BELÜGYMINISZTÉRIUM

Lessons learnt from the tailings dam failure at Kolontar, Hungary, in 2010

Péter Kovács

Ministry of Interior of Hungary

Improvement of international environmental legislation

- **Amendment of the Seveso II Directive**
- **New Directive of Mining Waste (Council Directive 2006/21/EC on the management of waste from the extractive industries)**
- **Inventories of existing abandoned sites**
- **Elaboration a special BAT reference document (BREF) concerning the management of tailings dams under the IPPC Directive**
- **Implementation of the Water Framework Directive (2000/60/EC Directive)**
- **Protocol on Civil Liability,**

Civil liability and compensation for damage in case of accidental transboundary water pollution were not regulated by international law.

UN ECE Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters

(elaborated by the two Helsinki Conventions focusing on consequences of transboundary industrial accidental water pollution)

Signed at 21 May 2003, Kiev

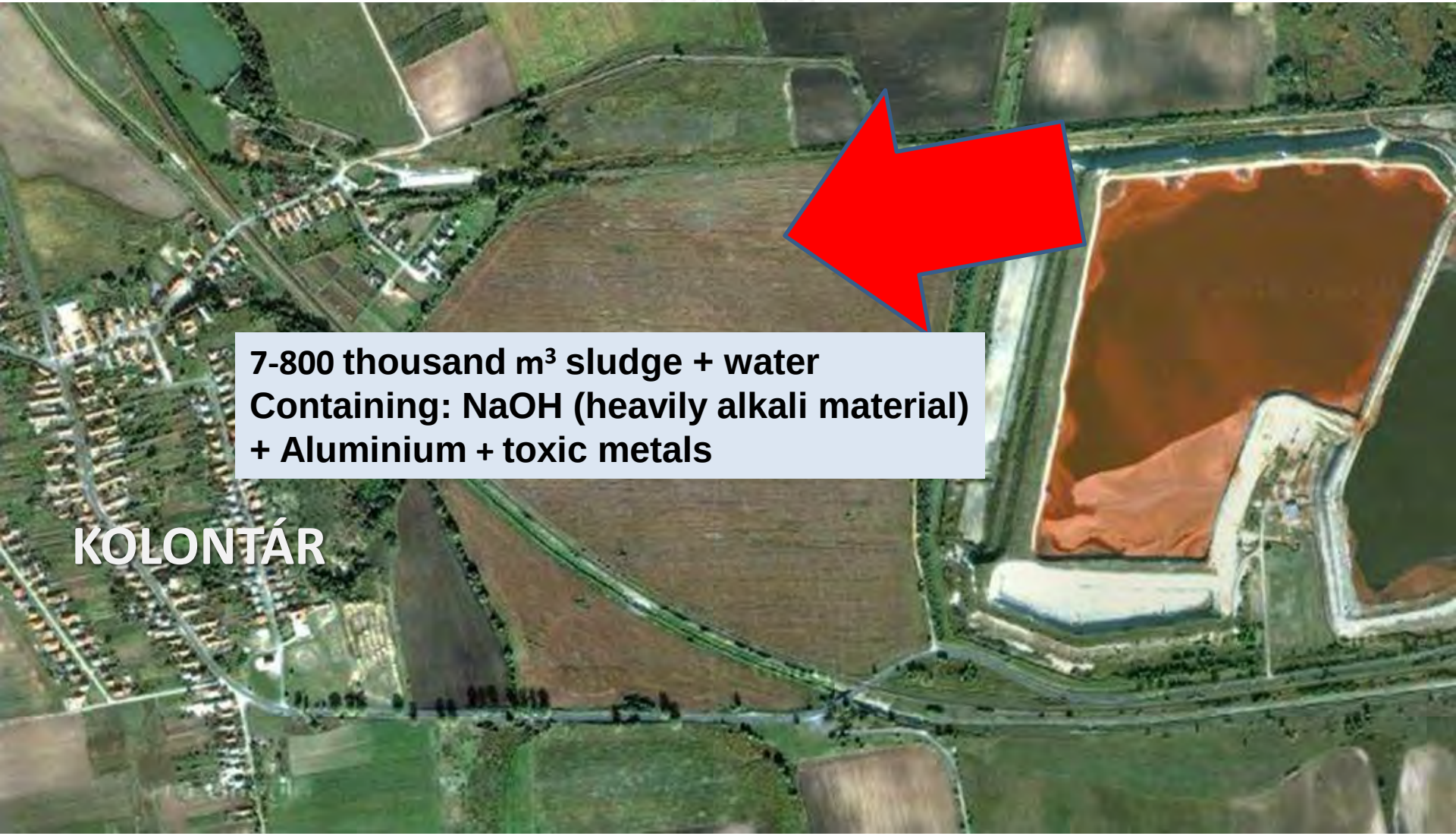
to date 24 countries signed the Protocol and only 1 country ratified it – „only” 15 more ratification is needed


