Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle Since 1965

GENII: Source Terms and Initial Conditions

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RAMP GENII Training, Taipei, Taiwan

GENII Version 2.10

A set of computer programs for estimation of radionuclide concentrations in the environment and dose/risk to humans from:

- Acute or chronic exposures to
- Releases to surface water or atmosphere, or
- Initial contamination conditions

Basic Assessment Questions

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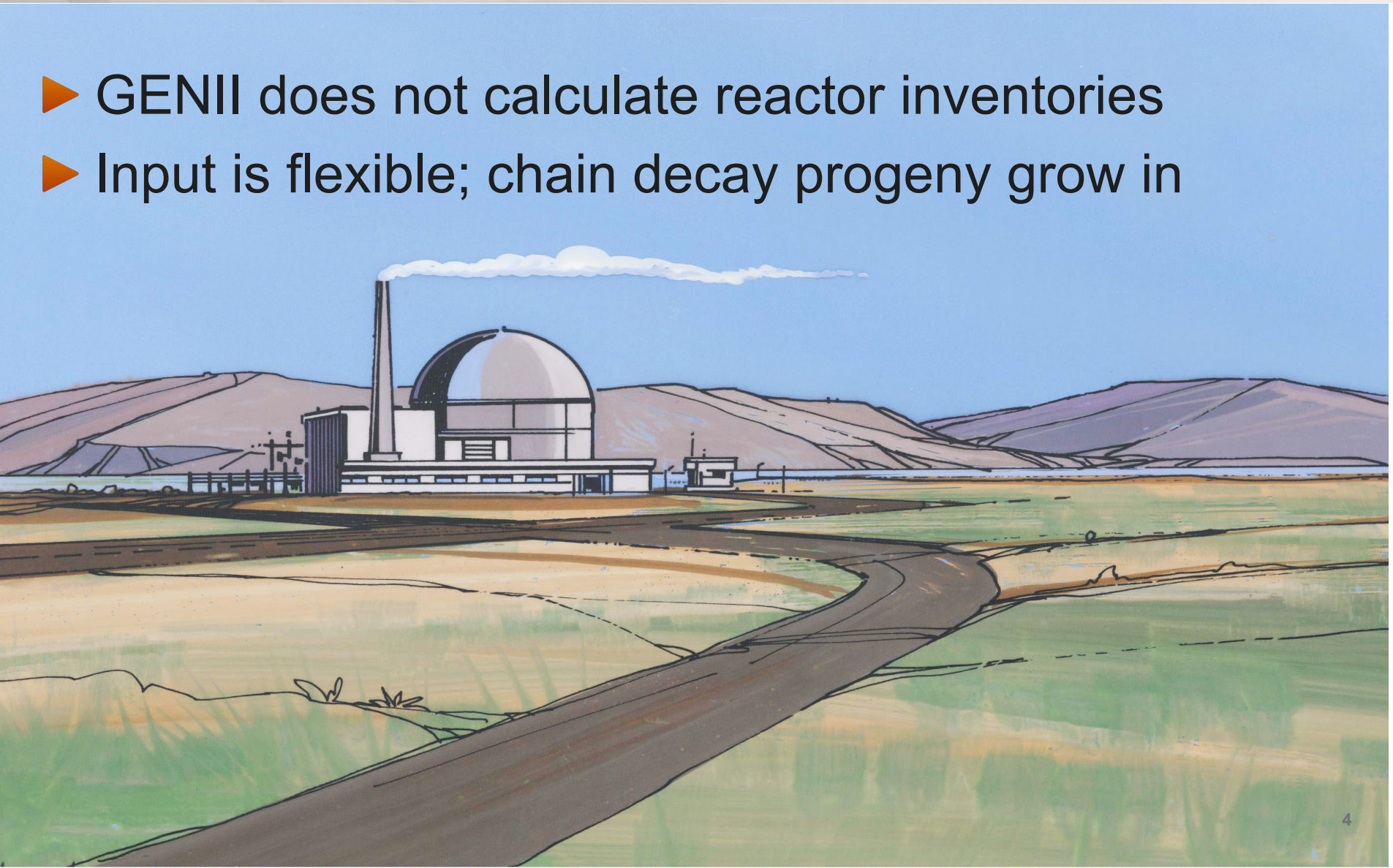
- How much material is released (and on what time scale)?
- What fraction of it reaches receptors (and on what time scale)?
- What is the resultant risk of harm to receptors?

