

Welcome to SWEMP

Sixteenth International Symposium on Mine Planning and Equipment Selection (MPES2007) and the Tenth International Symposium on Environmental Issues and Waste Management in Energy and Mineral Production (SWEMP2007)

December 11-13, 2007, Royal Orchid Sheraton Hotel & Towers, Bangkok, Thailand

Dear Colleagues,

At SWEMP over 100 papers will be presented over a three-day period. Abstracts accepted represent a wide range of Environmental issues and disciplines. These papers have been classified into Seven topics titled as follows.

1. Environmental Impacts, Emission Control & Greenhouse Gas Abatement
2. Remediation of Contaminated Soil and Groundwater
3. Mine Site Closure and Rehabilitation
4. Mining, Minerals & Environment
5. Chemistry, Control, Treatment of Effluents from Mineral Processing, Metallurgical and Chemical Plants
6. Emerging Technologies
7. Recovery of Useful Components from Industrial Waste

Our plenary session, luncheon and banquet speakers are leaders in their own fields. These few pages provide you with their biographies and a summary of the technical program.

For further details please consult the symposium website at <http://www.mpes-cami-swemp.com/>

Yours truly

Dr. Raj Singhal

TECHNICAL PROGRAM

TUESDAY, DECEMBER 11, 2007
BALLROOM 1

9:00-12:40 **JOINT PLENARY SESSION; MPES/SWEMP 2007**

Introduction **Dr. Raj K. Singhal**

9.00-10:40 **Chairs:** **Professor Raimondo Ciccu**
 University of Cagliari, Italy

Speakers; **Ir. MM.Winardi**
 Senior Vice President, Pongkor Gold mine-
 Gold Business Unit-PT ANTAM Tbk, Indonesia

Mr. Guntis Pukitis
 State Secretary of Ministry of Environment, Republic of Latvia

Professor Vladimir Kebo
 Vice –rector, Technical University of Ostrava

V.S. Rao
 Managing Director, VBC Industries Ltd, India

Dr. Adam P. Jarvis
 University of Newcastle,U.K

10:40-11:00 **Coffee Break**

11:00-12:40 **Chairs:** **Professor Richard Poulin**
 University of Laval, Canada

Speakers: **Dr. Marie Vrbova**
 Partner, R-PRINCIP Most Ltd, Czech Republic

Professor Sevket Durucan
 Imperial College, London

Professor Uday Kumar
 University of Lulea, Sweden

Professor Zhenqi Hu
 China University of Mining & Technology (Beijing)

Professor Y. Paul Chugh
 Southern Illinois University, USA

12:45-13:50 **Lunch**

Lunch Speakers: **Professor Per Nicolai Martens**
 RWTH Aachen University, Germany

Introduced By: **Prof. George N Panagiotou**
 National Technical University of Greece

TUESDAY, DECEMBER 11, 2007
RIVERSIDE # 4 ROOM

14:00-15:30 **Session 1 – Environmental Impacts, Control of Greenhouse Gas Abatement**
Chair: Dr. Richard L. McNearny, U.S.A.

1. Asian Prospects of Coalbed Methane as a Clean Energy Resource
Sohei Shimada (The University of Tokyo), Japan
2. Environmental Impacts of Artisanal and Small Scale Gold Mining in Developing Countries
Ernest Baafi (University of Wollongong) and Kaepae Ken Ail, (Papua New Guinea University of Technology), Australia
3. Lifecycle Carbon Dioxide Emission by Nickel Recovery from Wastes
Masayuki Sagisaka, Onoye Toshio, Tashiro Kyoichi, Kobayashi Kensuke, Thara Kiyotaka, Kitamura Osamu (National Institute of Advanced Industrial Science and Technology), Japan
4. Sustainability in Industrial Small Scale Mining
Nicolai Martens, Jose Pateiro-Fernandez and Simon Speer (RWTH Aachen University), Germany

15:30-16:00 **Coffee Break**

16:10–17:30 **Session 2 - Environmental Impacts, Control of Greenhouse Gas Abatement**
Chair: Dr. Lidia Gawlik, Poland

