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FINAL REPORT

***Training Course on Remediation Technologies: New Trends
and Tools for Soil Decontamination”
IETU, Katowice, Poland
30 November - 4 December 1998***



UNIDO Contract No 98/263/IR

Katowice, 4 January 1999

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INTRODUCTION

The Training Course on „Remediation Technologies: New Trends and Tools for Soil Decontamination” held in the days of 30 November - 4 December 1998 in Katowice, Poland delivered within its 1998 Work Program by the International Center for Science and High Technology (ICS-Trieste, Italy) was designed to give an overview of pollution problems in the countries with economy in transition and provide for an improvement in their capacity to solve environmental issues through a an up to date review on remediation technologies and their application in specific context of the countries from the Region. The Training Course also focused on the economic aspects of innovative remediation technologies application as well as policy addressing pollution prevention and control and in general for an environmentally friendly industrial development

The scope of the Training Course and its detailed program was subject to discussions carried out between ICS and the Institute for Ecology of Industrial Areas while developing the training module and carrying out the recruitment of participants.

OBJECTIVES

The objectives of the training course were as follows:

- To train participants on management strategies (methodologies, techniques and practical expertise) developed and applied to solve the issues with soil pollution in different situations;
- To discuss the prospects for in-situ and ex-situ approaches to contaminated sites that restore the soil without unduly disturbing the soil profile, as well as to discuss economic aspects of technologies for remediation of polluted sites. To review, assess and collect updated information on remediation technologies and economics.
- To identify regional R&D institutions in developing countries and countries in transition through contacts established with the participants in the TC in order to establish an ICS Network for future co-operation.
- To evaluate possible follow-up project proposals of feasibility studies under the ICS co-ordination;

VENUE AND DATE

The Training Course was held at the Institute for Ecology of Industrial Areas in Katowice, Poland in the days of 30 November - 4 December 1998.

ORGANIZATION

The Training Course was jointly organized by the International Center for Science and High technologies (ISC) from Trieste, Italy and the Institute for Ecology of Industrial

Areas (IETU) from Katowice, Poland. IETU assumed the responsibility as contractor and hosting institution.

The Organizing Committee constituted of the following persons:

Prof. Jacek Łączny, IETU, Poland
 Prof. Ewa Marchwińska, IETU, Poland
 Dr Andrea Lodolo, ICS, Italy
 Ms. Grażyna Siobowicz, IETU, Poland
 Ms. Izabela Ratman-Kłosińska, IETU, Poland

The Training Course was chaired by Dr Andrea Lodolo, ICS and Prof. Ewa Marchwińska, IETU.

FUNDING

The Training Course was funded by UNIDO-ICS. The UNIDO-ICS contribution for this activity was set to be 37.000 USD

LECTURERS

12 lectures, 2 case studies, 1 exercise a one day demonstration projects site visit („Orzeł Biały - a brownfield site and Czechowice Oil Refinery - biopile demonstration site) were delivered by 11 lecturers, reported in Table 1.

Table 1. Lecturers' Countries of Origin

Country	Number of lecturers
Italy	1
Germany	1
USA	1
Bulgaria	1
United Kingdom	1
Poland	7

In order to provide the attendants with the most up to date trends in the world of bio/phytoremediation activities a group of professionals had been invited to the TC. They had been selected to have both scientific and practical approach to the subject of TC - being academic lecturers, scientists directly involved in bio/phytoremediation technologies development in their home countries and world wide. Lecturers coming from the leading institutions dealing with soil and water remediation had been asked to include relevant examples of successfully deployed cleanup technologies. In this way the participants had been believed to receive a detailed and complete professional view ranging from basic scientific research through applied research to governmental decision making and cost analysis.

Lecturers' institutional distribution in reported in Table 2.

Table 2. Lecturers' institutional distribution

Institution	Number of lecturers
Universities	2
R&D	7
Governmental agency	1
Foundation	1

A complete list of lecturers is presented in Annex 1.

PARTICIPANTS

Invitations and calls for applications were circulated through IETU local organizers and ICS contact persons. The selection of attendants was made by IETU organizers by means of evaluation of application forms. The education level of applicants ranged from M.Sc to Professor degrees.

The number of 19 applicants have been chosen according to their country of origin, background and currently performed activities. The applicants were to be selected only from the Central and Eastern European Countries and from the Russian Federation Region. The background had to cover sciences like chemistry, biotechnology, agriculture, soil science, soil microbiology, irrigation engineering, civil engineering. The number of native participants was limited to 5. Table 3 shows the countries and attendants selected for the TC in Katowice.

Table 3 Countries and attendants selected for the TC in Katowice.

Country	Number of participants
Albania	1
Belarus	1
Bulgaria	2
Lithuania	1
Poland	5
Russia	3
The Slovak Republic	2
Ukraine	2
Yugoslavia	2

Selection of attendants from different branches- science, governmental authorities, R&D institutions had been made similar to the variety of lecturers invited in order to enhance the possibility of a broad exchange of different experiences as well as better contribution to the goals of the TC. Table 4 presents the institutional distribution of attendants.

Table 4. Participants' Institutional Distribution

Institution	Number of participants
Universities	6
R&D	11
Governmental agencies	3

In thanks to financial contributions all participants were supported by UNIDO- ICS i.e. travel and full board. All participants were waived from registration fee.

All participants supported by UNIDO-ICS and lecturers were accommodated at a special rate in HOTEL WARSZAWA in Katowice. The organizers provided transportation to and from the hotel to the TC venue.

According to initial request of the ICS authorities the participants prepared and delivered 19 country presentations on topics concerning the TC subject. All presentations were submitted in hard copies to the IETU organizers.

A complete list of participants is presented in Annex 2.

PRINTED MATERIALS DISTRIBUTION

The attendants were provided all TC materials before and during the week of TC. The full set of materials contained:

All application documents i.e. application forms, Aide Memoire, accommodation request form

- Preliminary Agenda
- Hard copies of lecture materials were supplied shortly before or during lecture deliverance to the attendants
- List of participants and lecturers with full data: institution, address, telephone and fax
- certificates for TC completion
- Special interest printed information on participants' request.

