, will result in variability in the distribution of water and contaminants and in the ease with which contaminants can be transported within, and removed from, the soil at a particular site. (EPA 1994.)

EPA disagrees with the commenter, however, that such soil physical-chemical variability is lacking in the soil data base. As shown in Chapter 4 and supporting Appendices of EPA 1998a, the soil data base adequately describe the treatment of various soil textures ranging from difficult-to-treat clays/silts to easier-to-treat coarse/sands. Soil texture/particle size distribution is among one of the most important soil characteristics to know because this soil characteristic parameter may be used to screen the applicability of certain remediation technologies. In other instances, particle size distribution enable the identification of adequate pre-treatment steps or specialty/ancillary equipment that enable the contaminants to be treated by an appropriate non-combustion treatment technology.

The soil data base also include some data points describing the treatment of oily acidic sludges and sediments. These particular streams can mimic the treatment of soils were clay/silts are the dominant soil texture. Further, the soil data base show the effectiveness of various technologies in treating difficult-to-treat soil textures and difficult-to-treat constituents such as PNAs (4 and 5 more rings), dioxin and furans, and creosote admixtures.

Corroborative data in the 1995 and 1997 Superfund studies[12] also show that soil variability can be managed by optimized ex-situ full-scale treatment processes. For instance, these Superfund 1995 and 1997 studies document the following approaches to treatment optimization:

(a) Soil homogenization[13] - involves the use of ex-situ physical/chemical (p/c) processes to reduce soil heterogeneities that may inhibit treatment performance.

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[12] These data consist of many full -scale treatment studies conducted at Superfund sites. Many of the ex-situ remediation studies met the soil treatment objectives sought by their Record of Decision. Such treatment objective, in many instances, also met the proposed treatment limit of 10 times UTS for soils or the 90 % reduction in the concentration of hazardous contaminants prior to disposal. See 1997 studies: (1) Remediation Case Studies: Bioremediation and Vitrification, July 1997, EPA 542-R-97-008 or PB97-177554; (2) Remediation Case Studies: Soil Vapor Extraction and Other In Situ Technologies, July 1997, EPA 542-R-97-009 or NTIS PB97-177562; (3) Analysis of Selected Enhancements for Soil Vapor Extraction, September 1997, EPA-542-R-97-007. See 1995 studies: (1) Abstracts of Remediation Case Studies, EPA-542-R-95-001, March 1995; (2) Remedia-tion Case Studies: Thermal Desorption, Soil Washing, and In situ Vitrification, EPA- 542-R-95-005 or NTIS: PB95-182945, March 1995; (3) Remediation Case Studies: Soil Vapor Extraction , EPA-542-R-95-004 or NTIS: PB95-182937, March 1995; (4) Remediation Case Studies: Bio remediation, EPA-542-R-95-002 or NTIS: PB95-182911, March 1995; and (5) Remediation Case Studies: Groundwater Treatment, EPA-542-R-95-003 or NTIS: PB95-182929, March 1995.

[13] See description of soil screening and separation processes that enable the treatment of difficult-to-treat clay/silty soils via bioremediation and the soil washing of sludge/soil bands; respectively, in the following Superfund 1995/1997 full-scale ex-situ treatability studies: (1) Slurry Phase Bioremediation at the Southern Wood Preserving Superfund Site, Canton, Mississippi , in p. 83, EPA 1997b and (2) Soil Washing at the King of Prussia Technical Corporation Superfund Site, Winslow Township, New Jersey, in p.36 through 38 of EPA 1995b.

P/C processes can be used to screen and segregate fines from large soil fractions, to mix soils with less contaminated/clean soils such that soil malleability can be improved, or to treat other dominant soil physical/chemical characteristic in order to facilitate or to enhance treatment.

Another technique is the selective excavation of soils.[14] This technique involves the combined use of visual inspections, adequate site characterization data on soil texture variability and contaminant distribution, historical site management practices, and field sampling testing equipment/protocols in order to screen vertical soil bands or horizontal soil that can be selectively excavated to undergo treatment. This other technique is routine to the excavation and remediation of hazardous soils.

(b) Technology design - involves an understanding of the contaminants in the soil, soil properties that can inhibit treatment, the extrapolation of empirical data from feasibility pilot-/bench-scale studies to full-scale operations. The extrapolation of empirical data also involves the exercise of sound engineering judgments with regard to soil/conta-minant characteristics that can cause material handling problems, identification of ancillary or specialty equipment units that can be installed to lessen such material handling problems, and designing the right sequence these equipment ought to be installed and operated.

(c) Technology operation - involves various trial and error steps that operators follow in scoping the operational technology parameters that can harness the capabilities of the technology to treat the contaminated soils and thus, meet the technology pre-designed treatment objectives. For instance, operators may identify key recalcitrant or difficult-to-treat hazardous constituents to monitor for and then, optimize operational parameters that enhance the removal or destructtion of such contaminants. For example, the operator may operate the treatment process at a higher temperatures, an optimum pH range, a greater ratio amount of reagent-to-contaminant, or at the upper range of the technology designed treatment range provide for longer residense time.

In conclusion, EPA believes that the concerns expressed by the commenter are adequately addressed in the soil data base. The corroborative data show that many of the issues raised by the commenters can be adequately addressed within the context of treatability feasibility studies which are an integral part of soil remediation activities under both RCRA and CERCLA programs. Further, the treatment performance of ex-situ full scale operations (bioremediation, thermal desorption, and soil washing) in the 1995 and 1997 Superfund studies are congruent (i.e. achieve) with the treatment performance that these technologies achieved for

[14] For example, see the selective soil excavation technique described in the corroborative full-scale Superfund study titled: Soil Washing at the King of Prussia Technical Corporation Superfund Site, Winslow Township, New Jersey, in p.35 & 36 of EPA 1995a.

similar difficult-to-treat hazardous constituents and harder-to treat soils in the soil data base described in EPA 1998a.

Methodology to Establish Treatment Standards for Hazardous Soils

The commenter is also concerned that a constituent by constituent analysis may fail to address site specific complexities that may arise from the presence of multiple constituents at a site.

These concerns are addressed in the background documents supporting today's final rule (EPA 1998a, EPA 1998b, EPA 1998c, and EPA 1998d). EPA agreesthat a constituent-by-constituent approach may be inappropriate. However, a constituent-by-constituent approach was not used as the stand alone method to arrive to the 90 % reduction or 10 times UTS treatment limit. In the proposed Phase II rule, EPA also grouped hazardous constituents into distinctive treatability groups (see discussions of treatment performance attained by clusters of BDAT hazardous constituents in Chapter 4 of EPA1993a and contaminated soil and debris functional treatability groups in Table 5.3 of Chapter 5 in EPA 1993a). EPA has improved its discussion of treatabilty groups and the transfer-ability of the avialble to other hazardous constituents/treatability groups that lack treat-ment data in the soil data base. (See EPA 1998a, EPA 1998b, EPA 1998c, and EPA 1998d.)

Other miscellaneous issues

EPA also disagrees with the commenter that the proposed approach will perpetuate current LDR potential impediments. The options provided in the final rule would have containment or treatment options using faster, cheaper, and newer technologies. More innovative stabilization technologies have been developed. Also, new technologies, such as electro kinetics have shown promise. (EPA 1991)

The commenter was also questioning the merits of EPA's proposed Bright Line levels and the proposed provisions that may enable an overseeing agency to impose more stringent requirements. However, based on further consideration and consideration of comments, the Agency is persuaded that a site-specific minimize threat variance should be available to all contaminated soils. The Agency believes this is proper because the outcome of a site-specific, risk-based minimize threat variance -- alternative, site-specific LDR treatment standards based on risk -- will

be the same regardless of the initial concentrations of hazardous constituents. In any case, the Agency is not at this time, taking action on the portion of the April 29, 1996 proposal that would have established a "bright line" to distinguish between higher- and lower-risk media. Therefore, the commenter's proposed two alternative approachesto LDR -technology based treatment standards can not be addressed in this final rule.

References:

EPA 1998a, Soil Data Analysis: Analysis of Treatability Data for Contaminated Soil Treatment Technologies, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF)**

EPA 1998b, memorandum titled:"Derivation of Treatment Achievability Results for Organic Functional Groups and Types of Compounds," April 1998. from José E. Labiosa and Rita Chow of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF.)**

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EPA 1991, November 1991, The Superfund Innovative Technology Evaluation Program: Technology Profiles, Fourth Edition, Office of Solid Waste and Emergency Repsonse and Office of Research and Developement, Washingtn, D.C., EPA 540/5-91/008 or NTIS: PB92-224294.

- "DuPont firmly believes that LDRs are inappropriate in the remedial context, and that EPA should adopt the Unitary approach to HWIR and so obviate the need to establish arbitrary generic treatment standards. If EPA chooses, however, to proceed with the Bright Line approach, an alternate approach to establishing treatment goals is sorely needed, as the proposed LDRs are badly flawed and will largely perpetuate the current impediments to remediation. In this instance we would encourage the Agency to specify a range of effective remedial technologies whose application would constitute compliance with LDRs. EPA could then collect real world treatment performance results, and in the future be in a position to promulgate either a risk methodology for determining site-specific LDR treatment requirements (our preference) or legitimate and achievable technology based LDRs based on the real performance of remedial technologies." (117)

Response: Many commenters expressed concern that application of LDRs to remediation wastes was (1) overly complex and (2) would result in treatment beyond the point at which threats to human health or the environment are minimized. The majority of these commenters, like this person, advised that the Agency either exempt remediation waste entirely from a duty to comply with LDRs or, if compliance with LDRs were required, allow treatment standards to be developed on a site-specific basis.

Regarding concerns that application of LDRs to remediation waste is overly complex and the suggestion that EPA simply exempt the majority of remediation waste, including contaminated soil, from a duty to comply with LDRs, at this time the Agency is not taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all remediation waste to exit large portions of the RCRA Subtitle C system. As discussed in the preamble to today's action, the Agency continues to believe that legislative amendment of the application of RCRA Subtitle C regulations, especially LDRs, to remediation waste is needed. If legislative change is forthcoming, EPA will likely re-examine application of LDRs to contaminated soil -- and remediation waste more generally -- at that time. If there is no legislative clarification, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soil or other remediation wastes. In the meantime, EPA has revised today's regulations to make it easier for generators to determine whether they have a duty to comply with LDRs for contaminated soil. Whether or not a duty to comply with LDR applies to any given contaminated soil can now be ascertained by applying information about the soil to questions in an easier to read chart. EPA believes this clarification will assist generators in complying with LDR treatment standards and will ensure that hazardous remediation wastes are treated appropriately.

Regarding the concern that application of national, technology-based, LDR treatment standards to contaminated soil - and other remediation waste -- will

prompt treatment beyond the point at which threats to human health and the environment are minimized and the suggestion that EPA allow treatment standards for remediation waste to be developed based on risk, EPA agrees that risk-based LDR treatment standards would be preferable. However, the Agency has, to date, been unable to develop risk-based standards that could be applied at a national level largely because of the wide variety of site-specific physical and chemical compositions encountered in the field and the uncertainties involved in evaluating long-term threats posed by land disposal. EPA believes, that it is possible to evaluate hwen threats are minimized at individual remediation sites and accordingly has adopted a site-specific risk-based variance as part of the final rule. Thus, in order to ensure that the technology-based standards for contaminated soil do not require treatment to a point beyond that at which threats to human health and the environment are minimized, the Agency has provided an opportunity for a treatment variance, which could be used, on a site-specific basis to cap the technology-based treatment standards. The variance is discussed in detail in the preamble to today's action.

- "We first note that EPA significantly mischaracterizes the agreement reached in the FACA regarding treatment goals. Throughout the FACA deliberations industry representatives raised significant concerns with a 90% reduction goal, which was used largely as a "placeholder" during those deliberations, and advocated a specified technology approach, wherein EPA would consider the application of certain specified remediation technologies to constitute adequate treatment. The FACA did not in the end support a single treatment goal, but directed EPA to look at either a specified technology approach or an undefined percent reduction goal realistically achievable by innovative remedial technologies." (117)

Response: EPA finds that 90% reduction goal is achievable by noncombustion type treatment technologies. Also, the establishment of treatment standards under 3004(m) do not compel EPA to establish treatment levels that are achievable by all or many technologies. This is because HSWA directs EPA to emphasize treatment levels that substantially reduce the mobility or toxicity of hazardous constituents prior to disposal such that the short- and long-term threats to the human health and the environment are minimized. EPA believes that by requiring a 90 % reduction or 10 times the UTS treatment limits in the 40 CFR 268.48, the provisions of 3004(m) are met. Although EPA agrees with most commenters that risk based limits are also valid constructs of 3004(m), and that such alternative construct may be more appropriate for some hazardous soils, EPA believes that technology based limits are also appropriate and valid constructs to regulate the disposal of soils comments contaminated with hazardous wastes. For certain media, EPA believes that the treatability variance process can be an effective tool to address concerns that may arise from uncertainties in meeting the treatment objectives set by today's treatment standards. However, the Agency believes that the technologies promulgated today are more than effective enough in reaching the required standard.

We regret that some commenters believe EPA mischaracterized the FACA committee's advice.

- "The proposed standards of 90 percent reduction or 10 times the universal treatment standard are arbitrary levels that are not supported by technical or risk data. These standards are particularly inappropriate for metals, which cannot be destroyed in the same manner as organics. Therefore, the standard may not be possible to achieve in some cases, depending on the characteristics of the particular soil. In practice, it is easier to meet the 90 percent reduction standard in soils with high metal concentrations than lower metal concentrations. A highly contaminated soil treated to the 90 percent level may still pose greater risks than a soil with lower metal concentrations that was not successfully treated to the 90 percent level. EPA should adopt risk-based treatment standards that reflect the special characteristics of metals rather than an arbitrary and scientifically unsupported 90 percent reduction standard." (75)

Response: As stated in today's preamble, EPA does not believe that the soil treatment standards are arbitrary. They are within the zone of reasonable values achievable by treatment technologies which are appropriate for remediation. Furthermore, EPA strongly believes that the soil treatment standards can be reliably achieved. Of course, since soil treatment is generally matrix dependent, the exact treatment technology which might by applied to any given contaminated soil will depend on the specific properties of the soil and the hazardous constituents of concern. However, based on 269 data points, EPA has determined that the treatment of metals in soils via stabilization resulted in average treatment efficiencies that range from 91% to 99.8% (as measured in TCLP extracts). Thus, the Agency concludes that today's treatment standards for metals in soils are feasible for a wide variety of soils, and can be achieved by stabilization. (EPA 1998c)

Reference:

EPA 1998c, memorandum titled:"Additional Information on Treatability of Contaminated Soils as Discussed in Section VII.B.8. of Phase IV Final Rule Preamble," April 1998, from José E. Labiosa and Rita Chow of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF.)**

- "Page 18806, column 3, paragraph 2, the proposed rule would establish alternative soil specific LDR standards requiring treatment that would reduce constituent concentrations by 90 percent. How effective is this target? At sites where such reductions have already been targeted, how effective have they been? Is such a reduction realistic? Also, for metal contaminants, the 90 percent standard would apply to the concentrations of the metals in leachate as measured using the TCLP (or to the total concentrations of metals, but not necessarily both). This may be protective of groundwater but not necessarily of direct ingestion of soils and therefore the concentration of total metals reduction should be given more weight when determining soils treatment." (41)

Response: The levels chosen –90% reduction capped at 10 xUTS -- are within the zone of reasonable levels the Agency could have selected as treatment standards for

contaminated soil, based upon performance of treatment technologies appropriate for contamianted soils. The soil treatability data from EPA's Soil Treatment Database indicate that the soil treatment standards are achievable. (See EPA 1998a, EPA 1998c)

References:

EPA 1998a, Soil Data Analysis: Soil Treatability Analysis of Treatability Data for Contaminated Soil Treatment Technologies, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF)**

EPA 1998c, memorandum titled:"Additional Information on Treatability of Contaminated Soils as Discussed in Section VII.B.8. of Phase IV Final Rule Preamble," April 1998, from José E. Labiosa and Rita Chow of EPA Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF.)**

- "**Land Disposal Restrictions.** The proposal requires that soils be treated to a 90% reduction of total constituent concentrations or as measured in leachate, if the constituent is present in the soil at 10 times the Universal Treatment Standard. These treatment standards aren't health-based, and the basis for those limits is arbitrary. Requirements concerning treatment of the waste should be determined on a site-specific basis. The requirement that remediation waste generated from cleanups should meet any land disposal restriction requirements should be eliminated. The goal behind the land disposal restrictions was to lessen the amount of generated waste. The goal behind a remediation project is to remove and appropriately dispose the remediation waste. Imposing land disposal restrictions creates disincentives to cleaning up the site." (128)

Response: The basis for the standards is not arbitrary. The standards are from a zone of reasonable values reflecting treatment of soils by technologies appropriate for treating soils. Further, though a goal of remediation is to re,move soils for treatment, it remains a goal that threats posed by land disposal be minimized. These standards help achieve that goal.