1. Developing Environmental Concepts for Vietnamese Coal Mines
Katrin Broemme, Harro Stolpe, and Mien Tran (Bochum University), Germany
2. Comparative Application of Environmental Bonding in Mining
R. Poulin and M. Jacques (Université Laval), Canada
3. The Contribution of Industrial Minerals to the Reduction of Environmental Impacts of Abrasive Blast - Cleaning
Dimitris Labrakis and D. Kaliampakos (National Technical University of Athens), Greece
4. Alternative Ways for Greenhouse Gas Abatement of Electric Industry in Korean Energy Policy
Young Eal Lee and Young-Beom, Jung (Korea Electric Power Research Institute), Korea

19:00-21:00 Reception – Embassy Garden

TUESDAY, DECEMBER 11, 2007
RIVERSIDE # 3 ROOM

14:00-15:30 **Session 3 -** **Mine Site Closure and Rehabilitation**
Chair: Dr. Suzan Oelofse, South Africa

1. In Situ Soil Remediation with HP Waterjet
Raimondo Ciccu, Battista Grosso, Marco Cigagna, and Paolo Tronci (University of Cagliari)
2. Sandpit Lakes as a New Ecosystems in the Trebon Basin Biosphere Reserve
Olga Křiváčková (University of South Bohemia in České Budějovice) and Hana Čížková (Institute of Systems Biology and Ecology), Czech Republic
3. Evaluation of the Vegetation Function in the New Landscape Units After Brown Coal Mining
Hana Broumová, Kateřina Novotná, and Emilie Pecharová (University of South Bohemia in České Budějovice), Czech Republic
4. Metal Balance in Thermal Treatment of CCA-Contaminated Soils
Reima Rönkkö, Désirée Nordmark, Jurate Kumpiene Lale Andreas & Anders Lagerkvist, (Luleå University of Technology), Sweden

15:30-16:00 **Coffee Break**

16:10–17:30 **Session 4:** **Mine Site Closure and Rehabilitation**
Chair: Ms. Ge Hao, China
Professor Kostas Fytas, Canada

1. Stakeholder Participation in Post-Closure Land Use Decision Making
Stefan Rutkowski and Fred Claridge (Worley Parsons Komex), Indonesia and Canada
2. Eco-Environmental Damage Evaluation for Resource-Exhausted Coal Mining Area Based on GIS- A Case Study in MTG District, China
Hu Zhenqi and Wang Linlin (China University of Mining and Technology), China
3. Fly Ash Utilization at Mine Reclamation
Petr Šašek, Pavel Schmidt, and Jiri Mann (Brown Coal Research Institute. j.s.c.), Czech Republic
4. A Case Study of an Active Landslide During the Post-Coal Mining Reclamation and Forestation Processes
Nuray Tokgoz (Istanbul University, Faculty of Engineering), Turkey

19:00-21:00 **Reception – Embassy Garden**

TUESDAY, DECEMBER 11, 2007
RIVERSIDE # 2 ROOM

14:00-15:30 **Session 5 -** **Environmental Issues in Tailings Disposal, Geotechnical Structures and Acid Mine Drainage**
Chair: Professor Ferri Hassani, Canada

1. Chatree Gold Mine Tailings Storage Facility Rehabilitation Study
Fiona Tromans, Yaowanud Chundung and Thananan Pratummin (AustralAsian Resource Consultants Pty Ltd.), Australia
2. Passive Treatment of Highly Contaminated Acid Mine Drainage in Batch and Column Bioreactors
Gerald J. Zagury, Carmen Neculita and Bruno Bussière (Ecole Polytechnique de Montréal), Canada
3. Research on 3-Dimensional Laser Scanner System Monitoring the Land Sliding of the Strip Mine
Yang Fan, Hu Zhen-qi, Qian Jian-guo, Li Hui (Institute of Land Reclamation and Ecological Reconstruction, School of Geomatics, Liaoning Technical University, State Key Laboratory of Coal Resources and Safe Mining, China University of Mining & Technology), China
4. Effluent Control at Pongkor Gold Mine
Agus Zamzam, Muhidin Processing Plant Dept, Pongkor Gold Mine, Indonesia

