ENHANCING SAFETY DURING THE GLOBAL NUCLEAR RENAISSANCE

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MARSAME

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OFFICE OF REGULATORY RESEARCH

Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual (MARSAME)

U.S. Department of Defense, U.S. Department of Energy,
U.S. Environmental Protection Agency, U.S. Nuclear Regulatory Commission

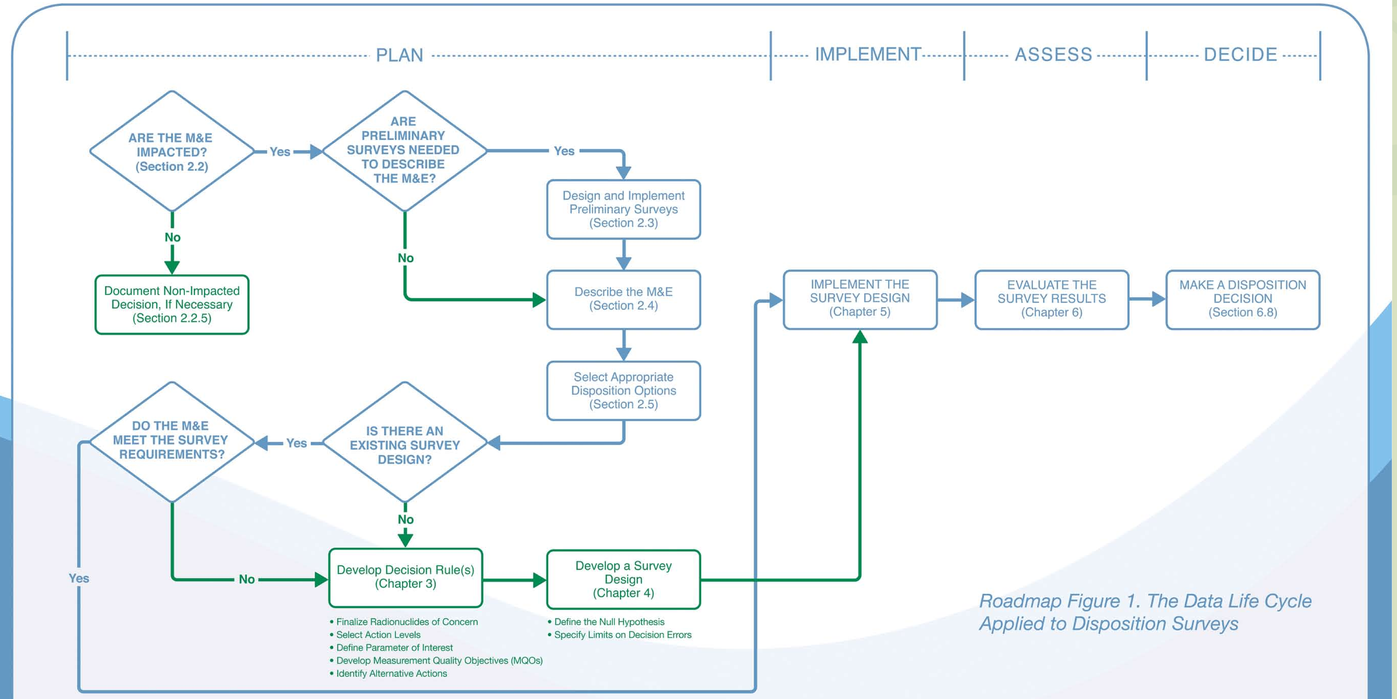
SCOPE:

- MARSAME is a supplement to the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) providing information on planning, conducting, evaluating, and documenting radiological disposition surveys for the assessment of materials and equipment (M&E).
- Examples of M&E include metals, concrete, tools, equipment, piping, conduit, furniture, and dispersible bulk materials such as trash, rubble, roofing materials, and sludge. Liquids, gases, and solids, stored in containers are also included.
- Radionuclides or radioactivity on workers or members of the public are outside the scope, as well as liquid and gaseous effluent releases, and real property, such as fixed buildings and structures, and surface and subsurface in situ soil.

NEXT STEPS:

- A draft MARSAME was issued for public comment and EPA Science Advisory Board comment in 2007. A final MARSAME is expected in 2008.
- EPA is developing three-day training and will be offering it in person and via webinar for EPA and State personnel after the final MARSAME is issued.

Ramachandra Bhat, Craig-Alan Bias, *US Air Force* | David Alberth, *US Army* | Steven Doremus, *US Navy* | Alexander Williams, *US Department of Energy*
Kathryn Snead, Nidal Azzam, Colleen Petullo, *US Environmental Protection Agency* | Robert Meck, George Powers, *US Nuclear Regulatory Commission*



Roadmap Figure 1. The Data Life Cycle Applied to Disposition Surveys

If there is insufficient information available to design a disposition survey following categorization, it may be necessary to perform preliminary surveys to obtain the required information.

The M&E being investigated must be described with regards to its physical and radiological attributes in order to establish the information necessary to design a survey approach that can adequately survey the M&E..

Scan-only surveys use scanning techniques to measure the M&E. The detector is moving at a constant speed relative to the M&E being surveyed, or vice versa, while maintaining a constant distance relative to the M&E.

In situ survey designs use static measurements to measure 100% of an item. The detector and the item being measured are held in a fixed geometry for a specified count time to meet the MQOs.

MARSSIM-type survey designs combine a statistically based number of static measurements to determine average radionuclide concentrations or radioactivity levels with scanning to identify areas of elevated measurements. In general, MARSSIM-type surveys of M&E are only performed on large, complicated M&E (like steel sheet piles shown here).

Depending on the survey design, it may be necessary to prepare the M&E for survey. The amount of preparation is determined by Data Quality Objectives (DQOs) and MQOs, and ranges from identifying measurement locations to adjusting the physical characteristics of the M&E.

The purpose of segregation is to separate M&E based on the estimated total measurement uncertainty, ease of handling, and disposition options. Segregation is based on physical and radiological attributes. (M&E before segregation shown above).