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**DWPFASTXL: DEFENSE WASTE PROCESSING FACILITY  
ALGORITHM FOR SOURCE TERMS FOR EXCEL (U)**

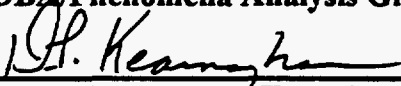
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# DWPF~~AST~~XL: Defense Waste Processing Facility Algorithm for Source Terms for Excel (U)

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## **ABSTRACT**

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The tool used to analyze the progression of accidents in the DWPF is called an Accident Progression Event Tree (APET). The APET methodology groups analyzed progressions into a series of bins, based on similarities in their characteristics. DWPFFASTXL is an Excel spreadsheet that can be used to calculate radiological source terms and consequences for these accident progression bins.

This document presents the calculations used in version 2.0 of the DWPFFASTXL spreadsheet. This revision of DWPFFASTXL has been written to complete the debugging of version 1.0, and to reconfigure the spreadsheet to model the new bin attribute table developed for the latest revision of the DWPF safety analyses.

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## 1.0 INTRODUCTION

Section 1.0 of this report introduces the background, purpose, and quality assurance requirements of the DWPFFASTXL spreadsheet. Section 2.0 describes the DWPFFASTXL Version 2.0 spreadsheet, including logic flow, input, output, data structures, and the actual equations used. Section 3.0 describes the configuration control associated with the spreadsheet. Section 4.0 provides instructions for installing and executing DWPFFASTXL. Section 5.0 presents the testing done to ensure that the DWPFFASTXL results are valid. Section 6.0 contains the references.

This report also contains five appendices: Appendix 1 contains the current bin attribute table employed by the DWPF accident analyses, Appendix 2 contains a printout of the DWPFFASTXL spreadsheet, Appendix 3 contains a listing of the cell formulas and variables used in DWPFFASTXL, Appendix 4 presents the output from the testing performed in section 5.0, and Appendix 5 contains a glossary of acronyms.

### 1.1 Introduction

The tool used to analyze the progression of accidents in the DWPF is called an Accident Progression Event Tree (APET) [5]. The APET methodology groups analyzed progressions into a series of bins, based on similarities in their characteristics. Each bin is characterized by a multi-character bin identification, in which each individual character (each character is referred to as a bin dimension) represents a specific attribute of the facility during the described progressions (currently DWPF APET bins contain 19 dimensions). This translation is achieved using the current bin attribute table. For example, Appendix 1 is the current bin attribute table for the DWPF APET.

The DWPF Algorithm for Source Terms (DWPFFAST) is a FORTRAN program that reads in these accident progression bins, and calculates an individual radiological source term for each one [7]. These data are then used in the integrated risk analysis.

To determine the radiological consequences from an individual accident progression bin, a spreadsheet called DWPFFASTXL has been developed on Microsoft Excel for Windows Version 4.0. This spreadsheet inputs the bin identification of an individual accident progression and calculates both the source term and the on- and offsite radiological consequences for that progression. This report documents the algorithm, theory, execution, and quality assurance of version 2.0 of the DWPFFASTXL spreadsheet. The spreadsheet itself is presented in Appendix 2, while the cell formulas are listed in Appendix 3.

### 1.2 Quality Assurance

Per 1Q, QAP 20-1, Revision 3, Section 2.4, user developed applications such as Excel spreadsheets are excluded from the normal software QA described in QAP 20-1, if the input and output are verified by one of the design verification processes described in E7. Per E7-2.40, Revision 0, Section 5.3, design verification may be accomplished through document review, interdisciplinary evaluation, qualification testing, or alternate calculations. Given that DWPFFASTXL (via this report) has been verified per E7-2.40, the equations and logic contained in DWPFFASTXL have already been qualified for the current version of the spreadsheet.

Therefore, if the current version of DWPFFASTXL is used for a critical calculation, the input and output must be reviewed per E7-2.40 to satisfy the quality assurance requirements; but, the reviewer should bear in mind that the spreadsheet equations and logic have already been qualified.

### **1.3 Background**

The original DWPFFAST code was written in 1993 and was based on the PRAST [6] code, which was developed for the K-Reactor probabilistic safety assessment. DWPFFAST was designed to calculate individual source terms for large groups of DWPF accident progressions, mainly for use in the integrated risk analysis section of the safety analyses. However, DWPFFAST could also be run in point-estimate mode, which would produce source term results for individual accident progressions.

When input variables were changed frequently, however, DWPFFAST's point-estimate mode was time-consuming and unwieldy to use. Therefore, the original version of DWPFFASTXL (version 1.0) was drafted to replace the DWPFFAST point-estimate mode calculations. Furthermore, consequence calculations were incorporated into version 1.0 of DWPFFASTXL, so that the spreadsheet would calculate radiological doses, as well as source terms.

However, since development of version 1.0 of DWPFFASTXL was not begun until after the DWPF Mode A/B accident analyses were completed, the spreadsheet was never debugged, documented, or used for any critical application. Version 2.0 of DWPFFASTXL, therefore, has been written to finish debugging version 1.0, and to reconfigure the spreadsheet to model the new bin attribute table developed for the latest revision of the DWPF safety analyses (Appendix 1).

## **2.0 METHOD**

Microsoft Excel for Windows Version 4.0 allows cells or groups of cells (arrays) to be assigned a variable name. This variable name can then be used in other cell formulas as opposed to identifying the cell or group of cells by column and row number. Throughout this document, the names assigned to specific cells or groups of cells will be defined. Refer to Appendix 2 for a printout of the DWPFFASTXL spreadsheet (with typical input values). Refer to Appendix 3 for a listing of the formula contents of each individual cell in DWPFFASTXL (for typical input values), as well as a listing of the variable names used in DWPFFASTXL.

### **2.1 Input**

The following blocks of cells contain the input data which must be entered by the user.

#### **2.1.1 Bin Identification Blocks**

The bin identification for the accident progression to be analyzed by DWPFFASTXL is input in the block of cells located in the upper left-hand corner of the spreadsheet. Later in the spreadsheet, the bin identification is translated into an accident progression using the bin attribute table given in Appendix 1. For example, using Appendix 1, a bin identification of "CFFDHGGAHGFEBBBBBED" indicates that everything in the facility is operating normally



(Normal Operation, No Release, etc.) except that the SME has detonated (see the 'A' character code in the eighth dimension which corresponds to SME Detonation in Appendix 1).

The first column of cells in this block, labeled *Dim*, lists the variable names for the numeric codes corresponding to each of the 19 dimensions in the bin. The actual numeric codes corresponding to each of the 19 dimensions are input by the user into the second column, labeled *Current*. Each individual bin dimension numeric code in this column is assigned a variable name of the form DIM\_x, where x is the ordinal of the dimension in question (the variables names shown in the first column of this block).

The numeric code for a bin dimension refers to the ordinal number (in the bin attribute table, Appendix 1) of the possible bin attribute being represented by that dimension's character code. For example, a "B" for the ninth dimension of a bin identification represents a SRAT deflagration (see Appendix 1). The corresponding numeric code for this bin dimension would be "2," since a deflagration is the second possible attribute for the SRAT in the bin attribute table (see Appendix 1).

Since the bin attributes are listed in alphabetic order by their character codes in the bin attribute table (see Appendix 1), the zth letter of the alphabet corresponds to the zth possible attribute. Therefore, the user can translate the bin dimensions (characters) of a given bin identification into numeric dimension codes by equating A with 1, B with 2, and so on.

The next column to the right, labeled *Default*, lists the default numeric code for each dimension; the codes representing normal or default conditions (no release, normal operation, etc.). The cells in the last column in the block, labeled *Error*, will remain blank if the corresponding bin dimension numeric codes in the *Current* column are valid. The bin attribute translation is designed so that the largest allowable bin dimension code (i.e., the endmost character in the alphabet) corresponds to the normal or default operation state; thus, any input code higher than the default setting must be an error. Therefore, if a current numeric code is greater than the default numeric code for that dimension, an error message ("ERROR") is generated in the corresponding cell in the *Error* column. An error will also be indicated if a bin dimension code is less than one, since such codes cannot equate to any bin attribute in the bin attribute table (Appendix 1).

Further down, past the operation mode cell, is another block of three columns. The first column, labeled *Dim*, lists the 19 bin dimensions. The second column, labeled *ID*, echoes the numeric bin dimension codes input above, by translating the numeric codes in the *Current* column into the corresponding character codes used in the bin identification. The third column contains a short label for each dimension that identifies the facility characteristic described by the dimension (i.e., the SRAT, the MFT, zone 1 ventilation, etc.).

### 2.1.2 Operation Mode

On the left edge of the spreadsheet is a cell labeled *Mode*. This cell refers to the operation mode for DWPF (mode A/B or mode C), and is used to determine which curie balance to use for the calculation of source terms and consequences. If mode A/B operation is to be modeled (simulated precipitate stream, hot sludge stream), the user must enter a one in this cell. If mode C operation is to be modeled (hot precipitate and sludge streams), the user must enter a two in this cell. This number is assigned the name, *Operation\_Mode*.

### 2.1.3 Input Parameters Blocks

The input parameters used by DWPF<sub>FASTXL</sub> are located in the right-most blocks of columns, labeled *INPUT PARAMETERS*. This section is further sub-divided into blocks labeled *TANK VOLUMES*, *MISC VALUES*, *EXPL. AERO. MASSES*, *RELEASE FRACTIONS*, *RELEASE RATES*, *CELL DFS*, *VIT. BLDG. DFS*, *SAND FILTER DFS*, *LPPP HEPA DFS*, *LPPP BLDG. DFS*, *CURIE BALANCE*, *CB - Modes A&B*, and *CB - Mode C*. Each block of input data is described separately below. Note that all of the input parameters in these blocks are assigned variable names (described below).

The actual values used for these data are chosen and manually input by the user. However, note that the variables associated with the OECT and the OEV are not used in the current version of DWPF<sub>FASTXL</sub>, since their radiological contributions are negligible compared to the other tanks of interest.

#### *Tank Volumes*

This block contains the volumes of the tanks modeled in DWPF<sub>FASTXL</sub>. The first column in the block lists the variable names for each of the tank volumes; and, the second column lists the values assigned to each tank volume, in units of gallons. The user must input the values in the second column. Table 1 presents the individual tank volumes defined in this block, as well as the variable names assigned to them.

**Table 1: Tank Volumes**

Tank	Variable
OWST	VOWST
LPPPST	VLPST
LPPPPT	VLPPT
LPPPRT	VLPRT
PR	VPR
PRFT	VPRFT
PRBT	VPRBT
SME	VSME
SRAT	VSRAT
MFT	VMFT
Melter	VMLT
RCT	VRCT
OEV	VOEV
OECT	VOECT

**Misc Values**

This block of data contains miscellaneous input parameters. The first column lists the variable names assigned to the parameters in this block, the second column lists the input values assigned to the parameters, and the third column lists the required units for the input values. The user must input the values in the second column. Table 2 presents the variable names, descriptions, and units for these parameters.

**Table 2: Misc. Values**

Variable	Description	Units
VUCRS	volume of material aerosolized due to an uncontrolled reaction in the SPC	gal
VUCRC	volume of material aerosolized due to an uncontrolled reaction in the CPC	gal
VUCRSPL	volume of material spilled due to an uncontrolled reaction	gal
MROG	mass of melter offgas released due to a melter offgas explosion (or other event leading to loss of offgas containment)	lb
MCAN	mass of glass in one filled canister	lb
VMSPL	volume of a partial melter spill	gal
VOVFL	volume of material spilled due to a tank overflow	gal
VLEAKP	volume of material spilled due to a leak in the LPPP	gal
VLEAKC	volume of material spilled due to a leak in the CPC	gal
VLEAKS	volume of material spilled due to a leak in the SPC	gal
RHO	density of the sludge and precipitate streams	kg/gal
RHOB	density of liquid benzene	kg/gal
RHOGL	density of molten glass	lb/gal
RHOG	density of melter offgas	lb/ft <sup>3</sup>

**Expl. Aero. Masses**

This block of data contains the explosive aerosolization masses used in DWPF<sub>FASTXL</sub>. These data are the masses of material made airborne and respirable due to detonations or deflagrations in a given tank or cell. Except for the SPC and OWST, each of the vessels or cells modeled here can experience either a detonation or a deflagration (the RCT, LPPPRT, and the other cells are omitted, since current modeling indicates they cannot detonate or deflagrate during the time periods of interest). Since different amounts of material will be aerosolized depending on the type of explosion, each of the explosive aerosolization variables for these tanks is an array of two

numbers (two-column, one-row array), where the first value is the detonation mass and the second value is the deflagration mass. SPC vapor cloud explosions and OWST vessel explosions are only modeled to occur as deflagrations, so the explosive aerosolization variables for the SPC and OWST are single-value variables.

For all vessels except the SPC and OWST, the first column in this block lists the variable names for the explosive aerosolization parameters, the second column lists the explosive aerosolization masses following a detonation, the third block lists the explosive aerosolization masses following a deflagration, and the fourth column lists the applicable units (all masses are in kilograms). The user must input the values in the second and third columns. For the SPC and OWST, the first column in this block lists the appropriate variable names, the second column lists the explosive aerosolization masses following a deflagration, and the third column lists the applicable units (all masses are in kilograms). The user must input the values in the second column. Note that the deflagration aerosolization mass for the OWST is not currently used in DWPF<sub>FASTXL</sub> (see section 2.3.1). Table 3 lists the explosive aerosolization mass variables and their associated tanks/cells.

**Table 3: Explosive Aerosolization Masses**

Tank/Cell	Variable
OWST	RLEXOW
LPPPPT	RLEXLPPT
LPPPST	RLEXLPST
PR	RLEXPR
PRFT	RLEXPRFT
PRBT	RLEXPRBT
SME	RLEXSME
SRAT	RLEXSRAT
MFT	RLEXMFT
OECT	RLEXOECT
SPC	RLEXSPC
OEV	RLEXOEV

### **Release Fractions**

This block of data contains the individual isotope release fractions for splashing, SPC benzene fires, glass canister releases, melter spills, and tornadoes. Release fractions in this sense are the fractions of available inventory that are made airborne and respirable by the given event. Splashing refers to aerosolization caused by material spilling from a damaged or fallen tank, SPC benzene fires refers to aerosolization caused by burning a benzene layer over a layer of precipitate in the SPC, canister releases refers to glass fines becoming airborne and respirable due to canister shearing, melter spills refers to radionuclide volatilization from partial or total molten glass spills from the melter, and tornadoes refer to resuspension of OWST available inventory due to tornado-induced high-winds. Since a given release fraction can vary from isotope to isotope, and DWPF<sub>FASTXL</sub> models thirteen individual isotopes (see *Curie Balance* section), each release

fraction is defined as an array of thirteen values (one-column, thirteen-row arrays), with each value in the array equivalent to the release fraction for a specific isotope. The first column in the release fraction data block presents the individual isotopes, and the next five columns present the individual release fraction for splashing, SPC benzene fires, canister releases, melter spills, and tornadoes, respectively. The user must input the values in the five release fraction columns. The order of the isotopes in each release fraction array is the same as is used in the curie balances (see *Curie Balance* section). Table 4 lists the names of the release fraction variable arrays, for each of the five types of release fractions.

**Table 4: Release Fraction Arrays**

Release Fraction	Array Name
Splashing	RFSPLSH
SPC Benzene Fires	RFFIRE
Canister Releases	RFCR
Melter Spills	RFMSPL
Tornadoes	RFTOR

### *Release Rates*

This block of data contains information related to release fraction rates: release fractions that are defined in terms of the fraction of available inventory that is made airborne and respirable per unit time. The first two variables defined in this block are RFLEAK and RFVENT. Both of these are two-column (one-row) arrays, with the first element in each array corresponding to a release fraction rate applicable when local ventilation is operating, and the second element corresponding to a release fraction rate applicable when local ventilation is not operating. RFLEAK is the release fraction rate for resuspension from pools, and RFVENT is the release fraction rate for resuspension from vented tanks. These release rates are in units of fraction per second, and are applied to inventories in the vitrification building and the LPPP. The four values (two values each for RFLEAK and RFVENT) must be input by the user.

The next two parameters in this block are single-value variables named DURSHT and DURLNG. DURSHT is the recovery time following a non-catastrophic event (leak, overflow, uncontrolled reaction, etc.), and DURLNG is the recovery time following a catastrophic event (explosion, earthquake, etc.). The recovery times are used to determine the amount of time the release fraction rates are applicable following an event (it is assumed that source term generation will be stopped by the end of the applicable recovery time). Both durations are in units of seconds, and must be input by the user.

### *Cell DFs*

This block of data contains the decontamination factors provided by the CPC, SPC, and melter cell. A decontamination factor is an indication of the amount of initially released airborne radioactive material that does not ultimately escape confinement (due to surface deposition or filter capture). The decontamination factor for a room or filter is defined as the ratio of the

amount of radioactive material entering the room or filter to the amount leaving the room or filter. Each of the three cell decontamination factors defined in this block are actually variable arrays of thirteen rows by two columns, named CPCDF, SPCDF, and MCDF, for the CPC, SPC, and melter cell, respectively. The thirteen rows correspond to the thirteen isotopes modeled by DWPFASSTXL (see *Curie Balance* section), and the two columns refer to whether or not the cell covers are intact (the first column of a given array is applicable when the cell covers have failed, and the second column is applicable when the cell covers are intact).

The first column in this block lists the thirteen isotopes of interest, the next two columns contain CPCDF, the next two columns contain SPCDF, and the last two columns contain MCDF. The user must input the values in the six decontamination factor columns of this block.

#### *Vit. Bldg. DFs*

This block of data contains the decontamination factor provided by the vitrification building. This decontamination factor can differ for each of the thirteen isotopes modeled (see *Curie Balance* section) and for each of the five possible states of the zone 1 ventilation system. Therefore, the vitrification building decontamination factor variable, VITDF, is a thirteen row by five column array. The five possible states of the zone 1 ventilation system are shown in Table 5 (these ventilation states also apply to the sand filter decontamination factor, SNDDF).

The first column in this block lists the thirteen modeled isotopes. The next five columns contain the individual isotope decontamination factors for the five ventilation states. The user must input the values for these five columns.

**Table 5: Zone 1 Ventilation States for VITDF and SNDDF**

Column #	Ventilation State
1	Building Collapse
2	Building Breach - No Vent.
3	Building Breach - Yes Vent.
4	Ventilation Failure
5	Normal Operation

#### *Sand Filter DFs*

This block of data contains the decontamination factor provided by the zone 1 ventilation sand filter. This decontamination factor can differ for each of the thirteen isotopes modeled (see *Curie Balance* section) and for each of the five possible states of the zone 1 ventilation system. Therefore, the sand filter decontamination factor variable, SNDDF, is a thirteen row by five column array. The five possible states of the zone 1 ventilation system are shown in Table 5 (these ventilation states also apply to the vitrification building decontamination factor, VITDF).

The first column in this block lists the thirteen modeled isotopes. The next five columns contain the individual isotope decontamination factors for the five ventilation states. The user must input the values for these five columns.

### ***LPPP HEPA DFs***

This block of data contains the decontamination factor provided by the LPPP HEPA filters. This decontamination factor can differ for each of the thirteen isotopes (see *Curie Balance* section) modeled and for each of the four possible states of the LPPP ventilation system. Therefore, the LPPP HEPA decontamination factor variable, LPFLDF, is a thirteen row by four column array. The four possible states of the LPPP ventilation system are shown in Table 6 (these ventilation states also apply to the LPPP decontamination factor, LPBDDF).

The first column in this block lists the thirteen modeled isotopes. The next four columns contain the individual isotope decontamination factors for the four ventilation states. The user must input the values for these four columns.

**Table 6: LPPP Ventilation States for LPFLDF and LPBDDF**

Column #	Ventilation State
1	Building Breach - No Vent.
2	Ventilation Failure
3	Building Breach - Yes Vent.
4	Normal Operation

### ***LPPP Bldg. DFs***

This block of data contains the decontamination factor provided by the LPPP itself. This decontamination factor can differ for each of the thirteen isotopes (see *Curie Balance* section) modeled and for each of the four possible states of the LPPP ventilation system. Therefore, the LPPP decontamination factor variable, LPBDDF, is a thirteen row by four column array. The four possible states of the LPPP ventilation system are shown in Table 6 (these ventilation states also apply to the LPPP HEPA decontamination factor, LPFLDF).

The first column in this block lists the thirteen modeled isotopes. The next four columns contain the individual isotope decontamination factors for the four ventilation states. The user must input the values for these four columns.

### ***Curie Balance***

This block of data contains the Curie balance used by DWPF<sub>FASTXL</sub>. DWPF<sub>FASTXL</sub> models eleven process streams and thirteen specific isotopes in each stream. The thirteen isotopes represent over 99.9% of the potential inhalation dose from DWPF (based on the current Curie balance [1]); and, the eleven streams characterize all of the specific vessels modeled in DWPF<sub>FASTXL</sub>. The modeled streams are described in Table 7. Note that although streams 18,

19, and 212 are listed in this block (and in Table 7), they are not currently used by DWPF*FASTXL* in the calculation of source terms or consequences.

**Table 7: Stream Descriptions**

<b>Stream Number</b>	<b>Stream Description</b>
1	Sludge feed to DWPF
3	SPC to SRAT
7	SRAT to SME
18	Undefined
19	Undefined
23	Melter Offgas
24	Molten glass
91	Recycled waste
201	Precipitate feed to DWPF
212	PRD to OEV
222	OWST feed

A single stream is used to model all releases from a given vessel, as shown in Table 8.

**Table 8: Characteristic Streams**

<b>Tank</b>	<b>Stream</b>
OWST	222
LPPPST	1
LPPPPT	201
LPPPRT	91
PR	3
PRFT	201
PRBT	3
SME	7
SRAT	7
MFT	7
RCT	91
Melter	24
Melter OG	23
Canisters	24



The thirteen isotopes modeled in DWPF<sub>FASTXL</sub> are presented in Table 9. Note that the order of the isotopes shown in this table is the same order that will be used for the thirteen isotopes throughout DWPF<sub>FASTXL</sub>, in all arrays and cell blocks based on the thirteen isotopes.

Table 9: Isotopes

#	Isotope
1	H3
2	Sr90
3	Ru106
4	Cs134
5	Cs137
6	Ce144
7	Pm147
8	Pu238
9	Pu239
10	Pu240
11	Pu241
12	Am241
13	Cm244

The first column of the Curie balance block lists the thirteen isotopes, and the next eleven columns list the radioactive contents of each of the eleven streams listed in Table 7. Except for streams 23 and 24, the units are Ci/gal. For stream 23, the units are Ci/ft<sup>3</sup>, and for stream 24 the units are Ci/lb. A thirteen-row by one-column array named Stream<sub>x</sub> is defined for each stream, where x is the stream number and the thirteen rows correspond to the thirteen isotopes in Table 9.

Actual Curie balance data is not input by the user in this block, however. Instead, the entire data-containing section of the block (eleven stream-columns by thirteen isotope-rows), is defined as an unnamed array containing a single IF-THEN-ELSE statement. This statement refers to the Operation\_Mode variable defined in section 2.1.2. If the operation mode is A/B (Operation\_Mode = 1), the data-containing section of the block will be set equal to the variable array Mode\_AB, which contains the Mode A/B data given in the next block, *CB - Modes A&B*. If the operation mode is C (Operation\_Mode = 2), the array Mode\_C is used, which contains the data from the *CB - Mode C* block.

#### *CB - Modes A&B*

The first column of this block lists the thirteen isotopes, and the next eleven column lists the radioactive contents of each of the eleven streams during Mode A/B operation. If mode A/B is to be modeled, the user must input the values for each of the thirteen rows in each of the eleven columns of this block (zeros may be input for streams 18, 19, and 212 since they are not currently used in DWPF<sub>FASTXL</sub>). Except for streams 23 and 24, the units are Ci/gal. For stream 23, the units are Ci/ft<sup>3</sup>, and for stream 24 the units are Ci/lb. A thirteen-row by eleven-column array

named Mode\_AB is defined to include all of the data-containing cells in this block, for use in the Curie Balance block described above.

### CB - Mode C

The first column of this block lists the thirteen isotopes, and the next eleven column lists the radioactive contents of each of the eleven streams during Mode C operation. If mode C is to be modeled, the user must input the values for each of the thirteen rows in each of the eleven columns of this block (zeros may be input for streams 18, 19, and 212 since they are not currently used in DWPF<sub>FASTXL</sub>). Except for streams 23 and 24, the units are Ci/gal. For stream 23, the units are Ci/ft<sup>3</sup>, and for stream 24 the units are Ci/lb. A thirteen-row by eleven-column array named Mode\_C is defined to include all of the data-containing cells in this block, for use in the Curie Balance block described above.

#### 2.1.4 Release Location

The last input datum required for DWPF<sub>FASTXL</sub> is the release location. DWPF<sub>FASTXL</sub> can calculate radiological consequences based on one of three possible release locations: the zone 1 ventilation stack, the vitrification building (ground release), or the LPPP (ground release). The release location is defined in a cell to the right of the dose calculation block, at the bottom of the spreadsheet. This cell, labeled *RELEASE LOCATION*, contains an integer (1, 2, or 3) and is assigned the name *RELEASE\_LOCATION*. A text table following the cell defines which *RELEASE\_LOCATION* value corresponds to each release location:

<i>RELEASE_LOCATION</i> Value	Release Location
1	Zone 1 Stack
2	Vitrification Building
3	LPPP

Based on the desired release location and the above table, the user must input a 1, 2, or 3 in the *RELEASE LOCATION* cell.

## 2.2 Language/Hardware Specifications

DWPF<sub>FASTXL</sub> is a spreadsheet written for Microsoft Excel for Windows Version 4.0. It is only designed to be used with this version of Excel for Windows, or with Microsoft Excel for the Macintosh Version 4.0. DWPF<sub>FASTXL</sub> will run on any computer that can run either of these versions of Excel.

## 2.3 Program

The following sections describe the calculations performed by DWPF<sub>FASTXL</sub>, using the input data described in section 2.1.

### 2.3.1 OWST Source Term Block

The first block in the middle region of the spreadsheet, labeled *OWST*, calculates the source term due to events in the OWST. Note that the array index *i* in the following equations refers to each of the thirteen isotopes (i.e., *i* = 1 to 13). The first column lists the thirteen isotopes for which source terms are individually calculated. The second column, labeled *BEG INV*, calculates the beginning inventory of the OWST, by multiplying the *Stream\_222* array (section 2.1.3) by the *VOWST* variable (Table 1), yielding the total activity (*C<sub>i</sub>*) in the OWST.

The next three columns (referred to herein as the explosion sub-block) calculate the source term that would result from an OWST explosion (deflagrations only; OWST detonations are not possible). For the OWST, the floating roof in the inner tank prevents any significant direct aerosolization from an explosion. Instead, the explosion is modeled to cause a tank failure leading to a fire (therefore, the explosive aerosolization mass contained in *RLEXOW* is not used in this version of DWPF<sub>FASTXL</sub>). The entire OWST inventory is assumed to be available for release in this event.

The first of these three columns, labeled *SPLASHING*, calculates the amount of respirable inventory aerosolized by the OWST inventory splashing onto the ground, using the following equation for each isotope:

$$\text{Release} = \text{Inventory} * \text{RFSPLSH}(i)$$

where the result is in Curies and *RFSPLSH* is the release fraction due to splashing (Table 4). Note that this equation is only used if the bin dimension numeric code for the OWST indicates that an explosion has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

The next column, labeled *INV AF SPLSH*, in the explosion sub-block calculates the remaining inventory after the splashing release by subtracting the above release from the beginning inventory. Note that if an explosion has not occurred, the previous column would be zero, and this column would be equal to the beginning inventory.

