

Site Remediation Strategies Under Bill 26

by

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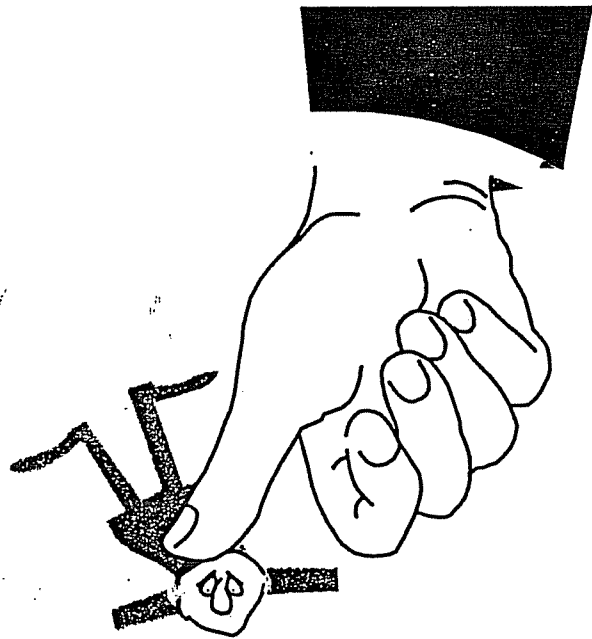
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Presentation to:
B.C. Expropriation Association
Vancouver, October 24, 1997



April 1, 1997 Bill 26

- prior drafts for several years
- does not really change tech. approach
- still several protocols to be issued
- still requires a lot of professional judgment



The Benefits of the New CSR

- Considers site specific conditions > cost effective
- improved framework and approach to remediation
- greater flexibility > reduces uncertainty
- earlier drafts widely distributed > transition should be easy

Key Messages

- established procedures exist for remediation work
- processes now more formalized - needs to be managed
- team of professionals work best
- remediation strategy development can avoid delays and \$\$



Contaminants and Media

- Some typical contaminants: BETX (gasoline), LEPH (diesel), HEPH (oil), metals, solvents, PAH (creosote)
- Media - Groundwater, Surface Water, Soil, Soil Vapour
- Warning Flags - fuelling areas, drum storage, old building, chemical use, etc.

Uncertainties Involved

» Prior to Commencing Study:

- unknown historical site activities; contaminants of concern; locations of contaminants

» After Stage 1/2 PSI

- limited analysis; discrete samples ; large distance between sampling sites; geological changes; human activities; time



Is The Site “Contaminated”?

- Comparison with numerical soil and water standards - generic, matrix, or site-specific
- Statistically valid investigation results required
- Proponent selects standard, based on site conditions
- Risk-based standards are not used for definition of Contaminated

Types of Standards

- Special Waste
- Numerical Standards -
Acceptable levels of
substances in soil and water
- Risk Based Standards -
Acceptable risk levels from
exposure to substances at
sites