TC AGENDA

IETU organizers in cooperation with ICS scheduled TC activities in a four days agenda. During the first day of the training the attendants made presentations about cleanup problems and technologies in their home countries. As a summary following this series of presentations a lecture on the regulatory and legal aspects of soil remediation in EU and CEE was delivered. Next day activities focused on the problems of soil contamination assessment and risk related to it. The lectures covered the subjects site characterization, data collecting and processing, monitoring of contaminated land, cleanup standards and risk assessment as a tool for guiding remediation of contaminated sites. The risk assessment lecture contained a case study carried out by the attendants. The third day of the TC participants spent on two site visits. The first site is located at Czechowice Oil Refinery. The refinery is approximately 100 years old and used the catalytic cracking process to refine crude

oil. The waste stream from the refinery process (a thick, viscous semi liquid) emptied into a series of lagoons. The lagoons contained several hundreds tons this heterogeneous waste product. The whole area is contaminated with petrochemicals. The bioremediation project successfully carried out by the Institute for Ecology of Industrial Areas in Katowice in cooperation with the Department of Energy of the United States demonstrates application of a biopile - a natural biochemical reactor which uses the ability of indigenous microbes to degrade the petrochemical contaminants in soil.

The other of the visited places is a brownfield site located in the area of a closed down zinc smelter „Orzeł Biały” on revitalization of which IETU has been closely cooperating with Environmental Protection Agency of the United States. The smelter site is situated between the towns of Bytom and Piekary Śląskie. The tradition of mining activities in that region goes back to the 19th century. The main minerals mined were zinc and lead ore, dolomite, silt and gravel. The zinc and lead ores were processed on-site as well. As a result of further development, housing estates interlace with the post-industrial installations, mining, processing and metal waste-dumps. Mining damage also causes deformations to the terrain and a lowering of the ground water level.

In 1989 mining was halted and put in liquidation. The smelter site occupies an area of 460 ha, with approximately 260 ha in the administrative boundaries of Bytom and 195 ha in Piekary Śląskie. The present-day work operates within 50 ha. Still working or liquidated plant sections are surrounded by a 1000 ha safety zone. Inside the site there are industrial installations, roads, waste dumps, water and residual reservoirs as well as waste lands.

The industrial buildings consist of production houses with detached technical installations, accessory and administrative service buildings, store-rooms (some of them abandoned) and the installations which are scrapped, dissembled, still in use or just abandoned. These installations are between 15 to 70 years old.

The present-day smelter is operating in an already contaminated surrounding. Especially important here is surface soil contamination and the physical elements including technical devices, mostly out of use or being on the edge of complete disrepair.

The agenda of the third day focused on remediation technologies both chemical and physical as well as bioremediation methods. Special attention was paid to phytoextraction as a promising technology for soil cleanup from heavy metals. During this day exercises were made by participants. Due to the fact that the first step in the application of any of the technologies is cost and benefit analysis the participants had a chance to learn about the economic portion of the decision making process related to a site redevelopment.

Day fifth was a continuation of remediation technologies discussion. Lectures were delivered on technologies for organic pollutants removal in Eastern Europe Countries. Also the redevelopment of sites degraded as a result of industrial activities was discussed. A presentation was made on the application of such tools as geographical Information System (GIS) for land recycling. The final part of the TC was a discussion on the problems of redevelopment of contaminated sites in the CEE countries.

Full agenda of the TC is presented in Annex 3.

SOCIAL EVENTS

A very strong integration among the participants characterized the TC from the very first day. An official opening dinner was organized on 30 November, 1998 in which participants, lecturers and organizers took part.

RESULTS

The main results can be summarized into the following points:

1. The first goal of the TC - to train participants on management strategies (methodologies, techniques and practical expertise) developed an applied to solve soil contamination issues in different situations was successfully performed. The attendants have been presented both scientific base and requirements for the application of bio- and phytoremediation technologies developed during recent years to cleanup and revitalize sites contaminated with heavy metals and organic pollutants. The lectures focused also on theoretical and decision making related aspects of soil cleanup like cleanup standards, "how clean is clean", economic aspects i.e. cost benefit analysis of technologies deployment as a step in the decision making process as well as legal and regulatory aspects.
2. Participants have received an up to date and concise information about technological, economic and regulatory aspects of technologies and their implementation through:
 - oral presentations delivered by lecturers and other materials
 - distribution of handouts and hardcopies of other materials related to presentations
 - discussion of various issues related to the principles of in situ remediation technologies implementation
 - distribution of handouts provided by the participants
3. The TC was carried out at a high scientific level conditioned by the presence of highly qualified scientists some of them world famous. Many efforts have been undertaken to invite appropriate experts coming from different countries in order to provide for a wide geographical representation of experience and knowledge in the field of remediation technologies. The distributed materials presented up to date information about bio and phytotechnologies for the cleanup of contaminated sites and helped the participants to learn about the state of art in this area of knowledge.
4. To the successes of the organization belongs the fact that the TC gathered a wide representation of the CEE countries - there representatives of 9 countries from the region. Additionally an important result of the training course was the establishment of relations and contacts between the participants. The TC promoted discussions between scientists and lecturers to achieve a more comprehensive understanding of the presented topics. The TC stimulated exchange of experiences, information and knowledge among governmental agencies, R&D centers and universities.
5. The TC agenda developed by IETU and ICS was fully realized. It seems worth mentioning that the participants attended all planned lecturers and site visits as well as actively contributed to the development of the agenda.

