Radiation Ready: Recovery, Bioassay, and Resources for Local Public Health

NACCHO's 2026 Radiation Webinar

June 17, 2026

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Agenda

- Opening Remarks – CDC
- Recovery Discussion
- Bioassay and Radiological Preparedness
- APHL
- NACCHO Radiation Preparedness Resources Showcase
- Webinar Close & Evaluation

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Opening Remarks

Jennifer Buzzell-Physical Scientist, CDC/DEHSP

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Basic Concepts of Community Reception Centers and Recovery

Mark Maiello, PhD - Radiological Projects Planning Manager, NYC Department of Health and Mental Hygiene

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Bioassay Screening

John Dowd - Division Head, Middlesex County Public Health Department

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Association of Public Health Laboratories (APHL)

Sherry Faye, PhD - Director, Nuclear Chemistry Laboratory &

Meghan Melnick - Environmental Health Specialist, APHL

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NACCHO Radiation Preparedness Resources

Evelyn Zavala, MPH, PMP – Senior Program Analyst, NACCHO

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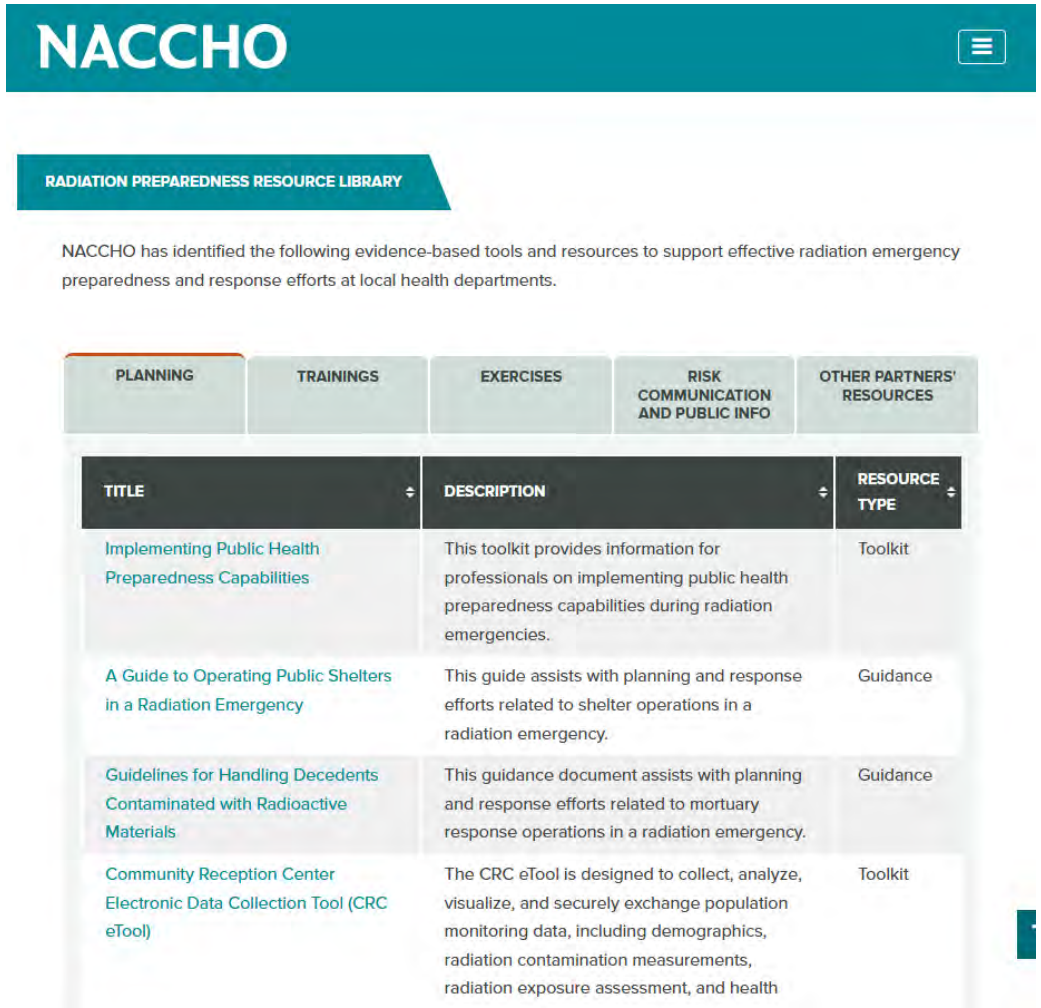
CRC Resources and Activities



- CRC Toolkit with planning guidance and templates
- Training modules and exercise support for LHD staff
- Webinars and peer-to-peer learning opportunities
- Case studies highlighting CRC planning in action

Radiation Preparedness Resource Library

NACCHO Resource Hub

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Building Readiness Through Exercise and Game

Practice. Play. Prepare

- Tennessee's Full-Scale Radiation Exercise – PY 2019.
- Dayton, OH Full Scale Exercise - PY 2019.
- El Paso, TX Full Scale Exercise - PY 2019.
- Austin's CRC Exercise – PY 2022.
- Tennessee's Full-Scale Radiation Exercise – PY 2022.
- West Virginia' CRC Exercise along with a RITN Hospital – PY 2023.
- Peoria & Decatur Illinois This is a T.E.S.T CRC exercises- June 2023.
- CRC-Radiation Exercise- Montgomery County PA-August 2023.
- Howard County, MD CRC/POD-September 2023.
- Radiological Emergency Preparedness and TEST Game- Milwaukee,
- Waukesha County- November 2023.
- CRC-Radiation Exercise- Virginia Department of Emergency Management- December 2023.

This is a TEST – CRC Edition

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Radiation Workshop

- NACCHO's Preparedness Summit (Spring)
  - National workshop for LHD Preparedness Coordinators & Partners
  - Hands-on opportunity to exercise together and build partnerships
  - Enhancing local capacity to plan and operate Community Reception Centers
  - 2026 Radiation Workshop Recap – Baltimore, MD

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Radiation Workgroup

- Objective: Raise local health department (LHD) awareness of radiological preparedness tools, resources, and information
- Members: Local, state, and federal public health and preparedness professionals with radiation subject matter expertise
- Roles and Activities: Review and advise on NACCHO radiation resources; incorporate practitioner insights into new materials and strategies
- Engagement: Regular conference calls and occasional national-level meetings; document review and input on preparedness materials
- Your Opportunity: Join the workgroup to shape resources and tools that support LHD radiation readiness

[Join an Advisory Workgroup - NACCHO]

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Questions?

Share, clarify, connect…

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Engage

- NACCHO Email:
  - ezavala@naccho.org or preparedness@naccho.org
- Join a Preparedness Workgroup:
  - https://www.naccho.org/membership/advisory-groups
- 2027 Preparedness Summit in Atlanta, GA
  - Subscribe to the Preparedness Summit e-newsletter

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Thank you!

Webinar Evaluation: Radiation Ready: Recovery, Bioassay and Resources for Local PH

https://forms.office.com/r/x1Tc71G9kX

We value your feedback because it helps us improve and tailor resources to your needs!

Explore NACCHO's Radiation Preparedness Resources anytime at: https://www.naccho.org/programs/public-health-preparedness/radiation-preparedness

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Basic Concepts of Community Reception Centers and Recovery

Overview, Role of Public Health, & Planning Resources

Mark L. Maiello, PhD - NYC Department of Health & Mental Hygiene
CBRN Unit, Office of Emergency Preparedness & Response
mmaiello@health.nyc.gov

June 17, 2026

Two-part presentation:

Part 1: Community Reception Centers

Some aspects of operation with an emphasis on public health agency support such as bioassay and other functions

Part 2: Basic Recovery Concepts

High-level overview of a few concepts behind recovery from a radiological incident

1. Community Reception Centers (CRCs)

- CRCs are places where the public can be surveyed for radioactive contamination in rapid fashion
  - Use portal monitors and hand-held devices for measurements
  - Their purpose is to divert as many people as possible from hospital emergency rooms
  - Can be run by multiple agencies with separate functions depending on your jurisdiction (e.g., in NYC, FDNY and NYC Health are the primary agencies)
  - Can be operated by state/county & Medical Reserve Corp volunteers (e.g., in New Jersey)

Community Reception Centers (CRCs)
NYC Version

Community Reception Centers (CRCs)

- **Public Health Support of CRCs:**
  - Medical Reserve Corp recruitment/maintenance
  - Developing/implementing training for CRC operations
  - Documentation (e.g., SOPs or plans) for CRC operations
  - Equipment procurement & maintenance
  - CRC functions:
    - Determining who is eligible for medical referral
    - Bioassay collection (collecting urine samples to verify internal contamination)
    - Establishing the public registry of people surveyed at CRCs for epidemiological follow up
  - Initiating, overseeing, funding or operating the epi-follow up of those registered at the CRCs for long-term health effects

Community Reception Centers (CRCs): Bioassays

- Bioassays can be obtained at CRCs or at hospitals
  - Necessary for those admitted to hospitals with potential uptake of radioactive materials
  - Bioassay analysis reveal whether the urine concentration exceeds the Clinical Decision Guides (CDGs) of NCRP Report 161
    - > the CDGs: use decorporation countermeasures
    - Also informs when to stop using countermeasures
- Reference:
  - Americium Inhalational Exposure with Successful Chelation Therapy in Disaster Medicine and Public Health Preparedness by Keenan, M. et al. https://doi.org/10.1017/dmp.2021.211
- Be aware…
  - Clinical Lab Improvement Amendments (CLIA): Must use a CLIA accredited lab and procedure for clinical decision making

Community Reception Centers (CRCs): Bioassay

- At least one commercial lab (General Engineering Lab, “GEL,” in S. Carolina) is CLIA-accredited to do radiological bioassay at cost per sample by contract
- CDC is also capable ShippingInstructions.pdf
- Note that physicians are unlikely to wait for results which at minimum can take 3 days. Some will treat presumptively if other indications are positive for uptake of radioactivity into the body

2. Recovery:
Four Primary Steps

- Characterization and Stabilization
  - Impacted areas isolated
  - Early waste considerations begun

Assume completed after a dirty bomb detonation

- Protection Action Guidelines for Reentry and Relocation
- Establishing Cleanup Goals
- Implementation of Recovery for Re-occupancy

Recovery:
U.S. Environmental Protection Agency

In a domestic incident, EPA becomes the lead federal agency in the Recovery Phase and takes over the Federal Radiological Monitoring and Assessment Center (FRMAC) from Department of Energy.

However, decision making remains with local authorities. EPA provides guidance, particularly technical guidance but can will also support logistics and administration of recovery.

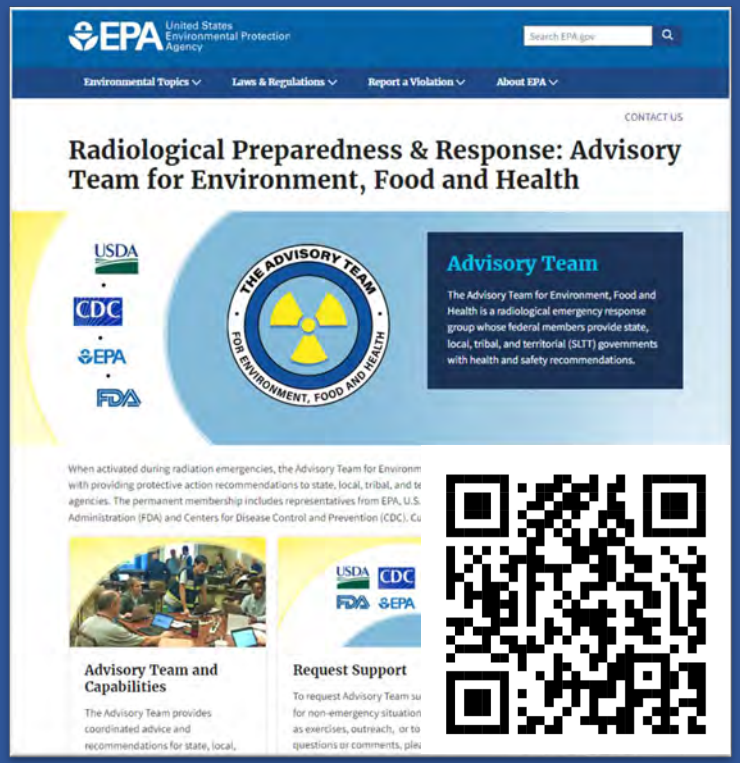
On the technical side, EPA is the current chair of the Advisory Team for Environment, Food, and Health – an important source of expertise for local public health decision makers

National Analytical Radiation Environmental Lab deployable monitors

National Center for Radiation Field Operations Field Team unloading equipment

Recovery: The Advisory Team

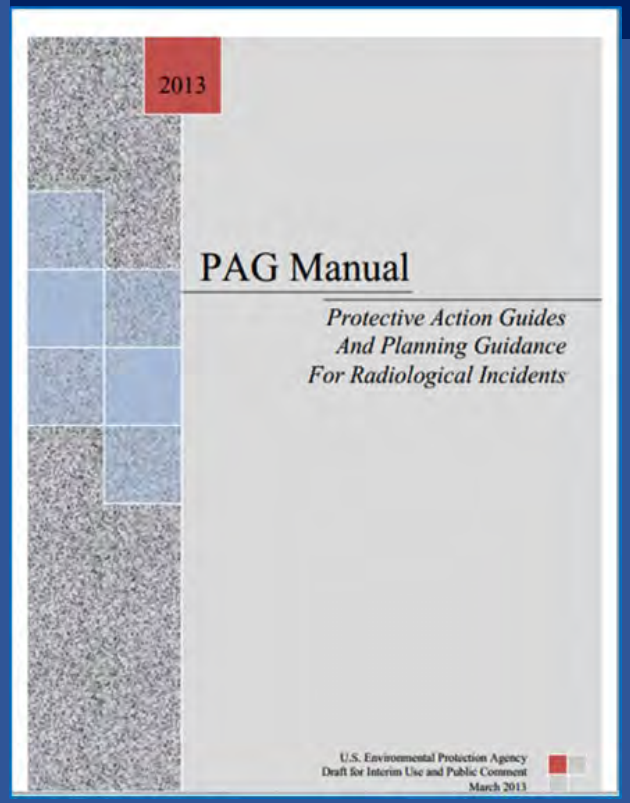
- The Advisory Team for Environment, Food and Health is a radiological emergency response group whose federal members provide state, local, tribal, and territorial (SLTT) governments with health and safety recommendations.
- FRMAC component probably most aligned with Public Health
- The Advisory Team can assist with the implementation of the EPA Protective Action Guidelines (PAGs) which serve as "health-based tipping points" that assist officials when deciding when it is necessary for people to evacuate, stay inside, issue a food or water advisory, or take other immediate steps to safeguard health during a radiological emergency



The website is hosted by EPA at: https://www.epa.gov/advisory-team

Recovery: PAGs

- Radiation protection is key to addressing the decisions that arise during Recovery
- To apply radiation protection, the EPA Protective Action Guidelines (PAGs) are consulted



- Protective Action Guide (PAG):

  The projected dose to an individual, that would trigger public safety measures, such as evacuation or staying indoors, to minimize or prevent radiation exposure during an emergency.

