

MAJOR CHANGES TO MAY 2012 DRAFT CONCENTRATION AVERAGING BRANCH TECHNICAL POSITION

1. Reorganized to improve readability. Added overview of concentration averaging, including key concepts, in Section 1, "Introduction." Added background material to Section 3, "Technical Position," on identification of waste streams and physical characterization for the purposes of concentration averaging and waste classification. Substantially reorganized Section 3, "Technical Position," to improve flow. Replaced three flow charts and added new ones. Moved background material from blendable waste section (Vol. 1, Section 3.2) to technical basis (Vol. 2, Section 4). Created two volumes, one containing the technical positions, a glossary, and the Safety Culture Policy Statement, the other containing responses to public comments and the technical basis. The first volume is designed for users (i.e., persons who average waste concentrations for the purpose of waste classification, or review or inspect those activities). The second is designed for stakeholders who commented on the CA BTP or others who want to have a detailed understanding of the basis for the averaging positions in Volume 1.
2. Added a definition of "waste stream" and revised the definition of "waste type" to clarify a distinction between the two terms. In the context of the revised CA BTP, wastes that share physical characteristics belong to a single waste type (e.g., all ion exchange resins are a single waste type) but wastes must share both physical and radiological characteristics to belong to the same waste stream (e.g., primary and secondary ion exchange resins are different waste streams).
3. Replaced the term "mixable waste" with "blendable waste." In the 2012 draft, "mixable waste" described waste that was not discrete and therefore could be blended to create a radiologically homogeneous product. This term has been replaced with the term "blendable." Blendable waste includes both (1) waste that can be physically mixed to create relatively uniform radionuclide concentrations (e.g., soil, spent ion exchange resins, ash) and (2) waste that is not expected to contain durable items with significant activity (e.g., contaminated trash). Replaced the term "homogeneous" waste with the term "adequately blended" waste, to better reflect the emphasis on reducing risk to an inadvertent intruder rather than a high degree of waste uniformity, which may not be related to risk.
4. Revised the basis for the volume thresholds for demonstrating a mixture of two or more blendable waste streams is adequately blended (Table 1 of Volume 1 of the revised CA BTP). Previously, some of the values in the 2012 draft of Table 1 were based on 0.1% of the national annual LLW production volumes. This value of 0.1% per licensee was chosen subjectively to limit the cumulative contributions from multiple licensees. The table identifying thresholds for homogeneity demonstrations has been revised so that it no longer relies on an annual production limit. Instead, its basis is the package volume as a function of the most concentrated influent waste stream. Package volume is related to potential dose because a larger package that meets class limits can contain more radioactivity than a smaller package meeting the same class limits.
5. Revised the criterion for demonstrating waste is adequately blended from demonstrating that no hot spot larger than 0.15 m³ (5 ft³) has a sum of fractions greater than 10 to demonstrating that no hotspot larger than 0.2 m³ (7 ft³) has a sum of fractions greater

- than 10. The change from 0.15 m³ (5 ft³) to 0.2 m³ (7 ft³) was made to use a more appropriate level of precision and to reflect minor changes in the probabilistic dose model used to develop the criterion for demonstrating adequate blending.
6. Replaced the list of certain waste types that were assumed to be homogeneous with the guidance that any single waste stream of blendable waste is free from concentration averaging constraints. That is, radionuclide concentrations in any single waste stream of blendable waste may be averaged over the volume or mass of the waste.
 7. Consolidated averaging constraints on discrete items, so that primary gamma-emitting radionuclides in a discrete item should meet either (1) the Table 2 activity constraint or (2) the Factor of 2 or 10 concentration limit, as applicable depending on whether primary gamma-emitting radionuclides control the waste classification. Added guidance that radionuclides other than primary gamma-emitting radionuclides should meet either (1) Table 3 or (2) the Factor of 10.
 8. Added guidance which states that, for encapsulated waste, container volumes up to 9.4 m³ (331 ft³) may be used for averaging (previously it was 0.21 m³ (55 gallons)), if the waste loading is at least 14% and the Factor of 2 and 10 constraints are met.
 9. Revised the position on solidified waste to indicate that, if solidification is performed to create a physically uniform waste form in accordance with NRC guidance for solidification and industry standards, the average radionuclide concentrations in solidified waste may be based on the total volume or mass of the solidified waste form. In the 2012 draft CA BTP, averaging over the entire solidified mass or volume was allowed for solidified solid waste only if the licensee demonstrated that the solidified product was radiologically homogeneous.
 10. Removed section on “Activated Metals and Contaminated Materials” from Alternative Approaches. This section provided guidance on when these waste types could be considered to be dispersible, rather than solid, at the time of intrusion. If dispersible, these wastes could be considered to be blendable and subject to different averaging constraints. Activated metals are not expected to become dispersible, because of their corrosion resistance and the staff believes the guidance is not necessary for activated metals. In addition, the absence of specific guidance in Alternative Approaches does not prevent a licensee from requesting a deviation from the CA BTP positions. For contaminated materials, licensees currently distinguish between “contaminated materials” (a discrete waste) and “contaminated trash,” (a blendable waste) and an Alternative Approach is not needed at this time. The staff may issue further guidance on contaminated materials and trash at a later time.
 11. Clarified licensee and regulator interactions for Alternative Approaches reviews. Licensees are strongly urged to submit a proposal to the disposal facility regulator for discussion and review. Some sections of the CA BTP had used the word “approval.”
 12. Added guidance from the 1995 CA BTP on characterization of contaminated materials (originally in Section 3.4 of the 1995 CA BTP, now in Section 3.1.4).
 13. Clarified that the Factor of 2, the Factor of 10, and Table 3 may be applied to each radionuclide individually, but Table 2 is applied using a sum of fractions.
 14. Revised the guidance for mixtures of discrete items and encapsulated items to indicate that Table 2 constraints can be applied individually to items larger than 280 cc (0.01 ft³) but items smaller than 280 cc (0.01 ft³) should be grouped.

15. Revised the definition of “classification-controlling” to remove ambiguity.
16. Added a section entitled, “Backfit Considerations,” which states that either the 1995 or revised CA BTP can be used by licensees.
17. Consolidated sections in Technical Basis, Vol. 2, Section 4.

