

An aerial photograph of the Ajka Red Sludge Reservoir, showing a large, irregularly shaped body of reddish-brown sludge. The sludge is contained within a concrete-lined reservoir, with some green vegetation visible on the surrounding land. The text is overlaid on the image.

**Sixth Meeting of the Conference of the Parties to the Convention on the
Transboundary Effects of Industrial Accidents**

The Hague, 8-10 November 2010.

**DISASTER
IN THE AJKA RED SLUDGE RESERVOIR
on 04 October 2010**

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Content of the presentation

- I. Circumstances of the disaster**
- II. Emergency management of the disaster**
- III. Primary rescue and mitigation measures**
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The industrial activity and an event

- Function of plant – red mud reservoir of an alumina plant – MAL Ltd.
- Materials involved in the accident:
- Mixture of red mud (EWC 01 03 09, pH 13) and alkaline water (contained NaOH).
at about 600-700.000 cubic metres



Date: 04 October 2010 at 12.30

Is red mud is hazardous?

- From technological process the red mud come into the landfill tailing pond to a **pH 12-14 because of the presence of natrium hydroxide.**
- **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 – irritant
 - 1 mol / l – pH 14 – R34 – caustic (light burns to the skin)
 - 8 mol / l – pH 14 - R35 – caustic (severe burns to the skin)



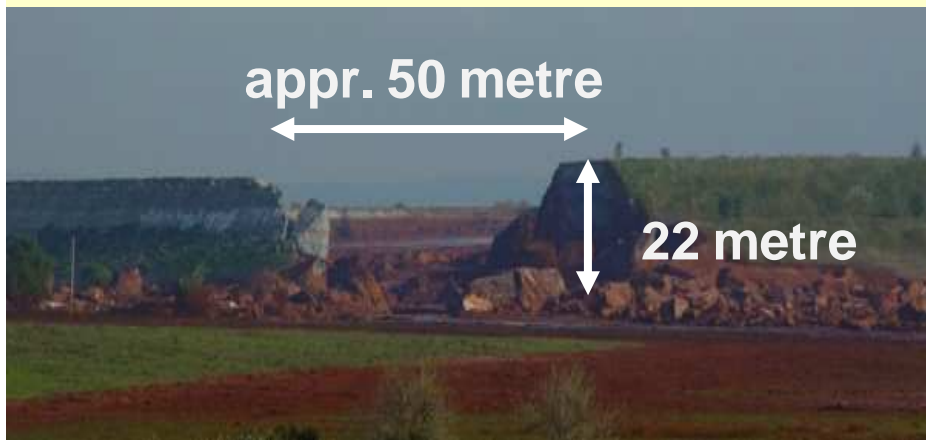
Location of the disaster

Location:

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

Activity:

Red mud (sludge) reservoir of the
MAL Ltd.



Affected settlements

17 houses

Óvásárhely

207 houses

Devecser

35 houses

1017 ha land
affected

affected persons:
790

10 persons died

123 persons injured

Kolontár

Consequences of the Disaster



Organisation of emergency management

- **Minister of Interior** is in charge of the crisis.
- At national level the **disaster management directorate general** has the operational lead.
- At the local level, a dedicated **Defence Committee** has been created, gathering all the rescue services
- **Involved in the management:** Disaster Management (leader), Civil Protection, fire fighters, police, army, ambulance service, mayors, etc.
- The **command post of Disaster Management Directorate** is located in Kolontar (since 18 October in Devecser).
- More than 1 100 official members of the intervention forces are working on the site.



Affected areas



Advanced Land Imager (ALI) system - NASA Earth Observing-1 (EO-1)

Affected area



Advanced Land Imager (ALI) system - NASA Earth Observing-1 (EO-1)

Primary rescue and mitigation measures

- Rescue of inhabitants and providing temporary shelter.
- Assessment of damage and the decontamination of the flooded residential area (10 ha).
- Localisation of the disruption of the bank in order to prevent further pollution.
- Neutralisation of the surface waters– affected rivers – the Marcal and Raba river, thus prevent the pollution of the transboundary river Danube.
- Taking immediate damage control measures – collection of the spilled red mud and carrying back to the reservoir
- State of emergency situation was announced by the Government for three counties (Győr-Moson-Sopron, Vas and Veszprém) down the basin of polluted rivers.
- Continuous monitoring of water and air pollution.

Surface water decontamination 1.

The waste water and red mud has not achieved water level of ground in affected villages.

