Best Practices for Sample Control During the Nuclear Incident Response

10-Point Sample Locations
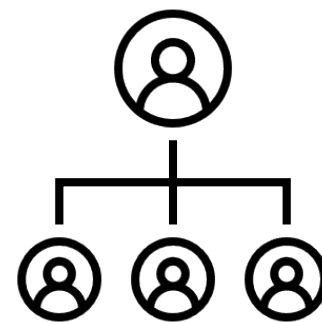
2022

"DOC CONTROL #"

Outline
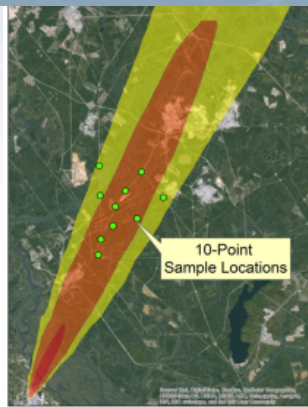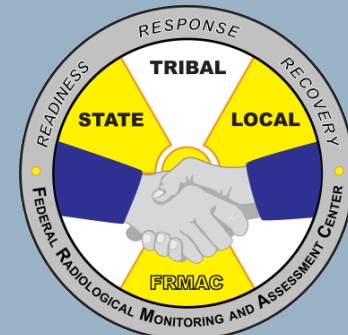
- Introductions
- Elements of an effective sample control process
- Issues that arise from an ineffective sample control processes
- Conclusion
- Integrated Consortium of Laboratory Networks: Working with Limited Laboratory Resources during an incident

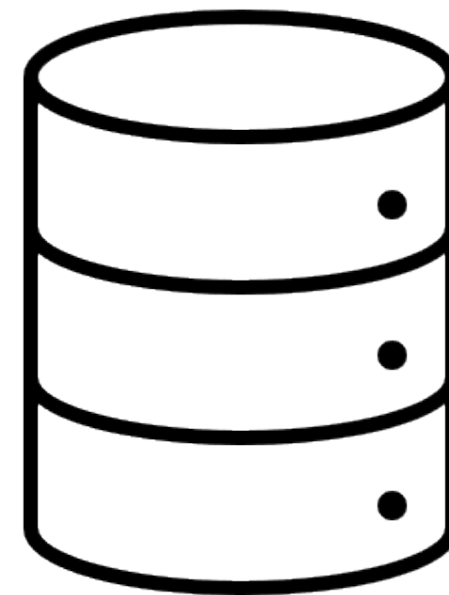# Panel Members

- Sean Fournier – Sandia National Laboratories – Consequence Management Laboratory Analysis skillset lead

- Sonoya Shanks – Sandia National Laboratories

- Lynn Jaussi – Nevada National Security Site

- Phil Torretto – Lawrence Livermore National Laboratories

- **YOU!** Please ask questions and raise issues with us, our goal is to start a conversation and learn from each other!

Elements of an effective sample control process: Pre-planning

Clear and concise analysis plan with direct ties to the DQOs and question being asked

Field sample plan coordinated between stakeholders

Defined Data Quality Objectives (DQOs)

