

Remediation Data Repository (RADAR) Project Report

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by

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DISCLAIMER

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FOREWORD

The U.S. Environmental Protection Agency (EPA) is charged by Congress with protecting the Nation's land, air, and water resources. Under a mandate of national environmental laws, the Agency strives to formulate and implement actions leading to a compatible balance between human activities and the ability of natural systems to support and nurture life. To meet this mandate, EPA's research program is providing data and technical support for solving environmental problems today and building a science knowledge base necessary to manage our ecological resources wisely, understand how pollutants affect our health, and prevent or reduce environmental risks in the future.

The Center for Environmental Solutions and Emergency Response (CESER) within the Office of Research and Development (ORD) conducts applied, stakeholder-driven research and provides responsive technical support to help solve the Nation's environmental challenges. The Center's research focuses on innovative approaches to address environmental challenges associated with the built environment. We develop technologies and decision-support tools to help safeguard public water systems and groundwater, guide sustainable materials management, remediate sites from traditional contamination sources and emerging environmental stressors, and address potential threats from terrorism and natural disasters. CESER collaborates with both public and private sector partners to foster technologies that improve the effectiveness and reduce the cost of compliance, while anticipating emerging problems. We provide technical support to EPA regions and programs, states, tribal nations, and federal partners, and serve as the interagency liaison for EPA in homeland security research and technology. The Center is a leader in providing scientific solutions to protect human health and the environment.

This report provides an overview of EPA's Remediation Data Repository (RADAR) application that provides a searchable database for accessing multi-hazard research and operational data conducted by the U.S. EPA and other federal and international partners. Instructions for using RADAR and associated technical documentation describing the technology architecture and security controls are also included.

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ACRONYMS AND ABBREVIATIONS

API	Application Programming Interface
CESER	Center for Environmental Solutions and Emergency Response
CSS	Cascading Style Sheet
CSV	Comma Separated Value
DOI	Digital Object Identifier
EDG	Environmental Data Gateway
EPA	U.S. Environmental Protection Agency
GFE	Government Furnished Equipment
GSA	General Services Administration
HSMMD	Homeland Security and Materials Management Division (EPA)
HSRP	Homeland Security Research Program
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
JSON	JavaScript Object Notation
LAN	Local Area Network
OLEM	Office of Land and Emergency Management (EPA)
OMS	Office of Mission Support (EPA)
ORD	Office of Research and Development (EPA)
OSIM	Office of Science and Information Management (EPA)
PHP	Hypertext Preprocessor
QAPP	Quality Assurance Project Plan
RADAR	Remediation Data Repository
SOP	Standard Operating Procedure
SQL	Structured Query Language
TIC	Trusted Internet Connection
URL	Uniform Resource Locator
VPN	Virtual Private Network
WAM	Web Access Management
XLSX	Microsoft Excel

EXECUTIVE SUMMARY

This project supports United States Environmental Protection Agency's (EPA) Homeland Security Research Program (HSRP) and the Center for Environmental Solutions and Emergency Response, Homeland and Materials Management Division's strategic goals as described in detail in the Homeland Security Strategic Research Action Plan (U.S. EPA, 2020). This work is pertinent to Long-Term Goal 2, which states, "The [EPA] Office of Land and Emergency Management (OLEM) and other clients use HSRP products and expertise to improve the capability to respond to terrorist attacks affecting buildings and the outdoor environments."

Numerous decision support tools and technical/operational data have been developed under EPA's HSRP. Collectively, the research data and tools support decision makers in a wide range of emergency response and recovery activities. In many cases, tools developed under HSRP (and elsewhere within the federal government) tend to rely on static data that are individually distributed with each tool and are therefore susceptible to becoming out of sync with source data updates; therefore, tools can be costly to maintain and keep up-to-date. Additionally, technical/operational data generated through various research initiatives are often made available through static reports that require an arduous amount of time to review or reference, and the associated data are not easily accessed in a format that readily supports subsequent research and modeling efforts.

To confront this issue, HSRP developed the Remediation Data Repository (RADAR), a searchable database for accessing peer-reviewed multi-hazard research and operational data conducted by EPA and other federal and international partners. The tool provides a central repository (i.e., database) that stores up-to-date data derived from HSRP literature reviews, studies, and tools, and provides a user interface to increase the discoverability and applied use of research data. RADAR is intended for use by a wide audience that includes scientists, engineers, and operational experts. Delivering on-demand data to the right people at the right time enhances the utility of the important research outputs that are generated.

RADAR allows EPA's homeland security specific research or operational guidance to be shared among partners and a broad array of users by way of an online platform – an offering that currently does not exist. RADAR provides users access to data both through a user-friendly searchable interface and via an application programming interface (API) to facilitate consumption of data by other HSRP tools through web services. This capability greatly reduces the cost of updating models and tools and ensures end-users are referencing the most up-to-date information, all the while significantly reducing development and maintenance costs. This report provides an overview of RADAR, instructions for using RADAR, and associated technical documentation describing the technology architecture and security controls.

1 INTRODUCTION

Numerous decision support tools and technical/operational data have been developed under EPA's HSRP. Collectively, the research data and tools support decision makers in a wide range of emergency response and recovery activities. In many cases, tools developed under HSRP (and elsewhere within the federal government) tend to rely on static data that are individually distributed with each tool and are therefore susceptible to becoming out of sync with source data updates; therefore, the tools can be costly to maintain and keep up-to-date. Additionally, technical/operational data generated through various research initiatives are often made available through static reports that require an arduous amount of time to review or reference, and the associated data are not harmonized using consistent taxonomy, units, and formatting, nor are data easily accessed in a format that readily supports subsequent research and modeling efforts.

To confront this issue, HSRP developed the Remediation Data Repository (RADAR), a searchable database for accessing multi-hazard research and operational data conducted by EPA and other federal and international partners. The tool provides a central repository (i.e., database) that stores up-to-date data derived from HSRP literature reviews, studies, and tools, and provides a user interface to increase the discoverability and applied use of research data. RADAR is intended for use by a wide audience that includes scientists, engineers, and operational experts. Delivering on-demand data to the right people at the right time enhances the utility of the important research outputs that are generated. Figure 1 presents a high-level, conceptual illustration of RADAR.

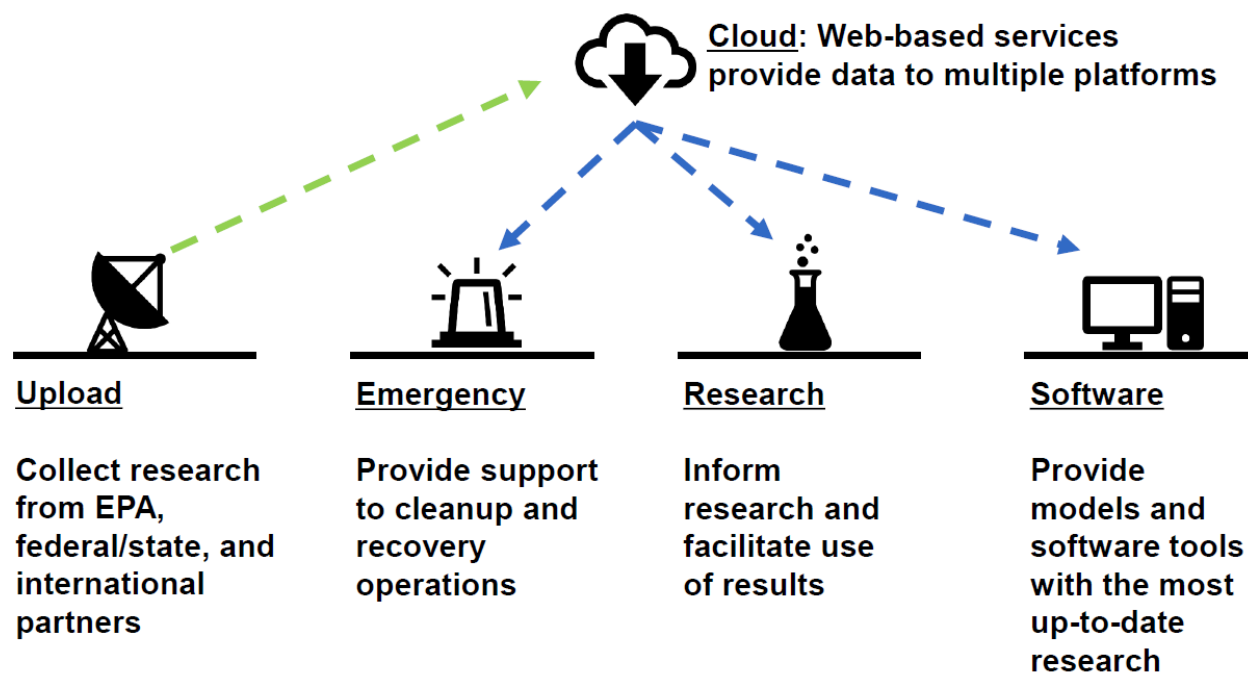


Figure 1. RADAR illustrative concept.

RADAR allows EPA's homeland security specific research or operational guidance to be shared among partners and a broad array of users by way of an online platform – an offering that currently does not exist. RADAR provides users access to data both through a user-friendly searchable interface and via an application programming interface (API) to facilitate consumption of data by other HSRP tools through web services. This capability greatly reduces the cost of updating models and tools and ensures end-users are referencing the most up-to-date information, all the while significantly reducing development and maintenance costs.

This report provides an overview of RADAR, instructions for using RADAR, and associated technical documentation describing the technology architecture and security controls. This report is structured in the following manner:

- Chapter 2 discusses quality assurance/quality control activities;
- Chapter 3 summarizes RADAR's technology architecture;
- Chapter 4 provides instructions for using RADAR;
- Chapter 5 describes how EPA users can submit data to include in RADAR;
- Chapter 6 describes instructions for RADAR Administrators to approve and manage registered users; and
- Chapter 7 presents next steps and recommendations.

2 QUALITY ASSURANCE/QUALITY CONTROL

The purpose of this project was to develop a web-based application to provide EPA's HSRP the capability to store, search, and discover research data. Software development activities conducted during this project adhere to industry best practices and follow an EPA project-approved quality assurance project plan (QAPP) that addresses requirements for software and application development. The application was approved and cleared by ORD's Office of Science Information Management (OSIM) and EPA's Office of Mission Support (OMS). No scientific experiments were performed. Technical area leads evaluated the quality of the application code and related technical documentation and security controls that were developed during this effort.

Separately, the RADAR project is governed by a Configuration Management Plan and undergoes monthly auditing.

3 RADAR INFORMATION ARCHITECTURE

RADAR's information architecture solution is built upon a cloud-based, open-source technology stack to leverage a modern framework that enables rapid development and deployment and optimal performance. The application-level architecture and user authentication components of RADAR are described in the sections that follow.

