CARES
Version 3.0
Training Workshop
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Practice Workbook

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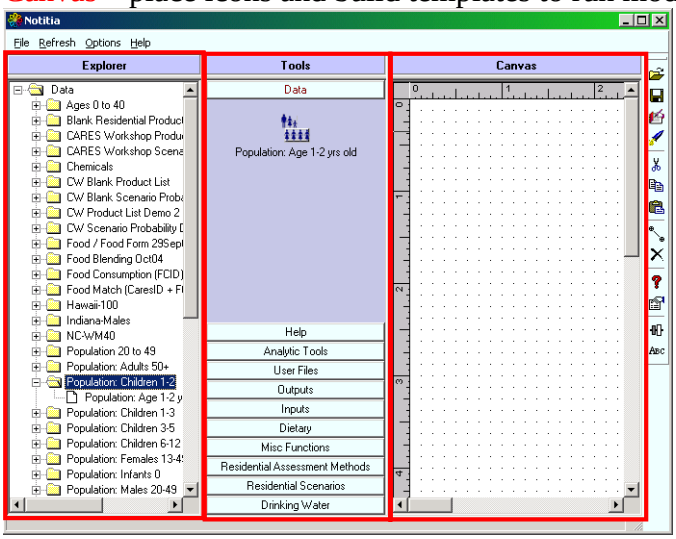
3 Work Panes
Explorer – data folders and data tables view under Tools.
Tools – displays tool tabs that have data or canvas functions.
Canvas – place icons and build templates to run models.



Notitia Data Grid Tools

Exit –Closes the current window.

Query –Opens query window to subset data table.

Stats – Opens stat window to perform select statistical functions..

Decode – Select column, click the button to see values.

Unique Values - Select column, click the button to get frequency table.

There are different file types in CARES:
*.not = Notitia™ file, permanent, data files
*.nov = CARES canvas file
*.usr = user created Notitia™ input and output files

File Management

1. All new files created in CARES will be stored in C:\Notitia\Data\UserFile
2. CARES will find any files stored in C:\Notitia\Data
3. You can rename and move files to organize.
4. All *.not and *.usr files can be opened with MS Access.
5. All *.not and *.usr files can be zipped to save space (CARES will not find them).

How to get data out of CARES:

1. In CARES, File> Save As ASCII. (slow for large files).
2. In CARES, select data grid – CTRL+C then go to Excel and Paste Special > Unicode. You get data without headings. (okay for small dataset < 100,000 records).
3. Open *.usr file using MS ACCESS and export to file.

General Practice Activities

1. How many individuals in the Reference Population are from the state of North Carolina and between ages of 20 to 49 yrs. old?

2. How many individuals in the 3-5 yrs. old population are male and female from the state of Missouri?

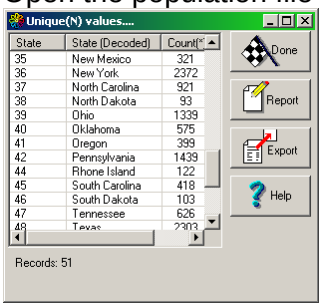
3. What is the decode dictionary values for “Units in Structure” in a population table?

4. How many Infants (< 1yrs. old) are in the Reference Population?

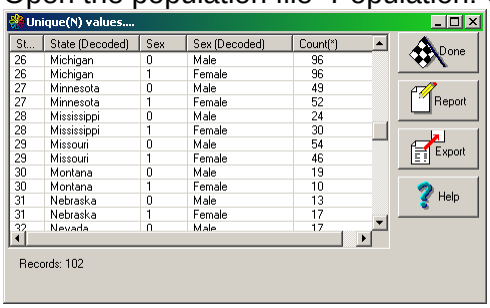
5. What is the average age of the Reference Population? Who’s the oldest?

Answers to Practice Activities

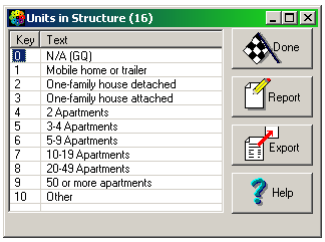
1. Answer is 921.
   Open the population file “Population 20 to 49” and do Unique Values on State.



2. Answer is males=54 and females=46.
   Open the population file “Population: Children 3-5” and do Unique Values on State and Sex.



3. Open any population file, right click on “Units in Structure” and select Decode Dictionary from submenu.



4. Answer = 20003.
   Open the population file “Population: Infants 0” and look at number of records.
   Or Open the “Reference Population file and do Unique values on age.

5. Answer: Arithmetic Mean = 26.6114; Max = 90
   Open the “Reference Population” file, click on stats tool, select Mean/Std Dev tab, double-click age variable.

Population Selector Practice Activities:

Example #1:
Create a subpopulation of “children 1-2 years old who live in California and from the white race”.

1. Move the population selector from the “Input” tab and paste it onto the canvas. Open population generator using the right click, then click “Select/Subset Population”
2. Select “Reference Population” and click the “Subset” button
3. Select “Age” from the “Field Column” and double click
4. Select the modifier “Between” then enter values 1 and for lower and upper bounds
5. Select the modifier “And”, then double click on “State” from the “Fields Column”
6. Select the modifier “=”
7. From the “Select Coded Value” menu, select “California” and click “OK”
8. Select the Modifier “And”
9. From the “Field Column” menu double click “Race” and select the modifier “=”
10. From the “Select Coded Value” menu, select “White” from the drop down list, then click “OK”. You should see “[82] Between 1 and 2 And [7] = 6 And [8] = 1”
11. Push the “Query” button. A green/white colored table with 247 individuals appears
12. Click “Done” and you will be prompted to name the created subpopulation
13. Name the subpopulation “California white children 1-2 years old” and click “OK”

Example file is available;
C:\Notitia\Data\2009 Workshop\ CW Population California white children 1-2 yrs.usr

Example #2
Create a subpopulation of “Hawaii individuals with families of 2 members”

1. Move the population selector from the “Input” tab and paste it onto the canvas. Open population generator using the right click, then click “Select/Subset Population”
2. Select “Reference Population” and click the “Subset” button
3. Select “State” from the “Field Column” and double click
4. Select the modifier “=”
5. From the “Select Coded Value” menu, select “Hawaii” from the drop down list and click “OK”
6. Select the Modifier “And”
7. From the “Field Column” menu double click “Number of Family Members” and select the modifier “=”
8. On the “Enter Value or Field” prompt screen, enter “2”, then click “OK”. You should see the following Syntax “[7] = 15 And [72] = 2”
9. Push the “Query” button. A green/white colored table with “100” individuals appears
10. Click “Done” and you will be prompted to name the created subpopulation
11. Name the subpopulation “Hawaii subpopulation with 2 family members” and click “OK”

Example file is available;
C:\Notitia\Data\2009 Workshop\ CW Population Hawaii with 2 family members.usr

Example #3
Create a Subpopulation of “Hawaii individuals 1-2 Years Old”

Example file is available;
C:\Notitia\Data\2009 Workshop\CW CW Population Hawaii children 1-2 yrs.usr

Chemical and Toxicology Selector

Chemical Selector Practice Example
Create a new Chemical Library named Demo Chem with the following chemical information.

	Chemical CAS	Chemical Name
1	12-345-6	Terminator

Example file is available;
C:\Notitia\Data\2009 Workshop\CW Chemical (07102007 113117).usr

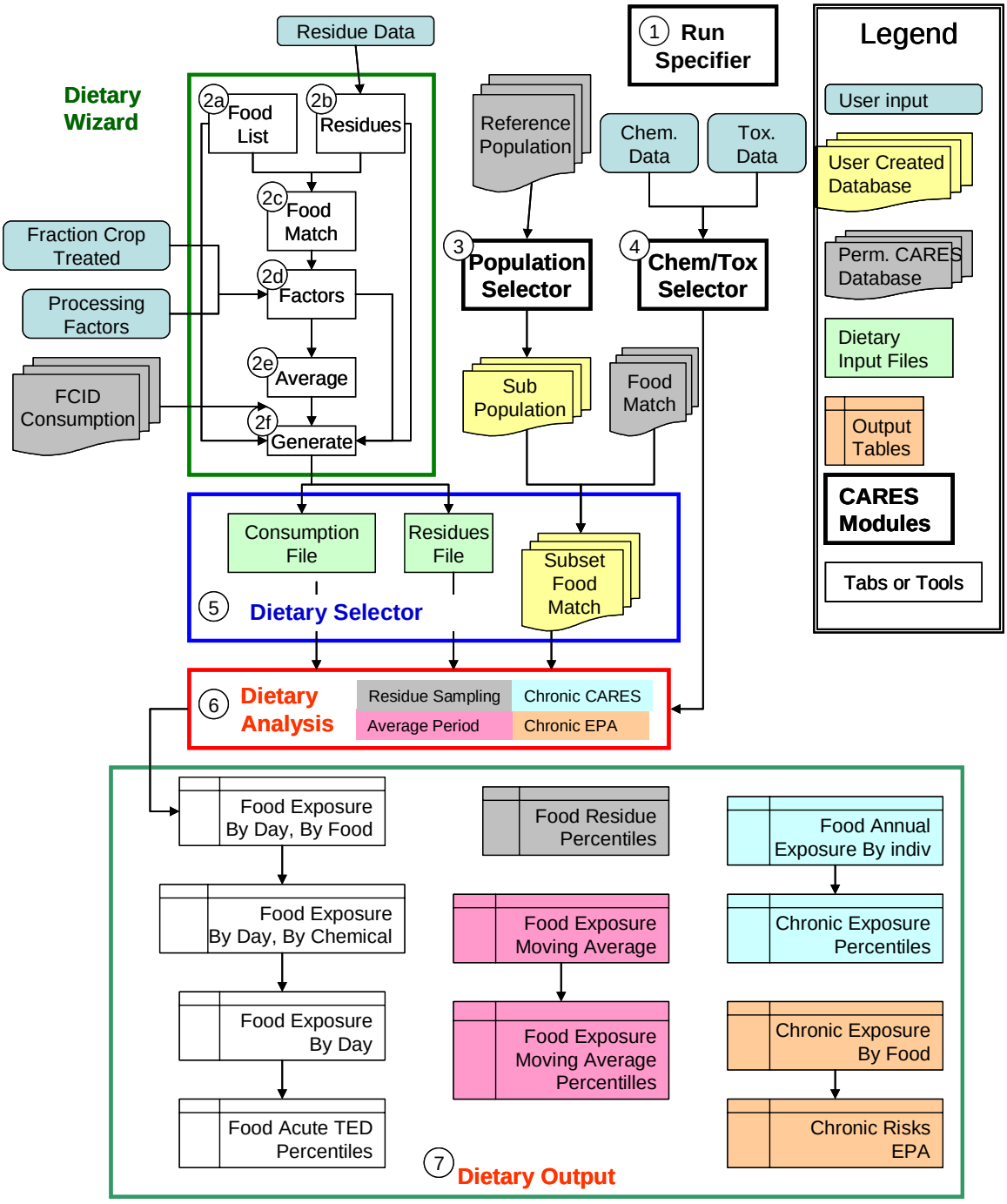
Toxicology Selector Practice Example
Create a new Toxicology Library named Demo Tox with the following toxicology information.

