

Dredged Material Management and Metals Immobilization

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- Founded in 1941 as a not-for-profit (501-c-3) organization conducting research in the areas of drug discovery, preclinical drug development, advanced engineering, and environmental protection.
- Environmental research has historically focused on issues related to the energy production industry

Water Research Center

Collaboration with Southern Company and EPRI for research focused on:

- Zero Liquid Discharge
- Waste Water Treatment
- Moisture Recovery
- Cooling Tower & Advanced Cooling Systems
- Carbon Technology Water Issues
- Solid Landfill Water Management



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Environmental Issues Associated with Dredging

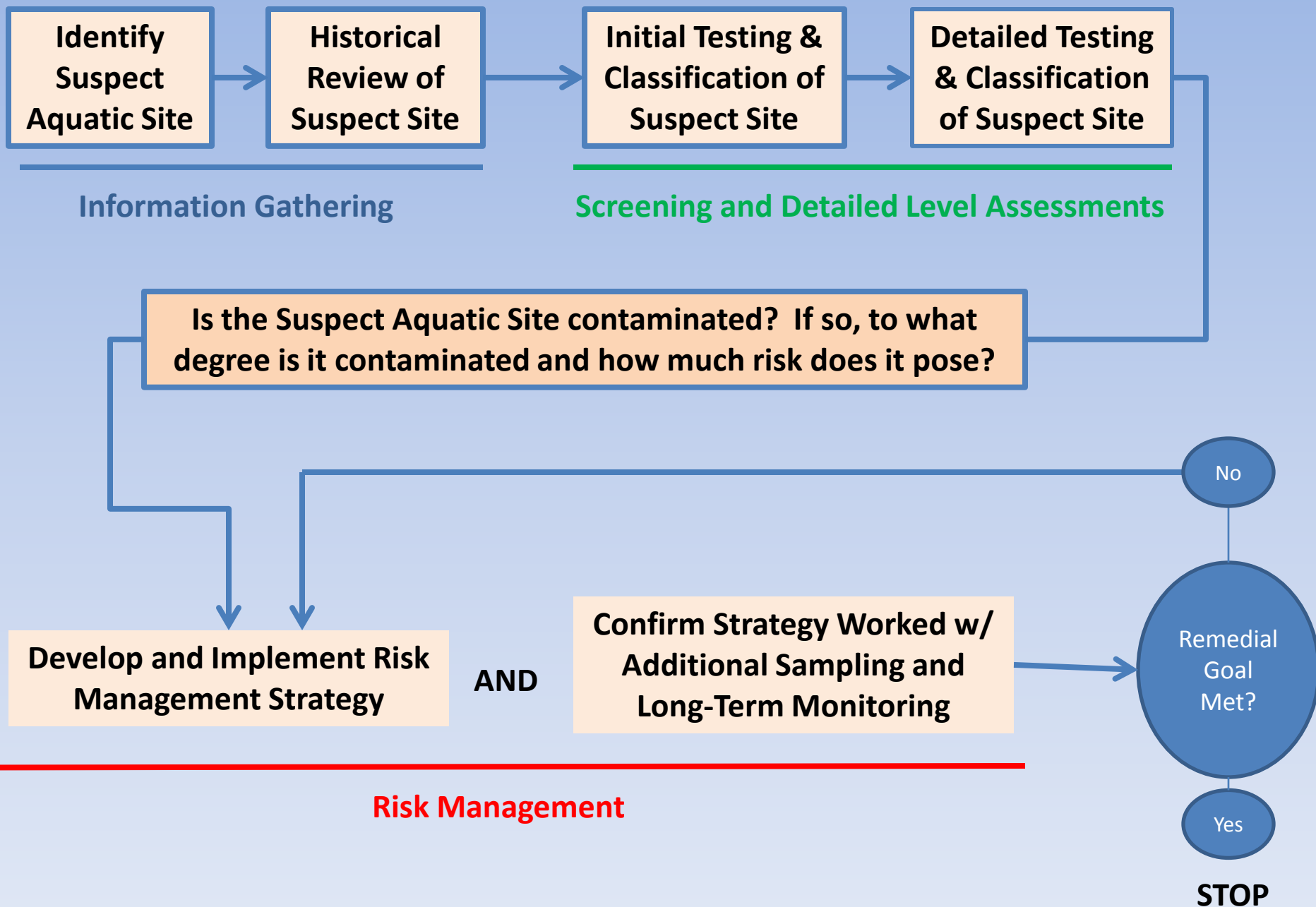
- **Resuspension of contaminated sediments**
 - Resuspension may occur during collection, deposition, and once placed in final location due to currents
- **Leaching of contaminants into overlying water column or into groundwater at inland disposal sites**
- **Disposal sites are limited for contaminated sediments**

