Dredged Material Evaluation and Testing Overview

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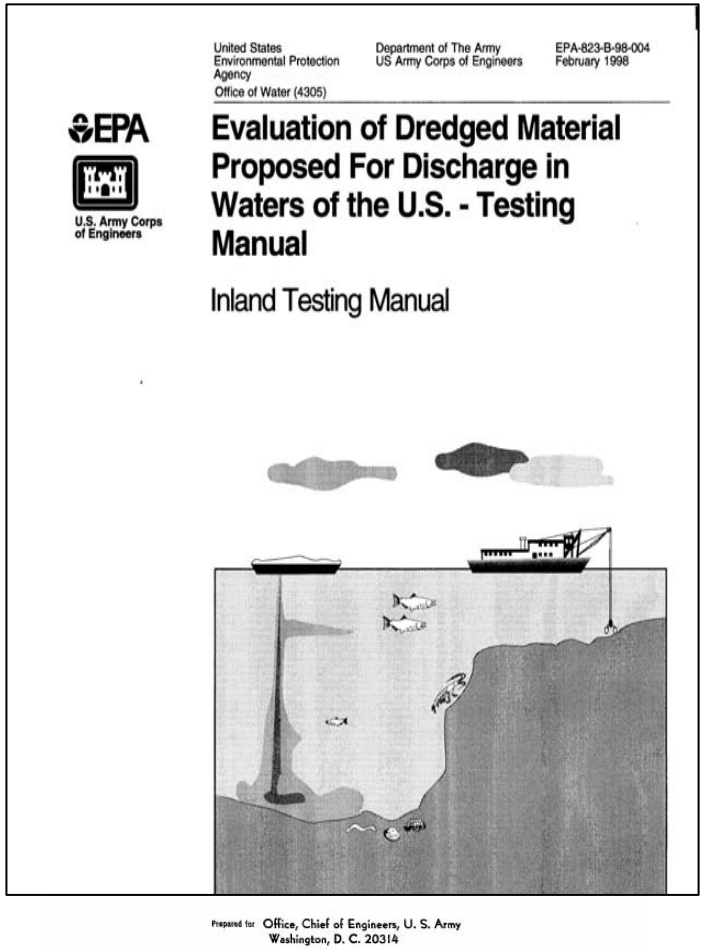
Guidance Documents for Management of Dredged Material

Technical Guidance

- **Technical Framework**
- **Inland Testing Manual**
- **Ocean Testing Manual**
- **Upland Testing Manual**
- **Ocean Site Designation Manual**
- **Site Management & Monitoring**