Protecting the surface water quality

Decontamination of the affected areas:

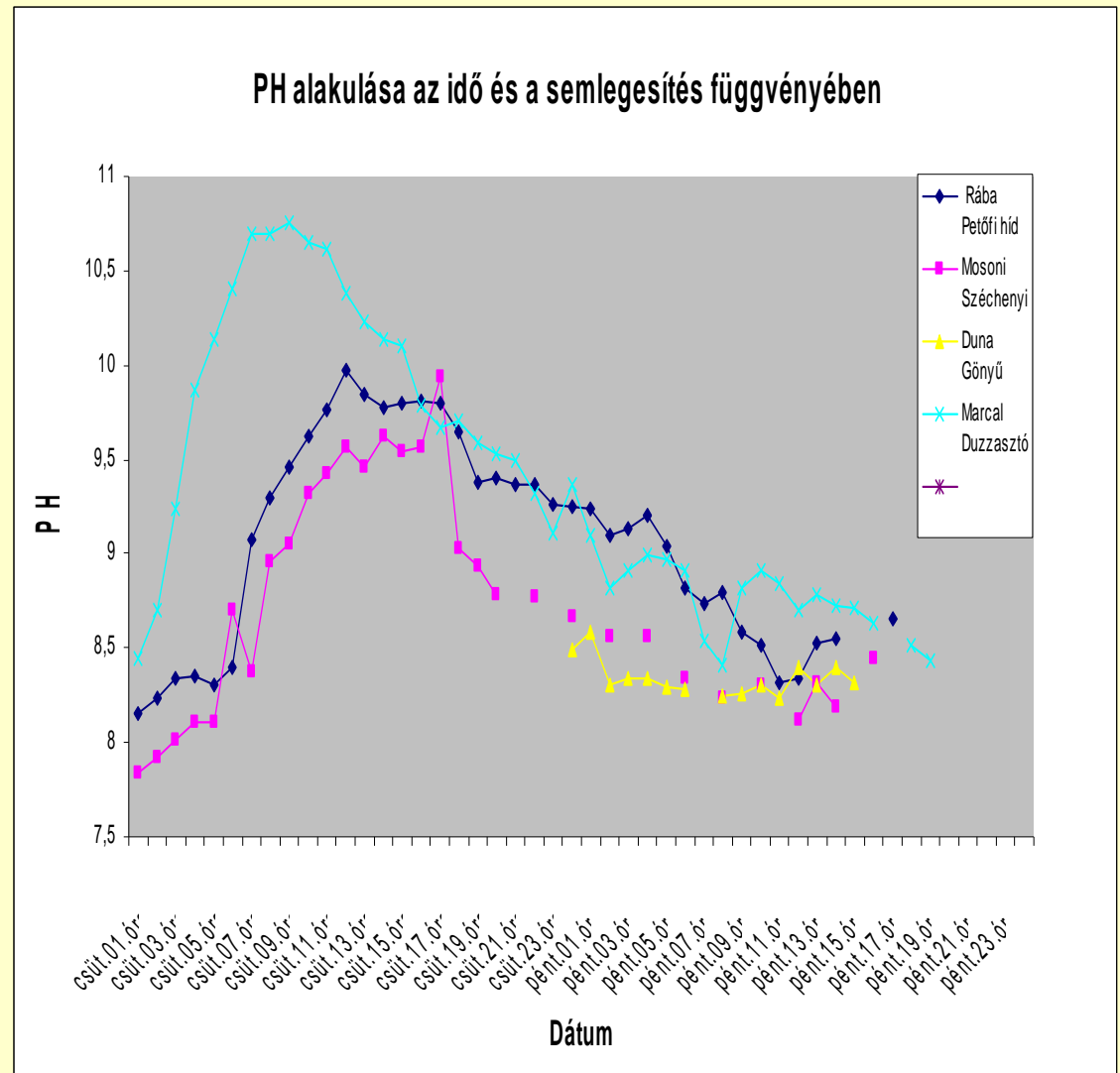
Bio-acetous acid: 247337 litres

Gypsum: 18000 t

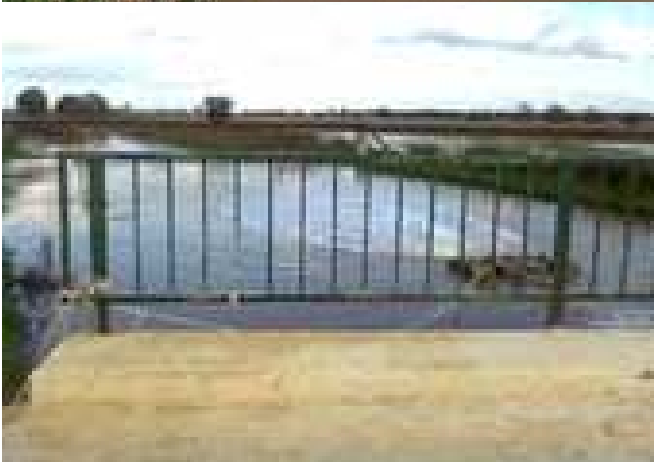
Consequences:

Torna, Marcal rivers: flora and fauna died out

Rába, Duna rivers: not affected



Surface water decontamination 2.



ISZAPÖMLÉS az ajkai térségben

2010. október 4.

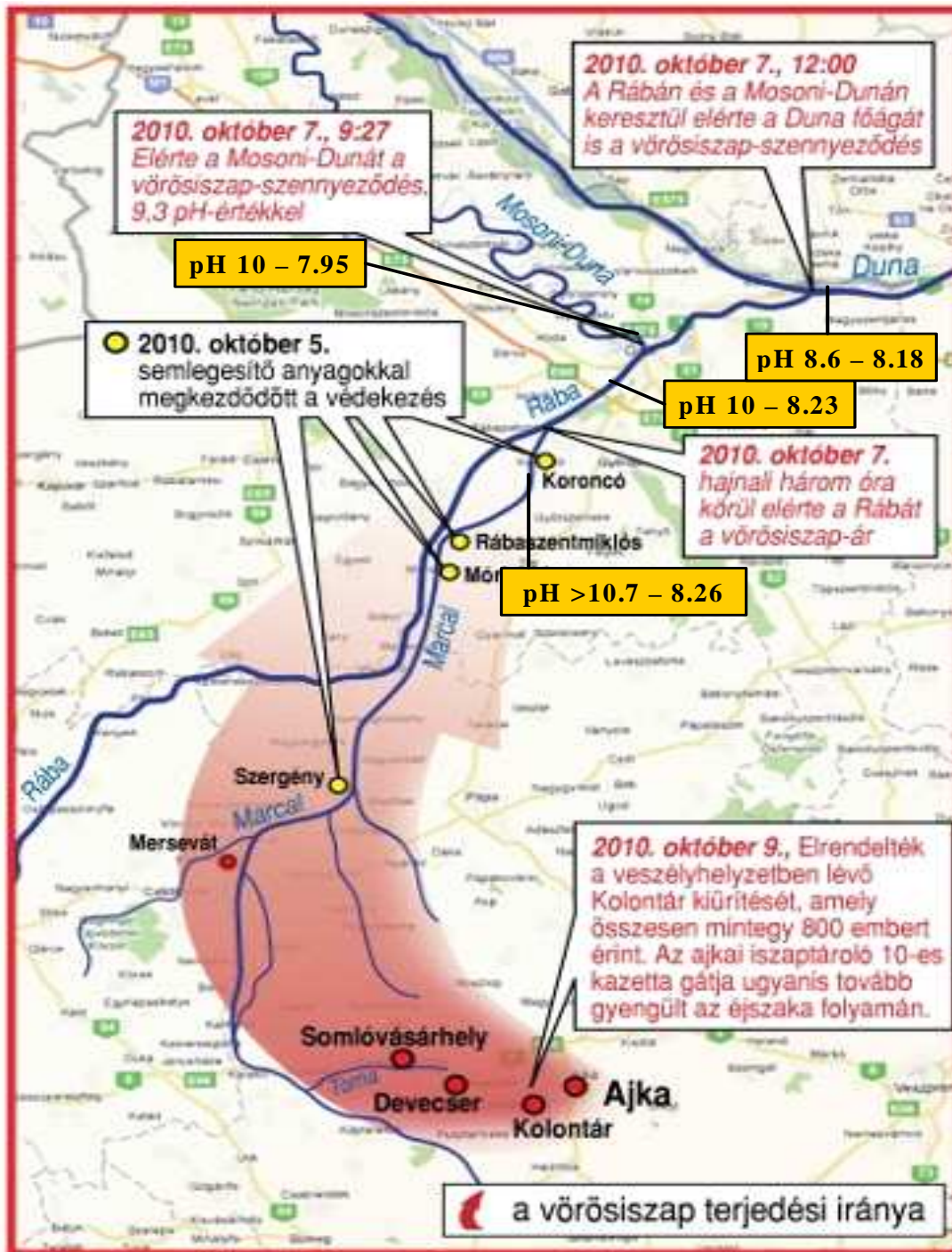
A Magyar Alumínium Termelő és Kereskedelmi Zrt. (MAL Zrt.) Ajka melletti tározójából több százezer köbméternyi mérgező vörösiszap ömlött a szabadba gátszakadás miatt. A térségben katasztrófa helyzet alakult ki.



