

Experiences on Risk-based Assessment of Soil Contamination and Remediation Needs

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Content of the presentation

- **Introduction**
- **New decree and guidelines on risk assessment**
- **One year of experience**

INTRODUCTION

Environmental Protection Act (EPA)

- **Soil pollution prohibition (7 §)**
- **Groundwater pollution prohibition (8 §)**
- **Duty to treat polluted soil and groundwater (75 §)**
 - 1st: polluter
 - 2nd: property owner
 - 3rd: municipality (or state)
- **Environmental permit required for remediation (78 §)**

The need for legal risk assessment framework

- **Soil pollution prohibition (EPA 7 §) -> definition of contamination**
 - *“...may endanger or harm health or the environment, substantially impair the amenity of the site or cause comparable violation of the public or private good”*
 - **Contamination is related to the potential harmful effects/risks, but the definition is yet very non-specific (interpretation difficult)**
- **In the absence of accurate regulations, decision-making was mainly based on guideline values (concentrations) issued in 1994**
 - The values were unofficial and meant to be advisory only
 - **Risk basis of the values was not properly reported**
- **Development of sound RBLM practices was hindered**
 - The lack of generic requirements for site-specific risk assessments -> inconsistent quality -> mistrust from the authorities
 - **Over-conservative decisions and unnecessary remedial actions**

NEW DECREE AND GUIDELINES ON RISK ASSESSMENT

Government Decree 214/2007 on the Assessment of Soil Contamination and Remediation Needs

1.6.2007 ->

- **Gives legal basis for the assessment of contaminated sites**

General objectives:

- **To improve the quality of the assessment of soil contamination and the need for remediation**
- **To promote the implementation of remedial actions that are both cost-effective and fit for purpose**

- **Are the objectives being attained?**
- **What are the factors affecting this?**
- **What are the things that should still be improved?**

Content of the Decree

- ***“Assessment shall be based on an estimate of the hazard and harm that the substances in soil may cause to human health or the environment”******
 - > **site specific (risk) assessment (EPA 7§)**
- **The elements that have to be taken into account in the assessment:**
 - e.g. concentrations, total amounts and properties of substances, soil and groundwater conditions, other factors affecting the migration of substances, current and approved use of land, elements of uncertainty
- **Threshold values used as triggers for the assessment**
 - Describing negligible risks
 - Baseline concentrations used as triggers when higher than the TVs
- **Soil guideline values; soil is regarded as contaminated when the GVs are exceeded unless otherwise indicated in the assessment**
 - Describing significant (maximum acceptable) risks
 - Upper guideline value for insensitive sites (e.g. industrial)
 - Lower guideline value for the other sites (e.g. residential)
 - Only indicative, giving priority to actual site-specific assessment

Guidelines on the Assessment of Soil Contamination and Remediation Needs

- Clarifies the general principles of the Decree
- Procedure for the assessment presented^{***}
 - Identification of the need for assessment
 - **Basic assessment:** following the Decree -> qualitative assessment and the use of guideline values
 - **Detailed assessment:** when GVs are exceeded or can't be used -> quantitative assessment
- Background information, examples of assessment methods, guidance for the documentation
- Application not legally binding, only recommended

