Corrosion and Odour Management in Sewers

The aim of this course is firstly to teach the key science and engineering principles under-pinning sewer processes, and secondly to use this knowledge to understand and manage key issues like corrosion, odour and greenhouse gas emissions.

The course presents; outcomes from a $20 million ARC Linkage Project on odour and corrosion, the SCORe Project; and other essential information and proven technologies for the cost-effective management of sewer odour and corrosion. Both liquid and vapor phase technologies will be covered. The effectiveness and limitations of each technology will be assessed through the use of case studies and fundamental knowledge of the in-sewer biotransformation processes. This is a practical course, and includes several real case studies of successful sewer management approaches.

ISSUES ADDRESSED

DAY 1 THE DRIVERS AND UNDER-PINNING SCIENCE
- In-sewer physical, chemical and biological processes
- Microbial processes leading to production of hydrogen sulfide, methane and other hazardous compounds
- New challenges under climate change conditions: reduced sewer flow and increased concentrations of pollutants
- Odour generation
- Gas/liquid mass transfer of volatile compounds
- Workshop 1: Prediction of hydrogen sulfide production

DAY 2   SEWER PROCESSES: MODELLING AND MEASUREMENT
- Modeling sulfide production and emission from sewers
- Modeling methane production and emission
- Chemical dosing for emission control in sewers – e.g. oxidants, ferric chloride, lime, caustic and nitrite
- Workshop 2: Design of chemical dosing for hydrogen sulfide control
- Corrosion in sewers
- Odour and odorant identification and measurement

DAY 3   TECHNOLOGIES, MAINTENANCE AND PLANNING
- Ventilation in sewers including design and operating principles
- Overview of air phase treatment technologies and emerging technologies
- Workshop 3: Design of a biological filter
- Odour control planning
- Benefits of public outreach approach
- Quantifying odour impacts
- Liquid and gas phase measurement using on-line sensors
- How public outreach and innovations can fit together
- Odour assessment and control innovations
- Master planning

WHAT DO YOU GET?
- Access to world leading researchers and practitioners
- Course notes and USB
- Real case studies
- Real field data and exercises
- Exposure to world-leading sewer models

WHO SHOULD ATTEND?
- Engineers and managers involved in the design and operation of sewer systems
- Local governmental officers
- Consulting engineers providing service on corrosion and odour management in sewers
- Regulatory agency officers
- Researchers

Go to www.iwes.com.au for the extended course outline

Zhiguo Yuan

Prof Yuan is an internationally renowned leading expert on sewer corrosion and odour management. He was the leader of the well-known Sewer Corrosion and Odour Research (SCORe) Project (2008-2013) funded by the Australian Research Council and most of the major Australian water utilities. His sewer research has delivered documented savings of over $400 million to the Australian water industry. His other areas of research include innovative wastewater treatment and resource recovery technologies.

He is the founder of three businesses namely SeweX, Cloevis and Lodomat. Prof Yuan has to date published over 300 fully refereed journal papers including a paper in Nature (2013) and Science (2014).

His h-index is 57 (Scopus, March 2017), with over 10000 citations. He was a recipient of the 2015 ATSE Clunies Award. He is a Fellow of the Australian Academy of Technological Sciences and Engineering (ATSE), and also an IWA Fellow. He was named as one of Engineers Australia's Top 100 Most Influential Engineers for 2015.

He is currently Director of the Advanced Water Management Centre (AWMC) at The University of Queensland.

Josef Cesca

Josef is a recognized national expert in air and odour emissions control and permitting for municipal and industrial applications and wastewater collection and treatment systems. He is currently the Technology Leader for Odour and Air Quality in the Asia Pacific Region for CH2M HILL, and has over 20 years experience in odour control and measurement in wastewater collection systems and treatment facilities.

He has been responsible for the review of systems to identify odour generation causes and assessment of odour impacts, and has implemented various emission control technologies at over 100 sites, including some of the largest facilities in Australia and New Zealand. This work has involved the design and commissioning of some of the largest biotechnology odour control systems in Australia. He also has over 25 years of extensive experience in biosolids, water, and wastewater treatment.

He is currently leading the Australian research into understanding the impacts of ventilation in sewers as part of a national program on corrosion and odour management which involves seven major Australian water utilities, four Australian universities, as well as several other Australian and international partners.

