

‘Water Quality: How Clean is Clean?’

An opportunity to hear from and meet decision makers from government, the regulator and industry alongside researchers at Brunel University engaged in understanding the significance of chemicals in water.

Newton Room, Hamilton Centre, Brunel University, Uxbridge, Middlesex, UB8 3PH
Monday 11 July 2011, 10 am for 10.30 start

To apply for free registration, please e-mail full contact details to: <water@brunel.ac.uk>

Brunel University are pleased to invite you to learn about our cutting-edge research in combating chemicals in the water supply chain, meet the researchers at Brunel, and discuss the challenges faced in keeping our waters clean.

With a population of over 60 million in the UK, we deliver to the UK water industry around 3.6 billion tonnes of sewage a year (1½ times the volume of Lake Victoria, the largest of all African lakes) – its treatment presents a huge challenge, exacerbated by the occurrence of often hazardous chemicals. With the addition of urban and agricultural runoff, controlling the water quality of our rivers is a challenge underpinned by meeting statutory standards.

Meeting these standards comes at a cost. How can we reduce the concentrations of chemicals in the environment at a time of increasing population and chemical use, alongside the need to reduce CO₂ emissions? What are appropriate standards and control measures? How can we be more intelligent about how we use chemicals and dispose of them?

Topics to be covered during the day include:

- What are the issues surrounding water quality in the UK, political, regulatory and industrial viewpoints (invited speakers)?
- Discussion of the ecotoxicological issues by Professors John Sumpter and Sue Jobling, recognised as experts worldwide.
- Sources and use of chemicals, and thoughts on novel materials for treatment of wastewater.

Who should attend?

- Those engaged in water quality issues.
- Senior managers and industrialists in the water and pharma industries.
- Industrial and academic researchers.

The Water Science Forum of the Royal Society of Chemistry is pleased to be associated with this event. This event is in celebration of the International Year of Chemistry, 2011.

Agenda – Order and timings subject to change

10:00	Arrival, Registration and Refreshments	
10:30	Welcome and Introduction	VC / PVC, Research
10:40	Set the scene	Dr. Mark Scrimshaw, Director of the Energy and Environmental Sustainability CRN, Brunel
10:50	Standards for hazardous substances	Dr. Paul Leinster, CEO, the Environment Agency
11:10	What is safe for aquatic biota?	Prof. Sue Jobling, Brunel
11:30	<i>Refreshment break</i>	
12:00	Sources and use of chemicals – we all have an impact	Dr. Mark Scrimshaw, Director of the E&ES CRN, Brunel
12:20	The political drivers behind water quality standards in Europe - title TBC	Dr Durk Kroll, Deputy Secretary-General, EUREAU ¹
12:40	Q&A	
13:00	Lunch, Networking and Poster session	
14:10	Ecological (and human health) risk assessments of pharmaceuticals in the environment	Prof. John Sumpter, Head of IfE, Brunel
14:30	Novel materials for wastewater treatment	Dr. Wenhui Song, Wolfson Materials Centre, Brunel
14:50	Treating waste waters to meet the standards – an industry view	Mr. Steve Kaye, Manager of Innovation, Anglian Water Services Ltd.
15:10	Q&A, Summary & lead into breakout session	Mark Scrimshaw / Deepak Gupta
15:20	Breakout session: (inc. refreshments)	Deepak Gupta
16:05	Panel discussion / plenary + Q&A	Dr. Mark Scrimshaw (Chair) + all speakers
16:30	Networking & refreshments	
17:30	Close	

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Registration and attendance is free, but space is strictly limited.

Directions of how to get to Brunel University may be found at:

<http://www.brunel.ac.uk/about/campus/directions.html>

<http://www.brunel.ac.uk/about/campus/directions6351.pdf?a=32720>

¹ European Federation of National Associations of Water and Waste Water Services

Brunel University's Research Centres

Brunel's Institute for the Environment (IfE)



The Institute for the Environment's focus is on world-class research and the provision of postgraduate studies dedicated to tackling environmental problems in collaboration with industry and the public sector. The IfE is recognised internationally for its

research in environmental science, and benefits from strong international links with pharmaceutical industries (such as: AstraZeneca, Pfizer, and GSK), water companies, and government authorities, including: the European Environment Agency, the Environment Agency of England and Wales, and DEFRA – all charged with protecting the environment and health of humans and wildlife. Every project the IfE undertakes, whether it be analysing air pollution and its impact on human health, gauging the threat posed by the presence of specific chemicals in drinking water, or investigating what major climatic events in the past can reveal about the future, is rooted in the notion that understanding environmental change is vital for the global community. Members of the Institute strive to further the public's understanding of their research, taking part in meetings and lectures, and contributing to non-academic books and news stories. IfE research, funded by the water industries, was used to assess advanced sewage treatment technologies for removing some chemicals, while research funded by the UK Government has led to them being banned or their use restricted.

<http://www.brunel.ac.uk/about/acad/ife>

Brunel's Energy and Environmental Sustainability Collaborative Research Network (CRN)



The current reliance on unsustainable resources has far-reaching environmental, political and economic consequences: if humans are to live sustainably, the Earth's energy and environmental resources can only be used in quotas at which they are renewable. The nature of these global challenges indicates the timeliness and importance of developing new research strategies across a diverse range of disciplines. Brunel's Collaborative Research Network in Energy and Environmental Sustainability was created with this in mind; it will establish new

interdisciplinary collaborations and programmes, whilst building on areas of excellent research across the University.

The core research expertise of the Network encompasses:

- sustainable energy and environmental systems;
- environmental integration of renewable sources of energy for electrical power production;
- improved efficiency and security in the planning and operation of large-scale complex energy systems, and
- environmental, regulatory and societal issues with regard to the strategic design and operation of future energy and environmental systems.

