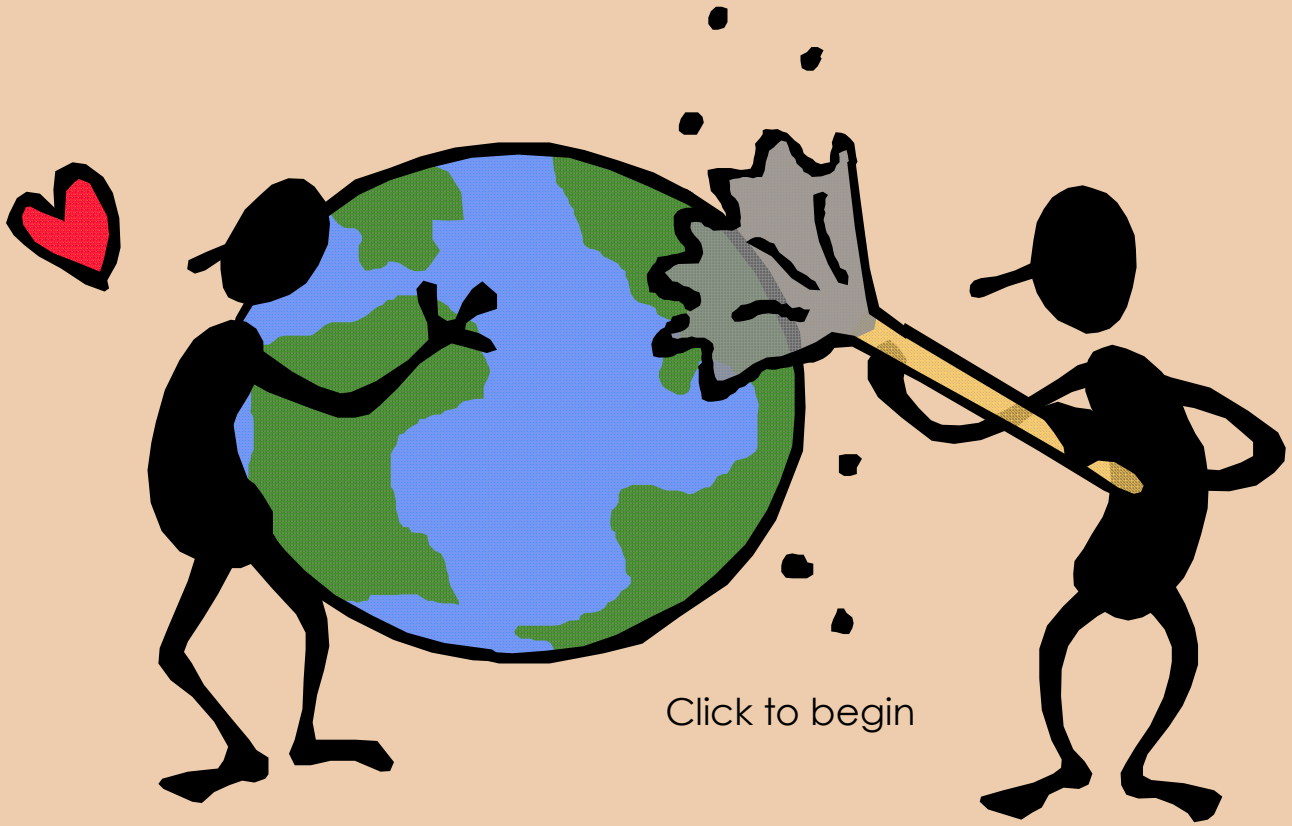
FRAMES *tutorial*



Click to begin

FRAMES 1.X Tutorial

TABLE OF CONTENTS

- **Tutorial overview** – FAMILIARIZES USERS WITH TUTORIAL FEATURES
- **Tutorial introduction** – INTRODUCES THE STORY IN WHICH THE TUTORIAL IS BASED ON
- **Creating a new scenario** – GETTING STARTED BY CREATING A NEW GID FILE
- **Dragging and dropping icons** – PLACING MODULE ICONS ONTO THE CSM
- **Connecting icons** – SIMULATES THE CONTAMINANT FLOW THROUGH THE MODULES
- **Setting up the Contaminant module** – STEP BY STEP INSTRUCTIONS AND ANIMATIONS
- **Setting up the Source Term module** – STEP BY STEP INSTRUCTIONS AND ANIMATIONS
- **Setting up remaining modules** – PROVIDES DATA FOR USERS TO INPUT
- **Selecting a viewer** – EXPLAINS OPTIONS FOR VIEWING RESULTS

OVERVIEW

What is the purpose of the FRAMES 1.5 Tutorial?

This tutorial describes how to start using the FRAMES software. The user will gain a more complete understanding of how to use FRAMES by building an example case. Step-by-step instructions to build a case are given starting with a case scenario and ending with viewing results.

FRAMES 1.5 Tutorial Features

1) To view the previous page, click on the () button.
2) To view the next page, click on the () button.
3) To end the tutorial and return to the main FRAMES page, click on the () button
4) To return to the Tutorial Table of Contents, click on the () button.
5) Underlined words throughout the tutorial will take you to the reference section. To return to the tutorial after browsing through the reference section, simply hit the ESC button on your keyboard.
6) If the navigation buttons below are grayed out (), it means that it has been disabled.
7) The navigational bar at the bottom of the page indicates the progress of the user through a specific section.

Tutorial Introduction

Every contaminated site has a story behind the scenes, containing explanations and descriptions of the location and exposure pathways. This is the story for the scenario used in the FRAMES 1.5 Tutorial. The data used to fill in this example scenario is consistent with the story told below. After completing this test scenario, you should be able to start with your own site and run a scenario. Step by step instructions are included throughout Getting Started. Read the following scenario and follow the instructions to create your own scenario.

The "story" behind the scenario

Beginning in November of 1995, a manufacturing company deposited its radioactive and nonradioactive by-products onto the ground in a 10' x 10' area. The deposit is not covered. The waste represents the only waste unit at the facility. The site is near the Green Stone River. The Site was ordered closed by the U.S. Environmental Protection Agency. Constituents of concern include antimony, strontium 90, and trichloroethylene.

While the site was still active, mechanical traffic and poor management practices resulted in a considerable amount of wind-blown particulate matter to be transported from the site. Over the years, the residential soil of the nearby town of Fieldview became contaminated. Residential soil samples have been taken.

Samples have also been taken of the site sediments. The river is used for drinking water, irrigation and stock/feed water for livestock. Also, fishing and swimming occur on this stretch of the river. The local population consumes aquatic life from the river, and locally grown crops and livestock.

. . . the "story" continued

There is an intake structure downstream where the contaminants enter the river; this structure is used to supply feed/stock water and irrigation water to two nearby agricultural farms: one in Bend County and one in Blue County. Inorganics were not sampled for in the river, but organics were sampled for. Measured concentrations of carbon tetrachloride have been detected five miles downstream from the facility.

Contaminants have been measured in the local groundwater in the local groundwater system. Several private and municipal wells use the groundwater from the same aquifer; however, most of the wells are located significantly up gradient from the landfill, are uncontaminated, and do not change the groundwater flow system when pumping. One pumping well though is located down gradient of the waste site, and is contaminated with low levels of constituents. This well is currently being used as a municipal drinking water well for the town of Fieldview. Besides contaminating the pumping well, the contaminated groundwater also recharges to the Green Stone River.

On hot days, local residents have complained of pungent odors, suggesting volatilization of chemicals; three of the chemicals of concern can volatilize. The area is heavily agricultural and dry deposition of contaminants on plants and consumption by humans is possible. It is also possible for plants to uptake residual chemicals from the soil. All records and information pertaining to the site, including maps, photographs, and sampling result summaries are stored at the County Health Department in Fieldview.

The following tutorial will demonstrate how to use this documented information to conduct an analysis in FRAMES 1.5.

FRAMES 1.X

Tutorial

CREATING A NEW SCENARIO

*Creating a new *.gid file*

The following steps used for this tutorial will be the similar to every case, but the icons and data used will vary from case to case.

1) After opening FRAMES, the Main Screen will appear, characterized by a gray background. To begin a new FRAMES case, a GID file must be opened. A GID (Global Input Data) file is simply the file extension used for the user input file in FRAMES. This can be an already existing file or a new file. In this scenario, we will create a new file.

2) Click on the File menu at the top left hand corner of the screen, and choose 'New.'

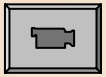
3) A window will appear, prompting you to save this new file under a specific folder and file name.

4) For this scenario, select an appropriate folder, and type in "Case01" as the file name. The file name should be no longer than 8 characters with no spaces or special characters. The extension, GID, stands for Global Input Data file.

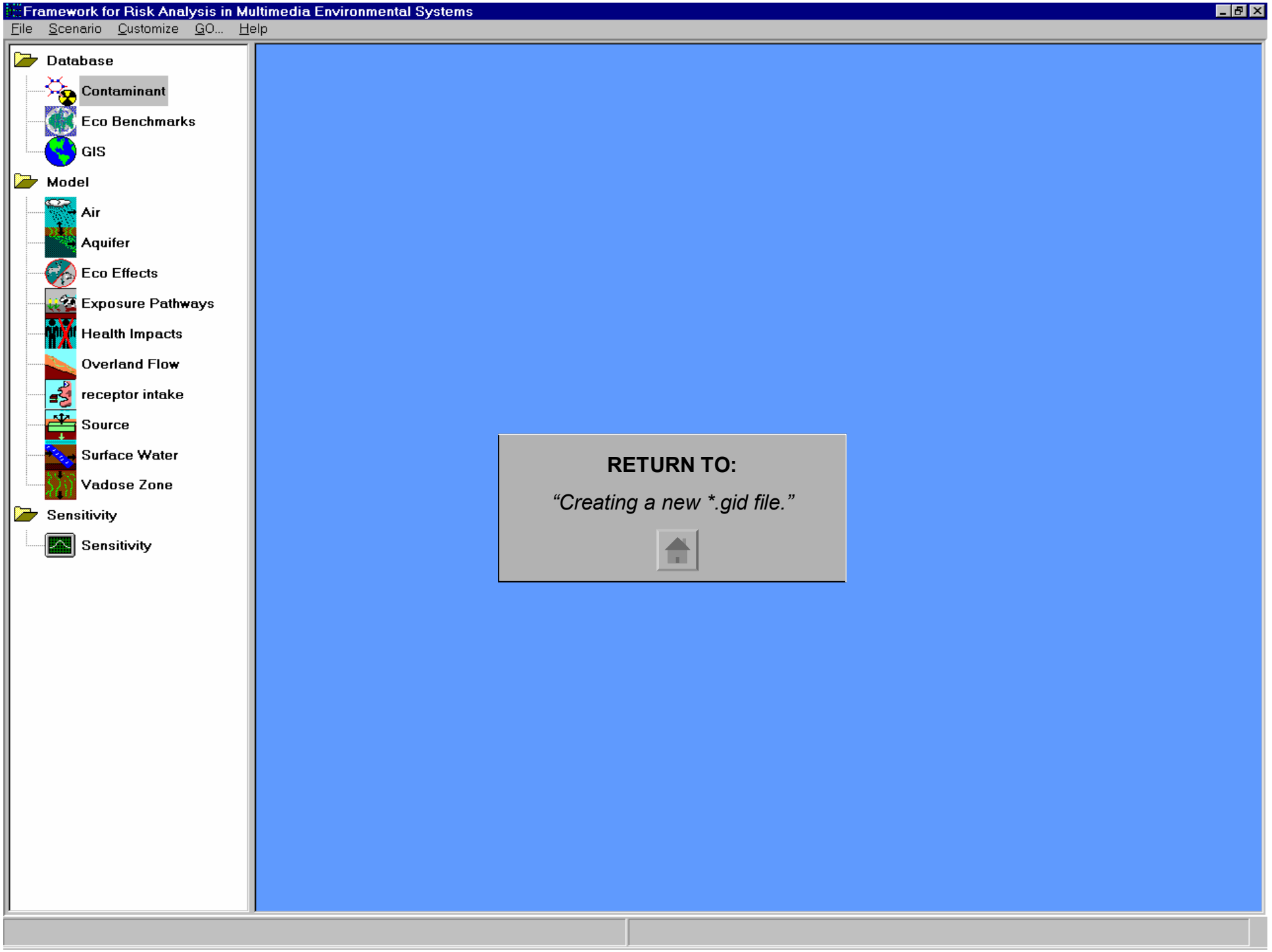
5) If you choose to cancel the screen without saivng, you will be unable to continue with the case. Click on the 'Save' button to continue.

6) A new FRAMES interface will appear, allowing you to begin a new case.

For more details on the opening an existing file, refer to the reference section.



CLICK TO VIEW ANIMATION


Framework for Risk Analysis in Multimedia Environmental Systems
File
Scenario
Customize
GO...
Help
Database
Contaminant
Eco Benchmarks
GIS
Model
Air
Aquifer
Eco Effects
Exposure Pathways
Health Impacts
Overland Flow
receptor intake
Source
Surface Water
Vadose Zone
Sensitivity
Sensitivity
RETURN TO:
“Creating a new *.gid file.”

FRAMES 1.X

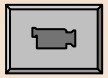
Tutorial

DRAGGING AND DROPPING ICONS

Inserting icons into the CSM

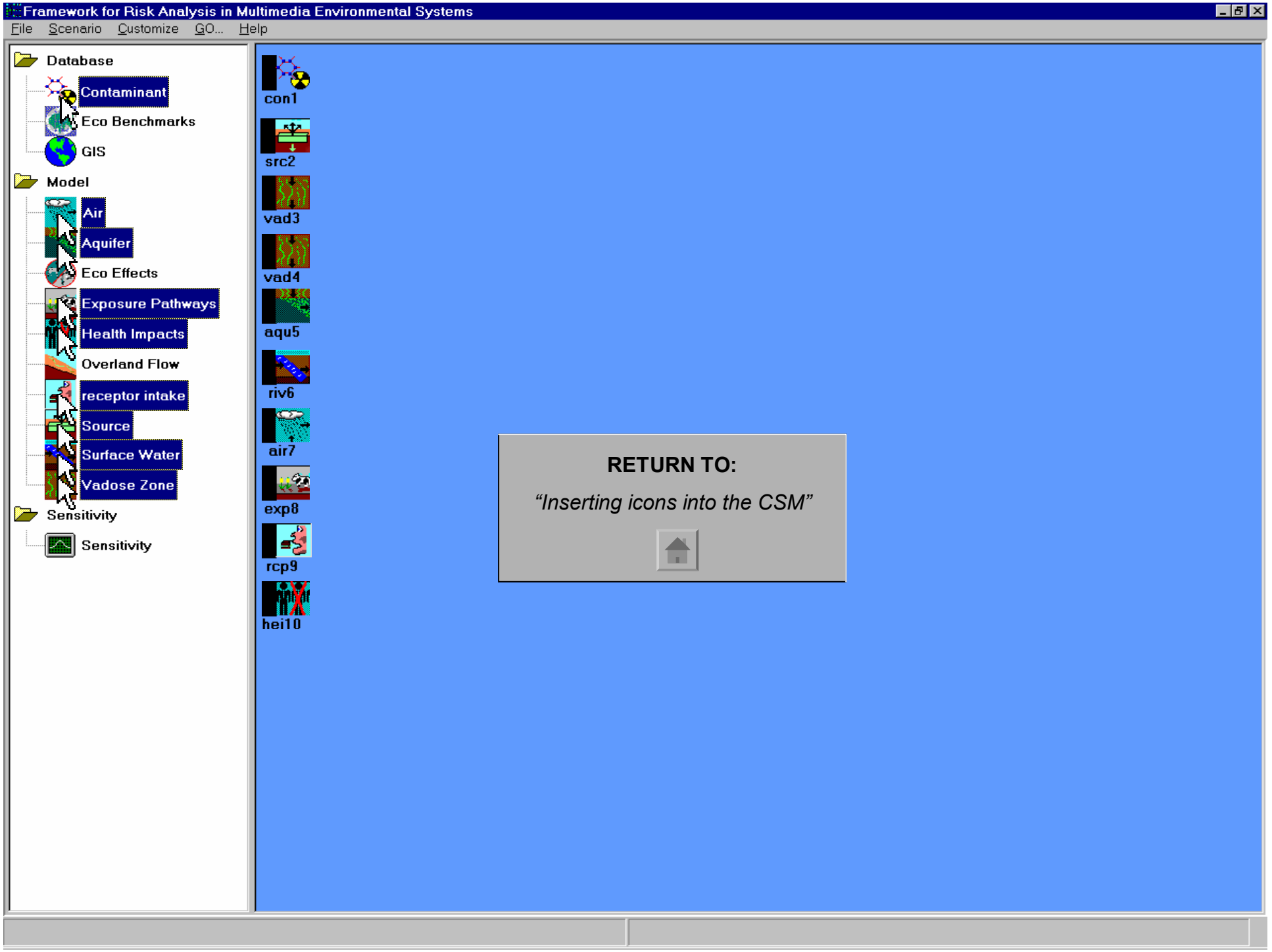
The following icons used are for the sample case only. To view a comprehensive list of icon information, refer to the reference section.

1) Double click on the contaminant icon () The icon should appear on the right side of the screen, within the main user interface. Do this for each of the following icons:
2) Insert the Source Term icon ()
3) Insert the Vadose Zone icon ()
4) Insert another Vadoze Zone icon. Each icon represents one layer of soil.
5) Insert the Aquifer Module ()
6) Insert the Surface Water Module icon ()
7) Insert the Air icon ()
8) Insert the Exposure Pathways Module icon ()
9) Insert the Receptor Intake Module icon ()
10) Insert the Health Impacts Module icon ()



CLICK TO VIEW ANIMATION

For icon description, refer to reference section.