Registration Form, 5 - 7 November 2018

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Please register me for the following course:

☐   Corrosion and Odour Management in Sewers (3 days)

Cost of Registration (inc. GST)

Register pre   1 October $2480

Register after   1 October $2680

Discounts for organisations registering multiple delegates

☐   2 - 3 delegates = 5%   ☐   4 - 5 delegates = 10%   ☐   6 and over = 15%

☐   AWA Member = 10%   AWA membership number: _____

☐   UQ Alumni = 10%   UQ student number: _____

Registration Details

Dr Mr Mrs Ms   First name   Last name

Organisation   Address

            Phone   Email

☐   *I have dietary requirements. Details* _____

☐   *Please add my contact details to the IWES enews so I can receive updates on upcoming events.*

☐   *Please send me more information on WaterAid Australia.*

Send completed form to IWES by email: info@iwes.com.au   **UQ ABN: 63 942 912 684**

Pond Design: The Next Generation

This course moves pond design principles to a new generation, from simple volumetric sizing, to designs incorporating temperature process equations, non-smelly anaerobic ponds of one day retention, hydraulic design and algae removal in the final effluent. Recent work has shown that ponds are capable of producing a 5:10:5, BOD:SS:NH3 mg/L effluent whilst achieving less than 100 Escherichia coli per 100ml.

Learn how to exploit this knowledge for your pond systems. This is a practical course, and participants will undertake design calculations, and work on real pond case studies for both municipal and industrial wastewaters.

ISSUES ADDRESSED

DAY 1
- A short history of ponds
- Why use ponds?
- Different types of pond systems
- The World Bank sewage treatment selection by economics
- The function of different ponds in sewage treatment
- Overview of new pond design guidelines
- Workshop 1: Pond and conventional treatment combinations

DAY 2
- Process design by temperature dependent equations
- Algae removal by tertiary treatment
- Pond hydraulic design parameters including thermistors
- Pond design guidelines
- Site Visit and debrief

DAY 3
- Upgrading existing ponds to meet tight discharge standards
- Pond operation
- Pond monitoring
- Commissioning, desludging and maintenance needs
- Workshop 2: Pond process designs

WHAT DO YOU GET?
- Case studies in green field pond design
- Case studies for upgrading an existing pond scheme
- Case studies of pond failure – lessons learned
- Course notes, and access to a leading international practitioner

WHO SHOULD ATTEND?
Engineers and scientists who need to learn about the next generation of pond design and operation. Project managers who need sufficient knowledge to assess consultants' recommendations.

Go to www.iwes.com.au for the extended course outline

Presenter

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John Ashworth

John is a civil engineer with almost 40 years specialisation in water and sanitation across the globe. He developed a passion for waste stabilisation ponds in the 1970s whilst on a construction project in the Saudi desert. This has extended to a large number of projects involving pond design, construction and trouble-shooting in a variety of places including Auckland, Colombia, Jamaica and Australia's Northern Territory.

Recently, John has advised on many pond projects across Australia. This included the development of the Pond Design Manual for the NT PWC, with Professor Duncan Mara (UK), the worlds leading pond expert. The manual reflects the problems and benefits of the Australian climate, and provides pond designs for the 21st century. In addition to his vast array of work on waste stabilisation ponds, John has spent a lot of his career working in developing countries, working on water, sewage, hygiene and emergency programmes.

John was recently the project manager for the Rural Hygiene and Sanitation Project in Kyrgyzstan, seconded to the UNHCR in Pakistan to develop camps for Afghan refugees, and seconded to UNICEF on hygiene promotion for the South Asia earthquake.

Registration Form, 5 - 7 November 2018

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☐   Pond Design: The Next Generation (3 days)

Cost of Registration (inc. GST)

Register pre   1 October $2480

Register after   1 October $2680

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Registration Details

Dr   Mr   Mrs   Ms   First name _____   Last name _____

Organisation _____   Address _____

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TERMS AND CONDITIONS
1. Cancellation of registration less than 3 weeks before the starting date of a course(s) will incur a cancellation fee of 50% of the course price. Alternatively, delegates may send a substitute. **2.** While every attempt will be made to deliver all advertised courses, IWES reserves the right to cancel individual courses at short notice. **3.** Only registrations submitted and invoiced in one batch qualify for multiple registration discounts. **4.** AWA Member and UQ almuni discount can not be used in conjunction with any other offer/discount.

