PROCEEDINGS OF
THE FOURTEENTH INTERNATIONAL CONFERENCE
ON SOLID WASTE TECHNOLOGY AND MANAGEMENT

Philadelphia, PA U.S.A.

November 1-4, 1998

Chair and Founder:
Iraj Zandi, University of Pennsylvania

Chair:
Ronald L. Mersky, Widener University

Associate Chair:
Wen K. Shieh, University of Pennsylvania
TABLE OF CONTENTS

SESSION 1A – Landfill Gas Generation

- “The Use of Waste Input Data to Predict Biogas Emissions in the UK – Mid Auchencarroch and Craigmuschat Landfill Sites,” Telemachus C. Koliopoulos and George Fleming

SESSION 1B – Solid Waste Policy Analysis

- “Planning for the Closure of New York City’s Fresh Kills Landfill: Integrated Waste Management or Export?” Marjorie J. Clarke
- “Solid Waste Management under the USEPA Resource Conservation and Recovery Act (RCRA),” Nicole L. Murry
- “Crossing the Divide, National Strategy and Local Practice? MSW Policy Implementation by Local Government in the UK,” Adam D. Read

SESSION 1C – Research on Specific Wastes

- “The Use of Papermill Wastes as a Sorbent Material for Heavy Metals in Aqueous Solution,” Marc J. Gallagher and Horace Moo-Young
- “The Chemical Partitioning and Solubility of Heavy Metals in Cement Based Chemically Stabilised Waste,” Xiangdong Li and C.S. Poon

SESSION 2A – Landfill Design

- “Successful Application of an Aerobic Landfill System,” Mark Hudgins and John March

SESSION 2B – Facility Siting and Waste Collection

- “Communications and Social Factors in Landfill Siting,” Shoou-Yuh Chang and Dean Goad

**SESSION 2C – Waste Reduction in Specific Industries**

• “Pollution Prevention in the Metal Finishing Industry – A Comparison between the United States and Colombia,” Rumana Riffat and Carlos E. Urrea
• “Minimization of Waste in the Solvent Based Ink Industry,” G. Ortiz Martinez and B. Trevino Arjona

**SESSION 3A – Leachate Modeling**

• “Development of a Predictive Facility Model to Aid Management of Leachate Production,” Mark Lahr and Randy Bodnar
• “Importance of Field Capacity in Modeling Leachate Production from MSW Landfills,” Vanita S. Shroff, J.P.A. Hettiaratchi, and M.D.N. Perera
• “Removal of Enriched-Leachate from RO Unit for Landfill Leachate with Electrolytic Process,” Min-Her Leu, Shu-Jiun Chang, Sy-Yn Chen, and Hui-Ian Liou

**SESSION 3B – Waste Composition Studies/Economics**

• “The Study of Composition and Recyclability of Waste from In-flight Services of the Airline Industry,” Xiangdong Li, C.S. Poon, S.C. Lee, and S.S. Chung
• “Product and Physio-Chemical Composition of the Wastes Collected by AGAC in Reggio Emilia, and Evaluation of Product and Energy Balance in the Different Treatment Phases,” Eugenio Bertolini, Mauro Del Rio, and Giulio Ferrari

**SESSION 3C – Composting/Biochemical/Thermal Treatment**

• “Is Composting a Viable Option for Management of Municipal Solid Wastes in South Asia?” Sumith Pilapitiya
• “Is There an Environmentally Acceptable Disposal Alternative to Sanitary Landfills for Small and Medium Cities in South Asia?” Sumith Pilapitiya and Santhana Ponnampalam
• “Stabilization of Sugar Beet Tailings through Cold Weather Composting…,” Don Richard, Russell Sorenson, Robert Zimmerman, Pat Zavoral, and Bruce Grubb

**SESSION 3D – Special Topics 1**

• “Treatability of Municipal Solid Waste by Anaerobic Digestion in Arid Region – An Experimental Approach,” U.S. Sharma and Sunil Sharma
• “Removal of Ammonia from Waste Water by Zeolite Tuff,” D.R. Pande and C. Fabiani
• “Sorption Aided Process Optimisation for the Removal and Recovery of Anionic Surfactant from Wastewater using Fly-Ash, the Waste Solid Generated from Thermal Power Plant,” Mitali Sarkar

**SESSION 4A – Landfill Gas Utilization 1**

• “Drainage and Erosion Control Problems at Municipal Solid Waste Landfills in Heavy Rains,” Robert L. Anderson, Scott Walker, and Timothy Crist