- "**Requiring Treatment of Soils Such That the Concentrations of Non-Metal Constituents Are Reduced By 90 Percent is Not Appropriate for Waste-Derived Products Under § 266.20**

  In section V.C.2. of the proposed rule (61 Fed. Reg. at p. 18806), EPA proposes that contaminated soils be treated so that the concentrations of non-metal constituents subject to treatment are reduced by 90 percent with treatment, or 10 times the Universal Treatment Standard, whichever is higher. For metal contaminants, the 90 percent standard would apply either to the total concentrations or the metals in leachate as measured using the TCLP.

  Under Part 266, Encapco products must meet specific criteria before being applied to land. The recyclable materials in such products must have undergone a chemical reaction in the course of producing the product so as to become inseparable by physical means. Such products must also satisfy the current Part 268 land disposal treatment standards. Such products must also constitute legitimate recycling, and must be produced for the general

public's use. See 40 CFR § 266.20(b). These stringent standards ensure that the waste-derived products are protective of human health and the environment.

In the HWIR-Media proposal, EPA proposes soil-specific LDRs that, for nonmetals, would require either a 90 percent reduction in total constituents or 10 times the Universal Treatment Standards, whichever is higher. The product produced by Encapco demonstrates why this proposal is inappropriate for waste-derived products which achieve the rigorous § 266.20 standards. Encapco employs asphaltic emulsions, modified through a proprietary process, to enhance the structural characteristics of soil through chemical reaction and bonding, not just simple mixing. The resulting product has structural properties, achieved without the use of any added aggregates, which enables it to be used as a high grade road or asphalt base product. Because it renders the hazardous constituents in soil, Encapco's stabilization/fixation technology will satisfy § 266.20 requirements. Encapco's process also satisfies the land disposal treatment standards in 40 C.F.R. Part 268, Subpart D.

However, the 90 percent reduction of total constituent concentration would bar the use of Encapco's process for treating soils contaminated with non-metal constituents. As a stabilization/fixation technology, Encapco's process, and other stabilization processes, only immobilizes hazardous constituents. The technology cannot alter the amount of hazardous constituents in the soil, and thus the resulting waste-derived product cannot satisfy an LDR based on total concentration. As a result, no stabilization/fixation process, and few if any recycling processes of any other type, will be able to satisfy such a test.

Thus, even though the Encapco process recycles hazardous waste into a safe commercial product which meets the current strict requirements of the waste-derived product exemption, its use would be precluded by the proposed soil-specific LDRs in the proposed HWIR-Media proposal. This result runs counter to RCRA's goal of promoting environmentally-protective recycling, and is inconsistent with the underlying goal of the HWIR-Media proposal." (53)

Response: As stated in more detail in the preamble, the Agency believes it is inappropriate to apply the revised standards for soils to contaminated soils which are used in a manner constituting disposal. There is a very real question whether such standards would be sufficient to minimize threats, given the possibility of virtually unlimited potential exposure pathways available for such wastes. In addition, there is no question that the more stringent UTS levels are “appropriate” for such wastes -- unlike other contaminated soils -- since EPA is not seeking to create regulatory incentives for unsupervised land placement of contaminated soils (i.e. Their use in a manner constituting disposal). The situation thus is different from where the Agency wishes to encourage exhumation of soils so that the soils can be treated and then disposed as part of a site remediation. EPA hopes to issue guidance in the near future addressing the question of when stabilization of organics might not be allowed as means of LDR compliance.

- "The Agency's use of the universal treatment standards for this purpose is misplaced and inappropriate. In the LDR Phase II proposal, EPA acknowledged that the treatment

standards applicable to "as generated" waste are not appropriate for contaminated soil, and the Agency proposed alternative methods for establishing treatment standards for contaminated soils (58 Fed. Reg. 48092, 48122-33 (Sept. 14, 1993)). The Agency later withdrew this proposal, stating that the Hazardous Waste Identification Rule ("HWIR") would be used as the mechanism for addressing the issue of contaminated media (59 Fed. Reg. 10778 (March 8, 1994)). Relying on EPA's statements, the Consensus Group deferred commenting on the PCB treatment standard in that earlier rulemaking. However, despite EPA's assurances, the final LDR Phase II rule subjected soils to the LDRs and imposed the same treatment standards on TC-organic soils as it did on "as generated" TC-organic wastes (59 Fed. Reg. 47982, 4798-87 (September 19, 1994)). At the same time, however, EPA acknowledged that these treatment standards are generally unachievable for such soils. Id. EPA's actions regarding the development of treatment standards for contaminated soil deprived the regulated community of any meaningful opportunity to provide comment on the proposal, and USWAG and NEMA have challenged EPA's action. Nat'l Elec. Mfr. Ass'n v. EPA, No. 94-1752 (D.C. Cir. filed December 15, 1994). Because these standards remain unlawful, the Agency's persistence in applying these same standards in the present rulemaking is similarly invalid." (58)

Response: The Agency strongly disagrees with the commenter's assertion that the regulated community was deprived of any meaningful opportunity to provide comment on the proposal, and rejects the other assertions made concerning EPA notice. Therefore, the commenter's position is not persuasive, and was declared so by the D.C. Circuit, finding that the Agency gave more than ample notice of its actions. NEMA, 99 F. 3d 1179 (D.C. Cir. 1996).

- "Even if EPA is reproposing the universal treatment standard for PCBs as part of the Media Rule, EPA has clearly acknowledged that the universal treatment standards are inappropriate for contaminated soil. The Agency stated in the preamble to the Phase II rule that because of the difference in physical form between soil and as-generated waste "the treatment standards for as generated wastes are generally inappropriate or unachievable for soils contaminated with hazardous wastes." (59 Fed. Reg. at 4798-087). As further recognition of the inappropriateness of the universal treatment standard for soils, the Agency provided that TC-organic soils would generally be eligible for a treatability variance on a site-specific basis. Id..

  The imposition of the Phase II LDR treatment standards on TC-organic soils also is contrary to the Agency's approach for establishing the LDR rules. In promulgating treatment standards, EPA has adopted a technology-based approach that focuses on the levels that are achievable by the performance of the best demonstrated available technology ("BDA"). The Agency has justified its use of a technology-based standard by referring to the legislative history of RCRA section 3004(m) which states that "the requisite levels of [sic] methods of treatment established by the Agency should be the best that has been demonstrated to be achievable" and that Congress intended "to require utilization of available technology in lieu of continued land disposal without prior treatment." 51 Fed. Reg. 40572, 40578 (November 7, 1986) (emphasis added). As a result, in promulgating a treatment standard that EPA presumes is unachievable for soils, the Agency has violated its own treatment standards and

acted in an arbitrary and capricious manner. See Horsehead Resource Development v. Browner, 16 P.3d 1246, 1269 (D.C. Cir. 1994), cert. denied, 115 S.Ct. 72 (1994).

In addition, as discussed below, the Media Rule would base the treatment standard for PCBs on the use of a universal treatment standard of 10 ppm which directly conflicts with the PCB standards established by the Agency in the TSCA program." (58) [Also See Chapter 21 comments on PCBs.]

Response: The commenter is incorrect in saying that the new treatment standards for contaminated soils are unachievable for PCBs. EPA also believes that the treatment standards are achievable by chemcial dechlorination, chemical/solvent extraction, and thermal desorption as shown in Chapter 3 and Appendix D of EPA 1998a. Therefore, EPA is promulgating treatment limits for ahzardous soils contaminated with PCB's and other hazardous constituents in the UHC list as proposed. Further, the commenter is wrong as factual matter since the amended standards would not compel treatment below 100 ppm (total PCBs). See 40 CFR 268.49.

Response:

EPA 1998a, Soil Data Analysis: Soil Treatability Analysis of Treatability Data for Contaminated Soil Treatment Technologies, Office of Solid Waste, Arlington, Virginia. **(RCRA Docket for Phase IV/Hazardous Soils/F-98-2P4F-FFFF)**

- "EPA guidance (including the SSL guidance) clearly states that risk and, thus, cleanup goals are based on mean concentrations in an exposure area. (See Attachment 6: Statistical Approach to Meeting Soil Cleanup Goals, 30 Environ. Sci. & Technol. 1437 (1996)). Therefore, RCRA corrective action "action levels" and the treatment standards should be based on mean concentrations. Any other approach will bias the results and not add significantly to the protection of human health or the environment." (80)

Response:

EPA disagrees with the commenter that the treatment standards for hazardous soils mustbe based, presumably, on mean concentrations that are measured in an exposure area. The treatment standards promulgated today are technology based and as such, EPA will be relying on grab samples to enforce the treatment standards. This is because EPA believes that ex-situ technologies that are well designed and operated are most likely to treat uniformly hazardous soils prior to land disposal. However, EPA will be issuing, shortly, guidance on how operators of technologies treating hazardous soils can deter-mine what concentration of the constituents of concern should be targeted to ensure compliance with the 90% reduction treatment limit.

- "The acid test of any rule aimed at removing impediments to remediation is how it addresses application of the LDRs to situations which were never contemplated when the Part 268 BDAT treatment standards were developed. In this regard, the proposed Bright Line

approach does not fare well. The three most basic problems with the proposal are (1) its failure to grapple with the point at which LDRs "attach" to remediation wastes and contaminated media, (2) its reliance on a generic modified set of LDRs (90% of BDAT or 10 x UTS) which frequently would require incineration of soil just as the Part 268 BDAT standards do, and (3) its resulting inability to address the severe disincentives the LDRs pose to remediation at many sites." (112)

Response: EPA disagrees with the commenter that the proposed approach will pose disincentives to remediation at many sites due to the LDR requirements. The Agency contends that the standards are appropriate because they are achievable by noncombustion technology and provides a balance towards goals of treatment without the need to discourage treatment holistically as part of remediation. (EPA 1998a, EPA 1998b, EPA 1998c, and EPA 1998d.)

EPA agrees that treatment decision may need to be site-specific and risk-based in some cases, but we feel that the technology based limits are also valid constructs and allowed by HSWA. In fact, risk based levels can be used pursuant to a treatability variance under 268.44 (h) or no-migration petition under 268.6.

OTHER REFERENCE
(1.B.6 - Literature supporting 90% reduction or 10xUTS Treatment Standards)

1. Dutta, Subijoy, 1997, Treatability Analysis of Completed Demonstration Projects, August 11, 1997.

1.B.7 Other Comments and Suggestions

One commenter indicates that cross-media transfer should not be addressed in the final rule. [Similar comments may be found in Chapter 16 on the content of RMPs.]

- "The issue of cross-media transfer should not be addressed in the final rule. A RAP or RMP can address any issues regarding the potential for cross-media transfer on a case-by-case basis." (66)

Response: EPA is not, at this time, going forward with the portion of the HWIR-Media proposal which explicitly required soil treatment technologies to be designed and operated in a manner that controlled cross-media transfer. On further consideration, EPA believes this is already required under the land disposal restriction regulations. The Agency interprets the existing land disposal restriction regulations to prohibit unacceptable levels of cross-media transfer during soil treatment, because such transfer would be a form of impermissible dilution (cross-media transfer to air, for example, is just diluting with air). See 40 CFR 268.3 and ThirdThird opinion, 976 F.2d at 17; see also, 60 FR at 43665 (Aug. 22, 1995) (excessive cross-media transfer to air is a form of dilution and is impermissible treatment).

The Agency advises facility owners/operators to carefully design and operate soil treatment systems to prevent unacceptable cross-media transfer. Guidance on such design and operation can be found

in the EPA guidance document titled "*Best Management Practices (BMPs) for Soil Treatment Technologies"* EPA 530-R-97-007, May 1997. The BMPs guidance document is available at the RCRA docket (703-603-9230) and electronically, over the Internet, at www.epa.gov\corrective action.

A couple of commenters indicate that cross-media impacts need to be considered, but not by using overly prescriptive standards. [Similar comments may be found in Chapter 16 on the content of RMPs.]

- "Control of transfer of pollutants to other media should be required only as necessary to protect human health and the environment.

  The proposed wording of 269.30(h) implies that controls would always be required, irrespective of need. Union Carbide is concerned that 269.30(h) will be interpreted to always require containers or tanks to employ covers, closed vent systems and controls, or similar arrangements. However, some processes, such as the artificial wetlands described in Union Carbide Case Study 3 at the end of these comments, commonly operate in open-topped units. Air emission controls should be applied only where necessary to protect health and the environment.

  This requirement also introduces another overlap with the Clean Air Act, under which EPA is developing MACT standards for remediation. Union Carbide believes that RCRA should defer to the Clean Air for air emission issues." (114)

Response: EPA is not, at this time, going forward with the portion of the HWIR-Media proposal which explicitly required soil treatment technologies to be designed and operated in a manner that controlled cross-media transfer. On further consideration, EPA believes this is already required under the land disposal restriction regulations. The Agency interprets the existing land disposal restriction regulations to prohibit unacceptable levels of cross-media transfer during soil treatment, because such transfer would be a form of impermissible dilution. See 40 CFR 268.3, and ThirdThird opinion, 976 F.2d at 17; see also, 60 FR at 43665 (Aug. 22, 1995) (excessive cross-media transfer to air is a form of dilution and is impermissible treatment).

The Agency advises facility owners/operators to carefully design and operate soil treatment systems to prevent unacceptable cross-media transfer. Guidance on such design and operation can be found in the EPA guidance document titled "*Best Management Practices (BMPs) for Soil Treatment Technologies"* EPA 530-R-97-007, May 1997. The BMPs guidance document is available at the RCRA docket (703-603-9230) and electronically, over the Internet, at www.epa.gov\corrective action.

Under the BMPs guidance, air emission controls are only recommended if emissions will exceed the existing regulatory limits.

- "While we concur that cross-media impacts are a relevant consideration in any treatment process, we encourage the Agency to avoid establishing prescriptive standards or guidance in this regard. Remediation technologies vary widely, and new technologies are emerging every day. Each needs to be judged on its own merits as regards the potential for cross-media

impacts. Overly prescriptive standards or guidance could inadvertently impede the application of effective technologies. Thus, the Agency should establish broad performance goals for cross-media impacts and allow the overseeing Agency to determine on a site-specific basis the controls required.

