

ENGINEERING FORUM TELECONFERENCE MINUTES

September 6, 2006

TOPICS IN THIS MONTH'S MINUTES:

TECHNICAL TOPIC

FALL 2006 TSP MEETING

TECHNICAL TOPIC

Dr. Patrick Evans (CDM) gave a presentation on recent advances in perchlorate treatment in soil and groundwater. Dr. Evans began by briefly discussing the regulatory framework for perchlorate found in groundwater, potable water, and soil, noting applicable federal, state, and local rules, action levels, and goals for these media. He provided an overview of perchlorate's properties and treatability, noting that it is highly soluble in water, anionic, nonvolatile, and easily biodegradable. Dr. Evans then discussed four recent treatment advances in perchlorate remediation, including packed bed bioreactors for groundwater, membrane biofilm reactors for groundwater, ex-situ soil bioremediation, and gaseous electron donor injection technology (GEDIT).

Pennsylvania State University and CDM conducted a demonstration project to investigate the ability of a packed bed bioreactor to remove perchlorate from drinking water. Both sand and plastic media were tested. The pilot-scale reactor was installed at the Texas Well Street facility in Redlands, CA. This demonstration showed that perchlorate can consistently be removed from potable water in a packed bed bioreactor. Dr. Evans said that reactor plugging can be prevented through proper reactor design and construction. Downstream processing, including aerobic stabilization and filtration, resulted in generation of potable-quality water. Operating costs were estimated to be on the order of \$100 per acre-foot.

DoD's Environmental Security Technology Certification Program (ESTCP) funded a demonstration project that tested a membrane biofilm reactor's (MBfR) ability to remove perchlorate from water. The MBfR technology was invented by Dr. Bruce Rittmann, a professor at Arizona State University and a co-principal investigator in this demonstration. The reactor was tested at the East Valley Water District in San Bernardino, CA. Laboratory and limited field testing has shown the MBfR to be a promising technology. Dr. Evans said the use of membrane-based systems is growing in the drinking water industry. Additional field testing of this technology must be done, and ESTCP will play an important role in demonstrating and validating MBfR systems.

Dr. Evans next discussed field studies that are being conducted to test the ability of ex-situ bioremediation to reduce perchlorate concentrations in soils. These field studies, which are being conducted at a private industrial facility, involve the use of Ag-Bags to contain the soil. The advantages of using Ag-Bags for bioremediation include the ability to treat large volumes using treatment cells, the potential to reduce other contaminants, and the elimination of wastewater discharge. Thus far, the field studies have demonstrated that bioremediation effectively and rapidly removes perchlorate on a large scale. Recent results show that permanganate and corn syrup can be added simultaneously to soil to destroy TCE and perchlorate.

Finally, Dr. Evans gave an overview of GEDIT, which is essentially bioventing in reverse. GEDIT has several benefits over liquid flushing and excavation when it comes to soil treatment, including the ability to treat perchlorate in soils at greater depths, the minimal risk of secondary groundwater impacts, and the fact that it is compatible with soil vapor extraction and chemical oxidation using ozone. Costs for this technology range from \$10 to \$30 per cubic yard. While this technology looks promising, demonstration and validation through ESTCP is ongoing.

For more information on any of these technologies, EF members can contact Dr. Evans by telephone at (425) 453-8383, or via email at evanspj@cdm.com.

FALL 2006 TSP MEETING

The Fall 2006 TSP meeting is being held in conjunction with the Groundwater Resources Association of California's (GRAC) 2nd Tools and Technologies Symposium. The symposium will take place November 14-16 at the Westin Hotel in Long Beach, CA. The EF business session will take place on Monday, November 13.

Additional information on the symposium is online at www.grac.org/hires.asp. To make a hotel reservation, EF members should call the Westin Long Beach at 562-436-3000 or 1-800-WESTIN1 and ask for reservations. Tell them you are with the EPA Technical Support Project group (do not mention the GRAC symposium) to get the negotiated rate of \$104/night. This rate is available from Sunday, November 12, through Thursday, November 16, with checkout on Friday. You must guarantee your reservation with a credit card. Room charges for regional EPA participants will be covered under a Headquarters purchase order upon checkout.

Headquarters is paying the registration fee for regional-EPA TSP forum members only. If there happens to be money left over, it may be extended to non-Regional EPA participants. Regional EPA forum members should not register for the symposium online, as they will be asked to pay the registration fee. Instead, Regional members should print the registration form available online (<http://www.grac.org/hiresreg.htm>), fill it out, and fax it to EMS (301-589-8487). EMS will collect all the registration forms and provide them to GRAC.

ATTENDEES

Ray Cody, Region 1	Bernie Schorle, Region 5
Aaron Gilbert, Region 1	David Seely, Region 5
Sharon Hayes, Region 1	Terry Burton, Region 6
Stephanie Vaughn, Region 2	Carlos Sanchez, Region 6
Fred MacMillan, Region 3	Steve Kinser, Region 7
Andy Palestini, Region 3	Brian Caruso, Region 8
Hilary Thornton, Region 3	Harry Ball, Region 9
Frank Vavra, Region 3	Mike Gill, Region 9 HSTL
Jon Bornholm, Region 4	Kelly Madalinski, TIFSD
Julie Corkran, Region 4	Linda Fiedler, TIFSD
Carl Froede, Region 4	Lindsey Lien, USACE
Leo Romanowski, Region 4	Patrick Evans, CDM
Gena Townsend, Region 4	Keith Arnold, EMS, Inc.
Tony Holoska, Region 5	

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