Found at:
el.erdc.usace.army.mil/dots/guidance.html

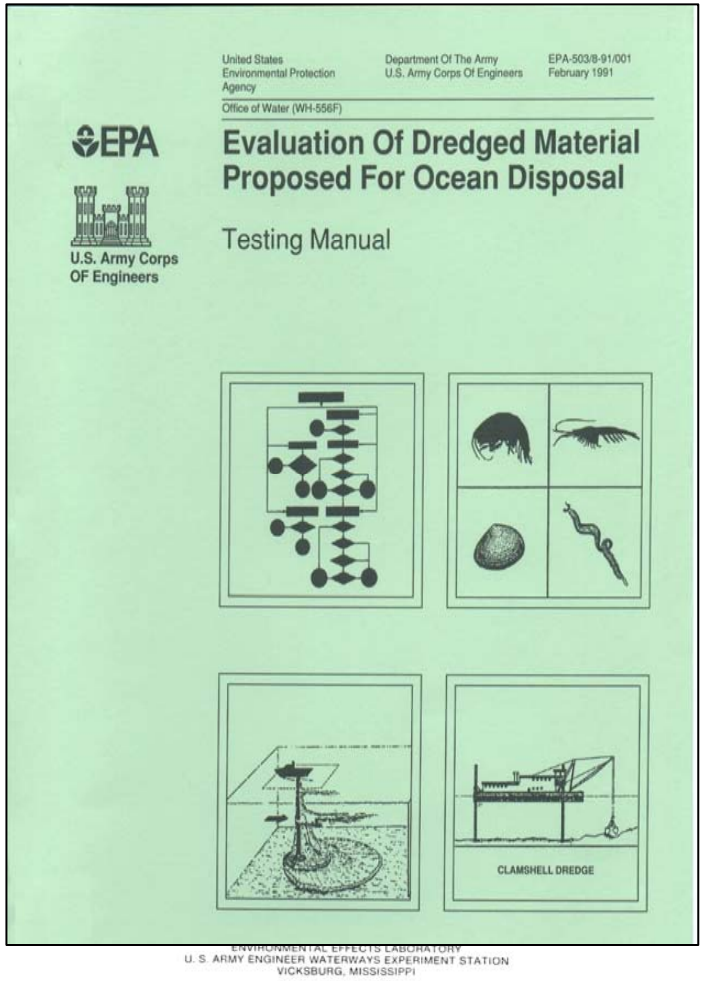
Inland Testing Manual



- **Addresses CWA**
- **Interim guidance in 1976, updated in 1998**
- **Included:**
  - **Effects-based testing**
  - **Sequenced > Tiered**

DM placement *"will not cause "an unacceptable adverse impact"*

Ocean Testing Manual



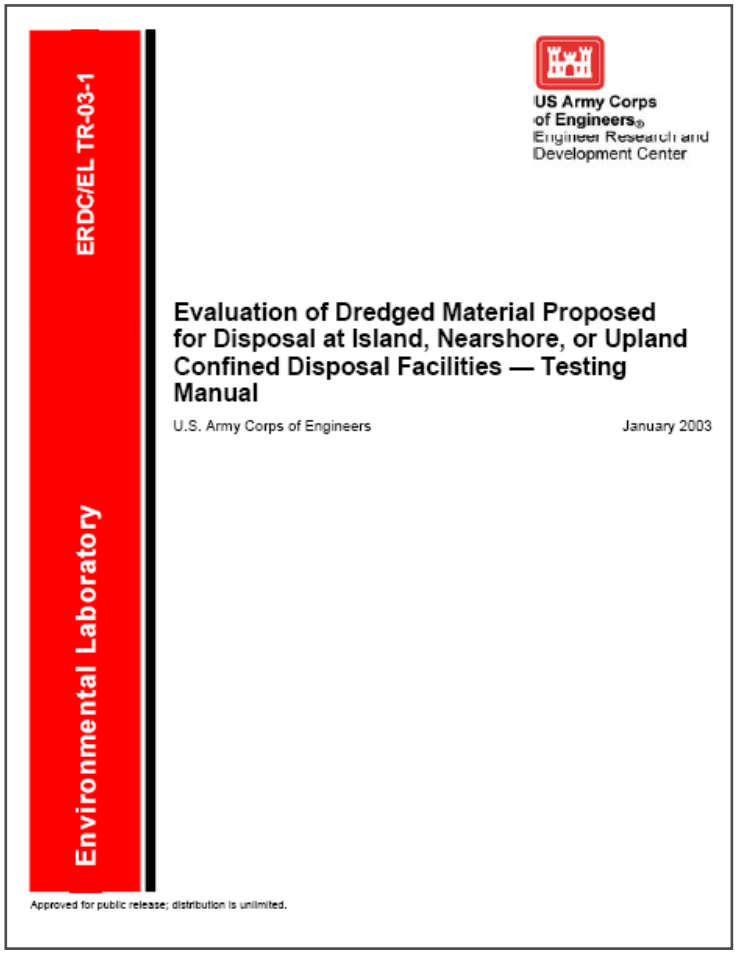
- **Addresses MPRSA**
- **Originally developed in 1977, updated in 1991**
- **Included:**
  - **Effects-based testing**
  - **Bioaccumulation**
  - **Sequenced >Tiered**

