

USDOE INITIATIVES ON RESIDUAL RADIOACTIVE MATERIAL STANDARDS

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ABSTRACT

The presentation discusses the DOE Radiological Survey Guide, and other activities relating to residual radioactivity.

OVERHEADS

DOE Radiological Survey Guide and Other Activities Relating to Residual Radioactivity

- DOE Radiological Survey Implementation Guide
 - Need, Purpose and Status
 - Comparison to NRC Manual
 - Planned Additions
 - Comments to Date
- Other Related Activities

DOE Radiological Survey Guide and Other Activities Relating to Residual Radioactivity

STATUS

- Draft Issued for Comment November 1992.
- 95% of Comments received
- Awaiting NRC and EPA comments
- Intend to Issue as DOE Guidance and Follow with Tri-Agency Guidance

DOE Radiological Survey Guide and Other Activities Relating to Residual Radioactivity

PURPOSE

- Provide Guidance for Implementing Radiological Surveys for:
 - Characterization,
 - Certification and
 - Verification
- Planning and Implementation
- Lands, Structures, and Equipment and Small Items

DOE Radiological Survey Guide and Other Activities Relating to Residual Radioactivity

NEED

- DOE 5400.5 Radiation Protection of the Public and Environment (Feb. 1990)
- DOE Study of Survey Methods for TRU
- Guidance Required to Ensure Consistent and Acceptable Survey Practices

**DOE Radiological Survey Guide and
Other Activities Relating to Residual Radioactivity**

NRC vs. DOE GUIDANCE

- Coordinated Development – Many Sections Exactly Alike
- DOE Guide Scope Is Broader
 - Covers all typical types of surveys.
 - Covers equipment and small items.
 - Discusses mixed waste issues.
- Draft Followed NRC Manual by 6 months
 - Consistent with DOE/EH-173T
 - Present Actual Data when BDL.
 - Use actual data for statistical summaries.
 - Alpha Survey Technique
 - Detailed procedures.
 - Used probability of Detection rather than instrument sensitivity.

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		SAMPLING (Sect. 4.3)					BACKGROUND MEASUREMENTS (Sect. 4.4)		SURVEY OF EQUIPMENT & SMALL ITEMS (Sect. 4.5)
		Soil (4.3.1)		Water (4.3.2)	Air (4.3.3)	Radon (4.3.4)	Gamma Exposure Rates	Soil Radionuclide Concentrations	
		Surface	Subsurface						
SCOPING SURVEY (Sect. 3.1.1)	INDOOR	Y	WA	WA	WA	WA	Y	WA	Y
	OUTDOOR	WA	Y	WA	WA	WA	Y	Y	Y
CHARACTERIZATION SURVEY (Sect. 3.1.2)	INDOOR	Y	WA	WA	WA	WA	Y	WA	Y
	OUTDOOR	WA	Y	WA	WA	WA	Y	Y	Y
REMEDIAL ACTION SUPPORT SURVEY (Sect. 3.1.3)	INDOOR	Y	WA	WA	WA	WA	WA	WA	Y
	OUTDOOR	WA	Y	WA	WA	WA	WA	WA	Y
FINAL STATUS SURVEY (Sect. 3.1.4)	INDOOR	Y	WA	WA	WA	WA	WA	WA	Y
	OUTDOOR	WA	WA	WA	WA	WA	WA	WA	Y
CONFIRMATORY/ VERIFICATION SURVEY (Sect. 3.1.5)	INDOOR	Y	WA	WA	WA	WA	WA	WA	Y
	OUTDOOR	WA	WA	WA	WA	WA	WA	WA	Y