An example of the complications presented by stringent one-size-fits-all prescriptions in the remediation context is illustrated by a long held EPA policy of not allowing the reinjection of groundwater contaminated above at the tap drinking water standards into an aquifer. This policy long served to impede the development and application of in situ treatment technologies, which often involve the reinjection of contaminated groundwater with certain additives to create an in-ground treatment reactor. Requiring treatment prior to reinjection skewed the economics of such approaches so as to make them impracticable. EPA should take care to avoid such unintended consequences in addressing cross-media impacts." (117)

Response: EPA is not, at this time, going forward with the portion of the HWIR-Media proposal which explicitly required soil treatment technologies to be designed and operated in a manner that controlled cross-media transfer. On further consideration, EPA believes this is already required under the land disposal restriction regulations. The Agency interprets the existing land disposal restriction regulations to prohibit unacceptable levels of cross-media transfer during soil treatment, because such transfer would be a form of impermissible dilution. See 40 CFR 268.3.

The Agency advises facility owners/operators to carefully design and operate soil treatment systems to prevent unacceptable cross-media transfer. Guidance on such design and operation can be found in the EPA guidance document titled "*Best Management Practices (BMPs) for Soil Treatment Technologies"* EPA 530-R-97-007, May 1997. The BMPs guidance document is available at the RCRA docket (703-603-9230) and electronically, over the Internet, at www.epa.gov\corrective action.

One commenter states that Bright Line concentrations are being used as cleanup levels when they should not be.

- "Although the Bright Line concentrations are not supposed to be cleanup levels, they would effectively become such in many cases. For example, if implementation of a remedy requires the digging soils exceeding Bright Line levels, these soils would have to be managed as hazardous— even if site specific evaluations under the CERCLA process indicated that these soils posed not threat to human health or the environment.

  Current RCRA requirements and those proposed under the Bright Line Approach have the effect of usurping site-specific action levels and remedies with generic levels and technical standards. As a result, remedies become less cost-effective and—because of increased handling and slower cleanup rates—in some cases, less protective of human health and the environment." (75)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous

constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards (and cleanup levels, if necessary) at that time.

One commenter mentions that a discussion on OSHA HAZWOPER regulations should be included in the rule. [Also see Chapter 1 discussions of relationship of HWIR-Media to other regulations.]

- "EPA provided much discussion in the proposed HWIR-media rule on it's impact on other applicable regulatory requirements. However, this discussion did not discuss how or if OSHA HAZWOPER regulations will apply to remediation wastes below the bright line." (108)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards (and HazWopper regulations, if necessary) at that time.

One commenter indicates that it will be difficult to predict how much of this contaminated media would be provided regulatory relief by this rule. [Also see Chapter 23 comments on the economic assessment.]

- "With regard to V.A.4.c. THE BRIGHT LINE, while the cost-benefit analysis prepared for this rule indicates that contaminated media make up the preponderance of material managed at Superfund, corrective action and voluntary cleanup sites, we find it hard to predict how much of this contaminated media would be provided regulatory relief by this rule. Such a prediction will require a review of how much of the waste is below the bright-line, and for how much of the waste management under an approved RMP would prove more cost-efficient than Subtitle C management. If the RMP development and review process is found to be expensive and if the volume of eligible media is low, contaminated media could end up going to Subtitle C facilities in spite of the relief offered by HWIR. Missouri will be reviewing these questions before deciding whether to adopt HWIR-media." (36)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards at that time.

- "With regard to V.A.4.c. THE BRIGHT LINE, we reiterate that the amount of contaminated media that would be provided regulatory relief by this rule is hard to predict, and that, if the RMP process is expensive and the volume of eligible media is low, contaminated media would go to Subtitle C facilities in spite of the regulatory relief offered by HWIR. Missouri will consider these cost-benefit issues, and may not incorporate HWIR-media if our findings do not indicate a savings to offset the costs." (L0007)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards at that time.

- "Also in regard to V.A.4.c. THE BRIGHT LINE, the Bright Line values do not consider environmental risks, and in this regard, the proposed rule fails to achieve its original stated intent." (L0007)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards at that time.

Several commenters thought the rule mandated treatment for treatment's sake, without factoring in site-specific, risk-based considerations.

- "Finally, based upon discussions in the Preamble and reports from FACA Subcommittee meetings, it would appear that the actual purpose of the Bright Line is to require some media to be treated for the sake of treatment. It is inappropriate to require treatment without regard to whether treatment is required for protection of human health and the environment." (134)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards at that time.

EPA is sensitive to the concern that application of national, technology-based, LDR treatment standards to contaminated soil - and other remediation waste -- will prompt treatment beyond the point at which threats to human health and the environment are minimized. (So called “treatment for treatment’s sake.”) In order to ensure that the technology-based standards for contaminated soil do not prompt treatment to a point beyond that at which threats to human health and the environment are minimized, the Agency has provided an opportunity for a treatment variance, which could be used, on a site-specific basis to cap the technology-based treatment standards. The treatment variance is discussed in detail in the preamble to today’s action.

- "The EPA should not impose mandatory treatment requirements or preferences for treatment, but should instead focus on remedy selection criteria with treatment as one possible remedy. We have state regulations governing remediations which already address site-specific factors such as "hot spots" and adequately protect human health and the environment. If the unitary approach is adopted and EPA finds it necessary to promulgate some type of treatment provision, this provision should be established as guidance rather than rule. By avoiding prescriptive treatment requirements, the rule will better allow for flexibility and innovation in remediation efforts. Also, we would prefer to see remedy selection criteria that can be applied uniformly between different programs, i.e. RCRA, CERCLA, PST, etc." (133)

Response: EPA is sensitive to the concern that application of national, technology-based, LDR treatment standards to contaminated soil - and other remediation waste -- will prompt treatment beyond the point at which threats to human health and the environment are minimized. (So called “treatment for treatment’s sake.” In order to ensure that the technology-based standards for contaminated soil do not prompt treatment to a point beyond that at which threats to human health and the environment are minimized, the Agency has provided an opportunity for a treatment variance, which could be used on a site-specific basis to cap the technology-based treatment standards. The treatment variance is discussed in detail in the preamble to today’s action.

Remedy selection criteria, such as applicable criteria under RCRA and CERCLA are not affected by today’s rulemaking.

- "If some of the soil is above the contained-out/Bright Line levels, may that soil be treated, as necessary, to the less stringent LDR treatment standards under proposed 40 C.F.R. 269.30(e)? In other words, are these more lenient LDR treatment standards only available to a company that goes through the Remediation Management Plan approval process under the proposed rule?

  A related question is, if the more lenient treatment standards are available, are they only available if the sampling has been done prior to removal of the soils?" (124)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to

establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards at that time.

EPA has clarified in the preamble to today's final rule, that it is not necessary to make a contained-in determination before removing any contaminated soil (besides the sample volume) from the land. Care, however, should be taken to avoid removing contaminated soil from the land and placing it in a way that would require compliance with the land disposal restriction treatment standards, without first complying with LDRs.

One commenter recommends that EPA focus on either a specified technology approach or an undefined percent reduction goal realistically achievable by innovative remedial technologies, rather than a single treatment goal.

- "In its discussion of treatment requirements EPA notes its preference to establish generic, nationwide risk-based treatment standards. While we concur with the Agency's desire for risk-based approaches to treatment, we find the desire for generic, nationwide standards for a remediation waste to be at significant odds with the Agency's statements elsewhere in the proposed rule regarding the site specific nature of remediation and the high degree of regulatory oversight, allowing for flexibility in remedial decision making. While generic, risk-based standards might make sense in the self implementing process waste context they are counterintuitive and counterproductive in the remediation context. Risk is inextricably wherein EPA would consider the application of certain specified remediation technologies to constitute adequate treatment. The FACA did not in the end support a single treatment goal, but directed EPA to look at either a specified technology approach or an undefined percent reduction goal realistically achievable by innovative remedial technologies." (117)

Response: The commenter appears to suggest that EPA allow LDR treatment standards to be developed entirely on a site-specific basis, considering the performance of remedial technologies.

At this time, the Agency has rejected the suggestion that EPA allow treatment standards to be developed entirely on a site-by-site basis, absent a national baseline, to date, the Agency has rejected this approach. RCRA Section 3004(m) requires EPA to promulgate, "levels or methods of treatment, if any. . .." Although 3004(m) could be implemented in many ways, at this time, EPA believes the most appropriate way to satisfy this RCRA Section 3004(m) mandate is to establish technology-based, nationally applicable treatment standards, including standards tailored for contaminated soil. Among other things, a national standard assures a basic measure of consistency in determining the level of performance at which a technology-based standard can be found to minimize threats posed by land disposal. However, because EPA realizes that technology-based nationally applicable treatment standards, because of site- and waste-specific characteristics, are sometimes not achievable or are inappropriate, EPA has long provided for variances under these circumstances. In addition, because the Agency believes that, during remediation, EPA and authorized states are in the position to make site-specific risk-based minimize threat determinations, the Agency is also providing a variance, for contaminated soils if, on a case-by-case basis, it is determined that the technology-based treatment standard would require treatment beyond the point at which threats are minimized, as discussed above and in the preamble to today's rule.

Regarding the concern that application of LDRs would limit the techniques allowed for treatment of hazardous contaminated soil, as discussed further in the preamble to today's final rule, the Agency believes that the soil treatment standards can be achieved using a variety of demonstrated, non-combustion, remediation technologies such as, depending on the exact nature of the soil and contaminants in question: biological treatment, thermal desorption, and dechlorination. If the soil treatment standards are shown, because of site- and waste-specific conditions, to be unachieveable (i.e. cannot be achieved using a properly operated treatment technology on which the treatment standards are based) or inappropriate for any given contaminated soil, a land disposal restriction treatment variance is available under current regulations at 40 CFR 268.44(h).

1.C MANAGING WASTES BELOW THE BRIGHT LINE AT SUBTITLE D FACILITIES

Two commenters suggests that EPA should develop and implement a public education campaign on the acceptance of nonhazardous contaminated media at Subtitle D facilities.

- "Regardless of which approach is adopted, the Agency has not addressed a serious problem in this rulemaking, concerning the public perception associated with Subtitle D facilities accepting contaminated media, which (if in the form of a process waste) would have to be managed as hazardous. Rhetoric over the past 16 years from a variety of public officials and private associations has overdramatized the "dangers" associated with "hazardous waste." In broad brush attacks, both generators of hazardous waste and hazardous waste treatment and disposal sites alike have been categorized as handlers of dark and dangerous materials, when in fact they have been providing a safe environmental and public service. Current manufacturing and disposal operations have been tarred with the Superfund brush of "toxic dumps"and "sickened communities." Now, the Agency proposes to relax requirements on the disposal of some of these same hazardous wastes. We see nothing in the Agency's proposal that addresses how it plans to help defuse this highly charged atmosphere it has helped create and the public perceptions it has helped to shape. This is a serious credibility issue for all stakeholders. Communities that have only begrudgingly, at best, accepted the disposal of municipal solid waste at a local landfill will likely have major problems with their local landfill receiving "hazardous wastes" newly classified by the Agency as "nonhazardous."

  Therefore, WMX strongly urges the Agency to begin a process, through this rulemaking, to properly define and educate the public about the true hazard associated with contaminated media waste. A good starting point would be a public outreach with includes a technical discussion of the advances that have taken place in modern landfill design (the closeness of Subtitle C and D technical designs), and why today's well run land disposal facilities are the proper environmental solution to aiding the corrective action and voluntary cleanup process across the United States." (104)

Response: At this time, EPA is not taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all remediation waste, including contaminated soil, to exit large portions of the RCRA Subtitle C system. EPA is also not, at this time, going forward with the portions of the HWIR-Media proposal which would have established a "bright line"

to distinguish between higher and lower risk remediation wastes. As discussed in the preamble to today's action, the Agency continues to believe that legislative action to address application of RCRA Subtitle C regulations, especially LDRs, to remediation waste is needed. If legislative action is forthcoming, EPA will likely re-examine application of LDRs to contaminated soil -- and remediation waste more generally -- at that time. If there is no legislation clarification, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soil or other remediation wastes.

If, in the future, EPA does take action to exempt or exclude some or all remediation waste from the RCRA Subtitle C system, the Agency will address the need for a related public education campaign, as necessary, at that time.

- "HWMA also believes that EPA must develop and implement a public education campaign to ensure that the public is willing to accept wastes that have been designated as "hazardous" for 20 years. We foresee serious problems in many communities that now reluctantly accept municipal solid waste. It is likely that these communities will object strongly to receiving contaminated media in their local landfills despite EPA's redesignation of such media as nonhazardous." (69)

Response: At this time, EPA is not taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all remediation waste, including contaminated soil, to exit large portions of the RCRA Subtitle C system. EPA is also not, at this time, going forward with the portions of the HWIR-Media proposal which would have established a "bright line" to distinguish between higher and lower risk remediation wastes. As discussed in the preamble to today's action, the Agency continues to believe that legislative action to address the application of RCRA Subtitle C regulations, especially LDRs, to remediation waste is needed. If legislative action is forthcoming, EPA will likely re-examine application of LDRs to contaminated soil -- and remediation waste more generally -- at that time. If there is no legislation clarification, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soil or other remediation wastes.

If, in the future, EPA does take action to exempt or exclude some or all remediation waste from the RCRA Subtitle C system, the Agency will address the need for a related public education campaign, as necessary, at that time.

Several commenters discuss the relationship of TCLP and bright line for managing remediation wastes with concentrations below the bright line. Commenters were concerned that unacceptable materials, including some characteristic waste, may be brought for disposal to Subtitle D facilities under an approved RMP.

- "SWANA's interest in the proposed rule deals mainly with the effect that exited contaminated media will have on the municipal solid waste management systems that are owned and operated by our membership. In general, these concerns deal with the practical impacts of cost and system viability for municipal solid waste management facilities, how these impacts are affected by the policy provisions under the proposed rule, and discrepancies between HWIR-Media exit levels and the current TCLP testing protocols used by MSWM facilities for acceptance or rejection of wastes." (84)

- "Under current operating procedures at MSWM facilities, the benchmark dictating the acceptance of solid waste containing toxic materials is the Toxicity Characteristic Leaching Procedure (TCLP). The regulatory levels for solid waste acceptance under the TCLP test are derived from a twenty times (20x) dilution rate from the concentration of constituents contained in the actual sample of solid waste being tested. Table 1 below shows the constituent concentrations necessary to yield the failing TCLP test concentrations shown in parentheses (20x dilution). As indicated below in Table 1, HWIR proposed soil Bright Line concentration exit levels for most TCLP listed materials far exceed the concentration levels allowable by the TCLP test.

  "Under the proposed HWIR exit levels it would seem that soil containing concentrations of hazardous materials at the HWIR-Media levels listed above would be unacceptable at MSWM facilities. SWANA is concerned that RMP standards that are determined on a site and State specific basis will allow unacceptable materials to be brought for disposal to MSWM facilities. SWANA believes that either the Bright Line system must be reviewed for protectiveness of these facilities, or that the rule making must provide more prescriptive standards that ensure that MSWM facilities will not be exposed to the liability and operational issues that will arise from these potentially hazardous materials." (84)

- "The proposed rule fails to deal with the protectiveness of the Bright Line. SWANA believes that if the proposed rule should become final, a quantitative Bright Line is appropriate. However, SWANA questions the quantitative Bright Lines set in this proposal for their protectiveness of the environment and MSWM facilities, and their relationship to currently established testing limits (see Section II regarding Bright Line comparison to TCLP levels)." (84)

Response: At this time, EPA is not taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all remediation waste, including contaminated soil, to exit large portions of the RCRA Subtitle C system. EPA is also not, at this time, going forward with the portions of the HWIR-Media proposal which would have established a "bright line" to distinguish between higher and lower risk remediation wastes. As discussed in the preamble to today's action, the Agency continues to believe that legislative action to address the application of RCRA Subtitle C regulations, especially LDRs, to remediation waste is needed. If legislative action is forthcoming, EPA will likely re-examine application of LDRs to contaminated soil -- and remediation waste more generally -- at that time. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soil or other remediation wastes.