COMMENTS AND CONCLUSIONS

1. The subject of the TC selected by ICS turned out to be very urgent especially in the case of CEE countries and the New Independent States due to the undesirable heritage of heavy and chemical industry in the form of soil and groundwater contamination with heavy metals, toxic elements, radionuclides, organic pollutants such as petrochemicals, PAHs etc. For those countries as well as for the countries of Western Europe implementation of an appropriate effective technology to mitigate the problem of contaminated soil is a very urgent task. Among many, especially bio and phytoremediation technologies are worth paying attention to as they allow to eliminate the contamination in situ and in a cost effective way without doing much harm to the environment. The participants were convinced that the subject of the TC was very carefully chosen and meets the expectations and needs of the CEE and NIS countries.
2. The TC agenda and discussed items can be assessed as appropriate to meet the goal of the TC. The titles of lectures, exercises, site visits and distributed materials are closely associated with the main subject of the TC: remediation technologies - new trends and tools for soil decontamination. As a result the participants were introduced to the latest and most innovative achievements in *in situ* technologies development which may find or has already found application to cleanup operation.
3. The lectures and other materials presented contain an overview and description of main achievements in the field of remediation technologies which can be applied for remediation of metal and organic substances contaminated soils. The lecturers provided the participants with handouts covering the contents of the presentation as well as some supplementary data which the participants found very useful for the training process. As the collected written material of the TC in that lecturers' presentations, case studies, participant's presentations and others represents reliable and exhausting source of information it could become a tool for a wider spreading of knowledge on remediation technologies and their applications. For this purpose ICS-UNIDO collected and will make a compilation of all the presented materials in a special edition.
4. The results show that the delivery of the TC is an effective form of training scientists, especially young and exploration of knowledge concerning topical issues on environmental protection. Limited number of participants gave opportunity for open discussion on the topics presented at the lectures and allow the organization of the TC to face properly the needs and interests which emerged and which have been stimulated during the TC.
5. During the wrap up session the participants identified the following areas of regional interest:
 - Polycyclic Organic Pollutants (TC, Workshop, Project)
 - Heavy metals contamination
 - Petrochemicals contamination
 - network for phyto and bioremediation technologies
 - Environmental newsletter in internet
 - Information exchange - soil cleanup standards
 - Public interest, Public participation
 - Risk assessment, risk analysis, risk communication
 - Training course on environmental management

- Detergents contamination
6. The general strategy of having the widest possible geographical representation in the TC it is necessary to take into due consideration the time that has to be devoted to the advertising of the event to all interested institutions and industries.
 7. It seems also necessary to comment on the financial support of the TC. The organizers of the TC „ Remediation Technologies: New Trends and Tools for Soil Decontamination” consider the financial support of the TC sufficient to carry out the agenda and planned activities. The only remark concerns the consideration of an additional category in the budget i.e. development of training materials and its copying as the amount of money spent by the organizers on that category is very high exceeds the funding which the organizers were able to allocate for the TC organization purpose.
 8. As confirmed in the evaluation questionnaires, taking into account the positive judgment which occurs when they are fully sponsored, the general feeling of participants showed that the TC was considered useful, of appropriate level and well scheduled. Many of the participants expressed their interest in having further contacts with ICS and asked to keep them informed on its future activities.

FEEDBACK

As a whole the participants and the lecturers who took part in the TC assessed positively the Training Course. It is proved by the results of the evaluation forms summarized by ICS. This assessment concerns the organization, duration of the program, training facilities and others. The participants assessed the whole organization of the TC as „excellent” or „very good” including organization of the information dissemination process, quality of the scientific program, practical exercise and case studies. They evaluated as „excellent” and „very good” also the lecture hall used for the TC, the accommodation and meals. The participants considered the course materials as appropriate for the purposes of the TC and find the country and international lecturers as highly qualified experts in the field of remediation technologies. 79% of participants recommended similar TC to be organized in their countries.

All these evaluations can be considered as a proof that the TC was successful and useful for the participants.

Nearly all of them expressed their satisfaction of receiving latest information and knowledge on innovative developments in the area of remediation technologies which could be effectively utilized to address environmental contamination problems in their countries.

STATISTICS OF THE EVALUATION FORMS OF THE PARTICIPANTS IN THE COURSE

Submitted by ICS - Trieste after review of the evaluation forms.

A. ORGANIZATION

Chart A.2: Information process

Excellent: 21%, Very Good: 36%, Good: 22%, Fair: 14%; no answers: 7%

Chart A.3: Announcement and pre-course material
Excellent: 29%, Very Good: 14%, Good: 36%, Fair: 14%; no answers: 7%

Chart A.4: Quality of scientific programme
Excellent: 43%, Very Good: 43%, Good: 14%, Fair: 0%

Chart A.4.1: Applied lecture/workshop
Excellent: 36%, Very Good: 36%, Good: 28%, Fair: 0%

Chart A.4.2: Use of small working groups
Excellent: 7%, Very Good: 36%, Good: 21%, Fair: 29%; no answers: 7%

Chart A.4.3: Case studies
Excellent: 29%, Very Good: 29%, Good: 35%, Fair: 7%

Chart A.4.4: Time spent by lecturers in class and after class on specific questions/examples
Excellent: 0%, Very Good: 64%, Good: 37%, Fair: 0%

Chart A.4.5: Students scientific knowledge
Balanced: 79%, Unbalanced: 14%; no answers: 7%

B. DURATION OF PROGRAMME

Chart B.1: Number of days
Just right: 93%, Too long: 0%, Too short: 7%

Chart B.2: Length of working days
Just right: 100%, Too long: 0%, Too short: 0%

C. TRAINING FACILITIES & HOTEL

Chart C.1: Lecture/training rooms
Excellent: 50%, Very Good: 36%, Good: 7%, Fair: 0%; no answers: 7%

Chart C.2: Breaks/refreshments
Excellent: 43%, Very Good: 36%, Good: 14%, Fair: 0%; no answers: 7%

Chart C.3: Hotel accommodation
Excellent: 64%, Very Good: 14%, Good: 0%, Fair: 0%; no answers: 22%

Chart C.4: Meals at the hotel
Excellent: 57%, Very Good: 14%, Good: 7%, Fair: 0%; no answers: 22%

D. ORGANIZER'S RESPONSE TO PARTICIPANTS NEEDS
Excellent: 29%, Very Good: 50%, Good: 21%, Fair: 0%

E. OVERALL PROGRAMME ORGANIZATION

Excellent: 36%, Very Good: 36%, Good: 28%, Fair: 0%

F. RECOMMENDATION TO OTHERS FROM SAME INSTITUTE/COUNTRY TO ATTEND A SIMILAR COURSE

Yes: 79%, Maybe: 21%, No: 0%

G. EVALUATION OF LECTURERS AND SPEAKERS**Chart G.1: Course material**

Excellent: 43%, Very Good: 36%, Good: 14%, Fair: 7%

Chart G.2: Resident lecturer presentation

Excellent: 29%, Very Good: 42%, Good: 29%, Fair: 0%

Chart G.3: International lecturer presentation

Excellent: 54%, Very Good: 29%, Good: 7%, Fair: 0%

Chart G.4: Ability of lecturers to answer specific questions

Excellent: 22%, Very Good: 64%, Good: 14%, Fair: 0%

FINANCIAL REPORT

Table below shows the comparison of the expenditures planned according to the Budget Breakdown of the TC and the real expenses incurred for the organization and delivery of the course.. The exchange rate for USD in relation to zlotys was taken from an Official Exchange Rate of Polish National Bank Table No 247/98 of 18. Dec.1998

