



Participant Profile

for the
Turkish-German Strategy Workshop 2006
TÜBİTAK Marmara Research Center,
Istanbul- Gebze Turkey
13 – 15 December 2006



International Bureau (IB)
of the Federal Ministry of
Education and Research
(BMBF)

1. Contact details and personal information

Name:	Gerhard Kemper	Phone:	+49 6232 629271
Role/function¹:	Postdoc, Researcher	Fax:	+49 6232 629274
Institution:	Forschungszentrum Karlsruhe	E-Mail:	kemper@ggs-speyer.de
Department:	Mineralogy	Website:	www.untertageverschluss.de
Address:	Kämmererstrasse 14	Organisation type²:	University, Research Institute
Postcode and City:	67346 Speyer		

¹ **Role/function** e.g. working group leader, managing director, postdoc, PhD etc.

² **Organisation type** e.g. university, research institution, small and medium enterprise (SME), industry etc.

Working Group:	<input type="checkbox"/> 1 Material Technologies <input type="checkbox"/> 2 Biotechnology, Genomics and Food <input type="checkbox"/> 3 Energy <input type="checkbox"/> 4 Information and Communication Technologies <input type="checkbox"/> 5 Environmental Protection, Climate Change and Sustainable Development
Areas of activity:	# research <input type="checkbox"/> training # technology development <input type="checkbox"/> dissemination <input type="checkbox"/> demonstration <input type="checkbox"/> other:
Keywords characterising your area of research:	Please choose the appropriate key words (max. 5) from the following list: http://www.cordis.lu/fp6/keywords 03.03.01.02.02.07.0 Mineralogy 03.03.01.02.02.02.00 Environmental geology 06.02.13.00.00.00.00 Geological engineering 03.01.06.11.00.00.00 Soil physics 04.06.02.01.00.00.00 Environmental physics subsurface barrier, soil humidity sensor, sealing elements, dumpsite monitoring
Expertise, technologies and infrastructures available in your institution:	Research activities / expertise: Design of innovative subsurface barriers and dump-site sealing TDR Sensors for monitoring of water movements in barriers Methods: TDR, Material Design, Geotextiles, bentonite, geodetical controll. Key technologies: TDR, Infrastructures: Soil laboratory, manufacturing and development of electronic devices, Mineralogical laboratory, environmental chemistry Key publications: Several publications in the field of Soil moisture measurements, Mineralogy, soil science, dump site management.



Participant Profile

for the
Turkish-German Strategy Workshop 2006
TÜBİTAK Marmara Research Center,
Istanbul- Gebze Turkey
13 – 15 December 2006



International Bureau (IB)
of the Federal Ministry of
Education and Research
(BMBF)

2. Past and present research collaborations

Are you familiar with the European Framework Programme?

<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> with Framework Programme 5 <input type="checkbox"/> with Framework Programme 6 <input type="checkbox"/> with Framework Programme 7	<input type="checkbox"/> No
--	------------------------------------

EU-projects you are involved in:

Past projects

Present projects

	Programme title / contract number / title / acronym / your function (coordinator / partner / contractor) Murbandy, Moland, Wireless Info
--	--

Other international collaborations:

ITÜ Istanbul

Name(s) and contact details of potential partners:

If you would like to suggest the participation of particular partners from the partner country based on existing contacts or collaboration experience, you are welcome to indicate their names and contact details below: Prof. Orhan Altan, Civil Engineering Faculty, Istanbul Technical University

3. Presentation at the Workshop

I will give a presentation at the workshop (approx. 10 min.) to present my institution, my expertise, and my collaboration interests. The contents of my presentations is summarised below (max. 1 page).

Hazardous waste frequently becomes encapsulated in subsurface landfills. It is a must to isolate such waste by suitable geological and geo-technical barriers. These barriers are the host rock on the one hand and mine shaft closure constructions on the other. To guarantee a long-term stability of the closure construction, an innovative multi-layered sealing system was developed and patented. In contrast to conventional constructions of the sealing element, consisting of only one mineral material, the new system combines layers of different soil hydraulic properties. Layers with cohesive mineral materials (i.e. bentonites) with a sealing function are combined with layers of non-cohesive materials (permeability several orders of magnitude higher than the cohesive materials) that compensate for the different hydraulic potential (equipotential layer). The new sealing system shall prevent inhomogeneous moisture transport in the barriers. Penetrating water will be evenly distributed within the equipotential layer and will build up a new homogeneous potential surface for the following clay layer. The aim of the “sandwich-project” is to design and construct a new sealing system that guarantees the homogeneous moistening of a sealing bentonite core with the help of equipotential layers. The new barrier system, simply called 'sandwich', offers the advantage of being perfectly adaptable to the surrounding host rock. Potential permeability around the barrier system can be minimized that way. Also possible non-homogeneities within the barrier are adjusted. The penetration of a waterfront into the barrier will be homogenized due to its layer geometry and the sealing function of the clay liner. This supports a more homogeneous swelling process. This all will help to increase the long-term stability of the new barrier system.

The equipotential layer perfectly can be used as a carrier for a TDR Monitoring System. Theses TDR Sensors are robust and enable the moister detection in this barrier. Position and saturation of the waterfront can be determined by this patented sensor system. Beside this also changes in the pressure of the system can be detected and monitored. This method even is operational in dump-sites to control the changes in the pressure and water penetration.



Participant Profile

for the
Turkish-German Strategy Workshop 2006
TÜBİTAK Marmara Research Center,
Istanbul- Gebze Turkey
13 – 15 December 2006



International Bureau (IB)
of the Federal Ministry of
Education and Research
(BMBF)

I agree with the publication of my data on the Workshop website!

PLEASE FILL IN THIS FORM **UNTIL 22 SEPT. 2006** AND RETURN IT TO:

Internationales Buero des BMBF
s.krummacher@fz-juelich.de;
Christian.schache@dlr.de

TÜBİTAK-Marmara Research Center
Sunullah.Ozbek@mam.gov.tr;
Artac.Turker@mam.gov.tr