

The RadAssessor Manual



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THIS manual will describe the functions and capabilities that are available from the RadAssessor database and will demonstrate how to retrieve and view its information. You'll learn how to start the database application, how to log in, how to use the common commands, and how to use the online help if you have a question or need extra guidance. RadAssessor can be viewed from any standard web browser. Therefore, you will not need to install any special software before using RadAssessor.

1.1 History of RadAssessor

The RadAssessor database system was developed to characterize data accumulated from commercial handheld radiation detectors and evaluate the radiation detection performance of the instruments (Figure 1). Previously, performance data from these handheld isotope-identifying instruments was unmethodically collected in laboratory notebooks, instrument memory, spreadsheets, data files, publications, or within an operator's memory, and it frequently had not been interpreted. It appeared in different formats, some of which were proprietary. Therefore, it was difficult to assimilate, interpret, or disseminate the detector performance data that had been compiled. It was almost impossible to compare data among different instruments.

As more and more commercial instruments became available, the number of measurements being taken grew larger and so did the number of radiation sources being measured. However, the sources that were being measured in experimental laboratories were not readily available to outside agencies that needed the results. Clearly, a solution was needed that could address all of these challenges.



Figure 1. Data acquisition using several different detector models (left). One of the radioactive sources used during data acquisition was 4.5 kg of ^{239}Pu .

In response, the RadAssessor database system was created. Existing and newly acquired data was assembled in the database, and measurement findings were evaluated. These findings have been integrated into a single, central repository that provides easy access to authorized users. Users can log in using a standard web browser and easily build queries based on the data, including information about particular detectors, isotopes, or shielding combinations.

1.2 What is RadAssessor?

The RadAssessor database is a central repository for information collected from handheld radiation detectors. There are countless ways this information can be used. For example, you can compare a particular detector with another detector. Or you can compare a detector's performance with special nuclear material to its performance with naturally-occurring radiation.

RadAssessor is a tool to help you determine a radioactive threat level by giving you known information about an instrument's performance and its radioactive source measurements. Handheld radiation detectors are important in first-responder programs for detecting illegal radioactive materials and reducing the threat of a terrorist attack. However, to prevent a radiological terrorism attack, you must be able to find the radiological material and distinguish it from legitimate radioactive sources.

It is also necessary to identify the isotopes in interdicted radioactive material. Handheld isotope-identifying instruments can be used to reveal the presence of radioactive material, localize the material, identify the radioactive isotopes, and determine the threat level. RadAssessor summarizes the performance of different handheld isotope-identifying instruments by compiling their radiation detection and identification results. A comprehensive understanding of each instrument's performance makes it easier to rapidly and accurately interpret the data and assess the threat.

Few commercial radiation detectors consistently interrogate questionable cargo accurately, and no detector has yet been able to meet all of the first responder's needs. Therefore, until technology provides a convenient, affordable, and robust instrument that can identify isotopes in a wide variety of circumstances when operated by responders with varying levels of training, it will remain important to carefully evaluate your intended use of an instrument and the conditions under which it will operate before selecting one. Studying the responses of various detectors to various sources of radiation is a good way to help you determine which instrument to buy.

In addition to previously acquired performance data, measurements taken under laboratory conditions have expanded both the number of instruments tested and the sources measured. Gamma-isotope identification and neutron-response findings have also been added. The instrument performance data and findings currently available in RadAssessor include information about radiation detectors, radioactive sources, shielding, experiments, detailed measurement results, spectra, and measurement performance categorizations, shown in Figure 2.

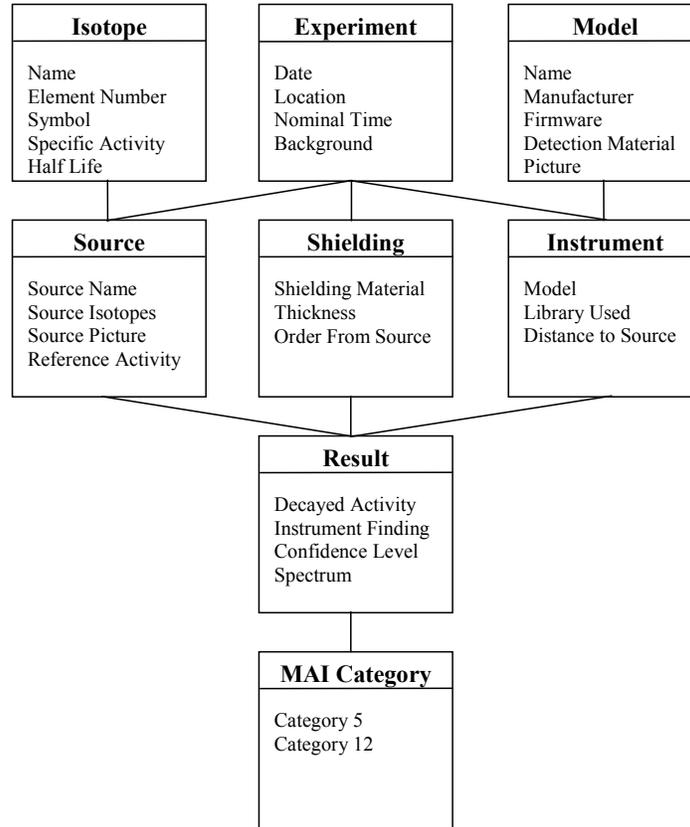


Figure 2. Major components of the RadAssessor database.

Measurement performance categorizations are used to categorize gamma identification results and are based on defining the most abundant isotopes (MAIs) identified during a measurement. There are currently two categorizing systems that provide an initial high-level understanding of an instrument’s performance and a more detailed understanding with additional granularity. (See section 1.3, Identification Categorization, below, for additional information.)

Instrument Model	Source Isotope	Instrument Findings	Number of Occurrences (Total= 206)
Instrument A	Pu-239	Unknown	36
Instrument B	Pu-239	Am-241	23
Instrument A	Pu-239	Am-241	16
Instrument A	Pu-239	Pu-239	16
Instrument A	Pu-239	Unknown Isotope	15
Instrument B	Pu-239	Ce-137	13
Instrument A	Pu-239	No Nuclide Found	11
Instrument A	Pu-239	I-131	10
Instrument B	Pu-239	Pu-239	10
Instrument A	Pu-239	Cs-137	8

Figure 3. RadAssessor generated measurement results when the instrument was measuring a ²³⁹Pu source.

RadAssessor features a web-based interface for selecting instruments, isotopes, and shielding combinations. Dynamically generated screens are based on the most recent data that has been added into the database. Graphics and textual results are generated and presented instantaneously. Figure 3 shows what an instrument might report when measuring a known radiation source, information that could be vital for quickly identifying a potential threat.

1.3 Identification Categorization

A detailed categorization system that grades the accuracy of an instrument's gamma identification has been added to RadAssessor. There are two ways to get measurement performance results—by the five-category system or the twelve-category system.

In the five-category categorization system, the categories are Correct, Conditionally Correct, Minor Daughter, False Negative, and False Positive. This system will provide a high-level understanding of an instrument's performance.

However, when a more detailed understanding of measurement performance is desired, the 12-category system is available. As an example, the additional categories would help differentiate between an identification failure caused by the absence of an isotope in the instrument's library and a failure where the isotope was in the library. If the additional granularity is not needed, the 12-category system can easily collapse back into the five-category system.

Both category systems rely on defining the MAIs. If the radiation source is a single object, the MAIs are the radioisotopes that are present with an atomic abundance of at least 10%. If the radiation source consists of two or more individual objects, the atomic abundance used to define the MAIs is the gamma-ray flux (at the detector) weighted average of the atomic abundances of each individual object. For example, if two individual isotope button sources such as ^{137}Cs and ^{60}Co were placed so that the gamma-ray flux at the detector is the same for each, they would both be considered to have 50% abundance and, therefore, both would be considered as the MAIs.

The grading approach, or method used to assign grades to the detectors' performance, is shown in Table 1. The grading approach for isotope-identifying instruments is based upon the type of source being measured, whether any or all MAIs were found, and the instrument identifications reported.

Table 1. Grading Approach for Isotope-Identifying Instruments

Source	Instrument Identifications Reported	Grade
Background		
	ALL (Background, NoID, or MD)	C2
	Any Incorrect ID	FP1
Non-Background		
All MAIs Found	MAIs BOGUS or MD or BKG	C2
All MAIs Found	MD or BKG Any MAI BOGUS	C2
All MAIs Found	MAI MD or BKG MAI	C2
All MAIs Found	BOGUS or NoID ALL MAIs	CC2
NOT All MAIs Found	MAI BOGUS or MD or NoID or BKG MAI	C1
NOT All MAIs Found	MAI BOGUS or MD or NoID or BKG	C1
NOT All MAIs Found	MD or BKG MAI	C1
NOT All MAIs Found	BOGUS or NoID MAI	CC1
Not C or CC	Any MD	MD
	ALL NoIDs or Empty (at least 1 MAI in LIB)	FN1
	ALL NoIDs (MAI not in LIB)	FN2
	ALL NoIDs or Background (at least 1 MAI in LIB)	FN3
	ALL NoIDs or Background (MAI not in LIB)	FN4
	BOGUS or Background (at least 1 MAI in LIB)	FP2
	BOGUS or Background (MAI not in LIB)	FP3

Below are the definitions of the 12 categories.

- Correct 2 (C2) means the instrument correctly identified all MAIs present as the isotopes identified with the most confidence or with confidence less than only a Minor Daughter (see definition below). Or, in the case of background, it means it identified either nothing or only ^{40}K (which occurs naturally in the environment).
- Correct 1 (C1) means the instrument correctly identified at least one MAI present when there was more than one, but not all MAIs with the highest confidence or with confidence less than a Minor Daughter (see definition below).
- Conditionally Correct 2 (CC2) means all MAIs present were correctly identified with less confidence than something that was not present or could not be identified.
- Conditionally Correct 1 (CC1) means at least one MAI, but not all MAIs present, was correctly identified, but with less confidence than something that was not present or could not be identified.

- Minor Daughter (MD) means that the instrument identified either a daughter of an MAI, a nonpresent parent of an MAI, or a radioisotope known to be present with less than 10% abundance, but the instrument failed to identify an MAI. Examples of identifying MDs would be identifying ^{226}Ra when the source was ^{238}U or identifying ^{232}Th when the source was ^{228}Th .
- False Negative 1 (FN1) means the instrument gave no identification when a radionuclide contained in the instrument's library was present.
- False Negative 2 (FN2) means the instrument gave no identification when a radionuclide NOT contained in the instrument's library was present.
- False Negative 3 (FN3) means the instrument only identified ^{40}K when a radionuclide contained in the instrument's library was present.
- False Negative 4 (FN4) means the instrument only identified ^{40}K when a radionuclide NOT contained in the instrument's library was present.
- False Positive 1 (FP1) means the instrument incorrectly reported one or more radionuclides as being present in a background measurement.
- False Positive 2 (FP2) means the instrument incorrectly reported one or more radionuclides as being present without making any correct identification other than ^{40}K when at least one MAI was in the instrument's library.
- False Positive 3 (FP3) means the instrument incorrectly reported one or more radionuclides as being present without making any correct identification other than ^{40}K when no MAI was in the instrument's library.

In cases where only one MAI is present, the divisions of C into C1 and C2, and of CC into CC1 and CC2 are unnecessary. It should be noted that when ^{40}K is used in the above categories, it is generally used to represent naturally occurring radioactive materials. In our experience, ^{40}K is the only background isotope routinely reported by identifiers.

1.4 RadAssessor System Architecture

Figure 4 illustrates how RadAssessor runs on a Windows[®] platform using Apache Web Server integrated with PHP: Hypertext Preprocessor as the front-end user interface. A relational database, currently Microsoft Access[®], sits at the back end as the final data repository serving up user query results. Secure Sockets Layer (SSL) protocol creates a secure encrypted connection between the client and the server. As a result, all authorized end users have secure access to RadAssessor through the Internet using any standard Internet browser.

The RadAssessor database is flexible enough to expand as new instruments and radioactive sources are added and is scalable to include various radiation measurement types such as gamma-isotope identification and neutron-response findings. Instrument performance data and findings that can be found within RadAssessor include data for radiation detectors, radioactive sources, source uses, isotope elements, shielding, experiments, detailed measurement results, spectra, and measurement performance categorizations. Detector information also includes detection materials, individual libraries, model details, and model distributors. User information is designed into a normalized structure of Users, Company, and Permissions. Numerous lookup tables are used throughout the system.

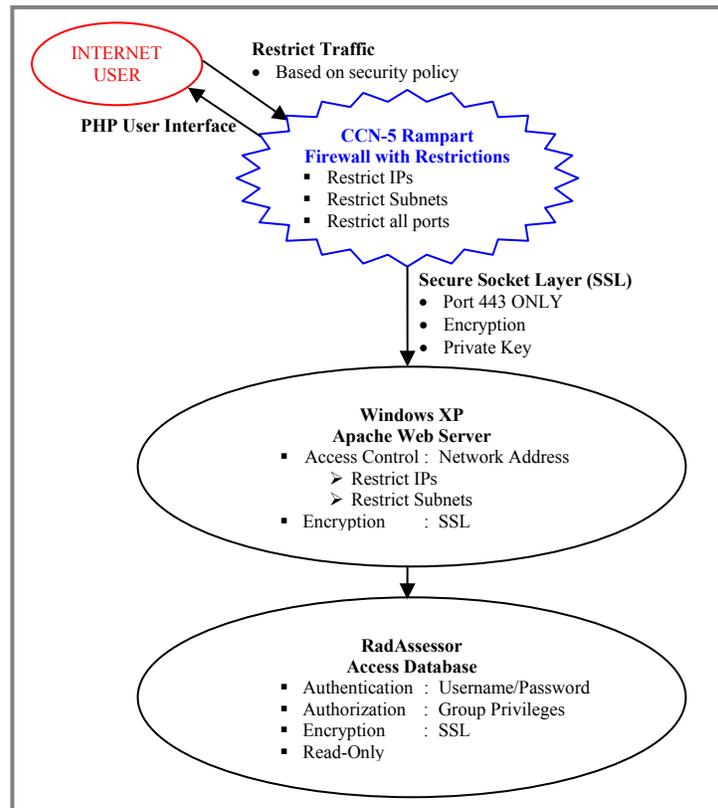


Figure 4. RadAssessor's system architecture provides secure, encrypted access control. Authentication and authorization requires a username and password with group privileges.

THIS chapter gives step-by-step instructions about where to find RadAssessor and how to use the menus and commands within the RadAssessor database. It also describes how to get an account started and how to use your account.

2.1 Getting Started

RadAssessor is an “**Official Use Only**” database that can be accessed only by authorized users with a “need-to-know”. To access the RadAssessor database, you must have a username and password for an account created by the Los Alamos National Laboratory RadAssessor team (see section 2.3, Request an Account, below).

The RadAssessor team will need to know your computer network location because only preauthorized Internet domains are allowed to access RadAssessor. If necessary, we can work with your system administrator to locate your Internet Protocol (IP) address or subnet. If you experience any problems with RadAssessor, please email the RadAssessor team at radassessor@lanl.gov.

2.2 System Requirements

The RadAssessor database is easily accessible with minimal system requirements. RadAssessor operates from any computer through a standard web browser when you are connected to the Internet. There is no need to compile anything nor do you need to install any extra tools to run RadAssessor.

Although your personal web browser settings may affect the look of the RadAssessor pages, they will not affect its functionality. For example, if you change your browser text size to “Large” it will not affect your usage, but the RadAssessor text may be shifted and not look optimal.

Your Internet connection speed will have an effect on your results and interaction with RadAssessor. Broadband is recommended. See your local network administrator for assistance with your connection speeds.

You may use any standard web browser to access RadAssessor. However, the following web browsers and versions have been fully tested and should be considered minimum requirements:

- Microsoft Internet Explorer, version 6.0
- Mozilla Firefox, version 1.5.0.4 and 1.5.0.5
- Netscape, version 7.2
- Opera, version 9.01
- Safari, version 2.0.4

RadAssessor requires the use of session validation through “cookies”. The default for most browsers is “cookies enabled”. To find out whether your browser is set to allow cookies, see Table 2 below.

Table 2. How to Set Your Browser to Allow Cookies

	Internet Explorer	Mozilla Firefox	Netscape	Opera	Safari
1	Click “ Tools ”	Click “ Tools ”	Click “ Tools ”	Click “ Tools ”	Click “ Safari ”
2	Select “ Internet Options... ”	Select “ Options... ”	Select “ Cookie Manager ”	Select “ Advanced ”	Select “ Preferences... ”
3	Click “ Privacy ” tab	Click “ Privacy ” icon on top	Select “ Use Default Cookie Permissions ”	Click “ Cookies... ”	Click “ Security ” icon on top
4	Set privacy to “ Medium ”	Click “ Cookies ” tab	If you do not want default cookies enabled as shown in the previous step, select “ Allow Session Cookies from this Site ” or “ Allow Cookies from this Site ”	In the Server manager window, click “ Edit... ” button	Find “ Accept Cookies ” and either choose “ Always ” or “ Only from sites you navigate to ”
5	If privacy is set higher than Medium, click “ Advanced... ” button	Check “ Allow sites to set Cookies ” box or use “ Exceptions ” button		In the Site preferences window, click “ Cookies ” tab	
6	If privacy is set higher than Medium, make sure “ First-party Cookies ” is set to “ Accept ”, or check “ Always allow session cookies ”			Click “ Accept cookies ” or “ Accept only cookies from the site I visit ”	

2.3 Request an Account

To request an account, send an email to radassessor@lanl.gov. You may be asked for more information to validate your need-to-know. The RadAssessor team will generate an account for you and will send you an email confirmation with your username and temporary password.