Integration with Incident Command

Pre-built database for sample control and results

Elements of an effective sample control process: Hotline and sample storage

Hotline Setup

- Organization of space
- Efficiency in process
- Data entry system

Hotline Operations

- Daily "tailgate" with field teams
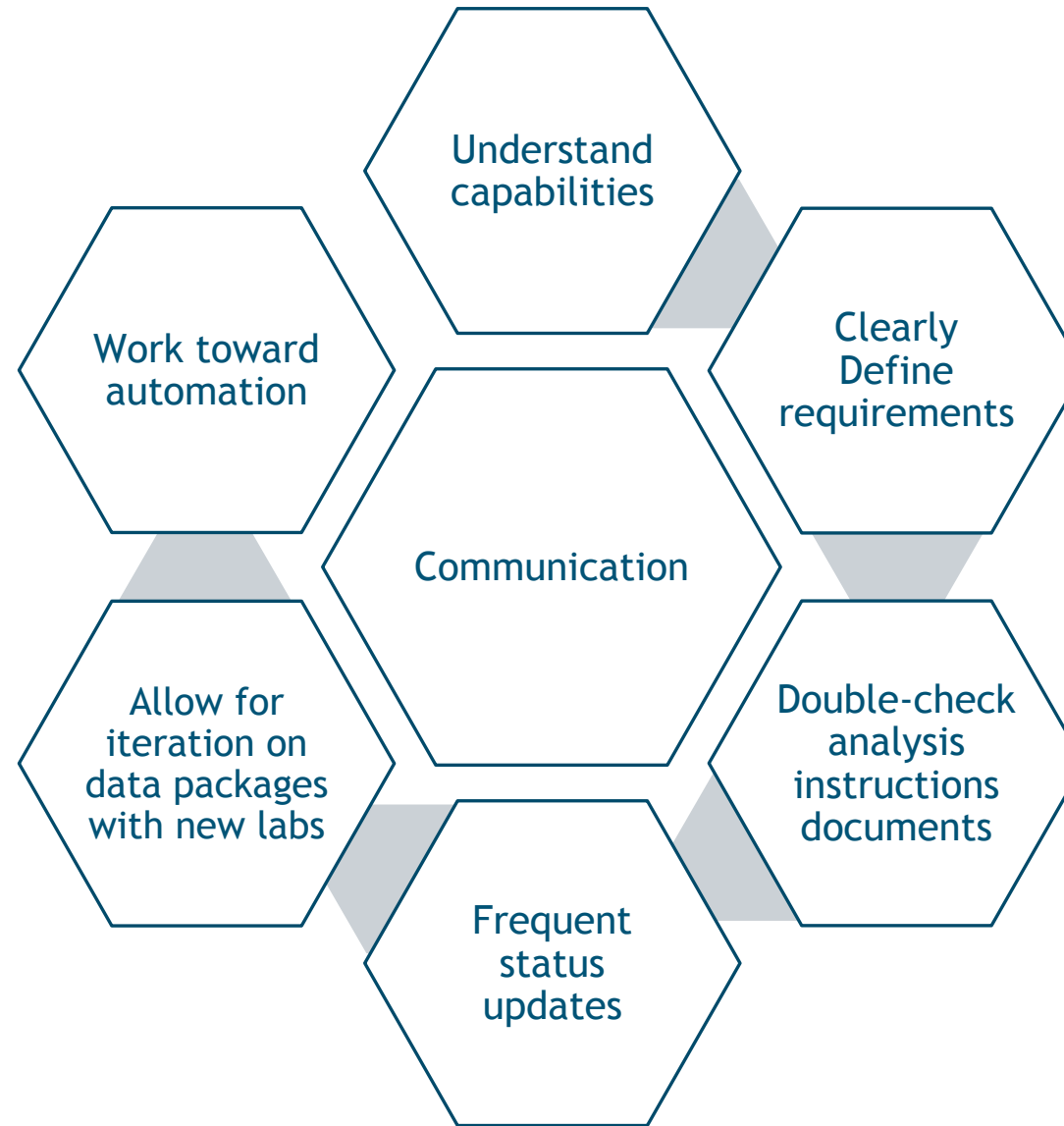- Contamination Control
- Buddy System