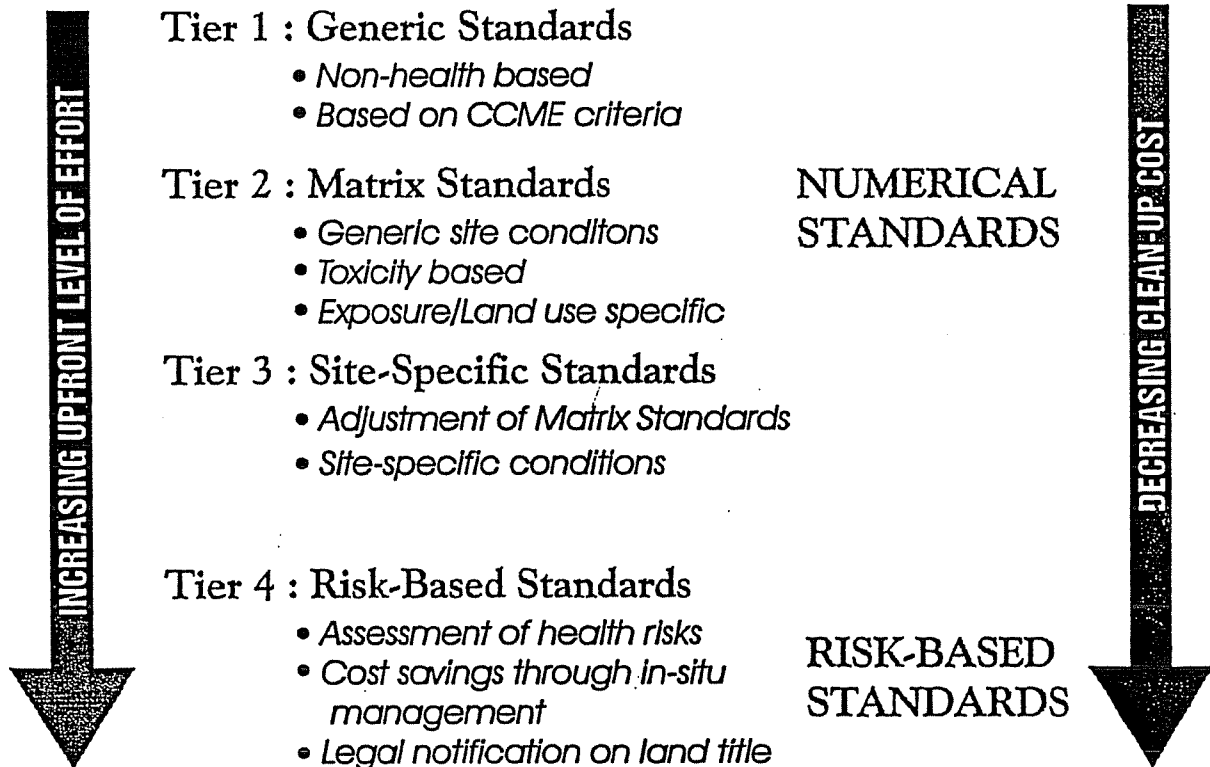
Numerical-Based Standards

- Soil and Water - land use
- typically removal or treatment
- most less stringent than '95
- more flexible than previous
 - matrix/site specific
 - >3m depth to Commercial
 - partial site cleanup

Risk-Based Standards

- risk-based standards
- in place management
- health officer option (public consultation)
- now 1:100,000 ICR
- Considerations :
 - Site Registry;
 - covenant; indemnification
 - conditional CofC;
 - O&M \$

Tiered Approach to Soil Remediation Standards



Remediation Planning Strategies

- select a team > develop strategy- technical+legal+others
- integrate site needs with remediation requirements
- follow risk analysis principles
- management of process as important as technical
- communicate with BCE

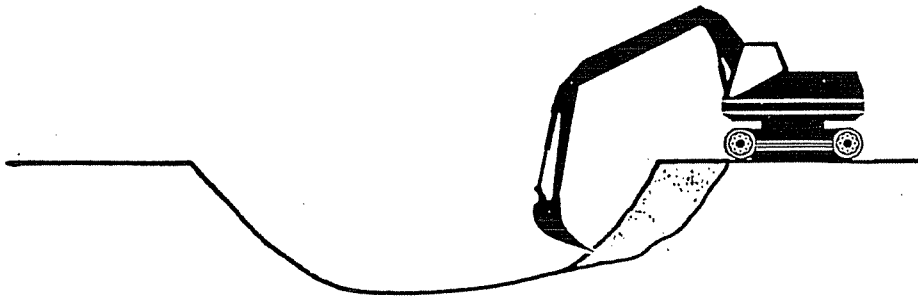
Remediation Approaches

Excavation / Treatment

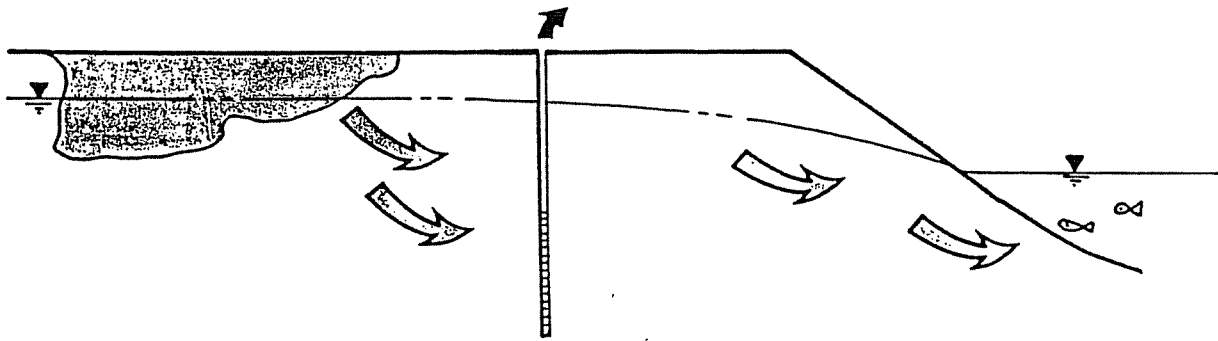
- generic numerical standards
- matrix numerical standards
- site specific factors

In Place Management

- risk based standards
 - 1:100,000 ICR
 - local medical health officer
 - Ministry has option
- combination of numerical + risk based approach