RadAssessor email:
radassessor@lanl.gov

The email confirmation will direct you to the RadAssessor login page, where you will log in for the first time (see section 2.4, Log In, below). You will then be directed to your personal account page where you will change your password and can either validate or change your account information.

2.4 Log In

After you receive your confirmation email, log in to RadAssessor. The first time you use your username and temporary password, RadAssessor will redirect you to your account page, where you will be asked to change your password and validate your account information (see steps below).

RadAssessor web site:
<https://radassessor.lanl.gov>

To log in to RadAssessor

1. Type in <https://radassessor.lanl.gov> to direct your web browser to the RadAssessor log-in page.



The screenshot shows the "Log In" page for RadAssessor. At the top, it says "Log In". Below that, a dark blue header reads "Existing RadAssessor users please log in". There are two input fields: "Username:" and "Password:". The "Username:" field contains a cursor. Below the fields is a "Login" button. At the bottom, there is a link: "[Lost your username or password?](#) or having [login problems?](#)".

2. In “**Username**”, enter your valid username.
3. In “**Password**”, enter your valid password (or temporary password from your confirmation email).
4. Click the “**Login**” button or press the “**Enter**” key.



The screenshot shows the "Log In" page for RadAssessor. At the top, it says "Log In". Below that, a dark blue header reads "Existing RadAssessor users please log in". There are two input fields: "Username:" and "Password:". The "Username:" field contains the text "MyUserNameHere". The "Password:" field contains a series of dots. Below the fields is a "Login" button with a mouse cursor pointing to it. At the bottom, there is a link: "[Lost your username or password?](#) or having [login problems?](#)".

RadAssessor will validate your user information and will display the message shown in Figure 5 if the login attempt is successful.

- Click the “OK” button to acknowledge that you have accepted the Official Use Only terms.



Figure 5. “Official Use Only” acceptance page. Click “OK” to continue.

- The first time you log in, you will be directed to the “**Your Account Information**” page (Figure 6). From here you must change your temporary password and may update your account information (see chapter 5, Your Account, below).

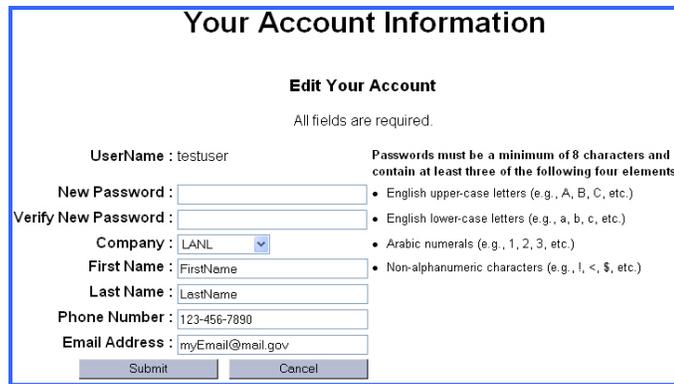
A screenshot of a web form titled "Your Account Information" with a sub-header "Edit Your Account". Below the sub-header, it says "All fields are required." The form contains several input fields: "UserName : testuser", "New Password : [text box]", "Verify New Password : [text box]", "Company : LANL [dropdown menu]", "First Name : FirstName [text box]", "Last Name : LastName [text box]", "Phone Number : 123-456-7890 [text box]", and "Email Address : myEmail@mail.gov [text box]". To the right of the password fields, there is a list of requirements: "Passwords must be a minimum of 8 characters and contain at least three of the following four elements:" followed by a bulleted list: "English upper-case letters (e.g., A, B, C, etc.)", "English lower-case letters (e.g., a, b, c, etc.)", "Arabic numerals (e.g., 1, 2, 3, etc.)", and "Non-alphanumeric characters (e.g., !, <, \$, etc.)". At the bottom of the form are "Submit" and "Cancel" buttons.

Figure 6. As a first-time user, you must change your temporary password.

- RadAssessor will validate your information and take you to the RadAssessor Home Page (Figure 7). From the Home Page, you'll have access to the entire RadAssessor database.

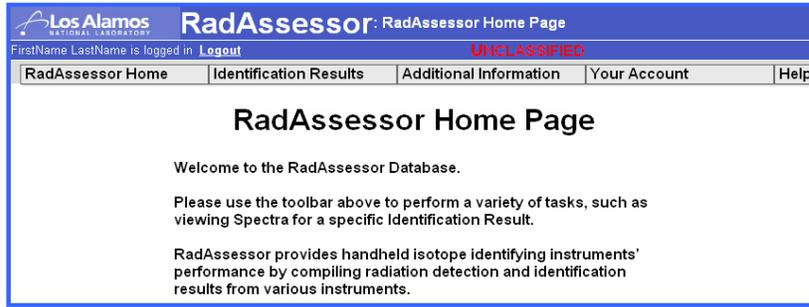


Figure 7. RadAssessor Home page displays upon successful log in.

2.5 RadAssessor Page Layout

RadAssessor has a consistent user interface to help you learn and maneuver through the application quickly. The user interface, accessed through your web browser, provides

- quick and easy access,
- freedom from any software installations on your local hard drive,
- a guarantee that you will be using the latest data and software versions,
- consistent system performance regardless of your local operating system,
- the ability to access RadAssessor from almost anywhere, and
- the ability to update and maintain RadAssessor without distributing and installing software on numerous computers and without disrupting your work.

The main window or page (Figure 8) has consistent header and footer sections at the top and bottom of each page, above and below the body of the page. The body section, the middle part of a page, may contain text or controls, such as buttons, text fields, or check boxes.

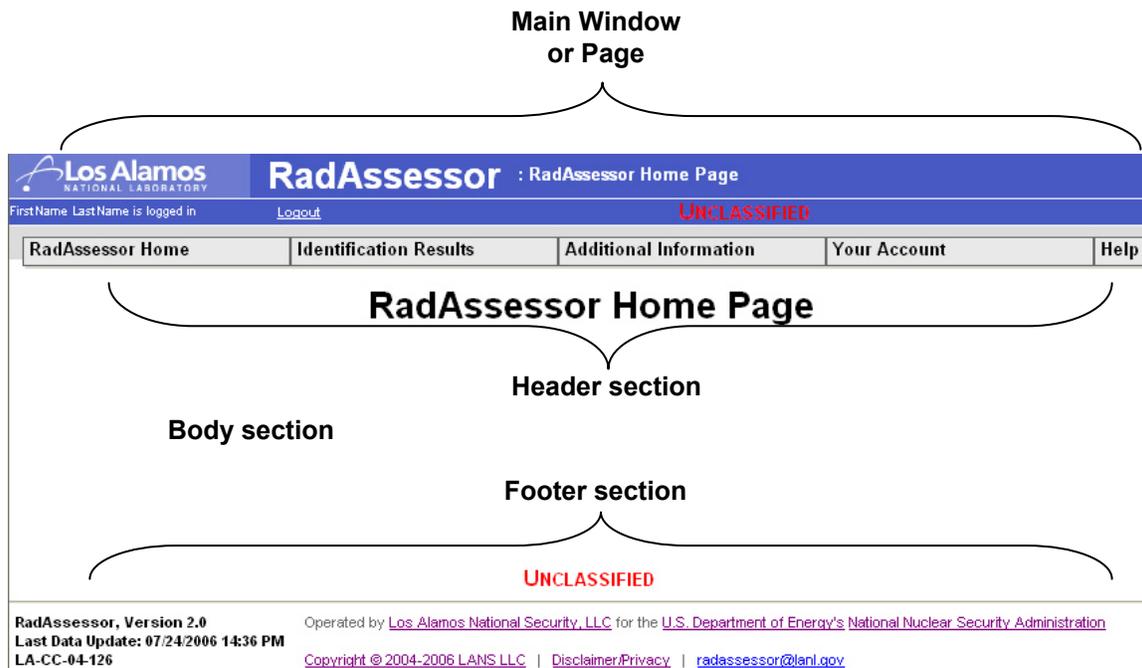


Figure 8. RadAssessor takes advantage of your web browser by providing a consistent user interface. Every RadAssessor page has the same standard header and footer sections.

The header section gives a quick reference for where you are in the application, and identifies you as the user currently logged in. Figure 9 shows the specific areas of the header section, described below.

1. **Link to LANL:** Link to the Los Alamos National Laboratory (LANL) home page.
2. **Application title:** Name of the application you are using (RadAssessor).
3. **Page title:** Name of the page you are currently viewing.
4. **User name:** First and last name of the user currently logged into RadAssessor.
5. **Logout link:** Click to log out of RadAssessor.
6. **Menu bar:** Click on items shown to view their related pages.
7. **Classification of the application:** RadAssessor is classified as “**Official Use Only**”. As a user of this system, you agree to not release any information contained in the database without prior approval from the developers.

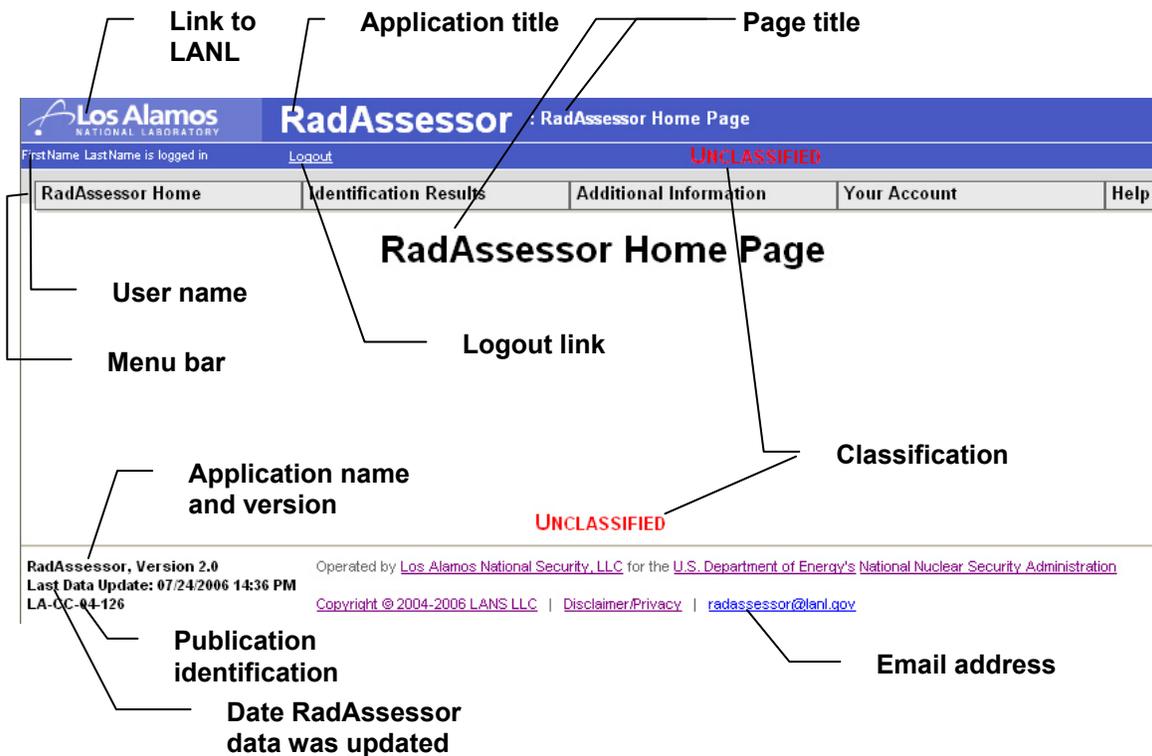


Figure 9. RadAssessor takes advantage of your web browser by using a consistent user interface. Every page within RadAssessor has the same standard header and footer.

The footer section (Figure 9) provides more static information about the RadAssessor application and general copyright information. The footer contains

1. **Application name and version.**
2. **Date RadAssessor data was updated:** The date when the most recent data was added or modified.
3. **Publication identification:** Identifying publication number assigned by LANL.
4. **Classification of the application:** Repeat of the classification in the header (OUO).
5. General links to LANS, DOE, and NNSA.
6. Links to application copyrights and disclaimers.
7. **Email address:** RadAssessor email address.

Please feel free to use the email address radassessor@lanl.gov to communicate with the RadAssessor developers about any topic relevant to system capabilities or instrument performance. The backend database contains much more data than what is actually seen in the standard queries, as you will see later in this document. If you need additional information, it is possible that we may already have the data and can easily make it available.

2.6 Menus

The menu bar near the top of each RadAssessor page (Figure 10) reveals the menu structure that will allow you to seamlessly navigate through the pages in the database. The menu bar shows first-level menu titles: the RadAssessor Home, Identification Results, Additional Information, Your Account, and Help pages. If you move the mouse over one of these menu titles (no need to click the mouse), it will become highlighted, and a drop-down list of second-level menu items or commands will appear. In Figure 10, the mouse is hovering over the Your Account menu title. The mouse changes automatically to a hand (as if choosing an item), and the menu title becomes highlighted. Select one of the menu items to perform the desired task.

Some items in the dropdown menu perform an action directly; for example, Log Out under the Your Account menu title logs you, the current user, out of RadAssessor and redirects you back to the Log-In page. Other menu items may display other windows or pages that require you to supply information needed by RadAssessor to perform the requested action.

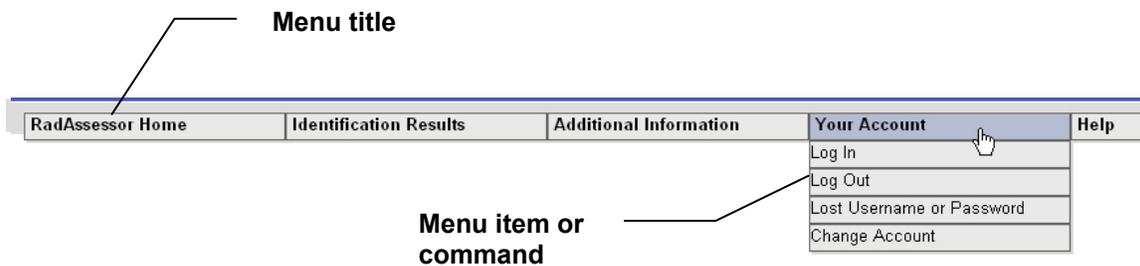


Figure 10. The RadAssessor menu bar contains first-level selections. When your mouse hovers over a menu title, a list of second-level items or commands drops down for selection.

2.7 Online Tutorial

Most of the information contained in this manual is also available online from the RadAssessor Online Tutorial located at <https://radassessor.lanl.gov/tutorials/>. If you are already logged into RadAssessor, you will find the online tutorial under the Help menu by clicking on Documentation.

RadAssessor online tutorial:
<https://radassessor.lanl.gov/tutorials/>

“IDENTIFICATION Results”, the menu title located in the menu bar at the top of the page between “RadAssessor Home” and “Additional Information”, will probably contain most of the information of interest to you. In this chapter, we will describe the overall purpose of Identification Results, and we will investigate each submenu query that can be accessed from that menu item. The queries can be customized based on predefined data fields. The four possible queries are

- Spectrum,
- Identification Performance,
- Known Source Isotope, and
- Known Instrument ID.

3.1 Selection Pages

Each of the queries listed in the submenu will take you to a selection page, where you will choose or enter the information RadAssessor needs to generate results for your query. The results will be displayed on a subsequent results page(s), as shown in Figure 11.

The selection pages are created dynamically based on the data in the database at that precise moment. Whenever measurements are acquired with a new instrument, that instrument will automatically be included in the instrument model list and will be available the next time the list is accessed.

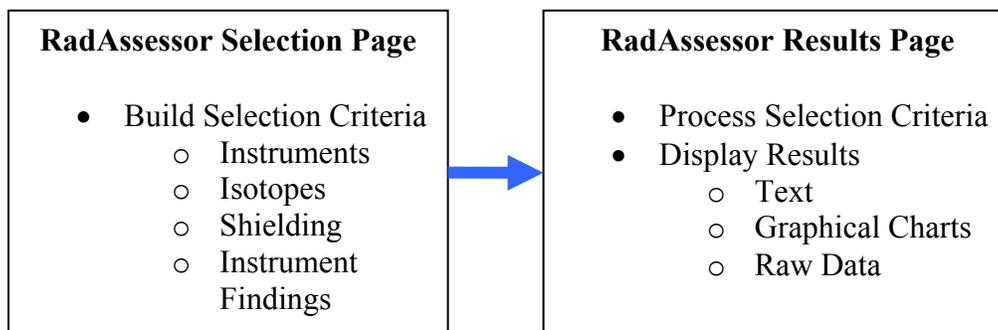


Figure 11. Selection pages let you determine what selection criteria will be used to search the database for results. Results may be shown in various formats such as text, graphical charts, and raw data.