2010. október 5.

A kormány veszélyhelyzet kihirdetését rendelte el Veszprém, Győr-Moson-Sopron és Vas megye területeire a kolontári vörösiszap-tároló gátszakadása miatt.

Forrás: MTI Zrt. Sajtóadatbank 



Present situation

Demolition of 23 houses designated for destruction has begun in Kolontár. Assessment of people's plans in Devecser is still underway; "census points" have been set up.

A Hazard Investigation Team takes turns in monitoring the sludge reservoir wall; as yet, no visible change in the condition of the dam has been discovered.

- Housing questionnaire survey in progress
- Cleaning up: clean-up of debris, removal demolition waste
- Casualties: 250 persons have treated, 109 persons were hospitalised, 141 persons recieved medical treatment on the scene.
- Drinking water and air: monitoring the quality of drinking water and carries out the detailed tests on samples. Drinking is safe to consume. Monitoring changes in the concentration of airborne dust particles. The currently installed measurement instruments perform tests at 13 locations.
- Rivers: Regular monitoring indicates that pollutants (alkali and heavy metals) continue getting into the Torna Stream. Water quality sampling is ongoing. No deviations other than normal were measured on the Danube.
- Soil: Based on initial assessments approximately 800 ha of land is affected by the pollution. The thickness of the red sludge cover is estimated to be 5 to 10 cm. The cultures affected are: 300 ha of grassland, about 310 ha of tilled area, 30 ha of alfalfa, 150 ha of corn and 15 ha of sorghum.

Further medium and long term measures to be planned

The main focuses of the Hungarian authorities are:

- 1) Secure the people, constructing 4 stone dams to direct an eventual new flow towards a less dangerous place
- 2) Continue controlling alkalinity of the water, avoiding the spreading out of the soil, surface water and air pollution
- 3) Decontaminate the area with as less consequences as possible on the environment. – 5 +1 EU experts from EU CP team (FR, SE, DE, AT, BE)
- 4) Reconstruction of the damaged residential areas
- 5) Calculation material loss and starting criminal, damage compensation processes – disaster management commissioner of the Government is appointed for securing the management of the site
- 6) Ongoing environmental and disaster management inspection of the plants similar to the disaster scene
- 7) Establishment of the Unified Industrial Safety Inspection on the basis of disaster management



International issues of the disaster

Seveso II EU Directive

- The reservoir of the red mud is not covered by the Seveso II Directive due to the fact that the tailings reservoir is part of the alumina plant and does not contain dangerous substances defined in Annex I – NaOH is R35.
- Continuous cooperation with MIC – Civil Protection Mechanism

UN ECE Industrial Accident Convention

- The activity is not come under the scope of the Convention because it is on one hand not covered by the Seveso II Directive, on the other hand the materials are used in the plant can not be classified based upon the annex 1 of the Convention. At the end no transboundary damage is measured.

UN ECE Water Convention and Danube River basin regional cooperation

- POC is The Ministry of Rural Development of Hungary – informed all Danube basin countries under the International Commission for the Protection of the Danube River (ICPDR) via Danube Accident Emergency Warning System (PIAC/DAEWS).

International issues of the disaster

Hungarian Government thanks for the support of the international organisations and countries to offer help

A, B, CH, CZ, D, E, F, L, PL, RO, SK, SRB, UK, CDN, USA, IND, J.

Countries offered equipment for decontamination, environment protection experts, SAR teams, etc.



The useful internet links:

www.redsludge.bm.hu

- **"Redsludge" tragedy, Official Website of the Hungarian Government** (English language)

www.katasztrofavedelem.hu

- **Official Website of National Directorate General for Disaster Management, Mol of Hungary**

An aerial photograph of a residential neighborhood. The houses are mostly single-story with light-colored roofs. There are many green trees scattered throughout the area. A river or stream flows through the lower part of the image, crossing a small bridge. The overall scene is a typical suburban or rural landscape.

Thank you for your attention!