538260

INFORMATION ONLY

Sandia National Laboratories
Operated for the U.S. Department of Energy by
Sandia Corporation

4100 National Parks Highway
Carlsbad, NM 88220

Phone: (505) 234-0050
Fax: (505) 234-0061
Internet: edvugri@sandia.gov

Date: December 14, 2004

To: David Kessel, 6821

From: Eric Vugrin, 6821

Technical Review By: Sean Dunagan, 6861 for Sean Dunagan

QA Review By: Mario Chavez, 6820

Subject: Corrected CRA Figures

The intent of this document is to correct erroneous tables and figures in DOE (2004). The revision of these results reflects the changes introduced by correcting an error in the CCDFGF code and three errors in the inputs to PRECCDFGF. First, there was an omission in the code for CCDFGF Version 5.00 of a correction of spallings releases for the volume fraction of contact handled waste in the repository. Second, an error in the input control files for SUMMARIZE used for the CRA incorrectly listed the variable representing spallings area where the variable representing spallings volume was required. These problems are documented in Kirchner and Vugrin (2004). Third, the incorrect LHS transfer files were used as input to PRECCDFGF for replicates 2 and 3. Finally, an error in the input control files to SUMMARIZE resulted in reading the ^{234}U colloid mobilization fraction as representing ^{230}Th and vice versa (Vugrin and Kirchner, 2004). These errors had relatively little impact on the results and no significant impact on the conclusions of the CRA.

Table 1 replaces Table PA-31 from DOE (2004), and Table 2 replaces Table PA-30 from DOE (2004). Table PA-29 is unaffected by the errors documented in Kirchner and Vugrin (2004) and Vugrin and Kirchner (2004). For more discussion of these tables, see Kirchner (2004).

WIPP:1.2.7:PA:QAL:533999

Table 1 Stepwise Ranked Regression Analysis-For Mean Total Releases

	Expected Normalized Release		
Step[a]	Variable[b]	SRRC[c]	R^{2d}
1	WTAUFAIL	-0.95137	0.91345
2	WMICDFLG	0.11538	0.92727
3	DOMEGA	0.10735	0.93639
4	SPALLVOL	0.08003	0.94139
5	BPINTPRS	0.06271	0.94475
6	PLGPRM	0.05841	0.94802
7	SHLPRM3	-0.04728	0.95022

[a] Steps in stepwise regression analysis

[b] Variables listed in order of selection in regression analysis

[c] Standardized Rank Regression Coefficient in final regression model

[d] Cumulative R^2 value with entry of each variable into regression model

Table 2 Stepwise Ranked Regression Analysis -For Mean Direct Brine Releases

	Expected Normalized Release		
Step[a]	Variable[b]	SRRC[c]	R^{2d}
1	WMICDFLG	-0.46784	0.15776
2	BPINTPRS	0.48223	0.34337
3	PBRINE	0.36000	0.47058
4	WSOLAM3C	0.29070	0.51608
5	WRBRNSAT	-0.15397	0.55481
6	CONGSSAT	-0.22426	0.57556
7	REPIPERM	-0.21496	0.60771
8	WGRCOR	-0.16265	0.63011
9	TENSLSTR	-0.14810	0.64990

[a] Steps in stepwise regression analysis

[b] Variables listed in order of selection in regression analysis

[c] Standardized Rank Regression Coefficient in final regression model

[d] Cumulative R^2 value with entry of each variable into regression model

Table 3 lists the figures in this memo and the figures from DOE (2004) that they replace. The corrected figures follow Table 3. Even though Figure 9 does not replace any figures from DOE (2004), it is provided here for greater resolution since Figure 8 is on a different scale than Figure PA-85 from DOE (2004).

Table 3 Figures to be Replaced from DOE (2004)

Corrected Figure in this Document	**Figures to be Replaced from DOE (2004)**
Figure 1	Figure 6-34, Figure PA-92
Figure 2	Figure 6-35, Figure PA-93

INFORMATION ONLY

Figure 3	Figure 6-36, Figure PA-94
Figure 4	Figure 6-37
Figure 5	Figure 1.1, Figure 6-38, Figure PA-96
Figure 6	Figure PA-83
Figure 7	Figure PA-84
Figure 8	Figure PA-85
Figure 9	(cropped view of Figure PA-85)
Figure 10	Figure PA-91
Figure 11	Figure 6-1, Figure PA-95
Figure 12	Figure 6-39, Figure PA-97
Figure 13	Figure PA-98
Figure 14	Figure PA-99
Figure 15	Figure PA-106
Figure 16	Figure PA-107
Figure 17	Figure PA-108
Figure 18	Figure PA-109
Figure 19	Figure PA-110
Figure 20	Figure PA-112
Figure 21	Figure PA-113
Figure 22	Figure PA-114
Figure 23	Figure PA-115
Figure 24	Figure PA-116
Figure 25	Figure PA-117
Figure 26	Figure PA-118
Figure 27	Figure PA-119
Figure 28	Figure PA-120
Figure 29	Figure PA-121

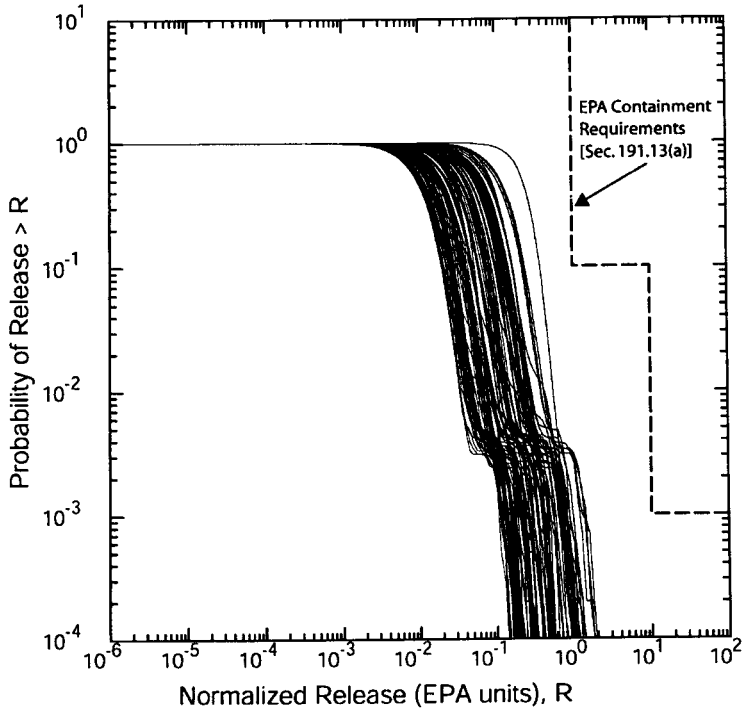

Figure 1 Distribution of CCDFs for Normalized Radionuclide Releases to the Accessible Environment from the WIPP, Replicate 1

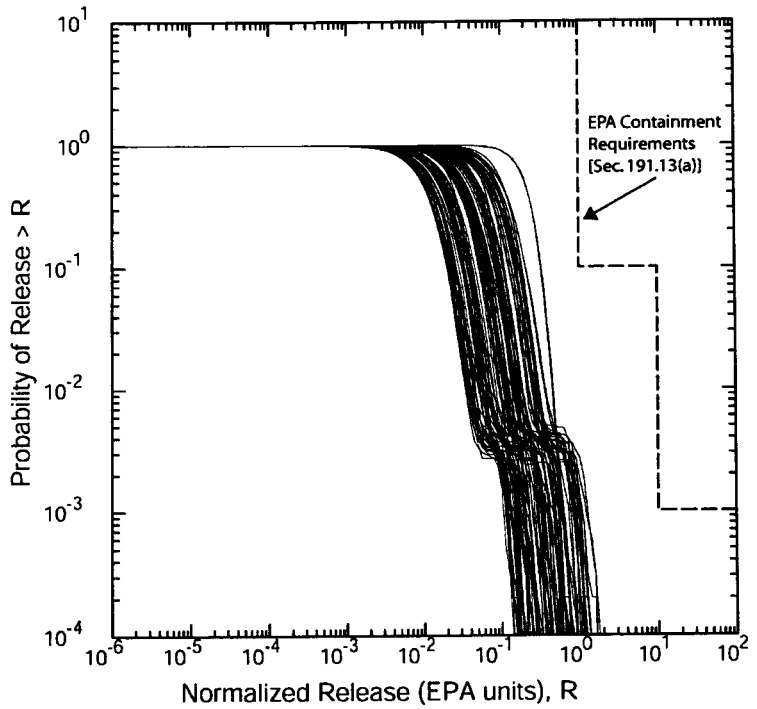

Figure 2 Distribution of CCDFs for Normalized Radionuclide Releases to the Accessible Environment from the WIPP, Replicate 2