3.1 Application-Level Architecture

RADAR consists of the following system components:

- **Front-End** – The front-end component powers the user experience. It provides the interface to the user to allow interaction with all the pages, data, and document access. The front-end also utilizes a subset of the data that drive the application and support several operational and navigational features. The front-end presentation component generally consists of HTML 5, CSS/Sass, JavaScript, and API web services consumption. RADAR uses Vue.js¹ as its user interface framework. The application utilizes the OneEPA template and integrates user interface components from the U.S. Web Design System².
- **Back-End and Server-Side Programming** – The back-end powers the website and consists of web servers, databases, and the server-side programming components and business logic. The back-end component provides web services to supply data to the front-end, as needed, based on user actions. Back-end data are stored in a PostgreSQL database, and server-side programming prepares blocks of data by way of web services. Server-side programming in the middle-tier is implemented using PHP (Laravel³ framework). Data are delivered using a representational state transfer (or RESTful) API in JavaScript Object Notation (JSON) format for consumption by the front-end for display to the user.

The database schema is maintained in version control using Laravel migrations, enabling consistency across environments and a recorded history of schema updates.

- **Hosting Environment** – RADAR is currently deployed in the General Services Administration (GSA) cloud.gov environment. RADAR resides within an EPA/ORD cloud.gov organization space and uses the standard cloud.gov provided PHP build pack to support deployments. The cloud.gov environment offers a few noteworthy features to improve the deployment process and increase website stability, including:
 - Dynamic Scalability – If the application receives a large uptick in users or data processing, the hosting platform can instantly scale to handle increased load.
 - Automated Build Processes – Developers can create automated processes that are triggered as code is updated. A set of steps (e.g., tests, code bundling, code deployment) can be automatically run.
 - Self-service Provisioning and Deployment – Developers can directly provision services (e.g., increasing resources) and deploy applications.

¹ Vue.js, <https://vuejs.org/>

² U.S. Web Design System, version 2.11.1, <https://designsystem.digital.gov/> (last accessed 14 April 2021).

³ Laravel, <https://laravel.com/>

RADAR application source code is available in a public [EPA GitHub repository](#). Figure 2 below illustrates RADAR's application-level architecture.

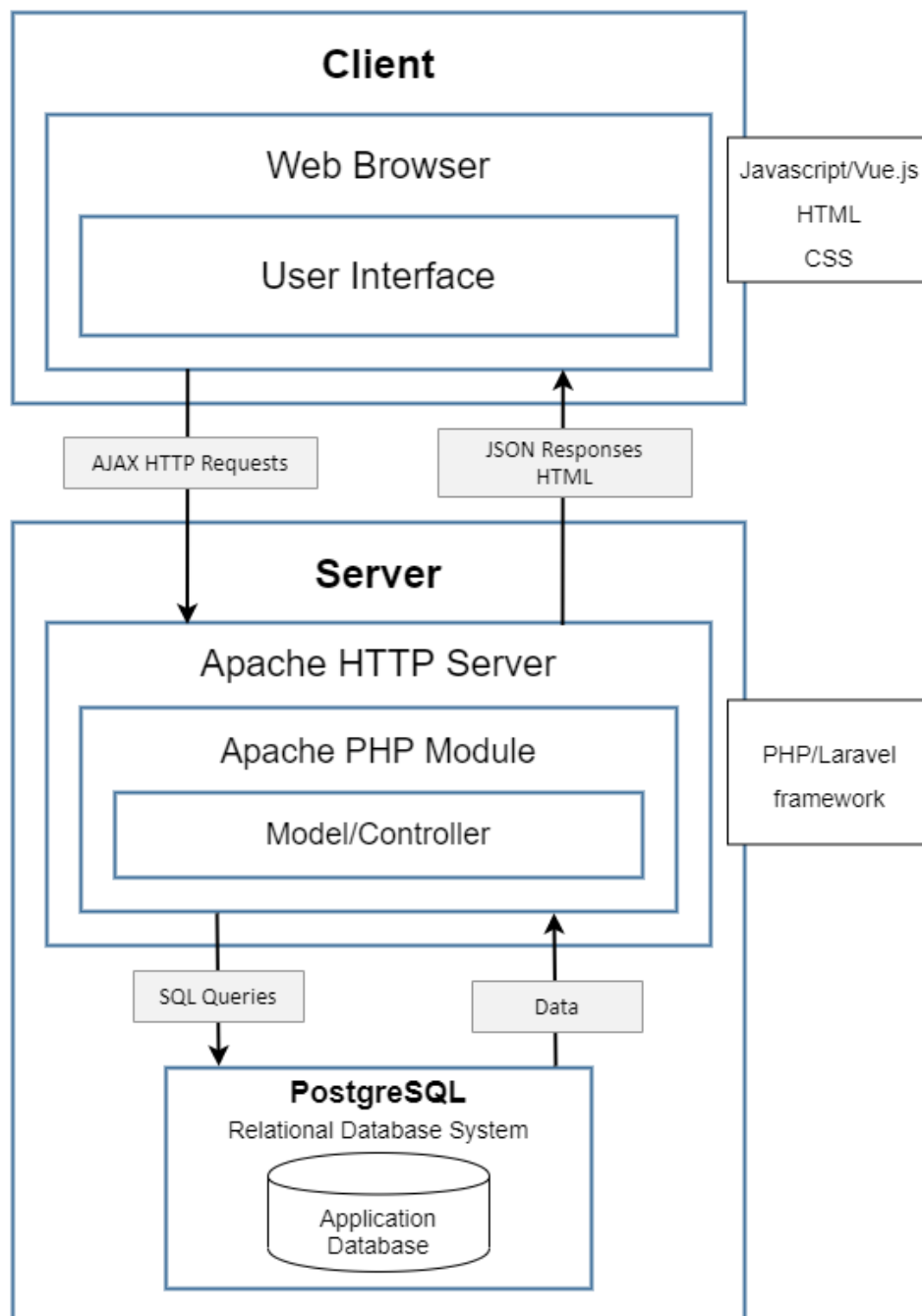


Figure 2. RADAR application-level architecture.

3.2 Cloud-Level Architecture and User Authentication

Data and information included in RADAR can be searched and retrieved by any public user as shown in Figure 3 below. Several additional features are provided for registered users that successfully authenticate (i.e., successfully login). The mechanisms that govern these interactions are briefly described below.

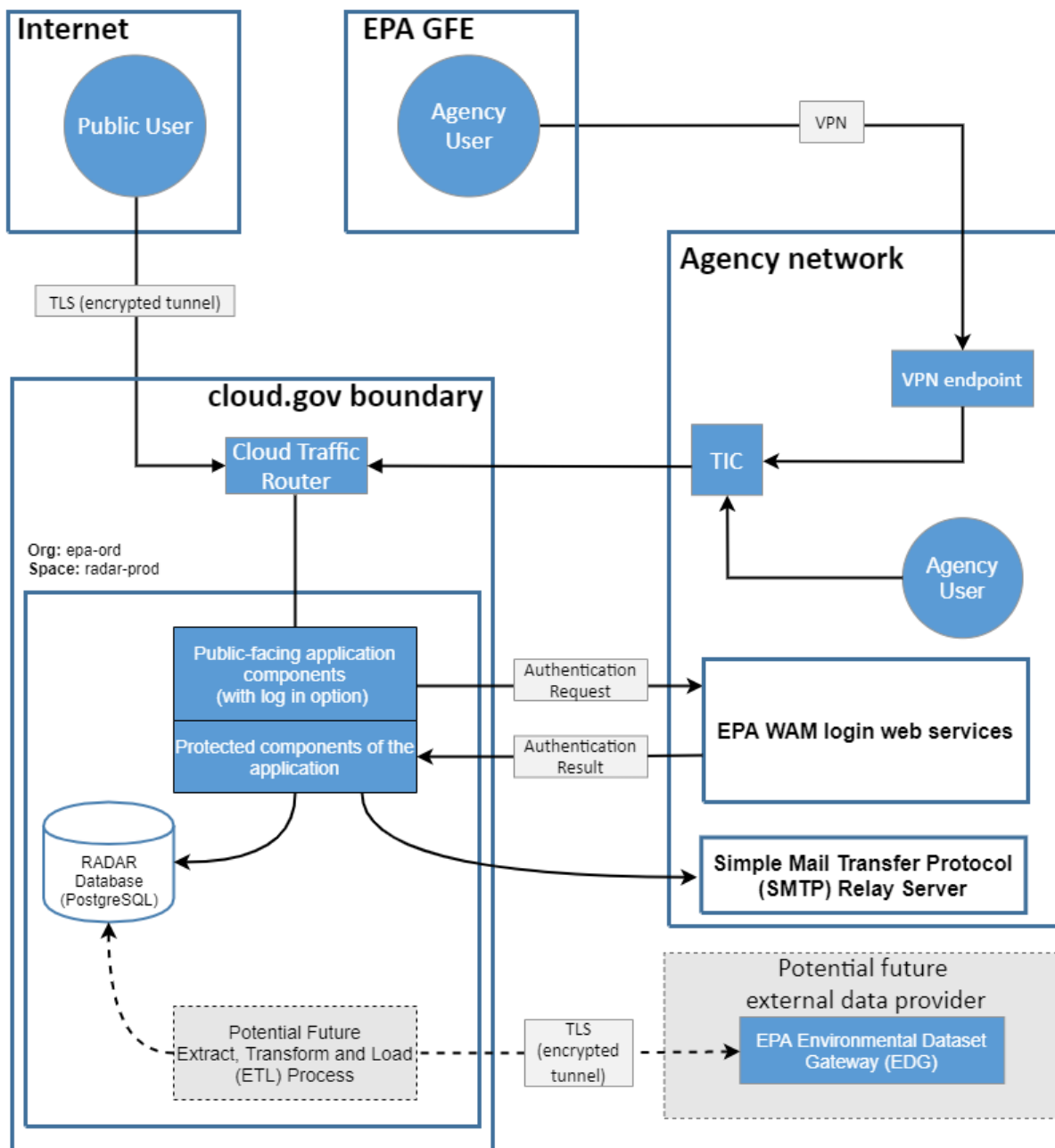


Figure 3. RADAR cloud-level architecture and user authentication.

3.2.1 Non-EPA User Flow

Other emergency response and operational stakeholders (e.g., state, local, other federal agencies) are considered “non-EPA” users. EPA has a standard procedure for granting non-EPA users access to EPA applications that require a login. Described below are procedures used and actions that are available for a non-EPA:

- A user uses their web browser to navigate to the publicly accessible RADAR application.
- The PHP-based cloud.gov server delivers the RADAR client application (HTML, CSS, JavaScript, images.) to the user.
- As the user interacts with the application:
 - For non-authenticated users (i.e., not logged in), the client application invokes application-level web services on the cloud.gov server which retrieves read-only data from the PostgreSQL based database.
 - For authenticated users (i.e., logged in), the application provides additional features (see Chapter 4).

3.2.2 EPA User Flow

The user flow for EPA employees accessing the application is generally same as for non-EPA users with one notable difference. If an EPA user is connected to the EPA network, the web browser to application server communication traverses a Trusted Internet Connection (TIC) route that EPA has established as opposed to going through normal public internet routes. This communication channel does not change how the application behaves.