Under current regulations, therefore, contaminated soil which exhibits a characteristic of hazardous waste must be managed as if it were hazardous waste and in not eligible for disposal at a Subtitle D municipal facility.

- "Recommendations for Handling Media Which is Below the Bright Line But Which Exhibits a Hazardous Waste Characteristic

EPA has proposed that media exhibiting a hazardous waste characteristic which is below the bright line should be exempt from Subtitle C control. The comments argue that this position is indefensible because EPA has failed to account for the risks of leachate contaminated groundwater in setting the bright line level for soils.

The comments state "The Toxicity Characteristic reflects, on at least a limited basis, the risk posed by leaching of hazardous constituents from wastes and the ingestion of contaminated drinking water. If EPA ignores these risks the human and environmental threats posed by waste leaching are essentially unaddressed in this proposal."

The comments go on to urge EPA to adhere to its previous position (and the consensus position of the FACA group) that characteristically hazardous waste must be subject to Subpart C control. In the alternative, the comments argue that EPA must revise the bright line concentration for contaminated soils to take account of groundwater exposures in accordance with the Ogden report. (Pages 15-18).

5) Off-Site Management of Contaminated Media

The comments note that contaminated media "below the bright line" will often still be several orders of magnitude more hazardous than wastes at the 10^{-6} risk levels which EPA has proposed as "safe" levels to allow PROCESS wastes to exit the Subtitle C system. The Council also discusses the absence of a requirement for manifests or shipping papers to alert Off-site facilities of the potential risks posed by this still-hazardous media.

Given these facts, the comments urge that media below the 10^{-3} bright line but still above the 10^{-6} HWIR exit level for HWIR process waste must be restricted to permitted Subtitle C facilities when shipped off-site for treatment or disposal.

This position was discussed at some length by those working on the comments. We were initially concerned that taking this position would increase the incentive to handle contaminated media on-site --even where on-site management posed increased environmental risks--since "below the bright line" media managed on-site would often not have to meet Subtitle C standards. We ultimately concluded, however, that PRP's would opt for on-site management wherever feasible--regardless of whether or not off-site shipments above the HWIR exit level would require Subtitle C management. Moreover, we concluded that allowing the Subtitle D disposal of off-site media shipments at concentrations above the 10^{-6} HWIR process waste exit level would seriously undercut the HWIR standard for management of process waste and potentially endanger MSW and other Subtitle D facilities which were not prepared to handle these higher-concentration wastes. Finally, we were concerned that absent requirements for the Subtitle C management of high-concentration media shipments there might be no manifest or other mechanisms in place to provide notice to facilities of the kinds and toxicity of the media they were receiving. (See pages 13-14)." (88)

- "EPA notes that non-hazardous contaminated media "would not be regulated as hazardous waste" but "might nonetheless be contaminated enough to be of some concern to the overseeing Agency's site cleanup decision." The Council believes that this "nonhazardous

media" will frequently still pose serious potential environmental problems. Non-hazardous media falling below the proposed 10^{-3} Bright Line level will still be several orders of magnitude more hazardous than the 10^{-6} risk level which EPA has established as a "safe" level to allow process wastes to exit the Subtitle C system.

We have serious concerns about any system which would allow media at these high concentrations to be disposed of in local municipal solid waste facilities. We are equally concerned that many industrial non-hazardous waste landfills, which are currently regulated only by individual states and vary greatly in technical sophistication and required technical safeguards, will often be inappropriate for disposal of these kinds of media. To make matters worse, there is no requirement that shipment of these materials to potentially unsuspecting off-site facilities will be accomplished by uniform manifests or shipping documents which provide adequate notice of the kinds of waste being tendered for disposal or the constituent concentrations that these wastes contain.

In addition to hazardous waste treatment, recycling, and disposal facilities, Council members currently operate commercial municipal solid waste facilities and industrial nonhazardous waste units. We view the potential threats posed by these off-site shipments with great concern. From our perspective, these kinds of off-site shipments pose worker-safety and facility-integrity problems which many municipal solid waste and industrial nonhazardous waste facilities are simply not prepared to deal with. Moreover, many of these facilities have formal or informal agreements with local communities concerning the nature of wastes they will accept. Shipment of materials which still pose objective hazards-regardless of their formal designation as "hazardous" or "non-hazardous"--could both breach these agreements and undermine facility integrity.

We urge the Agency to revise the current proposal, at least as it relates to the offsite shipment of "non-hazardous" media. We are convinced that media below the 10-3 Bright Line, but still above the 10^{-6} exit level proposed for HWIR process wastes, must be restricted to permitted Subtitle C facilities when shipped off-site for treatment or disposal. Absent this requirement, we anticipate widespread worker-safety and site contamination problems at off-site Subtitle D facilities and significant expansion of the very kinds of site cleanup problems that the contaminated media rule is designed to remedy.

Additionally, the rule must require that manifests or shipping papers meeting certain minimum standards accompany off-site shipments of media above the 10-6 HWIR process waste exit levels. These documents must alert Subtitle D facilities to the nature and constituent concentration levels of the media to provide them with a reasonable opportunity to determine whether they are prepared to accept this material and whether any special handling or facility operating requirements may be needed. While these facilities may be fully capable of safely managing these materials and of making contractual arrangements responding to the characteristics of this new category of waste, they will not be able to take these steps unless they are fully informed about the nature of the media they are receiving." (88)

Response: At this time, EPA is not taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all remediation waste, including contaminated

soil, to exit large portions of the RCRA Subtitle C system. EPA is also not, at this time, going forward with the portions of the HWIR-Media proposal which would have established a "bright line" to distinguish between higher and lower risk remediation wastes. As discussed in the preamble to today's action, the Agency continues to believe that legislative action to address the application of RCRA Subtitle C regulations, especially LDRs, to remediation waste is needed. If legislative action is forthcoming, EPA will likely re-examine application of LDRs to contaminated soil -- and remediation waste more generally -- at that time. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soil or other remediation wastes. If, in the future, EPA does take action to exempt or exclude some or all remediation waste from the RCRA Subtitle C system, the Agency will address issues associated with off-site management of so called, "non-hazardous" remediation waste at that time.

Under current regulations, therefore, contaminated soil which exhibits a characteristic of hazardous waste must be managed as if it were hazardous waste and in not eligible for disposal at a Subtitle D municipal facility.

EPA notes that the final rule does allow opportunities for contaminated media to be treated to site-specific, risk-based minimize threat levels instead of the 90% capped by 10xUTS soil treatment standards in some circumstances. EPA believes this will continue to protect Subtitle D facilities for two reasons. First, regulations governing the site-specific, risk-based minimize threat variance require that these decisions be made within the range of values the Agency has found generally acceptable in hazardous waste cleanup programs. I.e., for carcinogens, alternative treatment standards should ensure constituent concentrations that result in the total excess risk from any medium to an individual exposed over a lifetime generally falling within a range from 10^{-4} to 10^{-6}, using 10^{-6} as a point of departure and with a strong preference for treatment to that level; for non-carcinogenic effects, alternative treatment standards should ensure constituent concentrations that an individual could be exposed to on a daily basis without appreciable risk of deleterious effect during a lifetime; at a minimum, the hazard index should generally not exceed one (1). Second, soils treated to comply with the soil treatment standards (or with alternative soil treatment standards established through a site-specific, risk-based minimize threat variance) will continue to be regulated as hazardous waste unless it is determined that they no longer contain hazardous waste and/or no longer exhibit a characteristic of hazardous waste. Since EPA is not, at this time, taking action to codify the contained-in policy, the policy will continue to be implemented by EPA regions and authorized states on a site-specific basis, considering current Agency guidance. The Agency has advised that contained-in determinations be made using conservative, health-based levels derived assuming direct exposure pathways. See, for example, 61 FR at 18795 (April 29, 1996) and other sources cited therein. The contained-in policy has been in existence and in use for contaminated soil since, at least, 1990; in the past eight years of implementation, EPA is not aware of complaints from Subtitle D facility owners or operators that states or EPA regions were improperly determining that soil did not contain hazardous waste or that any given volume of "contained-out" soil was not appropriate for disposal at a Subtitle D facility.

One commenter asserts that EPA has failed to account for the risks of leachate-contaminated groundwater in setting the Bright Line levels for soils. Thus, characteristic media contaminated in concentrations below the bright line may still pose threats. [Also see Chapter 21 comments on specific constituents.]

- "Prior to this proposal, EPA had always maintained that contaminated media are regulated under Subtitle C if they exhibit a hazardous waste characteristic. See 57 Fed. Reg. 21450, 21453 (May 20, 1992). Likewise, EPA has always stated that contaminated media cease to be regulated as hazardous waste only when sufficient quantities of hazardous constituents are removed so that the media ceases to exhibit a hazardous characteristic. Id.

  EPA has made a serious mistake by now proposing that contaminated media exhibiting a hazardous characteristic that is below the Bright Line will be exempt from Subtitle C control. This position is indefensible because EPA has failed to account for the risks of leachate-contaminated groundwater in setting the Bright Line levels for soils. The Toxicity Characteristic reflects, at least on a limited basis, the risks posed by leaching of hazardous constituents from wastes and the ingestion of contaminated drinking water. If EPA ignores these risks, the human health and environmental threats posed by waste leaching are essentially unaddressed in this proposal. Moreover, the Ignitability, Corrosivity, and Reactivity Characteristics apply due to their inherent hazardous properties, regardless of hazardous constituent concentrations. EPA's proposal to ignore these hazardous characteristics is unlawful and unacceptable.

  The preamble states (Page 18796/1): "EPA recognizes that today's rule would have the effect of excluding from Subtitle C regulation some media that until now have been considered hazardous—i.e., media that exhibit a hazardous waste characteristic, with constituent concentrations below the Bright Line ...." As its justification, EPA claims that:

  "[I]t is the concentration levels of the individual hazardous constituents in the media that determine how the media will be regulated under Part 269. The origin of the constituents (i.e., listed wastes or characteristic hazardous wastes) is irrelevant in comparing measured levels in the media with Bright Line concentrations and/or contained-in concentrations. "

  This statement is clearly wrong. The origin of the hazardous constituents in contaminated media is not "irrelevant" if EPA fails to set Bright Line levels that take account of the very risks of soil-leachate-groundwater exposure that the Toxicity Characteristic is intended to address. In that case, applying the Toxicity Characteristic is very relevant because it is the only way that risks posed by leachate-contaminated media will be directly addressed. Alternatively, EPA can revise the Bright Line numbers—as urged later in these comments—to account for leachate contamination. Unless EPA takes one action or the other, the agency's stated rationale for making characteristically hazardous media eligible for exemption from Subtitle C is clearly, and alarmingly, incorrect.

  A good example of our concerns is media contaminated with lead. EPA has proposed a Bright Line level of 4000 ppm for lead. ETC member companies have treated lead-contaminated soils with 2500 ppm lead that have yielded pre-treatment TCLP levels of 117.47 mg/1 - 23 times higher than the 5 ppm characteristic level for lead. These contaminated soils are clearly hazardous by virtue of their leachability level, and should not be eligible for exit from Subtitle C controls and treatment requirements.

  EPA's proposal is also flawed because it will allow significant volumes of characteristically hazardous media to be left untreated, posing significant environmental threats. This

real-world impact can be seen by examining the data in EPA's Economic Assessment for the proposal. The volume of contaminated media below the Bright Line that would exhibit a hazardous characteristic can be calculated as 709,700 tons/year (Economic Assessment, page 4-32, Exhibit 4-19). This constitutes only 9.3% of the volume of RCRA and CERCLA soil that is remediated annually, yet it comprises media posing significant environment threats from the potential to contaminate groundwater. EPA projects that 68% of the contaminated soil below the Bright Line will be managed in Subtitle D landfills, capped, or left in place with no remediation at all. (Economic Assessment, page 3-26, Exhibit 3-6). Only 32% of contaminated soil below the Bright Line is projected to receive any treatment. Thus, applying these figures, EPA must conclude that 484,725 tons/year of contaminated soil exhibiting a hazardous characteristic will be sent to unsuspecting Subtitle D landfills, or will be capped or left in place with no treatment.

EPA's approach creates disincentives to necessary and cost-effective treatment of characteristically hazardous contaminated media. An illustration may be helpful. Many generators operate integrated manufacturing facilities that include electroplating operations, and that have areas of contaminated media onsite. If the media is subjected to a TCLP and the extract exceeds the 1.0 mg/l regulatory level the media would be characteristically hazardous for cadmium (D006). However, the generator may possess constituent data on the levels of Cd, Cr, Ni, CN, Pb, and Ag as well. As indicated in the table below, these constituents were the basis for the listing of F006, a waste from electroplating operations.

FO06 - CONSTITUENTS FORMING THE BASIS FOR LISTING SELECTED REGULATORY VALUES FOR CONSTITUENTS

F006		CHARACTERISTIC BRIGHT	
CONSTITUENT	UTS	REGULATORY LEVEL	LINE VALUE
Cd	0.19	1.0	390
Cr	0.86	5.0	3900
CN - Total	590	NA	NA
CN- Amenable	30	NA	10,000
Pb	0.37	5.0	4000
Nl	5	NA	10,000
Ag	0.3	NA	3900

As the generator would surely note, the levels of Ni and CN exceed the Bright Line levels for those constituents. Although the contaminated media is characteristic for cadmium, the cadmium level does not exceed the Bright Line value. Significantly, the generator must make a waste classification decision regarding this contaminated media. As shown by the table above, under EPA's approach, the generator actually has a strong incentive not to "look too closely" to determine if the media is contaminated with F006 listed waste. By retaining the characteristic classification only, the generator may exit Subtitle C without treatment since the constituent of concern, cadmium, is below the Bright Line. The fact that Ni and Cn are above the Bright Line is irrelevant under EPA's flawed approach to characteristically hazardous media. Had the generator properly classified the media as containing F006 waste, the generator would be obligated to treat the contaminated media to HWIR treatment

standards for Nl and Cn and any other constituents forming the listing basis that exceed 10xUTS. Yet the generator, under EPA's approach, would have a clear incentive to skew the classification to avoid treatment.

Another major problem is that EPA proposes to define the Bright Line relevant only to Appendix VII constituents. As discussed elsewhere in these comments, Appendix VII is not an inclusive list for all of the hazardous constituents that are typically found in a given listed waste. In addition, there are 43 potential characteristic constituents. In contrast, the Appendix VII list, for a given listed waste, can range from only 1 to 20 constituents, and for most listed wastes is less than 5 constituents. Therefore, in defining the media management relative to knowledge of a given listed waste code and Appendix VII, the full list of 43 possible characteristic constituents are not being addressed.

To illustrate this point, consider a contaminated media from a K001 waste and the constituent benzene. Because benzene is not included on Appendix VII, under EPA's current proposal for media, the media would not have to be assessed against the Bright Line with regard to benzene. However, as shown in EPA's background document for LDR treatment standard development for K001 waste, benzene is typically present in these wastes at levels of 51 to 83 ppm (see RCRA Docket Document#LDR8-S0358). Such waste would likely leach levels of benzene exceeding the characteristic level of 0.5 ppm.

A related point is that many of the Bright Line levels are set at total constituent levels that would likely exceed the characteristic leachate level. Consider for example the benzene Bight Line level of 500 ppm. The solubility of benzene in water is 0.188% (see Merck Index). The TCLP leachate agent used for the characteristic test has acetic acid, which should increase the solubility of benzene. Therefore, at a solubility of 0.188%, a minimum amount of benzene leached from a waste just below the bright line is 0.9 ppm. This exceeds the characteristic level of 0.5 ppm. The Bright Line for benzene would have to be at least below 260 ppm in order for the characteristic level not to be exceeded.