Sample Storage
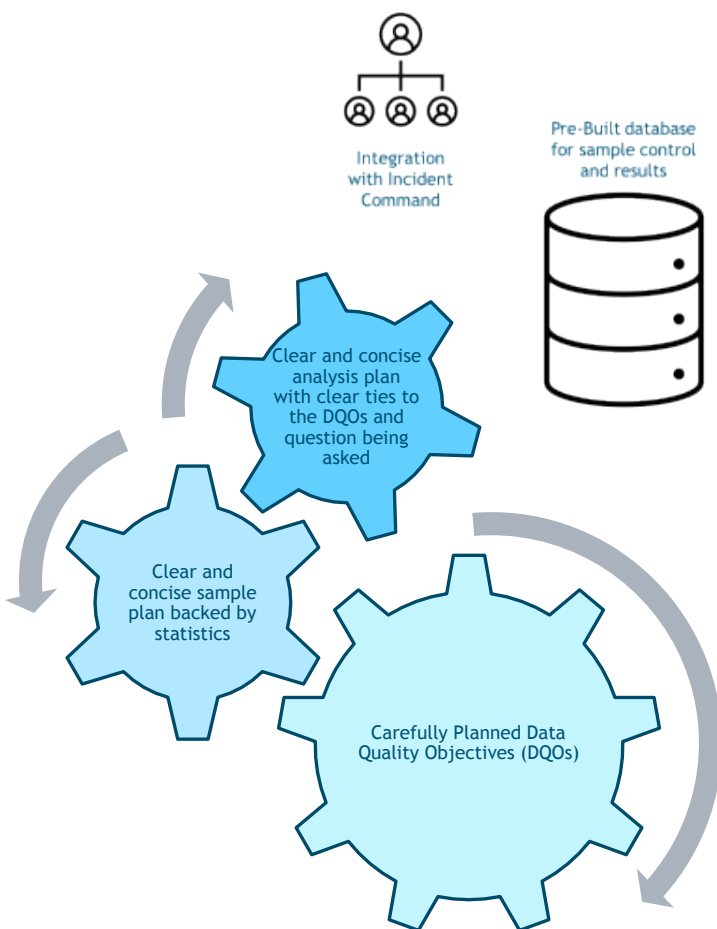
- Plan for expansion
- Practice ALARA

Elements of a rock-solid sample control process: Interactions with the laboratory

All elements work in concert and lead to a smooth, efficient response

Pre Planning

Sample Control Hotline

Laboratory Interactions

Integration with Incident Command

Pre-Built database for sample control and results

Clear and concise analysis plan with clear ties to the DQOs and question being asked

Clear and concise sample plan backed by statistics

Carefully Planned Data Quality Objectives (DQOs)

Hotline Setup
- Ergonomics
- Efficiency
- Data entry automation

Hotline Operations
- Pre Job Brief
- Contamination Control
- Buddy System

Sample Storage
- Plan for expansion
- Practice ALARA

Understand capabilities

Clearly Define requirements

Work toward automation

Communication

Double-check analysis instructions documents

Allow for iteration on data packages with new labs

Frequent status updates
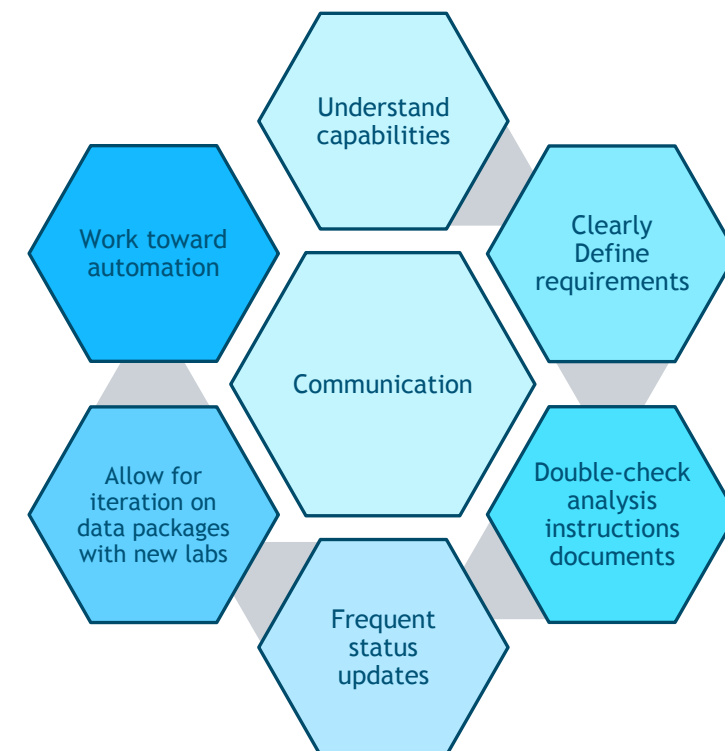
Issues that can arise when critical sample control elements are missing

