National Contaminates Sites Inventory in the Czech Republic

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REMTECH EUROPE
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REGULATORY FRAMEWORK session 1

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www.remtechexpo.com
Five Ws+H of a story

Who / What / When / Where / Why ( + How )

• What: contaminated sites inventory in Czechia
• Why: threats for human health and environment
• When: asap
• How: to identify and register CS via inventory
• Where: nationwide
• Who: government
WHAT: Contaminated Sites Inventory

History of development of contaminated sites databases in Czechia

- 1998 – 2004 United data platform – the first integrated database
- 2005 – Contaminated Sites Database System – SEKM (1)
- 2009 – SEKM 2
- 2019 – SEKM 3
Typical „old ecological burden“
Lagoons of acid tars/gudrons from waste oil refinery – city of Ostrava
WHO: government
Responsible bodies

- Ministry of Finance (MF) – from 2006
- „Ecological agreements“ between MF and the company
- Investigation, risk analysis, project, corrective measures, supervision

- Ministry of Environment (MoE) = Expert body: (Department of Environmental Hazards and Ecological Damages - DEHED)
WHY: threats for human health and environment

Reasons for action

• Need of information on old environmental burdens with impacts on the human health and on the environment (soil, subsoil, surface and underground water)

• Background documentation for privatization projects and for support of the state garanties for remediation of the old environmetal burdens occured before privatization
WHY: threats for human health and environment
European and national impetuses / driving forces

• Thematic strategy for soil protection
• INSPIRE Directive 2007/2/EC establishing an Infrastructure for Spatial Information in the European Community
WHY: threats for human health and environment

European and national impetuses / driving forces

• Directive 2006/118/EC on the protection of groundwater against pollution and deterioration.
• Directive 2000/60/EC establishing a framework for Community action in the field of water policy
• Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage
The Thematic Strategy for Soil Protection

COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 22.9.2006
COM(2006)231 final


Thematic Strategy for Soil Protection

[SEC(2006)620]
[SEC(2006)1165]
4.1.2. Contamination

With respect to management of contamination, an approach based on the following approach is envisaged:

- Common **DEFINITION** in Directive
- Common **LIST OF POTENTIALLY POLLUTING ACTIVITIES** in Directive

Member States establish an **INVENTORY** of contaminated sites

- **Soil Status Report**
- **MECHANISM FOR « ORPHAN SITES »**

Member States adopt a **NATIONAL REMEDIATION STRATEGY**

**REPORT to Commission**

• Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for the protection of soil

Withdrawn in 2014
Protection of Soil Directive

Article 10 Identification and inventory of contaminated sites

• within two years make public a national list of relevant activities which have a significant potential to cause soil contamination;

• within seven years to identify the location where the potentially soil-contaminating activities are taking place or have taken place in the past

• The results - for land use planning and development, to be compiled in a register of sites
Protection of Soil Directive - activities

**ANNEX II**
List of potentially soil polluting activities

1. Establishments where dangerous substances are or were present in quantities equal to or in excess of the amounts indicated in Parts 1 and 2, column 2 of Annex I to Council Directive 96/82/EC (Seveso)\(^\text{16}\).


3. Airports.

4. Ports.

5. Former military sites.

6. Petrol and filling stations.

7. Dry cleaners.


10. Waste water treatment installations.

11. Pipelines for the transport of dangerous substances.
HOW – the case of Czechia

• Since 2005 the key data source is provided through the MoE’s Contaminated Sites Database System (SEKM) - www.sekm.cz

• Priority evaluation and risk profile of each contaminated site are included.
MoE´s methodological support

- Methodological **Guidances** (7 documents)
- Methodological **Handbooks** (6 documents)
- other **Guidelines and Guidances** (3 documents).
- Methodological **Guidance** of the Ministry of Environment for the filling in the SEKM database incl. a priority evaluation (2011).
- **Guidance** for Categorization of Priorities of Contaminated Sites (2008)
Modernizing the database for enabling the inventory

2005 – 2008
• Two research projects (united methodology for prioritization, sw for database development and piloting inventory based od abroad experience)

2008 – 2010
• Two partial inventory projects (POPs, Environmental damages in former Soviet Army military areas)
Modernizing the database for enabling the inventory

• Studied databases and inventory from Australia, Belgium, Denmark, France, Canada, Ireland, Italy, Hungary, Germany, the Netherlands, Poland, Austria, Greece, Slovakia, United Kingdom, Spain, Sweden, Switzerland and USA.

• Experience taken into account from TWG Thematic Strategy for Soil Protection (EEA a JRS); EEA - EIONET; programmes CARACAS, CLARINET, EURODEMO; NICOLE, MINEO; U. S. EPA Clu-in, U. S. EPA ETV Program, NATO/CCMS.
Modernizing the database for enabling the inventory

- In 2008 MoE decided to upgrade the database and to perform an inventory based on a surface survey, with the aim to obtain the fullest possible overview of contaminated sites throughout the state’s territory.