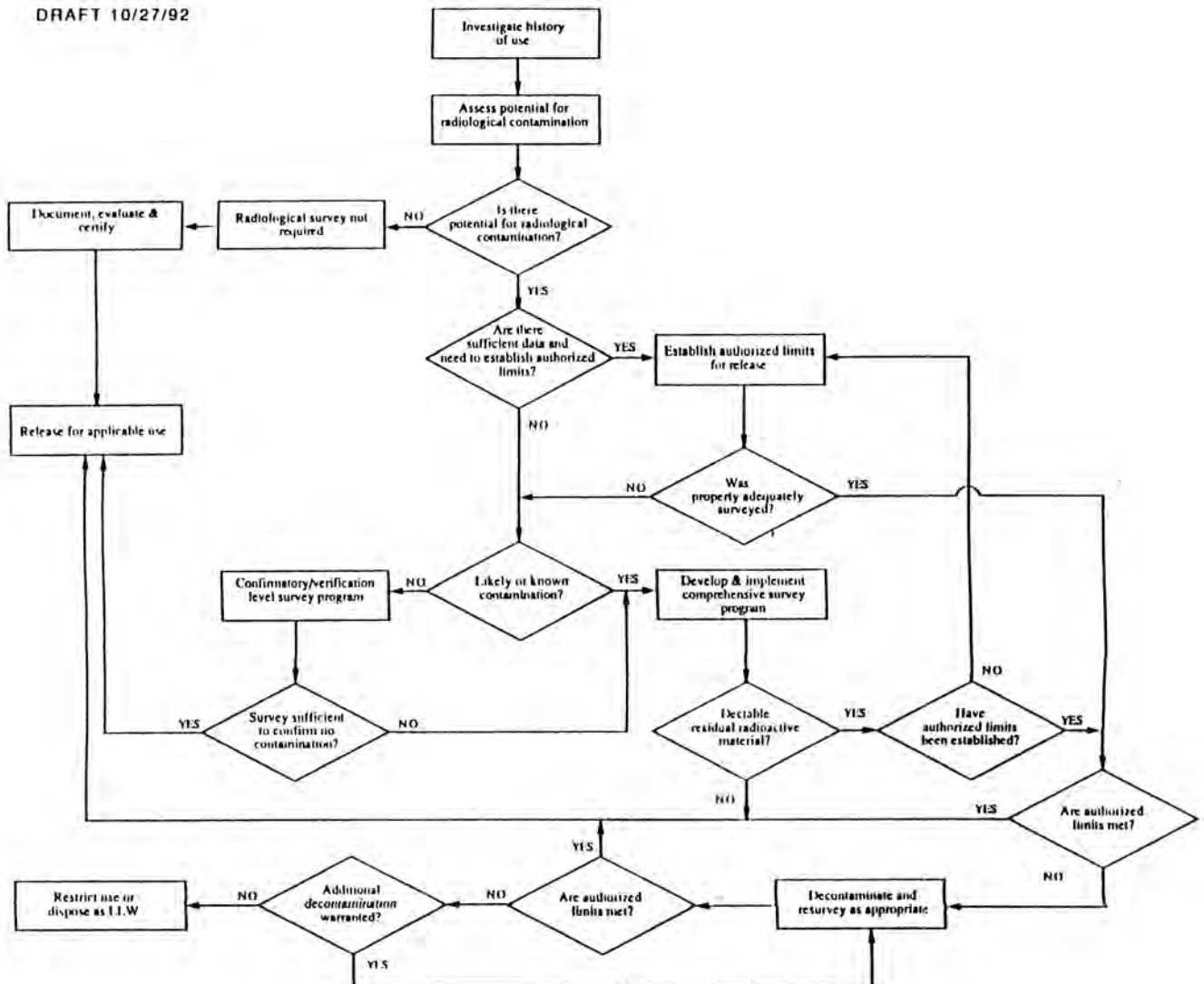
Y = YES N = NO WA = WHERE APPLICABLE: SITE-SPECIFIC.

