

USING THE VERTICAL CONCEPTUAL SITE MODEL TO DEVELOP AND ACHIEVE THE REMEDIAL ACTION OBJECTIVE

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TOPICS

- Remedial Investigation (RI) Objectives
- Post-RI Conceptual Site Model (CSM) Development
- Remedial Action Objective (RAO)
- Vertical Distribution
- Post-Remedy Data Assessment



PURPOSE OF THE REMEDIAL INVESTIGATION

What will we know that we don't know already?



PURPOSE STATEMENT FOR THE RI

To investigate the project area (MRS) to define nature and extent of release, and determination of “**acceptable** versus **unacceptable**” risk to support a recommendation for one of the following:

- No further action is required (**Acceptable/Negligible Risk**)
- Conduct Feasibility Study (**Unacceptable/not Protective**)
- Collect additional data via an “expanded” RI



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EPA RI/FS GUIDANCE

*“The objective of the RI/FS process is **not the unobtainable goal of removing all uncertainty**, but rather to gather information sufficient to **support an informed risk management decision** regarding which remedy appears to be most appropriate for a given site.”¹*

¹ *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, U.S. EPA, October 1988*

Note that the Remedial Investigation and Feasibility Study (RI/FS) share the same objective.



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CSM DEVELOPMENT

What we need to know to make decisions...



POST-RI CSM SHOULD DEFINE:

- Concentrated Munitions Use Areas (CMUA)
- Non-CMUA
- Areas with an unacceptable risk from MEC hazards
- Areas with no unacceptable risk
- Specific type of “MEC” and relative quantities
- Depth distribution profile
- Land use and access conditions (receptors)
- Land use depths (exposure pathways)
- Detection limit for specific munitions and instruments