3.2 Check Boxes

Check boxes are used to determine which data will be accessed. Figure 12 demonstrates how the check-box lists are used. In this example, the list is shown initially with no instruments checked or selected, then with “**All Instrument Models**” checked, and finally with all of the models selected except for the GN (Firmware Version . . .). Check boxes are on/off toggle switches. After you have checked the items you are interested in, click “**Submit**” to process the query based on those items.

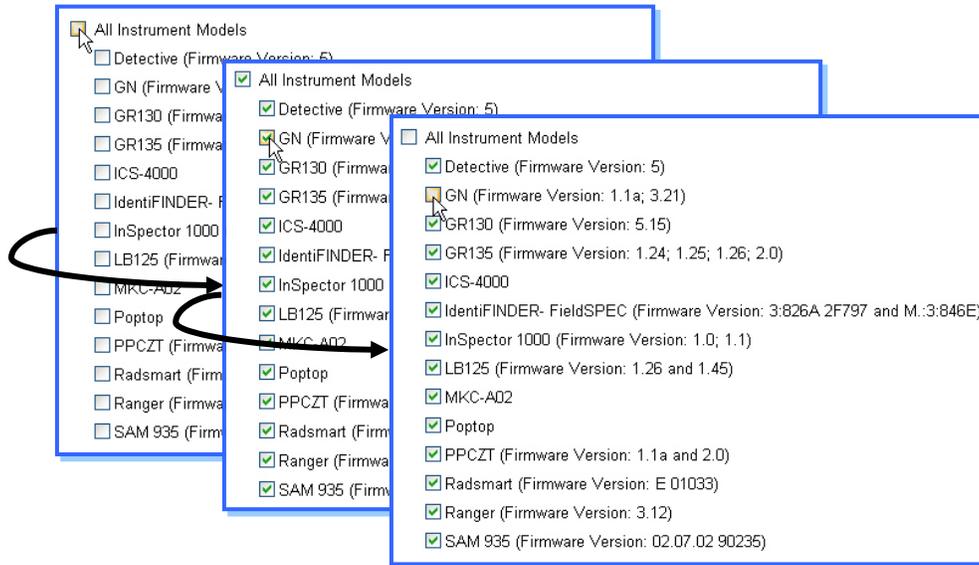


Figure 12. Selection pages show dynamic data as a list of check-box items. This list of instrument models first shows no instruments selected. Then, the user has chosen the entire list of instruments, and finally has unchecked only the GN model.

3.3 Download Images

Some of the images in the result pages can be downloaded to your computer. To download an image, either (a) move the mouse over the image and click the disk icon in the upper left corner, or (b) right click the mouse anywhere inside the image and select the “**Save Picture As...**” option. Both methods, shown in Figure 13, will allow you designate the file name and location of the saved image.

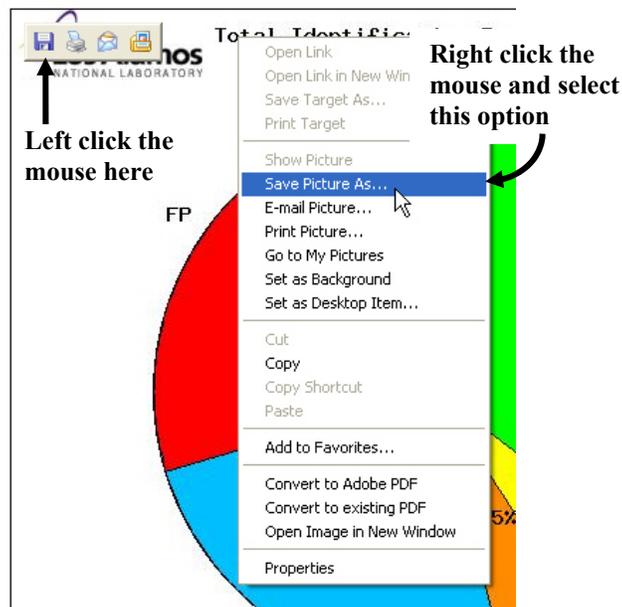


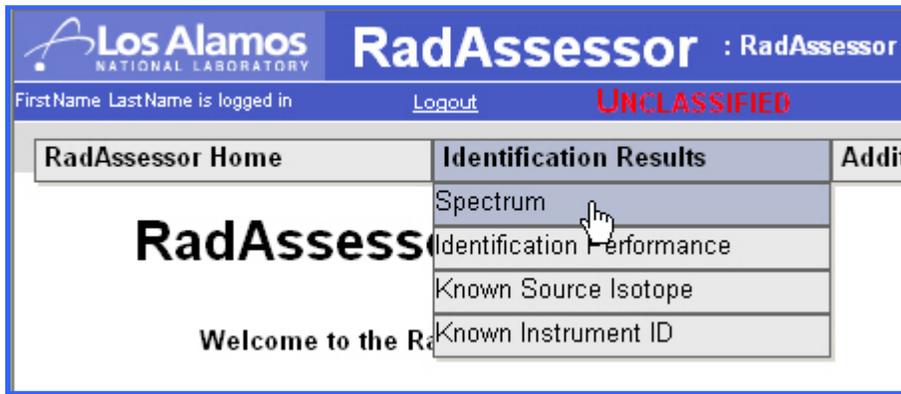
Figure 13. Two methods to save images to your computer.

3.4 “Spectrum” Queries

The “Spectrum” query, accessed from the Identification Results menu, will display the actual isotopic spectra collected from the measurements made with a detector. You choose which instrument model(s), source isotope(s), and shielding combinations will be used to generate the spectra and measurement details. The steps are described below.

3.4.1 To Open the Spectrum Page

1. Move your mouse over the “**Identification Results**” menu option. (You do not need to click the mouse.)
2. Single click “**Spectrum**” to open the Spectrum selection page.



3.4.2 Select Spectra to Display

1. Under “**1. Select Instrument Model(s)**”, select the instrument(s) to evaluate. (You must select at least one.)
2. Under “**2. Select Isotope(s)**”, select the source isotope(s) to use in the evaluation. (You must select at least one.)
3. Under “**3. Select Shielding and Thickness**”, select the shielding and thickness(es) to use in the evaluation.
4. Click “**Submit**” button. (“**Reset**” will change all of your selections back to their original settings.)

Spectrum

1. Select Instrument Model(s):	2. Select Isotope(s):																	
<input type="checkbox"/> All Instrument Models <input type="checkbox"/> Detector A (Firmware Version: 5) <input type="checkbox"/> Detector B (Firmware Version: 1.24; 1.25; 1.26; 2.0) <input checked="" type="checkbox"/> Detector C (Firmware Version: 3:826A 2F797 and M.:3:846E) <input type="checkbox"/> Detector D (Firmware Version: 02.07.02 90235) <input type="checkbox"/> Detector E (Firmware Version: 3.12) <input type="checkbox"/> Detector F (Firmware Version: 5.15) <input type="checkbox"/> Detector G (Firmware Version: E 01033) <input type="checkbox"/> Detector H (Firmware Version: 1.1a and 2.0) <input type="checkbox"/> Detector J (Firmware Version: 1.0; 1.1) <input type="checkbox"/> Detector K (Firmware Version: 1.26 and 1.45) <input type="checkbox"/> Detector M (Firmware Version: 1.1a; 3.21) <input type="checkbox"/> Detector N <input type="checkbox"/> Detector P <input type="checkbox"/> Detector T	<input type="checkbox"/> All Isotopes <table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr style="background-color: #cccccc;"><th style="text-align: left;">Isotope</th></tr></thead><tbody><tr><td><input type="checkbox"/> Pb-210 (Lead)</td></tr><tr><td><input type="checkbox"/> Pm-147 (Promethium)</td></tr><tr><td><input type="checkbox"/> Pu-238 (Plutonium)</td></tr><tr><td><input checked="" type="checkbox"/> Pu-239 (Plutonium)</td></tr><tr><td><input type="checkbox"/> Pu-240 (Plutonium)</td></tr><tr><td><input type="checkbox"/> Ra-226 (Radium)</td></tr><tr><td><input type="checkbox"/> Rn-220 (Radon)</td></tr><tr><td><input type="checkbox"/> Rn-222 (Radon)</td></tr><tr><td><input type="checkbox"/> Ru-104 (Ruthenium)</td></tr><tr><td><input type="checkbox"/> Sb-125 (Antimony)</td></tr><tr><td><input type="checkbox"/> Se-75 (Selenium)</td></tr><tr><td><input type="checkbox"/> Sm-153 (Samarium)</td></tr><tr><td><input type="checkbox"/> Sr-82 (Strontium)</td></tr><tr><td><input type="checkbox"/> Sr-85 (Strontium)</td></tr><tr><td><input type="checkbox"/> Sr-90 (Strontium)</td></tr><tr><td><input type="checkbox"/> Tc-99 (Technetium)</td></tr></tbody></table>	Isotope	<input type="checkbox"/> Pb-210 (Lead)	<input type="checkbox"/> Pm-147 (Promethium)	<input type="checkbox"/> Pu-238 (Plutonium)	<input checked="" type="checkbox"/> Pu-239 (Plutonium)	<input type="checkbox"/> Pu-240 (Plutonium)	<input type="checkbox"/> Ra-226 (Radium)	<input type="checkbox"/> Rn-220 (Radon)	<input type="checkbox"/> Rn-222 (Radon)	<input type="checkbox"/> Ru-104 (Ruthenium)	<input type="checkbox"/> Sb-125 (Antimony)	<input type="checkbox"/> Se-75 (Selenium)	<input type="checkbox"/> Sm-153 (Samarium)	<input type="checkbox"/> Sr-82 (Strontium)	<input type="checkbox"/> Sr-85 (Strontium)	<input type="checkbox"/> Sr-90 (Strontium)	<input type="checkbox"/> Tc-99 (Technetium)
Isotope																		
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<input type="checkbox"/> Sr-90 (Strontium)																		
<input type="checkbox"/> Tc-99 (Technetium)																		
3. Select Shielding and Thickness:																		
<input checked="" type="checkbox"/> Any Shielding (Uncheck to explicitly state No Shielding) <input checked="" type="checkbox"/> Agar (Agar) <input checked="" type="checkbox"/> Al (Aluminum)	<input checked="" type="checkbox"/> Any Agar Thicknesses <input checked="" type="checkbox"/> 2.0in <input checked="" type="checkbox"/> Any Al Thicknesses <input checked="" type="checkbox"/> Not recorded <input checked="" type="checkbox"/> 0.5in																	

3.4.3 “Display Spectrum” Results

After clicking “**Submit**”, all spectra matching your selection criteria will be displayed (Figure 14). The results can be downloaded to your computer either as raw data or as a JPEG image. The column headings from this screen are described below.

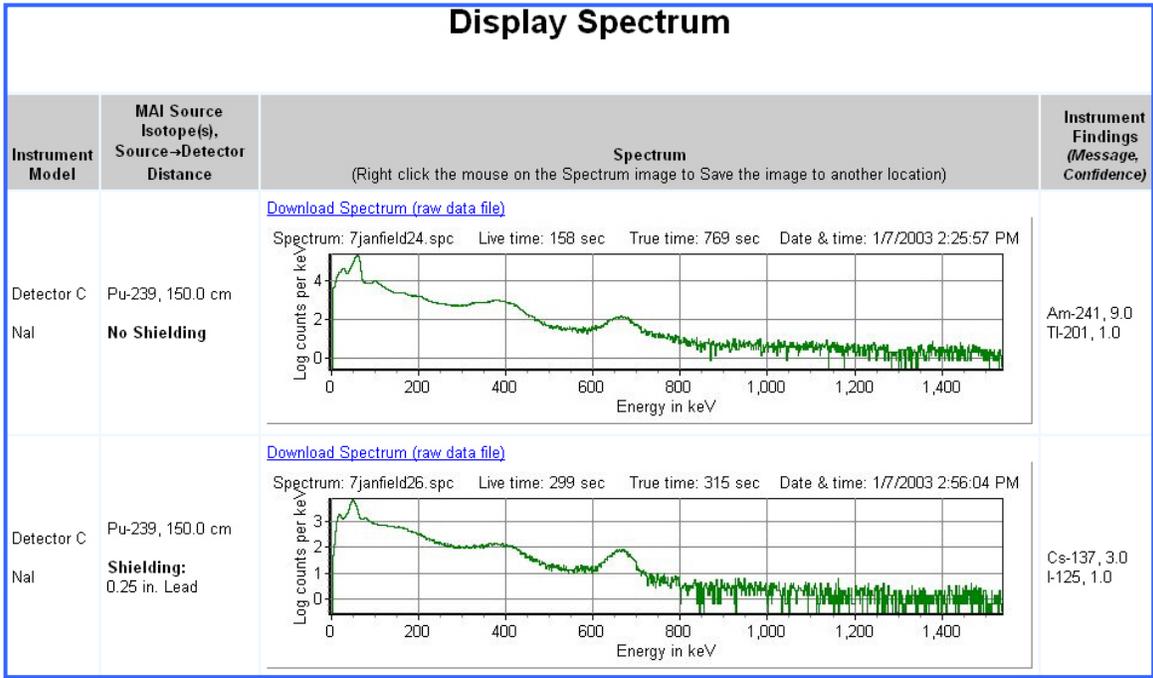


Figure 14. Graphical RadAssessor spectra results can be downloaded as a raw data file or a JPEG image.

Instrument Model

Name and model of the instrument that took the measurement. The detection material used by the instrument is shown beneath its name.

MAI Source Isotope(s)

Displays the most abundant isotope (MAI) source isotope(s) measured. Shielding material and thickness will also be listed in this column.

Spectrum

Actual isotopic spectrum generated from the measurements taken by the instrument. To save the image to your computer, move the mouse over the spectrum, right click the mouse, and choose “**Save Picture As...**”. Click the “**Download Spectrum (raw data file)**” link to download the original spectrum file saved from the instrument to your computer.

Instrument Findings (Message, Confidence)

The final isotope identification or other conclusion reported by the detector based on the measurements it collected. Findings are displayed with a number that represents the confidence the instrument has in its conclusion. (The Detective is the only detector that doesn’t use numeric confidence values for specific isotope identifications. Therefore, the Detective was assigned a 1, 2, or 3 confidence value to correspond with its Possible, Suspect, or Found messages, respectively.)

3.5 “Identification Performance” Queries

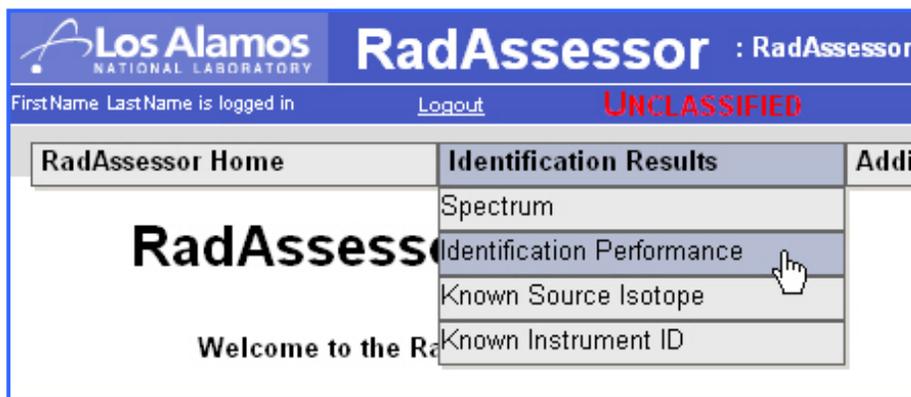
The “Identification Performance” menu item, accessed from the Identification Results menu, rates the performance of an instrument(s) based on the accuracy of its isotope identification. A pie chart will show either 5 or 12 categories that form the basis for the rating. The dynamically generated pie chart can be downloaded to your computer.

NOTE: A comparison with previously reported results shows overall improvement in instrument performance. This is primarily due to two factors. First, the current results include newer instruments with improved identification abilities. Second, the new results include a significant number of radiopharmaceutical measurements. Because of the widespread use of radionuclides in medical applications, many of the instruments have been designed to correctly identify the most popular radiopharmaceuticals.

You can choose the title for your pie chart, the source use(s), whether to display the 5 or 12 category system, and which instruments will be used to generate the pie chart. The steps are described below.

3.5.1 To Open the Identification Performance Page

1. Move your mouse over the “Identification Results” menu option. (You do not need to click the mouse.)
2. Single click “**Identification Performance**” to open the Identification Performance selection page.



3.5.2 How to Use the Identification Performance Query

1. Under “**Enter Pie Chart Title**”, type in a title for your pie chart. If you do not enter a title, RadAssessor will attempt to generate an appropriate title based on your criteria selections.
2. Under “**Select Source Use(s)**”, select the source(s) to use in the evaluation. (You must select at least one.) Source Use is the common application for that source throughout the world. A specific source may have many applications and may therefore fall into several of the “Source Use” categories shown.
3. Under “**Select Category System**”, choose either the 5- or 12-category system. (The default is the 5-category system of Correct, Conditionally Correct, Minor Daughter, False Negative, and False Positive.) The wedges in your pie chart will correspond to the categories from the system you select.
4. Under “**Select Instrument Model(s)**”, select the instrument(s) to evaluate. (You must select at least one.)
5. Click the “**Submit**” button. (“**Reset**” will change all of your selections back to their original settings.)