15:30-16:00 **Coffee Break**

16:10 – 17:30 **Session 6 -** **Environmental Issues in Tailings Disposal, Geotechnical Structures and Acid Mine Drainage**
Chair: Professor Gerald J. Zagury, Canada

1. The Use of Electroosmotic Techniques to Improve Safety Conditions of Abandoned Tailing Dams
Battista Grosso, Marco Cigagna, Pier Paolo Manca, Paolo Tronci (University of Cagliari), Italy
2. The Unique Landfill Site and the Mine Void Backfill as Solutions for the Environmental Safety of the Abandoned Mine Areas
Pier Paolo Manca and Tronci Cigagna (DIGITA UNICA), Italy
3. Study of the Settling Characteristics of Tailings using Nuclear Magnetic Resonance (NMR) Technique
Sandra Carolina Motta Cabrera, Apostolos Kantzas, Jonathan Bryan (University of Calgary), Canada
4. Problems and measures on the heavy metals contained sludge generated by AMD treatment in Japan
Nobuyuki Masuda and Susumu Nagae (Japan Oil, Gas and Metals National Corporation), Japan

19:00-21:00 Reception – Embassy Garden

WEDNESDAY, DECEMBER 12, 2007

RIVERSIDE # 4 ROOM

**09:00 – 10:30 Session 7 - Mining, Minerals and Environment
Chair: Dr. Katrin Broemme, Germany**

1. Strategy of Reconstruction of Ecological and Aesthetical Functions of the Landscape in Kladno Region Disturbed by Hard Coal Mining
Miroslav Martis, Vladimír Zdražil, and Emilie Pecharová (University of Life Sciences in Prague), Czech Republic
2. The Use of Factorial Kriging Analysis to Distinguish Natural from Anthropogenic Sources of Trace Metals in the Topsoils of Lavrio, Greece
Anna Korre, Claire Imrie and Sevket Durucan (Imperial College London), United Kingdom
3. Reducing Usage through the Strategic Application of Preconcentration to Underground Hard Rock Mines.
Bamber A.S, B. Klein, M.J. Scoble (Norman B. Keevil Institute of Mining Engineering, University of British Columbia) Canada
4. Energy Consumption in Cement Industry
Alicja Uliasz Bocheńczyk, Lidia Gawlik, and Eugeniusz Mokrzycki (Mineral and Energy Economy Research Institute) Poland

10:30 – 11:00 Coffee Break

**11:10 – 12:30 Session 8 - Mining, Minerals and Environment
Chair: Professor Giorgio Massacci, Italy**

1. Using the "Dry-Tomb" Technique in the Remediation of Heavily Contaminated Land
Dimitris Kaliampakos and Theodora Karachaliou (NTUA), Greece
2. Whole Body Vibrations in Mining Remediation Activities
Giorgio Massacci and Valentina Dentoni (DIGITA - Univ. di Cagliari), Italy
3. Fundamentals and Results of Use of Biodiesel in Large Mobile Mining Fleets
Carsten Drebenstedt and Jürgen Jauer (TU Bergakademie Freiberg), Germany
4. Assessing the External Costs of Fossil Fuelled Power Plants for Policy Purposes: Transferred vs. Site-Specific Values
Dimitris Damigos and Dimitris Kaliampakos (NTUA), Greece

12:30-13:50 Lunch

Luncheon Speakers:

Professor Hilary I. Inyang
Duke Energy Distinguished
Professor & Director, University of North Carolina

Introduced By: **Professor Kostas Fytas**
University Laval

14:00 – 15:30 **Session 9 - Emerging & Innovative Technologies**
Chair: Professor Toyaharu Nawa, Japan