Table 5. Training Course on Remediation Technologies ,30.Dec - 4.Nov.98, IETU, Katowice, Poland

Category	Amount allocated in the budget USD	Equivalent in PLN	Detailed costs breakdown in PLN	Difference of amounts allocated and spent in PLN	Difference Equivalent in USD
Transportation	1500	5220	Transportation during the TC (transfer of participants lecturers to and from the hotel to the TC venue, transfer of lecturers from and to the railway station or airport of their arrival/departure, transportation for the site visit Total= 5742 PLN	+522-	+150
Accommodation and full board for 5 invited international lecturers	4200 USD	14616	17 nights + full board = 7099.2 1 night in Warsaw (prof. Atanassov) - 140 PLN Total= 7239.20 PLN	7.376.80	2120 USD
Accommodation and full board of 13 invited international participants	12.600 USD	43.848	78 nights in Hotel Warsaw plus full board = 30.995,8 2 nights + full board in IETU guest room (Mr. Gylfi) = 493.2 1 night in Hotel in Warsaw (Mr. Gylfi) - 142.68 PLN Total=31.631,68 PLN	12.216,32	3510 USD
Accommodation and full board of 6 participants from the country	8.400 USD	29.232	6 nights + full board = 2.505,60 (only 1 participant was accommodated in hotel). 25 x full boards = 2.665,00 Total=5170,60	24.061,40	6914 USD
Accommodation and board of 6 lecturers from the country	2520 USD	8769.60	none of the lecturers was accommodated in the hotel 30 full boards = =3198 zł	5.571,6	1601 USD
Travel of 5 invited international lecturers	4.000	13920	2426 USD= 8442,48 PLN 2267,16 PLN 125,60 DEM x 2,07=259,96 PLN Total =10969,6 PLN	2.950.4	847,8 USD
Travel of 13 invited international participants	3.000 USD	10440 PLN	348,38 PLN 1798 USD = 6257 PLN 219 DEM =453,3 PLN Total=7058,68 PLN	3.381,32	971,6 USD
Honorarium *	900 USD	3132 PLN	825 USD = 2871 PLN	261	75 USD
Total	37.120	129.177,60	73.880,76 PLN	55.296.84	15.890 USD

- The honorarium amount for individual speakers was determined on the basis of the length of the lecture using the following scale:

Total lectures duration	Honorarium
<1 h	25 USD
1→2 h	50 USD
2→3h	75 USD
3→4h	100 USD

All expenditures are supported by relevant documents - invoices, Official Statement of the Institute for Ecology of Industrial Areas justifying the expenses not supported by other documents, travel costs reimbursement and honorarium receipt sheets, copies of air and train tickets and other documents. Copies of these documents are Annex 4 to this Report. The total sum according to the UNIDO Contract No. 98/263/IR was sufficient to carry out the training and due to smaller than originally assumed number of participants and lecturers the difference of many received and spent will be returned to UNIDO.

ACKNOWLEDGEMENT

The program of the TC has been created and performed in close cooperation with ICS officials, especially Dr A. Lodolo and Dr M. Varvesi.

The Directors of The Institute for Ecology of the Industrial Areas, Katowice as well as IETU personnel contributed to the successful work of the TC by providing lecturers hall, equipment for presentations, copying the materials, providing means of transportation, food and coffee services.

The Local organizer of the TC would like to acknowledge the organizational and secretarial assistance provided by Ms. Grazyna Siobowicz, IETU, Katowice and Dr Marina Varvesi from ICS, Trieste.

ANNEX 1

Training Course on 'Remediation Technologies: New Trends and Tools for Soil Decontamination'
IETU, Katowice, Poland , 30 November - 4 December 1998.

List of lecturers

Surname	First Name	Country	Institution	Fax no.	Tel no.	E-mail
Atanassov	Ivan	Bulgaria	Agricultural University- Plovdiv, Dep. of Soil Science, 12 Mendeleev st. Plovdiv 4000, Bulgaria	+359 32 633 158	+359 2 633 158 +359 2 51 4629	lalka@au-plovdiv.bg
Atlas	Ronald	USA	University of Louisville, Life Science Bldg 139, Louisville, KY 40292	502 852 0725	502 852 8962	r.atlas@louisville.edu
Barbafieri	Meri	Italy	National Research Council of Italy, Institute of Soil Chemistry, Via Corridoni 78, 56125 Pisa, Italy	+39 50 500631	+39 50 500939	barbafieri@ict.pi.cnr.it
Lodolo	Andrea	Italy	ICS-UNIDO Area Science Park, Bldg L2, Padriciano 99, 34012 Trieste, Italy	+39 40 922 8115	+39 40 922 8112, +39 40 922 8110	alodolo@sci.area.trieste.it
McGrath	Steven	UK	IACR-Rothamsted, Harpenden, Herts, AL5 2JQ, UK	+44 1582 760 981		steve.mcgrath@bbsrc.ac. uk
Terytze	Konstantin	Germany	Federal Environmental Agency and Free University of Berlin, Postfach 330022, 14191 Berlin Germany	004930 89032285	004930 89032351	
Korczyk	Marek	Poland	Instytut Ekologii Terenów Uprzemysłowych, ul. Kossutha 6. 40-833	+48 32 254 1717	+48 32 254 6031	

			Katowice, Poland			
Kucharski	Rafał	Poland	Instytut Ekologii Terenów Przemysłowych, ul. Kossutha 6, 40-833 Katowice, Poland	+48 32 254 1717	+48 32 254 6031	ietu@ietu.katowice.pl
Poborski	Piotr	Poland	Instytut Ekologii Terenów Przemysłowych, ul. Kossutha 6, 40-833 Katowice, Poland	+48 32 254 1717	+48 32 254 6031	ietu@ietu.katowice.pl
Sas- Nowosielska	Aleksandra	Poland	Instytut Ekologii Terenów Przemysłowych, ul. Kossutha 6, 40-833 Katowice, Poland	+48 32 254 1717	+48 32 254 6031	ietu@ietu.katowice.pl
Weisło	Eleonora	Poland	Instytut Ekologii Terenów Przemysłowych, ul. Kossutha 6, 40-833 Katowice, Poland	+48 32 254 1717	+48 32 254 6031	ietu@ietu.katowice.pl
Worsztynowicz	Adam	Poland	Instytut Ekologii Terenów Przemysłowych, ul. Kossutha 6, 40-833 Katowice, Poland	+48 32 254 1717	+48 32 254 6031	ietu@ietu.katowice.pl

ANNEX 2

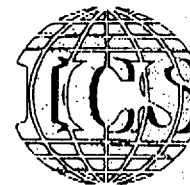
Training Course on 'Remediation Technologies: New Trends and Tools for Soil Decontamination'
IETU, Katowice, Poland, 30 November - 4 December 1998.

