



CRITICAL RAW MATERIALS DATA MANAGEMENT WORKSHOP

Berlin, 26th of November

The Hungarian ENFO-MOKKA Environmental Database

Environmental information on scandium containing wastes

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The Hungarian ENFO-MOKKA database

<http://www.enfo.hu/en>



ENFO

(Environmental Information database)

„ENFO” – *Dynamic information system for environmentally efficient and environment conscious decision making, Hungarian project (2008-2011)*

MOKKA

(Innovative Risk Assessment and Risk Reduction methods and tools database)

„MOKKA” – *Innovative Decision Support Tools for Risk Based Environmental Management in Hungary, Hungarian R&D project (2005-2008)*

The Hungarian ENFO-MOKKA database

<http://www.enfo.hu/en>



User entitlements:

- unregistered user (browse public data)
- registered user (browse public data and edit one's own uploads & datasheets)
- admin (browse and manage all uploads & datasheets)

Planned to be bilingual (Hungarian, English) however the amount of information in English is much less than the Hungarian.

Updating of the English version is in progress

Why to introduce ENFO-MOKKA at the CRM workshop?

ENFO
<http://www.enfo.hu/en>

SCALE database on ENFO
<http://www.enfo.hu/en/node/13165>

MOKKA

Title	Type	Date
Gypsum Board Waste, Plasterboard waste, Gypsum drywall waste, Sheetrock waste	Hulladék / melléktermék felmérés	2013-10-05 2018-06-22
Red mud and soil mixture from Ajka	Hulladék / melléktermék felmérés	2013-06-11 2018-10-04
Red mud from Ajka (dry storage)	Hulladék / melléktermék felmérés	2013-06-11 2018-10-04
Plant fly ash of Oroszlány	Hulladék / melléktermék felmérés	2012-12-03 2018-06-22
Red mud from Ajka (from wet storage)	Hulladék / melléktermék felmérés	2012-12-03 2018-10-04
Vorosiszap	felmérés	13 2018-10-04
Red mud from Almásfüzitő	Hulladék / melléktermék felmérés	2010-08-13 2018-10-04

Possibility for other CRM-containing wastes

Waste characterisation datasheets

The ENFO database



Glossary Maps Photos E-courses

ENvironmental inFormAtion

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Welcome to the ENFO webpage!

<http://www.enfo.hu/en>

ENVIRONMENTAL INFORMATION

The ENFO webpage is under construction, thank you for your patience!

The ENFO webpage intends to give you a hand in taking environmentally efficient and environment-conscious decisions whenever faced with environmental problems.

The **Glossary** contains explanations in the field of environmental law, environmental sciences and the relevant technical background.

If you navigate in the **Database** you can get acquainted with traditional and innovative methods able to measure and assess the actual condition of the environment inclusive of its deterioration or you get to know technologies able to maintain the environment healthy or technologies to remediate it.

Clicking on the **Photos** button you are given a quick and expressive overview of the areas of interest covered by the ENFO project. The **Maps** visualise GIS data layers and other environmental data types and help in locating environmental companies, institutions providing information relevant to the respective spot. If you click on the **Decision Support (DST)** button and you select a specific problem within it, you will be guided through the steps to be taken both in terms of the legal or scientific background.

E-learning gives you an insight into the scientific and practical basis of the modern environmental engineering.

After **Registration** you can post your methods and technologies in the ENFO database.

The content of the ENFO webpage is arranged in a matrix form combining the environmental elements and their deterioration with the relevant examination methods and remediation, cleaning, treatment procedures. The matrix itself is a table having the environmental elements and their deterioration along its horizontal line and the methods and technologies along the vertical line. This matrix-like arrangement can be found under the **Photos** and **E-learning** menus.

ENFO knowledge-base: a short film in Hungarian

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MOKK
A



Rapid bioaccumulation test with *Sinapis alba*

<http://www.enfo.hu/en/gallery/1852>

Author: Viktória Feigl

A képekre kattintva megtekinthetjük az adott képhez tartozó részletes leírást.

Diavetítés indítása

 <p>Measurement of soil (mine...)</p>	 <p>Wetting of soil</p>	 <p>Placement of white mustard...</p>	 <p>Thermostate: 20 °C, 5 days</p>	 <p>5 day old white mustard plants</p>
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The test was developed by Viktória Feigl (2005). It is a rapid method that can be used for the estimation of the amount of contaminants (metals) available for plant uptake. For detailed description visit the MOKKA-ENFO database!