Evaluation of Risk(s) Associated with Metal Contamination

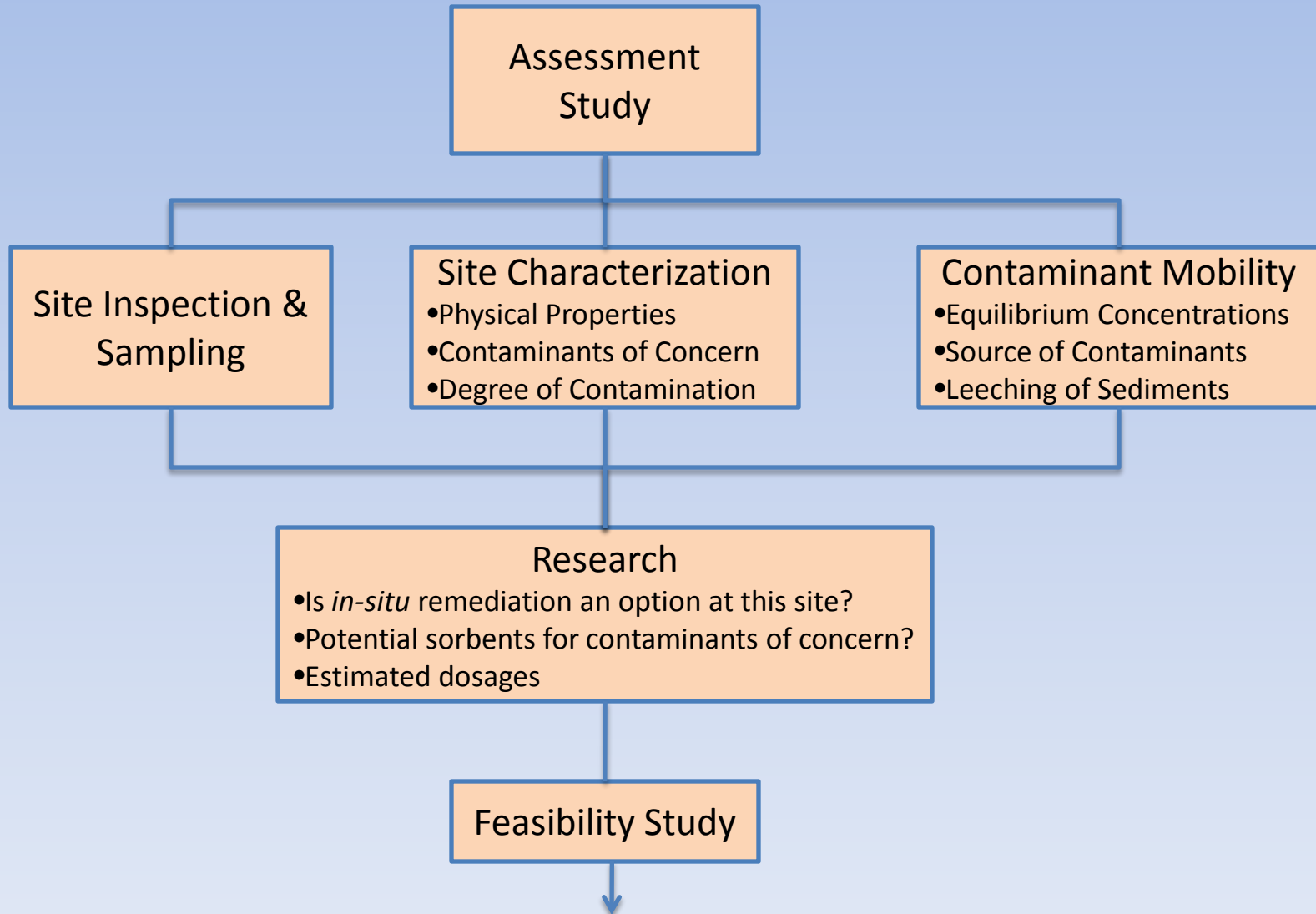
- Total extractable metals
 - Indicates the total concentration of the metal of interest
- Speciation analysis
 - What chemical forms of the element are present?
- Bioavailability testing
 - What fraction of the element is potentially available for biological uptake?
- Toxicity testing
 - Does the concentration/speciation of the element pose a risk to biology?
- Monitoring the aging process
 - How does the chemistry of relocated sediments change due to new environmental conditions?