The PAG Manual does not set cleanup levels.

EPA Protective Action Guidelines (PAGs): Reentry

ACTIVITY	SUGGESTED LEVELS (PAG)
Reentry for Use of Critical Infra-structure	Public: **2 rem** (20 mSv) in first year. Dosimeters could be considered for the public
Reentry for Use of Roads and Walkways	Public: **2 rem** (20 mSv) first year, 0.5 rem (5 mSv) per year in subsequent years
Reentry for Access to the Relocation Zone	Public: **0.5 rem** (5 mSv) over one year for temporary access with stay times (see below)

Example: For reentry purposes, people limited to 0.5 rem dose in 1 year should be given instructions to limit their time in the relocation zone so their dose < 0.5 rem in 1 year of going in/out of the zone (e.g., limit is 3 eight-hour visits).

Reentry: Workers or members of the public going into relocation or radiological contaminated areas on a temporary basis under controlled conditions.

Relocation: The removal or continued exclusion of people (households) from contaminated areas to avoid chronic radiation exposure. Not to be confused with evacuation.

Reoccupancy: The return of households and communities to relocation areas during the cleanup process, at radiation levels acceptable to the community.

EPA Protective Action Guidelines (PAGs): Relocation, Food & Water

Protective Action Recommendation	PAG or Guideline	Comments
Relocation of the public	**PAG**: ≥ 2 rem (20 mSv) projected dose in the first year, 0.5 rem (5 mSv)/year projected dose in the second and subsequent years	Projected dose over one year of exposure.
Apply simple dose reduction techniques	**Guideline**: < 2 rem (20 mSv) projected dose in the first year	These protective actions should be taken to reduce doses to as low as practicable levels.
Food Interdiction	**PAG**: 0.5 rem (5 mSv)/year projected whole body dose, or 5 rem (50 mSv)/year to any individual organ or tissue, whichever is limiting	See PAG Manual, Section 4.6
Drinking Water "Protections"	**PAG:** 100 mrem (1 mSv or 0.1 rem) projected dose, for one year, to the most sensitive populations (e.g., infants, children, pregnant women and nursing women); 500 mrem (5 mSv or 0.5 rem) projected dose, for one year, to the general population	

Recovery: Projected Public Doses

- Doses to the public from the contaminating incident must be estimated (projected) for comparison to the PAGs
- Use of Turbo-FRMAC code or ResRad codes (can do-it-yourself if adept)
  - Turbo-FRMAC: NIRP Website
  - ResRad: RESRAD Family of Codes
- Federal Radiological Monitoring and Assessment Center (FRMAC) scientists will evaluate projected doses
- Doses are estimated by considering such factors as the dose rates from the contamination and…
  - Where people live
  - How they commute to/from work
  - Where they work
  - Hours at each task
  - Food & water consumption

Recovery: Establish Final Cleanup Goals

EPA Recommendations

- Specific numerical final clearance remediation levels after a radiological terrorist attack in public areas do not exist and the federal agencies believe setting a numerical value restricts the flexibility of the recovery process.
- The level of contamination that drives remediation efforts to achieve final clearance are typically derived from the health risk corresponding to a dose to workers or the public who may be exposed to the material.
- Therefore, specific risk and dose levels used to establish clearance levels (e.g., EPA Superfund & Nuclear Regulatory Commission decommissioning rule), do not necessarily apply.

Private Sector Recommendations

- Recognize that public & technical consensus is required for developing clearance levels
- It is very possible that you will have different clearance levels for different infrastructure
- Prioritize the decon-process over prescriptive cleanup limits (cost & time for lower levels escalates)
- Guidance and circumstances of the cleanup may change
- Recognize waste management is a critical limiting factor (volume > the currently available capacity)

Recovery: Establish Final Cleanup Goals Consensus

- “Technical Working Group” (or “Advisory Panel”): Radiological, health and environmental experts whose activities include providing guidance and recommendations on cleanup prioritization and waste handling (e.g. the A-Team + local experts)
- “Stakeholder Group” (or “Community Advisory Panel”): Reviews cleanup plans and waste staging area options; provides community perspectives and community concerns to incident managers (e.g., the panel can draw from local business associations and civic groups; people who know the community)
  - Plus:
    - Legal experts
    - Radiological, environmental& engineering consultants
    - Academics, professional society members

Recovery Implementation: Federal Support

- EPA can provide:
  - Experience: Running various cleanups directly for many years
  - Contracting capacity large with both assessment and cleanup contractors
  - Cost Estimating and management teams
- Army Corps of Engineers can provide:
  - Experience: managed Formerly Utilized Sites Remedial Action Program (FUSRAP)
  - Contracting capacity and disposal contracts
  - Cost estimating, management also

Implementation: Private Sector Contractors

- Decommissioning Contractors should be recognized as critical to recovery
- Expertise to manage operational aspects of the cleanup resides with the private sector; Government agencies alone lack sufficient personnel, equipment, and direct experience
- Contractor integration should be early, not after decisions are made
- Success depends on enabling contractors, not constraining them with inflexible requirements
- No single contractor can fulfill potential demands; they pool expertise for large scale projects

Implementation: Private Sector Contractors

- Private Sector Radiological Contractors bring much to the project:
  - Historically act as a subcontractor
  - High technical expertise (years of decommissioning experience)
  - Sub-Contracting expertise (can acquire more expertise as needed)
    - Are adept at banding together to provide needed functions (e.g., companies with decon experience will contract with dosimetry vendors or will call in construction firms when needed to work on heavy infrastructure)
  - Possess the needed equipment (usually at hand)
  - Maintain trained staff (at hand and can recruit from nuclear workers)
  - Possess Radioactive Material Licenses (where they are necessitated by state or federal regulators)
  - <u>They routinely collaborate with waste brokers</u>

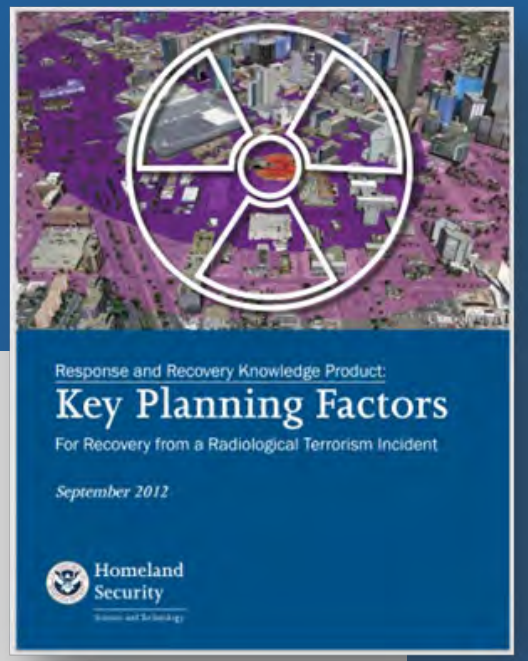
Recovery: Implementation

Radioactive Waste

- May pose the most significant problem to efficient recovery
- It's the economic and logistical driving-force in cleanup, and normally the single largest factor in total value
- The amount of waste generated is directly proportional to the cleanup approach and long-term goals; waste management is part of the total operational structure
- Currently in the U.S., there is limited disposal capacity leading to prohibitively high costs for waste
- Contractor MUST have strong understanding of material types and activity concentrations
- Packaging efficiency (truck loading) and waste minimization play a vital role
- Staging: may require fed/state/local governments to establish temporary space for rad waste storage and/or to seek out and develop in-state disposal

Key Planning Factors

Key Planning Factors For Recovery from a Radiological Terrorism Incident
Department of Homeland Security
September 2012



- Establish Background Radiation Levels Before An Incident*
- Develop Communication Plans
- Establish Radiation Protection Operational Guidelines
- Develop Pre-Incident Waste Management Guidelines
- Identify/Create Stakeholder Working Groups
- Identify Technical Working Group Participants
- Establish a Process for Developing Clearance Goals

*Inaccurate background levels will hinder cleanup efforts or may negate survey data or detection sensitivity of the instrumentation.

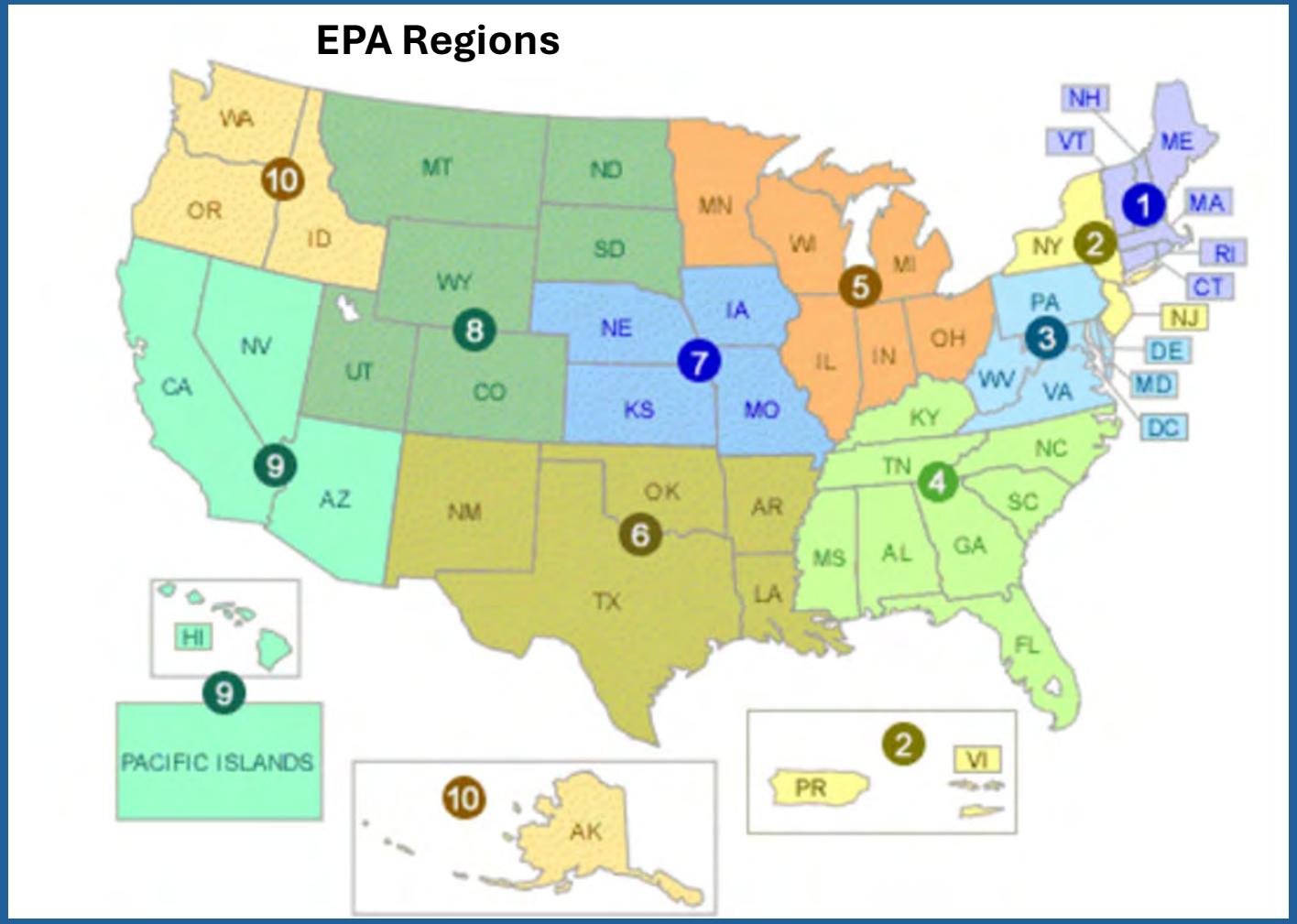
Resources: Links

- Advisory Team Radiological Preparedness & Response: Advisory Team for Environment, Food and Health | US EPA
- Centers for Disease Control (Rad Shipments) ShippingInstructions.pdf
- Community Reception Centers Community Reception Centers | Radiation Emergencies | CDC
- Derived Intervention Levels Supporting Document for Guidance Levels for Radionuclides in Domestic and Imported Foods | FDA
- FRMAC Federal Radiological Monitoring and Assessment Center (FRMAC) - Nevada National Security Site
- GEL Welcome to GEL Laboratories | The GEL Group
- Key Planning Factors 30_rrkp_key_planning_factors_radiological_incident.pdf
- PAG Manual Protective Action Guides (PAGs) | US EPA
- Public Messaging PAG Public Communication Resources | US EPA
- RESRAD: RESRAD Family of Codes

Resources: Links

- RDD Recovery Planning Guidance for Responding to and Recovering from Radiological Dispersal Device (RDD) Incidents
- REMM website Monitoring Radionuclides in Drinking Water and Food - Radiation Emergency Medical Management
- Stakeholder Involvement Practices and Experience in Stakeholder Involvement for Post-nuclear Emergency Management
- Turbo FRMAC NIRP Website
- World Trade Center Registry World Trade Center Health Registry - 9/11 Health