**SESSION 4B – Waste Generation Studies/Integrated Management**

• “Investigation of Battery Consumption Rates and Affecting Factors in Istanbul,” M. Talha Gonullu, Gurdal Kanat, and Ertan Arslankaya
• “Searching Mathematical Relationships between Municipal Refuse Generation Rate and Electricity and Water Consumption,” M.T. Gonullu, F.I. Aydinol, and E. Arslankaya
• “Waste Minimisation Project Clubs: A Successful Case Study from the East Midlands of England,” Paul S. Phillips, Karen Pike, and Adam D. Read

**SESSION 4C – Use of Solid Waste in Concrete**

• “Novel Admixtures for Concrete,” Kevin Rowghani and Gennaro J. Maffia
• “Compressive Strength and Durability of Concrete Made with Recycled Plastics,” Ashraf M. Ghaly and Michael S. Gill
• “Durability Evaluation of Portland Cement Concrete Modified with Recycled Tire Rubber Particles,” Dimitrios G. Goulias and Yothin Thongnuaekheng

**SESSION 4D – Wastes from Specific Industries**

• “Liquefaction of Printed Circuit Board Wastes with Valuable Metals Recovery,” Kuen-Song Lin, H. Paul Wang, Y.-C. Chien, Juu-En Chang, Y.-L. Wei, and Y.-P. Sun
• “Leaching and Stabilizing Characteristics of Copper Diethyl Dithiocarbamate in an Alkaline Solution,” Ming-Sheng Ko, Juu-En Chang, Tzong-Tzeng Lin, and Chien-Yi Huang

**SESSION 5A – Landfill Gas Sampling and Utilization 2**

• “Landfill Gas Sampling Protocol,” Robert Ham, Jim Hull, P. Mike Potter, Stuart Harlan, Michele Boussad, Frank Dolan, and Bill Duley
• “An Improved Flux Chamber Methodology to Determine Gas Emissions from Landfills,” M.D.N. Perera and J.P.A. Hettiaratchi
• “Experimental Assessment of Landfill Gas Extraction and Transport,” P.A. Gasparini, G.F. Saetti, and V. Nizzoli
SESSION 5B – Mining and Mineral Wastes/Environmental Topics

- "Chromium Leaching from Chromite Ore Processing Waste Material," Serkan Haskok and Kahraman Unlu
- "In-situ Treatment of Acid Mine Waters Using Coal Combustion Products," Jess W. Everett and Geoffrey A. Canty

SESSION 5C – Solidification of Wastes

- "Industrial Sludge Solidification by Using Clinoptilolite," Gunay Kocasoy and Mustafa Balkan

SESSION 5D – Special Topics 2

- "Mechanical Properties of Sands Rubberized with Granular Scrap Tires," Ashraf M. Ghaly and James S. Cogan
- "Remediation of the Oxford Tire Piles, Westley, California," Robert L. Anderson
- "Start-up of Anaerobic Digestion of OFMSW with Sewage Sludge Addition," E. Demirekler and G.K. Anderson
- "Experimental Research on M.S.W. Compaction Degree and Its Change with Time," P.A. Gasparini, M. Marastoni, and G.F. Saetti

SESSION 6A – Landfill: Specific Studies and Post-Closure Topics

- "Investigation and Analysis of Major Factors That Caused Landfill Fires in the Taiwan Area," Jao-Jia Horng, Chun-Jung Chang, and Jet-Chau Wen
- "Investigation of Aged Waste Residues at Songkhla Municipal Landfill Site in Southern Thailand," Suwannaporn Sittitavonsub, Somtip Danteravanich, and Cherdchan Siriwong
- "The Study Design and Cost Estimate of a Post-Closure Phase of a Solid Waste Controlled Landfill," Aulo Magagni, Adelio Peroni, Gianfranco Saetti
- "Restoring a Sand Quarry into a MSW Landfill," Mutasem El-Fadel and Salah Sadek

SESSION 6B – Research Advances 1

- "Chemical Fixation of Bivalent Copper in Cementitious Matrices," Luca Di Palma and Franco Medici
• “Total Petroleum Hydrocarbon Monitoring in Biodegradation of Weathered Crude Oily Residues,” Eduardo Ercoli, Jose Galvez, Ercilia Aranzadi, and Mariela Di Paola
• “Determining Operational Conditions for Selective Dissolution of Molybdenum Mandrel from Tungsten Filaments with Hydrogen Peroxide,” B. Trevino and M.A. Martinez

SESSION 6C – Construction Waste and Use of Waste in Roads

• “The Feasibility of On-site Sorting of Construction Waste in Hong Kong,” C.S. Poon and L.H. Ng
• “Recycling of Waste Brick and Reinforced-Concrete Debris,” Jaroslaw Rajczyk, Marlena Rajczyk, and Zbigniew Rajczyk
• “Laboratory Research on Use of Fly Ash to Road Base Made of Bituminous Mixtures of a Grave Emulsion Type,” Bozenna A. Kierus

