Radiation Protection Computer Code Analysis and Maintenance Program (RAMP) 2020 Fall Users Group Virtual Meeting

Introduction to Turbo FRMAC

Turbo FRMAC Primer

National Nuclear Security Administration

Sandia National Laboratories

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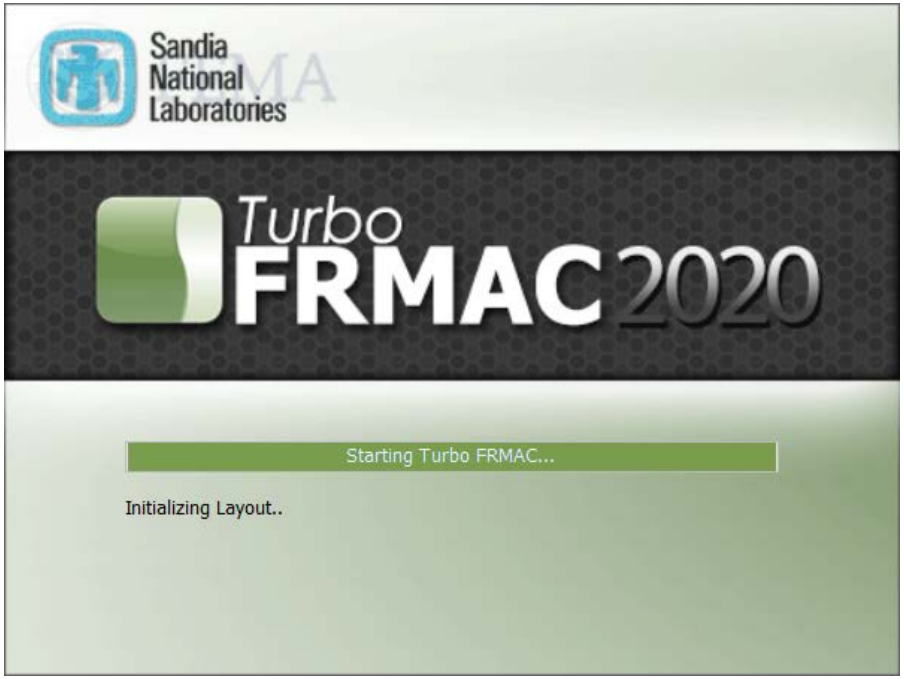
What is Turbo FRMAC?

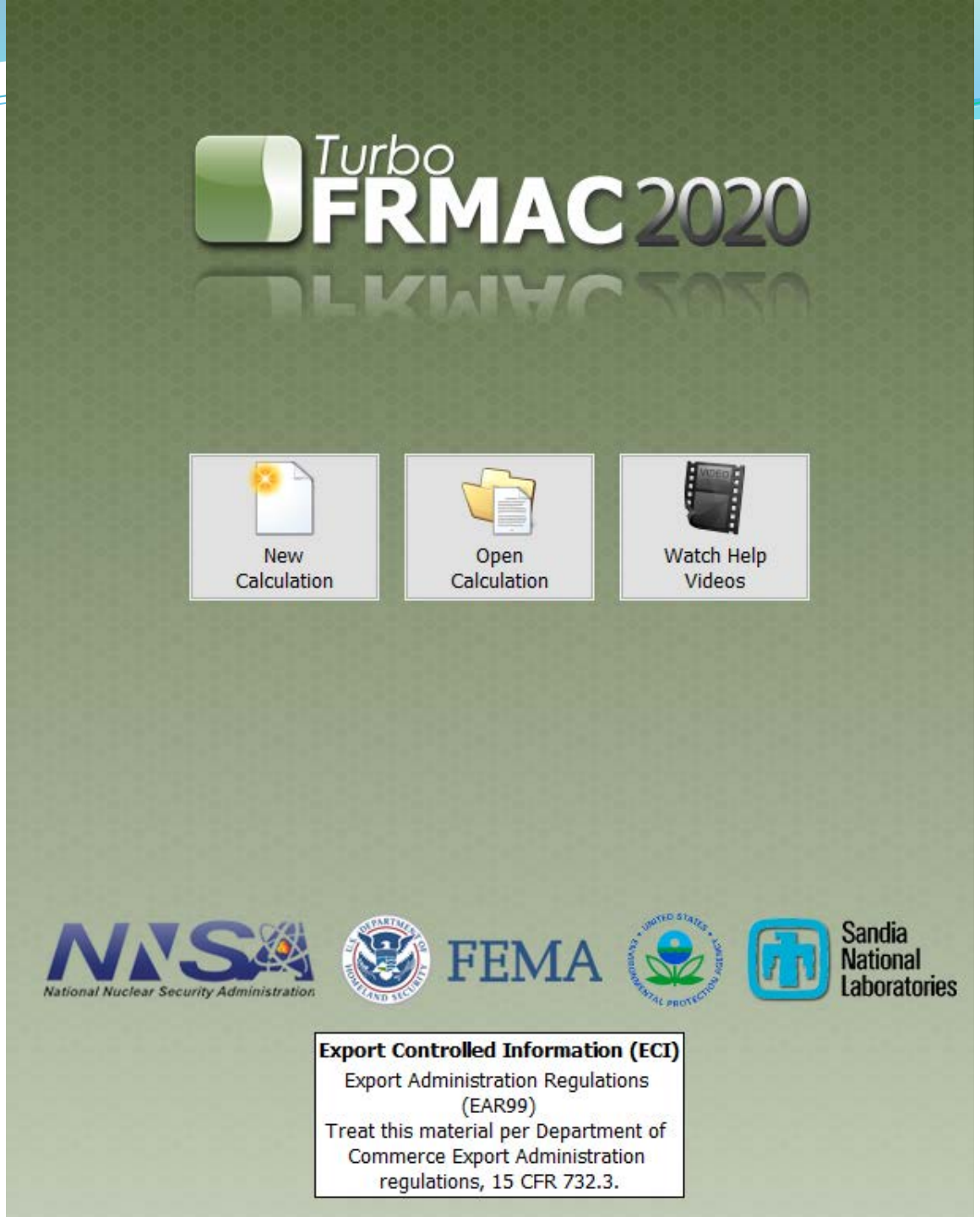
- Turbo FRMAC automates FRMAC Assessment Manual methods
- Turbo FRMAC eliminates most human errors
- Turbo FRMAC is a deployable software application
- Turbo FRMAC is not a replacement for Health Physics knowledge and experience

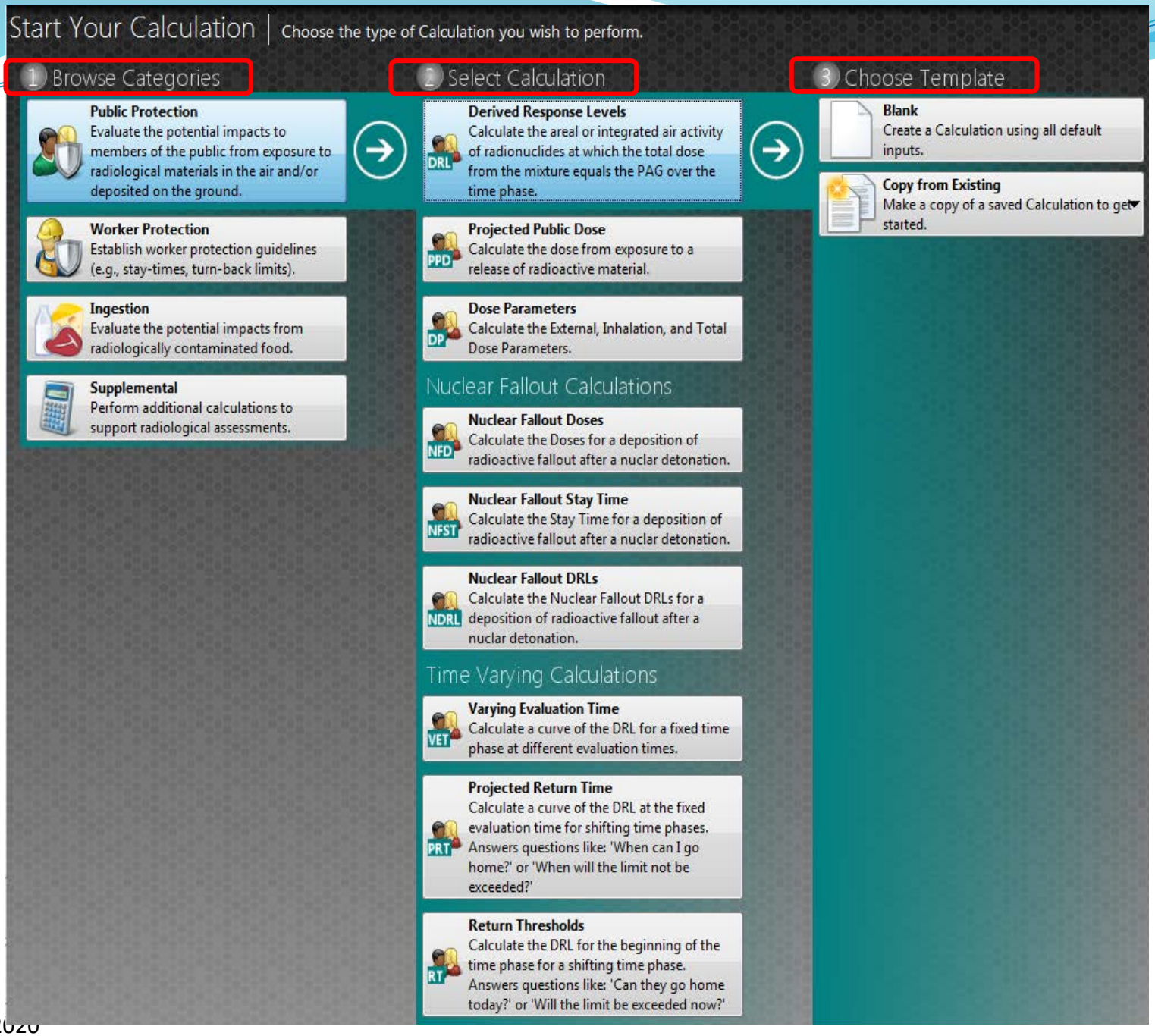


Accessing Turbo FRMAC

- Software may be issued to response organizations/individuals with justification
- Registration required via the following site:

