



Site Specific Remediation Objectives for Soil Vapour in Alberta (Draft)

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Outline

- Contaminated Site Management Policy
- General Principles of Risk Assessment
- Tiered Risk Assessment Framework
- Features of the Vapour Guidance
 - Conceptual Site Model
 - Calculation of the acceptable soil vapour concentration
 - Sampling Protocol
 - Data Interpretation and Analysis



Contaminated site management *-Policy*

- Pollution prevention
- Not “pollute-up-to” guidelines
- Source control
- Full delineation
- Protection for cross-media transfer
- Protection of Water Resources



Objectives of EPEA for Contaminated Sites Management System

Environmental Management Goals

Equivalent land capability

- Maintaining ability of land to support various uses

Prevention of “adverse effect”

- Impairment/damage to environment, human health, safety, property

Past, present and future component

- “Has caused, is causing or may cause adverse effect”

Principle of sustainable development

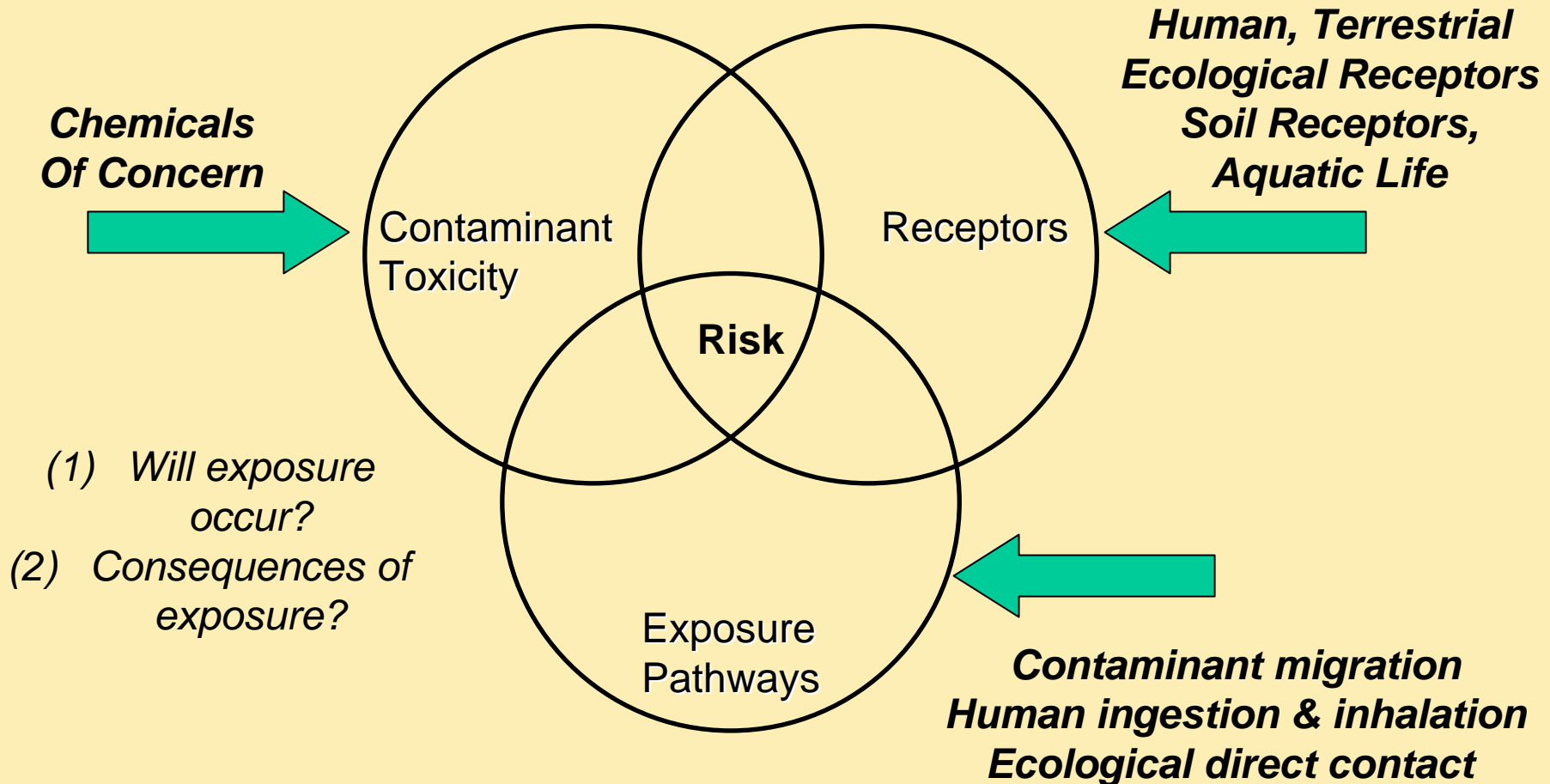
- Responsible use of resources and environment
- Maintain non-impairment for future generations

