



ENGINEERS
AUSTRALIA

Implementation of EEI - Anammox process for wastewater treatment

Hosted by Sustainable Engineering Society WA

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Across Australia and in other parts of the *world*, nitrogen removal has become an essential process of wastewater treatment. The conventional method of nitrogen removal - the nitrification and denitrification pathway requires substantial oxygen transfer (approximately 4.3 g of O₂ for each g of ammonia-N) and carbon (about 4 g/g of NO₃-N reduced). In the case of low carbon, high nitrogen wastewater, the addition of an external carbon source is required during the denitrification stage to effectively convert nitrate to nitrogen gas. These escalate the cost of the conventional nitrogen removal process, and utilities and industry have been looking for alternative low-cost nitrogen removal technologies. Some of the recent innovations in nitrogen removal include the anammox process, and struvite precipitation (precipitation of ammonium and phosphate as MgNH₄-PO₄, with the addition of magnesium salt if needed).

This presentation discusses the retrofitting of the anaerobic ammonia oxidation process (anammox) by Environmental Engineers International Pty Ltd (EEI) to an existing abattoir wastewater treatment plant (WWTP) in Western Australia. Abattoir wastewater requires advanced treatment prior to discharge to the environment due to its high nitrogen content. Since the implementation of the EEI-Anammox process over the past two years, the WWTP has consistently achieved good nitrogen removal, without any extra carbon addition. The plant is monitored online for various parameters to ensure its effective operation. The WWTP has achieved over 20% savings in overall electrical power since the implementation of the anammox process. Unlike the European case studies, the WWTP has achieved over 95% TN reduction even during the winter months when the temperature has fallen below 15°C.

VENUE

Engineers Australia WA
Auditorium
712 Murray Street
West Perth

DATE & TIME

Wednesday 20 June 2018
5.00pm for 5.30 pm start – 7.00pm

TICKETS (incl. GST)

SEng & EA Members & Students
Complimentary
Non-members \$30

REGISTRATIONS CLOSE

4.30pm 20 June 2018

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About the Speaker



**Dr Raj Kurup PhD FIEAust CPEng NER APEC Engineer IntPE(Aus) GAICD - CEO,
Environmental Engineers International Pty Ltd (EEI)**

Dr Raj Kurup, CEO of the specialist firm Environmental Engineers International Pty Ltd (EEI), is an internationally reputed environmental engineer. Raj was awarded the title of one of Australia's Most Innovative Engineers in the consulting category by Engineers Australia for 2017. Raj was also selected by the Australian Water Association as the WA Water Professional of the Year 2017. Raj was also selected by the Australian Water Association as the WA Water Professional of the Year 2017.

The anammox process technology developed by Raj for treating high nitrogen effluent streams received several awards - these include the Australian Water Association WA Branch Research Innovation Award for 2017 and the 2016 Innovating for Sustainability award. Raj was also selected as the Best Innovative Engineer by WA Business News and Engineers Australia in 2003.

Raj has over 25 years of professional experience in various facets of water and wastewater engineering. Raj has a long history of providing innovative and efficient solutions to challenging problems that are economical, environmentally and socially acceptable, technically advanced, and operationally simple. His expertise includes project management, contracts administration, process definition, design, equipment selection, commissioning, optimisation, numerical modelling, and remote monitoring and control.

Raj has authored over 60 publications, including highly-cited peer reviewed journal papers, refereed conference papers, books, and book chapters. He has been an invited keynote speaker on water and sustainability topics for many international conferences.

Raj's qualifications include a PhD in wastewater treatment from Murdoch University, a Master of Engineering Science (Research) in environmental engineering from UWA, a Master of Engineering in environmental science & technology from UNESCO-IHE Delft, The Netherlands, and a Bachelor of Engineering in Civil Engineering from the College of Engineering Trivandrum, India. In addition, Raj is also a graduate member of the Australian Institute of Company Directors. Raj is a Fellow and Chartered Professional Engineer (civil and environmental) of Engineers Australia and a registered professional engineer in Australia in civil and environmental engineering disciplines.

Raj also serves as an adjunct professor of environmental engineering at Murdoch University and the University of Missouri-Columbia, USA.