YMP	**Model** **Error Resolution Document** *Complete only applicable items.*	QA: QA Page 1 of 18

INITIATION

1. Originator: David C. Sassani	2. Date: 02/29/2008	3. ERD No.: ANL-WIS-PA-000001 ERD 01

4. Document Identifier: ANL-WIS-PA-000001 Rev 03	5. Document Title: EBS Radionuclide Transport Abstraction

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

Description:

This ERD evaluates issues in the following Condition Reports and TBVs and provides corrections to errors that have been identified by the Condition Reports listed below, found during evaluation of the TBVs, or identified in the document during the corrective actions being performed. The specifics of the issues for each CR and TBV can be found in the attached pages as follows:

CR 11425 is addressed in the first section of the attached pages;
CR 11755 is addressed in the second section of the attached pages;
CR 11816 is addressed in the third section of the attached pages;
TBV 8617 is addressed in the fourth section of the attached pages;
TBV 8620 is addressed in the fifth section of the attached pages.
TBV 8902 is addressed in the sixth section of the attached pages.

Note that there are DIRS changes to correct the errors in the DIRS.

Note that there is a revision to the **DTN: SN0703PAEBSRTA.001** with the following files modified:
"SN0703PAEBSRTA.001 - RTA Input Tables.Doc"
Note also that notes have been placed in the "Readme.doc" to indicate the above rows were modified based on this ERD and that the file "20070928_004_Changes.doc" includes a listing of the changes to the DTN file(s).

Justification:

The corrections made for the issues described, analyzed, and resolved in the attached pages have been evaluated for their impacts to the document. The corrections are primarily editorial in nature, even in the case of the changes to values for CR 11755 because the correct values are in the DTN and are used by the TSPA. In the case of the corrections for CR 11816, the corrected values are updated to be consistent with the current design information, but the outdated values used by TSPA provided a slightly conservative result that does not need to be reevaluated based on the new values. It is concluded that there are no impacts to the conclusions of the report and there are no impacts to downstream usages (for details see analyses in the attached pages).

CONCURRENCE

	Printed Name	Signature	Date
7. Checker	Christine Stockman	Christine Stockman	4/9/08
8. QCS/QA Reviewer	Robert E. Spencer	Robert E. Spencer	4/9/08
APPROVAL			
9. Originator	David C. Sassani	David C. Sassani	4/9/08
10. Responsible Manager	Paul Dixon	Paul Dixon	4-10-08

OUTLINE INFORMATION

Condition Report Numbers and TBV Numbers

This Error Resolution Document (ANL-WIS-PA-000001 ERD 01) is for the model report *EBS Radionuclide Transport Abstraction* (ANL-WIS-PA-000001 Rev 03) to correct errors reported by the condition reports (CRs), associated with the TBV numbers listed below, or identified in the document during the corrective actions being performed.

The following condition reports and TBVs are addressed sequentially below:
CR 11425;
CR 11755;
CR 11816;
TBV 8617;
TBV 8620; and
TBV 8902.

CR 11425 Report Information

I Background Information Summary

The CR 11425 was submitted to identify and track correction of an error in a section number that was discovered during Licensing and Data Qualification review of the TSPA Uncertainty and Sensitivity Analysis. In ANL-WIS-PA-000001 page 6-205 it is stated that "The target-flux out ratio rather than being set as a fixed number is given a range from 0.90 to 0.99 (uniform distribution) (BSC 2005 [DIRS 177423], Section 6.3.3.2) to indicate epistemic uncertainty in this value." There is no section 6.3.3.2 in MDL-EBS-PA-000004 REV 03, SNL 2007 [DIRS 177423].

II Inputs and/or Software

No software or any types of calculations are used to evaluate the extent of conditions in this CR. No assumptions were used in this analysis.

III Analysis and Results

The erroneous citation on page 6-205 is:

"The target flux out ratio rather than being set as a fixed number is given a range of 0.9 to 0.99 (uniform distribution) (BSC 2005 [DIRS 177423], Section 6.3.3.2) to indicate epistemic uncertainty in this value."

This is corrected to read:
"The target flux out ratio rather than being set as a fixed number is given a range of 0.9 to 0.99 (uniform distribution) (SNL 2007 [DIRS 177423], Section 6.3.12.2) to indicate epistemic uncertainty in this value."

This is a typographical error (even though the DIRS number was updated correctly the citation and section numbers were not) and does not impact the conclusions of the document.

Note that there are DIRS changes made to correct these typographical errors in the DIRS.