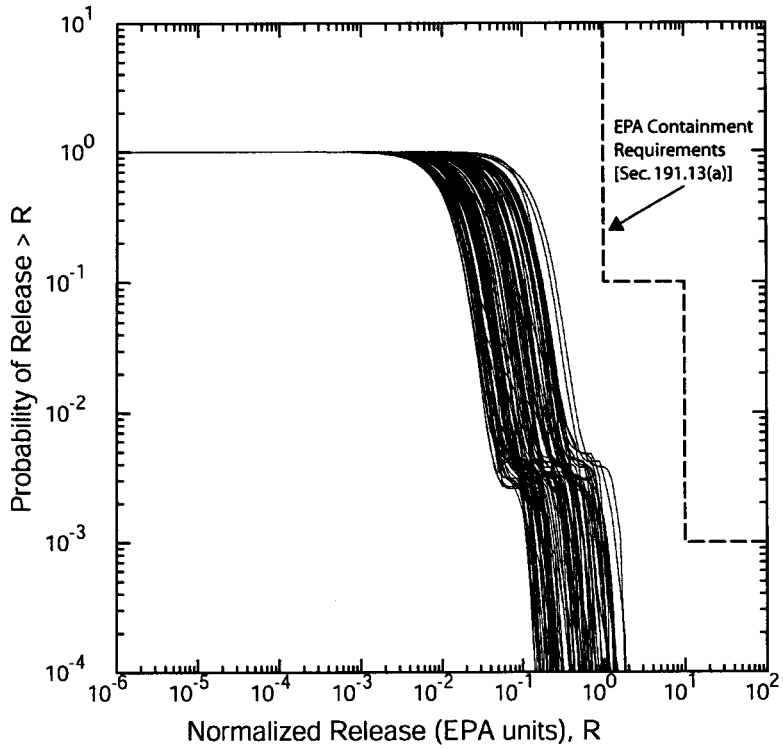

Figure 3 Distribution of CCDFs for Normalized Radionuclide Releases to the Accessible Environment from the WIPP, Replicate 3

