

## **Conference Programme and Invitation to Register**

### **ASSET MANAGEMENT OF SMALL AND MEDIUM WASTEWATER UTILITIES**

**Alexandroupolis, Thrace, Greece  
3-4 July 2009**

**Organised by  
IWA, Specialist Group on Strategic Asset Management  
Department of Environmental Engineering, Democritus University  
of Thrace**

**Under the Aegis and Sponsorship of**

- Research Committee of Special Account (DUTH)
- Prefecture of Evros
- Prefectural Local Authority of Rodopi-Evros
- Regional Authority of Eastern Macedonia-Thrace

**July 2009  
Alexandroupolis, Greece**

## ORGANIZERS



**DEMOCRITUS UNIVERSITY OF THRACE**  
DEPARTMENT OF ENVIRONMENTAL ENGINEERING  
LABORATORY OF ECOLOGICAL ENGINEERING AND  
TECHNOLOGY

## UNDER THE AEGIS AND SPONSORSHIP OF



**DEMOCRITUS UNIVERSITY OF THRACE**  
RESEARCH COMMITTEE OF THE SPECIAL ACCOUNT



**PREFECTURE OF EVROS**



**PREFECTURAL LOCAL AUTHORITY OF RODOPI-EVROS**



**REGIONAL AUTHORITY OF EAST MACEDONIA - THRACE**

## PREFACE

Effective management of wastewater infrastructure, such as collection and treatment systems, is a function of operational, technical, environmental and financial parameters, and consists today a challenging issue for utility companies all over the world. The main goal is to provide an acceptable level of service to customers, while minimizing costs and environmental and other risks. Achieving this goal offers even more challenges when dealing with wastewater infrastructure of geographically dispersed, small and medium size communities.

The rise in importance of effective asset management over recent years has posed challenges for engineers, academicians and industrial researchers. Within this context, “Asset Management of Medium and Small Wastewater Utilities” will introduce a new series of international conferences, which are hoped to become a tradition. They are planned to be organized every two or three years by a university or a research institute, which will be primarily responsible for the organization, in collaboration with the Strategic Asset Management Specialist Group of the International Water Association (IWA).

The task of organization of the first conference in this series was undertaken by the **Laboratory of Ecological Engineering and Technology, Department of Environmental Engineering, Democritus University of Thrace**, Xanthi, Greece. The aim of the conference was the presentation of timely scientific research and application studies by engineers, managers and scientists on topics concerning wastewater assets. Other aims were the exchange of information, experiences and achievements, evaluation of new technologies, and presentation of innovative ideas on the conference subject.

The conference papers are included in a proceedings volume containing in total 26 full papers, which were orally presented at the conference and 5 short papers. Extended summaries of poster presentations are also included in the proceedings. Full papers and presentations have been arranged in the following four sessions:

1. Major challenges and constraints in asset management (6 papers)
2. Social, economic and financial dimensions (5 papers)
3. Conventional wastewater treatment systems (7 papers)
4. Natural wastewater treatment systems (8 papers)

The editors would like to thank:

- The authors of the papers for contributing and sharing their own expertise.
- The scientific committee and the reviewers of the papers for ensuring high scientific standards for the presentations.
- The sponsors of the conference for their financial support.
- All conference participants for their involvement in the exchange of knowledge, which is the essence of any conference.

Xanthi, July 2009

Prof. Vassilios A. Tsihrintzis

Assistant Prof. Konstantinos P. Tsagarakis

## PARALLEL CONFERENCE

A parallel conference will be organized at the same venue by the Specialist Group on Water Economics and Statistics entitled “2<sup>nd</sup> International Conference on Water Economics Statistics and Finance” 3-5 July.

## CONFERENCE VENUE

The Conference will take place in the Conference Center of the “Thraki Palace Hotel”, located within a short distance (4 km) from the city center of Alexandroupolis, Thraki, Greece from July 3 to 4, 2009. Telephone: +30 25510 - 89100, Fax: +30 25510 – 89119, thraki@thrakipalace.gr. Presentations will take place in “ORFEAS” Room, while poster displays and coffee breaks will be held in the “FOYER APOLLO”.



## PUBLICATIONS

All papers from the platform and poster sessions are printed in one book of about 320 pages. The book will be handed out to the participants at the registration desk and is included in the registration fee. Additional copies may be ordered. Papers that, after thorough refereeing and editing, meet the quality standards of IWA, will be published in the Journals *Water Science and Technology* and *Water Asset Management International*.