https://nirp.sandia.gov/

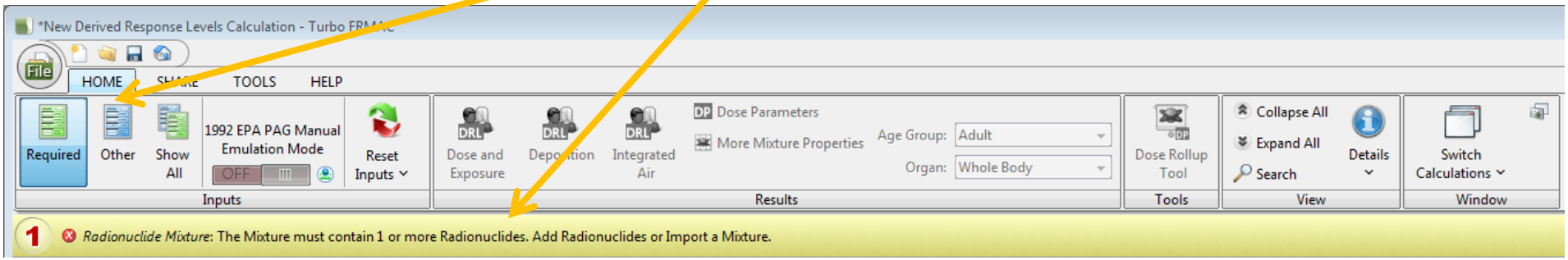

Turbo FRMAC 2020
New Calculation
Open Calculation
Watch Help Videos
National Nuclear Security Administration
FEMA
Sandia National Laboratories
Export Controlled Information (ECI)
Export Administration Regulations (EAR99)
Treat this material per Department of Commerce Export Administration regulations, 15 CFR 732.3.


Start Your Calculation | Choose the type of Calculation you wish to perform.
1 Browse Categories
2 Select Calculation
3 Choose Template
Public Protection
Evaluate the potential impacts to members of the public from exposure to radiological materials in the air and/or deposited on the ground.
Worker Protection
Establish worker protection guidelines (e.g., stay-times, turn-back limits).
Ingestion
Evaluate the potential impacts from radiologically contaminated food.
Supplemental
Perform additional calculations to support radiological assessments.
Derived Response Levels
Calculate the areal or integrated air activity of radionuclides at which the total dose from the mixture equals the PAG over the time phase.
Projected Public Dose
Calculate the dose from exposure to a release of radioactive material.
Dose Parameters
Calculate the External, Inhalation, and Total Dose Parameters.
Nuclear Fallout Calculations
Nuclear Fallout Doses
Calculate the Doses for a deposition of radioactive fallout after a nuclar detonation.
Nuclear Fallout Stay Time
Calculate the Stay Time for a deposition of radioactive fallout after a nuclar detonation.
Nuclear Fallout DRLs
Calculate the Nuclear Fallout DRLs for a deposition of radioactive fallout after a nuclar detonation.
Time Varying Calculations
Varying Evaluation Time
Calculate a curve of the DRL for a fixed time phase at different evaluation times.
Projected Return Time
Calculate a curve of the DRL at the fixed evaluation time for shifting time phases. Answers questions like: 'When can I go home?' or 'When will the limit not be exceeded?'
Return Thresholds
Calculate the DRL for the beginning of the time phase for a shifting time phase. Answers questions like: 'Can they go home today?' or 'Will the limit be exceeded now?'
Blank
Create a Calculation using all default inputs.
Copy from Existing
Make a copy of a saved Calculation to get started.

Turbo FRMAC General Layout

Ribbons and Tabs

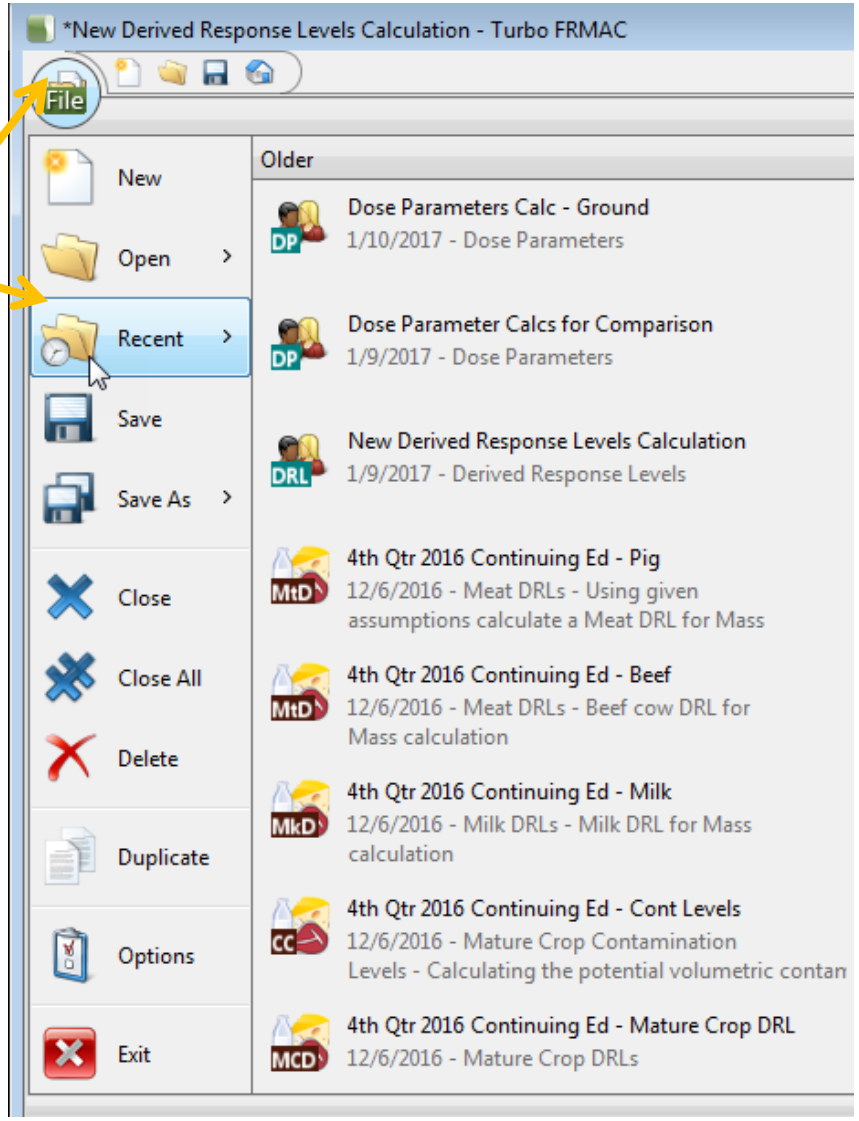
- Controls calculations
- Allows movement to other work options
- Provides any error messages



Turbo FRMAC General Layout

Drop Down Menu

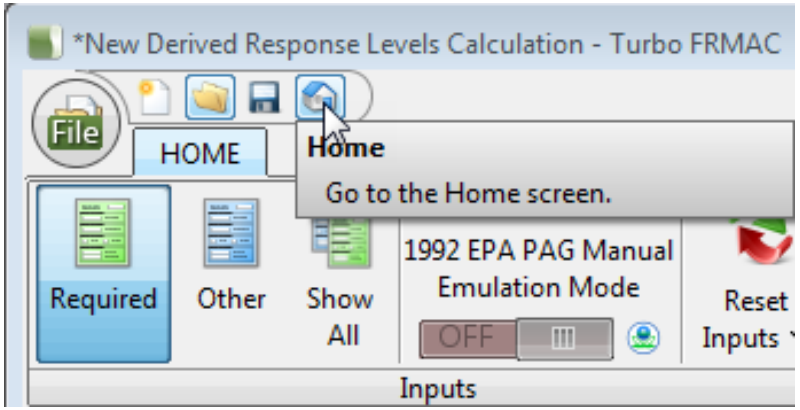
- Emulates Microsoft layouts
- Provides easy access to many commands