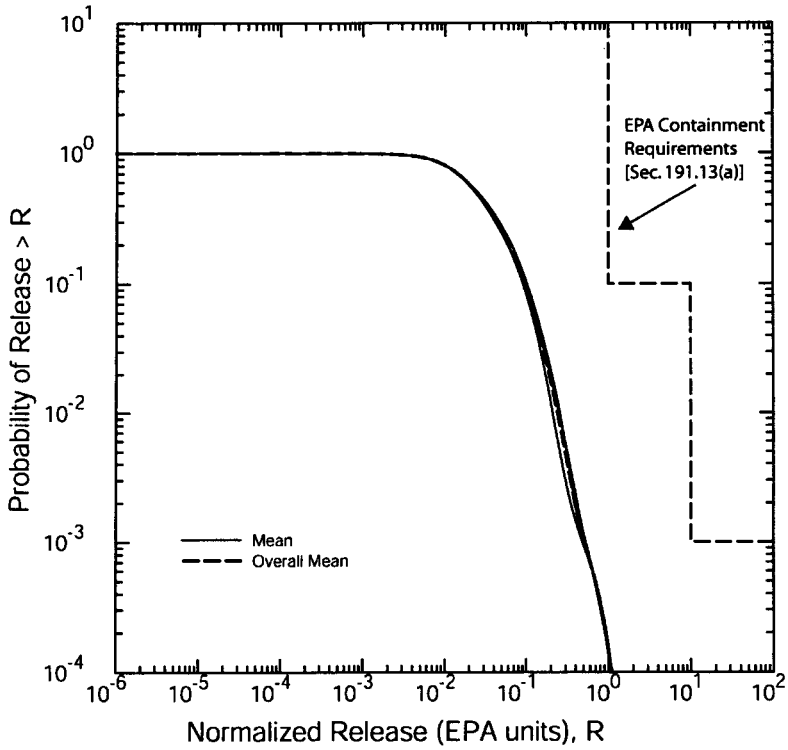

Figure 4 Mean CCDFs for Normalized Radionuclide Releases to the Environment

INFORMATION ONLY

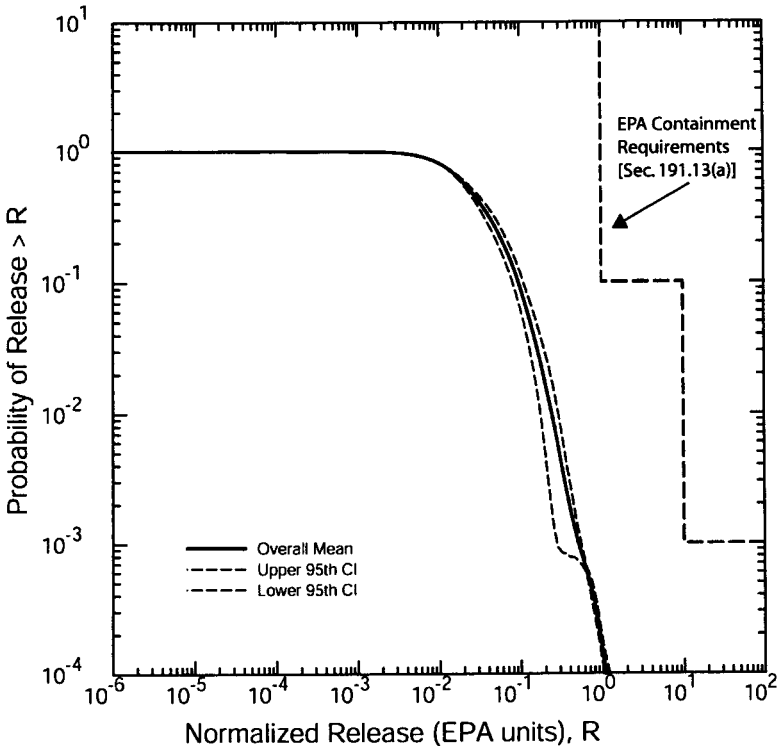

Figure 5 Confidence Levels for the Mean CCDF

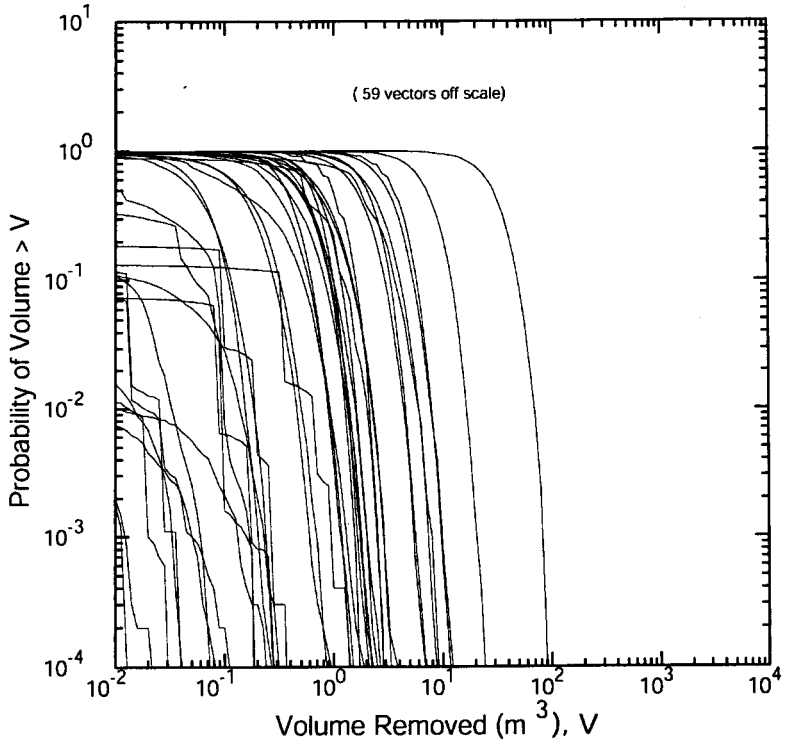

Figure 6 Total Volume Removed by Spallings, Replicate R1

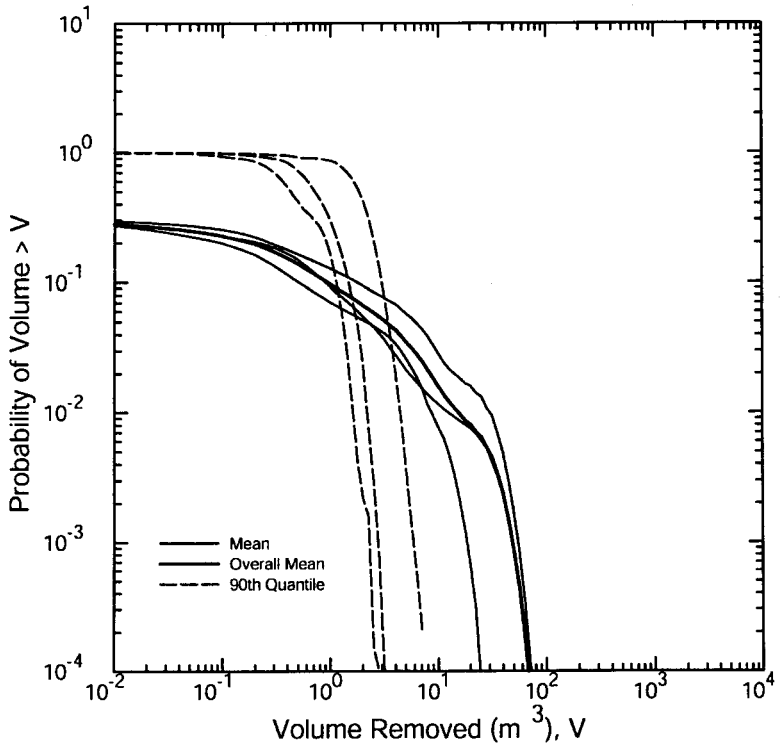

Figure 7 Statistics for Total Spall Volume, All Replicates

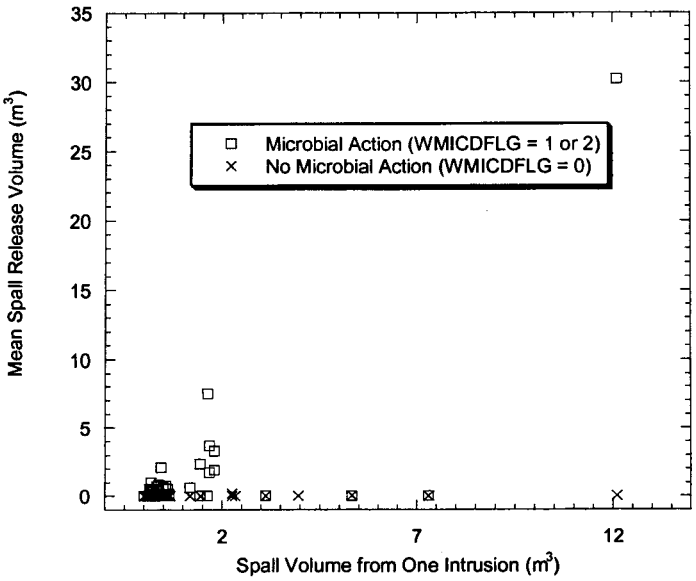

Figure 8 Sensitivity of Mean Total Spall Volume, Replicate R1

ATION ONLY

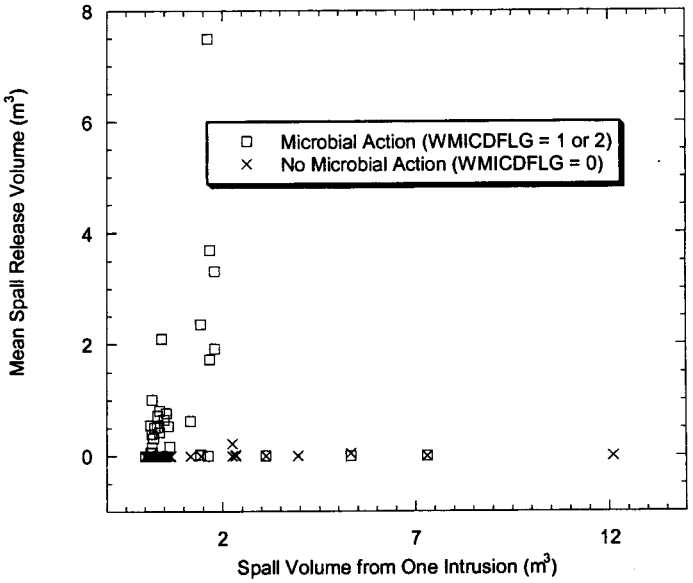

Figure 9 Sensitivity of Mean Total Spall Volume, Replicate R1 (Cropped View)