Chemical CAS	Exp. Period	Exp. Dur.	Route	Route-Specific NOEL	Uncertainty Factor (Acute)	Absorption Factor (0to1)	Systemic NOEL	Chronic NOEL	Uncertainty Factor (Chronic)	Qstar	Notes
12-345-6	1	0	1	2	300	0	0	0	0	0	Text
12-345-6	1	0	2	0.5	300	0	0	0	0	0	Text
12-345-6	1	0	3	0.5	300	0	0	0	0	0	Text
12-345-6	1	0	4	0.5	300	0	0	0	0	0	Text
12-345-6	1	0	5	0.05	300	0	0	0	0	0	Text
12-345-6	3	0	0	0	0	0	0	0.03	100	0.005	Text

Chemical CAS: Exposure Period: 1 = acute and 3 = chronic Exposure Duration: open text field Route: 0 = chronic, 1 = dermal, 2 = ingestion-food, 3 = ingestion-water, 4 = ingestion (H2M), 5 = inhalation Route Specific NOEL: mg/kg bw/day; left at 0 in chronic entry. Uncertainty Factor (Acute): UF and FQPA combined, left at 0 in chronic entry. Absorption Factor: not available in CARES 3.0 Systemic NOEL: not available in CARES 3.0 Chronic NOEL: mg/kg bw/day; left at 0 in acute entry. Uncertainty Factor (Chronic): UF and FQPA combined, left at 0 in acute entry. Qstar: mg/kg/day -1 Notes: open text field

Example file is available;
C:\Notitia\Data\2009 Workshop\CW Toxicology (07102007 113117).usr

Dietary Module



Dietary (Food) Example #1: (two commodities, import and data entry, FCT & MF)

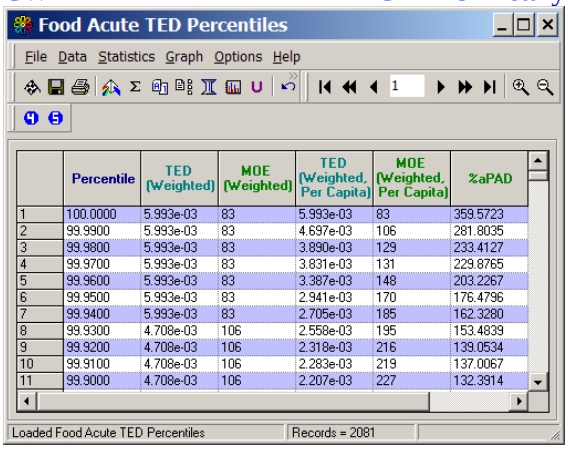
- Chemical (new): CAS = 12-345-6
- Toxicology (new): Acute = 0.5 UF = 300
  Chronic = 0.03 UF = 100 Q* =0.005
- Population: Children 1-2 (subset 100 with R. Seed =100)
- Commodities: all food forms for Carrots and Peaches (36 food forms)
- Residues Field Trial Data:

New field trial data on peaches: 0.1, 0.05, 0.2 ppm
Previous field trial data on carrots in Dietary Template imported and appended (Values= 0.1, 0.2, 0.3, 0.4, 0.5, 5@ND with LOD=0.1 ppm).
C:\Notitia\Data\2009 Workshop\Templates\CW Dietary Example #1.xls
Fraction Crop Treated:

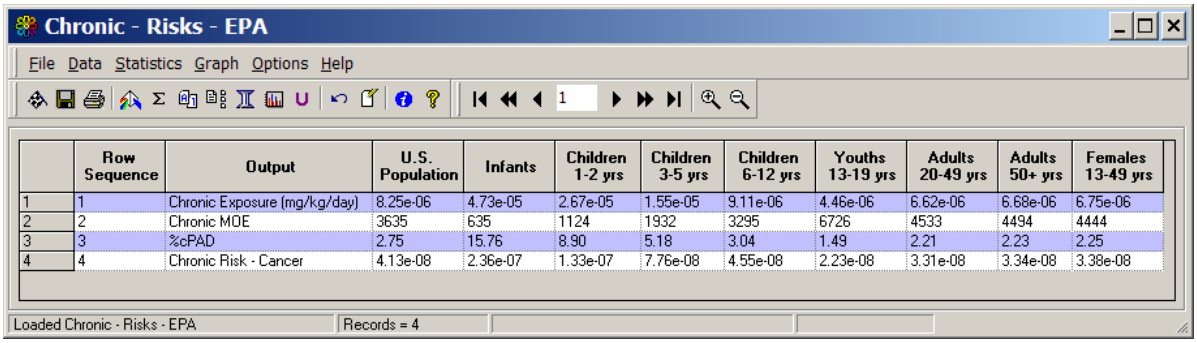
- Carrots: 0.2 (20%CT)
- Peaches: 0.1 (10%CT)

- Modifying Factors:
  - Carrot Juice: 0.1
- Set Run Parameters
  - All Outputs
  - Sampling Percentile based
  - Options – all acute and chronic

Examples are available in folder C:\Notitia\Data\2009 Workshop\
CW DIETARY EXAMPLE #1 Dietary Wizard (01192009 001023).usr – wizard file
CW DIETARY EXAMPLE #1 Food Consumption (01192009 001010).usr – consumption file
CW DIETARY EXAMPLE #1 Food Residues (01192009 001016).usr – residue file
CW DIETARY EXAMPLE #1 CARES Dietary (01192009 094541).usr – dietary output file.



	Percentile	TED (Weighted)	MOE (Weighted)	TED (Weighted, Per Capita)	MOE (Weighted, Per Capita)	%aPAD
1	100.0000	5.993e-03	83	5.993e-03	83	359.5723
2	99.9900	5.993e-03	83	4.697e-03	106	281.8035
3	99.9800	5.993e-03	83	3.890e-03	129	233.4127
4	99.9700	5.993e-03	83	3.831e-03	131	229.8765
5	99.9600	5.993e-03	83	3.387e-03	148	203.2267
6	99.9500	5.993e-03	83	2.941e-03	170	176.4796
7	99.9400	5.993e-03	83	2.705e-03	185	162.3280
8	99.9300	4.708e-03	106	2.558e-03	195	153.4839
9	99.9200	4.708e-03	106	2.318e-03	216	139.0534
10	99.9100	4.708e-03	106	2.283e-03	219	137.0067
11	99.9000	4.708e-03	106	2.207e-03	227	132.3914



	Row Sequence	Output	U.S. Population	Infants	Children 1-2 yrs	Children 3-5 yrs	Children 6-12 yrs	Youths 13-19 yrs	Adults 20-49 yrs	Adults 50+ yrs	Females 13-49 yrs
1	1	Chronic Exposure (mg/kg/day)	8.25e-06	4.73e-05	2.67e-05	1.55e-05	9.11e-06	4.46e-06	6.62e-06	6.68e-06	6.75e-06
2	2	Chronic MOE	3635	635	1124	1932	3295	6726	4533	4494	4444
3	3	%cPAD	2.75	15.76	8.90	5.18	3.04	1.49	2.21	2.23	2.25
4	4	Chronic Risk - Cancer	4.13e-08	2.36e-07	1.33e-07	7.76e-08	4.55e-08	2.23e-08	3.31e-08	3.34e-08	3.38e-08

Dietary (Food) Example #2: (two commodities, data entry, FCT & MF)

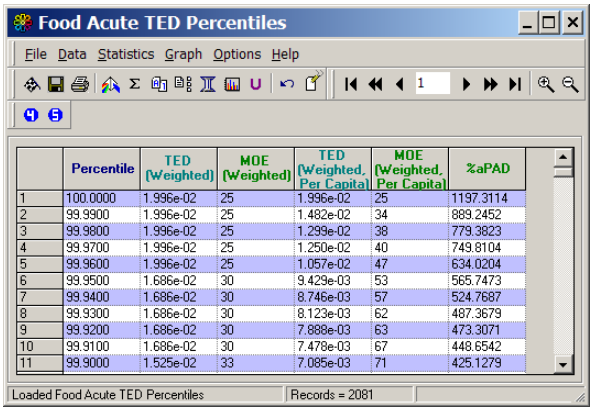
- Chemical (new): CAS = 12-345-6
- Toxicology (new): Acute = 0.5 UF = 300
  Chronic = 0.03 UF = 100 Q* =0.005
- Population: Children 1-2 (subset 100 with R. Seed =100)
- Commodities: Blueberries, Apples (47 food forms)
- Residues: Field Trial Data

Blueberries: 0.05, 0.02, 0.1, 0.3, ND, ND, 0.09, 0.4 ppm (LOD=0.01ppm)
Apples: 0.5, 0.3, 0.2, 0.09, 0.05, 0.05, 0.1, 0.4 ppm (LOD=0.01 ppm)
C:\Notitia\Data\2009 Workshop\Templates\CW Dietary Example #2.xls
Fraction Crop Treated:

  - Blueberries: 0.1 (10% CT)
  - Apples: 0.2 (20% CT)

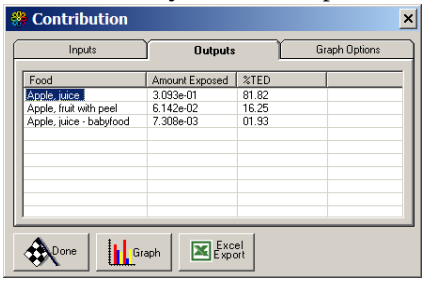
- Processing factors:
  - Apple Juice: 0.3
  - Apple Sauce: 0.1
- Set Run Parameters
  - All Outputs
  - Sampling Percentile based
  - Options – all acute and chronic

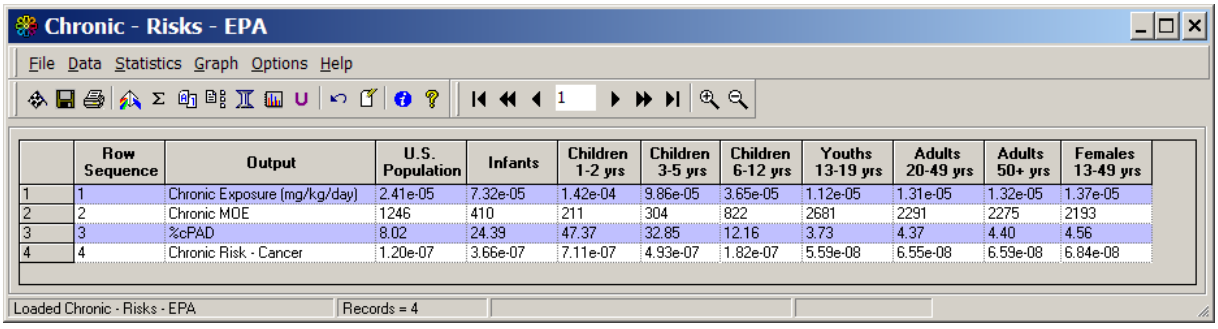
Examples are available in folder C:\Notitia\Data\2009 Workshop\
CW DIETARY EXAMPLE #2 Dietary Wizard (01182009 234049).usr – wizard file
CW DIETARY EXAMPLE #2 Food Consumption (01182009 234030).usr – consumption file
CW DIETARY EXAMPLE #2 Food Residues (01182009 234038).usr – residue file
CW DIETARY EXAMPLE #2 CARES Dietary (01192009 102108).usr – dietary output file.



