



# Exploring the Benefits and Future of Small-Scale, Laboratory-Focused Interagency Radiological Response Field Exercises

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# Presentation Outline

- Laboratory assets available for radiological response
- Laboratory challenges in large scale field exercises
- Recent examples of small-scale, lab-focused exercises
  - FRMAC/EPA mobile lab inter-comparison drill—Las Vegas, NV (2014)
  - FRMAC/EPA/RAP field drill—Savannah River Site (2014)
  - FRMAC/EPA/RAP field drill—Savannah River Site (2015)
- Lessons learned and opportunities for the future



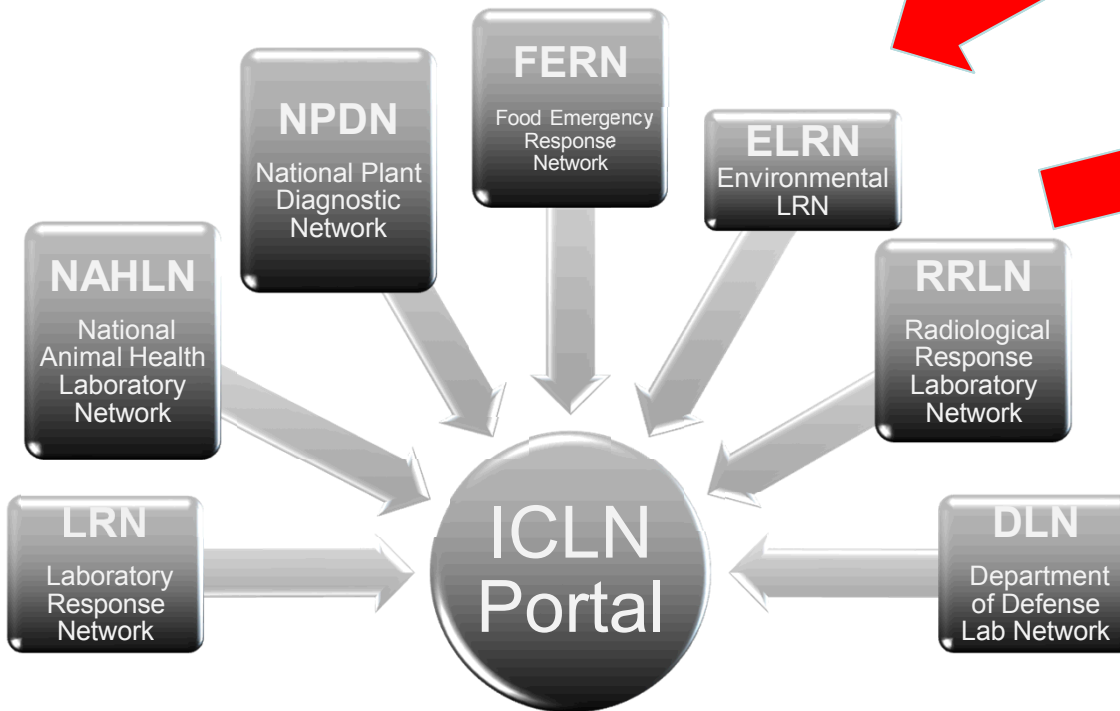
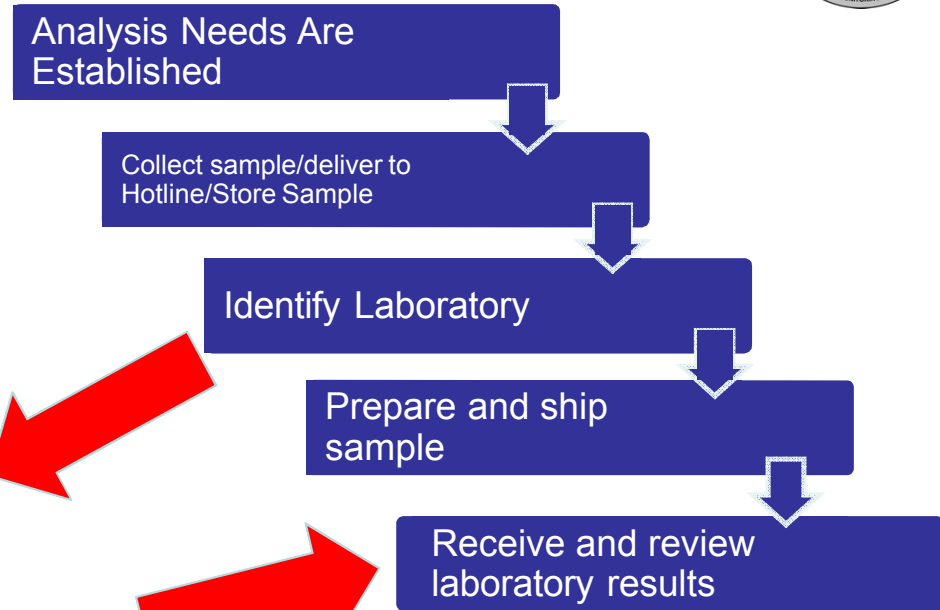
# Federal Radiological Monitoring and Assessment Center (FRMAC)