Regulatory risk management goal

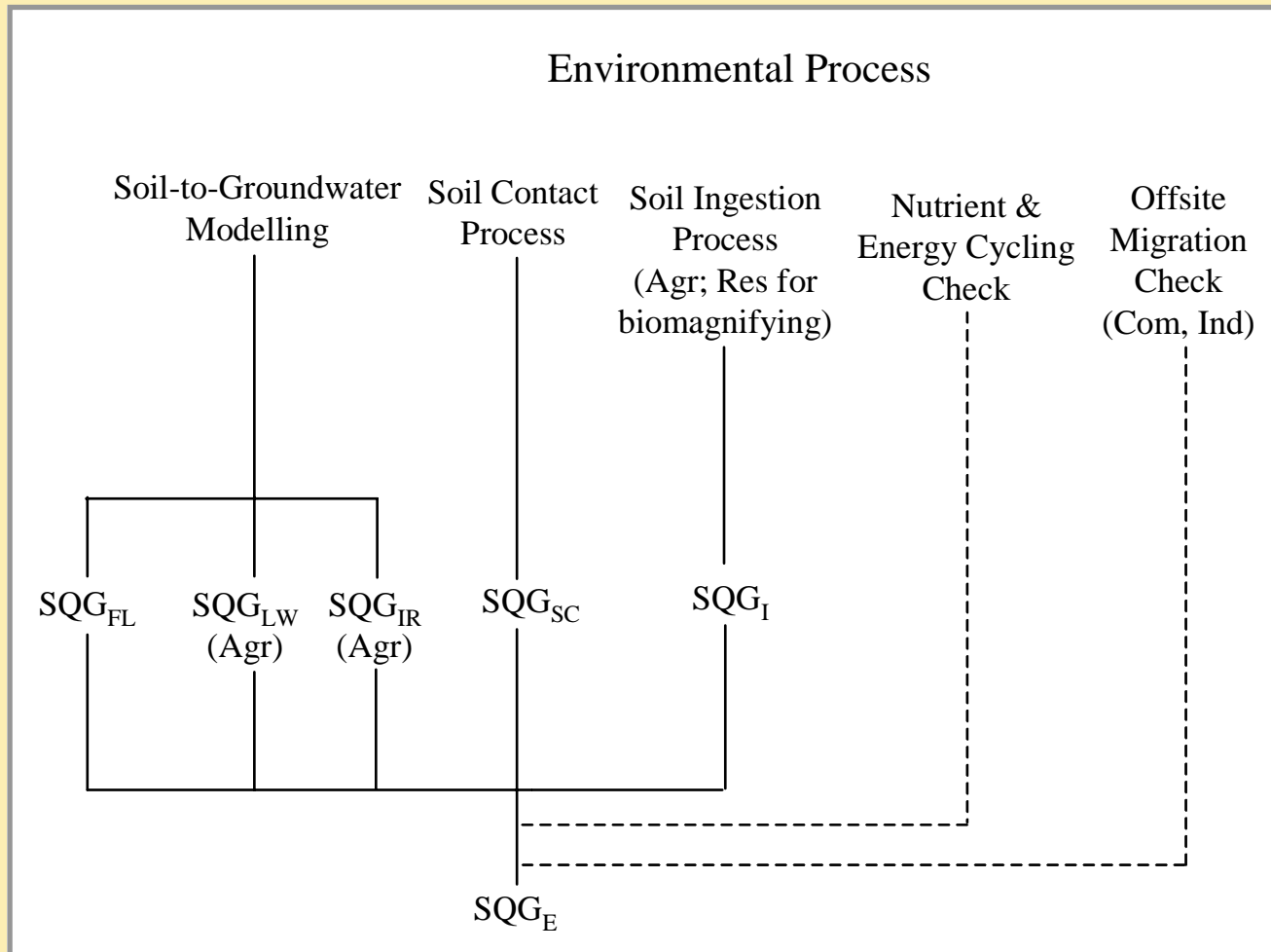
Preserve range of land use options

Risk Assessment

A characterization of the likelihood that a substance will produce harm to human health or ecosystems under specific conditions