List of participants

Surname	First Name	Country	Institution	Fax no.	Tel. no.	E-mail
Bojinova	Paunka	Bulgaria	Agricultural Academy, Institute of Soil Science and Agroecology, 1080 Sofia, Bulgaria	359 2 242297	359 02 268110	
Bronder	Joachim	Poland	Instytut Ekologii Terenów Uprzemysłowionych, ul. Kossutha 6, 40-833 Katowice, Poland	+48 32 254 1717	+48 32 254 6031	ietu@ietu.katowice.pl
Ginzbourg	Lev Natanovich	Russia	Institute of Mineralogy, Geochemistry and Crystal Chemistry of Rare Elements 15 Veresaeva st., Moscow 121357 Russia	095 443 9043	095 444 2587	krem@imgre.iitp.ru
Gjylh	Gazmend	Albania	Institute of Chemical Technology Blloku „Vasil Shanto” Tirana Albania	355 42 234 66	355 42 27520	
Gorgoń	Justyna	Poland	Biuro Programu SCP, Katowice, ul. Warszawska 4	253 9209	253 9210	
Iwaszenko	Sebastian	Poland	Instytut Ekologii Terenów Uprzem. ul. Kossutha 6, 40- 833 Katowice, Poland	+48 32 254 1717	+48 32 254 6031	ietu@ietu.katowice.pl
Izosimova	Aleksandra	Russia	Agrophysical Institute, Gusarskaya ul.9 198620 St. Petersburg Pushkin, Russia	7 812 465 5877 7 812 130 4298	7 812 465 5870	iamfe@minim.spb.ru
Kremenetskiy	Alexander	Russia	Institute of Mineralogy,	095 443 9043	095 443 8428	krem@imgre.iitp.ru

	Alexandrovich		Geochemistry and Crystal Chemistry of Rare Elements 15 Veresaeva st., Moscow 121357 Russia			
Krsmanovic	Vojin	Yugoslavia	University of Belgrade, Faculty of Chemistry, Studentski trg 16 P.O. Box 158, 11001 Belgrade, Yugoslavia	381 11 638 785	381 11 3282 111 ext.720	vobel@helix.chem.bg.ac.yu
Malakhov	Igor Nikolaevich	Ukraine	National Ecological Center of Ukraine, Branch in Kryvey Rig Pershotravneva 12, Ecocentre-K 324099 Kryvey Rig, Ukraine	38 0564 283078	38 0564 297331	malakhov@ecok.freenet.kiev.ua
Malysheva	Lyudmila	Ukraine	Kiev Univesity, Faculty of Geography, Vasilkovskaya st. 90, 252022 Kiev The Center of Ecological Monitoring of Ukraine of Ministry, Prospect Glushkova 2a, 252127 Kiev, Ukraine		38 044 266 2074 38 044 266 6403 38 044 228 7343	ecoedu@mep.freenet.kiev.ua
Micuda	Richard	Slovakia	Soil Fertility Research Institute Mladeznicka 36, 974 05 Banska Bystrica, The Slovak Republic	00421 88 4230473	00421 88 4135272	vupu@istenet.sk
Murin	Martin	Slovakia	Ekotoxikologicke Centrum Bratislava s.r.o. 90028 Ivanka pri Dunaj, The Slovak Republic	421 7 459 43712	421 7 459 45223	etcba@glinet.sk
Panek	Andrzej	Poland	Urząd Miejski, Wydz. Ekologii ul. Parkowa 2, Bytom, Poland	815875		
Piechowiak	Krzysztof	Poland	Politechnika Poznańska, Instytut Technologii i Inżynierii Chem.	061 - 831 3349	061 -831 3388	olszan@fct.put.poznan.pl

			Pl.M.Curie-Skłodowskiej 2. 60-965 Poznań			
Pigoulevski	Mikhail	Belarus	Belarussian State Polytechnical Academy, 220027 Minsk, Belarus	375 17 232 7426	375 17 232 7426 375 17 251 1439	
Siwek	Andrzej	Poland	Ośrodek Badań i Kontroli Środow. ul. Owocowa 8 Katowice, Poland	597030		
Skrbic	Biljana	Yugoslavi a	University of Novi Sad, Faculty of Technology, Bulevar Cara Lazara 1, 21000 Novi Sad, Yugoslavia	381 21 450413	381 21 450288	biljana@tehnol.ns.ac.yu
Taraskevicius	Ricardas	Lithuania	Institute of Geology, 13 T.Sevcenkos st. 2600 Vilnius Lithuania	370 2 236 710	370 2 236 016	ricardta@geologin.lt
Vassileva	Valentina Iordanova	Bulgaria	Ministry of Environments and Waters 136 „Tsar Bouris III” blv. PO BOX 251, Sofia 1618, Bulgaria	359 2 955 9015	359 2 47 4803	ncesd@nfp_bg.eionet.e u.int



Annex 3

AGENDA

TRAINING COURSE

Remediation Technologies: New Trends and Tools for Soil Decontamination

IETU, Katowice, Poland

30 November – 4 December 1998

30 November (Monday)

- | | |
|---------------|--|
| 8:15 | Meeting in hotel lobby, transfer to the Institute |
| 8:40 - 9:30 | Registration at the conference venue |
| 9:30-9:40 | Course opening Prof. Jacek Łączny, IETU Director |
| 9:40-10:00 | Opening comments |
| | ICS activities in the within the subprogramme of remediation - Dr. Andrea Lodolo -ICS, Italy |
| | IETU activities in the area of remediation and redevelopment of contaminated sites - Prof. Ewa Marchwińska, IETU, Poland |
| 10:00-11:30 | Short presentation of all participants |
| 11:30-11:40 | Break |
| 11:40-13:00 | TC participant's presentations |
| 11:40 - 11:50 | A. Izosimova „Reduce of heavy metals and plant remediation of soils polluted by wastes in St. Petersburg Region |
| 11:50 - 12:00 | A. Panek Short characteristics of waste disposal and soil pollution in the City of Bytom |
| 12:00 - 12:10 | Gazmend Gjyli „Outline of chemicals contamination in Albania” |
| 12:10 - 12:20 | Mikhail Pigoulevski - management systems of remediation technologies for Belarus |