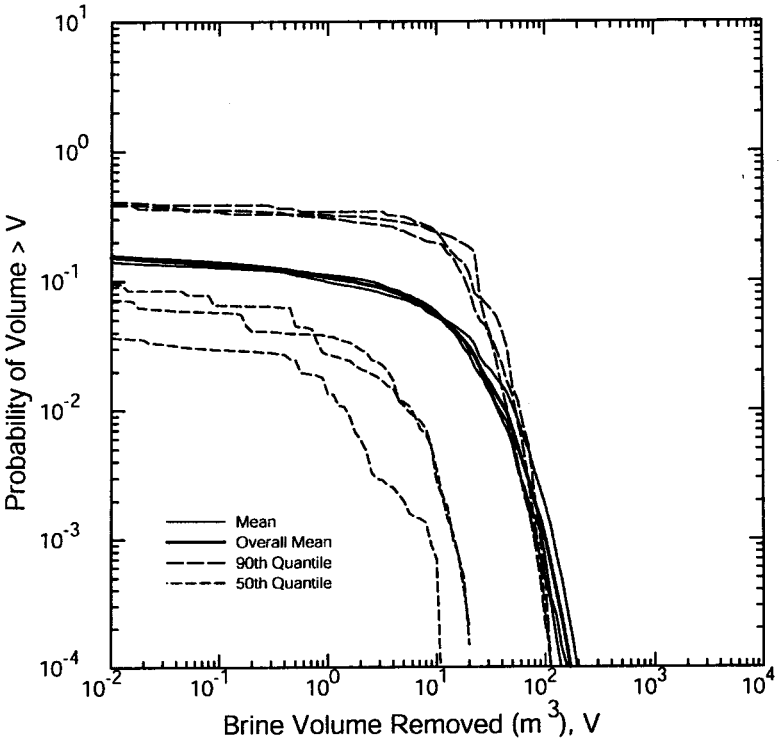

Figure 10 Statistics for Total DBR Volumes, All Replicates

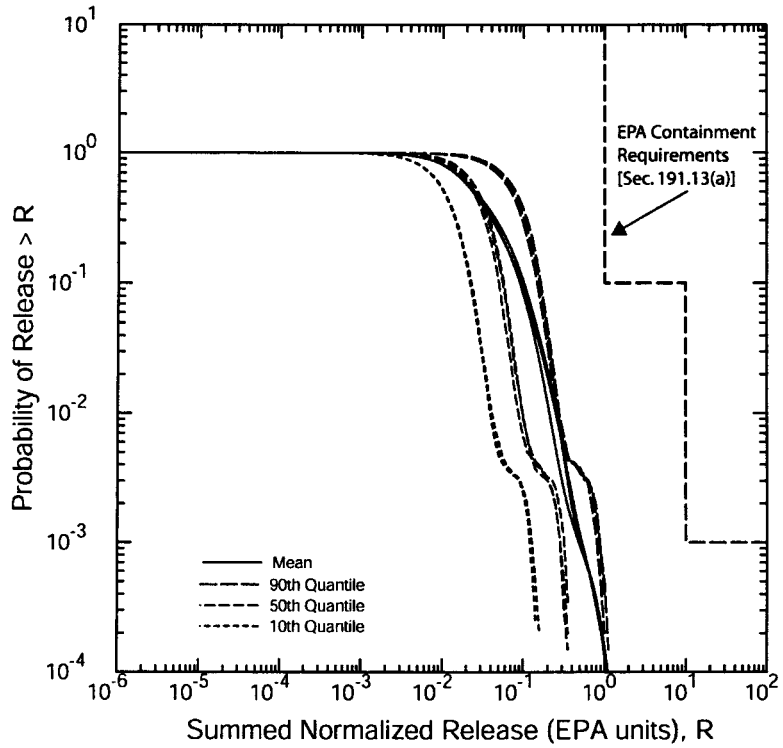

Figure 11 Mean and Quantiles CCDFS for Total Normalized Releases, All Replicates

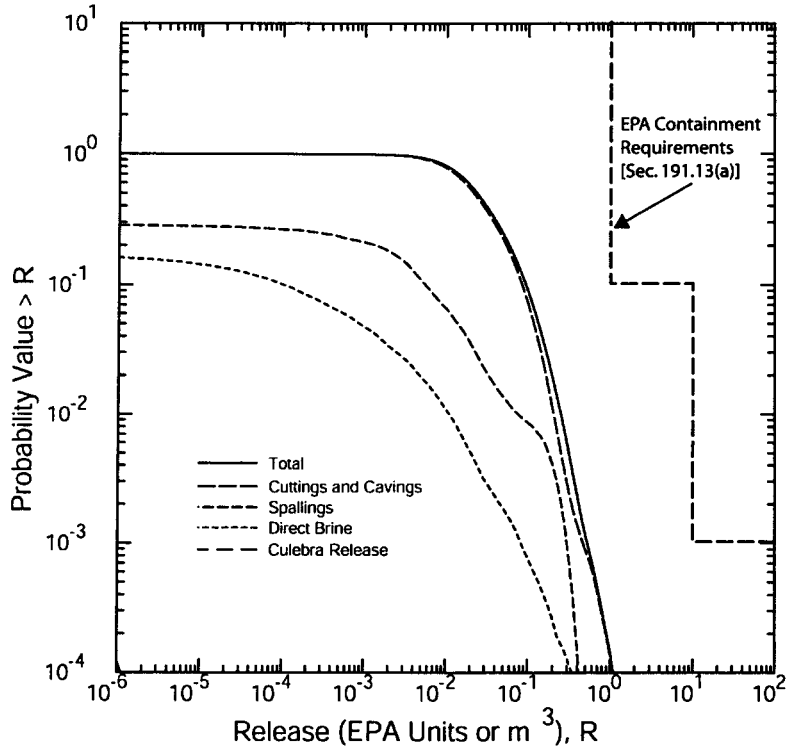

Figure 12 Mean CCDFs for Components of Total Normalized Releases, Replicate R1

INFORMATION ONLY

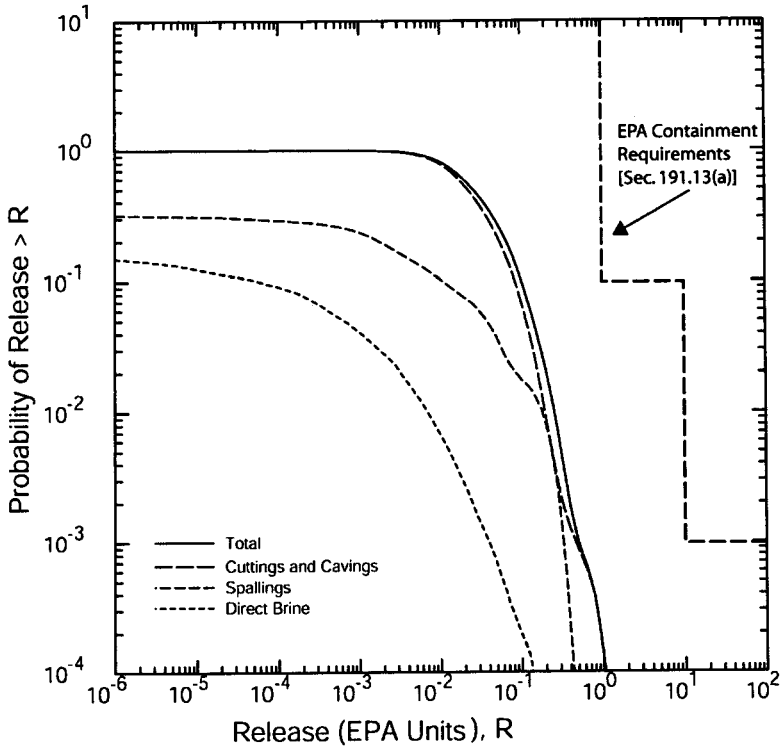

Figure 13 Mean CCDFs for Components of Total Normalized Releases, Replicate R2