Resources: Talk to EPA & Contractors



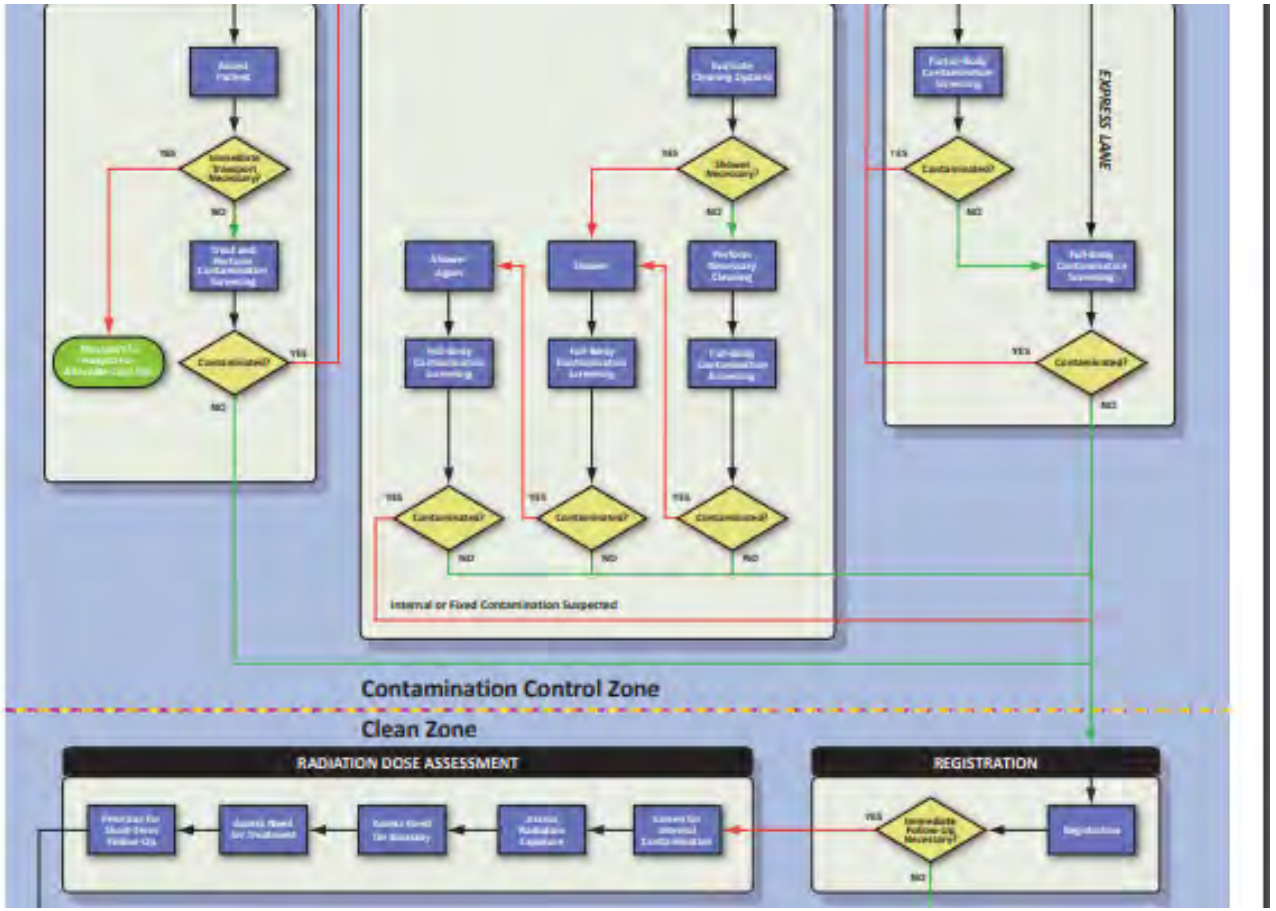
- Contact personnel in your EPA Region
- To identify EPA's Regional Radiation Program, visit https://www.epa.gov/radiation/regional-radiation-contacts
- RSOs can contact personnel in the decontamination and rad-waste industry for planning meetings and presentations

Bioassay Screening

Community Reception Center Radiation Dose Assessment

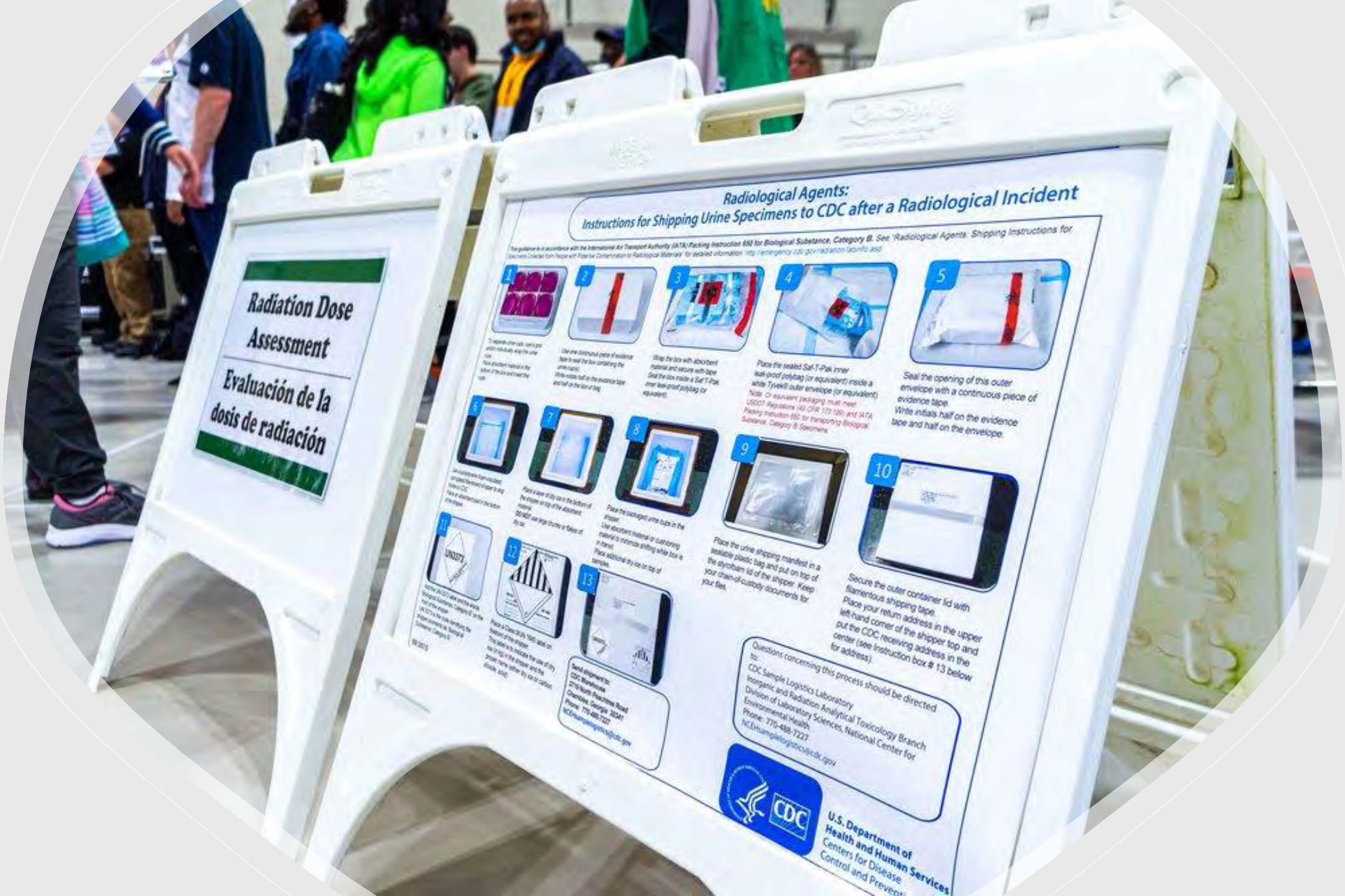
MIDDLESEX COUNTY • NJ

John Dowd, MCHES®
Middlesex County
Department of
Public Safety and Health
Office of Health Services

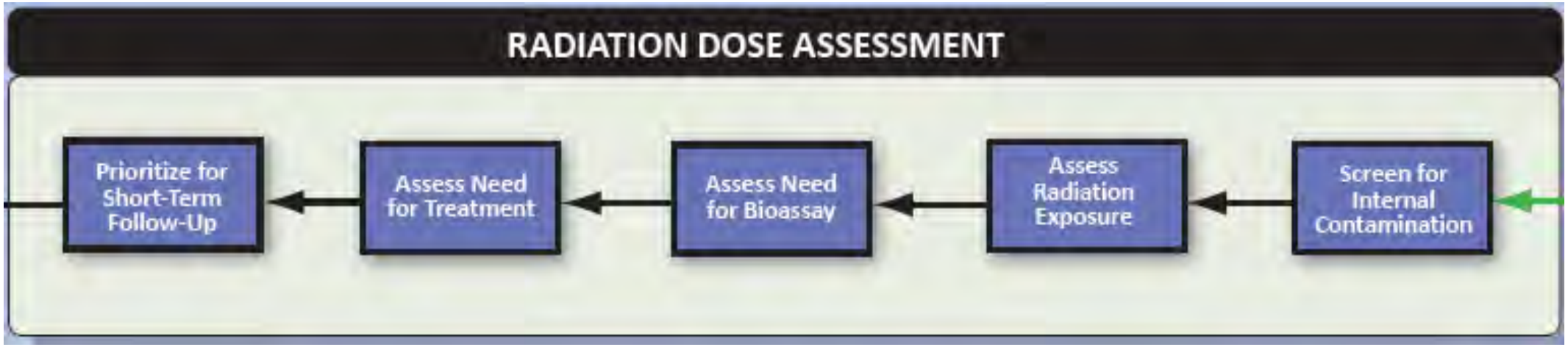


Community Reception Center Functional Exercise Objectives

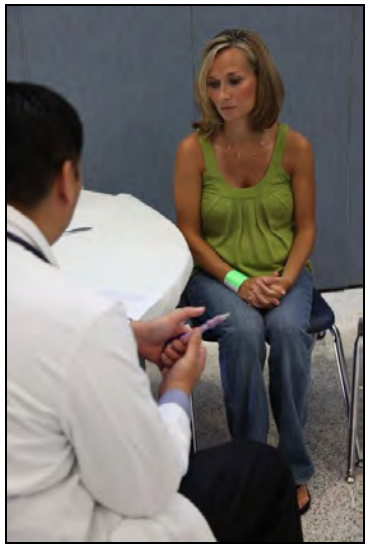
- Equipment and supplies required for CRC operations.
- Provide medical equipment, supplies, and services required for CRC operations.
- Address hazards during the operations of a CRC in support of the responder operations and the affected communities.
- First responders and community volunteers will collaborate with Access and Functional needs agencies to enhance emergency response planning.
- Training of new staff and Medical Reserve Corps volunteers in CRC operations.
- Conduct Radiation Dose Assessment activities during CRC operation.


Radiation Dose Assessment
Evaluación de la dosis de radiación
Radiological Agents:
Instructions for Shipping Urine Specimens to CDC after a Radiological Incident
Place the urine shipping manifest in a sealable plastic bag and put on top of the styrofoam lid of the shipper. Keep your chain-of-custody documents for your files.
Secure the outer container lid with filamentous shipping tape.
Place your return address in the upper left hand corner of the shipper top and put the CDC receiving address in the center (see Instruction box # 13 below for address)
Questions concerning this process should be directed to:
CDC Sample Logistics Laboratory
Inorganic and Radiation Analytical Toxicology Branch
Division of Laboratory Sciences, National Center for Environmental Health
Phone: 770-488-7227
CDC
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

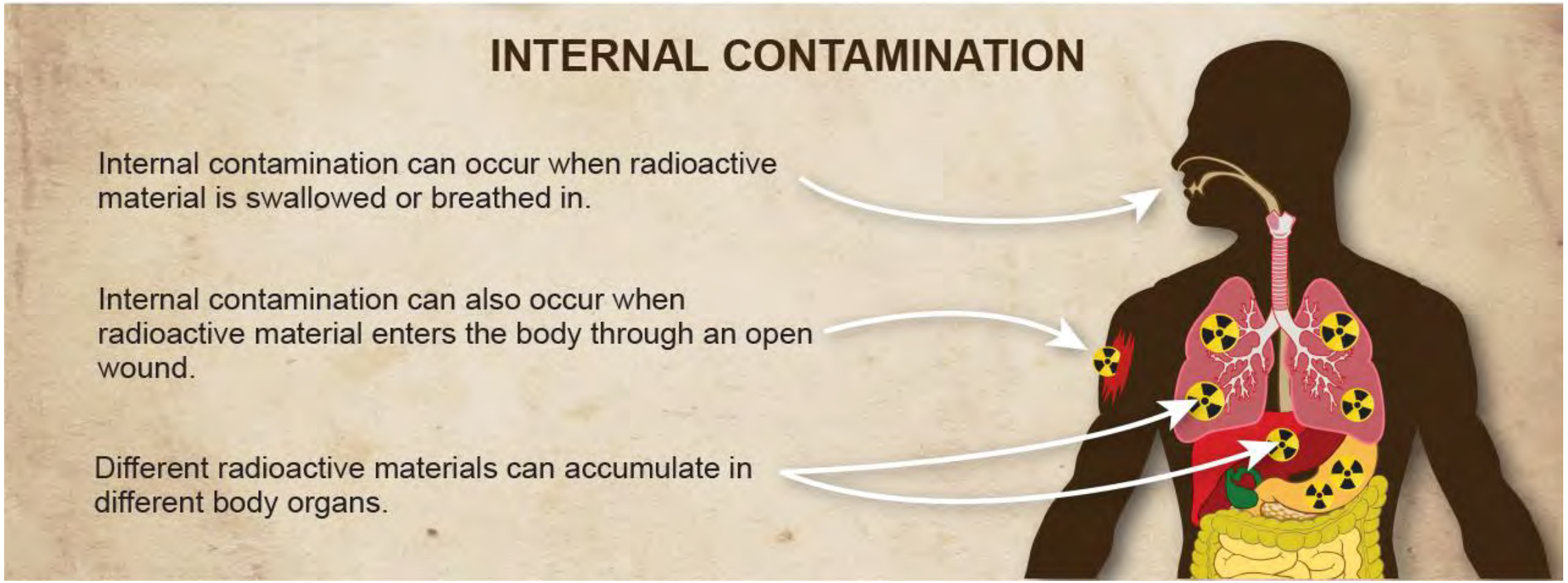
Radiation Dose Assessment



- **You will receive further screening to measure the amount of radiation you received.**
- **You may be referred to a hospital or clinic for follow up.**