Unclear/Confusing/Inconsistent/ Non-existent Chain of Command

- Difficult for sample control/labs to effectively coordinate efforts with stakeholders and decision-makers
- Difficult for sample control to understand what priorities are, what requirements are, and what assets are needed
- Ineffective lab support without stakeholder communication to define sample data quality objectives
- May result in wasted time arguing about who is in control
- Results in elevated confusion level for all Responders slowing the entire process
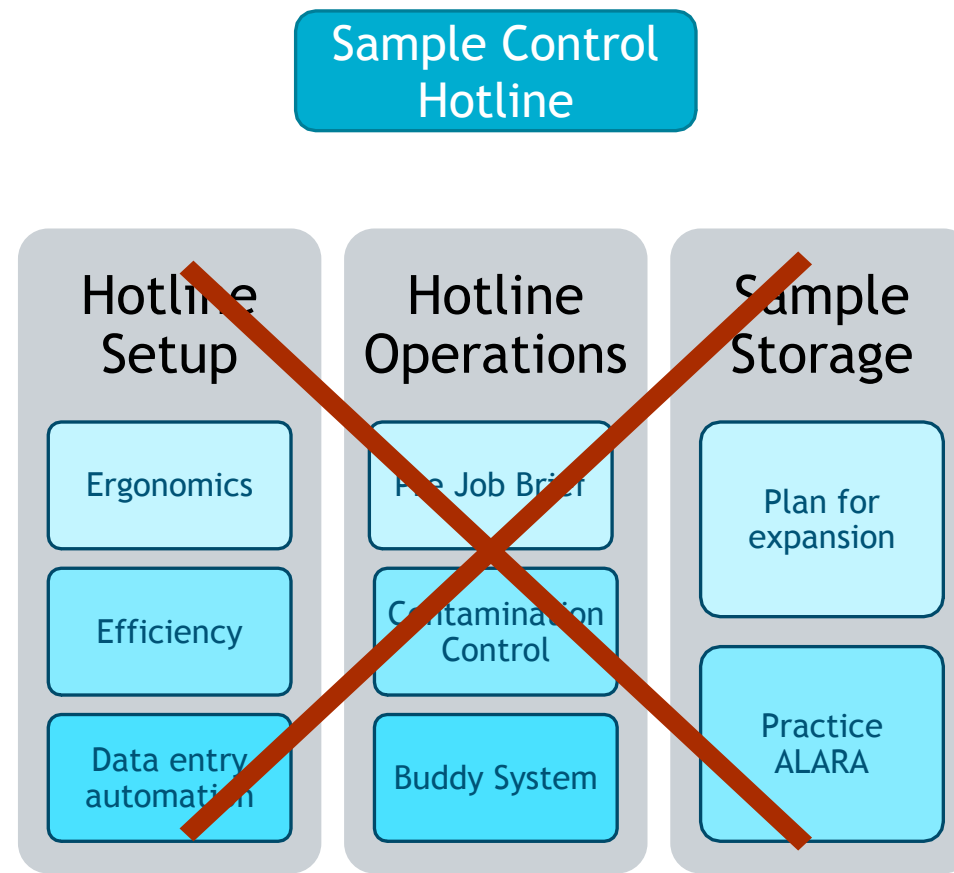
Pre Planning

Clear and concise analysis plan with clear ties to the DQOs and question being asked

Clear and concise sample plan backed by statistics

Carefully Planned Data Quality Objectives (DQOs)

Integration with Incident Command

Issues that can arise when critical sample control elements are missing

No standardized sample control processes

- Chain-of-Custody could become inconsistent, inappropriate sample packaging may occur, samples could become damaged and unusable without standardized collection and delivery process
- Effort to collect and analyze samples could be wasted due to inadequate sample control methods
- Resolving issues takes considerable time and consumes a considerable amount of personnel resources
- It results in haphazard, inefficient, ineffective, inconsistent operations, samples and results dropped through the cracks, difficulty in tracking samples and results, difficulty in prioritizing