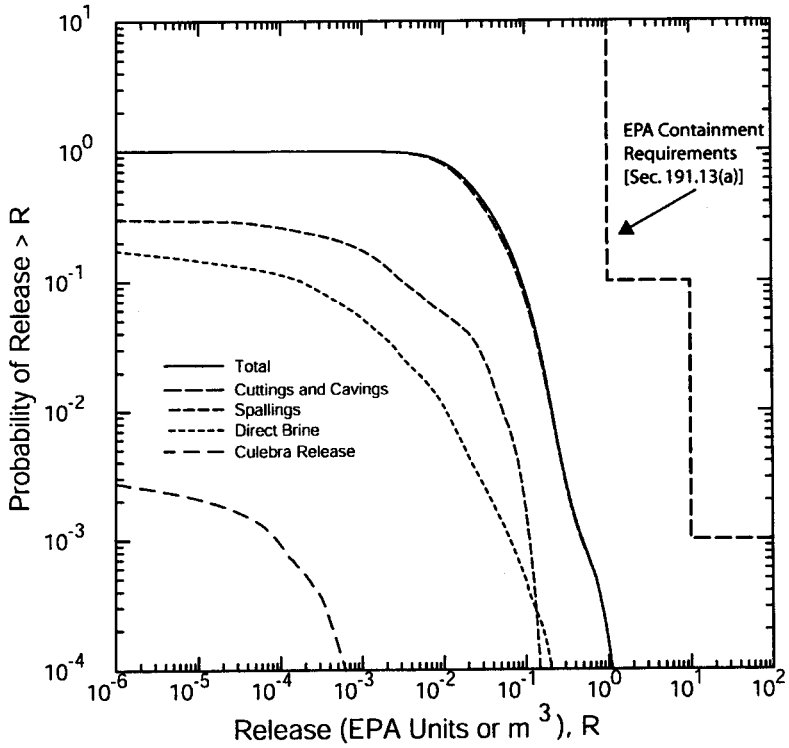

Figure 14 Mean CCDFs for Components of Total Normalized Releases, Replicate R3

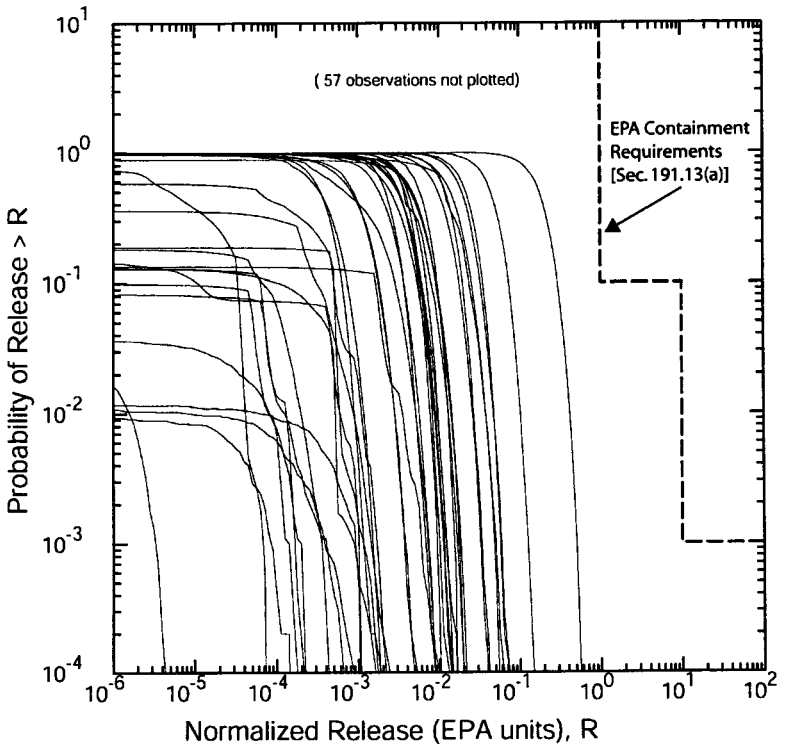

Figure 15 Spallings Releases, Replicate R1

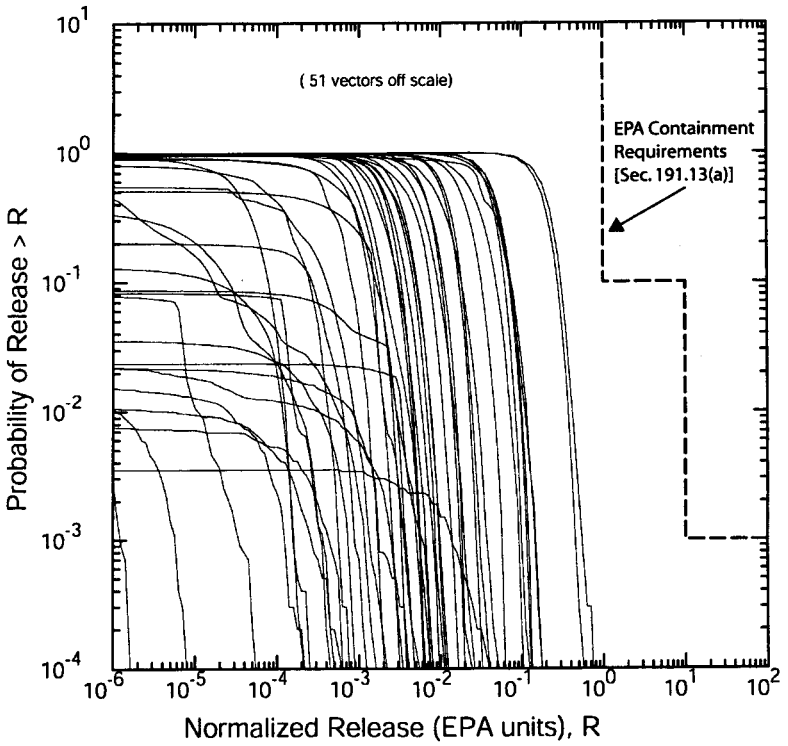

Figure 16 Spallings Releases, Replicate R2

INFORMATION ONLY

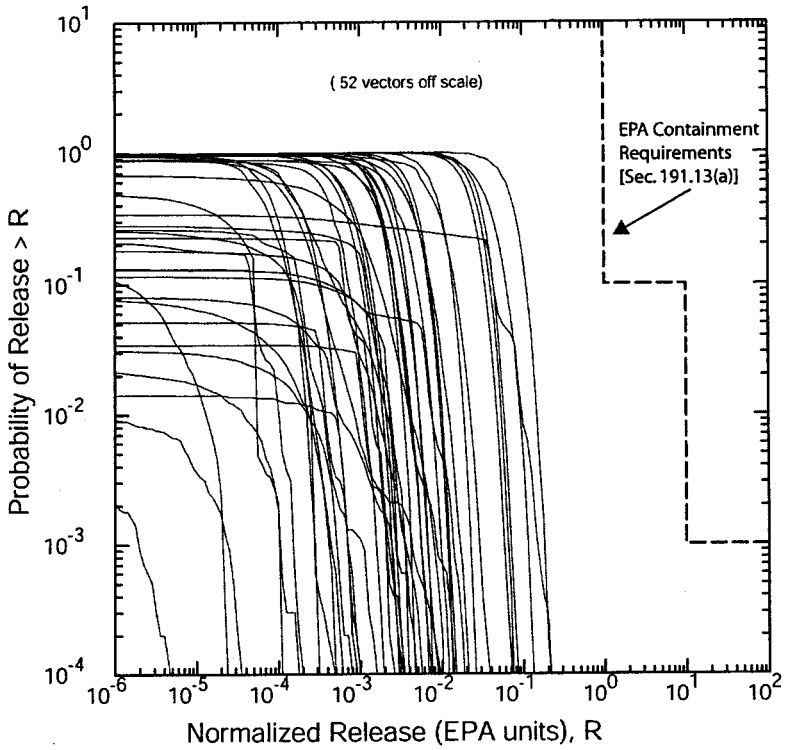

Figure 17 Spallings Releases, Replicate R3

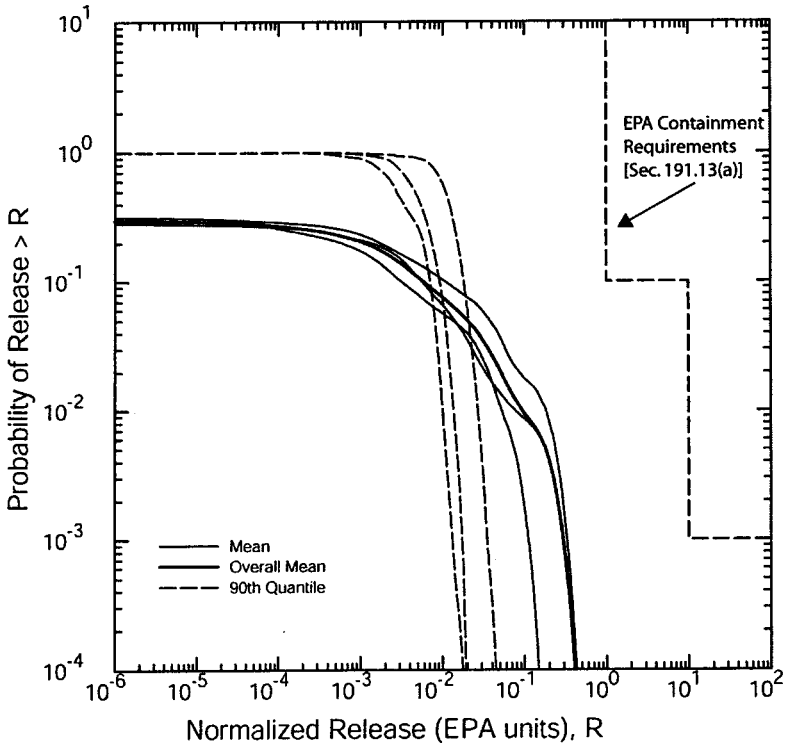

Figure 18 Mean and Quantile CCDFs for Spallings Releases, All Replicates