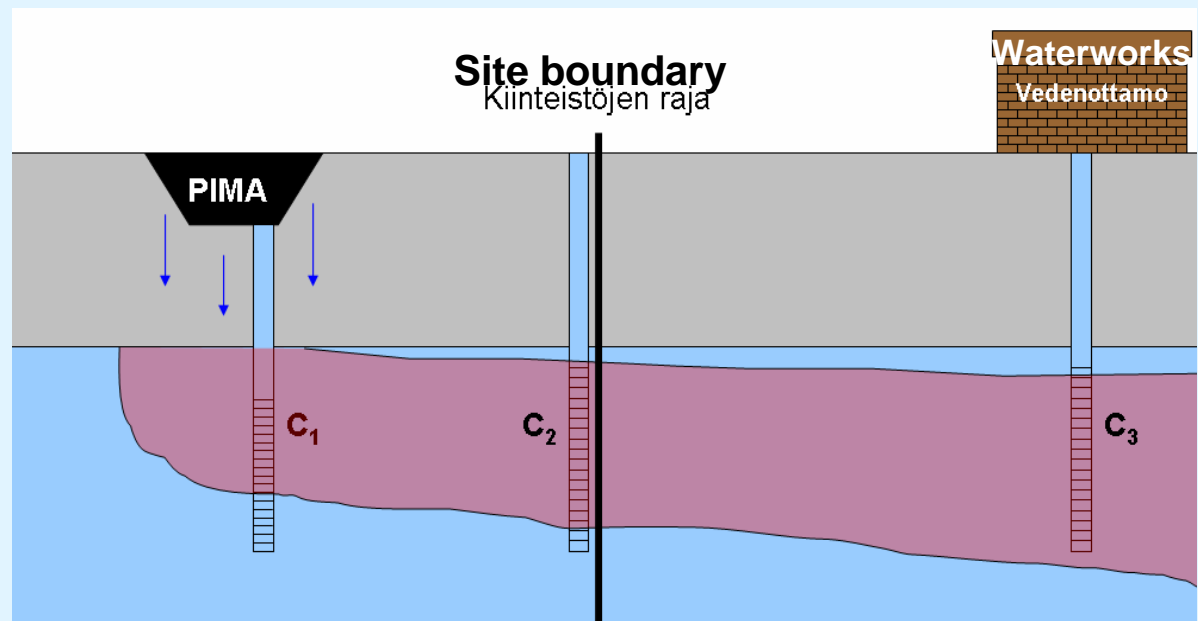
ONE YEAR OF EXPERIENCE

The state of risk assessment and remediation

- **The quality of the assessments has improved, but still varies a lot**
- **Most of the decisions based on guideline values**
- **Remediation mainly based on excavation and soil replacement**

Assessment issues 1/2

- **Setting the assessment objectives**
 - Ecological risks and risks due to contaminant migration?
 - Effects on the amenity and on private or public good (EPA 7§)
 - Regulations related to other environmental media than soil
 - RA used mainly for the setting of site-specific targets (concentrations), not for the management of risks



Assessment issues 2/2

■ **Methods**

- No obligatory methods (e.g. national models) presented
- No well-established methods for assessing ecological risks or risks caused by inorganics

■ **Documentation**

- The required elements of the Decree often just "listed", not really used in the identification and assessment of risks
- In quantitative assessments only the final results are often presented without proper description of the calculations and explanation of the results

■ **Uncertainty and acceptability of risks**

- Risk estimates (incl. guideline values) often used and interpreted too straightforwardly
- Lack of discussion and decisions on political level related to acceptability of risks

Remediation issues 1/2

- **Mainly small sites in Finland -> easy to excavate**
- **Remediation often related to construction works**
 - Some excavation is done in any case
 - Urgent timetables favor the use of fixed guideline values
- **Liabilities and risks - getting rid of the problem at once**
 - Considering time, confidence and safety, excavation is often the most reliable choice
 - By law the polluter's liability won't run out in time, which may cause doubts to risk-based solutions and some novel methods
- **Disposal/utilization of contaminated soil on landfills has been rather cheap and not really restricted**
 - No taxes, material need for daily covers and landfill closing
- **These issues will always favor excavation compared to e.g. *in situ*?**

Remediation issues 2/2

- Risk management by other actions than excavation seems to be increasing
- Site-specific target levels used more frequently
- Unnecessary remediation avoided on industrial sites
- Remediation to threshold values increased especially in the case of property transactions
 - Avoiding potential future liabilities
- The result of risk assessment only one factor affecting the decision of remediation
 - Liability issues, political, psychological, economical and many other reasons

Conclusions

- **Improvements can be seen, but there's still work to be done**
 - **Constant education is required**
 - **Decisions on the setting of environmental objectives is needed**
 - **Proper documentation of risk assessments is needed to help decision-making -> instructions**
 - **Harmonization of certain methodologies?**
- **You can only learn by doing**
- **Quality has to be required in every step of the process**
- **Legal framework for risk assessment provides a starting point for overall quality assurance**

Thank You!

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