Identification Performance

Enter Pie Chart Title:	<input type="text" value="Total Identification Results for All Instruments"/> Line One
	<input type="text"/> Line Two
Select Source Use(s):	<ul style="list-style-type: none"><input checked="" type="checkbox"/> All Source Uses<input checked="" type="checkbox"/> Activation Product (Neutron Activation Foils, etc.)<input checked="" type="checkbox"/> Beta Source<input checked="" type="checkbox"/> Fission Product<input checked="" type="checkbox"/> Industrial<input checked="" type="checkbox"/> Medical (Radio Pharmacology)<input checked="" type="checkbox"/> Neutron Source<input checked="" type="checkbox"/> NORM (Naturally Occurring Radioactive Material)<input checked="" type="checkbox"/> Other<input checked="" type="checkbox"/> SNM (Special Nuclear Material)
Select Category System:	<input type="text" value="5 Categories - Correct, Conditionally Correct, Minor Daughter, False Negative, False Positive"/> ▼
	<input type="button" value="Show Category Details"/>
Select Instrument Model(s):	<ul style="list-style-type: none"><input checked="" type="checkbox"/> All Instrument Models<input checked="" type="checkbox"/> Detective (Firmware Version: 5)<input checked="" type="checkbox"/> GN (Firmware Version: 1.1a; 3.21)<input checked="" type="checkbox"/> GR130 (Firmware Version: 5.15)<input checked="" type="checkbox"/> GR135 (Firmware Version: 1.24; 1.25; 1.26; 2.0)<input checked="" type="checkbox"/> ICS-4000

3.5.3 Display the Identification Performance Pie Chart

After you click “**Submit**”, your pie chart will be generated using the criteria you selected (Figure 15). Components of the display are described below.

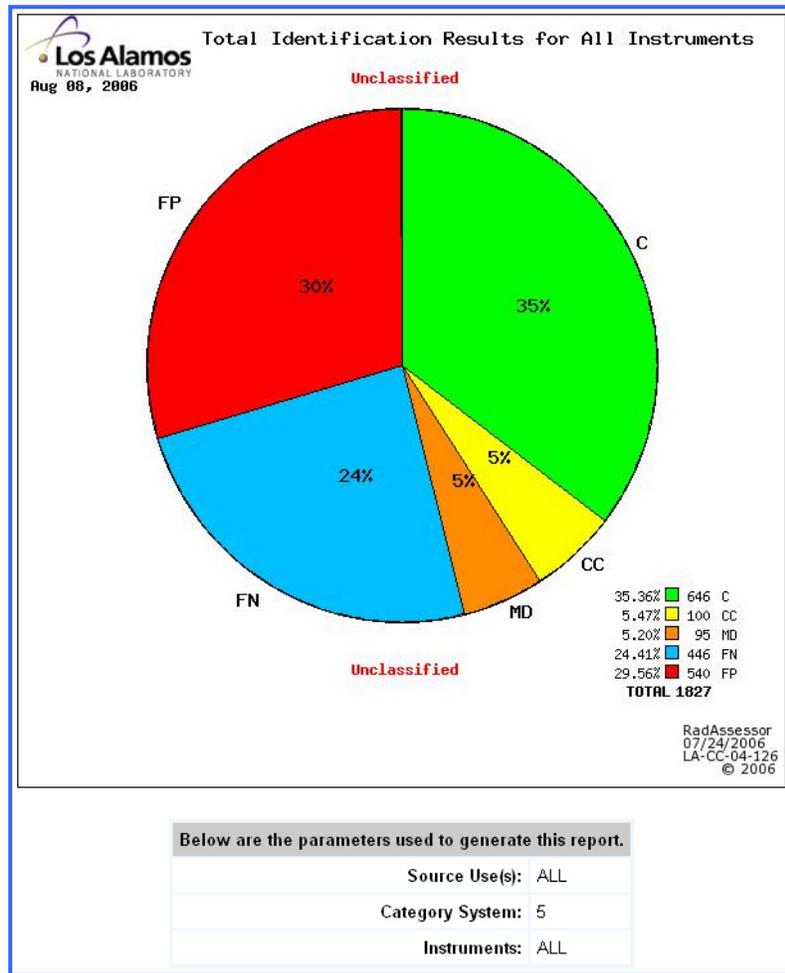


Figure 15. Gamma identification performance results generated by RadAssessor using the 5-category system. Graphical RadAssessor results allow you to download the JPEG image to your computer.

Performance Title

The title of the pie chart, either entered by you or generated by RadAssessor.

Date

The current date will be displayed in the upper left corner.

Pie Chart

The pie chart is generated based on the criteria you specified, using all the matching measurements in the current database. Each colored wedge indicates the category identification (e.g., C for Correct) and the percentage of the total measurements that fall into that category (Figure 15).

Figure 16 shows the chart from the 12-category system for all measurements, instruments, and source uses combined. In this chart, C2 is much larger than C1 because only one MAI was present in most experiments; therefore, C1 does not apply in those cases (see section 1.3, Identification Categorization, above).

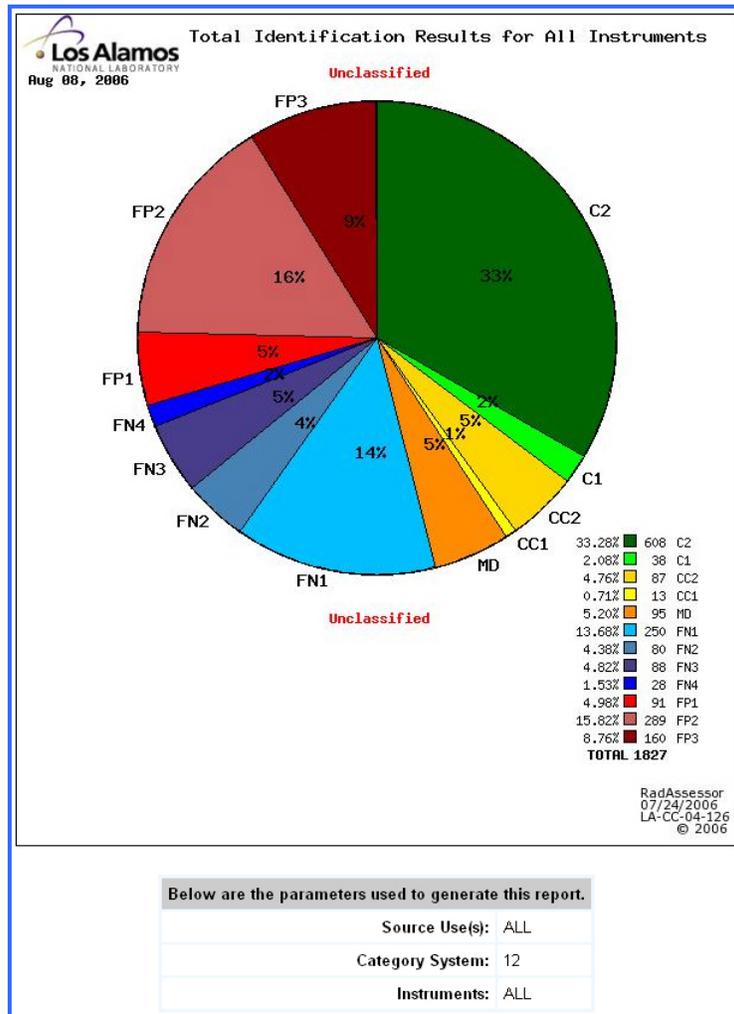


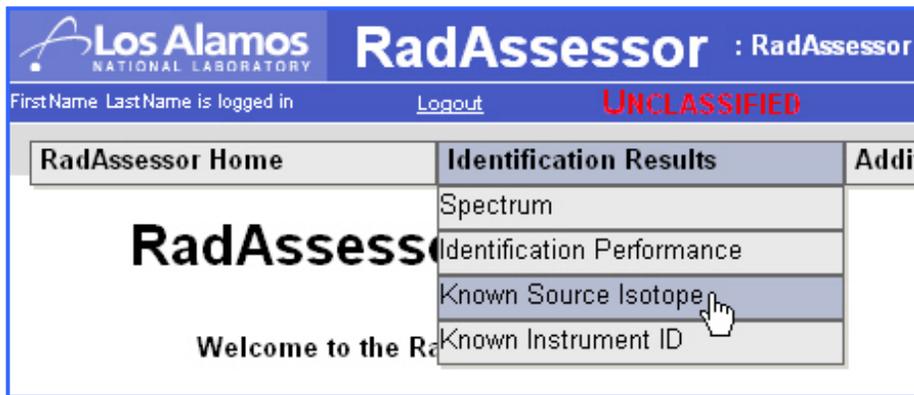
Figure 16. Gamma identification performance results generated by RadAssessor using the 12-category system.

3.6 “Known Source Isotope” Queries

The “Known Source Isotope” menu item, accessed from the Identification Results menu, displays all the findings (conclusions) that an instrument has reported to date for a selected source isotope(s). If you already know the isotope(s) that is being inspected, use this Known Source Isotope screen. For example, if you were inspecting a truck with a shipping manifest stating the specific isotopes onboard, you might be interested in knowing what instrument findings you could expect to see when you measure those known isotopes. If you select the instrument, the isotope(s) of interest, and the shielding (if any), the database will list all of the instrument’s findings that have occurred to date.

3.6.1 To Open the Known Source Isotope Page

1. Move your mouse over the “Identification Results” menu option. (You do not need to click the mouse.)
2. Single click “**Known Source Isotope**” to open the Known Source Isotope selection page.



3.6.2 How to Use the Known Source Isotope Query

1. Under “**1. Select Instrument Model(s)**”, select the instrument(s) to evaluate. (You must select at least one.)
2. Under “**2. Select Source Isotope(s)**”, select the source isotope(s) to use in the evaluation. (You must select at least one.) The resulting list will show all of the findings (conclusions) that an instrument has reported when it was asked to identify the selected isotope(s) .
3. Under “**3. Select Shielding and Thickness**”, select the shielding and thickness(es) to use in the evaluation.
4. Click the “**Submit**” button. (“**Reset**” will change all of your selections back to their original settings.)

Known Source Isotope

If you already know the identity of a Source Isotope:

Use this screen to show the Instrument Findings known to have been reported for the selected Source Isotope(s).

1. Select Instrument Model(s):	2. Select Source Isotope(s):																	
<input type="checkbox"/> All Instrument Models <input type="checkbox"/> Detector A (Firmware Version: 5) <input type="checkbox"/> Detector B (Firmware Version: 1.24; 1.25; 1.26; 2.0) <input type="checkbox"/> Detector C (Firmware Version: 3:826A 2F797 and M.:3:846E) <input type="checkbox"/> Detector D (Firmware Version: 02.07.02 90235) <input type="checkbox"/> Detector E (Firmware Version: 3.12) <input type="checkbox"/> Detector F (Firmware Version: 5.15) <input type="checkbox"/> Detector G (Firmware Version: E 01033) <input type="checkbox"/> Detector H (Firmware Version: 1.1a and 2.0) <input type="checkbox"/> Detector K (Firmware Version: 1.26 and 1.45) <input type="checkbox"/> Detector M (Firmware Version: 1.1a; 3.21) <input type="checkbox"/> Detector N <input checked="" type="checkbox"/> Detector P <input type="checkbox"/> Detector R	<input type="checkbox"/> All Isotopes <table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="text-align: left;">Isotope</th></tr></thead><tbody><tr><td><input type="checkbox"/> Pm-147 (Promethium)</td></tr><tr><td><input type="checkbox"/> Pu-238 (Plutonium)</td></tr><tr><td><input checked="" type="checkbox"/> Pu-239 (Plutonium)</td></tr><tr><td><input type="checkbox"/> Pu-240 (Plutonium)</td></tr><tr><td><input type="checkbox"/> Ra-226 (Radium)</td></tr><tr><td><input type="checkbox"/> Rn-220 (Radon)</td></tr><tr><td><input type="checkbox"/> Rn-222 (Radon)</td></tr><tr><td><input type="checkbox"/> Ru-104 (Ruthenium)</td></tr><tr><td><input type="checkbox"/> Sb-125 (Antimony)</td></tr><tr><td><input type="checkbox"/> Se-75 (Selenium)</td></tr><tr><td><input type="checkbox"/> Sm-153 (Samarium)</td></tr><tr><td><input type="checkbox"/> Sr-82 (Strontium)</td></tr><tr><td><input type="checkbox"/> Sr-85 (Strontium)</td></tr><tr><td><input type="checkbox"/> Sr-90 (Strontium)</td></tr><tr><td><input type="checkbox"/> Tc-99 (Technetium)</td></tr><tr><td><input type="checkbox"/> Tc-99m (Technetium)</td></tr></tbody></table>	Isotope	<input type="checkbox"/> Pm-147 (Promethium)	<input type="checkbox"/> Pu-238 (Plutonium)	<input checked="" type="checkbox"/> Pu-239 (Plutonium)	<input type="checkbox"/> Pu-240 (Plutonium)	<input type="checkbox"/> Ra-226 (Radium)	<input type="checkbox"/> Rn-220 (Radon)	<input type="checkbox"/> Rn-222 (Radon)	<input type="checkbox"/> Ru-104 (Ruthenium)	<input type="checkbox"/> Sb-125 (Antimony)	<input type="checkbox"/> Se-75 (Selenium)	<input type="checkbox"/> Sm-153 (Samarium)	<input type="checkbox"/> Sr-82 (Strontium)	<input type="checkbox"/> Sr-85 (Strontium)	<input type="checkbox"/> Sr-90 (Strontium)	<input type="checkbox"/> Tc-99 (Technetium)	<input type="checkbox"/> Tc-99m (Technetium)
Isotope																		
<input type="checkbox"/> Pm-147 (Promethium)																		
<input type="checkbox"/> Pu-238 (Plutonium)																		
<input checked="" type="checkbox"/> Pu-239 (Plutonium)																		
<input type="checkbox"/> Pu-240 (Plutonium)																		
<input type="checkbox"/> Ra-226 (Radium)																		
<input type="checkbox"/> Rn-220 (Radon)																		
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<input type="checkbox"/> Sr-82 (Strontium)																		
<input type="checkbox"/> Sr-85 (Strontium)																		
<input type="checkbox"/> Sr-90 (Strontium)																		
<input type="checkbox"/> Tc-99 (Technetium)																		
<input type="checkbox"/> Tc-99m (Technetium)																		
3. Select Shielding and Thickness: <input checked="" type="checkbox"/> Any Shielding (Uncheck to explicitly state No Shielding) <input checked="" type="checkbox"/> Agar (Agar) <input checked="" type="checkbox"/> Any Agar Thicknesses <input checked="" type="checkbox"/> Al (Aluminum) <input checked="" type="checkbox"/> Any Al Thicknesses <input checked="" type="checkbox"/> 2.0in <input checked="" type="checkbox"/> Not recorded <input checked="" type="checkbox"/> 0.5in																		

3.6.3 Display Known Source Isotope Results

After clicking “**Submit**”, all instrument findings (conclusions) will be displayed based on the criteria you selected (Figure 17). Components of the display are described below.

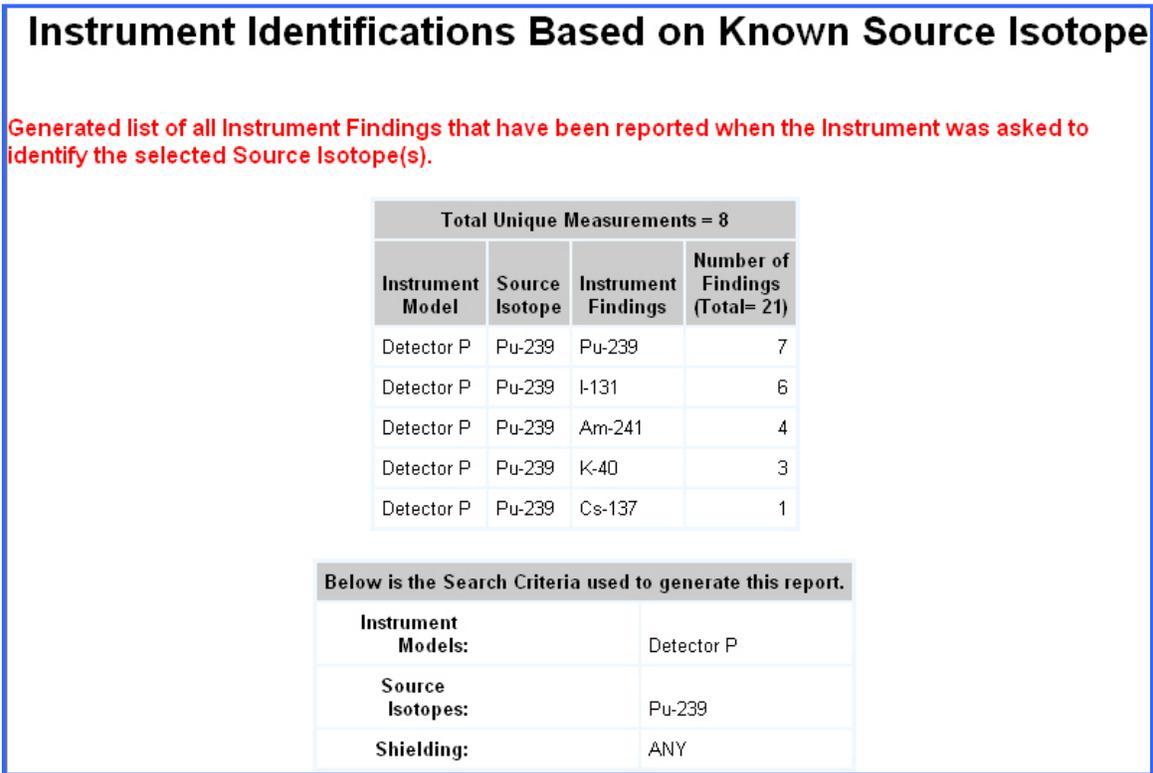


Figure 17. Known instrument findings when measuring ^{239}Pu . There were 21 instrument findings from 8 separate measurements.