DM placement in ocean will not *"unreasonably degrade or endanger: human health, welfare, or amenities, marine environment, ecological systems, or economic potentialities"*

MPRSA/CWA Differences

MPRSA	CWA
Water Quality Criteria	Water Quality Standards
Mixing Specified	Mixing Variable
Exclusions Restricted	Exclusions Broad
Reference Comparison	Disposal Comparison
Bioassays Mandatory	Bioassays Optional
Trace Contaminants	No Trace Contaminants
No Physical Isolation	Physical Isolation
1977 Regulation	1980 Regulation

Upland Testing Manual

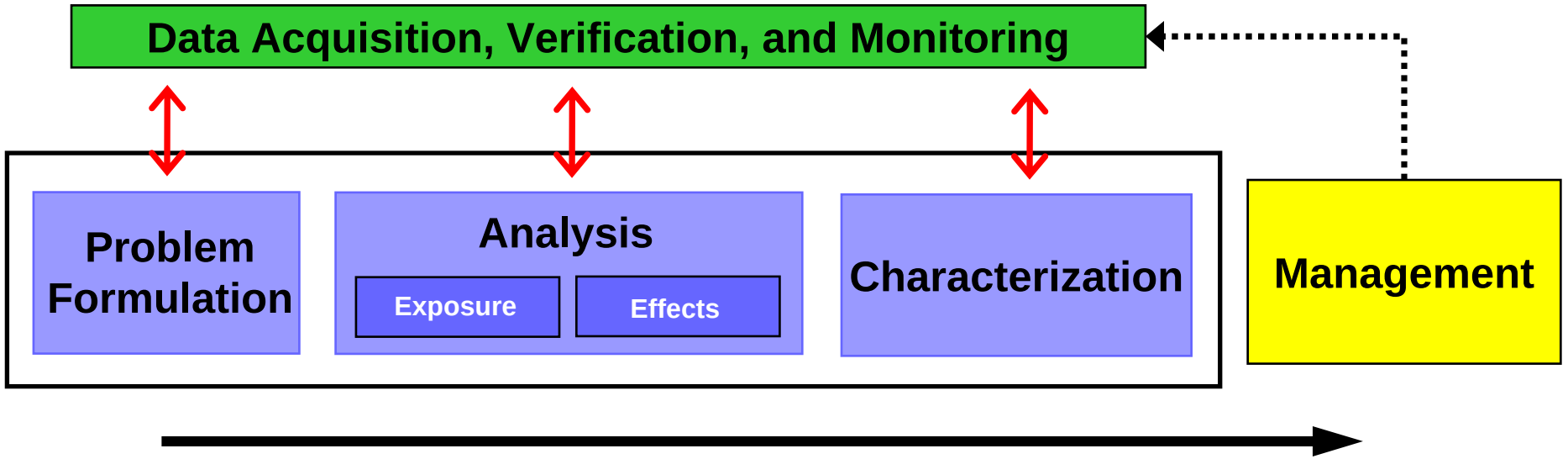


- **Addresses management of DM in confined disposal facilities (CDF)**
- **Published in 2003**
- **Included:**
  - **Tiered approach to assess contaminant releases**
  - **Focused on contaminant pathways and use of a conceptual model**
  - **Goal is to determine need/extent of contaminant controls**

Dredged Material Testing Manuals

- Tiered testing and evaluation
- Testing procedures (elutriate, benthic, and bioaccumulation)
- Computer models for mixing
- Statistical tools, QA/QC, and data interpretation
- Case-specific evaluations

Risk Assessment and Management Process



- Process that evaluates the likelihood that adverse effects may occur or are occurring as a result of exposure to one or more stressors (USEPA 1997).
- Risk management is an approach to consider the outcome and uncertainty of an assessment and mitigate risk through a range of alternatives.