Framework for Risk Analysis in Multimedia Environmental Systems
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Eco Effects
Exposure Pathways
Health Impacts
Overland Flow
receptor intake
Source
Surface Water
Vadose Zone
Sensitivity
Sensitivity
con1
src2
vad3
vad4
aqu5
riv6
air7
exp8
rcp9
hei10
RETURN TO:
“Inserting icons into the CSM”

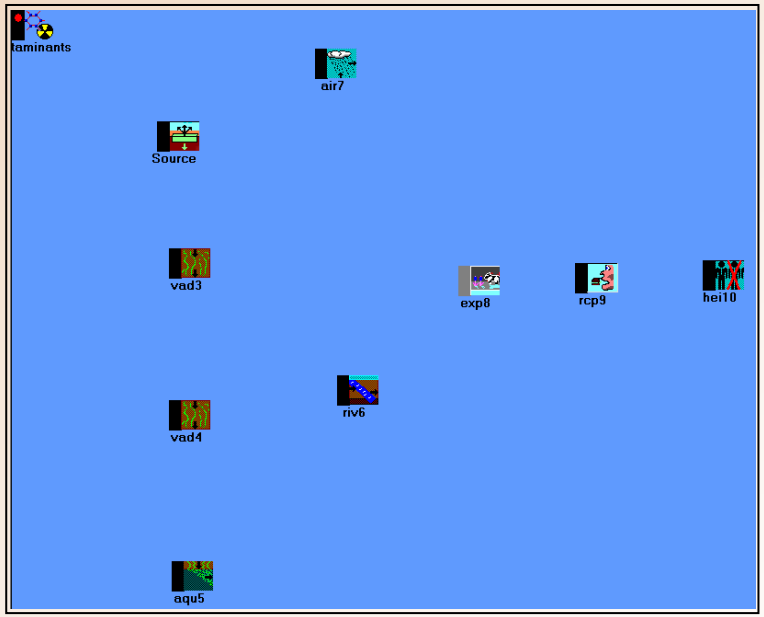
DRAGGING AND DROPPING ICONS

Arranging icons within the CSM

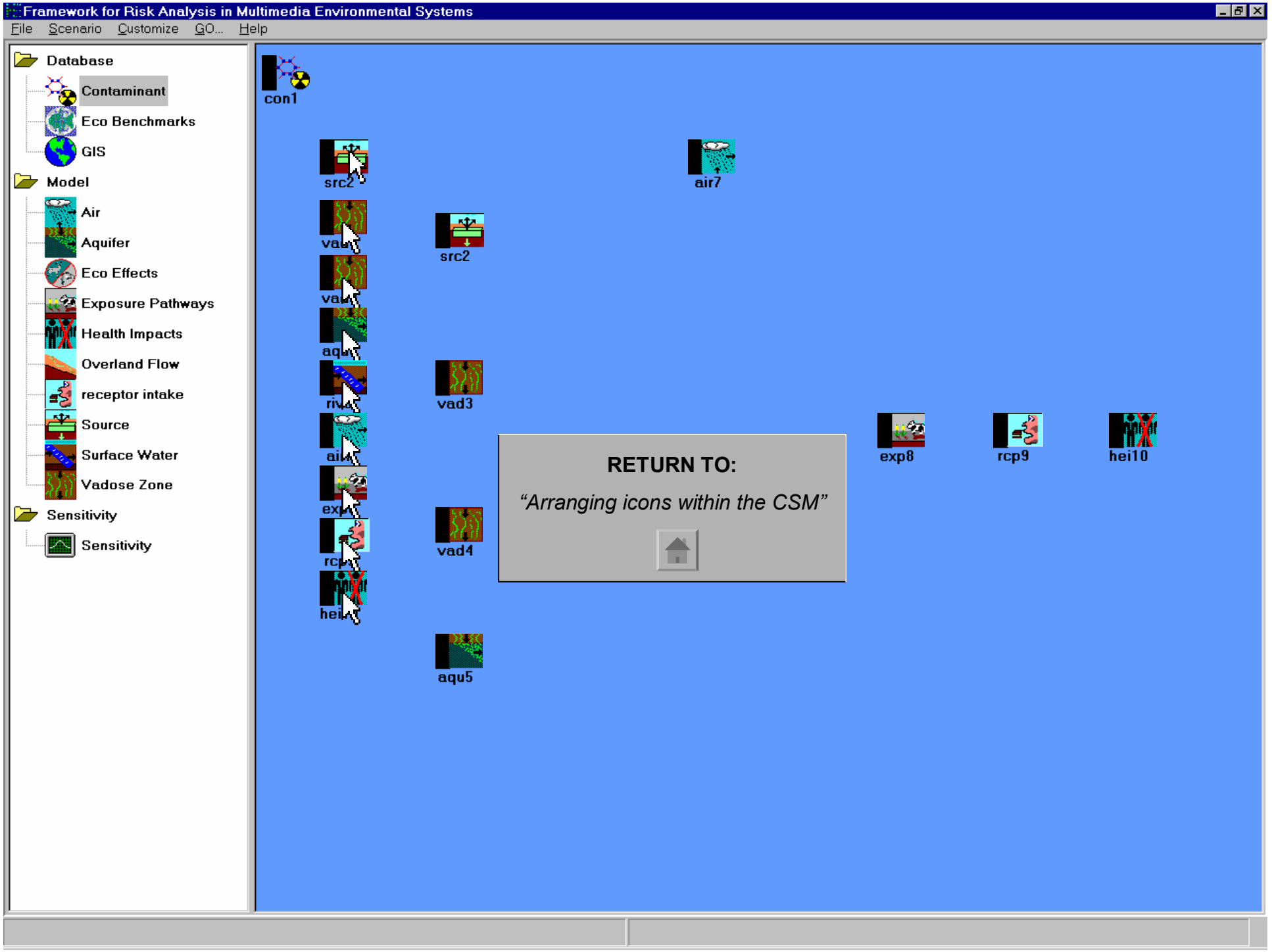
It is a good idea to arrange the icons in a more logical way so that it accurately simulates the flow of contamination.

1) Click on the contaminant database module icon, and (using your mouse) drag it to the desired location (without releasing the mouse). Once the icon is in the desired position, the mouse can be released. This process is called “dragging and dropping” an icon.

2) Drag and drop the different icons until the following layout is achieved:



CLICK TO VIEW ANIMATION


Framework for Risk Analysis in Multimedia Environmental Systems
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Aquifer
Eco Effects
Exposure Pathways
Health Impacts
Overland Flow
receptor intake
Source
Surface Water
Vadose Zone
Sensitivity
Sensitivity
con1
src2
air7
src2
vad3
vad4
aqu5
exp8
rcp9
hei10
RETURN TO:
"Arranging icons within the CSM"

CONNECTING ICONS

Connecting Icons

1) It is essential to link icons in the order of the flow of contamination. To link two icons together, hold down the shift key while left clicking on the initial icon and dragging the mouse to the next icon. Make the following connections between:

   a. The con1 icon and each of the other icons on the main screen.

   b. Src2 icon and vad3 icon

   c. Src2 icon and air7 icon

   d. Air7 icon and exp8 icon

   e. Vad3 icon and vad4 icon

   f. Vad4 icon and aqu5 icon

   g. Aqu5 icon and riv6 icon

   h. Aqu5 icon and exp8 icon

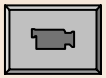
   i. Riv6 icon and exp8 icon

   j. exp8 icon and rcp9 icon

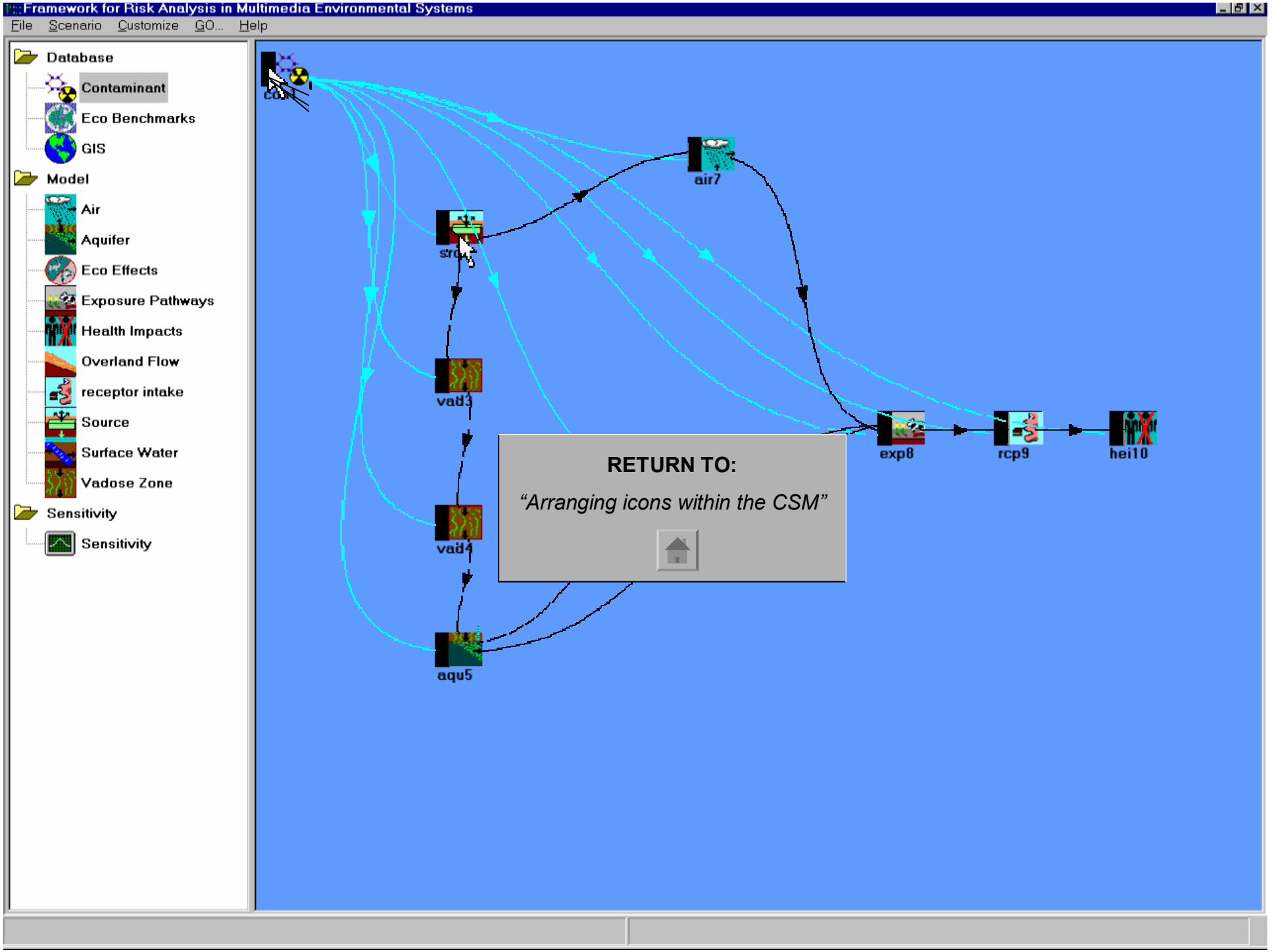
   k. Rcp9 icon and hei10 icon

2) Any number and direction of connections is permitted between icons. However, certain modules may limit the connections. Different colored lines and arrows are used to distinguish between database, sensitivity, and module links.

   For more details on adding, removing, or deleting a linkage, refer to the reference section.



CLICK TO VIEW ANIMATION


Framework for Risk Analysis in Multimedia Environmental Systems
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Database
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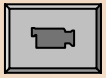
Aquifer
Eco Effects
Exposure Pathways
Health Impacts
Overland Flow
receptor intake
Source
Surface Water
Vadose Zone
Sensitivity
Sensitivity
air7
vad3
vad4
aqu5
exp8
rcp9
hei10
RETURN TO:
"Arranging icons within the CSM"

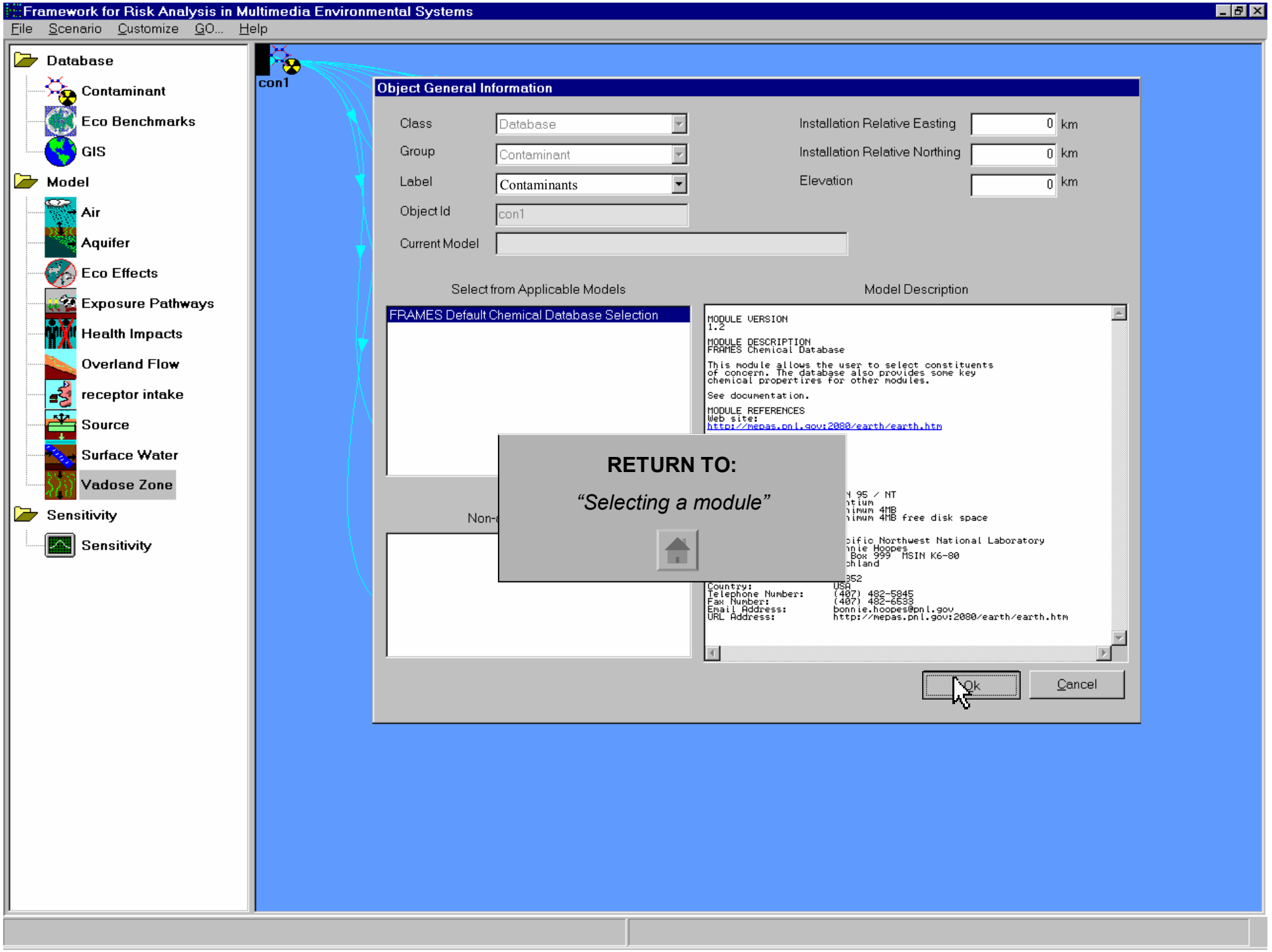
THE CONTAMINANT DATABASE MODULE

Selecting a Module

1) Right click on the Contaminant Database icon
2) Select "General Info" from the pop-up menu
3) The Object General Information screen will open.
4) A user-defined label can be entered to replace the default. In this scenario, enter Contaminants in the label section
5) Many modules have multiple applicable and non-applicable models. However, there is only one Applicable Model and no Non-applicable models for the Contaminant Database. Select the FRAMES Default Chemical Database Selection, and the Model Description should appear on the right side of the screen.
6) Click "Ok." The screen will close and the main FRAMES user interface will reappear



CLICK TO VIEW ANIMATION


Framework for Risk Analysis in Multimedia Environmental Systems
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Eco Effects
Exposure Pathways
Health Impacts
Overland Flow
receptor intake
Source
Surface Water
Vadose Zone
Sensitivity
Sensitivity
con1
Object General Information
Class
Database
Group
Contaminant
Label
Contaminants
Object Id
con1
Current Model
Installation Relative Easting
0
km
Installation Relative Northing
0
km
Elevation
0
km
Select from Applicable Models
FRAMES Default Chemical Database Selection
Model Description
MODULE VERSION
1.2
MODULE DESCRIPTION
FRAMES Chemical Database
This module allows the user to select constituents
of concern. The database also provides some key
chemical propertires for other modules.
See documentation.
MODULE REFERENCES
Web site:
http://mepas.pnl.gov:2080/earth/earth.htm
RETURN TO:
"Selecting a module"
Ok
Cancel

THE CONTAMINANT DATABASE MODULE

Choosing Contaminants

1) Notice the black side bar of the Contaminant Database Icon. This color will change every time a step is completed. At this point, the light should be red. For more details on the lighting system, refer to the reference section.