For these reasons, the ETC strongly urges EPA to adhere to its previous position that characteristically hazardous media must be subject to Subtitle C control. In the alternative, we believe that EPA should revise the Bright line concentrations for contaminated soils based on a groundwater exposure scenario in accordance with the attached report by Ogden Environmental Services. If the Bright Line numbers adequately account for leachate contamination, then we would agree that the Toxicity Characteristic levels would be superseded by these Bright Line concentrations." (88)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present in any given contaminated soil and are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards (or TCLP regulatory levels) at that time.

Under the current, unchanged, regulations environmental media which exhibits a hazardous characteristic must be managed as a hazardous waste until the characteristic has been eliminated. One commenter requests clarification on the management requirements for remediation waste that falls below the Bright Line but fails the Toxicity Characteristic Leaching Procedure (TCLP).

- "Westinghouse requests clarification on the management requirements for remediation waste that falls below the Bright Line but fails the Toxicity Characteristic Leaching Procedure (TCLP). There are numerous examples of this in the appendices for soil and groundwater. For example, benzene (D018) has a TCLP value of 0.5 ppm. The Bright Line value for benzene in soils is 500 ppm. Tetrachloroethylene (D039) has a TCLP value of 0.7 ppm. The Bright Line value for tetrachloroethylene in soils is 10,000 ppm." (35)

Response: At this time, EPA is not taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all remediation waste, including contaminated soil, to exit large portions of the RCRA Subtitle C system. EPA is also not, at this time, going forward with the portions of the HWIR-Media proposal which would have established a "bright line" to distinguish between higher and lower risk remediation wastes. As discussed in the preamble to today's action, the Agency continues to believe that legislative action to address the application of RCRA Subtitle C regulations, especially LDRs, to remediation waste is needed. If legislative action is forthcoming, EPA will likely re-examine application of LDRs to contaminated soil -- and remediation waste more generally -- at that time. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soil or other remediation wastes. If, in the future, EPA does take action to exempt or exclude some or all remediation waste from the RCRA Subtitle C system, the Agency will address issues associated with off-site management of so called, "non-hazardous" remediation waste at that time.

Under current regulations, therefore, contaminated soil which exhibits a characteristic of hazardous waste must be managed as if it were hazardous waste.

One commenter indicates that EPA lacks authority under the statute and the Agency's implementing regulations for application of characteristics to contaminated media.

- "EPA currently regulates contaminated media as hazardous under the Agency's "contained-in" policy. Under the contained-in policy, media contaminated by a listed hazardous waste, any mixture of the listed hazardous waste and another solid waste, or any residue from management of a listed hazardous wastes are hazardous until they are determined no longer to "contain" the waste or residue. By extension of this policy, EPA considers contaminated media that exhibit any characteristic to be subject to management as hazardous waste until the media no longer exhibit any characteristic.

  Contaminated media rarely exhibit the characteristics of corrosivity, ignitability, or reactivity. However, application of the toxicity characteristic to soil and groundwater at industrial facilities, including mineral processing plants, can readily stigmatize as hazardous waste large quantities of such media, thereby significantly and unnecessarily compounding the burdens of remedial actions at such facilities. This is made even more difficult by the fact that, in certain areas, uncontaminated soil can exhibit a characteristic.

In fact, EPA lacks authority under the statute and the Agency's implementing regulations for application of characteristics to contaminated media. As EPA's own contained-in policy recognizes, soil and groundwater and other environmental media are not "solid wastes." Yet, EPA's waste characterization regulations apply only to "solid wastes." See 40 CFR 261.20(a). EPA can achieve the purpose of its proposal—at least as applied to contaminated media exhibiting a characteristic—by clarifying that such media never enter the hazardous waste accountability system. Nonetheless, the Agency can prescribe reasonable management requirements for contaminated media as part of any site-specific cleanup plan, without encumbering the process with highly prescriptive hazardous waste management standards." (75)

Response: At this time, EPA is not taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all remediation waste, including contaminated soil, to exit large portions of the RCRA Subtitle C system. EPA is also not, at this time, going forward with the portions of the HWIR-Media proposal which would have established a "bright line" to distinguish between higher and lower risk remediation wastes. As discussed in the preamble to today's action, the Agency continues to believe that legislative action to address the application of RCRA Subtitle C regulations, especially LDRs, to remediation waste is needed. If legislative action is forthcoming, EPA will likely re-examine application of LDRs to contaminated soil -- and remediation waste more generally -- at that time. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soil or other remediation wastes.

Under current regulations, therefore, contaminated soil which exhibits a characteristic of hazardous waste must be managed as if it were hazardous waste. EPA is not persuaded that the contained-in policy is somehow contradictory to this approach, as failure of one of the hazardous waste characteristic tests seems, to the Agency at this time, to be a reasonable indication of whether or not any given environmental medium contains hazardous waste. The commenter is also referred to various responses dealing with the issue of hazardous constituent background concentrations in soil.

One commenter requests clarification that EPA intends to allow land disposal of characteristic wastes even though the treatment may not have eliminated the hazardous characteristic.

- "The proposed language indicates that soils that exhibit the characteristic of ignitability, corrosivity, or reactivity must be treated by deactivation technologies to eliminate those characteristics. All other soils that are characteristically hazardous must be treated for all constituents listed in Table UTS of 40 CFR 268.48. The soils must be treated to achieve either 90 percent reduction or concentrations less than 10 times the UTS levels. It is possible that soils treated in conformance with these LDR standards could continue to exhibit the hazardous characteristic. Westinghouse requests clarification that EPA intends to allow land disposal of such soils even though the treatment may not have eliminated the hazardous characteristic. [EPA policy (see 61 FR 18795) is for contaminated media (that are mixtures of media and characteristic wastes) to cease to be regulated as hazardous waste when sufficient quantities are removed so that the media ceases to exhibit the characteristic.] " (35)

Response: This interpretation is correct. The soil treatment standards do not require elimination of the characteristic of toxicity when contaminated soil exhibits this characteristic of hazardous waste. Treatment of the characteristic constituent to meet the soil treatment standards (i.e., ninety percent capped at ten times the UTS) is required. In addition, soil which continues to exhibit a characteristic of hazardous waste after treatment must continue to be managed as hazardous wastes, subject to all applicable RCRA Subtitle C requirements.

One commenter suggests that both CERCLA and the RCRA corrective action processes can manage contaminated media with concentrations above the Bright Line.

- "While EPA's proposal suggests that contaminated media with concentrations above the Bright Line cannot be managed safely outside of Subtitle C, both CERCLA and the RCRA corrective action processes are clearly capable of handling wastes of any concentrations. TCLP levels were intended to identify wastes that would be hazardous if improperly managed; wastes already being managed under a CERCLA or RCRA corrective action remedy are not "unmanaged" and should not be required to meet the prescriptive requirements of Subtitle C." (75)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present in any given contaminated soil and are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards (or RCRA and CERCLA cleanup programs) at that time.

One commenter supports EPA's proposal to allow states or federal authorities to specify the appropriate requirements for wastes below Bright Line levels.

- "API supports EPA's proposal in that it does not set cleanup standards for wastes below Bright Line levels, but allows states or federal authorities to specify the appropriate requirements. API supports this approach, particularly if states are given the maximum opportunity to oversee such determinations. As EPA has acknowledged, states have made great strides and enormous progress in the area of hazardous waste regulation. *Id.* at 18819. To put them in charge, to harness their expertise, and to allow them to exercise their professional judgment in determinations of adequate levels of treatment for contaminated media below the Bright Line would be the most appropriate delegation of authority that EPA could make. Regulated entities would have a better sense of a state's likely response and could depend on fairly consistent oversight. As stated previously, however, API maintains that wastes below the Bright Line should not be *eligible* for a "contained-out" determination, but should be *automatically* "contained-out."" (39)

Response: EPA appreciates this support of the proposed approach, however, EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil

and will require treatment for all underlying hazardous constituents that are reasonably expected to be present in any given contaminated soil and are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to the soil treatment standards at that time.

One commenter indicates that the rule should require a waste screening program for wastes entering Subtitle D landfills and also manifesting and record keeping for wastes that exit Subtitle C under an RMP.

- "SWANA has a number of concerns regarding the policy provisions under the proposed rule. These include:

  1. The rule is bereft of any detailed requirements regarding the manifesting and record keeping for wastes that exit Subtitle C under an RMP. The requirements for RMPs proposed Part 269.40 and 269.41 contain no language requiring records to accompany contaminated media to final off-site disposal facilities. It is clear, under the proposed policies for this rule, that MSWM facility owners/operators will have little opportunity to know what the characteristics of the wastes are that have arrived at the gate. Having sufficient information to make judgments of the acceptability of the wastes for a specific MSWM facility can only be done when there is sufficient information about the characteristics of the wastes. SWANA strongly recommends that the Agency require a manifesting of these exited wastes, with sufficient information about the characteristics of the exited wastes for MSWM facilities to make a proper determination as to their acceptability or unacceptability.

  2. The rule is totally silent on the need for Subtitle D landfill facilities to implement and document a waste screening program to determine whether or not these exited wastes can be accepted at their facilities under their existing permit conditions. The rule should require such screening and coupled with the need for manifesting and waste characteristic information mentioned in # 1 above, should assure that MSWM Subtitle D landfills will not inadvertently violate any Subtitle D rule. Our experience would indicate that the waste screening provisions of Subtitle D landfill rules appears to be one of the least paid attention to by both State agencies and EPA. SWANA strongly recommends that the Agency include language in the rule requiring that these wastes be screened at Subtitle D landfills before they are accepted." (84)

Response: At this time, EPA is not taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all remediation waste, including contaminated soil, to exit large portions of the RCRA Subtitle C system. As discussed in the preamble to today's action, the Agency continues to believe that legislative action to address the application of RCRA Subtitle C regulations, especially LDRs, to remediation waste is needed. If legislative action is forthcoming, EPA will likely re-examine application of LDRs to contaminated soil -- and remediation waste more generally -- at that time. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soil or other remediation wastes. If, in the future, EPA does take action to exempt or exclude some or all remediation waste from the RCRA Subtitle C system, the Agency will address

issues associated with tracking and acceptance by Subtitle D facilities of so called, “non-hazardous” remediation waste at that time.

One commenter requests clarification on complying with the LDR tracking and record keeping requirements for nonhazardous contaminated media that are still subject to LDRs.

- "EPA proposed in §269.10(b) that for hazardous and non-hazardous contaminated media that remain subject to LDRs, the provisions of part 268 do not apply except for §§268.2 through 268.7 and §268.50.

  DoD is concerned with the implementation of LDR notification requirements for contaminated media wastes and considers EPA's proposed regulations vague on this issue. There may be situations where contaminated media is determined to be non-hazardous but LDRs attach to the waste and the generator must comply with LDR notification requirements under §268.7. While not clearly stated in the proposed rule, DoD assumes that contaminated media determined to be non-hazardous can be managed at subtitle D facilities. DoD requests clarification on complying with the LDR tracking and record keeping requirements for non-hazardous contaminated media that are still subject to LDRs. For example, if the generator sent non-hazardous contaminated media (that is skill subject to the LDRs) to a subtitle D facility for treatment and disposal, would the LDR notice still accompany the shipment? Would the subtitle D facility be required to maintain copies of the LDR notice? If after treatment, the waste did not meet applicable treatment standards, would the subtitle D facility be required to provide another LDR notice to the subsequent treatment, storage, or disposal facility?

  DoD also notes that LDR notification requirements in §268.7 were designed to relate to treatment standards in §268.40 and are not suitable for media. 40 CFR 268.7 requires the notification to list applicable EPA hazardous waste numbers, any applicable subcategory, waste constituents that will be monitored (unless all are being monitored), whether the waste is a wastewater or non-wastewater, and requires the attachment of waste analysis data. It is requested that a separate paragraph be added to 268.7 to specifically address media. It is recommended that the nonfiction reference the alternative treatment standards applicable to media in 40 CFR 269.30; EPA hazardous waste numbers (waste codes) for which LDRs have attached; underlying hazardous constituent that must be monitored (if any); a statement that the waste must be reduced by 90 % or below 10 times the UTS prior to land disposal; and a statement regarding whether or not the waste has been designated as non-hazardous contaminated media or whether it has been designated as hazardous contaminated media." (97)

Response: The Agency has clarified in today’s final rule that contaminated soil subject to the land disposal restrictions must comply with the same record keeping and reporting requirements as other wastes subject to the land disposal restrictions. That is, the record keeping and reporting requirements of 40 CFR 268.7 will apply. EPA has clarified this in the final regulations by adding appropriate record keeping requirements for contaminated soils to the tables in 40 CFR 268.7(a) and 40 CFR 268.7(b). These rules specify that, for contaminated soil, generators and or treaters must include the following information with their land disposal restriction paperwork: the constituents subject to treatment as described in 40 CFR 268.49(d) and this statement, “this contaminated soil

[does/does not] contain listed hazardous waste and [does/does not] exhibit a characteristic of hazardous waste and [is subject to/complies with] the soil treatment standards as provided by 268.49(c)." Note that because in some cases contaminated soil will continue to be subject to LDRs even after it has been determined not to or no longer to contain listed hazardous waste (or de-characterized), the statement includes a notification of whether the soil is still considered hazardous. This is consistent with the approach the Agency used when establishing land disposal restriction treatment standards for hazardous contaminated debris. DOESN'T THIS SAME RESPONSE ALSO BELONG BACK WITH THE RESPONSE
TO ETC ABOUT THEIR CONCERN THAT SUBTITLE D OPERATORS GET NOTICE OF NATURE OF WASTE?
One commenter recommends that EPA include criteria for management controls in the rules on below-Bright Line contaminated media, and must provide mechanisms for enforcement of those controls.

- "It is unclear in the proposed rule what management controls are to be used to ensure that below-Bright Line contaminated media will not pose risks. Institutional controls (such as deed restrictions) may not be enforceable for state agencies. EPA must include criteria for management controls in the rules and must provide mechanisms for enforcement of those controls." (121)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil. The new soil treatment standards promulgated today will apply to all hazardous contaminated soil and will require treatment for all underlying hazardous constituents that are reasonably expected to be present in any given contaminated soil when such constituents are found at initial concentrations greater than ten times the universal treatment standard. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding enforcement of RCRA requirements for material determined to be below the bright line, as necessary.

- "What the proposed HWIR media rule does not address is a minimum treatment standard for non-hazardous contaminated media. The State of Utah recommends that a minimum treatment standard be established for non-hazardous contaminated media destined for disposal at a Subtitle D landfill, the minimum treatment standard should meet one of the following risk standards: Carcinogenic should be $<10^{-4}$ and the Hazard Index should be <10. This approach is consistent with Utah's risk-based closure rule which requires active remediation when the risk is $>10^{-4}$ and site management between 10^{-4} and 10^{-6}." (L02)

- "However, there are specific areas where we share a concern as to the impacts and complexities potentially created by the HWIR-media rule." (L02)

Response: At this time, EPA is not taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all remediation waste, including contaminated soil, to exit large portions of the RCRA Subtitle C system. The Agency is also not, today, taking action on the portions of the HWIR-Media proposal which would have established a "bright line" to distinguish between higher and lower risk remediation waste. As discussed in the preamble to today's action, the Agency continues to believe that legislative action to address the application of

RCRA Subtitle C regulations, especially LDRs, to remediation waste is needed. If legislative action is forthcoming, EPA will likely re-examine application of LDRs to contaminated soil -- and remediation waste more generally -- at that time. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to contaminated soil or other remediation wastes. If, in the future, EPA does take action to exempt or exclude some or all remediation waste from the RCRA Subtitle C system, the Agency will address issues associated with treatment requirements for so called, “non-hazardous” remediation waste, as necessary, at that time. However, the site-specific, risk-based, minimize threat variance established in the final rule contains certain features that are consistent with this comment.