Features of Risk Assessment

- Evaluate risk to different levels of ecological organization (ecosystems, communities, species, populations)
- Important planning components of RA
  - Problem formulation stage
  - Conceptual model
- Evaluate exposure and potential effects
- Result in a characterization of risk
- May determine levels of unacceptable risk/suitability of management options

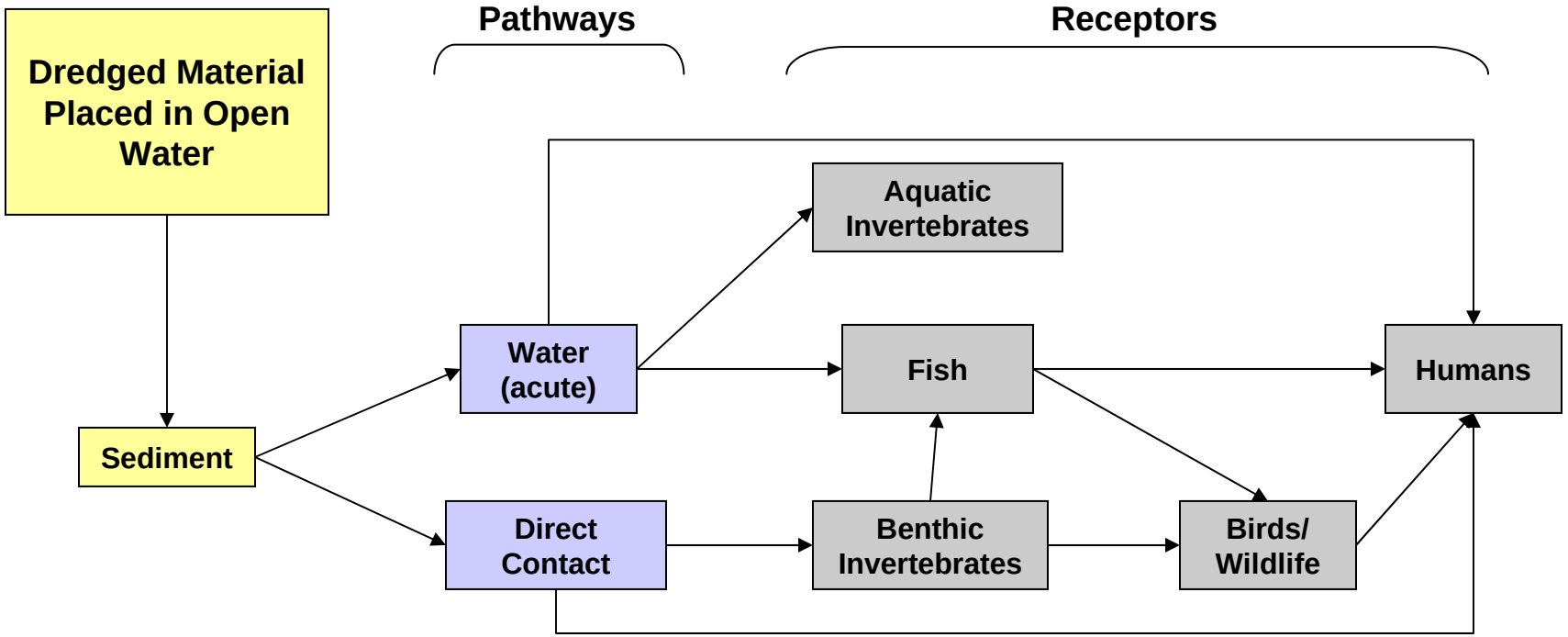
Stressor

A stressor is any physical, chemical, or biological entity that can induce an adverse response