3.2.3 RADAR User Roles

RADAR institutes several role-based features that are accessible based on roles that are linked to registered users. RADAR user roles are managed via EPA’s Web Access Management (WAM) system. Registered users are those users who have requested access to RADAR via the EPA WAM portal and are able to login to RADAR. The following roles and corresponding capabilities exist within RADAR:

Public Users (No registration required)

- ✓ Search for enabled datasets
- ✓ Cannot link datasets to My Notebook
- ✓ Cannot upload data

Non-EPA Authenticated Users

- ✓ Search for enabled datasets
- ✓ Link datasets to My Notebook
- ✓ Cannot upload data

EPA Users

- ✓ Search for enabled datasets
- ✓ Link datasets to My Notebook
- ✓ Upload datasets
- ✓ Edit datasets until submitted for approval
- ✓ Edit datasets in response to technical and quality assurance (QA) comments

RADAR Technical Reviewer

- ✓ Search for enabled datasets
- ✓ *If not a Technical Reviewer Role, cannot review datasets pending Technical review*
- ✓ Review and comment on dataset metadata and data for datasets with a status of Pending Technical Review
- ✓ Approve datasets and route to RADAR Admin for approval
- ✓ Link datasets to My Notebook

RADAR QA Reviewer

- ✓ Search for enabled datasets
- ✓ *If not a QA Role, cannot review datasets pending QA review*
- ✓ Review and comment on dataset metadata and data for datasets with a status of Pending QA Review
- ✓ Approve datasets and route to RADAR Technical Reviewer for approval
- ✓ Link datasets to My Notebook

<u>RADAR Admin</u>
✓ Approve user “Web Community Access” in WAM portal
○ HSRP Users
○ RADAR Admins
○ RADAR QA Reviewers
○ RADAR Technical Reviewers
✓ Manage “My Groups and Communities” (i.e., User Roles) in WAM portal
✓ Review and comment on dataset metadata and data
✓ Enable datasets for viewing within RADAR
✓ Disable datasets for viewing with RADAR
✓ Search for Enabled Datasets
✓ Link datasets to My Notebook

4 USING RADAR

RADAR offers several features that are available to any user who accesses the application. Figure 4 presents the RADAR home page where primary features are accessed.

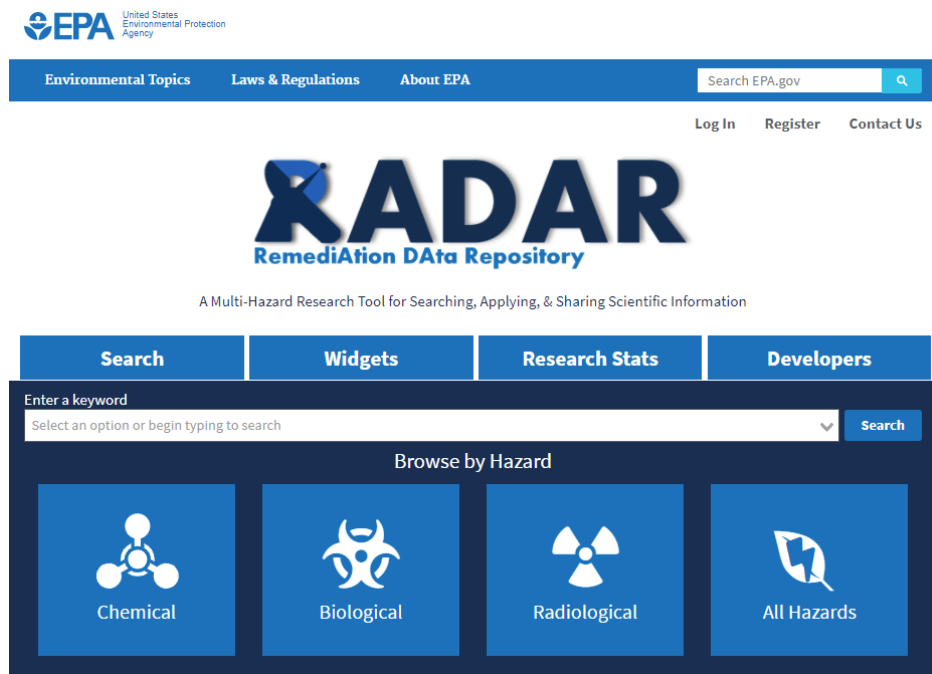


Figure 4. RADAR home page (not logged in).

4.1 Features for all RADAR Users

Features that are accessible by any users and that do not require a registered account or for users to be logged in are described below.

4.1.1 Search

Users can search for research data contained within RADAR by entering a keyword and clicking search. The search box provides an auto-generated pick list based on keywords associated with RADAR datasets, as well as searching against metadata attributes. Alternatively, users can choose from one of RADAR's primary research categories to execute a quick search.

Datasets matching search criteria will be displayed along with descriptive information about each dataset. Figure 5 illustrates an example search results page. Users can click on a hyperlinked dataset title heading in RADAR to view the dataset.

The screenshot displays the EPA RAdAR Remediation Data Repository interface. At the top, there's a navigation bar with links to Environmental Topics, Laws & Regulations, and About EPA, along with a search bar for EPA.gov. Below this is the RAdAR logo and a secondary navigation bar with Search, Widgets, Research Stats, and Developers. A search input field is present with a dropdown menu. The main content area shows 'Search Results' with a 'Total count: 2 results' indicator. Two results are listed:

- Remediation of Contaminated Areas in the Aftermath of the Accident at the Fukushima Daiichi Nuclear Power Plant: Overview, Analysis and Lessons Learned Volume 1: A Report on the "Decontamination Pilot Project"**
 - Japan Atomic Energy Agency Decontamination Pilot Project report
 - Publication Type: Primary Data
 - Date Last Modified: 2017-06-20
 - Reference: Shinichi Nakayama, Keiichi Kawase, Susan Hardie, Shoko Yashio, Kazuki Iijima, Ian McKinley, Kaname Miyahara, Liza Klein (2014). Remediation of Contaminated Areas in the Aftermath of the Accident at the Fukushima Daiichi Nuclear Power Plant: Overview, Analysis and Lessons Learned Volume 1: A Report on the "Decontamination Pilot Project"
 - Keywords: Chemical, Decontamination, Critical Infrastructure, Decontamination, Mitigation, Waste Disposal
 - Category: Primary Data, Incident Response
- Compendium of Spore Decontamination Methods**
 - Database of spore decontamination methods from published literature.
 - Publication Type: Report
 - Date Last Modified: 2015-05-01
 - Reference: Adrion, A.C., Lee, S. (2017). Compendium of Spore Decontamination Methods.
 - Keywords: Biological, Decontamination, Characterization, Decontamination, Methods, Waste Management, Waste Treatment
 - Category: Report, Literature Review

Figure 5. Example search results.

4.1.2 View and Interact with Datasets

Users can view and interact with datasets accessed from search results. As shown in Figure 6, the following interactive features are available for each dataset:

- **Download Data** – Download a .CSV or .XLSX format of the dataset.
- **Share Data** – Copy a shareable URL of the direct link to the dataset page.
- **Access the Application Programming Interface (API)** – Access information and hyperlinks that provide direct access to a dataset's metadata and data in JSON format.
- **Customize Columns** – Control the visibility of columns that are displayed on screen.
- **Switch Data Table Views** – Toggle between the default and a wider view of the data table.
- **Filter the Table** – Search and isolate records that match user-defined text.
- **Table Sorting and Pagination** – Control the sort order of individual columns in the table and page through records.

Biological Decontamination Compendium									
<div> Download Share API </div>									
Description: A compendium of research and efficacy results on various materials to decontaminate a biological agent									
Project Type: Literature Review									
Reference: U.S. Environmental Protection Agency, "Biological Decontamination Compendium" Office of Research and Development, Washington, DC, March 2021.									
Publication Type: Report									
Date Last Modified: 2021-03-01									
Keywords: Biological, Decontamination, Building, Data, Methods									

Customize Columns	Wide View	chlorine	Search
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SourceID	Decon Application Method	Surface	Loading	Loading Units	Decon Agent Dose Conc	Decon Agent Dose Conc Units	DeconAgent	Volume Applied Units	Contact Time Min
706	liquid suspension	Phosphate Buffer	10000	CFU/cm^3	0		brief simulated sunlight		70.049813200498
703	liquid suspension	Phosphate Buffer	10000	CFU/cm^3	0		brief simulated sunlight		0
705	liquid suspension	Phosphate Buffer	10000	CFU/cm^3	0		brief simulated sunlight		45.765877957659
704	liquid suspension	Phosphate Buffer	10000	CFU/cm^3	0		brief simulated sunlight		22.727272727273
2819	fumigation	Ceiling Tile	5917159.7633136	CFU/cm^2	0.0015	g/mL	chlorine dioxide		540
2695	liquid spray	Wood	7017543.8596491	CFU/cm^2	0.0004	g/mL	chlorine dioxide	mL/cm^2	10

«	<	1	2	3	4	5	6	7	8	9	10	...	>	»
---	---	---	---	---	---	---	---	---	---	---	----	-----	---	---

Displaying 1 through 100 of 1556 records

Figure 6. Dataset view.

4.1.3 Widgets

Widgets use data stored in RADAR and provide additional features (e.g., filters) to analyze data to aid in decision making. In the future, RADAR users may be able to create custom widgets and filtered views to support analyses and/or better connect related research. Users can click the Widgets tab as shown in Figure 7 below and select a widget to view.

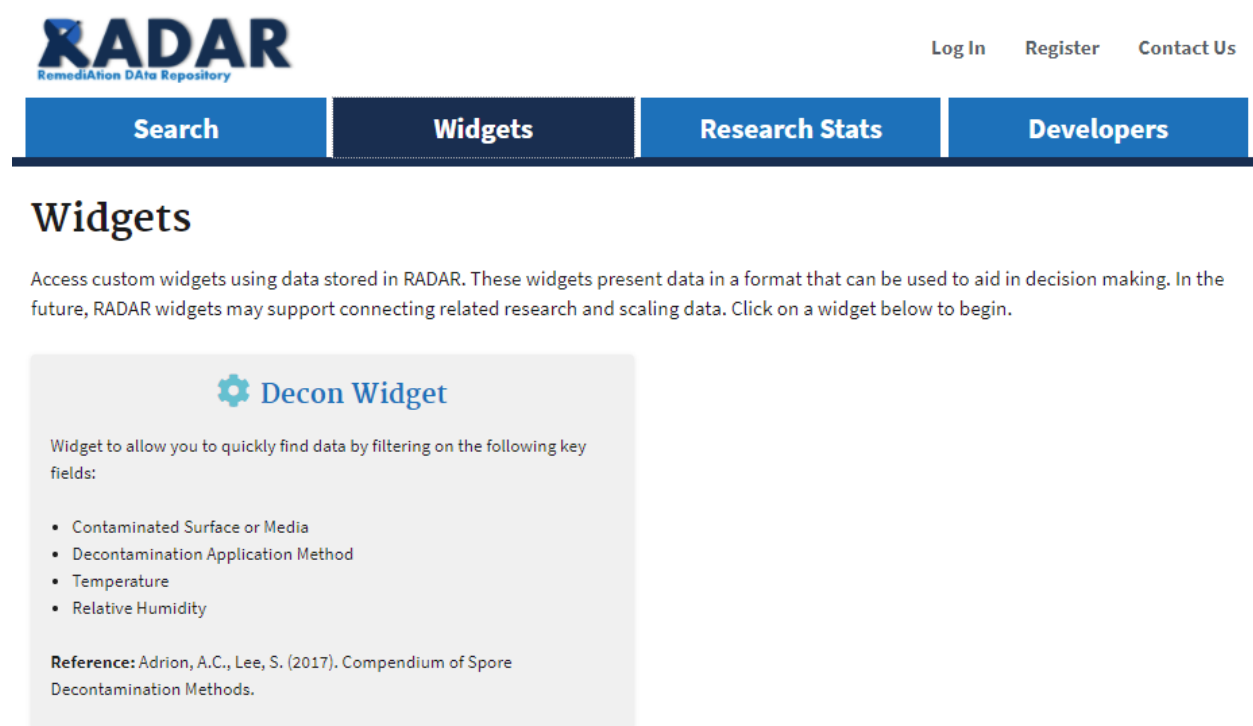


Figure 7. Example RADAR widget.