Site Specific Risk Assessment -Policy



Site Specific Risk Assessment -Policy

**Soil Quality,
Environmental Processes**

**Soil Quality,
Human Health Processes**

SQG_F

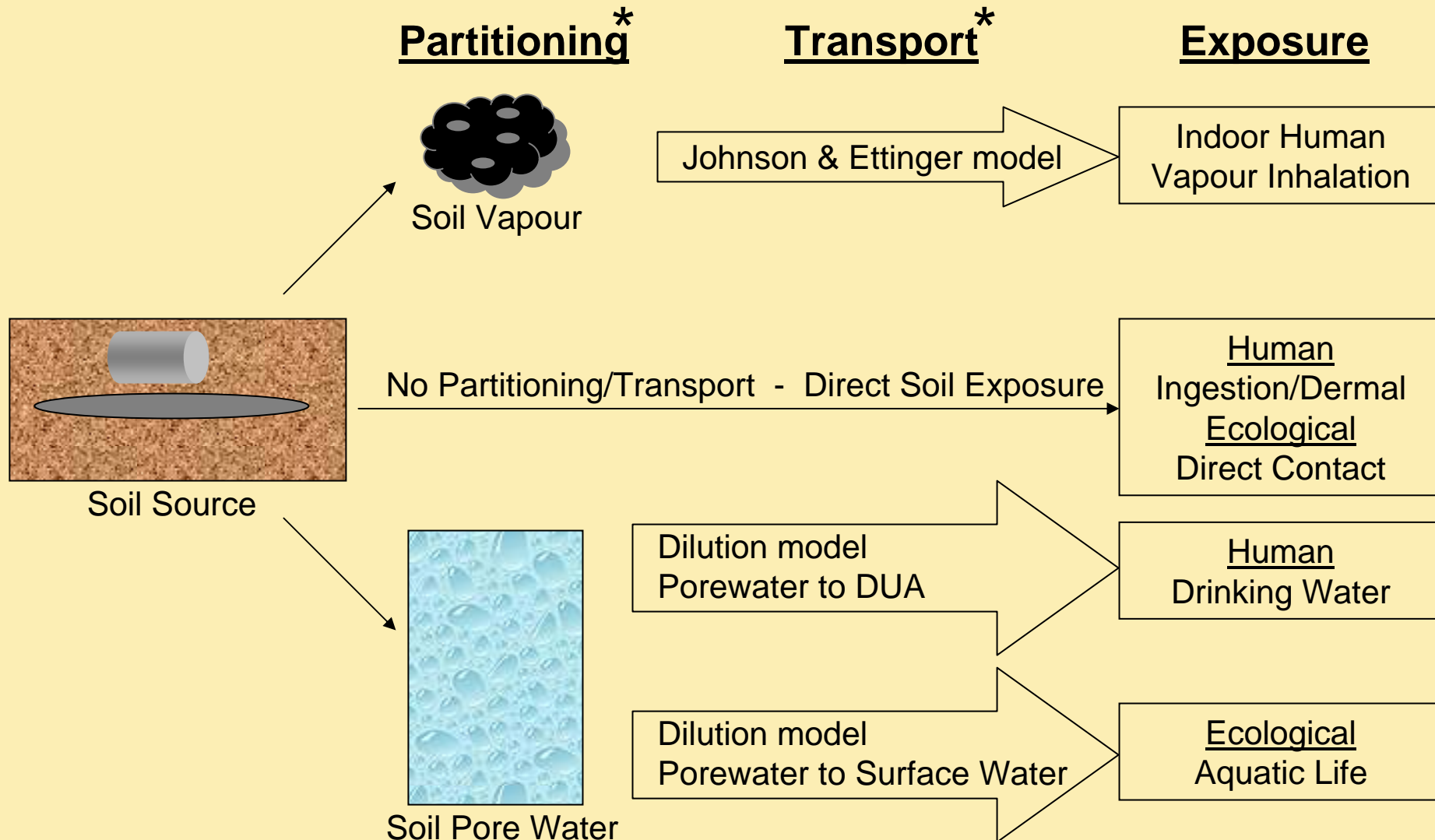
Other Considerations

**Management & Non-Toxicity
Considerations**

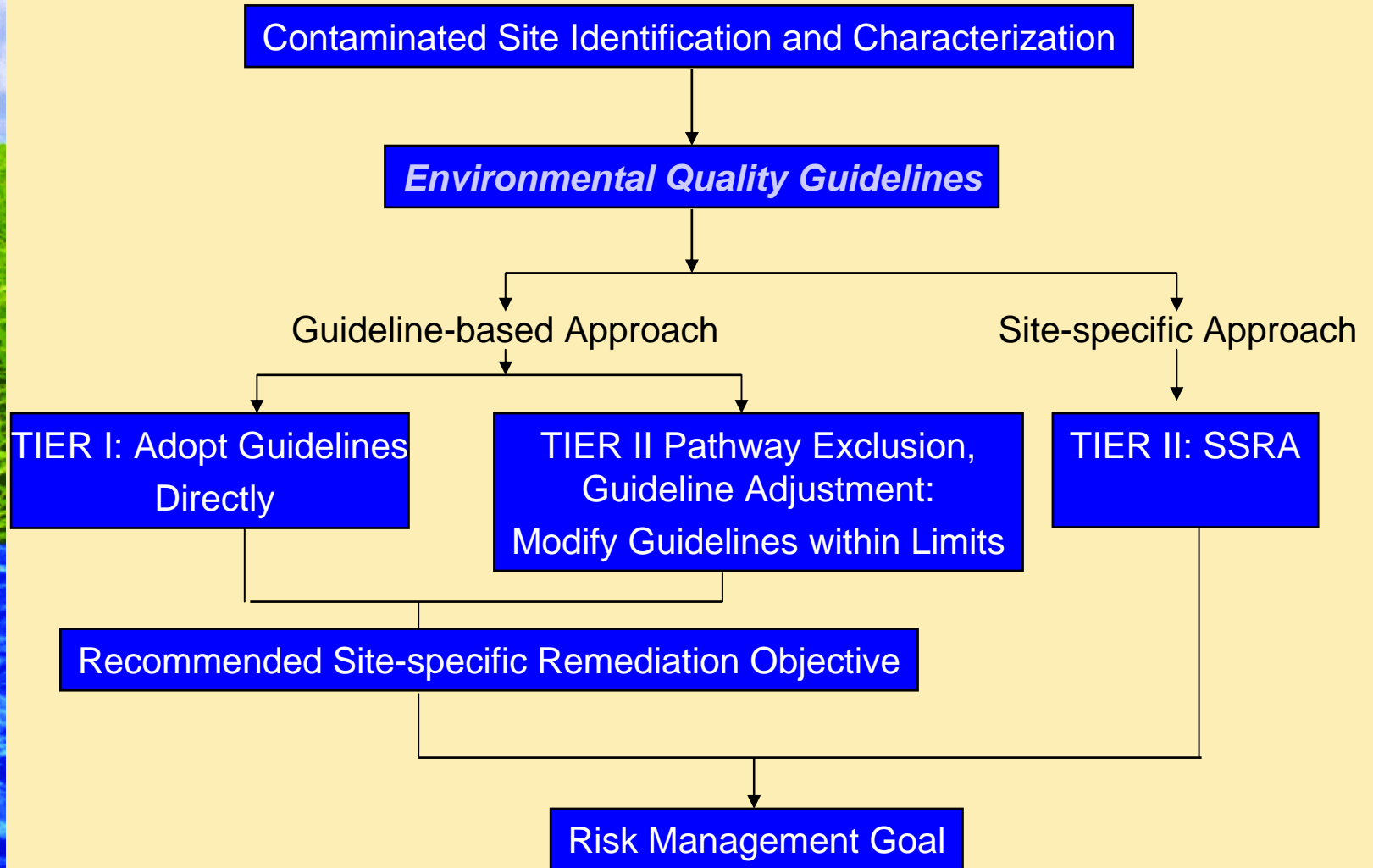
Check against:

