CRA 2009 ErrataTracking

Error #	Error Description	Correction	Originator	Responsibility	Status	Date of Completion
1	EPA comment 1-C-15 In Appendix SOTERM-2009, Table SOTERM-21, the parameter descriptions for PHUMCIM and PHUMSIM indicate "actinide solubilities are inorganic only (complexes with man-made organic ligands are not important); solubilities were calculated assuming equilibrium with Mg-bearing minerals (brucite and magnesite)." DOE should correct these statements to clarify that organic ligands were considered during calculation of the solubilities used with these proportionality constants for the CRA-2004 PABC, and that the solubilities were calculated assuming equilibrium with brucite and hydromagnesite.	The description for PHUMCIM in Appendix SOTERM-2009, Table SOTERM-21 should be changed to “Proportionality constant for concentration of actinides associated with mobile humic colloids; in Castile brine; actinide solubilities include organics (complexes with man-made organic ligands); solubilities are calculated assuming equilibrium with Mg-bearing minerals (brucite and hydromagnesite)."	EPA	LANL-Reed	Revised text included in 1st Response Submittal to the EPA	Submitted to EPA in 1st Response Aug 24, 2009
2	EPA comment 1-C-15 In Appendix SOTERM-2009, Table SOTERM-21, the parameter descriptions for PHUMCIM and PHUMSIM indicate "actinide solubilities are inorganic only (complexes with man-made organic ligands are not important); solubilities were calculated assuming equilibrium with Mg-bearing minerals (brucite and magnesite)." DOE should correct these statements to clarify that organic ligands were considered during calculation of the solubilities used with these proportionality constants for the CRA-2004 PABC, and that the solubilities were calculated assuming equilibrium with brucite and hydromagnesite.	The description for PHUMSIM in Appendix SOTERM-2009, Table SOTERM-21 should be changed to “Proportionality constant for concentration of actinides associated with mobile humic colloids; in Salado brine; actinide solubilities include organics (complexes with man-made organic ligands); solubilities are calculated assuming equilibrium with Mg-bearing minerals (brucite and hydromagnesite).”	EPA	LANL-Reed	Revised text included in 1st Response Submittal to the EPA	Submitted to EPA in 1st Response Aug 24, 2009

3	EPA comment 1-C-18 In Appendix MgO-2009, Section 4.2.2, DOE claims that hydromagnesite will completely convert to magnesite during the 10,000 year WIPP regulatory time period. However, DOE's evaluation of the likely conversion of hydromagnesite to magnesite ignores information about this issue presented in SCA (2008). As part of a thorough evaluation of the likely conversion rate for hydromagnesite to magnesite, SCA (2008) cited data from Vance et al. (1992) that showed hydromagnesite can persist for as long as 6,200 years. In addition, DOE does not consider that slow CPR degradation will result in continuous brucite carbonation during the 10,000-year regulatory period, rather than hydromagnesite formation that occurs only for a short time following repository closure. Consequently, even if hydromagnesite formed in the repository converts to magnesite within a few thousand years, hydromagnesite is likely to remain in the repository and would be likely to influence carbon dioxide fugacity for the entire 10,000-year regulatory period. DOE should revise this discussion to show that hydromagnesite is likely to be present in the backfill throughout the WIPP regulatory period.	The following statement should be added at the end of Subsection 4.2.2 of Appendix MgO 2009 to clarify the text in this subsection: "Based on the evidence discussed above, the DOE concludes that it is still unclear whether hydromagnesite will persist or convert to magnesite during the 10,000-year WIPP regulatory period. However, the EPA has specified that the brucite-hydromagnesite (5424) reaction be used to buffer the CO2 fugacity for compliance-related actinide-solubility calculations since the CCA PAVT (Trovato, 1997; U.S. EPA, 1998)."	EPA	SNL-Brush	Revised text included in 1st Response Submittal to the EPA	Submitted to EPA in 1st Response Aug 24, 2009

4	EPA comment 1-C-19 In Appendix MgO-2009, Section 5.1, DOE states that the actinide solubilities in WIPP brines calculated for the CRA-2004 PA and CRA-2004 PABC differed because of "changes in the thermodynamic databases for the An(III), An(IV), and An(V) models." The thermodynamic database for the An(IV) model changed between these two PA calculations when the chemical potential (μ0/RT) for Th(OH)4(aq) was revised. On the other hand, the An(III) and An(V) solubility results changed because of a recalculation of ligand concentrations. EPA was not informed of any changes to the thermodynamic data for the An(III) and An(V) oxidation states. DOE should either correct this statement or document the revised thermodynamic data.	The statement that, "The An(III), An(IV), and An(V) solubilities predicted for the CRA-2004 PA and PABC calculations are different for both brines because of changes in the thermodynamic databases for the An(III), An(IV), and An(V) models between these calculations" (U.S. DOE, 2009, Appendix MgO, Subsection 5.1, p. MgO-32), is incorrect. It should state, "The An(III) solubilities predicted for the CRA-2004 PA and PABC calculations are different for both brines because of an increase in the concentration of EDTA (compare Brush and Xiong, 2005, Table 4, columns labeled "CRA-2004 PA" and "PABC"). The An(IV), solubilities predicted for the CRA-2004 PA and PABC calculations are different for both brines because of changes in the thermodynamic database for An(IV). The An(V) solubilities predicted for the CRA-2004	EPA	SNL-Brush	Revised text included in 1st Response Submittal to the EPA	Submitted to EPA in 1st Response Aug 24, 2009