IV Impact Evaluation

This typographical error correction on the reference cited has no impact on the conclusions of the report and therefore there are no impacts related to this correction.

CR 11755 Report Information

I Background Information Summary

In the *EBS Radionuclide Transport Abstraction* (ANL-WIS-PA-000001 REV 03), Table 8.2-4, contains two parameter values for use in the calculation of the water adsorption isotherm for corrosion products that differ from the output values contained in the spreadsheet deriving these values within the output DTN of the AMR (DTN: SN0703PAEBSRTA.001_R3, file "Corrosion Products Composite Isotherm 7-19-2007.xls"). In addition, the values in Table 8.2-4 differ from the values developed in Section 6.3.4.3.2 of the AMR.

The values listed in Table 8.2-4 are also found in the output DTN: SN0703PAEBSRTA.001 in file "SN0703PAEBSRTA.001 - RTA Input Tables.Doc" and were used in TSPA Rev 00 [parameter entry form (PEF) 59]. This condition was discovered during the development of the TSPA Rev 00 Addendum 1, was corrected and verified during checking of the TSPA Input Database [PEF 203]. The correct inputs were used to develop the TSPA Addendum outputs.

The two parameters with the values in question are "FHH_Isotherm_k_CP_a" and "FHH_Isotherm_s_CP_a" and are found in rows 12 and 13 of Table 8.2-4 (see page 8-17) of the *EBS Radionuclide Transport Abstraction* (ANL-WIS-PA-000001 REV 03).

II Inputs and/or Software

No software or any types of calculations are used to evaluate the extent of conditions in this CR. No assumptions were used in this analysis.

III Analysis and Results

The values documented in both Table 8.2-4 and in the file "SN0703PAEBSRTA.001 - RTA Input Tables.Doc" of DTN: SN0703PAEBSRTA.001_R3 appear to be intermediate values of results that were not fully updated in the finalization of changes made to the calculation of these parameter values between Rev00 and Rev01 of the DTN that was being developed within the document. The spreadsheet workbook file "Corrosion Products Composite Isotherm 7-19-2007.xls" has been contained in the DTN unchanged since Rev01 and has the correct values in it. The change description file "20070814_001_Changes.doc" of Revision 01 of the DTN indicates the values of "FHH_Isotherm_k_CP_a" and "FHH_Isotherm_s_CP_a" were being updated, and gives the same erroneous values listed in Table 8.2-4. It appears that the spreadsheet workbook file "Corrosion Products Composite Isotherm 7-19-2007.xls" (see worksheet "Composite Isotherm", cells N40 through P41) and the AMR description/discussion of the derivation of the values in Section 6.3.4.3.2 (pages 6-71 through 6-73) are the correct values as they are the source of the calculated values. Given that this error was found by the TSPA group as they were checking the parameter entry forms for implementation of the TSPA Rev 00 Addendum 1, and that it was corrected and verified during checking of the TSPA Input Database [PEF 203], the correct inputs from the EBS RTA AMR were used to develop the TSPA Addendum outputs. In addition, the two sets of incorrect values are reproduced in Table 6.5-7 in the last two rows of the table. The values in Table 6.5-7 are used for some sample calculation presented within the EBS RTA AMR, but those calculations utilized the correct values as given here so there are no changes needed other than correction of the values listed in Table 6.5-7.

The incorrect rows of Table 8.2-4 (in the AMR and in the file "SN0703PAEBSRTA.001 - RTA Input Tables.Doc" of DTN: SN0703PAEBSRTA.001_R3) are:

FHH_Isotherm_k_CP_a	FHH adsorption isotherm parameter *k* for corrosion products	1.048 – 1.370 (dimensionless)	Uniform
FHH_Isotherm_s_CP_a	FHH adsorption isotherm parameter *s* for corrosion products	1.525 – 1.852 (dimensionless)	Uniform

These are corrected to read:

FHH_Isotherm_k_CP_a	FHH adsorption isotherm parameter *k* for corrosion products	1.030 – 1.326 (dimensionless)	Uniform
FHH_Isotherm_s_CP_a	FHH adsorption isotherm parameter *s* for corrosion products	1.493 – 1.799 (dimensionless)	Uniform

This correction is being made both in the Table 8.2-4 entries as well as the file "SN0703PAEBSRTA.001 - RTA Input Tables.Doc" of DTN: SN0703PAEBSRTA.001 in the listing of Table 8.2-4 therein. There will be an updated file listing this change for the revision to the DTN, as well as that in the CR 11816 below, and an updated readme file with the revision to this DTN.