1. *Develop the Coal - Water Slurry (CWS) in the Countries in Rich Coal and Lack Oil*
Lisheng Wu, United States
2. *Recycling of Seyitomer-Kutahya Thermal Power Plant Coal Combustion Wastes*
Huseyin Koca (Anadolu University), S. Koca (Eskisehir Osmangazi University) and
R. Ucar (Seyitomer-Kutahya Lignite Enterprise), Turkey
3. *Vitrification of Industrial Waste with Production of Supremax Glass and Flat Glass*
Nurcan Tuğrul, Emek M. Derun, Mehmet B. Pişkin, Ihsan M. Türkkal ((Yıldız Technical University),
Turkey
4. *Indonesian Energy Intensity: It's Convergence toward Energy Intensity in Asia Pacific*
Developed Countries
Aryo Prawoto Wibowo and Fadhila Achmadi Rosyid (Institute Technology of Bandung), Indonesia

15:30 – 16:00 **Coffee Break**

16:10 – 17:30 **Session 10 - Emerging & Innovative Technologies**
Chair: Sandra C. Motta, Canada

1. *Development of Technologies for Recycling Construction and Demolition Waste*
Toyoharu Nawa (Hokkaido University), Japan
2. *New Technology for Utilization of Waste Residues for GHG Abatement and Environment*
Protection in Thailand
Krongkaew Laohalidanond and Cristain Wirtgen (RWTH Aachen University), Germany
3. *Improvements of the Cyanide Destruction Process At Chatree Gold Mine*
Warong Saranrittichai, Thailand
4. *Resource Recovery from Waste – Phosphogypsum Waste in Poland*
Zygmunt Kowalski, Joanne Kulczycka and Malgorzata Góralczyk

19:00 **Banquet**

Speakers: **Mr Zou Jian**
President, Metallurgical Mining Corporation, China

Mr. Ivan Montenegro de Menzies
CVRD, Brazil

Introduced By: **Dr. Raj K. Singhal**
Ms. Sirintorn Jongsiri

WEDNESDAY, DECEMBER 12, 2007
RIVERSIDE # 3 ROOM

09:00 – 10:30 **Session 11 - Environmental Impacts, Emissions Control of Greenhouse Gas Abatement**
Chair: Dr. Josef Zeman, Czech Republic

1. Utilization of the Bottom Ash from Thermoelectric Power Plant as Stabilization Materials in Dredged Ground

Kim Jong-Yun, Han Sang-Jae, Lim Nam-Woong (Hanyang University), Korea

2. Study on a Model of Assessing the Effect of Green-House Gasses from Spontaneous Combustion in Xinjiang Coal-Field

Zeng Qiang (Xinjiang Coal Science Institute) and Chang Xin Tan (Xian University of Science and Technology), China,

3. Three Decades of Implosion in Brazil and Fifteen Years of Seismograph Monitoring

W.S. Iramina, S.M. Eston, M.J.D. Dias, Mining & Petroleum Engineering Department, Polytechnic School, University of Sao Paulo, Sao Paulo, Brazil

10:30 – 11:00 **Coffee Break**

11:10 – 12:30 **Session 12 - Environmental Impacts, Emissions Control of Greenhouse Gas Abatement**
Chair: Professor Sohei Shimada, Japan

1. Plant Species selecting in Mine reclamation Plans by AHP Method: Case Study Sungun Copper Mine

A.H. Bangian, Azad University, Iran and M.OsanlooProfessor, Amirkabir, University, Iran

2. Safety Aspects of Mine Liquidation

J. Ciganek, Faculty of Civil Engineering, VSB TU Ostrava

A. Materna, Dean of Faculty of Civil Engineering, VSB TU Ostrava

3. Environmental Innovation Strategy: A Jordanian Perspective

Yousef Eiadat, Department of Management, University College of Dublin, Dublin

4. Sustainable Futures for the Mining and Minerals Processing Sector: Turning Liabilities into Assets

D. McConchie (Southern Cross University), M. Clark (Laval University), K. Fytas (Laval University), S. de Boer (Southern Cross University), Australia and Canada

12:30-13:50

Lunch

Luncheon Speakers: **Professor Hilary I. Inyang**
Duke Energy Distinguished
Professor & Director, University of North Carolina