- 12:20 - 12:30 Andrzej Siwek - „ Polish standards for organic compounds in soil and methods of determination
- 12:30 - 12:40 Paouka Bozjinova - „Investigation of the harmful industrial impact on the environment and basic projects for solving some ecological problems”
- 12:40 - 12:50 Biljana Skrbic - „Identification of hydrocarbon contaminants in arable soil from view of bioremediation process
- 12:50 - 13:00 Vojin Krsmanovic - Environmental problems in Yugoslavia: Project Kalemegdan Park as an example
- 13:00-14:00 Lunch
- 14:00-15:50 TC participant's presentations - continuation
- 14:00 - 14:10 Ricardas Taraskevicius - Pedogeochemical investigations of urbanised areas in Lithuania
- 14:10 - 14:20 - Lev Ginsbourg/A Kremenetsky: Ecoscan a computer based technology for estimation of antropogenic pollution
- 14:20 - 14:30 - Martin Murin - Remediation - legislative base and practice in the Slovak Republic
- 14:40 - 14:50 Igor Malakhov - Risk management instrument for long-term bioremediation projects
- 14:50 - 15:00 Joachim Bronder:- The analysis of soil Cd. and Pb over small areas for Phytoremediation purposes
- 15:00 - 16:00 Other presentations
- 15:50-16 00 Break
- 16:00-16:30 Regulatory and legal aspects of soil remediation in EU and CEE – soil definition, standards for heavy metals and organic contaminants, target and intervention values, land use) (Dr P..Poborski, RACE, Poland)
- 17:00 - 18:30 Dinner

1 December (Tuesday)

Assessment of soil contamination

- 9:00-11:30 Site characterisation, site description, and data collecting and sampling strategies. – Prof. Ivan Atanassov , Agricultural University of Plovdiv, Bulgaria
- 11:30-11:40 Break
- 11:40-13:00 Monitoring of land contaminated by agrochemical pollutants - Prof. Dr Konstantin Terytze, Umweltbundesamt, Free University of Berlin, Germany
- 13:00-14:00 Lunch
- 14:00-15:00 Results obtained in harmonising soil investigation methods - Prof.Terytze Umweltbundesamt, Free University of Berlin, Germany
- 15:00-16:30 Risk assessment as a tool for guiding remediation of contaminated sites (Eleonora. Wcislo, IETU, Poland)

2 December (Wednesday)**Site visits**

- 9:00-13:00 Czechowice - Oil Refinery (biopile + presentation of sampling and monitoring)
- 13:00-14:00 Lunch
- 14:00-16:00 „Waryński” Zinc Smelter -a brownfield example

3 December (Thursday)**Remediation technologies**

- 9:00-10:30 Remediation of heavy metal contaminated sites: chemical and physical technologies - Dr.Meri Barbaferi Institute of Soil Chemistry C.N.R., Italy
- 10:30-12:00 Promising remediation technologies for the decontamination of heavy metals polluted sites - Prof.Steven McGrath, IACR, United Kingdom
- 12:00-12:15 Break
- 12:15-13:00 Phytoextraction – field experiments performed in Poland (Prof. Rafał Kucharski , Dr Sas Nowosielska)
- 13:00-14:00 Lunch

14:00-15:00 Bioremediation – activities performed in Czechowice Refinery from practice to theory Dr. Adam.Worsztynowicz, IETU, Poland.

15:00-15:15 Break

15:15-16:30 Cost/benefit analysis as a step in decision-making process - Dr Piotr. Poborski, RACE, Poland)

4 December (Friday)

Remediation technologies

9:00-13:00 State-of-the-art remediation technologies concerning organic contaminants in Eastern European countries (Prof.Ronald Atlas, University of Louisville, USA)

13:00-14:00 Lunch

14:00 - 14:30 Redevelopment of heavy metal contaminated sites - „Waryński” Zinc Smelter - Prof. Rafał Kucharski

14:30 - 15:00 Industrial and postindustrial sites - examples of GIS application - Mr. Marek Korcz, IETU, Poland

15:00 - 16:00 Discussion on the problem of redevelopment of sites contaminated in the Countries of Central and eastern Europe.

16:00 - 16:15 Break

16:15 - 17:00 Training wrap-up session

17:00 - Adjourn

Annex 4**Financial documents**

- a) Official Financial Statement of IETU
- b) Invoice from the hotel
- c) copies of air/train tickets of international lecturers
- d) copies of air/train tickets of participants
- e) travel costs reimbursement and lecturers honorarium sheet. The travel costs were recalculated to USD using the official exchange rate for November 1998 used by UNIDO.
- f) corrective invoice from IETU



**Instytut Ekologii Terenów
Uprzemysłowionych
Katowice**
**Institute for Ecology of Industrial
Areas**

Ref. No. 14/22/99

Katowice, 4 January 1999

Purchase and Contracts Section,
General Services Branch/AFC Field
Operations and Administration Division,
UNIDO, P.O. Box 300, A-1400 Vienna, Austria

Reference: *Provision of services relating to the Training Course on „Remediation Technologies: New Trends and Tools for Soil Decontamination”, UNIDO Contract No: 98/263*

Official Financial Statement

This document serves to state all the costs specified in the TC budget in categories other than the costs of the hosting institution which the Institute for Ecology of Industrial Areas incurred in connection to provision of services relating to the Training Course on „Remediation Technologies: New Trends and Tools for Soil Decontamination”, held in IETU Katowice, Poland in the days of 30 Nov. - 4 Dec. 1998. And which are not supported by relevant invoices.