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SOURCE AREA

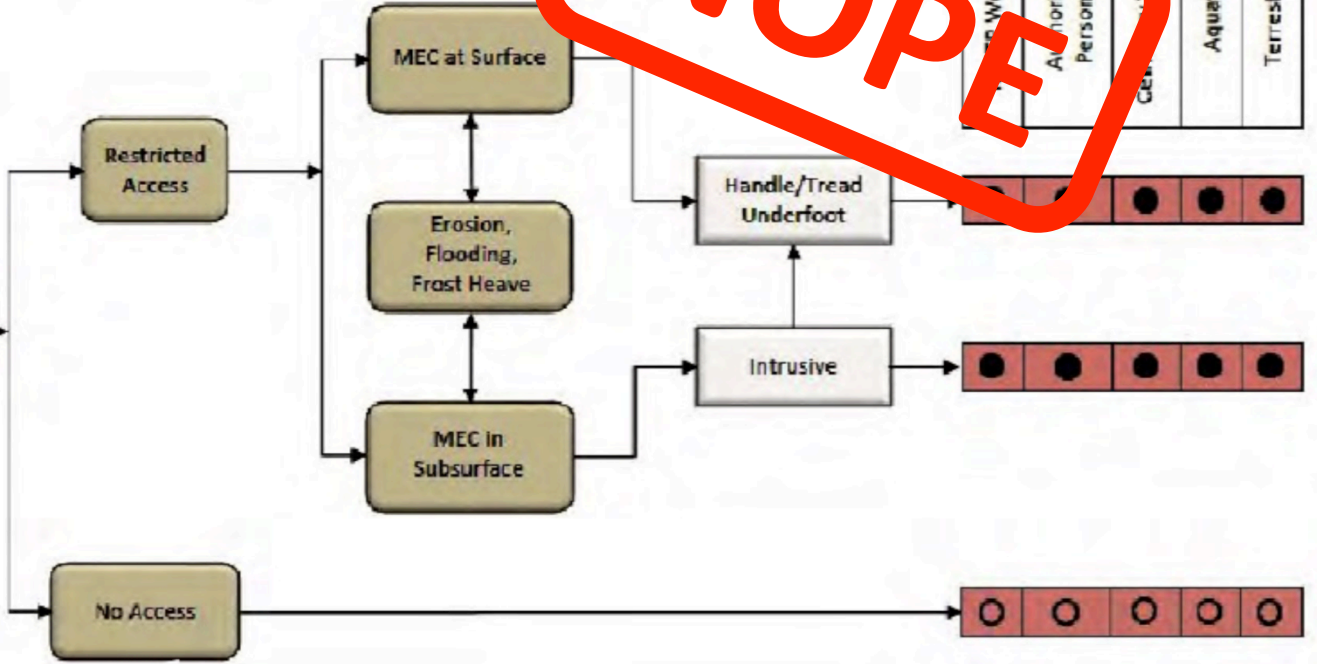
ACCESS

**MEC LOCATION/
RELEASE MECHANISM**

ACTIVITY

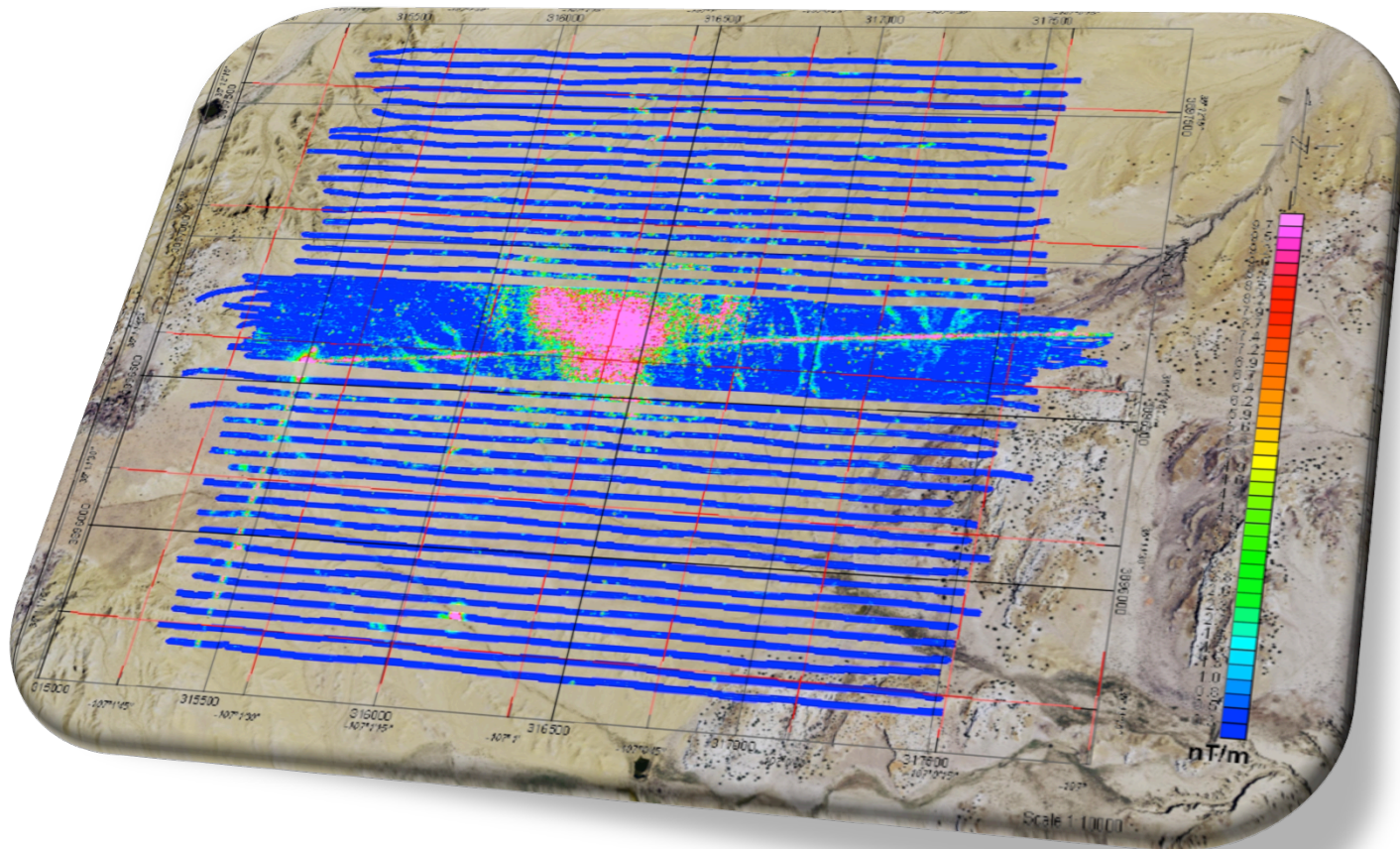
POTENTIAL RECEPTORS				
HUMAN (Current and Future)			BIOTA	
Workers	Authorized Personnel	General Public	Aquatic	Terrestrial