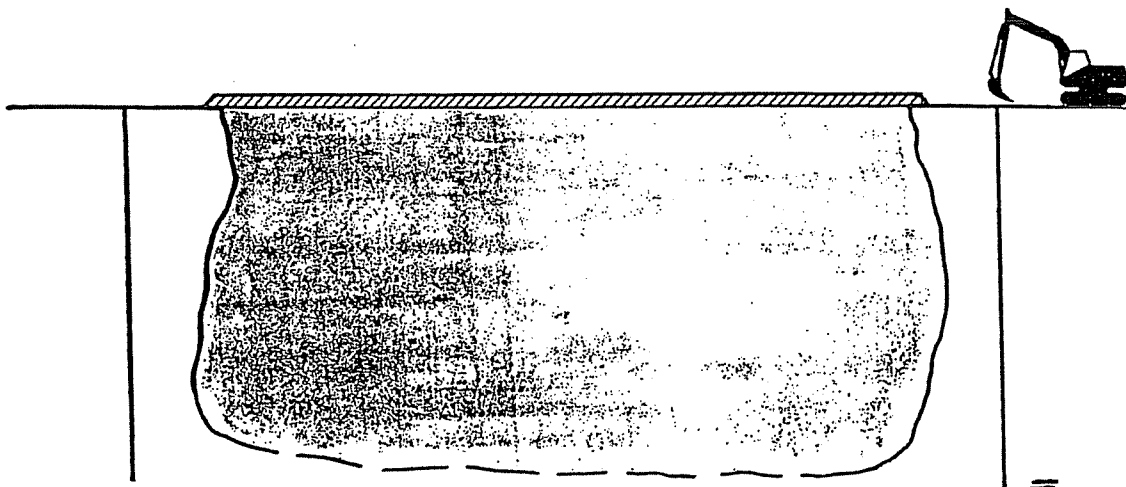


Tier 1 – Generic Standards



Tiers 2 & 3 – Matrix/Site Specific Standards

(Determined by directors/local background con.)



Tier 4 – Risk-based Standards

RISK COMPONENTS

CONTAMINANT

- *type*
- *concentration*
- *distribution*
- *release*



EXPOSURE PATHWAYS

- *media*
- *migration*
- *fate*



RECEPTORS

- *type*
- *sensitivity*
- *land use*

RISK MANAGEMENT OPTIONS



- *removal*
- *treatment*



- *interception*
- *ventilation*
- *containment*



- *relocations*
- *land use restrictions*

Selection of Remediation Options (Section 20.9)

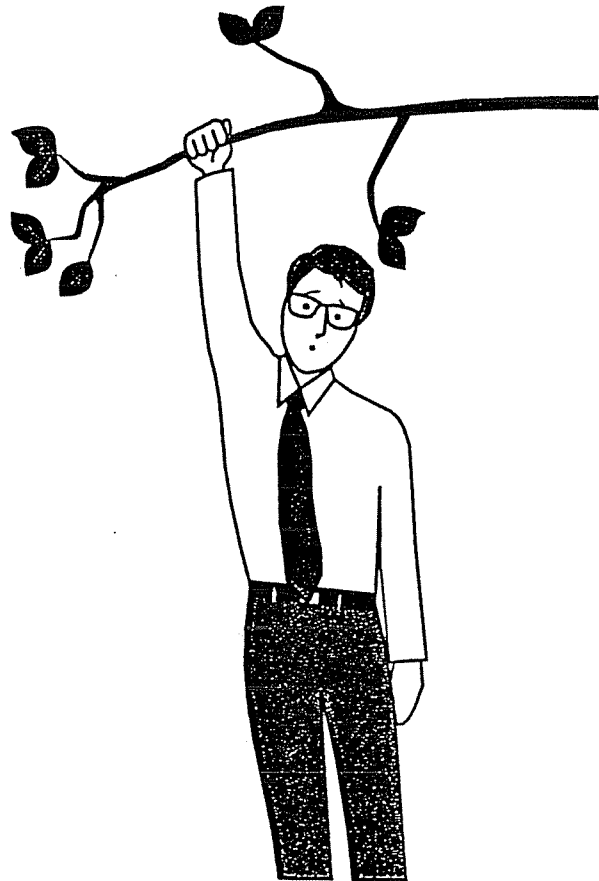
- must evaluate options
- preference for permanent solutions; considers:
 - adverse effects on HH or environment
 - tech. feasibility & risks of each option
 - cost-benefit analysis of options
 - practicality

Administrative Process for Remediation

- consultant's reports (Site Profile>Prelim. Site Invest Stages 1 & 2> Detailed Site Invest.>Remedial Plan)
- reports - include "*professional statements*" (remediation experience)
- Ministry review fees (or expert review consultants) - timing issues
- Orders v. Independent v. Voluntary Remediation Agreements
- Public Consultation
- Grandfathering provisions

Ministry Approvals

- AIP for a Plan
- Certificate of Compliance (numerical)
- Conditional C of C (often risk based)
- part of site
- covenant on title, security bond, registry.



Soil Relocation & Disposal

- required if soil is from a “contaminated site” (>Res. standards)
- Contaminated Soil Relocation Agreement (Ministry-owner of receiving site -responsible person of contam. site)
- exemptions (< 5m³; outside BC;authorized landfill)
- municipal bylaws (require approval of Ministry of Mun. Affairs and Envir.Lands/Parks)

Costs of Typical Studies

Typical generic studies (varies with project and site):

- Site Profiles < \$1k ?
- PSI Stage 1 \$2 - \$5k
- PSI Stage 2 \$5 - \$10k
- Detailed S I \$20 - \$100+ k
- Remedial Plans \$25 - \$200+ k
- Implementation \$25 - \$1500/tonne



Closing Comments

- “new” CSR Bill 26 does not appreciably change current consulting practice
- processes now more formalized
- ministry has limited staff - time
- early planning can avoid considerable delays and \$\$