4.1.4 Research Stats

Research Stats serves as a visual reference indicating the availability and distribution of research data that are stored in RADAR. Figure 8 displays an example chart. Users can analyze this information to gain a better understanding of available data, as well as data gaps.

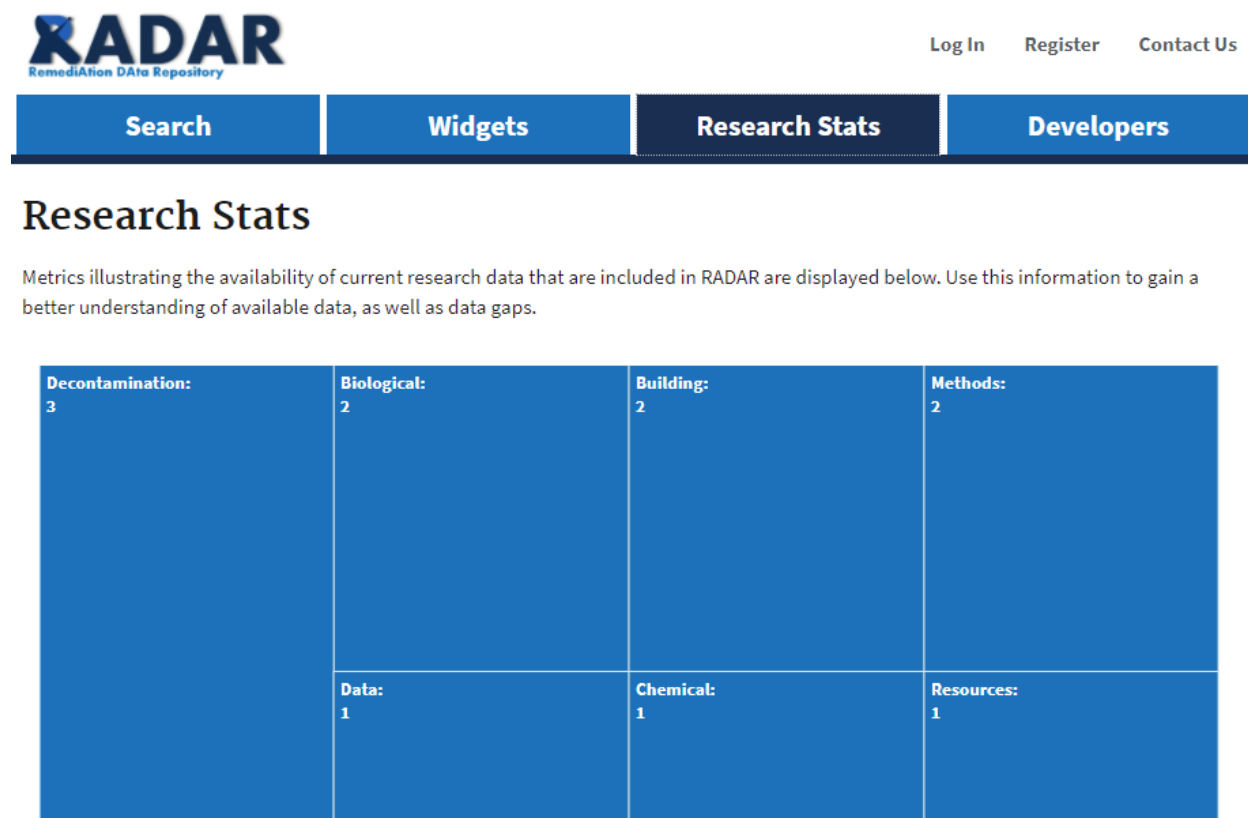


Figure 8. Example RADAR research stats.

4.1.5 Developers

Developers can leverage RADAR's API to share data with other applications. With this feature, users can directly access data stored in RADAR using public web services for use in their applications. RADAR provides a collection of "GET" or query-only RESTlike (REpresentational State Transfer) services, available through a simple URL HTTP link and provides output in JSON format. Figure 9 presents the RADAR API Documentation page.

RADAR API Documentation

Share data with other applications using RADAR's application programming interface (API). With this feature, users will be able to directly access data stored in RADAR for use in their applications.

Servers

<https://radar.epa.gov/api/v1> - RADAR API Server

Datasets API endpoints related to RADAR datasets



Schemas



```
Dataset {
  description: Dataset model including metadata collected from RADAR

  id          string($uuid)
  doi         string
              Hyperlink to published dataset's Digital Object Identifier (DOI), if available

  title       string
  description  string
  keywords    string
  dateIssued  string($date)
  dateModified string($date)
}
```

Figure 9. RADAR API documentation for developers.

4.2 Features for Registered Users

Features that require registering for a RADAR account are described in this section, along with instructions for both registering and logging into RADAR. RADAR administrators will use standard EPA WAM group functionality to approve user account requests.

4.2.1 Register for a RADAR Account

Users can register for a RADAR account by clicking the Register link at the top of the RADAR webpage and following the instructions on the page. For users that already have an EPA Local Area Network (LAN ID), a request should be made to be added to the HSRP Communities/HSRP Users group. For users without an existing EPA account, should follow instructions to self-register and provide the EPA sponsor information as shown on the page (and in Figure 10 below).

Register

You must register to the HSRP Users group before using certain RADAR features.

If you already have an EPA account

To request access to the HSRP Users group:

1. Go to [Web Application Access](#), and log in with your EPA LAN or Web Application Access ID and password.
2. After you've logged in, go to Community Access » Request Web Community Access.
3. Check the box for the HSRP Users group, and click on Request Access.

You will receive an acknowledgment email within a few minutes. A follow-up email approving or denying your request, or requesting more information, will be sent within about a day.

If you don't have an EPA account

You can request an EPA account with membership in the HSRP Users community. Go to [Web Application Access](#), and click the Self Register link. Fill in these values at the top of the form:

Form Field	Value
EPA Contact Name	Timothy Boe
EPA Contact's Email Address	boe.timothy@epa.gov
EPA Contact's Phone Number	919-541-2617

1. Under "Select the Community or Application", choose "HSRP Users".
2. Fill in your information in the remaining fields.
3. Submit the form.

You will receive an acknowledgment email within a few minutes. A follow-up email approving or denying your request, or requesting more information, will be sent within about a day.

Figure 10. RADAR register page.

4.2.2 Login to RADAR

Users can access additional RADAR features by clicking the Log In link and entering the credentials provided when they registered for RADAR access. Figure 11 illustrates the EPA Web Application Access login screen where users will enter their EPA LAN ID and password.

EPA United States Environmental Protection Agency

EPA Web Application Access Login

Welcome to the EPA Web Application Access

A gateway for authorized users to find, request access and manage EPA tools, applications and communities. If you have an EPA LAN account, log in using LAN account user id and password. If you do not have an EPA LAN account, you will need to [Self Register](#) for an account.

User ID

Password

Login

[Forgot your user-id or password \(external users only\)?](#)

Warning Notice

1. This is a United States Environmental Protection Agency (EPA) computer system, which may be accessed and used only for official Government business.
2. Unauthorized access or use of this system may subject violators to criminal, civil, and/or administrative action.
3. All information on this computer system may be monitored, recorded, read, copied, and disclosed by and to authorized personnel for official purposes, including law enforcement.
4. Access or use of this computer system by any person, whether authorized or unauthorized, constitutes consent to these terms.

Clicking the Login button constitutes consent to these terms.

Figure 11. RADAR login screen (EPA web application access gateway).

Figure 12 presents the home page for RADAR following a successful login. Additional features provided include:

- My Notebook, and
- Upload Data⁴.

⁴ Only EPA and EPA-sponsored affiliates can upload and submit data to include in RADAR.

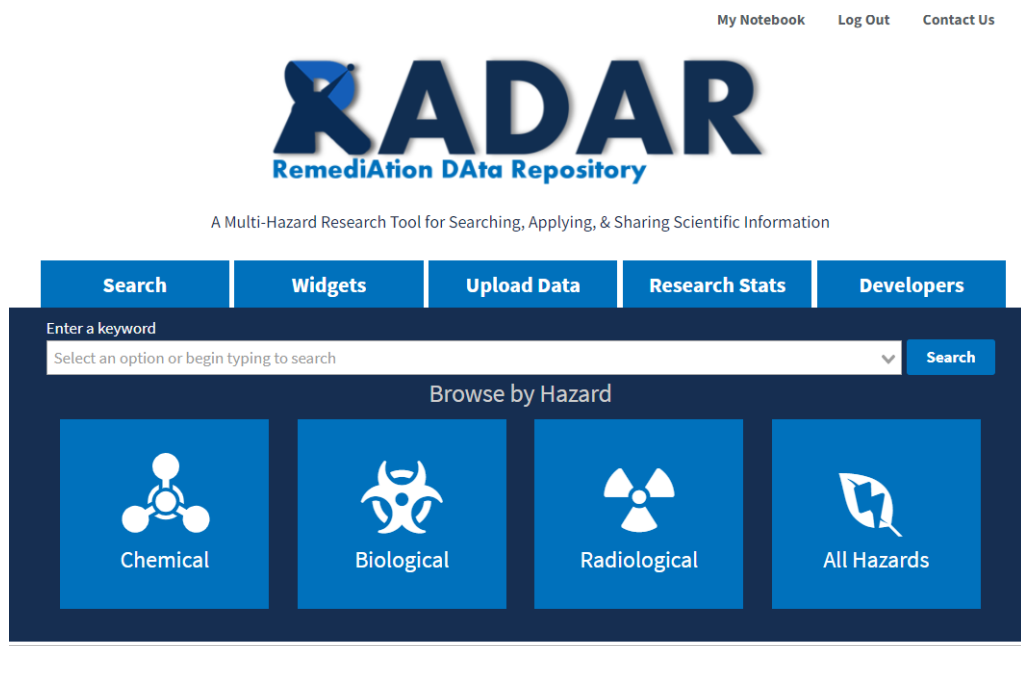


Figure 12. RADAR home page (logged in).