**L2-L3 Extended
Buffer Area
MRS
(IAAP-001-R-02)**



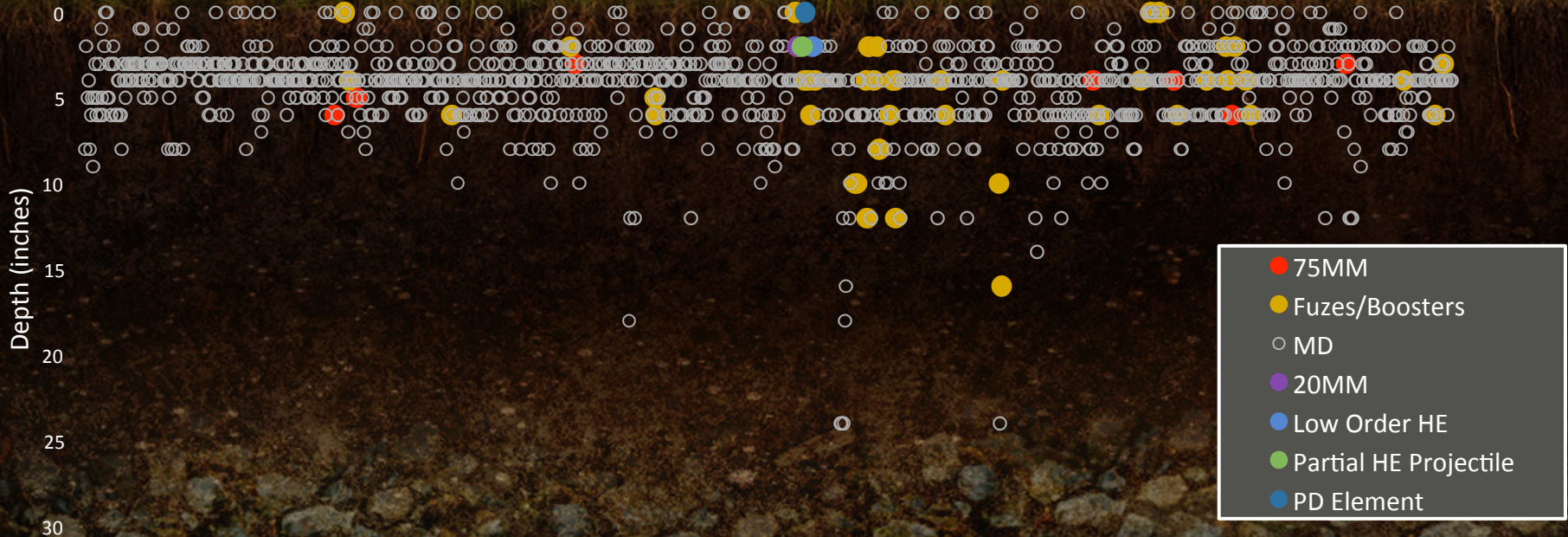
NOPE

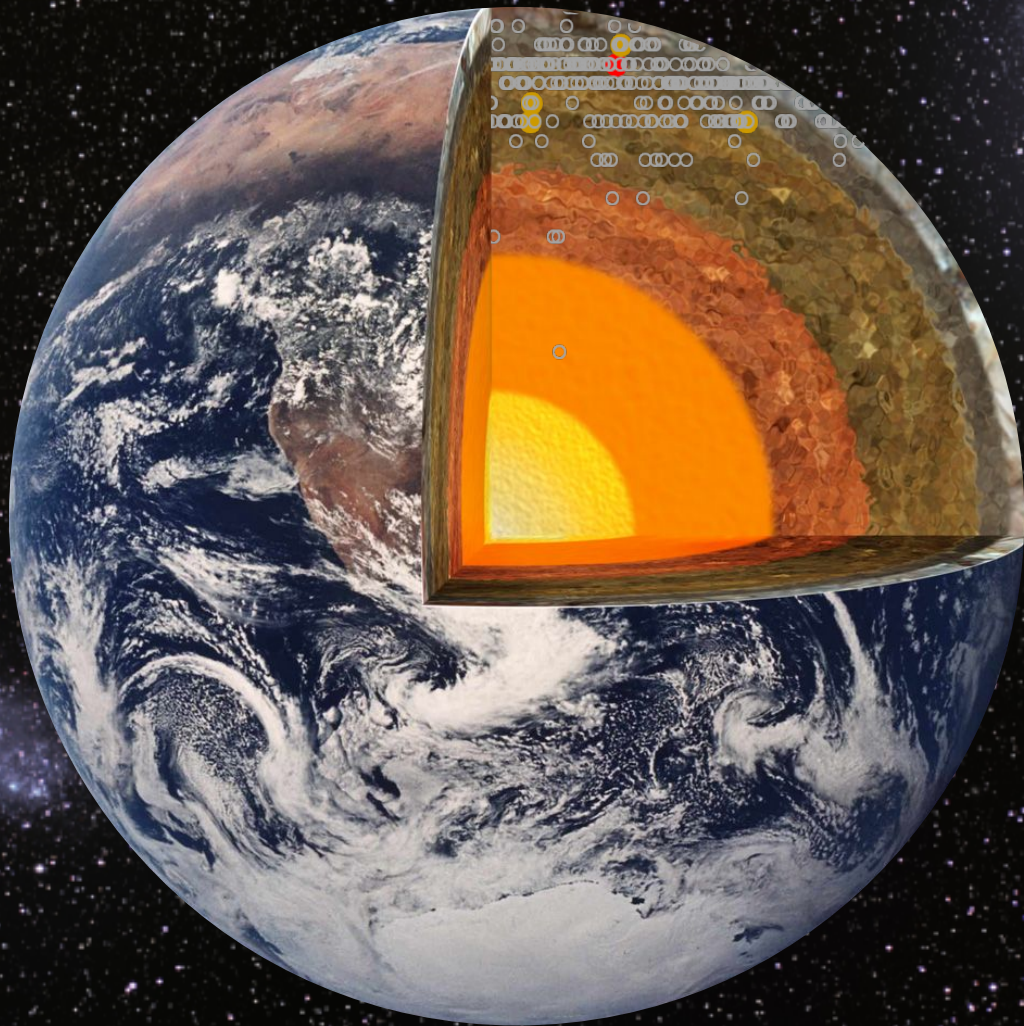
CSM: HORIZONTAL DISTRIBUTION

