

## **RadNet Air Monitoring Network Charge**

**Background:** EPA is currently upgrading and expanding the air portion of its environmental radiation monitoring system, RadNet, formerly known as the Environmental Radiation Ambient Monitoring System (ERAMS). The action responds to the recent emphasis on homeland security and preparedness since, in the early stages of a radiological incident, air is the most likely exposure pathway.

By adding new air monitoring stations across the country with the enhanced capability to detect and rapidly report environmental levels of radiation, EPA will provide public officials information to help them determine if and where additional assessments may be needed. EPA has developed a strategy to place the new fixed station monitors in locations that will ensure improved national coverage from both a population and geographic standpoint.

The expanded RadNet air network will provide information to help evaluate the degree and extent of contamination caused by an accidental release or a terrorist incident. The upgrades will include:

- air monitors that automatically transmit near-real-time data,
- the additional placement of monitors to improve national coverage and
- air monitors that can be deployed in the event of an accident or terrorist event involving radioactive materials.

The existing (unimproved) system has been monitoring the nation's air, drinking water, precipitation and pasteurized milk for more nearly half a century, providing baseline data on background levels of radiation in the environment and tracking increases above background from a variety of sources.

**RadNet Air Network Mission:** The mission of the RadNet Air Network is based upon fulfilling, or providing the data necessary to fulfill, responsibilities assigned to EPA in the National Response Plan, Nuclear/Radiological Incident Annex. Specifically, the Annex gives EPA the following responsibilities:

- Provide nationwide environmental monitoring data from the RadNet air network for assessing the national impact of the incident.
- Estimate effects of radioactive releases on human health and the environment.
- Recommend protective actions and other radiation protective measures.

To fulfill these responsibilities, EPA developed the following mission for the RadNet air network:

- Provide data for radiological emergency response assessments in support of homeland security and other responders to radiological accidents and incidents.
- Inform public officials and the general public of the impacts resulting from major radiological incidents/accidents and on ambient levels of radiation in the environment.
- Provide data on baseline levels of radiation in the environment.

The system was designed to fulfill its mission, but it was recognized that resource constraints would not allow a “do it all” system. Consequently, the system is designed to do the following:

- Measure large-scale atmospheric releases of radiation impacting large parts of the country and major population centers due to:
  - nuclear weapon detonations
  - radiological dispersion devices resulting in widely impacted areas (e.g., multi-county or larger)
  - large nuclear facility incidents/accidents
  - large foreign radiological incidents/accidents
- Measure ambient levels of radiation in the environment

However, the system is not designed to:

- Measure the impact to the immediate locality (“ground zero”) of a major incident/accident
- Measure releases of radiation resulting in a limited impacted area
- Monitor individual sources (nuclear facilities, storage facilities, etc.)
- Serve as an early warning/first detection system

Since there are unique phases of a radiological incident/accident in terms of response, data speed and accuracy requirements, the objectives of the RadNet air network were developed based upon three phases, which correspond to those from EPA’s Protective Action Guidelines.

**Overview of the Objectives:** The following tables provide overviews of the objectives for the fixed and deployable monitors of the RadNet air network during the early phase (typically the first four days following an incident), the intermediate phase (in the time frame of months to the first year), and the late phase (from the end of the intermediate phase) of an incident. Another category, the “pre-incident” phase, is included to show what the monitoring system will do prior to an event. A more detailed table on the overview of the objectives is provided in the Attachment.

Overview of objectives for the fixed component of the RadNet air network

<b>ONGOING OPERATIONS/PRE-INCIDENT</b>	<b>EARLY PHASE (0-4 days)</b>	<b>INTERMEDIATE PHASE (up to 1 year)</b>	<b>LATE PHASE (after 1 year)</b>
Maintain system readiness			
Provide baseline data		Reestablish baseline	Monitor baseline trends
	Provide data to modelers		
	Develop national impact picture	Continue national impact assessment	Determine long-term national impact
	Provide data to decision makers and the public		

Overview of objectives for the deployable component of the RadNet air network

<b>PRE-INCIDENT IF PRE-DEPLOYED</b>	<b>EARLY PHASE (0-4 days)</b>	<b>INTERMEDIATE PHASE (up to 1 year)</b>	<b>LATE PHASE IF NOT RETURNED TO READY STATUS (after 1 year)</b>
Provide baseline data			Provide continuity of data
	Provide data to modelers		
	Develop local or regional impact picture	Regional impact assessment	Determine long-term regional impact
	Provide data to decision makers and the public		

**Specific Charge:** This review is being requested to obtain guidance on the concept and plan for the upgraded air portion of RadNet as described in “*Expansion and Upgrade of the RadNet Air Monitoring Network.*” Please review the overall plans for the air monitoring network, and in particular, address the following questions:

1. Are the proposed upgrades and expansion of the RadNet air monitoring network reasonable in meeting the air network’s objectives?
2. Is the overall approach for siting monitors appropriate and reasonable given the upgraded and expanded system’s objectives?
  - a. Is the methodology for determining the locations of the fixed monitors appropriate given the intended uses of the data and the system’s objectives?
  - b. Are the criteria for the local siting of the fixed monitors reasonable given the need to address both technical and practical issues?
  - c. Does the plan provide sufficient flexibility for placing the deployable monitors to accommodate different types of events?