## LANGUAGE

The official language of the Conference for all presentations and discussions is English.

## REGISTRATION FEES

Conference standard registration fee for both conferences is 650 € and 550 € for IWA members. Student registration fee is 310 €. The conference fee covers

attendance, morning and afternoon teas/coffees, on site lunches for 3 days, welcome reception and conference gala dinner. Conference gala dinner is not included in the reduced student fee. Conference preprint books, programme, information pack and access to presentations will be given for both conferences.

### **ORGANIZING COMMITTEE**

Akratos Christos, University of Ioannina, Greece  
 Alegre Helena, National Laboratory of Civil Engineering, Portugal  
 Bridgeman John, University of Birmingham, UK  
 Paranychianakis Nikolaos, Technical University of Crete, Greece  
 Tsagarakis Konstantinos, Democritus University of Thrace, Greece  
 Tsihrintzis Vassilios (Chair), Democritus University of Thrace, Greece

### **SCIENTIFIC COMMITTEE - REVIEWERS**

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 ten Veldhuis Marie-Claire, Delft University of Technology, The Netherlands  
 Voudrias Evangelos, Democritus University of Thrace, Greece

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**SCIENTIFIC AND SOCIAL PROGRAMME**


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**THURSDAY, 02 JULY 2009**

18.00 – 21.00 Registration (Thraki Palace Hotel)  
 21.00 – 23.00 Welcome Reception (Thraki Palace Hotel)

**FRIDAY, 03 JULY 2009**

08.00 – 09.00 Registration  
 09.00 – 10.00 Welcoming Addresses (“DIMOKRITOS 1” Room), in common with the “2<sup>nd</sup> International Conference on Water Economics, Statistics and Finance”.  
 10.00 – 11.20 Keynote Presentations (“DIMOKRITOS 1” Room) in common with the “2<sup>nd</sup> International Conference on Water Economics, Statistics and Finance”.  
 11.20 – 11.50 Coffee Break ☕  
 11.50 – 13.30 Session 1 (“ORFEAS” Room)  
 13.30 – 13.50 Session 5 (“ORFEAS” Room)  
 13.50 – 14.50 Lunch Break 🍽️  
 14.50 – 15.30 Viewing of Posters  
 15.30 – 16.50 Session 2 (“ORFEAS” Room)  
 16.50 – 17.20 Coffee Break ☕  
 17.20 – 17.40 Session 2 (“ORFEAS” Room)  
 17.40 – 19.00 Session 3 (“ORFEAS” Room)  
 21.00 – 23.00 Gala Dinner 🍷

**SATURDAY, 04 JULY 2009**

09.00 – 10.00 Session 3 (“ORFEAS” Room)  
 10.00 – 10.40 Keynote Presentation (“ORFEAS” Room)  
 10.40 – 11.00 Session 4 (“ORFEAS” Room)  
 11.00 – 11.30 Coffee Break ☕  
 11.30 – 13.30 Session 4 (“ORFEAS” Room)  
 13.30 – 13.50 CLOSURE  
 13.50 – 15.00 Lunch Break 🍽️  
 15.00 – 21.00 Buss region tour 🚌

**DESCRIPTION OF SESSIONS**

Session 1: Major Challenges and Constrains in Asset Management  
 Session 2: Social, Economic and Financial Dimensions  
 Session 3: Conventional Wastewater Treatment Systems  
 Session 4: Natural Wastewater Treatment Systems  
 Session 5: Short Papers

## PROGRAMME - PRESENTATIONS

### THURSDAY, 02 JULY 2009

- 18.00 – 21.00 Registration  
 21.00 – 23.00 Welcome Reception

### FRIDAY, 03 JULY 2009

#### “DIMOKRITOS 1” Room

##### KEYNOTE PRESENTATIONS

Chair: V.A. Tsihrintzis and S. Renzetti

- 08.00 – 09.00 Registration  
 09.00 – 10.00 Welcoming Addresses  
 10.00 – 10.40 Climate Change and Water Resource Management: Tradeoffs and Opportunities in the Field of International Water (Keynote: “2<sup>nd</sup> International Conference on Water Economics, Statistics and Finance” )  
*A. Dinar (USA)*  
 10.40 – 11.20 Is Strategic Asset Management Applicable to Small and Medium Utilities? (Keynote: “Asset Management of Medium and Small Wastewater Utilities”)  
*H. Alegre (Portugal)*  
 11.20 – 11.50 Coffee Break ☿

