

**Brian A. Schumacher, Associate Director for Science, in EPA's National Exposure Research Laboratory**

Exposure Methods and Measurements Division

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**Area of Expertise:** My work primary research areas have been focused on examining ways to improve sample collection and analysis for soils and sediments. The main focus of the soils research has been on the collection of soils contaminated with volatile organic compounds (VOCs) and improving the techniques/methods for sample collection, handling, storage, and preservation. This initial research examining VOCs in soils was logically expanded to include vapor intrusion (VI). My VI research is focused in numerous areas including: the improvement/standardization of soil gas and subslab sampling methodologies; the spatial and temporal variability of VOCs in the environment, demonstration of fieldable technologies for vapor intrusion monitoring including the use of passive samplers; examining the efficacy of an installed mitigation system on limiting/preventing vapor intrusion into a home; and examining simple methods to predict when vapor intrusion will occur so that sampling events can be effectively planned.

The primary VOCs of concern are currently the chlorinated solvents (e.g. Trichloroethene - TCE, Tetrachloroethene - PCE, and chloroform). Current research efforts are focused on examining the use of a soil vapor extraction system to minimize or eliminate vapor intrusion into a community of buildings (e.g., homes, offices, warehouses) in a neighborhood and on developing a short-duration screening method that will induce the "maximum" vapor intrusion into a building. Other areas of recent research efforts have included: methods testing, modification, and development as related to hydraulic fracturing; arid green infrastructure; determination of urban background contaminant concentrations; and emerging contaminant determinations.

**Select Publications:**

Schumacher, B.A., J.H. Zimmerman, R. J. Elliot, G.R. Swanson. 2016. The Effect of Equilibration Time and Tubing Material on Soil Gas Measurements. *Soil and Sediment Contamination: An International Journal*. (accepted)

Schumacher, B.A., J.H. Zimmerman, R. Truesdale, C. Lutes, and B. Cosky. 2015. Simple, Efficient, and Rapid Methods to Determine the Potential for Vapor Intrusion into the Home: Temporal Trends, Vapor Intrusion Forecasting, Sampling Strategies, and Contaminant Migration Routes. U.S. Environmental Protection Agency, Las Vegas, NV. EPA/600/R-15/070.

Schumacher, B.A., J. Griggs, D. Askren, B. Litman, B. Shannon, M. Mehrhoff, A. Nelson, and M.K. Schultz. 2014. Development of Rapid Radiochemical Method for Gross Alpha and

## Gross Beta Activity Concentration in Flowback and Produced Waters from Hydraulic Fracturing Operations

Schumacher, B.A., J.H. Zimmerman, C.R. Sibert, K.E. Varner, and L.A. Riddick. 2009. Macro- and Micro-Purge Soil-Gas Sampling Methods for the Collection of Contaminant Vapors. *Ground Water Monitoring & Remediation* 29(1): 138–143.

Schumacher, B. and L. Zintek. 2014. The Verification of a Method for Detecting and Quantifying Diethylene Glycol, Triethylene Glycol, Tetraethylene Glycol, 2-Butoxyethanol and 2-Methoxyethanol in Ground and Surface Waters. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-14/008, 2014

Schumacher, B.A., J.H. Zimmerman, R. Truesdale, C. Lutes, and B. Cosky. 2014. Assessment of Mitigation Systems on Vapor Intrusion: Temporal Trends, Attenuation Factors, and Contaminant Migration Routes under Mitigated and Non-mitigated Conditions. U.S. Environmental Protection Agency, Las Vegas, NV. EPA/600/R-14/397.

View more research publications by [Brian Schumacher](#).

### **Education:**

- Ph.D. in Soil Science, University of Georgia, Athens, 1985
- M.S. in Soil Science, University of Georgia, Athens, 1982
- B.A. in Physical Geography, State University of New York at Buffalo, 1980

### **Professional Experience:**

#### Honors and Awards:

- U.S. EPA Office of Research and Development (ORD) Exceptional/Outstanding ORD Technical Assistance to the Regions or Program Offices (2015) for “ORD Engineering Technical Support Center Team Award”.
- U.S. EPA Office of Research and Development (ORD) Teamwork Award (2012) for “EPA/FHWA Near-Road Team”
- U.S. EPA Certificate of Appreciation (2010) for Deepwater Horizon Oil Spill Support.
- U.S. EPA Silver Medal for Superior Service (2008) for Standardizing and Streamlining Environmental Laboratories’ Ability to Respond to Homeland Security Incidents.
- U.S. EPA Bronze Medal for Commendable Service (1995) for Outstanding Efforts to Improve Assessment, Characterization, Remediation, and Monitoring at Contaminated Sites.
- U.S. EPA Bronze Medal for Commendable Service (1994) for Great Lakes Dredging Manual Preparation.
- U.S. EPA Bronze Medal for Commendable Service (1992) for Great Lakes Contaminated Sediments Team.