The final column in the explosion sub-block, labeled *FIRE*, calculates the additional amount of material made airborne and respirable by a benzene fire following the tank rupture and splashing. This fire release is calculated using the following equation:

$$\text{Release} = \text{Post-Splashing Inventory} * 1.0$$

where the result is in Curies. Since the radionuclides are dissolved directly in the highly volatile benzene in the OWST inventory, a release fraction of 1.0 is assumed (which differs from the SPC benzene fire, which assumes that the majority of the radionuclides are in the precipitate material layer under the burning benzene layer). Note that this equation is only used if the bin dimension numeric code for the OWST indicates that an explosion has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

The next column after the explosion sub-block in the OWST source term block, labeled *TORNADO*, calculates the amount of material made airborne and respirable following a tornado. The entire OWST inventory is assumed to be available for release during a tornado.

This release is calculated using the following equation:

$$\text{Release} = \text{Beginning Inventory} * \text{RFTOR}(i)$$

where the result is in Curies and RFTOR is the release fraction due to tornadoes (Table 4). The beginning inventory is the amount of material in the OWST, calculated in the second column of the OWST block. Note that this equation is only used if the bin dimension numeric code for the OWST indicates that a tornado has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

The final column in the OWST block, labeled *OWST RELEASE*, totals the source term from all release mechanisms in the previous columns. The columns that are summed are *SPLASHING*, *FIRE*, and *TORNADO*. Note that if any or all of these events did not occur according to the bin dimension numeric code, those specific columns would contain zeros, which would not contribute to the final OWST source term. The set of thirteen individual isotope releases (total activity in Curies released per isotope) calculated for the OWST in this column is defined as a thirteen-row by one-column array called *OWST\_RELEASE*.

### 2.3.2 LPPP, SPC, and CPC Vessel Source Term Blocks

The next ten blocks of cells calculate the source terms for the ten tanks modeled in the LPPP, SPC, and CPC: LPPPST, LPPPPT, LPPPRT, PR, PRFT, PRBT, SME, SRAT, MFT, and RCT. Since the equations used are the same for these blocks (except for some specific points which will be called out), they are all treated together in this section. Note that the array index *i* in the following equations refers to each of the thirteen isotopes (i.e., *i* = 1 to 13).

The first column in each vessel source term block lists the thirteen isotopes for which source terms are individually calculated. The second column in each block calculates the beginning inventory of the tanks, by multiplying the appropriate stream array, *Stream<sub>x</sub>* (where *x* is the appropriate stream number given in Table 8), by the appropriate tank volume variable (Table 1), yielding the total activity in the given vessel (*C<sub>i</sub>*).

The remaining fourteen columns in each block are divided into the following sections (or sub-blocks): explosion, splashing, leak, venting, uncontrolled reaction, overflow, and release. Each sub-block is described separately below.

#### *Explosion*

The next five columns in each block calculate the source term that would result from a tank explosion (detonation or deflagration). A detonation release is modeled to consist of an explosive aerosolization release, followed by a splashing release (aerosolization due to tank rupture and complete spill of the contents) due to the tank being ruptured by the force of the explosion. The material spilled on the floor is then modeled to be released through resuspension. For an explosion, the entire tank inventory is assumed to be available for release.

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Although the force of a deflagration alone is insufficient to splash a tank, these same releases are assumed to apply for a deflagration as well (explosive aerosolization, splashing, resuspension) since a deflagration will cause the applicable cell covers to be dislodged, which can then fall on the deflagrating tank and splash it. In most cases, however, the cell covers would not fall on the deflagrating tank; and, the tank would be vented rather than splashed. However, since a deflagrating tank *can* be splashed a significant percentage of the time, DWPF<sub>FASTXL</sub> conservatively assumes that a deflagration in one of these tanks is always followed by a splashing release (splashing results in a larger source term than venting), as is assumed for the detonation model.

The first of the five columns in each explosion sub-block, labeled *DAR* (direct aerosol release), calculates the amount of respirable inventory aerosolized by the explosion, using the following equation for each isotope:

$$\text{Release} = \text{RLEX?}(j) * \text{Stream}_x(i) / \text{RHO}$$

where the result is in Curies, RLEX?(j) refers to the appropriate explosive aerosolization mass array (Table 3), Stream<sub>x</sub> refers to the appropriate stream contents array (where *x* is the appropriate stream number given in Table 8), and RHO refers to the sludge/precipitate density (Table 2). Using an IF-THEN-ELSE statement, RLEX?(1) is used if the bin dimension numeric code indicates a detonation, and RLEX?(2) is used if the code indicates a deflagration (see section 2.1.3). Note that this equation is only used if the bin dimension numeric code for the given tank indicates that an explosion has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column. In addition, if the bin attribute table indicates that an explosion is not modeled for a given tank, this column is automatically set to zero in that tank's block.

The next column in each explosion sub-block, labeled *INV AF DAR*, calculates the remaining inventory after the explosive aerosolization release by subtracting the above release from the beginning inventory. Note that if an explosion has not occurred, the previous column would be zero, and this column would be equal to the beginning inventory.

The next column in each explosion sub-block, labeled *SPLASHING*, calculates the splashing release following the explosion, using the following equation for each isotope:

$$\text{Release} = \text{Post-Explosion Inventory} * \text{RFSPLSH}(i)$$

where the result is in Curies and RFSPLSH is the release fraction due to splashing (Table 4). Note that this equation is only used if the bin dimension numeric code for the given tank indicates that an explosion has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column. In addition, if the bin attribute table indicates that an explosion is not modeled for a given tank, this column is automatically set to zero in that tank's block.

The next column in each explosion sub-block, labeled *INV AF SPLSH*, calculates the remaining inventory after the explosive aerosolization and splashing releases by subtracting the above release from the post-explosion inventory. Note that if an explosion has not occurred, the previous column would be zero, and this column would be equal to the beginning inventory.

The final column in each explosion sub-block, labeled *EVAPORATION*, calculates the additional amount of material made airborne and respirable by resuspension from the spilled inventory following the explosion. This release is calculated using the following equation for each isotope:

$$\text{Release} = \text{Post-Splashing Inventory} * \text{RFLEAK}(j) * \text{DURLNG}$$

where the result is in Curies, RFLEAK is the release fraction rate due to pool resuspension (section 2.1.3), and DURLNG is the catastrophic recovery time (section 2.1.3). Since an explosion is a catastrophic event, and will lead to other catastrophic events (fallen cell covers, ruptured tanks, etc.), the catastrophic recovery time is used. The array index, j, in RFLEAK refers to the state of building ventilation: RFLEAK(1) is used if ventilation is operating, and RFLEAK(2) is used if ventilation is not operating (see section 2.1.3). The following IF-THEN-ELSE logic is used to determine the value of j for LPPP tanks:

IF DIM\_19 = 3 or 4 THEN use RFLEAK(1) ELSE use RFLEAK(2)

since the variable DIM\_19 holds the bin dimension numeric code for the 19th dimension (section 2.1.1), the 19th bin dimension (Appendix 1) contains the LPPP ventilation state, and Table 6 indicates that LPPP ventilation is operating for a ventilation state of 3 or 4 (C or D), and not operating for a ventilation state of 1 or 2 (A or B).

For SPC and CPC tanks, the following IF-THEN-ELSE logic is used to determine the value of j:

IF DIM\_18 = 3 or 5 THEN use RFLEAK(1) ELSE use RFLEAK(2)

since the variable DIM\_18 holds the bin dimension numeric code for the 18th dimension (section 2.1.1), the 18th bin dimension (Appendix 1) contains the zone 1 ventilation state, and Table 5 indicates that zone 1 ventilation is operating for a ventilation state of 3 or 5 (C or E), and not operating for a ventilation state of 1, 2 or 4 (A, B, or D).

Note that the *EVAPORATION* column equation is only used if the bin dimension numeric code for the given tank indicates that an explosion has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column. In addition, if the bin attribute table indicates that an explosion is not modeled for a given tank, this column is automatically set to zero in that tank's block.

### *Splashing*

The next three columns in each vessel source term block calculate the source term that would result from a splashing event. Note that a splashing event, as modeled in this sub-block, is not accompanied by a detonation or deflagration of the given tank. Instead, it is usually caused by one of the following: falling cell covers, a seismic event, or collateral damage from a nearby tank explosion. Such a release is modeled to consist of splashing aerosolization due to the tank falling and/or becoming ruptured, followed by resuspension from the spilled material. For a splashing event, the entire tank inventory is assumed to be available for release.

The first column in each splashing sub-block, labeled *SPLASHING*, calculates the amount of material made airborne and respirable by splashing. This release is calculated using the following equation for each isotope:

$$\text{Release} = \text{Beginning Inventory} * \text{RFSPLSH}(i)$$

where the result is in Curies and RFSPLSH is the release fraction due to splashing (Table 4). The beginning inventory is used because only one given sub-block will be active for any given bin dimension numeric code for a tank: if the splashing sub-block is active for a given tank, the bin dimension numeric code will reflect this, and the spreadsheet IF-THEN-ELSE structures will ensure that the explosion sub-block releases equal zero (thus, the entire beginning inventory would be available for the splashing sub-block). Note that this equation is only used if the bin dimension numeric code for the given tank indicates that a splashing event has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

The second column in each splashing sub-block, labeled *INV AF SPLSH*, calculates the remaining inventory after the splashing release by subtracting the above release from the beginning inventory. Note that if a splashing event has not occurred, the previous column would be zero, and this column would be equal to the beginning inventory.

The final column in each splashing sub-block, labeled *EVAPORATION*, calculates the additional amount of material made airborne and respirable by resuspension following the splashing. This release is calculated using the following equation for each isotope:

$$\text{Release} = \text{Post-Splashing Inventory} * \text{RFLEAK}(j) * \text{DURLNG}$$

where the result is in Curies, RFLEAK is the release fraction rate due to pool resuspension (section 2.1.3), and DURLNG is the catastrophic recovery time (section 2.1.3). Since splashing is the result of a catastrophic event (fallen cell covers, explosions, earthquake, etc.), the catastrophic recovery time is used. The array index, j, in RFLEAK refers to the state of building ventilation: RFLEAK(1) is used if ventilation is operating, and RFLEAK(2) is used if ventilation is not operating (see section 2.1.3). To determine the value of j, the same IF-THEN-ELSE logic used in the explosion sub-blocks is employed here.

Note that the *EVAPORATION* column equation is only used if the bin dimension numeric code for the given tank indicates that a splashing event has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

### *Leak*

The first column following the splashing sub-block in each vessel source term block, labeled *LEAK*, calculates the source term due to a simple leak from the given vessel. Leaks from tanks result in the formation of pools, from which material can be released through resuspension. Only the pool inventory is considered to be available for release during a leak event. This release is calculated using the following equation for each isotope:

$$\text{Release} = \text{RFLEAK}(j) * \text{DURSHT} * \text{VLEAK?} * \text{Stream}_x(i)$$

where the result is in Curies, VLEAK? refers to the appropriate leak volume variable (VLEAKP for LPPP tanks, VLEAKS for SPC tanks, or VLEAKC for CPC tanks; see Table 2), Stream<sub>x</sub> refers to the appropriate stream contents array (where x is the appropriate stream number given in Table 8), RFLEAK is the release fraction rate due to pool resuspension (section 2.1.3), and DURSHT is the non-catastrophic recovery time (section 2.1.3). Since a leak does not create serious repercussions for the plant that would affect recovery, the non-catastrophic recovery time is used. The array index, j, in RFLEAK refers to the state of building ventilation: RFLEAK(1) is used if ventilation is operating, and RFLEAK(2) is used if ventilation is not operating (see section 2.1.3). To determine the value of j, the same IF-THEN-ELSE logic used in the explosion sub-blocks is employed here.

Note that this column equation is only used if the bin dimension numeric code for the given tank indicates that a leak event has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

### ***Venting***

The next column in each vessel source term block, labeled *VENTING*, calculates the amount of material made airborne and respirable by resuspension from a tank vented to the cell atmosphere. Tank venting is normally due to a failure of the process vessel vent system (due to explosion, cell cover failure, etc.). The entire tank contents are assumed to be available for release during this event.

This release is calculated using the following equation for each isotope:

$$\text{Release} = \text{Beginning Inventory} * \text{RFVENT}(j) * \text{DURLNG}$$

where the result is in Curies, RFVENT is the release fraction rate due to resuspension from a vented tank (section 2.1.3), and DURLNG is the catastrophic recovery time (section 2.1.3). Since venting is the result of a catastrophic event (fallen cell covers, explosions, etc.), the catastrophic recovery time is used. The array index, j, in RFVENT refers to the state of building ventilation: RFVENT(1) is used if ventilation is operating, and RFVENT(2) is used if ventilation is not operating (see section 2.1.3). To determine the value of j, the same IF-THEN-ELSE logic used in the explosion sub-blocks for RFLEAK is employed here.

Note that this column equation is only used if the bin dimension numeric code for the given tank indicates that a tank venting event has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column. In addition, if the bin attribute table indicates that a tank venting event is not modeled for a given tank, this column is automatically set to zero in that tank's block.

### ***Uncontrolled Reaction***

The next column in each vessel source term block, labeled *UNC'D RC'N*, calculates the amount of material made airborne and respirable due to an uncontrolled reaction in the given tank. DWPF<sub>FASTXL</sub> models uncontrolled reactions by assuming a direct aerosol release from the affected tank, followed by a spill. The spill is modeled to form a pool, from which material is



released due to resuspension. Only the pool volume is assumed to be available for resuspension release.

The release is calculated using the following equation for each isotope:

$$\text{Release} = (\text{Pool Resuspension Release}) + (\text{Direct Aerosolization Release})$$

$$\text{Release} = (\text{RFLEAK}(j) * \text{DURSHT} * \text{VUCRSPL} * \text{Stream}_x(i)) + (\text{VUCR?} * \text{Stream}_x(i))$$

where the result is in Curies, VUCR? refers to the volume of material directly aerosolized by the reaction (VUCRS for SPC tanks or VUCRC for CPC tanks; see Table 2), VUCRSPL is the volume of material spilled during an uncontrolled reaction (from which resuspension can occur; Table 2), Stream<sub>x</sub> refers to the appropriate stream contents array (where x is the appropriate stream number given in Table 8), RFLEAK is the release fraction rate due to pool resuspension (section 2.1.3), and DURSHT is the non-catastrophic recovery time (section 2.1.3). Since an uncontrolled reaction does not create serious repercussions for the plant that would affect recovery, the non-catastrophic recovery time is used. The array index, j, in RFLEAK refers to the state of building ventilation: RFLEAK(1) is used if ventilation is operating, and RFLEAK(2) is used if ventilation is not operating (see section 2.1.3). To determine the value of j, the same IF-THEN-ELSE logic used in the explosion sub-blocks is employed here.

Note that this column equation is only used if the bin dimension numeric code for the given tank indicates that an uncontrolled reaction has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column. In addition, if the bin attribute table indicates that an uncontrolled reaction is not modeled for a given tank, this column is automatically set to zero in that tank's block.

### *Overflow*

The next column in each vessel source term block, labeled *OVERFLOW*, calculates the source term due to an overflow of the given tank. Overflows from tanks result in the formation of pools, from which material can be released through resuspension. Only the pool inventory is considered to be available for release during an overflow event.

This release is calculated using the following equation for each isotope:

$$\text{Release} = \text{VOVFL} * \text{Stream}_x(i) * \text{RFLEAK}(j) * \text{DURSHT}$$

where the result is in Curies, VOVFL is the volume of material spilled during an overflow (Table 2), Stream<sub>x</sub> refers to the appropriate stream contents array (where x is the appropriate stream number given in Table 8), RFLEAK is the release fraction rate due to pool resuspension (section 2.1.3), and DURSHT is the non-catastrophic recovery time (section 2.1.3). Since an overflow does not create serious repercussions for the plant that would affect recovery, the non-catastrophic recovery time is used. The array index, j, in RFLEAK refers to the state of building ventilation: RFLEAK(1) is used if ventilation is operating, and RFLEAK(2) is used if ventilation is not operating (see section 2.1.3). To determine the value of j, the same IF-THEN-ELSE logic used in the explosion sub-blocks is employed here.

Note that this column equation is only used if the bin dimension numeric code for the given tank indicates that an overflow has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

### **Release**

The last two columns, in each LPPP, SPC, and CPC vessel source term block, calculate the net source term due to the given vessel. The first of these two columns, labeled *DF*, calculates the decontamination factor applicable to the source term in question. For LPPP tanks, the combined decontamination factor for the LPPP and LPPP HEPA filters is calculated using the following equation for each isotope:

$$\text{Decontamination Factor} = \text{LPBDDF}(i, \text{DIM}_{19}) * \text{LPFLDF}(i, \text{DIM}_{19})$$

where LPBDDF is the decontamination factor due to the LPPP itself (section 2.1.3), LPFLDF is the decontamination factor due to the LPPP HEPA filters (section 2.1.3), and DIM<sub>19</sub> is the numeric code for the 19th bin dimension (section 2.1.1). Note that, since decontamination factors are ratios of material in to material out, it is appropriate to multiply decontamination factors for consecutive barriers.

The row index for the two decontamination factor arrays, *i*, refers to each of the thirteen isotopes (i.e., *i* = 1 to 13). The column index, DIM<sub>19</sub>, refers to the four possible LPPP ventilation states (Table 6). The possible numeric codes defined in the bin attribute table for the 19th bin dimension (see Appendix 1) are identical, in order and definition, to the four LPPP ventilation states that the decontamination factor arrays are based on (see Table 6). Therefore, using DIM<sub>19</sub> as the column index for the LPBDDF and LPFLDF arrays will ensure that the appropriate LPPP and LPPP HEPA decontamination factors are used.

For SPC tanks, the combined decontamination factor for the salt process cell, vitrification building, and sand filter is calculated using the following equation for each isotope:

$$\text{Decontamination Factor} = \text{SPCDF}(i, \text{DIM}_{16}) * \text{VITDF}(i, \text{DIM}_{18}) * \text{SNDDF}(i, \text{DIM}_{18})$$

where SPCDF is the decontamination factor due to the SPC itself (section 2.1.3), VITDF is the decontamination factor due to the vitrification building (section 2.1.3), SNDDF is the decontamination factor due to the zone 1 ventilation sand filter (section 2.1.3), DIM<sub>16</sub> is the numeric code for the 16th bin dimension (section 2.1.1), and DIM<sub>18</sub> is the numeric code for the 18th bin dimension (section 2.1.1). Note that, since decontamination factors are ratios of material in to material out, it is appropriate to multiply decontamination factors for consecutive barriers.

The row index for the three decontamination factor arrays, *i*, refers to each of the thirteen isotopes (i.e., *i* = 1 to 13). The column index for the SPC decontamination factor, DIM<sub>16</sub>, refers to the two possible cell cover states (failed or intact; see section 2.1.3). The column index for the vitrification building and sand filter decontamination factors, DIM<sub>18</sub>, refers to the five possible zone 1 ventilation states (Table 5). The same argument used to justify the use of the DIM<sub>19</sub> variable as the column index for the LPPP decontamination factor arrays also applies to the use of DIM<sub>16</sub> and DIM<sub>18</sub> for the decontamination factor arrays discussed here.

For CPC tanks, the combined decontamination factor for the chemical process cell, vitrification building, and sand filter is calculated using the following equation for each isotope:

$$\text{Decontamination Factor} = \text{CPCDF}(i, \text{DIM\_15}) * \text{VITDF}(i, \text{DIM\_18}) * \text{SNDDF}(i, \text{DIM\_18})$$

where CPCDF is the decontamination factor due to the CPC itself (section 2.1.3), VITDF is the decontamination factor due to the vitrification building (section 2.1.3), SNDDF is the decontamination factor due to the zone 1 ventilation sand filter (section 2.1.3), DIM\_15 is the numeric code for the 15th bin dimension (section 2.1.1), and DIM\_18 is the numeric code for the 18th bin dimension (section 2.1.1). Note that, since decontamination factors are ratios of material in to material out, it is appropriate to multiply decontamination factors for consecutive barriers.

The row index for the three decontamination factor arrays, *i*, refers to each of the thirteen isotopes (i.e., *i* = 1 to 13). The column index for the CPC decontamination factor, DIM\_15, refers to the two possible cell cover states (failed or intact; see section 2.1.3). The column index for the vitrification building and sand filter decontamination factors, DIM\_18, refers to the five possible zone 1 ventilation states (Table 5). The same argument used to justify the use of the DIM\_19 variable as the column index for the LPPP decontamination factor arrays also applies to the use of DIM\_15 and DIM\_18 for the decontamination factor arrays discussed here.

The final column in each LPPP, SPC, and CPC vessel source term block calculates the total source term for all release mechanisms modeled in that block, as modified by the combined decontamination factor calculated for the given vessel. For each of the ten vessels, the following equation is used for each isotope:

$$\text{Total Source Term} = \text{Sum of All Source Term Columns} / \text{DF Column}$$

which yields Curies. The columns that are summed in a given block to yield the total pre-decontamination source term for each LPPP, SPC, and CPC block are: *DAR* (explosion sub-block), *SPLASHING* (explosion sub-block), *EVAPORATION* (explosion sub-block), *SPLASHING* (splashing sub-block), *EVAPORATION* (splashing sub-block), *LEAK*, *VENTING*, *UNC'D RC'N*, and *OVERFLOW*. Note that if any or all of these events did not occur according to the bin dimension numeric code, those specific columns would contain zeros, which would not contribute to the final source term.

For each LPPP, SPC, and CPC vessel source term block, the set of thirteen individual isotope releases (total activity in Curies released per isotope) calculated in this column is defined as a thirteen-row by one-column array called *?TANK?\_RELEASE*, where *?TANK?* is the name of the given vessel, as shown in Table 10.

Table 10: LPPP, SPC, and CPC Vessel Source Term Arrays

Vessel	Array Name
LPPPST	LPPPST_RELEASE
LPPPPT	LPPPPT_RELEASE
LPPPRT	LPPPRT_RELEASE
PR	PR_RELEASE
PRFT	PRFT_RELEASE
PRBT	PRBT_RELEASE
SME	SME_RELEASE
SRAT	SRAT_RELEASE
MFT	MFT_RELEASE
RCT	RCT_RELEASE

### 2.3.3 Melt Cell Source Term Block

The next block of cells below the last LPPP, SPC, and CPC source term block, labeled *Melt Cell*, calculates the source term for melt cell events. Note that the array index *i* in the following equations refers to each of the thirteen isotopes (i.e., *i* = 1 to 13).

The first column in this block lists the thirteen isotopes for which source terms are individually calculated. The second column, labeled *Total Melt Inv*, calculates the total beginning inventory of the melter using the following equation for each isotope:

$$\text{Beginning Inventory} = \text{VMLT} * \text{Stream}_{24}(i) * \text{RHOGL}$$

where the results are in Curies, VMLT is the melter glass volume (Table 1), Stream<sub>24</sub> is the molten glass stream contents array (Table 7), and RHOGL is the density of the stream 24 glass (Table 2). The stream 24 density (lb/gal) is necessary in this equation because the stream 24 Curie balance is in units of activity per unit mass (Ci/lb), while the melter capacity is in units of volume (gal).

The next column, labeled *TOT. Release*, calculates the source term due to a total melter release. In this postulated event, the entire molten contents of the melter are assumed to be spilled into the melt cell catch pan, while the melter offgas inventory is released into the melt cell. Radioisotopes are released from the molten glass pool (probably due to high-temperature volatilization) and through the escape of the offgas inventory. The most likely initiator for this event would be a large inadvertent injection of water into the melter which would result in steam overpressurization.

This release is calculated using the following equation for each isotope:

$$\text{Release} = (\text{Release from Molten Glass}) + (\text{Release from Melter Offgas})$$

$$\text{Release} = (\text{Beginning Inventory} * \text{RFMSPL}(i)) + (\text{Stream}_{23}(i) * 0.6 \text{ lb} / \text{RHOG})$$

where the results are in Curies, RFMSPL is the release fraction for melter spills (Table 4), Stream<sub>23</sub> is the melter offgas stream contents array (Table 7), and RHOG is the melter offgas density (Table 2). The first term calculates the release from the spilled glass; while the second term calculates the additional source term provided by the melter offgas release (the melter offgas system inventory is 0.6 lb [3]). Since the melter offgas would most likely be freed by any event that spilled glass from the melter, and since it is a gas (thus, respirable), the total instantaneous melter offgas inventory is assumed to be made airborne and respirable.

Note that this equation is only used if the bin dimension numeric code for the melt cell indicates that a total melter release has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

The next two columns calculate the source term due to a partial melter release. In this postulated event, a small part of the molten contents of the melter is spilled into the melt cell catch pan, accompanied by a release of the melter offgas inventory. Radioisotopes are released from the molten glass pool (probably due to high-temperature volatilization) and through the escape of the offgas inventory. The most likely cause for this event would be a small inadvertent injection of water into the melter which would result in steam overpressurization.

The first of these two columns, labeled *Part Melt Inv*, calculates the inventory available for release during a partial melter spill, using the following equation for each isotope:

$$\text{Partial Melter Inventory} = \text{VMSPL} * \text{Stream}_{24}(i) * \text{RHOGL}$$

where the results are in Curies, VMSPL is the volume of glass spilled during a partial melter release (Table 2), Stream<sub>24</sub> is the molten glass stream contents array (Table 7), and RHOGL is the density of the stream<sub>24</sub> glass (Table 2). The stream<sub>24</sub> density (lb/gal) is necessary in this equation because the stream<sub>24</sub> Curie balance is in units of activity per unit mass (Ci/lb), while the spill is in units of volume (gal).

The next column, labeled *PMS Release*, calculates the actual source term resulting from a partial melter spill, using the following equation for each isotope:

$$\text{Release} = (\text{Release from Molten Glass}) + (\text{Release from Melter Offgas})$$

$$\text{Release} = (\text{Partial Melter Inventory} * \text{RFMSPL}(i)) + (\text{Stream}_{23}(i) * 0.6 \text{ lb} / \text{RHOG})$$

where the results are in Curies, RFMSPL is the release fraction for melter spills (Table 4), Stream<sub>23</sub> is the melter offgas stream contents array (Table 7), and RHOG is the melter offgas density (Table 2). The first term calculates the release from the spilled glass; while the second term calculates the additional source term provided by the melter offgas release (the melter offgas system inventory is 0.6 lb [3]). Since the melter offgas would most likely be freed by any event

that spilled glass from the melter, and since it is a gas (thus, respirable), the total instantaneous melter offgas inventory is assumed to be made airborne and respirable.

Note that this equation is only used if the bin dimension numeric code for the melt cell indicates that a partial melter release has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

The next two columns calculate the source term due to an isolated melter offgas release. In this postulated event, an explosion in the melter offgas system (or other event leading to loss of offgas containment) releases the offgas inventory and vents the molten glass to the melt cell. The high-temperature glass in the melter then continues to generate offgas (which escapes to the melt cell) until the molten glass is cooled down or the offgas system integrity is restored. The initial explosion (or other loss-of-containment event) is also modeled to create sufficient overpressurization in the melter to spill a small volume of glass, from which radionuclides may be released.

The first of these two columns, labeled *Melter Offgas*, calculates the melter offgas inventory available for release, using the following equation for each isotope:

$$\text{Melter Offgas Inventory} = \text{Stream}_{23}(i) * \text{MROG} / \text{RHOG}$$

where the results are in Curies, *Stream<sub>23</sub>* is the melter offgas stream contents array (Table 7), *MROG* is the mass of offgas released (Table 2), and *RHOG* is the melter offgas density (Table 2). The input parameter, *MROG*, is used instead of the instantaneous melter offgas inventory (as was done for the total and partial melter releases above); because, in this event, offgas can continue to be created and released for an extended period following the initial event. In a total or partial melter spill, the offgas produced by any glass remaining in the melter will continue to be processed by the melter offgas system (and thus not be released), while offgas produced by the spilled glass is accounted for in the glass spill release fractions.