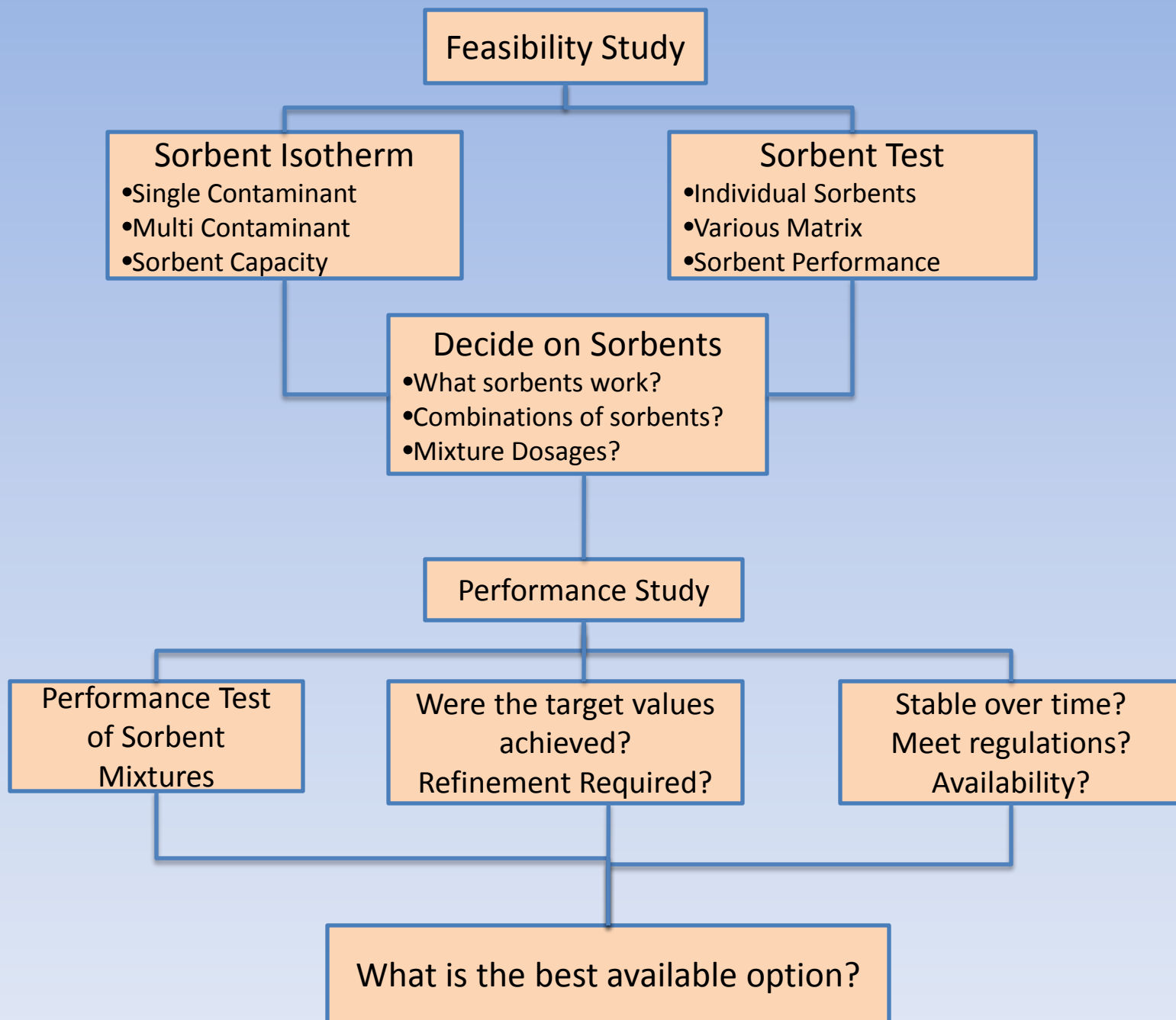
Potential Management Solutions for Contaminated Sediments