	Percentile	TED (Weighted)	MOE (Weighted)	TED (Weighted, Per Capita)	MOE (Weighted, Per Capita)	%aPAD
1	100.0000	1.996e-02	25	1.996e-02	25	1197.3114
2	99.9900	1.996e-02	25	1.482e-02	34	889.2452
3	99.9800	1.996e-02	25	1.299e-02	38	779.3823
4	99.9700	1.996e-02	25	1.250e-02	40	749.8104
5	99.9600	1.996e-02	25	1.057e-02	47	634.0204
6	99.9500	1.686e-02	30	9.429e-03	53	565.7473
7	99.9400	1.686e-02	30	8.746e-03	57	524.7687
8	99.9300	1.686e-02	30	8.123e-03	62	487.3679
9	99.9200	1.686e-02	30	7.888e-03	63	473.3071
10	99.9100	1.686e-02	30	7.478e-03	67	448.6542
11	99.9000	1.525e-02	33	7.085e-03	71	425.1279

Contribution Analysis at 99.9th percentile





	Row Sequence	Output	U.S. Population	Infants	Children 1-2 yrs	Children 3-5 yrs	Children 6-12 yrs	Youths 13-19 yrs	Adults 20-49 yrs	Adults 50+ yrs	Females 13-49 yrs
1	1	Chronic Exposure (mg/kg/day)	2.41e-05	7.32e-05	1.42e-04	9.86e-05	3.65e-05	1.12e-05	1.31e-05	1.32e-05	1.37e-05
2	2	Chronic MOE	1246	410	211	304	822	2681	2291	2275	2193
3	3	%cPAD	8.02	24.39	47.37	32.85	12.16	3.73	4.37	4.40	4.56
4	4	Chronic Risk - Cancer	1.20e-07	3.66e-07	7.11e-07	4.93e-07	1.82e-07	5.59e-08	6.55e-08	6.59e-08	6.84e-08

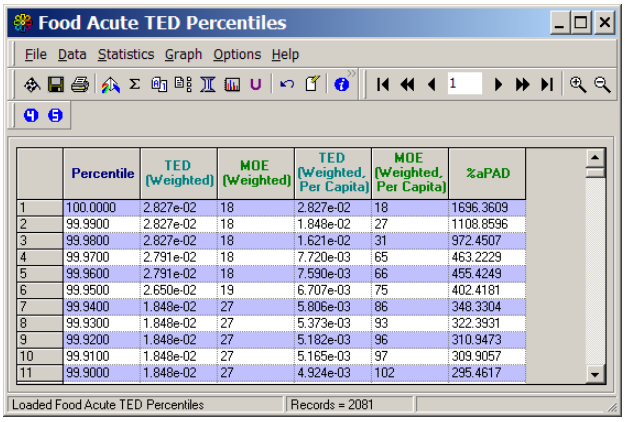
Dietary (Food) Example #3: (create chem/tox, multiple commodities, import)

- Chemical (new): CAS = 12-345-6
- Toxicology (new): Acute = 0.5 UF = 300
  Chronic = 0.03 UF = 100 Q* =0.005
- Population: Children 1-2 (subset 1000 with R. Seed =100)
- Commodities: Carrots, Oranges, Sweet Corn, Milk, Beef (204 food forms)
- Crop residues (ppm): *enter in Excel template and import*
  - Sweet Corn Field Trial: 0.02, 0.02, 0.03, 0.15, 6 ND's (LOD = 0.01)
  - Oranges Monitoring Data: 0.01, 19 ND's (LOD = 0.005)
  - Carrots Field Trial Data: 0.2, 0.3, 0.15, 0.05, 0.5, 0.4, 0.25, 0.22
  - Meat and Byproducts Tolerance: 0.02
  - Milk Tolerance: 0.01

C:\Notitia\Data\2009 Workshop\Templates\CW Dietary Example #3.xls
FCT: 100%

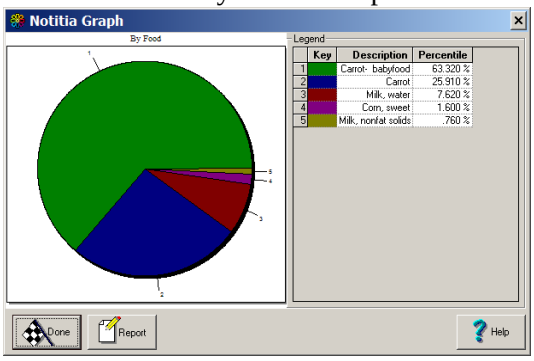
- Processing Factors: none
- Set Run Parameters
  - All Outputs
  - Sampling Percentile based
  - Options – all acute and chronic

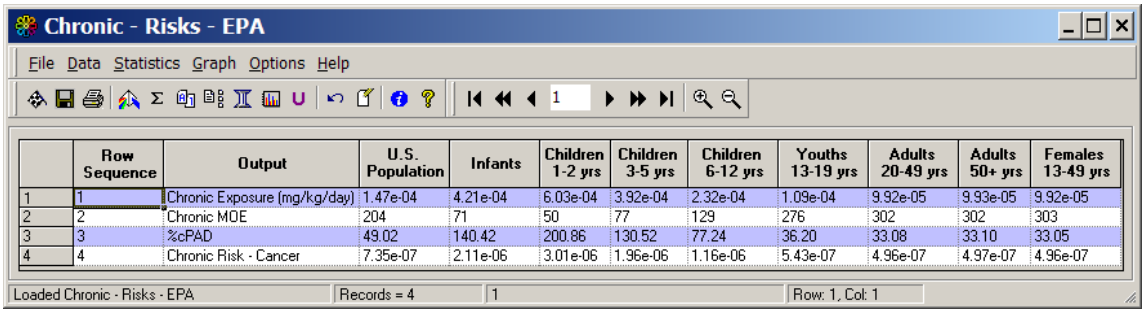
Examples are available in folder C:\Notitia\Data\2009 Workshop\
CW DIETARY EXAMPLE #2 Dietary Wizard (01182009 234049).usr – wizard file
CW DIETARY EXAMPLE #2 Food Consumption (01182009 234030).usr – consumption file
CW DIETARY EXAMPLE #2 Food Residues (01182009 234038).usr – residue file
CW DIETARY EXAMPLE #2 CARES Dietary (01192009 102108).usr – dietary output file.



	Percentile	TED (Weighted)	MOE (Weighted)	TED (Weighted, Per Capita)	MOE (Weighted, Per Capita)	%aPAD
1	100.0000	2.827e-02	18	2.827e-02	18	1696.3609
2	99.9900	2.827e-02	18	1.848e-02	27	1108.8596
3	99.9800	2.827e-02	18	1.621e-02	31	972.4507
4	99.9700	2.791e-02	18	7.720e-03	65	463.2229
5	99.9600	2.791e-02	18	7.590e-03	66	455.4249
6	99.9500	2.650e-02	19	6.707e-03	75	402.4181
7	99.9400	1.848e-02	27	5.806e-03	86	348.3304
8	99.9300	1.848e-02	27	5.373e-03	93	322.3931
9	99.9200	1.848e-02	27	5.182e-03	96	310.9473
10	99.9100	1.848e-02	27	5.165e-03	97	309.9057
11	99.9000	1.848e-02	27	4.924e-03	102	295.4617

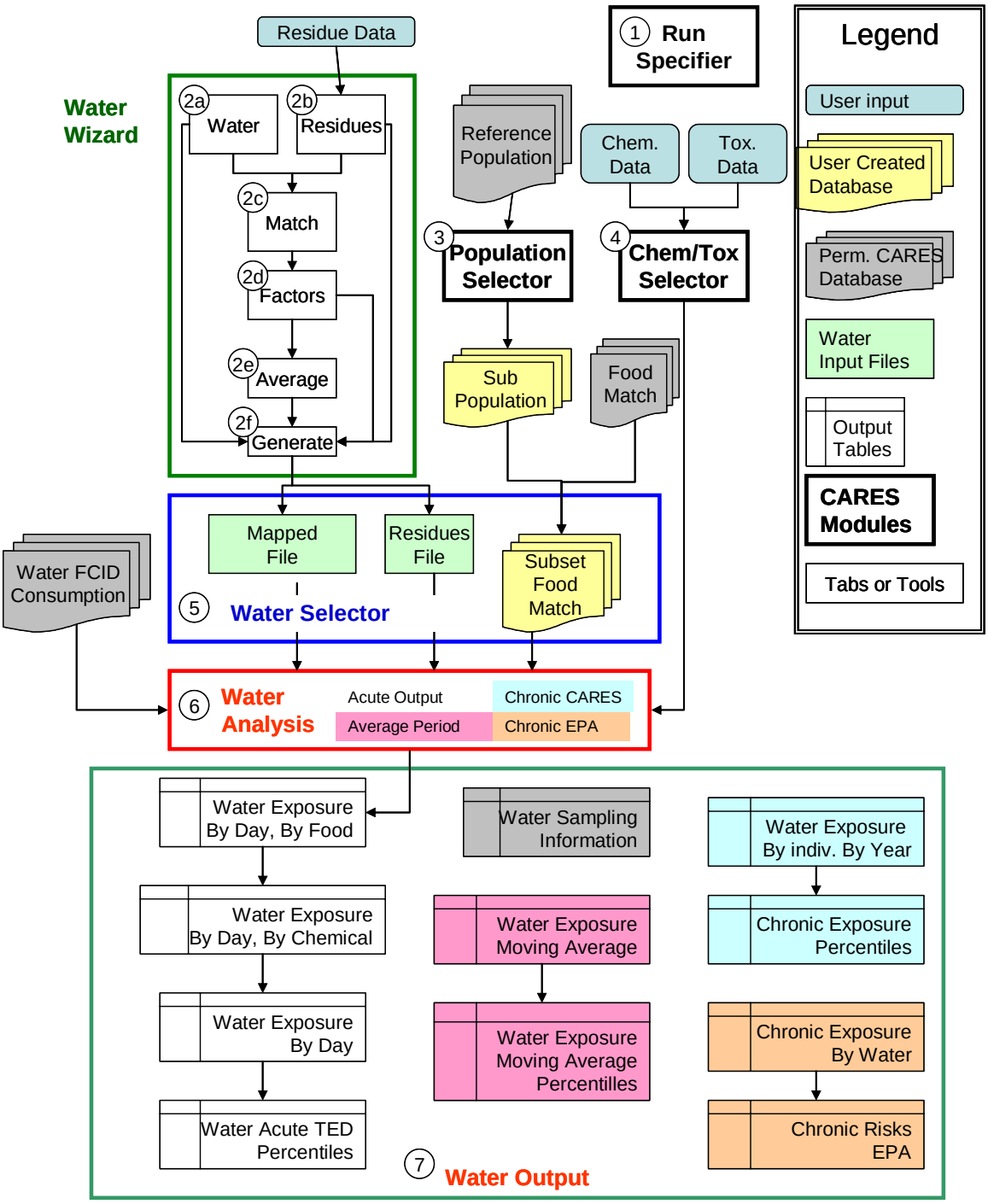
Contribution Analysis at 99.9th percentile





	Row Sequence	Output	U.S. Population	Infants	Children 1-2 yrs	Children 3-5 yrs	Children 6-12 yrs	Youths 13-19 yrs	Adults 20-49 yrs	Adults 50+ yrs	Females 13-49 yrs
1	1	Chronic Exposure (mg/kg/day)	1.47e-04	4.21e-04	6.03e-04	3.92e-04	2.32e-04	1.09e-04	9.92e-05	9.93e-05	9.92e-05
2	2	Chronic MOE	204	71	50	77	129	276	302	302	303
3	3	%cPAD	49.02	140.42	200.86	130.52	77.24	36.20	33.08	33.10	33.05
4	4	Chronic Risk - Cancer	7.35e-07	2.11e-06	3.01e-06	1.96e-06	1.16e-06	5.43e-07	4.96e-07	4.97e-07	4.96e-07

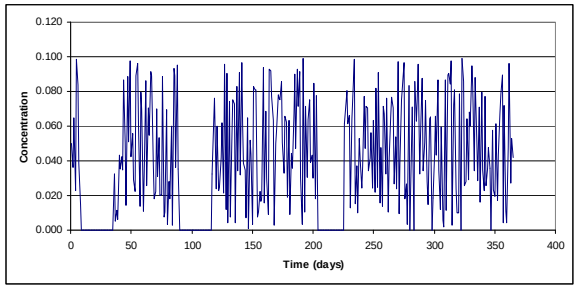
Water Module



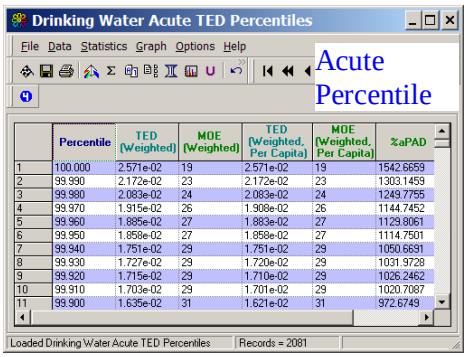
Water Example #1 (import water modeling data)

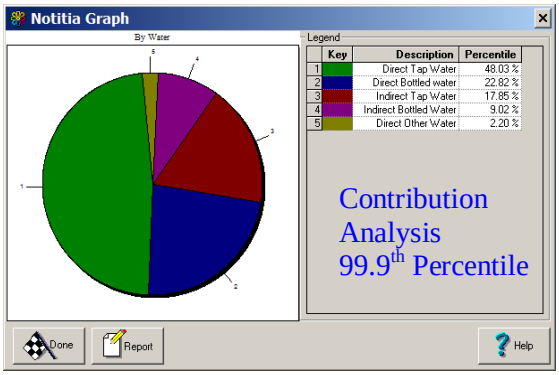
Water modeling data generated by programs such as, PRZM-EXAMS is contiguous consisting of 365 day time series of predicted water concentration based on typical application scenario. The spreadsheet: C:\Notitia\Data\2009 Workshop\Templates\CW Water Example #1.xls contains 365 day time series for 10 years.