MINING FOR CLOSURE
POLICIES AND GUIDELINES FOR SUSTAINABLE MINING PRACTICE AND CLOSURE OF MINES
UNEP
UNDP
NATO OTAN
BEST PRACTICE ENVIRONMENTAL MANAGEMENT IN MINING
Cyanide Management
Environment Australia
Department of the Environment
UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE
Safety guidelines and good practices for tailings management facilities
UNITED NATIONS
Mining and environment in the Western Balkans
UNEP
MINING, MINING WASTE AND RELATED ENVIRONMENTAL ISSUES: PROBLEMS AND SOLUTIONS IN CENTRAL AND EASTERN EUROPEAN CANDIDATE COUNTRIES
A report of JRC Enlargement Project
PECOMINES
Inventory, Regulations and Environmental Impact of Toxic Mining Wastes in Pre-accession Countries
G. Jordan and M. D'Alessandro Editors
EUROPEAN COMMISSION
Joint Research Centre

INDUSTRIAL ACCIDENT

BELÜGYMINISZTÉRIUM

04.10.2010 12:25



7-800 thousand m³ sludge + water
Containing: NaOH (heavily alkali material)
+ Aluminium + toxic metals

Location:

Ajka town (Veszprém County) – distance from the capital (Budapest) approx. 160 km

Carstic area

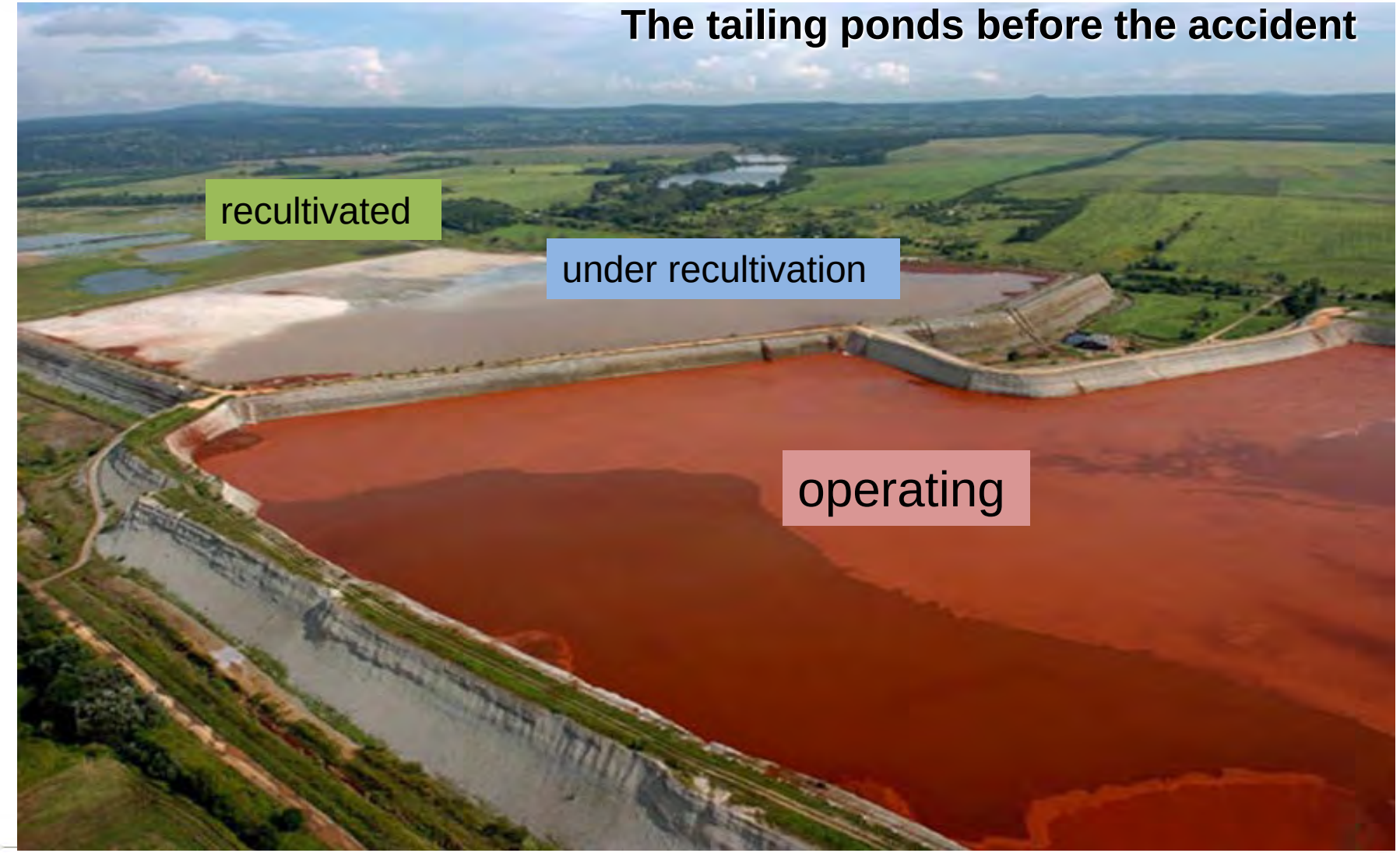
Close to the Balaton lake

Activity:

Red mud (sludge) storage of the MAL Ltd.

