

Curriculum Vitae for Robert B. Brobst

Short Narrative

Robert B. Brobst, P.E., is employed as a senior environmental engineer for the United States Environmental Protection Agency in Denver, CO. He has conducted inspections and process evaluations of wastewater facilities and biosolids land application sites for the last 30 years. Currently, his responsibilities as a senior environmental engineer include Regional Biosolids Program Manager, Co-Chair of EPA's Pathogen Equivalency Committee, and Subject Matter Expert for biosolids. Bob has conducted research in the beneficial use of biosolids in reclaiming arid lands and areas devastated by wildfires. Current Research interest include enhancing biophysical properties of soil to remediate contaminated soils and airborne release of endotoxins from land application of biosolids. In his spare time Bob is a faculty affiliate teaching introduction to soils labs at Colorado State University, Department of Soils and Crop Sciences.

Degrees Received

- 1976 B.S. Environmental Science (Lake Superior State University; MI)
- 1977 B.S.E. Environmental Engineering (Michigan Technological University; MI)
- 1996 M.S.C.E. Sanitary and Water Resource Engineering (University of Colorado-Denver; CO)
- Current Ph.D. Candidate in Soils (ABD) (Colorado State University, CO)

Licenses/Certifications Held

- Professional Engineer (CO0025255)
- Certified Biosolids Land Applier (Association of Boards of Certification; Certificate No. 33)
- Incident Command System 300-400 (FEMA); Key Leadership Position – Situation Unit Leader
- Subject Matter Expert – land application, biosolids

Positions Held

- 1977 - 1980: District Engineer - Wisconsin Department of Natural Resources
- 1980 - 1985: City Engineer -City of Antigo WI
- 1985 - 1987: Environmental Engineer - Geotech
- 1987 - 1988: Environmental Engineer - CC Johnson Malhotra
- 1988- Present: Environmental Engineer - Environmental Protection Agency
- 2000-Present: Associate Faculty Affiliate - Colorado State University

Performance reviews last 10 years (2004 -2013 Outstanding, 2014 Exceeds Expectations)

Instructional

Teaching Introduction to Soils Laboratory 2006 – to present (Course Evaluations 4.5/5.0)

Substitute Teach Introduction to soils 2006 – Present

University of Colorado Conference Services – Intermediate and Advance School – Biosolids

2009, 2010, 2011, 2012, 2013, 2014

Current Research Interests

Enhancing soil biophysical processes to remove and or ameliorate anthropogenic contaminants.

Restoration ecological services to lands devastated by fire, mining and salinization both short-term and long-term.

Biophysical responses of soil organic carbon from organic amendments, principally carbon sequestration, temperature, and functions of soil water in soils.

Memberships in Honorary Academic Societies

Gamma Sigma Delta – The Honor Society of Agriculture

Selected Honors and Awards

Gold Metal – Agency –Individual 1992

Regional - Special Act Award – Buffalo Creek Fire Biosolids Project 1997

Regional Special Award Design and Specifications for the Culture Water System 2001

Bronze Metal – Agency

Bronze Metal –Agency

Regional Friend of ECEJ award 2002, 2004, 2005

State of Utah – Public Servant Award 2005

Katrina-Rita Recognition Metal - 2005-2006

Regional NPDES Team Award 2006

Regional Science Award 2006

Bronze Metal – Office of Water - Team 2009

Bronze Metal – Office of Water – Team 2010

Gold Metal – Agency – Team 2010

Professional Societies/Groups

Active Member Soil Science Society of America

Active Member Western Society of Soil Science

Active Member American Society of Agronomy

W 3170 USDA Research Committee -Beneficial Reuse of Residuals and Reclaimed Water:
Impact on Soil Ecosystem and Human Health (formerly W2170)

Professional Publications

Books, Technical Reports and Chapters

Technical Transfer Handbook. Management of Water Treatment Plant Residuals. EPA 625/R-95/008. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory. Published April 1996 Chapter 8 Primary Author.

Principles of Design and Operations of Wastewater Treatment Pond Systems for Plant Operators, Engineers, and Managers. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory. Published April 2011. Special Contributions.

Process Design Manual - Land Treatment of Municipal Wastewater Effluents. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory. Published April 2011. Coordinating Author.

Risks and Benefits of Tertiary Sewage Effluent as Drinking Water for Livestock in California Opinions of an Expert Panel February 25, 2014. Expert Panel.

Selected Books, Technical Reports and Chapters Edited

Reducing Waste and Waste Management Cost during an RDD Incident Cleanup, Environmental Protection Agency, Office of Research and Development, National Homeland Security Research Center (2013).