#### “ORFEAS” Room

##### Session 1

##### MAJOR CHALLENGES AND CONSTRAINTS IN ASSET MANAGEMENT

Chair: M. Gratiou and R. Brito

- 11.50 – 12.10 Change and Asset Management in Wastewater Utilities – a UK Perspective  
*A. Rees, T. Young, I. Richardson (UK)*  
 12.10 – 12.30 Management of the Effluent of a Large Hospital Situated in a Small Town. A Case Study  
*P. Verlicchi, A. Galletti, L. Masotti (Italy)*

- 12.30 – 12.50 A Simplified Methodology to Estimate Rainwater Contribution to Domestic Sewers  
*R. Brito, J.S. Matos, A. Monteiro, F. Ferreira, Bruno Machado (Portugal)*
- 12.50 – 13.10 Integrated Strategies for the Reduction of Infiltration and Inflow in Sanitary Sewer Systems  
*A.J. Monteiro, A.T. Silva (Portugal)*
- 13.10 – 13.30 Bayesian Pipe Burst Models Using Cumulative Failure History  
*T. Economou, Z. Kapelan, T. Bailey (UK)*

### Session 5

#### SHORT PAPER PRESENTATION

- 13.30 – 13.50 Training Modules on Low Cost Wastewater Treatment Technologies  
*N. Fonder, D. Xanthoulis, M. Wauthélet (Belgium)*
- Adequateness and Sustainability of Wastewater Treatment in Medium and Small Communities  
*H.M.M. Simão, J.A. A. Sá Marques (Portugal)*
- On-site Treatment of Household Wastewater in Avdira, Xanthi  
*A. Tsireme, C. Sofis, G.D. Gikas, V. A. Tsihrintzis (Greece)*
- The Sustainable, Real-time Wastewater Utilities  
*G.L.S. Wong (USA)*
- Optimal Selection of Anaerobic Tank Type  
*A. Bacak, G.D. Hatzigeorgiou, K.P. Tsagarakis (Greece)*
- 13.50 – 14.50 Lunch Break ☛
- 14.50 – 15.30 Viewing of Posters

### Session 2

#### SOCIAL, ECONOMIC AND FINANCIAL DIMENSIONS

Chair: T. Ertl and A. Rees

- 15.30 – 15.50 Economic Valuation of Environmental Benefits from the Wastewater Treatment Processes: An Empirical Approach for Spain  
*F. Hernandez-Sancho, M. Molinos-Senante, R. Sala-Garrido (Spain)*
- 15.50 – 16.10 Evaluation of Wastewater Systems in Rural Areas of the Balkan Region with Focus on Ecological and Socio-economical Aspects  
*T. Ertl, M. Wippel, C. Prandtstetten (Austria), S. Kuvendzije (FYROM), H. Jung, N. Weissenbacher, F. Kretschmer (Austria), T. Anovski (FYROM)*

- 16.10 – 16.30 Reuse of Treated Wastewater for Irrigation Purposes in Greece: Investigation of Economic, Social and Environmental Factors  
*S. Bakopoulou, A. Kungolos (Greece)*
- 16.30 – 16.50 Capital Outlays on Water Pollution Control in Poland  
*P. Bartoszczuj, R. Milaszewski, J. Sleszynski (Poland)*
- 16.50 – 17.20 Coffee Break ☿
- 17.20 – 17.40 Multicriteria Evaluation of Alternative Wastewater Treatment Processes: the Topiros Municipality (Greece) Example  
*M. Gratziou, A. Vavatsikos, M. Tsalkatidou (Greece)*

### Session 3

#### CONVENTIONAL WASTEWATER TREATMENT SYSTEMS

Chair: P. Melidis and A. Monteiro

- 17.40 – 18.00 Intermittent Feeding of Wastewater in Combination with Alternating Aeration for Complete Denitrification and Control of Filaments  
*S. Kantartzi, P. Melidis, A. Aivasidis (Greece)*
- 18.00 – 18.20 Development and Evaluation of a Hybrid UASB-UAF Reactor: Effect of Media-packing Ratio on its Performance  
*R. Rajagopal (India, France), I. Mehrotra, P. Kumar (India), M. Torrijos (France)*
- 18.20 – 18.40 Control of Active Biomass in Biological Wastewater Treatment Systems Through New Generation of ATP-Methods: Improving Effluent Toxicity Monitoring and Optimization of Performances in Bioreactors  
*C. Delporte, V. Todorova, M. Raymond (France)*
- 18.40 – 19.00 Efficiency Improvement of Simultaneous Nitrification and Denitrification (SND) Batch Bioreactor by Intermittent Aeration  
*W. Khanitchaidecha, T. Nakamura, T. Sumino, F. Kazama (Japan)*