Is red sludge hazardous?

- From technological process the red sludge come into the landfil tailing pond to a pH 12-14 because of the presence of natrium hydroxide in the covering water layer.
- The red mud is stored in the reservoir without treatment (neutralisation).
- EWC 01 03 09 – not determined as dangerous waste by European Union's legislation.
- Natrium hydroxide is not toxic material, it is caustic (corrosive) substance
- Depending of the concentration of NaOH there are different risk phrases and different health consequences:
  - 0.1 mol/l – pH 13 – R36/38 – iritant
  - 1 mol / l – pH 14 – R34 – caustic (light burns to the skin)
  - 8 mol / l – pH 14 - R35 – caustic (severe burns to the skin)


The tailing ponds before the accident
recultivated
under recultivation
operating

The dike breach


Devecser
Kolontár
waste
reservoir
N
500 m

BELÜGYMINISZTÉRIUM

The extent of damage

- The most extreme devastation was caused in the villages of Devecser and Kolontár, which are located near the reservoir.
- In the catastrophe 10 people died and 250 were treated by the National Ambulance Service.
- 109 of them were hospitalized.
- ~250 houses were destroyed

12

Governmental responses

- The Hungarian Government immediately declared a state of emergency in the three affected counties (Győr-Moson-Sopron, Veszprém and Vas) on 6 October and will remain valid until 31 December 2010.
- The rescue forces immediately started rescue operations and introduced further protective measures under the command and control of the Governmental Coordination Committee (GCC), chaired by the Minister for the Interior.
- The environmental protective measures were aimed at stopping the flow of the red sludge, reinforcing the dyke, and collecting the red sludge and the polluted materials.
- Provision of continuous information flow (WEB, AEWS)

