

ASSESSING CERTIFIED REFERENCE MATERIALS NEEDS FOR RADIOLOGICAL AND NUCLEAR SECURITY

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The analytical community communicates the need for new or improved certified reference materials (CRMs) to reference material producers through direct communication with staff, user group meetings, and focused inquiries such as surveys from producers. In the fall of 2020, the Radioactivity Group within the Physical Measurements Laboratory at NIST conducted a survey of selected federal and state analytical laboratories to gauge ongoing and future needs associated with analyses for radiological and nuclear security. This survey included detailed questions about the current uses and anticipated needs for certified reference materials. The respondents indicated significant use of currently available single nuclide radioactivity Standard Reference Materials (SRMs) and complex matrix SRMs. Two categories of additional reference material needs were also identified as enhancement of existing reference material and a short list of potential new reference materials.

Several respondents indicated that additional certified attributes for the single nuclide counting standards and complex matrix standards are highly desirable. Characterization for the isotopic composition and the amount content of the element(s) in activity standards was cited by multiple facilities. The content of specific chemical impurities in reference materials such as the Sr-90 radioactivity standard was also identified as a need. New reference materials cited by the respondents were primarily single nuclide standards (e.g., Pu-236, Np-236, Ba-140, Zr-95, Y-91, Ce-144, Cd-115m, Nd-147) and more regular/predictable availability of relatively short-lived standards such as Mo-99.

Although feedback from users helps reference material providers set project priorities, anecdotal interest in a reference material is not sufficient to initiate a CRM project. Providers, such as NIST, have limited resources and are required to make an economic case for production of new reference materials. This economic case typically involves a commitment from users to purchase a significant fraction of a production run in addition to documented need for the material from the user community. More often, new projects are initiated as part of a program implemented by the reference material producer or by project-specific funding from a user organization or a government agency.