



Review of MARSAME by
EPA-SAB-RAC
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DESIGN

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MARSAME Survey Planning and Design

- Developed and documented using DQO Process (EPA QA/G-4), similar to MARSSIM
- **Chapter 2: Initial Assessment of M&E**
 - Results in *categorization* (impacted or non-impacted), description, and disposition option(s) for M&E
- **Chapter 3: Identify Inputs to Decision Rule**
 - Results in survey units and decision rule(s) for chosen disposition option(s) , provisional measurement methods, and reference material(s)

Initial Assessment (Chapter 2)

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- Categorize as Impacted or Non-Impacted
- Design and Implement Preliminary Surveys
- Describe M&E
- Select M&E disposition option(s)
- Document Results of IA

Categorization (Section 2.2)

- Impacted or non-impacted decision
 - Sources of information for decision
 - Visual Inspections
 - Historical Records
 - Process Knowledge
 - Sentinel Measurements
 - If M&E has reasonable potential to contain radioactivity above background, then is categorized as impacted

Design & Implement Preliminary Surveys (Section 2.3)

- Required if information is inadequate to select disposition options or to design disposition surveys
- Designed using professional judgment to fill identified data gaps

Describe the M&E (Section 2.4)

- Physical Attributes
 - Physical Dimensions
 - Complexity
 - Accessibility
 - Inherent Value
- Radiological Attributes
 - Radionuclides of Potential Concern
 - Activity
 - Distribution
 - Location

Select Disposition Option(s) (Section 2.5)

- Release
 - Release for reuse with or without controls
 - Release for recycle with or without controls
 - Release for disposal
- Interdiction

Document Results of IA (Section 2.6)

- Documentation dependent on:
 - Information collected
 - Quantity of M&E covered by IA
 - Type of assessment
 - Standardized IA documented in SOP
 - Project-specific IA documented in Conceptual Model
 - Administrative or Regulatory Requirements

Identify Inputs To Decision (Chapter 3)

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- Select Radionuclide(s)/Radiation(s) of Concern
- Identify Action Level(s)
- Describe Parameter of Interest
- Identify Alternative Actions
- Identify Survey Units
- Develop a Decision Rule
- Develop Inputs for Measurement Method Selection
- Identify Reference Materials
- Evaluate Existing Survey Design(s)

Select Radionuclides Or Radiation(s) of Concern (Section 3.2)

- Finalized from list of radionuclides of potential concern developed during IA
- Iterative and linked to Action Level and measurement methods

Identify Action Levels (Section 3.3)

- Sources:
 - Dose- or Risk-based Regulatory Standards
 - Waste Acceptance Criteria
 - Regulatory Thresholds (e.g., No Det. Activity)
 - DOT Regulations for Shipping
 - Activity-based Standards
 - ALARA
 - Administrative Limits
 - Limitations on Technology (e.g, performance criteria for an analytical method)

Identify Action Levels (Cont.)

- Selection affected by:
 - Measurement methods
 - Surficial versus volumetric activity
 - Chosen disposition option
- More than one AL may be required to demonstrate compliance

Describe Population Parameter of Interest

- Population parameter (e.g. mean, median, percentile) considered for decision about target population
- Target population is all data supporting decision for M&E within given survey unit
- May be specified as part of action level

Identify Alternative Actions (Section 3.5)

- Based on chosen disposition option(s)
- Each disposition option defines the action alternative and always includes a No Action alternative

Identify Survey Units (Section 3.6)

- The lot, amount, or piece of M&E on which measurements are made to support a disposition decision
- Survey unit definition affected by:
 - Action Level
 - M&E Physical and Radiological Attributes
 - Available Measurement Methods

Develop a Decision Rule (Section 3.7)

- Theoretical Decision Rule:
 - Assumes ideal data are available and no uncertainty in decision-making process
 - Combines action level and parameter of interest with alternative actions in “if...then” statement
- Need decision rule for each chosen action level
- Operational Decision Rule developed in Chap. 4 as part of final survey design

Develop Inputs for Selection of Provisional Measurement Methods (Section 3.8)

- Measurement method performance characteristics used to develop project Measurement Quality Objectives
- Measurement methods evaluated to:
 - Assess availability and scope of resources required to implement
 - Determine if method meets MQOs for measurability of the radionuclides or radiations of concern

Identify Reference Materials (Section 3.9)

- M&E may serve as its own reference material if pre-contact survey is possible
- If IA determines only surficial activity is present, impacted surface may be removed and remaining non-impacted volume used as reference material

Evaluate Existing Survey Design (Section 3.10)

- Existing survey designs may be available for repetitive or routine surveys
- Existing survey designs should be evaluated for applicability to M&E being surveyed
 - Description of M&E should be consistent
 - M&E should be measurable using survey design

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Questions