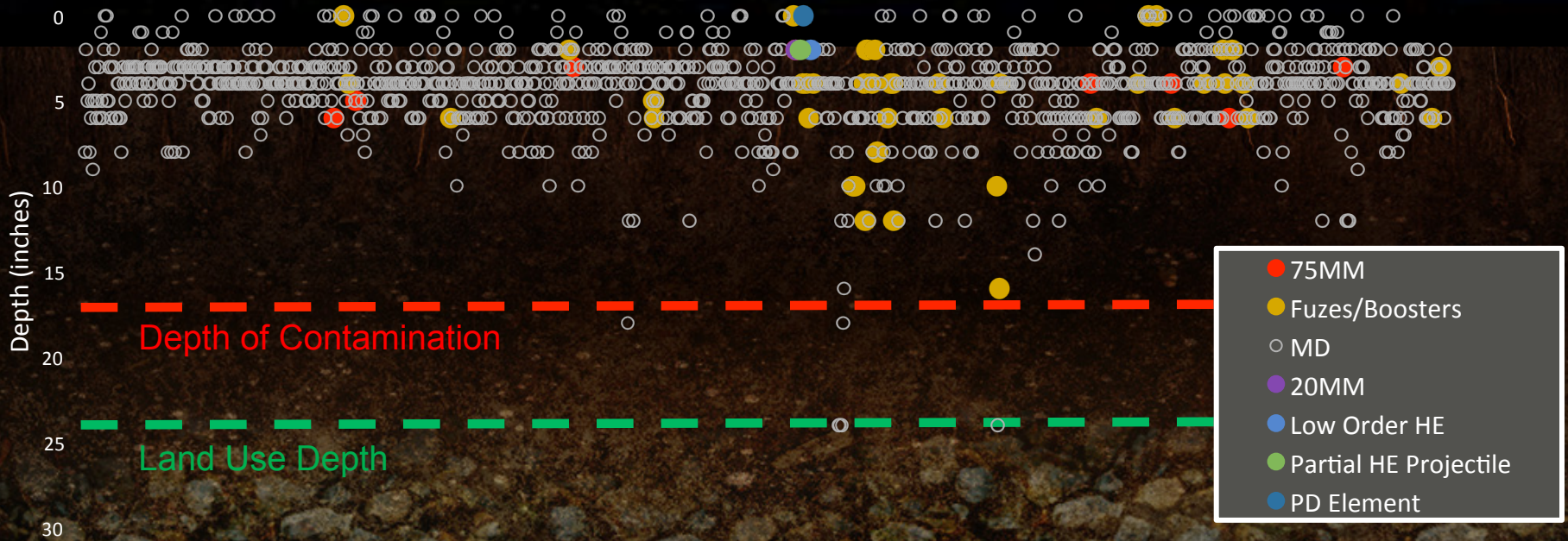


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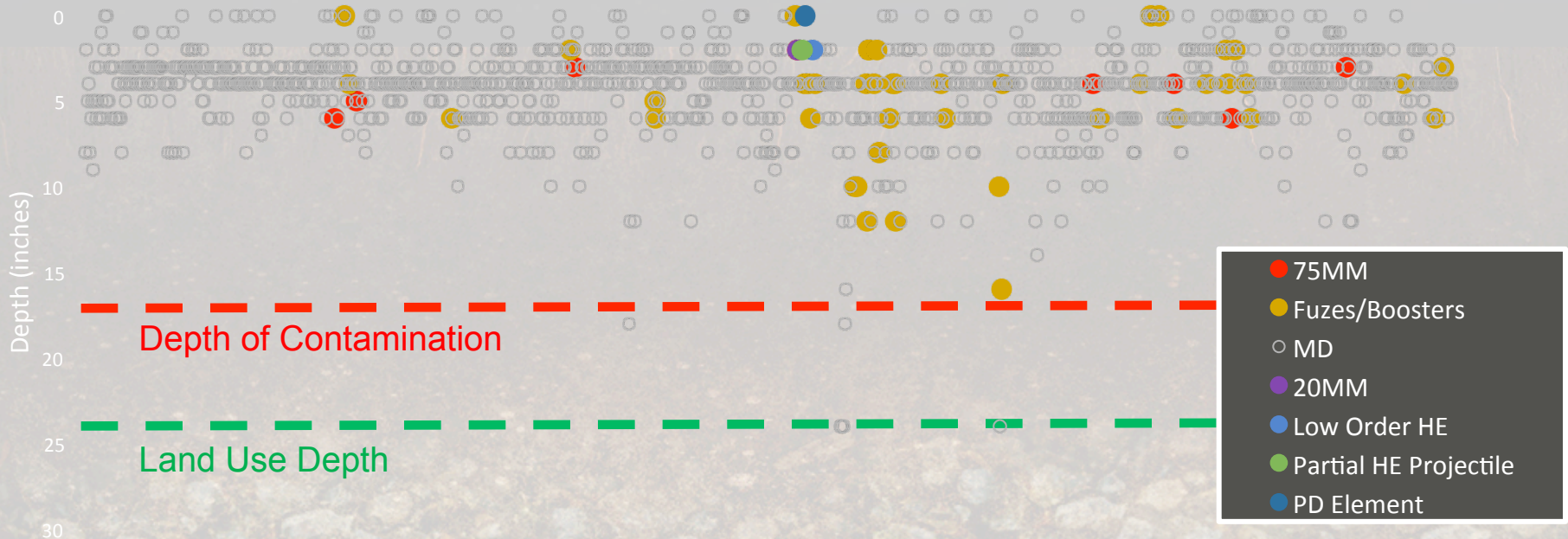




THE REMEDIAL ACTION OBJECTIVE (RAO) IS:

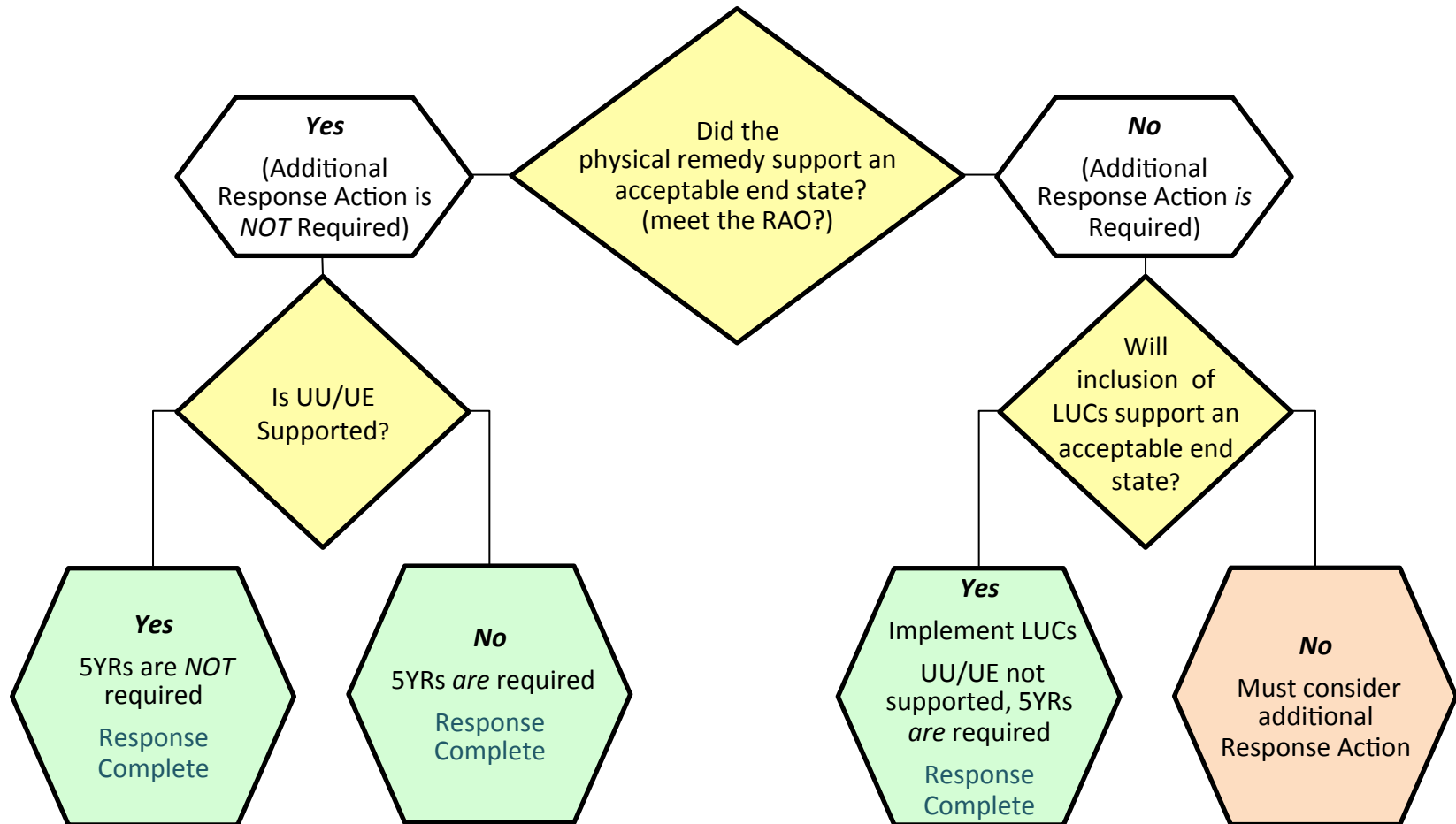
FS

“...to reduce the unacceptable risk due to the presence of [name specific munitions] within [horizontal boundary] and [depth] to address exposure to [receptors] via [pathway] such that an acceptable risk level is achieved.”



ACCEPTABLE END STATES

FS



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VERTICAL DISTRIBUTION

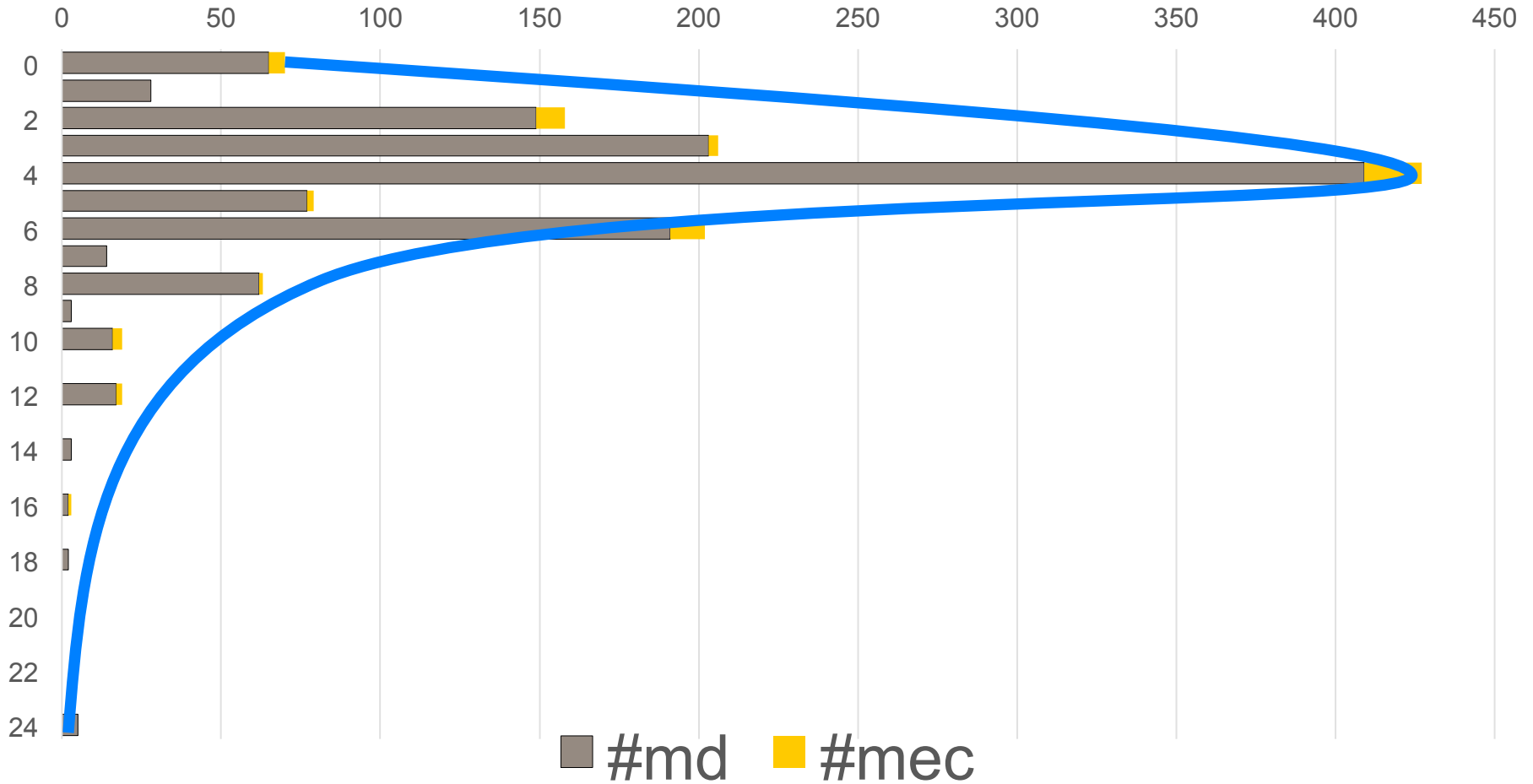
What's down there and how far does it go?