<http://www.brunel.ac.uk/research/crn/energy-and-environmental-sustainability>

Speaker Profiles and Presentation Abstracts

Dr Mark Scrimshaw is the Director of the Energy and Environmental Sustainability Collaborative Research Network (CRN) at Brunel University. His research topics include: public perception of environmental management, risk in relation to exposure to chemicals, and issues of sustainability related to the recovery of phosphorus from wastewaters. However, his main focus has always been the fate and behaviour of chemicals. Dr Scrimshaw conducts laboratory research into: the sources, fate, and behaviour of organic micro pollutants in sediment and water; the fate of contaminants in wastewater treatment processes; the cost and benefits of increasing stringency of environmental quality standards; and the development of analytical methods for the determination of contaminants in the environment and wastewater matrices. His work has been recognised by the International Commission of Agricultural Engineering, and he won the “Outstanding Paper Award” at the 2004 GIGR International Conference in Beijing.

Sources and use of chemicals – we all have an impact

Mark will talk about the occurrence of chemicals in the environment and use two examples to illustrate that how we use them on a day-to-day basis can contribute to their presence in rivers. This will demonstrate the challenge faced in meeting existing standards and the uncertainty about the risk posed by their presence.

Dr Durk Kroll is currently the Deputy Secretary-General of EUREAU, the European Federation of National Associations of Water and Waste Water Services. On behalf of EUREAU, he is a Board Member of the Water Supply and Sanitation Technology Platform (WssTP) and Secretary General of the Intergroup Water in the European Parliament. From the 1 August he becomes Director of WssTP and of ACQUEAU. He previously worked for the provincial government of Friesland (NL) as senior legal policy officer. He obtained a master's degree in Latin American literature and in International Law, from Leiden University (NL). He also holds a MBA from United Business Institutes (Belgium).

The political drivers behind water quality standards in Europe - title TBC

Professor Susan Jobling is a Senior Research Fellow at Brunel's Institute for the Environment. Her interests concern the effects environmental contaminants have upon the health of wildlife and humans. Her recent work has focused on the ability of environmental contaminants to mimic chemical messengers (hormones) and alter the functioning of the reproductive and endocrine systems. Professor Jobling's current research includes: exploring new methods and models with which to determine the safety of mixtures of industrial chemicals, and understanding the role of exposure to these chemicals in the manifestation of health problems – particularly reproductive health problems. Her research has led to regulatory action by the European Union on chemicals such as nonylphenol and some phthalates, which has resulted in the restriction – and in some cases banning – of such chemicals. Consequently, there have been rapid improvements in water quality and the health of aquatic life. In 2004 she established a consultancy which advises governments and industries on the risks posed by environmental chemicals.

What is safe for aquatic biota?

Dr Paul Leinster is the Chief Executive of the Environment Agency. Up until the end of May 2008 he was the Director of Operations, and prior to this he was the Director of Environmental Protection, having joined the Environment Agency in 1998. Dr Leinster's previous employers include SmithKline Beecham, BP International and Schering Agrochemicals. Dr Leinster has amassed over 30 years of experience working in the health and safety environment field, and he holds a degree in chemistry, a PhD in Environmental Engineering from Imperial College, and an MBA from the Cranfield School of Management. In 2008 Dr Leinster was awarded a CBE "for public and voluntary service".

Standards for hazardous substances

Professor John P. Sumpter is the Head of the Institute for the Environment (IfE) at Brunel University. His research group focuses on chemicals in the aquatic environment and their effects on fish. Professor Sumpter discovered endocrine disruption in fish caused by oestrogenic chemicals entering rivers in effluents from sewage treatment works. The main focus of his research has now expanded from oestrogenic chemicals to comprise other human pharmaceuticals present in rivers, such as: beta-blockers, other steroid hormones including progestogens and glucocorticoids, and anti-cancer drugs. His research ranges from detailed molecular studies of the mechanisms of action of these chemicals, through to ecological studies on fish populations. Professor Sumpter has received international recognition for his research into endocrine disruption. His research has, to date, been cited over 18,000 times, and this figure is currently increasing by over 1,500 per year. The consequence of this level of citation is that Brunel University's environmental science research is extremely highly rated on an international scale.

Ecological (and human health) risk assessments of pharmaceuticals in the environment

Dr Wenhui Song is a lecturer in the Wolfson Centre for Materials Processing/Mechanical Engineering, School of Engineering and Design, Brunel. She has extensive research experience in nanomaterials, polymers and polymer composites. Her pioneering work on the liquid crystalline phase of carbon nanotubes and polymers has made an important contribution to the understanding of the self-organising behaviour of such nanoparticles and macromolecules. In parallel to fundamental research, she leads a team that works closely with industries on the development of real-world engineering applications of nanomaterials and nanotechnology, such as: controlled self-assembling nanostructured block-copolymers blends for pressure sensitive adhesives, implantable carbon nanotube fibre biosensors, and carbon nanomaterial-based field-emission devices. Her original work has been awarded 9 prizes, including "Best use of Materials in Science and Engineering Prize" at the Materials KTN Annual Conference 2010. She has authored/co-authored over 80 highly-cited papers in high-impact journals including Science, Advanced materials, a book chapter, and conference papers. She is the PI (principal investigator) for a portfolio of projects funded by EPSRC, Royal Society, TSB, LDA and industry. She is a member of the EPSRC College, Institute of Physics, Society of Chemical Industries, and a Fellow of the Institute of Nanotechnology.

Novel materials for wastewater treatment

Steve Kaye is the Manager of Innovation at Anglian Water Services Ltd.
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Treating waste waters to meet the standards – an industry view