Source:

Feigl Viktória: Toxikus fémekkel szennyezett talajok stabilizációja - Kísérletek integrált fitoremediációjához, Diploma thesis, BME MGKT, Budapest, 2005.

Datasheets in the MOKKA database



<http://mokka.en>

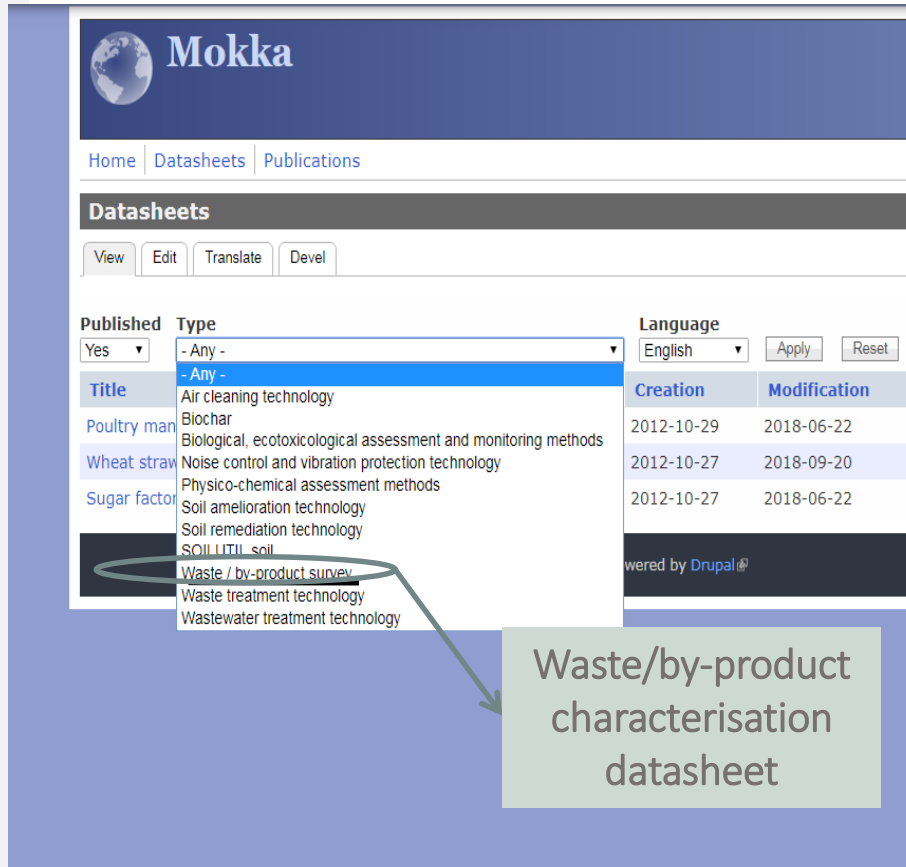
Focus:

Risk-based environmental management



Datasheet types:

- ✓ **Technologies** (Soil remediation Soil amelioration, Waste treatment, Wastewater treatment, Air cleaning, Noise and vibration control)
- ✓ **Assessment methods** (Biological, ecotoxicity and monitoring, Physico-chemical method)
- ✓ **Characterisation/Assessment** (Soil, Waste/by-product, Biochar)



Mokka

Home | Datasheets | Publications

Datasheets

View Edit Translate Devel

Published	Type	Language	Creation	Modification
Yes	- Any -	English		
	- Any -			
	Air cleaning technology			
	Biochar		2012-10-29	2018-06-22
	Biological, ecotoxicological assessment and monitoring methods			
	Noise control and vibration protection technology		2012-10-27	2018-09-20
	Physico-chemical assessment methods			
	Soil amelioration technology		2012-10-27	2018-06-22
	Soil remediation technology			
	SOIL LUTIL soil			
	Waste / by-product survey			
	Waste treatment technology			
	Wastewater treatment technology			

