Quick Reference Guide to the INTEC RI/BRA

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During the Sr-90 breakout group discussion of the Environmental Remediation Science Program Workshop held June 12-14, 2006 at INL, copies of the "Operable Unit 3-14 Tank Farm Soil and Groundwater Remedial Investigation/Baseline Risk Assessment" document were requested. This document has been approved for external release as: DOE/NE-ID-11227, REV 0, with Lorie Cahn, Michael L. Abbott, John F Keck, Peter Martian, Annette L. Schafer, and Michael C. Swenson as authors. The complete document is very long as indicated by the multiple "PDF files" required to present it.

Copies of this report were requested in order to more fully become familiar with the site geohydrology, chemistry and locations of the various spills, and previous modeling work. To facilitate this, we would like to point the breakout group participants to the sections specifically covering the INTEC operational history, the geohydrology, and summary of the three key releases (CPP-31, CPP-79 shallow, CPP-79 deep, and CPP-28) all found in the main document. For those specifically interested in the Sr-90 release from CPP-31 and its observed behavior in the vadose zone, we've added pointers to the modeling work that we've done in Appendix J. Appendix J summarizes available site-specific and INL-relevant data, and some previous laboratory work, but does not cover the Rhodes column data. It does present results using the competitive cation exchange model, but does not discuss the disconnect between the Rhodes column data and the model predictions. Also for those interested in the general vadose zone and aquifer models, we suggest reviewing specific sections in Appendicies A and C. We've included two pdf files summarizing some of the information obtained at the INL's Vadose Zone Research Park (VZRP). The tensiometer data at the VZRP is collected much more frequently than it is at INTEC, and provides a great deal of insight that is not available in the RI/BRA data.

For those of you wondering why you are getting this at all, we've included a copy of our presentation as a friendly reminder.

Thank you for your interest,

Annette Schafer and Larry Hull

Table 1: Summary sections of specific Interest to the ERSP Sr-90 breakout group

Section	Title	Document Pages	PDF sub-document	acrobat page #
Main Document				
3.	INTEC Background and Operational History. This section contains wonderful pictures of the tank farm, its installation, and plan map-views of the INTEC facility.	3-1	1-Main-doc.pdf	57
4.	Environmental Setting and Summary of Subsurface Water Contamination. This section provides a high-level overview of the geologic setting, and regional and local hydrology. For a more quantitative description, this information is summarized in Appendix A as part of the overall conceptual model presentation.	4-1	1-Main-doc.pdf	110
5.11	CPP-31 (description of the CPP-31 release)	5-97	1-Main-doc.pdf	241
5.16	CPP-79 Shallow	5-142	1-Main-doc.pdf	286
5.17	CPP-79 Deep	5-153	1-Main-doc.pdf	297
Appendix A: Groundwater Risk Pathway Model Development, Calibration, and Predictive Results				
Appendix A-3	Summary of Vadose Zone Data	A-3-1	2-Appendix-A to pg_A-5-20	21
Appendix A-4	Aquifer Data Summary	A-4-1	2-Appendix-A to pg_A-5-20	49
Appendix A-5	Vadose Zone and Aquifer Conceptual Models	A-5-1	2-Appendix-A _to_A-5-20 and 3-Appendix-A _pg_A-5-21_to_A-8-14	55 in first document 1 in second document

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Section	Title	Document Pages	PDF sub-document	acrobat page #
Appendix A-7	Vadose Zone Model Calibration This contains the time-releases for specific contaminants and the available perched water data by well, and plots showing 4-D distributions for Tc-99, H-3, I-129, Nitrate	A-7-1	3-Appendix-A _pg_A-5-21_to_A-8-14	11
Appendix A-8	Aquifer Model Calibration This contains the time-releases for specific contaminants and the available aquifer data by well, and plots showing 3-D distributions for Tc-99, H-3, I-129, Nitrate	A-8-1	3-Appendix-A _pg_A-5-21_to_A-8-14 and 4-Appendix-A _pg_A-8-14_to_end	11 first document and first page in second document
Appendix C: Geostatistical Modeling of Subsurface Characteristics in the Area of the Idaho Nuclear Technology and Engineering Center				
Appendix C	This shows the available data and interpretation for the interbed tops and thicknesses in addition to that for the alluvium	C-1	4-Appendix-B_to_Appendix_E	66
Appendix J: Evaluation of Sr-90: Hydrogeochemical Simulation of the CPP-31 Release from the Alluvium, Inclusion of Other Sources, Sensitivity, and Implications				
Appendix J-2	CPP-31 Release: Overview of Geochemical Processes -- basically suggests that the early release was dominated by competitive cation exchange	J-2-1	7-Appendix-H_to_end	55
Appendix J-3	Cation Exchange Model Parameters -- where did they come from?	J-3-1	7-Appendix-H_to_end	75
Appendix J-4	Verification of the Ion Exchange Model -- this is a comparison to the Hawkins and Short batch experimental data	J-4-1	7-Appendix-H_to_end	87

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Appendix J-5	Coupled Transport and Geochemical Phenomena: one dimensional simulations This section contains the bulk of the model results shown in Annette's presentation at the ERSP workshop.	J-5-1	7-Appendix-H_to_end	99
Appendix J-7	Site-Specific Application: This section presents the Cs-137 data necessary to determine the pathway of the released liquid from CPP-31	J-7-1	7-Appendix-H_to_end	115
Appendix J-8	RI/BRA Model Results This section carries the release out of the alluvium and into the perched water and underlying aquifer. It presents the model calibration data available in the perched water for Sr-90.	J-8-1	7-Appendix-H_to_end	123
INL's Vadose Zone Research Park				
	Idaho National Laboratory Vadose Zone Research Park Geohydrological Monitoring Results. INL/EXT/05-01044, 2006, Kristine Baker	05-01044_r4	05-01044_r4	
	A Research Park for Studying Processes in Unsaturated Fractured Media, EOS, 2004ES000845R, Kristine Baker, Travis McLing, Leah Street, Annette Schafer, ShannonAnsley, Larry Hull, Robert Holt, Robert Roback, and Catherine Jones, 2004			
Idaho National Laboratory, Environmental Remediation Sciences Program Workshop, June 12-14, 2006				
	Sr-90 Transport through the INTEC vadose zone. Annette Schafer and Larry Hull		Annette_larry.pdf	