4.2.3 My Notebook

My Notebook provides a feature for users to bookmark or save datasets of interest. Registered users that are logged in are presented with additional features. From RADAR search results, users can choose datasets to include in their notebook by checking the “Add to Notebook” checkbox as shown in Figure 13.

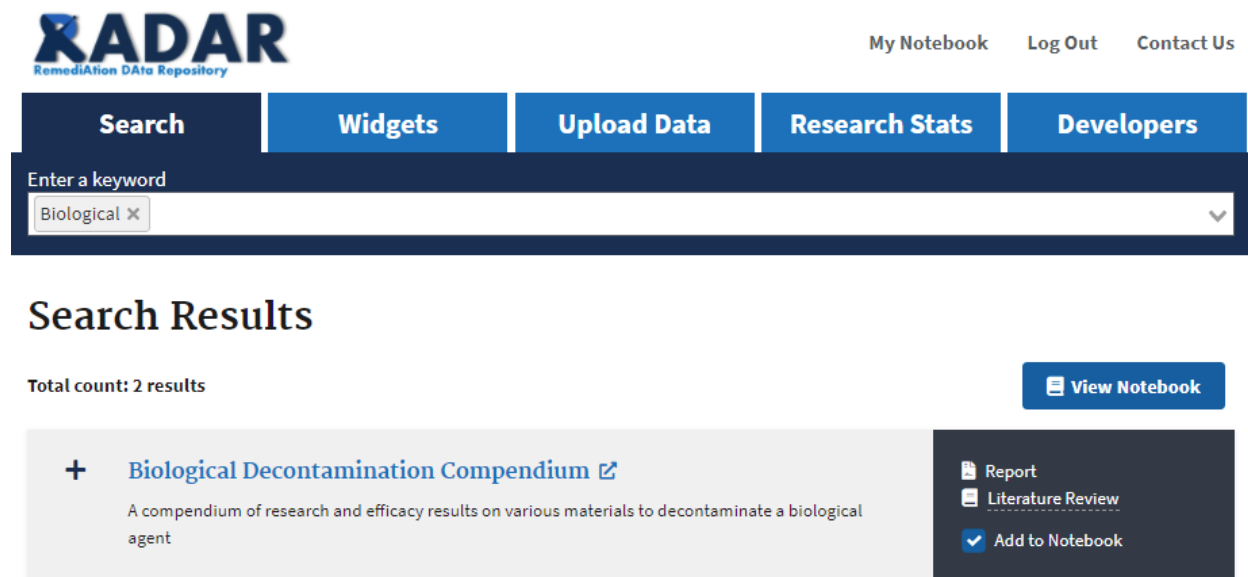


Figure 13. Search results – add to notebook.

Clicking the View Notebook button or My Notebook link at the top of the webpage will display a table with basic metadata for selected datasets. As shown in Figure 14, individual datasets can be accessed directly by clicking the hyperlinked dataset title name. Users can simply click the “Remove” button to remove a dataset from their notebook.

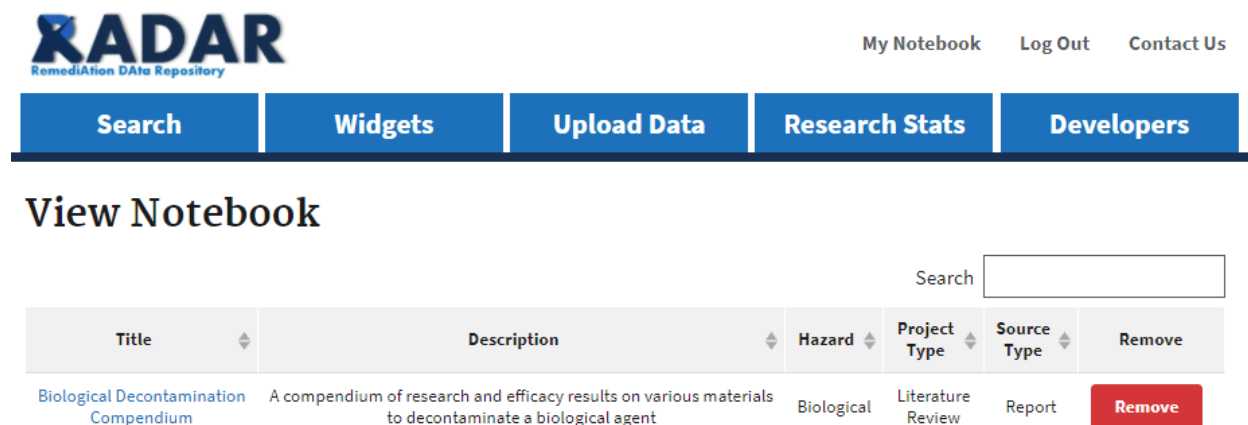


Figure 14. View notebook

4.2.4 Upload Data

EPA staff that has registered for the HSRP Communities/HSRP Users WAM group and EPA-sponsored affiliate users (e.g., contractors with EPA credentials) can upload and submit data to include in RADAR. Once approved, these data are shared with other RADAR users and applications. Chapter 5 provides detailed instructions for uploading data to RADAR.


5 UPLOAD DATA TO RADAR

Detailed instructions are provided in this section to successfully upload and request that data be included in RADAR.

5.1 Upload Data

To upload data to RADAR, the following three criteria must be met:

- Be an EPA user,
- Have an approved HSRP user account, and
- Be logged into RADAR.

 You must be logged in to access the Upload Data tab.

From the RADAR homepage, users can click the Upload Data tab as shown in Figure 12 to add their data to RADAR. The Upload Data page will be displayed as shown in Figure 15. Users have the option to upload a new dataset or manage their existing datasets. Users can click Start a new dataset upload to add a new dataset.

Upload Data

Upload custom data to RADAR. Once approved, these data are shared with other RADAR users and applications. Start a new upload, or select an action from an existing dataset below.

 **Start a new dataset upload**

Getting Started

- [Upload Data Overview](#)
- [Data Formatting Requirements](#)
- [Review and Approval Process](#)

My Existing Datasets

Title	Upload Date	Status	Actions
-------	-------------	--------	---------

No datasets available. Start a new upload to continue.

Figure 15. RADAR upload data page.

5.2 Start a New Dataset Upload

Metadata requirements must be fulfilled when adding data to RADAR. RADAR metadata requirements comply with the [Project Open Data Metadata Schema](#) that is used by the Environmental Data Gateway (EDG) (See: [Metadata Technical Specification](#) for non-geospatial data) and also include additional metadata fields that are unique to RADAR to support application search functionality. For instances where datasets might already be published with an activated Digital Object Identifier (DOI), RADAR provides users with the option to retrieve existing metadata; otherwise, data entry prompts for required fields are presented for completion.

5.2.1 Find / Enter Metadata

RADAR will pre-populate metadata from EDG if the dataset has already been published with an activated DOI. Different data entry options are presented based on the following scenarios:

- Whether a dataset has a DOI,
- Whether a dataset is derived from a published EPA Report, or
- Whether a dataset only has an approved QAPP.

5.2.1.1 Dataset with a Digital Object Identifier (DOI)

As shown in Figure 16, RADAR will first prompt users for the existence of a DOI on the Find Metadata tab.

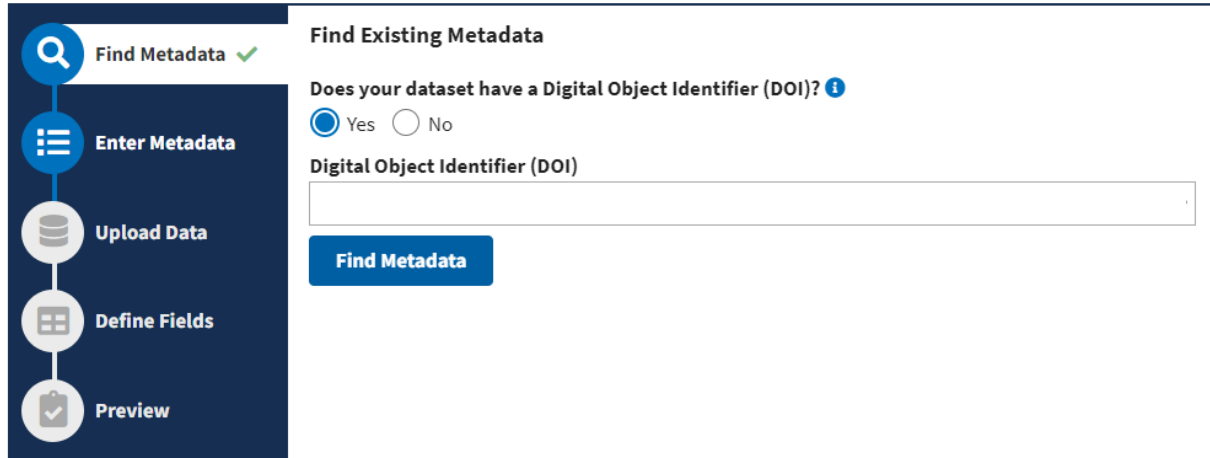


Figure 16. Find metadata form - DOI question.

If a dataset has a DOI:

- Select Yes in response to the question: Does your dataset have a Digital Object Identifier (DOI)?
- Type the DOI into the search bar and click Find Metadata
- If the DOI is valid, RADAR will display a message as shown in Figure 17 and automatically populate the relevant metadata into the Enter Metadata page.

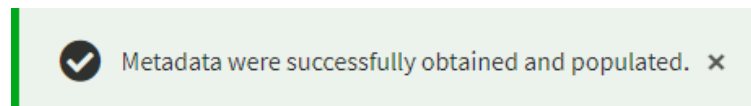


Figure 17. Successful metadata import prompt.

On the Enter Metadata tab, the following metadata will be populated as shown in the example in Figure 18:

- Title,
- Description,
- Date Last Modified,
- Access Level,
- Keywords,
- Publisher,
- Contact Name,
- Bureau Code, and
- Program Code.

The screenshot shows a web interface for entering dataset metadata. On the left is a dark blue sidebar with five icons and labels: 'Find Metadata' (magnifying glass), 'Enter Metadata' (list icon), 'Upload Data' (database icon), 'Define Fields' (table icon), and 'Preview' (checkmark icon). The main content area is titled 'Enter Dataset Metadata' and includes a light blue banner stating 'All fields are required unless noted as optional.' Below this is a section 'Project Open Data Fields' with a help icon. The form fields are as follows:

- Title:** Wash Down Data Set
- Description:** These data are of spore removal from an asphalt parking lot using a power washer and garden hose and different wash aids.
- Date Last Modified:** 06/07/2021
- Access Level:** Public (in a dropdown menu)
- Keywords:** Bacillus anthracis, Decontamination, pressure washing (in separate input boxes)
- Publisher:** U.S. EPA Office of Research and Development (ORD)
- Contact Name:** Anne Mikelonis
- Bureau Code:** Environmental Protection Agency - General Services Administration (in a dropdown menu)
- Program Code:** Environmental Protection Agency - (Primary Program Not Available) (in a dropdown menu)

Figure 18. Imported project open data metadata fields from DOI search.

