



Scientific Analysis/Calculation Error Resolution Document

QA: QA
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Complete only applicable items.

INITIATION

1. Originator: James C Cunnane	2. Date: 03-27-2008	3. ANL-WIS-MD-000006 ERD 01
4. Document Identifier: ANL-WIS-MD-000006 REV 02	5. Document Title: Radionuclide Screening	

6. Description of and Justification for Change (Identify applicable CRs and TBVs):

The following changes/corrections are posted to resolve TBV 7772 and to address the fact that this TBV was not linked in DIRS to ANL-WIS-MD-000006 REV 02. The specific changes to ANL-WIS-MD-000006 REV 02 are given in the attachments to this ERD.

6A. Resolve TBV 7772 and make changes in ANL-WIS-MD-000006 REV 02 consistent with resolution of TBV 7772

CONCURRENCE

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APPROVAL

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6A. Resolution of TBV-7772**I. Background Information Summary**

As discussed in the Radionuclide Screening AMR (SNL 2007 [DIRS 177424], Section 6.2.3), it became apparent during the development of the AMR that the ^{113}Cd input data for sludge batches 2 and 3 in Table 4-5 was probably not correct. As indicated in the footnote at the bottom of Table 4-5 (SNL 2007 [DIRS 177424], Table 4-5), the source of the ^{113}Cd input data is Allison 2004 [DIRS 168734], Tables 5-8. More specifically, the source of the ^{113}Cd input data for sludge batches 2 and 3 is Allison 2004 [DIRS 168734], Table 7.

II. Inputs and/or Software

N/A

III. Analysis and Results

Updated radionuclide inventory data are now available for the HLW glass canisters from the Savannah River Site (Ray 2007 [DIRS 181690]). The updated ^{113}Cd data (Curies per canister basis) are provided in Table 2 of this reference (Ray 2007 [DIRS 181690], Table 2). These updated data verify that the data for sludge batches 2 and 3 in Allison 2004 [DIRS 168734], Table 7 were indeed incorrect. The updated data show that the maximum projected ^{113}Cd inventory is $2.62\text{E-}11$ (Ci/canister on 11/16/2008) and the Macro batch 2 inventory is $2.56\text{E-}11$ (Ci/canister on 6/5/00) (Ray 2007 [DIRS 181690], Table 2) whereas the earlier value for sludge batches 2 and 3 was $1.1300\text{E}01$ (Ci/canister decayed to 2030) (Allison 2004 [DIRS 168734], Table 7). Given that the half life of ^{113}Cd is $7.7\text{E}15$ yrs. (SNL 2007 [DIRS 177424], Table 4-3), it is clear that the updated ^{113}Cd data are nearly twelve orders of magnitude lower than the value given in Allison 2004 [DIRS 168734], Table 7.

This verifies that the data in Allison 2004 [DIRS 168734], Table 7 were indeed incorrect as indicated in the "NOTE" at the bottom of Table 4-5 in the AMR (SNL 2007 [DIRS 177424], Table 4-5) and resolves TBV 7772.

The following AMR changes are needed to implement resolution of TBV 7772:

- The footnote at the bottom of Table 4-5 is changed as follows:

Source: Allison 2004 [DIRS 168734], Tables 5 to 8.

NOTE: The ^{113}Cd inventory data is not correct. This is discussed in Section 6.2.3.

- The text in Section 5.4 (Assumption 4) is changed as follows:

As part of resolution of TBV -7772, it was confirmed that the ^{113}Cd inventory listed in Table 4-5 is not correct as indicated by the "NOTE" at the bottom of the table. The effects of Assumption 4 on the screening results are addressed in Section 6.2.3.

- The text at the bottom of Section 6.2.3 is changed as follows:

As noted at the bottom of Table 4-5, the ^{113}Cd inventory given for sludge batches 2 and 3 is incorrect. Assumption 4 assigned the ^{113}Cd inventory in Table 4-5 to $^{113\text{m}}\text{Cd}$ for the GoldSim calculations (Appendix C). As shown by the screening results discussed in Section 6.3, neither ^{113}Cd nor $^{113\text{m}}\text{Cd}$ are screened in, even at the marginally significant level, for any waste form. This result indicates that Assumption 4 has no effect on the screening results.

This ERD is being issued to resolve TBV-7772. Therefore, although it was identified that the TBV was not linked to the Radionuclide Screening analysis report (SNL 2007 [DIRS 177424])

in the DIRS, there is no need to generate a new DIRS linkage to link the TBV because this ERD provides that function.

IV. Impact Evaluation

These changes do not affect any output result or conclusion of the radionuclide screening analysis (SNL 2007 [DIRS 177424]) and therefore have no impact on other documents that use technical product output from ANL-WIS-MD-000006 REV 02 (SNL 2007 [DIRS 177424]).