

UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING
Department of Civil & Environmental Engineering

Distinguished Lecture Series

Mason Tomson, Ph.D.

Rice University

Environmental Issues Related to Shale Oil and Gas in Western US

Monday, March 25, 2013

10:30 to 11:30AM

Seminar Room D3 W122



Abstract

Shale oil and gas produced water, additive, and frac water samples have been collected from major shale plays in the central and western United States. This work has been led by Ross Tomson at the Shale Water Research Center in Houston. These samples have been extensively analyzed, specifically of makeup water, hydraulic stimulation water and additives, direct produced waters from the well head, and produced and frac water from temporary storage ponds. Samples have been analyzed for about 40 parameters per sample, to establish trends and key parameters needed to establish threshold constituent levels in order to reuse produced water and reduce the environmental footprint. Laboratory researches conducted at Rice and at Shale Water Research Center's laboratories on the impact to frac water compatibility and disposal of additives have identified numerous areas of research needed to ensure minimum, or positive, environmental impact, compared to all other sources of hydrocarbons. Successes and challenges in these new fields of natural gas and oil production will be presented.

About the speaker

Professor Mason Tomson holds a BS degree in Chemistry and Mathematics and a Ph.D. in Chemistry and is a licensed professional engineer (P.E.) He is a Professor of Civil and Environmental Engineering at Rice University, Houston, TX. He teaches courses and does research on all aspects of organic and inorganic chemical fate and transport, with emphasis on aquatic processes. He has authored or

coauthored over 250 articles in high impact journals, including two articles in Science, Journal of the American Chemical Society, Environmental Science and Technology, Oil and Gas Journal, and numerous SPE journals; he holds four patents, and has authored two books. While at Rice, he has directed research grants totaling over twenty million dollars. His research has focused around two themes, fate and transport of organic and inorganic chemicals in the environment and mechanisms of mineral scale formation and control. His research team was one of the first (circa 1978) to prove that ground water could be readily contaminated by organic chemicals from the surface; they then developed and demonstrated the concepts of facilitated (enhanced) transport and more recently of irreversible (resistant) desorption of chemicals from soils, sediments, and nanomaterials. These concepts of irreversible adsorption have recently been demonstrated to apply to fullerene, activated carbon nanoparticles and are now being adapted for oil reservoir interrogation.

He is presently involved in numerous research projects from DOE, Advanced Energy Consortium, Brine Chemistry Consortium of twenty six oil and gas production and service companies (about 25 yrs.), and shale gas water treatment. Prof. Tomson is also leading a joint program between Rice University and Nankai University on sustainable environmental development and several energy/environment related projects. In collaboration with Prof. Colvin his work on arsenic removal was named one of the top five nanotech breakthroughs of 2006 by Forbes magazine and was featured in New York Times.

** Professional Engineers who attend the Distinguished seminars are eligible for one PDH credit. Please sign in and out at the seminar and provide your e-mail address for delivery of your certificate.*

The seminars listed above will be recorded and live-streamed on the internet. The video links will be posted at cive.uh.edu the week before each seminar.