Enter RADAR-Specific Metadata

The following additional metadata to support RADAR functionality needs to be entered next as shown in Figure 19:

- QA Activity Number (optional),
- Hazard type (select one),
- Primary Topic (select one),
- Secondary Topic(s) (choose at least one),
- Short Description,
- Citation,
- Project Type (select one), and
- Source Type (select one).

RADAR Fields

QA Activity Number *(optional)*

Hazard

☐ Biological
 ☐ Chemical
 ☐ Radiological
 ☐ All Hazards

Primary Topic

☐ Characterization
 ☐ Data
 ☐ Decontamination
 ☐ Mitigation
 ☐ Resources
 ☐ Tools
 ☐ Waste Management

Secondary Topic(s)

Short Description

Citation

Project Type

☐ Field Exercise
 ☐ Lab Experiment
 ☐ Literature Review
 ☐ Incident Response

Source Type

☐ Primary Data
 ☐ Report

Figure 19. RADAR required metadata fields following DOI import.

After entering information in these fields, users click Submit Metadata and a prompt will be displayed stating that the metadata were successfully submitted. RADAR will display a validation message if any required fields are left blank. Users can then move on to the Upload Data tab.

5.2.1.2 Dataset with an EPA Report Number and no DOI

If the dataset does not have a DOI, users will be prompted to enter the EPA Report Number as shown in Figure 20.

Figure 20. Find metadata form - EPA report number.

If a dataset is derived from a published EPA Report and does not have a DOI:

- Select No in response to the question: Does your dataset have a Digital Object Identifier (DOI)?
- Select Yes in response to the question: Is your dataset associated with an EPA Report Number?
- Enter the EPA Report Number in the text box and click Continue.

Figure 21 presents the corresponding view of the Enter Metadata tab where users will enter the following metadata⁵:

Enter Project Open Data Fields

- Title,
- Description,
- Date Last Modified,
- Access Level,
- Publisher,
- Contact Name,
- EPA Bureau Code (pre-populated), and
- Program Code.

Enter RADAR-Specific Metadata

The following additional metadata to support RADAR functionality will need to be entered next:

- QA Activity Number (optional),

⁵ Note: The Project Open Data “keywords” metadata field will be automatically populated with the RADAR keywords that are selected.

- Hazard type (select one),
- Primary Topic (select one),
- Secondary Topic (choose at least one),
- Short Description,
- Citation,
- Project Type (select one), and
- Source Type (select one).

Find Metadata ✓

Enter Metadata

Upload Data

Define Fields

Preview

Enter Dataset Metadata

[Project Open Data Fields ?](#)

Title

Description

Date Last Modified

Access Level

☒ Public ☐ Restricted Public ☐ Non-Public

Publisher

Contact Name

Bureau Code

Program Code

RADAR Fields

QA Activity Number *(optional)*

Hazard

☐ Biological ☐ Chemical ☐ Radiological ☐ All Hazards

Primary Topic

☐ Characterization ☐ Data ☐ Decontamination ☐ Mitigation ☐ Resources ☐ Tools ☐ Waste Management

Secondary Topic(s)

Short Description

Citation

Project Type

☐ Field Exercise ☐ Lab Experiment ☐ Literature Review ☐ Incident Response

Source Type

☐ Primary Data ☐ Report

Submit Metadata

Figure 21. Enter dataset metadata form – no DOI.

After entering information in these fields, users can click Submit Metadata and a prompt will be displayed stating that the metadata were successfully submitted. Users can then move on to the Upload Data tab. RADAR will display a validation message if any required fields are left blank.

5.2.1.3 Dataset with Only an Approved QAPP

If a DOI or EPA Report Number is not available, users will be prompted to enter additional QA information, including a QA Activity Number as shown in Figure 22. This QA information will be routed to an EPA QA Manager to streamline verification that data meet QA requirements prior to publishing within RADAR.

Find Existing Metadata

Does your dataset have a Digital Object Identifier (DOI)? ?

☐ Yes ☒ No

Is your dataset associated with an EPA Report Number?

☐ Yes ☒ No

Does your dataset have an approved Quality Assurance Project Plan?

☒ Yes ☐ No

QA Activity Number

QA Manager

Date Approved

mm/dd/yyyy

Continue

Figure 22. Find existing metadata form – quality assurance information.

If a dataset is associated with an approved QAPP but a DOI or EPA Report Number is not available, users need to enter the following information:

- Select No in response to the question: Does your dataset have a Digital Object Identifier (DOI)?
- Select No in response to the question: Is your dataset associated with an EPA Report Number?
- Select Yes in response to the question: Does your dataset have an approved Quality Assurance Project Plan?

- Enter the QA Activity Number, the QA Manager's name, and the date approved (see Figure 22).

Users should then enter the following metadata on the Enter Metadata tab (refer to Figure 21):

Enter Project Open Data Fields

- Title,
- Description,
- Date Last Modified,
- Access Level,
- Publisher,
- Contact Name,
- EPA Bureau Code (pre-populated), and
- Program Code.

Enter RADAR-Specific Metadata

The following additional metadata to support RADAR functionality will be entered next:

- QA Activity Number (optional),
- Hazard type (select one),
- Primary Topic (select one),
- Secondary Topic (choose at least one),
- Short Description,
- Citation,
- Project Type (select one), and
- Source Type (select one).

After entering information in these fields, users click Submit Metadata and a prompt will be displayed stating that the metadata were successfully submitted. Users can then move on to the Upload Data tab. RADAR will display a validation message if any required fields are left blank.

If the dataset does not have a DOI, EPA Report Number, or QAPP, a prompt will alert the user that they must contact their QA Manager to continue as shown in Figure 23.

Find Existing Metadata

Does your dataset have a Digital Object Identifier (DOI)? i
☐ Yes ☒ No

Is your dataset associated with an EPA Report Number?
☐ Yes ☒ No

Does your dataset have an approved Quality Assurance Project Plan?
☐ Yes ☒ No

Stop
Contact your Quality Assurance (QA) Manager to review secondary data QA requirements and assure adherence to quality procedures to include your dataset in RADAR.

[Exit Data Upload](#)

Figure 23. Find existing metadata form -- QAPP requirement alert.

5.2.2 Upload Dataset

Once the required metadata are entered and successfully pass validation, users can now submit a file to upload that conforms to the following specifications (via the Upload Data tab):

- File type of XLSX or CSV.
- File size below 50MB.
- Data must have 200 or fewer data fields (columns).
- Data must be in a flat table format (i.e., single table) with field headers as the first row.

Note: Only the first tab of an XLSX workbook will be imported.

Users can either drag the file into the browser window or click Choose from folder and select the file from a navigation window. Upon initial upload, the data file will be scanned to confirm that the file does not contain a virus, is in the correct format, and meets the specific file size limit. Figure 24 illustrates a successful pending file upload.

Find Metadata ✓

Enter Metadata ✓

Upload Data ✓

Define Fields

Preview

Upload Dataset

Upload a data file with the following requirements:

- File type of XLSX or CSV.
- File size below 50MB.
- Data must have 200 or fewer data fields.
- Only the first tab of an XLSX workbook will be imported.
- Data must be in a flat table format with field headers as the first row.

Upload dataset file

Selected file [Change file](#)

CSV BioDecon_Compendum_RADAR_Upload.xlsx

Figure 24. Dataset upload form following successful validation.

When a file successfully passes RADAR’s validation checks, a prompt will appear stating that the file was successfully uploaded as shown in Figure 25 (a green checkmark will be displayed once an individual step is completed). Users will be presented with the Define Fields tab.

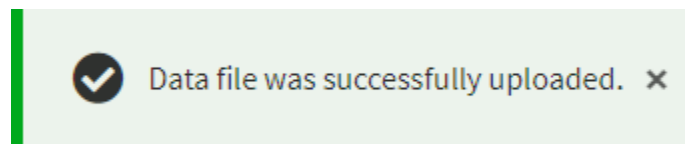


Figure 25. Prompt after successful dataset upload.

5.2.3 Define Fields

When uploading data to RADAR, RADAR requires that users specify additional details for each data field. RADAR will display a new form that is dynamically generated based on the data file that was uploaded. A listing of all fields included in the uploaded dataset will be displayed as shown in the example in Figure 26.

💡 Users are encouraged to gather this information in advance, ideally using descriptions that are already cleared for release. Users should refer to the companion spreadsheet template to help them organize required information, Appendix A – RADAR Data Upload Template.

Define Fields

Descriptions are required for all data fields.

Name	Display Name	Data Type	Default?	Description
SourceID	SourceID	Text	<input checked="" type="checkbox"/>	Original Source Identifier
Reference	Source Reference	Text	<input checked="" type="checkbox"/>	Source Reference
AppMethod	AppMethod	Text	<input checked="" type="checkbox"/>	Decontamination application method
Surface	Surface	Text	<input checked="" type="checkbox"/>	Surface
Loading	Loading	Text	<input checked="" type="checkbox"/>	Target number of spores the surface is initially
LoadingUn	Loading Units	Text	<input checked="" type="checkbox"/>	Units of the Loading

Submit Field Definitions

Figure 26. Define fields form.

Additional information describing each data field needs to be entered, including:

- **Name:** Auto-populated based on the column heading supplied in the source file.
- **Display Name** (optional): Enter a more user-friendly column display name. If there is no display name provided, RADAR will use the Name field.
- **Data Type** (required): Indicate the data type of each data field. Text is selected by default. Selection options include:
 - Text – any combination of characters, up to 65,000 characters,
 - Integer – any whole number, positive or negative, or
 - Number – any number that requires accuracy beyond an integer.
- **Default?:** Checked by default. Users can determine which data fields should be visible/hidden from the default dataset view when viewed from within RADAR. Users can adjust column visibility settings to alter the default view presented.

Note: Users' progress will not be saved if they navigate away from the Define Fields tab. before

- **Description** (required): Enter the description of the data field to aid interpretation and use of the data by other researchers. The descriptions will be carried forward into data presentation and download files associated with the dataset.

Users need to click Submit Field Definitions to save their entries and continue to the next step. RADAR login sessions will expire after 15 minutes of inactivity with the server. Given that it could take some time to finish entering dataset attribute information, RADAR will alert users when three minutes remain in their active session as shown in Figure 27. Clicking Continue will reset the session timer to allow users more time to complete their work.

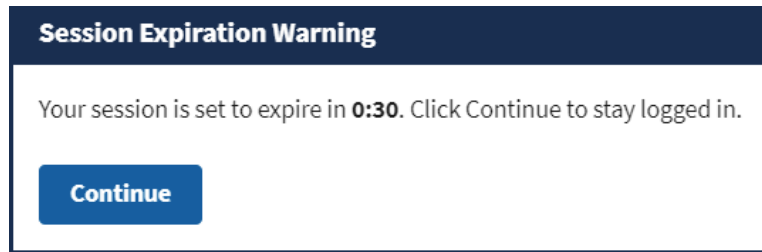


Figure 27. RADAR session expiration warning.