Total Unique Measurements

The total number of measurements taken by a particular instrument(s) that match the criteria you specified.

Instrument Model

Name and model of the instrument that took the measurement.

Source Isotope

The actual isotope(s) that was measured.

Instrument Findings

The final isotope identification or other conclusion reported by the detector based on the measurements it collected.

Number of Findings (Total=...)

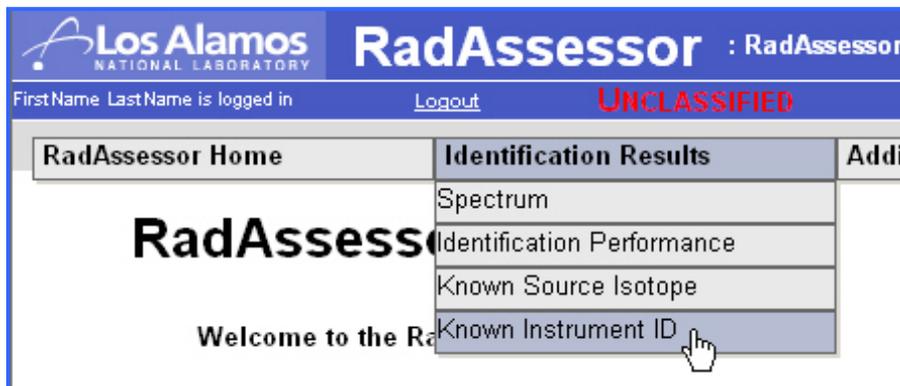
The number of times the instrument reported this finding.

3.7 “Known Instrument Identification” Queries

“Known Instrument Identification” is used to display the Source Isotope(s) that have been known to generate the Instrument Findings selected. When you know the message of the instrument(s) used then use this Known Instrument Identification screen. For example, you may not know what radioactive materials may be on board a vessel, but may only see what the instrument findings are from measuring the vessel. You would then be interested in knowing what isotopes are known to elicit a particular identification from an instrument. If you select the instrument, instrument findings, and shielding of interest (if any), the database will display all known isotopes to have generated the identification of interest. The tasks include:

3.7.1 To Open the Known Instrument Identification Page

1. Move your mouse over the “Identification Results” menu option. (You do not need to click the mouse.)
2. Single click the “**Known Instrument ID**” option to open the Known Instrument Identification selection page.



3.7.2 How to Use the Select Known Instrument Identification Query

1. Under “**1. Select Instrument Model(s)**”, select the instrument(s) to evaluate. (You must select at least one.)
2. Under “**2. Select Instrument Finding(s)**”, select the finding(s) shown on your instrument to use in the evaluation. (You must select at least one.) This finding will be used to generate a list of all source isotopes that have elicited the same finding.
3. Under “**3. Select Shielding and Thickness**”, select the shielding and thickness(es) to use in the evaluation.
4. Click the “**Submit**” button. (“**Reset**” will change all of your selections back to their original settings.)

Known Instrument Identification

If the Instrument has displayed a Message:

Use this screen to show what Source Isotope(s) have been known to generate the same Instrument Findings selected below.

1. Select Instrument Model(s):	2. Select Instrument Finding(s):																	
<input type="checkbox"/> All Instrument Models <input checked="" type="checkbox"/> Detector A (Firmware Version: 5) <input type="checkbox"/> Detector B (Firmware Version: 1.24; 1.25; 1.26; 2.0) <input type="checkbox"/> Detector C (Firmware Version: 3:826A 2F797 and M.:3:846E) <input type="checkbox"/> Detector D (Firmware Version: 02.07.02 90235) <input type="checkbox"/> Detector E (Firmware Version: 3.12) <input type="checkbox"/> Detector F (Firmware Version: 5.15) <input type="checkbox"/> Detector G (Firmware Version: E 01033) <input type="checkbox"/> Detector H (Firmware Version: 1.1a and 2.0) <input type="checkbox"/> Detector K (Firmware Version: 1.26 and 1.45) <input type="checkbox"/> Detector M (Firmware Version: 1.1a; 3.21) <input type="checkbox"/> Detector N <input type="checkbox"/> Detector P <input type="checkbox"/> Detector R	<input type="checkbox"/> All Instrument Messages <table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="text-align: left;">Isotope</th></tr></thead><tbody><tr><td><input type="checkbox"/> Pb-214 (Lead)</td></tr><tr><td><input type="checkbox"/> Pd-103 (Palladium)</td></tr><tr><td><input type="checkbox"/> Po-210 (Polonium)</td></tr><tr><td><input type="checkbox"/> Pr-144 (Praseodymium)</td></tr><tr><td><input type="checkbox"/> Pu-238 (Plutonium)</td></tr><tr><td><input checked="" type="checkbox"/> Pu-239 (Plutonium)</td></tr><tr><td><input type="checkbox"/> Pu-240 (Plutonium)</td></tr><tr><td><input type="checkbox"/> Ra-224 (Radium)</td></tr><tr><td><input type="checkbox"/> Ra-226 (Radium)</td></tr><tr><td><input type="checkbox"/> Ra-227 (Radium)</td></tr><tr><td><input type="checkbox"/> Rb-82 (Rubidium)</td></tr><tr><td><input type="checkbox"/> Residual (Residual)</td></tr><tr><td><input type="checkbox"/> Rh-106 (Rhodium)</td></tr><tr><td><input type="checkbox"/> Ru-103 (Ruthenium)</td></tr><tr><td><input type="checkbox"/> Ru-106 (Ruthenium)</td></tr><tr><td><input type="checkbox"/> Sb-122 (Antimony)</td></tr></tbody></table>	Isotope	<input type="checkbox"/> Pb-214 (Lead)	<input type="checkbox"/> Pd-103 (Palladium)	<input type="checkbox"/> Po-210 (Polonium)	<input type="checkbox"/> Pr-144 (Praseodymium)	<input type="checkbox"/> Pu-238 (Plutonium)	<input checked="" type="checkbox"/> Pu-239 (Plutonium)	<input type="checkbox"/> Pu-240 (Plutonium)	<input type="checkbox"/> Ra-224 (Radium)	<input type="checkbox"/> Ra-226 (Radium)	<input type="checkbox"/> Ra-227 (Radium)	<input type="checkbox"/> Rb-82 (Rubidium)	<input type="checkbox"/> Residual (Residual)	<input type="checkbox"/> Rh-106 (Rhodium)	<input type="checkbox"/> Ru-103 (Ruthenium)	<input type="checkbox"/> Ru-106 (Ruthenium)	<input type="checkbox"/> Sb-122 (Antimony)
Isotope																		
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<input type="checkbox"/> Pr-144 (Praseodymium)																		
<input type="checkbox"/> Pu-238 (Plutonium)																		
<input checked="" type="checkbox"/> Pu-239 (Plutonium)																		
<input type="checkbox"/> Pu-240 (Plutonium)																		
<input type="checkbox"/> Ra-224 (Radium)																		
<input type="checkbox"/> Ra-226 (Radium)																		
<input type="checkbox"/> Ra-227 (Radium)																		
<input type="checkbox"/> Rb-82 (Rubidium)																		
<input type="checkbox"/> Residual (Residual)																		
<input type="checkbox"/> Rh-106 (Rhodium)																		
<input type="checkbox"/> Ru-103 (Ruthenium)																		
<input type="checkbox"/> Ru-106 (Ruthenium)																		
<input type="checkbox"/> Sb-122 (Antimony)																		
3. Select Shielding and Thickness: <input checked="" type="checkbox"/> Any Shielding (Uncheck to explicitly state No Shielding) <input checked="" type="checkbox"/> Agar (Agar) <input checked="" type="checkbox"/> Any Agar Thicknesses <input checked="" type="checkbox"/> Al (Aluminum) <input checked="" type="checkbox"/> Any Al Thicknesses <input checked="" type="checkbox"/> 2.0in <input checked="" type="checkbox"/> Not recorded <input checked="" type="checkbox"/> 0.5in																		

3.7.3 Display Known Instrument Identification Results

After clicking “**Submit**”, all possible source isotopes will be displayed based on the criteria you selected (Figure 18). Components of the display are described below.

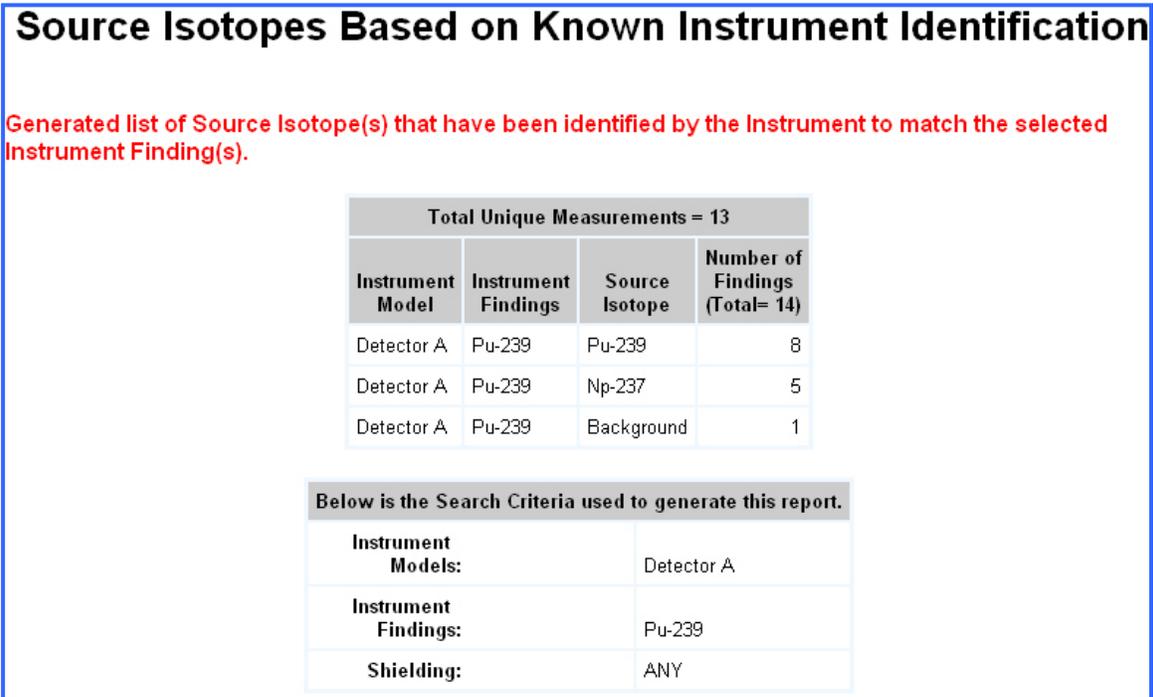


Figure 18. Source Isotopes identified by the Detective when asked to show ²³⁹Pu instrument finding. There were 14 instrument findings from 13 separate measurements.

Total Unique Measurements

The total number of measurements taken by a particular instrument(s) that match the criteria you specified.

Instrument Model

Name and model of the instrument that took the measurement.

Instrument Findings

The final isotope identification or other conclusion reported by the detector based on the measurements it collected.

Source Isotope

The actual isotope(s) that was measured.

Number of Findings (Total=...)

The number of times the instrument reported this finding.

Additional Information

“**A**DDITIONAL Information”, located in the menu bar between “Identification Results” and “Your Account”, provides details about the instrument models, the distributors for the instruments, shielding used in the measurements, and performance category descriptions. These pages let you view, re-sort, and filter data based on the criteria you select and also allow you to view the data in greater detail. We will explore how these pages use the filter and sort functions and will learn how each of the following four query screens is used:

- Instrument Models,
- Model Distributors,
- Shielding, and
- Category12MAIs (most abundant isotopes).

4.1 Filter Section

Each of the four queries within Additional Information will initially display all of the records for that topic. If you want to narrow your results, you can use the filter section located at the top of the page. Each query screen has a filter section with filter fields for you to complete. These allow you to limit your search to specific information. The filter searches the entire set of records and returns only the results that match the information you have typed into the filter fields. Figure 19 shows the filter section in the Instrument Models screen.

Instrument Models

Model Name	Manufacturer	Avail. For Purchase	Est. Cost (\$)	Dimensions	Picture	Size Category
* <input type="text"/>	* <input type="text"/>	* <input type="text"/>	> <input type="text"/> AND < <input type="text"/>	* <input type="text"/>	* <input type="text"/>	* <input type="text"/>
			Filter	Reset Filter		
<input type="radio"/>	1401 KE	TSA Systems Previous Primaster	Yes	7900.0	9.5 x 2.4 x 2.5 in	 Pack as BUT Smaller than Car Battery
<input type="radio"/>	Detective	Ortec	Yes	55000.0	35h x 16w x 32d (cm)	 Larger than Car Battery
<input type="radio"/>	GN	LANL N-2	No		13h x 15w x 40d (cm)	 No Filter Available Larger than Pack of Cigarettes BUT Smaller than Car Battery

Figure 19. The filter searches the entire set of records, in this case Instrument Models, to narrow the results that are displayed in the lower section.

To use the filter, begin with the page of data that appears when a query screen is selected, as shown in Figure 20. Complete all of the filter fields that apply to your query, and press “Enter” or click the “Filter” button. RadAssessor will display only those items that meet your criteria.

RadAssessor uses two basic types of filter fields: alphanumeric and numeric. Each will be further examined in the following sections.

A. Query page initially displays all records.

Model Name	Manufacturer	Avail. For Purchase	Est. Cost (\$)	Dimensions	Picture	Size Category
*	*	*	> 9000 AND < 15000	*	*	*

B. You specify filter criteria in filter fields.

Model Name	Manufacturer	Avail. For Purchase	Est. Cost (\$)	Dimensions	Picture	Size Category
1401 KE	TSA Systems Previously Polimaster	Yes	7900.0	9.5 x 2.4 x 2.5 in		Larger than Pack of Cigarettes BUT Smaller than Car Battery
Detective	Ortec	Yes	55000.0	35h x 16w x 32d (cm)		Larger than Car Battery
GN	...	No		13h x 15w x	No Picture Available	Larger than Pack of Cigarettes

C. Filter button is pressed.

Model Name	Manufacturer	Avail. For Purchase	Est. Cost (\$)	Dimensions	Picture	Size Category
%[0-5]	*	*	> 9000 AND < 15000	*	*	*

D. RadAssessor displays only the records that meet the filter criteria.

Model Name	Manufacturer	Avail. For Purchase	Est. Cost (\$)	Dimensions	Picture	Size Category
GR135	Exploranium	Yes	10000.0	17.2 x 22.9 x 10.2 cm		Larger than Pack of Cigarettes BUT Smaller than Car Battery
SAM 935	Berkeley Nucleonics Corp.	Yes	9700.0	12 x 8.6 x 2 in		Larger than Pack of Cigarettes BUT Smaller than Car Battery

In this example, only Model Names that end in 0 through 5 and have an Est. Cost that is more than 9000 but less than 15000 are displayed.

Figure 20. In this example, the filter produces the models with names that end in 0 through 5 and cost between 9000 and 15000 (\$).

4.1.1 Alphanumeric Filter

If a filter field has a single asterisk (*) inside the filter box, the field is an alphanumeric filter. The alphanumeric filter searches for data based upon combinations of letters and numbers (the upper- and lower-case alphabetic characters and the numeric characters 0–9) and special characters, such as the symbols \$, #, and @, mathematical symbols, and punctuation marks.



Several characters have special meanings to the filter. For example, the percent sign (%) is a wildcard that essentially means “any number of characters may go here”. The % sign can be used with known characters to represent the unknown characters. For example, to find model names ending in “5”, you would use “%5”; or if you wanted the “5” in the middle of the model name, you could use “%5%”.

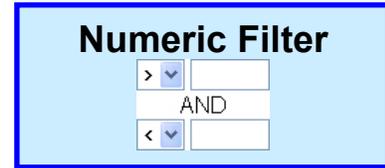
Table 3 shows wildcard characters that can be used to search RadAssessor. These wildcards can be combined to produce the results you need.

Table 3. Alphanumeric Wildcards and Descriptions

Wildcard	Name	Description
*	Asterisk	Matches zero or more alphanumeric characters. For example, “L*” will find anything that begins with the letter “L”.
-	Hyphen	Matches any one of the alphanumeric characters specified in the range. For example, if your data contains the words “bat, cat, cats, cop, cot, and cut”, then “c[a-p]t” will locate every word beginning with “c”, ending with “t”, and containing any letter from “a” to “p”, inclusive. Therefore, it will find “cat” and “cot”.
%	Percent	Matches zero or more alphanumeric characters.
[]	Square brackets	Matches any one of the alphanumeric characters in the brackets. For example, if your data contains the words “blam, slam, slams, slim, slum, and slums”, then “sl[ia]m” will locate “slim”, “slam”, and “slum”.
_	Underscore	Matches any single alphanumeric character found in that location. For example, if your data contains the words “bat, cat, cats, cop, cot, and cut”, then “c_t” will locate “cat”, “cot”, and “cut”.