Process Modelling for Water Treatment Professionals

This interactive two-day course is built around forecasting water quality and addressing treatment plant performance issues arising from changing feed water conditions. This is an interactive two-day course built around forecasting water quality and addressing treatment plant performance issues arising from changing feed water conditions. Engineers will learn to understand the influence of water chemistry on process design and how to use this knowledge to optimise performance. Participants will also design new treatment plants and size equipment using comprehensive software that integrates material and heat balancing, equipment sizing, stream property and solubility prediction.

Each module includes realistic scenarios for advanced water treatment applications including boiler feedwater, cooling water blowdown, industrial wastewater, seawater desalination, mine dewatering and brine management. Up to 21 technologies in water treatment will be explored during the sessions.

ISSUES ADDRESSED

DAY 1 MODULE 1 - Water chemistry essentials

- A comprehensive overview of essential water quality properties for treatment plant design
- • Basic theory around chemical equilibrium reaction kinetics and redox potential

MODULE 2 Unit operation types

- An overview of most technologies used in water treatment
- Modes of action defining separation for each technology

MODULE 3 Configuring flowsheets for process design

- Developing a feed water scenario for typical and boundary conditions
- Process design considerations, constraints, performance objectives and assumptions

DAY 2 MODULE 4 Process modelling for performance optimisation

- An overview of each unit operation, their key process parameters (design/operational) and how they are used in each model simulate equipment performance
- Learn how to optimise a process design for performance objectives by refining process design parameters for each unit operation.

MODULE 5 Proccess Economics and Lifestyle Evaluation

- Produce vendor data sheets and RFQ documentation for equipment pricing
- Calculate power, chemical and consumable operating costs
- Estimate turnkey capital costs for a greenfield application

MODULE 6 Creating a Process Design or Scenario Modelling Report

- Documenting the basis of design
- Key elements of a process design report

Go to www.iwes.com.au for the extended course outline

WHAT DO YOU GET?

- Free 3 months subscription to AqMBTM simulation software for water treatment
- Complimentary course notes and USB
- Q&A with experienced designers.

WHO SHOULD ATTEND?

There is an assumed level of knowledge for this course. Please consult the AqMB User Guide if uncertain whether your level of experience is adequate.

Process engineers, consultants and operators involved in concept design, sizing and/or operation of existing physico-chemical water treatment plants involving conventional (settling, filtration), membrane, resin, electrolytic or thermal technologies.

Matthew Brannock

Dr Matthew Brannock has a wealth of experience in water and wastewater plant design and brine characterisation. He is a very capable modeller with extensive experience using chemical speciation and computational fluid dynamic (CFD) models for process simulation both for academic and process design applications.

Matthew holds a PhD in Environmental Engineering from The University of Queensland. His research saw him develop CFD tools for the design of wastewater treatment and membrane systems. He has published more than 20 papers in respected journals such as Water Research, Desalination and the Journal of Membrane Science.

Following his academic career, Matthew has spent 10 years in the consulting engineering industry specialising in process design of water and brine treatment systems.

Darren Szczepanski

Darren has many years of project experience in the field of membrane, resin, electrolytic and thermal technologies within the water, wine and dairy industries. His process design experience includes installations in coal seam gas water, acid mine drainage, seawater, potable drinking water, industrial and municipal tertiary effluent, pharmaceutical, brewery waste, NBC contaminated waste and cooling tower blowdown applications.

Darren has worked on the characterisation of water and brine, developed detailed design and functional specifications, and led the evaluation of complex competing process designs from major thermal technology vendors.

Darren holds a Bachelor of Chemical Engineering from The University of Queensland.

Registration Form, 5 - 6 November 2018

iwes

Please register me for the following course:

☐ Process Modelling for Water Treatment Professionals (2 days)

Cost of Registration (inc. GST)

Register pre   1 October $1710

Register after 1 October $1860

Discounts for organisations registering multiple delegates

☐ 2 - 3 delegates = 5%   ☐ 4 - 5 delegates = 10%   ☐ 6 and over = 15%

☐ AWA Member = 10%   AWA membership number: _____

☐ UQ Alumni = 10%   UQ student number: _____

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