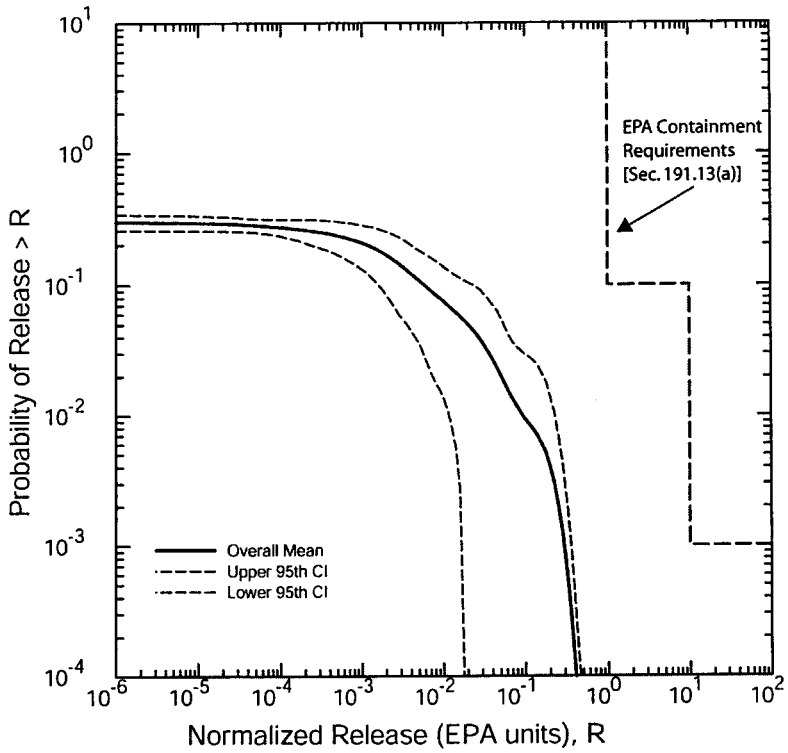

Figure 19 Confidence Interval on Overall Mean CCDF for Spallings Releases

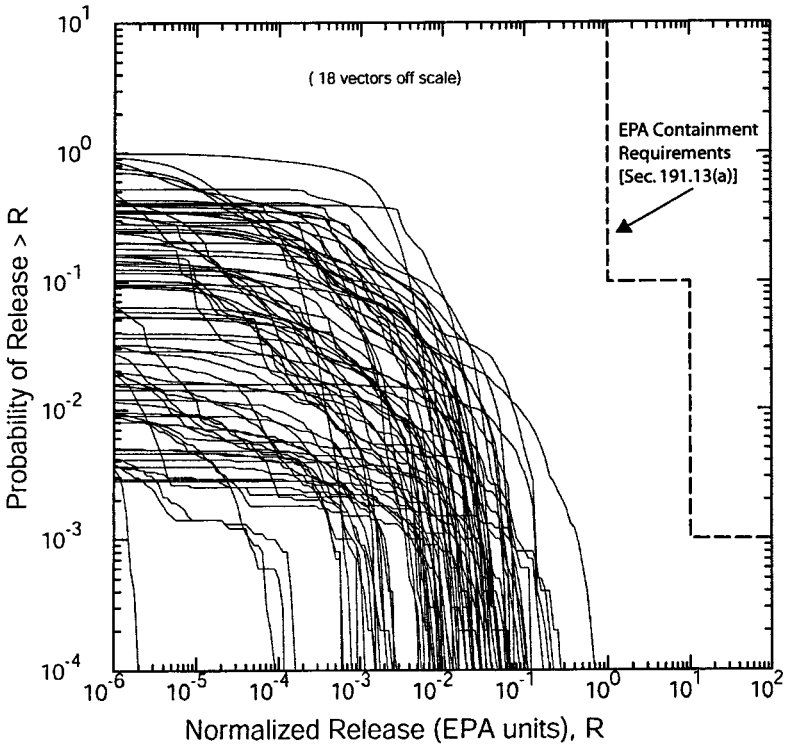

Figure 20 DBRs, Replicate 2

INFORMATION ONLY

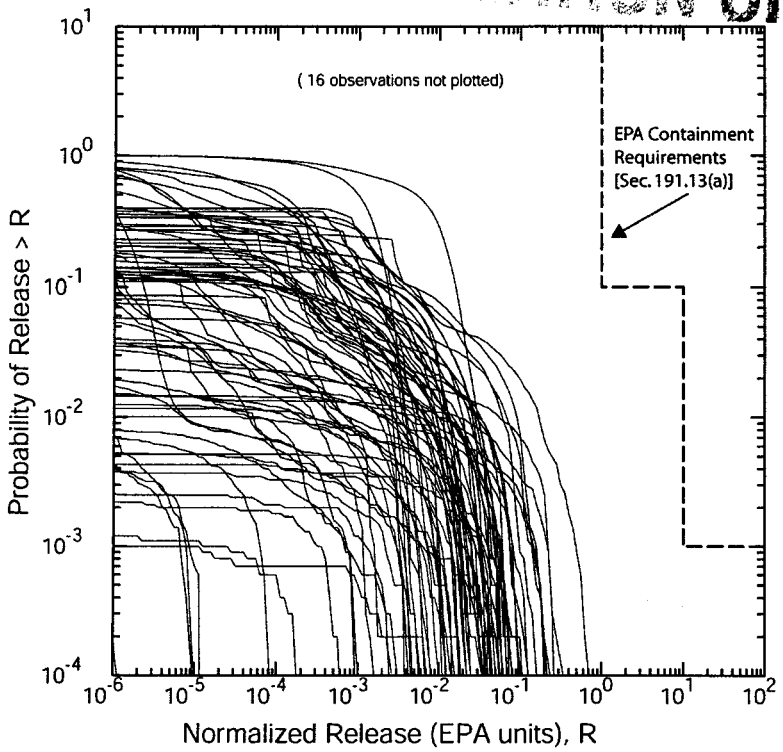

Figure 21 DBRs, Replicate R3

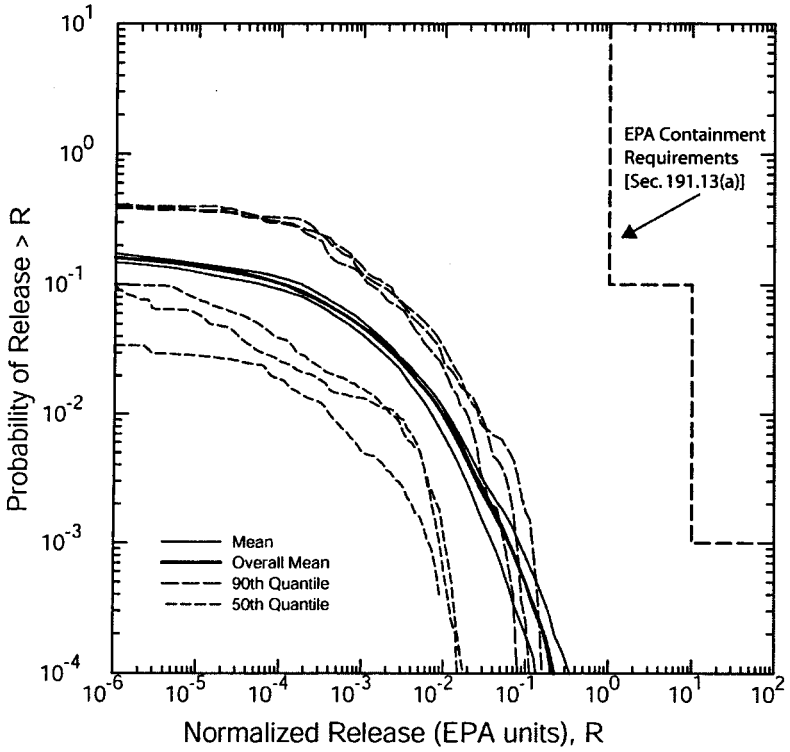

Figure 22 Mean and Quantile CCDFs for DBRs, All Replicates

INFORMATION ONLY

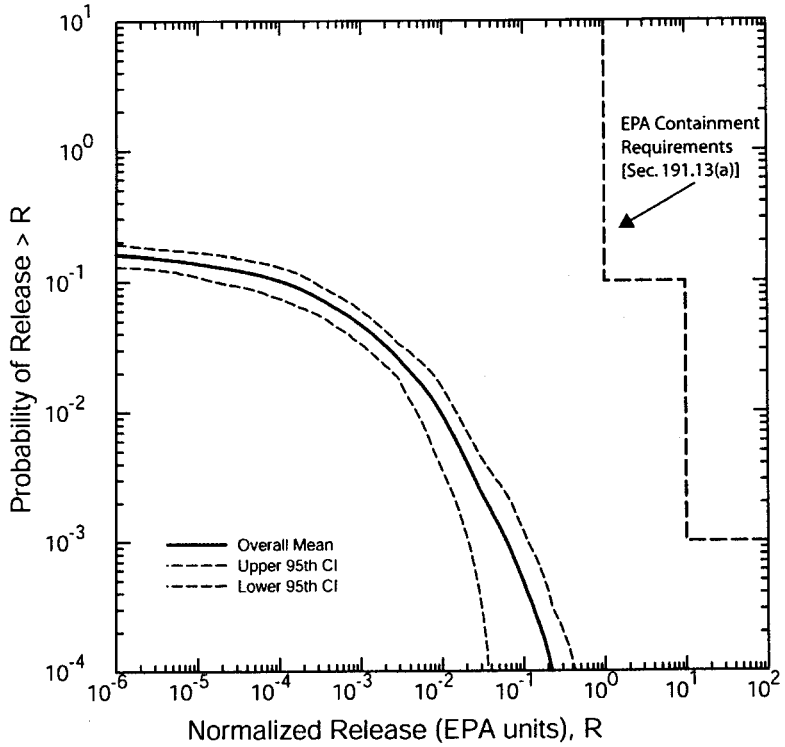