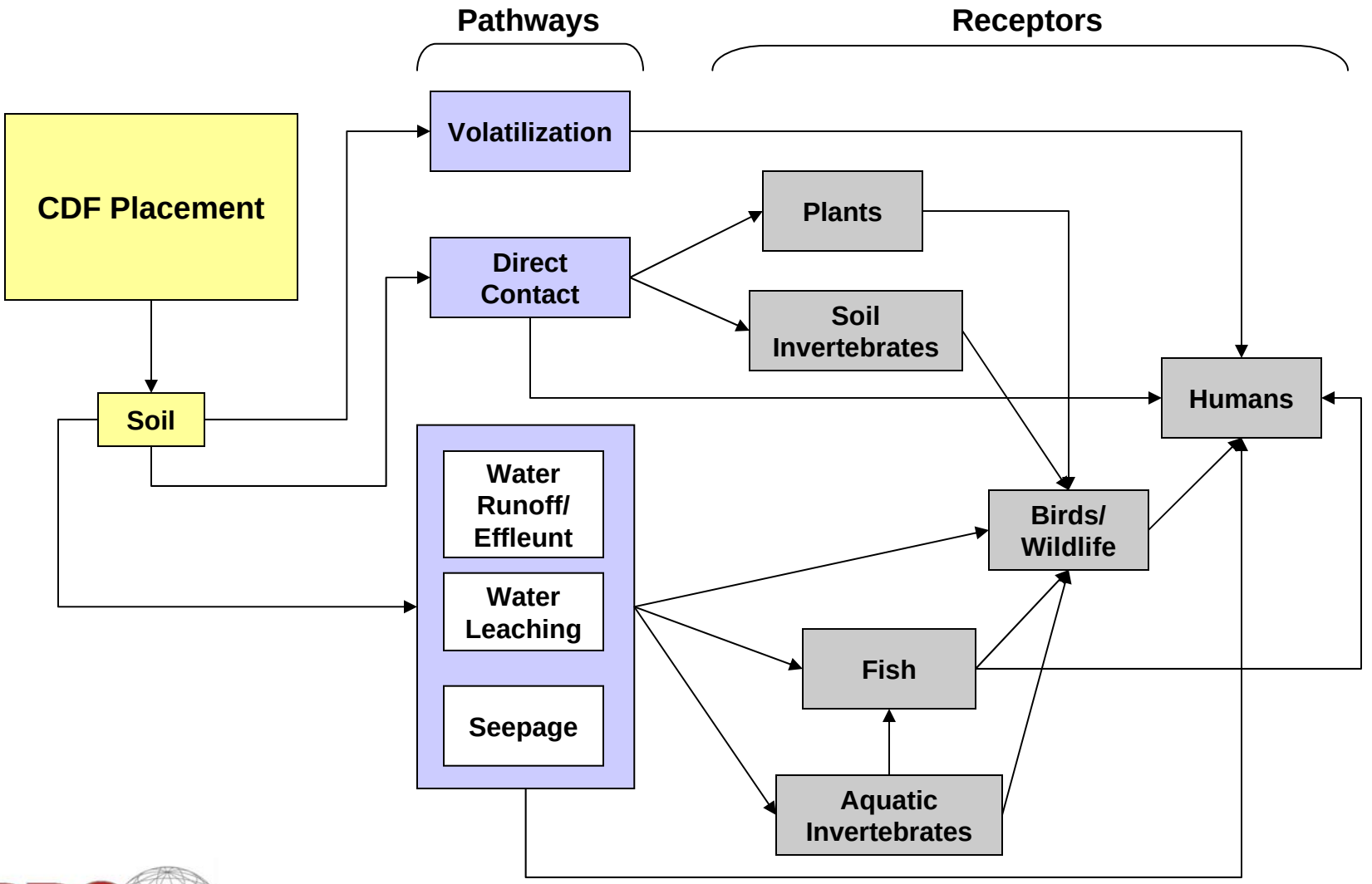
Dredging Stressors:

- Chemicals in sediment
- Chemicals released into surface waters from dredging activities
- Resuspension
- Physical activities (e.g., noise) associated with dredging