FIRST CUTS AT [X] VS. DEPTH

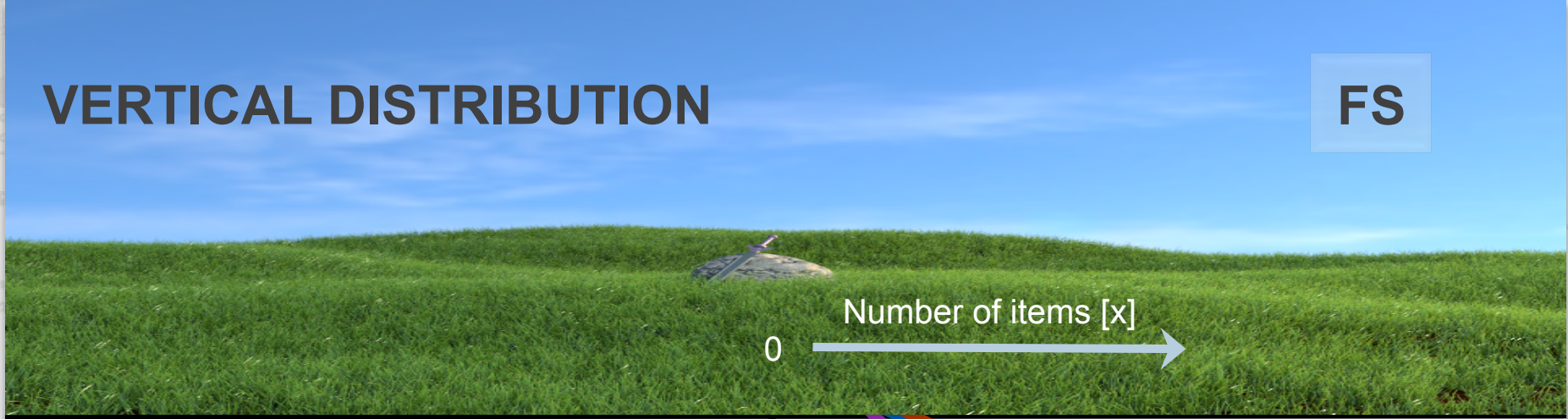
RI

Where are the munitions?



VERTICAL DISTRIBUTION

FS



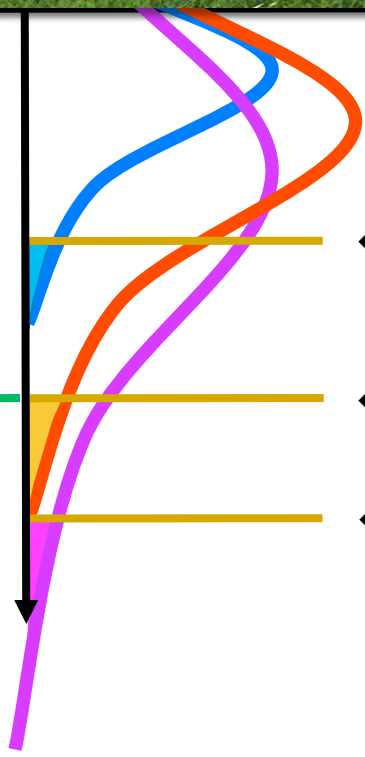
0 $\xrightarrow{\text{Number of items [x]}}$

Surface

Land Use Depth =
Action Limit

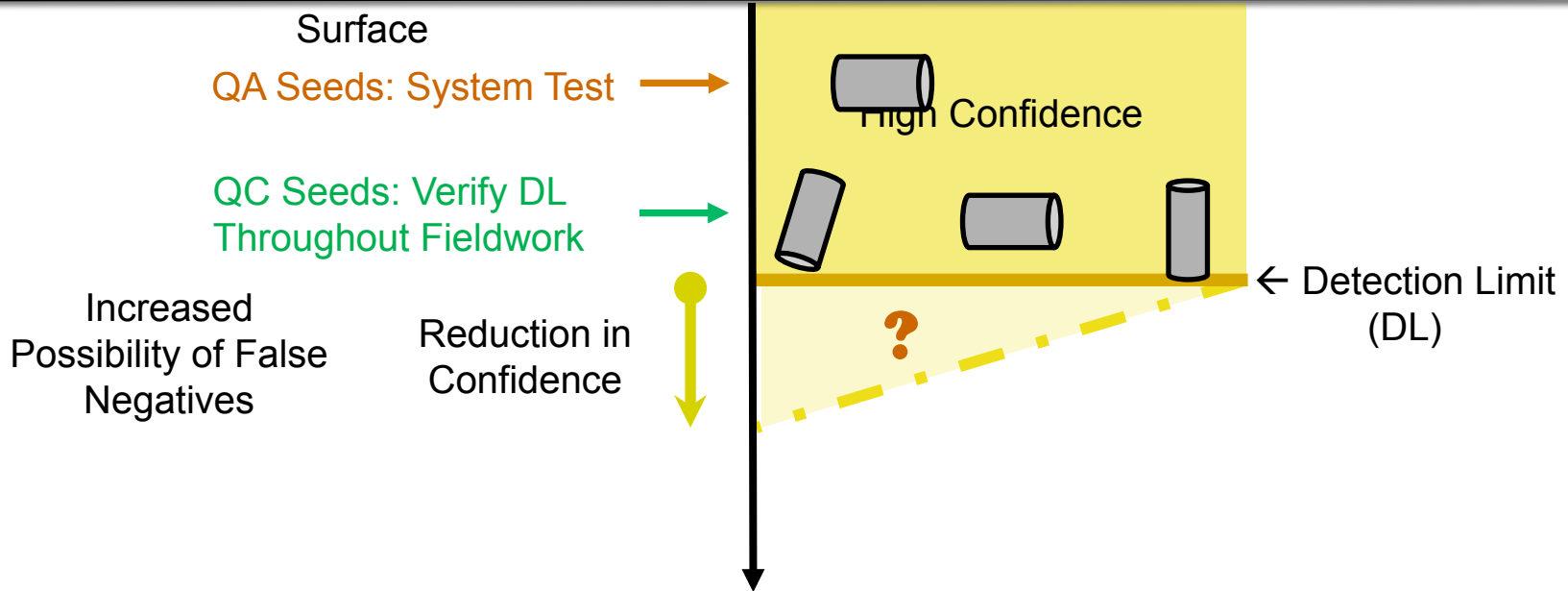
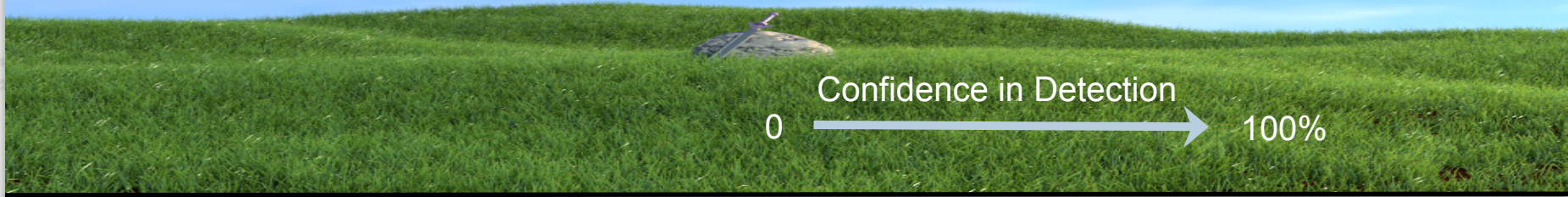
Uncertainty \rightarrow
Confidence \rightarrow
Confidence \rightarrow