Internal Contamination



Urine Radionuclide Screen

- A urine radionuclide screen is a collection of clinical lab tests used to detect the presence of radiation-emitting isotopes in urine.
- Its purpose is to detect samples with radioactivity, provide data for radiation exposure assessment, and inform about an individual's health risk

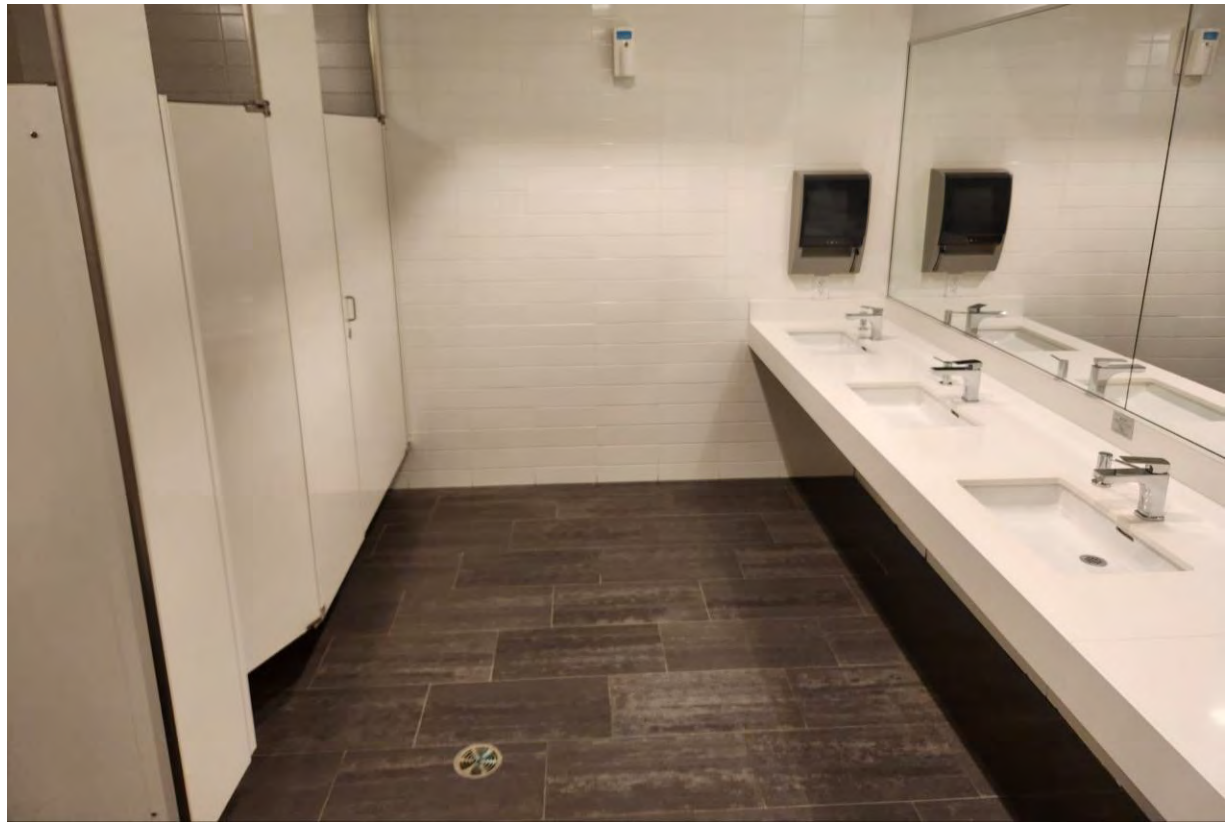
Why Screening is Important

- Assists in the early detection and assessment of radiation exposure.
- Allows public health officials and medical professionals to allocate limited resources to the people who need them the most.
- Great tool to support population monitoring efforts and data collection for epidemiological studies.

Sample Collection and Analysis

- Urine and patient data collection is completed by clinical staff members or other medical professionals at hospitals, community reception centers, or clinics.
- Those medical professionals will then ship the samples to State and/or CDC lab personnel for laboratory testing.
- The test results will be interpreted by health physicists who will assist medical professionals in determining appropriate countermeasures when necessary.

Facilities



Patient Data

- Patients may need further assessment to measure the internal and external dose of radiation received.
- For internal contamination, a urine sample will be collected for screening.

Forms

TrakBAND™

Patient Log
Vaccination/Meds

Location _____ Date ____ / ____ / ____ Time _____

DMS-05356 TrackLog-MassVax

Staff Use Only

Vaccination ☐ Flu ☐ Small Pox ☐ Other _____

Meds ☐ Cipro ☐ Doxycycline ☐ Other _____

ME03003110

1

Yellow Copy - Patient Record

PLEASE PRINT

Patient's Name _____ ☐ Male ☐ Female

Guardian (if applicable) _____

Address _____ St _____ Zip _____

Phone _____ Cell Phone _____

Contact in Case of Emergency _____ Relationship _____ Phone _____

Allergies _____

Patient or Guardian's Signature _____ Date _____

STAFF INSTRUCTIONS

(Step 1) REGISTRATION - Apply TrakBAND™ Sticker 1 to Pink Copy AFTER attaching wrist band to patient. REGISTRATION Retains Pink Copy.
(Step 2) VACCINATION/MEDS - Apply TrakBAND™ Sticker 2 to White Copy AFTER Administering Vax/Meds - VACCINATION/MEDS Retains White Copy.
(Step 3) EXIT - Staple Patient's TrakBAND™ to Yellow Copy. Patient/Guardian Retains Yellow Copy for His/Her Records.

I. CONTAMINATION ASSESSMENT FORM

NAME: _____ _____ _____
(LAST) (FIRST) (MI)

ID NUMBER: | | | | | | | | | | | | | | | | DATE: _____ TIME: _____

INSTRUCTIONS:

- RECORD MEASURED LEVELS OF CONTAMINATION FOR SPECIFIED AREAS
- MARK CONTAMINATION FINDINGS ON DIAGRAMS
- IDENTIFY CONTAMINATED WOUNDS IF PRESENT
- PLACE AN "X" IN THE BOX IF NO MEASUREMENTS WERE TAKEN

TABLE 1: PRE-DECONTAMINATION MEASUREMENTS (IN CPM)

	FRONT	BACK
HEAD		
BREATHING ZONE		
TORSO		
	LEFT	RIGHT
ARM		
HAND		
LEG		
SOLE OF SHOE		

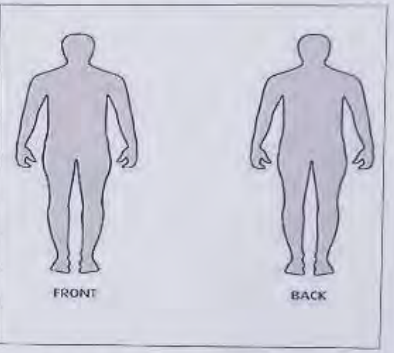
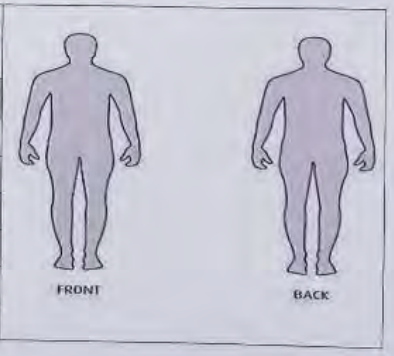
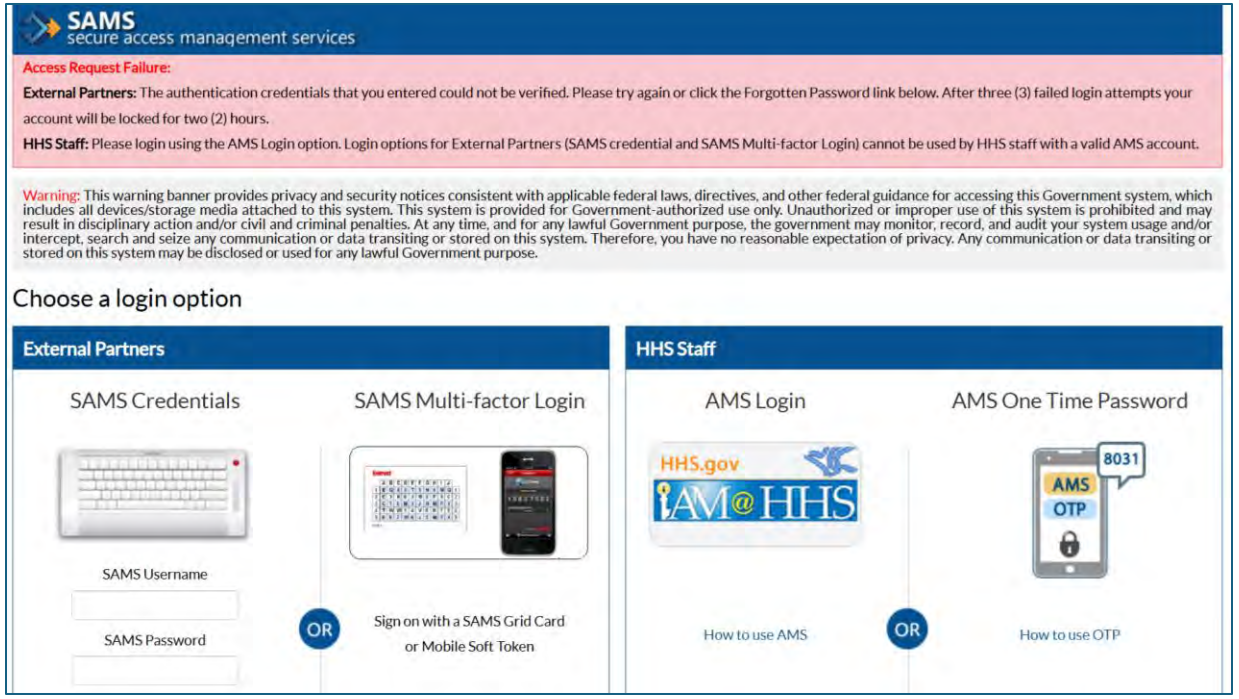


TABLE 2: POST-DECONTAMINATION MEASUREMENTS (IN CPM)

	FRONT	BACK
HEAD		
BREATHING ZONE		
TORSO		
	LEFT	RIGHT
ARM		
HAND		
LEG		
SOLE OF SHOE		



Database Account



- Create a SAMS account on the CDC webpage
- Receive an invite to create a project from CDC laboratory staff
- Create a project within the data collection system

Sample Equipment

- Sample Cups
- Sample labels
- Forms
- Markers / Pens
- Medical gloves (PPE gown, face shield, mask)
- Dry Ice gloves
- Dry Ice
- Refrigerator / Freezer

Radiological Agents:
CDC Specimen Collection Protocol for a Radiological Incident

See "Radiological Agents: CDC Shipping Instructions for Specimens Collected from People with Potential Contamination to Radiological Materials" for detailed information. http://emergency.cdc.gov/labissues/index.asp

Collect 40 to 60 mL of urine for each person in a screw-cap urine cup. Use the following steps below.

1. Wash hands with soap and water.

2. Collect 40 to 60 mL of urine in a screw- cap urine cup.

3. Deliver specimen to clinic personnel.

4. Label the urine cup with the appropriate bar-coded label, indicating the method of collection if other than "clean catch."

5. Place bar-coded label on all cups so that when upright, the barcode looks like a ladder.

6. Freeze samples (optimally at -70° C or use dry ice).

Questions concerning this process should be directed to:

CDC Sample Logistics Laboratory
Inorganic and Radition Analytical Toxicology Branch
Division of Laboratory Sciences, National Center for Envtronmental Health
Phone: 770-488-7227
NCEHsamplelogistics@cdc.gov

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

09/2015

Packaging and Shipping Specimens

- After collecting the samples, package and ship them to the appropriate laboratory destination based on your state's radiological terrorism comprehensive response plan.

Shipping Equipment

- Polystyrene foam insulated corrugated fiberboard shipper
- Grid box (to hold cups)
- Absorbent material
- Leak proof polybag
- Evidence Tape
- Shipping tape
- Markers
- Plastic bags

- Biohazard Bags
- Sample cups
- Surgical gloves
- Dry Ice gloves
- Dry Ice
- UN 3373 labels
- Class 9 / UN 1845 labels
- Address labels
- Shipping Forms

Radiological Agents:
Instructions for Shipping Urine Specimens to CDC after a Radiological Incident

This guidance is in accordance with the International Air Transport Authority (IATA) Packing Instruction 650 for Biological Substance, Category B. See "Radiological Agents: Shipping Instructions for Specimens Collected from People with Potential Contamination to Radiological Materials" for detailed information: http://emergency.cdc.gov/radiation/labinfo.asp

1

To separate urine cups, use a grid and/or individually wrap the urine cups.
Place absorbent material in the bottom of the box and insert the cups.

2

Use one continuous piece of evidence tape to seal the box containing the urine cup(s).
Write initials half on the evidence tape and half on the box or bag

3

Wrap the box with absorbent material and secure with tape.
Seal the box inside a Saf T-Pak inner leak-proof polybag (or equivalent).

4

Place the sealed Saf-T-Pak inner leak-proof polybag (or equivalent) inside a white Tyvek® outer envelope (or equivalent).
Note: Or equivalent packaging must meet USDOT Regulations (49 CFR 173.199) and IATA Packing Instruction 650 for transporting Biological Substance, Category B Specimens.

5

Seal the opening of this outer envelope with a continuous piece of evidence tape.
Write initials half on the evidence tape and half on the envelope.

6

Use a polystyrene foam-insulated, corrugated fiberboard shipper to ship boxes to CDC.
Place an absorbent pad in the bottom of the shipper.

7

Place a layer of dry ice in the bottom of the shipper on top of the absorbent material.
DO NOT use large chunks or flakes of dry ice.