Additionally, the last two rows of Table 6.5-7 are corrected as follows:

FHH adsorption isotherm parameter *k* for corrosion products	1.030 – 1.326 (dimensionless) Uniform	See Section 6.3.4.3.2
FHH adsorption isotherm parameter *s* for corrosion products	1.493 – 1.799 (dimensionless) Uniform	See Section 6.3.4.3.2

Note that the third column of the third and fourth rows of Table 6.5-7 erroneously indicates:
"Based on data in Table 6.3-10"

These are corrected to read:
"Based on data in Table 6.3-7"

These documentation corrections do not impact any of the conclusions of the EBS RTA AMR itself. Given that this error was found by the TSPA group as they were checking the parameter entry forms for implementation of the TSPA Rev 00 Addendum 1, and that it was corrected and verified during checking of the TSPA Input Database [PEF 203], the correct inputs from the EBS RTA AMR were used to develop the TSPA Addendum outputs. Based on an evaluation of the DIRS system for this EBS RTA AMR output DTN, there are no other downstream products that use these values. Therefore there are no impacts from these corrections.

IV Impact Evaluation

There are no impacts to conclusions of the *EBS Radionuclide Transport Abstraction*, ANL-WIS-PA-000001 Rev 03. The TSPA Rev 00 Addendum 1 utilized the correct parameter values for these inputs and there are no other documents that have used these parameters from the DTN. Therefore there are no impacts from these corrections.

CR 11816 Report Information

I Background Information Summary

The range used for parameter "Diff_Path_Length_Invert_Top_a" developed by the *EBS Radionuclide Transport Abstraction* (ANL-WIS-PA-000001, Rev 03—see Table 8.2-4, last row; and DTN SN0703PAEBSRTA.001) has been found to be outdated, being based on an earlier invert configuration. For use in TSPA analyses, this diffusive path length represents the distance from a potential breach in the waste package outer barrier to the mid-point of the invert. This parameter is treated in TSPA as an epistemic uncertain parameter that is sampled uniformly over the range of 0.30 m to 1.24 m (given by parameter "Diff_Path_Length_Invert_Top_a" in Table 6.3.8-4 of the TSPA document as taken from Table 8.2-4 of the *EBS Radionuclide Transport Abstraction* (ANL-WIS-PA-000001, Rev 03). The lower end of this original range is defined by one half of the average invert thickness of 0.597 m (utilized in the previous revision of the EBS RTA AMR).

This original value of the average invert thickness has been superseded by a new value of 0.934 m (*EBS Radionuclide Transport Abstraction*, Equation 6.5.2.3-5) based on the increased maximum thickness of the invert of 52 in. (see Table 4.1-20 of ANL-WIS-PA-000001, Rev 03). Because this current value is larger, the value of half of the invert average thickness that defines the lower-end value for the parameter "Diff_Path_Length_Invert_Top_a" (i.e., average diffusive path length from the waste package to the invert) increases to 0.47 m and provides an updated constraint on the lower and upper values of this parameter. Within the TSPA analyses, the current value of 0.934 m is used in computing invert domain properties for transport calculations except for the diffusive path length from the waste package outer barrier to the midpoint of the invert "Diff_Path_Length_Invert_Top_a", thereby leading to a small inconsistency. The values for this parameter are corrected below, the changes analyzed and the impacts evaluated.

II Inputs and/or Software

No software or any types of calculations are used to evaluate the extent of conditions in this CR. No assumptions were used in this analysis.

III Analysis and Results

Table 8.2-4 and the file "SN0703PAEBSRTA.001 - RTA Input Tables.Doc" (in DTN: SN0703PAEBSRTA.001 in the listing of Table 8.2-4 therein), both contain the following erroneous row:

Diff_Path_Length_Invert_Top_a	Diffusive path length from waste package outer corrosion barrier to mid-point of invert	0.30 – 1.24 m	Uniform

This is corrected to read:

Diff_Path_Length_Invert_Top_a	Diffusive path length from waste package outer corrosion barrier to mid-point of invert	0.47 – 1.41 m	Uniform

This correction is being made both in the Table 8.2-4 entries as well as the file "SN0703PAEBSRTA.001 - RTA Input Tables.Doc" of DTN: SN0703PAEBSRTA.001 in the listing of Table 8.2-4 therein. There is an updated file listing this change for the revision to the DTN, as well as those in the CR 11755 above, and there is an updated readme file with the revision to this DTN.

