



GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

Area Averaging Technical Training For the Land Protection Branch

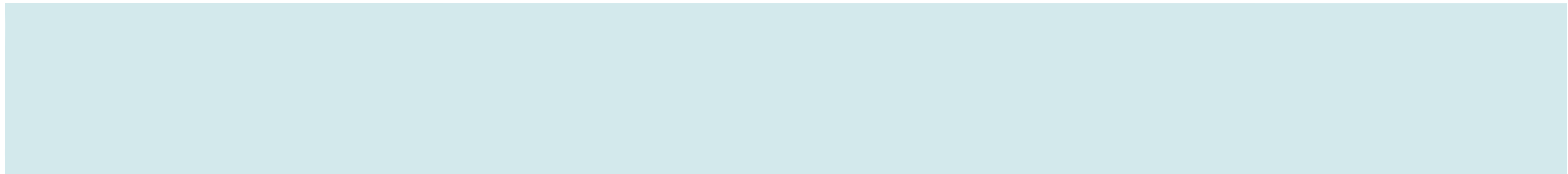
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Training Presentation
April XX, 2023



TODAY'S AGENDA

- **Guidance Document Overview**
- **Mock Meeting & Case Study Presentation**
- **Questions / Comments / Discussion**





WHAT IS SOIL AREA AVERAGING?

- The area averaging approach to soil compliance can be defined as the utilization of discrete soil data to demonstrate that the average concentration of contaminants in soils at a site is less than the applicable cleanup level.





BRIEF BACKGROUND INFORMATION

New Regulations & Updates to existing Regulations



Increase in Area Averaging for Soil Compliance



Need for Guidance





GUIDANCE DOCUMENT

“Area Averaging Approach to Soil Compliance for Direct Contact Exposure Scenarios”

December 15, 2020



Land Protection Branch

Hazardous Waste Corrective Action Program

Hazardous Waste Management Program

Response & Remediation Program



GUIDANCE OVERVIEW

Regulatory Applicability:

- Hazardous Waste Corrective Action Program
- Hazardous Waste Management Program
- Response & Remediation Program
- Risk Assessment Program





GUIDANCE OVERVIEW

INTRODUCTION:

- **General Information & Limitations**
 - “bright line” vs. area average
 - Tool for the data
 - Direct contact scenarios
 - Use of discrete soil data
 - Applies to soil only





GUIDANCE OVERVIEW

Document Structure:

- Key Concepts
- General Site Assessment Considerations
- Choosing a Sampling Plan
- Establishing a Decision Unit
- Dataset and Action Levels



GUIDANCE OVERVIEW

Key Concepts:

- Decision Unit (DU)
- Exposure Point Concentration (EPC)
- Hot Spot
- Release Area(s) & Randomness





KEY CONCEPTS

Decision Unit (DU):

- A volume of soil within which a receptor comes in contact over an established exposure duration
- Has also been identified as: “exposure area”, “exposure unit”, “exposure domain”, “area of concern”, or “RCRA solid waste management unit”.



KEY CONCEPTS

Exposure Point Concentration (EPC):

- The arithmetic average long-term concentration of a chemical (within an DU) to which receptors are exposed. The EPC is often estimated as the 95% upper confidence limit (UCL) of the arithmetic mean and may be used to demonstrate compliance with the direct contact exposure soil cleanup criteria.



KEY CONCEPTS

Hot Spot:

- **A hot spot can be defined statistically as one sample, or more than one adjacent sample locations, at which concentrations are above the remediation/screening criteria and significantly higher than concentrations found surrounding the location(s) (i.e., spatially correlated concentrations sufficiently above criteria) to indicate that they:**
 - Represent a different statistical population; and
 - Pose a potential risk that should not be masked by a statistical analysis



KEY CONCEPTS

Randomness & Release Areas:

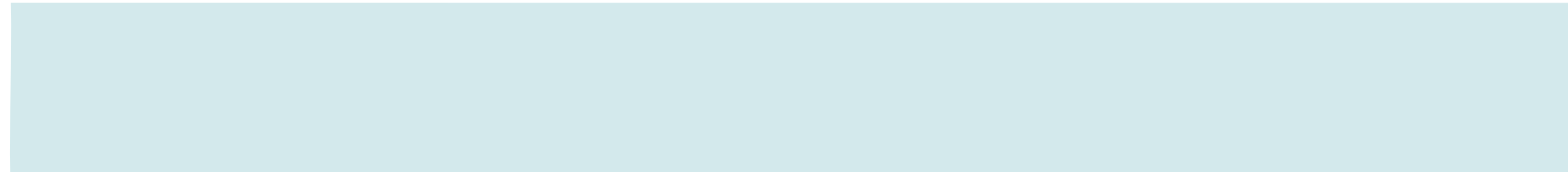
- Randomness implies that nothing impedes, prohibits, or concentrates exposure
- release areas are typically defined through the interpretation of site information and site observations vs. hot spots are primarily defined through the use of site data