Figure 23 Confidence Interval on Overall Mean CCDF for DBRs

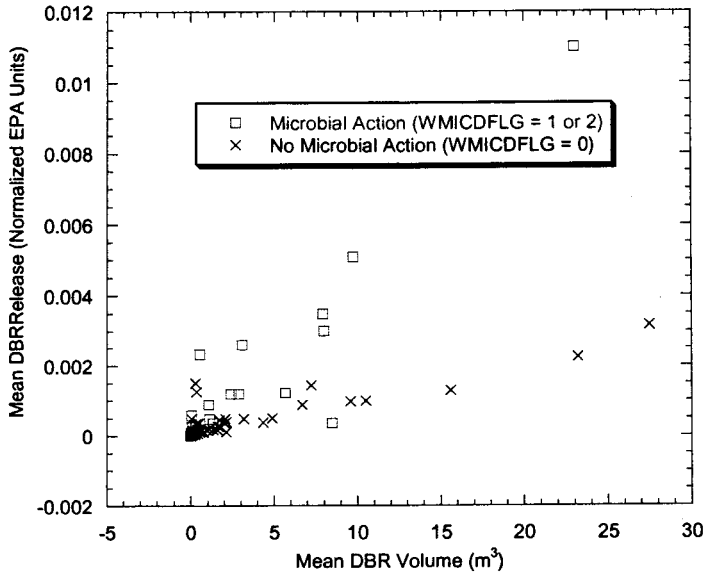

Figure 24 Sensitivity of DBRs

INFORMATION ONLY

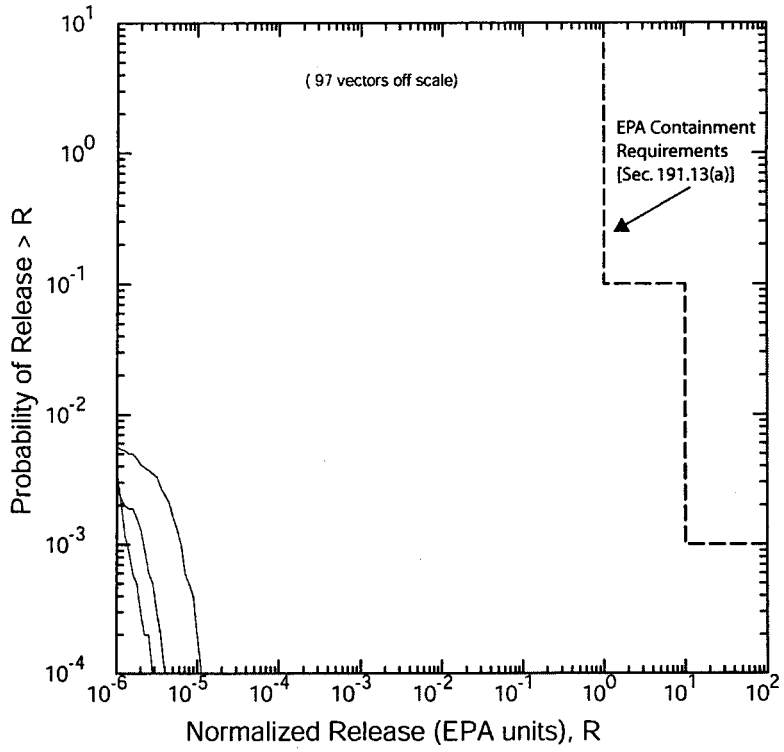

Figure 25 Transport Releases Through the Culebra, Replicate R1

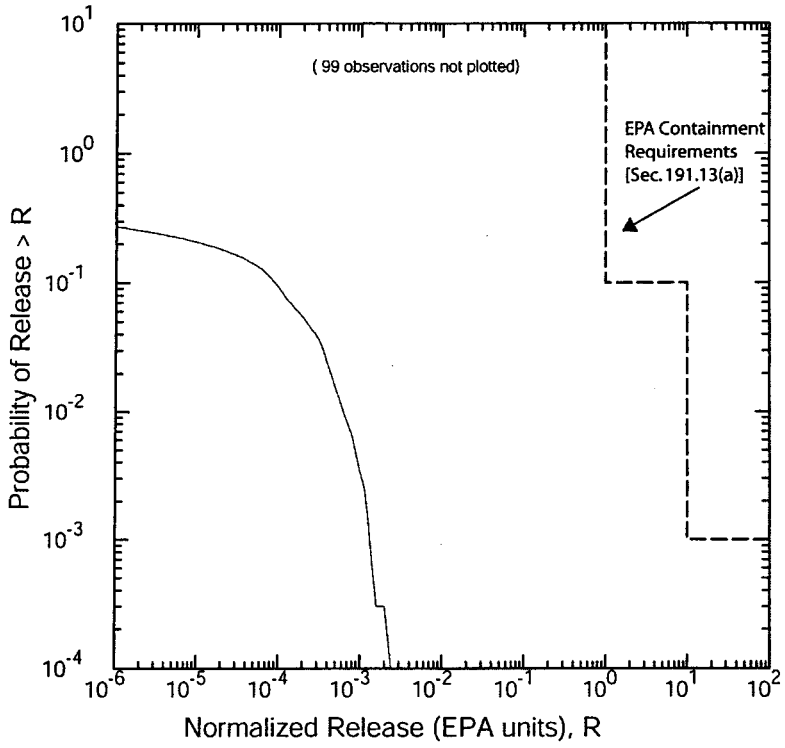

Figure 26 Transport Releases Through the Culebra, Replicate R3

INFORMATION ONLY

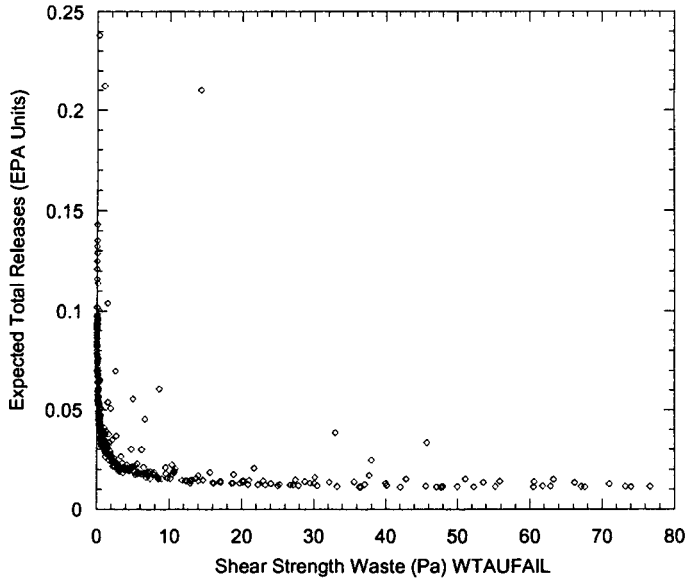

Figure 27 Uncertainty in Mean Total Releases Due to Waste Shear Strength, All Replicates