In addition the following description of the parameter value range development is added to the EBS RTA AMR on page 6-191, just below the paragraph that develops the average invert thickness (which contains Equation 6.5.2.3-5):

"Given the average thickness of the invert above, the diffusive path length for radionuclides migrating from the surface of the waste package to the midpoint of the invert ranges between (a) a lower- value that corresponds to the distance from the center of the invert to the top of the invert (half the average thickness is 0.47 m); and (b) an upper-end value that represents the distance from the center of the invert up to a representative breach location at some point on the surface of the waste package. Note that the lower-end value corresponds to a potential breach at the base of the waste package where it touches the invert (i.e., the pallet is not represented). A straightforward geometric calculation of the upper-end value is made based on considering the radionuclide migration from the waste package surface to the invert to occur solely in the vertical downward direction. Because breaches can be randomly located on the waste package surface, the average vertical location of a breach will correspond to the radius of the waste package, which is represented here using the radius for the CSNF package (0.94 m). This value added to half the invert thickness provides a the upper-end value of the range of diffusive path lengths. Thus, the range is 0.47 m to 1.41 m. Uncertainty in breach locations in different waste packages over time precludes defining any distribution other than uniform for this range of values."

Evaluation:
The lower end of the original range is defined by one half of the average invert thickness of 0.597 m (utilized in the previous revision of the EBS RTA AMR). This original value of the average invert thickness has been superseded by a new value of 0.934 m (EBS Radionuclide Transport Abstraction, Equation 6.5.2.3-5) based on the increased maximum thickness of the invert of 52 in. (see Table 4.1-20 of ANL-WIS-PA-000001, Rev 03). Because this current value is larger, the value of half of the invert average thickness that defines the lower-end value for the parameter "Diff_Path_Length_Invert_Top_a" (i.e., average diffusive path length from the waste package to the invert) increases to 0.47 m and provides an updated constraint on the lower and upper values of this parameter. The range in the path length corresponding to the representative distance from the top of the invert to the potential breach remains the same as before (1.24 – 0.30 = 0.94 m) corresponding to the radius of the CSNF waste package. So the revised range is shifted upward by 0.17 m. Within the TSPA analyses, the current value of the average invert thickness (0.934 m) is used in computing invert domain properties for transport calculations except for the diffusive path length from the waste package outer barrier to the midpoint of the invert "Diff_Path_Length_Invert_Top_a", thereby accurately representing all aspects except the diffusive path length. Because the TSPA utilized the smaller range of values for "Diff_Path_Length_Invert_Top_a", the TSPA results are conservative, but only in a minor manner because the difference in ranges (0.17 m) is small compared to the range itself (0.94 m). This is expected to have a negligible impact on any results and would serve to demonstrate a slight conservatism in the model. Therefore, there is no impact to the TSPA results. Based on an evaluation of the DIRS system for this EBS RTA AMR output DTN, there are no other

downstream products that use these values. The correction to the values in the EBS RTA AMR do not affect any conclusions of the document.

IV Impact Evaluation

There is no impact to the TSPA based on the updated average invert thickness, the new diffusive path length would range from 0.47 m to 1.41 m. The range (minimum to maximum value) would be unchanged (0.94 m, the radius of a CSNF waste package) from the range currently used, but the diffusive path length would now be slightly larger (0.17 m). Since the range used in the TSPA has smaller values for the diffusive path length, the TSPA calculation conservatively overestimates diffusive releases from a breached waste package to the invert relative to releases that would be obtained using the updated path length range. However, since the change of range is small (0.17 m) compared to the uncertainty in the range itself (0.94 m), using the updated range is likely to show negligible effect on the overall releases from the EBS.

TBV 8617 Report Information

I Background Information Summary

To resolve TBV 8617, a number of erroneous section citations and typographical errors on the citation of SNL (2007 [DIRS 177423] are corrected within this section of this ERD. These resulted from incomplete updating of the citations of the previous version of the report, but the DIRS number was correct in all cases. These instances are listed below with their corrections given explicitly.

II Inputs and/or Software

No software or any types of calculations are used to evaluate the extent of conditions in this CR. No assumptions were used in this analysis.

III Analysis and Results

In this section, 16 corrections to typographical errors on the citation (erroneous BSC 2005 versus correct SNL 2007) or to section numbers (sections not updated to new version of AMR (SNL 2007). These were only documentation errors because the DIRS number cited in all cases was the correct one for the current AMR ([DIRS 177423]). After the corrections are given, an evaluation of these is made as a package because they are all of the same character.