4.1.2 Numeric Filter

Numeric filters are applied to fields in the database that store only numeric values. A numeric filter will find records where the numeric field is equal to a specific value or records where the numeric field is found between two values, called a range. Use the pull-down menus (down arrow) to select “<”, “=”, or “>”.



In Figure 20, the Estimated Cost fields are numeric. If you use the greater than (>) and less than (<) characters, notice that the range is noninclusive. For example, in Figure 21, the filter is requesting models that cost *between* 9000 and 55000 (\$). Thus, an actual cost of either 9000 or 55000 will not be included. The range of numbers included is actually 9000.01 to 54999.99.



Figure 21. Numeric filter.

Now look at Figure 22. This shows the filter asking for costs that are equal to 9000 and, at the same time, greater than 55000. This is impossible and, therefore, will not return any results.

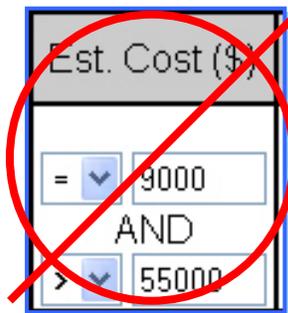


Figure 22. Filter will not return any results.

4.1.3 Searching for Wildcards as Literals

If you are looking for a value that contains a literal wildcard character, use the square brackets to “delimit” the special character. This tells the filter to treat everything inside the square brackets as a literal character instead of as a character with special meaning. For example, if you want to find a percent sign anywhere within a field, you would use %[%%] or *[%]*.

4.2 Sorting Results

Figure 23 shows a sample of the lower portion of the Instrument Models screen, called the results. The results will initially contain all records sorted by some default field. For example, the Instrument Models page initially defaults to “sort by Model Name in ascending order”.

	Model Name	Manufacturer	Avail. For Purchase	Est. Cost (\$)	Dimensions	Picture	Size Category
<input type="radio"/>	GR130	Exploranium	No		17.2 x 22.9 x 10.2 cm		Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input type="radio"/>	GR135	Exploranium	Yes	10000.0	17.2 x 22.9 x 10.2 cm		Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input type="radio"/>	Guardian	NucSafe Inc.	Yes		50 x 36 x 10 cm		Larger than Car Battery

Figure 23. Initial results are displayed using a sort; in this case, by Model Name.

To change the sort, click on the column heading that you want to sort on, as seen here in Figure 24. Clicking the same column heading again will toggle the sort between ascending and descending order.

	Model Name	Manufacturer	Avail. For Purchase	Est. Cost (\$)	Dimensions	Picture	Size Category
<input type="radio"/>	MKC-A03	Aspect			28 x 13 x 18.1 cm		Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input type="radio"/>	MKC-A02	Aspect			310 x 160 x 135 mm		Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input type="radio"/>	PPCZT	eV Products	I Don't Know				Larger than Pack of

	Model Name	Manufacturer	Avail. For Purchase	Est. Cost (\$)	Dimensions	Picture	Size Category
<input type="radio"/>	Rad-ID	D-Tect Systems	Yes		7.4 x 5.4 x 11.1 in		Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input type="radio"/>	Ranger	Quantrad Sensor or Biocentric Solutions	Yes	12470.0	6.5 x 13.25 x 2.75 in		Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input type="radio"/>	InSpector 1000	Canberra	Yes	8700.0	22 x 18 x 7 cm		Larger than Pack of Cigarettes BUT Smaller than Car Battery

Figure 24. Click the column headings to sort. Here we first clicked on Available for Purchase to sort in ascending (alphabetical) order. Then we clicked the Available for Purchase heading again to sort in descending order.

4.3 “Instrument Models” Query

The Instrument Models query allows you to view all the models that have been used for RadAssessor measurements. You can narrow your results by using the filter section (e.g., to display only the models with a specific manufacturer or whose model name begins with “m”). You can select a single instrument model using the radio button on the left of the list. Click the “**View**” button to the right of the table to display all the available details about that instrument model. The steps for using this query are described below.

4.3.1 To Open the Instrument Models Page

1. Move your mouse over the “Additional Information” menu option. (You do not need to click the mouse.)
2. Single click “**Instrument Models**” to open the Instrument Models selection page.



The screenshot shows the RadAssessor Home Page. At the top left is the Los Alamos National Laboratory logo. The main header reads "RadAssessor : RadAssessor Home Page". Below this, it says "FirstName LastName is logged in" with a "Logout" link, and "UNCLASSIFIED" in red. A navigation menu has three tabs: "RadAssessor Home", "Identification Results", and "Additional Information". The "Additional Information" tab is active, showing a list of options: "Instrument Models" (with a mouse cursor), "Model Distributors", "Shielding", and "Category 12 MAIs". The main content area displays "RadAssessor Home" and "Welcome to the RadAssessor Database."

4.3.2 To View All Instrument Models

The initial view of the Instrument Models query page will display all instrument models that are listed in RadAssessor (Figure 25). This page defaults to “sort by Model Name”.

- To view all models again after the filter has narrowed the results, click “**Reset Filter**” to clear the filters.
- Click on any column heading to re-sort the list in either ascending or descending order by that column. Each click will toggle the sort order between ascending and descending.

Instrument Models							
Model Name	Manufacturer	Avail. For Purchase	Est. Cost (\$)	Dimensions	Picture	Size Category	
<input type="text" value="*"/>	<input type="text" value="*"/>	<input type="text" value="*"/>	<input type="text" value=">"/> <input type="text" value="AND"/> <input type="text" value="<"/>	<input type="text" value="*"/>	<input type="text" value="*"/>	<input type="text" value="*"/>	
Filter			Reset Filter				
Model Name	Manufacturer	Avail. For Purchase	Est. Cost (\$)	Dimensions	Picture	Size Category	View
<input type="radio"/>	GR130	Exploranium	No		17.2 x 22.9 x 10.2 cm		Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input type="radio"/>	GR135	Exploranium	Yes	10000.0	17.2 x 22.9 x 10.2 cm		Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input type="radio"/>	Guardian	NucSafe Inc.	Yes		50 x 36 x 10 cm		Larger than Car Battery
<input type="radio"/>							Smaller than Pack

Figure 25. The Instrument Models page will initially show all models in ascending order by Model Name.

4.3.3 To Filter Instrument Models

The filter uses standard query notations such as “*” (wildcard). See section 4.1, Filter Section, for more information about wildcards.

1. Enter the information you will use to limit your search into the appropriate field. For example, we have entered “e*” in the Manufacturer filter field to find all instruments whose manufacturer begins with the letter “e”.
2. Single click the “**Filter**” button to display all the information that meets the criteria.
3. RadAssessor returns only the models that have a manufacturer whose name begins with an “e”.

Model Name	Manufacturer	Firm Ware Version	Avail. For Purchase	Est. Cost	Image	Size Category
<input type="text" value="*"/>	<input type="text" value="e*"/>	<input type="text" value="*"/>	<input type="text" value="*"/>	> <input type="text" value=""/> AND < <input type="text" value=""/>	<input type="text" value="*"/>	<input type="text" value="*"/>
		Filter		Reset Filter		
Model Name	Manufacturer	Firm Ware Version	Avail. For Purchase	Est. Cost	Image	Size Category
<input type="radio"/> GR130	Exploranium	5.15	No			Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input type="radio"/> GR135	Exploranium	1.24	Yes	10000.0		Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input type="radio"/> PPCZT	eV Products	1.1a and 2.0	I Don't Know			Larger than Pack of Cigarettes BUT Smaller than Car Battery

4.3.4 To Select an Instrument Model to Display

1. Select which Instrument Model you want to see by clicking the radio button to the left of the Model Name.

Model Name	Manufacturer	Firm Ware Version	Avail. For Purchase	Est. Cost	Image	Size Category
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/> > AND <input type="text"/> < <input type="text"/>	<input type="text"/>	<input type="text"/>
Filter				Reset Filter		
Model Name	Manufacturer	Firm Ware Version	Avail. For Purchase	Est. Cost	Image	Size Category
<input type="radio"/> GR130	Exploranium	5.15	No			Larger than Pack of Cigarettes BUT Smaller than Car Battery
<input checked="" type="radio"/> GR135	Exploranium	1.24	Yes	10000.0		Larger than Pack of Cigarettes BUT Smaller than Car Battery

2

[View](#)

2. Click the “**View**” button to the right of the table above to display additional features of the selected model.

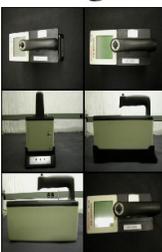
Instrument Models

[View Record](#)

Model Name : GR135
Model Rad Type : Gamma, Neutron
Manufacturer : Exploranium
Manufacturer Phone : 1-905-670-7071
Manufacturer Web Address : www.exploranium.com
Distributor : SAIC (http://www.saic.com)
Serial Numbers :
Firm Ware Version : 1.16; 1.24
Avail. For Purchase : Yes
Est. Cost (\$): 10000.0
Dimensions : 17.2 x 22.9 x 10.2 cm
Picture :



Additional Pictures :



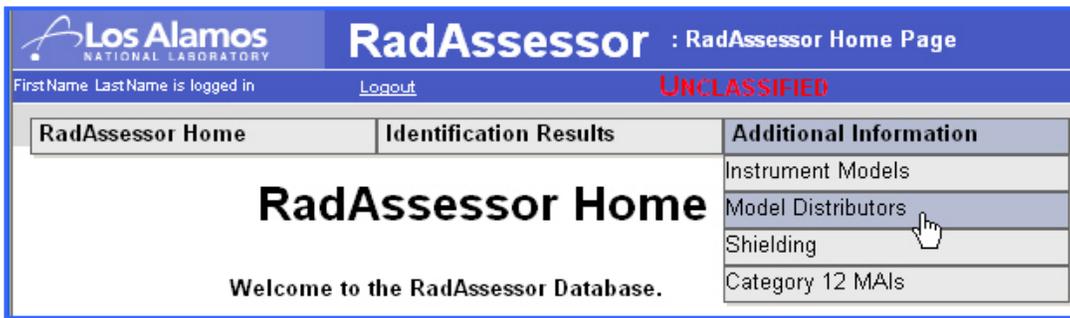
Size Category : Larger than Pack of Cigarettes BUT Smaller than Car Battery
Weight : 2.0
Weight Unit : kg
Physical Description : White with Black on top; Handle on top; Display on top; 1 Button
Dynamic Range : -14°F to 122°F
Energy Range (MeV) : 0.05 to 3.0 MeV
Calibration Type : External
Calibration Source : Cs-137
Multiplier Fields :
Battery Type : D Cell
Number Of Batteries : 2
Battery Life : 15 hours
Audible Tone : Yes; Earphone w/ volume control
Model Color : Black; Silver; Ivory; White
LED Color : None
Backlight Color :
Cabled Detector : Yes
Cable Type : RS232 Serial
Detector Material : CZT (Cadmium Zinc Telluride) - Gamma; NaI (Sodium Iodide) - Gamma; LiI (Lithium Iodide) - Neutron
Detector Material Size : NaI-1.5x2.2 in; GM-1/2inDiamx2inLength; Li-.7inDiam.x8.6inLength; CZT-unknown
Production Dates :
Comments : 3 Functions, 2 Modes; Rechargeable batteries; Detection Material = Sodium Iodide (NaI), CZT (optional), Neutron-solid state (optional); Continuously calibrates when in docking station; Four pre-defined Libraries with 200 nuclides; Custom libraries available upon request; Operating temperature is -10 to 50 degrees C; Display size is 6.5cm x 6.5cm; Large display w/ backlighting; Weatherproof, water resistant aluminum case; Energy Range is From .03 keV to 3.0 MeV; Multichannel Analyzer is 1024 MCA; Data Transfer is integrated into the docking station; Data Storage is >40,000 dose measurements; >187.3 MeV spectra; Cost is Gamma only: 8,900.00, Gamma neutron: 10,900.00, Gamma Neutron CZT: 15,900.00 (possible discounts); Delivery Time is Gamma 4-6 weeks, Neutron and Neutron CZT 8 weeks, bulk purchases may take longer.

4.4 “Model Distributors” Query

The Model Distributors query allows you to view all of the current distributors for the instruments you select. You can narrow your results by using the filter section (e.g., to find information about all models whose names begin with “m”).

4.4.1 To Open the Model Distributors Page

1. Move your mouse over the “Additional Information” menu option. (You do not need to click the mouse.)
2. Single click “**Model Distributors**” to open the Model Distributors selection page.

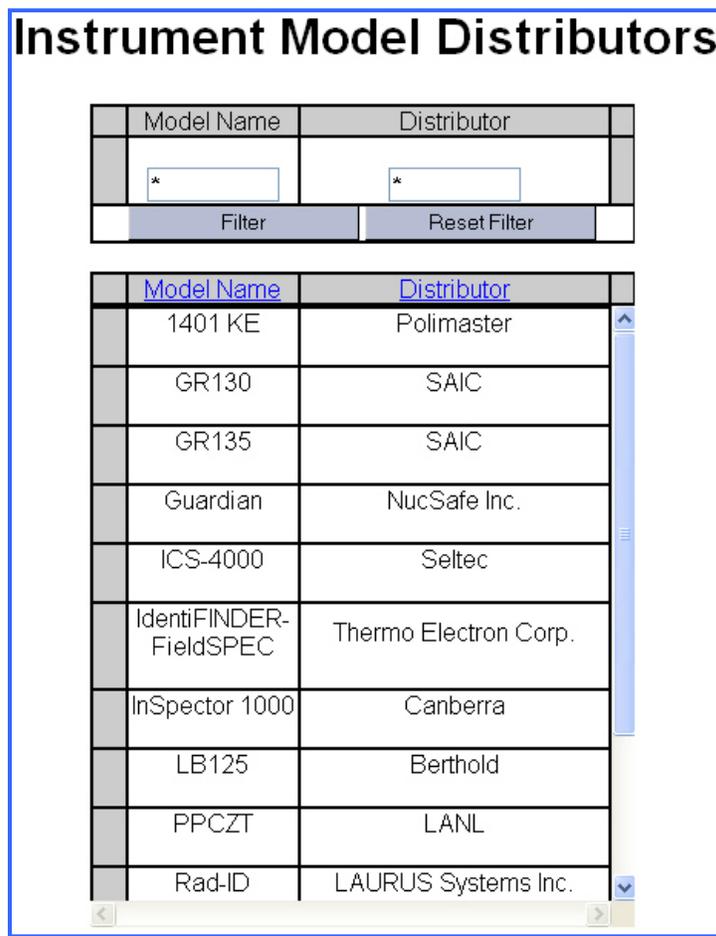


The screenshot shows the RadAssessor Home Page. At the top left is the Los Alamos National Laboratory logo. The main header reads "RadAssessor : RadAssessor Home Page". Below this, it says "FirstName LastName is logged in" and "Logout". A red "UNCLASSIFIED" stamp is visible. The page has a navigation menu with three items: "RadAssessor Home", "Identification Results", and "Additional Information". The "Additional Information" menu is expanded, showing a list of options: "Instrument Models", "Model Distributors", "Shielding", and "Category 12 MAIs". A mouse cursor is pointing at "Model Distributors". The main content area displays "RadAssessor Home" and "Welcome to the RadAssessor Database."

4.4.2 To View All Instrument Model Distributors

The initial view of the Instrument Model Distributors query page will display all distributors for the instruments in the RadAssessor database (Figure 26). This page defaults to “sort by Model Name” and then by “Distributor”.

- To view all models again after the filter has narrowed the results, click “**Reset Filter**” button to clear the filters.
- Click on any column heading to re-sort the list in either ascending or descending order by that column. Each click will toggle the sort order between ascending and descending.



The screenshot shows a web interface titled "Instrument Model Distributors". At the top, there are two input fields with asterisks, a "Filter" button, and a "Reset Filter" button. Below this is a table with two columns: "Model Name" and "Distributor". The table contains the following data:

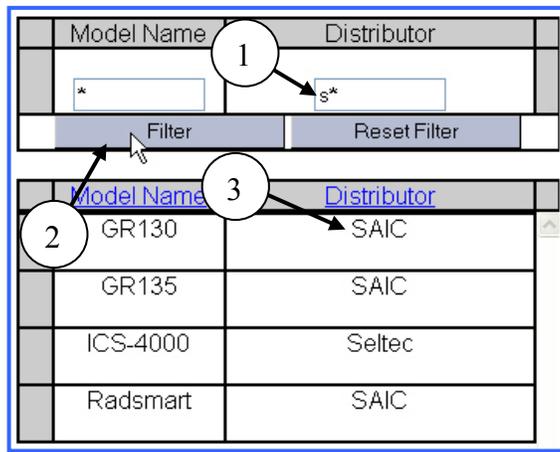
Model Name	Distributor
1401 KE	Polimaster
GR130	SAIC
GR135	SAIC
Guardian	NucSafe Inc.
ICS-4000	Seltec
IdentiFINDER-FieldSPEC	Thermo Electron Corp.
InSpector 1000	Canberra
LB125	Berthold
PPCZT	LANL
Rad-ID	LAURUS Systems Inc.

Figure 26. The Instrument Model Distributors page will initially show all distributors in ascending order by Model Name then Distributor.