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	SITE PREPARATION (Sect. 4.1)				RADIATION MEASUREMENTS (Sect. 4.2)								
	Property Boundaries/ Civil Survey (4.1.1)	Clearing To Provide Access (4.1.2)	Reference Grid System (4.1.3)	Gamma (4.2.1)			Alpha (4.2.2)			Beta-Gamma (4.2.3)			
				Direct		Gamma Hole Logging	Direct		Removable	Direct		Removable	
				Static	Scan		Static	Scan		Static	Scan		
SCOPING SURVEY (Sect. 3.1.1)	INDOOR	N	WA	N	Y	Y	WA	Y	Y	Y	Y	Y	Y
	OUTDOOR	N	WA	N	Y	Y	WA	WA	WA	WA	Y	WA	WA
CHARACTERIZATION SURVEY (Sect. 3.1.2)	INDOOR	Y	WA	Y	Y	Y	WA	Y	Y	Y	Y	Y	Y
	OUTDOOR	Y	WA	Y	Y	Y	WA	WA	WA	WA	Y	WA	WA
REMEDIAL ACTION SUPPORT SURVEY (Sect. 3.1.3)	INDOOR	N	WA	N	Y	Y	N	Y	Y	Y	Y	Y	Y
	OUTDOOR	N	WA	N	Y	Y	N	WA	WA	WA	Y	WA	WA
FINAL STATUS SURVEY (Sect. 3.1.4)	INDOOR	N	N	WA	Y	Y	N	Y	Y	Y	Y	Y	Y
	OUTDOOR	N	N	WA	Y	Y	N	WA	WA	WA	Y	WA	WA
CONFIRMATORY/ VERIFICATION SURVEY (Sect. 3.1.5)	INDOOR	N	N	N	Y	Y	WA	Y	Y	Y	Y	Y	Y
	OUTDOOR	N	N	N	Y	Y	WA	WA	WA	WA	Y	WA	WA

Y = YES N = NO WA = WHERE APPLICABLE: SITE-SPECIFIC.

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4.29

Fig. 6. General process for surveys for release or characterization of non-real property

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ANTICIPATED ADDITIONS

- Additional discussion regarding statistical treatment of data.
 - Data Transformation and Tests for Lognormal, DOE/EH-0173T
 - Statistics for Comparison to Background and Guidelines
 - Normal Distribution
 - Lognormal Distribution
 - Nonparametric Statistics
- Example Work Plans
- Survey Check Lists

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Example of Sample Data Presentation

Sample ID Number	Radionuclide Concentration	
	pCi/g	Bq/kg
Ex/T-001A	6.0 ± 0.2	200 ± 7
Ex/T-002	< 3.0 (-1.0 ± 1.2)	< 110 (-37 ± 44)
Ex/T-003	< 3 (2.0 ± 1.0)	< 100 (74 ± 37)
Ex/T-004	3.2 ± 1.2	120 ± 44

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COMMENTS TO DATE

- Great just what is needed -- Difficult to follow -- Too Technical -- Needs to be more technical -- not consistent -- Too general -- Too specific -- What about alternative procedures?
- Should include standards.
- May not be consistent with State requirements.
- Address Worker Protection
- INSTRUMENTATION --
 - Gamma Spectrometers.
 - Be more Specific and include more models and types.
 - Allow more flexibility.

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DATA ANALYSIS AND STATISTICAL TREATMENT

- Radionuclide data should be transformed to logarithms before calculating summary statistics.
- Data sets or transformed data should be tested for normality (not applicable for nonparametric statistic).
- The measure of central tendency should be appropriate to the data.
- Less-than-detectable values should be stated along with the actual numerical estimates.
- Actual values (rather than less-than-detectable or zero) should be used in calculating the measure of central tendency.

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COMMENTS TO DATE

- DQO and QA --
 - Need to use and include guidance for Data Quality Objectives.
 - More need on Quality Assurance.
- DEFINITIONS --
 - Not consistent with DOE 5820.2A waste definitions.
 - Sites, dose equivalent.
 - Hot spots
 - Operational limits vs Remedial Action Limits
 - Knowledge of applied health physics
 - User of the Guide
- Coordinate with NRC and Get EPA involved.

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COMMENTS TO DATE

- STATISTICS --
 - Critical level or decision level for differentiating from background will generate large quantities of unnecessary waste.
 - Statistics assume large number of background counts and that background counting time are the same as sample counting time.
 - Counting statistics and assumptions.
 - More guidance on significant digits and rounding.
- ALARA --
 - In some cases survey requirements may be more than ALARA.