- Multi-agency response effort including DOE, DOD, EPA, FDA, CDC, USDA.
- Mission to assist with predictions, measurements, analysis and assessments related to radiological incidents.
- Six divisions of FRMAC
  - Monitoring
  - Assessment
  - Health & Safety
  - Support
  - Liaison
  - Laboratory Analysis

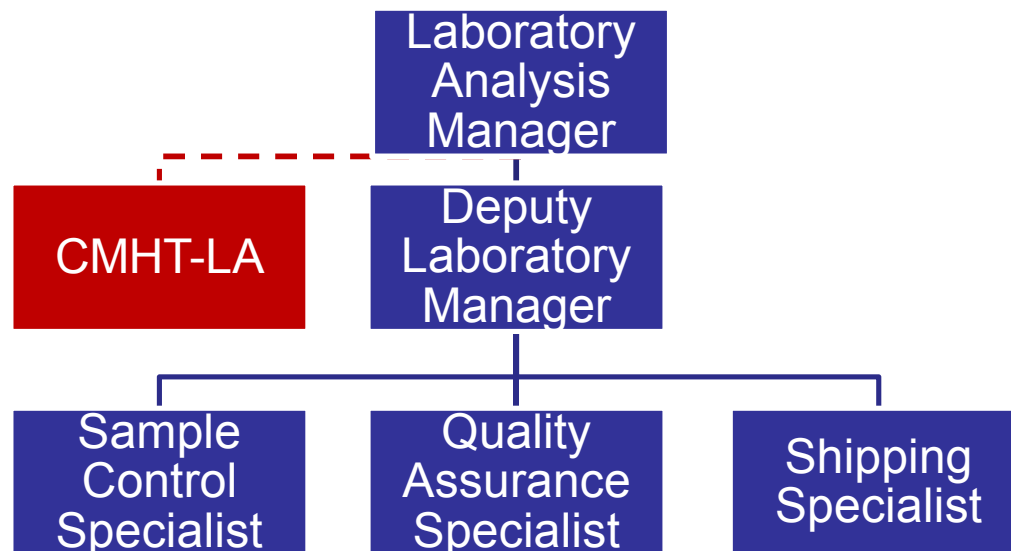


# Laboratory Analysis Division Responsibilities



**Responsibilities  
turned over to EPA  
in recovery phase**

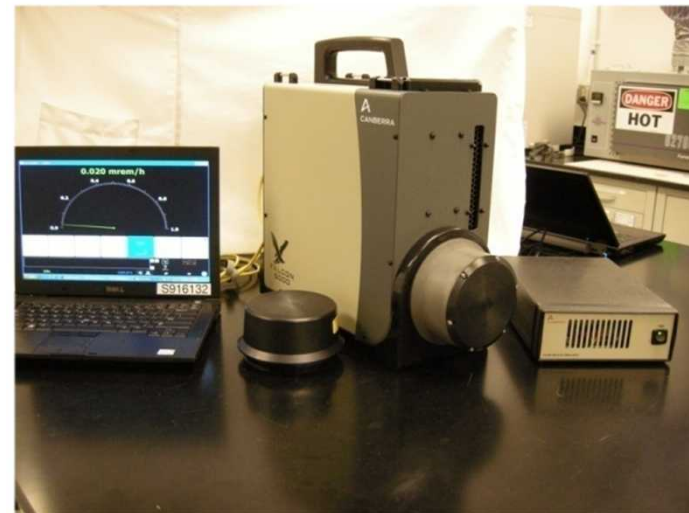
# FRMAC: Laboratory Analysis Division



# Mobile/Deployable Laboratory Assets



- FRMAC Lab Analysis Division resources
- DOE Fly Away Laboratory
- EPA Mobile Environmental Radiation Laboratory (MERL)
- EPA Sample Preparation Laboratory
- State mobile laboratories



# Field Exercise Dilemmas for Laboratories



Not enough  
time in  
exercises

Lab processes  
often conjured  
up

No  
radioactivity in  
samples

How do  
mobile labs fit  
in?

How to  
incorporate  
off-site labs?



# FEMA-NIRT Project Plan 2014



- Conduct joint lab-focused drills with 2 EPA MERLs and FRMAC Lab Analysis
  - Drill with MERL stationed at Las Vegas, NV
  - Drill with MERL stationed at Montgomery, AL
- Sample inter-comparison with EPA MERL and DOE Fly-Away Lab (FAL)
- Cross-training/equipment familiarization with both EPA MERLs
- Identify areas of potential collaboration on sample preparation capabilities
- Improve conduct of operations between MERLs and FAL



# FRMAC/EPA Mobile Lab Inter-comparison Drill— Las Vegas, NV (2014)



- 2-day joint drill with FRMAC Fly-Away Lab (FAL) and EPA MERL stationed at Las Vegas, NV
- Drill designed to test lab interoperability and conduct lab inter-comparison study
  - 17 pre-staged, laboratory performance testing samples used for inter-comparison
  - Samples logged into RAMS at FRMAC Sample Control and distributed to labs
  - Samples surveyed and re-packaged in EPA Sample Preparation Laboratory (SPL)
  - After laboratory analysis, samples traded between labs and re-analyzed
  - Data reviewed and returned to FRMAC via Electronic Data Deliverable (EDD)