Specification of costs:

Transportation (as specified in Table 5 of the Final Report) -	1650 USD
Accommodation of Mr. Gylli in IETU guest rooms - 2 nights	80 USD
Meals for participants and lecturers during the TC	4840 USD
Total:	6570 USD

Persons authorized to administer the funds under this contract:


Mrs. Maria Solorz
General Accountant


Prof. Jacek M. łączny
IETU Director

Institute for Ecology of Industrial Areas, 6 Kossutha Street, 40-833 Katowice, Poland

tel.: +48 32 254 60 31 fax: +48 32 254 17 17 e-mail: ietu@ietu.katowice.pl

identyfikator 271590804
 INSTYTUT EKOLOGII TERENÓW UPRAZEMYSŁOWIENYCH
 40-832 Katowice, ul. Koszutha 6
 tel. 2546-031, 2540-164 fax 2541-717

List of lecturers

Surname	First Name	Country	Passport no.	Money	USD/DEM,zł/	Honorarium	Total USD /DEM, zł/	I hereby certify the receipt of the amount due specified in the previous column
Atanassov	Ivan	Bulgaria	0797603	476 USD + 140 zł	476 USD + 140 zł	75 USD	551 USD + 140 zł	
Atlas	Ronald	USA	150993737	627 + 145 + 35 USD	807 USD	125 USD	932 USD	
Barbaferi	Meri	Italy	3257742	121,76 zł	121,76 zł	50 USD	50 USD + 121,76 zł	
McGrath	Steven	UK	014685142	687,30 GBP	1143 USD	75 USD	1218 USD	
Terytze	Konstantin	Germany	2455038429	125,60 DEM	125,60 DEM	75 USD	75 USD + 125,60 DEM	


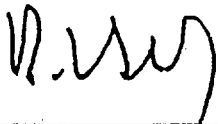

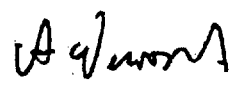
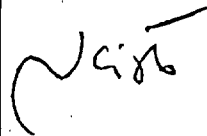

List of participants

Surname	First Name	Country	Passport no.	Travel expenses in original currency	Exchange Rate USD/DEM	Total USD /DEM, zł/	I hereby certify the receipt of the amount due specified in the previous column
Bojinova	Paunka	Bulgaria	K 3780717	82,62 DEM, 600 DIN, 264014 lewa	82,62 DEM + 60,18 USD + 162,47 USD	82,00 DEM + 223 USD	
Ginzbourg	Lev	Russia	43 N4892862	190 USD, 79,84 zł	190 USD + 79,84 zł	190 USD + 79,84 zł	
Gjyli	Gazmend	Albania	0322693	241 USD, 87,84 zł	241 USD + 87,84 zł	241 USD + 87,84 zł	

Izosimova	Aleksandra	Russia	44 No 5783563	2249,20 rubli, 11,00 zł	134,93 USD + 11,00 zł	135 USD + 11,00 zł	<i>Ukrainian</i>
Kremenetsky	Alexander	Russia	50 No 0009421	190 USD, 79,84 zł	190 USD + 79,84 zł	190 USD + 79,84 zł	<i>[Signature]</i>
Krsmanovic	Vojin	Yugoslavia	000986783	32,34 USD, 1021 DIN	32,34 USD + 102,41 USD	135 USD	<i>[Signature]</i>
Malakhov	Igor	Ukraine	AC.554275	448,40 grn (Ukr)	130,73 USD	131 USD	<i>[Signature]</i>
Malysheva	Lyudmila	Ukraine	AE 397106	293 grn (Ukr)	85,42 USD	85 USD	<i>[Signature]</i>
Micuda	Richard	Slovakia	2660862	640 SK	17,83 USD	18 USD	<i>[Signature]</i>
Murin	Martin	Slovakia	2650869	2674 SK	74,51 USD	75 USD	<i>[Signature]</i>
Piechowiak	Krzysztof	Poland		27,22 zł	27,22 zł	27,22 zł	<i>[Signature]</i>
Pigoulevsky	Mikhail	Belarus	MP 0353461	32 USD, 2250 tys.rubli (Bielrus), 87,98 zł	32 USD + 39,82 USD + 87,98 zł	72 USD	<i>[Signature]</i>
Skrbic	Biljana	Yugoslavia	000171319	55,08 DEM, 978 DIN	55,08 DEM + 98,09 USD	55,10 DEM + 98 USD	<i>[Signature]</i>
Taraskevicius	Ricardas	Lithuania	LG 839734	92 lity, 89,84 zł	23 USD + 89,84 zł	23 USD + 89,84 zł	<i>[Signature]</i>
Vassileva	Valentina Iordanova	Bulgaria	0164131	82,62 DEM, 600 DIN, 264014 lewa	82,62 DEM + 60,18 USD + 162,47 USD	82,00 DEM + 223 USD	<i>[Signature]</i>

identyfikator 271590804
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 40-832 Katowice, ul. Koszyna 6
 tel. 2546-031, 2540-164 fax 2541-717

Honorarium Sheet for Country Lecturers

Family name	Name	Country	Institution	Honorarium	I hereby certify the receipt of the honorarium
Korcz	Marek	Poland	Instytut Ekologii Terenów Uprzemysłowionych, ul. Kossutha 6, 40-833 Katowice, Poland	50 USD	
Kucharski	Rafał	Poland	Instytut Ekologii Terenów Uprzemysłowionych, ul. Kossutha 6, 40-833 Katowice, Poland	100 USD	
Poborski	Piotr	Poland	Instytut Ekologii Terenów Uprzemysłowionych, ul. Kossutha 6, 40-833 Katowice, Poland	75 USD	
Sas-Nowosielska	Aleksandra	Poland	Instytut Ekologii Terenów Uprzemysłowionych, ul. Kossutha 6, 40-833 Katowice, Poland	50 USD	
Wcisło	Eleonora	Poland	Instytut Ekologii Terenów Uprzemysłowionych, ul. Kossutha 6, 40-833 Katowice, Poland	50 USD	
Warsztynowicz	Adam	Poland	Instytut Ekologii Terenów Uprzemysłowionych, ul. Kossutha 6, 40-833 Katowice, Poland	100 USD	

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 INSTYTUT EKOLOGII I UPRZEMYSŁOWIENIA
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 tel. 2546-031, 2540-164 fax 2541-717

FLY AWAY TRAVEL
 SP. Z O.O.
 00-042 WARSZAWA, ul. Nowy Świat 54/56
 Tel. 26 24 85

Adres: **UL. KOSSUTHA 6**
40-855 KATOWICE
 NIP: _____
 REGON: _____

Rachunek uproszczony
 Nr **686/98**

Data: sprzedaży, wykonania usługi, wydania towaru, wpłaty zaliczki: **18.11.98**

Lp.	Nazwa i charakterystyka przedmiotu sprzedaży (SWW, KU, KOB)**	Jedn. miary	Ilość	Cena jednostkowa netto		Wartość sprzedaży netto		VAT			Wartość sprzedaży brutto	
				zł	gr	zł	gr	stawka %	kwota		zł	gr
1	2	3	4	5	6	7	8	9	10	11	12	
1.	055509782586(6700)	slt	1	2067,00		2067,00		0	-	-	2067,00	
2.	Tax (671010)	slt	1	223,09		223,09		0	-	-	223,09	

Instytut Ekologii Terenów Przemysłowych
 Wpłynęło dnia **26.11.98** r.
 Nr **2382** dat. na ark.