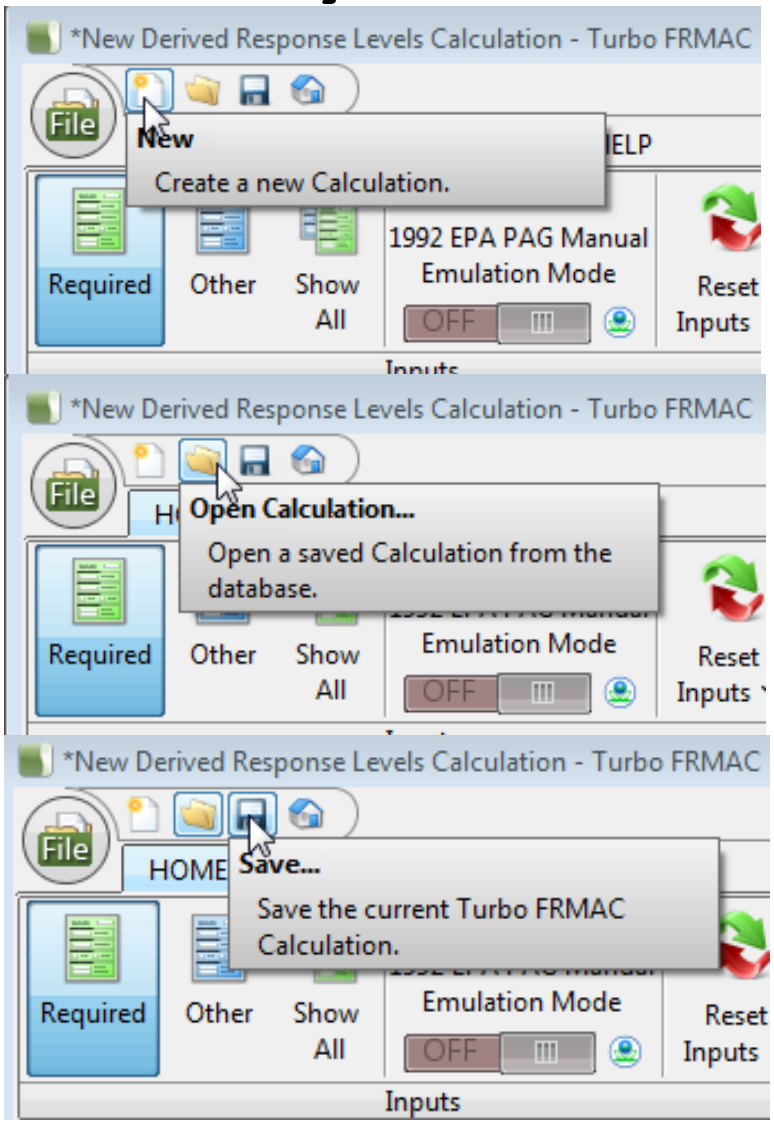


Turbo FRMAC General Layout

Quick Access Tool Bar

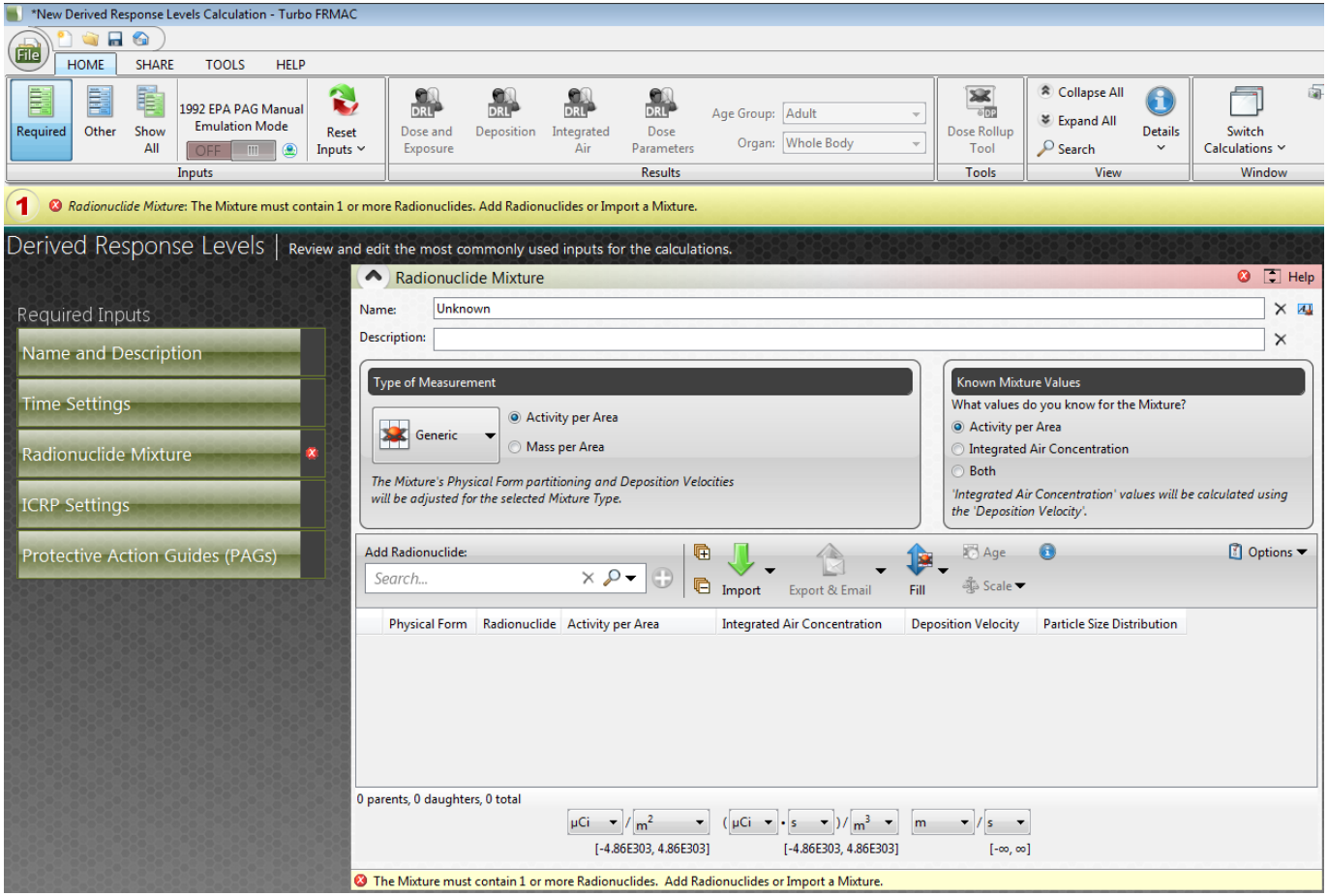
- Start New Calculation
- Open Existing Calculation
- Save Current Calculation
- Start from Home