2) Right click the Contaminant icon and choose "User Input" from the menu.

3) The FRAMES Constituent Database Editor screen will open.

   Several tabs span across the window. For this (and most) scenario, use the defaults provided in the Constituent Identification and Constituent Properties. The main concern is the "Constituent of Interest" tab which allows the user to enter the scenario-specific contaminants

   There are several different ways to group contaminants to narrow the selection and assist in finding the desired contaminant. For this example case, use the default selections in the Constituent View Options area.

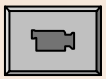
4) Type "Antimony" in the 'Search for:' box below. The search will automatically find the first listing of the contaminant.

5) Click Find Next until the specific contaminant is found. Once the desired contaminant is highlighted, click 'Add,' and the contaminant will appear on the right.

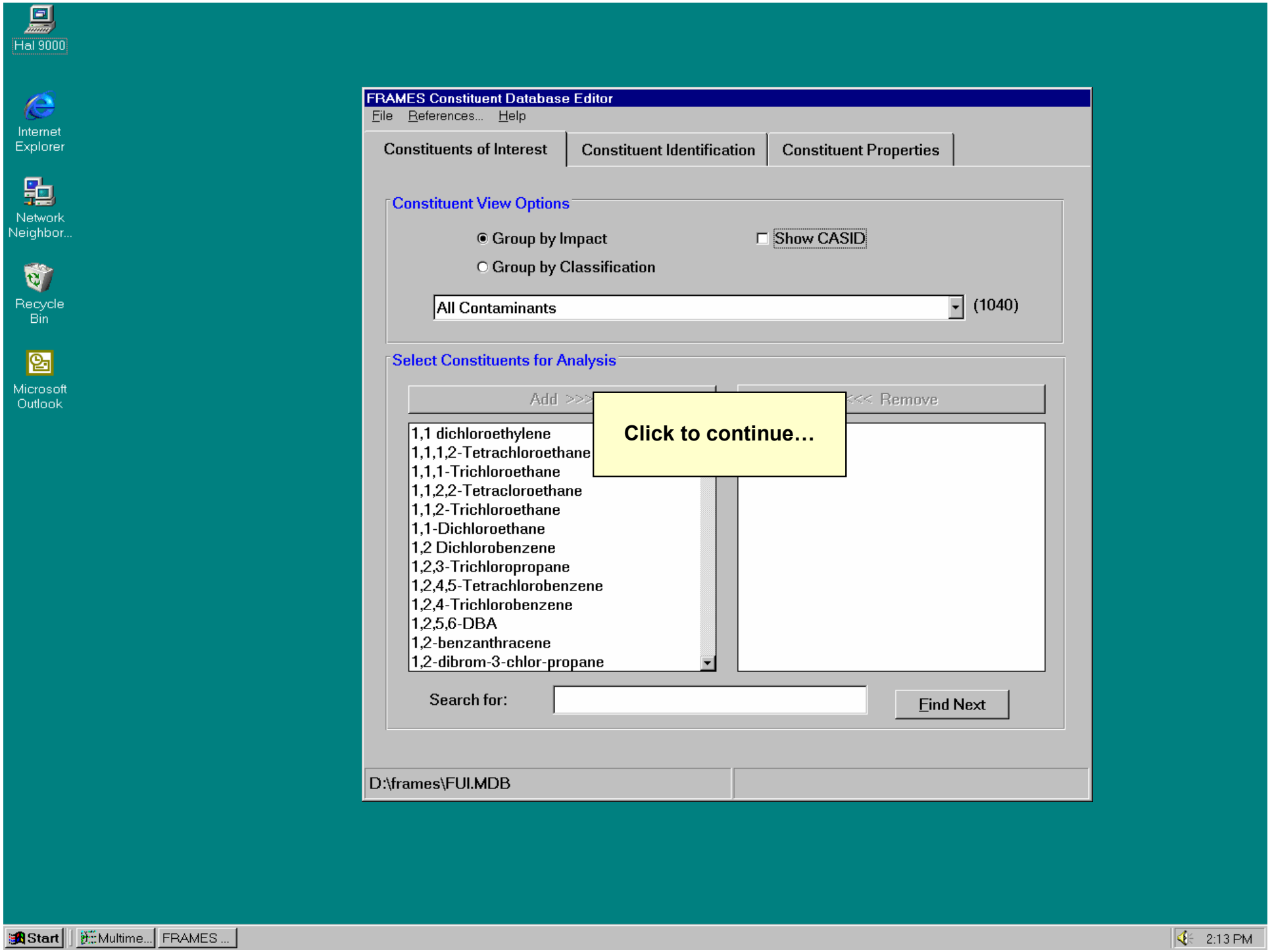
6) Repeat these steps to add Strontium-90 and Trichloroethylene to the list.

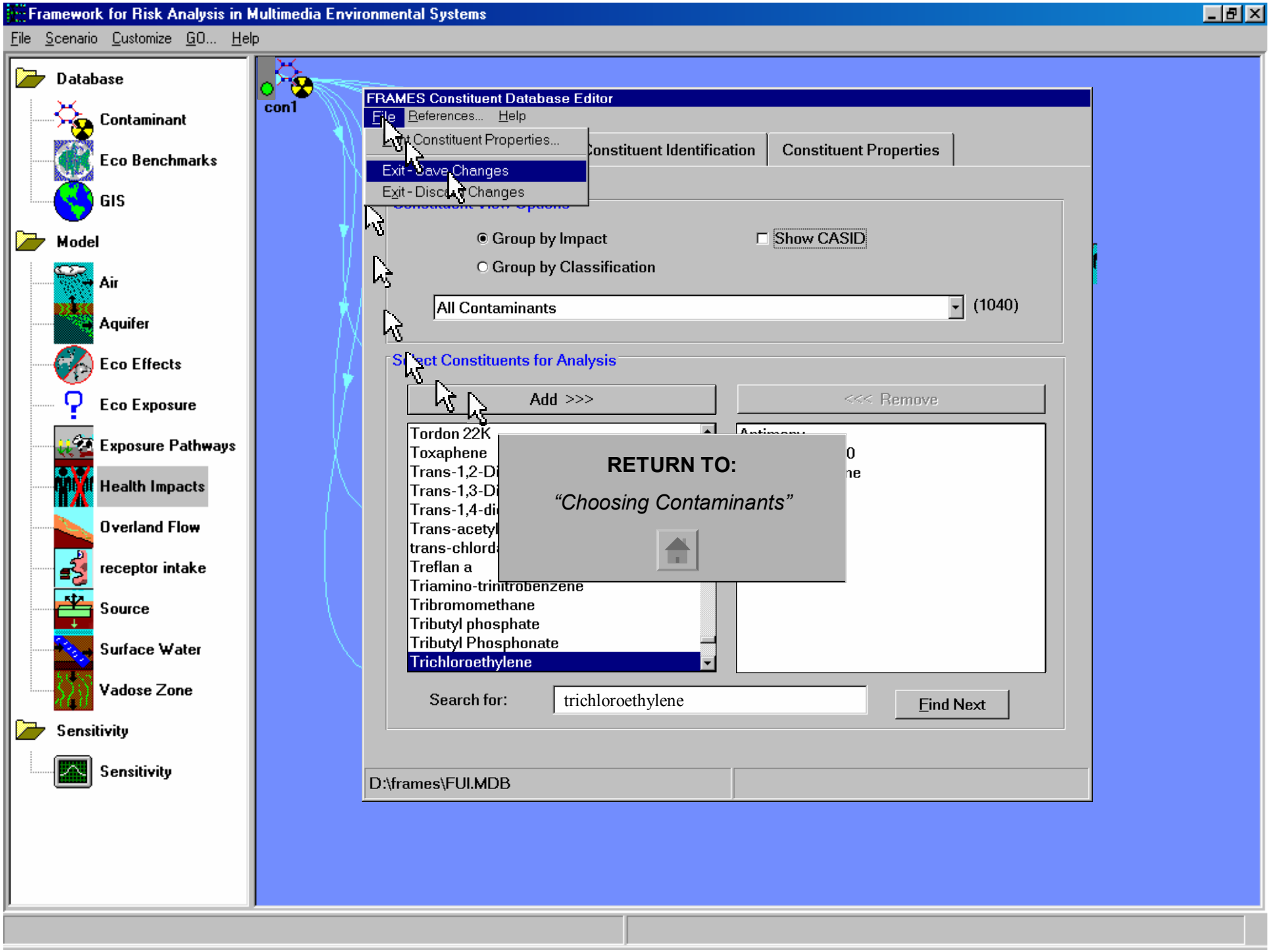
   An unlimited number of contaminants can be added to the scenario in any order. They will appear alphabetized on the right side of the screen.To remove a contaminant from the scenario, highlight the contaminant on the right side of the screen and click 'Remove.'

4) Click on the 'File menu' and choose 'Exit and Save Changes.' This will bring you back to the main user interface screen, and concludes the Contaminant Database Icon setup. Unlike other modules, the Contaminant Database module does not need to be run. Also notice that a green light will appear on the side of the icon.



CLICK TO VIEW ANIMATION


Hal 9000
Internet Explorer
Network Neighbor...
Recycle Bin
Microsoft Outlook
FRAMES Constituent Database Editor
File References... Help
Constituents of Interest
Constituent Identification
Constituent Properties
Constituent View Options
Group by Impact
Show CASID
Group by Classification
All Contaminants
(1040)
Select Constituents for Analysis
Add >>>
<<< Remove
Click to continue…
1,1 dichloroethylene
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
1,1,2,2-Tetracloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,2 Dichlorobenzene
1,2,3-Trichloropropane
1,2,4,5-Tetrachlorobenzene
1,2,4-Trichlorobenzene
1,2,5,6-DBA
1,2-benzanthracene
1,2-dibrom-3-chlor-propane
Search for:
Find Next
D:\frames\FUI.MDB
Start
Multime...
FRAMES ...
2:13 PM


Framework for Risk Analysis in Multimedia Environmental Systems
File Scenario Customize GO... Help
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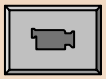
Aquifer
Eco Effects
Eco Exposure
Exposure Pathways
Health Impacts
Overland Flow
receptor intake
Source
Surface Water
Vadose Zone
Sensitivity
Sensitivity
con1
FRAMES Constituent Database Editor
File References... Help
Constituent Properties...
Exit - Save Changes
Exit - Discard Changes
Constituent Identification
Constituent Properties
Group by Impact
Group by Classification
Show CASID
All Contaminants
(1040)
Select Constituents for Analysis
Add >>>
<<< Remove
Tordon 22K
Toxaphene
Trans-1,2-Di
Trans-1,3-Di
Trans-1,4-di
Trans-acetyl
trans-chlord
Treflan a
Triamino-trinitrobenzene
Tribromomethane
Tributyl phosphate
Tributyl Phosphonate
Trichloroethylene
RETURN TO:
"Choosing Contaminants"
Search for:
trichloroethylene
Find Next
D:\frames\FUI.MDB

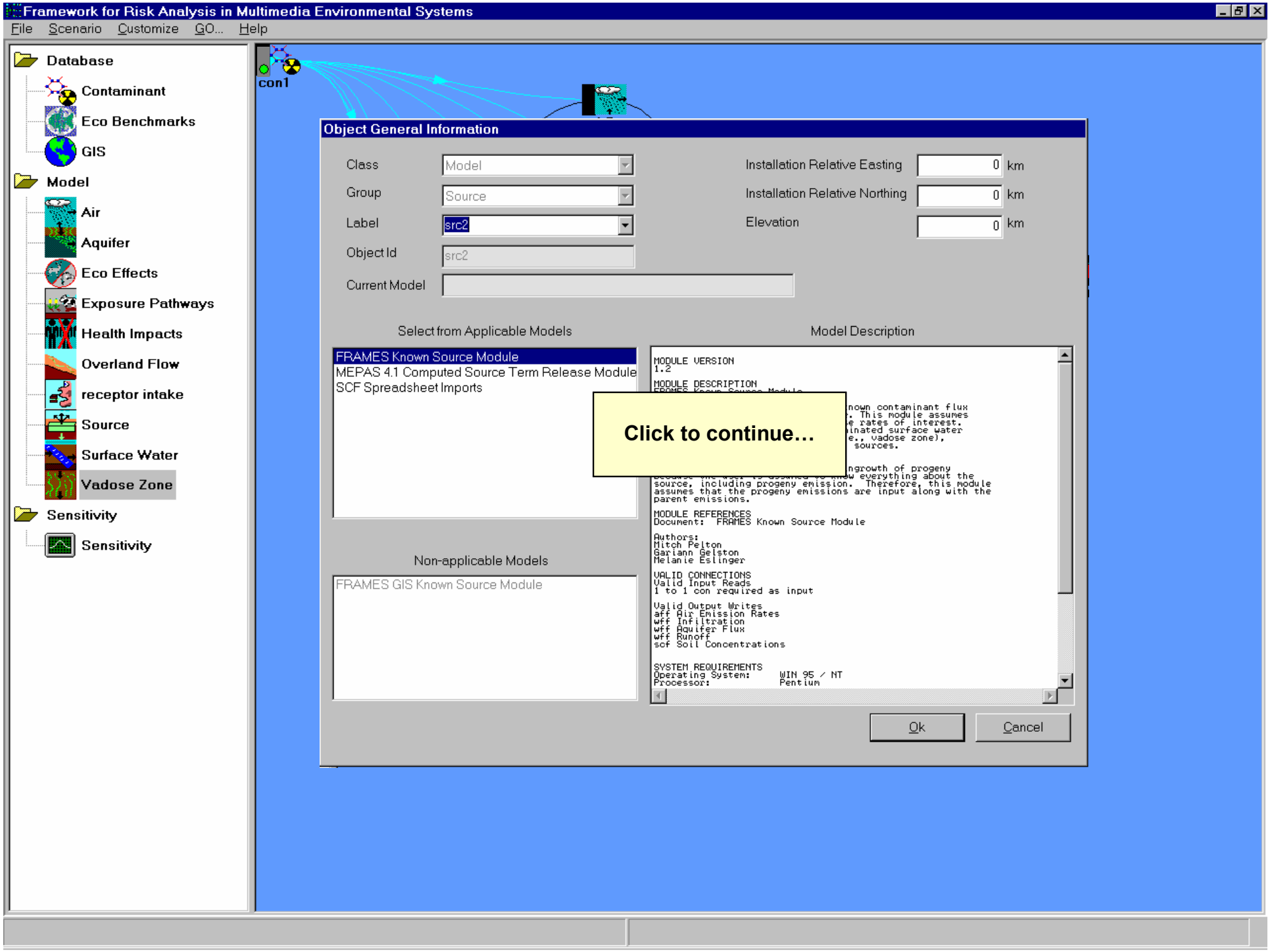
THE SOURCE TERM MODULE

Selecting a Module

1) Right click on the Source Term module icon
2) Select "General Info" from the pop-up menu
3) The Object General Information screen will open.
4) Enter "Source" as the label in the label section
5) In the 'Select from Applicable Models' list, choose the "MEPAS 4.1 Computed Source Term Release Module." The model description will appear at the right of the screen.
6) Click "Ok." The screen will close and the main FRAMES user interface will reappear