measures

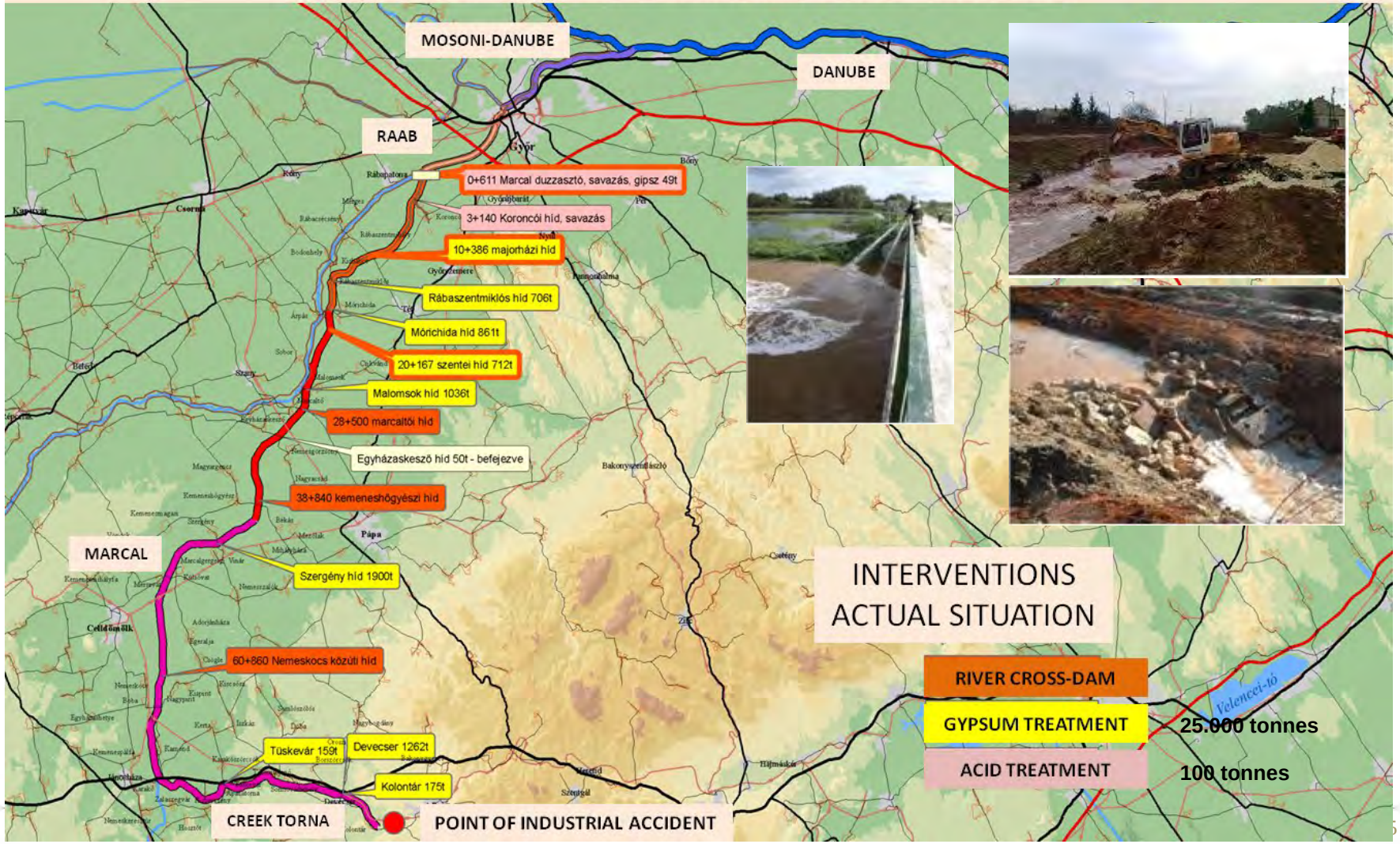
BELÜGYMINISZTÉRIUM

Emergency health response	accomodation	Water protection	Remediation Arable land, gardens, parks,	Remediation Forests, natural zones, river banks
Life -saving	evacuation	pH treatment - to save the Danube river	Mechanical treatment	Mechanical treatment
First aid	Temporary accomodation	Emergency measures to stop source and the running contaminants Riverbed barriers	Agricultural Soil treatments, soil fertilizers, peats, humids etc.	Ecological assessments, revitalisation plans
Air pollution control	New residential areas, new houses built,	Remediation the rivers	Biological Soil improvers	Biological treatments
monitoring	relocation	Revitalization the rivers monitoring	Long term protective soil management	Monitoring

BELÜGYMINISZTÉRIUM

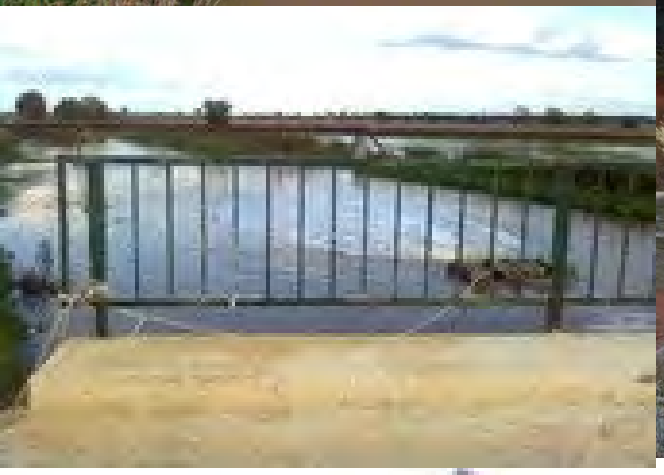
RED-SLUDGE RUNOFF OVERVIEW MAP

Hungarian Technical Managing Crew (OMIT) - 09th of October, 2010.



Surface water decontamination

BELÜGYMINISZTÉRIUM



Danube confluence 2010. 10. 08.


Rába
Marcal, Rába torkolat
tisztított víz
Szennyező forrás

New protection system

Decontaminated land	**267 ha**
Collected and transported mud	**560 000 m^3**
Ploughing	**~250 ha**
River sections to be cleaned	
Torna-creek	**26 km**
Marcal	**27 km**
Other river section	**5 km**
Floodplain	**60 ha**
Number of samples	**14 000**

Soil contamination: in the 5-20 cm layer

Soil measures:
- pH
- toxic metals
-Salinity
-Soil texture
- humus content
- soil biological activity

22

Remediation of the inner areas, Devecser

Remediation of agricultural areas (Kolontár)

25

Causes of the accident.

- Unfavourable weather and geological conditions ?
- Bad planning ? Bad permitting ?
- Neglected maintenance ? Human error ?
- Not sufficient control ?
- Not adequate emergency preparedness ?
- Polluter pays?

Conclusions

- The intervention was successful – the pollution did not reach the Danube
- Response measures were quick and adequate
- Danube AEWS is useful

Lessons to learn

• further improvement of emergency warning systems (eg. DAEWS)

• insite/outsite contingency planning

• risk assessment has to be applied

•„hot spot” inventories has to be updated and more widely used

•stringent control, permitting, clear responsibility of authorities

• stringent enforcement of existing legislation

30