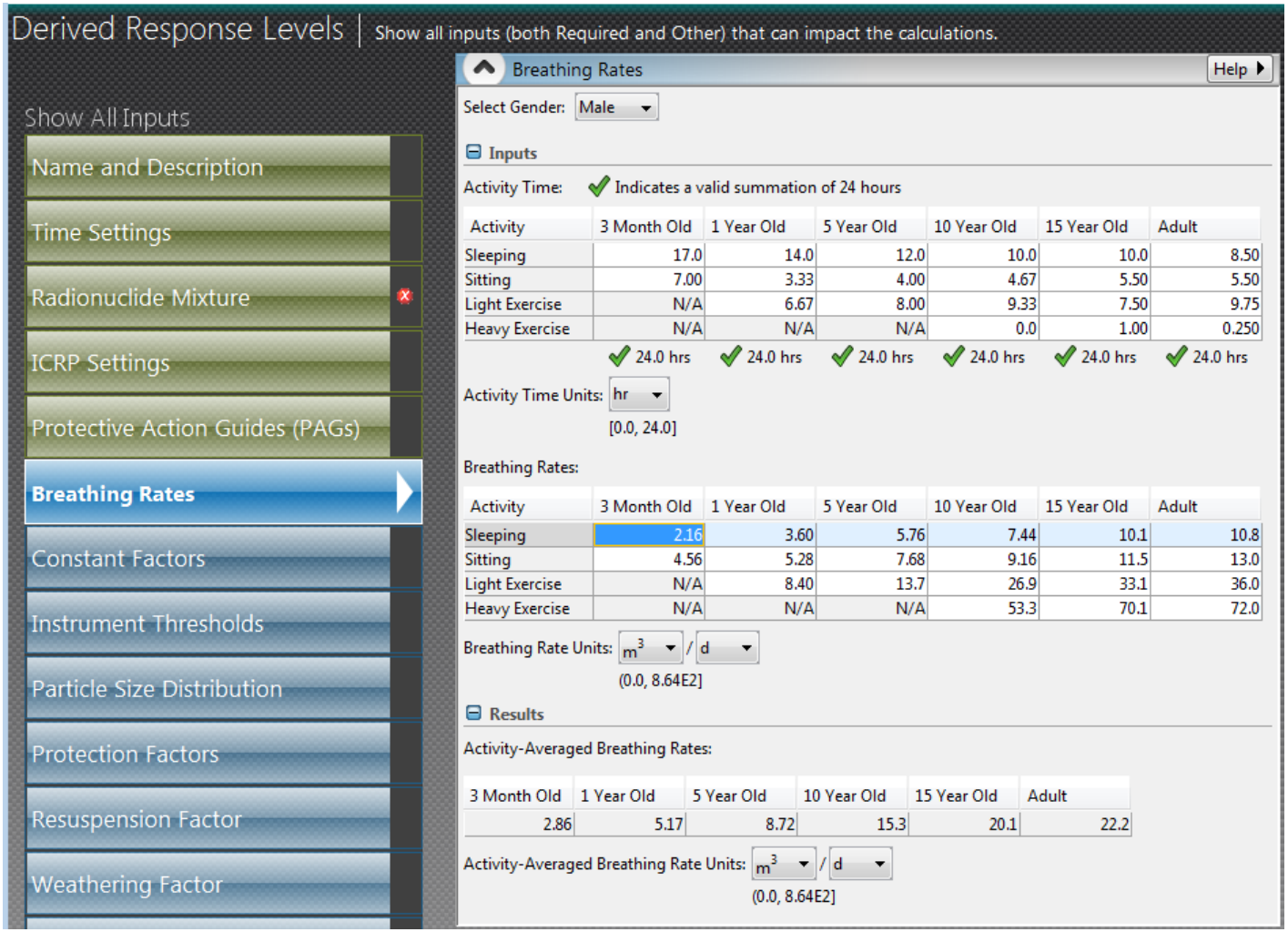
Turbo FRMAC General Layout

- Buttons
  - Required Inputs
  - Other Inputs
- Panels
  - Individual data



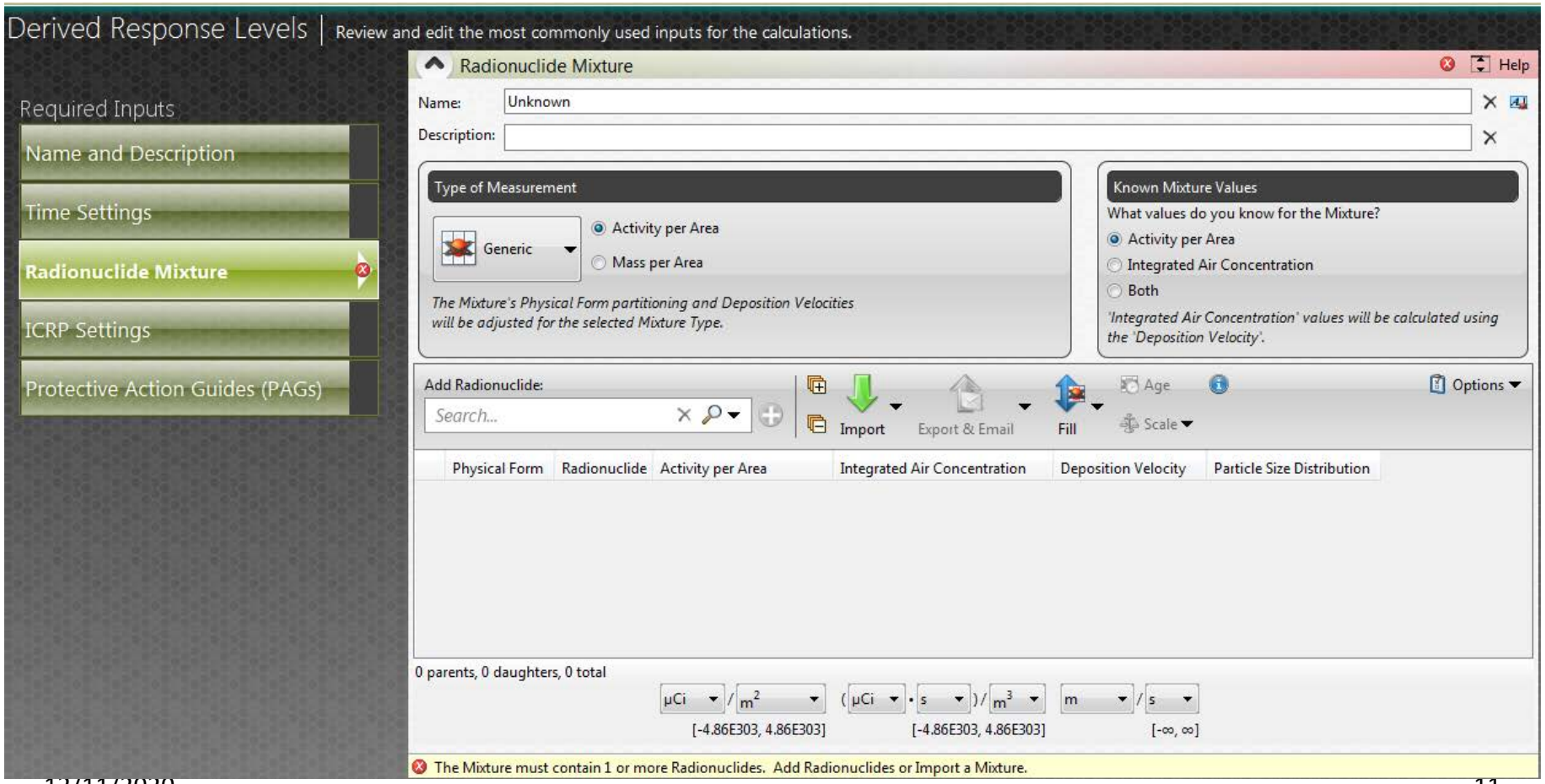
Features → Main Window

All data in panels are viewable and editable



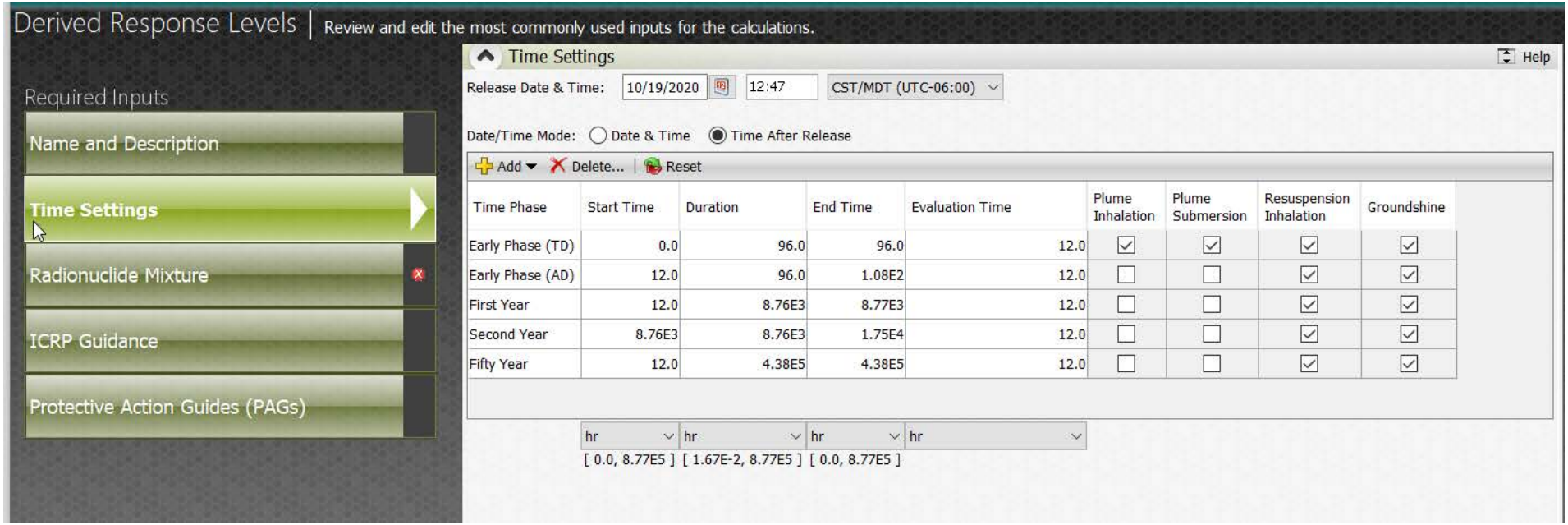
Features → Main Window

- Clicking the button brings the panel into viewing area
- Panel provides information about the error message



Features → Main Window

- Lets preview a few of the more important Panels
- Begin with the Time Settings Panel



Features → Main Window

- 5 Time Phases are pre-populated (Time Phases can be added/deleted)
- Each Time Phase has exposure pathways assigned

Time Settings

Help

Release Date & Time: 10/19/2020 12:47 CST/MDT (UTC-06:00)

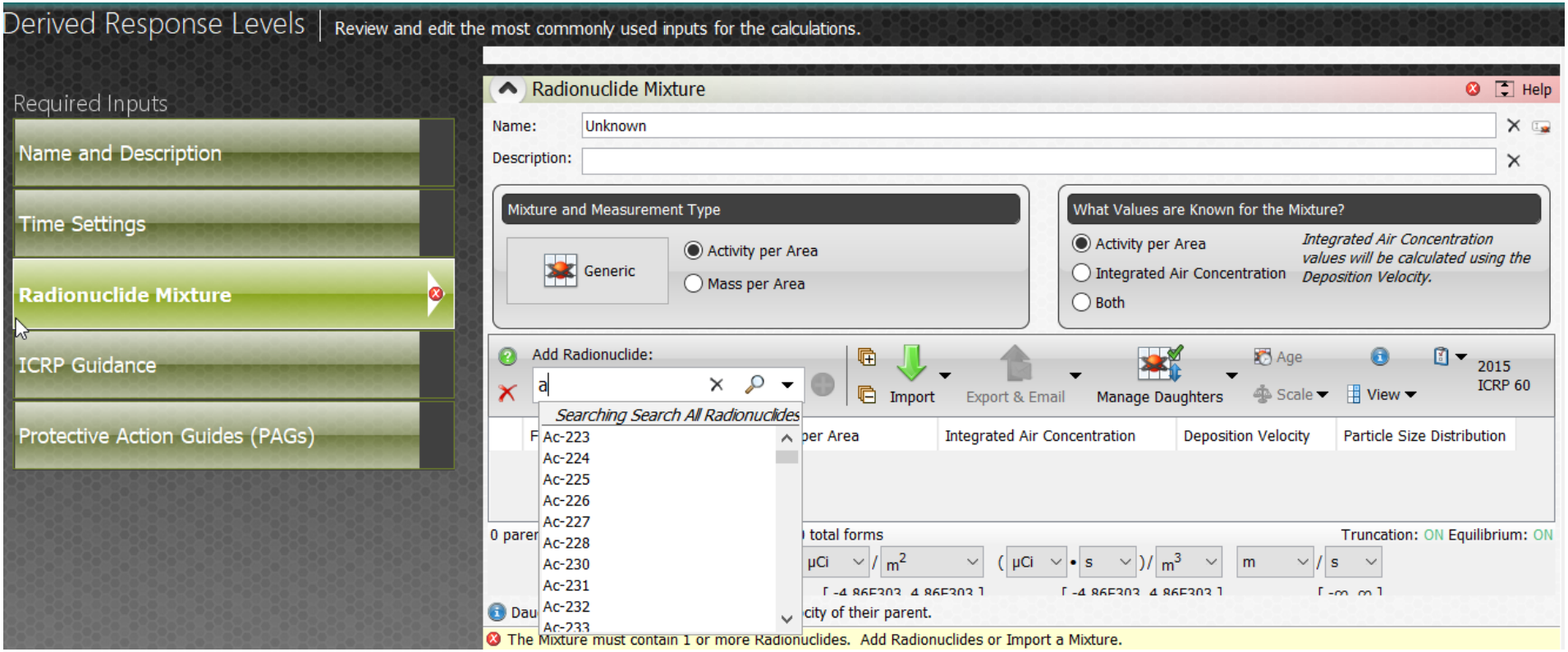
Date/Time Mode: ○ Date & Time ◉ Time After Release