Sample Control Hotline

Hotline Setup	Hotline Operations	Sample Storage
Ergonomics	Pre Job Brief	Plan for expansion
Efficiency	Contamination Control	Practice ALARA
Data entry automation	Buddy System	

Issues that can arise when critical sample control elements are missing

No structured process or tools for tracking sample status and lab results

- May be difficult to tie sample analysis results to sample collection locations and times
- May be difficult to verify if sample results meet their intended purpose (i.e. original question being asked)
- Without a structured format (adequately constructed database, specific data and result formats), it is difficult to share results in a readily usable form with Assessment personnel and Decision Makers
- Data quality review becomes difficult
- Difficulties may be encountered with data storage and retrievability
- Results will not get to the data Assessors, or the Decision Makers fast enough.
- Inefficiencies will abound

Laboratory Interactions
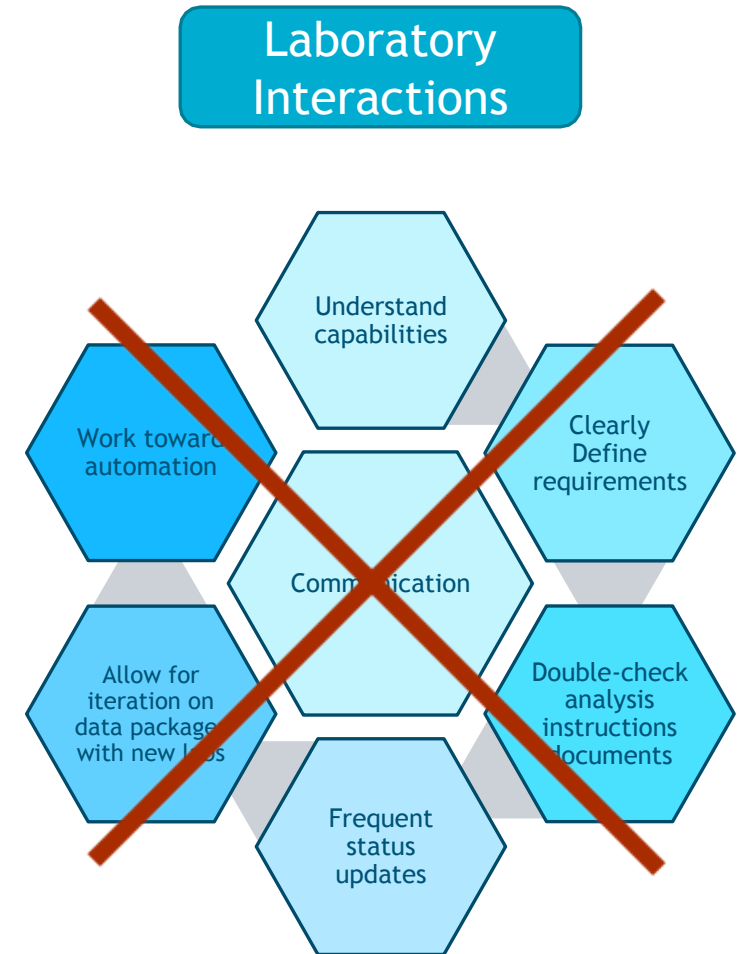
What happens when all the elements (Best Practices) are in place?

Pre-Planning: Clear data quality objectives, negotiated with stakeholders, leads to robust and easy to follow sampling plans

- Field teams able to telemeter situational awareness to analysts generating sampling plans remotely
- Clear tie between sample plan location and sample identification allows for easier data product generation

Hotline setup and sample control: Sample control in the field with sample collectors allows for effective and efficient sample flow through the process. Regular briefings keep personnel informed and up to date.

- Responders will be less stressed, less confused, happier, more efficient, more productive

What happens when all the elements (Best Practices) are in place?