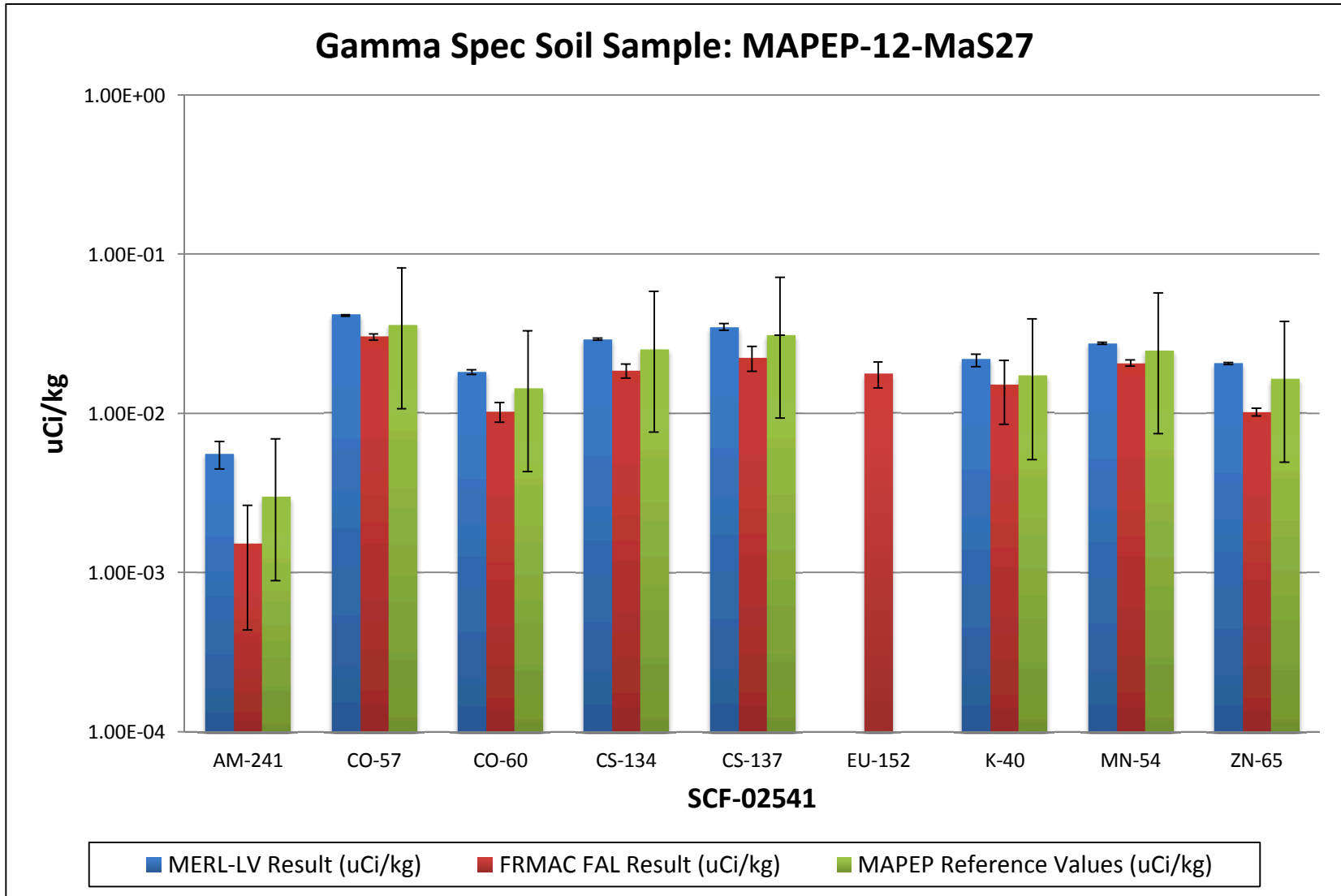
# FRMAC/EPA Mobile Lab Inter-comparison Study Las Vegas, NV (2014)