8

Place the packaged urine cups in the shipper.
Use absorbent material or cushioning material to minimize shifting while box is in transit.
Place additional dry ice on top of samples.

9

Place the urine shipping manifest in a sealable plastic bag and put on top of the styrofoam lid of the shipper. Keep your chain-of-custody documents for your files.

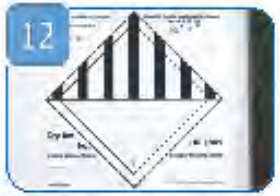
10

Secure the outer container lid with filamentous shipping tape.
Place your return address in the upper left-hand corner of the shipper top and put the CDC receiving address in the center (see instruction box # 13 below for address).

11

Add the UN 3373 label and the words "Biological Substance, Category B" on the front of the shipper.
UN 3373 is the code identifying the shipper's contents as "Biological Substance, Category B."

12



Place a Class 9/UN 1845 label on the front of the shipper.
This label is to indicate the use of dry ice (in kg) in the shipper and the proper name (either dry ice or carbon dioxide, solid)

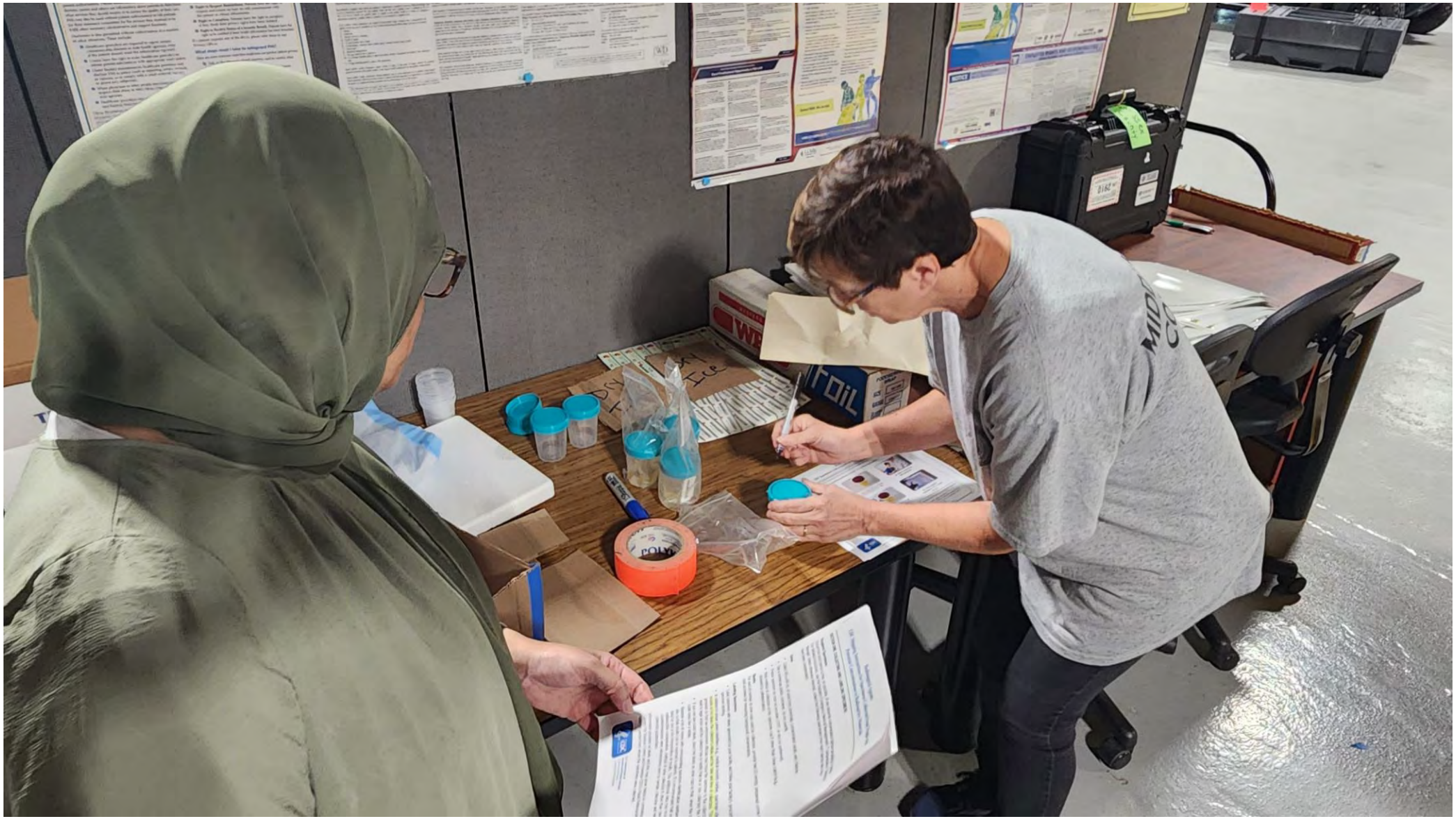
13

Send shipment to:
CDC Warehouse
3719 North Peachtree Road
Chamblee, Georgia 30341
Phone: 770-488-7227
NCEHsamplelogistics@cdc.gov

Questions concerning this process should be directed to:
CDC Sample Logistics Laboratory
Inorganic and Radiation Analytical Toxicology Branch
Division of Laboratory Sciences, National Center for Environmental Health
Phone: 770-488-7227
NCEHsamplelogistics@cdc.gov

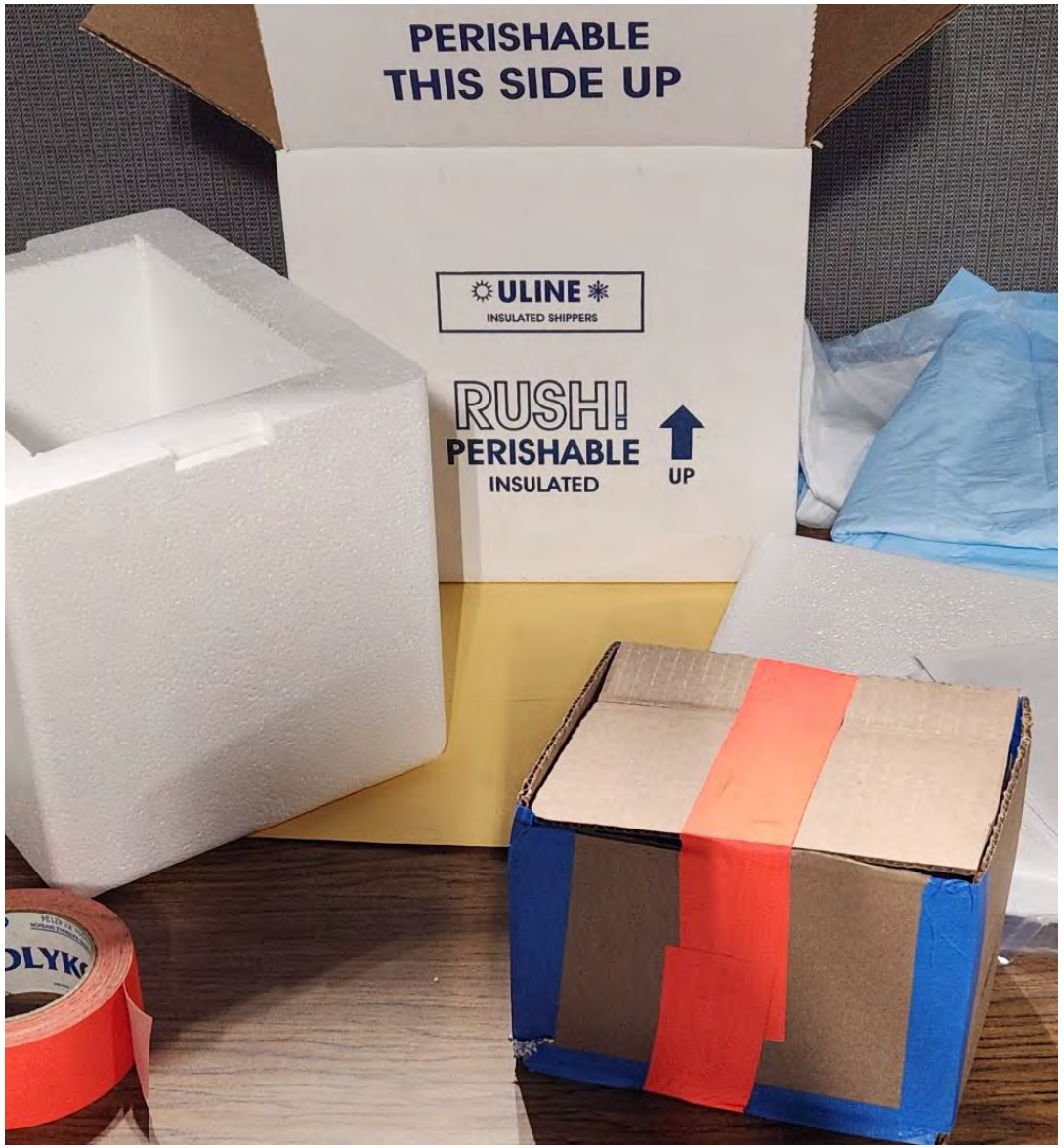
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