- plant nutrient requirements
- background concentrations

Exposure - Contaminant Fate & Behavior



Framework for Contaminated Site Assessment and Remediation

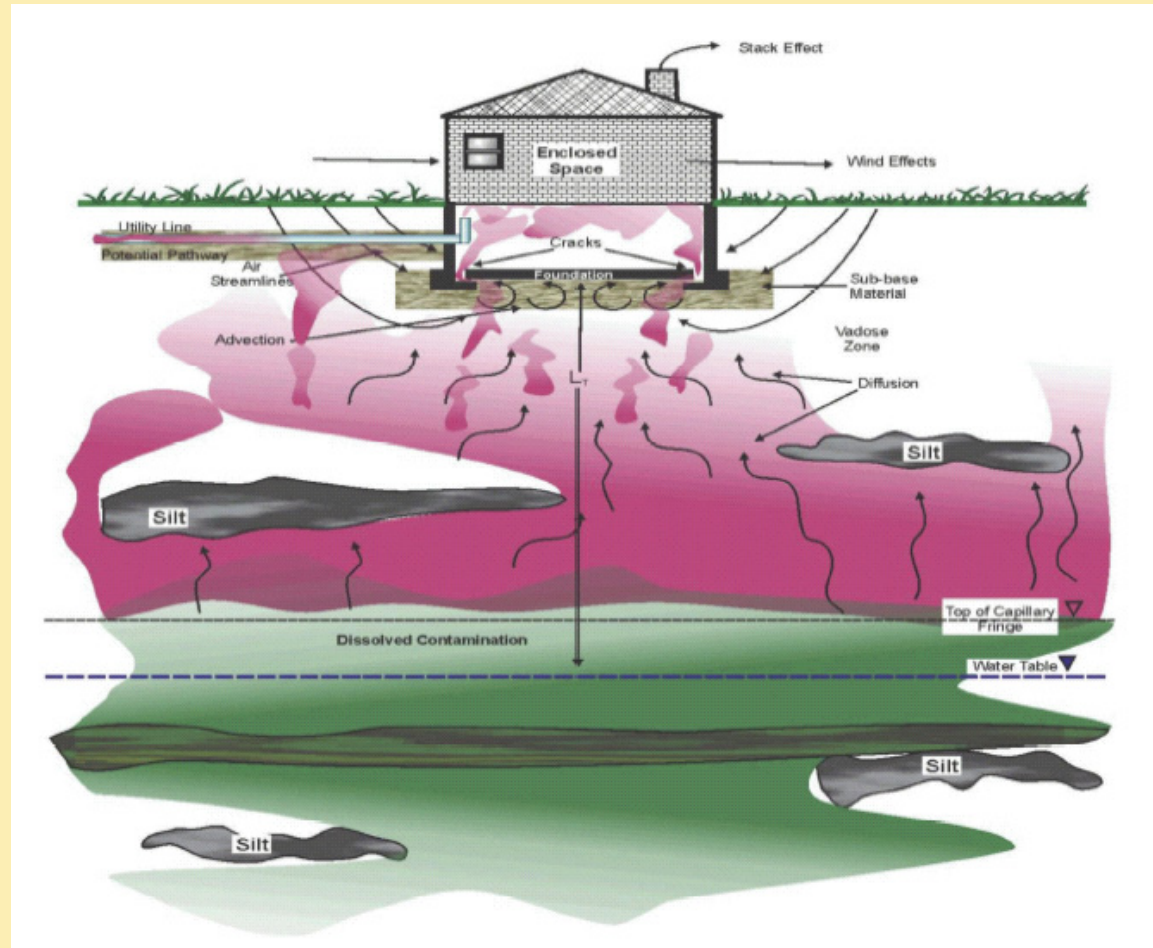





Major Features of the Vapour Guidance.