powered by Drupal

Waste/by-product characterisation datasheet

Waste characterisation datasheet : mains chapters of the datasheet on wastes



Red mud from Ajka (dry storage)	
<ul style="list-style-type: none"> • Data provider 	
Organisation/Data provider's name:	Budapesti Műszaki és Gazdaságtudományi Tanszék, Al Tanszék, Környezeti Mikrobiológia és Biotechnológia K
Name of contact:	Dr. Molnár Mónika, Dr. Feigl Viktória
Contact details	
Telephone/fax:	+36-1-4632347
E-mail:	mmolnar@mail.bme.hu vfeigl@mail.bme.hu
Website:	http://envirotox.hu
<ul style="list-style-type: none"> • Data on the producer, manager and collector 	
Name:	MAL Magyar Alumínium Termelő és Kereskedelmi Zrt.
Settlement:	Ajka
Street,streetnumber:	Gyártelep hrsz. 598/15
Postal code:	8400
Telephone/fax:	Tel: +36-88-522-400 Fax: +36-88-311-634
E-mail:	mal@mal.hu
Website:	http://www.mal.hu/Engine.aspx
Connection with the waste or by-product:	Producer Owner

Data Provider, Producer, Qwnership and Geographical location

General information about the waste or by-product	
Denomination of the waste or by-product:	Red mud from Ajka (dry storage)
Denomination of the waste or by-product in English:	Red mud from Ajka (dry storage)
Type of the waste or by-product data-sheet:	Characterisation of particular waste or se
Functional characterization:	Non-hazardous waste from mining
Other:	Due to its high alkalinity and toxic metal
EWC code of waste:	01 WASTE RESULTING FROM EXPLORATI TREATMENT OF MINERALS > 01 03 wastes from physical and chemical 01 03 09 red mud from alumina producti
Consistency of the waste or by-product:	Solid
Description of the waste generating technology:	Az alumíniumgyártás első lépése a timfölk finomítást használják. A folyamat során a

Information about the waste: origin, EWC code, technology, estimated quantity

Waste characterisation datasheet : the mains chapters of the datasheet on wastes

▼ Features and chemical content/composition of the chemical, mixture of chemicals

Chemical substance, Main group Chemical substance, Subgroup:	Metals, semi-metals and their compounds > aluminium
Amount of the chemical substance in the waste or by-product / biochar:	Main component
Concentration of the chemical in the waste or by-product / biochar:	31 264 mg/kg

▼ Main characteristics of the product and/or of the waste blend

The name of the product:	Ajkai vörösiszap (száraz tár
Components of the product:	Fő összetevői vas-, alumínium könnyűfémek: Na, K, Cr, V, Összetétele függ a kiinduló
Other characteristics of the product:	A vizet nehezen átteresztő, a tulajdonságokkal bíró, nedv vízzel telítik, ezt a tulajdonságoktól függően változ

▼ Characterisation of the waste or by-product

pH:	9.27
Conductivity (mS/cm):	9390
Drymatter content (%):	81
Moisture content (%):	19
Homogeneity:	Inhomogeneous
Pozzolana activity:	no
Other:	Arany-féle kötöttség K(A)=<
Is this waste or by- product being utilized?:	No information

▼ Hazards of the waste or by-product


Hazard characteristics:	Not classified
Has any harmful effect been measured in connection with your waste?:	Yes
If harmful effect was measured, please, specify what was measured, which method was used, who did the measurement, and what was the result!:	A szárazan tárolt vörösiszap Kutatócsoport vizsgálta. A k vörösiszap-tartalmát, ami te A vörösiszap talajra gyakor foglalja a fizikai-kémiai (ph,

Chapters for decision support:

- waste characterisation (chemical composition, physical properties, hazards)
- potential utilisation in soil

Location of the SCALE database on ENFO






ENvironmental inFOrmation




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Photos > Practical use > Practical use: Environmental management gallery >



Environmental management of waste

<http://www.enfo.hu/en/node/705>

	<div style="border: 2px solid black; border-radius: 50%; padding: 10px; display: inline-block;">SCALE environmental database on ENFO</div>
	Waste types
	Mining waste