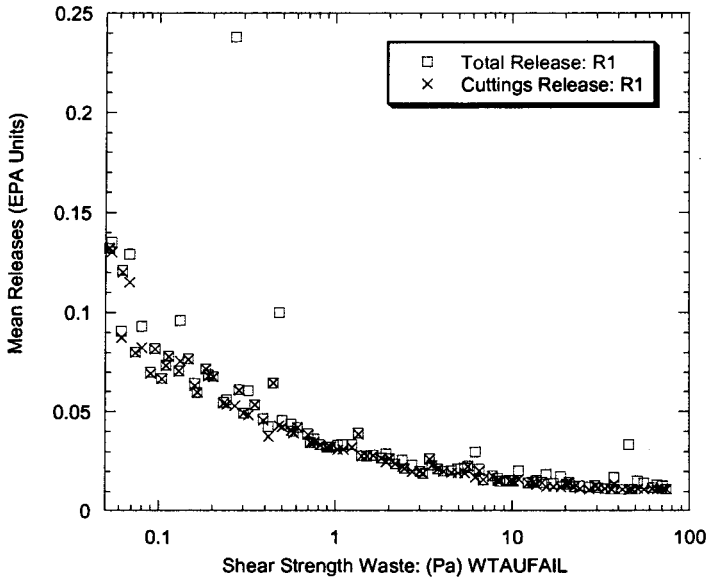

Figure 28 Comparison of Mean Total Releases to Mean Cuttings and Cavings Releases, Replicate R1

INFORMATION ONLY

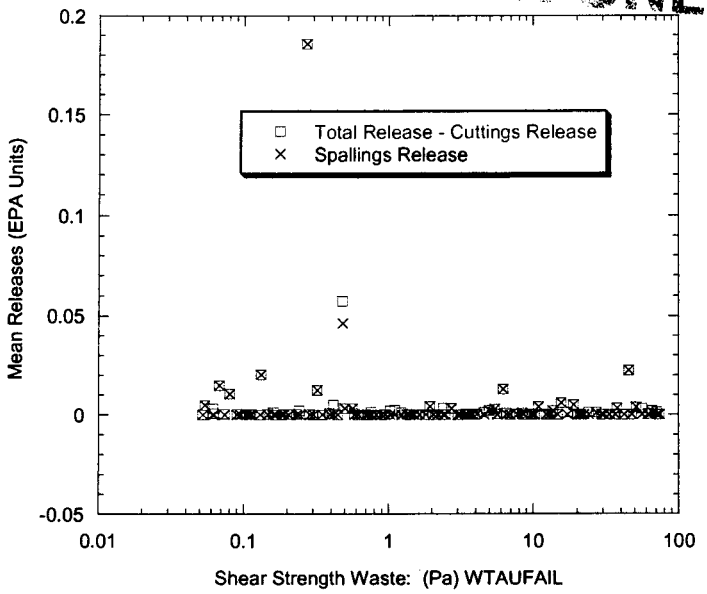

Figure 29 Comparison of Mean Total Releases Minus Mean Cuttings Releases to Spall Releases, Replicate R1

References:

Kirchner, T. 2004. "Stepwise regression analysis of the final release for each release mechanism, in response to C-23-18, Revision 2." Memorandum to David Kessel dated December 6, 2004. Sandia National Laboratories. Carlsbad, NM. ERMS #537992

Kirchner, T. and E. Vugrin. 2004. Errors affecting spallings releases, Rev. 0. Sandia National Laboratories, Carlsbad, NM. ERMS #537852.

U.S. Department of Energy (DOE). 2004. Title 40 CFR Part 191 Compliance Recertification Application for the Waste Isolation Pilot. DOE/WIPP 2004-3231, U.S. Department of Energy Waste Isolation Pilot Plant, Carlsbad Field Office, Carlsbad, NM.

Vugrin, E. and T. Kirchner. 2004. Incorrect LHS and SUMMARIZE Input Files for PRECCDFGF. Memo to Dave Kessel dated December 3, 2004. Sandia National Laboratories, Carlsbad, NM. ERMS #537965.

Vugrin, Eric D Eric D Vugrin 12/20/04

From: Dunagan, Sean
Sent: Tuesday, December 14, 2004 2:59 PM
To: Vugrin, Eric D; Chavez, Mario Joseph
Subject: Signature authority

I have reviewed the memo, "Corrected CRA Figures," written by Eric Vugrin dated Dec. 14. I have no comments. I give signature authority to Eric Vugrin for this document.

Sean Dunagan
Sandia National Laboratories
P.O. Box 5800, MS 0748
Building 823/3488
Albuquerque, NM 87185
Work: (505) 845-0406
Fax: (505) 844-2829
Cell: (505) 400-1203

538466

INFORMATION ONLY

Sandia National Laboratories

Operated for the U.S. Department of Energy
by
Sandia Corporation

4100 National Parks Highway
Carlsbad, NM 88220

Phone: (505) 234-0050
Fax: (505) 234-0061
Internet: edvugri@sandia.gov

Date: January 18, 2005

To: David Kessel, 6821

From: Eric Vugrin, 6821

Technical Review By: Tom Kirchner, 6821

QA Review By: Mario Chavez, 6820

Subject: Incorrect Units for Two Figures in "Corrected CRA Figures"

The horizontal axes for Figures 12 and 14 of "Corrected CRA Figures" (Vugrin 2004) were incorrectly labeled. The units were erroneously listed as "EPA Units or m^3." The correct units should be "EPA Units." The figures are listed below with the corrected axis labels.

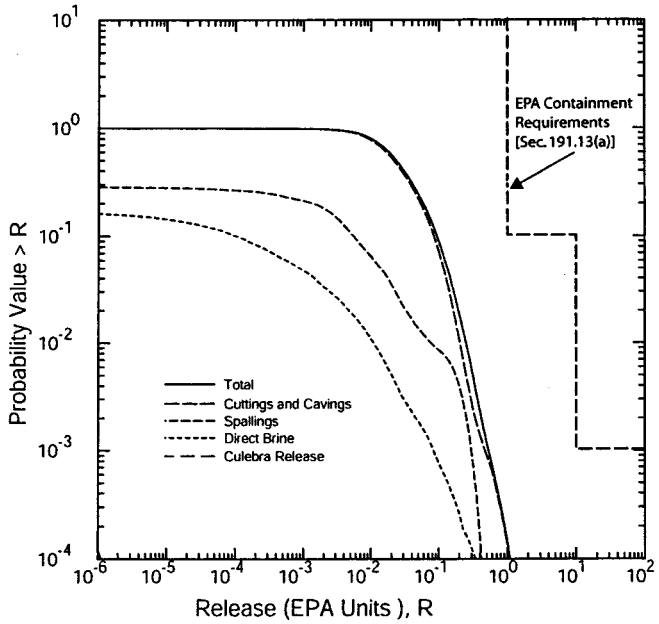

Figure 12 Mean CCDFs for Components of Total Normalized Releases, Replicate R1

WIPP:1.2.7:PA:QAL:533999

INFORMATION ONLY

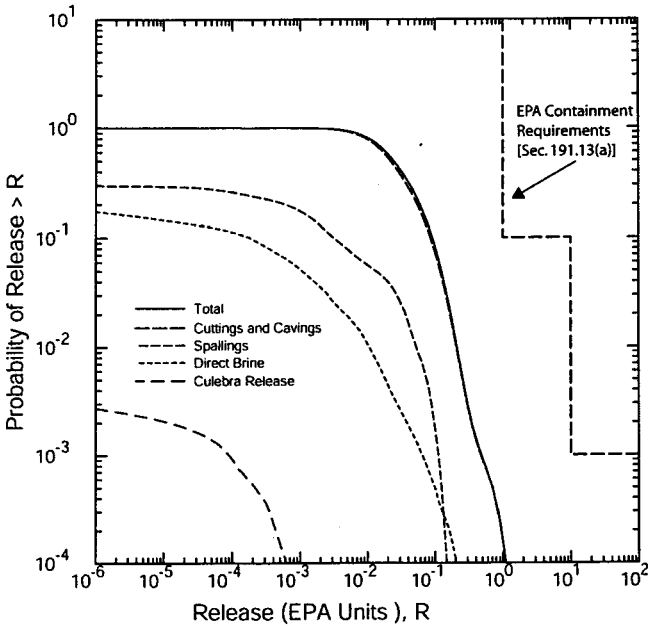

Figure 14 Mean CCDFs for Components of Total Normalized Releases, Replicate R3

References:

Vugrin, E. 2004. "Corrected CRA Figures." Memorandum to David Kessel. December 14, 2004. Sandia National Laboratories. Carlsbad, NM. ERMS# 538260.