4.4.3 To Filter the Model Distributors

The Filter capability uses standard query notations (e.g., * is wild meaning any number of characters).

1. Enter the information you will use to limit your search into the appropriate field. For example, we have entered “s*” in the Distributor filter field to find all distributor names that begin with the letter “s”.
2. Single click the “**Filter**” button to display all the information that meets the criteria.
3. RadAssessor returns the distributors whose names begin with “s”.



4.5 “Shielding” Query

The Shielding query allows you to view all shielding used in RadAssessor measurements. You can narrow your results by using the filter section (e.g., to display only the shielding with a specific material or where comments contain the word “green”). You can select a single shielding material by using the radio button on the left of the list. Click the “View” button to display all the available details about that selected shielding. Steps for using the Shielding query are described below.

4.5.1 To Open the Shielding Page

1. Move your mouse over the “Additional Information” menu option. (You do not need to click the mouse.)
2. Single click “Shielding” to open the Shielding selection page.



4.5.2 To View All Shielding

The initial view of the Shielding query page will display all shielding that has been used in any measurements made by the detectors listed in the RadAssessor database (Figure 27).

- To view all shielding again after the filter has narrowed the results, click “**Reset Filter**” button to clear the filters.
- Click on any column heading to re-sort the list in either ascending or descending order by that column. Each click will toggle the sort order between ascending and descending.

Shielding ID	Shielding Material Z	Comments
<input type="text"/>	<input type="text"/>	<input type="text"/>
Filter		Reset Filter
Shielding ID	Shielding Material Z	Comments
<input type="radio"/>	Agar	Agar
<input type="radio"/>	Air	Air
<input type="radio"/>	Al	Aluminum 13
<input type="radio"/>	Candle	Candle
<input type="radio"/>	Cardboard	Cardboard
<input type="radio"/>	Cd	Cadmium 48
<input type="radio"/>	Cu	Copper 29
<input type="radio"/>	DU	Depleted Uranium U-238 U-238
<input type="radio"/>	Fe	Iron/Steel 26
<input type="radio"/>	HE	High Explosives

Figure 27. The Shielding page will initially show all shielding in ascending order by Shielding ID.

4.5.3 To Filter Shielding

The filter uses standard query notations such as “*” (wildcard). See section 4.1, Filter Section, for more information about wildcards.

1. Enter the information you will use to limit your search into the appropriate field. For example, we have entered “*238*” in the Shielding Material Z filter field to find all types of shielding that have the numbers “238” in the shielding material’s name.
2. Single click the “**Filter**” button to display all the information that meets the criteria.
3. RadAssessor returns the shielding materials with “238” in their names.

The screenshot shows a web-based interface for filtering shielding materials. At the top, there are three input fields: 'Shielding ID' (containing '*'), 'Shielding Material Z' (containing '*238*'), and 'Comments' (containing '*'). Below these fields are two buttons: 'Filter' and 'Reset Filter'. A mouse cursor is pointing at the 'Filter' button. Below the buttons is a table with the following data:

Shielding ID	Shielding Material Z	Comments
DU	Depleted Uranium U-238	U-238

Numbered callouts in the image indicate: 1. The 'Shielding Material Z' input field containing '*238*'; 2. The 'Filter' button; 3. The 'DU' entry in the 'Shielding ID' column of the results table.

4.5.4 To Select a Shielding Material to Display

1. Select which shielding material you want to see by clicking the radio button to the left of the Shielding ID.

Shielding ID	Shielding Material Z	Comments	
<input type="text"/>	<input type="text"/>	<input type="text"/>	
Filter		Reset Filter	
Shielding ID	Shielding Material Z	Comments	View
<input type="radio"/>	Agar	Agar	
<input type="radio"/>	Air	Air	
<input type="radio"/>	Al	Aluminum	13
<input type="radio"/>	Candle	Candle	
<input type="radio"/>	Cardboard	Cardboard	
<input type="radio"/>	Cd	Cadmium	48
<input type="radio"/>	Cu	Copper	29
<input checked="" type="radio"/>	DU	Depleted Uranium U-238	U-238
<input type="radio"/>	Fe	Iron/Steel	26

2. Click the “**View**” button to the right of the table above to display additional features of the selected shielding material.

Shielding

View Record

Shielding ID : DU
Shielding Material Z : Depleted Uranium U-238
Comments : U-238

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4.6 “Category 12 MAIs” Query

The Category 12 MAIs query allows you to view all of the categories from the 5- and 12-category systems used to grade the measurements from each detector (see also section 3.5 above). You can narrow your results by using the filter section (e.g., to display only the Category 12 Names that begin with a specific letter). To see the details about a single category, click the radio button on the left side of the list, then click the “**View**” button to the right of the table. The steps for using this query are described below.

4.6.1 To Open the Category 12 MAIs Page

1. Move your mouse over the “Additional Information” menu option. (You do not need to click the mouse.)
2. Single click “**Category 12 MAIs**” to open the Category 12 MAIs selection page.



4.6.2 To View all Categories

The initial view of the Category 12 MAIs query page will display all the categories that are used to grade RadAssessor measurements (Figure 28).

- To view all shielding again after the filter has narrowed the results, click “**Reset Filter**” button to clear the filters.
- Click on any column heading to re-sort the list in either ascending or descending order by that column. Each click will toggle the sort order between ascending and descending.

Category 12 Most Abundant Isotopes (MAIs)						
Category 12 Letter	Category 12 Name	Category 5 Letter	Description	Report Order	Color	Comments
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value=">"/> <input type="button" value="AND"/> <input type="button" value="<"/>	<input type="text"/>	<input type="text"/>
			Filter	Reset Filter		
Category 12 Letter	Category 12 Name	Category 5 Letter	Description	Report Order	Color	Comments
C1	Correct1	C	Instrument correctly identified at least one most abundant isotopes (MAI) present when there is more than one, but not all MAIs with the highest confidence or with confidence less than a minor daughter.	2	Lime	
C2	Correct2	C	Instrument correctly identified ALL most abundant isotopes (MAI) present as the isotopes identified with the most confidence or with confidence less than only a minor daughter (see definition below). Or, in the case of background, it means it identified either nothing or only K-40 (which is naturally in the	1	DarkGreen	

Figure 28. The Category 12 MAIs page will initially show all categories in ascending order by Category 12 Letter.

4.6.3 To Filter Category 12 MAIs

The filter uses standard query notations such as “*” (wildcard). See section 4.1, Filter Section, for more information about wildcards.

1. Enter the information you will use to limit your search into the appropriate field. For example, we have entered “> 3 AND < 10” (greater than 3 and less than 10) in the Report Order filter field to find all categories ranked from 4 through 9.
2. Single click the “Filter” button to display all the information that meets the criteria.
3. RadAssessor returns only the categories that have a report order whose rank is between 3 and 10.

Category 12 Letter	Category 12 Name	Category 5 Letter	Description	Report Order	Color	Comments
CC1	Conditionally Correct1	CC	At least one most abundant isotopes (MAI) present but not all MAIs were correctly identified, but with less confidence than something that was not present or could not be identified.	4	Yellow	
FN1	False Negative1	FN	The instrument gave no identification when a radionuclide contained in the instrument's library was present as an MAI.	6	DeepSkyBlue	
FN2	False Negative2	FN	The instrument gave no identification when a radionuclide NOT contained in the instrument's library was present as an MAI.	7	SteelBlue	

4.6.4 To Select a Single Category 12 MAI to Display

1. Select which category you want to see by clicking the radio button to the left of the Category 12 Letter column.

Category 12 Letter	Category 12 Name	Category 5 Letter	Description	Report Order	Color	Comments
* <input type="text"/>	* <input type="text"/>	* <input type="text"/>	* <input type="text"/>	<input type="button" value=">"/> <input type="button" value="AND"/> <input type="button" value="<"/>	* <input type="text"/>	* <input type="text"/>
Filter			Reset Filter			
Category 12 Letter	Category 12 Name	Category 5 Letter	Description	Report Order	Color	Comments
<input type="radio"/> C1	Correct1	C	Instrument correctly identified at least one most abundant isotopes (MAI) present when there is more than one, but not all MAIs with the highest confidence or with confidence less than a minor daughter.	2	Lime	
<input checked="" type="radio"/> C2	Correct2	C	Instrument correctly identified ALL most abundant isotopes (MAI) present as the isotopes identified with the most confidence or with confidence less than only a minor daughter (see definition below). Or, in the case of background, it means it identified either nothing or only K-40 (which is naturally in the	1	DarkGreen	

View

2. Click the “**View**” button to the right of the table above to display additional details about the selected category.

Category 12 Most Abundant Isotopes (MAIs)

View Record

Category 12 Letter : C2
Category 12 Name : Correct2
Category 5 Letter : C

Description : Instrument correctly identified ALL most abundant isotopes (MAI) present as the isotopes identified with the most confidence or with confidence less than only a minor daughter (see definition below). Or, in the case of background, it means it identified either nothing or only K-40 (which is naturally in the environment).

Report Order : 1
Color : DarkGreen
Comments :

“YOUR Account”, the menu title located in the menu bar at the top of the page between “Additional Information” and the “Help” option, will allow you to log in or out of the database, to get your Username or a new password if you have forgotten your old one, and to edit your account information. The four menu items in “Your Account” are

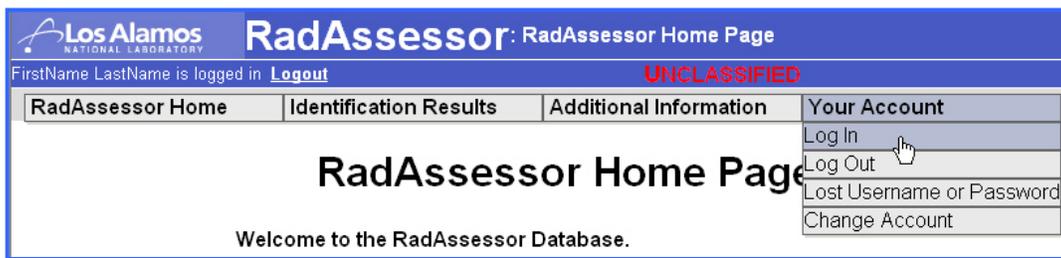
- Log In,
- Log Out,
- Lost Username or Password, and
- Change Account.

5.1 Log In

The Log In screen allows you to sign in to RadAssessor with your Username and password. The RadAssessor system uses Secure Sockets Layer (SSL) with a site certificate from VeriSign to provide encryption before transmission for enhanced security. RadAssessor uses a first-party “cookie” that will be saved to your local computer for session identification to help validate and authenticate users of RadAssessor. This cookie will be deleted when you log out or end the session.

5.1.1 To Open the Log In Page

1. Move your mouse over “Your Account” menu option. (You do not need to click the mouse.)
2. Single click “Log In” to open the Log In page.



5.1.2 To Log In

To log in to RadAssessor

1. In “**Username**”, enter your valid username.
2. In “**Password**”, enter your valid password.
3. Click the “**Login**” button or press the “**Enter**” key.



The screenshot shows a web browser window titled "Log In". Below the title is a dark blue header with the text "Existing RadAssessor users please log in". The main content area contains a login form with two input fields: "Username:" with the value "MyUserNameHere" and "Password:" with a masked password of ten dots. A "Login" button is positioned below the password field, with a mouse cursor hovering over it. At the bottom of the form, there are two blue hyperlinks: "[Lost your username or password?](#)" and "[or having login problems?](#)".

If another user was already logged into RadAssessor, they will automatically be logged out so that you, as a new user, may log in.

RadAssessor will authenticate your account before allowing access. The “**Official Use Only**” acceptance page will be displayed if the login attempt is successful.

- Click the “**OK**” button to acknowledge that you have accepted the Official Use Only terms.



After you accept the “Official Use Only” terms, RadAssessor will direct you to the RadAssessor Home Page (Figure 29). Your first and last name is displayed in the upper left corner to identify you as the current user. You now have access to the entire RadAssessor database and may navigate through the system via the main menu.

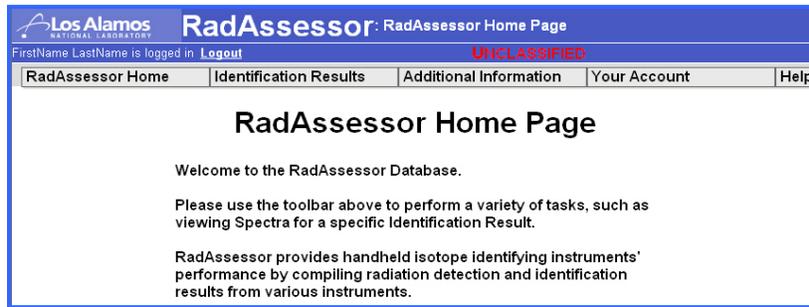


Figure 29. RadAssessor Home page displays upon successful log in.

5.1.3 Log In Problems

If you have any problems with the log in process, there is a link to possible solutions in the lower right corner of the Log In page (Figure 30).

- Click the “**login problems?**” link in the lower right corner of the Log In box.

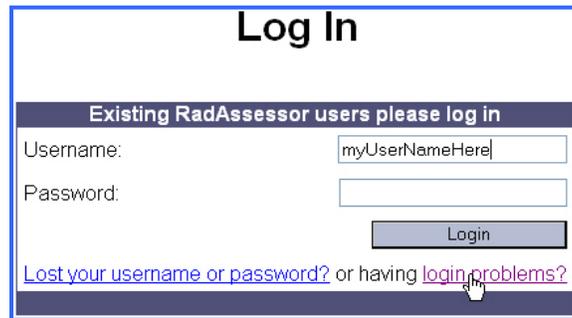


Figure 30. Click “login problems?” to find assistance with the log in process.

This will connect you to the suggested solutions shown in Figure 31. If none of these solutions solves your login problems, email the RadAssessor team at radassessor@lanl.gov for additional assistance.

The most common problem encountered when logging in is that the browser is not set to accept cookies. RadAssessor requires the use of session validation through cookies. If you are having trouble accessing RadAssessor, start by following the instructions in Figure 31 for allowing cookies. Section 2.2 above provides additional details on setting your browser to accept cookies.

Login Solutions

If you are having problems logging into RadAssessor, please try the following solutions.

1. Delete temporary internet files.

From Internet Explorer, click "Tools", select "Internet Options...". Click the "General" tab. Inside the "Temporary Internet files" frame, click the "Delete Files..." button. Check the "Delete all offline content" box. Press the "OK" button.

2. Clear your browser's history folder.

From Internet Explorer, click "Tools", select "Internet Options...". Click the "General" tab. Inside the "History" frame, click the "Clear History" button. Press "Yes" when asked "Are you sure you want Windows to delete your history of visited Web sites?".

3. Make sure your browser allows "cookies" for session validation.

From Internet Explorer, click "Tools", select "Internet Options...". Click the "Privacy" tab. Set privacy to "Medium". If privacy is set to higher than medium, then make sure that "first-party Cookies" are accepted.

4. Make sure that the date and time on your computer are set correctly.

If you still cannot login, write to radassessor@lanl.gov

Figure 31. Solutions to login problems.

5.2 Log Out

There are three ways to log out of RadAssessor. Logging out will ensure that unauthorized individuals do not gain access to RadAssessor from your computer or access your user information.

5.2.1 To Log Out of RadAssessor

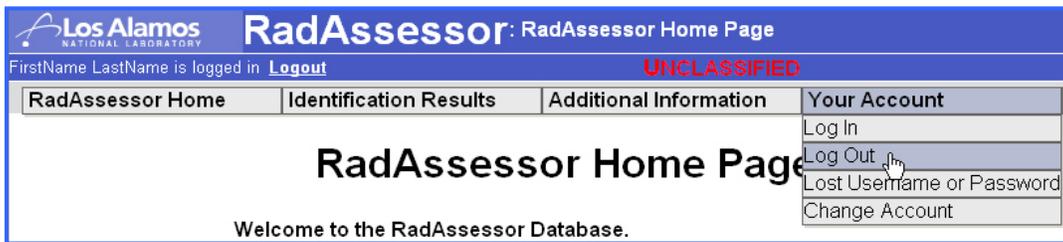
Choose one of the three following ways to close the RadAssessor database.

- Click “**Logout**” next to your name in the upper left corner above the menu bar.



Or

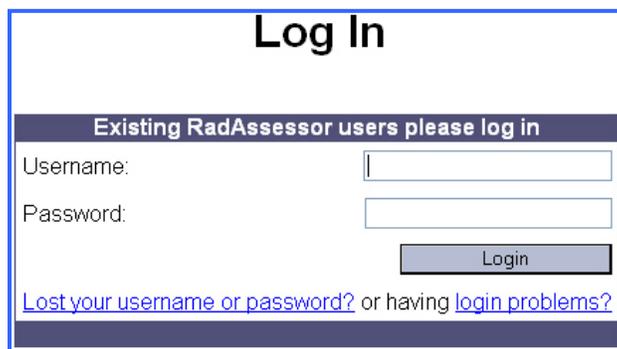
1. Move your mouse over the “**Your Account**” menu option. (You do not need to click the mouse.)
2. Single click “**Log Out**” to log out of RadAssessor.



Or

- Close your browser window which will automatically log you out of RadAssessor.

The Log In page appears when you have logged off RadAssessor and have not closed your browser window.