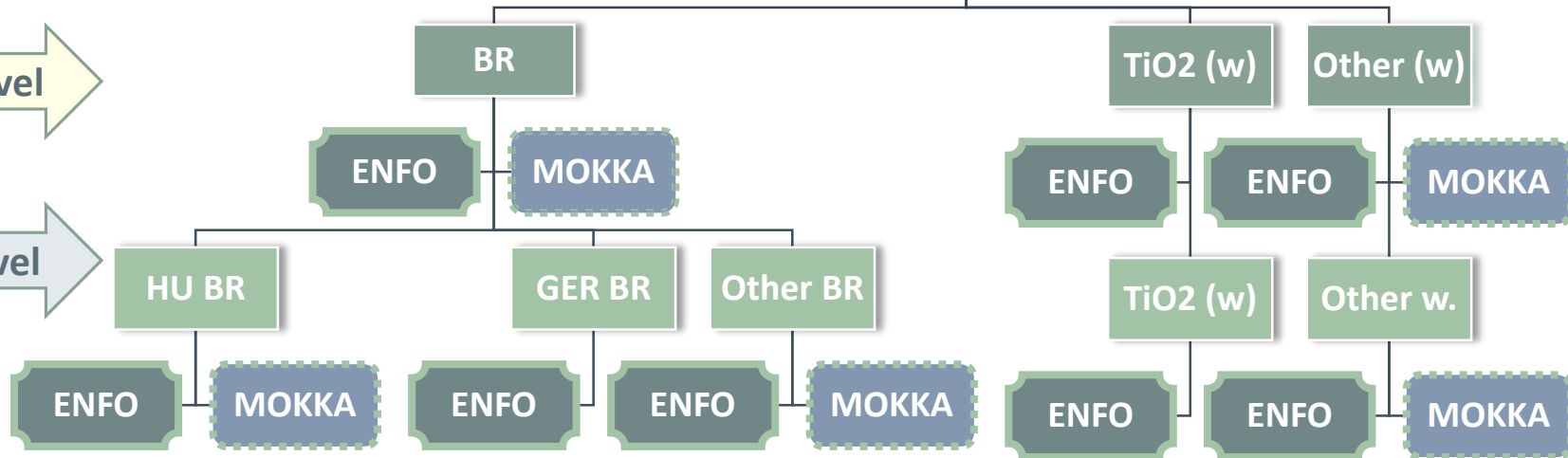
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General structure of the „SCALE – Scandium containing waste materials database” within ENFO



Abbreviations:

- BR: *Bauxite residue*
- TiO₂ (w): *TiO₂ production waste*
- Other (w): *Other Sc containing waste*
- HU BR: *Hungarian Bauxite Residue*
- GE BR: *German Bauxite Residue*
- Other BR: Other Bauxite Residues*



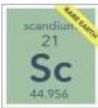


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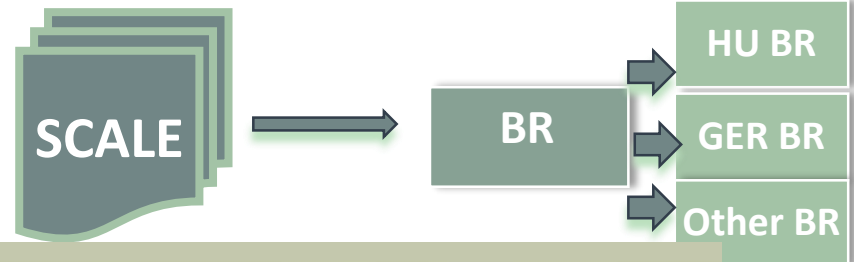
Scandium containing wastes and by-products in Europe

<http://www.enfo.hu/en/node/13167>

Author: Viktória Feigl

	Bauxite residue	BR
	Titanium-dioxide production waste	TiO ₂ (w)
	Other Sc- and/or Critical Raw Material (CRM) containing wastes/by-products	Other (w)

Bauxite Residue



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Red Mud (Fine Fraction Bauxite Processing Residue)

3169

HU BR

↑

Red mud from Hungary

GER BR

↑

Red mud from Germany

Other BR

↑

Red Mud from Greece

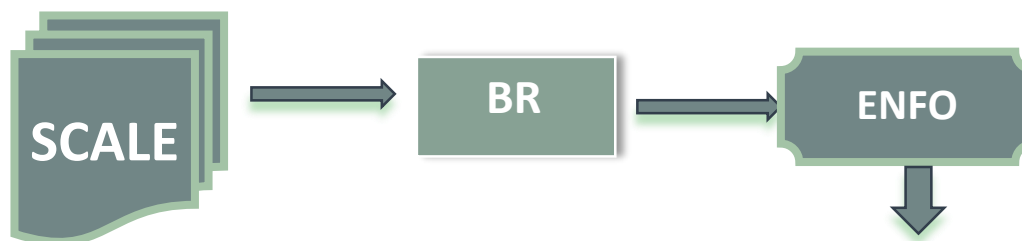
Author: Ujaczki Éva

A képekre kattintva megtekinthetők az adott képhez tartozó részletes leírások.