CLICK TO VIEW ANIMATION


Framework for Risk Analysis in Multimedia Environmental Systems
File Scenario Customize GO... Help
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GIS
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Overland Flow
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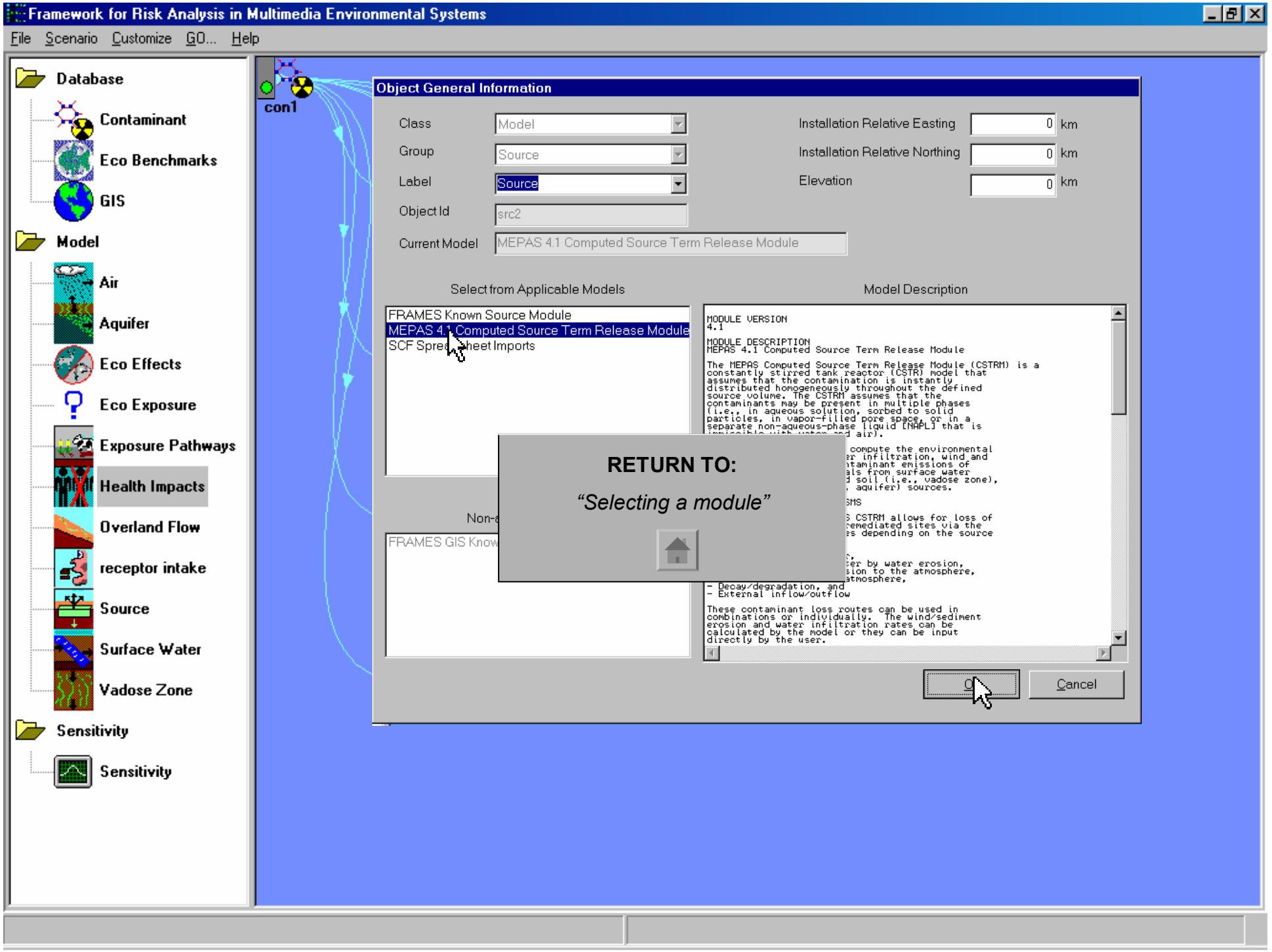
Vadose Zone
Sensitivity
Sensitivity
con1
Object General Information
Class
Model
Group
Source
Label
src2
Object Id
src2
Current Model
Installation Relative Easting
0
km
Installation Relative Northing
0
km
Elevation
0
km
Select from Applicable Models
FRAMES Known Source Module
MEPAS 4.1 Computed Source Term Release Module
SCF Spreadsheet Imports
Non-applicable Models
FRAMES GIS Known Source Module
Model Description
MODULE VERSION
1.2
MODULE DESCRIPTION
nown contaminant flux
. This module assumes
e rates of interest.
inated surface water
e., vadose zone),
sources.
ngrowth of progeny
w everything about the
source, including progeny emission. Therefore, this module
assumes that the progeny emissions are input along with the
parent emissions.
MODULE REFERENCES
Document: FRAMES Known Source Module
Authors:
Mitch Pelton
Gariann Gelston
Melanie Eslinger
VALID CONNECTIONS
Valid Input Reads
1 to 1 con required as input
Valid Output Writes
aff Air Emission Rates
wff Infiltration
wff Aquifer Flux
wff Runoff
scf Soil Concentrations
SYSTEM REQUIREMENTS
Operating System: WIN 95 / NT
Processor: Pentium
Click to continue…
Ok
Cancel


Framework for Risk Analysis in Multimedia Environmental Systems
File Scenario Customize GO... Help
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Eco Exposure
Exposure Pathways
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receptor intake
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Vadose Zone
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Sensitivity
con1
Object General Information
Class
Model
Group
Source
Label
Source
Object Id
src2
Current Model
MEPAS 4.1 Computed Source Term Release Module
Installation Relative Easting
0
km
Installation Relative Northing
0
km
Elevation
0
km
Select from Applicable Models
Model Description
FRAMES Known Source Module
MEPAS 4.1 Computed Source Term Release Module
SCF Spreadsheet Imports
MODULE VERSION
4.1
MODULE DESCRIPTION
MEPAS 4.1 Computed Source Term Release Module
The MEPAS Computed Source Term Release Module (CSTRM) is a constantly stirred tank reactor (CSTR) model that assumes that the contamination is instantly distributed homogeneously throughout the defined source volume. The CSTRM assumes that the contaminants may be present in multiple phases (i.e., in aqueous solution, sorbed to solid particles, in vapor-filled pore space, or in a separate non-aqueous-phase liquid [NAPL] that is
- Decay/degradation, and
- External inflow/outflow
These contaminant loss routes can be used in combinations or individually. The wind/sediment erosion and water infiltration rates can be calculated by the model or they can be input directly by the user.
Cancel
RETURN TO:
"Selecting a module"

THE SOURCE TERM MODULE

Inputting Data

Notice the black side bar of the Contaminant Database Icon. This color will change every time a step is completed. At this point, the light should be red. For more details on the lighting system, click here.

1) Right click the Source Icon

2) Choose "User Input" from the menu.

3) The Source Term Module Input screen will open.

4) Once the User Input screen has opened, click 'OK' to dismiss the "About MEPAS CSTRM" window.

5) Input the scenario specific data as indicated by the tables provided in the following slides.

   Boxes will be shaded either red or green. A red box signifies missing information that needs to be filled in. The user will be unable to continue if red boxes are not filled in. A green box signifies that the data is acceptable.

   The user must also make sure that the inputted values are within its numeric value range. This can be found at the bottom of the screen, once the cursor is placed inside of the box.

6) The bold headings at the top of the table indicates the section as specified by the tabs across the top of the window. Enter the data under the appropriate tab. An empty parameter entry shown by a red box can cause an error message after you click 'Exit and Save.' The error message will appear and should tell you which parameter is incorrect/empty. The data must be entered before the scenario can proceed.

   To view tables, proceed onto the next page. In this tutorial, an animation will be provided as a guide to filling out the "Options" tab. The rest of the tabs will be shown through screen captures.

CLICK TO VIEW TABLES

THE SOURCE TERM MODULE

Under the OPTIONS tab:

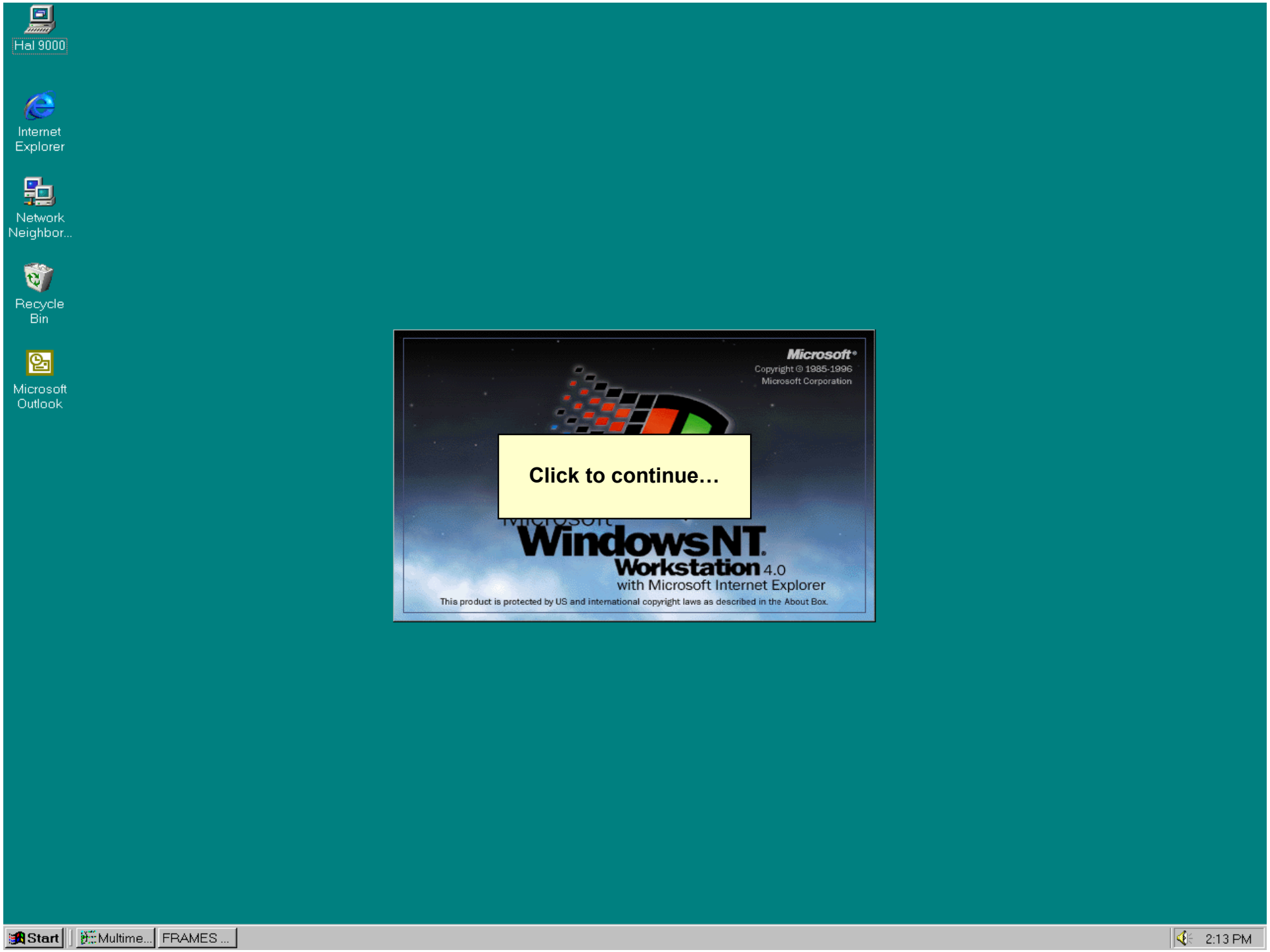
Medium type for waste zone - STMEDIA	soil/vadose	
Leaching loss route– STINF _ OP	Compute Pathway	
Overland runoff loss route– STOVL _ OP	Turn off pathway	
Suspension loss route– STSUS _ OP	Compute Pathway	
Volatilization loss route– STVOL _ OP	Turn off pathway	
Known Source/Sink – STSRC _ OP	Turn off pathway	
Time interval for simulation – STDELTA _ T	1	years
Time period for simulation – STMAXTIME	100	years
Residual mass for simulation - STMINWST	0.01	fraction

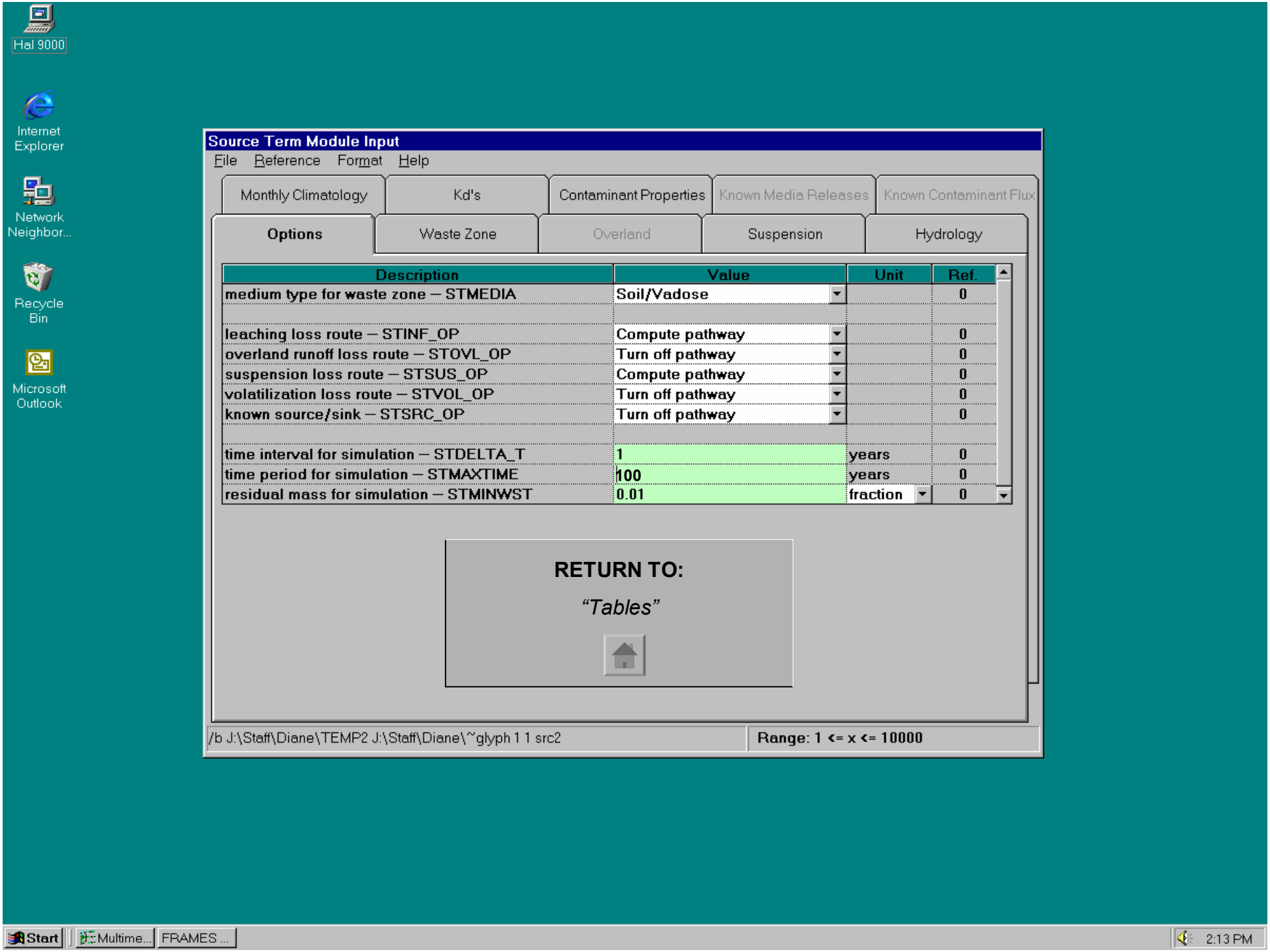
CLICK TO VIEW ANIMATION

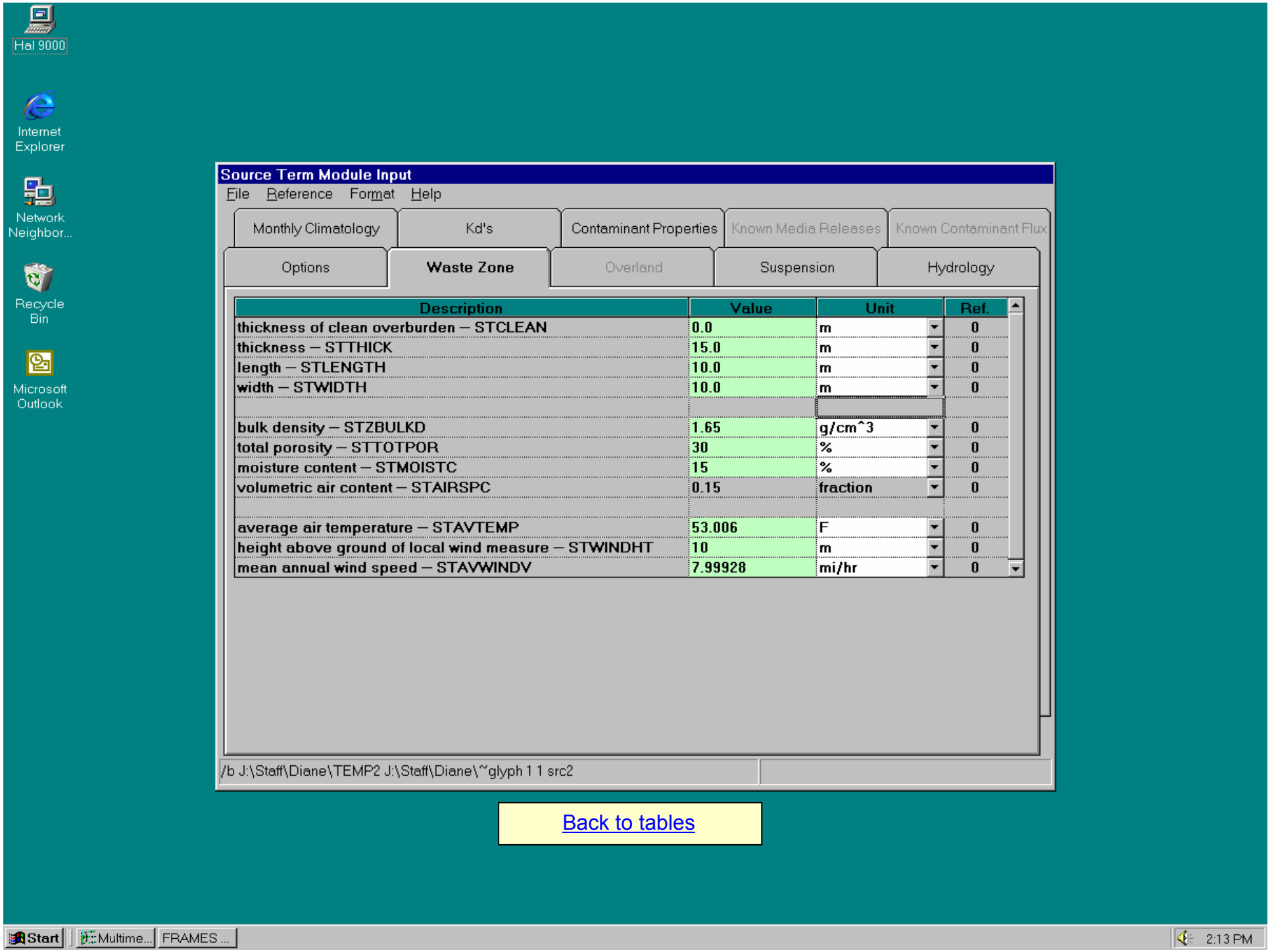
Under the WASTE ZONE tab:

Thickness of clean overburden- STCLEAN	0.0	m
Thickness– STTHICK	15.0	m
Length - STLENGTH	10.0	m
Width - STWIDTH	10.0	m
Bulk density – STZBULKD	1.65	g/cm^3
Total porosity – STTOTPOR	30	%
Moisture content – STMOISTC	15.0	%
Volumetric air content – STAIRSPC	0.15	fraction
Average air temperature - STAVTEMP	53.006	F
Height above ground of local wind measure - STWINDHT	10	m
Mean annual wind speed – STAVWINDV	7.99928	mi./hr

CLICK TO VIEW SCREEN CAPTURES


Hal 9000
Internet Explorer
Network Neighbor...
Recycle Bin
Microsoft Outlook
Microsoft
Copyright © 1985-1996
Microsoft Corporation
Click to continue…
Windows NT
Workstation 4.0
with Microsoft Internet Explorer
This product is protected by US and international copyright laws as described in the About Box.
Start
Multime...
FRAMES ...
2:13 PM


Hal 9000
Internet Explorer
Network Neighbor...
Recycle Bin
Microsoft Outlook
Source Term Module Input
File Reference Format Help
Monthly Climatology
Kd's
Contaminant Properties
Known Media Releases
Known Contaminant Flux
Options
Waste Zone
Overland
Suspension
Hydrology
Description
Value
Unit
Ref.
medium type for waste zone – STMEDIA
Soil/Vadose
0
leaching loss route – STINF_OP
Compute pathway
0
overland runoff loss route – STOVL_OP
Turn off pathway
0
suspension loss route – STSUS_OP
Compute pathway
0
volatilization loss route – STVOL_OP
Turn off pathway
0
known source/sink – STSRC_OP
Turn off pathway
0
time interval for simulation – STDELTA_T
1
years
0
time period for simulation – STMAXTIME
100
years
0
residual mass for simulation – STMINWST
0.01
fraction
0
RETURN TO:
"Tables"
/b J:\Staff\Diane\TEMP2 J:\Staff\Diane\~glyph 1 1 src2
Range: 1 <= x <= 10000
Start
Multime...
FRAMES ...
2:13 PM


Hal 9000
Internet Explorer
Network Neighbor...
Recycle Bin
Microsoft Outlook
Source Term Module Input
File Reference Format Help
Monthly Climatology
Kd's
Contaminant Properties
Known Media Releases
Known Contaminant Flux
Options
Waste Zone
Overland
Suspension
Hydrology
Description | Value | Unit | Ref.
thickness of clean overburden – STCLEAN | 0.0 | m | 0
thickness – STTHICK | 15.0 | m | 0
length – STLENGTH | 10.0 | m | 0
width – STWIDTH | 10.0 | m | 0
bulk density – STZBULKD | 1.65 | g/cm^3 | 0
total porosity – STTOTPOR | 30 | % | 0
moisture content – STMOISTC | 15 | % | 0
volumetric air content – STAIRSPC | 0.15 | fraction | 0
average air temperature – STAVTEMP | 53.006 | F | 0
height above ground of local wind measure – STWINDHT | 10 | m | 0
mean annual wind speed – STAVWINDV | 7.99928 | mi/hr | 0
/b J:\Staff\Diane\TEMP2 J:\Staff\Diane\~glyph 1 1 src2
Back to tables
Start
Multime...
FRAMES ...
2:13 PM

THE SOURCE TERM MODULE

Under the SUSPENSION tab:

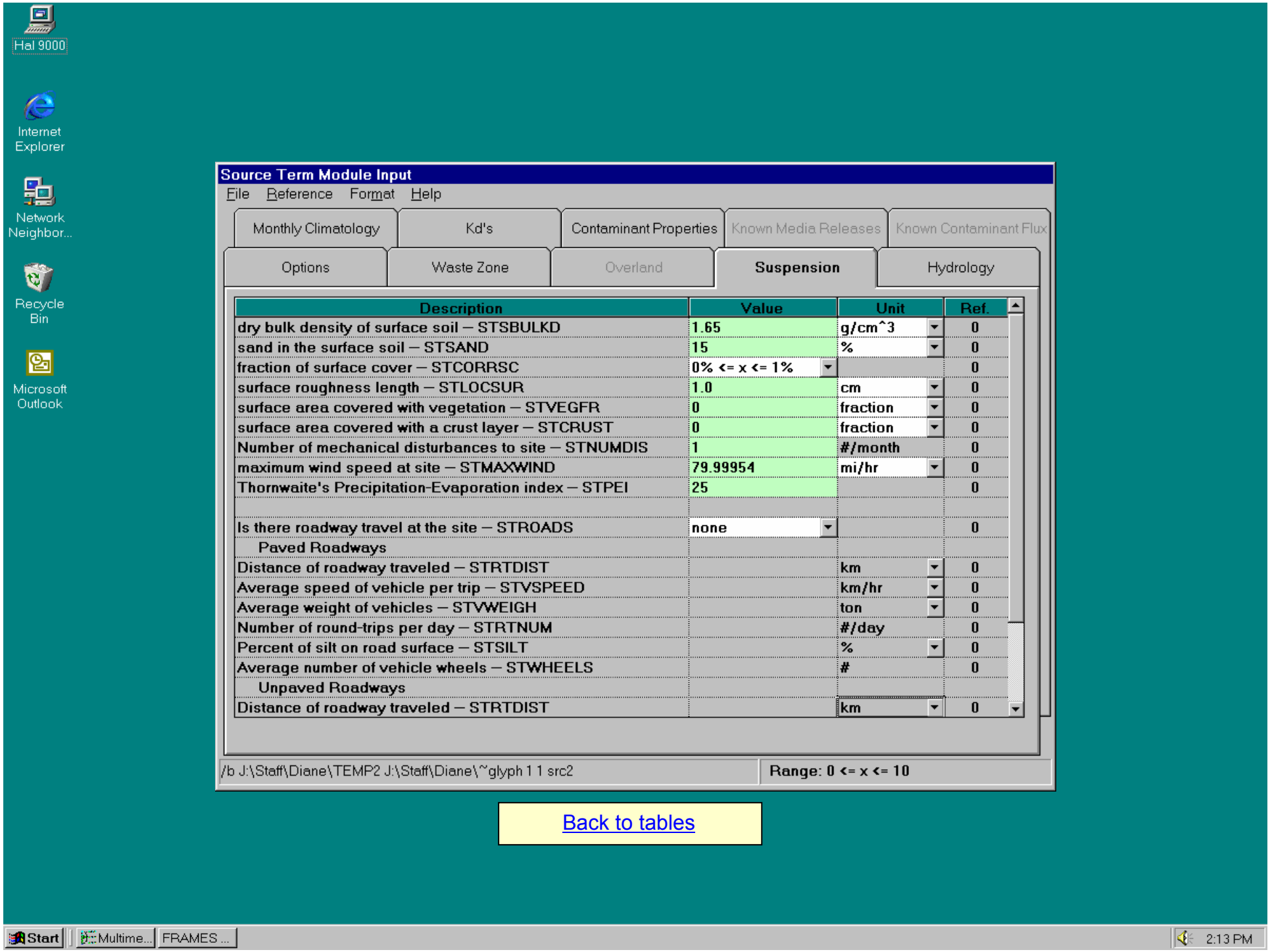
Dry bulk density of surface soil - STSBULKD	1.65	g/cm^3
Sand in the surface soil – STSAND	15	%
Fraction of surface cover - STCORRSC	0%<=x<=1%	
Surface roughness length – STLOCSUR	1.0	Cm
Surface area covered with vegetation - STVEGFR	0	fraction
Surface area covered with a crust layer – STCRUST	0	fraction
Number of mechanical disturbances to site	1	#/month
Maximum wind speed at site – STMAXWIND	79.99954	mi./hr.
Thornwaite's Precipitation – Evaporation index - STPEI	25	
Is there roadway travel at the site – STROADS	None	
Paved roadway		
Distance of roadway traveled – STRTDIST		km
Average speed of vehicles per trip – STVSPEED		km/hr
Average weight of vehicles – STVWEIGH		Ton
Number of round-trips per month – STRTNUM		#/day
Percent of silt on road surface - STSILT		%
Average number of vehicle wheels - STWHEELS		#
Unpaved Roadways		
Distance of roadway traveled – STRTDIST		km

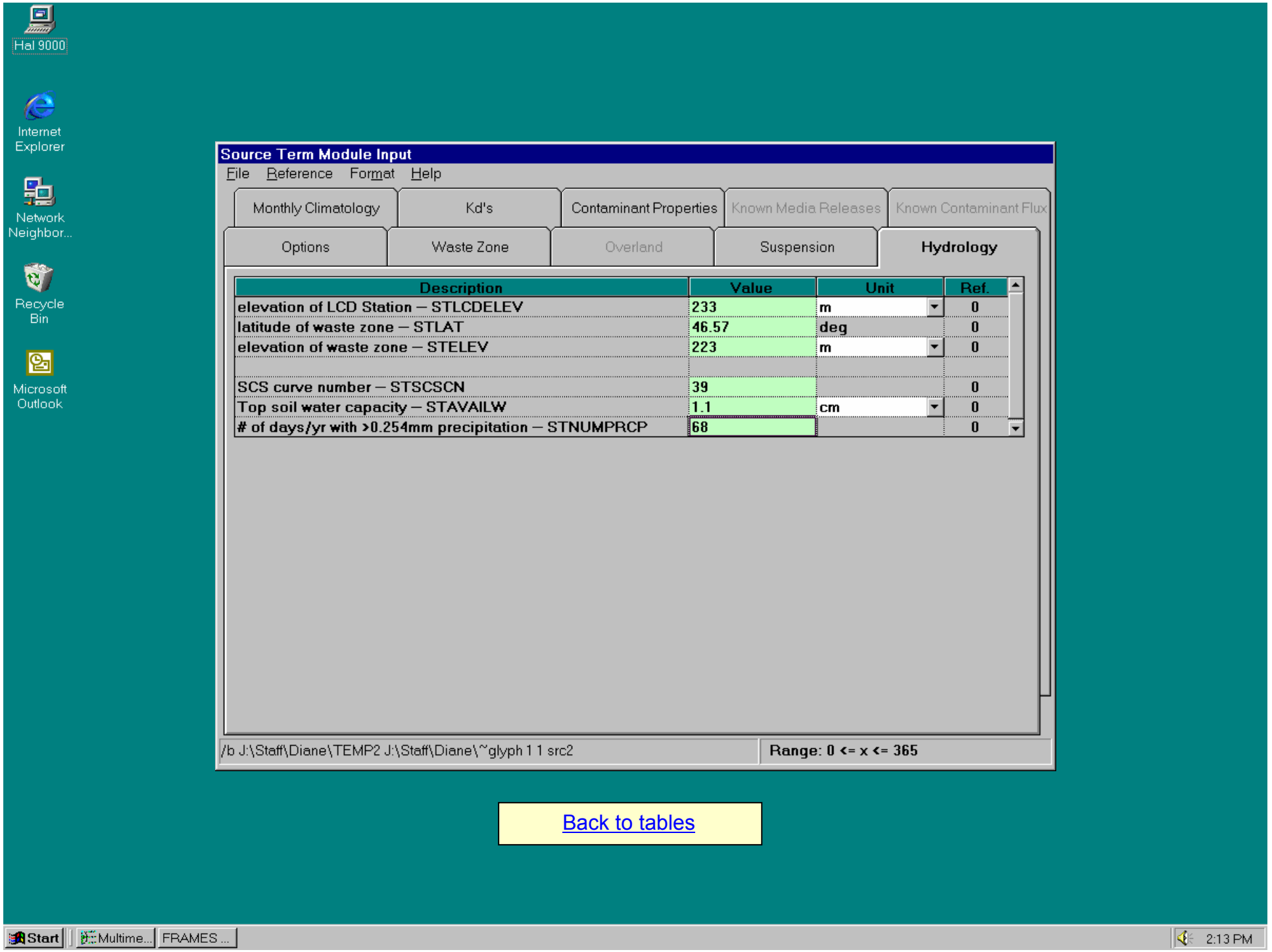
CLICK TO VIEW SCREEN CAPTURES

Under the HYDROLOGY tab:

Elevation of LCD station – STLCDELEV	223	m
Latitude of waste site – STLAT	46.57	degrees
Elevation of waste site – STELEV	223	m
SCS curve number - STSCSCN	39	
Top soil water capacity – STAVAILW	1.1	cm
# of days with >0.254mm precipitation – STNUMPRCP	68	

CLICK TO VIEW SCREEN CAPTURES


Hal 9000
Internet Explorer
Network Neighbor...
Recycle Bin
Microsoft Outlook
Source Term Module Input
File Reference Format Help
Monthly Climatology
Kd's
Contaminant Properties
Known Media Releases
Known Contaminant Flux
Options
Waste Zone
Overland
Suspension
Hydrology
Description | Value | Unit | Ref.
dry bulk density of surface soil – STSBULKD | 1.65 | g/cm^3 | 0
sand in the surface soil – STSAND | 15 | % | 0
fraction of surface cover – STCORRSC | 0% <= x <= 1% | | 0
surface roughness length – STLOCSUR | 1.0 | cm | 0
surface area covered with vegetation – STVEGFR | 0 | fraction | 0
surface area covered with a crust layer – STCRUST | 0 | fraction | 0
Number of mechanical disturbances to site – STNUMDIS | 1 | #/month | 0
maximum wind speed at site – STMAXWIND | 79.99954 | mi/hr | 0
Thornwaite's Precipitation-Evaporation index – STPEI | 25 | | 0
Is there roadway travel at the site – STROADS | none | | 0
Paved Roadways
Distance of roadway traveled – STRTDIST | | km | 0
Average speed of vehicle per trip – STVSPEED | | km/hr | 0
Average weight of vehicles – STVWEIGH | | ton | 0
Number of round-trips per day – STRTNUM | | #/day | 0
Percent of silt on road surface – STSILT | | % | 0
Average number of vehicle wheels – STWHEELS | | # | 0
Unpaved Roadways
Distance of roadway traveled – STRTDIST | | km | 0
/b J:\Staff\Diane\TEMP2 J:\Staff\Diane\~glyph 1 1 src2
Range: 0 <= x <= 10
Back to tables
Start
Multime...
FRAMES ...
2:13 PM


Hal 9000
Internet Explorer
Network Neighbor...
Recycle Bin
Microsoft Outlook
Source Term Module Input
File Reference Format Help
Monthly Climatology
Kd's
Contaminant Properties
Known Media Releases
Known Contaminant Flux
Options
Waste Zone
Overland
Suspension
Hydrology
Description
Value
Unit
Ref.
elevation of LCD Station – STLCDELEV
233
m
0
latitude of waste zone – STLAT
46.57
deg
0
elevation of waste zone – STELEV
223
m
0
SCS curve number – STSCSCN
39
0
Top soil water capacity – STAVAILW
1.1
cm
0
# of days/yr with >0.254mm precipitation – STNUMPRCP
68
0
/b J:\Staff\Diane\TEMP2 J:\Staff\Diane\~glyph 1 1 src2
Range: 0 <= x <= 365
Back to tables
Start
Multime...
FRAMES ...
2:13 PM

THE SOURCE TERM MODULE

Under the MONTHLY CLIMATOLOGY tab:

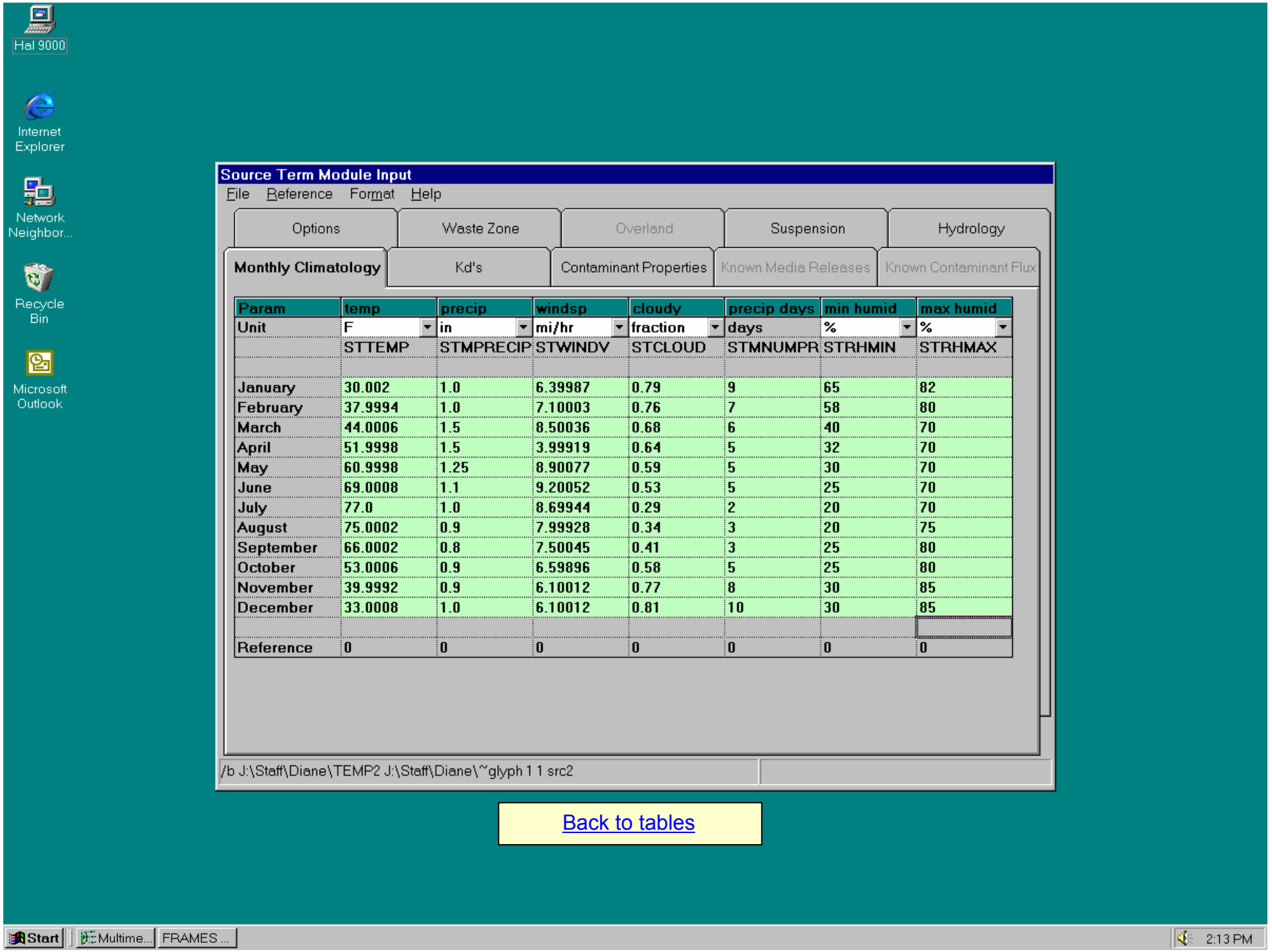
Param	Temp	Percip	Windsp	Cloudy	Precip Days	Min humid	Max humid
Unit	F	In	Mi/hr	Fraction	days	%	%
	sttemp	stmprecip	stwindv	stcloud	stmnumpre	strhmin	strhmax
January	30.002	1.0	6.39987	0.79	9	65	82
February	37.9994	1.0	7.10003	0.76	7	58	80
March	44.0006	1.5	8.50036	0.68	6	40	70
April	51.9998	1.5	8.99919	0.64	5	32	70
May	60.9998	1.25	8.90077	0.59	5	30	70
June	69.0008	1.1	9.20052	0.53	5	25	70
July	77.0	1.0	8.69944	0.29	2	20	70
August	75.0002	0.9	7.99928	0.34	3	20	75
September	66.0002	0.8	7.50045	0.41	3	25	80
October	53.0006	0.9	6.59896	0.58	5	25	80
November	39.9992	0.9	6.10012	0.77	8	30	85
December	33.0008	1.0	6.10012	0.81	10	30	85

CLICK TO VIEW SCREEN CAPTURES

Under the K_d's tab:

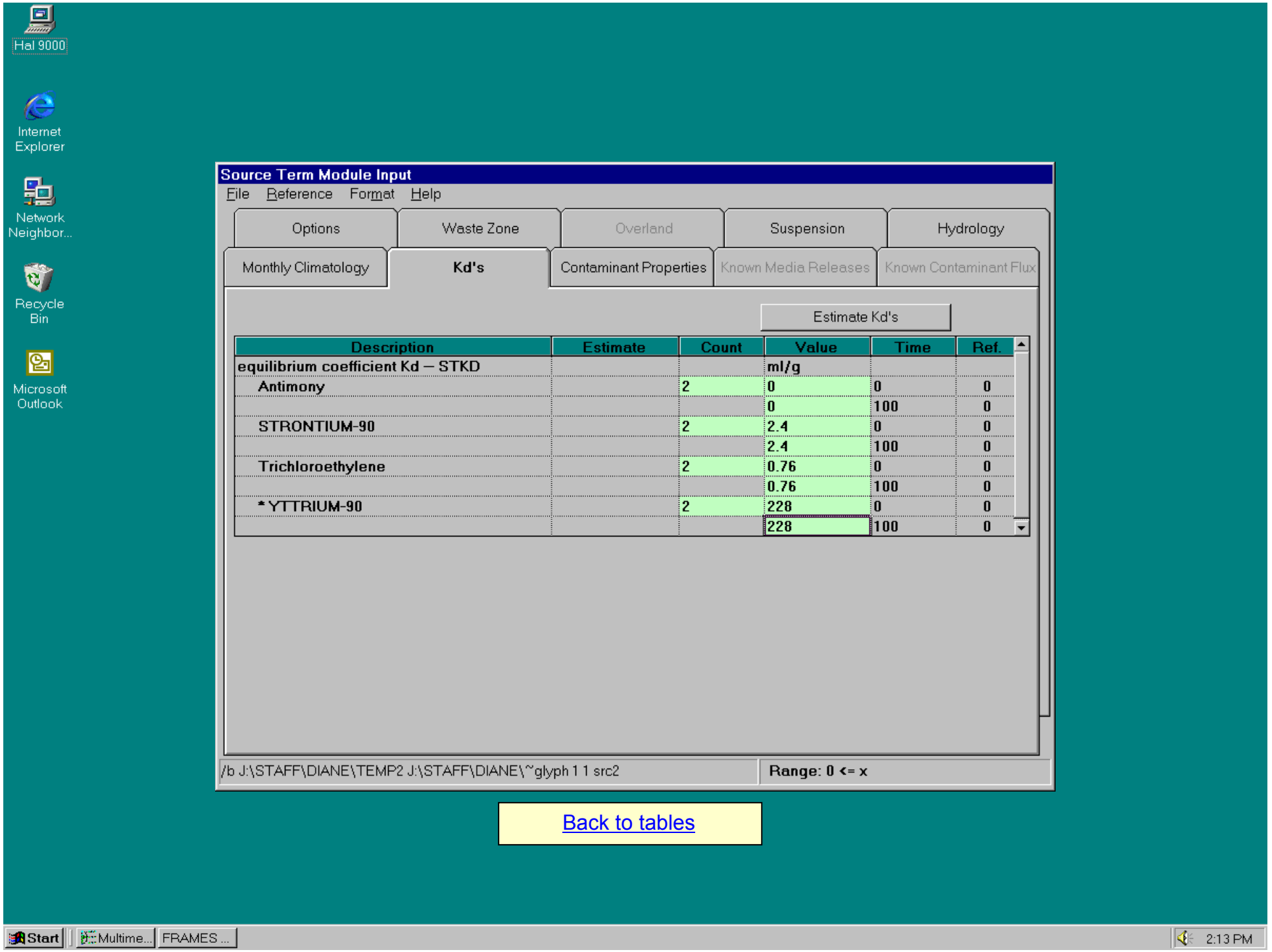
Equilibrium coefficient KD– STKD		Ml/g	
Antimony	2	0.0	0
		0.0	100
STRONYIUM-90	2	2.4	0
		2.4	100
Trichloroethylene	2	0.76	0
		0.76	100
*YTTRIUM	2	228.0	0
		228.0	100

CLICK TO VIEW SCREEN CAPTURES



Param	temp	precip	windsp	cloudy	precip days	min humid	max humid
Unit	F	in	mi/hr	fraction	days	%	%
	STTEMP	STMPRECIP	STWINDV	STCLOUD	STMNUMPR	STRHMIN	STRHMAX
January	30.002	1.0	6.39987	0.79	9	65	82
February	37.9994	1.0	7.10003	0.76	7	58	80
March	44.0006	1.5	8.50036	0.68	6	40	70
April	51.9998	1.5	3.99919	0.64	5	32	70
May	60.9998	1.25	8.90077	0.59	5	30	70
June	69.0008	1.1	9.20052	0.53	5	25	70
July	77.0	1.0	8.69944	0.29	2	20	70
August	75.0002	0.9	7.99928	0.34	3	20	75
September	66.0002	0.8	7.50045	0.41	3	25	80
October	53.0006	0.9	6.59896	0.58	5	25	80
November	39.9992	0.9	6.10012	0.77	8	30	85
December	33.0008	1.0	6.10012	0.81	10	30	85
Reference	0	0	0	0	0	0	0

Back to tables


Hal 9000
Internet Explorer
Network Neighbor...
Recycle Bin
Microsoft Outlook
Source Term Module Input
File Reference Format Help
Options
Waste Zone
Overland
Suspension
Hydrology
Monthly Climatology
Kd's
Contaminant Properties
Known Media Releases
Known Contaminant Flux
Estimate Kd's
Description | Estimate | Count | Value | Time | Ref.
equilibrium coefficient Kd -- STKD | | | ml/g | |
Antimony | | 2 | 0 | 0 | 0
 | | | 0 | 100 | 0
STRONTIUM-90 | | 2 | 2.4 | 0 | 0
 | | | 2.4 | 100 | 0
Trichloroethylene | | 2 | 0.76 | 0 | 0
 | | | 0.76 | 100 | 0
*YTTRIUM-90 | | 2 | 228 | 0 | 0
 | | | 228 | 100 | 0
/b J:\STAFF\DIANE\TEMP2 J:\STAFF\DIANE\~glyph 1 1 src2
Range: 0 <= x
Back to tables
Start
Multime...
FRAMES ...
2:13 PM

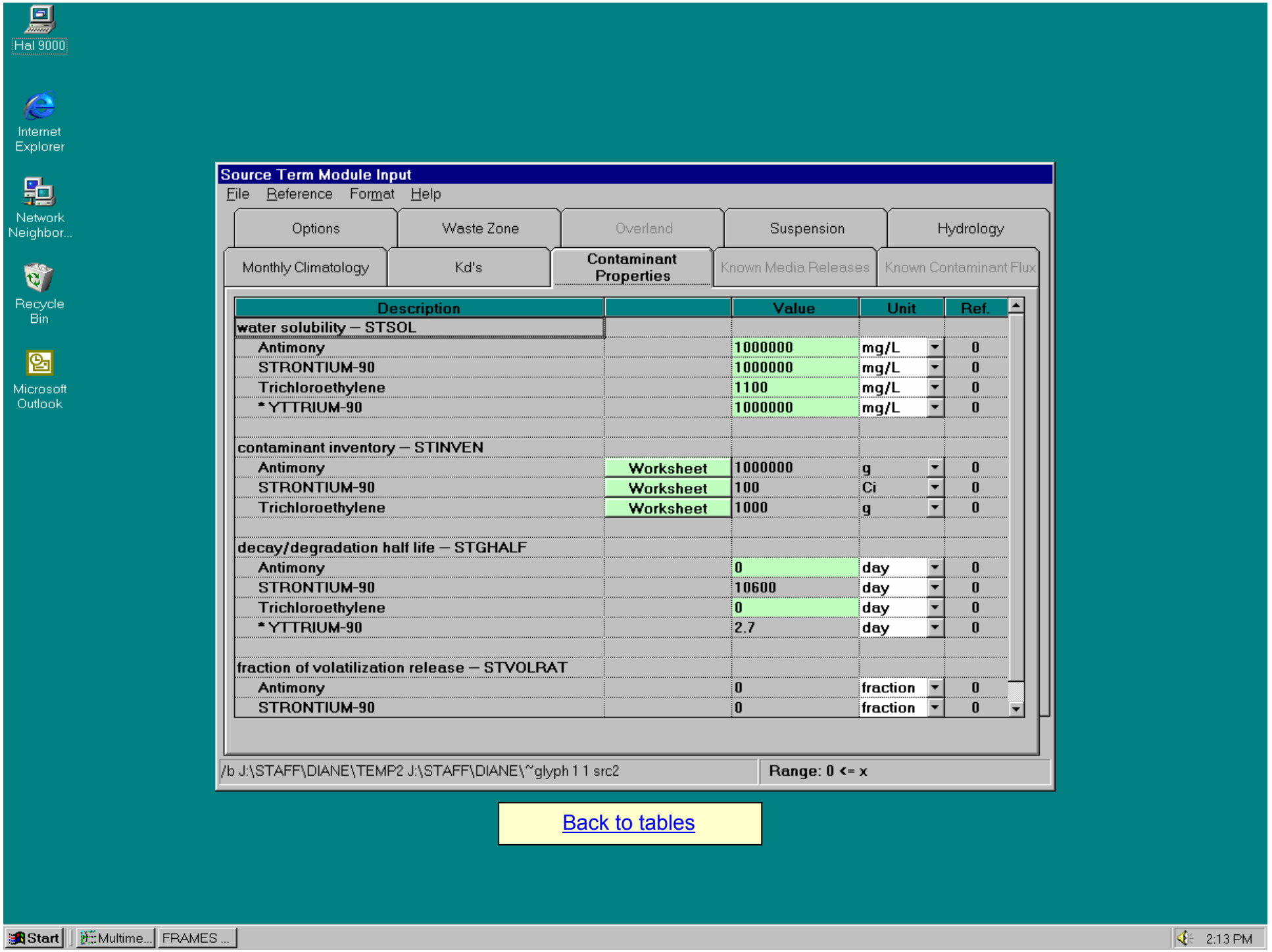
THE SOURCE TERM MODULE

Under the CONTAMINANT PROPERTIES tab:

Water solubility-STSOL			
Antimony		1.0E+06	mg/L
STRONTIUM -90		1.0E+06	mg/L
Trichloroethylene		1100.0	mg/L
*YTTRIUM -90		1.0E+06	mg/L
Contaminant inventory quantity-STINVEN			
Antimony	Worksheet*	1.00E+06	g
STRONTIUM-90	Worksheet*	100.0	Ci
Trichloroethylene	Worksheet*	1000.0	g
Decay/degradation half life-STGHALF			
Antimony		0.0	Day
STRONTIUM -90		10600.0	Day
Trichloroethylene		0.0	Day
*YTTRIUM -90		2.7	Day
Fraction of volatilization release-STVOLRAT			
Antimony		0.0	Fraction
STRONTIUM-90		0.0	Fraction
Trichloroethylene		0.0	Fraction

* Click on this parameter to enter the values listed on its right.

CLICK TO VIEW SCREEN CAPTURES


Hal 9000
Internet Explorer
Network Neighbor...
Recycle Bin
Microsoft Outlook
Source Term Module Input
File Reference Format Help
Options
Waste Zone
Overland
Suspension
Hydrology
Monthly Climatology
Kd's
Contaminant Properties
Known Media Releases
Known Contaminant Flux
Description
Value
Unit
Ref.
water solubility – STSOL
Antimony 1000000 mg/L 0
STRONTIUM-90 1000000 mg/L 0
Trichloroethylene 1100 mg/L 0
*YTTRIUM-90 1000000 mg/L 0
contaminant inventory – STINVEN
Antimony Worksheet 1000000 g 0
STRONTIUM-90 Worksheet 100 Ci 0
Trichloroethylene Worksheet 1000 g 0
decay/degradation half life – STGHALF
Antimony 0 day 0
STRONTIUM-90 10600 day 0
Trichloroethylene 0 day 0
*YTTRIUM-90 2.7 day 0
fraction of volatilization release – STVOLRAT
Antimony 0 fraction 0
STRONTIUM-90 0 fraction 0
/b J:\STAFF\DIANE\TEMP2 J:\STAFF\DIANE\~glyph 1 1 src2
Range: 0 <= x
Back to tables
Start
Multime...
FRAMES ...
2:13 PM

THE SOURCE TERM MODULE

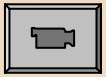
Running the Model

After all necessary data has been inputted, the light on the side bar of the source term module icon will turn yellow. This indicates that the model is ready to be run.

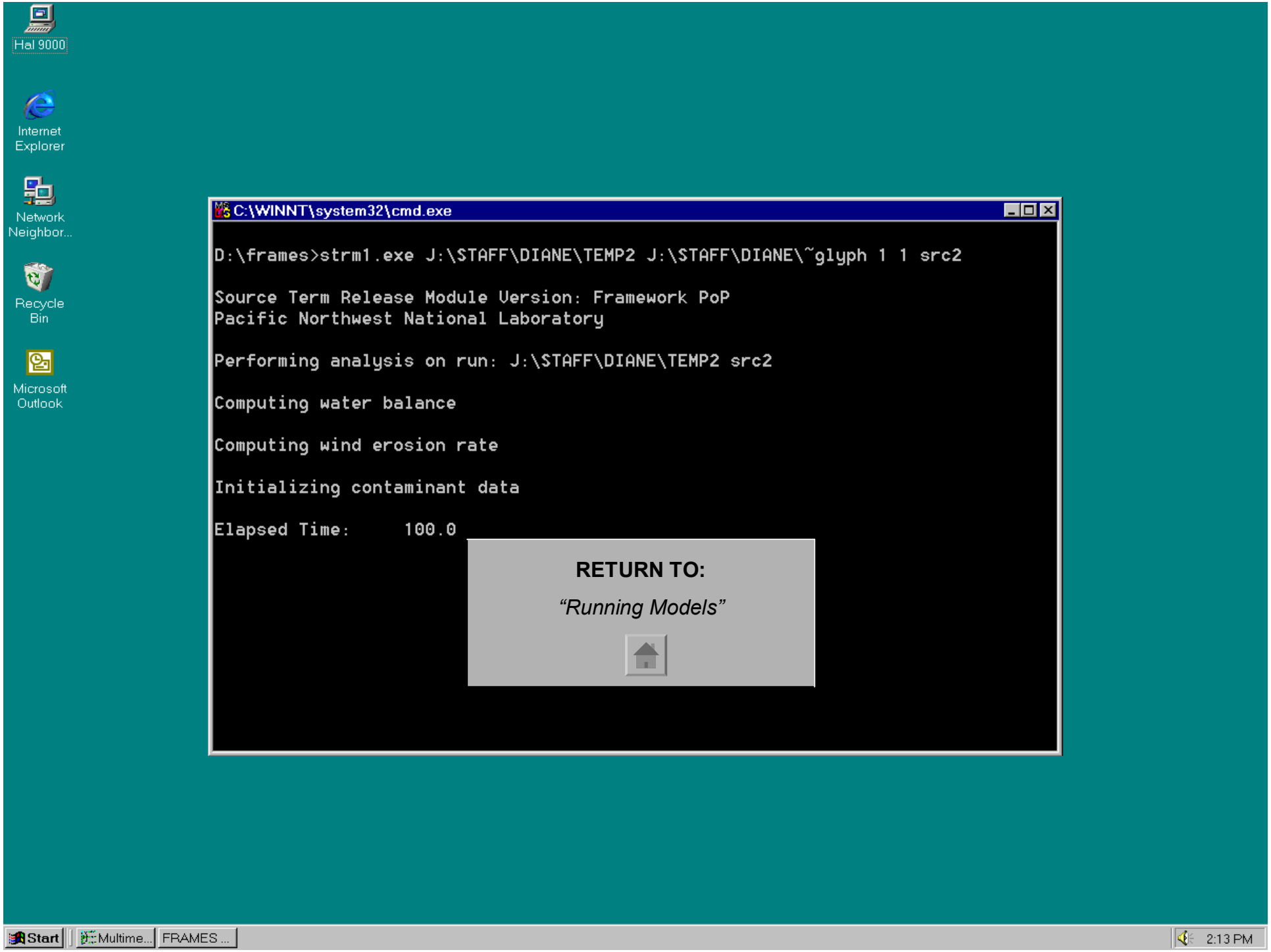
1) To run the model, right-click on the source term module icon and choose "Run Model." The FRAMES user interface will close and the model will run in a MS-DOS screen before returning to the main FRAMES window.