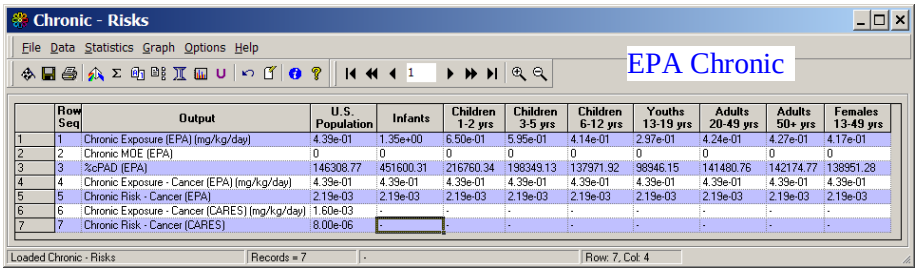
Year	Count
1991	365
1992	366
1993	365
1994	365
1995	365
1996	366
1997	365
1998	365
1999	365
2000	366



- Chemical (new): CAS = 12-345-6
- Toxicology (new): Acute = 0.5 UF = 300
  Chronic = 0.03 UF = 100 Q* =0.005
- Population: Children 1-2 (subset 1000 with R. Seed =100)
- Water Codes: All
- Water residues (ppm): import from 10 yrs.
  C:\Notitia\Data\2009 Workshop\Templates\CW Water Example #1.xls
- Average: Change Direct Tapwater (8601100) to 20
- Set Run Parameters
  - All Outputs
  - 7 day moving average
  - Options – all acute and chronic





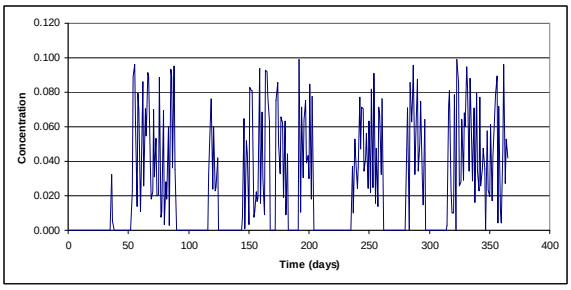


Examples are available in folder C:\Notitia\Data\2009 Workshop\
CW WATER EXAMPLE #1 WaterPrep (01202009 205844).usr – wizard file
CW WATER EXAMPLE #1 Water Maps (01202009 205830).usr – match file
CW WATER EXAMPLE #1 Water Residues (01202009 205828).usr – residue file
CW WATER EXAMPLE #1 Water (01202009 211254).usr – water output file.

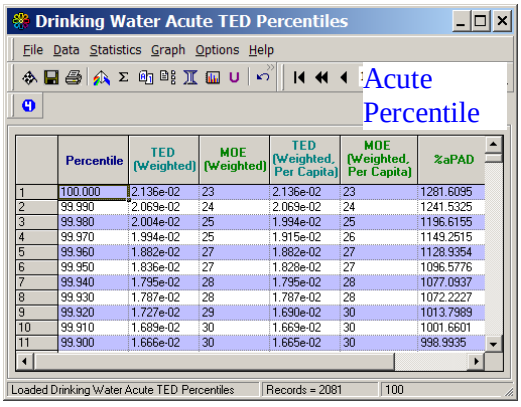
Water Example #2 (import water monitoring data)

Water monitoring data is typically non-contiguous consisting of weekly or monthly samples.
The spreadsheet: C:\Notitia\Data\2009 Workshop\Templates\CW Water Example #2.xls contains 2 years of monitoring data.

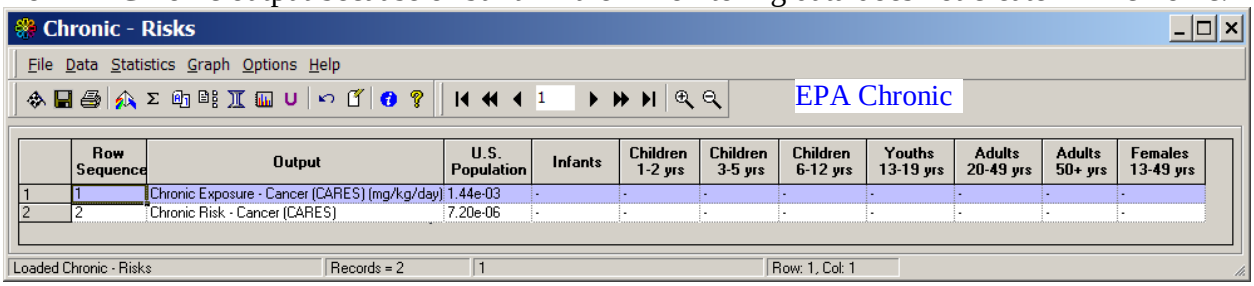
Year	Count
1991	212
1992	202



- Chemical (new): CAS = 12-345-6
- Toxicology (new): Acute = 0.5 UF = 300
  Chronic = 0.03 UF = 100 Q* =0.005
- Population: Children 1-2 (subset 1000 with R. Seed =100)
- Water Codes: All
- Water residues (ppm): import from 10 yrs.
  C:\Notitia\Data\2009 Workshop\Templates\CW Water Example #2.xls
- Average:
- Set Run Parameters
  - All Outputs
  - Options – all acute and chronic



No EPA Chronic output because of built in rule – monitoring data does not create EPA chronic.



Examples are available in folder C:\Notitia\Data\2009 Workshop\
CW WATER EXAMPLE #2 WaterPrep (01202009 213622).usr – wizard file
CW WATER EXAMPLE #2 Water Maps (01202009 213614).usr – match file
CW WATER EXAMPLE #2 Water Residues (01202009 213613).usr – residue file
CW WATER EXAMPLE #2 Water (01202009 213731).usr – water output file.

Water Example #3 (enter single values, use SetId probability)

In this case study, we will explore the capabilities of assigning weighting factors to residue datasets. We will use the following information for our example assessment (Table 1). Ground water residue data was obtained from 1,000 wells in Florida. This data has a large proportion of the wells sampled with non-detects, while only 10% of the wells have detected values above the LOD. We are assuming in this assessment that residue values for a ground water source remains constant throughout the year and an individual has a specific probability of drinking from a given well or ground water source.

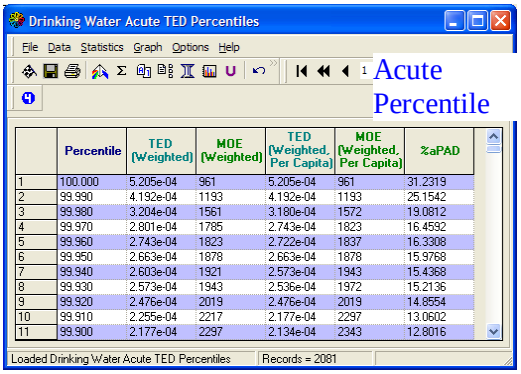
Table 1. Water Example Dataset

Water Types – all water types			
Residues – import single values from Example #3			
SourceID	Residue(ppb)	#Wells	Prob.
FLWellND	ND(0.5)	900	0.90
FLWell1	1.0	50	0.05
FLWell2	2.0	20	0.02
FLWell3	3.0	20	0.02
FLWell4	5.0	10	0.01

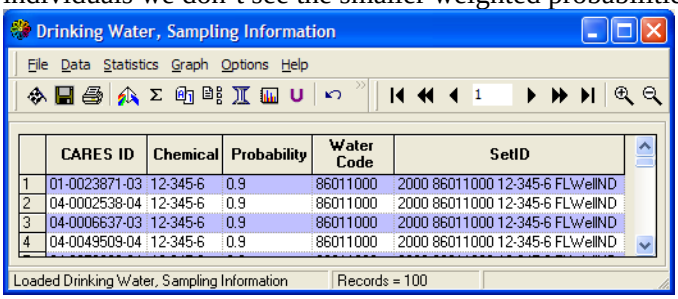
C:\Notitia\Data\2009 Workshop\Templates\CW Water Example #3.xls

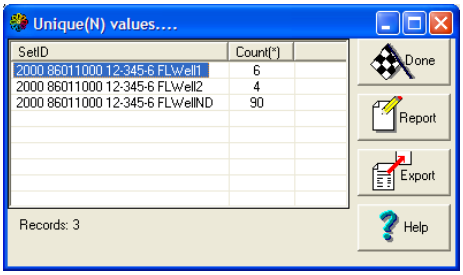
Table 2. Water Wizard - Residue Example Dataset

Data ID	Case1
Source ID	FLWell1
Residue Type	1-Single Value
Source Type	G-Ground Water
Treatment Type	F-Finished
Region	0-National
State	12-Florida
Water Code	86011000-Direct Tap Water
Chemical CAS:	12-345-6
Water Treatment Factor	1
Date Option Type	1
Date Option Value 1	1/1/2000
Residue Value:	See table above.
Units	2-ppb
LOD:	0.5



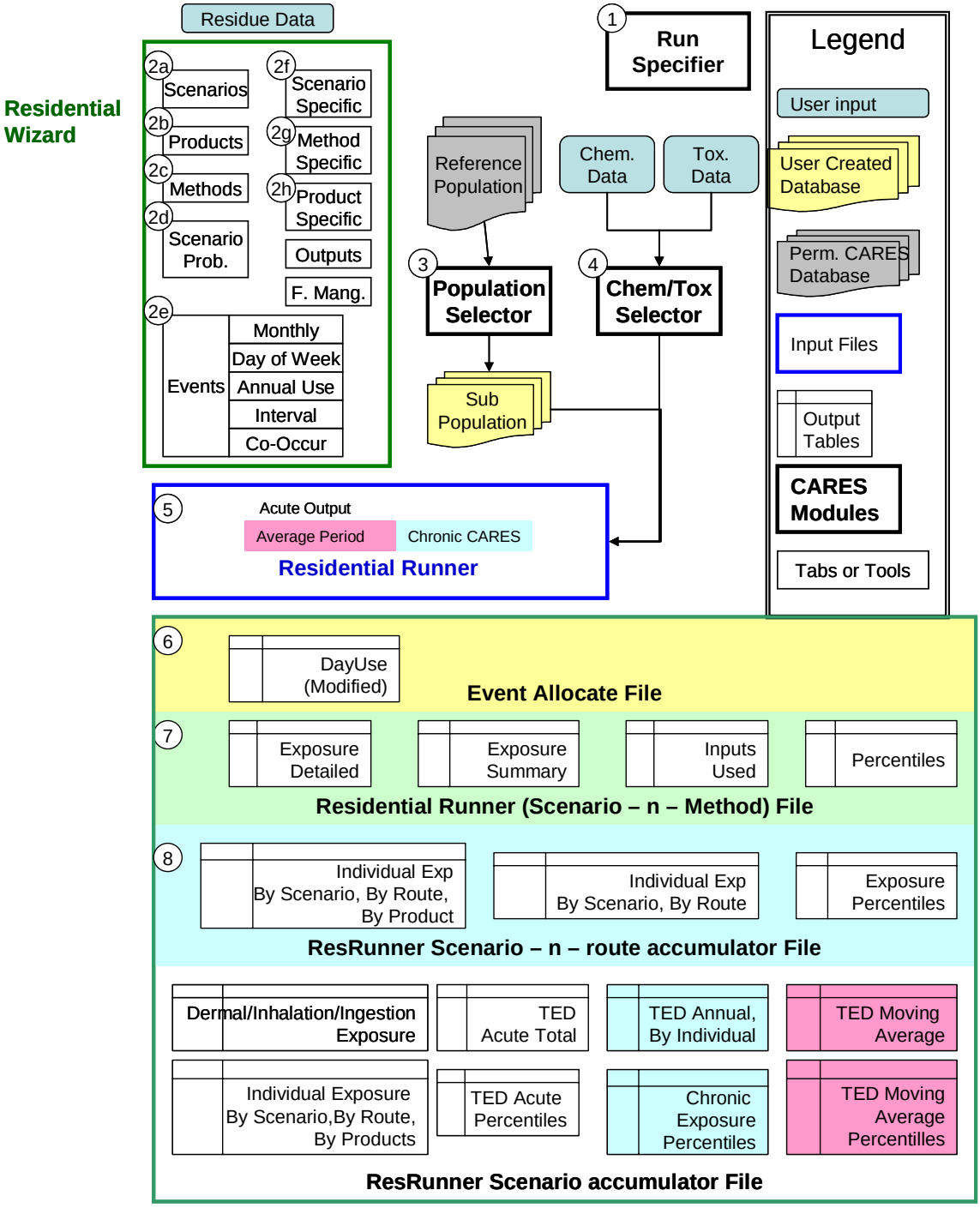
The Sampling Information output shows the random assignment of well samples based on the weighted probabilities. Use the Unique Values tool for SetID to see frequency, due to the small sample size of 100 individuals we don't see the smaller weighted probabilities.