Interactions with the laboratory:

- Clear instructions, established detection limits, agreed upon result data reporting requirements and a standardized format, ensures data results will be delivered in a timely manner, easily transferred to event database/data entry system

When all elements are in place:

- Samples collected will have a purpose. Few wasted efforts. Fewer results generated that serve no real purpose.
- Maps, Models, and other data products will be updated faster with more accurate data. This allows data Assessors to provide data sooner to the Decision Makers so they can make their decisions Sooner.
- Data flow will be faster, more efficient, more accurate.

Importance of Drills and Exercises

Drills and Exercises:

- Help train personnel and condition them to react in a specified, directed, organized, consistent and efficient manner.
- Familiarizes and prepares Responders with probable and potential real world events.

Bottom Line

- If Sample Control has a well established process that is effective, then the Data Assessors can be effective.

- If Sample Control is not effective, then the Data Assessors cannot be effective.

- If the Data Assessors are not effective, then the Decision Makers cannot be effective.

- If the Decision Makers cannot be effective, **then we all suffer**.

Ineffective decision-making

Standard lanes of traffic open

Effective decision-making

All lanes of traffic open for evacuation

Integrated Consortium of Laboratory Networks Guidance Document

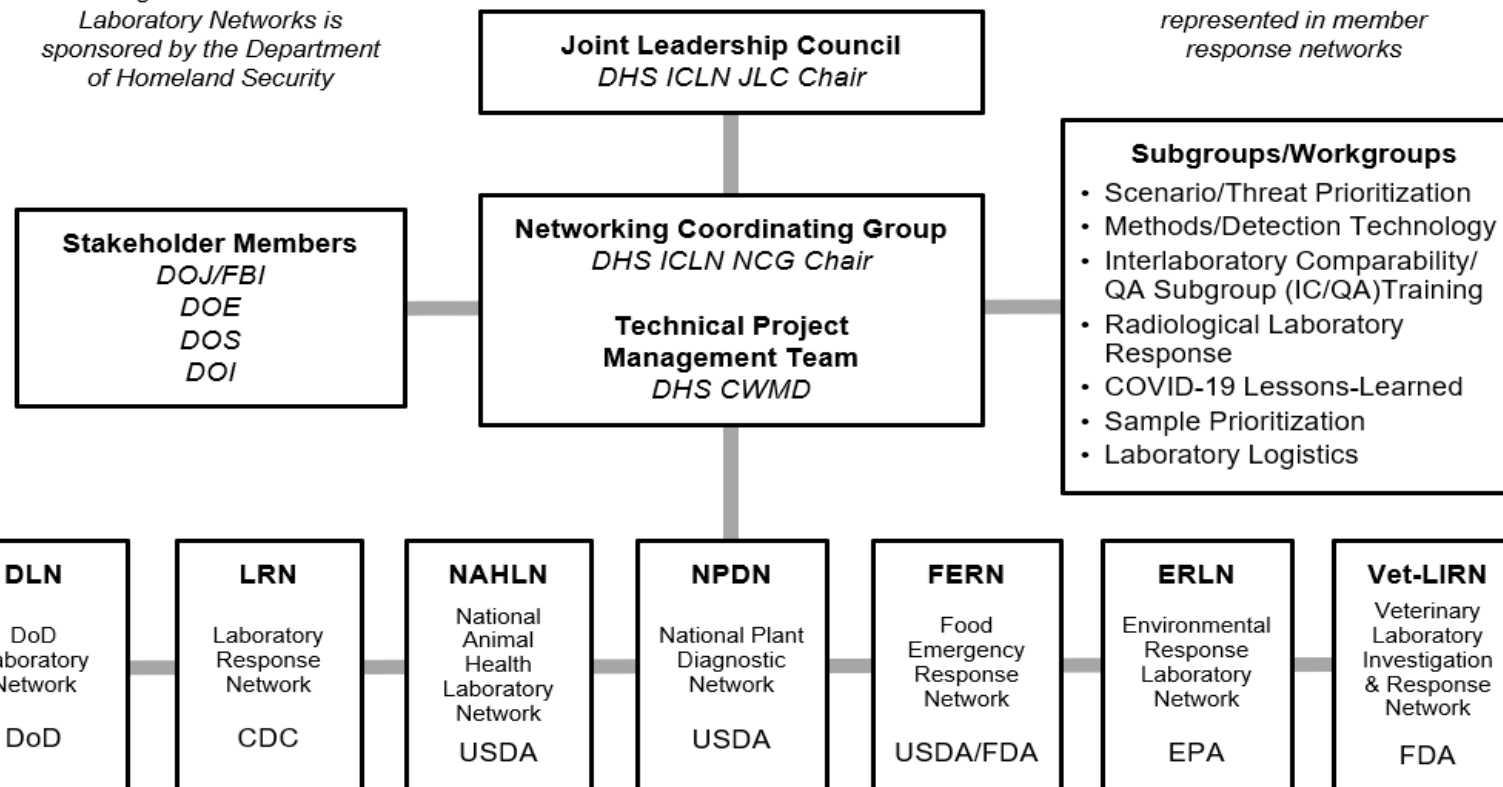*Addressing the Unique Resources of Radiological Laboratories for Emergency Response*