Conceptual Model: Open Water Placement of DM

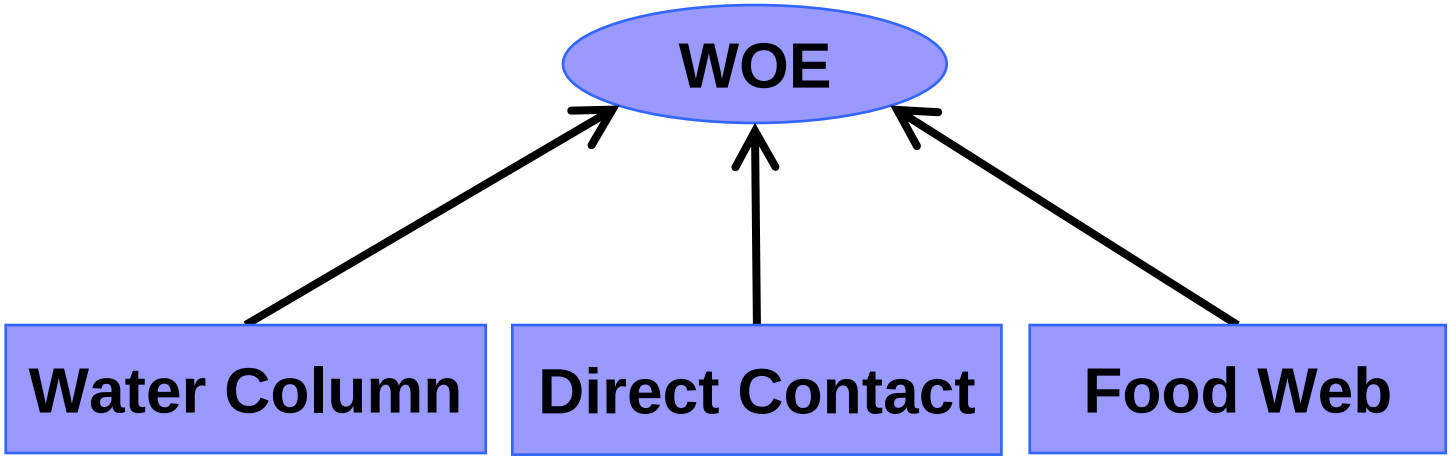


Conceptual Model: Upland (CDF) Placement of DM



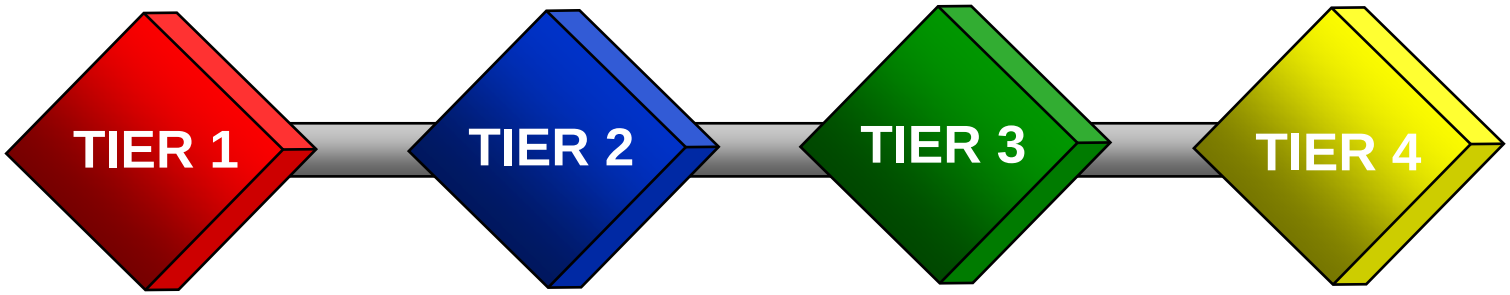
Weight of Evidence

- Relies on multiple lines-of-evidence (LOE)
- Reach conclusions regarding the potential risks to receptors identified within the CM
- Three main lines-of-evidence