2) Models can be run at any time during the scenario, as long as all data has been inputted, and the light has turned yellow.

3) To run all models at one time, use the "GO" button. Refer to the reference section for more details.



CLICK TO VIEW ANIMATION


Hal 9000
Internet Explorer
Network Neighbor...
Recycle Bin
Microsoft Outlook
C:\WINNT\system32\cmd.exe
D:\frames>strm1.exe J:\STAFF\DIANE\TEMP2 J:\STAFF\DIANE\~glyph 1 1 src2
Source Term Release Module Version: Framework PoP
Pacific Northwest National Laboratory
Performing analysis on run: J:\STAFF\DIANE\TEMP2 src2
Computing water balance
Computing wind erosion rate
Initializing contaminant data
Elapsed Time: 100.0
RETURN TO:
"Running Models"
Start
Multime...
FRAMES ...
2:13 PM

THE SOURCE TERM MODULE

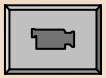
Selecting a Viewer

The FRAMES user interface provides viewers that allow users to view text and graphical information produced by modules that meet the FRAMES data file specifications. Viewers and chart viewers are available to view .WFF, .WCF, .SCF, .EPF, .RIF, and .HIF files.

To view results, the signal light on the module must be green, signaling the run has been completed. Once it is green, the results can be viewed anytime.

1) Right-click on the module icon and select "View/Print Module Output" from the popup menu.

2) Select the desired viewer from the View/Print Module Output list. There are at least two choices for each viewer attached to a module: a graphical and text viewer.The graphical option is usually the most effective way to view data. To see the results in the various viewers, reselect a different viewer.



CLICK TO VIEW ANIMATION

The remaining modules to be set up for this example case scenario are described in the following slides, in much less detail, but in similar fashion to the source term module and the contaminant database module. The tutorial will lead the user through each remaining module and provide the data needed for the user input.

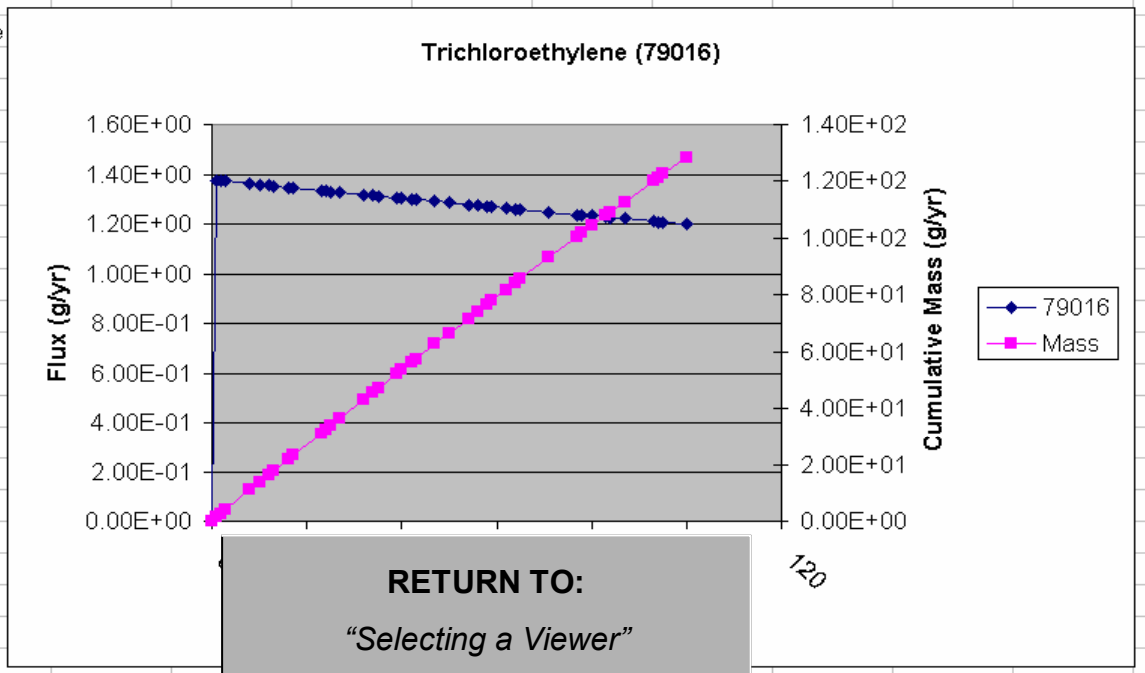
Consequent screen captures of (1) the module's Object General Inforamation screen, and (2), the first tab of the module's "User Input" screen, will be shown at the bottom of the page, for each module. Upon exiting each of these screens, be sure to go to the file menu and choose "Exit – Save Changes."

Microsoft Excel - Book1

File Edit View Insert Format Tools Data Window Help

A1 = File:

	A	B	C
1	File:	J:\STAFF\DIANE\TEMP2.wff	
2	Module:	Source (src2)	
3			
4	(yr)	(g/yr)	(g/yr)
5	Time	Cumulative	Trichloroethylene
6		Mass	79016
7			
8	0	0	0
9	1	1.37519	1.37519
10	2	2.74849	1.3733
11	3	4.119902	1.371412
12	8	10.95344	1.362005
13	10	13.67371	1.358257
14	12	16.38648	1.354518
15	13	17.73913	1.352652
16	16	21.78871	1.347066
17	17	23.13392	1.345208
18	23	31.17187	1.334107
19	24	32.50413	1.332264
20	25	33.83455	1.330424
21	27	36.49173	1.326749
22	32	43.10259	1.317598
23	34	45.73414	1.313953
24	35	47.04628	1.312134
25	39	52.2803	1.304877
26	40	53.58337	1.303068
27	42	56.18589	1.299456
28	43	57.48354	1.297653
29	47	62.65978	1.290463
30	50	66.52311	1.285093
31	54	71.64922	1.277961
32	56	74.20159	1.274408
33	58	76.74686	1.270862
34	59	78.01595	1.269093
35	62	81.81528	1.263797
36	64	84.33936	1.260276
37	65	85.59788	1.258519
38	71	93.11749	1.248019



RETURN TO:

"Selecting a Viewer"

7440360 SR90 79016

Ready

VADOSE ZONE

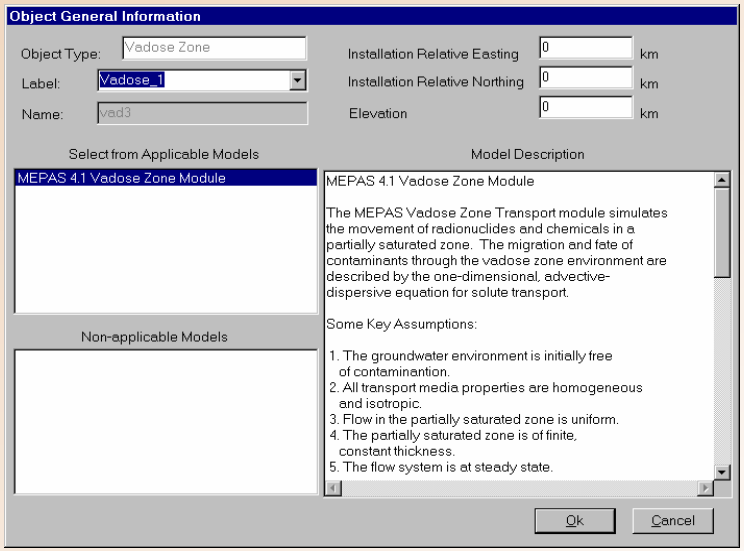
Vadose Zone Module (1)

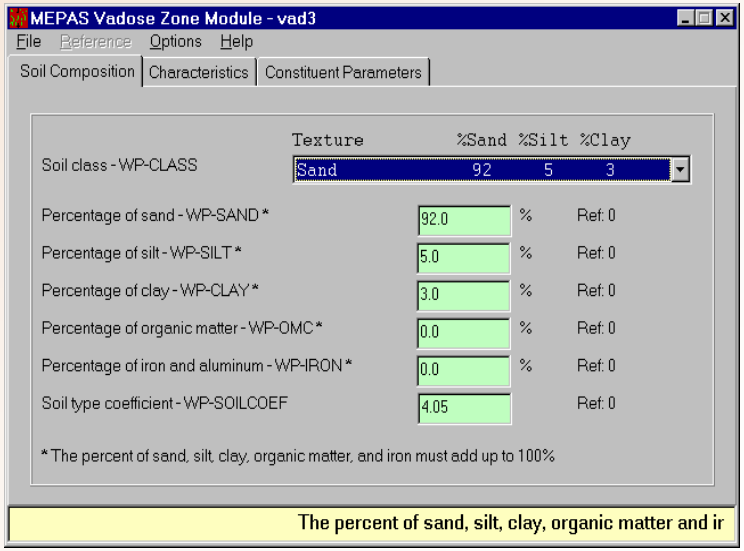
After the Source Term module, the next module is the Vadose Zone Module, which simulates the movement of solutes through partially saturated porous media. Multiple Vadose Zone icons can be attached to the Source Term depicting the different medium layers (i.e., soil, clay, etc). For more details on this module, click here.

1) Right click on the vadose zone icon and choose 'General Info' from the menu. The Object General Information screen will appear. Type in "Vadose_1" for the label.

2) Highlight the MEPAS 4.1 Vadose Zone Module on the list of Applicable Models on the left side of the screen, and click 'OK.' The signal light on the main screen should turn red, signaling the step was successfully completed.

3) Right click on the icon again, and choose 'User Input.' Another screen will open and you can begin inputting data. For the data input information for this module, click here.



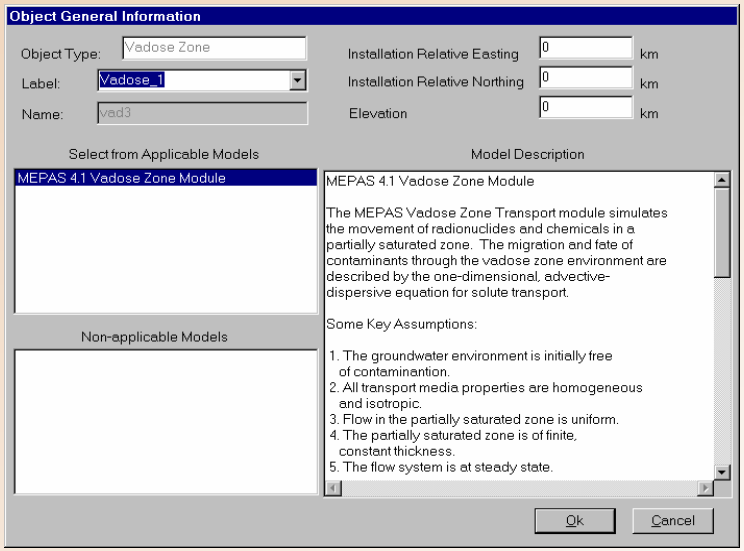


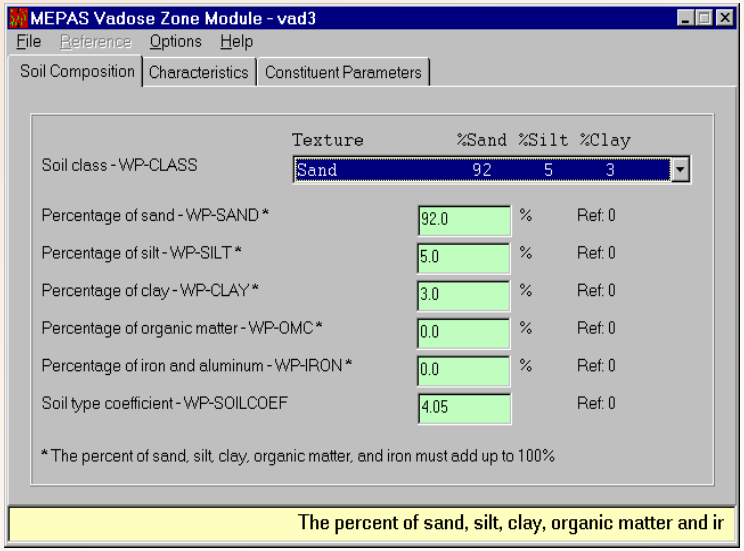
VADOZE ZONE (2)

Vadose Zone Module (2)

A second vadoze zone icon is needed to simulate the two layers of soil which is crucial to the scenario simulation.

- Right click on the vadose zone icon again and choose 'General Info' from the menu. The Object General Information screen will appear. Type in "Vadose_2" for the label. Highlight the MEPAS 4.1 Vadose Zone Module on the list of Applicable Models on the left side of the screen, and click 'OK.' The signal light on the main screen should turn red, signaling the step was successfully completed.
- Right click on the icon again, and choose 'User Input.' Another screen will open and you can begin inputting data. For the data input information for this module, click here.





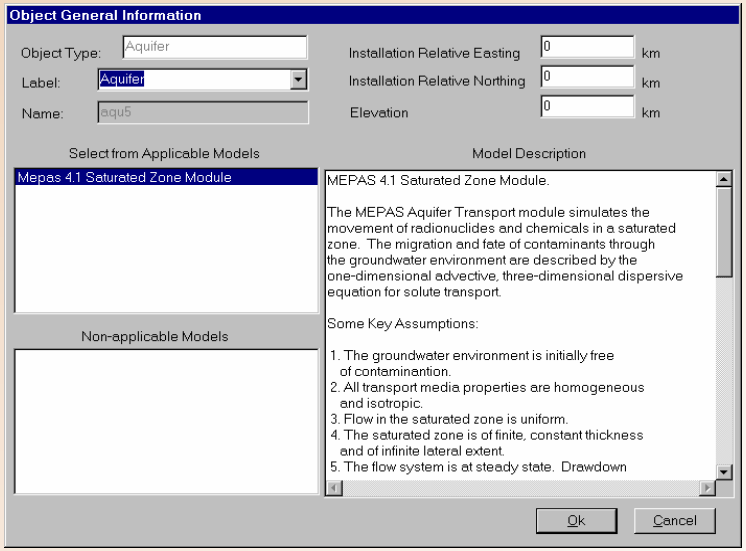
AQUIFER MODULE

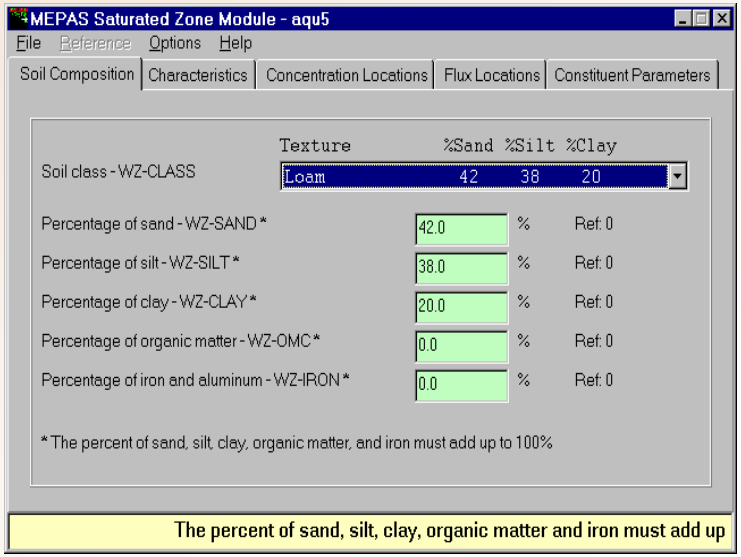
Aquifer Module

The Aquifer Module also known as the Saturated Zone Module simulates the movement of solutes through saturated porous media. For more details on this module, click here.