ICLN Organizational Structure

THE INTEGRATED CONSORTIUM OF LABORATORY NETWORKS

The Integrated Consortium of Laboratory Networks is sponsored by the Department of Homeland Security

More than 450 distinct labs represented in member response networks

Joint Leadership Council
DHS ICLN JLC Chair

Stakeholder Members
DOJ/FBI
DOE
DOS
DOI

Networking Coordinating Group
DHS ICLN NCG Chair

Technical Project Management Team
DHS CWMD

Subgroups/Workgroups
- Scenario/Threat Prioritization
- Methods/Detection Technology
- Interlaboratory Comparability/ QA Subgroup (IC/QA)Training
- Radiological Laboratory Response
- COVID-19 Lessons-Learned
- Sample Prioritization
- Laboratory Logistics

DLN
DoD Laboratory Network
DoD

LRN
Laboratory Response Network
CDC

NAHLN
National Animal Health Laboratory Network
USDA

NPDN
National Plant Diagnostic Network
USDA

FERN
Food Emergency Response Network
USDA/FDA

ERLN
Environmental Response Laboratory Network
EPA

Vet-LIRN
Veterinary Laboratory Investigation & Response Network
FDA

Addressing the Unique Resources of Radiological Laboratories for Emergency Response

Why is this important?

This allows for more strategic preplanning for laboratories to identify and address potential shortages.

- Limited availability;
- Available only from a single or limited number of vendors; and
- Long lead times for acquisition.

- **Technology**
  - Instrumentation (purchase/repurpose)

- **Supplies**
  - Standards
  - Resins
  - Reagents
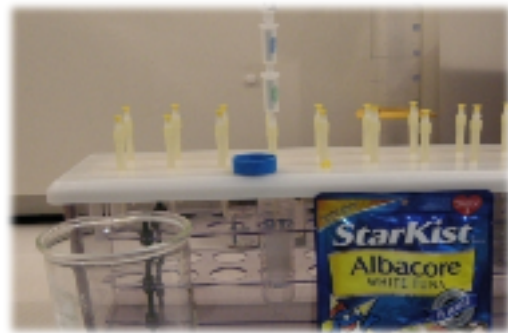
General Preparation

- Permits, licensing
- Advance packaging, shipping, and delivery protocols with overnight carriers
- Staffing plan and WP&C documentation to address 24/7 operations
- Cross-training of staff
- Install IT infrastructure
- Establish formal and informal agreements and accelerated procurement processes
- Plan for acquisition of temporary secure storage space
- Increase instrumentation automation and data-processing steps where possible
- Adopt rapid methods for use during an emergency response
- Develop a plan and **EXERCISE** for long-term operations

This document was developed by the Radiological Laboratory Subgroup (RLS) which is part of the ICLN Program.

For Information on other ICLN Documents you can visit

https://www.icln.org/subgroups.cfm#radiological-laboratory-response

Questions?