Examples are available in folder C:\Notitia\Data\2009 Workshop\
CW WATER EXAMPLE #3 WaterPrep (01202009 220229).usr – wizard file
CW WATER EXAMPLE #3 Water Maps (01202009 220223).usr – match file
CW WATER EXAMPLE #3 Water Residues (01202009 220222).usr – residue file
CW WATER EXAMPLE #3 Water (01202009 220404).usr – water output file.

Residential Module



Example #1 (single scenario)

Scenarios & Methods

Scenario	During/Post	Route	Method
Lawn Care - 1	During	Dermal	Dermal 101: Unit Exposure, Area Treated
Lawn Care - 1	Post	Dermal	Dermal 103: Transfer Coeffecient, Residue
Lawn Care - 1	Post	Ingestion (H-To-M)	Ingestion 109: EPA SOP
Lawn Care - 1	During	Inhalation	Inhalation 101: Unit Exposure, Area Treated

Scenarios & Products

Scenario	Product	CAS	Product Probability
Lawn Care	P101;Product 1	12-345-6	0.3
Lawn Care	P102;Product 2	12-345-6	0.4
Lawn Care	P103;Product 3	12-345-6	0.3

Scenario Probabilities

Scenario	Scenario Probability	Market Share (Chemical Probability)
Lawn Care - 1	0.5	0.1

Event Allocation
Monthly Probabilities

Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lawn Care - 1	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833

Day of Week Probabilities

Scenario	Sun	Mon	Tue	Wed	Thr	Fri	Sat
Lawn Care – 1	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429	0.1429

Annual Use & Treatment Interval

Scenario	# Uses	Treatment Interval (Days)
Lawn Care – 1	Single (2)	Single (30)

Co-Occurrence

Scenario 1	Scenario 2	Co-Occurence
Lawn Care – 1	Lawn Care - 1	0

INPUTS
Scenario-Specific

Group	Variable Name	Unit	Value
Lawn Care - 1	Area Treated	m^2	Normal (100,50,0,1000)
Lawn Care - 1	Exposure Duration (Adult)	hr/day	Triangular (0.5,1,2)
Lawn Care - 1	Exposure Duration (Child)	hr/day	Triangular (0.5,1,2)

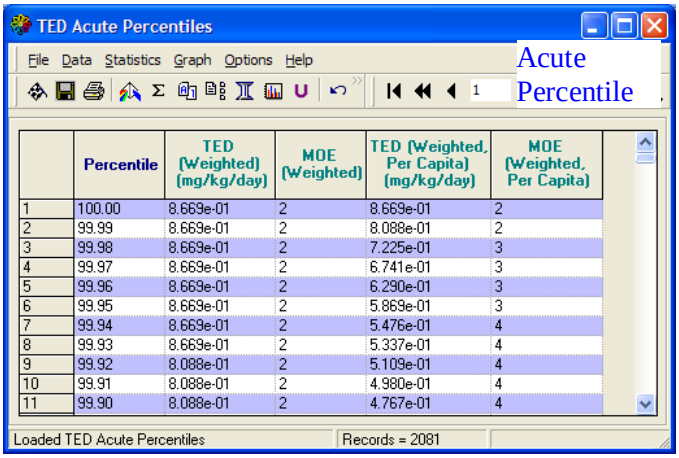
Method-Specific

Group	Variable Name	Unit	Value
Lawn Care - 1 ; Dermal 103:	Transfer Coefficient (Adult)	cm^2/hr	Triangular (1000,5000,15000)
Lawn Care - 1 ; Dermal 103:	Transfer Coefficient (Child)	cm^2/hr	Triangular (1000,5000,15000)
Lawn Care - 1 ; Ingestion 109:	Contact Frequency (H2M)	event/hr	Single (20)
Lawn Care - 1 ; Ingestion 109:	Transfer Efficiency per Contact (H2M)	unitless	Single (0.5)
Lawn Care - 1 ; Ingestion 109:	Exposure Duration	hr/day	Triangular (0.5,1,2)
Lawn Care - 1 ; Ingestion 109:	Surface Area - Hands (Mouthed)	cm^2	Single (20)

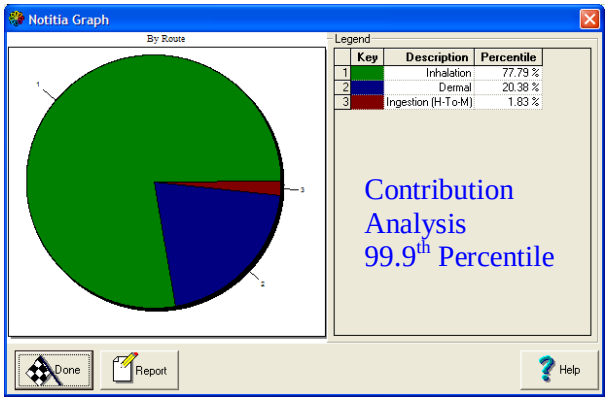
Product-specific

Group	Variable Name	Unit	Value
P101; Product 1	Application (AI per Area Treated)	kg/m²	Single (0.000222)
P101; Product 1	Unit Exposure (Dermal)	mg/kg	Single (0.222)
P101; Product 1	Transferable Residue (Surface)	mg/cm²	Single (0.0005)
P101; Product 1	Fraction Transferred to Hand	unitless	Single (1)
P101; Product 1	HalfLife	day	Single (10)
P101; Product 1	Fraction AI Dislodgeable in Surface	unitless	Single (0.05)
P101; Product 1	Unit Exposure (Inhalation)	mg/kg	Single (0.0009)
P102; Product 2	Application (AI per Area Treated)	kg/m²	Single (0.000222)
P102; Product 2	Unit Exposure (Dermal)	mg/kg	Single (0.222)
P102; Product 2	Transferable Residue (Surface)	mg/cm²	Single (0.0005)
P102; Product 2	Fraction Transferred to Hand	unitless	Single (1)
P102; Product 2	HalfLife	day	Single (10)
P102; Product 2	Fraction AI Dislodgeable in Surface	unitless	Single (0.05)
P102; Product 2	Unit Exposure (Inhalation)	mg/kg	Single (0.0009)
P103; Product 3	Application (AI per Area Treated)	kg/m²	Single (0.000222)
P103; Product 3	Unit Exposure (Dermal)	mg/kg	Single (0.222)
P103; Product 3	Transferable Residue (Surface)	mg/cm²	Single (0.0005)
P103; Product 3	Fraction Transferred to Hand	unitless	Single (1)
P103; Product 3	HalfLife	day	Single (10)
P103; Product 3	Fraction AI Dislodgeable in Surface	unitless	Single (0.05)
P103; Product 3	Unit Exposure (Inhalation)	mg/kg	Single (0.0009)

Examples are available in folder C:\Notitia\Data\2009 Workshop\
CW RESIDENTIAL EXAMPLE #1 Residential Wizard (01212009 085125).usr – Wizard file
CW RESIDENTIAL EXAMPLE #1 Event Allocate (01212009 085256).usr – Use pattern
CW RESIDENTIAL EXAMPLE #1 Residential Runner (01212009 085259) (Lawn Care - 1 - der103).usr
CW RESIDENTIAL EXAMPLE #1 Residential Runner (01212009 085259) (Lawn Care - 1 - ing109).usr
CW RESIDENTIAL EXAMPLE #1 ResRunner Lawn Care - 1 route accumulator (01212009 085308).usr
CW RESIDENTIAL EXAMPLE #1 ResRunner Scenario accumulator (01212009 085316).usr – residential output



	Percentile	TED (Weighted) (mg/kg/day)	MOE (Weighted)	TED (Weighted, Per Capita) (mg/kg/day)	MOE (Weighted, Per Capita)
1	100.00	8.669e-01	2	8.669e-01	2
2	99.99	8.669e-01	2	8.088e-01	2
3	99.98	8.669e-01	2	7.225e-01	3
4	99.97	8.669e-01	2	6.741e-01	3
5	99.96	8.669e-01	2	6.290e-01	3
6	99.95	8.669e-01	2	5.869e-01	3
7	99.94	8.669e-01	2	5.476e-01	4
8	99.93	8.669e-01	2	5.337e-01	4
9	99.92	8.088e-01	2	5.109e-01	4
10	99.91	8.088e-01	2	4.980e-01	4
11	99.90	8.088e-01	2	4.767e-01	4



Example #2 (multiple scenario)

- Run Specifier
- Residential Wizard – right-click to Call Wizard
  - Select File Management tab, select CW Residential Example #1, click Restore
- Scenarios
  - Lawn Care Groups = 2 (Group 1 = Spot Treatment; Group 2 = Broadcast)
  - Vegetable Garden
  - Crack & Crevice
- Products – add new rows for additional scenarios

	ID	Name	Chemical CAS	Scenario	Group	Product Probability	Prof/Cons
1	P101	LC-S Product 1	12-345-6	Lawn Care	1	0.3	2
2	P102	LC-S Product 2	12-345-6	Lawn Care	1	0.4	2
3	P103	LC-S Product 3	12-345-6	Lawn Care	1	0.3	2
4	P104	LC-B Prod.1	12-345-6	Lawn Care	2	0.6	2
5	P105	LC-B Prod.2	12-345-6	Lawn Care	2	0.4	2
6	P106	VG-RTU	12-345-6	Vegetable Garden Care	1	0.3	2
7	P107	VG-Handwant	12-345-6	Vegetable Garden Care	1	0.6	1
8	P108	CC-Tank Spray	12-345-6	Crack & Crevice Treatment	1	1	1

- Methods –
  - LC-Spot: Dermal 101, Dermal 103, Inhalation 101
  - LC-Broadcast: Dermal 101, Dermal 104, Ingestion 107, Inhalation 101
  - VG Dermal 102 Dermal 103, Ingestion109, Inhalation 102
  - C&C Dermal 103; Ingestion 109
- Scenario Prob –

	Scenario	Scenario Probability	Market Share (Chemical Probability)
1	Lawn Care - 1	0.25	1
2	Lawn Care - 2	0.25	1
3	Vegetable Garden Care - 1	0.10	1
4	Crack & Crevice Treatment - 1	0.5	1

- Events

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lawn Care - 1	0.0000	0.0000	0.0000	0.0000	0.2500	0.2500	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000
Lawn Care - 2	0.0000	0.0000	0.0000	0.0000	0.2500	0.2500	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000
Vegetable Garden Care - 1	0.0000	0.0000	0.0000	0.0000	0.2500	0.2500	0.2500	0.2500	0.0000	0.0000	0.0000	0.0000
Crack & Crevice Treatment - 1	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833	0.0833

Monthly Prob.

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Lawn Care - 1	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000
Lawn Care - 2	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000
Vegetable Garden Care - 1	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000	0.5000
Crack & Crevice Treatment - 1	0.0000	0.2000	0.2000	0.2000	0.2000	0.2000	0.0000

Daily Prob.

	Events
Lawn Care - 1	Single (2)
Lawn Care - 2	Single (2)
Vegetable Garden Care - 1	Single (5)
Crack & Crevice Treatment - 1	Single (5)

Number of Applications

	Interval
Lawn Care - 1	Single (30)
Lawn Care - 2	Single (30)
Vegetable Garden Care - 1	Single (7)
Crack & Crevice Treatment - 1	Single (14)

Time between Appl.