2012 Guidelines for Water Reuse. (2012) EPA/USDA/USAID/CDM Smith. EPA/600/R-12/618 September 2012. Expert Review Panel.

Handbook of Applied Hydrology, McGraw-Hill, Vijay Singh author of 50th anniversary issue Chapter 148 Reviewed. (In Review) (2014)

EPA. NPDES Compliance Inspection Manual, Chapter 10 and the Training Modules (2014)

Significant Agency Request for Proposals Preparation and Proposal Reviews

Reviewed proposals for Middle East Regional Cooperation (MERC) Program U.S. Agency for International Development. (2013) Reviewed Agricultural Projects.

Reuse Team in preparation of RFP and review and recommendation of proposals received. (2014) Human and Ecological Health Impacts of Water Reuse & Conservation. EPA ORD STAR Grant process.

Member of team to develop reuse question for USDA NIFA RFP. (2014)

Refereed Articles in Scientific Journals

Brobst, R. B. and P. M. Buszka (1986). "The Effect of Three Drilling Fluids on Ground Water Sample Chemistry." *Ground Water Monitoring and Remediation* 1(1).

Pierce, B.L., E.F. Redente, K.A. Barbarick, **R.B. Brobst**, and P. Hegeman. 1998. Plant biomass and elemental changes in Shrubland forages following biosolids application. *J. Environ. Qual.* 27:789-794.

Meyer, V.F., E.F. Redente, K.A. Barbarick, and **R. Brobst**. 2001. Biosolids application affect runoff water quality following forest fire. *J. Environ. Qual.* 30:1528-1532.

O'Connor, G. A., **R. B. Brobst**, et al. (2001). "A Modified Risk Assessment to Establish Molybdenum Standards for Land Application of Biosolids." *J. Environ. Qual.* 30(5): 1490-1507.

Gaskin, J. W., **R. B. Brobst**, et al. (2003). "Long-Term Biosolids Application Effects on Metal Concentrations in Soil and Bermudagrass Forage." *J. Environ. Qual.* 32(1): 146-152.

Barbarick, K.A., K.G. Doxtader, E.F. Redente, and **R.B. Brobst**. 2004. Biosolids effects on microbial activity in shrubland and grassland soils. *Soil Sci.* 169:176-187.

Meyer, V.F., E.F. Redente, K. A. Barbarick, **R.B. Brobst**, M.W. Paschke, and A.L. Miller. 2004. Plant and soil responses to biosolids application following forest fire. *J. Environ. Qual.* 33:873-881.

Kester, G. B., **R. B. Brobst**, et al. (2005). "Risk Characterization, Assessment, and Management of Organic Pollutants in Beneficially Used Residual Products." *J. Environ. Qual.* 34(1): 80-90.

Paschke, M. W., K. Topper, et al. (2005). "Long-Term Effects of Biosolids on Revegetation of Disturbed Sagebrush Steppe in Northwestern Colorado." *Restoration Ecology* 13(3): 545-551.

Brobst, R. B. (2006). "Recycling sewage sludge." *International Journal of Occupational and Environmental Health* 12(4): 429-429.

Ippolito, J.A., K.A. Barbarick, and **R. Brobst**. 2009. Fate of Biosolids Cu and Zn in a Semi-Arid Grassland. *J. Agric. Ecosys. Environ.* 131:325-332.

Ippolito, J.A., K.A. Barbarick, M.E. Stromberger, M.W. Pasche, and **R.B. Brobst**. (2009). Water treatment residuals and biosolids long term co-applications effects to semi-arid grassland soils and vegetation. *Soil Sci. Soc. Am. J.* 1880-1889.

Greenhalgh, L. K., M. J. McFarland, et al. (2009). "Metals in biosolids-amended soils in Western Utah." *Journal of Agricultural Extension and Rural Development* 1(1): 008-017.

McFarland, M. J., I. R. Vasquez, et al. (2010). "Use of Biosolids to Enhance Rangeland Forage Quality." *Water Environment Research* 82(5): 455-461.

Ippolito, J.A., K.A. Barbarick, M.W. Paschke, and **R.B. Brobst**. (2012). Infrequent composted biosolids applications affect semi-arid grassland soils and vegetation. *J. Environ. Manage.* 91:1123-1130.

McFarland, M. J., K. Kumarsamy, **R. B. Brobst**, A. Hais, M.D. Schmitz. (2012). "Groundwater quality protection at biosolids land application sites." *Water Research* 46: 5963- 5969.