Radionuclide Source Terms

- GENII does not calculate reactor inventories
- Input is flexible; chain decay progeny grow in

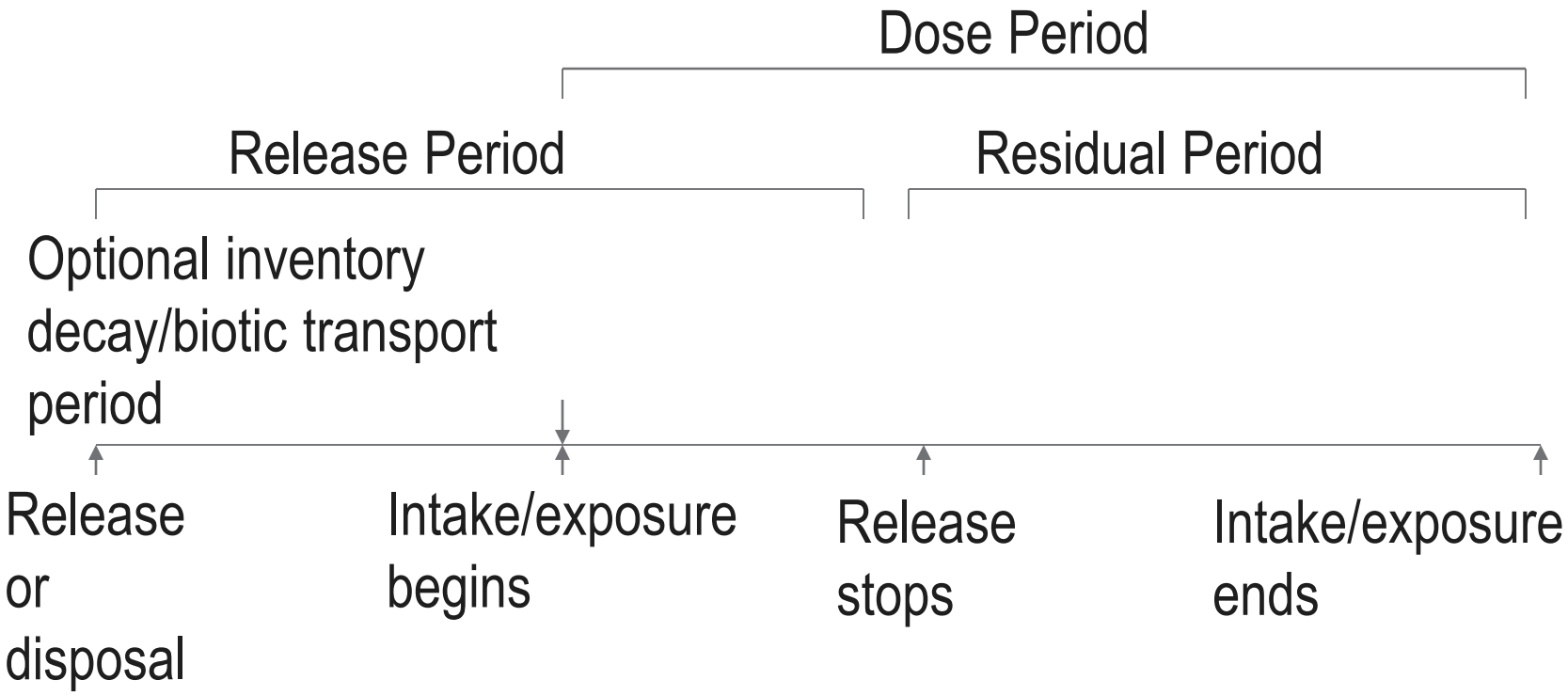


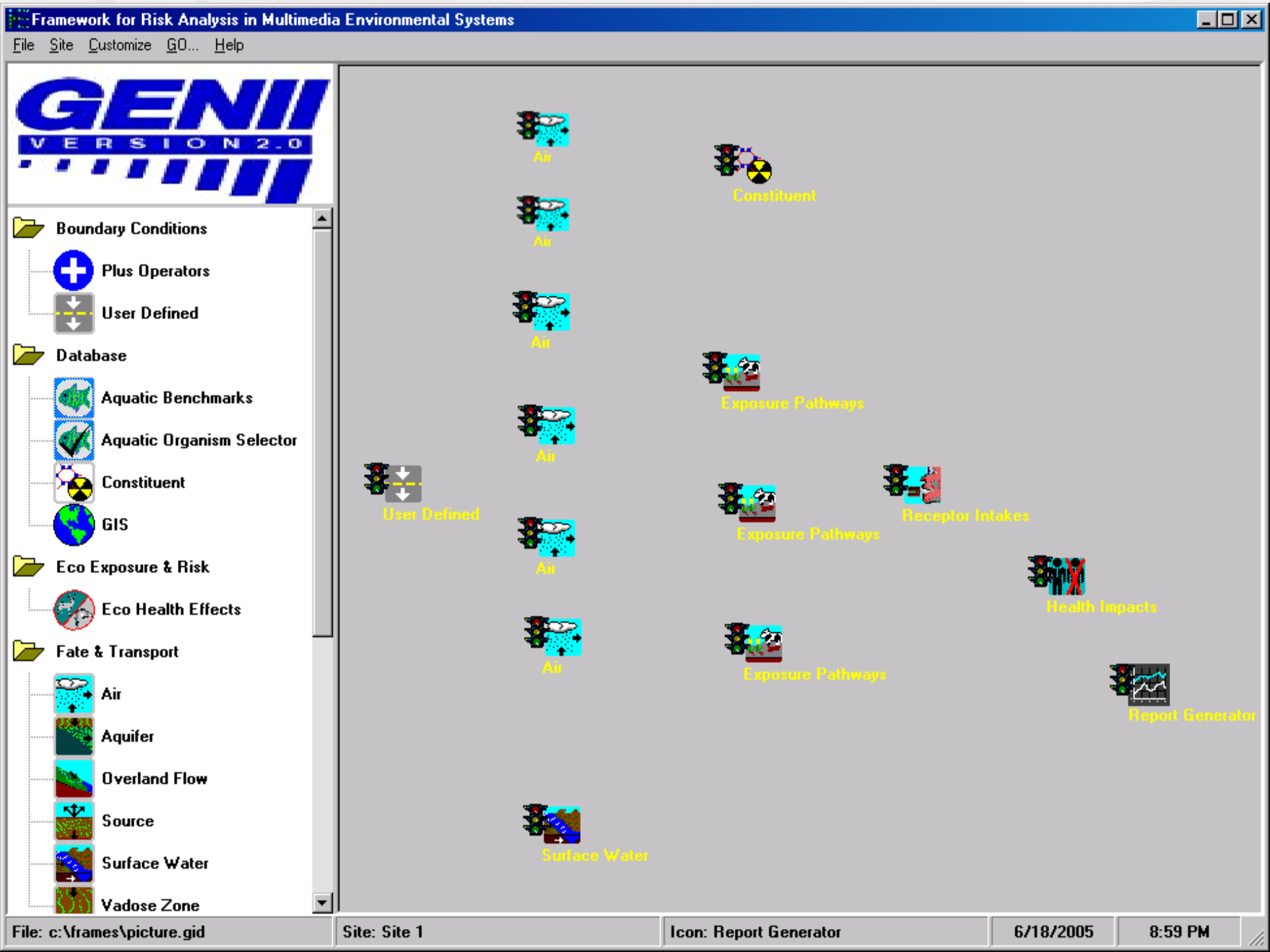
Radionuclides of Interest

- All those with half-lives greater than 10 minutes*
- All decay progeny of these
  - Some are included “implicitly”

*(Except radon progeny…)

GENII V.2 Time Line




Framework for Risk Analysis in Multimedia Environmental Systems
File Site Customize GO... Help
GENII
VERSION 2.0
Boundary Conditions
Plus Operators
User Defined
Database
Aquatic Benchmarks
Aquatic Organism Selector
Constituent
GIS
Eco Exposure & Risk
Eco Health Effects
Fate & Transport
Air
Aquifer
Overland Flow
Source
Surface Water
Vadose Zone
Air
Air
Air
Air
Air
Air
Constituent
Exposure Pathways
User Defined
Exposure Pathways
Receptor Intakes
Health Impacts
Exposure Pathways
Report Generator
Surface Water
File: c:\frames\picture.gid
Site: Site 1
Icon: Report Generator
6/18/2005
8:59 PM