	Lawn Care - 1	Lawn Care - 2	Vegetable Garden Care - 1	Crack & Crevice Treatment - 1
Lawn Care - 1	0	0	0.25	0.05
Lawn Care - 2	0	0	0.25	0.05
Vegetable Garden Care - 1	0.125	0.125	0	0
Crack & Crevice Treatment - 1	0.05	0.05	0	0

Co-Occurrence Prob.

Scenario Specific - Lawn Care – 1 and Lawn Care -2
Exposure Duration create Percentile1

Child

	Percentile	Value
1	0	0
2	25	0.333
3	50	1.2
4	75	2
5	99	2.0167
6	100	2.1

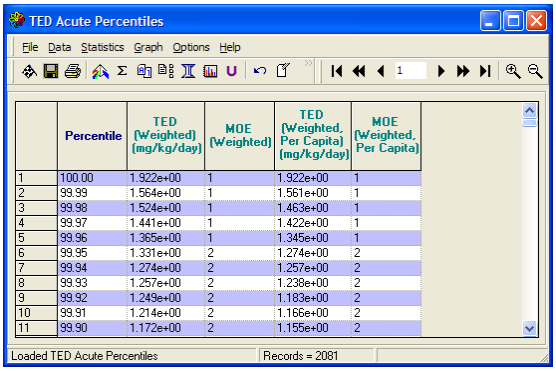
Adult

	Percentile	Value
1	0	0
2	5	0.25
3	25	0.33
4	50	0.9
5	75	2.45
6	90	3.5
7	100	3.5

C:\Notitia\Data\2009 Workshop\Templates\LC Exp Duration-Adult.usr
C:\Notitia\Data\2009 Workshop\Templates\LC Exp Duration-Child.usr

Method Specific – Crack&Crevice
Transfer Coefficient (adult) Lognormal (7788, 5505, 0, 28000)
Transfer Coefficient (child) Lognormal (7013, 3897, 0, 20000)

Product Specific – Lawn Care all products (P101, P102, P103, P104, P105)
Application (ai per area treated) Uniform (0.0000011, 0.0000022)

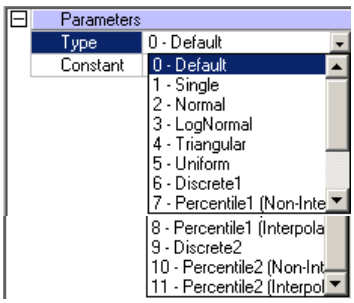


	Percentile	TED (Weighted) (mg/kg/day)	MOE (Weighted)	TED (Weighted, Per Capita) (mg/kg/day)	MOE (Weighted, Per Capita)
1	100.00	1.922e+00	1	1.922e+00	1
2	99.99	1.564e+00	1	1.561e+00	1
3	99.98	1.524e+00	1	1.463e+00	1
4	99.97	1.441e+00	1	1.422e+00	1
5	99.96	1.365e+00	1	1.345e+00	1
6	99.95	1.331e+00	2	1.274e+00	2
7	99.94	1.274e+00	2	1.257e+00	2
8	99.93	1.257e+00	2	1.238e+00	2
9	99.92	1.249e+00	2	1.183e+00	2
10	99.91	1.214e+00	2	1.166e+00	2
11	99.90	1.172e+00	2	1.155e+00	2

Examples are available in folder C:\Notitia\Data\2009 Workshop\
CW RESIDENTIAL EXAMPLE #2 Residential Wizard (01212009 233652).usr – Wizard file
CW RESIDENTIAL EXAMPLE #2 Event Allocate (01212009 233809).usr – Use pattern
CW RESIDENTIAL EXAMPLE #2 Residential Runner (01212009 233816) (Lawn Care - 1 - der103).usr
CW RESIDENTIAL EXAMPLE #2 ResRunner Lawn Care - 1 route accumulator (01212009 233954).usr
CW RESIDENTIAL EXAMPLE #2 Residential Runner (01212009 233811) (Lawn Care - 2 - der104).usr
CW RESIDENTIAL EXAMPLE #2 Residential Runner (01212009 233811) (Lawn Care - 2 - ing107).usr
CW RESIDENTIAL EXAMPLE #2 ResRunner Lawn Care - 2 route accumulator (01212009 234005).usr
CW RESIDENTIAL EXAMPLE #2 Residential Runner (01212009 233821) (Vegetable Garden Care - 1 - der103).usr
CW RESIDENTIAL EXAMPLE #2 Residential Runner (01212009 233821) (Vegetable Garden Care - 1 - ing109).usr
CW RESIDENTIAL EXAMPLE #2 ResRunner Vegetable Garden Care - 1 route accumulator (01212009 234015).usr
CW RESIDENTIAL EXAMPLE #2 Residential Runner (01212009 233812) (Crack & Crevice Treatment - 1 - der103).usr
CW RESIDENTIAL EXAMPLE #2 Residential Runner (01212009 233812) (Crack & Crevice Treatment - 1 - ing109).usr
CW RESIDENTIAL EXAMPLE #2 ResRunner Crack & Crevice Treatment - 1 route accumulator (01212009 233937).usr
CW RESIDENTIAL EXAMPLE #2 ResRunner Scenario accumulator (01212009 234058).usr - residential output

Parameter Distribution Inputs

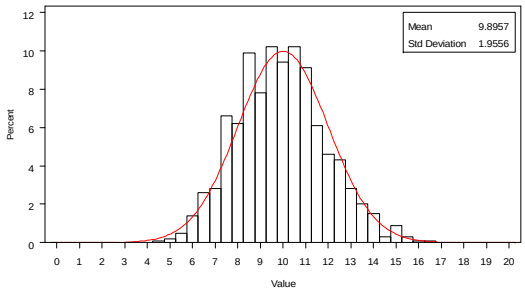
In the residential wizard, there are 12 probabilistic distribution types that can be assigned to parameters in the scenario, method, and product specific tabs.

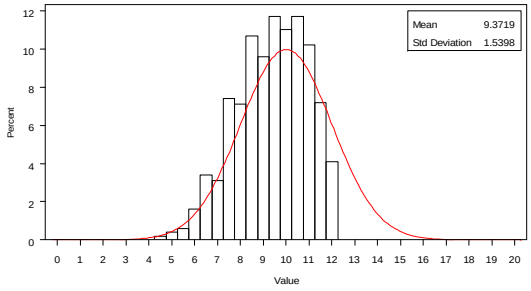


0 – Defaults -

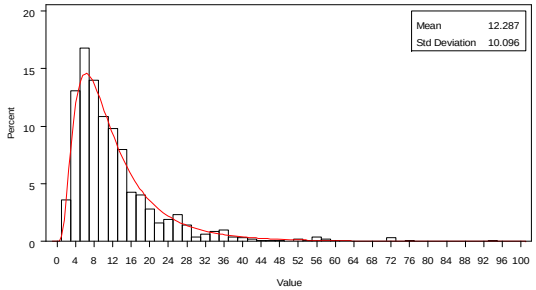
1 – Single – same value for all iterations (deterministic)

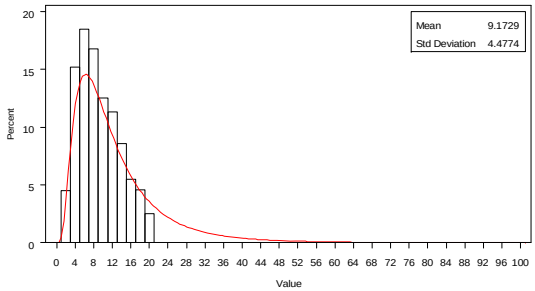
2 – Normal (Mu, Sigma, Min, Max)
Creates a normal distribution based in mean and standard deviation. The maximum value will truncate the distribution as show in the graph on the right.



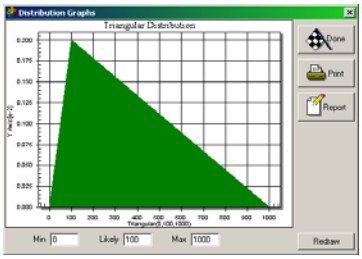


3 – Lognormal (Mu, Sigma, Min, Max)
Creates a lognormal distribution based in mean and standard deviation. The maximum value will truncate the distribution as show in the graph on the right.

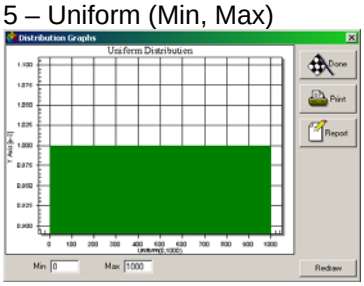




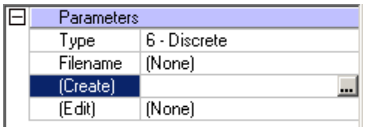
4 – Triangular (Min, Likely, Max)



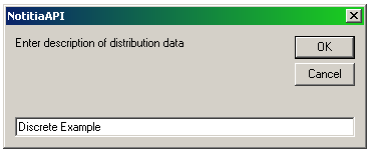
5 – Uniform (Min, Max)

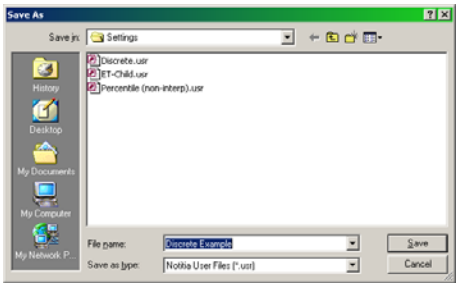


For the discrete, percentile (non-interpolated) and percentile (interpolated) distributions, you must create a data file. Click on the row Create, then click on the **...** button. Enter table name and filename. Enter data in to table according to the layout below.



Parameters	
Type	6 - Discrete
Filename	(None)
(Create)	
(Edit)	(None)





6 – Discrete1
9 – Discrete2

Parameters	
Type	6 - Discrete
Filename	~\Discrete Example.usr
(Create)	
(Edit)	~\Discrete Example.usr

	Value
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

7 – Percentile1 (non-interpolated)
10. – Percentile2 (non-interpolated)

Parameters	
Type	7 - Percentile (Non-Interpolate
Filename	~\Percentile (non-interpol) Ex
(Create)	
(Edit)	~\Percentile (non-interpol) Ex

	Percentile	Value
1	0	0
2	25	2.5
3	50	5
4	90	9
5	100	10

8 – Percentile (interpolated)
11. – Percentile2 (interpolated)

Parameters	
Type	8 - Percentile (Interpolated)
Filename	~\Percentile (interpolated).usr
(Create)	
(Edit)	~\Percentile (interpolated).usr

	Percentile	Value
1	0	0
2	25	2.5
3	50	5
4	90	9
5	100	10

A **Discrete** distribution gives equally probability of randomly choosing a value from a set of numbers. A set of numbers is entered and each number has the same likelihood of being selected in the output file. The **Percentile (Non-Interpolated)** distribution function requires input of two columns of data. The first column is the percentile ranging from 0 to 100 where 0 indicates the minimum value and 100 would be the maximum value. The second column is the value at a specified percentile. The function works by randomly drawing a value between 0 and 100, the random value is compared to the specified percentiles and selects the next higher value. The **Percentile (Interpolated)** distribution is the same as the above Percentile (Non-Interpolated) except that if a random value is chosen between two percentiles then the program does a linear interpolation between the values to estimate a point in between. The 1 and 2

Residential Algorithms

Residential Algorithms based on EPA SOP (23 algorithms)