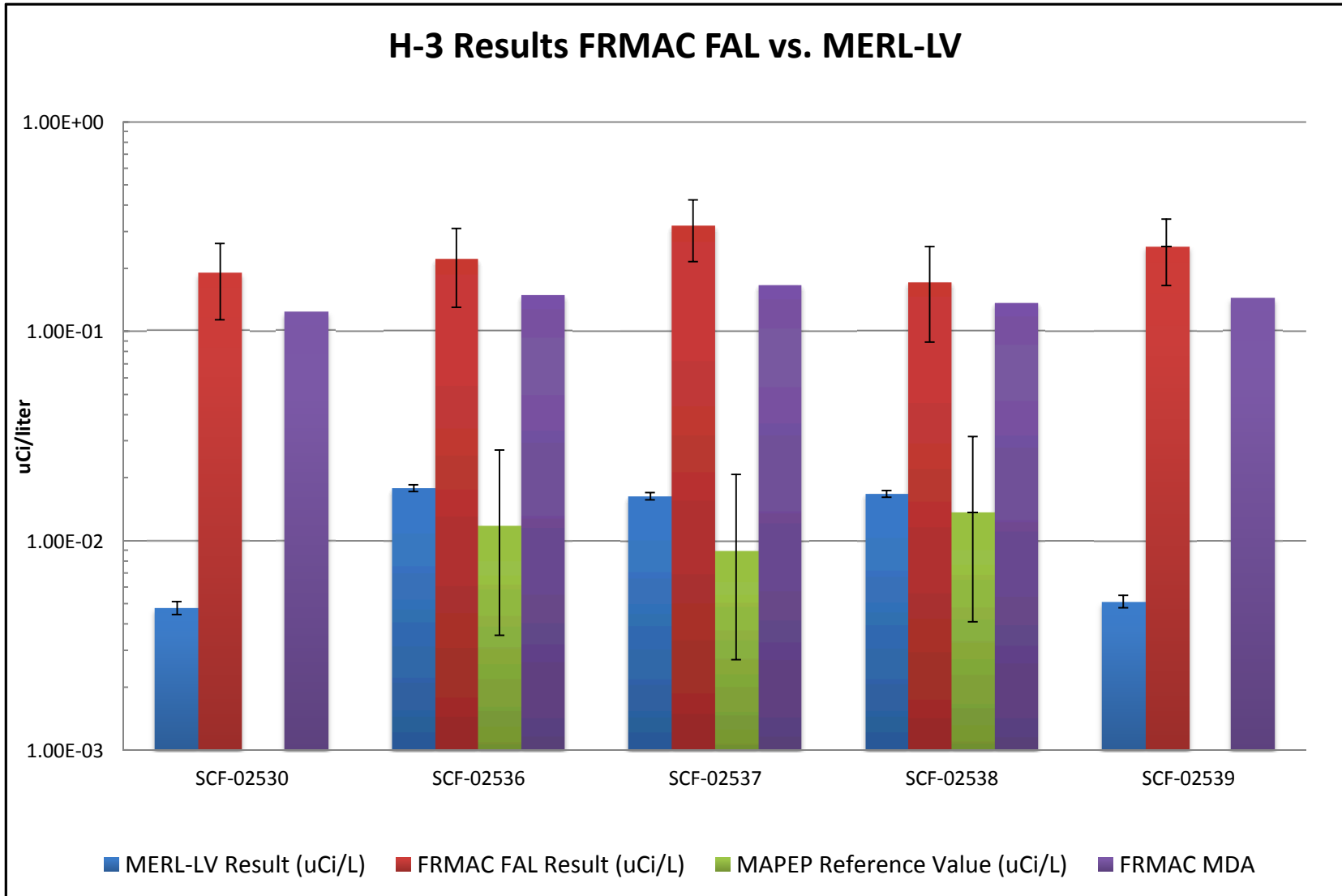
- MAPEP (DOE Multi-Analyte Performance Evaluation) Samples:
  - 5 Gross alpha/Gross Beta Air Filters
  - 1 mixed nuclide Air Filter for Gamma Spec
  - 5 mixed nuclide Soil Samples for Gamma Spec
  - 5 mixed nuclide Water Samples for Gamma Spec and Tritium



# FRMAC/EPA Mobile Lab Inter-comparison Study



# FRMAC/EPA Mobile Lab Inter-comparison Study



# Lessons Learned: FRMAC/EPA Mobile Lab Inter-comparison Drill Las Vegas, NV (2014)



- Good inter-laboratory exchange regarding analytical methods and processes
- Recognition of the different sample prep and analytical capabilities of the two labs
- Identified opportunities for FRMAC and EPA future interoperability, including:
  - Strengths and weaknesses of lab-based vs. portable instruments identified
  - Recognition of opportunities to share lab supplies and sources to reduce costs
  - Opportunity for labs to jointly develop gamma spec geometries and libraries
  - Future joint exercises key to improvement and identifying shortfalls
  - Lessons learned captured in Summary Report to FEMA (SAND Report No. 154774)



# FRMAC/EPA/RAP Field Drill— Savannah River Site (2014)



- Objectives
  - Exercise focused on interaction between field teams and laboratory operations
  - FRMAC equipment familiarization with EPA MERL stationed in Montgomery, AL
  - MERL training and qualification process for lab operators
  - Identify areas of potential collaboration on sample preparation capabilities
  - Analyze spiked soil samples in exercise environment
- Participants included FRMAC Lab Analysis/Health & Safety, EPA MERL (AL)