1. Section 6.3.4.2.3, page 6-50, 2nd paragraph last sentence, contains an erroneous citation in the statement:
   "Laboratory experiments of plutonium sorption onto iron oxide colloids have shown that approximately 1 percent of the initially sorbed plutonium can be desorbed into solution over a period of several months (Lu et al. 2000 [DIRS 166315]; BSC 2005 [DIRS 177423], Section 6.3.3.2)...".

   This is corrected to read:
   "Laboratory experiments of plutonium sorption onto iron oxide colloids have shown that approximately 1 percent of the initially sorbed plutonium can be desorbed into solution over a period of several months (Lu et al. 2000 [DIRS 166315]; SNL (2007 [DIRS 177423], Section 6.3.12.2)...".

2. Section 6.3.4.4, page 6-98 1st full paragraph, 1st sentence, contains an erroneous section citation in the statement:
   "The potential mass of radionuclides embedded in the waste form colloids (SNL 2007 [DIRS 177423], Section 6.3.3.3) is determined from reactions within the waste package."

   This is corrected to read:
   "The potential mass of radionuclides embedded in the waste form colloids (SNL 2007 [DIRS 177423], Sections 6.3.2.2 and 6.3.2.4) is determined from reactions within the waste package."

3. Section 6.3.4.4, page 6-98, 3rd paragraph, last sentence, contains an erroneous section citation in the statement:
   "...and goethite (FeOOH) (Zarrabi et al. 2003 [DIRS 171238], Table 10 and Section 5; DTN: MO0302UCC034JC.003 [DIRS 162871]; BSC 2005 [DIRS 177423], Section 6.3.1.3)."

This is corrected to read:
"...and goethite (FeOOH) (Zarrabi et al. 2003 [DIRS 171238], Table 10 and Section 5; DTN: MO0302UCC034JC.003 [DIRS 162871]; SNL 2007 [DIRS 177423], Section 6.3.8)."

4. Section 6.3.4.4, page 6-99, 2nd paragraph, first sentence, contains an erroneous citation in the statement:
"Colloids are defined as ranging in size (diameter) from 1 nm to 1,000 nm (BSC 2005 [DIRS 177423], p. 1-2)."

   This is corrected to read:
"Colloids are defined as ranging in size (diameter) from 1 nm to 1,000 nm (SNL 2007 [DIRS 177423], p. 1-2)."

5. Section 6.3.4.4, page 6-100, 3rd paragraph, first sentence, contains an erroneous section citation in the statement:
"Groundwater colloid particle sizes are discussed in Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (BSC 2005 [DIRS 177423], Section 6.3.2.4 and Appendix I)."

   This is corrected to read:
"Groundwater colloid particle sizes are discussed in Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (SNL 2007 [DIRS 177423], Section 6.3.11 and Appendix I)."

6. Section 6.3.4.4, page 6-100, 3rd paragraph, first sentence, contains an erroneous page/section citation in the statement:
"Evaluation of the colloid populations in the various size fraction classes for each groundwater sample did not reveal a systematic increase in the number of particles with decreasing particle-size class (SNL 2007 [DIRS 177423], pp. 6-30 to 6-31)."

   This is corrected to read:
"Evaluation of the colloid populations in the various size fraction classes for each groundwater sample did not reveal a systematic increase in the number of particles with decreasing particle-size class (SNL 2007 [DIRS 177423], Section 6.3.11)."

7. Section 6.3.3.4, page 6-100, 3rd paragraph, first sentence, contains an erroneous citation in the statement:
"In Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (BSC 2005 [DIRS 177423], Appendix II, Table II-2)..."

   This is corrected to read:
"In Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (SNL 2007 [DIRS 177423], Appendix II, Table II-~~2~~ 16)..." DCS 4/10/08 PRD 4-10-08

8. Section 6.5.1.2, page 6-149, 2nd paragraph, 3rd sentence, contains an erroneous section citation in the statement:
"However, as a bounding assumption (BSC 2005 [DIRS 177423], Assumption 5.4)..."

   This is corrected to read:
"However, as a bounding assumption (SNL 2007 [DIRS 177423], Assumption 5.8)..."

9. Section 6.5.1.2, page 6-155, 2nd paragraph, 3rd sentence, contains an erroneous section citation in the statement:
"...their stability and concentrations are dependent on the local domain chemistry (BSC 2005 [DIRS 177423])."

   This is corrected to read:
"...their stability and concentrations are dependent on the local domain chemistry (SNL 2007 [DIRS 177423])."

10. Section 6.5.1.2, page 6-155, last paragraph, last sentence, contains an erroneous section citation in the statement:

   "...capture at the air-water interface; as mentioned earlier, this term is neglected as a bounding assumption (BSC 2005 [DIRS 177423], Assumption 5.4)."