- 21:00 – 23.00 Gala Dinner

**SATURDAY, 04 JULY 2009**

**“ORFEAS” Room**

**Session 3 (cont.)**

**CONVENTIONAL WASTEWATER TREATMENT SYSTEMS**

Chair: H. Marecos Do Monte and V. Kanakoudis

- 09.00 – 09.20    Technical and Economic Evaluation of a Flat-sheet Microfiltration Process for Water Recovery from Secondary Sewage  
*V. Diamantis, I. Antoniou, A. Kapagiannidis, P. Melidis, A. Aivasidis (Greece)*
- 09.20 – 09.40    Implementation of Fenton Process on Small Domestic Wastewater Treatment Units  
*A. Vlyssides, E.M. Barampouti, S. Mai, A. Stamatoglou, E. Tsimas (Greece), A. Vlyssidis (UK)*
- 09.40 – 10.00    An Integrated Hydraulic and Biological Carbon Removal Model for the Optimal Design of Decentralised Wastewater Treatment Systems  
*N. Moelants, I.Y. Smets, R. Van Den Broeck, P. Declerck, L. Vanysacker, J.F. Van Impe (Belgium)*

**Session 4**

**NATURAL WASTEWATER TREATMENT SYSTEMS**

Chair: G. Gikas and N. Paranychianakis

- 10.00 – 10.40    Constructed Wetlands for Wastewater and Activated Sludge Treatment in Northern Greece (Keynote: “*Asset Management of Medium and Small Wastewater Utilities*”)  
*V.A. Tsihrintzis (Greece)*
- 10.40 – 11.00    Evaluation of the Treatment Capability of HSSF Constructed Wetlands for Irrigation Reuse  
*H. Marecos Do Monte, A. Albuquerque (Portugal)*
- 11.00 – 11.30    Coffee Break ☼

**Session 4 (cont.)**

**NATURAL WASTEWATER TREATMENT SYSTEMS**

- 11.30 – 11.50    On-site Treatment of Domestic Wastewater Using Small-Scale Constructed Wetlands  
*G.D. Gikas, V.A. Tsihrintzis (Greece)*

11.50 – 12.10	Effective Treatment of Municipal Wastewater for Reuse as Water for Irrigation in Agriculture <i>D.K. Lee, D.S. Kim, T.H. Kim (Korea)</i>
12.10 – 12.30	Septage Treatment by Duckweed Covered Stabilization Ponds <i>F.H. Papadopoulos, V.A. Tsihrintzis (Greece)</i>
12.30 – 12.50	Chemical Exergy as an Ecological Indicator to Assess the Performance of Soil Treatment Systems Using Domestic Wastewater <i>V.E. Tzanakakis, A.N. Angelakis (Greece)</i>
12.50 – 13.10	Use of Various Substrates as Filter Media to Treat the Effluent of a Vertical Flow Constructed Wetland <i>A.I. Stefanakis, V.A. Tsihrintzis (Greece)</i>
13.10 – 13.30	Treatment of Olive Mill Wastewater with Constructed Wetlands <i>I.E. Kapellakis, N.V. Paranychianakis, K.P. Tsagarakis, A.N. Angelakis (Greece)</i>
13.30 – 13.50	CLOSURE
13.50 – 15.00	Lunch Break 🍴
15.00 – 21.00	Buss region tour 🚌

## OTHER ACTIVITIES AND SOCIAL PROGRAMME

- On Thursday, July 2, a welcome event will be organised at 21:00 at Thraki Palace Hotel. Includes drinks and a buffet.
- On Friday, July 3, a Gala Diner will be organised at 21:00 at Thraki Palace Hotel.
- On Saturday, July 4, a bus tour will be organised at 15:00. Participants and accompanying persons will be transferred to different areas of Evros region and then will be left downtown for an independent walk or dinner, or return to the hotel. This tour is included in the conference fee.