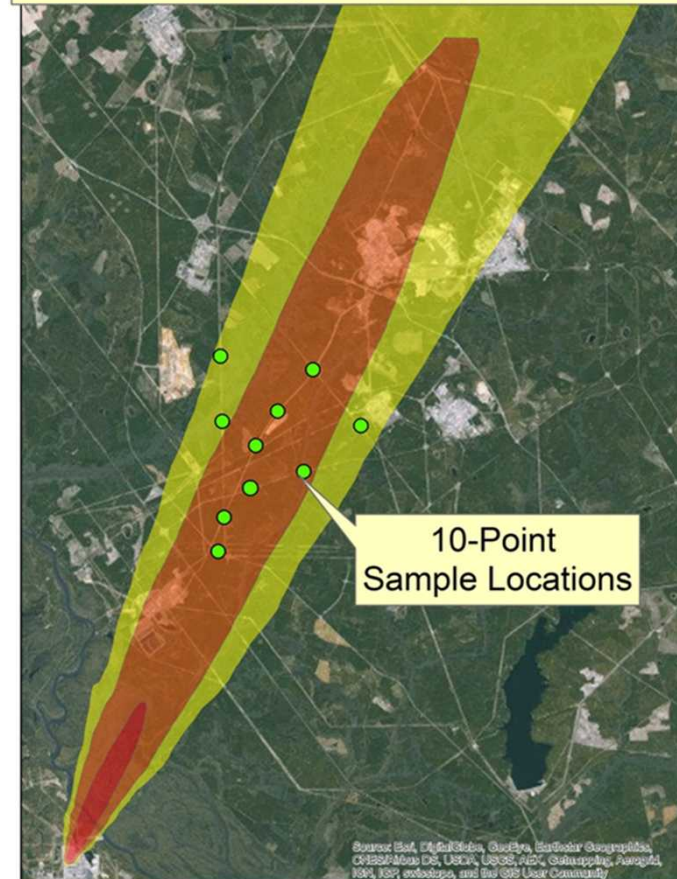


# FRMAC/EPA/RAP Field Drill— Savannah River Site (2014)



- 3-day exercise + 1 day for setup + 1 day for teardown/hotwash
- RAP-3 teams collected soil, water, vegetation, air samples
  - Soil samples spiked with Cs-137
- 68 samples processed through FRMAC hotline and delivered to EPA MERL
- Samples surveyed and re-packaged in EPA Sample Preparation Lab
- Lab radiological analysis—EPA MERL
- Data returned to FRMAC via Electronic Data Deliverable (EDD)
- EDD reviewed by FRMAC and uploaded into the FRMAC Radiological Assessment and Monitoring System (RAMS)

DOE - EPA - DHEC - CST Interoperability Exercise  
Sample Locations





# Lessons Learned: FRMAC/EPA/RAP Field Drill— Savannah River Site (2014)

- 1 day of setup required to get MERL and sample prep lab operational
- Pre-staging samples worked well
- “Back-end” processes were exercised (i.e. QC of results, uploading EDD into RAMS)
- 41 process improvements and 11 noteworthy practices identified (FEMA summary report)
- Opportunities for future interoperability recognized, including:
  - Resource sharing between EPA and FRMAC (lab supplies, office equipment, etc.)
  - Need to identify accountability in regards to waste disposal
  - Need tool to match capabilities of EPA sample prep lab with compatible sample types



# FRMAC/EPA/RAP Field Drill— Savannah River Site (2015)



## FRMAC Objectives:

- Involve both on-site mobile and off-site laboratories
- Incorporate more spiked samples
- Train new lab analysis personnel
- Ship samples to an off-site laboratory
- Test FRMAC Web Portal functionality



# FRMAC Laboratory Analysis Web Portal



Nuclear Incident Response Program - Lab Analysis Web Portal - Home

Hello, Sean.Fou

[Portal Home](#)