The next column, labeled *MOGR*, calculates the source term, using the following equation for each isotope:

$$\begin{aligned} \text{Release} = & (\text{Melter Offgas Inventory} * 1.0) \\ & + (2.6 \text{ gal} * \text{Stream}_{24}(i) * \text{RHOGL} * \text{RFMSPL}(i)) \end{aligned}$$

where the results are in Curies, *RFMSPL* is the release fraction for melter spills (Table 4), *Stream<sub>24</sub>* is the molten glass stream contents array (Table 7), 2.6 gal is the amount of glass spilled due to overpressurization of the melter, and *RHOGL* is the glass density (Table 2). The first term calculates the release from the melter offgas release; while the second term calculates the additional source term provided by the spilled glass. Since the melter offgas is a gas (thus, respirable), the release fraction applied to the melter offgas inventory is unity. The amount of glass spilled is taken from reference 3, for a bounding deflagration and a melter offgas system resistance of 10 (in this regard, an explosion should bound other loss-of-containment events).

Note that this equation is only used if the bin dimension numeric code for the melt cell indicates that an isolated melter offgas release has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

The next two columns calculate the source term from a glass canister release. This release is postulated to be the result of dropping a solid glass cylinder. The glass canister is modeled to shear, allowing glass fines to become airborne and respirable.

The first of these two columns, labeled *Canister*, calculates the canister inventory, using the following equation for each isotope:

$$\text{Canister Inventory} = \text{Stream}_{24}(i) * \text{MCAN}$$

where the results are in Curies, *Stream<sub>24</sub>* is the molten glass stream contents array (Table 7), and *MCAN* is the mass of glass in a single canister (Table 2).

The next column, labeled *MCR*, calculates the source term resulting from a canister release, using the following equation for each isotope:

$$\text{Release} = \text{Canister Inventory} * \text{RFCR}(i)$$

where the results are in Curies and *RFCR* is the release fraction for canister releases (Table 4). Note that this equation is only used if the bin dimension numeric code for the melt cell indicates that a canister release has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

The next column in the melt cell source term block, labeled *DF*, calculates the decontamination factor applicable to the melt cell source term. The combined decontamination factor for the melt cell, vitrification building, and sand filter is calculated using the following equation for each isotope:

$$\text{Decontamination Factor} = \text{MCDF}(i, \text{DIM}_{17}) * \text{VITDF}(i, \text{DIM}_{18}) * \text{SNDDF}(i, \text{DIM}_{18})$$

where *MCDF* is the decontamination factor due to the melt cell itself (section 2.1.3), *VITDF* is the decontamination factor due to the vitrification building (section 2.1.3), *SNDDF* is the decontamination factor due to the zone 1 ventilation sand filter (section 2.1.3), *DIM<sub>17</sub>* is the numeric code for the 17th bin dimension (section 2.1.1), and *DIM<sub>18</sub>* is the numeric code for the 18th bin dimension (section 2.1.1). Note that, since decontamination factors are ratios of material in to material out, it is appropriate to multiply decontamination factors for consecutive barriers.

The row index for the three decontamination factor arrays, *i*, refers to each of the thirteen isotopes (i.e., *i* = 1 to 13). The column index for the melt cell decontamination factor, *DIM<sub>17</sub>*, refers to the two possible cell cover states (failed or intact; see section 2.1.3). The column index for the vitrification building and sand filter decontamination factors, *DIM<sub>18</sub>*, refers to the five possible zone 1 ventilation states (Table 5). The same argument used to justify the use of the *DIM<sub>19</sub>* variable as the column index for the LPPP decontamination factor arrays (see section 2.3.2) also applies to the use of *DIM<sub>17</sub>* and *DIM<sub>18</sub>* for the decontamination factor arrays discussed here.

The final column in the melt cell source term block, labeled *MELTER RELEASE*, calculates the total source term for all release mechanisms modeled in the block, as modified by the combined decontamination factor calculated in the preceding column. The following equation is used for each isotope:

$$\text{Total Source Term} = \text{Sum of All Source Term Columns} / \text{DF Column}$$

which yields Curies. The columns that are summed to yield the total pre-decontamination source term are: *TOT. Release*, *PMS Release*, *MOGR*, and *MCR*. Note that if any or all of these events did not occur according to the bin dimension numeric code, those specific columns would contain zeros, which would not contribute to the final source term.

The set of thirteen individual isotope releases (total activity in Curies released per isotope) calculated in this column is defined as a thirteen-row by one-column array called *MELTER\_RELEASE*.

#### 2.3.4 Cell Effects Source Term Block

The last source term block in DWPF<sub>FASTXL</sub> is the cell effects source term block, which consists of three columns to the right of the melt cell source term block. This block calculates the individual source terms due to SPC vapor cloud deflagrations and SPC benzene fires. Note that the array index *i* in the following equations refers to each of the thirteen isotopes (i.e., *i* = 1 to 13).

The first column in this block, *SPC DEF.*, calculates the source term due to a ex-vessel vapor cloud deflagration in the SPC. The same type of equation used for vessel deflagrations in section 2.3.2 is used here, for each isotope:

$$\text{Release} = (\text{RLEXSPC} * \text{Stream}_3(i) / \text{RHO}) / \text{PR DF Column}$$

where the result is in Curies, RLEXSPC is the explosive aerosolization mass for an SPC deflagration (Table 3), Stream<sub>3</sub> refers to the stream contents array used to characterize the PR (Table 7), and RHO refers to the sludge/precipitate density (Table 2). In reality, the material released would be a combination of the inventory of the PR and PRFT (the two tanks modeled in the SPC). However, the PR stream (stream 3) has a higher concentration of radionuclides than the PRFT stream (stream 201). Therefore, it is conservative to simplify the code by assuming stream 3 characterizes the cell deflagration. Since the PR and PRFT decontamination factors both model the combined decontamination provided by the SPC, the vitrification building, and the zone 1 ventilation sand filter (the same barriers affecting the SPC deflagration source term), either of them could be used to reduce the SPC deflagration source term. As shown in the above equation, however, the PR decontamination factor is used.

Note that this equation is only used if the bin dimension numeric code for the SPC deflagration indicates that such an event has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.



The second column in this block, *SPC FIRE*, calculates the source term due to fires in the SPC. SPC fires are modeled as a burning benzene layer floating on top of a precipitate layer on the cell floor. Thus, fires are assumed to only affect inventories that already have release paths. For a tank explosion, splashing, or venting, the entire tank inventory has a release path from the tank, and is therefore considered available for the fire (less any material that has already been released by the explosion, splashing, or venting). For a tank leak, overflow, or uncontrolled reaction, only the spilled volume has a release path from the tank, and is considered available for the fire (less any material that has already been released by the leak, overflow, or uncontrolled reaction). If a tank has experienced no releases in the current progression, no inventory for that tank is available for the fire. Each modeled tank in the SPC (PR and PRFT) is examined using the above assumptions, and its resultant source term is added to the total for the SPC fire source term. The following equation is used for each isotope:

$$\begin{aligned} \text{Release} = & \text{RFFIRE}(i) * [(\text{Available PR Inventory} - \{\text{PR\_RELEASE}(i) * \text{PR DF Column}\}) \\ & + (\text{Available PRFT Inventory} - \{\text{PRFT\_RELEASE}(i) * \text{PR DF Column}\})] \\ & / \text{PR DF Column} \end{aligned}$$

where the results are in Curies, RFFIRE is the release fraction for SPC benzene fires (Table 4), and PR\_RELEASE and PRFT\_RELEASE are the vessel source term arrays for the PR and PRFT (Table 10). In this equation, the available inventories for the PR and PRFT are calculated using the equations described in section 2.3.2 (through the use of IF-THEN-ELSE statements). The amount of material already released is subtracted from the available inventory, where the previous release is obtained from the vessel source term arrays. The vessel source term arrays must be multiplied by the PR decontamination factors in order to account for material trapped by filtration or deposition that is unavailable for the fire (note that the PR and PRFT decontamination factors are identical and may be used interchangeably). The final result is multiplied by the fire release fraction and divided by the PR decontamination factor. Since the PR and PRFT decontamination factors both model the combined decontamination provided by the SPC, the vitrification building, and the zone 1 ventilation sand filter (the same barriers affecting the SPC fire source term), either of them could be used in the above equation to reduce the SPC fire source term.

Note that this equation is only used if the bin dimension numeric code for the SPC fire indicates that such an event has occurred (through the use of an IF-THEN-ELSE function); otherwise, a zero is assigned to this column.

Because the actual formula used in DWPF<sub>FASTXL</sub> to calculate the thirteen individual isotope releases in the SPC fire source term column is too long to be printed out by Excel, the cell formulas listed for these cells in Appendix 3 have been cut short. Therefore, the entire formula used for each of these thirteen cells (T196 to T208) in the *SPC FIRE* column is reproduced here:

```
=IF(DIM_14=1,RFFIRE*(((IF(DIM_5=8,0,IF(DIM_5=7,VOVFL*Stream_3,IF(DIM_5=6,VUCRSPL*Stream_3+VUCRS*Stream_3,
IF(DIM_5=4,VLEAKS*Stream_3,G74:G86))))-(PR_RELEASE*T74:T86)))+(IF(DIM_6=7,0,IF(DIM_6=6,VOVFL*Stream_201,
IF(DIM_6=4,VLEAKS*Stream_201,G94:G106))))-(PRFT_RELEASE*T74:T86)))/T74:T86),0)
```

Refer to Appendix 3 for the specific cell entries referenced in this equation.

The final column in the cell effects source term block, labeled *TOTAL EFFECTS*, calculates the total source term (in Curies) due to cell effects (fires and ex-vessel explosions) by summing the preceding two columns. Note that if either or both of these events did not occur according to the bin dimension numeric code, those specific columns would contain zeros, which would not contribute to the final source term.

Additionally, note that each of the three columns in this block has an additional row after the thirteen isotope rows that sums the values from all thirteen isotopes in each column. Therefore, the last row in the third column contains the total number of Curies, from all thirteen isotopes, released from DWPF due to cell effects (fires and ex-vessel explosions) during the given progression.

### 2.3.5 Total Release Block

This block of cells, labeled *TOTAL RELEASES*, summarizes the source terms calculated earlier, and calculates the total DWPF source term for the given progression. The first column lists the thirteen isotopes, for which source terms are individually calculated. The next twelve columns are set equal to the twelve source term arrays defined earlier (the ten vessel source term arrays given in Table 10, the OWST source term array, and the melt cell source term array). The last column in this block, labeled *TOTAL RELEASE (Ci)*, contains the total DWPF source term for each of the thirteen modeled isotopes (in Curies). This total source term is calculated by summing the source terms from the twelve previous columns and from the *TOTAL EFFECTS* column in the cell effects source term block.

Additionally, note that each column in the total release block has an additional row after the thirteen isotope rows, labeled *Total*, that sums the values from all thirteen isotopes in each column. Therefore, the last row in the last column contains the total number of Curies, from all thirteen isotopes, released from DWPF during the given progression.

### 2.3.6 Dose Calculation Block

The next block of cells below the total release block, labeled *DOSE*, calculates the offsite and onsite (co-located) radiological consequences of the given accident progression, based on the source terms calculated in the previous sections of the spreadsheet. The first column lists the thirteen isotopes, for which source terms are individually calculated; and, the second column is set equal to the *TOTAL RELEASE (Ci)* column from the total release block (section 2.3.5).

The next sub-block of three columns, labeled *ONSITE DCF (REM/Ci)*, lists the dose conversion factors (DCFs) for onsite releases from three different release locations: the zone 1 ventilation stack, the vitrification building (ground level), and the LPPP (ground level). These DCFs are given in units of REM/Ci for each of the thirteen isotopes of interest. The three columns of this sub-block are defined as a thirteen-row by three-column array called *ONSITE\_DCF*.

The DCFs for the stack and vitrification building are derived in reference 4 using the AXAIR89Q code (Version 1.2), for a receptor at 640 m and meteorological conditions not exceeded 50% of the time. The DCFs for the LPPP are derived in reference 2 using the AXAIR89Q code (Version

1.2), for a receptor at 640 m and meteorological conditions not exceeded 50% of the time. Note that the quality assurance for AXAIR89Q described in reference 4 also applies to the use of AXAIR89Q in reference 2.

The next sub-block of three columns, labeled *OFFSITE DCF (REM/Ci)*, lists the dose conversion factors (DCFs) for offsite releases from three different release locations: the zone 1 ventilation stack, the vitrification building (ground level), and the LPPP (ground level). These DCFs are given in units of REM/Ci for each of the thirteen isotopes of interest. The three columns of this sub-block are defined as a thirteen-row by three-column array called *OFFSITE\_DCF*.

The DCFs for the stack and vitrification building are derived in reference 4 using the AXAIR89Q code (Version 1.2), for the maximally exposed individual at the site boundary and meteorological conditions not exceeded 99.5% of the time. The DCFs for the LPPP are derived in reference 2 using the AXAIR89Q code (Version 1.2), for the maximally exposed individual at the site boundary and meteorological conditions not exceeded 99.5% of the time. Note that the quality assurance for AXAIR89Q described in reference 4 also applies to the use of AXAIR89Q in reference 2.

The next two columns, labeled *ONSITE DOSE (rem)* and *OFFSITE DOSE (rem)*, calculate the onsite and offsite effective dose equivalents (EDEs) for the given accident progression, based on the input release location:

$$\text{Onsite EDE} = \text{Total Release Column} * \text{ONSITE\_DCF}(i, \text{RELEASE\_LOCATION})$$

$$\text{Offsite EDE} = \text{Total Release Column} * \text{OFFSITE\_DCF}(i, \text{RELEASE\_LOCATION})$$

where the total releases are in Curies, the EDEs are in REM, *RELEASE\_LOCATION* is the variable containing the numeric code representing the desired release location (section 2.1.4), and the row index for the DCF arrays, *i*, refers to each of the thirteen isotopes (i.e., *i* = 1 to 13). The last row in each of these two columns contains a total cell that sums the individual isotope EDEs to yield total DWPF onsite and offsite EDEs for the given accident progression.

The last column in the dose calculation block, labeled *Sequence Frequency*, only contains one data-cell, into which the user can manually input the sequence frequency for the progression. This datum is not currently used by DWPF<sub>FASTXL</sub>, however.

## 2.4 Output

The individual vessel source term output (including melt cell source terms) for DWPF<sub>FASTXL</sub> is contained in the block of cells labeled *TOTAL RELEASES* (section 2.3.5), while the source term output due to cell effects (fires and ex-vessel explosions) is contained in the columns of cells labeled *SPC DEF.* and *SPC FIRE* (section 2.3.4). Each source term is output in Curies, for each of the thirteen isotopes of interest (Table 9). The total DWPF isotope-specific source terms are contained in the column labeled *TOTAL RELEASE (Ci)*, for each of the thirteen isotopes of interest. The total source term (summed over all isotopes of interest) is contained in the last cell of this column.

The isotope-specific onsite and offsite radiological EDEs are contained in the columns labeled *ONSITE DOSE (rem)* and *OFFSITE DOSE (rem)*, for each of the thirteen isotopes of interest. The total onsite EDE (summed over all isotopes of interest) is contained in the last cell of the *ONSITE DOSE (rem)* column, and the total offsite EDE (summed over all isotopes of interest) is contained in the last cell of the *OFFSITE DOSE (rem)* column.

### 3.0 CONFIGURATION CONTROL

#### 3.1 Configuration Control

The current version of *DWPF*FASTXL is 2.0. This version number and the date October 14, 1994 are listed at the top of the spreadsheet. Prior to using *DWPF*FASTXL for any critical applications, verify that the correct version is being used, or have the entire spreadsheet re-verified per E7-2.40. Version verification may be accomplished by successfully executing the test cases given in section 5.0.

### 4.0 INSTALLATION AND EXECUTION

#### 4.1 Installation

*DWPF*FASTXL is contained in the Microsoft Excel for Windows Version 4.0 file *DWPF*FAST.XLS. To install *DWPF*FASTXL in a given drive or directory, simply copy the *DWPF*FAST.XLS file there. Since all of the input and output for *DWPF*FASTXL is self-contained, there are no other requirements.

#### 4.2 Execution

To execute *DWPF*FASTXL, first load the *DWPF*FAST.XLS file into Microsoft Excel for Windows Version 4.0 or Microsoft Excel for the Macintosh Version 4.0. Then, modify the input data described in section 2.1. The output data will automatically appear in the appropriate cells described in section 2.4 (Excel spreadsheets automatically update all of their cells when any input changes).

#### 4.3 Error Messages

There is only one error message written into *DWPF*FASTXL. As described in section 2.1.1, if any of the bin dimension numeric codes input in the *Current* column of the bin identification block are too large, or are less than unity, the message "ERROR" will be output in the corresponding cell in the *Error* column of the bin identification block. If this error message is received, the user should verify that the bin dimension numeric codes input in the *Current* column are valid, with regards to the bin attribute table given in Appendix 1.

## 5.0 TESTING

### 5.1 Test Cases

Twenty-five test cases were developed for DWPF<sub>FASTXL</sub> Version 2.0:

CFFDHGGHHGFEBBBBBED	No Release
CFFDHGGHAGFEBBBBBED	SRAT Detonation
CFFDHGGHBGFEBBBBBED	SRAT Deflagration
CFFDHGGHAGFEBBBBBDD	SRAT Detonation, Zone 1 Ventilation Failure
CFFDBGGHHGFEBBBBBDD	PR Deflagration, Vit. Building Breach w/o Ventilation
CFFDBGGHHGFEBABBBBB	PR Deflagration, SPC Fire, Vit. Building Breach w/o Ventilation
CFFDHGGHHGFEBBBBBED	SPC Deflagration
CBFDHGGHHGFEBBBBBED	PPST Deflagration
CBFDHGGHHGFEBBBBBEB	PPST Deflagration, LPPP Ventilation Failure
BFFDHGGHHGFEBBBBBED	OWST Tornado
AFFDHGGHHGFEBBBBBED	OWST Deflagration
CFADHGGHHGFEBBBBBED	PPPT Detonation
CFADHGGHHGFEBBBBBEA	PPPT Detonation, LPPP Breach w/o Ventilation
CFFDFGGHHGFEBBBBBED	PR Uncontrolled Reaction
CFFDHGGHHGFEBBBBBED	PRFT Leak
CFFDHGFHHGFEBBBBBED	PRBT Overflow
CFFDHGGHHGFEBBBBBED	Total Melt Release
CFFDHGGHHGFEBBBBBDD	Total Melt Release, Zone 1 Ventilation Failure
CFFDHGGHHGFEBBBBBAD	Partial Melt Release, Vit. Building Collapse
CFFDHGGHHC FEBBBBBED	MFT Splash
CFFDHGGHHC FEBBAAAED	MFT Splash, All Cell Covers Failed
CFFDHGGHHGC EBBBBBCD	RCT Vented, Vit. Building Breach w/Ventilation
CFFCHGGHHGFEBBBBBED	PPRT Overflow
CFFDHGGHHGFCBBBBBED	Melter Offgas Release
CFFDHGGACBFEBBBBBDD	SME Detonation, MFT Deflagration, SRAT Splash, Vit. Building Breach w/o Ventilation

These accident progressions represent a full spectrum of different types of release events, including detonations, deflagrations, vapor cloud explosions, leaks, overflows, splashing, uncontrolled reactions, and other events. The required input data for these test cases (except for the actual bin identifications, which are given above) are those included in the DWPF<sub>FASTXL</sub> printout in Appendix 2. Note that the test cases are performed for Operation Mode C; therefore, the input data in the *CB - Modes A&B* block are not used. Also, note that all the test cases are performed assuming a vitrification building release location (`RELEASE_LOCATION = 2`).

These test cases were executed on DWPF<sub>FASTXL</sub> Version 2.0 in October 1994, producing the consequence output data given in Appendix 4. These data were found to be identical to consequence data produced by independent hand calculations employing the equations and theory given in this document. Therefore, given the dependence of consequence on source term, these test cases demonstrate that DWPF<sub>FASTXL</sub> correctly calculates radiological source terms and consequences for DWPF accidents. These results have been independently reviewed per the technical review of this document.

## 6.0 REFERENCES

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4. East, J. M., *AXAIR89Q Dose Analysis for Plutonium Vitrification PEIS*, S-CLC-S-00018, October 27, 1994.
5. Griesmeyer, J. M., and Smith, L. N., *A Reference Manual for the Event Progression Analysis Code (EVNTRE)*, NUREG/CR-5174, SAND88-1607, RG, Sandia National Laboratories, September 1989.
6. Kearnaghan, D. P., *The Production Reactor Algorithm for Source Terms (PRAST), A Computer Code Used for Estimating Source Terms for SRS Reactors*, WSRC-RP-92-700, 1992.
7. Gough, S. T., *User's Manual for DWPF*FAST: Defense Waste Processing Facility Algorithm for Source Terms, WSRC-TR-94-0504, October 1994.

**APPENDIX 1: CURRENT BIN ATTRIBUTE TABLE**

Dim. #	Facility Attribute	Possible States
1	Organic Waste Storage Tank (OWST)	A. Deflagration B. Tornado C. No Release
2	Low Point Pump Pit Sludge Tank (PPST)	A. Detonation B. Deflagration C. Splash D. Leak E. Overflow F. No Release
3	Low Point Pump Pit Precipitate Tank (PPPT)	A. Detonation B. Deflagration C. Splash D. Leak E. Overflow F. No Release
4	Low Point Pump Pit Recycle Tank (PPRT)	A. Splash B. Leak C. Overflow D. No Release
5	Precipitate Reactor (PR)	A. Detonation B. Deflagration C. Splash D. Leak E. Vented F. Uncontrolled Reaction G. Overflow H. No Release
6	Precipitate Reactor Feed Tank (PRFT)	A. Detonation B. Deflagration C. Splash D. Leak E. Vented F. Overflow G. No Release
7	Precipitate Reactor Bottoms Tank (PRBT)	A. Detonation B. Deflagration C. Splash D. Leak E. Vented F. Overflow G. No Release
8	Slurry Mix Evaporator Tank (SME)	A. Detonation B. Deflagration C. Splash D. Leak E. Vented F. Uncontrolled Reaction G. Overflow H. No Release

9	Sludge Receipt and Adjustment Tank (SRAT)	A. Detonation B. Deflagration C. Splash D. Leak E. Vented F. Uncontrolled Reaction G. Overflow H. No Release
10	Melter Feed Tank (MFT)	A. Detonation B. Deflagration C. Splash D. Leak E. Vented F. Overflow G. No Release
11	Recycle Collection Tank (RCT)	A. Splash B. Leak C. Vented D. Uncontrolled Reaction E. Overflow F. No Release
12	Melt Cell	A. Total Melt Release B. Partial Melt Release C. Melter Offgas Release D. Canister Rupture E. No Release
13	Deflagration in the Salt Process Cell (SPC)?	A. Yes B. No
14	Fire in the Salt Process Cell (SPC)?	A. Yes B. No
15	Chemical Process Cell (CPC) Covers	A. Failed B. Intact
16	Salt Process Cell (SPC) Covers	A. Failed B. Intact
17	Melt Cell Covers	A. Failed B. Intact
18	Zone 1 Ventilation	A. Vit Building Collapse B. Vit Building Breach Without Ventilation C. Vit Building Breach With Ventilation D. Ventilation Failure E. Normal Operation
19	LPPP Ventilation	A. LPPP Building Breach Without Ventilation B. Ventilation Failure C. LPPP Building Breach With Ventilation D. Normal Operation



**APPENDIX 2: DWPF**FASTXL SPREADSHEET

DWPF<sub>FASTXL</sub>: Defense Waste Processing Facility Algorithm for Source Terms for Excel  
 WSRC-TR-94-0532  
 November 1994