GUIDANCE OVERVIEW

General Site Assessment Considerations:

- Conceptual Site Model (CSM)
- Exposure Pathway & Exposure Scenarios





GUIDANCE OVERVIEW

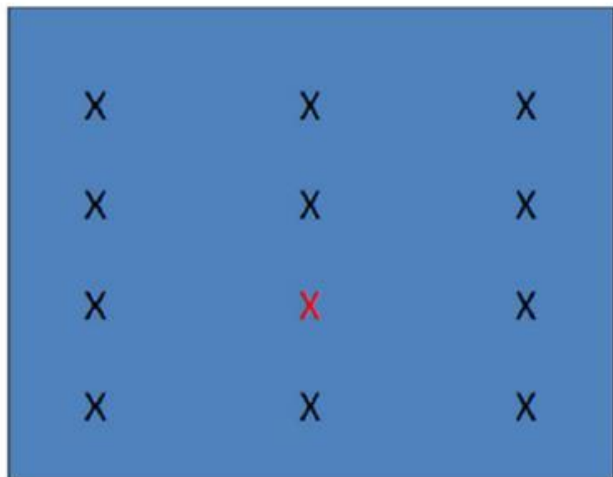
Choosing a Sampling Design:

- Identifying a Release
- Characterization of a release
- Determining a Hot Spot

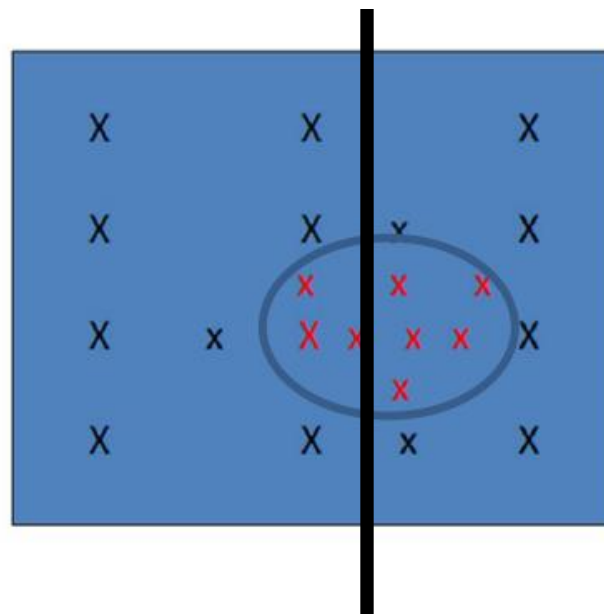




SAMPLING DESIGN



Phase 1 of Sampling: Use grid sampling to determine if there is any contamination within DU. One sample was identified as a hot spot. Implement Phase 2 sampling to delineate size of hot spot.



Phase 2 of Sampling: delineate hot spot using biased sampling. Sample locations are indicated by lowercase "x". Entire hot spot is represented by ellipse.



GUIDANCE OVERVIEW

Establishing a Decision Unit:

- Residential vs. Non-Residential
- Size & Orientation
- Influential Factors





GUIDANCE OVERVIEW

Dataset and Action Levels:

- Establishing an Action Level
- Exposure Point Concentration (EPC)
- Statistical Methods
- Reporting
- Compliance Considerations



OVERVIEW OF THE GUIDANCE

CSM & DQOs



Sampling Design



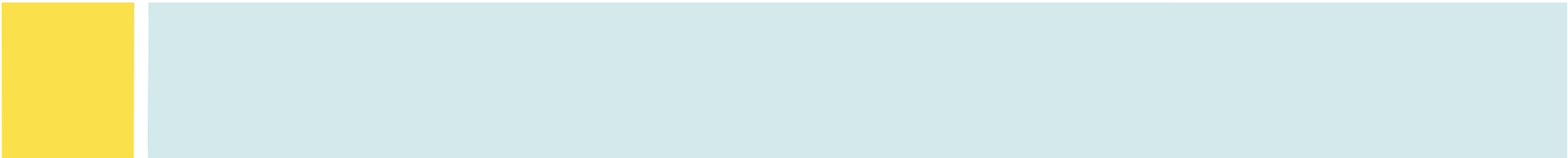
Establishing a Decision Unit



Data & Action Levels



Site Closure





WHAT TO REMEMBER:

- **Summary of Key Topics**
 - Key Concepts
 - Residential/Non-Residential DU
 - Hot Spot, Randomness
 - General Site Assessment Considerations
 - CSM & DQO
 - Choosing a Sampling Plan
 - Different sampling strategies
 - Establishing a Decision Unit
 - Considerations/Supporting Documentation
 - Dataset and Action Levels
 - RMLs, Multiple COCs (Cumulative), Lead



UNIFORM ENVIRONMENTAL COVENANTS (UEC)

- **Guidance on UECs is available on the EPD website**
- **General language to include in the Activity and Use Limitations when using Soil Area Averaging**





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