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ENVIRONMENTAL MONITORING ANALYSIS TOOL TO ENHANCE SAFEGUARDS ACTIVITIES

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The success of the environmental sampling portion of "Programme 93+2" has raised the profile of environmental sampling as a cost effective and potentially nonintrusive tool for determining the nature and extent of nuclear activities at a site. While safeguards applications are the focus of IAEA's activities, environmental sampling also affords the user with information to protect or enhance public health and environmental quality, and to address public concern about the safety of nuclear-related facilities.

Regardless of the application, environmental sampling is a powerful tool because all nuclear facilities release some trace contaminants to the environment, and once released, these contaminants are extremely difficult to recover or disguise. With this in mind, a well designed sampling program requires at least three considerations: 1) Which radiological "signatures" are associated with a facility? 2) What are the predominant pathways along which these signatures escape to the environment? and 3) Once released, where should one look to maximize the probability of finding the signatures?

Effective, routine monitoring for certain parameters can usually be implemented with minimal site-specific planning. However, designing and conducting a detailed monitoring program requires knowledge about the fuel cycle, reactor physics, plant design and processes, geochemistry, meteorology, and analytical chemistry. To assist those interested in designing a site-specific environmental sampling plan, Pacific Northwest National Laboratory is developing a sampling strategies tool to help users maximize the likelihood of detecting signatures of nuclear activities. This framework identifies process-specific signatures, release pathways, and major environmental and chemical factors that should be considered when developing a sampling plan. We are presenting an overview of the approach used in constructing this tool and describe how it can be used in the design of a sampling program to verify the nature of activities being conducted at a nuclear-related facility.