A	B	C	D	E	F	G	H	I	J	K	L
1	DWPF <sub>FASTXL</sub> : Individual Event Radiological Source Terms and Consequences, Ver. 2.0, 10/14/94										
2	S.T.Gough & D.P.Kearnaghan										
3											
4											
5											
6					OWST	BEG INV	SPLASHING	INV AF SPLSH	FIRE	TORNADO	OWST
7	Dim	Current	Default	Error	H3	3.24E-02	0.00E+00	3.24E-02	0.00E+00	0.00E+00	0.00E+00
8	DIM 1	3	3		SR90	1.24E-07	0.00E+00	1.24E-07	0.00E+00	0.00E+00	0.00E+00
9	DIM 2	6	6		RU106	8.74E-12	0.00E+00	8.74E-12	0.00E+00	0.00E+00	0.00E+00
10	DIM 3	6	6		CS134	5.15E-08	0.00E+00	5.15E-08	0.00E+00	0.00E+00	0.00E+00
11	DIM 4	4	4		CS137	1.43E-05	0.00E+00	1.43E-05	0.00E+00	0.00E+00	0.00E+00
12	DIM 5	8	8		CE144	1.58E-12	0.00E+00	1.58E-12	0.00E+00	0.00E+00	0.00E+00
13	DIM 6	7	7		PM147	2.04E-09	0.00E+00	2.04E-09	0.00E+00	0.00E+00	0.00E+00
14	DIM 7	7	7		PU238	4.73E-09	0.00E+00	4.73E-09	0.00E+00	0.00E+00	0.00E+00
15	DIM 8	8	8		PU239	4.47E-11	0.00E+00	4.47E-11	0.00E+00	0.00E+00	0.00E+00
16	DIM 9	8	8		PU240	3.00E-11	0.00E+00	3.00E-11	0.00E+00	0.00E+00	0.00E+00
17	DIM 10	7	7		PU241	3.60E-09	0.00E+00	3.60E-09	0.00E+00	0.00E+00	0.00E+00
18	DIM 11	6	6		AM241	7.43E-11	0.00E+00	7.43E-11	0.00E+00	0.00E+00	0.00E+00
19	DIM 12	1	5		CM244	3.72E-10	0.00E+00	3.72E-10	0.00E+00	0.00E+00	0.00E+00
20	DIM 13	2	2								
21	DIM 14	2	2								
22	DIM 15	2	2								
23	DIM 16	2	2		LPPPST	BEG INV	DAR	INV AF DAR	SPLASHING	INV AF SPLSH	EVAPORATION
24	DIM 17	2	2		H3	1.20E-01	0.00E+00	1.20E-01	0.00E+00	1.20E-01	0.00E+00
25	DIM 18	1	5		SR90	2.51E+05	0.00E+00	2.51E+05	0.00E+00	2.51E+05	0.00E+00
26	DIM 19	4	4		RU106	1.24E+04	0.00E+00	1.24E+04	0.00E+00	1.24E+04	0.00E+00
27					CS134	8.74E+02	0.00E+00	8.74E+02	0.00E+00	8.74E+02	0.00E+00
28					CS137	8.31E+03	0.00E+00	8.31E+03	0.00E+00	8.31E+03	0.00E+00
29					CE144	5.42E+04	0.00E+00	5.42E+04	0.00E+00	5.42E+04	0.00E+00
30					PM147	1.33E+05	0.00E+00	1.33E+05	0.00E+00	1.33E+05	0.00E+00
31	Mode	2			PU238	8.06E+03	0.00E+00	8.06E+03	0.00E+00	8.06E+03	0.00E+00
32					PU239	7.01E+01	0.00E+00	7.01E+01	0.00E+00	7.01E+01	0.00E+00
33					PU240	4.71E+01	0.00E+00	4.71E+01	0.00E+00	4.71E+01	0.00E+00
34	Dim	ID			PU241	9.05E+03	0.00E+00	9.05E+03	0.00E+00	9.05E+03	0.00E+00
35	DIM 1	C	OWST		AM241	5.87E+01	0.00E+00	5.87E+01	0.00E+00	5.87E+01	0.00E+00
36	DIM 2	F	PPST		CM244	5.83E+02	0.00E+00	5.83E+02	0.00E+00	5.83E+02	0.00E+00
37	DIM 3	F	PPPT								
38	DIM 4	D	PPRT								
39	DIM 5	H	PR								
40	DIM 6	G	PRFT		LPPPPT	BEG INV	DAR	INV AF DAR	SPLASHING	INV AF SPLSH	EVAPORATION
41	DIM 7	G	PRBT		H3	5.85E-01	0.00E+00	5.85E-01	0.00E+00	5.85E-01	0.00E+00
42	DIM 8	H	SME		SR90	2.58E+03	0.00E+00	2.58E+03	0.00E+00	2.58E+03	0.00E+00
43	DIM 9	H	SRAT		RU106	2.03E-01	0.00E+00	2.03E-01	0.00E+00	2.03E-01	0.00E+00
44	DIM 10	G	MFT		CS134	1.07E+03	0.00E+00	1.07E+03	0.00E+00	1.07E+03	0.00E+00
45	DIM 11	F	RCT		CS137	2.97E+05	0.00E+00	2.97E+05	0.00E+00	2.97E+05	0.00E+00
46	DIM 12	A	Melt		CE144	3.30E-02	0.00E+00	3.30E-02	0.00E+00	3.30E-02	0.00E+00
47	DIM 13	B	SPC-VC		PM147	4.24E+01	0.00E+00	4.24E+01	0.00E+00	4.24E+01	0.00E+00
48	DIM 14	B	SPC-F		PU238	9.88E+01	0.00E+00	9.88E+01	0.00E+00	9.88E+01	0.00E+00
49	DIM 15	B	SPC-C		PU239	9.30E-01	0.00E+00	9.30E-01	0.00E+00	9.30E-01	0.00E+00
50	DIM 16	B	SPC-C		PU240	6.27E-01	0.00E+00	6.27E-01	0.00E+00	6.27E-01	0.00E+00
51	DIM 17	B	Melt-C		PU241	7.49E+01	0.00E+00	7.49E+01	0.00E+00	7.49E+01	0.00E+00
52	DIM 18	A	Z1-V		AM241	1.55E+00	0.00E+00	1.55E+00	0.00E+00	1.55E+00	0.00E+00
53	DIM 19	D	LPPRV		CM244	7.75E+00	0.00E+00	7.75E+00	0.00E+00	7.75E+00	0.00E+00
54											
55											
56					LPPPRT	BEG INV	DAR	INV AF DAR	SPLASHING	INV AF SPLSH	EVAPORATION
57					H3	1.24E-01	0.00E+00	1.24E-01	0.00E+00	1.24E-01	0.00E+00
58					SR90	4.26E+02	0.00E+00	4.26E+02	0.00E+00	4.26E+02	0.00E+00
59					RU106	4.07E+01	0.00E+00	4.07E+01	0.00E+00	4.07E+01	0.00E+00
60					CS134	3.74E+01	0.00E+00	3.74E+01	0.00E+00	3.74E+01	0.00E+00
61					CS137	6.10E+03	0.00E+00	6.10E+03	0.00E+00	6.10E+03	0.00E+00
62					CE144	9.06E+01	0.00E+00	9.06E+01	0.00E+00	9.06E+01	0.00E+00
63					PM147	2.23E+02	0.00E+00	2.23E+02	0.00E+00	2.23E+02	0.00E+00
64					PU238	1.36E+01	0.00E+00	1.36E+01	0.00E+00	1.36E+01	0.00E+00
65					PU239	1.19E-01	0.00E+00	1.19E-01	0.00E+00	1.19E-01	0.00E+00
66					PU240	8.00E-02	0.00E+00	8.00E-02	0.00E+00	8.00E-02	0.00E+00
67					PU241	1.53E+01	0.00E+00	1.53E+01	0.00E+00	1.53E+01	0.00E+00
68					AM241	1.01E-01	0.00E+00	1.01E-01	0.00E+00	1.01E-01	0.00E+00
69					CM244	9.91E-01	0.00E+00	9.91E-01	0.00E+00	9.91E-01	0.00E+00
70											
71											
72											
73					PR	BEG INV	DAR	INV AF DAR	SPLASHING	INV AF SPLSH	EVAPORATION
74					H3	7.99E-01	0.00E+00	7.99E-01	0.00E+00	7.99E-01	0.00E+00
75					SR90	3.57E+03	0.00E+00	3.57E+03	0.00E+00	3.57E+03	0.00E+00
76					RU106	2.81E-01	0.00E+00	2.81E-01	0.00E+00	2.81E-01	0.00E+00
77					CS134	1.49E+03	0.00E+00	1.49E+03	0.00E+00	1.49E+03	0.00E+00
78					CS137	4.11E+05	0.00E+00	4.11E+05	0.00E+00	4.11E+05	0.00E+00
79					CE144	4.57E-02	0.00E+00	4.57E-02	0.00E+00	4.57E-02	0.00E+00
80					PM147	5.87E+01	0.00E+00	5.87E+01	0.00E+00	5.87E+01	0.00E+00
81					PU238	1.36E+02	0.00E+00	1.36E+02	0.00E+00	1.36E+02	0.00E+00
82					PU239	1.29E+00	0.00E+00	1.29E+00	0.00E+00	1.29E+00	0.00E+00
83					PU240	8.68E-01	0.00E+00	8.68E-01	0.00E+00	8.68E-01	0.00E+00
84					PU241	1.04E+02	0.00E+00	1.04E+02	0.00E+00	1.04E+02	0.00E+00

DWPFASLX: Defense Waste Processing Facility Algorithm for Source Terms for Excel

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	M	N	O	P	Q	R	S	T	U
1									
2									
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17									
18									
19									
20									
21		SPLASHING							LPPPST
22	SPLASHING	INV AF SPLSH	EVAPORATION	LEAK	VENTING	UNC'D RC'N	OVERFLOW	DF	RELEASE
23	0.00E+00	1.20E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
24	0.00E+00	2.51E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
25	0.00E+00	1.24E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
26	0.00E+00	8.74E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
27	0.00E+00	8.31E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
28	0.00E+00	5.42E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
29	0.00E+00	1.33E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
30	0.00E+00	8.06E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
31	0.00E+00	7.01E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
32	0.00E+00	4.71E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
33	0.00E+00	9.05E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
34	0.00E+00	5.87E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
35	0.00E+00	5.83E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
36									
37									
38		SPLASHING							LPPPPT
39	SPLASHING	INV AF SPLSH	EVAPORATION	LEAK	VENTING	UNC'D RC'N	OVERFLOW	DF	RELEASE
40	0.00E+00	5.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
41	0.00E+00	2.58E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
42	0.00E+00	2.03E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
43	0.00E+00	1.07E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
44	0.00E+00	2.97E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
45	0.00E+00	3.30E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
46	0.00E+00	4.24E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
47	0.00E+00	9.88E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
48	0.00E+00	9.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
49	0.00E+00	6.27E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
50	0.00E+00	7.49E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
51	0.00E+00	1.55E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
52	0.00E+00	7.75E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
53									
54									
55		SPLASHING							LPPPRT
56	SPLASHING	INV AF SPLSH	EVAPORATION	LEAK	VENTING	UNC'D RC'N	OVERFLOW	DF	RELEASE
57	0.00E+00	1.24E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
58	0.00E+00	4.26E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
59	0.00E+00	4.07E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
60	0.00E+00	3.74E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
61	0.00E+00	6.10E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
62	0.00E+00	9.06E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
63	0.00E+00	2.23E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
64	0.00E+00	1.36E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
65	0.00E+00	1.19E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
66	0.00E+00	8.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
67	0.00E+00	1.53E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
68	0.00E+00	1.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
69	0.00E+00	9.91E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E+02	0.00E+00
70									
71									
72		SPLASHING							PR
73	SPLASHING	INV AF SPLSH	EVAPORATION	LEAK	VENTING	UNC'D RC'N	OVERFLOW	DF	RELEASE
74	0.00E+00	7.99E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
75	0.00E+00	3.57E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
76	0.00E+00	2.81E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
77	0.00E+00	1.49E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
78	0.00E+00	4.11E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
79	0.00E+00	4.57E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
80	0.00E+00	5.87E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
81	0.00E+00	1.36E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
82	0.00E+00	1.29E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
83	0.00E+00	8.68E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
84	0.00E+00	1.04E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00

DWPF<sub>FASTXL</sub>: Defense Waste Processing Facility Algorithm for Source Terms for Excel

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V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
1												
2												
3		INPUT PARAMETERS										
4												
5		TANK VOLUMES GALLONS										
6		VOWST	150000									
7		VLPST	6200									
8		VLPPT	6460									
9		VLPRT	5300									
10		VPR	8350									
11		VPRFT	8350									
12		VPRBT	11000									
13		VSM	11000									
14		VSRAT	11000									
15		VMFT	11000									
16		VMLT	726									
17		VRCT	11000									
18		VOEV	0									
19		VOECT	0									
20		MISC VALUES										
21		VUCRS	0.03	GALLONS								
22		VUCRC	0.09	GALLONS								
23		VUCRSPL	1393	GALLONS								
24		MROG	7.13E+04	LBS								
25		MCAN	3710	LBS								
26		VMSP	10.6	GALLONS								
27		VOVFL	832	GALLONS								
28		VLEAKP	200	GALLONS								
29		VLEAKC	45	GALLONS								
30		VLEAKS	30	GALLONS								
31		RHO	3.83	KG/GAL								
32		RHOB	3.33	KG/GAL								
33		RHOGL	21.5	LB/GAL								
34		RHOG	1.69E-02	LB/FT <sup>3</sup>								
35		EXPL AERO MASSES	DET	DEF								
36		RLEXOW	0	KG				DEF ONLY				
37		RLEXPST	18.6	0.739	KG							
38		RLEXPST	16.2	1.309	KG							
39		RLEXPRT	16.3	1.925	KG							
40		RLEXPRT	16.3	1.283	KG							
41		RLEXPRT	28.1	1.357	KG							
42		RLEXSME	23.3	1.124	KG							
43		RLEXSRAT	28.1	1.357	KG							
44		RLEXMFT	23.3	0.874	KG							
45		RLEXOECT	0	0	KG							
46		RLEXSPC	3.786	KG				DEF ONLY				
47		RLEXOEV	0	0	KG							
48												
49		RELEASE FRACTIONS										
50		ISOTOPE	RFSPLSH	RFIRE	RFCR	RFMSPL	RFTOR					
51		H3	1.0E+00	1.0E+00	1.0E+00	1.0E+00	1.0E+00					
52		SR90	4.0E-05	1.6E-04	1.0E-06	2.20E-03	3.8E-03					
53		RU106	4.0E-05	1.6E-04	1.0E-06	6.38E-04	3.8E-03					
54		CS134	4.0E-05	1.6E-04	1.0E-06	0.00E+00	3.8E-03					
55		CS137	4.0E-05	1.6E-04	1.0E-06	4.89E-03	3.8E-03					
56		CE144	4.0E-05	1.6E-04	1.0E-06	0.00E+00	3.8E-03					
57		PM147	4.0E-05	1.6E-04	1.0E-06	0.00E+00	3.8E-03					
58		PU238	4.0E-05	1.6E-04	1.0E-06	0.00E+00	3.8E-03					
59		PU239	4.0E-05	1.6E-04	1.0E-06	0.00E+00	3.8E-03					
60		PU240	4.0E-05	1.6E-04	1.0E-06	0.00E+00	3.8E-03					
61		PU241	4.0E-05	1.6E-04	1.0E-06	0.00E+00	3.8E-03					
62		AM241	4.0E-05	1.6E-04	1.0E-06	0.00E+00	3.8E-03					
63		CM244	4.0E-05	1.6E-04	1.0E-06	0.00E+00	3.8E-03					
64												
65		RELEASE RATES										
66		RFLEAK	1.10E-10	1.10E-11								
67		RFVENT	1.10E-12	1.10E-12								
68		DURSH	28800									
69		DURLNG	345600									
70												
71												
72		CELL DFS	CPCDF	SPCDF	MCDF							
73		H3	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
74		SR90	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
75		RU106	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
76		CS134	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
77		CS137	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
78		CE144	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
79		PM147	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
80		PU238	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
81		PU239	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
82		PU240	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
83		PU241	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
84		AM241	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00

DWPF<sub>FASTXL</sub>: Defense Waste Processing Facility Algorithm for Source Terms for Excel

WSRC-TR-94-0532

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	A	B	C	D	E	F	G	H	I	J	K	L
85						AM241	2.15E+00	0.00E+00	2.15E+00	0.00E+00	2.15E+00	0.00E+00
86						CM244	1.08E+01	0.00E+00	1.08E+01	0.00E+00	1.08E+01	0.00E+00
87												
88												
89												
90												
91												
92												
93						PRFT	BEG INV	DAR	INV AF DAR	EXPLOSION	INV AF SPLSH	EVAPORATION
94						H3	7.57E-01	0.00E+00	7.57E-01	0.00E+00	7.57E-01	0.00E+00
95						SR90	3.33E+03	0.00E+00	3.33E+03	0.00E+00	3.33E+03	0.00E+00
96						RU106	2.62E-01	0.00E+00	2.62E-01	0.00E+00	2.62E-01	0.00E+00
97						CS134	1.39E+03	0.00E+00	1.39E+03	0.00E+00	1.39E+03	0.00E+00
98						CS137	3.84E+05	0.00E+00	3.84E+05	0.00E+00	3.84E+05	0.00E+00
99						CE144	4.27E-02	0.00E+00	4.27E-02	0.00E+00	4.27E-02	0.00E+00
100						PM147	5.48E+01	0.00E+00	5.48E+01	0.00E+00	5.48E+01	0.00E+00
101						PU238	1.28E+02	0.00E+00	1.28E+02	0.00E+00	1.28E+02	0.00E+00
102						PU239	1.20E+00	0.00E+00	1.20E+00	0.00E+00	1.20E+00	0.00E+00
103						PU240	8.11E-01	0.00E+00	8.11E-01	0.00E+00	8.11E-01	0.00E+00
104						PU241	9.69E+01	0.00E+00	9.69E+01	0.00E+00	9.69E+01	0.00E+00
105						AM241	2.00E+00	0.00E+00	2.00E+00	0.00E+00	2.00E+00	0.00E+00
106						CM244	1.00E+01	0.00E+00	1.00E+01	0.00E+00	1.00E+01	0.00E+00
107												
108												
109												
110						PRBT	BEG INV	DAR	INV AF DAR	EXPLOSION	INV AF SPLSH	EVAPORATION
111						H3	1.05E+00	0.00E+00	1.05E+00	0.00E+00	1.05E+00	0.00E+00
112						SR90	4.70E+03	0.00E+00	4.70E+03	0.00E+00	4.70E+03	0.00E+00
113						RU106	3.70E-01	0.00E+00	3.70E-01	0.00E+00	3.70E-01	0.00E+00
114						CS134	1.96E+03	0.00E+00	1.96E+03	0.00E+00	1.96E+03	0.00E+00
115						CS137	5.41E+05	0.00E+00	5.41E+05	0.00E+00	5.41E+05	0.00E+00
116						CE144	6.02E-02	0.00E+00	6.02E-02	0.00E+00	6.02E-02	0.00E+00
117						PM147	7.73E+01	0.00E+00	7.73E+01	0.00E+00	7.73E+01	0.00E+00
118						PU238	1.79E+02	0.00E+00	1.79E+02	0.00E+00	1.79E+02	0.00E+00
119						PU239	1.69E+00	0.00E+00	1.69E+00	0.00E+00	1.69E+00	0.00E+00
120						PU240	1.14E+00	0.00E+00	1.14E+00	0.00E+00	1.14E+00	0.00E+00
121						PU241	1.36E+02	0.00E+00	1.36E+02	0.00E+00	1.36E+02	0.00E+00
122						AM241	2.83E+00	0.00E+00	2.83E+00	0.00E+00	2.83E+00	0.00E+00
123						CM244	1.42E+01	0.00E+00	1.42E+01	0.00E+00	1.42E+01	0.00E+00
124												
125												
126												
127						SME	BEG INV	DAR	INV AF DAR	EXPLOSION	INV AF SPLSH	EVAPORATION
128						H3	5.89E-01	0.00E+00	5.89E-01	0.00E+00	5.89E-01	0.00E+00
129						SR90	3.89E+05	0.00E+00	3.89E+05	0.00E+00	3.89E+05	0.00E+00
130						RU106	1.90E+04	0.00E+00	1.90E+04	0.00E+00	1.90E+04	0.00E+00
131						CS134	3.12E+03	0.00E+00	3.12E+03	0.00E+00	3.12E+03	0.00E+00
132						CS137	5.10E+05	0.00E+00	5.10E+05	0.00E+00	5.10E+05	0.00E+00
133						CE144	8.28E+04	0.00E+00	8.28E+04	0.00E+00	8.28E+04	0.00E+00
134						PM147	2.04E+05	0.00E+00	2.04E+05	0.00E+00	2.04E+05	0.00E+00
135						PU238	1.24E+04	0.00E+00	1.24E+04	0.00E+00	1.24E+04	0.00E+00
136						PU239	1.08E+02	0.00E+00	1.08E+02	0.00E+00	1.08E+02	0.00E+00
137						PU240	7.30E+01	0.00E+00	7.30E+01	0.00E+00	7.30E+01	0.00E+00
138						PU241	1.40E+04	0.00E+00	1.40E+04	0.00E+00	1.40E+04	0.00E+00
139						AM241	9.24E+01	0.00E+00	9.24E+01	0.00E+00	9.24E+01	0.00E+00
140						CM244	9.04E+02	0.00E+00	9.04E+02	0.00E+00	9.04E+02	0.00E+00
141												
142												
143												
144						SRAT	BEG INV	DAR	INV AF DAR	EXPLOSION	INV AF SPLSH	EVAPORATION
145						H3	5.89E-01	0.00E+00	5.89E-01	0.00E+00	5.89E-01	0.00E+00
146						SR90	3.89E+05	0.00E+00	3.89E+05	0.00E+00	3.89E+05	0.00E+00
147						RU106	1.90E+04	0.00E+00	1.90E+04	0.00E+00	1.90E+04	0.00E+00
148						CS134	3.12E+03	0.00E+00	3.12E+03	0.00E+00	3.12E+03	0.00E+00
149						CS137	5.10E+05	0.00E+00	5.10E+05	0.00E+00	5.10E+05	0.00E+00
150						CE144	8.28E+04	0.00E+00	8.28E+04	0.00E+00	8.28E+04	0.00E+00
151						PM147	2.04E+05	0.00E+00	2.04E+05	0.00E+00	2.04E+05	0.00E+00
152						PU238	1.24E+04	0.00E+00	1.24E+04	0.00E+00	1.24E+04	0.00E+00
153						PU239	1.08E+02	0.00E+00	1.08E+02	0.00E+00	1.08E+02	0.00E+00
154						PU240	7.30E+01	0.00E+00	7.30E+01	0.00E+00	7.30E+01	0.00E+00
155						PU241	1.40E+04	0.00E+00	1.40E+04	0.00E+00	1.40E+04	0.00E+00
156						AM241	9.24E+01	0.00E+00	9.24E+01	0.00E+00	9.24E+01	0.00E+00
157						CM244	9.04E+02	0.00E+00	9.04E+02	0.00E+00	9.04E+02	0.00E+00
158												
159												
160												
161						MFT	BEG INV	DAR	INV AF DAR	EXPLOSION	INV AF SPLSH	EVAPORATION
162						H3	5.89E-01	0.00E+00	5.89E-01	0.00E+00	5.89E-01	0.00E+00
163						SR90	3.89E+05	0.00E+00	3.89E+05	0.00E+00	3.89E+05	0.00E+00
164						RU106	1.90E+04	0.00E+00	1.90E+04	0.00E+00	1.90E+04	0.00E+00
165						CS134	3.12E+03	0.00E+00	3.12E+03	0.00E+00	3.12E+03	0.00E+00
166						CS137	5.10E+05	0.00E+00	5.10E+05	0.00E+00	5.10E+05	0.00E+00
167						CE144	8.28E+04	0.00E+00	8.28E+04	0.00E+00	8.28E+04	0.00E+00
168						PM147	2.04E+05	0.00E+00	2.04E+05	0.00E+00	2.04E+05	0.00E+00

*DWPF*ASTXL: Defense Waste Processing Facility Algorithm for Source Terms for Excel  
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	M	N	O	P	Q	R	S	T	U	
85	0.00E+00	2.15E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
86	0.00E+00	1.08E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
87										
88										
89										
90										
91										
92		SPLASHING								PRFT
93	SPLASHING	INV AF SPLSH	EVAPORATION	LEAK	VENTING	UNC'D RC'N	OVERFLOW	DF	RELEASE	
94	0.00E+00	7.57E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
95	0.00E+00	3.33E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
96	0.00E+00	2.62E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
97	0.00E+00	1.39E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
98	0.00E+00	3.84E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
99	0.00E+00	4.27E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
100	0.00E+00	5.48E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
101	0.00E+00	1.28E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
102	0.00E+00	1.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
103	0.00E+00	8.11E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
104	0.00E+00	9.89E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
105	0.00E+00	2.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
106	0.00E+00	1.00E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
107										
108										
109		SPLASHING								PRBT
110	SPLASHING	INV AF SPLSH	EVAPORATION	LEAK	VENTING	UNC'D RC'N	OVERFLOW	DF	RELEASE	
111	0.00E+00	1.05E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
112	0.00E+00	4.70E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
113	0.00E+00	3.70E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
114	0.00E+00	1.96E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
115	0.00E+00	5.41E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
116	0.00E+00	6.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
117	0.00E+00	7.73E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
118	0.00E+00	1.79E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
119	0.00E+00	1.69E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
120	0.00E+00	1.14E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
121	0.00E+00	1.36E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
122	0.00E+00	2.83E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
123	0.00E+00	1.42E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
124										
125										
126		SPLASHING								SME
127	SPLASHING	INV AF SPLSH	EVAPORATION	LEAK	VENTING	UNC'D RC'N	OVERFLOW	DF	RELEASE	
128	0.00E+00	5.89E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
129	0.00E+00	3.89E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
130	0.00E+00	1.90E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
131	0.00E+00	3.12E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
132	0.00E+00	5.10E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
133	0.00E+00	8.28E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
134	0.00E+00	2.04E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
135	0.00E+00	1.24E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
136	0.00E+00	1.08E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
137	0.00E+00	7.30E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
138	0.00E+00	1.40E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
139	0.00E+00	9.24E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
140	0.00E+00	9.04E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
141										
142										
143		SPLASHING								SRAT
144	SPLASHING	INV AF SPLSH	EVAPORATION	LEAK	VENTING	UNC'D RC'N	OVERFLOW	DF	RELEASE	
145	0.00E+00	5.89E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
146	0.00E+00	3.89E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
147	0.00E+00	1.90E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
148	0.00E+00	3.12E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
149	0.00E+00	5.10E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
150	0.00E+00	8.28E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
151	0.00E+00	2.04E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
152	0.00E+00	1.24E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
153	0.00E+00	1.08E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
154	0.00E+00	7.30E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
155	0.00E+00	1.40E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
156	0.00E+00	9.24E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
157	0.00E+00	9.04E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
158										
159										
160		SPLASHING								MFT
161	SPLASHING	INV AF SPLSH	EVAPORATION	LEAK	VENTING	UNC'D RC'N	OVERFLOW	DF	RELEASE	
162	0.00E+00	5.89E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
163	0.00E+00	3.89E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
164	0.00E+00	1.90E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
165	0.00E+00	3.12E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
166	0.00E+00	5.10E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
167	0.00E+00	8.28E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	
168	0.00E+00	2.04E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00	

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V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
85	CM244	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00					
86												
87												
88	VIT. BLDG. DFS	VITDF										
89	H3	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00						
90	SR90	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
91	RU106	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
92	CS134	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
93	CS137	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
94	CE144	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
95	PM147	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
96	PU238	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
97	PU239	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
98	PU240	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
99	PU241	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
100	AM241	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
101	CM244	1.00E+00	2.00E+00	1.00E+00	2.00E+00	1.00E+00						
102												
103												
104	SAND FILTER DFS	SNDDF										
106	H3	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00						
106	SR90	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
107	RU106	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
108	CS134	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
109	CS137	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
110	CE144	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
111	PM147	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
112	PU238	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
113	PU239	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
114	PU240	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
115	PU241	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
116	AM241	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
117	CM244	1.00E+00	1.00E+00	2.00E+02	1.00E+00	2.00E+02						
118												
119												
120	LPPP HEPA DFS	LPFLDF										
121	H3	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
122	SR90	1.00E+00	1.00E+00	1.00E+00	1.00E+00	2.00E+02						
123	RU106	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
124	CS134	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
125	CS137	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
126	CE144	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
127	PM147	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
128	PU238	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
129	PU239	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
130	PU240	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
131	PU241	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
132	AM241	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
133	CM244	1.00E+00	1.00E+00	1.00E+00	2.00E+02							
134												
135												
136	LPPP BLDG. DFS	LPBDDF										
137	H3	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
138	SR90	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
139	RU106	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
140	CS134	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
141	CS137	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
142	CE144	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
143	PM147	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
144	PU238	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
145	PU239	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
146	PU240	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
147	PU241	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
148	AM241	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
149	CM244	1.00E+00	1.00E+00	1.00E+00	1.00E+00							
150												
151												
152	CURIE BALANCE	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal
153		Stream 1	Stream 3	Stream 7	Stream 18	Stream 19	Stream 23	Stream 24	Stream 81	Stream 201	Stream 212	Stream 222
154	H3	1.93E-05	9.57E-05	5.35E-05	0.00E+00	0.00E+00	3.00E-08	0.00E+00	2.34E-05	9.06E-05	0.00E+00	2.16E-07
155	SR90	4.05E+01	4.27E-01	3.54E+01	0.00E+00	0.00E+00	6.54E-04	1.26E+01	8.04E-02	3.89E-01	0.00E+00	8.24E-13
156	RU106	2.00E+00	3.36E-05	1.73E+00	0.00E+00	0.00E+00	6.37E-05	6.07E-01	7.87E-03	3.14E-05	0.00E+00	6.49E-17
157	CS134	1.41E-01	1.78E-01	2.84E-01	0.00E+00	0.00E+00	5.73E-05	9.09E-02	7.05E-03	1.66E-01	0.00E+00	3.43E-13
158	CS137	1.34E+00	4.92E+01	4.64E+01	0.00E+00	0.00E+00	9.34E-03	1.49E+01	1.15E+00	4.60E+01	0.00E+00	9.50E-11
159	CE144	8.74E+00	5.47E-06	7.53E+00	0.00E+00	0.00E+00	1.39E-04	2.86E+00	1.71E-02	5.11E-06	0.00E+00	1.05E-17
160	PM147	2.14E+01	7.03E-03	1.85E+01	0.00E+00	0.00E+00	3.41E-04	6.52E+00	4.20E-02	6.56E-03	0.00E+00	1.36E-14
161	PU238	1.30E+00	1.63E-02	1.13E+00	0.00E+00	0.00E+00	2.09E-05	4.00E-01	2.57E-03	1.53E-02	0.00E+00	3.15E-14
162	PU239	1.13E-02	1.54E-04	9.84E-03	0.00E+00	0.00E+00	1.82E-07	3.48E-03	2.24E-05	1.44E-04	0.00E+00	2.88E-16
163	PU240	7.59E-03	1.04E-04	6.64E-03	0.00E+00	0.00E+00	1.23E-07	2.34E-03	1.51E-05	8.71E-05	0.00E+00	2.00E-16
164	PU241	1.46E+00	1.24E-02	1.27E+00	0.00E+00	0.00E+00	2.35E-05	4.50E-01	2.89E-03	1.16E-02	0.00E+00	2.40E-14
165	AM241	8.47E-03	2.57E-04	8.40E-03	0.00E+00	0.00E+00	1.55E-07	2.97E-03	1.91E-05	2.40E-04	0.00E+00	4.95E-16
166	CM244	9.40E-02	1.29E-03	8.22E-02	0.00E+00	0.00E+00	1.52E-06	2.90E-02	1.87E-04	1.20E-03	0.00E+00	2.48E-15
167												
168												

