

ARTS & SCIENCES PROGRAM

GUEST SPEAKER SERIES 2009

Presenter: Rolf Herrmann
Principal Hydrogeologist /
Technical Manager, Middle East
Schlumberger Water Services
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Lecture Hall 1-100, Zarkuh Building



Using Oilfield Technology in Water Industry: Improving Integrated Aquifer Characterization

Abstract

In the United Arab Emirates, Abu Dhabi has long dealt with challenges imposed by climate, but now is facing increased rates of water consumption to meet the needs of a burgeoning population and economy. Well over 90% of the fresh water supplied for domestic use in Abu Dhabi is produced through desalination of seawater or brackish groundwater. Excess production from desalination plants can be stored for future demand, and certain shallow aquifers in the area may be well suited for this purpose. In arid climates, water storage in natural aquifers provides a favorable alternative to storage in surface reservoirs, lakes or tanks. Current water demand and forecasts of near-term growth in Abu Dhabi and other parts of the UAE call for significant increases in desalinated water production, fresh water storage capacity, and ground-water replacement. To meet this demand, water managers proposed an ASR project to develop a 30 billion imperial gallon (BIG) reserve of fresh water. Their plan called for aquifers in the eastern region of the Emirate of Abu Dhabi to be artificially recharged with water piped from a coastal desalination plant at Qidfa, in the Emirate of Fujairah.

Many parts of the world experience seasonal or long-term imbalances between freshwater supply and demand. Groundwater resources are increasingly called upon to offset a greater share of these shortfalls. To help manage and sustain dependable groundwater supplies, resource managers are turning to advanced oil field technology adapted for the water industry.

Geophysical logging and modeling technology applied for over 25 years in the oil and gas industry have been adapted to ground water characterization and modeling and used successfully in water resource studies. Injection and production scenarios have been modeled and simulated using Petrel and Eclipse software tools. The insight in oil and gas workflows for numerical modeling will add a new perspective in how to value the input data to build the ground water model and subsequently the calibration of the simulation results.

- **How can oil field technology applied in the water industry improve the aquifer characterization?**
- **Can we bring the traditional technical methods used in the water industry to a new technical level with oil field technology?**
- **Are we ready to solve the water supply problems in the future with oil field technology?**

Rolf Herrmann is a Technical Manager for Schlumberger Water Services in Abu Dhabi, UAE. As a principal engineer with 17 years of experience, he is involved in subsurface exploration and evaluation of aquifers and reservoirs. He provides expertise in the development of conceptual models and numerical simulations. His specialties include aquifer and reservoir characterization, dynamic simulation and evaluation of geophysical logs, and all aspects of aquifer storage and recovery (ASR) systems. He has an MS degree in geology from the State University of New York, and a BS degree in earth sciences from the University of Wuerzburg in Germany.

Open to all. For details, contact Dr. Mirella Elkadi: melkadi@pi.ac.ae