SESSION 7A – Landfill Liners and Covers

• “A Method for Evaluating the Performance of Double Lined Containment Systems,” Haluk Akgun
• “Freezing and Thawing Effects on a Municipal Landfill Cover,” Juan D. Quiroz, Thomas F. Zimmie, and Christine M. LaPlante
• “Differences in the Diffusion Time Scale of HDPE Geomembranes under Various Test Conditions,” William Martin Barrett, Jr., Richard Ian Stessel, and Frederick Anthony Fetterly, III

SESSION 7B – International Case Studies 1

• “Waste Solidification in the Czech Republic,” Mecislav Kuras

SESSION 7C – Recycling

• “Excuse Me, Do You Recycle? Public Participation in Kerbside Recycling in the UK,” Adam D. Read
• “Polystyrene Recycling: Processes, Trends, and Opportunities,” Tony Kingsbury and Raymond Ehrlich
• “PET-PVC Separating Plant: Improvement and Experimental Tests,” M. Carlini, P. Di Ianni, and M. Villarini

SESSION 8A – Specialized Wastes

• “Problem of Alum Sludges Disposal in Cali, Colombia,” Ruby de Gutierrez, Silvio Delvasto, and Elizabeth Mesa
• “Dewatering Study of the Alum Sludges from Cali City Water Treatment Plants,” Ruby de Gutierrez, Silvio Delvasto, and Elizabeth Mesa

SESSION 8B – Modeling for Solid Waste

• “Grey Goal Programming Modelling for Regulating Regional Solid Waste Shipping Strategies in the Metropolitan Region,” Ni-Bin Chang and Y.H. Chang
• “Optimal Sizing of Presorting Facility Prior to Incinerator Using Goal Programming as a Tool,” Ni-Bin Chang and Y.H. Chang
• “Waste Treatment in the Logistical Chains,” Jiri Urbanek, Marie Jurova, and Ivana Dvorakova
• “Object Oriented Modeling of Waste Management,” Eva Pongracz and Veikko J. Pohjola

SESSION 8C – Applications of Technology and Incineration Case Studies

• “Technological & Methodological Innovations in the Management of Environmental Treatment Plants & Services for M.S.W.” Adelio Peroni and Gian Franco Saetti
• “A Case Study of a Campus Waste Incineration Facility Operation,” Kuen-Song Lin, H. Paul Wang, Juu-En Chang, Gwo-Tzuuo Wei, and Wen-Chiang Lin
• “Characterization and Co-incineration of Waste in a Paper Mill – A Case Study,” F. Tamaddon
• “Co-incineration of High Btu Solid Waste and Municipal Sludge in Antwerp, Belgium,” Thomas J. Maestri

SESSION 9A – Research Advances 2

• “Recycling of the Alimentary Residues of Domestic Waste as Ration for Chickens,” Ednilson Viana, Harry Edmar Schulz, and Adriana Backx Noronha
• “Decomposition of Dichlorodifluoromethane by Using an RF Plasma Reactor,” Ya-Fen Wang, Wen-Jhy Lee, and Chuh-Yung Chen

SESSION 9B – International Case Studies 2

• “Behavior of Residential Solid Waste in a Colonia in Mexico-USA Border Zone,” Sara Ojeda Benitez, F. Fernando Gonzales Navarro, Ruben Munoz Lujan, and Hugo Silva K.
• “Solid Waste Management and Technology in Greater Tehran,” Ali A. Tofigh
• “Solid Waste Disposal in Ahmedabad,” S.D. Dave
SESSION 9C – Site Contamination

- “Reuse of Contaminated Soil – A Future Framework of Soil Sanitation in The Netherlands?” Jelte van der Heide
- “Laboratory Tests for Materials Polluted by Lead,” V. Gente, P. Massacci, and L. Piga
- “Assessment of the Long-term Release of Heavy Metals from Waste Deposits,” Sami Bozkurt, Luis Moreno, and Ivars Neretnieks

SESSION 10A – Research Advances 3

- “A Contaminant Transport Model for Determining Risk Due to Containments in Brownfields,” Shailesh Chirputkar and Dorairaja Raghu

SESSION 10B – Compost Studies

- “Thermophilic Composting of Food Waste and Farm Residue Using Rotary Drum,” Suporn Koottatep, Poonsak Chanchampee, and Shinichi Sakai

SESSION 10C – Medical Wastes

- “Hospital Differentiate Waste Management – Needed or Not?” Joao Alberto Ferreira, Anamaria Testa Tambellini, and Carmem Lucia Pessoa da Silva
- “Incineration of Bio-Medical Waste: Environmental Pollution and Control,” Manish Kashyap