1.D EXTENDING SOIL-SPECIFIC LDR STANDARDS TO OTHER REMEDIATION WASTES

1.D.1 Debris

Several commenters support the application of HWIR-media rule soil-specific standards to debris. [Also see other related sections of this document, such as Chapter 5 definitions of media and remediation waste.]

- "To the extent that EPA requires the LDRs to be applied to remediation wastes, remediation waste-specific standards should be developed and utilized. As EPA has acknowledged, remediation wastes often are quite different in nature than the process wastes for which generic LDR standards have been developed. NMA supports EPA's decision to establish soil-specific LDR standards that take into account the "distinct treatment issues" posed by this material. See 61 Fed. Reg. at 18,806.

  EPA has stated that it is considering applying the soil-specific LDR standards to other remediation waste, id., and the Agency has requested comment on whether debris should be subject to the treatment standards proposed for soils in the HWIR-media rule. NMA supports the application of HWIR-media rule soil-specific standards to debris. In some cases, debris will be virtually identical to soil materials, other than with respect to particle size. Use of the soil-ds will not only simplify the regulations applicable to debris at remediation sites, needed and warranted relief from the overly stringent Debris Rule LDRs.

  EPA should only require treatment of the hazardous constituents that originated from the contaminating waste to the extent that the LDRs are to be applicable to remediation waste, NMA supports EPA's proposal that remediation waste be subject to treatment only for those hazardous constituents that originated from the hazardous waste and for which treatment standards have been established. 61 Fed. Reg. at 18,852 (to be codified at 40 C.F.R. § 269.30(g)); see also id. at 18,809. NMA agrees with EPA that the duty to treat remediation wastes should only attach to constituents for which treatment would have been required in the first place." (20)

Response: EPA is not, at this time, taking action on the portions of the HWIR-Media proposal which would have addressed remediation wastes other than soil (e.g., debris). The Agency continues to believe that legislative action is necessary to address application of RCRA hazardous waste management requirements to hazardous remediation wastes, including hazardous debris. If

legislation is not forthcoming, EPA may take additional regulatory action. If, in the future, EPA takes action on the portions of the proposal that would have addressed hazardous debris, it will consider these comments, as necessary, at that time.

Hazardous debris, therefore, will continue to be subject to the existing alternative treatment standards for debris.

Regarding constituents subject to treatment, Despite this support of the proposed approach, on further consideration, EPA was persuaded by other comments that it is prudent to apply the logic of the *Chemical Waste* court both to soil contaminated by listed hazardous waste and to soils which exhibit a characteristic of hazardous waste.

As the Agency explained in the 1990 proposal, contaminated soils are potentially contaminated with a wider range of hazardous constituents than process wastes -- in no small part because they generally reflect uncontrolled disposal settings. 58 FR at 48124 (September 14, 1993). Since this is the type of circumstance addressed in the *Chemical Waste* opinion, the Agency is persuaded that it is prudent to apply the logic of the *Chemical Waste* opinion and require treatment of all underlying hazardous constituents. See *Chemical Waste Management v. US EPA*, 976 F.2d at 16 - 18 (D.C. Cir 1992). Therefore, today's final rule requires that all contaminated soil subject to the LDRs be treated to achieve the soil treatment standards for each underlying hazardous constituent reasonably expected to be present in the soil when such constituents are initially found at concentrations greater than ten times the universal treatment standard. Characteristic soil must also be treated, in the case of TC soil, for the TC constituent and, in the case of ignitable, corrosive, or reactive soil, for the characteristic property.

As discussed further in the preamble to today's action, EPA is confident that sampling and analysis can be appropriately targeted to ensure that it is focused on appropriate hazardous constituents or classes of hazardous constituents and does not intend that sampling and analysis would routinely be required for the entire suite of universal treatment standard constituents. Other commenters support this approach.

- "**p. 18813, col. 3 -- EPA requests comments on whether the current LDR treatment standards for hazardous debris remain appropriate or whether hazardous debris should, instead, be subject to treatment standards similar to the standards in the proposed rule for contaminated media, or whether some combination of the standards would be most appropriate.**

  As stated in General Comment 3, DOE supports expanding the scope of the HWIR-media rule to include hazardous debris and other non-media remediation wastes such as sludges. This would allow inextricably mixed media and non-media remediation wastes to be managed more efficiently under management requirements developed on a site specific basis. Nevertheless, in circumstances where hazardous debris is not generated as a result of remedial activities per se, or is not inextricably mixed with media, DOE believes that the current LDR treatment standards would remain appropriate, and should be explicitly retained." (60)

Response: EPA is not, at this time, taking action on the portions of the HWIR-Media proposal which would have addressed non-soil remediation waste (e.g., sludges, debris). The Agency continues to believe that legislative action is necessary to address application of RCRA hazardous waste management requirements to hazardous remediation wastes, including hazardous debris. If legislation is not forthcoming, EPA may take additional regulatory action. If, in the future, EPA takes action on those portions of the proposal it will consider these comments, as necessary, at that time. EPA notes that the alternative LDR treatment standards for hazardous debris are not affected by today's rulemaking. See, 40 CFR 268.45.

- "EPA discussed the scope of the HWIR-media proposal on page 18789 and proposed §269.1. EPA is limiting the applicability of the rule to contaminated media for several reasons including: (1) the legal theory underlying the binary approach; (2) EPA's cost/benefit analysis; (3) relief needed from the LDRs is more acute for contaminated media than other remediation wastes; and (4) the proposed rule constitutes a major change in the way covered materials are regulated and will require a "break-in" period while regulators and the regulated community adjust to the new system.

  Unless EPA adopts the unitary approach, DoD recommends that EPA include debris within the scope of the of the final rule (as discussed by the hybrid approach) for the following reasons: Distinguishing debris from contaminated media creates a more complex regulatory regime by subjecting these wastes to different and varying regulatory requirements. During cleanup operations, it often is difficult to separate remediation wastes between media and non-media. Furthermore, because of the heterogeneous nature of debris, representative sampling and analysis of debris and contaminated media also is difficult to implement.

  However, DoD recommends retention of the existing alternative LDR treatment standards for hazardous debris in addition to inclusion of debris within the scope of the final rule. Allowing the use of either approach, on site-specific basis, would provide facilities the flexibility and ease of implementation originally sought by the proposed rule. DoD also recommends EPA provide past contained-in determinations as supplemental information to this rulemaking. This information is necessary as a reference for the regulated community to evaluate in context of applying the proposed Bright Line to contaminated media and debris.

  If debris are included in the scope of the final rule, DoD would recommend that EPA allow the results from sampling and analysis of media surrounding the debris to serve as an adequate measure of debris contamination. This would simplify the sampling and analysis of mixtures of contaminated media and debris." (97)

Response: EPA is not, at this time, taking action on the portions of the HWIR-Media proposal which would have addressed non-soil remediation waste (e.g., debris). The Agency continues to believe that legislative action is necessary to address application of RCRA hazardous waste management requirements to hazardous remediation wastes, including hazardous debris. If legislation is not forthcoming, EPA may take additional regulatory action. If, in the future, EPA takes action on those portions of the proposal it will consider these comments.

EPA notes that the alternative LDR treatment standards for hazardous debris are not affected by today's rulemaking. See 40 CFR 268.45.

- "In conjunction with this approach to defining "remediation wastes," an issue arises concerning how to address the established LDRs for hazardous debris vs. the proposed methodology for addressing LDRs for contaminated media in this rule. Since hazardous debris will be generated at sites other than those being remediated under federal or authorized state oversight, the LDRs for hazardous debris should remain as they presently are. However, through this rule, where hazardous debris is being managed as part of a remediation project and meets the definition of "remediation waste," the Regional Administrator/State Program Director should be authorized to allow the requirements of this rule to be applied to hazardous debris as an alternative to 40 CFR 268. The present hazardous debris rule already allows some environmental media to be co-managed as debris. The reverse should also be allowed and administered through an RMP or as an exclusion pursuant to proposed 40 CFR 269.4." (142)

Response: EPA is not, at this time, taking action on the portions of the HWIR-Media proposal which would have addressed non-soil remediation waste (e.g., debris) or established a remedial action plan (RMP) to allow Agencies to oversee remedial action. The Agency continues to believe that legislative action is necessary to address application of RCRA hazardous waste management requirements to hazardous remediation wastes, including hazardous debris. If legislation is not forthcoming, EPA may take additional regulatory action. If, in the future, EPA takes action on those portions of the proposal it will consider these comments.

EPA notes that the existing alternative LDR treatment standards for hazardous debris are not affected by today's rulemaking. See 40 CFR 268.45.

- "EPA's proposal to further restrict the applicability of the Bright Line approach to remediation waste by excluding debris adds yet another source of complexity without corresponding benefit. As EPA notes in the preamble:

  > "While EPA believes that the technologies specified for debris treatment are generally compatible with most types of remedial activities, the Agency recognizes that applying different regulatory schemes at the same site (one for media and one for debris) may unnecessarily complicate cleanups and raise cleanup costs without a discernible environmental benefit."

  While we question EPA's contention that specified debris treatment technologies are generally compatible with remedial activities, the Agency is certainly on target regarding added complexity without benefit.

  We note that many remedial settings have extremely heterogeneous conditions. For example, many facilities have old landfills, often little more than trenches or a hole in the ground, into which trash wastes, off-specification products, old equipment, process wastes, wastewater treatment sludges, demolition rubble and soil cover were placed. These materials are typically randomly mixed in place, and become even more so during removal. Many of them would meet EPA's definition of debris. Further, many natural soils contain large quantities of gravel and cobble size particles that would meet the debris definition. EPA's proposed approach would require the segregation of these materials. and their separate management in subtitle C, regardless of whether such segregation and separate treatment/management is of

any environmental benefit. This will simply perpetuate the status quo impediments to remediation for many sites.

The proposed approach also fails to recognize common and emerging remedial practices. For example, in soils washing technologies, larger soil particles are separated from the soil matrix by mechanical means. These larger particles are usually water sprayed during the separation to dislodge any adhered contaminated soil, and then managed as uncontaminated. Under EPA's proposed approach those materials would have to continue to be managed as hazardous waste and would be subject to additional, generally unnecessary, treatment. In the emerging field of phytoremediation plants capable of concentrating certain materials are grown in contaminated soil and thereby extract contaminants from the soil. Apparently under the Agency's proposed approach those plants when harvested would have to be managed as hazardous debris.

Overseeing agencies should have the ability to establish appropriate treatment and management requirements for debris on a case by case basis. We encourage EPA to address all remediation wastes equally under HWIR, using the authorities it has clearly articulated to decline to regulate as hazardous those materials for which mismanagement is implausible, and to allow these remediation wastes to be managed with the maximum amount of site-specific flexibility and local decision making. If treatment variances are employed for debris we believe the variances presented in the proposal for soil are more appropriate than those provided at 40 CFR 968.44(h)." (117)

Response: EPA is not, at this time, taking action on the portions of the HWIR-Media proposal which would have addressed non-soil remediation waste (e.g., debris). The Agency continues to believe that legislative action is necessary to address application of RCRA hazardous waste management requirements to hazardous remediation wastes, including hazardous debris. If legislation is not forthcoming, EPA may take additional regulatory action. If, in the future, EPA takes action on those portions of the proposal it will consider these comments.

EPA notes that the existing alternative LDR treatment standards for hazardous debris are not affected by today's rulemaking. See 40 CFR 268.45.

- "As discussed in the prior section III.A., the Agency has proposed to limit alternative national LDRs to soils so it would not be available for other types of media or non-media. If EPA is determined to withdraw the CAMU rule, then it should allow all types of remediated wastes, debris and non-wastes to be eligible for the new soil specific LDR standards." (76, 77)

Response: EPA is not, at this time, taking action on the portions of the HWIR-Media proposal which would have addressed non-soil remediation waste (e.g., debris) or established a remedial action plan (RMP) to allow Agencies to oversee remedial action. The Agency continues to believe that legislative action is necessary to address application of RCRA hazardous waste management requirements to hazardous remediation wastes, including hazardous debris. If legislation is not forthcoming, EPA may take additional regulatory action. If, in the future, EPA takes action on those portions of the proposal it will consider these comments.

The existing alternative LDR treatment standards for hazardous debris are not affected by today's rulemaking. See 40 CFR 268.45.

EPA notes that the Agency is not, in today's action, withdrawing the CAMU rule. CAMUs, therefore, remain available, as appropriate, for management of remediation waste, including hazardous contaminated soils and hazardous debris.

Other commenters do not support any changes in the current LDR requirements for debris.

- "EPA requests comment on whether current LDR treatment standards for hazardous debris remain appropriate or whether hazardous debris should be subject to standards similar to those for contaminated media.

  TDS does not support any changes in the current LDR requirements for debris for the following reasons:

  - "The current debris standards already provide a significant amount of flexibility. Generators can select from a variety of approved treatment technologies (e.g. Technology Standards), or may treat debris where appropriate to the LDR treatment standards applicable to the constituents present. In many cases, the use of specified technologies can result in the debris being rendered non-hazardous, and therefore eligible for disposal in a subtitle D unit. In addition, the debris standards provide wide ranging flexibility in assessing mixed waste by allowing for determination of any given waste stream as debris if it is > 50% debris by visual inspection. This allows for use of the less stringent debris treatment technologies on the entire mixture. In any case, where treatment technologies are not appropriate to the type or disposition of a specific debris waste stream, the generator may gain relief by application to EPA for a variance from the treatment standard under 268.44."

  - "Many subtitle C facilities have invested heavily in debris management systems and, including facilities and equipment for size reduction, sorting and processing; as a result an abundance of capacity is available to manage all types of hazardous debris."

  - "Encapsulation technologies are applicable to all forms of debris, and have no restrictions on constituent type or concentration Due to the convenience, cost effectiveness, and available capacity of encapsulation technologies, the use of more expensive and time consuming technologies has been minimized.

  - Such techniques are currently priced in the market in the range of $70 to $250/ton. The footnote (#25) on page 18813 citing a cost of $3200 to $6000/ton is not representative of market conditions. Debris, even in a location as remote as Alaska, can be readily removed and transported to a commercial Subtitle C facility in the lower 48 states for a shipping charge of approximately $300 - 350/ton, based on TDS S own experience in shipping waste from Alaska to its Idaho Subtitle C facility, ESII. The upper market price for encapsulation at $250/ton yields a total cost in the range of $600/ton, not $3200 to $6000/ton.

- Given that the LDR's for debris are have been implemented for over 4 years, TDS sees no reason why continued adherence to these rules should 'unnecessarily complicate' any cleanups. Indeed, changing the rules at this time would seem to be an invitation to unnecessary confusion. It would also be a disincentive to commercial services providers investing in services capabilities to meet regulatory requirements. Such disincentives result in less capacity being made available, justifying longer variances in the hope that rules will change, undermining the ability to implement regulations." (25)

Response: EPA appreciates this support of the alternative LDR treatment standards for hazardous debris.

EPA is not, at this time, taking action on the portions of the HWIR-Media proposal which would have addressed non-soil remediation waste (e.g., debris) or established a remedial action plan (RMP) to allow Agencies to oversee remedial action. The Agency continues to believe that legislative action is necessary to address application of RCRA hazardous waste management requirements to hazardous remediation wastes, including hazardous debris. If legislation is not forthcoming, EPA may take additional regulatory action. If, in the future, EPA takes action on those portions of the proposal it will consider these comments.

The existing alternative LDR treatment standards for hazardous debris are not affected by today's rulemaking. 40 CFR 268.45.