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	A	B	C	D	E	F	G	H	I	J	K	L
169						PU238	1.24E+04	0.00E+00	1.24E+04	0.00E+00	1.24E+04	0.00E+00
170						PU239	1.08E+02	0.00E+00	1.08E+02	0.00E+00	1.08E+02	0.00E+00
171						PU240	7.30E+01	0.00E+00	7.30E+01	0.00E+00	7.30E+01	0.00E+00
172						PU241	1.40E+04	0.00E+00	1.40E+04	0.00E+00	1.40E+04	0.00E+00
173						AM241	9.24E+01	0.00E+00	9.24E+01	0.00E+00	9.24E+01	0.00E+00
174						CM244	9.04E+02	0.00E+00	9.04E+02	0.00E+00	9.04E+02	0.00E+00
176												
177												
178						RCT	BEG INV	DAR	INV AF DAR	EXPLOSION	INV AF SPLSH	EVAPORATION
179						H3	2.57E-01	0.00E+00	2.57E-01	0.00E+00	2.57E-01	0.00E+00
180						SR90	8.84E+02	0.00E+00	8.84E+02	0.00E+00	8.84E+02	0.00E+00
181						RU106	8.44E+01	0.00E+00	8.44E+01	0.00E+00	8.44E+01	0.00E+00
182						CS134	7.76E+01	0.00E+00	7.76E+01	0.00E+00	7.76E+01	0.00E+00
183						CS137	1.27E+04	0.00E+00	1.27E+04	0.00E+00	1.27E+04	0.00E+00
184						CE144	1.88E+02	0.00E+00	1.88E+02	0.00E+00	1.88E+02	0.00E+00
185						PM147	4.62E+02	0.00E+00	4.62E+02	0.00E+00	4.62E+02	0.00E+00
186						PU238	2.83E+01	0.00E+00	2.83E+01	0.00E+00	2.83E+01	0.00E+00
187						PU239	2.46E-01	0.00E+00	2.46E-01	0.00E+00	2.46E-01	0.00E+00
188						PU240	1.66E-01	0.00E+00	1.66E-01	0.00E+00	1.66E-01	0.00E+00
189						PU241	3.18E+01	0.00E+00	3.18E+01	0.00E+00	3.18E+01	0.00E+00
190						AM241	2.10E-01	0.00E+00	2.10E-01	0.00E+00	2.10E-01	0.00E+00
191						CM244	2.06E+00	0.00E+00	2.06E+00	0.00E+00	2.06E+00	0.00E+00
192												
193												
194												
195						Melt Cell	Total Melt Inv	TOT. Release	Part Melt Inv	PMS Release	Melter Offgas	MOGR
196						H3	0.00E+00	1.07E-06	0.00E+00	0.00E+00	1.27E-01	0.00E+00
197						SR90	1.97E+05	4.33E+02	2.87E+03	0.00E+00	2.76E+03	0.00E+00
198						RU106	9.47E+03	6.05E+00	1.38E+02	0.00E+00	2.89E+02	0.00E+00
199						CS134	1.42E+03	2.03E-03	2.07E+01	0.00E+00	2.42E+02	0.00E+00
200						CS137	2.33E+05	1.16E+03	3.40E+03	0.00E+00	3.94E+04	0.00E+00
201						CE144	4.15E+04	4.93E-03	6.06E+02	0.00E+00	5.86E+02	0.00E+00
202						PM147	1.02E+05	1.21E-02	1.49E+03	0.00E+00	1.44E+03	0.00E+00
203						PU238	6.24E+03	7.42E-04	9.12E+01	0.00E+00	8.82E+01	0.00E+00
204						PU239	5.43E+01	6.46E-06	7.93E-01	0.00E+00	7.68E-01	0.00E+00
205						PU240	3.65E+01	4.37E-06	5.33E-01	0.00E+00	5.19E-01	0.00E+00
206						PU241	7.02E+03	8.34E-04	1.03E+02	0.00E+00	9.91E+01	0.00E+00
207						AM241	4.64E+01	5.50E-06	6.77E-01	0.00E+00	6.54E-01	0.00E+00
208						CM244	4.53E+02	5.40E-05	6.61E+00	0.00E+00	6.41E+00	0.00E+00
209												
210												
211												
212						TOTAL	OWST	LPPPST	LPPPPT	LPPPRY	PR	PRFT
213						RELEASES	RELEASE	RELEASE	RELEASE	RELEASE	RELEASE	RELEASE
214						H3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
215						SR90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
216						RU106	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
217						CS134	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
218						CS137	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
219						CE144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
220						PM147	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
221						PU238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
222						PU239	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
223						PU240	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
224						PU241	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
225						AM241	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
226						CM244	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
227						Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
228												
229												
230						TOTAL		ONSITE DCF (REM/C)			OFFSITE DCF (REM/C)	
231						DOSE	RELEASE (C)	STACK	VIT	LPPP	STACK	VIT
232						H3	1.07E-06	4.01E-07	1.60E-06	1.60E-06	1.41E-07	2.20E-07
233						SR90	4.33E+02	5.49E-03	2.18E-02	2.18E-02	1.93E-03	3.01E-03
234						RU106	6.05E+00	1.86E-03	7.39E-03	7.39E-03	6.52E-04	1.02E-03
235						CS134	2.03E-03	2.11E-04	7.96E-04	7.96E-04	7.04E-05	1.10E-04
236						CS137	1.16E+03	1.35E-04	5.38E-04	5.38E-04	4.74E-05	7.41E-05
237						CE144	4.93E-03	1.48E-03	5.88E-03	5.88E-03	5.19E-04	8.11E-04
238						PM147	1.21E-02	1.44E-04	5.71E-04	5.71E-04	5.04E-05	7.88E-05
239						PU238	7.42E-04	1.94E+00	7.73E+00	7.73E+00	6.82E-01	1.07E+00
240						PU239	6.46E-06	2.15E+00	8.57E+00	8.57E+00	7.56E-01	1.18E+00
241						PU240	4.37E-06	2.15E+00	8.57E+00	8.57E+00	7.56E-01	1.18E+00
242						PU241	8.34E-04	4.22E-02	1.69E-01	1.68E-01	1.48E-02	2.32E-02
243						AM241	5.50E-06	2.20E+00	8.74E+00	8.74E+00	7.71E-01	1.20E+00
244						CM244	5.40E-05	1.14E+00	4.54E+00	4.54E+00	4.00E-01	6.25E-01
245						TOTAL	1.60E+03					



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	M	N	O	P	Q	R	S	T	U
169	0.00E+00	1.24E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
170	0.00E+00	1.08E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
171	0.00E+00	7.30E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
172	0.00E+00	1.40E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
173	0.00E+00	9.24E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
174	0.00E+00	9.04E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
176									
177		SPLASHING							RCT
178	SPLASHING	INV AF SPLSH	EVAPORATION	LEAK	VENTING	UNC'D RC'N	OVERFLOW	DF	RELEASE
179	0.00E+00	2.57E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
180	0.00E+00	8.84E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
181	0.00E+00	8.44E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
182	0.00E+00	7.76E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
183	0.00E+00	1.27E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
184	0.00E+00	1.88E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
185	0.00E+00	4.62E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
186	0.00E+00	2.83E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
187	0.00E+00	2.46E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
188	0.00E+00	1.66E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
189	0.00E+00	3.18E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
190	0.00E+00	2.10E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
191	0.00E+00	2.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E+00	0.00E+00
192									
193									
194				MELTER			SPC	SPC	TOTAL
195	Canister	MCR	DF	RELEASE			DEF.	FIRE	EFFECTS
196	0.00E+00	0.00E+00	1.00E+00	1.07E-06			0.00E+00	0.00E+00	0.00E+00
197	4.67E+04	0.00E+00	1.00E+00	4.33E+02			0.00E+00	0.00E+00	0.00E+00
198	2.25E+03	0.00E+00	1.00E+00	6.05E+00			0.00E+00	0.00E+00	0.00E+00
199	3.37E+02	0.00E+00	1.00E+00	2.03E-03			0.00E+00	0.00E+00	0.00E+00
200	5.53E+04	0.00E+00	1.00E+00	1.16E+03			0.00E+00	0.00E+00	0.00E+00
201	9.87E+03	0.00E+00	1.00E+00	4.93E-03			0.00E+00	0.00E+00	0.00E+00
202	2.42E+04	0.00E+00	1.00E+00	1.21E-02			0.00E+00	0.00E+00	0.00E+00
203	1.48E+03	0.00E+00	1.00E+00	7.42E-04			0.00E+00	0.00E+00	0.00E+00
204	1.29E+01	0.00E+00	1.00E+00	6.46E-06			0.00E+00	0.00E+00	0.00E+00
205	8.68E+00	0.00E+00	1.00E+00	4.37E-06			0.00E+00	0.00E+00	0.00E+00
206	1.67E+03	0.00E+00	1.00E+00	8.34E-04			0.00E+00	0.00E+00	0.00E+00
207	1.10E+01	0.00E+00	1.00E+00	5.50E-06			0.00E+00	0.00E+00	0.00E+00
208	1.08E+02	0.00E+00	1.00E+00	5.40E-05			0.00E+00	0.00E+00	0.00E+00
209							0.00E+00	0.00E+00	0.00E+00
210									
211									
212	PRBT	SME	SRAT	MFT	RCT	MELTER	TOTAL		
213	RELEASE	RELEASE	RELEASE	RELEASE	RELEASE	RELEASE	RELEASE (CJ)		
214	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.07E-06	1.07E-06		
215	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.33E+02	4.33E+02		
216	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.05E+00	6.05E+00		
217	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.03E-03	2.03E-03		
218	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.16E+03	1.16E+03		
219	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.93E-03	4.93E-03		
220	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-02	1.21E-02		
221	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.42E-04	7.42E-04		
222	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.46E-06	6.46E-06		
223	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.37E-06	4.37E-06		
224	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.34E-04	8.34E-04		
225	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.50E-06	5.50E-06		
226	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.40E-05	5.40E-05		
227	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E+03	1.60E+03		
229									
230		ONSITE DOSE	OFFSITE DOSE	Sequence					
231	LPPP	(rem)	(rem)	Frequency					
232	2.12E-07	1.70E-12	2.34E-13						
233	2.91E-03	9.43E+00	1.30E+00						
234	9.84E-04	4.47E-02	6.17E-03						
235	1.06E-04	1.62E-06	2.24E-07						
236	7.16E-05	6.25E-01	8.60E-02						
237	7.83E-04	2.90E-05	4.00E-06						
238	7.60E-05	6.91E-06	9.54E-07						
239	1.03E+00	5.74E-03	7.94E-04		RELEASE LOCATION	2	STACK		
240	1.14E+00	5.54E-05	7.62E-06		1	2	VIT		
241	1.14E+00	3.74E-05	5.15E-06		2	3	LPPP		
242	2.24E-02	1.40E-04	1.94E-05						
243	1.16E+00	4.81E-05	6.60E-06						
244	6.04E-01	2.45E-04	3.37E-05						
245		1.01E+01	1.40E+00	7.00E-03					

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V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH
169												
170	CB - Modes A&B											
171		Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal	Ci/gal
172	Isotope	Stream 1	Stream 3	Stream 7	Stream 18	Stream 19	Stream 23	Stream 24	Stream 31	Stream 201	Stream 212	Stream 222
173	H3	1.83E-05	0.00E+00	5.35E-05	0.00E+00	0.00E+00	3.00E-08	0.00E+00	2.34E-05	0.00E+00	0.00E+00	0.00E+00
174	SR90	4.05E+01	0.00E+00	3.54E+01	0.00E+00	0.00E+00	6.54E-04	1.26E+01	8.04E-02	0.00E+00	0.00E+00	0.00E+00
175	RU106	2.00E+00	0.00E+00	1.73E+00	0.00E+00	0.00E+00	6.35E-05	6.07E-01	7.67E-03	0.00E+00	0.00E+00	0.00E+00
176	CS134	1.41E-01	0.00E+00	2.84E-01	0.00E+00	0.00E+00	5.73E-05	9.09E-02	7.05E-03	0.00E+00	0.00E+00	0.00E+00
177	CS137	1.14E-01	0.00E+00	1.36E+00	0.00E+00	0.00E+00	2.73E-04	4.35E-01	3.37E-02	0.00E+00	0.00E+00	0.00E+00
178	CE144	8.74E+00	0.00E+00	7.53E+00	0.00E+00	0.00E+00	1.39E-04	2.66E+00	1.71E-02	0.00E+00	0.00E+00	0.00E+00
179	PM147	2.14E+01	0.00E+00	1.85E+01	0.00E+00	0.00E+00	3.41E-04	6.52E+00	4.20E-02	0.00E+00	0.00E+00	0.00E+00
180	PU238	1.30E+00	0.00E+00	1.13E+00	0.00E+00	0.00E+00	2.09E-05	4.00E-01	2.57E-03	0.00E+00	0.00E+00	0.00E+00
181	PU239	1.13E-02	0.00E+00	9.84E-03	0.00E+00	0.00E+00	1.82E-07	3.48E-03	2.24E-05	0.00E+00	0.00E+00	0.00E+00
182	PU240	7.59E-03	0.00E+00	6.64E-03	0.00E+00	0.00E+00	1.23E-07	2.34E-03	1.51E-05	0.00E+00	0.00E+00	0.00E+00
183	PU241	1.46E+00	0.00E+00	1.27E+00	0.00E+00	0.00E+00	2.35E-05	4.50E-01	2.89E-03	0.00E+00	0.00E+00	0.00E+00
184	AM241	9.47E-03	0.00E+00	8.40E-03	0.00E+00	0.00E+00	1.55E-07	2.97E-03	1.91E-05	0.00E+00	0.00E+00	0.00E+00
185	CM244	9.40E-02	0.00E+00	8.22E-02	0.00E+00	0.00E+00	1.52E-06	2.90E-02	1.87E-04	0.00E+00	0.00E+00	0.00E+00
186												
187												
188	CB - Mode C											
189		Stream 1	Stream 3	Stream 7	Stream 18	Stream 19	Stream 23	Stream 24	Stream 31	Stream 201	Stream 212	Stream 222
190	H3	1.83E-05	9.57E-05	5.35E-05	0.00E+00	0.00E+00	3.00E-08	0.00E+00	2.34E-05	9.06E-05	0.00E+00	2.18E-07
191	SR90	4.05E+01	4.27E-01	3.54E+01	0.00E+00	0.00E+00	6.54E-04	1.26E+01	8.04E-02	3.99E-01	0.00E+00	8.24E-13
192	RU106	2.00E+00	3.36E-05	1.73E+00	0.00E+00	0.00E+00	6.37E-05	6.07E-01	7.67E-03	3.14E-05	0.00E+00	6.49E-17
193	CS134	1.41E-01	1.78E-01	2.84E-01	0.00E+00	0.00E+00	5.73E-05	9.09E-02	7.05E-03	1.66E-01	0.00E+00	3.43E-13
194	CS137	1.34E+00	4.92E+01	4.64E+01	0.00E+00	0.00E+00	9.34E-03	1.49E+01	1.15E+00	4.80E+01	0.00E+00	9.50E-11
195	CE144	8.74E+00	5.47E-06	7.53E+00	0.00E+00	0.00E+00	1.39E-04	2.66E+00	1.71E-02	5.11E-06	0.00E+00	1.05E-17
196	PM147	2.14E+01	7.03E-03	1.85E+01	0.00E+00	0.00E+00	3.41E-04	6.52E+00	4.20E-02	6.56E-03	0.00E+00	1.36E-14
197	PU238	1.30E+00	1.63E-02	1.13E+00	0.00E+00	0.00E+00	2.09E-05	4.00E-01	2.57E-03	1.53E-02	0.00E+00	3.15E-14
198	PU239	1.13E-02	1.54E-04	9.84E-03	0.00E+00	0.00E+00	1.82E-07	3.48E-03	2.24E-05	1.44E-04	0.00E+00	2.98E-16
199	PU240	7.59E-03	1.04E-04	6.64E-03	0.00E+00	0.00E+00	1.23E-07	2.34E-03	1.51E-05	9.71E-05	0.00E+00	2.00E-18
200	PU241	1.46E+00	1.24E-02	1.27E+00	0.00E+00	0.00E+00	2.35E-05	4.50E-01	2.89E-03	1.16E-02	0.00E+00	2.40E-14
201	AM241	9.47E-03	2.57E-04	8.40E-03	0.00E+00	0.00E+00	1.55E-07	2.97E-03	1.91E-05	2.40E-04	0.00E+00	4.95E-16
202	CM244	9.40E-02	1.29E-03	8.22E-02	0.00E+00	0.00E+00	1.52E-06	2.90E-02	1.87E-04	1.20E-03	0.00E+00	2.48E-15
203												
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### APPENDIX 3: DWPFAS<sup>T</sup>XL FORMULA LISTING

Microsoft Excel for Windows Version 4.0 allows cells or groups of cells (arrays) to be assigned a variable name. This variable name can then be used in other cell formulas as opposed to identifying the cell or group of cells by column and row number. Table A3-1 lists the variable names defined in version 2.0 of DWPFAS<sup>T</sup>XL, along with the specific cell or range of cells defining each name. Note, however, that not all of these variable names are used in the current version of DWPFAS<sup>T</sup>XL. In addition, note that the cell ranges (row and column numbers) given in Table A3-1 correspond to the DWPFAS<sup>T</sup>XL printout in Appendix 2, as well as the formula listing given in this appendix.

The remainder of this appendix provides a listing of the formula contents of each individual cell in DWPFAS<sup>T</sup>XL, for typical input values. The row and column numbers in this listing correspond to the DWPFAS<sup>T</sup>XL printout in Appendix 2, as well as the variable names in Table A3-1.

Table A3-1: Variable Names Used in DWPF<sub>FASTXL</sub> V2.0

Variable	Range	Variable	Range	Variable	Range
CPCDF	=X73:Y85	Onsite_chart	=M207:S246	SME_RELEASE	=U128:U140
curr_acc_num	=AJ1	ONSITE_DCF	=H232:J244	SNDDF	=X105:AB117
DIM_1	=B7	Operation Mode	=B31	SOURCE_TERM	=F212:R226
DIM_2	=B8	OWST_RELEASE	=L6:L18	SPCDF	=Z73:AA85
DIM_3	=B9	pas_freq	=P245	SRAT_RELEASE	=U145:U157
DIM_4	=B10	Paste_area	=B7:B25	Stream_1	=X154:X166
DIM_5	=B11	PR_RELEASE	=U74:U86	Stream_18	=AA154:AA166
DIM_6	=B12	PRBT_RELEASE	=U111:U123	Stream_19	=AB154:AB166
DIM_7	=B13	PRFT_RELEASE	=U94:U106	Stream_201	=AF154:AF166
DIM_8	=B14	RCT_RELEASE	=U179:U191	Stream_212	=AG154:AG166
DIM_9	=B15	RELEASE_LOCATION	=S238	Stream_222	=AH154:AH166
DIM_10	=B16	Results_Description	=AK3:CH3	Stream_23	=AC154:AC166
DIM_11	=B17	Results_Duration	=AK18:CH18	Stream_24	=AD154:AD166
DIM_12	=B18	Results_Elevation	=AK17:CH17	Stream_3	=Y154:Y166
DIM_13	=B19	Results_Frequency	=AK19:CH19	Stream_7	=Z154:Z166
DIM_14	=B20	Results_Section	=AK2:CH16	Stream_91	=AE154:AE166
DIM_15	=B21	Results_src_trm	=AK4:CH16	Total_Release_Ci	=S214:S226
DIM_16	=B22	RFCR	=Z51:Z63	VITDF	=X89:AB101
DIM_17	=B23	RFFIRE	=Y51:Y63	VLEAKC	=X29
DIM_18	=B24	RFLEAK	=X66:Y66	VLEAKP	=X28
DIM_19	=B25	RFMSPL	=AA51:AA63	VLEAKS	=X30
DURLNG	=X69	RFSPLSH	=X51:X63	VL PPT	=X8
DURSHT	=X68	RFTOR	=AB51:AB63	VL PRT	=X9
Error_Ck	=D7:D25	RFVENT	=X67:Y67	VLPST	=X7
FIRE	=U196:U208	RHO	=X31	VMFT	=X15
LPBDDF	=X137:AA149	RHOB	=X32	VMLT	=X16
LPFLDF	=X121:AA133	RHOG	=X34	VMSPL	=X26
LPPPPT_RELEASE	=U40:U52	RHOGL	=X33	VOECT	=X19
LPPPRT_RELEASE	=U57:U69	RLEXPPT	=X37:Y37	VOEV	=X18
LPPPST_RELEASE	=U23:U35	RLEXPST	=X38:Y38	VOVFL	=X27
mbr_dose	=O245	RLEXMFT	=X44:Y44	VOWST	=X6
MCAN	=X25	RLEXOECT	=X45:Y45	VPR	=X10
MCDF	=AB73:AC85	RLEXOEV	=X47:Y47	VPRBT	=X12
MELTER_RELEASE	=P196:P208	RLEXOW	=X36	VPRFT	=X11
MFT_RELEASE	=U162:U174	RLEXPR	=X39:Y39	VRCT	=X17
Mode_AB	=X173:AH185	RLEXPRBT	=X41:Y41	VSME	=X13
Mode_C	=X190:AH202	RLEXPRFT	=X40:Y40	VSRAT	=X14
MROG	=X24	RLEXSME	=X42:Y42	VUCRC	=X22
offsite_chart	=M247:S288	RLEXSPC	=X46	VUCRS	=X21
OFFSITE_DCF	=K232:M244	RLEXSRAT	=X43:Y43	VUCRSPL	=X23

DWPFFASTXL: Defense Waste Processing Facility Algorithm for Source Terms for Excel

WSRC-TR-94-0532

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	A	B	C
1		DWPFFASTXL: Individual Event Radiological Source Terms and Consequences, Ver. 2.0, 10/14/94	
2		S.T.Gough & D.P.Keamaghan	
3			
4			
5			
6	Dim	Current	Default
7	DIM_1	3	3
8	DIM_2	6	6
9	DIM_3	6	6
10	DIM_4	4	4
11	DIM_5	8	8
12	DIM_6	7	7
13	DIM_7	7	7
14	DIM_8	8	8
15	DIM_9	2	8
16	DIM_10	7	7
17	DIM_11	6	6
18	DIM_12	5	5
19	DIM_13	2	2
20	DIM_14	2	2
21	DIM_15	2	2
22	DIM_16	2	2
23	DIM_17	2	2
24	DIM_18	4	5
25	DIM_19	4	4
26			
27			
28			
29			
30			
31	Mode	2	
32			
33	Dim	ID	
34	DIM_1	=IF(B7=1,"A",IF(B7=2,"B",IF(B7=3,"C",IF(B7=4,"D",IF(B7=5,"E",IF(B7=6,"F",IF(B7=7,"G",IF(B7=8,"H","ERROR"))))))))	OWST
35	DIM_2	=IF(B8=1,"A",IF(B8=2,"B",IF(B8=3,"C",IF(B8=4,"D",IF(B8=5,"E",IF(B8=6,"F",IF(B8=7,"G",IF(B8=8,"H","ERROR"))))))))	PPST
36	DIM_3	=IF(B9=1,"A",IF(B9=2,"B",IF(B9=3,"C",IF(B9=4,"D",IF(B9=5,"E",IF(B9=6,"F",IF(B9=7,"G",IF(B9=8,"H","ERROR"))))))))	PPPT
37	DIM_4	=IF(B10=1,"A",IF(B10=2,"B",IF(B10=3,"C",IF(B10=4,"D",IF(B10=5,"E",IF(B10=6,"F",IF(B10=7,"G",IF(B10=8,"H","ERROR"))))))))	PPRT
38	DIM_5	=IF(B11=1,"A",IF(B11=2,"B",IF(B11=3,"C",IF(B11=4,"D",IF(B11=5,"E",IF(B11=6,"F",IF(B11=7,"G",IF(B11=8,"H","ERROR"))))))))	PR
39	DIM_6	=IF(B12=1,"A",IF(B12=2,"B",IF(B12=3,"C",IF(B12=4,"D",IF(B12=5,"E",IF(B12=6,"F",IF(B12=7,"G",IF(B12=8,"H","ERROR"))))))))	PRFT
40	DIM_7	=IF(B13=1,"A",IF(B13=2,"B",IF(B13=3,"C",IF(B13=4,"D",IF(B13=5,"E",IF(B13=6,"F",IF(B13=7,"G",IF(B13=8,"H","ERROR"))))))))	PRBT
41	DIM_8	=IF(B14=1,"A",IF(B14=2,"B",IF(B14=3,"C",IF(B14=4,"D",IF(B14=5,"E",IF(B14=6,"F",IF(B14=7,"G",IF(B14=8,"H","ERROR"))))))))	SME
42	DIM_9	=IF(B15=1,"A",IF(B15=2,"B",IF(B15=3,"C",IF(B15=4,"D",IF(B15=5,"E",IF(B15=6,"F",IF(B15=7,"G",IF(B15=8,"H","ERROR"))))))))	SRAT
43	DIM_10	=IF(B16=1,"A",IF(B16=2,"B",IF(B16=3,"C",IF(B16=4,"D",IF(B16=5,"E",IF(B16=6,"F",IF(B16=7,"G",IF(B16=8,"H","ERROR"))))))))	MFT
44	DIM_11	=IF(B17=1,"A",IF(B17=2,"B",IF(B17=3,"C",IF(B17=4,"D",IF(B17=5,"E",IF(B17=6,"F",IF(B17=7,"G",IF(B17=8,"H","ERROR"))))))))	RCT
45	DIM_12	=IF(B18=1,"A",IF(B18=2,"B",IF(B18=3,"C",IF(B18=4,"D",IF(B18=5,"E",IF(B18=6,"F",IF(B18=7,"G",IF(B18=8,"H","ERROR"))))))))	Melt
46	DIM_13	=IF(B19=1,"A",IF(B19=2,"B",IF(B19=3,"C",IF(B19=4,"D",IF(B19=5,"E",IF(B19=6,"F",IF(B19=7,"G",IF(B19=8,"H","ERROR"))))))))	SPC-VC
47	DIM_14	=IF(B20=1,"A",IF(B20=2,"B",IF(B20=3,"C",IF(B20=4,"D",IF(B20=5,"E",IF(B20=6,"F",IF(B20=7,"G",IF(B20=8,"H","ERROR"))))))))	SPC-F
48	DIM_15	=IF(B21=1,"A",IF(B21=2,"B",IF(B21=3,"C",IF(B21=4,"D",IF(B21=5,"E",IF(B21=6,"F",IF(B21=7,"G",IF(B21=8,"H","ERROR"))))))))	CPC-C
49	DIM_16	=IF(B22=1,"A",IF(B22=2,"B",IF(B22=3,"C",IF(B22=4,"D",IF(B22=5,"E",IF(B22=6,"F",IF(B22=7,"G",IF(B22=8,"H","ERROR"))))))))	SPC-C
50	DIM_17	=IF(B23=1,"A",IF(B23=2,"B",IF(B23=3,"C",IF(B23=4,"D",IF(B23=5,"E",IF(B23=6,"F",IF(B23=7,"G",IF(B23=8,"H","ERROR"))))))))	Melt-C
51	DIM_18	=IF(B24=1,"A",IF(B24=2,"B",IF(B24=3,"C",IF(B24=4,"D",IF(B24=5,"E",IF(B24=6,"F",IF(B24=7,"G",IF(B24=8,"H","ERROR"))))))))	Z1-V
52	DIM_19	=IF(B25=1,"A",IF(B25=2,"B",IF(B25=3,"C",IF(B25=4,"D",IF(B25=5,"E",IF(B25=6,"F",IF(B25=7,"G",IF(B25=8,"H","ERROR"))))))))	LPPP-V
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	D	E	F	G
1				
2				
3				
4				
5			OWST	BEG INV
6	Error		H3	=VOWST*Stream_222
7	=IF(OR(B7>C7,B7<1),"ERROR",")		SR90	=VOWST*Stream_222
8	=IF(OR(B8>C8,B8<1),"ERROR",")		RU106	=VOWST*Stream_222
9	=IF(OR(B9>C9,B9<1),"ERROR",")		CS134	=VOWST*Stream_222
10	=IF(OR(B10>C10,B10<1),"ERROR",")		CS137	=VOWST*Stream_222
11	=IF(OR(B11>C11,B11<1),"ERROR",")		CE144	=VOWST*Stream_222
12	=IF(OR(B12>C12,B12<1),"ERROR",")		PM147	=VOWST*Stream_222
13	=IF(OR(B13>C13,B13<1),"ERROR",")		PU238	=VOWST*Stream_222
14	=IF(OR(B14>C14,B14<1),"ERROR",")		PU239	=VOWST*Stream_222
15	=IF(OR(B15>C15,B15<1),"ERROR",")		PU240	=VOWST*Stream_222
16	=IF(OR(B16>C16,B16<1),"ERROR",")		PU241	=VOWST*Stream_222
17	=IF(OR(B17>C17,B17<1),"ERROR",")		AM241	=VOWST*Stream_222
18	=IF(OR(B18>C18,B18<1),"ERROR",")		CM244	=VOWST*Stream_222
19	=IF(OR(B19>C19,B19<1),"ERROR",")			
20	=IF(OR(B20>C20,B20<1),"ERROR",")			
21	=IF(OR(B21>C21,B21<1),"ERROR",")			
22	=IF(OR(B22>C22,B22<1),"ERROR",")		LPPPST	BEG INV
23	=IF(OR(B23>C23,B23<1),"ERROR",")		H3	=VLPST*Stream_1
24	=IF(OR(B24>C24,B24<1),"ERROR",")		SR90	=VLPST*Stream_1
25	=IF(OR(B25>C25,B25<1),"ERROR",")		RU106	=VLPST*Stream_1
26			CS134	=VLPST*Stream_1
27			CS137	=VLPST*Stream_1
28			CE144	=VLPST*Stream_1
29			PM147	=VLPST*Stream_1
30			PU238	=VLPST*Stream_1
31			PU239	=VLPST*Stream_1
32			PU240	=VLPST*Stream_1
33			PU241	=VLPST*Stream_1
34			AM241	=VLPST*Stream_1
35			CM244	=VLPST*Stream_1
36				
37				
38				
39			LPPPPT	BEG INV
40			H3	=VLPPT*Stream_201
41			SR90	=VLPPT*Stream_201
42			RU106	=VLPPT*Stream_201
43			CS134	=VLPPT*Stream_201
44			CS137	=VLPPT*Stream_201
45			CE144	=VLPPT*Stream_201
46			PM147	=VLPPT*Stream_201
47			PU238	=VLPPT*Stream_201
48			PU239	=VLPPT*Stream_201
49			PU240	=VLPPT*Stream_201
50			PU241	=VLPPT*Stream_201
51			AM241	=VLPPT*Stream_201
52			CM244	=VLPPT*Stream_201
53				
54				
55				
56			LPPPRT	BEG INV
57			H3	=VLPRT*Stream_91
58			SR90	=VLPRT*Stream_91
59			RU106	=VLPRT*Stream_91
60			CS134	=VLPRT*Stream_91
61			CS137	=VLPRT*Stream_91
62			CE144	=VLPRT*Stream_91
63			PM147	=VLPRT*Stream_91
64			PU238	=VLPRT*Stream_91
65			PU239	=VLPRT*Stream_91
66			PU240	=VLPRT*Stream_91
67			PU241	=VLPRT*Stream_91
68			AM241	=VLPRT*Stream_91
69			CM244	=VLPRT*Stream_91
70				
71				
72				
73			PR	BEG INV
74			H3	=VPR*Stream_3
75			SR90	=VPR*Stream_3
76			RU106	=VPR*Stream_3