- **Disposal**
 - Offshore disposal, in-bay disposal, upland disposal
- **Beneficial Reuse**
 - Beach nourishment, land reclamation, construction materials, wetland creation/restoration, etc.
- **Remediation and Reuse**
- ***In-situ* immobilization of contaminants**

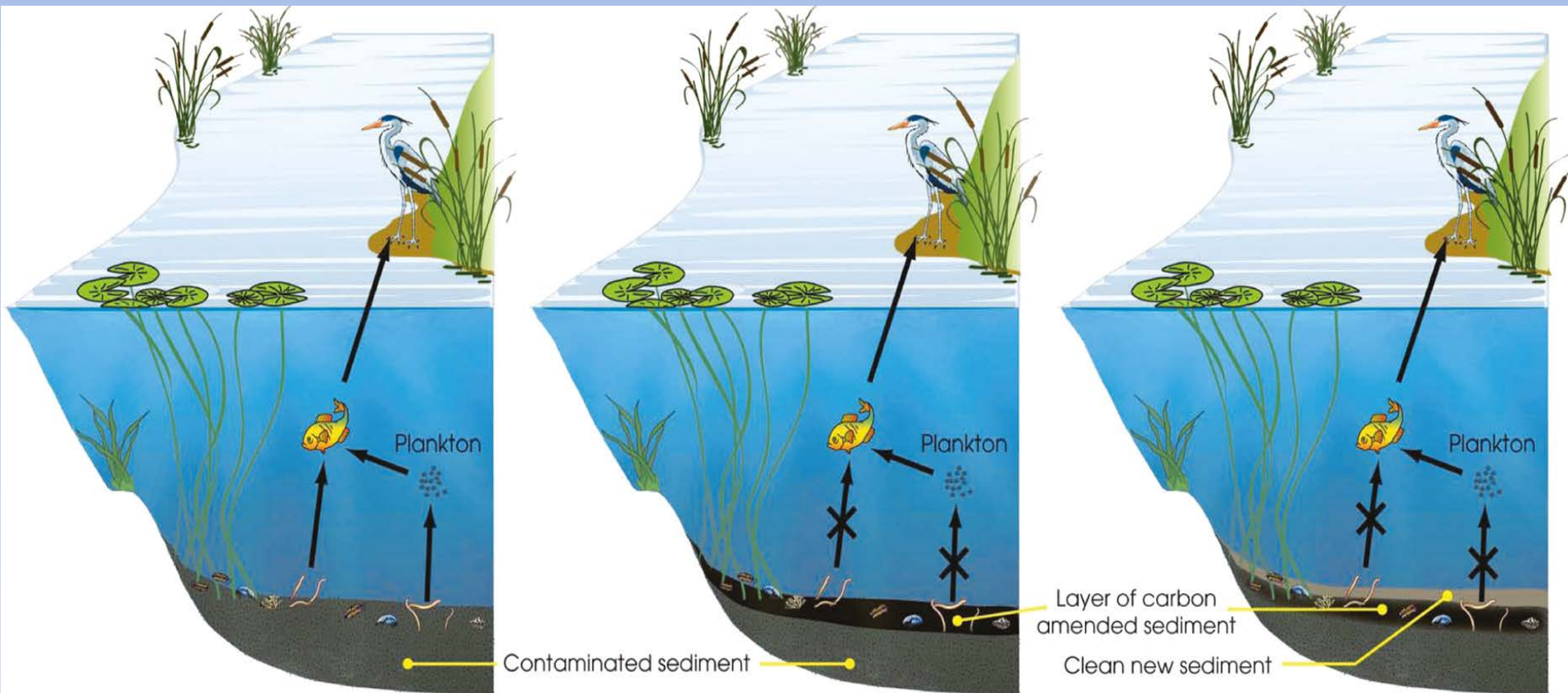


In-situ Immobilization Strategy





Conceptual *In-Situ* Immobilization

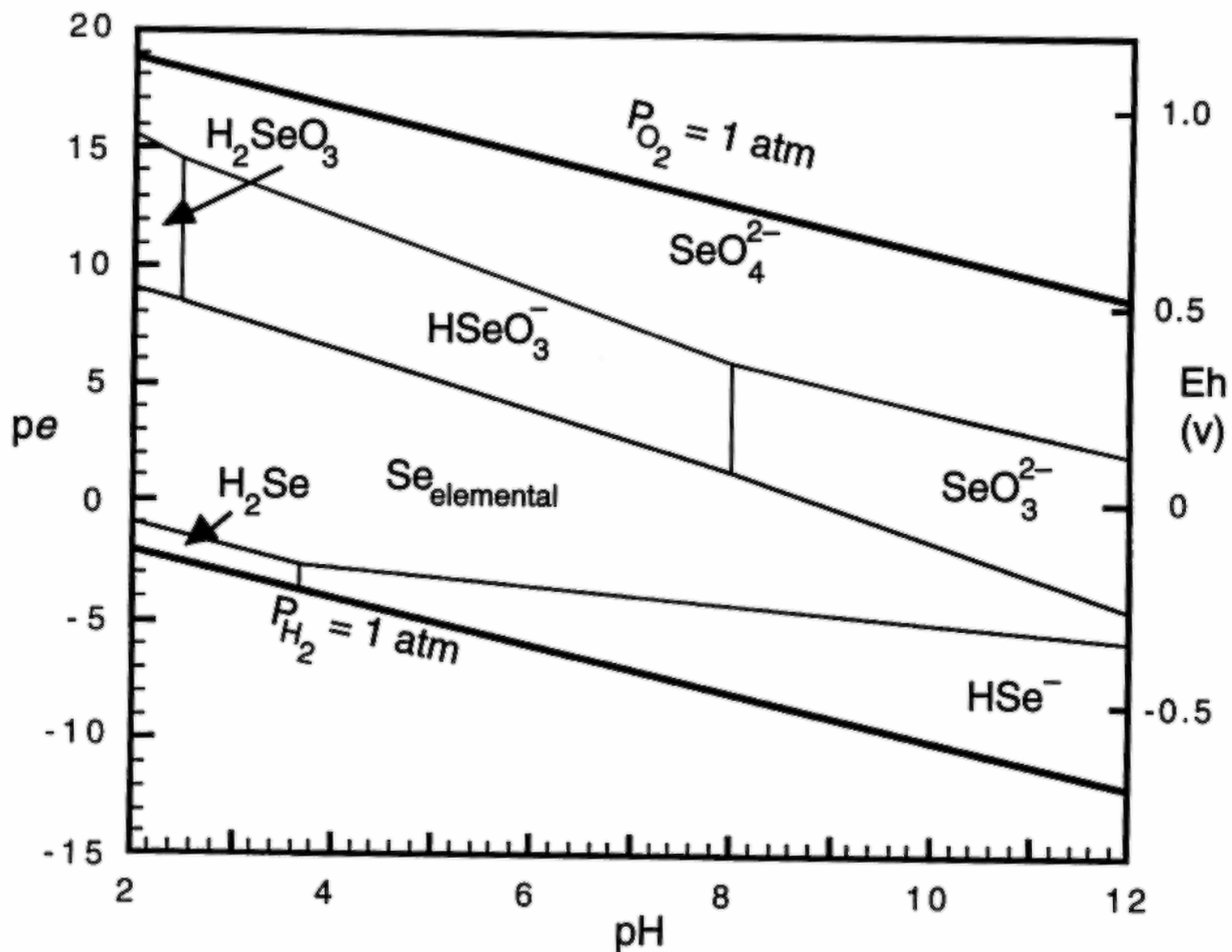


X-Ray Instrumentation for Characterization of Solids

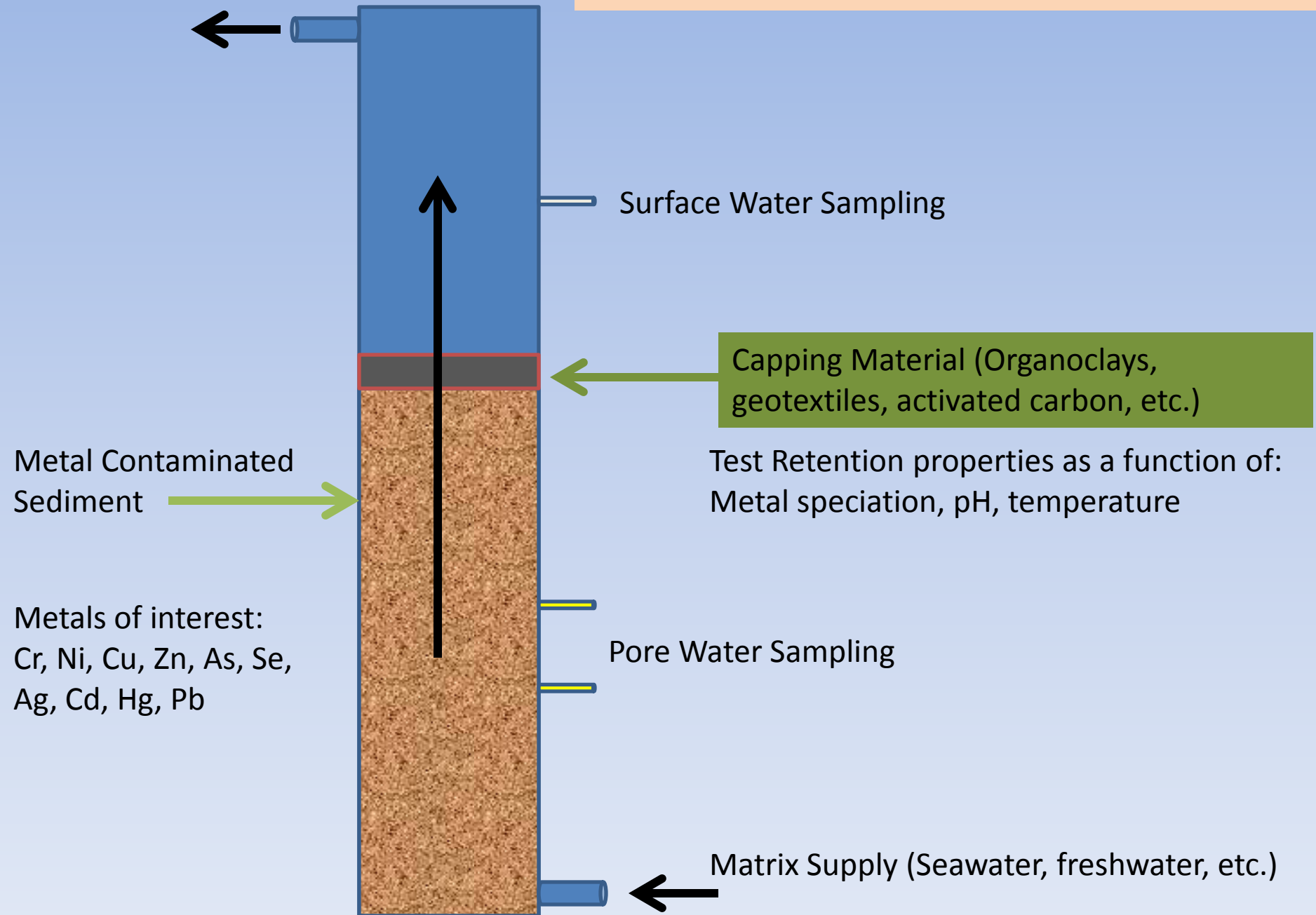


HPLC-ICP-MS Instrumentation used for speciation analysis of metals





Simplified Illustration of Laboratory Scale Testing



Previous Bioreactor Research





Thank You For Your Attention
Questions?

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