- "As proposed the Agency has not proposed to include debris within the "Bright Line" approach. WMX agrees with this decision, consistent with its comments in section III.F." (104)

Response: EPA appreciates this support of the proposed approach; however, the Agency is not, at this time, taking action on the portions of the HWIR-Media proposal which would have addressed non-soil remediation waste (e.g., debris) or established a remedial action plan (RMP) to allow Agencies to oversee remedial action. The Agency continues to believe that legislative action is necessary to address application of RCRA hazardous waste management requirements to hazardous remediation wastes, including hazardous debris. If legislation is not forthcoming, EPA may take additional regulatory action. If, in the future, EPA takes action on those portions of the proposal it will consider these comments.

The existing alternative LDR treatment standards for hazardous debris are not affected by today's rulemaking. See 40 CFR 268.45.

1.D.2 Soils Not Managed Under an Approved RMP

A few commenters support applying soil-specific LDR standards to soils not managed under an approved RMP.

- "The Agency solicited comments regarding whether it would be appropriate to extend the proposed 90% or 10 x UTS treatment standards to all hazardous contaminated soils, as

opposed to limiting them to soils managed under an approved RMP. 61 Fed. Reg. 18813/2. We believe this should be appropriate, so long as the materials will be managed in a protective manner that assures they are not hazardous. Such materials again should qualify for a conditional exclusion from Subtitle C requirements." (112)

Response: On further consideration of the issue and in response to comment, EPA agrees that the new soil treatment standards should apply to all hazardous contaminated soil and has adjusted the final regulations accordingly. This issue is discussed in more detail in the preamble to today's final rule.

- "Flying J also supports the application of less stringent treatment standards (e.g., 90%/10 x UTS) to all hazardous contaminated soils instead of limiting it to soils managed under an RMP. The standard would be particularly useful with regard to the disposal of hazardous contaminated media at a permitted hazardous waste landfill. It makes no sense that soils containing the same contaminants but managed under an RMP would be subject to less stringent treatment standards, while soil removed and disposed at a hazardous waste landfill without an RMP would be governed by stricter treatment standards. The two different sets of regulatory standards would result in a disincentive to remove soils that are hazardous waste." (66)

Response: On further consideration of this issue and in response to comment, EPA agrees that the new soil treatment standards should apply to all hazardous contaminated soil and has adjusted the final regulations accordingly. This issue is discussed in more detail in the preamble to today's final rule.

- ". . . the extension of the modified LDRs (90% reduction or 10 times the UTS) to all hazardous contaminated soils, instead of limiting them to soils managed under an approved RMP. One example would be where a product spill occurs and affected soils and groundwater need to be managed in a timely manner; the modified LDRs would be more appropriate. It may be too much material to be sent off-site for incineration (limited incineration capacity, limited funds), and other technologies (e.g. bioremediation, soil washing, or thermal desorption) could be quickly and effectively utilized to treat the contaminated soil. Currently, RCRA LDR regulations can be an obstacle to timely, efficient remediations of product spills." (98)

Response: On further consideration of this issue and in response to comment, EPA agrees that the new soil treatment standards should apply to all hazardous contaminated soil and has adjusted the final regulations accordingly. This issue is discussed in more detail in the preamble to today's final rule.

- "The Agency requests comment on whether it would be appropriate to extend the generic LDR treatment standards of 90% reduction in the concentration of a hazardous constituent and/or constituent-specific concentration level of 10 times the LDR universal treatment standard contained in part 268 proposed for hazardous contaminated soils, to all contaminated soils undergoing remediation instead of limiting the new treatment standard to only soils managed under an approved RMP.

Comment: It is appropriate to apply the generic LDR soil treatment standard of 10 times LDR universal treatment standards to all contaminated soils generated during any cleanup and not just to those soils managed under a RMP. However, it is not appropriate to apply the 90% constituent-specific reduction standard to contaminated media generated by a remedial activity that does not have direct oversight by the overseeing authority.

The 10 times LDR-UTS standard is numerically defined and straight forward. There appears to be no need for an overseeing authority to indirectly approve the use of the defined standard through approval of a RMP. In addition, facility owners/operators are accustomed to implementing regulatory standards with little oversight from the state and should not have difficulty in implementing this standard. Generators and facility operators implement standards everyday in the context of the current LDR program and the hazardous waste characteristics regulatory approach. Furthermore, by making this generic LDR soil treatment standard (10 times LDR-UTS) eligible for use in all types of remedial activities, cleanups of contaminated sites will be expedited.

The use of the 90% reduction in hazardous constituents generic LDR treatment standard should be limited for use to only those soils managed under an approved RMP, Agency oversight is necessary to assure that the treated soil still does not contain unacceptable concentrations of hazardous constituents that may warrant further treatment." (L01)

Response: On further consideration of this issue and in response to comment, EPA agrees that the new soil treatment standards should apply to all hazardous contaminated soil and has adjusted the final regulations accordingly. This issue is discussed in more detail in the preamble to today's final action.

In addition, EPA has made two changes from the proposal to strengthen the soil treatment standards: first, EPA has modified its approach to constituents subject to treatment to require treatment for any underlying hazardous constituent reasonable expected to be present in any given contaminated soil when such constituents are found at initial concentrations greater than ten time the universal treatment standard. Second, EPA has placed additional restrictions on used of treated soil in hazardous waste derived products which will be used in a manner constituting disposal (i.e., will be placed in or on the land).

The Agency is not persuaded that oversight is necessary to implement the 90% reduction portion of the soil treatment standards. The Agency believes these types of determinations can be made using information (such as constituent concentrations across contaminated media) typically gathered during remediation activities. The Agency notes that, as discussed in the preamble to today's final action, although contaminated soils are often characterized using composite sampling techniques; compliance with the 90% LDR treatment standard will, like compliance with other LDR treatment standards, be measured using grab samples. The Agency will publish additional guidance on the measuring compliance with the 90% soil treatment standard in the future.

- "Proposed §269.2(b) specifies that part 269 would only apply to cleanup activities conducted in accordance with a RMP approved by EPA or an authorized state. On page 18813, EPA solicits comments regarding whether it would be "appropriate to extend the 90%/ 10 times the UTS treatment standard proposed today to all hazardous contaminated

soil, instead of limiting them to soils managed under an approved RMP. This would allow their use in States that do not seek authorization for this rule or by facility owners/operators who wish to proceed with remedies ahead of formal agency approval of a RMP."

Under the Defense Environmental Restoration Program (DERP), DoD has been tasked by the President to act as lead agency for conducting remedial actions at non-National Priority Listed (NPL) sites. Though it is DoD policy to request State/EPA participation in the remediation process, EPA/States may not always have the resources to actively oversee these lower priority, non-NPL projects. Therefore it is requested that a provision be adopted which facilitates the use of the 90% reduction/10 times the UTS media treatment standard even in the absence of a RMP approved by the EPA/state and without active EPA/state oversight. This additional provision would facilitate and encourage voluntary cleanups of both Federal facilities and private sites." (97)

Response: On further consideration of the issue and in response to comments, EPA agrees that the new soil treatment standards should apply to all hazardous contaminated soil and has adjusted the final regulations accordingly. This issue is discussed in more detail in the preamble to today's final rule.

- "We concur with the Agency that many States may decline to become authorized for the proposed Bright Line based HWIR-media. The States have already expressed strong reservations about the extreme complexity and limited reform of the Bright Line approach. This will serve to further limit the effectiveness of HWIR-media in removing impediments and disincentives to remediation. Further, all of the current disincentives to voluntary corrective action will remain in place. We encourage the Agency to adopt the Unitary approach to avoid many of these limitations. However, if the Agency pursues the Bright Line approach, making the new LDRs applicable to hazardous soils managed outside an RMP would help to extend the limited benefits of the Bright Line approach to a larger universe of remediation activities. DuPont does not believe that these overly stringent soil treatment requirements should be made any more stringent for this purpose, as such an action would only serve to further undermine the Bright Line approach's limited benefits and reinforce existing impediments." (117)

Response: On further consideration of this issue and in response to comment, EPA agrees that the new soil treatment standards should apply to all hazardous contaminated soil and has adjusted the final regulations accordingly. This issue is discussed in more detail in the preamble to today's final rule.

- "**p. 18813, cols. 1&2 -- EPA notes that the proposed alternative LDR treatment requirements for hazardous contaminated soils will not be available for contaminated soils in states that choose not to adopt the final HWIR-media rule, or for contaminated soils generated at sites where cleanup occurs without direct agency approval (e.g., voluntary cleanups). The Agency requests comment on whether it would be appropriate to extend the proposed alternative LDR treatment standards to all hazardous contaminated soils regardless of whether the cleanup is subject to State or Agency oversight (i.e., managed under an approved RMP). As an alternative, the Agency asks whether it should adopt soil treatment standards for non-HWIR-media**

hazardous soils that are adjusted to account for the lack of State or Agency oversight over how they are administered.

DOE urges EPA to adopt the alternative LDR treatment standards for *all* hazardous soils, regardless of whether they are generated by a cleanup that is subject to State or Agency oversight pursuant to proposed 40 CFR Part 269. The absence of such standards will likely act as a significant disincentive for voluntary cleanups. EPA states that it believes situations will be rare where meeting the proposed treatment standards for hazardous contaminated media would be insufficient to meet RCRA section 3004(m)=s requirement that threats to human health and the environment be minimized [p. 18809, col.1]. Therefore, DOE would support extending the proposed LDR treatment standards to all contaminated soils. DOE believes that besides being inconsistent, it would be very confusing to have LDR treatment standards for contaminated soils managed under 40 CFR Part 269 that differ from LDR treatment standards applicable to non-HWIR-media contaminated soils." (60)

Response: On further consideration of this issue and in response to comment, EPA agrees that the new soil treatment standards should apply to all hazardous contaminated soil and has adjusted the final regulations accordingly. This issue is discussed in more detail in the preamble to today's final rule.

Conversely, another commenter believed that soil-specific LDR standards should not be extended to waste not managed under an approved RMP.

- "EPA requests comment on whether it would be appropriate to extend the modified HWIR-Media treatment standards to all hazardous contaminated soils, instead of limiting them to soils managed under an approved RMP.

  TDS does not support such a concept for the following reasons:

  - The RMP process imposes an obligation on the generator and the overseeing agency to provide the necessary technical data to justify the utilization of the flexibility provided by this rule. It may not be justified in many situations and a burden of proof threshold is part of the safety net to assure that such flexibility is used wisely.

  - The RMP also provides the public with a forum to participate in a remediation process that provides for more flexibility. By making the HWIR-Media standards available to all soils without the need for a RMP, the public has, in effect, been removed from the process.

  - Since the HWIR-Media rule has not been promulgated and utilized, there is no convincing track record, based on the implementation of many RMP's, to suggest that the HWIR-Media treatment standards can be applied in such a blanket manner without need for any site specific determinations under the RMP format." (25)

Response: As discussed in detail in the preamble to today's rulemaking, EPA no longer believes that the soil treatment standards should be limited to soils managed under site-specific Agency oversight, e.g., through a Remediation Management Plan or RMP. EPA is convinced that the soil treatment

standards will satisfy the standard of RCRA Section 3004(m) that short-term and long-term threats to human health and the environment posed by land disposal be minimized. As discussed in the preamble to today's final rule, technology-based standards such as the ninety percent reduction requirement capped by treatment to ten times the universal treatment standard promulgated today provide an objective measure of assurance that hazardous wastes (or in this case hazardous contaminated soil) are substantially treated before they are land disposed, thus eliminating the long-term uncertainties associated with land disposal. In addition, the extent of treatment required substantially reduces the mobility or total concentrations of hazardous constituents.

In addition, EPA has made two changes from the proposal to strengthen the soil treatment standards: first, EPA has modified its approach to constituents subject to treatment to require treatment for any underlying hazardous constituent reasonable expected to be present in any given contaminated soil when such constituents are found at initial concentrations greater than ten time the universal treatment standard. Second, EPA has placed additional restrictions on used of treated soil in hazardous waste derived products which will be used in a manner constituting disposal (i.e., will be placed in or on the land).

1.D.3 Sediment [Also see related Sediment comments under Chapter 5, Definitions, and other Chapters.]

One commenter notes that:

- "The proposed rule does not include "bright line" numbers for contaminated sediments. EPA believes that the amount of sediment that is classified as hazardous is very low and, therefore, site-specific "contained in" determinations should be made for hazardous contaminated sediments." (142)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soil or the portions of the rule which would have provided a system for most contaminated media, including many sediments, to exit the RCRA Subtitle C system. If, in the future, EPA takes action to establish a bright line or codify the contained-in policy, EPA will address concerns regarding the relationship of the bright line and the contained-in policy to contaminated sediments, as necessary, at that time.

The Agency notes that application of the current contained-in policy to contaminated sediments is unaffected by today's rule. Under the current policy, a determination can be made that any given volume of contaminated environmental sediments does not contain hazardous waste. As discussed in detail in the preamble to today's final rule, EPA recommends these determinations be made at site-specific, risk-based levels.

Several commenters stated that risk levels proposed for soil were not appropriate for sediments managed in situ due to the use of different exposure factors.

- "The soil bright line levels identified in the proposed rule do not appear to be appropriate for sediments managed in-situ. The risk levels are not consistent for sediments due to the use of different exposure factors." (143)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soils and environmental sediments. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to contaminated sediments, as necessary, at that time.

- "CMA is encouraged that the proposed rule does not include Bright line numbers for contaminated sediment, but rather proposes that site-specific contained-in decisions be utilized for sediment assessment. Indeed, given the complex, extraordinarily site-specific nature of sediment, CMA asserts it is inappropriate and scientifically unsound to apply Bright Line values for the assessment of contaminated sediment. Moreover, CMA urges EPA to stress effective risk assessment and management decision-making throughout its contained-in approach." (112)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soils and sediments. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to contaminated sediments, as necessary, at that time.

- "As indicated previously, Shell does not support the use of bright lines for the evaluation of contaminated media. We support regulating sediments under the Unitary Approach.

  SEDIMENT AND SLUDGES SHOULD BE MANAGED UNDER THE UNITARY APPROACH

  The remediation of sediment and sludges (which fit the definition of sediment) should be determined based on site specific risk assessments.

  Note: Sediment is defined in the proposal to include "industrial wastes, other organic and inorganic materials, and chemicals." The physical description of a sludge would or could fit the proposed description of sediment.

  GROUNDWATER SHOULD BE MANAGED UNDER THE UNITARY APPROACH

  The same logic that we believe should apply to sediment and sludges should also apply to groundwater. The regulation of these and other contaminated media simply do not belong under the full Subtitle C requirements of RCRA which were designed (in part) to discourage the generation of hazardous waste. Since a contaminated media such as groundwater is not "generated" via an intentional industrial process, the Subtitle C program becomes a bottleneck to the remediation instead of an effective tool to protect the environment from harm." (115)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soils and sediments and ground water. If, in the future, EPA takes

action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to contaminated sediments, sludges and ground water.

Regarding the suggestion that EPA promulgate the so called “unitary approach,” as discussed in the preamble to today’s rulemaking, the Agency is not, at this time, taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all hazardous remediation waste to exit large portions of the RCRA Subtitle C system. The Agency continues to believe that legislative action is needed to address the application of RCRA Subtitle C regulations, especially LDRs, to hazardous remediation waste. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance, represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste.

“In regards to EPA's request for comments on whether to develop a Bright Line specifically for contaminated sediments, we believe that, since the amount of sediments classified as RCRA hazardous is very low, EPA's efforts would be better focused on other priorities. In any case, the Bright Line levels for soils should not be applied to sediments since sediments interface with both surface and ground water, and the soil Bright Line levels consider only ingestion and inhalation.” (00036)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soils and sediments. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to contaminated sediments, as necessary at that time.

