Wednesday, December 14, 2011

Black Lab Pub, Churchill Room • 4100 Montrose Blvd.

Social 5:30 p.m., Dinner 6:30 p.m.

Cost: $25 Preregistered members; $30 non-members & walk-ups

To guarantee a seat, you must pre-register on the HGS website and pre-pay with a credit card.
Pre-registration without payment will not be accepted.
You may still walk up and pay at the door, if extra seats are available.

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Addressing Environmental Concerns in Shale Gas Development: Baseline Groundwater Sampling, Monitoring, and Other Mitigation Strategies

Shale gas development has led to increasing concerns regarding the impact of drilling and completions operations on groundwater quality and drinking water supplies. Relatively few water wells are impacted by drilling operations and there are no documented cases of groundwater contamination directly related to hydraulic fracturing operations. In contrast, impacts to groundwater quality resulting from accidental releases of stray gases from commercial gas wells are well documented. Failed casing cement jobs, uncemented annuli, and compromised casing cement bonds can, under just the right set of conditions, allow buoyant hydrocarbons to rise from depth and invade shallow aquifers. Yet such events are continually misinterpreted and reported by the media as resulting from well completion activities.

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Pressurized stray gas invasion into shallow water supplies generates widely and commonly reported water quality impacts that the general public perceives as resulting from hydraulic fracture operations. Colloidal complexes and fine sediments normally resting at the bottom of water wells rapidly become suspended throughout the water column. Once such suspensions are introduced into the well pump intake port, normally clear water in homes suddenly becomes colored, turbid, slimy, and smelly. Effervescing hydrocarbon gases, immediately noticeable and a threat to safety, rapidly transform the redox environment in water wells to strongly reducing conditions. Such conditions excite the growth of strict anaerobes, such as sulfate-reducing bacteria, which can readily convert dissolved sulfate into odiferous, noxious, and toxic sulfides that can negatively impact air quality in homes. Many of the health-related effects reported in water quality complaints appear to be consistent with short term exposure to stray gases and noxious fumes in small enclosed and poorly ventilated spaces.

Risk-mitigation strategies needed to address such circumstances include baseline water sampling and monitoring. Forensic analyses needed to identify stray gas point-sources also rely on sampling and analysis of gas shows detected while drilling, casing head gases, produced gases, and free and dissolved gases in water supplies. This information, when evaluated within a well-characterized geohydrologic framework, allow stray gas sources to be quickly identified and mitigated. Because intrinsic bioremediation and natural attenuation are the only viable remediation options for stray gas invasion, rapid and effective response is the key to minimizing impacts to groundwater resources. Low volume stray gas releases also minimize monitoring costs associated with verifying a return to baseline conditions as established prior to drilling. ■

Biographical Sketch

Dr. Anthony Gorody is a geoscientist with more than 30 years of diverse international and domestic oil and gas industry experience. His technical specialty relates to state-of-the-art forensic geochemical fingerprinting and hydrogeologic characterization techniques useful for evaluating natural gas resources, groundwater and surface water resources, produced water, and pollution in the near-surface hydrogeologic environment. Dr. Gorody's work experience includes domestic projects in the Appalachian, Piceance, Denver, Washakie, Wind River, Powder River, Green River, San Juan, Raton, Fort Worth, Gulf of Mexico, Black Warrior, and Uinta basins, and international projects in the North Sea, Baltic, Telkwa (British Columbia), Comox (BC), and Hat Creek (BC) basins. He earned his Ph.D. as a Weiss Scholar at Rice University, is a Certified Professional Geologist, and is licensed and registered as a Professional Geologist in the states of Texas, Wyoming, and Pennsylvania. He is president of his own firm, based in Houston, Texas, and provides training services to both operators and regulatory agencies and consulting services related to baseline groundwater sampling and monitoring practices.