Diavetítés indítása

Source:
 Photo: <http://www.greenspec.co.uk/building-design/aluminium-production-environm...>

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Chemical Substances database within ENFO


Environmental inFOrmation








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[Photos](#) > [Basic knowledge](#) >

Chemical substances >>Types

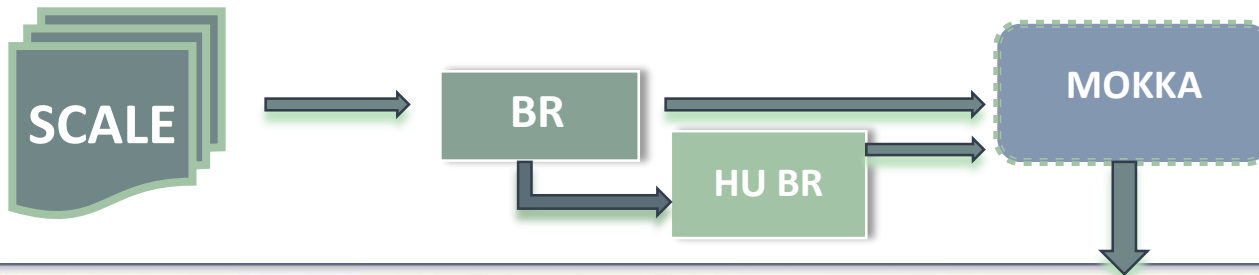
<http://enfo.hu/en/node/1232>

Author: Gruiz Katalin

	Emerging pollutants
	<u>Alkali metals, alkaline earth metals and their compounds</u>
	Transition metals, post-transition metals and their compounds
	Metalloids and their compounds
	Lanthanoids, actinoids and their compounds
	Nonmetals (halogens, other nonmetals and their compounds, noble gases)



SCALE



Mokka

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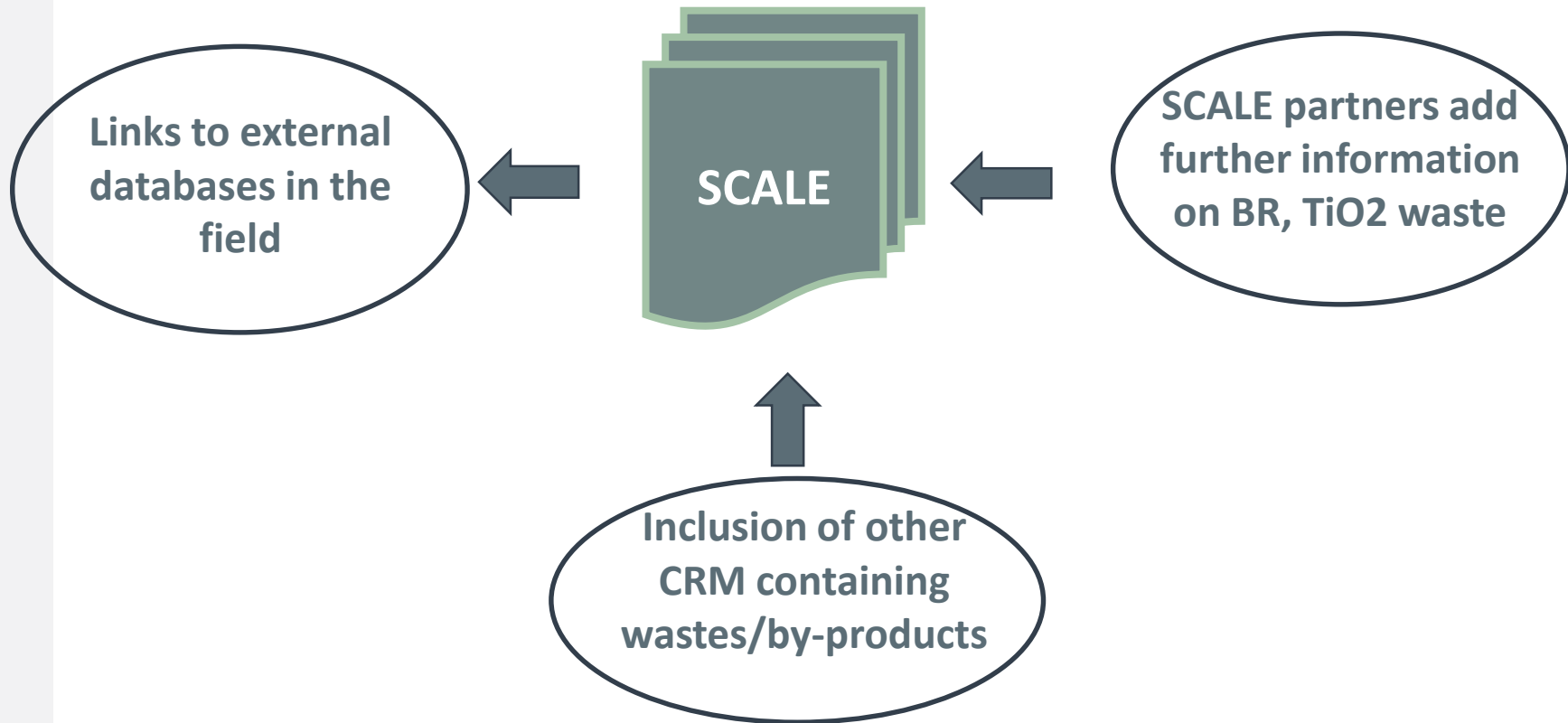
Datasheets