5	EPA comment 1-C-20 In the discussion of MgO uncertainties (Appendix MgO-2009, Section 6.2.4.4), DOE does not include the uncertainties associated with the chemical composition of the cellulose, plastics, and rubber in the WIPP inventory. DOE should acknowledge this uncertainty in the discussion.	The following statement should be added at the end of the first paragraph of Subsection 6.2.4.4.1 of Appendix MgO-2009, "Vugrin et al. (2006) did not include uncertainties associated with the chemical compositions of the CPR materials in the WIPP inventory. However, the DOE acknowledges that there are uncertainties associated with the chemical compositions of these materials."	EPA	SNL-Brush	Revised text included in 1st Response Submittal to the EPA	Submitted to EPA in 1st Response Aug 24, 2009
6	EPA comment 1-C-21 Appendix PA-2009, Table PA-10 does not include units for the concentrations, which should be moles/L	The units moles/L should be added to Appendix PA-2009, Table PA-10.	EPA	SNL-Clayton	Revised text included in 1st Response Submittal to the EPA	Submitted to EPA in 1st Response Aug 24, 2009
7	EPA comment 1-C-22 Appendix PA-2009, Section 4.9 includes a statement that releases are controlled almost entirely by direct releases to the surface as cuttings, cavings, and spallings. DOE should correct this statement to include cuttings, cavings, and direct brine release, as explained in Appendix PA-2009, Section 9.0.	In Appendix PA-2009, Section 4.9, page PA-162, line 2, the phrase "cuttings, cavings, and spallings" should be changed to "cuttings, cavings, and direct brine releases".	EPA	SNL-Clayton	Revised text included in 1st Response Submittal to the EPA	Submitted to EPA in 1st Response Aug 24, 2009
8	EPA Comment 1-C-10 Chemistry Issues In Appendix SOTERM-2009, Section 4.4, DOE states that the chemical potential (μo/RT) for Th(OH)4(s) was changed in the FMT database since the CRA-2004 PA. However, only the chemical potential for Th(OH)4(aq) changed between the CRA-2004 PA and the CRA-2004 PABC (Xiong et al. 2005). DOE should correct this statement	The DOE agrees with this comment – this is a typographical error in the text. The text will be corrected to read Th(OH)4 (aq). Note that this is correctly stated in Figure SOTERM-17 and Equation SOTERM. 48.	EPA	LANL-Reed	Revised text included in 2nd Response Submittal to the EPA	Submitted to EPA in 2nd Response Oct, 2009

9	EPA Comment 1-C-11 In Appendix SOTERM-2009, Section 4.4, DOE should explain what is meant by their statement that, "The effects of hydromagnesite and calcite precipitation were added..." to the FMT database for the CRA-2004 PABC, because hydromagnesite and calcite thermodynamic data have been included in the database at least since the CCA PAVT. In addition, SOTERM-4.4 states that the version of the code used was FMT_050405.CHEMDAT, which is the database version, not the code. DOE should correct this misstatement.	The EPA is correct in their statement that hydromagnesite and calcite precipitation were included in the FMT calculations at least since the time of the CCA PAVT. The second bullet in SOTERM-2009, Section 4.4 should be replaced with, "The dimensionless standard chemical potential for whewellite (CaC2O4•H20) was added to the database (Xiong 2004)." The first sentence in SOTERM-2009, Section 4.4 should read, "The version of the database used with the FMT code for the CRA-2004 PABC was FMT_050405.CHEMDAT (Xiong 2005)." These corrections will be added to the errata list for Appendix SOTERM-2009.	EPA	LANL-Reed	Revised text included in 2nd Response Submittal to the EPA	Submitted to EPA in 2nd Response Oct, 2009
10	EPA Comment 1-C-17 Chemistry Issues – Proper Reference for Brush (2005) in Section 2.3.2 In Appendix SOTERM-2009, Section 2.3.2, Brush et al. (2006) is cited as part of the documentation for the CRA-2004 PABC, but this report was prepared after the CRA-2004 PABC. DOE should replace it with the correct reference (Brush 2005).	The DOE agrees with this comment. Brush 2005 is the correct reference. This will be added to the errata list for Appendix SOTERM-2009.	EPA	LaNL-Reed	Included in 2nd Response Submittal to the EPA	Submitted to EPA in 2nd Response Oct, 2009