McFarland, M. J., K. Kumarsamy, **R. B. Brobst**, A. Hais, M.D. Schmitz. (2013). "Impact of Biosolids Recycling on Groundwater Resources." *Water Environment Research* 85(11): 2141-2146.

McFarland, M. J., K. Kumarsamy, **R. B. Brobst**, A. Hais, M.D. Schmitz. (2013). "Protecting Groundwater Resources at Biosolids Recycling Sites." *Journal of Environmental Quality* 60: 660-665.

Ippolito, J. A., K. A. Barbarick, and **R. B. Brobst** (2014). Copper and Zinc Speciation in a Biosolids-Amended Semiarid Grassland Soil. *J. Environ. Qual.* 43:1576–1584

Herrmann R. F., R.J. Grosserf, D. Farrar, and **R. B. Brobst** Field Studies Measuring the Aerosolization of Endotoxin During the Land Application of Class B Biosolids., (2015). IN PREPARATION

Professional Magazines/Journals (Non-Refereed)

Gallier, W.T., **R. Brobst**, R. Aguillar, K.A. Barbarick, P. Hegeman, B. Janonis, D. Salahub, and S. Wilson. 1993. Rx for rangelands. *Water Environment and Technology*. 5(10):56-60.

Brobst, R. B. (1999). "National Database on Biosolids Quality." *Biocycle*.

McFarland, M. J., M. V. I. R. Vutran, et al. (2007). "Increase in forage cover - land applied biosolids restore disturbed rangelands." *BioCycle* 48(9): 34-38.

McFarland, M. J., **R. B. Brobst**, G. Kester. (2009). "Restoring fire ravaged land in California with biosolids." *Water (Australia)*.

Selected Conferences

Brobst, R. B., P. Hegeman, B. Kent (1990). Round Robin Laboratory Study - Metals Analysis in Sewage Sludge. The Status of Municipal Sludge Management from the 1990s, New Orleans, LA, Water Environment Federation.

Bastian, R. K. and **R. B. Brobst** (1993). Molybdenum occurrence in biosolids - sources and techniques. Water Environment Federation Specialty Conf., Phoenix, AZ, Water Environment Federation.

Brobst, R. B. (1994). Biosolids Project Acceptance; New York City's Biosolids are land applied to the eastern plains of Colorado. Management of water and wastewater solids for the 21st century: A Global Perspective, Washington D.C. Washington Hilton Hotel and Towers, Water Environment Federation.

Brobst, R. B., P. Hegeman, et al. (1995). A Comparison of production of dryland wheat between use of Anhydrous Ammonia and Biosolids in Southeastern Colorado. Effects of land application of biosolids in arid and semi-arid environments, Fort Collins, CO.

Brobst, R. B., R. K. Bastian, et al. (1998). EPA's Biosolids Data Management System and Plans for Evaluating Biosolids Quality. Proc. 12th Annual Residual Biosolids Management Conference.

Brobst, R. B., V. F. Meyer, et al. (2004). Vegetation Response to Biosolids Application following Forest Fire. Proceeding of the Water Environment Federation, WEF.

Smith, J. E. and **R. B. Brobst** (2004). Changing Approaches to Controlling Pathogens in Biosolids and Their Vector Attractiveness. ASCE Conference Proceeding.

McFarland, M. J., M. Schmitz, et al. (2006). Use of disturbed western rangelands as dedicated biosolids beneficial use sites. WEFTEC06.

Ippolito, J. A., M. Scharp, et al. (2007). Biosolids Application Affects An Overgrazed Rangeland. Proceeding of the Water Environment Federation. Denver.

McFarland, M. J., V. MaiAnh, et al. (2007). "Use of aerobically digested, anaerobically digested and lime stabilized biosolids for restoring semi-arid rangelands." Proceedings of the Water Environment Federation 2007: 166-180.

Brobst, R. B., R. R. Stevens, H. B. McCarty. (2009). Poster 48 Occurrence of Emerging Contaminates in Sewage Sludge, Results from the Targeted National Sewage Sludge Survey. EmCon 2009. Fort Collins, CO.

Brobst, R.B. Rocky Mountain Water Environment Association annual biosolids conference (numerous).

Brobst, R.B. Wyoming Professional Water and Wastewater Operators' annual conference (numerous).

Brobst, R.B. Utah Water Environment Association annual meeting (numerous).

Service

State: State of Colorado Office of Energy Management and Conservation task force on hog farm composting (1999).

County: Jefferson County School – Wilmot Council (2001, 2002, 2003, 2004, 2005, 2006).

EPA: Co-Chair of Pathogen Equivalency Committee (2013 - current).

EPA: Chair of Regional Health and Safety Committee (2014 - current).