   This is corrected to read:
"...capture at the air-water interface; as mentioned earlier, this term is neglected as a bounding assumption (SNL 2007 [DIRS 177423], Assumption 5.8)."

11. Section 6.5.1.2, page 6-156, first paragraph, last sentence, contains an erroneous citation in the statement:
"The colloid source term is the subject of Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (BSC 2005 [DIRS 177423]), and is discussed further below."

   This is corrected to read:
"The colloid source term is the subject of Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (SNL 2007 [DIRS 177423]), and is discussed further below."

12. Section 6.5.2.4.6, page 6-205, first full sentence on page, contains an erroneous section citation in the statement:
"The target flux out ratio rather than being set as a fixed number is given a range of 0.9 to 0.99 (uniform distribution) (BSC 2005 [DIRS 177423], Section 6.3.3.2) to indicate epistemic uncertainty in this value."

   This is corrected above in the analysis for CR 11425, see that section above for the corrected text.

13. Section 6.5.2.5, page 6-220, 3rd full paragraph, 3rd sentence, contains an erroneous section citation in the statement:
"This mass is thus transported separately as a distinct species [Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (BSC 2005 [DIRS 177423], Sections 6.3.1 & 6.3.3.3)]."

   This is corrected to read:
"This mass is thus transported separately as a distinct species [Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (SNL 2007 [DIRS 177423], Sections 6.3.1 & 6.3.3)]."

14. Section 6.5.2.5, page 6-220, last full paragraph, 1st sentence, contains an erroneous section citation in the statement:

"...logic given in the Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (BSC 2005 [DIRS 177423], Section 6.5.1.1)."

This is corrected to read:
"...logic given in the Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (SNL 2007 [DIRS 177423], Sections 6.5.1.1 and 6.5.1.2)."

15. Section 6.5.2.5, page 6-221, first paragraph just below equations, 1st sentence, contains an erroneous section citation in the statement:
"...calculated from the logic provided in the Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (BSC 2005 [DIRS 177423], Section 6.5.1.1)."

    This is corrected to read:
"...calculated from the logic provided in the Waste Form and In-Drift Colloids-Associated Radionuclide Concentrations: Abstraction and Summary (SNL 2007 [DIRS 177423], Sections 6.5.1.1 and 6.5.1.2)."

16. Section 6.7, page 6-304, second full paragraph, 6th sentence, contains an erroneous citation in the statement:
"...and the behavior of colloids (BSC 2005 [DIRS 177423])."

    This is corrected to read:
"...and the behavior of colloids (SNL 2007 [DIRS 177423])."

Note that there are DIRS changes made to correct these typographical errors in the DIRS.

Evaluation:
None of these typographical errors (vestigial citation information) affect the conclusions of the document because the correct information was used. The corrections to the text provide the appropriate traceability to the source information that exists and was used.

IV Impact Evaluation

There are no impacts to the conclusions of the document and there are no impacts to any downstream documents from the corrections made above to address TBV 8617.

TBV 8620 Report Information

I Background Information Summary

This TBV is open against the *EBS Radionuclide Transport Abstraction*, (ANL-WIS-PA-000001 Rev 03) for its usage of the document SNL (Sandia National Laboratories) 2008. Total System Performance Assessment Model/Analysis for the License Application. MDL-WIS-PA-000005 REV 00. Las Vegas, Nevada: Sandia National Laboratories. ACC: DOC.20080204.0003. [DIRS178871]. The verification of the TBV will be complete once all uses are verified. Because the TSPA document is cited as SNL 2007 throughout the EBS RTA report as "SNL 2007 [DIRS178871]" , but is actually "SNL 2008 [DIRS178871]", the citations and the reference need to be corrected in the text of this ERD to address those citations in the EBS RTA sections as described below:

1. Section 1 Uses output from the RTA.

2. Sections 6.3.1.1, 6.3.2.4, 8.1; Tables 6.3-1, 8.1-1 Flux through the waste package - number of patches in the waste package.

3. Tables 6.3-2, 6.6.1; Section 6.7 Diffusive area for each patch.

4. Section 6.3.3.1 The stainless steel inner vessel of the waste package is modeled as having no resistance to corrosion.

5. Sections 6.3.3.2, 6.3.3.2.5, 6.5.1.1.3 The size and timing of patches resulting from general corrosion are predicted by the WAPDEG analysis.

6. Section 6.5.2.5 Implementation of the EBS flow and transport model for TSPA uses the models for drip shield and waste package degradation..