09/2015


FOIL


PERISHABLE
THIS SIDE UP
ULINE
INSULATED SHIPPERS
UP
RUSH!
PERISHABLE
INSULATED
UP


UP
INSULATED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THIS SIDE UP
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RUSH!
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INSULATED
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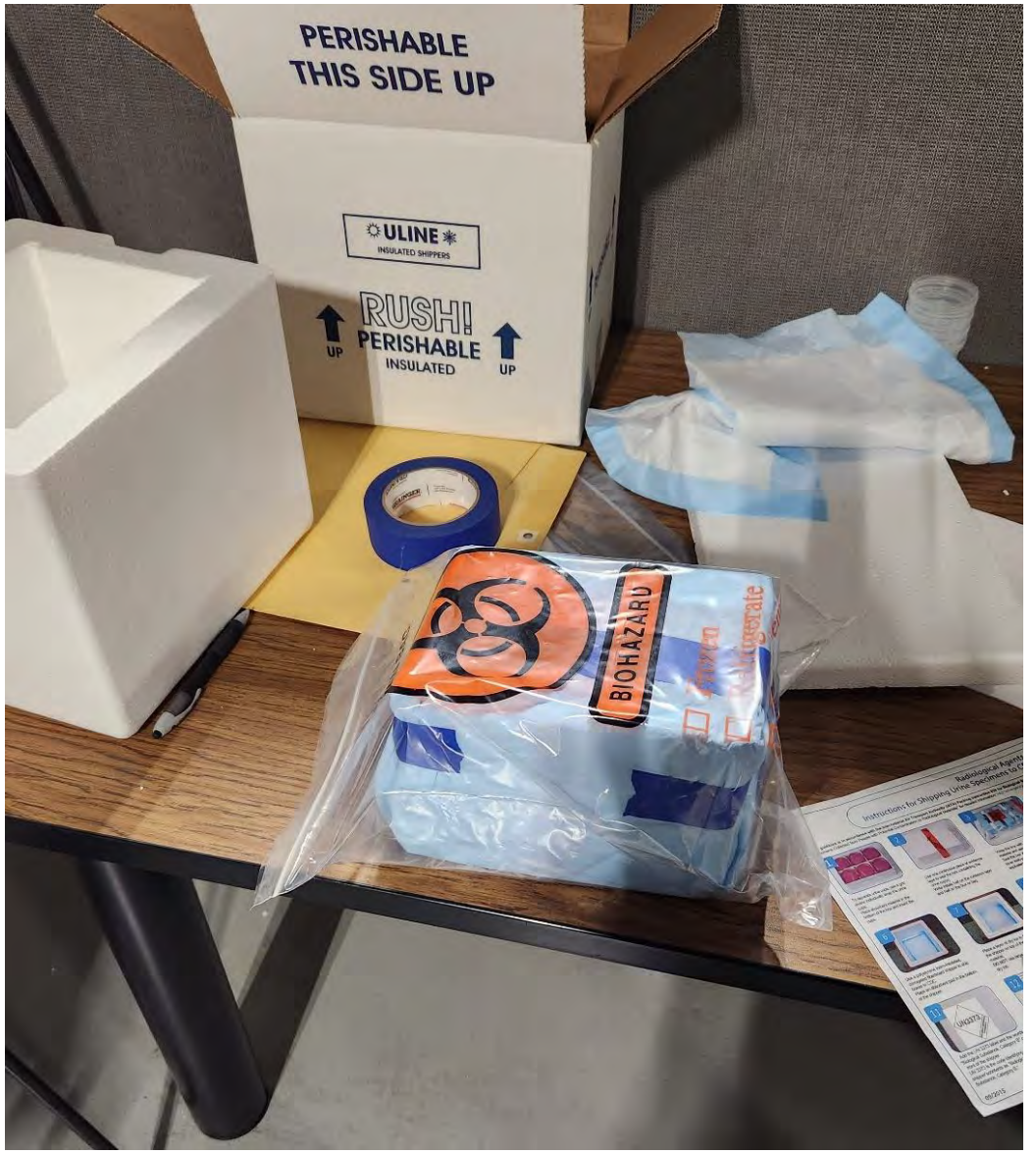
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THIS SIDE UP
ULINE
INSULATED SHIPPERS
UP
RUSH!
PERISHABLE
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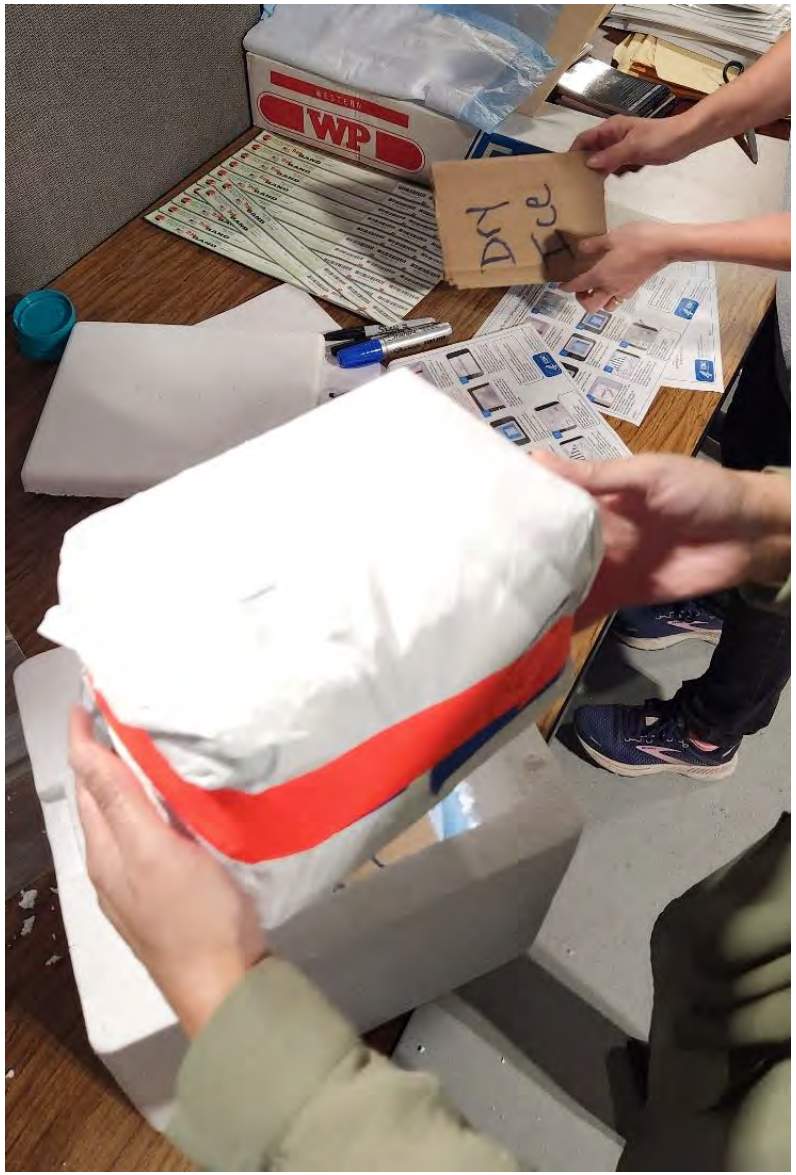
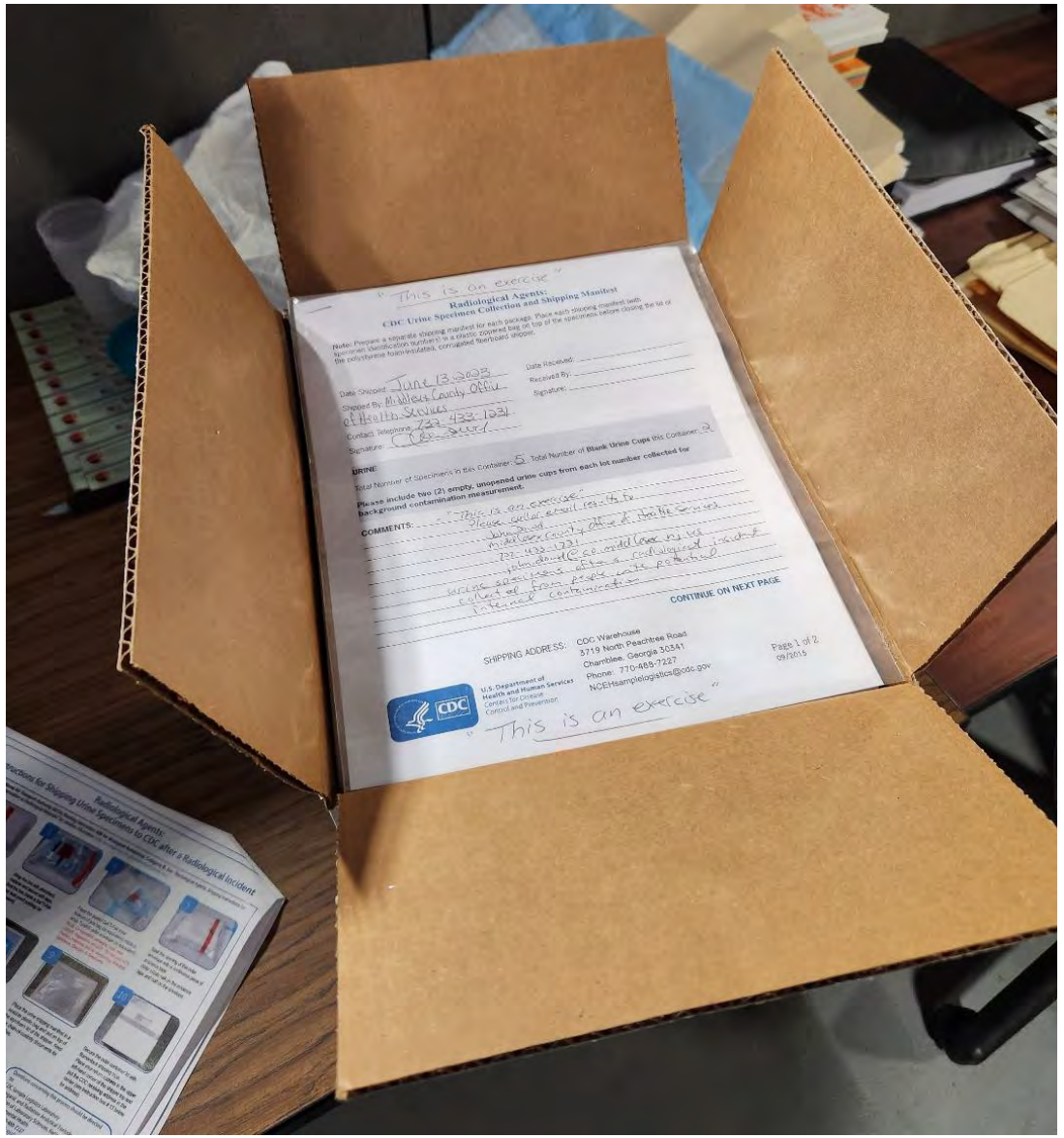
UP
BIOHAZARD


WP


ULINE
INSULATED SHIPPERS
RUSH!
PERISHABLE
INSULATED
UP
UP
PERISHABLE


"This is an exercise"
Radiological Agents:
CDC Urine Specimen Collection and Shipping Manifest
Date Shipped: June 13 2023
Shipped By: Middlesex County Office of Health Services
Contact Telephone: 732 433 1231
Signature:
Date Received:
Received By:
Signature:
URINE:
Total Number of Specimens in this Container: 5 Total Number of Blank Urine Cups this Container: 2
Please include two (2) empty, unopened urine cups from each lot number collected for background contamination measurement.
COMMENTS: "This is an exercise"
Please call or email results to
John Doe
Middlesex County Office of Health Services
732 433 1231
JohnDoe@CO.middlesex.nj.us
Urine specimens are considered
contaminated after 4 days
CONTINUE ON NEXT PAGE
SHIPPING ADDRESS: CDC Warehouse
3719 North Peachtree Road
Chamblee, Georgia 30341
Phone: 770-488-7227
NCEHsampleplogistics@cdc.gov
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention
Page 1 of 2
09/2015
"This is an exercise"
Radiological Agents:
Instructions for Shipping Urine Specimens to CDC after a Radiological Incident


"This is an exercise"
SECURITY SEAL A8046995
PERIS
THIS SIDE
UP
"This is an exercise"

ECLS Radioanalytical Laboratory Services

Purpose

- To gain experience with receiving and handling bio-radiological samples
- To train and familiarize all laboratory personnel with proper procedures for handling bio-radiological samples
- To identify any insufficiency and improvement areas for future, large scale radiological emergency preparations

MIDDLESEX COUNTY
OFFICE OF HEALTH SERVICES
LOGISTICS

EQUIPMENT/MATERIALS SIGN OUT SHEET

Name: [illegible] Signature: [illegible]
Date: 6/13/23 Time: _____
Department: State Health Laboratory
Delivered By: [illegible] Plate No. _____

The following item(s) has/have been received from the Middlesex County Office of Health Services and the checked item(s) will be returned in the same condition:

	Serial/ID #
* 5 urine samples	☐
* for internal radiological	☐
* contamination testing	☐
*	☐
*	☐
* THIS IS	☐
*	☐
* AN EXERCISE	☐
*	☐
*	☐
*	☐

Approved by: [illegible] Return Date: _____
Return Time: _____

WHITE: MCOHS YELLOW: AGENCY PINK: MCOHS RETURN BLUE:AGENCY RETURN

Chain of Custody from Courier

Package Receival (2 of 3)

"This is an exercise"

Radiological Agents:
CDC Urine Specimen Collection and Shipping Manifest

Note: Prepare a separate shipping manifest for each package. Place each shipping manifest (with specimen identification numbers) in a plastic zippered bag on top of the specimens before closing the lid of the polystyrene foam-insulated, corrugated fiberboard shipper.

Date Shipped: June 13 2023
Shipped By: Middlesex County Office of Health Services
Contact Telephone: 732-433-1231
Signature: [signature]

Date Received: 6/13/23
Received By: Wm. "Kirk" Nemeth
Signature: Wm. K. Nemeth

URINE

Total Number of Specimens in this Container: 5 Total Number of **Blank Urine Cups** this Container: 2

Please include two (2) empty, unopened urine cups from each lot number collected for background contamination measurement.

COMMENTS: "This is an exercise"
Please call or email results to
John Dowd
middlesex County Office of Health Services
732-433-1231
john.dowd@co.middlesex.nj.us
Urine specimens after a radiological incident collected from people with potential internal contamination

CONTINUE ON NEXT PAGE

SHIPPING ADDRESS: CDC Warehouse
3719 North Peachtree Road
Chamblee, Georgia 30341
Phone: 770-488-7227
NCEHsamplelogistics@cdc.gov

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

"This is an exercise"

Packing Slip (1 of 2)

"This is an exercise"

Radiological Agents:
CDC Urine Specimen Collection and Shipping Manifest

CONTINUED FROM PREVIOUS PAGE Observation made by A. Kidd and documented by W. Nemeth. W. Nemeth

PLEASE INDICATE THE AMOUNT OF URINE COLLECTED IN THE URINE CUP (UC) COLUMN.

Patient/Sample ID Label	UC (mL)	Comments
C MA03003110	(50 mL) 30ml	Test for radiological materials Some urine in bag surrounding the sample
MA03003111	(40 mL) 30ml	Test for radiological materials bag unsealed and leaking inside
MA03003112	30 ml	Test for radiological materials intact
MA03003113	50mL full 30 ml	Test for radiological materials intact
MA03003114	(60 mL) 30 ml	Test for radiological materials leaking inside bag

USE ADDITIONAL COPIES OF THIS PAGE IF NECESSARY

NOTE: Please include two (2) empty, unopened urine cups from each lot number collected for background contamination measurement.

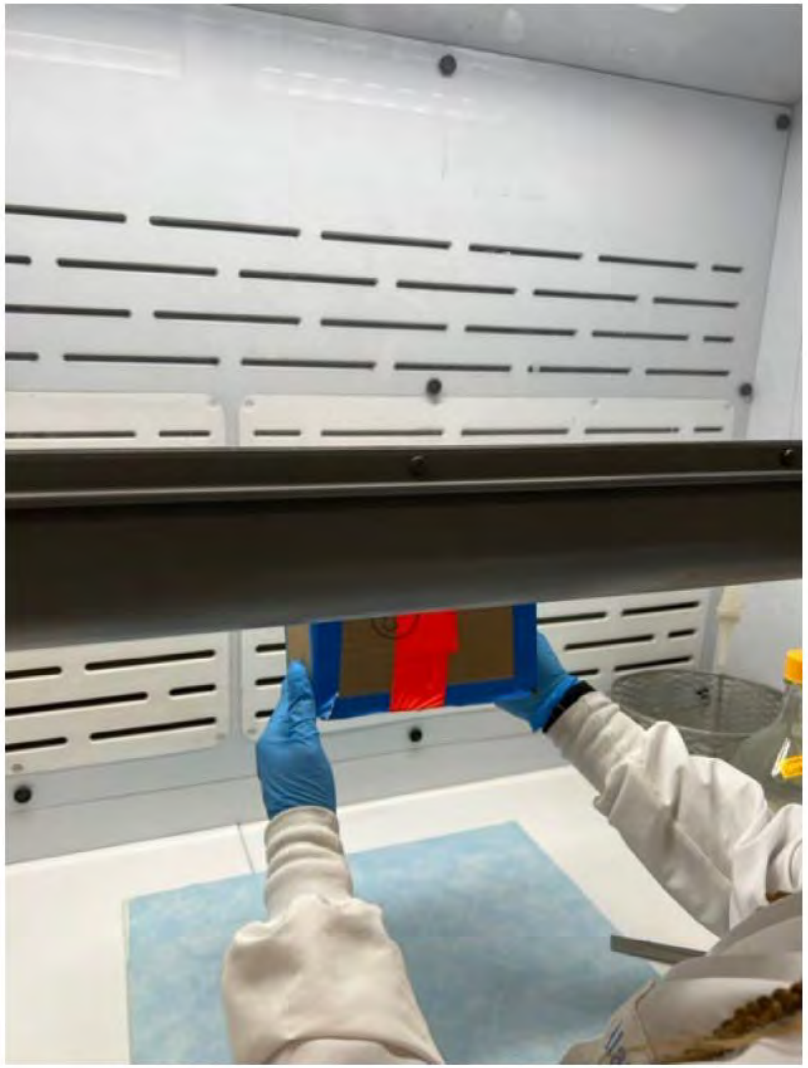
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

"This is an exercise"

Packing Slip (2 of 2)

Scanning/Inspecting All Packaging Layers (1 of 4)