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	H	I
1		
2		
3		
4	EXPLOSION	
5	SPLASHING	INV AF SPLSH
6	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
7	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
8	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
9	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
10	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
11	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
12	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
13	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
14	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
15	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
16	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
17	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
18	=IF(DIM_1=1,G6:G18*RFSPSLH,0)	=G6:G18-H6:H18
19		
20		
21	EXPLOSION	
22	DAR	INV AF DAR
23	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
24	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
25	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
26	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
27	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
28	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
29	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
30	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
31	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
32	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
33	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
34	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
35	=IF(DIM_2=1,((INDEX(RLEXPST,1)*Stream_1)RHO),IF(DIM_2=2,((INDEX(RLEXPST,2)*Stream_1)RHO),0))	=G23:G35-H23:H35
36		
37		
38	EXPLOSION	
39	DAR	INV AF DAR
40	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
41	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
42	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
43	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
44	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
45	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
46	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
47	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
48	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
49	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
50	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
51	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
52	=IF(DIM_3=1,((INDEX(RLEXPPT,1)*Stream_201)RHO),IF(DIM_3=2,((INDEX(RLEXPPT,2)*Stream_201)RHO),0))	=G40:G52-H40:H52
53		
54		
55	EXPLOSION	
56	DAR	INV AF DAR
57	=0	=G57:G69-H57:H69
58	=0	=G57:G69-H57:H69
59	=0	=G57:G69-H57:H69
60	=0	=G57:G69-H57:H69
61	=0	=G57:G69-H57:H69
62	=0	=G57:G69-H57:H69
63	=0	=G57:G69-H57:H69
64	=0	=G57:G69-H57:H69
65	=0	=G57:G69-H57:H69
66	=0	=G57:G69-H57:H69
67	=0	=G57:G69-H57:H69
68	=0	=G57:G69-H57:H69
69	=0	=G57:G69-H57:H69
70		
71		
72	EXPLOSION	
73	DAR	INV AF DAR
74	=IF(DIM_5=1,((INDEX(RLEXPR,1)*Stream_3)RHO),IF(DIM_5=2,((INDEX(RLEXPR,2)*Stream_3)RHO),0))	=G74:G86-H74:H86
75	=IF(DIM_5=1,((INDEX(RLEXPR,1)*Stream_3)RHO),IF(DIM_5=2,((INDEX(RLEXPR,2)*Stream_3)RHO),0))	=G74:G86-H74:H86
76	=IF(DIM_5=1,((INDEX(RLEXPR,1)*Stream_3)RHO),IF(DIM_5=2,((INDEX(RLEXPR,2)*Stream_3)RHO),0))	=G74:G86-H74:H86

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	J	K
1		
2		
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4		
5	FIRE	TORNADO
6	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
7	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
8	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
9	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
10	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
11	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
12	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
13	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
14	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
15	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
16	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
17	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
18	=IF(DIM_1=1,6:18*1,0)	=IF(DIM_1=2,66:G18*RFTOR,0)
19		
20		
21		
22	SPLASHING	INV AF SPLSH
23	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
24	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
25	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
26	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
27	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
28	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
29	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
30	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
31	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
32	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
33	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
34	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
35	=IF(OR(DIM_2=1,DIM_2=2),I23:I35*RFSPSLH,0)	=I23:I35~I23:J35
36		
37		
38		
39	SPLASHING	INV AF SPLSH
40	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
41	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
42	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
43	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
44	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
45	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
46	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
47	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
48	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
49	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
50	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
51	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
52	=IF(OR(DIM_3=1,DIM_3=2),I40:I52*RFSPSLH,0)	=I40:I52~J40:J52
53		
54		
55		
56	SPLASHING	INV AF SPLSH
57	=0	=I57:I69~J57:J69
58	=0	=I57:I69~J57:J69
59	=0	=I57:I69~J57:J69
60	=0	=I57:I69~J57:J69
61	=0	=I57:I69~J57:J69
62	=0	=I57:I69~J57:J69
63	=0	=I57:I69~J57:J69
64	=0	=I57:I69~J57:J69
65	=0	=I57:I69~J57:J69
66	=0	=I57:I69~J57:J69
67	=0	=I57:I69~J57:J69
68	=0	=I57:I69~J57:J69
69	=0	=I57:I69~J57:J69
70		
71		
72		
73	SPLASHING	INV AF SPLSH
74	=IF(OR(DIM_5=1,DIM_5=2),I74:I86*RFSPSLH,0)	=I74:I86~J74:J86
75	=IF(OR(DIM_5=1,DIM_5=2),I74:I86*RFSPSLH,0)	=I74:I86~J74:J86
76	=IF(OR(DIM_5=1,DIM_5=2),I74:I86*RFSPSLH,0)	=I74:I86~J74:J86



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3	
4	OWST
5	RELEASE
6	=H6:H18+J6:J18+K6:K18
7	=H6:H18+J6:J18+K6:K18
8	=H6:H18+J6:J18+K6:K18
9	=H6:H18+J6:J18+K6:K18
10	=H6:H18+J6:J18+K6:K18
11	=H6:H18+J6:J18+K6:K18
12	=H6:H18+J6:J18+K6:K18
13	=H6:H18+J6:J18+K6:K18
14	=H6:H18+J6:J18+K6:K18
15	=H6:H18+J6:J18+K6:K18
16	=H6:H18+J6:J18+K6:K18
17	=H6:H18+J6:J18+K6:K18
18	=H6:H18+J6:J18+K6:K18
19	
20	
21	
22	EVAPORATION
23	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
24	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
25	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
26	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
27	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
28	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
29	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
30	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
31	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
32	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
33	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
34	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
35	=IF(OR(DIM_2=1,DIM_2=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K23:K35,INDEX(RFLEAK,2)*DURLNG*K23:K35),0)
36	
37	
38	
39	EVAPORATION
40	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
41	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
42	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
43	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
44	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
45	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
46	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
47	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
48	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
49	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
50	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
51	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
52	=IF(OR(DIM_3=1,DIM_3=2),IF(OR(DIM_19=3,DIM_19=4),INDEX(RFLEAK,1)*DURLNG*K40:K52,INDEX(RFLEAK,2)*DURLNG*K40:K52),0)
53	
54	
55	
56	EVAPORATION
57	=0
58	=0
59	=0
60	=0
61	=0
62	=0
63	=0
64	=0
65	=0
66	=0
67	=0
68	=0
69	=0
70	
71	
72	
73	EVAPORATION
74	=IF(OR(DIM_5=1,DIM_5=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K74:K86,INDEX(RFLEAK,2)*DURLNG*K74:K86),0)
75	=IF(OR(DIM_5=1,DIM_5=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K74:K86,INDEX(RFLEAK,2)*DURLNG*K74:K86),0)
76	=IF(OR(DIM_5=1,DIM_5=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K74:K86,INDEX(RFLEAK,2)*DURLNG*K74:K86),0)

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20		
21		SPLASHING
22	SPLASHING	INV AF SPLSH
23	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
24	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
25	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
26	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
27	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
28	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
29	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
30	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
31	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
32	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
33	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
34	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
35	=IF(DIM_2=3,G23:G35*RFSPSLH,0)	=G23:G35-M23:M35
36		
37		
38		SPLASHING
39	SPLASHING	INV AF SPLSH
40	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
41	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
42	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
43	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
44	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
45	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
46	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
47	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
48	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
49	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
50	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
51	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
52	=IF(DIM_3=3,G40:G52*RFSPSLH,0)	=G40:G52-M40:M52
53		
54		
55		SPLASHING
56	SPLASHING	INV AF SPLSH
57	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
58	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
59	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
60	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
61	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
62	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
63	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
64	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
65	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
66	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
67	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
68	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
69	=IF(DIM_4=1,G57:G69*RFSPSLH,0)	=G57:G69-M57:M69
70		
71		
72		SPLASHING
73	SPLASHING	INV AF SPLSH
74	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
75	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
76	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86





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22	VENTING
23	=0
24	=0
25	=0
26	=0
27	=0
28	=0
29	=0
30	=0
31	=0
32	=0
33	=0
34	=0
35	=0
36	
37	
38	
39	VENTING
40	=0
41	=0
42	=0
43	=0
44	=0
45	=0
46	=0
47	=0
48	=0
49	=0
50	=0
51	=0
52	=0
53	
54	
55	
56	VENTING
57	=0
58	=0
59	=0
60	=0
61	=0
62	=0
63	=0
64	=0
65	=0
66	=0
67	=0
68	=0
69	=0
70	
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73	VENTING
74	=IF(DIM_5=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G74:G86,INDEX(RFVENT,2)*DURLNG*G74:G86),0)
75	=IF(DIM_5=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G74:G86,INDEX(RFVENT,2)*DURLNG*G74:G86),0)
76	=IF(DIM_5=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G74:G86,INDEX(RFVENT,2)*DURLNG*G74:G86),0)

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22	UNCD RCN
23	=0
24	=0
25	=0
26	=0
27	=0
28	=0
29	=0
30	=0
31	=0
32	=0
33	=0
34	=0
35	=0
36	
37	
38	
39	UNCD RCN
40	=0
41	=0
42	=0
43	=0
44	=0
45	=0
46	=0
47	=0
48	=0
49	=0
50	=0
51	=0
52	=0
53	
54	
55	
56	UNCD RCN
57	=0
58	=0
59	=0
60	=0
61	=0
62	=0
63	=0
64	=0
65	=0
66	=0
67	=0
68	=0
69	=0
70	
71	
72	
73	UNCD RCN
74	=IF(DIM 5=0,IF(OR(DIM 18=3,DIM 19=5),INDEX(RFLEAK,1)*DURSHT*VUCRSPL*Stream 3,INDEX(RFLEAK,2)*DURSHT*VUCRSPL*Stream 3)+VUCRS*Stream 3,0)
75	=IF(DIM 5=0,IF(OR(DIM 18=3,DIM 19=5),INDEX(RFLEAK,1)*DURSHT*VUCRSPL*Stream 3,INDEX(RFLEAK,2)*DURSHT*VUCRSPL*Stream 3)+VUCRS*Stream 3,0)
76	=IF(DIM 5=0,IF(OR(DIM 18=3,DIM 19=5),INDEX(RFLEAK,1)*DURSHT*VUCRSPL*Stream 3,INDEX(RFLEAK,2)*DURSHT*VUCRSPL*Stream 3)+VUCRS*Stream 3,0)



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22	DF
23	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
24	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
25	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
26	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
27	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
28	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
29	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
30	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
31	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
32	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
33	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
34	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
35	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
36	
37	
38	
39	DF
40	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
41	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
42	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
43	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
44	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
45	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
46	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
47	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
48	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
49	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
50	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
51	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
52	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
53	
54	
55	
56	DF
57	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
58	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
59	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
60	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
61	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
62	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
63	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
64	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
65	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
66	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
67	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
68	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
69	=INDEX(LPBDDF,0,DIM_19)*INDEX(LPFLDF,0,DIM_19)
70	
71	
72	
73	DF
74	=INDEX(SPCDF,0,DIM_16)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
75	=INDEX(SPCDF,0,DIM_16)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
76	=INDEX(SPCDF,0,DIM_16)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)



DWPFFASTXL: Defense Waste Processing Facility Algorithm for Source Terms for Excel

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21	LPPPST	
22	RELEASE	
23	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
24	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
25	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
26	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
27	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
28	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
29	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
30	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
31	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
32	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
33	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
34	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
35	=(H23:H35+J23:J35+L23:L35+M23:M35+O23:O35+P23:P35+Q23:Q35+R23:R35+S23:S35)/(T23:T35)	
36		
37		
38	LPPPPT	
39	RELEASE	
40	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
41	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
42	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
43	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
44	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
45	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
46	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
47	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
48	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
49	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
50	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
51	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
52	=(H40:H52+J40:J52+L40:L52+M40:M52+O40:O52+P40:P52+Q40:Q52+R40:R52+S40:S52)/(T40:T52)	
53		
54		
55	LPPPRT	
56	RELEASE	
57	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
58	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
59	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
60	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
61	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
62	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
63	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
64	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
65	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
66	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
67	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
68	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
69	=(H57:H69+J57:J69+L57:L69+M57:M69+O57:O69+P57:P69+Q57:Q69+R57:R69+S57:S69)/(T57:T69)	
70		
71		
72	PR	
73	RELEASE	
74	=(H74:H86+J74:J86+L74:L86+M74:M86+O74:O86+P74:P86+Q74:Q86+R74:R86+S74:S86)/(T74:T86)	
75	=(H74:H86+J74:J86+L74:L86+M74:M86+O74:O86+P74:P86+Q74:Q86+R74:R86+S74:S86)/(T74:T86)	
76	=(H74:H86+J74:J86+L74:L86+M74:M86+O74:O86+P74:P86+Q74:Q86+R74:R86+S74:S86)/(T74:T86)	

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	W	X	Y
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2			
3	INPUT PARAMETERS		
4			
5	TANK VOLUMES	GALLONS	
6	VOWST	150000	
7	VLPST	6200	
8	VLPPT	6460	
9	VLPRT	5300	
10	VPR	8350	
11	VPRFT	8350	
12	VPRBT	11000	
13	VSME	11000	
14	VS RAT	11000	
15	VMFT	11000	
16	VMLT	726	
17	VRCT	11000	
18	VOEV	0	
19	VOECT	0	
20	MISC VALUES		
21	VUCRS	0.03	GALLONS
22	VUCRC	0.09	GALLONS
23	VUCRSPL	1393	GALLONS
24	MROG	71300	LBS
25	MCAH	3710	LBS
26	VMSPL	10.6	GALLONS
27	VOVFL	932	GALLONS
28	VLEAKP	200	GALLONS
29	VLEAKC	45	GALLONS
30	VLEAKS	30	GALLONS
31	RHO	3.83	KG/GAL
32	RHOB	3.33	KG/GAL
33	RHOGL	21.5	LB/GAL
34	RHOG	0.0169	LB/FT <sup>3</sup>
35	EXPL. AERD. MASSES	DET	DEF
36	RLEXOW	0	KG
37	RLEXPPT	19.6	0.739
38	RLEXPST	16.2	1.309
39	RLEXPR	16.3	1.925
40	RLEXPRFT	16.3	1.283
41	RLEXPRBT	28.1	1.357
42	RLEXSME	23.3	1.124
43	RLEXSRAT	28.1	1.357
44	RLEXMFT	23.3	0.874
45	RLEXOECT	0	0
46	RLEXSPC	3.786	KG
47	RLEXOEV	0	0
48			
49	RELEASE FRACTIONS		
50	ISOTOPE	RFSPLSH	RFFIRE
51	H3	1	1
52	SR90	0.00004	0.00016
53	RU106	0.00004	0.00016
54	CS134	0.00004	0.00016
55	CS137	0.00004	0.00016
56	CE144	0.00004	0.00016
57	PM147	0.00004	0.00016
58	PU238	0.00004	0.00016
59	PU239	0.00004	0.00016
60	PU240	0.00004	0.00016
61	PU241	0.00004	0.00016
62	AM241	0.00004	0.00016
63	CM244	0.00004	0.00016
64			
65	RELEASE RATES	W/VENT'N	W/O VENT'N
66	RFLEAK	0.000000000011	0.000000000011
67	RFVENT	0.0000000000011	0.000000000011
68	DURSHY	=8*3600	
69	DURLNG	=4*24*3600	
70			
71			
72	CELL DFS	CPCDF	
73	H3	1	1
74	SR90	1	1
75	RU106	1	1
76	CS134	1	1

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36		DEF ONLY	
37	KG		
38	KG		
39	KG		
40	KG		
41	KG		
42	KG		
43	KG		
44	KG		
45	KG		
46		DEF ONLY	
47	KG		
48			
49			
50	RFCR	RFMSPL	RFTOR
51	1	1	1
52	0.000001	0.00220310468613975	0.0038
53	0.000001	0.000637595323917013	0.0038
54	0.000001	0	0.0038
55	0.000001	0.00498981751165822	0.0038
56	0.000001	0	0.0038
57	0.000001	0	0.0038
58	0.000001	0	0.0038
59	0.000001	0	0.0038
60	0.000001	0	0.0038
61	0.000001	0	0.0038
62	0.000001	0	0.0038
63	0.000001	0	0.0038
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72	SPCDF		MCDF
73	1	1	1
74	1	1	1
75	1	1	1
76	1	1	1

*DWPF*FASTXL: Defense Waste Processing Facility Algorithm for Source Terms for Excel

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74	1		
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*DWPF*ASTXL: Defense Waste Processing Facility Algorithm for Source Terms for Excel

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*DWPF*ASTXL: Defense Waste Processing Facility Algorithm for Source Terms for Excel

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DWPF<sub>FASTXL</sub>: Defense Waste Processing Facility Algorithm for Source Terms for Excel

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	D	E	F	G
77			CS134	=VPR*Stream_3
78			CS137	=VPR*Stream_3
79			CE144	=VPR*Stream_3
80			PM147	=VPR*Stream_3
81			PU238	=VPR*Stream_3
82			PU239	=VPR*Stream_3
83			PU240	=VPR*Stream_3
84			PU241	=VPR*Stream_3
85			AM241	=VPR*Stream_3
86			CM244	=VPR*Stream_3
87				
88				
89				
90				
91				
92				
93			PRFT	BEG INV
94			H3	=VPRFT*Stream_201
95			SR90	=VPRFT*Stream_201
96			RU106	=VPRFT*Stream_201
97			CS134	=VPRFT*Stream_201
98			CS137	=VPRFT*Stream_201
99			CE144	=VPRFT*Stream_201
100			PM147	=VPRFT*Stream_201
101			PU238	=VPRFT*Stream_201
102			PU239	=VPRFT*Stream_201
103			PU240	=VPRFT*Stream_201
104			PU241	=VPRFT*Stream_201
105			AM241	=VPRFT*Stream_201
106			CM244	=VPRFT*Stream_201
107				
108				
109				
110			PRBT	BEG INV
111			H3	=VPRBT*Stream_3
112			SR90	=VPRBT*Stream_3
113			RU106	=VPRBT*Stream_3
114			CS134	=VPRBT*Stream_3
115			CS137	=VPRBT*Stream_3
116			CE144	=VPRBT*Stream_3
117			PM147	=VPRBT*Stream_3
118			PU238	=VPRBT*Stream_3
119			PU239	=VPRBT*Stream_3
120			PU240	=VPRBT*Stream_3
121			PU241	=VPRBT*Stream_3
122			AM241	=VPRBT*Stream_3
123			CM244	=VPRBT*Stream_3
124				
125				
126				
127			SME	BEG INV
128			H3	=VSME*Stream_7
129			SR90	=VSME*Stream_7
130			RU106	=VSME*Stream_7
131			CS134	=VSME*Stream_7
132			CS137	=VSME*Stream_7
133			CE144	=VSME*Stream_7
134			PM147	=VSME*Stream_7
135			PU238	=VSME*Stream_7
136			PU239	=VSME*Stream_7
137			PU240	=VSME*Stream_7
138			PU241	=VSME*Stream_7
139			AM241	=VSME*Stream_7
140			CM244	=VSME*Stream_7
141				
142				
143				
144			SRAT	BEG INV
145			H3	=VSRAT*Stream_7
146			SR90	=VSRAT*Stream_7
147			RU106	=VSRAT*Stream_7
148			CS134	=VSRAT*Stream_7
149			CS137	=VSRAT*Stream_7
150			CE144	=VSRAT*Stream_7
151			PM147	=VSRAT*Stream_7
152			PU238	=VSRAT*Stream_7





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	J	K
77	=IF(OR(DIM_5=1,DIM_5=2),I74:J86*RFSPSLH,0)	=I74:J86-J74:J86
78	=IF(OR(DIM_5=1,DIM_5=2),I74:J86*RFSPSLH,0)	=I74:J86-J74:J86
79	=IF(OR(DIM_5=1,DIM_5=2),I74:J86*RFSPSLH,0)	=I74:J86-J74:J86
80	=IF(OR(DIM_5=1,DIM_5=2),I74:J86*RFSPSLH,0)	=I74:J86-J74:J86
81	=IF(OR(DIM_5=1,DIM_5=2),I74:J86*RFSPSLH,0)	=I74:J86-J74:J86
82	=IF(OR(DIM_5=1,DIM_5=2),I74:J86*RFSPSLH,0)	=I74:J86-J74:J86
83	=IF(OR(DIM_5=1,DIM_5=2),I74:J86*RFSPSLH,0)	=I74:J86-J74:J86
84	=IF(OR(DIM_5=1,DIM_5=2),I74:J86*RFSPSLH,0)	=I74:J86-J74:J86
85	=IF(OR(DIM_5=1,DIM_5=2),I74:J86*RFSPSLH,0)	=I74:J86-J74:J86
86	=IF(OR(DIM_5=1,DIM_5=2),I74:J86*RFSPSLH,0)	=I74:J86-J74:J86
87		
88		
89		
90		
91		
92		
93	SPLASHING	INV AF SPLSH
94	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
95	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
96	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
97	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
98	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
99	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
100	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
101	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
102	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
103	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
104	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
105	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
106	=IF(OR(DIM_6=1,DIM_6=2),I94:J106*RFSPSLH,0)	=I94:J106-J94:J106
107		
108		
109		
110	SPLASHING	INV AF SPLSH
111	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
112	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
113	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
114	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
115	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
116	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
117	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
118	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
119	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
120	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
121	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
122	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
123	=IF(OR(DIM_7=1,DIM_7=2),I111:J123*RFSPSLH,0)	=I111:J123-J111:J123
124		
125		
126		
127	SPLASHING	INV AF SPLSH
128	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
129	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
130	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
131	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
132	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
133	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
134	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
135	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
136	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
137	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
138	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
139	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
140	=IF(OR(DIM_8=1,DIM_8=2),I128:J140*RFSPSLH,0)	=I128:J140-J128:J140
141		
142		
143		
144	SPLASHING	INV AF SPLSH
145	=IF(OR(DIM_9=1,DIM_9=2),I145:J157*RFSPSLH,0)	=I145:J157-J145:J157
146	=IF(OR(DIM_9=1,DIM_9=2),I145:J157*RFSPSLH,0)	=I145:J157-J145:J157
147	=IF(OR(DIM_9=1,DIM_9=2),I145:J157*RFSPSLH,0)	=I145:J157-J145:J157
148	=IF(OR(DIM_9=1,DIM_9=2),I145:J157*RFSPSLH,0)	=I145:J157-J145:J157
149	=IF(OR(DIM_9=1,DIM_9=2),I145:J157*RFSPSLH,0)	=I145:J157-J145:J157
150	=IF(OR(DIM_9=1,DIM_9=2),I145:J157*RFSPSLH,0)	=I145:J157-J145:J157
151	=IF(OR(DIM_9=1,DIM_9=2),I145:J157*RFSPSLH,0)	=I145:J157-J145:J157
152	=IF(OR(DIM_9=1,DIM_9=2),I145:J157*RFSPSLH,0)	=I145:J157-J145:J157



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	M	N
77	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
78	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
79	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
80	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
81	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
82	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
83	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
84	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
85	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
86	=IF(DIM_5=3,G74:G86*RFSPSLH,0)	=G74:G86-M74:M86
87		
88		
89		
90		
91		
92		SPLASHING
93	SPLASHING	INV AF SPLSH
94	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
95	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
96	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
97	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
98	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
99	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
100	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
101	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
102	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
103	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
104	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
105	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
106	=IF(DIM_6=3,G94:G106*RFSPSLH,0)	=G94:G106-M94:M106
107		
108		
109		SPLASHING
110	SPLASHING	INV AF SPLSH
111	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
112	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
113	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
114	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
115	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
116	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
117	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
118	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
119	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
120	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
121	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
122	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
123	=IF(DIM_7=3,G111:G123*RFSPSLH,0)	=G111:G123-M111:M123
124		
125		
126		SPLASHING
127	SPLASHING	INV AF SPLSH
128	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
129	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
130	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
131	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
132	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
133	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
134	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
135	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
136	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
137	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
138	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
139	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
140	=IF(DIM_8=3,G128:G140*RFSPSLH,0)	=G128:G140-M128:M140
141		
142		
143		SPLASHING
144	SPLASHING	INV AF SPLSH
145	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
146	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
147	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
148	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
149	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
150	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
151	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
152	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157

