1) Right click on the aquifer icon and choose 'General Info' from the menu. The Object General Information screen will appear. Type in "Aquifer" for the label. Highlight the MEPAS 4.1 Saturated Zone Module on the list of Applicable Models on the left side of the screen, and click 'OK.' The signal light on the main screen should turn red, signaling the step was successfully completed.

2) Right click on the aquifer icon again, and choose 'User Input.' Another screen will open and you can begin inputting data. For the data input information on this module, click here.



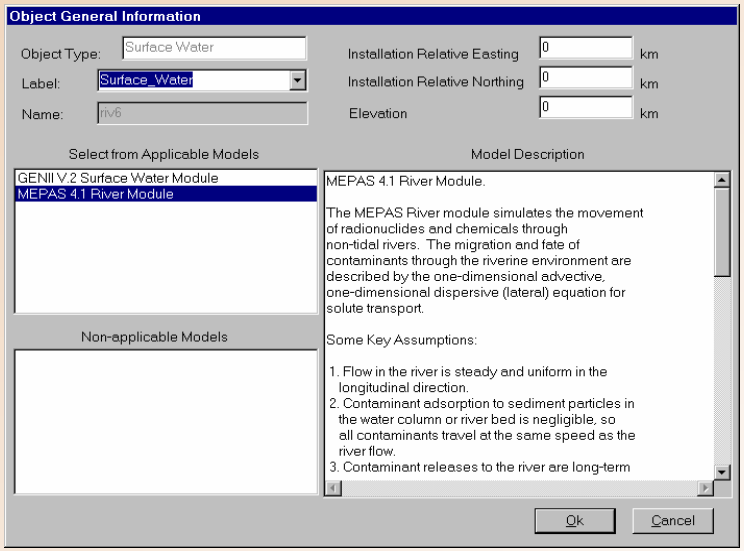


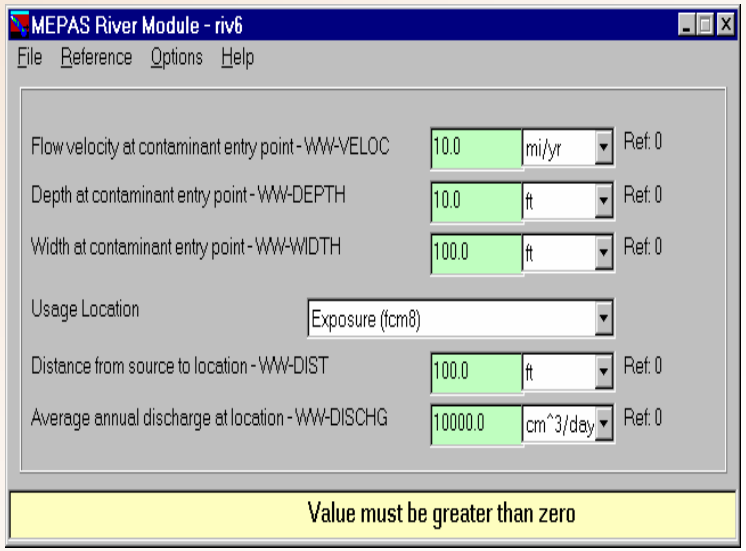
Surface Water Module

The Surface Water Module is also known as the River Module and simulates the movement of solutes through non-tidal rivers. For more details on this module, click here.

1) Right click on the icon and choose 'General Info' from the menu. The Object General Information screen will appear. Type in "Surface_Water" for the label.Highlight the MEPAS 4.1 River Module on the list of Applicable Models on the left side of the screen, and click 'OK.' The signal light on the main screen should turn red, signaling the step was successfully completed.

2) Right click on the icon again, and choose 'User Input.' Another screen will open and you can begin inputting data. For the data input information on this module, click here.





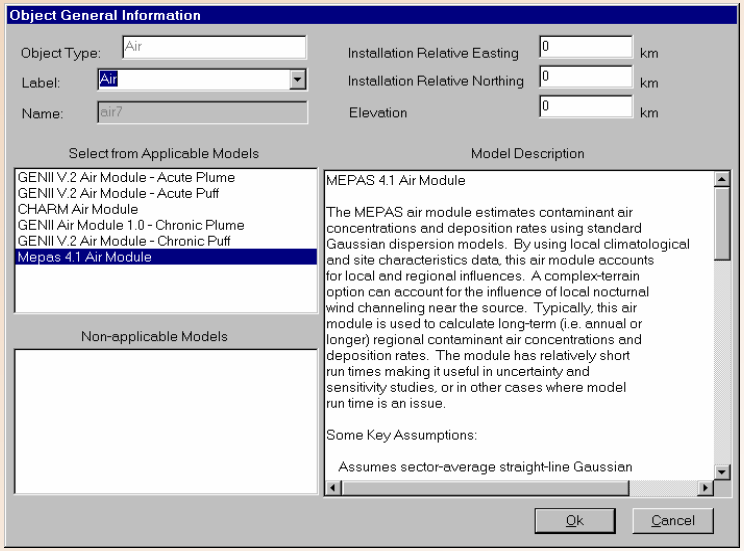
ATMOSPHERIC TRANSPORT

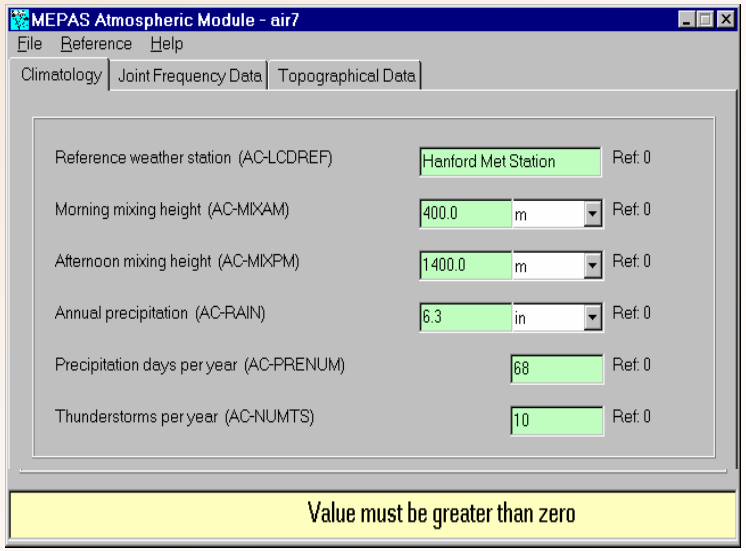
Atmospheric Transport Module

The Atmospheric Transport module is also known as the Air module. For more details on this module, click here.

- Right click on the icon and choose 'General Info' from the menu. The Object General Information screen will appear. Type in "Air" for the label. Highlight the MEPAS 4.1 Air Module on the list of Applicable Models on the left side of the screen, and click 'OK.' The signal light on the main screen should turn red, signaling the step was successfully completed.
- Right click on the icon again, and choose 'User Input.' Another screen will open and you can begin inputting data. For the data input information for this module, click here.

An important note: The Joint Frequency Data tab contains an option called 'Import Joint Frequency Data'. Use this option to import data to fill the wind class tabs instead of typing in the information. All of the classes must have a number entered on the Joint Frequency Data tab before continuing. For more detailed information, contact the software developers.





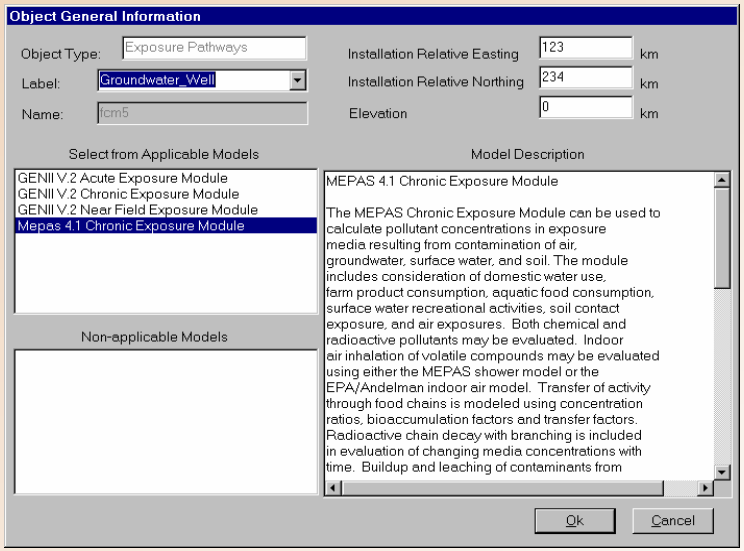
EXPOSURE PATHWAYS

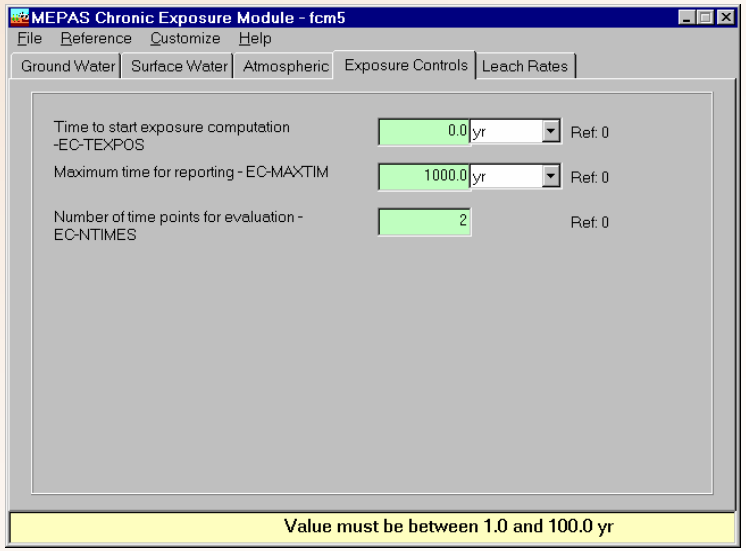
Exposure Pathways Module

The Exposure Pathway is linked to the Receptor Intake to give results in the Human Health Impacts. For more details on this module, click here.

1) Right click on the icon and choose 'General Info' from the menu. The Object General Information screen will appear. Type in "Groundwater_Well" for the label. Highlight the MEPAS 4.1 Chronic Exposure Module on the list of Applicable Models on the left side of the screen, and click 'OK.' The signal light on the main screen should turn red, signaling the step was successfully completed.

2) Right click on the icon again, and choose 'User Input.' Another screen will open and you can begin inputting data. For the data input information for this module, click here.



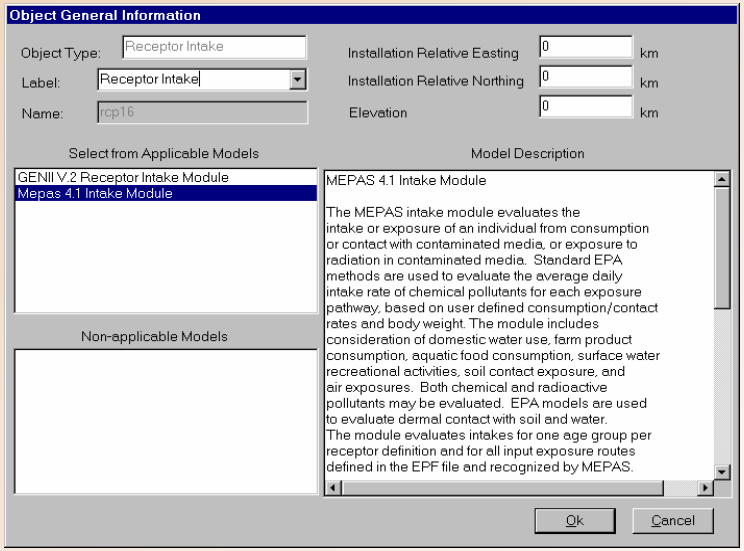


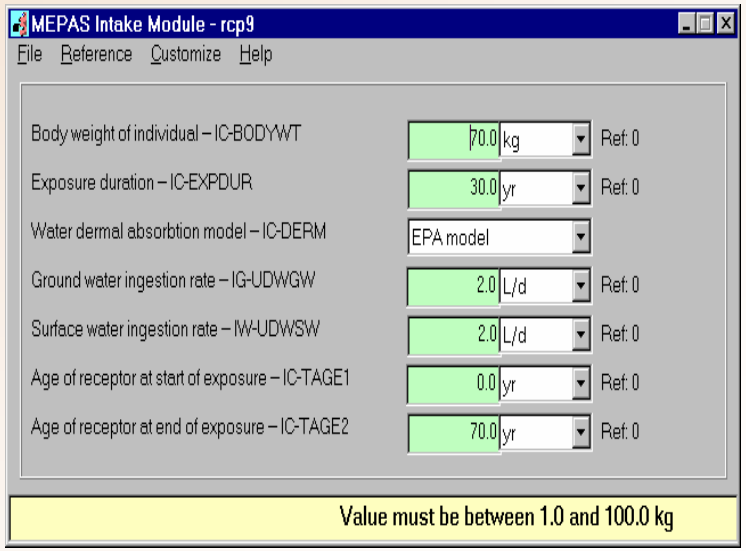
RECEPTOR INTAKE

Receptor Intake Module

The receptor intake module is the second to last of modules to be set up in this example case. For more details on this module, click here.

- Right click on the icon and choose 'General Info' from the menu. The Object General Information screen will appear. Type in "Receptor_Intake" for the label. Highlight the MEPAS 4.1 Intake Module on the list of Applicable Models on the left side of the screen, and click 'OK.' The signal light on the main screen should turn red, signaling the step was successfully completed.
- Right click on the icon again, and choose 'User Input.' Another screen will open and you can begin inputting data. For the data input information for this module, click here.



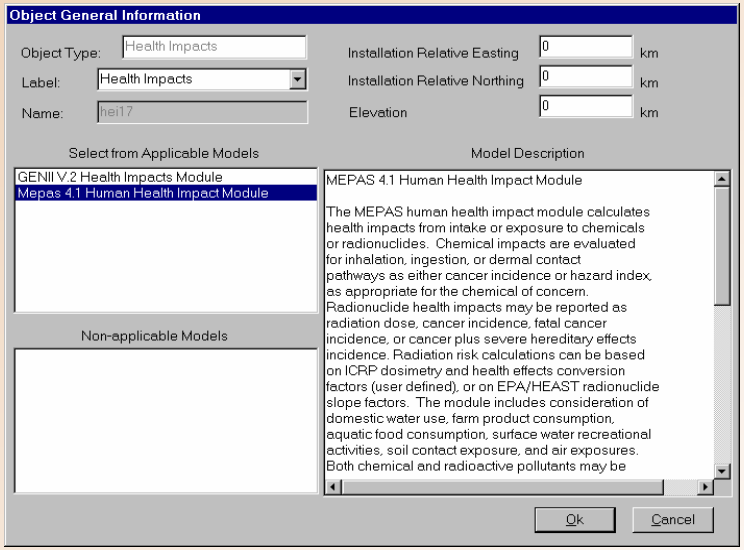


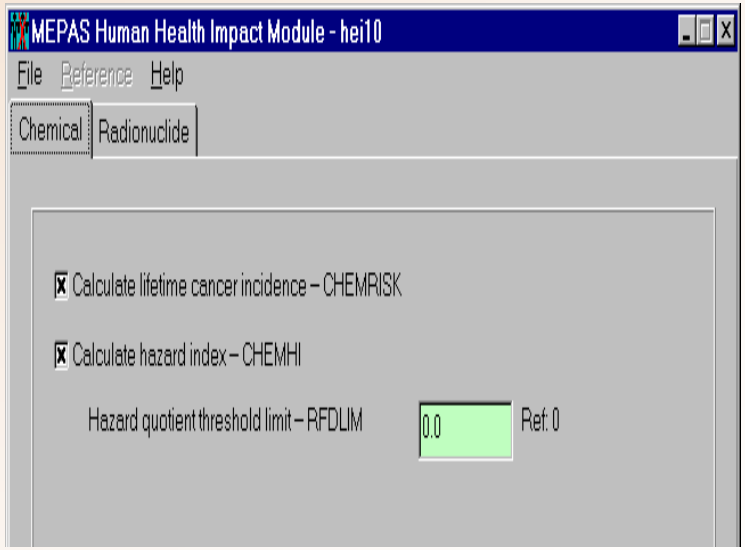
HUMAN HEALTH IMPACT

Human Health Impact Module

The human health impact module is the last module to set up. For more details on this module, click here.

- Right click on the icon and choose 'General Info' from the menu. The Object General Information screen will appear. Type in "Health_Impacts" for the label. Highlight the MEPAS 4.1 Human Health Impact Module on the list of Applicable Models on the left side of the screen, and click 'OK.' The signal light on the main screen should turn red, signaling the step was successfully completed.
- Right click on the icon again, and choose 'User Input.' Another screen will open and you can begin inputting data. For the data input information for this module, click here.





Finishing Up

At the completion of all the modules, the user can either click the "GO" button, and run all modules at once (if the modules have not been run individually yet). Or, if the user has already ran each module manually, then the case has concluded, and the user can select viewers to view the results of this case.

To review the processes of running a case or selecting a viewer, refer to the Source Term Module section, in which step by step animation was shown.

Taking One Step Further

For a more comprehensive understanding of FRAMES and its functionality, it is best to look over the Reference Section for any additional issues that the Tutorial may not have covered.

While the reference section and tutorial stands as interactive and visual tools for learning, users may prefer to approach FRAMES with a more "textbook-like" fashion. In this case, a PDF document called "Getting Started with FRAMES 1.5" has been created, encompassing information presented in both the tutorial and reference section. To view and print out this file, click here.

For additional help and questions regarding FRAMES, please refer to the Contacts Section.