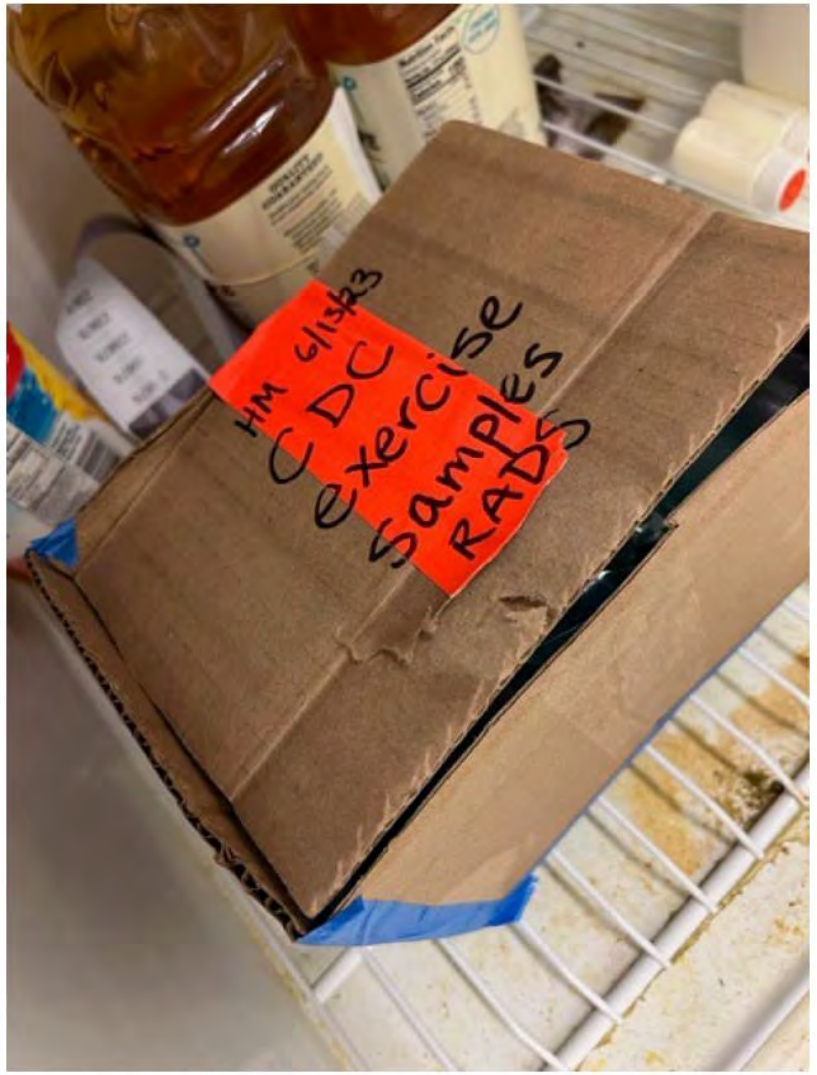
Scanning All Packaging Layers (2 of 4)



Scanning All Packaging Layers (4 of 4)

Scanning All Packaging Layers (3 of 4)

Verifying Sample Identification/Packaging (2 of 4)



Sample Storage/Secured Location (1 of 1)

Strengths

- CDC guides and protocols
  - Population Monitoring in Radiation Emergencies guide
  - Specimen collection protocol
  - Instructions for shipping for urine specimens
- Was able to create a database account with the CDC
- Had equipment on hand to collect, ship, and analyze specimens
- Laboratory staff provided knowledge and resources
- Staff received training on bioassay screening

Findings - Local Health Department

- Radiation Dose Assessment plan for a large-scale radiation incident is needed.
- Plans and procedures are needed with vendors, hospitals, and state and federal laboratories.
- Standardization of forms used to collect information for bioassay screening.
- Additional equipment is required to collect and ship specimens.
- Additional training of staff is required for specimen collection and shipping.

Findings - Laboratory

- Bio-radioanalytical plan for a large-scale radiation incident is needed.
- No formal Chain-of Custody associated with sample package.
- Laboratory is not equipped with low temperature refrigerators for sample storge, if biological analyses are needed.
- Laboratory is not equipped with enough survey equipment to scan and analyze volume of radiological urine samples
- Additional bio-safety space is needed to handle large numbers of bio-radiological samples.
- Additional training of staff for receiving and analysis of a large number of radiological urine samples.

Improvement Planning

Planning

- Radiation Dose Assessment plan with partners (Hospitals, Laboratory, Vendors)
- Specimen collection, shipping, and storage
- Bio-radioanalytical plan for a large-scale radiation incident

Forms

- Contamination Assessment
- Patient Log
- Chain of Custody
- Shipping Manifest
- Database information

Improvement Planning

Equipment

- Sampling
- Shipping
- Detection/Survey
- Low temperature refrigerators and ancillary supplies
- Bio-safety storage space

Training

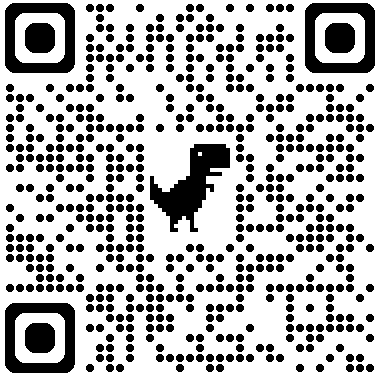
- CRC operations
- Specimen collection and shipping
- Receiving and analyzing of large number of samples

Improvement Planning

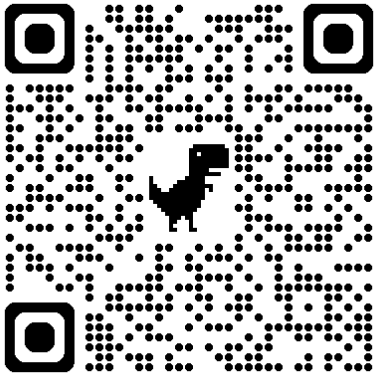
- Build specimen collection and shipping kits with required supplies
- Create planning elements as required
- Train staff on CRC operations; specimen collection and shipping; and receiving and analyzing samples
- Procure a dry ice vendor
- Establish a contract with a vendor to ship specimens
- Collaborate with partners (Hospital, State Lab, CDC Lab)

CDC Laboratory Contacts / Resources

- For questions regarding laboratory urine samples, contact the CDC Sample Logistics Laboratory by:
  - Phone: 770-488-7227
  - Email: NCEHamplelogistics@cdc.gov



- The CDC information line is another important source of information:
  - Phone: 800-CDC-INFO (800-232-4636)



- LRN-C Specimen Packaging and Shipping Exercise Video Tutorial

Thank you

John Dowd, MCHES®

Middlesex County
Office of Health Services

Division Head Public Health
Preparedness and Health Education

732-433-1231

john.dowd@co.middlesex.nj.us

MIDDLESEX
COUNTY • NJ

APHL and Radiation Readiness

June 17, 2026

Radiation Ready: Recovery, Bioassay, Resources for Local Public Health Webinar

Meghan Melnick, MPH
Environmental Health Specialist

Table of Contents

APHL Overview

Association of Public Health Laboratories Overview

The Association of Public Health Laboratories proudly works to strengthen laboratory systems serving the public's health; our activities support laboratories in the US and around the world.

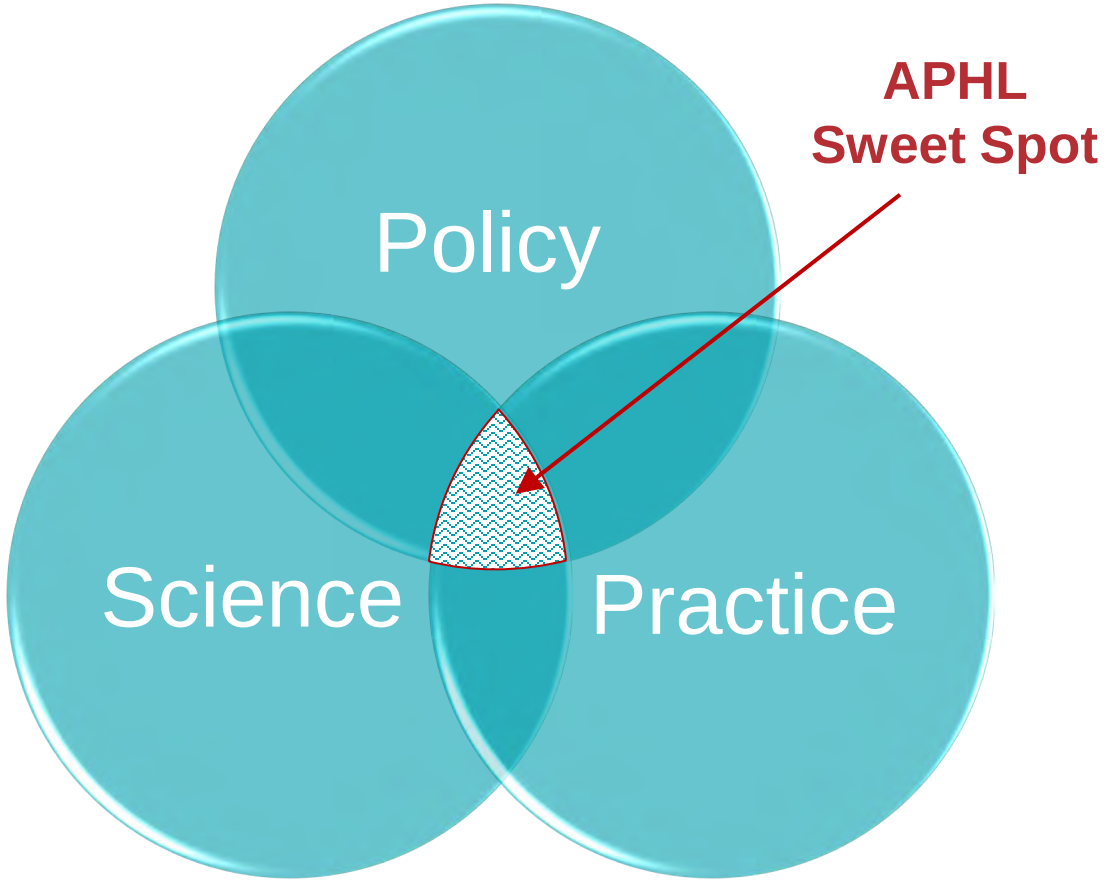
- Our core members are laboratories— public health, environmental, agricultural science, chemical and food safety laboratories—known collectively as “public health laboratories.”
- Our network includes over 130 member laboratories, 50 corporate partner organizations and 1,600 individuals. Representatives from federal agencies, nonprofit organizations, corporations and interested individuals also participate in the association.

Vision

A healthier world through quality laboratory systems.

Mission

Shape national and global health outcomes by promoting the value and contribution of public health laboratories and continuously improving the public health laboratory system and practice.



APHL Priorities

Advocate for the Role and Value of Public Health Laboratories

- Help our members engage policy makers to build understanding of the important work of public health laboratories

Advance Laboratory Science and Practice

- Offer technical assistance and consultation for public health informatics needs and through data services and coordinating with SMEs to develop resources

Support a Capable, Resilient and Innovative Workforce

- Providing environments where our members can engage with one another through meetings, committees, networks, and conference

Radiochemistry, Public Health, and APHL

Radiochemistry Workforce Crisis

- The US faces a critical threat: losing the ability to measure radioactive materials accurately, precisely, and in a timely manner. The decline in essential expertise has persisted for decades.
- 44% of the national laboratory nuclear and radiochemistry workforce is eligible to retire within the next 5-10 years.
- Fewer universities are offering radiochemistry concentrations and degrees.

APHL's Response

- The APHL Environmental Laboratory Science Committee (ELSC) and Environmental Health Committee (EHC) identified a need and created a workgroup in 2019 to address the radiochemistry workforce shortage.
- With dedicated funding in 2023 APHL was able to implement recommendations of the workgroup to begin addressing radiochemistry workforce issues.

APHL Radiochemistry Program

Advisory Group

- Provided guidance for activities
- Developed Knowledge Retention Toolkit tab for Radiochemistry

Community of Practice

- Fosters connections among radiochemistry professionals

Graduate Certificate Program

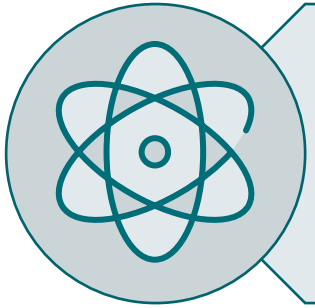
- Offers formal academic training to new radiochemistry professionals with the University of Iowa

Training and Travel

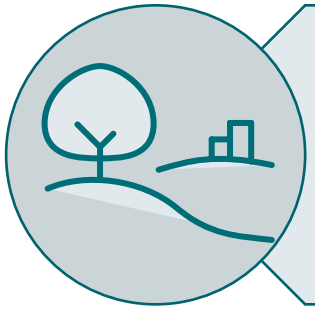
- Training awards
- Peer-to-Peer Exchange program
- Conference Travel Awards

Public Health Laboratories and Radiation Readiness

Radiochemistry in Public Health Laboratories



Test the radiologic materials to identify and quantify the radiochemical



Test food and the environment to understand the reach of radiological contamination

Test human specimens to **assess exposure over time**

Laboratory Testing

What are laboratories testing for?

Actinides	Americium	Barium-140	Carbon – 14
Cesium-134/137	Curium	Gamma	Gross Alpha and Beta
Iodine-131	Nickel-63	Plutonium	Potassium-40
Radium 226 / Radium 228	Radon	Ruthenium-103/106	Strontium (89 / 90/ total)
Technetium-99	Thorium	Tritium	Uranium

Where are laboratories testing?

- Environmental matrices
  - Air
  - Non-potable and public water
  - Soil
  - Vegetation
- Food matrices
  - Milk
  - Fish
- Drinking water
- Clinical (human) samples

Public Health Laboratory Response

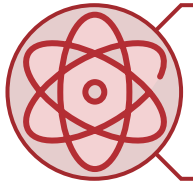
APHL Role in Response

- Provide leadership, advocacy and scientific guidance
- APHL activates an Incident Command System to ensure a coordinated laboratory response for crisis management
  - Current ongoing ICS responses include Ebola, Andes Virus (Hantavirus)
- Founding member of Laboratory Response Network along with CDC and FBI
- Emergency Laboratory Contacts

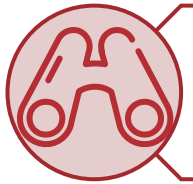
Public Health Laboratories

- State, local and territorial governmental laboratories are at the forefront of detecting novel threats and responding to all-hazard threats, such as biological, chemical, radiological or nuclear emergencies and natural disasters
- Members of laboratory networks including LRN, FERN, NAHLN, NPDN, ERLN, Vet-LIRN are prepared to respond to any incident as they work across multiple networks

Public Health Laboratory Response

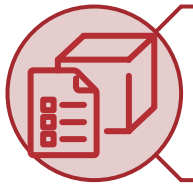


Support the detection and identification of radiological agents

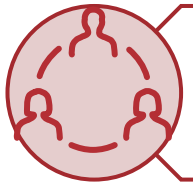


Monitoring, surveillance and ruling out radiological threats

Analysis and quantification of radiological exposures



Conduit for radiobioassay shipping



Collaborate on response activities and best practices

Radiological Incidents

INVESTIGATIONS

2019 Seattle radiation leak a 'near miss' to disaster, federal report finds

In May 2019, radiation leaked from a device at Harborview Research and Training. At first called a "minor" breach, investigators warn it could have been much worse.