\leftarrow Detection Limit
 \leftarrow Detection Limit
 \leftarrow Detection Limit



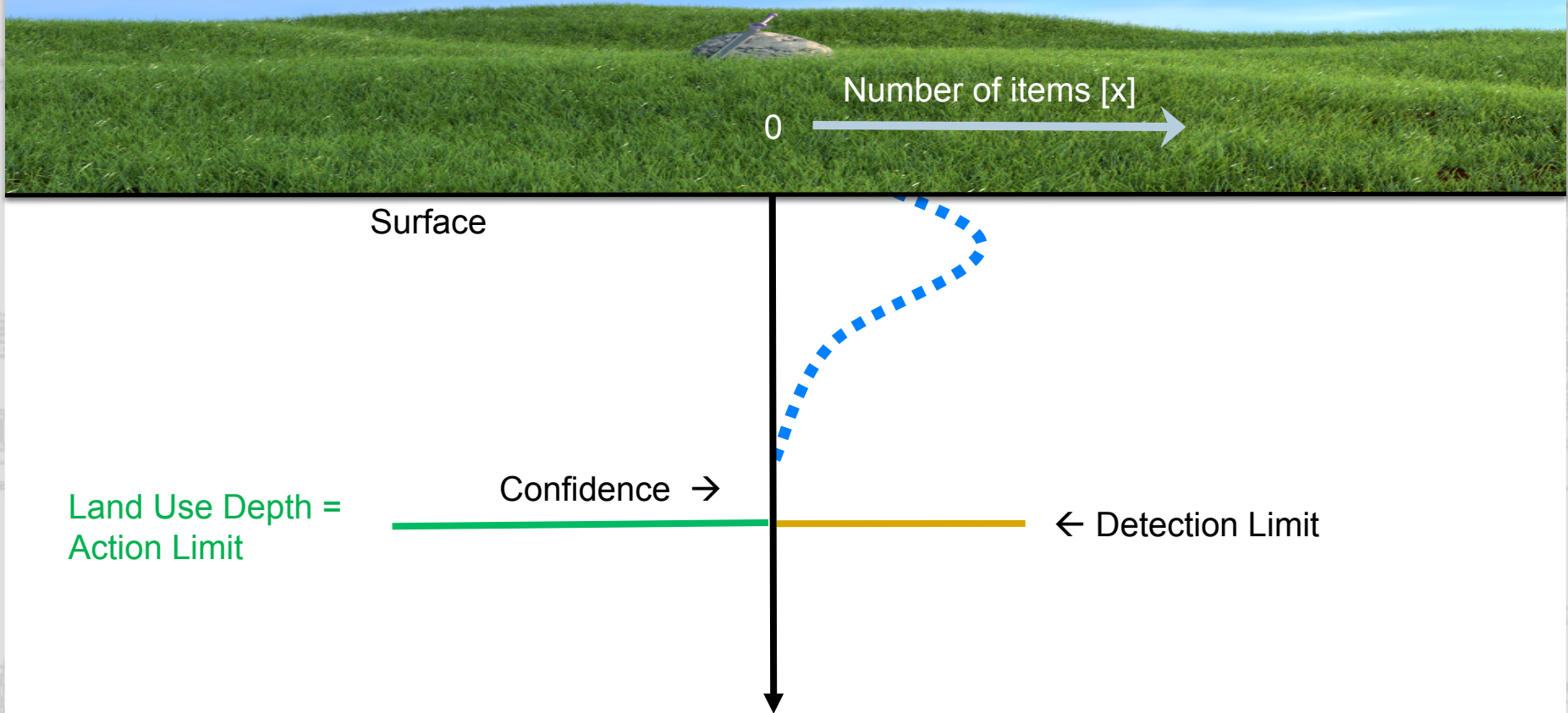
WHAT IS THE DETECTION LIMIT?

RA



VERTICAL DISTRIBUTION POST RI

FS



This helps us develop the Remedial Action Objective (RAO)!

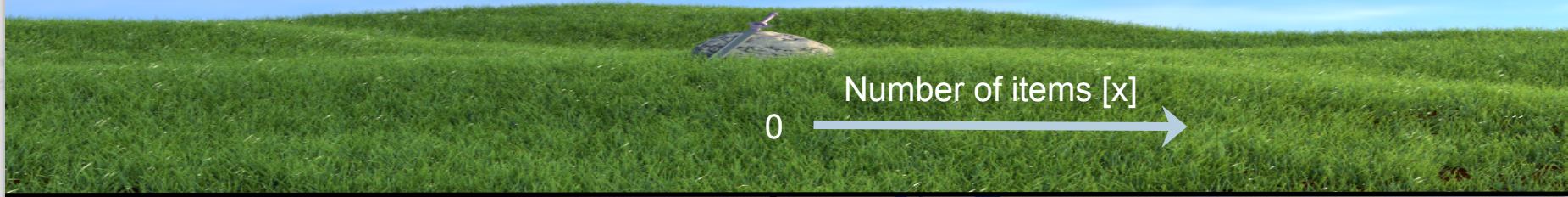


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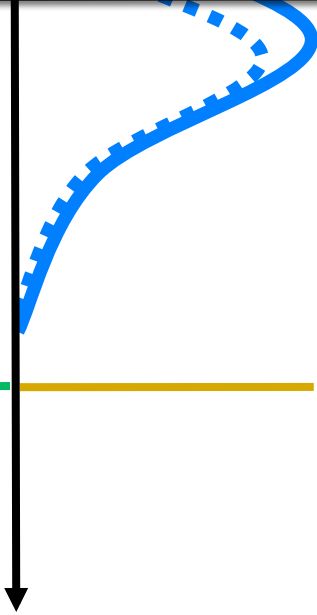


POST REMEDY DATA ASSESSMENT

RA



Surface



Land Use Depth =
Action Limit

Confidence →



← Detection Limit

Did we meet the RAO?