Once the Submit Field Definitions button is clicked, the user moves to the Preview tab. A preview of the first 10 rows of the dataset will appear. Users should verify that the information appears correct. Users can review an expanded version of the dataset by accessing the dataset data page shown at the top of Figure 28. Users should click Submit Dataset for Review as shown in Figure 28 when they are satisfied with their entries.

Find Metadata ✓

Enter Metadata ✓

Upload Data ✓

Define Fields ✓

Preview

Preview and Finalize

i The preview below only contains the first 10 rows of data for fields marked as default. Navigate to the [dataset data page](#) for a full preview.

SourceID	Source Reference	AppMethod	Surface	Loading	Loading Units	LPosRec	Coupon Area
97	Schnabel 2014 Inactivation of Vegetative Microorganisms and Bacillus atrophaeus Endospores by Reactive Nitrogen Species (RNS)	fumigation	Glass Bottle Interior	40000	CFU/cm^3		250
	Schnabel 2014 Inactivation of Vegetative Microorganisms						

Submit Dataset for Review

Figure 28. Dataset preview after dataset upload is complete.

RADAR will prompt users one last time to confirm that their dataset is finalized as shown Figure 29. Users should click Submit Dataset for Review again, and RADAR will trigger the Review process described in the following section. If users need to review the dataset again, then they can click Cancel.

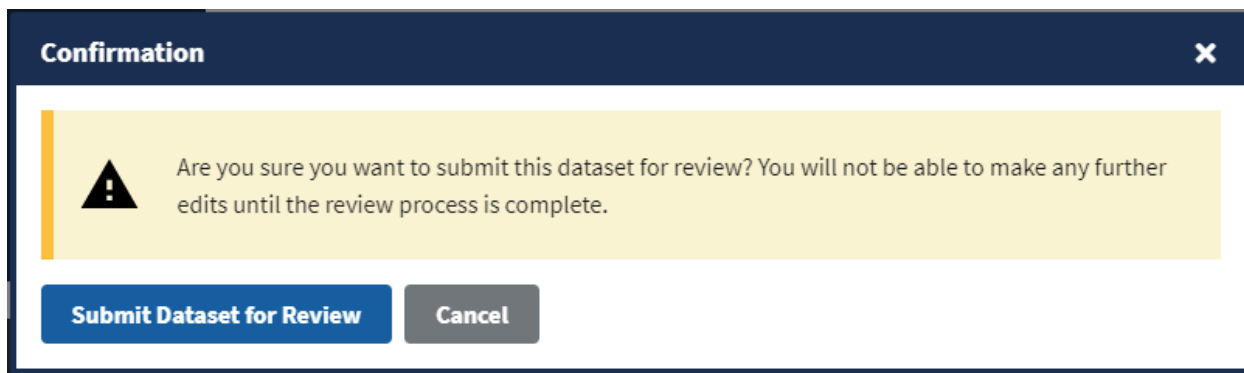


Figure 29. Dataset upload confirmation.

5.2.4 Dataset Review Process

After a dataset is uploaded, RADAR requires that the dataset be reviewed and approved prior to the dataset becoming discoverable in RADAR. Figure 30 illustrates the overall workflow of the dataset review process. The sequence of reviews depends on whether the dataset has a DOI, EPA Report Number, or QA Activity Number as specified when uploading the dataset. RADAR notifies reviewers and administrators accordingly as datasets are queued for review and approval.

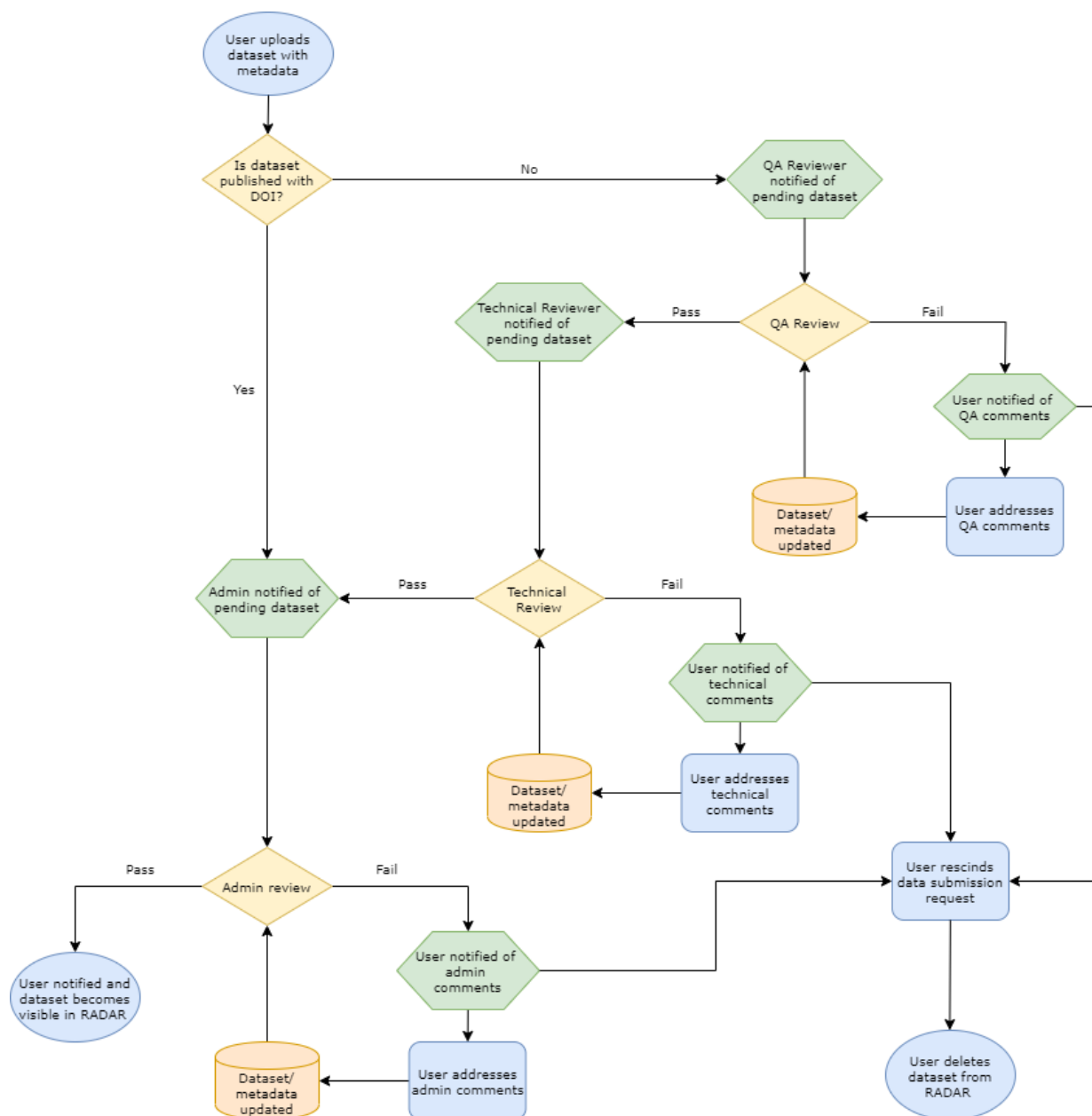


Figure 30. Dataset review process workflow.

Reviewers can add comments next to any metadata field or dataset field. They can also add an overall comment for anything that is not specific to a field for the user who contributed the data to resolve. If comments are added and changes are required, the RADAR reviewer or administrator can send comments back to the user for resolution. The dataset will remain pending until RADAR review or administrator comments are satisfied. Should a user choose not to address comments, users can rescind the dataset submission and delete the dataset from RADAR.

RADAR provides a notification alert to any pending actions that require a user's attention. When a RADAR user navigates to Upload Data area, a table is displayed that presents their datasets along with statuses and actions as shown in Figure 31. Datasets can have the following statuses:

- Incomplete
- Pending QA Review
- Pending Technical Review
- Pending Admin Review
- Denied
- Approved

Datasets marked as incomplete will include an action to continue the dataset submittal process, which will link to the Data Upload form where fields already entered are pre-filled. As shown in Figure 31 below, an outstanding action to Address Comments on a pending dataset is displayed. Users should click Address Comments to view and resolve reviewer comments. Selecting the Address Comments button opens the submittal form displaying comments that must be addressed prior to advancing through the review sequence.

The screenshot shows the RADAR (Remediation Data Repository) interface. At the top, there's a navigation bar with the RADAR logo, a 'Pending Actions' alert, and links for 'My Notebook', 'Log Out', and 'Contact Us'. Below this is a secondary navigation bar with tabs for 'Search', 'Widgets', 'Upload Data' (which is active), 'Research Stats', and 'Developers'. The main content area is titled 'Upload Data' and includes a brief description: 'Upload custom data to RADAR. Once approved, these data are shared with other RADAR users and applications. Start a new upload, or select an action from an existing dataset below.' A prominent blue button says 'Start a new dataset upload'. To the right, a 'Getting Started' sidebar lists links for 'Upload Data Overview', 'Data Formatting Requirements', and 'Review and Approval Process'. Below the description, the 'My Existing Datasets' section features a table with columns: Title, Upload Date, Status, and Actions. The table contains one entry: 'Biological Decontamination Compendium' with an upload date of '03/12/2021 06:03 pm' and a status of 'Denied'. An 'Address Comments' button is visible next to this entry.

Title	Upload Date	Status	Actions
Biological Decontamination Compendium	03/12/2021 06:03 pm	Denied	Address Comments

Figure 31. Example dataset with pending comments.

Users will be returned to the Data Upload form where previously submitted data elements will be pre-populated along with any reviewer comments as shown in Figure 32. Review comments could appear in both the Enter Metadata and Define Fields tabs depending on which data elements a reviewer provided comments.

Enter Dataset Metadata

QA Review Metadata Comment

Please update format of the citation

- Reviewed by galloway.devin@epa.gov, 2021-03-12T19:38:14.000000Z

Figure 32. Example reviewer metadata comments.

Users can update any field that requires attention and then resubmit. Resubmitting will alert the reviewer of a pending dataset, where the reviewer can verify whether comments were satisfactorily addressed. Reviewers will then either approve the dataset or add additional comments for resolution. This review cycle will incrementally continue until all comments are addressed from all reviewers.

Once no comments remain or if the initial dataset entry does not require revisions, the RADAR Admin will approve the dataset for inclusion in RADAR. After approval, the dataset will be visible to all RADAR users.

Note: Should a dataset be denied (i.e., returned to the user for further review) or if a user would find it easier to start over, users can delete any dataset with a status of Denied or Incomplete. If datasets are pending reviews, no additional action can be taken by the user who contributed the data until a reviewer returns the dataset. If a dataset is approved, only a RADAR Admin can disable a dataset from view with RADAR.