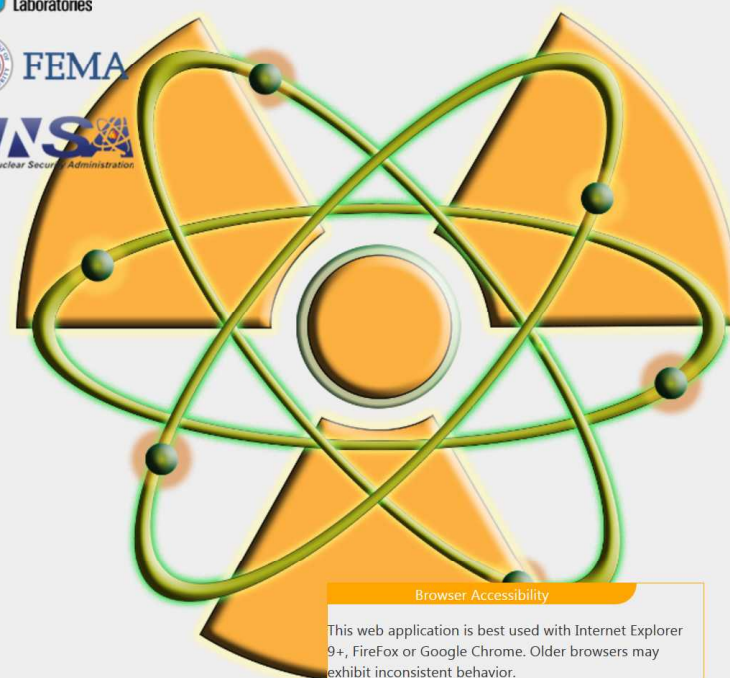
[Admin](#)

[My Profile](#)

## Welcome to the Laboratory Analysis Portal

This tool is used by the Department of Energy's Federal Radiological Monitoring and Assessment Center (FRMAC) to send and receive information to and from your laboratory. The FRMAC has requested assistance from your laboratory to analyze samples of various matrices in support of emergency response efforts. The information in this web portal will assist you in preparing to receive and analyze these high-priority samples. The Analysis Request Form (ARF) and Analysis Instruction Sheet (AIS) for each sample group can be accessed in the table below by selecting the analysis group you wish to view.

Analysis requests that show up here are currently on their way to your laboratory or may already be at your laboratory undergoing analysis. Please use this portal to report electronic data back to the FRMAC. A tutorial for using this portal can be found through a link at the bottom of this page. If you have questions regarding the use of this web portal, please contact the FRMAC Point of Contact indicated on your analysis request form. Thank you for your service to the nation during this time of crisis.



ARF's assigned to [National Analytical Radiation Environmental Laboratory \(NAREL\)](#)

Click 'Open ARF' to view the ARF details page.

	ARF #	Date Sent (utc)	Samples Complete	Viewed?	
1	ARF-00019	2015/04/13	Test: 53; Results: 47	viewed	<a href="#">Open ARF</a>
2	ARF-00015	2015/04/20	Test: 82; Results: 137	viewed	<a href="#">Open ARF</a>
3	ARF-DEMO-EPA-NAREL-001	2015/03/25	Test: 13; Results: 1	viewed	<a href="#">Open ARF</a>
4	ARF-00020	2015/04/13	Test: 60; Results: 60	viewed	<a href="#">Open ARF</a>
5	ARF-00024	2015/04/21	Test: 12; Results: 0	viewed	<a href="#">Open ARF</a>
6	ARF-00016	2015/04/20	Test: 62; Results: 78	viewed	<a href="#">Open ARF</a>
7	ARF-00021	2015/04/13	Test: 121; Results: 93	viewed	<a href="#">Open ARF</a>

2 page(s): [1] 2

Jump to Page  Go

[Laboratory Analysis Portal Tutorials \[PDF\]](#)

[Manage Laboratory Accounts](#)

### Browser Accessibility

This web application is best used with Internet Explorer 9+, FireFox or Google Chrome. Older browsers may exhibit inconsistent behavior.