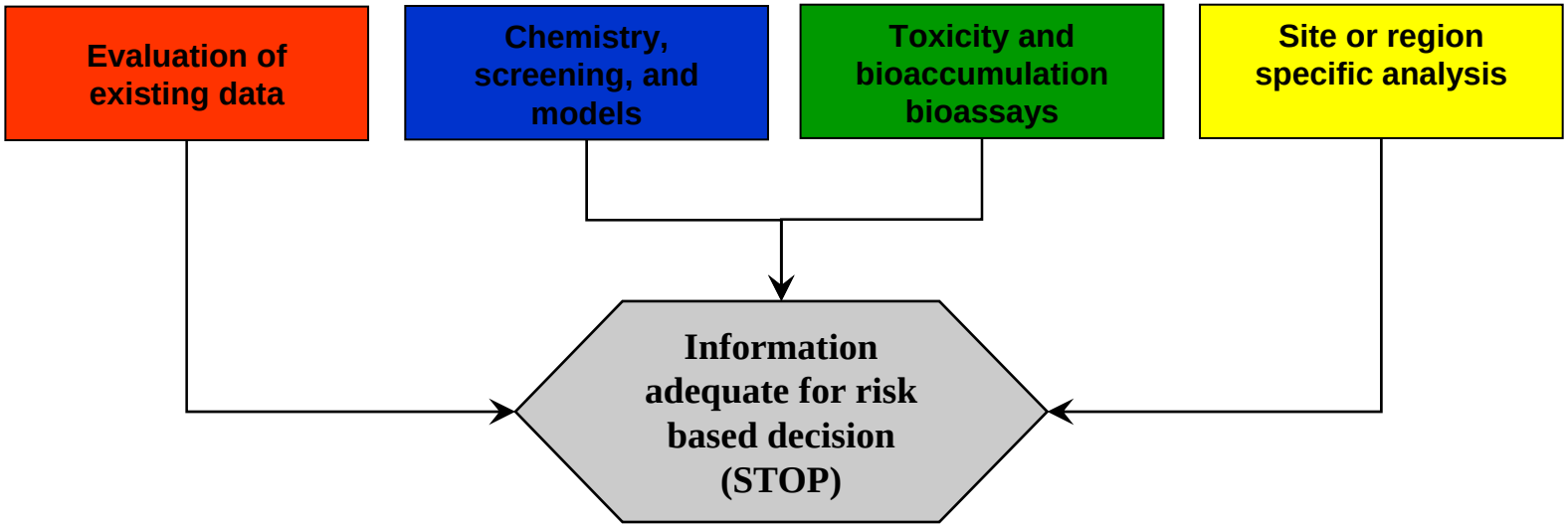


Lines of Evidence

Guidance Manuals: 4 Tiered Procedure



Tiered process → follow as far as necessary to make decision



Tier I

- **Examine existing information**
  - **Contaminant sources**
    - **Pathways of contaminant sources**
    - **Spill information**
  - **Physical characteristics of site**
    - **Bathymetry, currents, deposition, time since last dredging was required**
  - **Prior physical monitoring**

Tier I

- **Exclusions from testing**
  - **MPRSA**
    - **Primarily sand, gravel, rock and high energy environment (or)**
    - **Beach nourishment material (or)**
    - **Same as disposal and "far removed" from sources of contamination**
  - **CWA**
    - **Not a carrier of contaminants (e.g. sand)**
    - **Far removed from sources of contaminants**
    - **Adjacent to placement site**
    - **If constraints are available to manage sediments**