- Based on the call from the Czech Operational Programme Environment (EU Cohesion Fund), a project proposal of the National Contaminated Sites Inventory (NIKM) was prepared by CENIA.
NIKM 1st phase

- NIKM project 1st phase was run in the period 2009 - 2013 by CENIA and several suppliers selected from an open public tender process.

- The project was focused on methods of contaminated and potentially contaminated sites inventory and on a categorization of priorities. Four-year project provided tools and methodological background for the proper inventory (NIKM 2nd phase 2018-2021)
The project was co-financed from EU funds namely from the Cohesion Fund under the Operational Program Environment (area of support 4.2 - Remediation of historical environmental burdens) [www.opzp.cz](http://www.opzp.cz).

1st phase had a total budget approx. 4 million EUR. EU contribution (Cohesion Fund) is approx. 3,4 million EUR.
Test areas
NIKM 2\textsuperscript{nd} phase

• Project NIKM – 2\textsuperscript{nd} stage (National Inventory of Contaminated Sites) is co-financed from European Union Funds - the Cohesion Fund - in the frame of the Operational Programme of the Environment 2014-2020, the area of intervention 4.2. - The Rehabilitation of Old Environmental Burdens“.

• The 2\textsuperscript{nd} phase of the NIKM project is focused on the inventory and evaluation of information on contaminated sites throughout the whole territory of the Czech Republic.
NIKM 2\textsuperscript{nd} phase

- The \textbf{target value} for the year 2023 is \textbf{9 053} registered contaminated sites incl. their priority ranking.

- NIKM 2\textsuperscript{st} phase had a total budget approx. 4,6 millions EUR

EU contribution (Cohesion Fund) is approx. 3,9 millions EUR
Principles of contaminated sites inventory

❖ Phase by phase methodological approach
❖ The mapping process is divided into several phases:

(1) The initial stage,
(2) Information campaign,
(3) Primary data analysis,
(4) Data collection,
(5) Priority evaluation and
(6) Outcome documents elaboration.
Territorial Inventory
(2018 - 2021)

Initial Phase & Information Campaign

Primary Data Analysis

Data collection

Offices & Other Bodies Visits

Collection and Excerption of Information and Data from External Sources & Thematic Maps Analysis

Contaminated Sites Inventory

Priority Evaluation / Site Classification & Outcome Documents Elaboration

Inventory Conclusion

Internal Control of Outcomes

Validation and Verification of Data stored in the Central Data Warehouse

Registered Sites incl. Map Presentation on SEKM Portal

Evaluation Reports for the Regions and for the Czech Republic, incl. Map Presentation
NIKM 2nd phase

• In parallel with NIKM 2 project, an upgrade of the Contaminated Sites Database System (SEKM 2) to the SEKM 3 database is running,

• to be in full function by December 2019.
Historical orthophotomap (output of NIKM 1)

“Contaminated sites” www.kontaminace.cenia.cz
SEKM 1 – November 2013

4775 registered sites
NIKM I – contribution to the sites priority evaluation
SEKM 2 – November 2018

4965 registered sites

<table>
<thead>
<tr>
<th>Statistiky</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Obecná statistika databáze SEKM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Obecné informace k databázi</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Celkový počet evidovaných lokalit:</td>
<td>4965</td>
<td></td>
</tr>
<tr>
<td>Celkový počet evidovaných látek:</td>
<td>309</td>
<td></td>
</tr>
<tr>
<td>Celkový počet evidovaných vzorků:</td>
<td>1148476</td>
<td></td>
</tr>
<tr>
<td>Celkový počet lokalit kde stav není uveden:</td>
<td>2338</td>
<td></td>
</tr>
<tr>
<td>Celkový počet lokalit kde stav je ke schválení:</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Celkový počet lokalit kde stav je schváleno:</td>
<td>2558</td>
<td></td>
</tr>
<tr>
<td>Celkový počet lokalit kde stav je nepřijato:</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

| **Informace k organizacím** |                |                |
| Celkový počet editujících organizací registrovaných v databázi SEKM: | 268 |                |
| Počet editorujících organizací s přidělenou licencí: | 94 |                |
| Počet editorujících organizací bez licence: | 174 |                |
SEKM 2 – November 2018

4965 registered sites
SEKM - March 2019

13 233 records
SEKM 2 - March 2019

13 233 records incl. 8 031 sites from territorial analytical data
NIKM 2\textsuperscript{nd} phase

- In the initial step (January 2018 to April 2019) of NIKM 2 we collected clues of contaminated sites using Remote Sensing methods.
- This task was provided by CENIA.
- The supplier's mapping teams for the field inventory have obtained, among other data sources, a data layer containing information about the location and the type of clue of the contaminated site.
# Schedule and State of Project Works

## Project Work

<table>
<thead>
<tr>
<th>Cisnosti / měsíce</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>II</td>
</tr>
</tbody>
</table>

### Management Project

1.000

1.100 - Managerial arrangement of the project, including, among other things, the definition of the company's name, its management, and the organization's structure. The first phase of the project is the implementation and visualization of the entire project, including the visualization of the entire project in the form of visualizations, drawings, and calculations.