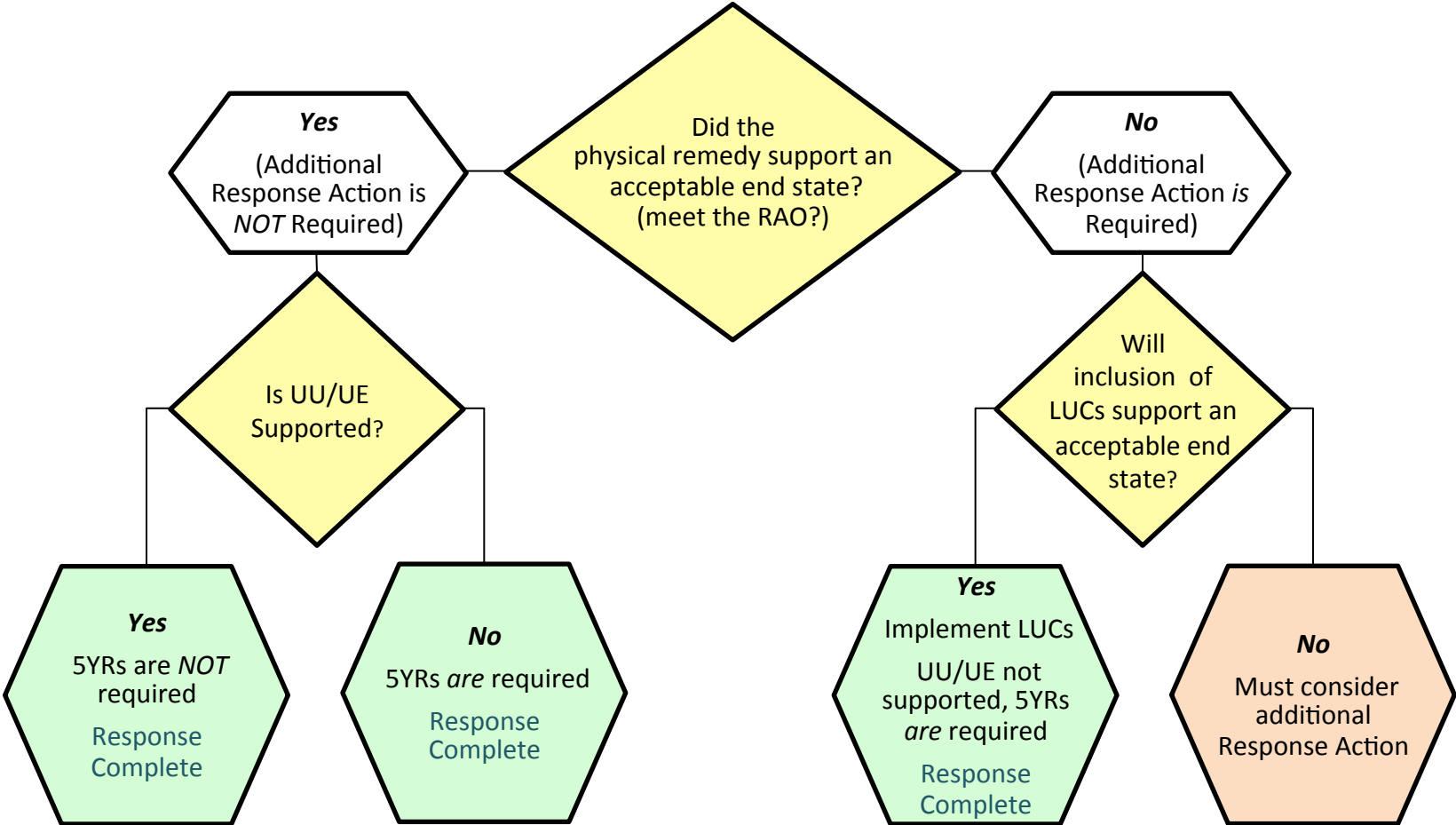


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POST REMEDY DATA ASSESSMENT

RA

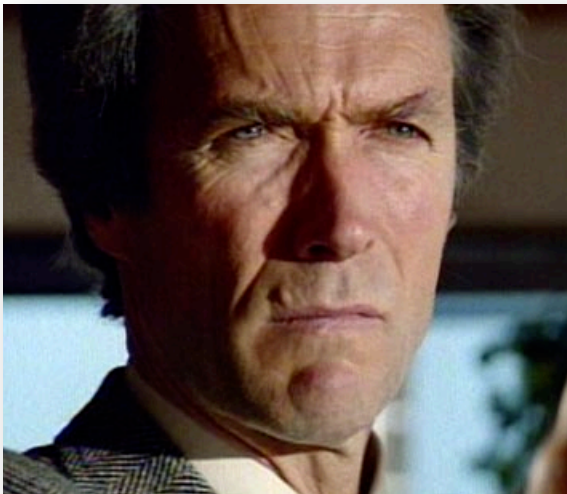


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SUMMARY

- Depth matters!
- The RI should develop the vertical CSM
- RAO must identify a depth
- Consider the vertical distribution
- Use the post-remedy data assessment to determine if the RAO was achieved



A PDT's got to know it's depth limitations.



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