



Radiological Laboratories: Unique Resources

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

A Briefing for Senior Executives & Administrators

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The ICLN Radiological Laboratory Workgroup

Integrated Consortium of Laboratory Networks (ICLN) Radiological Laboratory Workgroup Unique Resources Executive Briefing

A major radiological or nuclear incident can occur without warning; and therefore, advance planning and preparation is vital to achieving a successful and sustained laboratory response. Large numbers of samples and as-quick-as-possible turnaround times will be the rule, and overwhelming analytical or diagnostic demand is likely to continue for many months. The COVID-19 pandemic has reinforced the critical importance of a robust national laboratory testing capacity in the event of a major incident. Accurate and timely data from laboratory testing is crucial to protecting public health and will serve as the basis for sound decision making during incident response, recovery and monitoring. Delays in laboratory data generation during and following a major radiological or nuclear incident can result in disastrous public health and economic consequences as well as loss of public confidence in the responding agencies.

Any major radiological or nuclear incident will require a greatly enhanced laboratory capacity in a very short time frame. An inadequate supply of resources may stop or delay the high-quality analytical work needed to support critical assessment and decision-making regarding contamination and exposure of people, the environment, food, and other key matrices. These resources may include major items such as analytical instrumentation and equipment, expendable supplies, reagents, and standards. Sufficiently qualified, experienced, and trained personnel are also critical resources needed to ensure that a laboratory will be prepared to perform analytical operations in support of an incident response. The personnel issue has been addressed in detail in another ICLN document which can be accessed at:

[https://www.icln.org/subgroups.cfm#radiological-laboratory-response.](https://www.icln.org/subgroups.cfm#radiological-laboratory-response)

The ICLN Radiological Laboratory Workgroup recognizes that many resources will readily be available following an incident. In this document, however, the workgroup has compiled a list of *unique resources* that could severely limit a laboratory's operations, but which may not be readily available without prior planning and preparation. The *unique resources* summarized on page 3 were identified based on the following criteria.

- Physical resources:
 - limited availability or shelf-life;
 - available only from a single or limited number of vendors; and
 - long lead times for acquisition.

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In addition to the limitations listed above, during and following a major radiological or nuclear incident, disruptions in transportation may create a breakdown in key supply chains further delaying the acquisition of unique resources. There will likely be intense “competition” between laboratories for unique resources, placing additional strain on vendors. Without adequate preparation, there will almost certainly be a significant decrease in laboratory capacity over time when increased capacity will be needed to support response and recovery activities.

This list of *unique resources* is not exhaustive and will not identify every critical need applicable to a specific laboratory. Each laboratory is encouraged to use this list as a starting point to evaluate and identify *unique resources* that apply to its operation and to explore possible solutions to ensure that a lack of *unique resources* will not negatively impact a laboratory's ability to support an incident response. Where possible, participation in tabletop or larger-scale exercises may be helpful in identifying resource gaps not yet identified in this document.

While it may not be possible to ensure that laboratory capacity matches the actual or anticipated analytical demand resulting from a major incident, this should not serve as the basis for inaction or inadequate planning and preparation. Laboratories and laboratory networks are strongly encouraged to create a stockpile of *unique resources* to ensure an appropriate and adequate laboratory testing surge capacity is available in the event of a major radiological or nuclear incident.

The ICLN Network Coordinating Group's (NCG) Radiological Laboratory Working Group developed this document. It encourages networks to submit any newly identified *unique resources* in their operations that meet the defined criteria for consideration in future revisions. Please send comments to the co-chairs of the workgroup, Robert Jones, CDC, at rljones@cdc.gov, or John Griggs, EPA, at griggs.john@epa.gov.

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Appendix of Critical Technologies and Essential Supplies:

| <u>Technology:</u> | <u>Time to Obtain:</u> | <u>Why needed: Identification of Radionuclides</u> |
|---------------------------|--|--|
| Gamma Spectroscopy | Very long lead times** for acquisition | Gamma Emitting Radionuclides (e.g. Cesium-137) |
| Alpha Spectroscopy | Long lead times* for acquisition | Alpha Emitting Radionuclides (e.g. Plutonium-239) |
| Gas Proportional Counting | Long lead times* for acquisition | Screening and analysis of Alpha or Beta Emitting Radionuclides (e.g. Strontium-90) |

| <u>Supplies:</u> | <u>Acquisition Issues:</u> | <u>Why needed:</u> |
|--|---|---|
| Extraction Resins | Only one vendor; limited shelf life | Needed for the pre-analytical purification of radionuclides |
| Radionuclide Standards | Long to Very Long lead times* for acquisition and limited vendors: limited shelf life | Needed for analytical calibrations and method validations |
| Analytical Reagents (e.g. Liquid Scintillation Cocktail) | Long lead times* for acquisition and limited shelf life | Needed for analytical measurements |

***Long Lead times:** weeks to months

****Very Long Lead times:** months to years