	Path	Route	Method	Age	
01	During	Dermal 101	Unit Exposure, Area Treated	> 18 yrs.	Must pick one method.
02	During	Dermal 102	Unit Exposure, Amount of Formulation Used	> 18 yrs.	
03	Post	Dermal 103	Transfer Coeffecient, Residue	all ages	Must pick one method.
04	Post	Dermal 104	Transfer Coeffecient, Area Treated	all ages	
05	Post	Dermal105	Transfer Factor, Residue	all ages	
06	Post	Dermal 106	Transfer Factor, Area Treated	all ages	
07	Post	Dermal 107	Fraction Transferred	all ages	
08	Post	Dermal 108	Flux Rate	all ages	
09	Post	Dermal 109	Water Concentration	all ages	
10	Post	Dermal 110	Film Thickness	all ages	
01	Post	Ingestion 101	Ingestion, Formulation	1-5 yrs. old	
02	Post	Ingestion 102	Ingestion, Grass/Plants	1-5 yrs. old	
03	Post	Ingestion 103	Ingestion, Soil	1-5 yrs. old	
04	Post	Ingestion 104	Ingestion, Paint Chips	1-5 yrs. old	
05	Post	Ingestion 105	Ingestion, Water	all ages	
06	Post	Ingestion 106	Ingestion. Flux Rate	all ages	
07	Post	Ingestion 107	Mass Balance	0-5 yrs. old	Must pick one method.
08	Post	Ingestion 108	Fraction Transferred	0-5 yrs. old	
09	Post	Ingestion 109	EPA SOP	0-5 yrs. old	
01	During	Inhalation 101	Unit Exposure, Area Treated	> 18 yrs.	Must pick one method.
02	During	Inhalation 102	Unit Exposure, Amount of Formulation Used	> 18 yrs.	
03	Post	Inhalation 103	Air Concentration, Specified	all ages	Must pick one method.
04	Post	Inhalation 104	Air Concentration, Calculated	all ages	

Dermal 101 – Unit Exposure, Area Treated During, Adult

$$Exposure_{Adult} = \frac{(Unit\ Exposure)_{Dermal} \times (Application)_{Area\ Treated} \times (Area\ Treated)}{(Reference\ Duration) \times (Body\ Weight)_{Adult}}$$

PS	Unit Exposure (dermal)	mg/kg a.i.	
PS	Application (a.i. per area treated)	kg a.i./m^2	
SS	Area Treated	m^2	Normal (100,50,0,1000)
	Reference Duration	Day	1
	Body Weight (adult)	Kg	
	Exposure	mg/kg/day	

Dermal 102 – Unit Exposure, Amount of Formulation Used During, Adult

$$Exposure_{Adult} = \frac{(Unit\ Exposure)_{Dermal} \times (Application)_{Amt\ Form\ Used} \times (Amount\ of\ Form\ Used)}{(Reference\ Duration) \times (Body\ Weight)_{Adult}}$$

PS	Unit Exposure (dermal)	mg/kg a.i	
PS	Application (amount a.i. used)	kg a.i./m^3	
PS	Amount of Form. Used	m^3	
	Reference Duration	day	1
	Body Weight (adult)	kg	
	Exposure	mg/kg/day	

Dermal 103 – Transfer Coefficient (Residues) Post, Adult/Child

$$Exposure_{Adult/Child} = \frac{(Trans\ Residue) \times (Transfer\ Coefficient)_{Adult/Child} \times (Exposure\ Duration)_{Adult/Child}}{(Body\ Weight)_{Adult/Child}}$$

$$Exposure_{Hand,Child} = (Trans\ Residue) \times (Trans\ Coeff)_{Child} \times (Frac\ Trans)_{Hand,Child} \times (Exposure\ Duration)_{Chil}$$

PS	Transferable Residue (surface)	mg/cm^2	
PS	Fraction Transf. to Hand (child)	unitless	
PS	Half-Life	day	
MS	Transfer Coefficient (adult/child)	cm^2/hr.	Triangular (1000,5000,15000)
SS	Exposure Duration (adult/child)	hr./day	Triangular (0.5, 1, 2)
	Body Weight (adult/child)	kg	
	Exposure	mg/kg/day	
	Exposure (hand) (child)	mg/day	

Scenario Specific = SS	Method Specific = MS	Product Specific = PS

Dermal 104 – Transfer Coefficient (Area Treated) Post, Adult/Child

$$Trans\ Residue = (Application)_{Area\ Treated} \times CF_1 \times CF_2 \times (Frac\ AI\ Dislodge)$$

$$Exposure_{Adult/Child} = \frac{(Trans\ Residue) \times (Transfer\ Coefficient)_{Adult/Child} \times (Exposure\ Duration)_{Adult/Child}}{(Body\ Weight)_{Adult/Child}}$$

$$Exposure_{Hand,Child} = (Trans\ Residue) \times (Trans\ Coeff)_{Child} \times (Frac\ Trans)_{Hand,Child} \times (Exposure\ Duration)_{Chil}$$

PS	Application (area treated)	kg a.i./m^2	
	CF1 (mg to kg)	10^6	
	CF2 (m^2 to cm^2)	10^{-4}	
PS	Frac. a.i. Dislodgeable in Surface	unitless	
PS	Fraction Transf. to Hand (child)	unitless	
PS	Half-Life	day	
	Transferable Residue (surface)	mg/cm2	
MS	Transfer Coefficient (adult/child)	cm^2/hr.	Triangular (1000,5000,15000)
SS	Exposure Duration (adult/child)	hr./day	Triangular (0.5, 1, 2)
	Body Weight	Kg	
	Exposure	mg/kg/day	
	Exposure (hand) (child)	mg/day	

Dermal 105 – Transfer Factor (Residue) Post, Adult/Child

$$Exposure_{Adult/Child} = \frac{\sum \{(Trans\ Factor) \times (Surf\ Area)_{Adult/Child} \times (Cloth\ Pen\ Factor)\} \times (Trans\ Res)}{(Reference\ Duration) \times (Body\ Weight)_{Adult/Child}}$$

$$Exposure_{Hand,Child} = \frac{\sum \{(Trans\ Fact) \times (Surf\ Area)_{Child} \times (Cloth\ Pen\ Factor)\} \times (Trans\ Res)}{(Reference\ Duration)}$$

MS	Transfer Factor–Hands (UC)/(C)	Unitless	11.8 / 0.118
MS	Transfer Factor–Upper Body (UC)/(C)	Unitless	3.1 / 0.031
MS	Transfer Factor–Lower Body (UC)/(C)	Unitless	3.2 / 0.032
MS	Transfer Factor–Feet (UC)/(C)	Unitless	15.5 / 0.154
MS	Clothing Penetration Fract.(UC)/(C)	Unitless	1 / 1
	Surface Area-Hands (UC)/(C)	Cm^2	
	Surface Area–Upper Body (UC)/(C)	Cm^2	
	Surface Area–Lower Body (UC)/(C)	Cm^2	
	Surface Area–Feet (UC)/(C)	Cm^2	
PS	Transferable Residue (surface)	mg/cm^2	
PS	Half-life	Day	
	Reference Duration	Day	1
	Body Weight	Kg	
	Exposure	mg/kg/day	
	Exposure (Hand)	mg/day	

Scenario Specific = SS	Method Specific = MS	Product Specific = PS

Dermal 106 – Transfer Factor (Area Treated) Post, Adult/Child

$$Trans\ Residue = (Application)_{Area\ Treated} \times CF_1 \times CF_2 \times (Frac\ AI\ Dislodge)$$

$$Exposure_{Adult/Child} = \frac{\sum\{(Trans\ Factor) \times (Surf\ Area)_{Adult/Child} \times (Cloth\ Pen\ Factor)\} \times (Trans\ Res)}{(Reference\ Duration) \times (Body\ Weight)_{Adult/Child}}$$

$$Exposure_{Hand,Child} = \frac{\sum\{(Trans\ Fact) \times (Surf\ Area)_{Child} \times (Cloth\ Pen\ Factor)\} \times (Trans\ Res)}{(Reference\ Duration)}$$

PS	Application (area treated)	kg a.i./m^2	
	CF1 (mg to kg)	10^6	
	CF2 (m^2 to cm^2)	10^{-4}	
PS	Frac. a.i. Dislodgeable in Surface	Unitless	
MS	Transfer Factor–Hands (UC)/(C)	Unitless	11.8 / 0.118
MS	Transfer Factor–Upper Body (UC)/(C)	Unitless	3.1 / 0.031
MS	Transfer Factor–Lower Body (UC)/(C)	Unitless	3.2 / 0.032
MS	Transfer Factor–Feet (UC)/(C)	Unitless	15.5 / 0.154
MS	Clothing Penetration Fract.(UC)/(C)	Unitless	1 / 1
	Surface Area-Hands (UC)/(C)	cm^2	
	Surface Area–Upper Body (UC)/(C)	cm^2	
	Surface Area–Lower Body (UC)/(C)	cm^2	
	Surface Area–Feet (UC)/(C)	cm^2	
PP	Transferable Residue (surface)	mg/cm^2	
	Reference Duration	Day	1
	Body Weight	Kg	
	Exposure	mg/kg/day	
	Exposure (Hand)	mg/day	

Dermal 107 – Fraction Transferred Post, Adult/Child

$$Trans\ Residue = (Amt\ Form\ Used) \times (Frac\ AI\ Form) \times (Frac\ AI\ Dislodge)$$

$$Exposure_{Adult/Child} = \frac{(Trans\ Residue) \times (Fraction\ Transferred)_{Whole\ Body,Adult/Child}}{(Reference\ Duration) \times (Body\ Weight)_{Adult/Child}}$$

$$Exposure_{Hand,Child} = \frac{(Trans\ Residue) \times (Fraction\ Transferred)_{Hand,Child}}{(Reference\ Duration)}$$

PS	Amount of Form. Used (by weight)	Mg	
PS	Fraction of a.i. in Formulation	Unitless	
PS	Frac. a.i. Dislodgeable in Surface	Unitless	
	Transferable Residue	Mg	
MS	Frac. Transferred to Whole Body	Unitless	0.5
PS	Frac. Transferred to Hand	Unitless	1
	Reference Duration	Day	1
	Body Weight	Kg	
	Exposure	mg/kg/day	
	Exposure (Hand)	mg/day	

Scenario Specific = SS	Method Specific = MS	Product Specific = PS

Dermal 108 – Flux Rate Post, Adult/Child

$$Exposure_{Adult/Child} = (Flux\ Rate\ AI) \times \frac{(Surface\ Area)_{Contact,Adult/Child} \times (Exposure\ Duration)_{Adult/Child} \times CF_2}{(Reference\ Duration) \times (Body\ Weight)_{Adult/Child} \times CF_3}$$

$$Exposure_{Hand,Child} = (Flux\ Rate\ AI) \times \frac{(Surface\ Area)_{Contact,Child} \times (Fraction\ Transferred)_{Hand,Child} \times (Exposure\ Duration)_{Child} \times CF_2}{(Reference\ Duration) \times CF_3}$$

PS	Flux Rate of a.i. through material	mg/m^2/day	15
MS	Surface Area contact material	cm^2	1000
PS	Frac. Transferred to Hand	Unitless	1
SS	Exposure Duration (Adult/Child)	hr./day	Triangular (0.5, 1, 2)
	CF2 (m2 to cm2)	10^{-4}	
	Reference Duration	Day	1
	Body Weight	Kg	
	CF3 (hr to day)	24	
	Exposure	mg/kg/day	
	Exposure (Hand)	mg/day	

Dermal 109 – Water Concentration Post, Adult/Child

$$Exposure_{Adult/Child} = (Conc\ AI\ Water) \times (Permeability\ Coeff) \times \frac{(Surface\ Area)_{Contact,Adult/Child} \times (Exposure\ Duration)_{Adult/Child} \times CF_4}{(Reference\ Duration) \times (Body\ Weight)_{Adult/Child}}$$

PS	Concentration of a.i. water	mg/m^3	
PS	Permeability Coefficient	cm/hr	
	Surface Area (whole body)	cm^2	
SS	Exposure Duration (adult/child)	hr./day	Triangular (0.5, 1, 2)
	CF4 (m3 to cm3)	10^{-6}	
	Reference Duration	Day	1
	Body Weight (adult/child)	Kg	
	Exposure	mg/kg/day	

Dermal 110 – Film Thickness Post, Adult/Child

$$Exposure_{Adult/Child} = \frac{(Density\ Form) \times (Frac\ AI\ Form) \times (Film\ Thick) \times (Surf\ Area)_{Exposed,Adult/Child}}{(Reference\ Duration) \times (Body\ Weight)_{Adult/Child}}$$

$$Exposure_{Hand,Child} = (Density\ Formulation) \times (Fraction\ AI\ Formulation) \times (Film\ Thickness) \times \frac{(Surface\ Area)_{Exposed,Child} \times (Fraction\ Transferred)_{Hand,Child}}{(Reference\ Duration)}$$