1.200 - Methodology control. Detailed preparation, implementation, and visualization of the project, including the visualization of the project in the form of visualizations, drawings, and calculations.

1.300 - Financial management and control. Detailed preparation, implementation, and visualization of the project, including the visualization of the project in the form of visualizations, drawings, and calculations.

1.400 - Preparation of documentation for the VZ on the basis of the project, organization, and structure of the project.

1.500 - Organization and implementation of the project, including the visualization of the project, organization, and structure of the project.

2.000

2.100 - Identification of potentially contaminated buildings and the implementation of the project.

2.200 - Identification and interpretation of significant objects to be included in the project, including the visualization of the project, organization, and structure of the project.

2.300 - Geographical identification of the project, including the visualization of the project, organization, and structure of the project.

2.400 - Preparation for the preparation of the project, including the visualization of the project, organization, and structure of the project.

2.500 - Preparation for the project, including the visualization of the project, organization, and structure of the project.

3.000

3.100 - Preparing the project, including the visualization of the project, organization, and structure of the project.

3.200 - Preparing the project, including the visualization of the project, organization, and structure of the project.

4.000

4.100 - Preparing the project, including the visualization of the project, organization, and structure of the project.

4.200 - Preparing the project, including the visualization of the project, organization, and structure of the project.

5.000

5.100 - Preparing the project, including the visualization of the project, organization, and structure of the project.

5.200 - Preparing the project, including the visualization of the project, organization, and structure of the project.

5.300 - Preparing the project, including the visualization of the project, organization, and structure of the project.

5.400 - Preparing the project, including the visualization of the project, organization, and structure of the project.

5.500 - Preparing the project, including the visualization of the project, organization, and structure of the project.
Remote sensing

• Inventory methodology includes analysis of raster data (aerial photomaps and satellite images).
• Used QGIS software.
• As a mapping unit chosen regional districts - ORP (Municipality with extended competence = "small districts“, there are 206 in Czechia).
• Their areas are very different in size (the smallest is 45 km², while the largest is 1242 km²)
1. TYPOLOGY AND KNOWLEDGE BASES OF OBJECTS OF INTEREST

- 11 clue types already defined in NIKM I project
- February 2018 – completed to 14 types
- The knowledge base - the methodical aid - the interpretative key (manual)

<table>
<thead>
<tr>
<th>Code</th>
<th>Contamination type</th>
<th>Code</th>
<th>Contamination type</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>industrial park with an impact on the environment</td>
<td>p</td>
<td>suspicion of illegal dump site</td>
</tr>
<tr>
<td>b</td>
<td>industrial brownfield</td>
<td>s</td>
<td>a new clue linked to the site already included in SEKM database</td>
</tr>
<tr>
<td>c</td>
<td>illegal dump / landfill</td>
<td>v</td>
<td>scrapyard</td>
</tr>
<tr>
<td>h</td>
<td>dunghill</td>
<td>z</td>
<td>abandoned agriculture object/farm / agricultural brownfield</td>
</tr>
<tr>
<td>j</td>
<td>silage pit</td>
<td>n</td>
<td>unrecognized, other type of clue</td>
</tr>
<tr>
<td>l</td>
<td>abandoned quarry</td>
<td>t</td>
<td>waste dumps within the industrial area</td>
</tr>
<tr>
<td>o</td>
<td>abandoned property</td>
<td>r</td>
<td>object identified only in DMR (Hill Shaded Digital Terrain Model)</td>
</tr>
</tbody>
</table>
Remote sensing – primary findings

33 436 findings (14 types)
Remote sensing – after revisions

Density of clues per 100 km²

17 011 clues after revisions (16 425 eliminated)
Group of „industrial“ clues
Group of „agricultural“ clues
Group of „dumping“ clues

Density of clues per 100 km²
Illegal dumping clue (type „p“)

7540 clues
Illegal dumping clue (type „p“)
Illegal dumping clue (type „p“)
Illegal dumping clue (type „p“)
The state of inventory in numbers after 7 districts finished (from 77 districts – 9 %)