6 REVIEWING AND APPROVING DATASETS

RADAR users who have at least one of the following three roles also have access to additional features to review and approve datasets submitted for inclusion in RADAR:

RADAR QA Reviewer Activities

- ✓ Review and comment on dataset metadata and data
- ✓ Approve datasets and route to RADAR Technical Reviewer for approval

RADAR Technical Reviewer Activities

- ✓ Review and comment on dataset metadata and data
- ✓ Approve datasets and route to RADAR Admin for approval

RADAR Admin Activities

- ✓ Review and comment on dataset metadata and data
- ✓ Enable datasets for viewing within RADAR
- ✓ Disable datasets for viewing with RADAR

As discussed in Section 5.2.4 and illustrated in Figure 30, the overall workflow of the dataset review process depends on whether the dataset has a DOI, EPA Report Number, or QA Activity Number as specified when uploading the dataset. The sections that follow describe components of the workflow that correlate with different dataset review status categories.


6.1 Pending QA and/or Technical Review

Datasets that require a QA Manager to first approve the dataset (based on the existence of an associated EPA Report Number and/or QAPP) will appear as a pending action for users with a QA Reviewer role. As shown in Figure 33, RADAR will alert users who have pending actions with a notification that will appear at the top of the page. Users can click the Pending Actions button to go directly to the Upload Data page. Any datasets that require a user's attention will be separately displayed in a table noting the same. Depending on the status, the value in the status column will show: Pending QA Review, Pending Technical Review, or Pending Admin Review.

Reviewers can click the Review button to begin reviewing both the metadata and data that were submitted.

Upload Data


Upload custom data to RADAR. Once approved, these data are shared with other RADAR users and applications. Start a new upload, or select an action from an existing dataset below.

 Start a new dataset upload

Getting Started

- [Upload Data Overview](#)
- [Data Formatting Requirements](#)
- [Review and Approval Process](#)

Datasets Requiring Review

Title	Upload Date	Status	Actions
Biological Decontamination Compendium	03/25/2021 02:18pm EDT	Pending QA Review	 Review

My Existing Datasets






Title	Upload Date	Status	Actions
Test - Chemical Decontamination Compendium	03/26/2021 10:29am EDT	Approved	 Disable  View
Evaluation of Commercially-available Equipment for the Decontamination of Bacillus anthracis Spores in an Urban Setting	03/31/2021 03:07pm EDT	Approved	 Disable  View

Figure 33. Dataset pending QA review.

Selecting the review action will present a dataset review page displaying the metadata, list of fields, and a preview of the dataset as shown in Figure 34.



Pending Actions

My Notebook

Log Out

Contact Us

Search

Widgets

Upload Data

Research Stats

Developers

Review Dataset

Dataset Metadata

[Project Open Data Fields](#)

Title

Biological Decontamination Compendium

Description

A compendium of research and efficacy results on various materials to decontaminate a biological agent

Date Last Modified

03/01/2021

Access Level

Public

Publisher

U.S. Environmental Protection Agency

Contact Name

Timothy Boe

Bureau Code

Environmental Protection Agency - Gen

Program Code

Environmental Protection Agency - Hor Management, Superfund)

RADAR Fields

QA Activity Number *(optional)*

K-HSMMD-0011111

Hazard

Biological

Primary Topic

Decontamination

Secondary Topic(s)

Building Data Methods

Short Description

A compendium of research and efficacy results on various materials to decontaminate a biological agent

Citation

U.S. Environmental Protection Agency, "Biological Decontamination Compendium" Office of Research and Development, Washington, DC, March 2021

Project Type

Literature Review

Source Type

Report

Add Metadata Comment

Dataset Data Preview

The preview below only contains the first 10 rows of data for fields marked as default. Navigate to the [dataset data page](#) for a full preview.

SourceID	Source Reference	Decon Application Method	Surface	Loading	Loading Units	LPosRec	Coupon Area	Coupon Area Units	Decon Agent Dose Conc	Decon Agent Dose Conc Units
97	Schnabel 2014 Inactivation of Vegetative Microorganisms and Bacillus atrophaeus Endospores by Reactive Nitrogen Species (RNS)	fumigation	Glass Bottle Interior	40000	CFU/cm^3		250	cm^3	7700	J
	Schnabel 2014 Inactivation of Vegetative Microorganisms									


Add Data Comment

Approve and Send to Technical Review

Reject and Send Comments to Uploader

Figure 34. Review dataset page.

Reviewers can comment on both metadata and/or data fields. Reviewers can also access a full dataset preview by clicking the dataset data page hyperlink. An example is shown in Figure 35.

 This dataset has not yet been approved. You are currently previewing the dataset.

Biological Decontamination Compendium

 Download

Description: A compendium of research and efficacy results on various materials to decontaminate a biological agent

Project Type: Literature Review

Reference: U.S. Environmental Protection Agency, "Biological Decontamination Compendium" Office of Research and Development, Washington, DC, March 2021.

Publication Type: Report

Date Last Modified: 2021-03-01

Keywords: Biological, Decontamination, Building, Data, Methods

 Customize Columns

 Wide View

Filter table



Search

SourceID	Source Reference	Decon Application Method	Surface	Loading	Loading Units	LPosRec	Coupon Area	Coupon Area Units	Decon Agent Dose Conc	Decon Agent Dose Conc Units
97	Schnabel 2014 Inactivation of Vegetative Microorganisms and Bacillus atrophaeus Endospores by Reactive Nitrogen Species (RNS)	fumigation	Glass Bottle Interior	40000	CFU/cm^3		250	cm^3	7700	J
98	Schnabel 2014 Inactivation of Vegetative Microorganisms and Bacillus atrophaeus Endospores by Reactive Nitrogen Species (RNS)	fumigation	Glass Bottle Interior	40000	CFU/cm^3		250	cm^3	7700	J

« < 1 2 3 4 5 6 7 8 9 10 ... > » Displaying 1 through 100 of 7599 records

Figure 35. Dataset review – full data preview.

A subset of the features previously described in Section 4.1.2 are available. RADAR provides a warning banner at the top of the page to reinforce the pending status of the dataset. This view supports a more detailed review of the data, the individual data fields, their descriptions, and the actual values of data presented. Reviewers can also download the complete dataset in spreadsheet format.

If a reviewer adds comments that need to be addressed prior to moving the dataset further along the review queue, the reviewer should enter comments and reject the dataset. RADAR

will update the status of the dataset and set a pending action for the user who contributed data to address. Figure 36 illustrates an example.

Enter Comment

Please enter a more descriptive title

Dataset Data Preview

i The preview below only contains the first 10 rows of data for fields marked as default. Navigate to the [dataset data page](#) for a full preview.

SourceID	Source Reference	Decon Application Method	Surface	Loading	Loading Units	LPosRec	Coupon Area	Coupon Area Units	Decon Agent Dose Conc	Decon Agent Dose Conc Units
97	Schnabel 2014 Inactivation of Vegetative Microorganisms and Bacillus atrophaeus Endospores by Reactive Nitrogen Species (RNS)	fumigation	Glass Bottle Interior	40000	CFU/cm^3		250	cm^3	7700	J
	Schnabel 2014 Inactivation of Vegetative Microorganisms									

Enter Comment

Source ID has too many digits

Approve and Send to Technical Reviewer

✖ Reject and Send Comments to Uploader

Figure 36. Enter review comments and return to user who contributed data.

Otherwise, following verification that an approved QAPP exists, and that the review did not identify any issue to resolve, the QA Reviewer will queue the dataset to a Technical Reviewer for review. A Technical Reviewer will follow the same steps as the QA Reviewer. Following approval by a Technical Reviewer, the RADAR Admins will be notified to complete a final review. Figure 37 illustrates the buttons for the Technical Reviewer view.

✔ Approve and Send to Admin Review

✖ Reject and Send Comments to Uploader

Figure 37. Technical reviewer approval.

6.2 RADAR Admin Review

RADAR Admins have the same features available as those that are described in Section 6.1. Following resolution of any comments, if applicable, RADAR Admins will approve a dataset to

include in RADAR. Figure 38 illustrates the buttons for the Admin Reviewer view. Once the RADAR Admin approves the dataset, it will become visible to all RADAR users.



Figure 38. Admin reviewer approval.

RADAR Admins have additional controls available from the Upload Data page as shown in Figure 39 below. RADAR Admins can view a listing of all datasets that are included in RADAR and their current visibility state (enabled or disabled). While RADAR Admins cannot edit approved datasets, users with this role can enable or disable from view any datasets using the corresponding controls on this page.

Upload Data

Upload custom data to RADAR. Once approved, these data are shared with other RADAR users and applications. Start a new upload, or select an action from an existing dataset below.

[Start a new dataset upload](#)

Getting Started

- [Upload Data Overview](#)
- [Data Formatting Requirements](#)
- [Review and Approval Process](#)

My Existing Datasets

Title	Upload Date	Status	Actions
Biological Decontamination Compendium	03/25/2021 02:18pm EDT	Approved	Disable View
Evaluation of Commercially-available Equipment for the Decontamination of Bacillus anthracis Spores in an Urban Setting	03/31/2021 03:07pm EDT	Approved	Disable View
Test - Chemical Decontamination Compendium	03/26/2021 10:29am EDT	Disabled	Enable View

Figure 39. Admin view – enable/disable datasets.

7 NEXT STEPS AND RECOMMENDATIONS

EPA's HSRP continuously strives to find innovative ways to support its scientists and stakeholders. Data are an integral component to all research and how researchers access and use data is changing, and forward-thinking solutions to facilitate these changes are needed. The RADAR project supports EPA's larger goal to collectively work from standardized data elements to improve relatability among similar research datasets and standardize communication of

research. Data element harmonization can be facilitated using standardized data capture forms and can be enforced through validation procedures established for data upload features used in RADAR. At present, RADAR provides the initial framework to establish a more robust process for exposing HSRP research data. Incremental advances are in place to support achieving this larger goal.

RADAR facilitates structuring data to separate and explicitly format data by type (i.e., text, integer, numeric). This project has moved efforts forward by providing a platform to centrally store homeland security research data and intentionally organize data in a structured manner. Separating numeric values from units is one simple example. By providing a template to organize data in a structured format, capture key metadata to aid data discovery and reuse, and enforce basic validation principles, RADAR is facilitating better connections to research data by other researchers and other tools and models.

Additionally, as the compilation of datasets included in RADAR expands, the tool will provide emergency response personnel and decision makers the prompt and concise information that is required to effectively perform their tasked objectives. RADAR will also facilitate the other decision support tools and models in sourcing the most current research from a central data repository through modern communication mechanisms (i.e., shared services).

While the technological solution to support EPA in achieving its goal is in place, the ultimate success is rooted in adoption by researchers to support building out the repository. Work is underway to identify additional opportunities to further advance harmonization efforts to standardize terminology, preferred units, and related metadata. This will improve the ability to merge and compare multiple datasets within RADAR. It could also allow for development of more robust data validation (e.g., detecting and flagging outlier values) in the future. Upon building consensus within the HSRP researchers, additional data validation mechanisms can be built into RADAR to enforce data integrity standards that are prioritized and adopted by the program.

In addition, demonstrating the value and utility of RADAR by way of real-world examples is crucial to generate support and buy-in from stakeholders. Illustrating the benefits and directly addressing the “why should I do this” to build consensus among HSRP researchers will ensure EPA can achieve its vision and that those who stand to benefit most are part of refining the solution.



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