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	W	X	Y
77	CS137	1	1
78	CE144	1	1
79	PM147	1	1
80	PU238	1	1
81	PU239	1	1
82	PU240	1	1
83	PU241	1	1
84	AM241	1	1
85	CM244	1	1
86			
87			
88	VIT. BLDG. DFS	VITDF	
89	H3	1	1
90	SR90	1	2
91	RU106	1	2
92	CS134	1	2
93	CS137	1	2
94	CE144	1	2
95	PM147	1	2
96	PU238	1	2
97	PU239	1	2
98	PU240	1	2
99	PU241	1	2
100	AM241	1	2
101	CM244	1	2
102			
103			
104	SAND FILTER DFS	SNDDF	
105	H3	1	1
106	SR90	1	1
107	RU106	1	1
108	CS134	1	1
109	CS137	1	1
110	CE144	1	1
111	PM147	1	1
112	PU238	1	1
113	PU239	1	1
114	PU240	1	1
115	PU241	1	1
116	AM241	1	1
117	CM244	1	1
118			
119			
120	LP <sup>PP</sup> HEPA DFS	LPFLDF	
121	H3	1	1
122	SR90	1	1
123	RU106	1	1
124	CS134	1	1
125	CS137	1	1
126	CE144	1	1
127	PM147	1	1
128	PU238	1	1
129	PU239	1	1
130	PU240	1	1
131	PU241	1	1
132	AM241	1	1
133	CM244	1	1
134			
135			
136	LP <sup>PP</sup> BLDG. DFS	LPBDDF	
137	H3	1	1
138	SR90	1	1
139	RU106	1	1
140	CS134	1	1
141	CS137	1	1
142	CE144	1	1
143	PM147	1	1
144	PU238	1	1
145	PU239	1	1
146	PU240	1	1
147	PU241	1	1
148	AM241	1	1
149	CM244	1	1
150			
151			
152	CURIE BALANCE	Ci/gal	Ci/gal

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	Z	AA	AB
77	1	1	1
78	1	1	1
79	1	1	1
80	1	1	1
81	1	1	1
82	1	1	1
83	1	1	1
84	1	1	1
85	1	1	1
86			
87			
88			
89	1	1	1
90	1	2	1
91	1	2	1
92	1	2	1
93	1	2	1
94	1	2	1
95	1	2	1
96	1	2	1
97	1	2	1
98	1	2	1
99	1	2	1
100	1	2	1
101	1	2	1
102			
103			
104			
105	1	1	1
106	200	1	200
107	200	1	200
108	200	1	200
109	200	1	200
110	200	1	200
111	200	1	200
112	200	1	200
113	200	1	200
114	200	1	200
115	200	1	200
116	200	1	200
117	200	1	200
118			
119			
120			
121	1	1	1
122	1	200	1
123	1	200	1
124	1	200	1
125	1	200	1
126	1	200	1
127	1	200	1
128	1	200	1
129	1	200	1
130	1	200	1
131	1	200	1
132	1	200	1
133	1	200	1
134			
135			
136			
137	1	1	1
138	1	1	1
139	1	1	1
140	1	1	1
141	1	1	1
142	1	1	1
143	1	1	1
144	1	1	1
145	1	1	1
146	1	1	1
147	1	1	1
148	1	1	1
149	1	1	1
150			
151			
152	C/gal	C/gal	C/gal

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	AC	AD	AE
77	1		
78	1		
79	1		
80	1		
81	1		
82	1		
83	1		
84	1		
85	1		
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152	CUM3	CUMb	CUMa1

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	AF	AG	AH
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148			
149			
150			
151			
152	Ci/gal	Ci/gal	Ci/gal

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	A	B	C
153			
154			
155			
156			
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DWPF<sub>FASTXL</sub>: Defense Waste Processing Facility Algorithm for Source Terms for Excel

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	D	E	F	G
153			PU239	=VSRAT*Stream_7
154			PU240	=VSRAT*Stream_7
155			PU241	=VSRAT*Stream_7
156			AM241	=VSRAT*Stream_7
157			CM244	=VSRAT*Stream_7
158				
159				
160				
161			MFT	BEG INV
162			H3	=VMFT*Stream_7
163			SR90	=VMFT*Stream_7
164			RU106	=VMFT*Stream_7
165			CS134	=VMFT*Stream_7
166			CS137	=VMFT*Stream_7
167			CE144	=VMFT*Stream_7
168			PM147	=VMFT*Stream_7
169			PU238	=VMFT*Stream_7
170			PU239	=VMFT*Stream_7
171			PU240	=VMFT*Stream_7
172			PU241	=VMFT*Stream_7
173			AM241	=VMFT*Stream_7
174			CM244	=VMFT*Stream_7
175				
176				
177				
178			RCT	BEG INV
179			H3	=VRCT*Stream_91
180			SR90	=VRCT*Stream_91
181			RU106	=VRCT*Stream_91
182			CS134	=VRCT*Stream_91
183			CS137	=VRCT*Stream_91
184			CE144	=VRCT*Stream_91
185			PM147	=VRCT*Stream_91
186			PU238	=VRCT*Stream_91
187			PU239	=VRCT*Stream_91
188			PU240	=VRCT*Stream_91
189			PU241	=VRCT*Stream_91
190			AM241	=VRCT*Stream_91
191			CM244	=VRCT*Stream_91
192				
193				
194				
195			Melt Cell	Total Melt Inv
196			H3	=VMLT*Stream_24*RHOGL
197			SR90	=VMLT*Stream_24*RHOGL
198			RU106	=VMLT*Stream_24*RHOGL
199			CS134	=VMLT*Stream_24*RHOGL
200			CS137	=VMLT*Stream_24*RHOGL
201			CE144	=VMLT*Stream_24*RHOGL
202			PM147	=VMLT*Stream_24*RHOGL
203			PU238	=VMLT*Stream_24*RHOGL
204			PU239	=VMLT*Stream_24*RHOGL
205			PU240	=VMLT*Stream_24*RHOGL
206			PU241	=VMLT*Stream_24*RHOGL
207			AM241	=VMLT*Stream_24*RHOGL
208			CM244	=VMLT*Stream_24*RHOGL
209				
210				
211				
212			TOTAL	OWST
213			RELEASES	RELEASE
214			H3	=OWST_RELEASE
215			SR90	=OWST_RELEASE
216			RU106	=OWST_RELEASE
217			CS134	=OWST_RELEASE
218			CS137	=OWST_RELEASE
219			CE144	=OWST_RELEASE
220			PM147	=OWST_RELEASE
221			PU238	=OWST_RELEASE
222			PU239	=OWST_RELEASE
223			PU240	=OWST_RELEASE
224			PU241	=OWST_RELEASE
225			AM241	=OWST_RELEASE
226			CM244	=OWST_RELEASE
227			Total	=SUM(G214:G226)
228				



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	H	I
153	=IF(DIM_9=1,((INDEX(RLEXSRAT,1)*Stream_7YRHO),IF(DIM_9=2,((INDEX(RLEXSRAT,2)*Stream_7YRHO),0))	=G145:G157-H145:H157
154	=IF(DIM_9=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_9=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G145:G157-H145:H157
155	=IF(DIM_9=1,((INDEX(RLEXSRAT,1)*Stream_7YRHO),IF(DIM_9=2,((INDEX(RLEXSRAT,2)*Stream_7YRHO),0))	=G145:G157-H145:H157
156	=IF(DIM_9=1,((INDEX(RLEXSRAT,1)*Stream_7YRHO),IF(DIM_9=2,((INDEX(RLEXSRAT,2)*Stream_7YRHO),0))	=G145:G157-H145:H157
157	=IF(DIM_9=1,((INDEX(RLEXSRAT,1)*Stream_7YRHO),IF(DIM_9=2,((INDEX(RLEXSRAT,2)*Stream_7YRHO),0))	=G145:G157-H145:H157
158		
159		
160	EXPLOSION	
161	DAR	INV AF DAR
162	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
163	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
164	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
165	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
166	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
167	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
168	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
169	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
170	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
171	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
172	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
173	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
174	=IF(DIM_10=1,((INDEX(RLEXMFT,1)*Stream_7YRHO),IF(DIM_10=2,((INDEX(RLEXMFT,2)*Stream_7YRHO),0))	=G162:G174-H162:H174
175		
176		
177	EXPLOSION	
178	DAR	INV AF DAR
179	=0	=G179:G191-H179:H191
180	=0	=G179:G191-H179:H191
181	=0	=G179:G191-H179:H191
182	=0	=G179:G191-H179:H191
183	=0	=G179:G191-H179:H191
184	=0	=G179:G191-H179:H191
185	=0	=G179:G191-H179:H191
186	=0	=G179:G191-H179:H191
187	=0	=G179:G191-H179:H191
188	=0	=G179:G191-H179:H191
189	=0	=G179:G191-H179:H191
190	=0	=G179:G191-H179:H191
191	=0	=G179:G191-H179:H191
192		
193		
194		
195	TOT. Release	Part Melt Inv
196	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
197	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
198	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
199	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
200	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
201	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
202	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
203	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
204	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
205	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
206	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
207	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
208	=IF(DIM_12=1,G196:G208*RFMSPL+Stream_23*0.6/RHOGL)	=VMSPL*Stream_24*RHOGI
209		
210		
211		
212	LPPPST	LPPPST
213	RELEASE	RELEASE
214	=LPPPST_RELEASE	=LPPPST_RELEASE
215	=LPPPST_RELEASE	=LPPPST_RELEASE
216	=LPPPST_RELEASE	=LPPPST_RELEASE
217	=LPPPST_RELEASE	=LPPPST_RELEASE
218	=LPPPST_RELEASE	=LPPPST_RELEASE
219	=LPPPST_RELEASE	=LPPPST_RELEASE
220	=LPPPST_RELEASE	=LPPPST_RELEASE
221	=LPPPST_RELEASE	=LPPPST_RELEASE
222	=LPPPST_RELEASE	=LPPPST_RELEASE
223	=LPPPST_RELEASE	=LPPPST_RELEASE
224	=LPPPST_RELEASE	=LPPPST_RELEASE
225	=LPPPST_RELEASE	=LPPPST_RELEASE
226	=LPPPST_RELEASE	=LPPPST_RELEASE
227	=SUM(H214:H226)	=SUM(I214:I226)
228		

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	J	K
153	=IF(OR(DIM_9=1,DIM_9=2),I145:I157*RFSPSLH,0)	=I145:I157-J145:J157
154	=IF(OR(DIM_9=1,DIM_9=2),I145:I157*RFSPSLH,0)	=I145:I157-J145:J157
155	=IF(OR(DIM_9=1,DIM_9=2),I145:I157*RFSPSLH,0)	=I145:I157-J145:J157
156	=IF(OR(DIM_9=1,DIM_9=2),I145:I157*RFSPSLH,0)	=I145:I157-J145:J157
157	=IF(OR(DIM_9=1,DIM_9=2),I145:I157*RFSPSLH,0)	=I145:I157-J145:J157
158		
159		
160		
161	SPLASHING	INV AF SPLSH
162	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
163	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
164	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
165	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
166	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
167	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
168	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
169	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
170	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
171	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
172	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
173	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
174	=IF(OR(DIM_10=1,DIM_10=2),I162:I174*RFSPSLH,0)	=I162:I174-J162:J174
175		
176		
177		
178	SPLASHING	INV AF SPLSH
179	=0	=I179:I191-J179:J191
180	=0	=I179:I191-J179:J191
181	=0	=I179:I191-J179:J191
182	=0	=I179:I191-J179:J191
183	=0	=I179:I191-J179:J191
184	=0	=I179:I191-J179:J191
185	=0	=I179:I191-J179:J191
186	=0	=I179:I191-J179:J191
187	=0	=I179:I191-J179:J191
188	=0	=I179:I191-J179:J191
189	=0	=I179:I191-J179:J191
190	=0	=I179:I191-J179:J191
191	=0	=I179:I191-J179:J191
192		
193		
194		
195	PMS Release	Meltar Offgas
196	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
197	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
198	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
199	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
200	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
201	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
202	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
203	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
204	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
205	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
206	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
207	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
208	=IF(DIM_12=2,I196:I208*RFMSPL+Stream_23*0.6/RHOG,0)	=Stream_23*MROG/RHOG
209		
210		
211		
212	LPPRT	PR
213	RELEASE	RELEASE
214	=LPPRT_RELEASE	=PR_RELEASE
215	=LPPRT_RELEASE	=PR_RELEASE
216	=LPPRT_RELEASE	=PR_RELEASE
217	=LPPRT_RELEASE	=PR_RELEASE
218	=LPPRT_RELEASE	=PR_RELEASE
219	=LPPRT_RELEASE	=PR_RELEASE
220	=LPPRT_RELEASE	=PR_RELEASE
221	=LPPRT_RELEASE	=PR_RELEASE
222	=LPPRT_RELEASE	=PR_RELEASE
223	=LPPRT_RELEASE	=PR_RELEASE
224	=LPPRT_RELEASE	=PR_RELEASE
225	=LPPRT_RELEASE	=PR_RELEASE
226	=LPPRT_RELEASE	=PR_RELEASE
227	=SUM(J214:J226)	=SUM(K214:K226)
228		

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L	
153	=IF(OR(DIM_9=1,DIM_9=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K145:K157,INDEX(RFLEAK,2)*DURLNG*K145:K157),0)
154	=IF(OR(DIM_9=1,DIM_9=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K145:K157,INDEX(RFLEAK,2)*DURLNG*K145:K157),0)
155	=IF(OR(DIM_9=1,DIM_9=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K145:K157,INDEX(RFLEAK,2)*DURLNG*K145:K157),0)
156	=IF(OR(DIM_9=1,DIM_9=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K145:K157,INDEX(RFLEAK,2)*DURLNG*K145:K157),0)
157	=IF(OR(DIM_9=1,DIM_9=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K145:K157,INDEX(RFLEAK,2)*DURLNG*K145:K157),0)
158	
159	
160	
161	EVAPORATION
162	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
163	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
164	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
165	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
166	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
167	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
168	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
169	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
170	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
171	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
172	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
173	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
174	=IF(OR(DIM_10=1,DIM_10=2),IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*K162:K174,INDEX(RFLEAK,2)*DURLNG*K162:K174),0)
175	
176	
177	
178	EVAPORATION
179	=0
180	=0
181	=0
182	=0
183	=0
184	=0
185	=0
186	=0
187	=0
188	=0
189	=0
190	=0
191	=0
192	
193	
194	
195	MOGR
196	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
197	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
198	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
199	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
200	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
201	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
202	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
203	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
204	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
205	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
206	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
207	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
208	=IF(DIM_12=3,(K196:K208*1)*(2.6*Stream_24*RHOGH*RFMSPL),0)
209	
210	
211	
212	PRFT
213	RELEASE
214	=PRFT_RELEASE
215	=PRFT_RELEASE
216	=PRFT_RELEASE
217	=PRFT_RELEASE
218	=PRFT_RELEASE
219	=PRFT_RELEASE
220	=PRFT_RELEASE
221	=PRFT_RELEASE
222	=PRFT_RELEASE
223	=PRFT_RELEASE
224	=PRFT_RELEASE
225	=PRFT_RELEASE
226	=PRFT_RELEASE
227	=SUM(L214:L226)
228	

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	M	N
153	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
154	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
155	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
156	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
157	=IF(DIM_9=3,G145:G157*RFSPSLH,0)	=G145:G157-M145:M157
158		
159		
160		SPLASHING
161	SPLASHING	INV AF SPLSH
162	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
163	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
164	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
165	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
166	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
167	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
168	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
169	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
170	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
171	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
172	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
173	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
174	=IF(DIM_10=3,G162:G174*RFSPSLH,0)	=G162:G174-M162:M174
175		
176		
177		SPLASHING
178	SPLASHING	INV AF SPLSH
179	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
180	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
181	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
182	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
183	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
184	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
185	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
186	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
187	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
188	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
189	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
190	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
191	=IF(DIM_11=1,G179:G191*RFSPSLH,0)	=G179:G191-M179:M191
192		
193		
194		
195	Canister	MCR
196	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
197	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
198	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
199	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
200	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
201	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
202	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
203	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
204	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
205	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
206	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
207	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
208	=Stream_24*MCAN	=IF(DIM_12=4,M196:M208*RFRCR,0)
209		
210		
211		
212	PRBT	SME
213	RELEASE	RELEASE
214	=PRBT_RELEASE	=SME_RELEASE
215	=PRBT_RELEASE	=SME_RELEASE
216	=PRBT_RELEASE	=SME_RELEASE
217	=PRBT_RELEASE	=SME_RELEASE
218	=PRBT_RELEASE	=SME_RELEASE
219	=PRBT_RELEASE	=SME_RELEASE
220	=PRBT_RELEASE	=SME_RELEASE
221	=PRBT_RELEASE	=SME_RELEASE
222	=PRBT_RELEASE	=SME_RELEASE
223	=PRBT_RELEASE	=SME_RELEASE
224	=PRBT_RELEASE	=SME_RELEASE
225	=PRBT_RELEASE	=SME_RELEASE
226	=PRBT_RELEASE	=SME_RELEASE
227	=SUM(M214:M226)	=SUM(N214:N226)
228		

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	0
153	=IF(DIM_9=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N145:N157,INDEX(RFLEAK,2)*DURLNG*N145:N157),0)
154	=IF(DIM_9=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N145:N157,INDEX(RFLEAK,2)*DURLNG*N145:N157),0)
155	=IF(DIM_9=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N145:N157,INDEX(RFLEAK,2)*DURLNG*N145:N157),0)
156	=IF(DIM_9=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N145:N157,INDEX(RFLEAK,2)*DURLNG*N145:N157),0)
157	=IF(DIM_9=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N145:N157,INDEX(RFLEAK,2)*DURLNG*N145:N157),0)
158	
159	
160	
161	EVAPORATION
162	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
163	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
164	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
165	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
166	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
167	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
168	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
169	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
170	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
171	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
172	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
173	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
174	=IF(DIM_10=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N162:N174,INDEX(RFLEAK,2)*DURLNG*N162:N174),0)
175	
176	
177	
178	EVAPORATION
179	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
180	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
181	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
182	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
183	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
184	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
185	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
186	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
187	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
188	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
189	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
190	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
191	=IF(DIM_11=1,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFLEAK,1)*DURLNG*N179:N191,INDEX(RFLEAK,2)*DURLNG*N179:N191),0)
192	
193	
194	
195	DF
196	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
197	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
198	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
199	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
200	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
201	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
202	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
203	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
204	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
205	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
206	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
207	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
208	=INDEX(MCDF,0,DIM_17)*INDEX(VITDF,0,DIM_18)*INDEX(SNDDF,0,DIM_18)
209	
210	
211	
212	SRAT
213	RELEASE
214	=SRAT_RELEASE
215	=SRAT_RELEASE
216	=SRAT_RELEASE
217	=SRAT_RELEASE
218	=SRAT_RELEASE
219	=SRAT_RELEASE
220	=SRAT_RELEASE
221	=SRAT_RELEASE
222	=SRAT_RELEASE
223	=SRAT_RELEASE
224	=SRAT_RELEASE
225	=SRAT_RELEASE
226	=SRAT_RELEASE
227	=SUM(O214:O226)
228	



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Q	
153	=IF(DIM_9=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G145:G157,INDEX(RFVENT,2)*DURLNG*G145:G157),0)
154	=IF(DIM_9=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G145:G157,INDEX(RFVENT,2)*DURLNG*G145:G157),0)
155	=IF(DIM_9=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G145:G157,INDEX(RFVENT,2)*DURLNG*G145:G157),0)
156	=IF(DIM_9=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G145:G157,INDEX(RFVENT,2)*DURLNG*G145:G157),0)
157	=IF(DIM_9=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G145:G157,INDEX(RFVENT,2)*DURLNG*G145:G157),0)
158	
159	
160	
161	VENTING
162	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
163	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
164	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
165	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
166	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
167	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
168	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
169	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
170	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
171	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
172	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
173	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
174	=IF(DIM_10=5,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G162:G174,INDEX(RFVENT,2)*DURLNG*G162:G174),0)
175	
176	
177	
178	VENTING
179	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
180	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
181	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
182	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
183	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
184	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
185	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
186	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
187	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
188	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
189	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
190	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
191	=IF(DIM_11=3,IF(OR(DIM_18=3,DIM_18=5),INDEX(RFVENT,1)*DURLNG*G179:G191,INDEX(RFVENT,2)*DURLNG*G179:G191),0)
192	
193	
194	
195	
196	
197	
198	
199	
200	
201	
202	
203	
204	
205	
206	
207	
208	
209	
210	
211	
212	RCT
213	RELEASE
214	=RCT_RELEASE
215	=RCT_RELEASE
216	=RCT_RELEASE
217	=RCT_RELEASE
218	=RCT_RELEASE
219	=RCT_RELEASE
220	=RCT_RELEASE
221	=RCT_RELEASE
222	=RCT_RELEASE
223	=RCT_RELEASE
224	=RCT_RELEASE
225	=RCT_RELEASE
226	=RCT_RELEASE
227	=SUM(Q214:Q226)
228	

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R	
153	=IF(DIM_9=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*VUCRSPL*Stream_7,INDEX(RFLEAK,2)*DURSHT*VUCRSPL*Stream_7)+VUCRC*Stream_7,0)
154	=IF(DIM_9=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*VUCRSPL*Stream_7,INDEX(RFLEAK,2)*DURSHT*VUCRSPL*Stream_7)+VUCRC*Stream_7,0)
155	=IF(DIM_9=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*VUCRSPL*Stream_7,INDEX(RFLEAK,2)*DURSHT*VUCRSPL*Stream_7)+VUCRC*Stream_7,0)
156	=IF(DIM_9=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*VUCRSPL*Stream_7,INDEX(RFLEAK,2)*DURSHT*VUCRSPL*Stream_7)+VUCRC*Stream_7,0)
157	=IF(DIM_9=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*VUCRSPL*Stream_7,INDEX(RFLEAK,2)*DURSHT*VUCRSPL*Stream_7)+VUCRC*Stream_7,0)
158	
159	
160	
161	UNCD RCN
162	=0
163	=0
164	=0
165	=0
166	=0
167	=0
168	=0
169	=0
170	=0
171	=0
172	=0
173	=0
174	=0
175	
176	
177	
178	UNCD RCN
179	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
180	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
181	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
182	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
183	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
184	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
185	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
186	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
187	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
188	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
189	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
190	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
191	=IF(DIM_11=4,IF(OR(DIM_18=3,DIM_19=5),INDEX(RFLEAK,1)*DURSHT*Stream_91*VUCRSPL,INDEX(RFLEAK,2)*DURSHT*Stream_91*VUCRSPL)+VUCRC*Stream_91,0)
192	
193	
194	
195	
196	
197	
198	
199	
200	
201	
202	
203	
204	
205	
206	
207	
208	
209	
210	
211	
212	MELTER
213	RELEASE
214	=MELTER_RELEASE
215	=MELTER_RELEASE
216	=MELTER_RELEASE
217	=MELTER_RELEASE
218	=MELTER_RELEASE
219	=MELTER_RELEASE
220	=MELTER_RELEASE
221	=MELTER_RELEASE
222	=MELTER_RELEASE
223	=MELTER_RELEASE
224	=MELTER_RELEASE
225	=MELTER_RELEASE
226	=MELTER_RELEASE
227	=SUM(R214:R226)
228	



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S	
T53	=IF(DIM_9=7,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T54	=IF(DIM_9=7,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T55	=IF(DIM_9=7,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T56	=IF(DIM_9=7,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T57	=IF(DIM_9=7,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T58	
T59	
T60	
T61	OVERFLOW
T62	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T63	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T64	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T65	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T66	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T67	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T68	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T69	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T70	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T71	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T72	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T73	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T74	=IF(DIM_10=6,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_7*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_7*INDEX(RFLEAK,2)*DURSHT),0)
T75	
T76	
T77	
T78	OVERFLOW
T79	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T80	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T81	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T82	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T83	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T84	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T85	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T86	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T87	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T88	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T89	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T90	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T91	=IF(DIM_11=5,IF(OR(DIM_18=3,DIM_18=5),VOVFL*Stream_91*INDEX(RFLEAK,1)*DURSHT,VOVFL*Stream_91*INDEX(RFLEAK,2)*DURSHT),0)
T92	
T93	
T94	SPC
T95	DEF.
T96	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
T97	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
T98	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
T99	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
Z00	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
Z01	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
Z02	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
Z03	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
Z04	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
Z05	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
Z06	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
Z07	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
Z08	=IF(DIM_13=1,(((RLEXSPC*Stream_3yRHO)/T74:T86),0)
Z09	=SUM(S196:S208)
Z10	
Z11	
Z12	TOTAL
Z13	RELEASE (CI)
Z14	=SUM(G214:R214)+U196
Z15	=SUM(G215:R215)+U197
Z16	=SUM(G216:R216)+U198
Z17	=SUM(G217:R217)+U199
Z18	=SUM(G218:R218)+U200
Z19	=SUM(G219:R219)+U201
Z20	=SUM(G220:R220)+U202
Z21	=SUM(G221:R221)+U203
Z22	=SUM(G222:R222)+U204
Z23	=SUM(G223:R223)+U205
Z24	=SUM(G224:R224)+U206
Z25	=SUM(G225:R225)+U207
Z26	=SUM(G226:R226)+U208
Z27	=SUM(G227:R227)+U209
Z28	



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	U	V
153	=(H145:H157+J145:J157+L145:L157+M145:M157+O145:O157+P145:P157+Q145:Q157+R145:R157+S145:S157)/(T145:T157)	
154	=(H145:H157+J145:J157+L145:L157+M145:M157+O145:O157+P145:P157+Q145:Q157+R145:R157+S145:S157)/(T145:T157)	
155	=(H145:H157+J145:J157+L145:L157+M145:M157+O145:O157+P145:P157+Q145:Q157+R145:R157+S145:S157)/(T145:T157)	
156	=(H145:H157+J145:J157+L145:L157+M145:M157+O145:O157+P145:P157+Q145:Q157+R145:R157+S145:S157)/(T145:T157)	
157	=(H145:H157+J145:J157+L145:L157+M145:M157+O145:O157+P145:P157+Q145:Q157+R145:R157+S145:S157)/(T145:T157)	
158		
159		
160	MFT	
161	RELEASE	
162	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
163	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
164	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
165	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
166	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
167	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
168	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
169	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
170	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
171	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
172	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
173	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
174	=(H162:H174+J162:J174+L162:L174+M162:M174+O162:O174+P162:P174+Q162:Q174+R162:R174+S162:S174)/(T162:T174)	
175		
176		
177	RCT	
178	RELEASE	
179	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
180	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
181	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
182	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
183	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
184	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
185	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
186	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
187	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
188	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
189	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
190	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
191	=(H179:H191+J179:J191+L179:L191+M179:M191+O179:O191+P179:P191+Q179:Q191+R179:R191+S179:S191)/(T179:T191)	
192		
193		
194	TOTAL	
195	EFFECTS	
196	=T196+S196	
197	=T197+S197	
198	=T198+S198	
199	=T199+S199	
Z00	=T200+S200	
Z01	=T201+S201	
Z02	=T202+S202	
Z03	=T203+S203	
Z04	=T204+S204	
Z05	=T205+S205	
Z06	=T206+S206	
Z07	=T207+S207	
Z08	=T208+S208	
Z09	=SUM(U196:U208)	
Z10		
Z11		
Z12		
Z13		
Z14		
Z15		
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Z28		