Introduced By: **Professor Kostas Fytas**
University Laval

14:00 – 15:30 **Session 13 - Mining, Minerals & Environmental**
Chair: Professor Andera Lagerkvist, Sweden

1. Mining and Environment - Integrated Environmental Planning and Dump Restoration in Mining Operations in Vietnam
Per Nicolai Martens, Jose Pateiro-Fernandez, and Shakeel Ahmad (RWTH Aachen University), Germany

2. Local, Regional and Global Initiatives Addressing Environmental Management Issues in the Mining Sector
Adam P. Jarvis, Jaime M. Amezaga and Paul L. Younger (Institute for Research on Environment & Sustainability, Newcastle University), United Kingdom

3. Dynamic Changes of Ecological Footprint of a Mining City in China: A Case Study of Wu'an City
Jianjun Zhang (China University of Geosciences), Meichen Fu (China University of Mining and Technology), Hui Zeng (China University of Mining and Technology), China

15:30 – 16:00 **Coffee Break**

16:10 – 17:30 **Session 14 - Mining, Minerals & Environmental**
Chair: Dr. K. Thomas Klasson, U.S.A.

1. Application of the Multi-Product Allocation Principle to Mining Life Cycle Assessment at a Zn-Pb Mine in Europe
Anna Korre, Gabriela Munoz Melendez and Sevket Durucan (Imperial College London), United Kingdom

2. Energy Profit Ratios and Economic Values of Non-Conventional Oil Development
Gento Mogi (The University of Tokyo), Yosuke Adachi (Japan Petroleum Exploration Co.Ltd.), Masanari Koike (The University of Tokyo), and Waleed Al-Bedaiwi (Saudi Petroleum Co.Ltd.), Japan and Saudi Arabia

3. Utilization of Waste Products of Mining Processes

Urszula Lorenz and Lidia Gawlik (Mineral and Energy Economy Research Institute), Poland

4. Overcoming Bureaucratic Obstacles to the Re-Use of Metallurgical Slag - A South African Case Study

Suzanna Oelofse (CSIR), South Africa

5. Technology for Water-Fuel (water in oil type) Emulsion Preparation for Boilers of Heat Generating Installations

A.M. Balabyshko and R.Y. Poderni (Moscow State Mining University), Russia.

19:00

Banquet

Speakers:

Mr Zou Jian

President, Metallurgical Mining Corporation, China

Mr. Ivan Montenegro de Menzies

CVRD, Brazil

Introduced By:

Dr. Raj K. Singhal

Ms. Sirintorn Jongsiri

WEDNESDAY, DECEMBER 12, 2007
RIVERSIDE # 4 ROOM

09:00 – 10:30 **Session 15 - Environmental Issues in Tailings Disposal, Geotechnical Structures and Acid Mine Drainage**
Chair: Dr. Anna Korre, England

1. Permeable Reactive Barriers Using Red Mud to Treat of Acid Mine Effluents
Kostas Fytas (Laval University), Marie-Eve Desjardins, and David McConchie (Southern Cross University), Canada, Australia
2. Waste Rock Dump Capping Strategy and Soil Moisture Probe Research for Closure at Chatree Gold Mine
Fiona Tromans, Yaowanud Chundung, Thananan Pratummin, Andrew Pearce, Peter Macey and Allan Watson (AustralAsian Resource Consultants Pty Ltd.), Australia
3. The Pollution and Destruction Potential of Gold Mining Waste on the Witwatersrand – A West Rand Case Study
Suzan Oelofse, Jude Cobbing and Jeanette Rascher (CSIR), South Africa
4. Neutralization of Acid Mine Tailings Using Red Mud Bauxite: Long Term Evaluation
Josee Duchesne and Marine Paradis (Université Laval), Canada

10:30 – 11:00 **Coffee Break**

11:10 – 12:30 **Session 16 - Environmental Issues in Tailings Disposal, Geotechnical Structures and Acid Mine Drainage**
Chair: Dr. Damigos, Greece