100 - 100 - 100 - 2 145,40
 686

BRE S.A. O/Warszawa
 11401010-00-29394637113
 -PLNCURR01-56

Data zapłaty do 7 dni od daty wystawienia
 sposób zapłaty: **Przelew**
 Razem: **2145,40**
 Robot 7% - 144,64

KASJER LOTNICZY
Suba
Barbara Subotowicz

* Niepotrzebne skreślić.
 ** Uwaga! Nr SWW, KU lub KOB podaje się tylko w przypadku stawki VAT niższej niż 22%.
 • Umieszczenie na rachunku stawki 17% stawki stawki VAT 22% przy zaniechaniu ustalenia i wykazy poniesić VAT w całości przewyższając: 17% podstawy opodatkowania.

w tym:	Zw.		
	22%		
	17%*		
	7%		
	0%		
2145,40			2145,40

Słownie: **Dwatisięce czterdzieści pięć złotych i czterdzieści groszy.**

Invoice for the purchase
 of air ticket for
 Dr. Meni Barbara Fieri

**HOTEL ORBIS „WARSZAWA”**

40-202 KATOWICE, Al. Roździeńskiego 16

Katowice, 04.01.99

Instytut Ekologii Terenów
Uprzemysłowionych
Ul. Koszutha 6
40-832 Katowice

Szp. Ratman - Kłosiniska
nr fax: 2541717

Zgodnie z Państwa prośbą przesyłamy szczegółowe zestawienie
Państwa gości, mieszkających w naszym hotelu w terminie 29.11-05.12.98.

Nr rachunku	Nazwisko	Nr pokoju	Termin pobytu	Kwota
30829	BILJANA SKROBIC	214	29.11-05.12	1866,00
	VOJIN KRSMANOVIC	212		1866,00
30828	KRZYSZTOF PIECHOWIAK	309	29.11-05.12	1866,00
	LEV GINZBOURG	204	30.11-04.12	1555,00
	ALEKSANDER KREMENETSKY	205	30.11-04.12	1555,00
30827	LYUDMILA MALYSHEVAJW	207	29.11-05.12	1866,00
30826	IGOR MALAKOV	206	29.11-05.12	1866,00
	+ TELEFON			0,70
30825	ALEKSANDRA IZOSIMOWA	402	29.11-05.12	1866,00
30824	RICARDES TARASKEVICIUS	925	29.11-05.12	1866,00
30811	RICARD MICUDA	203	30.11-05.12	1555,00
30804	VALENTINA VASSILIEVA	408	30.11-05.12	2155,00
	PAUNKA BOJNOWA			
30803	RONALD ATLAS	306	03.12-05.12	622,00
30842	GAZMED GJYLI	714	30.11-05.12	1555,00
30782	MUKHAIL PIGOULEVSKI	9023	30.11-05.12	1555,00
30871	MERI BARBAFIERI	315	29.11-06.12	2177,00
	MUVIN	317	29.11-04.12	1555,00
	MCGRATH STEVEN	411	01.12-04.12	933,00
30418	KONSTANTIN TERYTZE	310	29.11-02.12	933,00
30417	IWAN ATANASSOV	614	30.11-02.12	622,00
	TOTAL			29834,70

Z poważaniem

Anna Malik
Anna Malik
Business Centre

Beata Rogowska
Beata Rogowska
Business Centre

Adres do korespondencji: skrytka pocztowa 200, 40-951 Katowice 2

Tel. 48 (32) 200-4444 ; 200-4454
Fax: 48 (32) 200-4411 ; 200-4412
Telex: 315747/748
e-mail: info@hotelwarszawa.pl
NIP 954-00-05-502
Nr konta: BH S.A. O/Katowice 10301159-03870201

Zarząd:
"ORBIS" S.A. w Warszawie ul. Bracka 16,
00-028 Warszawa
Sąd Rejonowy M. St. Warszawy RHB 25134
Kapitał akcyjny 82.184.016 zł
Zarząd: M.O. Grotowski, K.A. Gerula,
A.B. Szudrzyński, I.A. Węgliński, L. Mielaszko



**Instytut Ekologii Terenów
Uprzemysłowionych
Katowice
Institute for Ecology of Industrial
Areas**

Katowice, 2. Dec. 1998

Konstantin Terytze, Germany

Lecturer

I hereby certify the receipt of 75 (seventy five) USD honorarium for lecturing during the ICS Training Course : „ Remediation technologies: New Trends and Tools for Soil Decontamination organized in Katowice, Poland in the days of 30 November - 4 December 1998 as well as 125,60 DEM (one hundred twenty five, 60/100 DEM) reimbursement of my train ticket.

Signature.....

Konstantin Terytze

Institute for Ecology of Industrial Areas, 6 Kossutha Street, 40-833 Katowice, Poland

tel.: +48 32 254 60 31 fax: +48 32 254 17 17 e-mail: ietu@ietu.katowice.pl



**Instytut Ekologii Terenów
Uprzemysłowionych
Katowice**
**Institute for Ecology of Industrial
Areas**

Katowice, 2. Dec. 1998

Ivan Atanassov, Bulgaria
Lecturer

I hereby certify the receipt of 75 (seventy five) USD honorarium for lecturing during the ICS Training Course : „ Remediation technologies: New Trends and Tools for Soil Decontamination organized in Katowice, Poland in the days of 30 November- 4 December 1998 as well as 476 (four hundred seventy six) USD reimbursement of my air ticket and 140 (one hundred forty) PLN for the one night accommodation in Warsaw.

Signature.....

Institute for Ecology of Industrial Areas, 6 Kossutha Street, 40-833 Katowice, Poland

tel.: +48 32 254 60 31 fax: +48 32 254 17 17 e-mail: ietu@ietu.katowice.pl