Conversely, several commenters indicated that soil Bright Lines should apply to sediments. Two commenters suggested that applicability is appropriate to sediments being remediated pursuant to an RMP, rather than sediments being redeposited in an aquatic environment. One commenter encouraged EPA to coordinate the development of sediment Bright Lines with EPA’s development of sediment quality criteria.

- "The preamble to the proposed HWIR-Media rule gives a detailed explanation of how LDRs would "attach" to environmental media. EPA states that:

  > "...environmental media contaminated by hazardous wastes placed before the effective dates of the applicable land disposal restrictions does not become subject to the LDRs unless they are removed from the land and placed into a land disposal unit after the effective dates of the applicable restrictions.
  >
  > The land disposal restrictions do not attach to environmental media contaminated by hazardous wastes when the wastes were placed before the effective dates of the applicable land disposal prohibitions. If these media are determined not to contain

hazardous wastes before they are removed from the land, then they can be managed as nonhazardous contaminated media and they're not subject to land disposal restrictions. (61 FR 18805)"

Here again, it is the "contained-in" decision, and not the Bright Line concentration that determines the applicability of the LDRs. Once media are determined to contain hazardous wastes, LDRs would attach to the media. For soil, the proposed rule establishes alternative LDR restrictions which would require that "soils be treated so that the concentrations of constituents subject to treatment are reduced by 90 percent with treatment capped at 10 times the Universal Treatment Standard (UTS). If treatment of a given constituent to meet the 90 percent reduction standard would result in reducing constituent concentrations to less than 10 times the UTS, treatment beyond 10 times the UTS would not be required."

For sediments, alternative LDR restrictions were not developed; thus, according to this proposed rule, sediments would be required to meet the much more stringent LDR treatment standards applicable to the hazardous wastes contained in the sediment. Many of the hazardous waste LDRs were developed based on thermal treatment technologies; these treatment levels cannot be consistently met using non-thermal technologies, such as bioremediation. For treatment purposes, this distinction between soil and sediment seems arbitrary. Once removed from an aqueous environment and dewatered, sediment is essentially soil, and should be managed as such for the purposes of this rule. Thus, given the fact that there are no significant risk-based differences between the management of excavated soil and dredged dewatered sediment, sediments should be subject to the same alternative treatment standards as were developed for soil." (40)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a system to allow most contaminated environmental media, including environmental sediments, to exit the RCRA system. If, in the future, EPA takes action to establish such a system, EPA will address these comments, as necessary, at that time.

The Agency is also not, at this time, taking action on the portions of the proposal which would have applied the soil treatment standards to other environmental media or remediation wastes (such as dewatered sediments). The Agency will continue to evaluate this issue; if, in the future, EPA takes action to apply the soil treatment standards it will address these comments, as necessary, at that time.

- In 1994, the EPA Office of Water issued EPA's Contaminated Sediment Management Strategy, EPA/823/R-94/--1 (Aug. 1994) as part of the federal initiative to "reinvent government." The Strategy indicated that it was EPA's intent to develop and promulgate standard sediment quality criteria for use in determining when RCRA corrective actions or CERCLA remedial activities should be required at a site. Apparently, EPA has not yet promulgated such criteria, but DOE encourages EPA, to the extent appropriate, to coordinate future development of sediment Bright Line concentrations with its development of sediment quality criteria. In the mean time, DOE believes the Bright Line concentrations for soil should be used as bright line guidance for sediment. DOE believes this would be appropriate for the following reason. Remediation of contaminated sediments may involve removal of the sediments from the associated water body followed by treatment and disposal

on uplands. In situ treatment or ex situ treatment and either replacement into the drained water body or placement on uplands followed by backfilling of the water body is also a possible remedy. In similar fashion, remediation may involve permanent drainage of a water body (e.g., impoundment) and subsequent management and disposal of permanently exposed sediments in uplands. In all such cases, the end state of sediments is, in effect, soil. With this in mind, it seems appropriate to establish the soil Bright Line values as applicable to sediments. At a minimum, the soil Bright Line levels should be applied where the RMP specifies that the sediments will be land disposed outside of a water body." (00060)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soils or sediments. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to contaminated sediments, as necessary, at that time.

- "In general, soil numbers should apply to sediments being remediated pursuant to an RMP. The only instance when soil numbers may be inappropriate occurs when sediments are being redeposited in an aquatic environment. In this instance, the RMP could specify alternative cleanup standards consistent with the cleanup goals for that environment." (81)

Response: The Agency is also not, at this time, taking action on the portions of the proposal which would have applied the soil treatment standards to other environmental media or remediation wastes (such as dewatered sediments). The Agency will continue to evaluate this issue; if, in the future, EPA takes action to apply the soil treatment standards it will address these comments, as necessary, at that time.

- "The Agency requests comments on whether specific "Bright-Line" values should be developed for sediments or whether the values established for soils are appropriate.

  WMX believes that sediments should be included within the soil "Bright-Line" values. Despite the definition provided in this proposal, which suggests that sediments are distinctly separate and different than soil, this purported dissimilarity is not supported by WMX's experience. Sediments dredged from waterways generally appears to be wet gritty soil. The same is true for sediments cleaned out of manholes and underground water lines. Due to the dispersion of hazardous contaminants in a waterway, the contamination may be of low level, distributed over a large area. Thus from a contaminant concentration perspective, treatment of sediment to less than the Part 268 standards appears as justified as for soil. In addition, the same treatment technologies would likely be applied to sediment as soil with similar results. For example, pozzolanic stabilization of lead contaminated sediment will be equally as effective as stabilization of lead contaminated soil. Therefore, sediment should be eligible for the same requirements as soil." (104)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a "bright line" to distinguish between higher- and lower-risk contaminated media, including contaminated soils and sediments. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to contaminated sediments, as necessary, at that time.

The Agency is also not, at this time, taking action on the portions of the proposal which would have applied the soil treatment standards to other environmental media or remediation wastes (such as dewatered sediments). The Agency will continue to evaluate this issue; if, in the future, EPA takes action to apply the soil treatment standards it will address these commentes, as necessary, at that time.

- "The bright line numbers for sediments should be the same as the bright line numbers for soils." (108)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soils and sediments. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to contaminated sediments, as necessary, at that time.

- "Bright line number for sediments should be the same as the bright line numbers for soils since in may instances remediation involves removal of sediments, dewatering and treatment and disposal with soils generated during remediation." (108)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soils and sediments. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to contaminated sediments, as necessary, at that time.

The Agency is also not, at this time, taking action on the portions of the proposal which would have applied the soil treatment standards to other environmental media or remediation wastes (such as dewatered sediments). The Agency will continue to evaluate this issue; if, in the future, EPA takes action to apply the soil treatment standards it will address these commentes, as necessary, at that time.

- "The reduced LDR requirements proposed for soils above the bright line should be applied to all remediation wastes including sediments. Characteristic waste should simply need to be treated to remove the characteristic." (108)

Response: EPA is not, at this time, taking action on the portion of the HWIR-Media proposal that would have established a “bright line” to distinguish between higher- and lower-risk contaminated media, including contaminated soils and sediments. If, in the future, EPA takes action to establish a bright line, EPA will address concerns regarding the relationship of the bright line to contaminated sediments, as necessary, at that time.

The Agency is also not, at this time, taking action on the portions of the proposal which would have applied the soil treatment standards to other environmental media or remediation wastes (such as dewatered sediments). The Agency will continue to evaluate this issue; if, in the future, EPA takes action to apply the soil treatment standards it will address these comments, as necessary, at that time.

Regarding treatment of media that exhibits a characteristic of hazardous waste, as discussed in detail in the proposal, the agency believes such media, like characteristic waste, must be treated for the

characteristic constituent (for media that exhibit the toxicity characteristic) or the characteristic property (for media that exhibit the characteristics of ignitability, corrosivity, or reactivity) and for all underlying hazards constituents reasonable expected to be present when such constituents are found at concentrations greater than ten times the universal treatment standard. See 61 FR 18809, April 29, 1996 and other sources cited therein.

- "EPA's proposed approach provides virtually no reform for sediments and groundwater, which must be treated to meet the existing process waste-based LDRs. These materials were never excluded from reform in the FACA discussions, and there is no apparent basis for EPA's proposal to address them in a fundamentally different manner than soil. Such as approach simply serves to further undermine the limited relief afforded by the Bright Line approach and add to its cumbersome complexity. EPA justifies soil specific LDRs largely because soils are fundamentally different than the process wastes upon which they did not form the basis for the UST. Further, sediments and groundwater are not solid wastes, but media, which may contain hazardous waste. We see no logic for addressing them differently than other media. If EPA truly wishes to remove RCRA's substantial impediments from remedial activities they must provide meaningful reform for all remediation wastes, no piecemeal, incremental changes for snippets of the remediation waste universe. We simply do not believe that the Hazardous Waste Identification Rule for some undefined portion of contaminated soils accomplishes this goal." (117)

Response: The Agency shares concerns that application of LDRs to hazardous remediation waste, including hazardous contaminated soil, might prove overly complex or create impediments to efficient and aggressive remedial actions. However, as discussed in the preamble to today's rulemaking, the Agency is not, at this time, taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all hazardous remediation waste to exit large portions of the RCRA Subtitle C system. The Agency continues to believe that legislative action is needed to address the application of RCRA Subtitle C regulations, especially LDRs, to hazardous remediation waste. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes.

- "EPA proposes in §269.30(f) to require sediment to be treated to a different standard than soil. On page 61 FR 18807, EPA explains that they considered applying the alternative 90% or 10 times UTS treatment standard to media other than soil, but decided not to because "there is little information available to the Agency to indicate that the LDR treatment standards that currently apply to these other media are inappropriate, or otherwise pose the same type of technical challenges as they do for soils."

  DoD requests that sediments be treated similarly to soils because of their physical similarities. Sediment is defined in §269.3 as including "transported soil particles from surface erosion" and soil is defined as including "silt and sand." From a practical perspective, delineating the point at which the soil area stops and the sediment area starts and ensuring the two media are not mixed will be difficult. Also, once excavated and dried, it may be difficult to distinguish between the two. Applying different treatment criteria will

necessitate segregation and separate management and thus prolonging the cleanup process and increasing costs which is contrary to the intent of this rulemaking." (97)

Response: The Agency is also not, at this time, taking action on the portions of the proposal which would have applied the soil treatment standards to other environmental media or remediation wastes (such as dewatered sediments). The Agency will continue to evaluate this issue; if, in the future, EPA takes action to apply the soil treatment standards it will address these comments, as necessary, at that time.

- "In most cases, the end state of remediated sediments is, in effect, soil. Westinghouse recommends EPA establish the soil Bright Line values as applicable to sediments. The soil Bright Levels should be applied where the RMP specifies that the sediments will be land disposed outside of a water body." (00035)

Response: The Agency is also not, at this time, taking action on the portions of the proposal which would have applied the soil treatment standards to other environmental media or remediation wastes (such as dewatered sediments). The Agency will continue to evaluate this issue; if, in the future, EPA takes action to apply the soil treatment standards it will address these comments, as necessary, at that time.

[From Chapter 5 of HWIR-Media RTC: 5.H SOIL]

One commenter supports EPA's definition of soil.

- "a. p. 18794, col. 2 - EPA proposes to define soil as:

  > ... unconsolidated earth material composing the superficial geologic strata (material overlying bedrock), consisting of clay, silt, sand, or gravel size particles (sizes as classified by the U.S. Soil Conservation Service), or a mixture of such materials with liquids, sludges, or solids which is inseparable by simple mechanical removal processes, and is made up primarily of soil.

  The Agency specifically solicits comments on this proposed definition and the approach it implies for classifying mixtures of soil and other materials.

  As indicated in the preamble, EPA previously proposed this same definition of soil as part of the Phase II LDR proposal (i.e., LDRs for Newly Identified and Listed Wastes and Hazardous Soil; 58 FR 48092, 48123). In general, DOE concurs with this definition of soil. The Department believes that its comment in response to the definition of soil when it was previously presented remains pertinent. DOE commented as follows:[15]
  The Department supports this definition because, as EPA states, it would avoid requiring chemical analyses for soil properties in order to differentiate precisely between waste, soil

[15] DOE Comments, Land Disposal Restrictions for Newly Identified and Listed Hazardous Wastes and Hazardous Soil, Specific Comment VII.B.4, item 1, pp. 6-7 (03/15/94).

and debris. This type of approach would minimize handling and exposure, and would avoid analytical delays which yield no value-added results. For the sake of better clarification and consistency with the hazardous debris rule, EPA should provide further guidance regarding mixtures of soil with other materials. DOE suggests that mixtures of materials should be classified as soil based on volume (i.e., where the soil portion comprises the largest amount of material present by volume), according to visual inspection. This method of classification would be consistent with the classification scheme specified for debris (August 18, 1992, Phase I LDR final rule, 57 FR 37224)."(60)

Response: EPA appreciates this support of the definition of soil.

EPA is also persuaded that it is appropriate to conform the definition of soil to that of debris, by clarifying that, determinations of whether a mixture of soil and non-soil is "made up primarily of soil" should be determined based on volume based on visual inspection. As EPA discussed in the preamble to the debris rule, it is important that remediation project managers and field personnel have a means of classifying material as "debris," "soil," or "waste" that is easy to implement in the field. Using this approach, for example, a mixture of soil and cobbles where the soil makes up the majority of the mixture based on visual inspection would be classified as soil.

A couple of commenters argue against EPA's definition of soil.

- "The Project believes there will be great difficulty in applying this definition in the field as well. Furthermore, EPA seems to be conceding as much by proposing to let the States grapple with the problem See 61 Fed. Reg. 18,794. One could question how, if the States are not considered capable of addressing all remediation wastes, as is inherent in the media-only, bright-line proposal, they nonetheless would be expected to address the fundamental determination necessary under that approach. Again, we believe that the problems with attempting to apply this definition during actual remediations are a further strong justification for moving to the Unitary Approach."(55)

Response: EPA does not believe that the definition of soil will pose severe implementation problems. The Agency adopted a similar approach in the definition of "debris" and is not aware of implementation difficulties. In addition, the Agency proposed the same definition, as a definition of "soil," in the April 29, 1996 proposal and did not receive this type of adverse comment.

Regarding the suggestion that EPA adopt the Unitary approach, as discussed in the preamble to today's rulemaking, the Agency is not, at this time, taking action on the portions of the HWIR-Media proposal which would have provided opportunities for some or all hazardous remediation waste to exit large portions of the RCRA Subtitle C system. The Agency continues to believe that legislative action is needed to address the application of RCRA Subtitle C regulations, especially LDRs, to hazardous remediation waste. If legislation is forthcoming, EPA will likely re-examine application of LDRs to hazardous remediation waste, including hazardous contaminated soil. If there is no legislation, EPA may choose to take additional regulatory action, which may include a re-examination of the application of LDRs to hazardous contaminated soils and other hazardous remediation wastes. In the meantime, EPA believes the alternative LDR treatment standards for contaminated soil promulgated today, including the site-specific, risk-based minimize threat variance,

represent a significant improvement over the current practice of applying the treatment standards developed for pure industrial hazardous waste.

- "Soil -- As stated in Part I, Section II, USWAG disagrees with the limited scope of EPA's proposal. EPA's effort to divide remediation waste into discrete, separate categories is fundamentally flawed. And the Agency's effort to solve the problem by defining "soil" to include a mixture which is "inseparable by simple mechanical removal processes and is made up primarily of soil" (id. at 18794) will only add another layer of confusion into an already complex rule. By creating uncertainty about the type of remediation waste present and the corresponding regulatory framework governing the waste, EPA may create disincentives to remediating the site. The provision relating to mixtures is likely to become the subject of considerable uncertainty and, ultimately, enforcement litigation. However, EPA could avoid these problems by expanding the rule to the entire universe of remediation waste."(59)

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