- d. Does the plan provide for a practical interplay between the fixed and deployable monitors to accommodate different types of events that would utilize them?
3. Given that the system will be producing near real-time data, are the overall proposals for data management appropriate to the system's objectives?
- a. Is the approach and frequency of data collection for the near real-time data reasonable for routine and emergency conditions?
  - b. Do the modes of data transmission from the field to the central database include effective and necessary options?
  - c. Are the review and evaluation of data efficient and effective considering the decision making and public information needs during an emergency?
  - d. Given the selected measurements systems, are the quality assurance and control procedures appropriate for near real-time data?

**Attachment:** Overview of objectives and data uses for the RadNet air monitoring network

	<b>ONGOING OPERATIONS/PRE-INCIDENT</b>	<b>EARLY PHASE (0-4 days)</b>	<b>INTERMEDIATE PHASE (up to 1 year)</b>	<b>LATE PHASE (after 1 year)</b>
<b>Fixed Monitors</b>				
Objectives	<ul style="list-style-type: none"> <li>▪ Provide baseline data</li> <li>▪ Maintain system readiness</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provide data to modelers</li> <li>▪ Develop national impact picture</li> <li>▪ Provide data to decision makers and the public</li> </ul>	<ul style="list-style-type: none"> <li>▪ Continue national impact assessment</li> <li>▪ Reestablish baseline</li> <li>▪ Provide data to decision makers and the public</li> </ul>	<ul style="list-style-type: none"> <li>▪ Determine long-term impact</li> <li>▪ Monitor baseline trends</li> <li>▪ Provide data to decision makers and the public</li> </ul>
Data Uses	<ul style="list-style-type: none"> <li>▪ Pre and post event comparisons</li> <li>▪ Provide public information</li> </ul>	<ul style="list-style-type: none"> <li>▪ Adjust model parameters and verify outputs</li> <li>▪ Assist decision makers in allocation of response assets</li> <li>▪ Identify non-impacted areas</li> <li>▪ Help determine follow-up monitoring needs</li> <li>▪ Verify or assist in modifying protection action recommendations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Assist in determining if delayed contamination transport is occurring</li> <li>▪ Assure citizens and decision makers in unaffected areas</li> <li>▪ Assist in dose reconstruction</li> <li>▪ Determine short- or long-term baseline changes from event</li> </ul>	<ul style="list-style-type: none"> <li>▪ Assist in determining if delayed contamination transport is occurring</li> <li>▪ Assure public that conditions are back to normal</li> <li>▪ Ensure that recovery efforts are not causing contamination spread</li> <li>▪ Verify return to previous baselines</li> </ul>
<b>Deployable Monitors</b>				(Options: May be Returned to Laboratories or Remain in Field)
Objectives	<ul style="list-style-type: none"> <li>▪ Provide baseline data (if deployed)</li> <li>▪ Ensure readiness by conducting regular exercises</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provide data to modelers</li> <li>▪ Provide data to decision makers and the public</li> </ul>	<ul style="list-style-type: none"> <li>▪ Assess regional impact</li> <li>▪ Provide data to decision makers and the public</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provide continuity of data in impacted or non-impacted areas</li> <li>▪ Provide data to decision makers and the public</li> </ul>
Data Uses	<ul style="list-style-type: none"> <li>▪ Pre- and post- event comparisons</li> <li>▪ Provide public information</li> </ul>	<ul style="list-style-type: none"> <li>▪ Adjust model parameters and verify outputs</li> <li>▪ Assist in identifying un-impacted areas</li> <li>▪ Help determine follow-up monitoring needs</li> <li>▪ Verify or assist in modifying protection action recommendations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Assist in determining if delayed contamination transport is occurring</li> <li>▪ Assure citizens and decision makers in unaffected areas</li> <li>▪ Help determine when to relax or reduce protective actions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Assist in determining if delayed contamination transport is occurring</li> <li>▪ Ensure that recovery efforts are not causing contamination spread</li> </ul>
<b>Note.</b> —Objectives and data uses may overlap from one phase to another.				