## TRAVEL

Alexandroupolis can be reached with the following means and ways:

- A direct flight from Athens to Alexandroupolis airport: you can choose among the various Greek flight companies: Aegean Airlines, Skyexpresss and Olympic Airlines. When you arrive to Alexandroupolis airport you can take a taxi to the conference venue or rent a car. Public bus transport is also available. You will find various car rental companies in the arrivals lounge (AVIS, Europcar, Evros Car Rental, Hertz, Sixt).

- A flight from Athens to Kavala airport: Kavala airport is 1.5 h drive to Alexandroupolis. This airport is NOT recommended unless you plan to rent a car. This is because there is not public transport from the airport to a nearby town and the only mean to leave the airport is by car or taxi. A taxi to Alexandroupolis would cost about 110 €
- A flight from Athens to Thessaloniki (Salonica): Then take the bus or train to Alexandroupolis or rent a car. It takes a 3 hours drive from Thessaloniki to Alexandroupolis. This choice might be convenient only if you find a direct flight from your country to Thessaloniki. Otherwise Thessaloniki is a bit far from the conference venue, but if you take this choice, you are going to enjoy the route through the brand new, uncongested and safe "Egnatia" motorway. If you decide to drive to Alexandroupolis from Salonica, you will find the conference venue on the first Alexandroupolis motorway exit.
- Intercity (long distance) bus: This is an intercity bus called KTEL (Tel. +30 25510 26479), it connects Alexandroupolis with other towns. Thessaloniki - Alexandroupolis: 07:30-10:15-12:00-14:30-15:45-17:00 express (not on Saturday)-19:00-23:45 (5 hrs), Athens - Alexandroupolis: 17:00 (9 hrs)
- Radio Taxi phone number: 25510 33500, Local Bus Station: 25510 26479

### OTHER PRACTICAL INFORMATION

Alexandroupolis is the capital of Evros prefecture. Evros is the Greek prefecture that constitutes the cross roads for three countries: Greece, Turkey and Bulgaria. Alexandroupolis is a seaside town with a population of 70,000. It has an airport serving domestic flights and a port connecting to various Aegean island destinations.

The nearest customs point and entrance to Turkey ("Kipi" customs point) is only 30 km away while the corresponding entrance to Bulgaria ("Ormenio" customs point) is 1.5 h. West of Alexandroupolis, 45 min drive is the city of Komotini (Rodopi prefecture) and 1.2 h the city of Xanthi.

**Telephone:** The town code is 25510. Phone calls can be made from OTE's office (Greek Telecommunication Organisation: 5 Kavyri St., 25510 26699-27699) and from public phone stands only with phone cards (Tilekarta, 4 €). Prepaid phone cards (Teledome, Vivodi, Smartalk, Talk Talk, Hronokarta, with prices from 3 € to 10 €) can be bought at kiosks or mini markets, charge less and can be used from any fixed public or private tone phone. Calling home is cheaper from 10:00 pm- 6:00 am on the weekdays and from 3 pm at Saturday till 6 am Monday (Greek time). Transferred calls can be operated through the operator, by dialling 161. Telegrams can be sent from OTE's office and faxes from OTE, travel agencies and hotels. Useful phone numbers in Alexandroupoli: Emergency number 100, Tourist Police 25510 66200, Police Station 25510 37386, First aid 166, Hospital 25510 74000, Municipality 25510 64100 (Note: + 30 before these numbers if call is made from abroad).

**Post office (ELTA):** One office, at 42 Vasileos Alexandrou St. (main office) (Mon-Sat 8:00 am - 8:00 pm). Post code: 100 Rethymno. Letter boxes are painted yellow and can be found in the most central locations. Stamps can be bought from the post offices or from kiosks and shops selling postcards and foreign newspapers, with a small premium being charged, Tel: 25510 23122, Fax: 25510 23425

**Medical treatment:** There is a public hospital at 19 Dimitras St., (Tel. 25510 25772-6) and many private medical centres. There is always a pharmacy open from 8:00 am to 8:00 pm and another one from 8:00 pm to 8:00 am. Lists of these pharmacies, for each day, can be found on the window of any pharmacy.

### **CLIMATE**

In July, days are warm (average high temperature above 26°C). Good prospects for swimming are realised. Sun glasses are helpful. High protection sun cream is essential but can be found in any shop after arrival.

### **CORRESPONDENCE**

Correspondence regarding travel arrangements, hotel accommodation, taxis, and conference tours should be directed to:

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