7. Section 6.6.1.2.3 A wide range of variability in corrosion rates for the TSPA WAPDEG model.

II Inputs and/or Software

No software or any types of calculations are used to evaluate the extent of conditions in this CR. No assumptions were used in this analysis.

III Analysis and Results

1. Section 1

   Page 1-5, last bullet, the error "(SNL 2007 [DIRS 178871])." is corrected to read "(SNL 2008 [DIRS 178871])."

2. Sections 6.3.1.1, 6.3.2.4, 8.1; Tables 6.3-1, 8.1-1.

   Page 6-6, item 4, 2nd sentence:

   "The number of patches in the waste package is calculated independently of the RTA by the WAPDEG code (SNL 2007 [DIRS 178871])."

   is corrected to read
   "The number of patches in the waste package is calculated independently of the RTA by the WAPDEG code (SNL 2008 [DIRS 178871])."

Sect. 6.3.2.4, page 6-18, 1st full sentence

"Since the number of patches, N_b, varies over time, f_{DS} should be a function of time, with a starting value of zero and potentially reaching a value equal to the total number of patches in the WAPDEG corrosion model of the drip shield (SNL 2007 [DIRS 178871])."

is corrected to read
"Since the number of patches, N_b, varies over time, f_{DS} should be a function of time, with a starting value of zero and potentially reaching a value equal to the total number of patches in the WAPDEG corrosion model of the drip shield (SNL 2008 [DIRS 178871])."

Table 6.3-1, 4th row, 3rd column, 1st item.

"WAPDEG (SNL 2007 [DIRS 178871]) provides the number of patches and stress corrosion cracks on the WP."

is corrected to read
"WAPDEG (SNL 2008 [DIRS 178871]) provides the number of patches and stress corrosion cracks on the WP."

Sect. 8.1, page 8-2, 4th bullet, last sentence.

"The number of corrosion patches in the waste package is calculated independently of the RTA by the WAPDEG code (SNL 2007 [DIRS 178871])."

is corrected to read
"The number of corrosion patches in the waste package is calculated independently of the RTA by the WAPDEG code (SNL 2008 [DIRS 178871])."

Table 8.1-1, 4th row, 3rd column, 1st item.

"WAPDEG (SNL 2007 [DIRS 178871]) provides the number of patches and stress corrosion cracks on the WP."

is corrected to read
"WAPDEG (SNL 2008 [DIRS 178871]) provides the number of patches and stress corrosion cracks on the WP."

3. Tables 6.3-2, 6.6.1; Section 6.7.

Table 6.3-2, 1st row 3rd column, 4th item.

"Diffusive area for each patch is provided by WAPDEG (SNL 2007 [DIRS 178871])."

is corrected to read
"Diffusive area for each patch is provided by WAPDEG (SNL 2008 [DIRS 178871])."

Table 6.6-1, 1st row, 3rd column, 4th item.

"Diffusive area for each patch is provided by WAPDEG (SNL 2007 [DIRS 178871])."

is corrected to read
"Diffusive area for each patch is provided by WAPDEG (SNL 2008 [DIRS 178871])."

Sect. 6.7, 4th paragraph, 3rd sentence.

"...for the waste package inner vessel, and it is modeled as breaching quickly after the outer barrier is breached; (SNL 2007 [DIRS 178871])."

is corrected to read
"...for the waste package inner vessel, and it is modeled as breaching quickly after the outer barrier is breached; (SNL 2008 [DIRS 178871])."

4. Section 6.3.3.1.

Page 6-20, 2nd full paragraph, 1st sentence.

"The stainless steel inner vessel of the waste package is modeled as having no resistance to corrosion as reflected in the WAPDEG analysis of waste package and drip shield degradation (SNL 2007 [DIRS 178871])."

is corrected to read
"The stainless steel inner vessel of the waste package is modeled as having no resistance to corrosion as reflected in the WAPDEG analysis of waste package and drip shield degradation (SNL 2008 [DIRS 178871])."

5. Sections 6.3.3.2, 6.3.3.2.5, 6.5.1.1.3.

Sect. 6.3.3.2, 1st paragraph, 3rd sentence.

"The size and timing of patches resulting from general corrosion are predicted by the WAPDEG analysis (SNL 2007 [DIRS 178871])."

is corrected to read
"The size and timing of patches resulting from general corrosion are predicted by the WAPDEG analysis (SNL 2008 [DIRS 178871])."

Sect. 6.3.3.2.5, 4th paragraph, 4th sentence.