- Conceptual Site Model
- Calculation of the acceptable soil vapour concentration
- Sampling Protocol
 - Sampling Strategy
 - Probe Construction and Installation
 - Soil Gas Analysis
- Data Interpretation and Analysis

Conceptual Site Model



Example of a Conceptual Site Model for Vapour Intrusion into a Residential Building (adapted from US EPA, 2002)



CSM Risk Evaluation, Main Features

- Source and distribution of Contamination
- Receptor Risks
- Description of Fate and Transport



CSM Data Evaluation, Main Features

- Delineation: chemical distribution and presence in different media of concern
- Location and distribution of all contaminants of concern
- Geological Information
- Hydrogeological information (where relevant based on contaminant distribution)
- Utility corridors that may influence contaminant migration
- Others as may be relevant to site specific circumstances.

Calculation of the Site Specific Dilution Factor

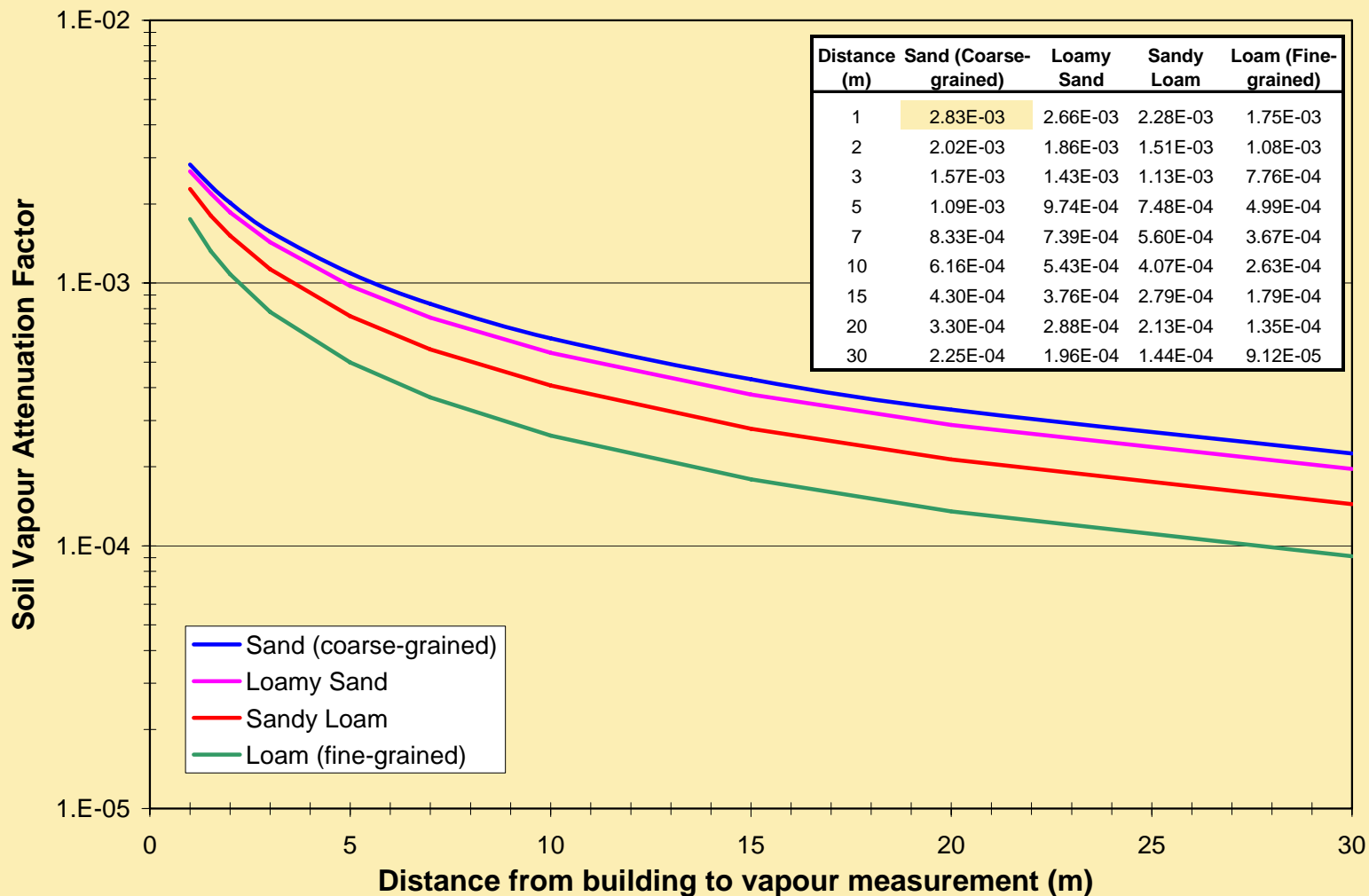
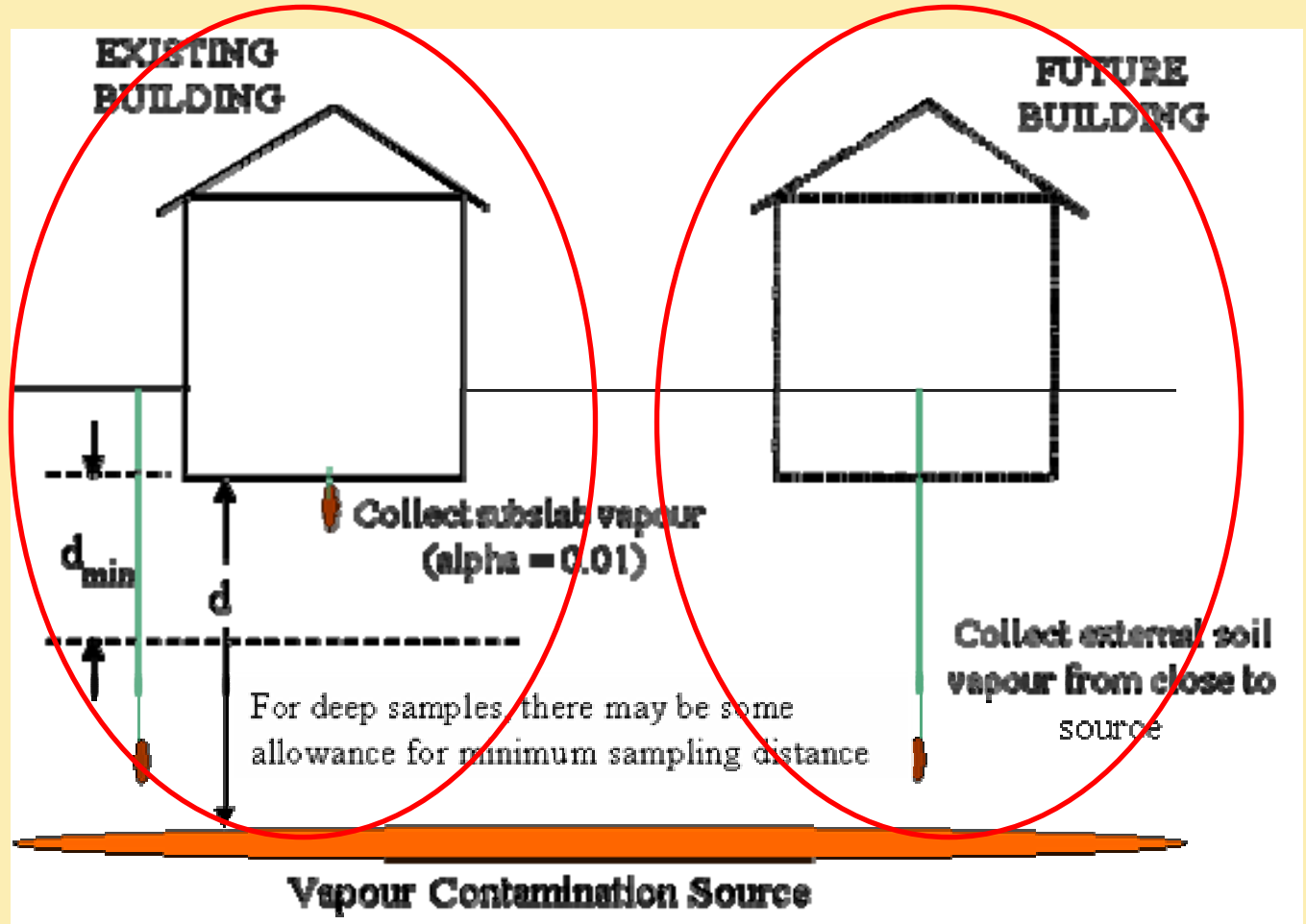
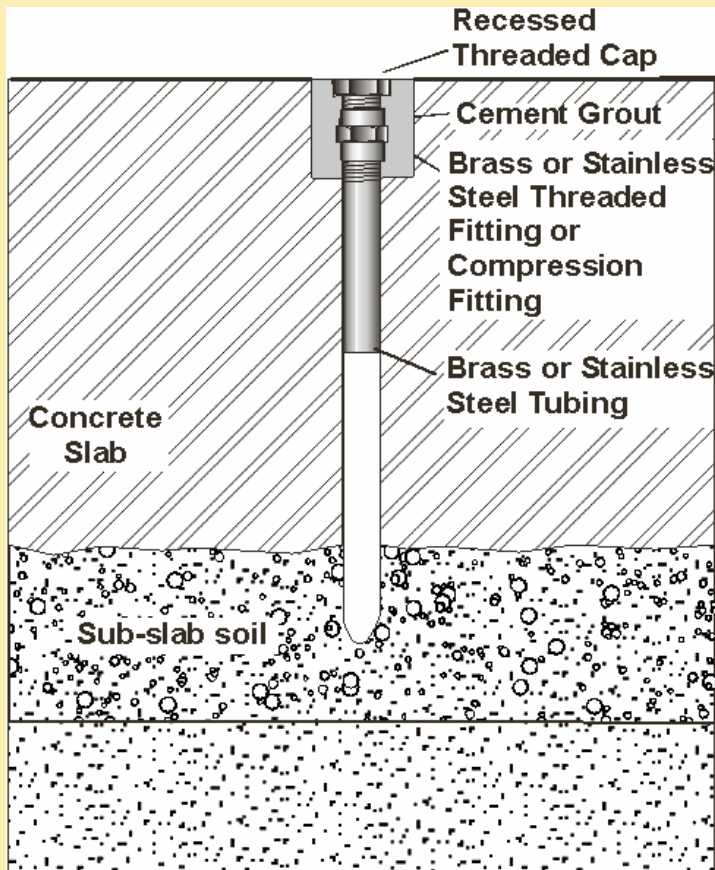


Figure 5. Residential Soil Vapour to Indoor Air Attenuation Factors

Sampling Strategy



Probe Construction and Installation



- Sampling QA/QC
- Well Equilibration
- Leak/Short circuiting detection.
- Well Purging
- Flow and Performance Checks
- Sampling, sample collection and Storage Requirements.



Soil Gas Analysis

- Final site assessment will require analysis at fixed laboratory facilities
- Field screening methods cannot be used for final site assessment although they may provide screening information during preliminary and remedial stages.
- Sampling protocols will need to correspond with sample preservation needs required for fixed laboratory analysis. Some sampling methods do not provide adequate sample preservation.
- Protocols will be defined against detection limit requirements.



Data Interpretation and Analysis

- Outline of data reporting requirements
- Data quality analysis: Final QA/QC check
- Data consistency: are results consistent through different lines of evidence/predictions/CSM.



Timelines

- Completion of Draft Vapour Guidance (2007)
- Completion of Public Review (Winter, 2008)
- Completion of Final Draft (Spring 2008)

Thank you