Source Term

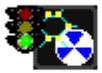
- Identity of contaminants released
- Amount of each contaminant released
- Physical and chemical characteristics
- Time of day, season of release
- Routine vs. episodic release

Important Source Term Characteristics

- Height of release above ground
- Time and duration of release
- Geographical location of release
- Structures near release
- Buoyancy of release

Initial GENII Input has Two Parts

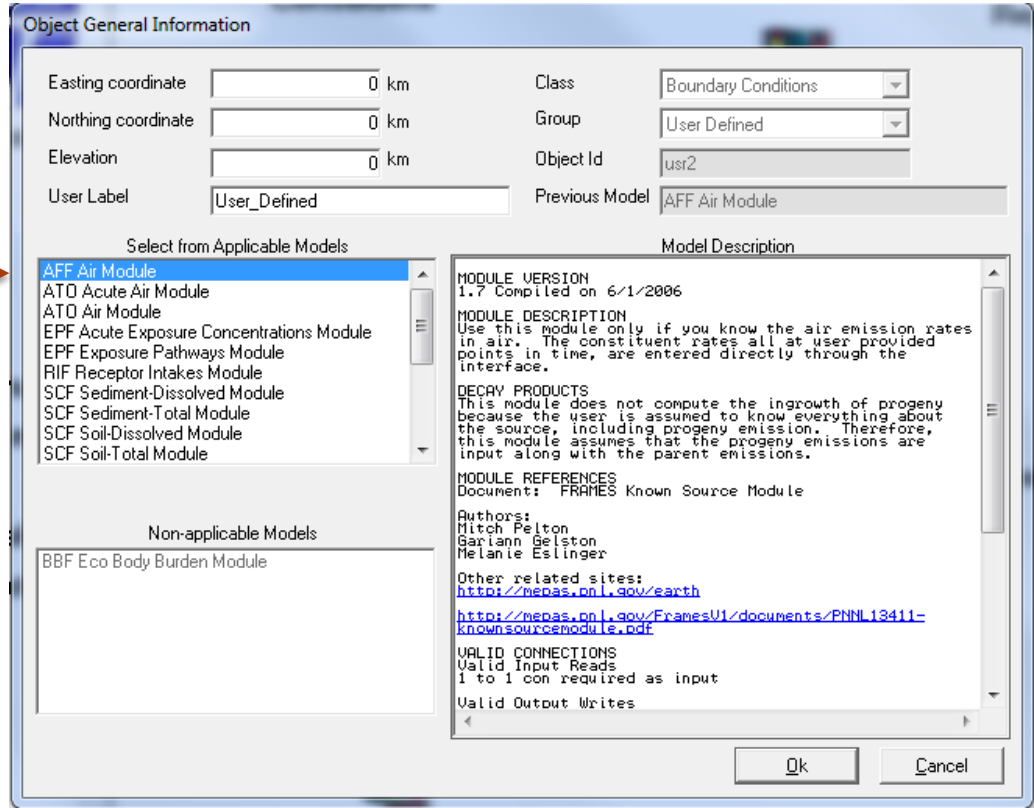