PS	Density of Formulation	mg/cm^3	
PS	Fraction of a.i. in Formulation	Unitless	
MS	Film Thickness of Form. On Dermal	Cm	0.03
MS	Surface Area (exposed to formul.)	cm^2	1000
PS	Fraction Transferred to hand (dermal)	Unitless	1
MS	Reference Duration	Day	1
	Body Weight	Kg	
	Exposure	mg/kg/day	
	Exposure (Hand)	mg/day	

Scenario Specific = SS	Method Specific = MS	Product Specific = PS

Ingestion 101 – Granules/Pellets (formulation) Post, Child

$$Exposure_{Child} = \frac{(Ingestion\ Rate)_{Granules/Pellets,Child} \times (Fraction\ AI\ in\ Granules/Pellets)}{(Body\ Weight)_{Child}}$$

MS	Ingestion Rate	mg/day	0.20
PS	Fraction of a.i. in formulation	Unitless	
	Body Weight	Kg	
	Exposure	mg/kg/day	

Ingestion 102 – Grass/Plants Post, Child

$$Residue_{Grass/Plants} = \frac{(Application)_{Area\ Treated} \times (Frac\ AI\ Grass/Plants) \times CF_1 \times CF_2}{(Ground\ Cover) \times CF_6}$$

$$Exposure_{Child} = \frac{(Residue)_{Grass/Plants} \times (Ingestion\ Rate)_{Grass/Plants,Child}}{(Body\ Weight)_{Child}}$$

PS	Application (a.i. per area treated)	kg a.i./m^2	
PS	Frac. a.i. dislodgeable (grass/plants)	Unitless	0.05
	CF1 (mg to kg)	10^6	
	CF2 (m^2 to cm^2)	10^{-4}	
MS	Ground Cover (grass/plants)	g/cm^2	0.01
	CF6 (mg to g)	1000	
	Residue (grass/plants)	mg a.i./mg	
MS	Ingestion Rate (grass/plants)	mg/day	25
	Body Weight	Kg	
	Exposure	mg/kg/day	

Ingestion 103 – Direct: Soil Post, Child

$$Residue_{Soil} = \frac{(Application)_{Area\ Treated} \times (Fraction\ AI\ Soil) \times CF_1 \times CF_2}{(Soil\ Density) \times (Thickness\ Soil\ Layer) \times CF_6}$$

$$Exposure_{Child} = \frac{(Residue)_{Soil} \times (Ingestion\ Rate)_{Soil,Child}}{(Body\ Weight)_{Child}}$$

PS	Application (a.i. per area treated)	kg a.i./m^2	
PS	Frac. a.i. dislodgeable (soil)	Unitless	1
	CF1 (mg to kg)	10^6	
	CF2 (m^2 to cm^2)	10^{-4}	
MS	Soil Density (outdoor)	g/cm^3	1.5
MS	Thickness of soil layer	Cm	1
	CF6 (mg to g)	1000	
	Residue (soil)	mg a.i./mg	
MS	Ingestion Rate (grass/plants)	mg/day	100
	Body Weight	Kg	
	Exposure	mg/kg/day	

Scenario Specific = SS	Method Specific = MS	Product Specific = PS

Ingestion 104 – Paint Chips Post, Child

$$Exposure_{Child} = \frac{(Ingestion\ Rate)_{Paint\ Chips,Child} \times (Frac\ AI\ in\ Paint\ Chips) \times (Frac\ AI\ Available)}{(Body\ Weight)_{Child}}$$

MS	Ingestion Rate (paint chips)	mg/day	40
PS	Fraction a.i. in paint chips	Unitless	0.01
MS	Fraction a.i. available for ingestion	Unitless	0.2
	Body Weight	Kg	
	Exposure	mg/kg/day	

Ingestion 105 – Water Concentration (Pool) Post, Adult/Child

$$Exposure_{Adult/Child} = \frac{(Water\ Conc)_{Swimming\ Pool} \times (Ing\ Rate)_{Pool\ Water,Adult/Child} \times (Exp\ Dur)_{Adult/Child}}{(Reference\ Duration) \times (Body\ Weight)_{Adult/Child}}$$

PS	Water Concentration (pool)	mg a.i./m^3	
MS	Ingestion Rate (water) (adult/child)	m^3/hr	0.00005
SS	Exposure Duration (adult/child)	hr/day	Triangular (0.5, 1, 2)
	Reference Duration	Day	
	Body Weight (adult/child)	Kg	
	Exposure	mg/kg/day	

Ingestion 106 – Flux Rate Post, Child

$$Exposure_{Child} = \frac{(Flux\ Rate\ AI) \times (Surface\ Area\ Impregnated\ Material)_{Mouthed}}{(Body\ Weight)_{Child}}$$

PS	Flux rate of a.i.	mg/cm^2/day	0.015
MS	Surface area (impreg. material) mouth	cm^2	500
	Body Weight (adult/child)	Kg	
	Exposure	mg/kg/day	

Ingestion 107 – Hand-to-Mouth (Mass Balance) Post, Child

$$Transfer\ Factor_{Hand-To-Mouth} = (Transfer\ Eff) \times \sum_{n=1}^{[(Contact\ Freq) \times (Exp\ Duration)]} [1-(Transfer\ Eff)]^{n-1}$$

$$Exposure_{Child} = \frac{(Exposure)_{Hand\,(Dermal),Child} \times (Transfer\ Factor)_{Hand-To-Mouth}}{(Body\ Weight)_{Child}} \times \frac{(Area)_{Hands,HtoM}}{(Area)_{Hands,Uncovered}}$$

MS	Transfer Eff. (h2m) (per contact)	Unitless	Single (0.1)
MS	Contact Freq. (h2m) (child)	events/hr	Single (20)
SS	Exposure Duration (h2m) (child)	hr/day	Triangular (0.5, 1, 2)
	Transfer Factor (h2m)	Unitless	
	Dermal Exposure (hand) (child)	mg/day	from Dermal 104, 105, 106
MS	Surface Area hands (mouthed)	cm^2	Single (20)
MS	Surface Area hands (uncovered)	cm^2	Single (452)
	Body Weight (child)	Kg	
	Exposure	mg/kg/day	

Scenario Specific = SS	Method Specific = MS	Product Specific = PS

Ingestion 108 – Hand-to-Mouth Transfer (Fraction Transferred) Post, Child

$$Exposure_{Child} = \frac{(Exposure)_{Hand\,(Dermal),Child} \times (Fraction\ Transferred)_{Hand-To-Mouth}}{(Body\ Weight)_{Child}} \times \frac{(Area)_{Hands,HtoM}}{(Area)_{Hands,Uncovered}}$$

	Dermal Exposure (hand) (child)	mg/day	
MS	Fraction Transferred (h2m) (total)	Unitless	Single (1)
MS	Surface Area hands (h2m)	cm^2	Single (1)
MS	Surface Area hands (uncovered)	cm^2	Single (1)
	Body Weight (child)	Kg	
	Exposure	mg/kg/day	

Ingestion 109 – Hand-to-Mouth Transfer (EPA SOP) Post, Child

$$Trans\ Residue = (Application)_{Area\ Treated} \times (Frac\ AI\ Dislodge) \times CF_1 \times CF_2$$

$$Exposure_{Child} = \frac{(Trans\ Residue) \times (Contact\ Freq)_{HtoM,Child} \times (Surf\ Area)_{HtoM,Child} \times (Trans\ Eff)_{HtoM} \times (Exposure\ Duration)_{Child}}{(Body\ Weight)_{Child}}$$

PS	Application (area treated)	kg a.i./m^2	
PS	Fraction a.i. dislodgeable (surface)	unitless	
	CF1 (mg to kg)	10^6	
	CF2 (m2 to cm2)	10^{-4}	
	Transferable Residue	mg/cm^2	
MS	Contact Frequency (h2m)	events/hr	Single (20)
MS	Surface Area hands (mouthed)	cm^2	Single (20)
MS	Transfer Eff. (h2m) (per contact)	unitless	Single (0.5)
MS	Exposure Duration (h2m)	hr/day	Triangular (0.5, 1, 2)
	Body Weight (child)	kg	
	Exposure	mg/kg/day	

Scenario Specific = SS	Method Specific = MS	Product Specific = PS

Inhalation 101 – Unit Exposure, Area Treated During, Adult

$$Exposure_{Adult} = \frac{(Unit\ Exposure)_{Inhalation} \times (Application)_{Area\ Treated} \times (Area\ Treated)}{(Reference\ Duration) \times (Body\ Weight)_{Adult}}$$

PS	Unit Exposure (inhalation)	mg/kg a.i.	
PS	Application (a.i. per area treated)	kg a.i./m^2	
SS	Area Treated	m^2	Normal (100,50,0,1000)
	Reference Duration	day	1
	Body Weight	kg	
	Exposure	mg/kg/day	

Inhalation 102 – Unit Exposure, Amount of Formulation Used During, Adult

$$Exposure_{Adult} = \frac{(Unit\ Exposure)_{Inhalation} \times (Application)_{Amt\ Form\ Used} \times (Amount\ of\ Form\ Used)}{(Reference\ Duration) \times (Body\ Weight)_{Adult}}$$

PS	Unit Exposure (inhalation)	mg/kg a.i	
PS	Application (amount a.i. used)	kg a.i./m^3	
PS	Amount of Form. Used (by volume)	m^3	
	Reference Duration	day	1
	Body Weight	kg	
	Exposure	mg/kg/day	

Inhalation 103 – Air Concentration (Specified) Post, Adult/Child

$$Exposure_{Adult/Child} = \frac{(Air\ Conc\ AI) \times (Inhalation\ Rate)_{Adult/Child} \times (Exposure\ Duration)_{Adult/Child}}{(Body\ Weight)_{Adult/Child}}$$

PS	Air Concentration of a.i. (in or out)	mg/m^3	
	Inhalation Rate (adult/child)	m^3/hr	
SS	Exposure Duration (adult/child)	hr/day	Triangular (0.5, 1, 2)
	Body Weight	kg	
	Exposure	mg/kg/day	

Inhalation 104 – Air Concentration (Calculated) Post, Adult/Child

$$Air\ Concentration = \frac{(Amt\ Form) \times (Frac\ AI\ Form) \times (Density\ Form) \times (Dilution\ Factor)}{(Volume)}$$

$$Exposure_{Adult/Child} = \frac{(Air\ Concentration) \times (Inhalation\ Rate)_{Adult/Child} \times (Exposure\ Duration)_{Adult/Child}}{(Body\ Weight)_{Adult/Child}}$$

PS	Amount of Form. Used (by volume)	m^3	
PS	Fraction of a.i. in Formulation	unitless	
PS	Density of Formulation	mg/m^3	
MS	Dilution Factor (in or out)	unitless	0.01
MS	Volume (in or out, imaginary)	m^3	90.62
	Air Concentration of a.i. (in or out)	mg/m^3	
	Inhalation Rate (adult/child)	m^3/hr	
SS	Exposure Duration (adult/child)	hr/day	Triangular (0.5, 1, 2)
	Body Weight	kg	
	Exposure	mg/kg/day	

Scenario Specific = SS	Method Specific = MS	Product Specific = PS

Aggregate Assessment

- Chemical (new): CAS = 12-345-6
- Toxicology (new): Acute = 0.5 UF = 300
  Chronic = 0.03 UF = 100 Q* =0.005
- Population: Children 1-2 (subset 1000 with R. Seed =100)
- Source Accumulator Plus
  - Select Acute(MOE), Chronic (MOE), Chronic (Cancer Risk)
  - Select missing input files

- Residential File:
  CW RESIDENTIAL EXAMPLE #1 ResRunner Scenario accumulator (01212009 085316).usr

- Dietary Food
  CW DIETARY EXAMPLE #1 CARES Dietary (01192009 094541).usr

- Dietary Water
  CW WATER EXAMPLE #1 Water (01202009 211254).usr

C:\Notitia\Data\2009 Workshop\AGG DEMO Rex Source accumulator (01212009 171121).usr