Add ▾ | Delete... | Reset

Time Phase	Start Time	Duration	End Time	Evaluation Time	Plume Inhalation	Plume Submersion	Resuspension Inhalation	Groundshine
Early Phase (TD)	0.0	96.0	96.0	12.0	☑	☑	☑	☑
Early Phase (AD)	12.0	96.0	1.08E2	12.0	☐	☐	☑	☑
First Year	12.0	8.76E3	8.77E3	12.0	☐	☐	☑	☑
Second Year	8.76E3	8.76E3	1.75E4	12.0	☐	☐	☑	☑
Fifty Year	12.0	4.38E5	4.38E5	12.0	☐	☐	☑	☑
	hr	hr	hr	hr				
	[0.0, 8.77E5]	[1.67E-2, 8.77E5]	[0.0, 8.77E5]					

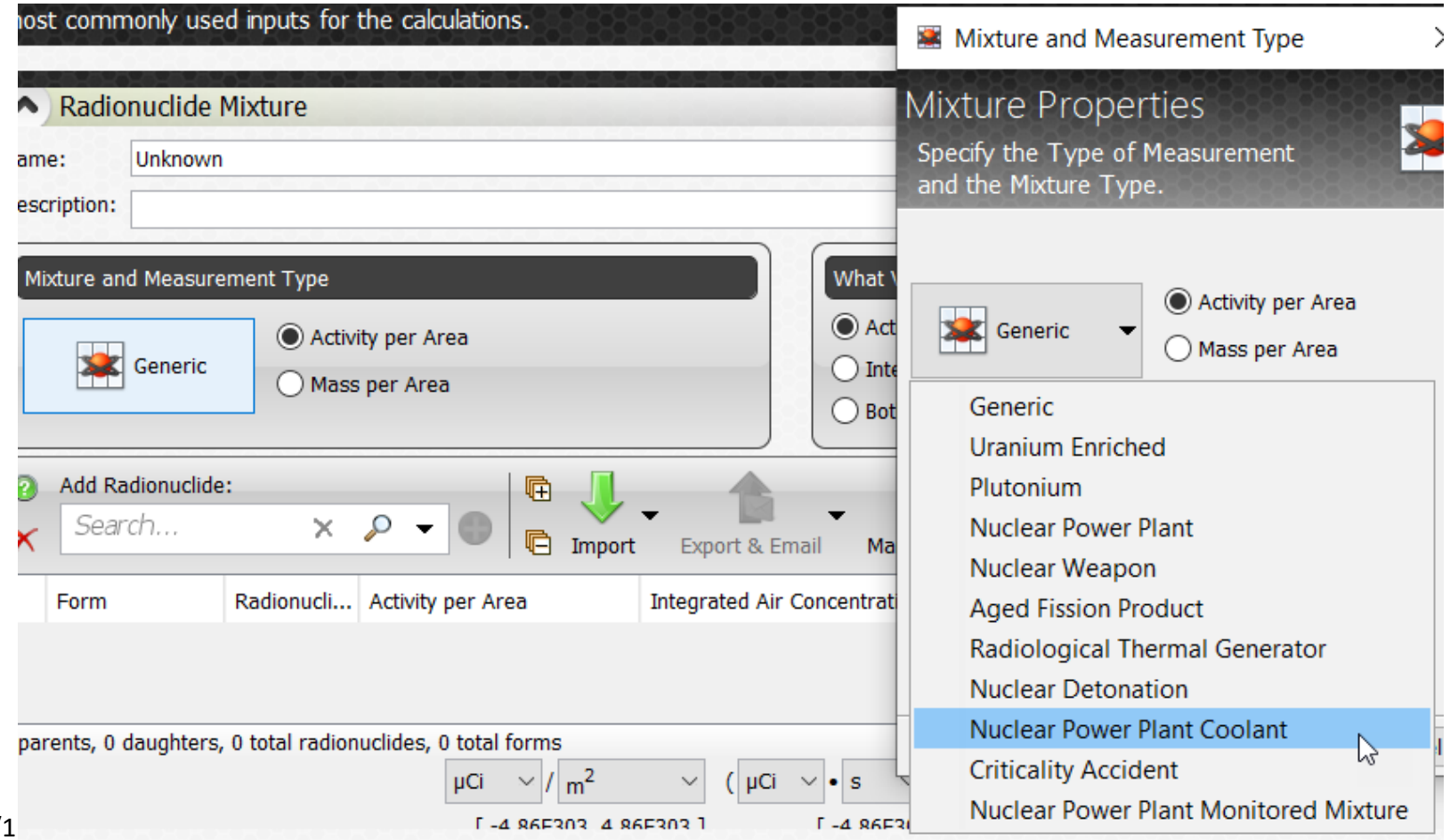
Features → Main Window

The Radionuclide Mixture Panel provides the user with multiple options



Features → Main Window

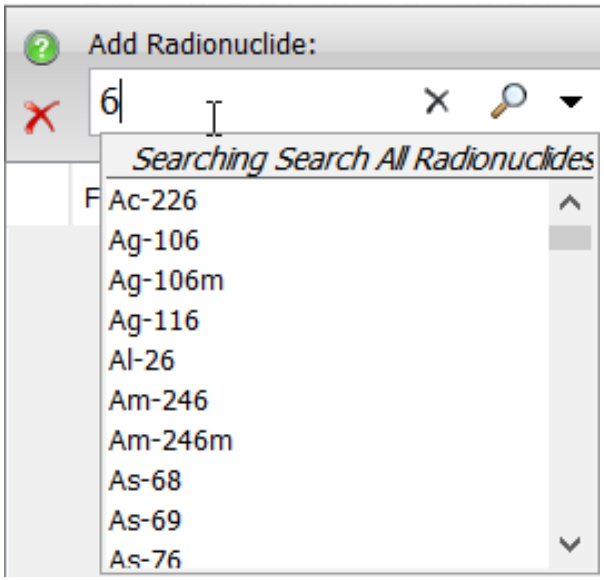
Clicking on the “”Generic” button allows the user to select the type of mixture to use

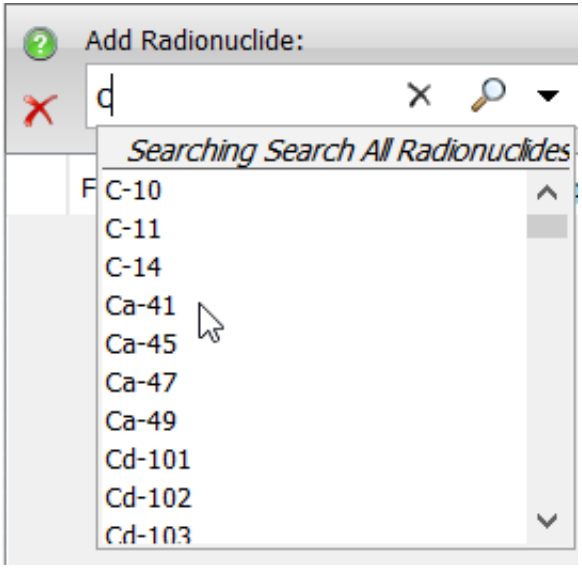


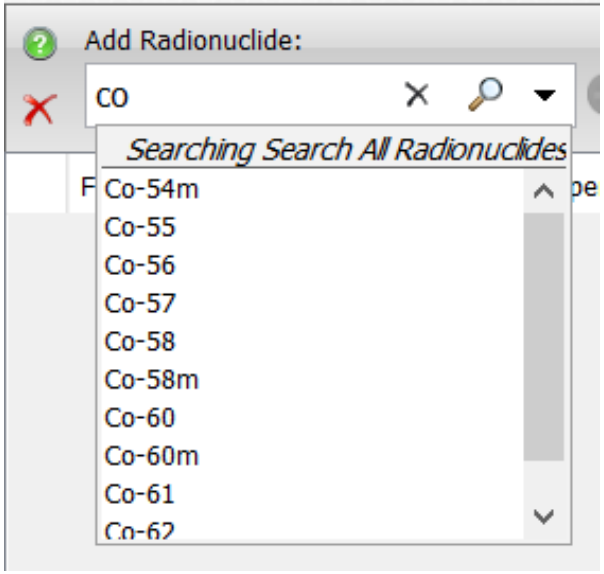
Features → Main Window

The software allows the user to search for a radionuclide in multiple ways

- Using a number
- Using the just first letter of the name
- Using the radionuclide symbol