- Selection of Radionuclides



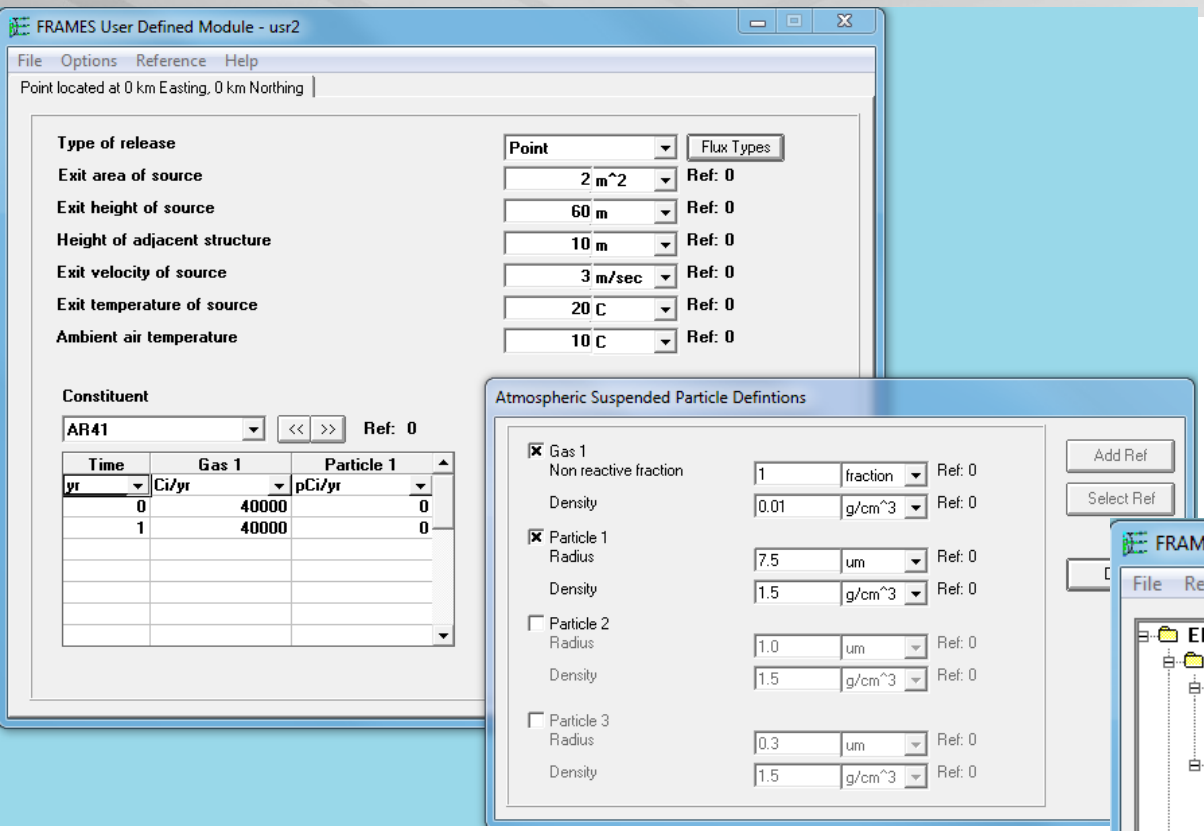
Constituent

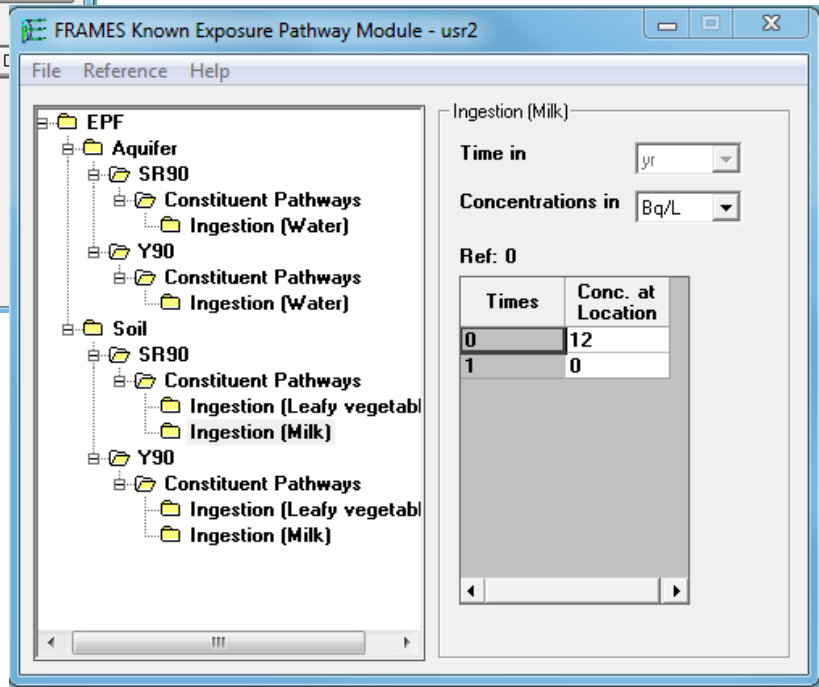
- Input of releases or initial concentrations

User_Defined



The Input Format Varies with Type





Almost always need to enter values for 2 (or more) time periods

Initial Contamination in Soil - a Special Case

- Only a single value is used (although FRAMES requires 2)
  - Other inputs are also not used (but *something* is required)