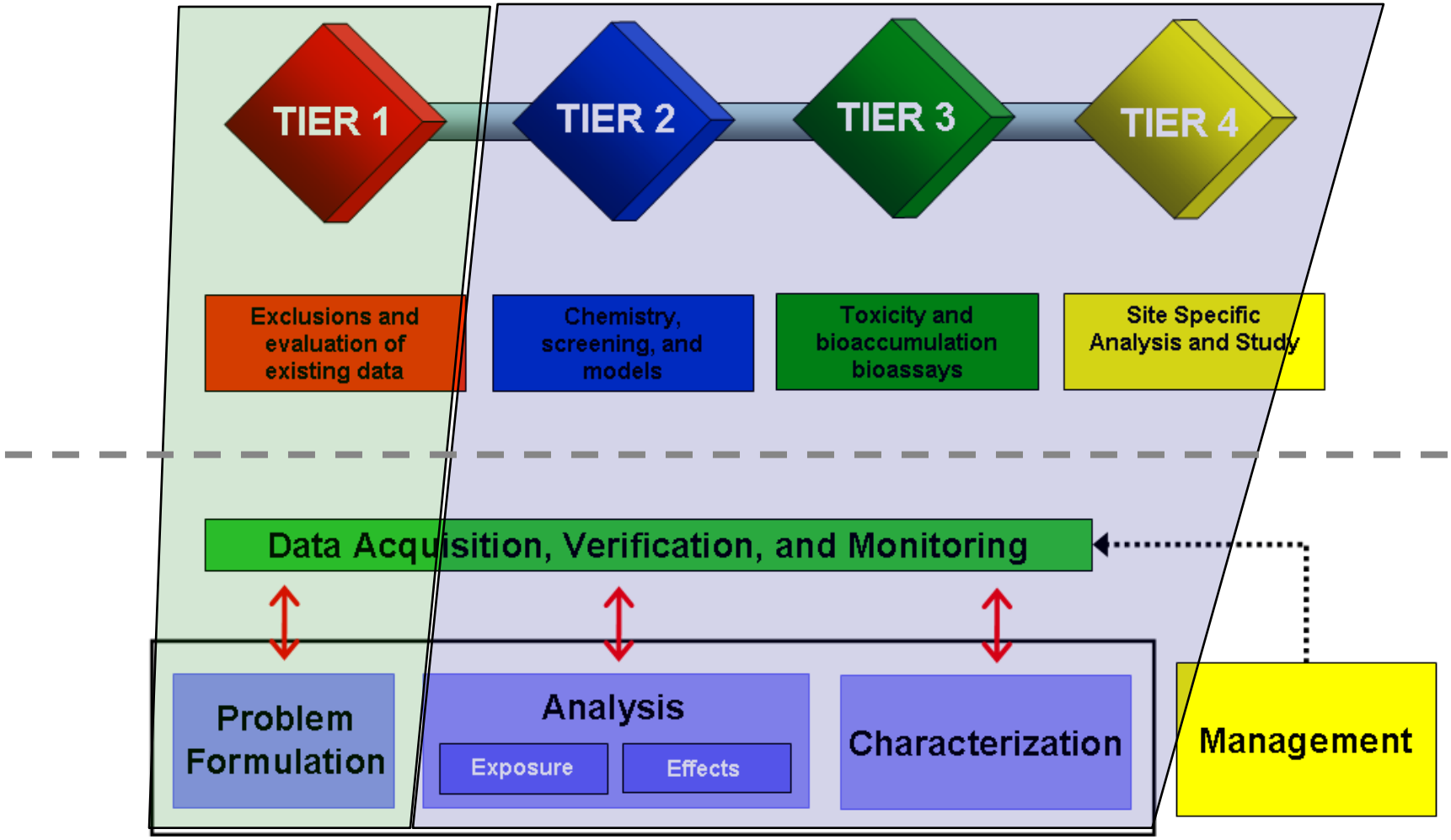
Tier I

- **Identify Contaminants of Concern**
  - **Presence in sediment**
  - **Chemical properties**
    - **Water solubility**
    - **Persistence**
  - **Toxicological significance**
  - **Propensity to bioaccumulate**

Other Tiers

- **Tier II**
  - **Water column screen**
  - **Thermodynamically based bioaccumulation potential (TBP)**
- **Tier III**
  - **Elutriate, Sediment Toxicity, and Bioaccumulation Bioassays**
- **Tier IV**
  - **Site specific studies**

Relation of RA Process and DM Guidance Procedures



Revised Manual Approach