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	W	X	Y
153		Stream 1	Stream 3
154	H3	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
155	SR90	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
156	RU106	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
157	CS134	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
158	CS137	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
159	CE144	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
160	PM147	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
161	PU238	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
162	PU239	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
163	PU240	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
164	PU241	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
165	AM241	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
166	CM244	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
167			
168			
169			
170	CB - Modes A&B		
171		C/gal	C/gal
172	isotope	Stream 1	Stream 3
173	H3	0.0000193	0
174	SR90	40.5	0
175	RU106	2	0
176	CS134	0.141	0
177	CS137	0.114	0
178	CE144	8.74	0
179	PM147	21.4	0
180	PU238	1.3	0
181	PU239	0.0113	0
182	PU240	0.00759	0
183	PU241	1.46	0
184	AM241	0.00947	0
185	CM244	0.094	0
186			
187			
188	CB - Mode C		
189		Stream 1	Stream 3
190	H3	0.0000193	0.0000957
191	SR90	40.5	0.427
192	RU106	2	0.0000336
193	CS134	0.141	0.178
194	CS137	1.34	49.2
195	CE144	8.74	0.0000547
196	PM147	21.4	0.00703
197	PU238	1.3	0.0163
198	PU239	0.0113	0.000154
199	PU240	0.00759	0.000104
200	PU241	1.46	0.0124
201	AM241	0.00947	0.000257
202	CM244	0.094	0.00129
203			
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	Z	AA	AB
153	Stream 7	Stream 18	Stream 19
154	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
155	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
156	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
157	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
158	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
159	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
160	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
161	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
162	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
163	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
164	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
165	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
166	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
167			
168			
169			
170			
171	Ci/gal	Ci/gal	Ci/gal
172	Stream 7	Stream 18	Stream 19
173	0.0000535	0	0
174	35.4	0	0
175	1.73	0	0
176	0.284	0	0
177	1.3578	0	0
178	7.53	0	0
179	18.5	0	0
180	1.13	0	0
181	0.00984	0	0
182	0.00664	0	0
183	1.27	0	0
184	0.0084	0	0
185	0.0822	0	0
186			
187			
188			
189	Stream 7	Stream 18	Stream 19
190	0.0000535	0	0
191	35.4	0	0
192	1.73	0	0
193	0.284	0	0
194	46.4	0	0
195	7.53	0	0
196	18.5	0	0
197	1.13	0	0
198	0.00984	0	0
199	0.00664	0	0
200	1.27	0	0
201	0.0084	0	0
202	0.0822	0	0
203			
204			
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206			
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	AC	AD	AE
T53	Stream 23	Stream 24	Stream 91
T54	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T55	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T56	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T57	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T58	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T59	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T60	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T61	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T62	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T63	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T64	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T65	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T66	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
T67			
T68			
T69			
T70			
T71	CVR*3	C/ib	C/gal
T72	Stream 23	Stream 24	Stream 91
T73	0.00000003	0	0.0000234
T74	0.000654	12.6	0.0804
T75	0.000635	0.607	0.00767
T76	0.0000573	0.0909	0.00705
T77	0.00027342	0.43524	0.033666
T78	0.000139	2.66	0.0171
T79	0.000341	6.52	0.042
T80	0.0000209	0.4	0.00257
T81	0.000000182	0.00348	0.0000224
T82	0.000000123	0.00234	0.0000151
T83	0.0000235	0.45	0.00289
T84	0.000000155	0.00297	0.0000191
T85	0.00000152	0.029	0.000187
T86			
T87			
T88			
T89	Stream 23	Stream 24	Stream 91
T90	0.00000003	0	0.0000234
T91	0.000654	12.6	0.0804
T92	0.0000637	0.607	0.00767
T93	0.0000573	0.0909	0.00705
T94	0.00934	14.9	1.15
T95	0.000139	2.66	0.0171
T96	0.000341	6.52	0.042
T97	0.0000209	0.4	0.00257
T98	0.000000182	0.00348	0.0000224
T99	0.000000123	0.00234	0.0000151
Z00	0.0000235	0.45	0.00289
Z01	0.000000155	0.00297	0.0000191
Z02	0.00000152	0.029	0.000187
Z03			
Z04			
Z05			
Z06			
Z07			
Z08			
Z09			
Z10			
Z11			
Z12			
Z13			
Z14			
Z15			
Z16			
Z17			
Z18			
Z19			
Z20			
Z21			
Z22			
Z23			
Z24			
Z25			
Z26			
Z27			
Z28			

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	AF	AG	AH
153	Stream 201	Stream 212	Stream 222
154	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
155	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
156	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
157	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
158	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
159	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
160	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
161	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
162	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
163	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
164	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
165	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
166	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)	=IF(Operation_Mode=1,Mode_AB,Mode_C)
167			
168			
169			
170			
171	Ci/gal	Ci/gal	Ci/gal
172	Stream 201	Stream 212	Stream 222
173	0	0	0
174	0	0	0
175	0	0	0
176	0	0	0
177	0	0	0
178	0	0	0
179	0	0	0
180	0	0	0
181	0	0	0
182	0	0	0
183	0	0	0
184	0	0	0
185	0	0	0
186			
187			
188			
189	Stream 201	Stream 212	Stream 222
190	0.0000906	0.00000258	0.00000216
191	0.399	0.0000000234	0.000000000000824
192	0.0000314	0.000000000000184	0.00000000000000649
193	0.166	0.000000000974	0.000000000000343
194	46	0.00000269658	0.000000000949554
195	0.0000511	0.00000000000003	0.00000000000000105
196	0.00656	0.0000000000385	0.000000000000136
197	0.0153	0.0000000000897	0.000000000000315
198	0.000144	0.00000000000846	0.0000000000000298
199	0.0000971	0.00000000000057	0.000000000000002
200	0.0116	0.0000000000683	0.000000000000024
201	0.00024	0.0000000000141	0.0000000000000495
202	0.0012	0.0000000000705	0.000000000000248
203			
204			
205			
206			
207			
208			
209			
210			
211			
212			
213			
214			
215			
216			
217			
218			
219			
220			
221			
222			
223			
224			
225			
226			
227			
228			

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	A	B	C
Z29			
Z30			
Z31			
Z32			
Z33			
Z34			
Z35			
Z36			
Z37			
Z38			
Z39			
Z40			
Z41			
Z42			
Z43			
Z44			
Z45			



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	D	E	F	G
Z29				
Z30				TOTAL
Z31			DOSE	RELEASE (CI)
Z32			H3	=S214
Z33			SR90	=S215
Z34			RU106	=S216
Z35			CS134	=S217
Z36			CS137	=S218
Z37			CE144	=S219
Z38			PM147	=S220
Z39			PU238	=S221
Z40			PU239	=S222
Z41			PU240	=S223
Z42			PU241	=S224
Z43			AM241	=S225
Z44			CM244	=S226
Z45			TOTAL	=SUM(G232:G244)

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H		I
Z29		
Z30		
Z31	STACK	ONSITE DCF (REMCI)
Z32	0.00000401	VIT
Z33	0.00549	0.0000016
Z34	0.00186	0.0218
Z35	0.000211	0.00739
Z36	0.000135	0.000796
Z37	0.00148	0.000538
Z38	0.000144	0.00589
Z39	1.94	0.000571
Z40	2.15	7.73
Z41	2.15	8.57
Z42	0.0422	8.57
Z43	2.2	0.168
Z44	1.14	8.74
Z45		4.54

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	J	K
Z29		
Z30		
Z31	LPPP	STACK
Z32	0.0000016	0.00000141
Z33	0.0218	0.00193
Z34	0.00739	0.000652
Z35	0.000796	0.0000704
Z36	0.000538	0.0000474
Z37	0.00588	0.000519
Z38	0.000571	0.0000504
Z39	7.73	0.682
Z40	8.57	0.756
Z41	8.57	0.756
Z42	0.168	0.0148
Z43	8.74	0.771
Z44	4.64	0.4
Z45		

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L	
Z29	
Z30	OFFSITE DCF (REM/CI)
Z31	VIT
Z32	0.00000022
Z33	0.00301
Z34	0.00102
Z35	0.00011
Z36	0.0000741
Z37	0.000811
Z38	0.0000788
Z39	1.07
Z40	1.18
Z41	1.18
Z42	0.0232
Z43	1.2
Z44	0.625
Z45	

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	M	N
Z29		
Z30		ONSITE DOSE
Z31	LPPP	(rem)
Z32	0.000000212	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z33	0.00291	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z34	0.000984	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z35	0.000106	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z36	0.0000716	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z37	0.000783	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z38	0.000076	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z39	1.03	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z40	1.14	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z41	1.14	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z42	0.0224	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z43	1.16	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z44	0.604	=G232:G244*INDEX(ONSITE_DCF,0,RELEASE_LOCATION)
Z45		=SUM(N232:N244)

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	0
Z29	
Z30	OFFSITE DOSE
Z31	(rem)
Z32	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z33	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z34	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z35	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z36	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z37	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z38	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z39	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z40	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z41	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z42	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z43	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z44	=G232:G244*INDEX(OFFSITE_DCF,0,RELEASE_LOCATION)
Z45	=SUM(O232:O244)

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P	
Z29	
Z30	Sequence
Z31	Frequency
Z32	
Z33	
Z34	
Z35	
Z36	
Z37	
Z38	
Z39	
Z40	
Z41	
Z42	
Z43	
Z44	
Z45	0.007

	Q
229	
230	
231	
232	
233	
234	
235	
236	
237	
238	
239	
240	
241	
242	
243	
244	
245	



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	R
Z29	
Z30	
Z31	
Z32	
Z33	
Z34	
Z35	
Z36	
Z37	
Z38	RELEASE LOCATION
Z39	1
Z40	2
Z41	3
Z42	
Z43	
Z44	
Z45	

	S
Z29	
Z30	
Z31	
Z32	
Z33	
Z34	
Z35	
Z36	
Z37	
Z38 2	
Z39 STACK	
Z40 VIT	
Z41 LPPP	
Z42	
Z43	
Z44	
Z45	

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	T
Z29	
Z30	
Z31	
Z32	
Z33	
Z34	
Z35	
Z36	
Z37	
Z38	
Z39	
Z40	
Z41	
Z42	
Z43	
Z44	
Z45	

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	U	V
Z29		
Z30		
Z31		
Z32		
Z33		
Z34		
Z35		
Z36		
Z37		
Z38		
Z39		
Z40		
Z41		
Z42		
Z43		
Z44		
Z45		

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	W	X	Y
Z29			
Z30			
Z31			
Z32			
Z33			
Z34			
Z35			
Z36			
Z37			
Z38			
Z39			
Z40			
Z41			
Z42			
Z43			
Z44			
Z45			

	Z	AA	AB
Z29			
Z30			
Z31			
Z32			
Z33			
Z34			
Z35			
Z36			
Z37			
Z38			
Z39			
Z40			
Z41			
Z42			
Z43			
Z44			
Z45			

	AC	AD	AE
Z29			
Z30			
Z31			
Z32			
Z33			
Z34			
Z35			
Z36			
Z37			
Z38			
Z39			
Z40			
Z41			
Z42			
Z43			
Z44			
Z45			

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	AF	AG	AH
Z29			
Z30			
Z31			
Z32			
Z33			
Z34			
Z35			
Z36			
Z37			
Z38			
Z39			
Z40			
Z41			
Z42			
Z43			
Z44			
Z45			



**APPENDIX 4: TEST CASES CONSEQUENCE OUTPUT**

*DWPF*ASTXL: Defense Waste Processing Facility Algorithm for Source Terms for Excel

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Isotope	No Release		SRAT Detonation		SRAT Deflagration		SRAT Detonation, Zone 1 Vent. Fails	
	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)
H3	0.00E+00	0.00E+00	9.42E-07	1.29E-07	9.42E-07	1.29E-07	9.42E-07	1.29E-07
SR90	0.00E+00	0.00E+00	3.16E-02	4.37E-03	4.68E-03	6.46E-04	3.02E+00	4.17E-01
RU106	0.00E+00	0.00E+00	5.24E-04	7.23E-05	7.75E-05	1.07E-05	5.00E-02	6.90E-03
CS134	0.00E+00	0.00E+00	9.26E-06	1.28E-06	1.37E-06	1.89E-07	8.84E-04	1.22E-04
CS137	0.00E+00	0.00E+00	1.02E-03	1.41E-04	1.51E-04	2.08E-05	9.76E-02	1.34E-02
CE144	0.00E+00	0.00E+00	1.81E-03	2.50E-04	2.68E-04	3.70E-05	1.73E-01	2.39E-02
PM147	0.00E+00	0.00E+00	4.33E-04	5.97E-05	6.40E-05	8.84E-06	4.13E-02	5.70E-03
PU238	0.00E+00	0.00E+00	3.58E-01	4.95E-02	5.30E-02	7.33E-03	3.41E+01	4.73E+00
PU239	0.00E+00	0.00E+00	3.46E-03	4.76E-04	5.11E-04	7.04E-05	3.30E-01	4.54E-02
PU240	0.00E+00	0.00E+00	2.33E-03	3.21E-04	3.45E-04	4.75E-05	2.22E-01	3.06E-02
PU241	0.00E+00	0.00E+00	8.74E-03	1.21E-03	1.29E-03	1.79E-04	8.34E-01	1.15E-01
AM241	0.00E+00	0.00E+00	3.01E-03	4.13E-04	4.45E-04	6.11E-05	2.87E-01	3.94E-02
CM244	0.00E+00	0.00E+00	1.53E-02	2.10E-03	2.26E-03	3.11E-04	1.46E+00	2.01E-01
<b>TOTAL</b>	0.00E+00	0.00E+00	4.26E-01	5.90E-02	6.31E-02	8.72E-03	4.07E+01	5.62E+00

Isotope	PR Deflagration, Vit. Breach w/o Vent.		PR Deflagration, Vit. Breach w/o Vent., Fire		SPC Deflagration		PPST Deflagration	
	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)
H3	1.28E-06	1.76E-07	1.28E-06	1.76E-07	1.51E-10	2.08E-11	1.91E-07	2.63E-08
SR90	4.04E-03	5.58E-04	1.03E-02	1.42E-03	4.60E-05	6.35E-06	3.64E-03	5.03E-04
RU106	1.08E-07	1.49E-08	2.74E-07	3.78E-08	1.23E-09	1.69E-10	6.10E-05	8.42E-06
CS134	6.15E-05	8.50E-06	1.56E-04	2.16E-05	7.00E-07	9.68E-08	4.63E-07	6.40E-08
CS137	1.15E-02	1.58E-03	2.92E-02	4.02E-03	1.31E-04	1.80E-05	2.98E-06	4.10E-07
CE144	1.40E-08	1.93E-09	3.54E-08	4.89E-09	1.59E-10	2.19E-11	2.12E-04	2.93E-05
PM147	1.74E-06	2.41E-07	4.42E-06	6.11E-07	1.98E-08	2.74E-09	5.04E-05	6.96E-06
PU238	5.47E-02	7.57E-03	1.39E-01	1.92E-02	6.23E-04	8.62E-05	4.15E-02	5.74E-03
PU239	5.73E-04	7.89E-05	1.45E-03	2.00E-04	6.52E-06	8.98E-07	4.00E-04	5.50E-05
PU240	3.87E-04	5.33E-05	9.82E-04	1.35E-04	4.41E-06	6.07E-07	2.68E-04	3.70E-05
PU241	9.04E-04	1.25E-04	2.30E-03	3.17E-04	1.03E-05	1.42E-06	1.01E-03	1.40E-04
AM241	9.75E-04	1.34E-04	2.48E-03	3.40E-04	1.11E-05	1.52E-06	3.42E-04	4.69E-05
CM244	2.54E-03	3.50E-04	6.45E-03	8.89E-04	2.89E-05	3.98E-06	1.76E-03	2.42E-04
<b>TOTAL</b>	7.57E-02	1.05E-02	1.92E-01	2.66E-02	8.62E-04	1.19E-04	4.92E-02	6.81E-03

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Isotope	<i>PPST Deflagration, LPPP Vent. Fails</i>		<i>OWST Tornado</i>		<i>OWST Deflagration</i>		<i>PPPT Detonation</i>	
	Onsite	Offsite	Onsite	Offsite	Onsite	Offsite	Onsite	Offsite
	(REM)	(REM)	(REM)	(REM)	(REM)	(REM)	(REM)	(REM)
H3	1.91E-07	2.63E-08	5.18E-08	7.13E-09	5.18E-08	7.13E-09	9.36E-07	1.29E-07
SR90	5.42E-01	7.48E-02	1.02E-11	1.41E-12	2.69E-09	3.72E-10	2.44E-04	3.38E-05
RU106	9.07E-03	1.25E-03	2.73E-16	3.77E-17	7.19E-14	9.93E-15	6.52E-09	9.00E-10
CS134	6.88E-05	9.51E-06	1.56E-13	2.15E-14	4.10E-11	5.66E-12	3.71E-06	5.13E-07
CS137	4.42E-04	6.09E-05	2.91E-11	4.01E-12	7.67E-09	1.06E-09	6.96E-04	9.58E-05
CE144	3.15E-02	4.35E-03	3.52E-17	4.85E-18	9.26E-15	1.28E-15	8.44E-10	1.16E-10
PM147	7.49E-03	1.03E-03	4.43E-15	6.11E-16	1.16E-12	1.61E-13	1.05E-07	1.45E-08
PU238	6.16E+00	8.53E-01	1.39E-10	1.92E-11	3.65E-08	5.06E-09	3.32E-03	4.60E-04
PU239	5.94E-02	8.18E-03	1.46E-12	2.00E-13	3.83E-10	5.27E-11	3.47E-05	4.78E-06
PU240	3.99E-02	5.49E-03	9.77E-13	1.35E-13	2.57E-10	3.54E-11	2.34E-05	3.22E-06
PU241	1.50E-01	2.08E-02	2.30E-12	3.17E-13	6.05E-10	8.35E-11	5.48E-05	7.56E-06
AM241	5.08E-02	6.97E-03	2.47E-12	3.39E-13	6.49E-10	8.91E-11	5.90E-05	8.09E-06
CM244	2.62E-01	3.60E-02	6.42E-12	8.84E-13	1.69E-09	2.33E-10	1.53E-04	2.11E-05
<b>TOTAL</b>	<b>7.32E+00</b>	<b>1.01E+00</b>	<b>5.20E-08</b>	<b>7.15E-09</b>	<b>1.02E-07</b>	<b>1.41E-08</b>	<b>4.59E-03</b>	<b>6.35E-04</b>

Isotope	<i>PPPT Detonation, LPPP Breach w/o Vent.</i>		<i>PR Uncontrolled Reaction</i>		<i>PRFT Leak</i>		<i>PRBT Overflow</i>	
	Onsite	Offsite	Onsite	Offsite	Onsite	Offsite	Onsite	Offsite
	(REM)	(REM)	(REM)	(REM)	(REM)	(REM)	(REM)	(REM)
H3	9.36E-07	1.29E-07	5.27E-12	7.25E-13	1.38E-14	1.89E-15	4.52E-13	6.22E-14
SR90	4.70E-02	6.49E-03	1.60E-06	2.21E-07	4.13E-09	5.71E-10	1.37E-07	1.90E-08
RU106	1.25E-06	1.73E-07	4.27E-11	5.90E-12	1.10E-13	1.52E-14	3.67E-12	5.06E-13
CS134	7.14E-04	9.86E-05	2.44E-08	3.37E-09	6.28E-11	8.68E-12	2.09E-09	2.89E-10
CS137	1.34E-01	1.84E-02	4.55E-06	6.27E-07	1.18E-08	1.62E-09	3.91E-07	5.38E-08
CE144	1.62E-07	2.24E-08	5.53E-12	7.63E-13	1.43E-14	1.97E-15	4.75E-13	6.55E-14
PM147	2.02E-05	2.79E-06	6.91E-10	9.53E-11	1.78E-12	2.46E-13	5.93E-11	8.18E-12
PU238	6.39E-01	8.84E-02	2.17E-05	3.00E-06	5.62E-08	7.78E-09	1.86E-06	2.57E-07
PU239	6.66E-03	9.18E-04	2.27E-07	3.13E-08	5.86E-10	8.07E-11	1.95E-08	2.68E-09
PU240	4.49E-03	6.19E-04	1.53E-07	2.11E-08	3.95E-10	5.44E-11	1.32E-08	1.81E-09
PU241	1.05E-02	1.45E-03	3.58E-07	4.95E-08	9.26E-10	1.28E-10	3.08E-08	4.25E-09
AM241	1.13E-02	1.56E-03	3.86E-07	5.31E-08	9.97E-10	1.37E-10	3.32E-08	4.55E-09
CM244	2.94E-02	4.05E-03	1.01E-06	1.39E-07	2.59E-09	3.56E-10	8.65E-08	1.19E-08
<b>TOTAL</b>	<b>8.82E-01</b>	<b>1.22E-01</b>	<b>3.00E-05</b>	<b>4.15E-06</b>	<b>7.77E-08</b>	<b>1.07E-08</b>	<b>2.57E-06</b>	<b>3.56E-07</b>

DWPF<sub>FASTXL</sub>: Defense Waste Processing Facility Algorithm for Source Terms for Excel

WSRC-TR-94-0532

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Isotope	Total Melter Spill		Total Melter Spill, Zone 1 Vent. Fails		Partial Melter Spill, Vit. Collapse		MFT Splash	
	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)
H3	1.70E-12	2.34E-13	1.70E-12	2.34E-13	1.70E-12	2.34E-13	9.42E-07	1.29E-07
SR90	4.72E-02	6.51E-03	4.72E+00	6.51E-01	1.38E-01	1.91E-02	3.31E-03	4.57E-04
RU106	2.23E-04	3.08E-05	2.23E-02	3.08E-03	6.69E-04	9.23E-05	5.49E-05	7.57E-06
CS134	8.10E-09	1.12E-09	8.10E-07	1.12E-07	1.62E-06	2.24E-07	9.70E-07	1.34E-07
CS137	3.12E-03	4.30E-04	3.12E-01	4.30E-02	9.29E-03	1.28E-03	1.07E-04	1.48E-05
CE144	1.45E-07	2.00E-08	1.45E-05	2.00E-06	2.90E-05	4.00E-06	1.90E-04	2.62E-05
PM147	3.46E-08	4.77E-09	3.46E-06	4.77E-07	6.91E-06	9.54E-07	4.53E-05	6.26E-06
PU238	2.87E-05	3.97E-06	2.87E-03	3.97E-04	5.74E-03	7.94E-04	3.75E-02	5.19E-03
PU239	2.77E-07	3.81E-08	2.77E-05	3.81E-06	5.54E-05	7.62E-06	3.62E-04	4.98E-05
PU240	1.87E-07	2.58E-08	1.87E-05	2.58E-06	3.74E-05	5.15E-06	2.44E-04	3.36E-05
PU241	7.01E-07	9.68E-08	7.01E-05	9.68E-06	1.40E-04	1.94E-05	9.15E-04	1.26E-04
AM241	2.40E-07	3.30E-08	2.40E-05	3.30E-06	4.81E-05	6.60E-06	3.15E-04	4.33E-05
CM244	1.22E-06	1.69E-07	1.22E-04	1.69E-05	2.45E-04	3.37E-05	1.60E-03	2.20E-04
TOTAL	5.05E-02	6.98E-03	5.05E+00	6.98E-01	1.54E-01	2.13E-02	4.46E-02	6.17E-03

Isotope	MFT Splash, All Cell Covers Fail		RCT Vented, Vit. Breach w/ Vent.		PPRT Overflow		Melter Offgas Release	
	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)	Onsite (REM)	Offsite (REM)
H3	9.42E-07	1.29E-07	1.57E-13	2.15E-14	1.11E-13	1.52E-14	2.03E-07	2.78E-08
SR90	3.31E-03	4.57E-04	3.66E-08	5.06E-09	2.59E-08	3.57E-09	3.01E-01	4.15E-02
RU106	5.49E-05	7.57E-06	1.19E-09	1.64E-10	8.37E-10	1.15E-10	9.93E-03	1.37E-03
CS134	9.70E-07	1.34E-07	1.17E-10	1.62E-11	8.28E-11	1.14E-11	9.62E-04	1.33E-04
CS137	1.07E-04	1.48E-05	1.29E-08	1.78E-09	9.13E-09	1.26E-09	1.06E-01	1.46E-02
CE144	1.90E-04	2.62E-05	2.10E-09	2.90E-10	1.48E-09	2.05E-10	1.72E-02	2.38E-03
PM147	4.53E-05	6.26E-06	5.01E-10	6.92E-11	3.54E-10	4.89E-11	4.11E-03	5.67E-04
PU238	3.75E-02	5.19E-03	4.15E-07	5.75E-08	2.93E-07	4.06E-08	3.41E+00	4.72E-01
PU239	3.62E-04	4.98E-05	4.01E-09	5.53E-10	2.83E-09	3.90E-10	3.29E-02	4.53E-03
PU240	2.44E-04	3.36E-05	2.71E-09	3.73E-10	1.91E-09	2.63E-10	2.22E-02	3.06E-03
PU241	9.15E-04	1.26E-04	1.02E-08	1.40E-09	7.17E-09	9.90E-10	8.33E-02	1.15E-02
AM241	3.15E-04	4.33E-05	3.49E-09	4.79E-10	2.46E-09	3.38E-10	2.86E-02	3.92E-03
CM244	1.60E-03	2.20E-04	1.78E-08	2.44E-09	1.25E-08	1.73E-09	1.46E-01	2.00E-02
TOTAL	4.46E-02	6.17E-03	5.07E-07	7.01E-08	3.58E-07	4.95E-08	4.16E+00	5.75E-01

*SME Detonation,  
MFT Deflagration,  
SRAT Splash, Vit.  
Breach w/o Vent.*

Isotope	Onsite (REM)	Offsite (REM)
H3	2.82E-06	3.88E-07
SR90	2.99E+00	4.13E-01
RU106	4.96E-02	6.84E-03
CS134	8.77E-04	1.21E-04
CS137	9.68E-02	1.33E-02
CE144	1.72E-01	2.37E-02
PM147	4.10E-02	5.65E-03
PU238	3.39E+01	4.69E+00
PU239	3.27E-01	4.50E-02
PU240	2.21E-01	3.04E-02
PU241	8.28E-01	1.14E-01
AM241	2.85E-01	3.91E-02
CM244	1.45E+00	1.99E-01
<b>TOTAL</b>	<b>4.03E+01</b>	<b>5.58E+00</b>

## APPENDIX 5: GLOSSARY OF ACRONYMS

APET	Accident progression event tree
CPC	Chemical process cell
DCF	Dose conversion factor
DF	Decontamination factor
EDE	Effective dose equivalent
LPPP	Low point pump pit
LPPPPT	Low point pump pit precipitate tank (also LPPT or PPPT)
LPPPRT	Low point pump pit recycle tank (also LPRT or PPRT)
LPPPST	Low point pump pit sludge tank (also LPST or PPST)
LPPT	Low point pump pit precipitate tank (also LPPPPT or PPPT)
LPRT	Low point pump pit recycle tank (also LPPPRT or PPRT)
LPST	Low point pump pit sludge tank (also LPPPST or PPST)
MFT	Melter feed tank
MOG	Melter offgas
OECT	Organic evaporator condensate tank
OEV	Organic evaporator
OWST	Organic waste storage tank
PPPT	Low point pump pit precipitate tank (also LPPPPT or LPPT)
PPRT	Low point pump pit recycle tank (also LPPPRT or LPRT)
PPST	Low point pump pit sludge tank (also LPPPST or LPST)
PR	Precipitate reactor
PRBT	Precipitate reactor bottoms tank
PRFT	Precipitate reactor feed tank
RCT	Recycle collection tank
RF	Release fraction
SME	Slurry mix evaporator
SPC	Salt process cell
SRAT	Slurry receipt and adjustment tank