Waste characterisation datasheets

Published Type Language
- Any - Waste / by-product survey English Apply Reset

Title	Type	Creation	Modification
Gypsum Board Waste, Plasterboard waste, Gypsum drywall waste, Sheetrock waste	Hulladék / melléktermék felmérés	2013-10-05	2018-06-22
Red mud and soil mixture from Ajka			
Red mud from Ajka (dry storage)			
Plant fly ash of Oroszlány	Hulladék / melléktermék felmérés	2012-12-03	2018-06-22
Red mud from Ajka (from wet storage)			
Poultry manure	Hulladék / melléktermék felmérés	2012-10-29	2018-06-22
Sugar factory lime	Hulladék / melléktermék felmérés	2012-10-27	2018-06-22
Wheat straw	Hulladék / melléktermék felmérés	2012-10-27	2018-09-20
Vörösiszap	Hulladék / melléktermék felmérés	2010-08-13	2018-10-04
Red mud from Almásfüzitő			

Further Actions, Prospects, Possibilities



Acknowledgement









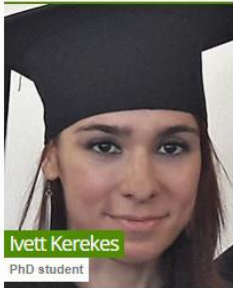
We acknowledge

Dr. Katalin Gruiz's (*retired Associate Professor*)
valuable contribution to planning, establishing
and maintaining the MOKKA and ENFO database



Thank you for your attention!
<http://envirottox.hu/en/people/>

Ön itt van: Főoldal » People

 <p>Katalin Gruiz retired associate professor</p> <p>✉</p> <p>Dr. Katalin Gruiz, dipl. chemical engineer</p>	 <p>Mónika Molnár associate professor</p> <p>✉</p> <p>Dr. Mónika Molnár, dipl. bioengineer</p>	 <p>Viktória Feigl senior lecturer</p> <p>✉</p> <p>Dr. Viktória Feigl, dipl. bioengineer</p>	 <p>Mária Tolner technical instructor</p> <p>✉</p> <p>Mária Tolner, environmental engineer (BSc)</p>
 <p>Emese Vaszita department engineer</p> <p>✉</p> <p>Emese Vaszita, dipl. eng. geologist</p>	 <p>Ildikó Fekete Kertész assistant lecturer</p> <p>✉</p> <p>Ildikó Fekete Kertész, dipl. bioengineer</p>	 <p>Éva Ujaczki external research fellow</p> <p>✉</p> <p>Éva Ujaczki, dipl. bioengineer</p>	 <p>Éva Farkas PhD student</p> <p>✉</p> <p>Éva Farkas, dipl. bioengineer</p>
			 <p>Ivett Kerekes PhD student</p> <p>✉</p> <p>Ivett Kerekes, dipl. ecotoxicologist</p>