Author: Chris Ingalls
Published: 6:57 PM PDT May 20, 2020
Updated: 7:00 PM PDT May 23, 2020

- Radiological incidents are often considered low-probability but high-impact events.
  - Nuclear explosion weapon
  - Improvised nuclear device
  - Nuclear incident at a power plant or reactor
- However, incidents may come from routine practices.

Radiological Responses

KIRO 7 LIVE. LOCAL. IN-DEPTH. 62° WATCH

NEWS PINPOINT WEATHER STREAM NOW KIRO 7 INVESTIGATES SPORTS GETS REAL KIRO 7 CARES STEALS & DEALS

VIDEO: Clean-up efforts for radiation spill still...

LOCAL

Critical medical research inside UW facility at risk

seattlepi

LOCAL

Radioactive cleanup at UW to force 200 staffers to move

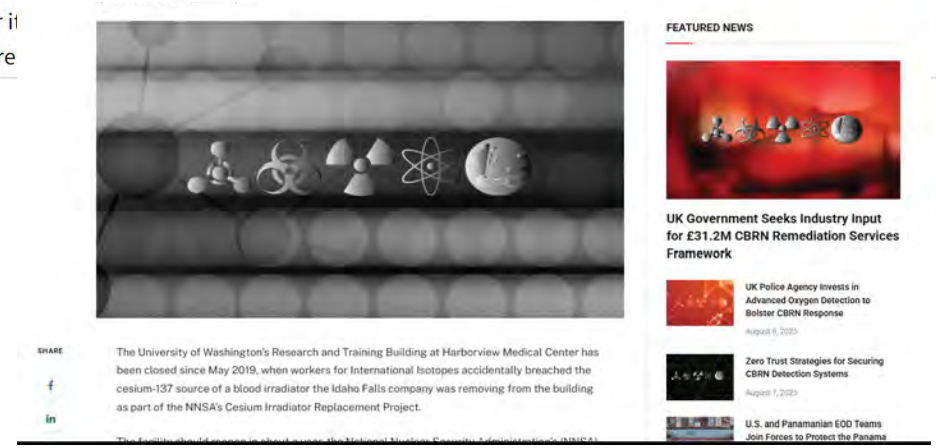
13 people were exposed about three weeks ago

By Zosha Millman, SeattlePI

10th CST attends exercise based on real

"Hundreds of thousands of dollars worth of equipment, labor and samples are being lost on a daily basis. This could destroy the careers of people who have been working their entire lives on research meant to save lives and improve public health and hospital outcomes. "

determine whether it
contamination scare



FEATURED NEWS

UK Government Seeks Industry Input for £31.2M CBRN Remediation Services Framework

UK Police Agency Invests in Advanced Oxygen Detection to Bolster CBRN Response

Zero Trust Strategies for Securing CBRN Detection Systems

U.S. and Panamanian EOD Teams Join Forces to Protect the Panama

SHARE

The University of Washington's Research and Training Building at Harborview Medical Center has been closed since May 2019, when workers for International Isotopes accidentally breached the cesium-137 source of a blood irradiator the Idaho Falls company was removing from the building as part of the NNSA's Cesium Irradiator Replacement Project.

Seattle building nears completion, two remediation managers discuss lessons learned

to detect and respond to a foreign substance.

design at JRTC rotation

Public Health Laboratory Response in Action

- In May 2019, during an irradiator decommissioning process at a building owned by the University of Washington at the Harborview Medical Center in downtown Seattle resulted in the release of Cs-137.
- Radioactive material was spread throughout the building and escaped into the surrounding neighborhood.
- Several individuals were exposed during the decommission process and needed to be tested.

The Washington State Department of Health Laboratory:

Provided testing services for air, soil, and surface wipes

Acted as the primary conduit for human samples to be shipped for radiobioassay

Coordinated with federal partners including the Department of Energy and the Federal Radiological Monitoring and Assessment Center

Public Health Laboratories and You

Connecting with your Public Health Laboratory

- Connect with your laboratory and radiochemistry leads
  - Reach out to eh@aphl.org if you need help finding them!
- LRN-C Level 3 Support
  - Chemical Threat Coordinator
  - Outreach capabilities
- State health departments

Every state, territory and the District of Columbia has its own public health laboratory system, as do many cities and counties.

Connecting with your Public Health Laboratory

- Include laboratories in preparedness exercises
  - “This is a TEST”: CDC preparedness game
    - Best between exercises and drills
    - Laboratories can request games from the CDC for an exercise
- Include laboratories in after-action and recovery activities

APHL 2026 attendees participated in “This is a TEST” CRC Edition and learned about population monitoring, resource management, and coordination during nuclear or radiological emergencies.

Resources and Trainings

APHL Resources

APHL Learning Center: APHL's Learning Management System

Professional Development Resources:
- Laboratory Response Network 101
- Measuring Radon in Water: An Important Tool to Understanding Radon Exposure

Member-Developed Resource Center: Sharing Community Knowledge

Member-Developed Resources:
- Protocol for the Evaluation of Alternate Test Procedures for Analyzing Radioactive Contaminants in Drinking Water
- Radiological Analytical Methods Expert Workshop with the U.S. Environmental Protection Agency

APHL Publications:

Lab Matters, Lab Culture, APHL Blog

Key Articles:
- Spring 2026: Training Yields Readiness: Lessons Learned from a North Dakota Radiation Response
- Winter 2025: Con-GRAD-ulations! Laboratory Scientists Help Revive Nationwide Radiochemistry Workforce

Member Perspective

New York State Department of Health

Wadsworth Center

NEW YORK STATE

Department of Health
Wadsworth Center

RADIATION READINESS AT WADSWORTH CENTER

SHERRY FAYE, PHD
DIRECTOR, NUCLEAR CHEMISTRY LABORATORY

JUNE 17, 2026 | NACCHO WEBINAR

NUCLEAR CHEMISTRY LABORATORY

Nuclear Chemistry Laboratory (NCL) Staff

- 4 Ph.D. staff scientists (radiochemistry, chemistry, biology, nuclear engineering)
- 8 technical staff in chemistry, instrumentation, calculation, and reporting
- 1 postdoctoral fellow through Association of Public Health Laboratories (APHL)

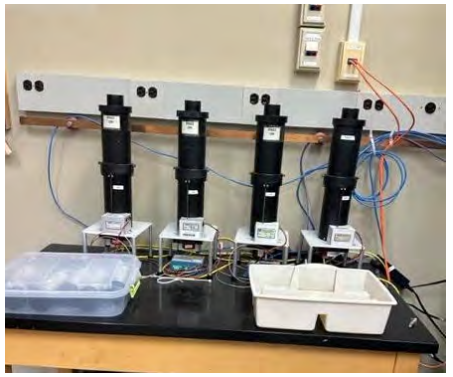
Nuclear Chemistry Laboratory Mission

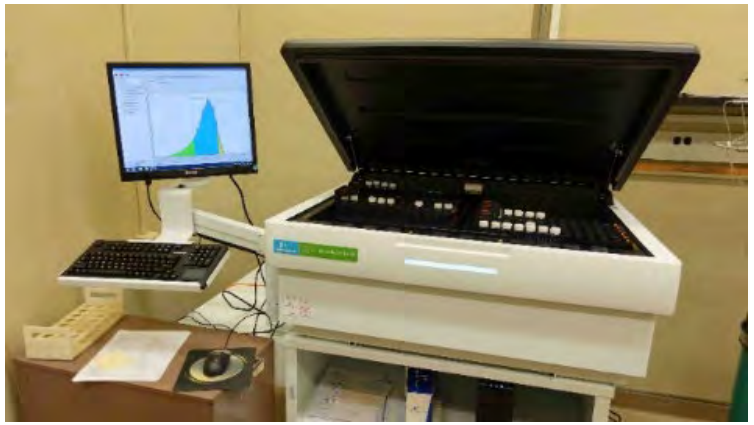
Bureau of Environmental Radiation Protection (BERP): Environmental monitoring	Bureau of Water Supply Protection (BWSP): Compliance with Safe Drinking Water Act

Our primary mission is to protect the public health of all New Yorkers through routine analysis of radiological surveillance samples collected statewide

NUCLEAR CHEMISTRY LAB CAPABILITIES

- Over 10,000 sq ft of space
- Chemistry: 10 labs, 20 fume hoods, specialized radioanalytical chemistry equipment
- Instrumentation:
  - 8 High Purity Germanium (HPGe) gamma detectors
  - 4 Lucas cell counters
  - 4 Gas Flow Proportional Counters (GPC)
  - 2 Liquid Scintillation Counters (LSC)
  - 2 alpha spectrometers (12 detectors)





NUCLEAR CHEMISTRY LAB CAPABILITIES

- Gross alpha/gross beta (EPA 900.0)
- Isotopic gamma (EPA 901.1)
- Determination of Tritium as HTO (EPA 906.0)
- Determination of ^{89}Sr and ^{90}Sr (EPA 905.0)
- Isotopic Uranium Determination (ASTM D3972-97)
- Determination of ^{226}Ra and ^{228}Ra (Ra-NY03)
- Isotopic Plutonium Determination (NYSDOH Method Pu-02)
- Determination of ^{131}I in Liquid Samples (NYSDOH Method I-08L)

Matrices include:

- Drinking water
- Non-potable water
- Milk
- Air
- Rainwater
- Food (fish, vegetation, etc.)
- Wipes and leak tests
- Soil and sediment

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EMERGENCY RESPONSE EXERCISES

Staff participate in routine state and federally evaluated drills designed to test capabilities for the analysis of environmental samples to simulate a response to a nuclear incident.

Scenario and Sample Collection

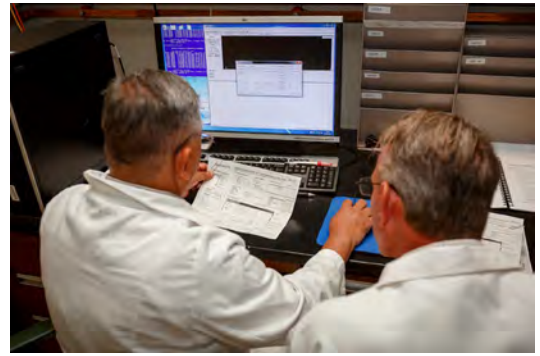
- At 8:36 am on June 21st, an alert was issued at James A. Fitzpatrick Nuclear Power Plant in Oswego County
  THIS IS A DRILL
- A field team was sent to collect samples of air particulates, water, milk, vegetation, produce and soil
- Samples were sent to NCL for analysis on June 28th

Sample Receipt and Screening

Sample Preparation

Counting

Data Analysis and Reporting



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FOOD EMERGENCY RESPONSE NETWORK

The U.S. Food and Drug Administration's (FDA) and U.S. Department of Agriculture's (USDA) Food Emergency Response Network (FERN) integrates the nation's food-testing laboratories at the local, state, and federal levels into a network that is able to respond to emergencies involving biological, chemical, or radiological contamination of food.

Laboratories that are part of FERN are responsible for:

- Analyzing food samples implicated in threats
- Responding to terrorist events or contamination
- Responding to large scale food emergencies
- Providing continual monitoring support

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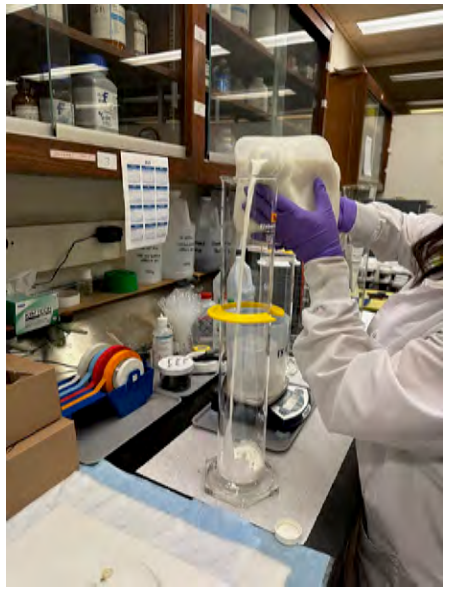
COBALT MAGNET 2025

- U.S. FDA's Food Emergency Response Network was activated in response to the exercise
- NCL staff coordinated with Department of Energy (DOE) to receive milk samples
- Sample analysis and data reporting was completed within one business day



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LABORATORY RESPONSE NETWORK – RADIATION

Laboratory Response Network – Radiation (LRN-R) Pilot

- Centers for Disease Control (CDC) pilot program to develop radiation detection capabilities for clinical samples from nuclear emergency incidents
- Aim of characterizing logistical, temporal, and analytical challenges related to rapid radiation detection among LRN-R partners
- Radiobioassay method development for gross alpha, beta, and gamma detection screening in urine

NCL participation:

- Analysis of spiked urine samples via gamma spectrometry and liquid scintillation counting (gross alpha/gross beta)
- Development of a method for rapid gamma spectrometric analysis of radionuclides in urine samples and calculation of associated intakes

Gamma Radioactivity Detection Limits and Associated Radionuclide Intakes Study in Artificial Human Urine Using Sodium-iodide and High-purity Germanium Detectors

Burn, Adam G.[1,2]; Haines, Douglas K.[1]; Khan, Abdul J.[1]; Torres, Miguel A.[1]; Faye, Sherry A.[1,2]; Costello, Cynthia A.[3]; Hoffman, Timothy J.[1]; Chu, Liang T.[1,2]; Bradt, Clayton J.[4]; Semkow, Thomas M.[1,2]

Author Information

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Thank You

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