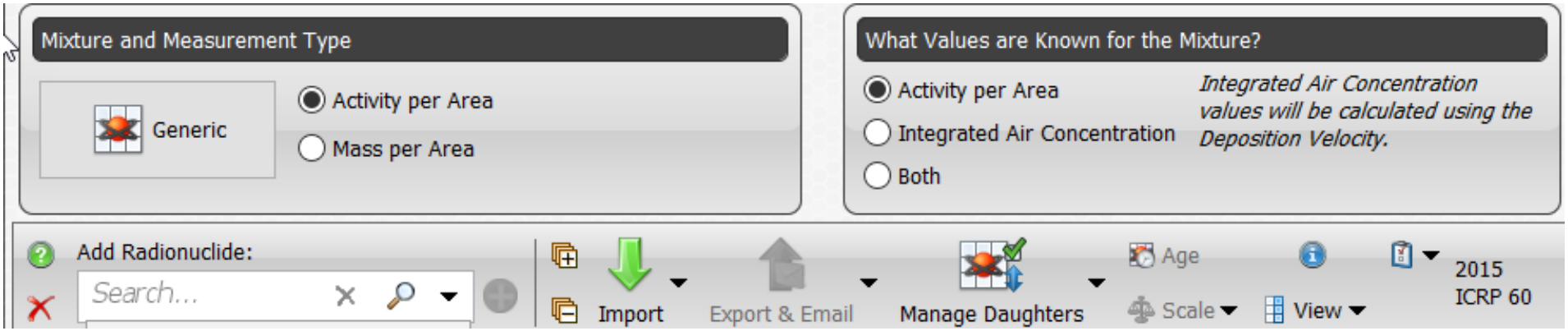






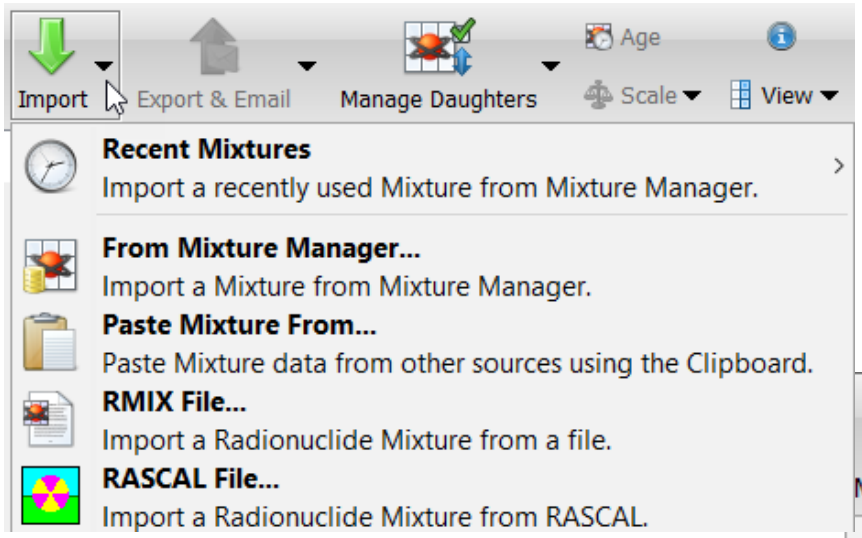
Features → Main Window

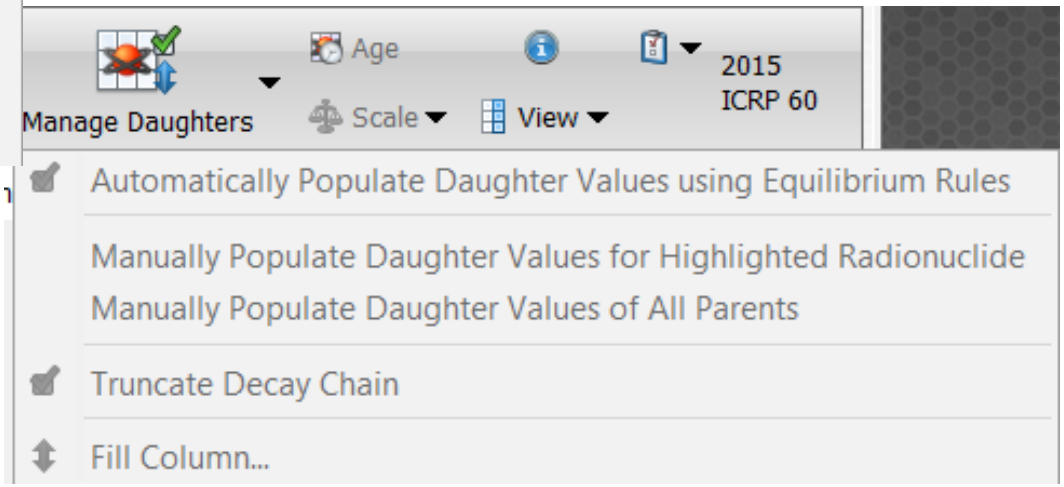
The Radionuclide Panel provides several other options to manage the mixture