1. Prediction Model for Vertical Surface Movements in Mine Flooding
Carsten Drebenstedt and Juraj Ortuta (TU Bergakademie Freiberg), Germany
2. Employment of “Geo-Tubes” for the Sustainable Water Management in the Excavation Waste Processing
Elena Garbarino and Marilena Cardu (Politecnico di Torino), Italy
3. Satellite Image Based Strategies to Evaluate the Impact of Dismissed Mine Site: An Application to the Mae Moh Lignite Mine in Northern Thailand
Giuseppe Bonifazi, Lino Nardoni, Silvia Serranti and Fabio Volpe (Sapienza - Università di Roma), Italy
4. Acid Rock Drainage Management at Pt. Kaltim Prima Coal and Its Relationship With Water Quality Regulations in Indonesia
Candra Nugraha, Imanuel Manege, Takashi Sasaoka, Hideki Shimada, Masatomo Ichinose, and Kikuo Matsui (Faculty of Engineering, Kyushu University), Japan, (Environment Department, PT. Kaltim Prima Coal), Indonesia

12:30-13:50	Lunch	
	Luncheon Speaker:	Professor Hilary I. Inyang Duke Energy Distinguished Professor & Director, University of North Carolina
	Introduced By:	Professor Kostas Fytas University Laval

14:00 – 15:30 **Session 17 - Environmental Issues in Tailings Disposal, Geotechnical Structures and Acid Mine Drainage**
Chair: Professor Pier Paulo Manca, Italy

1. Use of Numerical Modeling to Prediction of Thermal Regime of Tailings Deposits in Cold Regions Based on Tailings Deposition Plan
Fernando Junqueira, Terry Eldridge, Marcelo Musse and Marco Barrientos (Golder Associates Ltd.), Canada
2. Determining Environmental Effects of Utilizing or Disposing of Pulverised Fly Ash from UK Power Stations
Mohammad Zandi and Nigel Russel (Company: University of Sheffield), United Kingdom
3. Management Tools for Tailings Impoundment Modeling
Marco Barrientos, Marcelo Musse (Golder Associates S.A., Santiago), Chile, Terry Eldridge (Golder Associates LTDA), Canada
4. Acid Coal Mine Drainage in the Arctic
Jens Sondergaard (University of Copenhagen), Denmark

15:30 – 16:00 **Coffee Break**

16:10 – 17:30 **Session 18 - Mining, Minerals & Environment**
Chair: Dr. Bern Klein, Canada

1. Assessing Stability of Waste Dump - A Case Study
T.N. Singh, K.S. Barde, N.Purwar, S. Gupta and K. Sarkar (IIT Bombay), India
2. Use of RS and GIS techniques in Soil Erosion Monitoring: A Case Study at Huojitu, China
Chengxue Li, Shilu Tang, Zhenqi Hu, Jingtao Kang, Wu Xiao (China University of Mining & Technology), China
3. Waste Dump Site Selection in Open Pit Mines Using Fuzzy MADM Algorithm
A. Hekmat, M. Osanloo and M. Akbarpur Shirazi (Amirkabir University of Technology), Iran
4. Sources and Utilization of Coal Combustion Products in Poland
Krzysztof Galos, Jaroslaw Szlugaj, Ewa Lewicka, and Jaroslaw Kamyk (Mineral & Energy Economy Research Institute, Polish Academic of Sciences), Poland

19:00**Banquet****Speakers:****Mr Zou Jian**

President, Metallurgical Mining Corporation

Mr. Ivan Montenegro de Menzies

CVRD, Brazil

Introduced By:**Dr. Raj K. Singhal****Ms. Sirintorn Jongsiri**

THURSDAY, DECEMBER 13, 2007
RIVERSIDE # 3 ROOM

09:00 – 10:30 **Session 19 - Remediation of Contaminated Air, Soil & Water**
Chair: Professor Ewa Cukrowska, South Africa