<table>
<thead>
<tr>
<th>District</th>
<th>SEKM Data source SEKM</th>
<th>SEKM registered</th>
<th>SEKM excluded</th>
<th>Remote sensing Data source RS</th>
<th>Remote sensing registered</th>
<th>Remote sensing excluded</th>
<th>New sites</th>
<th>Imput total</th>
<th>Registered total In 7 districts</th>
<th>Number of sites - projection after 7 districts done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czechia</td>
<td>13233</td>
<td></td>
<td></td>
<td>17011</td>
<td></td>
<td></td>
<td>79</td>
<td>30323</td>
<td>1073</td>
<td>11433</td>
</tr>
<tr>
<td>Česká Lípa</td>
<td>218</td>
<td>137</td>
<td>81</td>
<td>163</td>
<td>38</td>
<td>125</td>
<td>14</td>
<td>395</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>Český Krumlov</td>
<td>104</td>
<td>56</td>
<td>48</td>
<td>157</td>
<td>8</td>
<td>149</td>
<td>4</td>
<td>265</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Chrudim</td>
<td>231</td>
<td>115</td>
<td>116</td>
<td>425</td>
<td>25</td>
<td>400</td>
<td>9</td>
<td>665</td>
<td>149</td>
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<tr>
<td>Karviná</td>
<td>109</td>
<td>87</td>
<td>22</td>
<td>125</td>
<td>3</td>
<td>122</td>
<td>20</td>
<td>254</td>
<td>110</td>
<td></td>
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<tr>
<td>Rakovník</td>
<td>177</td>
<td>113</td>
<td>64</td>
<td>173</td>
<td>5</td>
<td>168</td>
<td>1</td>
<td>351</td>
<td>119</td>
<td></td>
</tr>
<tr>
<td>České Budějovice</td>
<td>173</td>
<td>87</td>
<td>86</td>
<td>340</td>
<td>5</td>
<td>335</td>
<td>8</td>
<td>521</td>
<td>100</td>
<td></td>
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<tr>
<td>Šumperk</td>
<td>339</td>
<td>281</td>
<td>58</td>
<td>110</td>
<td>34</td>
<td>76</td>
<td>23</td>
<td>472</td>
<td>338</td>
<td></td>
</tr>
<tr>
<td>7 districts total</td>
<td>1351</td>
<td>876</td>
<td>475</td>
<td>1493</td>
<td>118</td>
<td>1375</td>
<td>79</td>
<td>2923</td>
<td>1073</td>
<td>11433</td>
</tr>
</tbody>
</table>
Summary of investments and remediation expenses

Remediation and inventory financed from EU OP Environment

exchange rate 1 EUR = 25,5 CZK

<table>
<thead>
<tr>
<th></th>
<th>2007 - 2013</th>
<th>2014 - 2020</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZK</td>
<td>5,245</td>
<td>3,16</td>
<td>8,405</td>
</tr>
<tr>
<td>EUR</td>
<td>0,21</td>
<td>0,12</td>
<td>0,33</td>
</tr>
</tbody>
</table>
Summary of investments and remediation expenses

Investments for inventory of contaminated sites
exchange rate 1 EUR = 25,5 CZK in millions

<table>
<thead>
<tr>
<th></th>
<th>NIKM 1 2009 - 2013</th>
<th>NIKM 2 2018 - 2021</th>
<th>NIKM total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZK</td>
<td>100,7</td>
<td>116,6</td>
<td>217,3</td>
</tr>
<tr>
<td>EUR</td>
<td>3,9</td>
<td>4,6</td>
<td>8,5</td>
</tr>
</tbody>
</table>
Summary of investments and remediation expenses

Remediation of the old ecological burdens - the state by the end of 2018

<table>
<thead>
<tr>
<th></th>
<th>from 1991</th>
<th>spent by 2018</th>
<th>guarantees solved by 2018</th>
<th>paid from 1991</th>
<th>remains</th>
<th>new remediations under contracts</th>
<th>already paid</th>
<th>to be solved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guarantees CZK</td>
<td>175,7</td>
<td>23,5</td>
<td>36,7</td>
<td>62,6</td>
<td>139</td>
<td>42,1</td>
<td>39</td>
<td>100</td>
</tr>
<tr>
<td>Guarantees EUR</td>
<td>6,9</td>
<td>0,9</td>
<td>1,4</td>
<td>2,5</td>
<td>5,5</td>
<td>1,7</td>
<td>1,5</td>
<td>3,9</td>
</tr>
<tr>
<td>No. of Ecological agreements</td>
<td>326</td>
<td>185</td>
<td>141</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary of investments and remediation expenses

Remediations financed from **National Environmental Fund** (for private persons, municipality, regions)

<table>
<thead>
<tr>
<th></th>
<th>since 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZK</td>
<td>100</td>
</tr>
<tr>
<td>EUR</td>
<td>3,9</td>
</tr>
</tbody>
</table>
THANKS FOR THE ATTENTION,

Zdeněk Suchánek

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