"Second, the drip shield is modeled as a single entity and all drip shields in the repository fail by general corrosion at the same time in the model for a given realization (SNL 2007 [DIRS 178871])."

is corrected to read
"Second, the drip shield is modeled as a single entity and all drip shields in the repository fail by general corrosion at the same time in the model for a given realization (SNL 2008 [DIRS 178871])."

Sect. 6.3.3.2.5, page 6-28, last sentence on page.

"In analogy to f_{DS} an upper bound on f_{WP} can be obtained using the minimum rivulet spread angle α of 5.5° and the known values for N_{bWP} (SNL 2007 [DIRS 178871])..."

is corrected to read
"In analogy to f_{DS} an upper bound on f_{WP} can be obtained using the minimum rivulet spread angle α of 5.5° and the known values for N_{bWP} (SNL 2008 [DIRS 178871])..."

Sect. 6.5.1.1.3, 1st paragraph, 3rd sentence.

"...(2) the nominal corrosion patch size as modeled by WAPDEG (SNL 2007 [DIRS 178871])..."

is corrected to read
"...(2) the nominal corrosion patch size as modeled by WAPDEG (SNL 2008 [DIRS 178871])..."

6. Section 6.5.2.5.

Sect. 6.5.2.5, 4th paragraph, 3rd sentence.

"...the models for drip shield and waste package degradation (SNL 2007 [DIRS 178871]),..."

is corrected to read
"...the models for drip shield and waste package degradation (SNL 2008 [DIRS 178871]),..."

7. Section 6.6.1.2.3.

Sect. 6.6.1.2.3, 5th paragraph, 4th sentence.

"This is not considered a major difference because there is a wide range of variability in corrosion rates for the TSPA WAPDEG model (SNL 2007 [DIRS 178871])."

is corrected to read
"This is not considered a major difference because there is a wide range of variability in corrosion rates for the TSPA WAPDEG model (SNL 2008 [DIRS 178871])."

8. Section 9.1, page 9-29.

"178871 SNL 2007. Total System Performance Assessment Model /Analysis for the License Application. MDL-WIS-PA-000005 REV 00. Las Vegas, Nevada: Sandia National Laboratories."

is corrected to read
"178871 SNL 2008. Total System Performance Assessment Model /Analysis for the License Application. MDL-WIS-PA-000005 REV 00. Las Vegas, Nevada: Sandia National Laboratories."

This includes a correction to the DIRS based on the above corrections.

IV Impact Evaluation

Note that all of the above changes are solely to correct a the year "2007" to the year "2008" in the citation and reference to the TSPA document. None of these changes impact the conclusions of the EBS Radionuclide Transport Abstraction (ANL-WIS-PA-000001 Rev 03) and therefore, none of these corrections have any impact on downstream uses of the document.

TBV 8902 Report Information

I Background Information Summary

In Section 2 of the EBS Radionuclide Transport Abstraction, (ANL-WIS-PA-000001 Rev 03) the classification of models for evaluating the performance of the EBS, including drip shields, waste packages, and invert is referenced to the older version of the Q-list (which was current at the time), and needs to be updated to the recently completed revision of the document. This updated version of the document given by:

BSC (Bechtel SAIC Company) 2008. Q-List. 000-30R-MGR0-00500-000-004. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20080312.0037. 180109

This reference has been verified as containing the appropriate information and this ERD corrects the citation in the AMR.

II Inputs and/or Software

No software or any types of calculations are used to evaluate the extent of conditions in this CR. No assumptions were used in this analysis.

III Analysis and Results

Section 2, last sentence, the phrase needing an updated reference:

"...the conclusions do not directly impact engineered features or engineered and natural barriers important to waste isolation, as discussed in *Q-List* (BSC 2005 [DIRS 175539])."

is corrected to read:

"...the conclusions do not directly impact engineered features or engineered and natural barriers important to waste isolation, as discussed in *Q-List* (BSC 2008 [DIRS 180109])."

Section 9.1, the reference:

"175539 BSC 2005. Q-List. 000-30R-MGR0-00500-000-003. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20050929.0008."

is corrected to read:

"180109 BSC 2008. Q-List. 000-30R-MGR0-00500-000-004. Las Vegas, Nevada: Bechtel SAIC Company. ACC: ENG.20080312.0037."

This includes a correction to the DIRS based on the above corrections.

IV Impact Evaluation

This is a minor error that is corrected to update the reference to the current documentation of the Q-List. Because this does not change any of the modeling, analyses or results, this has no impact on the conclusions of the *EBS Radionuclide Transport Abstraction* (ANL-WIS-PA-000001 Rev 03) and therefore there are no impacts from this correction.