1. Compost Bioremediation of Hydrocarbon-Contaminated Soil Inoculated with Organic Manure
Harrison Atagana (University of South Africa), South Africa
2. Nanomaterials in Mining Environment Remediation and Mineral Processing: New Approaches to Old Problems
Louis Mercier, Luc Beaudet, Adil Aledresse, Laxman Amaratunga (Laurentian University), Canada
3. Stream Water Quality and Metal Bioavailability Around the Rapel Basin, Central Chile
Anna Korre and Paula Ramirez-Munoz (Imperial College London), United Kingdom
4. Hardpan Formation in Sulphidic Tailings: Column and Humidity Cell Tests
Anthimos Xenidis (National Technical University of Athens), Greece

10:30 – 10:50 **Coffee Break**

11:00 – 12:30 **Session 20 - Remediation of Contaminated Air, Soil & Water**
Chair: Malgorzata Goralczyk

1. In Vitro Oral Bioavailability Testing in Human Health Risk Assessment of Metal Contaminated Soils
Gerald J. Zagury (Ecole Polytechnique de Montréal), Canada
2. Long Term Chemical Evolution of Mine Water After Mine Closure in Czech Republic
Josef Zeman, Kamila Trojackova, and Radomir Tabasek (Masaryk University), Czech Republic
3. Neutralization of Waste-Water pH During Concrete Cutting Using Waterjet
Jae-Joon SONG, Chang-Hyun YEO, Jung-Gyu KIM (Soeul National University), Korea
4. Using GIS-Based Weights-of-Evidence Method for Assessing Mining Induced Rock Fall
Ernest Baafi and Hani Zahiri (University of Wollongong, School of Civil, Mining and Environmental Engineering), Australia

12:30 – 13:50 **Lunch**

14:00 – 15:30 **Session 21 - Chemistry, Control & Treatment of Effluents and Recovery of Useful Components**
Chair: Professor Carsten Drebenstedt, Germany

3. The Removal of arsenic from water Using Natural Iron Oxide Minerals
S. Aredes, M. Pawlik, and B. Klein (Norman B. Keevil Institute of Mining Engineering, University of British Columbia), Canada
4. Water Chemistry Investigation in the Vicinity of Imgi Mine to Assess the Pollution Potential in Soo-Young River, Korea
Young Wook Cheong, Sang Woo Ji, Jayanta Bhattacharya, Gil Jae Yim, Hyeon Seok Lee, Jeong Sik Min and Yong Suk Choi (Korea Institute of Geoscience and Mineral Resources), Korea
5. Laboratory Investigation of Hydrogen Cyanide (HCN) Gas Formation from Cemented Paste Fill (CPF) Samples
Hla Aye Saw and Ernesto Villaescusa (CRC Mining, Curtin University of Technology), Australia
4. Agricultural By-products as Mercury Adsorbents in Flue Gas Applications
K. Thomas Klasson, Isabel M. Lima, Wayne E. Marshall (USDA-ARS-SRRC), United States

15:30 – 16:00 **Coffee Break**

16:10 – 17:30 **Session 22 - Chemistry, Control & Treatment of Effluents and Recovery of Useful Components**
Chair: Dr. Yang Fan, China

1. Modelling and Assessment of Water Quality Data Influenced by Gold Mining in the Central Rand, South Africa
Ewa Cukrowska and Hlanganani Tutu (School of Chemistry, University of the Witwatersrand), South Africa
2. Innovative Technique for Decontamination and Recovery of Creosote Impregnated Railway Crossties
Paolo Plescia, Maria Tocino, Giuseppe Paoloni, and Rosario Sottile (National Research Council), Italy
3. Sorption and Desorption of Zinc from Illite Silica
Aneel Kumar, Jiro Takemura, Hideo Nakajima (Tokyo Institute of Technology), Japan
4. Geochemical Assessment of Heavy Metals Accumulation and Fractionation in Fluvial Sediments of the Central Rand Goldfield, South Africa
Hlanganani Tutu, Ewa Cukrowska, M. B. Ndasi, Terence S. McCarthy, Moris. J. Viljoen (School of Chemistry, University of the Witwatersrand), South Africa
5. New Acoustic Spirometers in Breathing Protection Problems
Shkundin S.Z. (Moscow State Mining University), Russia

17:30 - **Symposium Closure.**