A screenshot of the RadAssessor "Log In" page. The title "Log In" is centered at the top. Below it is a dark blue header with the text "Existing RadAssessor users please log in". The form contains two input fields: "Username:" and "Password:". Below the password field is a "Login" button. At the bottom, there is a blue hyperlink: "Lost your username or password? or having login problems?".

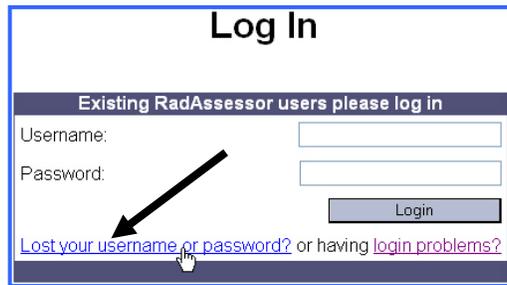
5.3 Lost Username or Password

If you forget your username or password, you can set a new password through the “Lost Username or Password” page. RadAssessor will send you an email with your username and a web address where you can reset your password.

5.3.1 To Open the Lost Username or Password Page

There are two ways to open the Lost Username or Password page.

- From the “**Log In**” page, click the “**Lost your username or password?**” link in the lower left corner.



Or

1. Move your mouse over the “**Your Account**” menu option. (You do not need to click the mouse.)
2. Single click “**Lost Username or Password**” to open the Lost Username or Password page.



5.3.2 To Get Your Username or Set a New Password

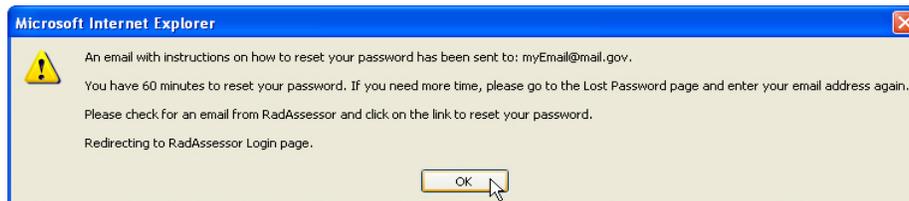
When the “Lost Username or Password” page appears

1. In “**Email**”, enter your email address.
2. Click the “**Submit**” button.



Your email address will be validated by RadAssessor, an email will be sent with further instructions, and a confirmation notice will be displayed on the screen.

1. Click the “**OK**” button.
2. Check your email and follow the instructions.



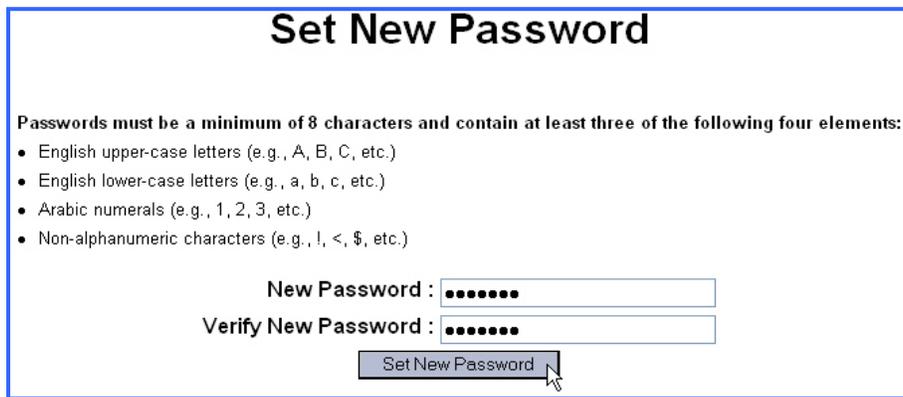
The email will tell you your Username, and you can log in, if that was all you forgot.

If you forgot your password, follow the instructions below and in the email you receive to reset your password before attempting to log in. **You will have 60 minutes to reset your password.** If more than 60 minutes passes before you are able to reset your password, return to the “**Lost Username or Password**” page and enter your email address again. You will receive another email message with new instructions and you will have 60 minutes to reset your password.

5.3.3 Reset Password Page

The email message from RadAssessor with your Username and the instructions to reset your password will direct you to a temporary Set New Password screen. Read the directions for choosing an appropriate password and follow the instructions below to set a new password.

1. Enter your new password in the “**New Password**” field. *Your password must have at least eight characters and contain at least three of the four elements as shown.*
2. Enter your new password again in the “**Verify New Password**” field.
3. Click “**Set New Password**”.



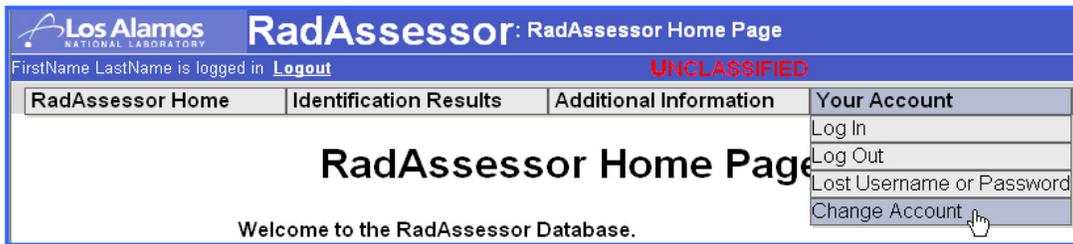
The screenshot shows a web form titled "Set New Password". Below the title, there is a bold instruction: "Passwords must be a minimum of 8 characters and contain at least three of the following four elements:". This is followed by a bulleted list of requirements: English upper-case letters, English lower-case letters, Arabic numerals, and Non-alphanumeric characters. Below the list are two input fields: "New Password" and "Verify New Password", both containing six black dots. At the bottom of the form is a button labeled "Set New Password" with a mouse cursor pointing to it.

5.4 Change Account

“Change Account” allows you to view and update your account information, such as your name, phone, email, company, and password.

5.4.1 To Open the Change Account Page

1. Move your mouse over the “**Your Account**” menu option. (You do not need to click the mouse.)
2. Single click “**Change Account**” to open the Change Account page.



5.4.2 To View or Change Account Information

You can review and change information in your RadAssessor account from the “Your Account Information” page.

To update your account information

1. Make the desired changes.
2. Click the “**Submit**” button.

Press the “**Cancel**” button to return to the RadAssessor Home page without making any changes.

Your Account Information

Edit Your Account

All fields are required.

UserName : testuser	Passwords must be a minimum of 8 characters and contain at least three of the following four elements:
New Password : <input type="text"/>	• English upper-case letters (e.g., A, B, C, etc.)
Verify New Password : <input type="text"/>	• English lower-case letters (e.g., a, b, c, etc.)
Company : LANL <input type="button" value="v"/>	• Arabic numerals (e.g., 1, 2, 3, etc.)
First Name : <input type="text"/>	• Non-alphanumeric characters (e.g., !, <, \$, etc.)
Last Name : <input type="text"/>	
Phone Number : <input type="text"/>	
Email Address : <input type="text"/>	
<input type="button" value="Submit"/>	<input type="button" value="Cancel"/>

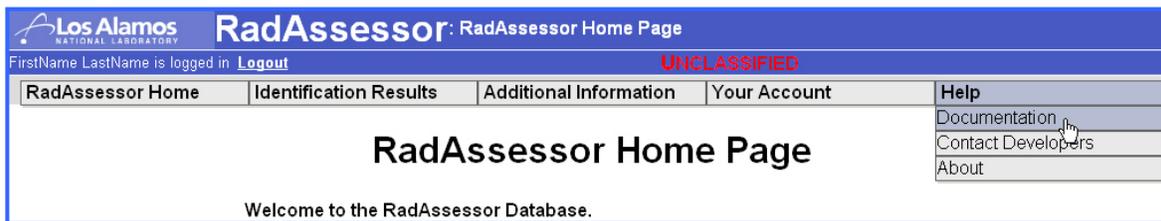
“HELP” provides a RadAssessor online tutorial, the names of the developers and an email address for contacting them, and copyright details for the RadAssessor database system.

6.1 Documentation

The “Documentation” menu item will open an online tutorial in a new browser window, allowing you to continue navigating in RadAssessor while viewing the tutorial.

6.1.1 To Open the RadAssessor Online Tutorial

1. Move your mouse over the “Help” menu option. (You do not need to click the mouse.)
2. Single click “Documentation” to open the RadAssessor online tutorial.



6.1.2 To Use the Online RadAssessor Tutorial

The RadAssessor tutorial pages are displayed in a new browser window to allow you to continue to use RadAssessor while viewing the online tutorial (Figure 32).

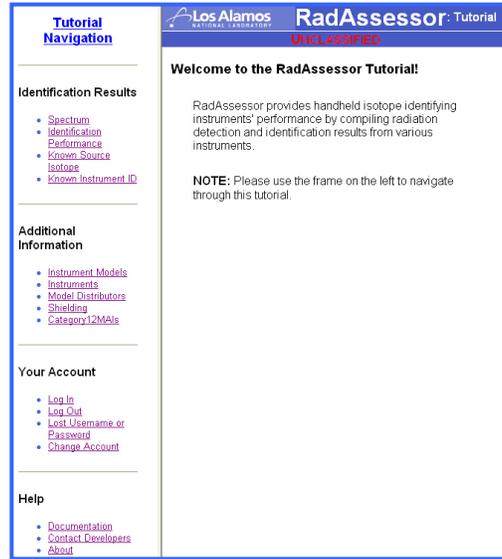


Figure 32. A new browser window displays the RadAssessor online tutorial.

On the left side of the window is the navigation section where you can click on any of the links to see instructions displayed in the main window to the right (Figure 33).

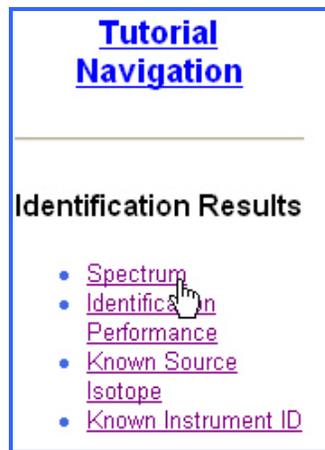


Figure 33. Click the Spectrum link in the navigation section.

For example, if you click the “**Spectrum**” link under “Identification Results” in the left section, the Spectrum tutorial will appear in the right section, where you may scroll down to view all of the entire information about how to use the Spectrum query (Figure 34).

Tutorial Navigation

Identification Results

- [Spectrum](#)
- [Identification](#)
- [Performance](#)
- [Known Source Isotope](#)
- [Known Instrument ID](#)

Additional Information

- [Instrument Models](#)
- [Instruments](#)
- [Model Distributors](#)
- [Shielding](#)
- [Category 12MAls](#)

Your Account

- [Log In](#)
- [Log Out](#)
- [Lost Username or Password](#)
- [Change Account](#)

Help

- [Documentation](#)
- [Contact Developers](#)
- [About](#)

RadAssessor Tutorial: Spectrum

UNCLASSIFIED

The Spectrum page is used to display the actual Spectra collected from measurements. You may choose which Instrument Models, Source Isotopes, and Shielding combinations should be used to generate the resulting Spectra to be displayed.

- [Open the Spectrum Page](#)
- [Select Spectra to Display](#)
- [Display Spectra Records](#)

Open the Spectrum Page

- Move your mouse over the "Identification Results" menu option. You do not need to click the mouse.
- Single click the "Spectrum" option to open the Spectrum page.

RadAssessor: RadAsses

Sharon Seltz is logged in [Logout](#)

RadAssessor Home	Identification Results	Additional Information
	Spectrum	
	Identification Performance	
	Known Source Isotope	
	Known Instrument ID	

Welcome to the RadAssessor Databases

Please use the toolbar above to perform as viewing Spectra for a specific Identification Results

RadAssessor provides handheld isotope performance by compiling radiation detection results from various instruments.

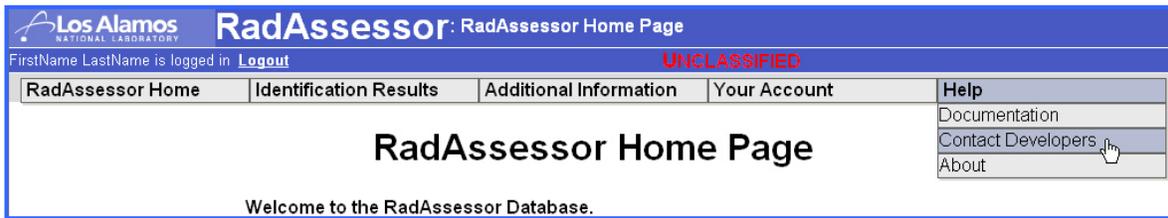
Figure 34. When you click a link in the navigation section, you’ll see that tutorial appear on the right.

6.2 Contact Developers

The “Contact Developers” page contains information about how to communicate with the RadAssessor authors and investigators.

6.2.1 To Open the Contact Developers Page

1. Move your mouse over the “**Help**” menu option. (You do not need to click the mouse.)
2. Single click “**Contact Developers**” to open the Contact Developers page.



The RadAssessor email address and developers’ names are displayed.

Contact Developers

Los Alamos National Laboratory

radassessor@lanl.gov

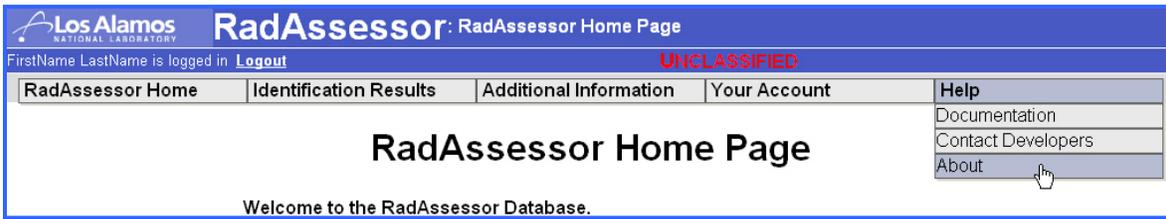
Sharon Seitz
John Blackadar
Paul Felsher

6.3 About

The “About” page contains RadAssessor copyright and version information.

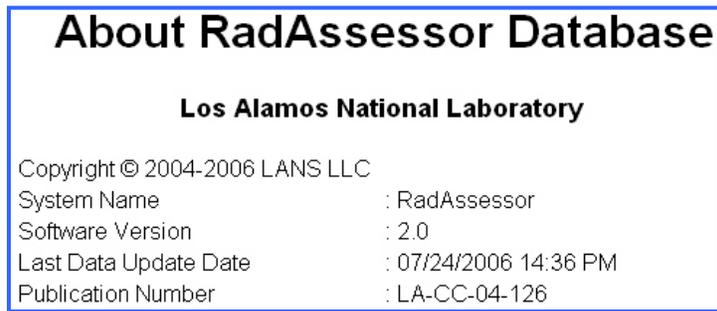
6.3.1 To Open the About Page

1. Move your mouse over the “**Help**” menu option. (You do not need to click the mouse.)
2. Single click “**About**” to open the About RadAssessor Database page.



The screenshot shows the RadAssessor Home Page. At the top left is the Los Alamos National Laboratory logo. The main header reads "RadAssessor: RadAssessor Home Page". Below this, it says "FirstName LastName is logged in" followed by a "Logout" link and a red "UNCLASSIFIED" label. A navigation menu contains "RadAssessor Home", "Identification Results", "Additional Information", "Your Account", and "Help". The "Help" menu is open, showing "Documentation", "Contact Developers", and "About" (with a mouse cursor over it). The main content area displays "RadAssessor Home Page" and "Welcome to the RadAssessor Database."

The latest RadAssessor software and data versions are displayed in the About RadAssessor Database page. Copyright and publication information is also shown.



The screenshot shows the "About RadAssessor Database" page. The title is "About RadAssessor Database" in a large, bold font. Below it is "Los Alamos National Laboratory". The page contains the following text:

Copyright © 2004-2006 LANS LLC
System Name : RadAssessor
Software Version : 2.0
Last Data Update Date : 07/24/2006 14:36 PM
Publication Number : LA-CC-04-126

Resources and Additional Reading

The following works are useful resources for those who would like additional information about the topics covered in this manual.

- Bailey, Paul. "A First Responders Guide to Purchasing Personal Radiation Detectors (PRDs) for Homeland Security Purposes." Version 2. Springfield, VA: Technology Administration of the U.S. Department of Commerce, Environmental Measurements Laboratory, U.S. Department of Homeland Security, November 2004. <http://www.eml.st.dhs.gov/Standards/gateway/guide/gen/RadPagers.pdf>
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- Blackadar, John M. "Automatic Isotope Identifiers and Their Features." *IEEE Sensors Journal* 5 (August 2005): 589–592. <http://www.ieee.org/> Los Alamos National Laboratory document LA-UR-04-2852 (2004).
- Blackadar, J. M., J. A. Bounds, P. A. Hypes, D. J. Mercer, and C. J. Sullivan. "Evaluation of Handheld Isotope Identifiers." Los Alamos National Laboratory document LA-UR-03-2742 (April 2003).
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- IEEE Standards. *American National Standard for Portable Radiation Detection Instrumentation for Homeland Security*. ANSI N42.33-2003, New York: Institute of Electrical and Electronics Engineers, 2004. <http://standards.ieee.org/getN42/>
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