Features → Main Window

Most used are the Import and Manage Daughters drop downs



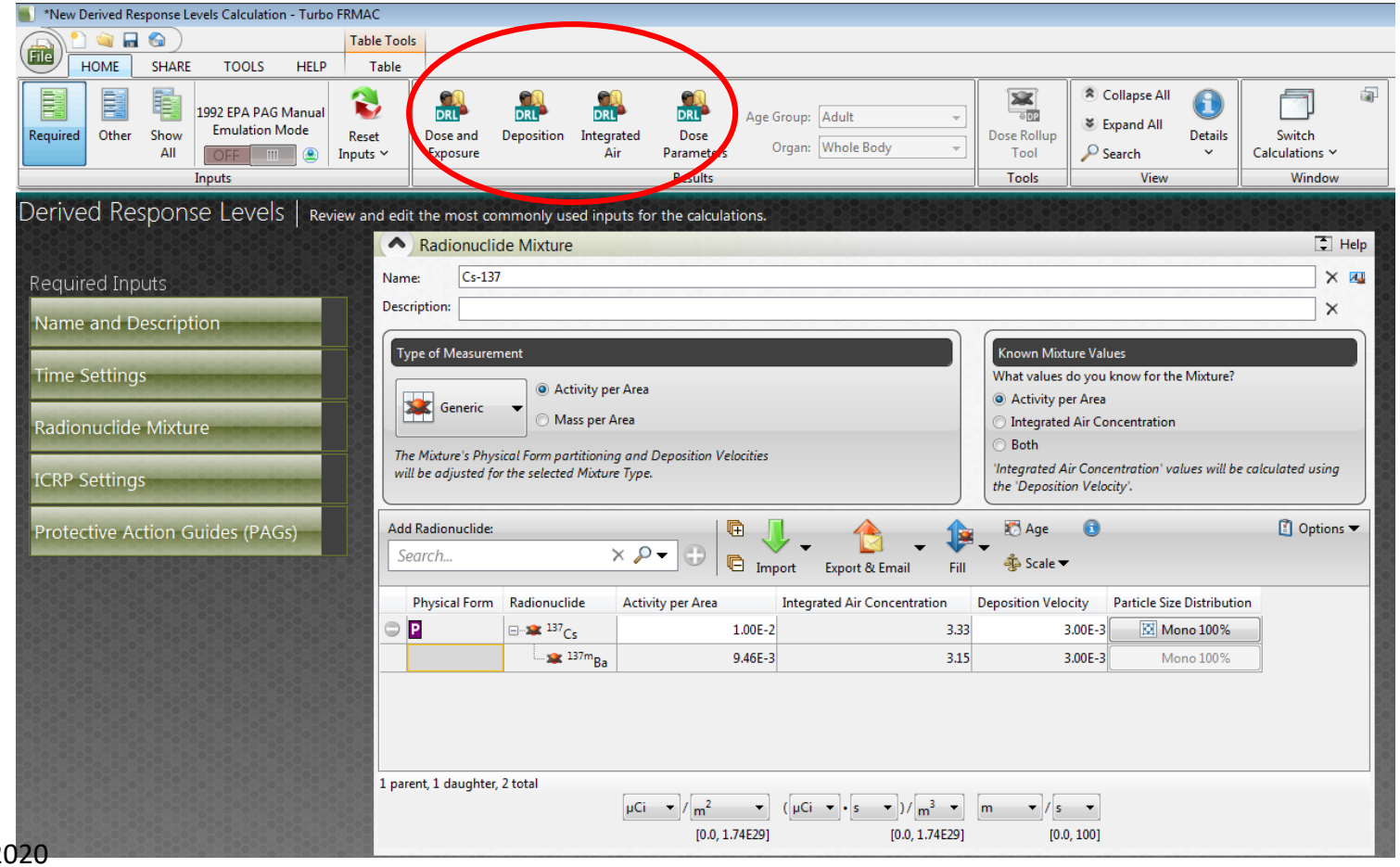


Features → Main Window

Several other calculation factors are available for viewing and editing

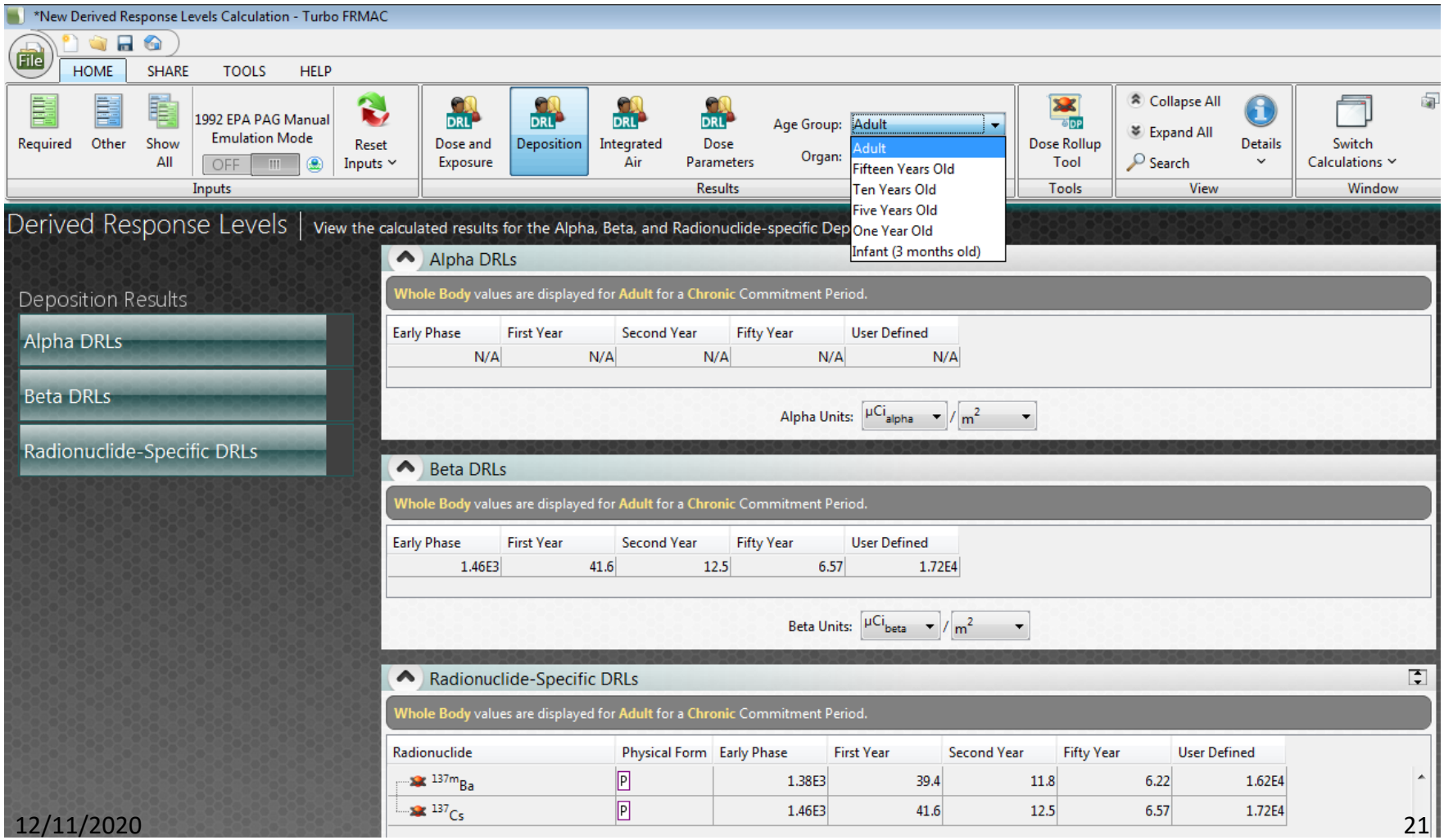
Features → Main Window

Once required data is provided, error message is removed and calculation buttons are “active”