# FRMAC/EPA/RAP Field Drill— Savannah River Site (2015)



## EPA Objectives:

- Deliver, set up, and operate MERL
- Connect with National Analytical Radiation Environmental Lab (NAREL) for data back up
- Receive, screen, process samples and report results from MERL and NAREL
- Implement new EPA Lab Information Management System
- Liaison with state mobile lab staff



# FRMAC/EPA/RAP Field Drill— Savannah River Site (2015)



- Participants: FRMAC Lab Analysis/Health and Safety, EPA MERL, SC DHEC (Field Teams and Mobile Lab staff), 43<sup>rd</sup> Civil Service Team
- Pre-staged samples and data
  - Pre-staged, spiked samples all ready in FRMAC RAMS for immediate delivery to on-site mobile laboratory (EPA MERL)
  - Pre-staged, spiked samples at EPA NAREL laboratory (Montgomery, AL)
  - Pre-staged data packages available for immediate QA/QC review
- Received soil, water, vegetation, air samples collected from field teams
- Samples processed through FRMAC hotline and delivered/shipped to:
  - On-site EPA Mobile Laboratory
  - Off-site EPA NAREL laboratory (Montgomery, AL)
- Processed Electronic and Hardcopy Data received from:
  - EPA Mobile Laboratory
  - Off-site laboratory via the Web Portal process
- QA/QC Data verification performed and uploaded into RAMS



# Lessons Learned: FRMAC/EPA/RAP Field Drill— Savannah River Site (2014)



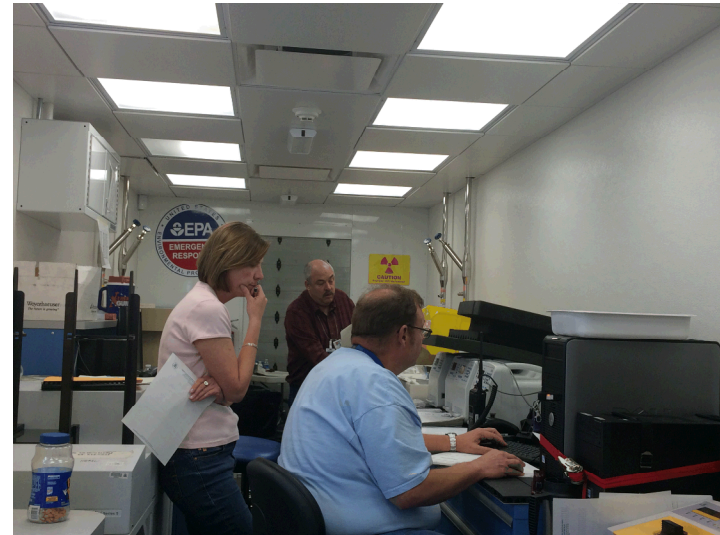
- Venue proved to be an excellent lab-focused training opportunity
  - FRMAC QA/QC data review processes practiced in real time
- Communications between groups are strengthened through regular practice
- Off-site labs can be integrated into exercise play with real samples
- FRMAC shipping process and tools need to be refined/developed
- Additional training needed for trouble shooting FRMAC Web Portal



# Summary of Lessons Learned from Lab-Focused Interagency Drills



- Drills/exercises do not need to be elaborate to be beneficial
- Pre-staging samples and results allow labs to exercise full process
- Off-site labs can be incorporated into exercises in real time
- Performance testing samples allow for “real” radioactivity to be analyzed
- Communications between groups are strengthened through regular practice
- Process problems cannot be identified in a controlled environment





# Opportunities for the Future

- Additional joint FRMAC/EPA MERL field lab drills
  - Planning 2016 small scale lab drill in Albuquerque with EPA MERL
- Incorporate state fixed and mobile laboratories into drills
  - Can be scalable based on budgets
- Involve local field teams for field collection
  - In conjunction with RAPTER exercises?
- Share sampling, monitoring and lab processes among states and feds to encourage consistency
- Possible formation of lab/field operation workgroup
- Offer training and develop opportunities to inform states of federal capabilities and services
- Develop future FEMA-NIRT proposals with recently developed lab gap analysis document



# Questions ?