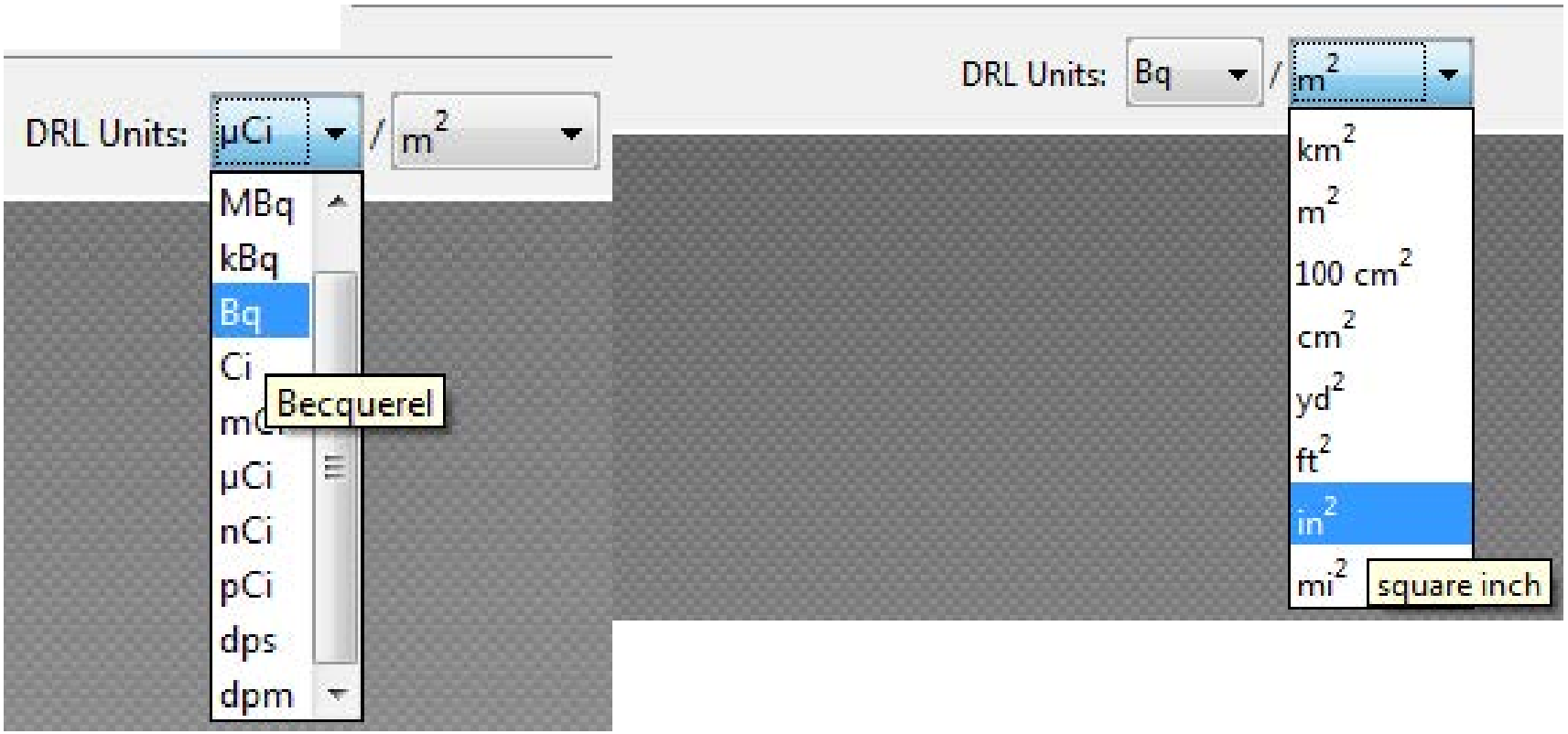
Features → Results

Calculation completed for all radionuclides and for all age groups



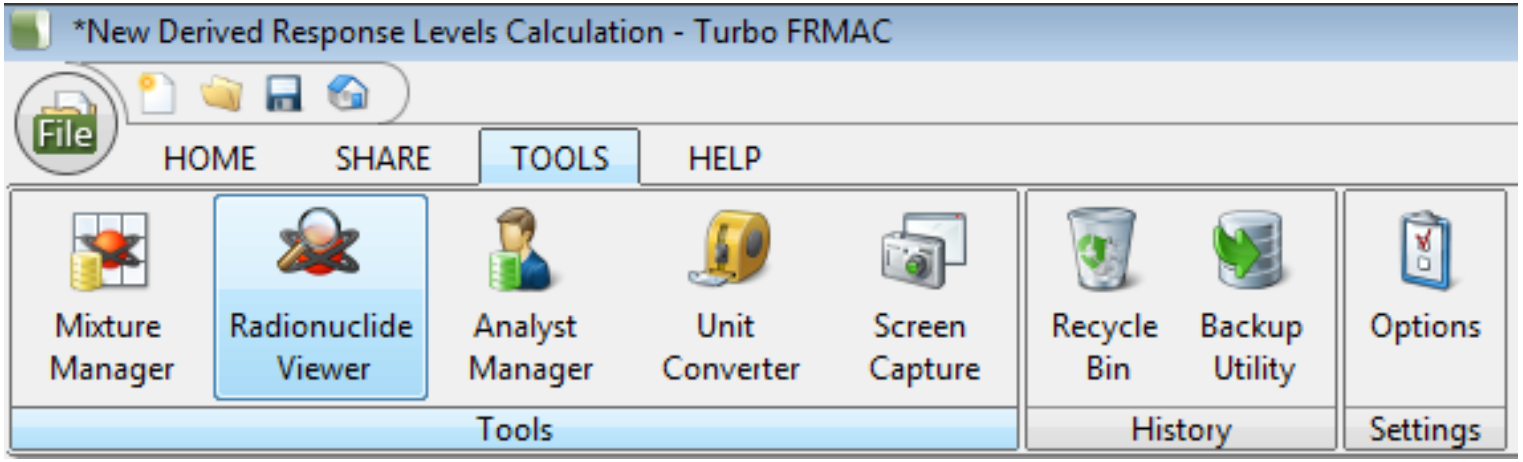
Features → Results

Units can be converted as needed

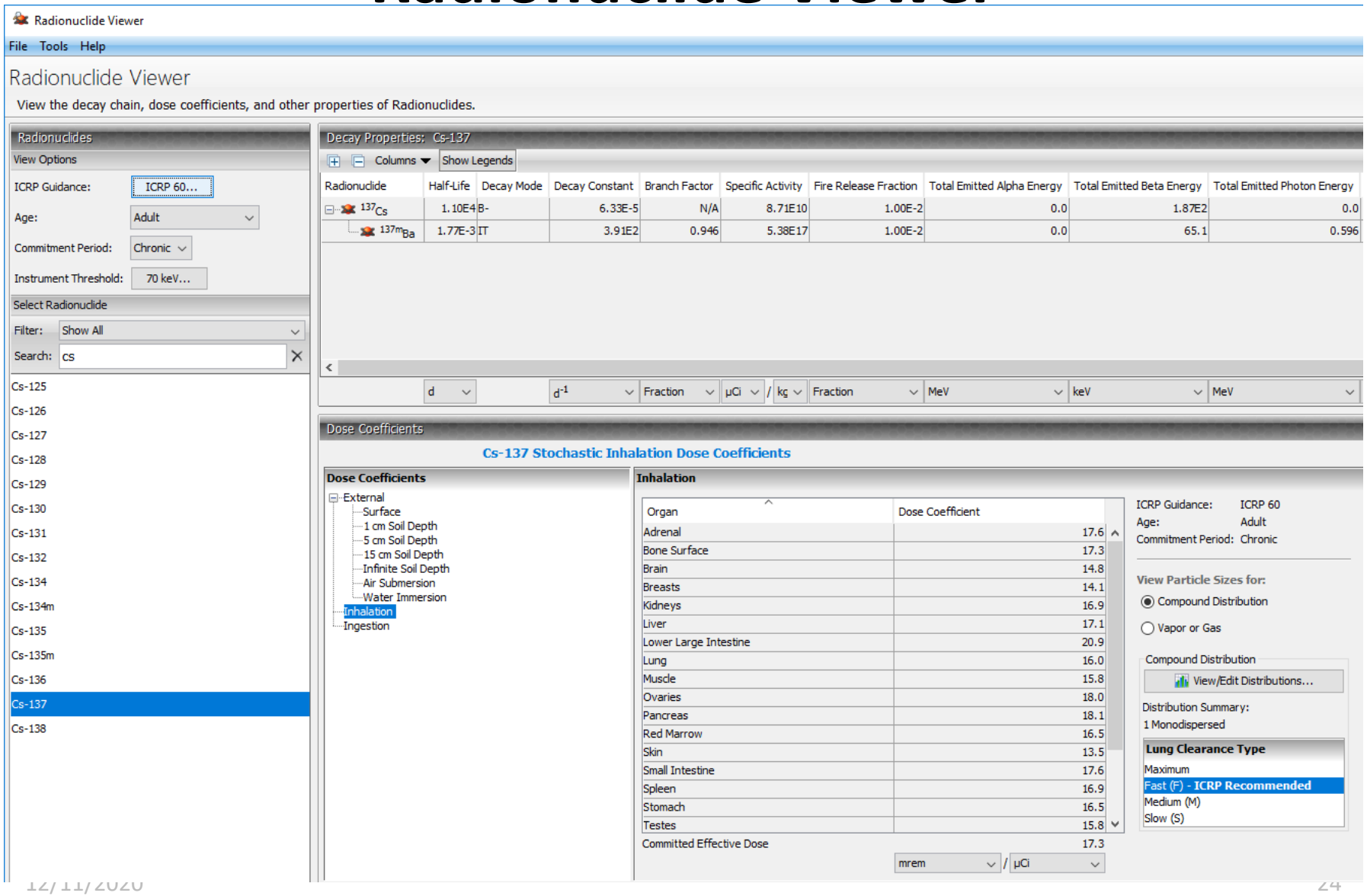


Radionuclide Viewer

- Displays Full Radionuclide Decay Chain
- Displays basic nuclide data
  - Half Life
  - Decay mode
- Provides access to Dose Coefficients for each nuclide

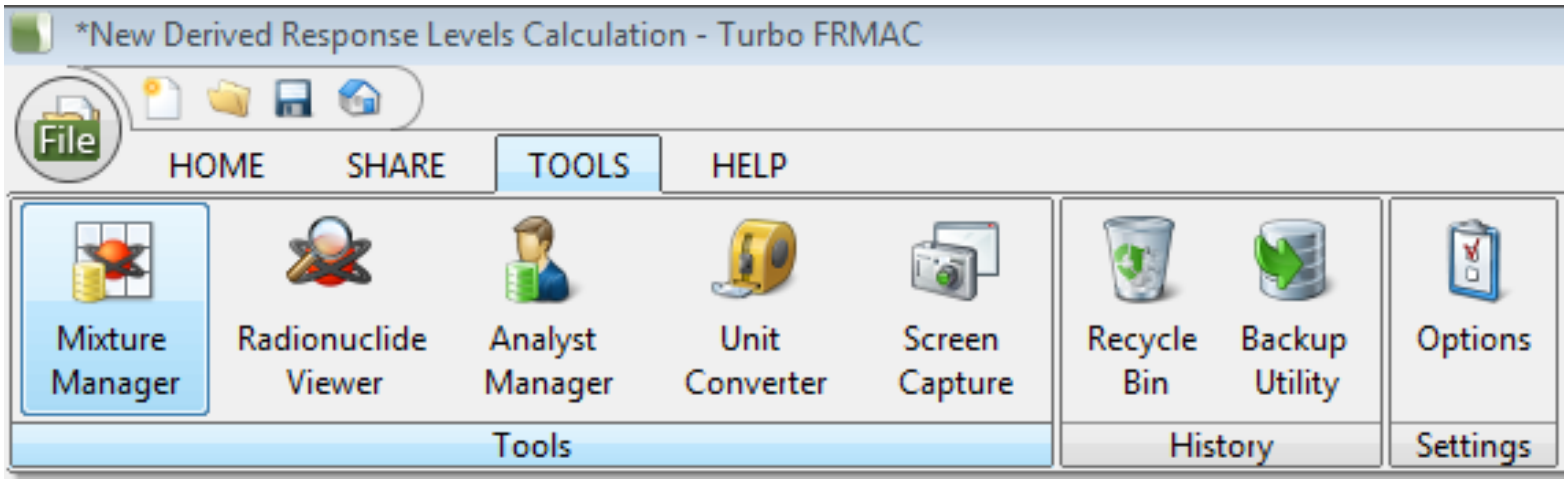


Radionuclide Viewer

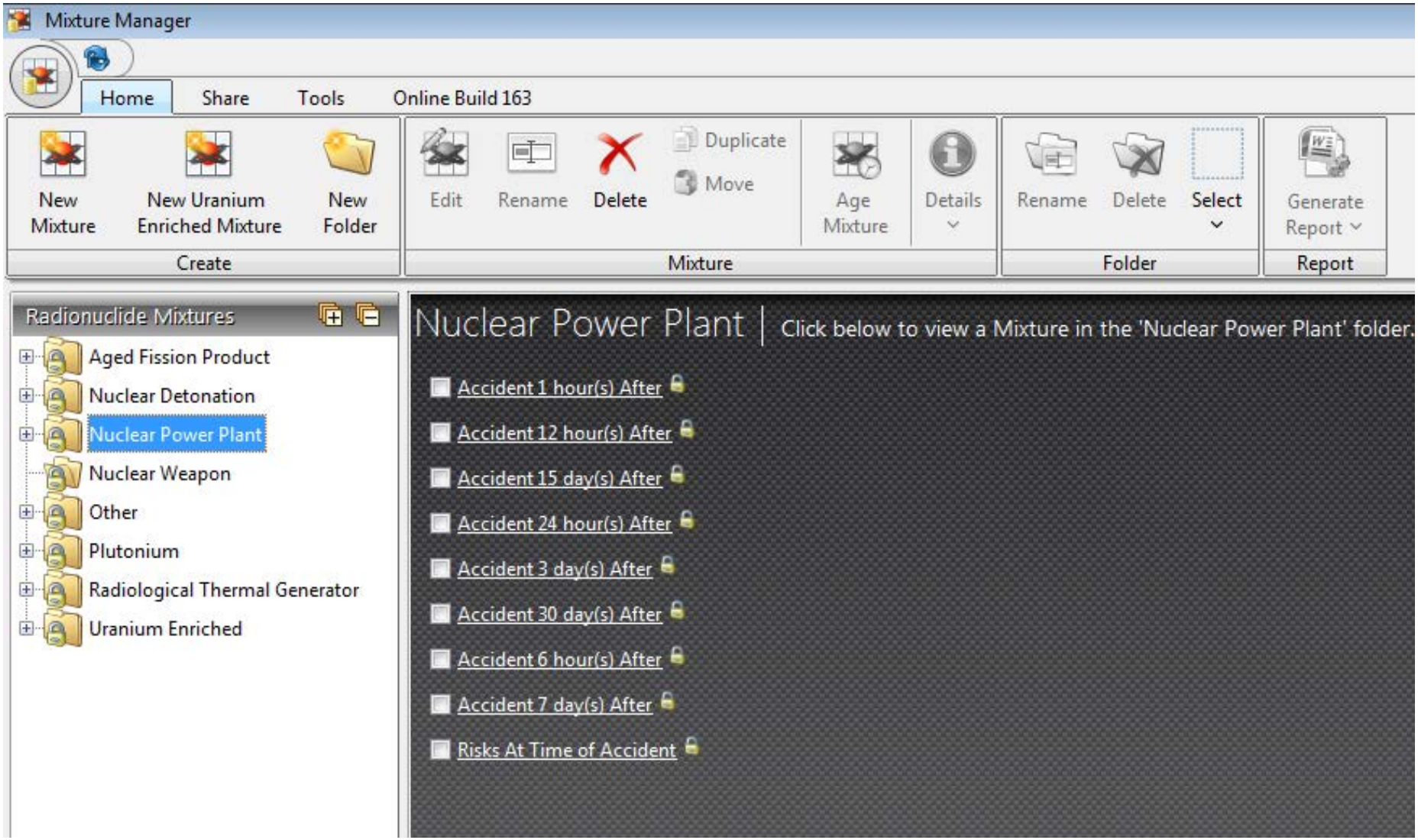


Radionuclide Mixture Manager

- Allows User to Create/Save/Export/Import Custom Mixtures
- User may select Pre-determined Mixtures



Radionuclide Mixture Manager



Turbo FRMAC System Requirements

- Turbo FRMAC has been designed for Windows 10 and is compatible with Windows Vista, 7 and 8
- Compatible with Mac OS 10.6 or newer

- Minimum 2 GHz Pentium 4 Processor
  - Recommended: Dual- or Quad-Core or higher
- Minimum 2 GB RAM Memory
  - Recommended: 4 GB RAM or higher
- Minimum 30 GB Free Disk Space
  - Recommended: 50 GB Free or higher
- Recommended: 1280 x 1024 or higher

- Other Software
  - MS Excel 2007 or newer (for special data export capabilities)
  - MS Outlook 2007 or newer (for built-in email attachment support)
  - MS PowerPoint 2007 or newer (for briefing products)
  - MS Word 2007 or newer (for report generation)
  - Adobe Acrobat Reader (for viewing related documents)

Questions?