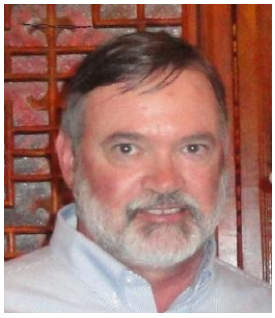

ROBERT W. PULS

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EDUCATION

University of Wisconsin	Natural Resources	B.S., 1978
University of Washington	Forest Resources	M.F.R., 1979
University of Arizona	Soil & Water Science	Ph.D., 1986

APPOINTMENTS

01/12 – present	Director Oklahoma Water Survey, Associate Professor, College of Atmospheric and Geographic Sciences, Norman, OK
1987-2011	USEPA, Office of Research and Development, Ground Water and Ecosystems Restoration Division, Sr. Environmental Scientist, Branch Chief, Director of Research, Laboratory Director, Ada, OK
1986-1987	Westinghouse Hanford Company, Sr. Geochemist, Richland, WA
1980-1982	Soil and Land Use Technology, Inc., Sr. Soil Scientist, Columbia, MD
1979-1980	Washington State DNR, Forest Soil Specialist, Longview, WA

PUBLICATIONS (out of more than 100 peer reviewed publications)

1. Su, C., R.W. Puls, T.A. Krug, M.T. Watling, S.K. O'Hara, J.W. Quinn, and N.E. Ruiz. 2012. A Two and Half-year-performance Evaluation of a Field Test on Treatment of Source Zone Tetrachloroethene and its Chlorinated daughter Products Using Emulsified Zero Valent Iron Nanoparticles. *Water Research,* **46**: 5071-5084.
2. Puls, R.W.. 2010. Water Availability and Management of Water Resources, *Proceedings of Oklahoma Town Hall Meeting for development of Oklahoma Comprehensive Water Plan*.
3. Smith, S.J., S.T. Paxton, S.C. Christensen, R.W. Puls and J.R. Greer. 2009. Determination of Flow Contribution and Water Quality With Depth in Public-Supply Wells. *EPA*/600/R-09/036.
4. Su, C. and R.W. Puls. 2008. Arsenate and Arsenite Sorption on Magnetite: Relations to Ground Water Arsenic Treatment Using Zerovalent Iron and Natural Attenuation, *Water, Air and Soil Pollution*, **193**: 65-78.
5. Su, C. and R.W. Puls. 2007. Removal of added nitrate in the single, binary, and ternary systems of cotton burr compost, zerovalent iron, and sediment:Implicationsfor groundwater nitrate remediation using permeable reactive barriers, *Chemosphere* 67(8): 1653-1662.
6. Su, C. and R.W. Puls. 2007. Removal of added nitrate in cotton burr compost, mulch compost, and peat: Mechanisms and potential use for groundwater nitrate remediation. *Chemosphere*, **66**(1): 91-98.
7. Su, C. And R.W. Puls. 2004. Nitrate Reduction by Zerovalent Iron: Ligand Effects of Formate, Oxalate, Citrate, Chloride, Sulfate, Borate, and Phosphate. *Environmental Science and Technology,* 38(9); 2715-272
8. Lin, Z. and R.W. Puls. 2003. Potential Indicators for the Assessment of Arsenic Natural Attenuation in the Subsurface. *Advances in Environmental Research*, **7**, 825-834.
9. Su, C. and R.W. Puls. 2003. In Situ Remediation of Arsenic in Simulated Groundwater Using Zerovalent Iron: Laboratory Column Tests on Combined Effects of Phosphate and Silicate. *Environmental Science and Technology*, 37(11) 2582-2587
10. Lin, Z. and R.W. Puls. 2003. Potential Indicators for the Assessment of Arsenic Natural Attenuation in the Subsurface. *Advances in Environmental Research*, 7, 825-834.
11. Su, C. and R.W. Puls. 2003. In Situ Remediation of Arsenic in Simulated Groundwater Using Zerovalent Iron: Laboratory Column Tests on Combined Effects of Phosphate and Silicate. *Environmental Science and Technology*,

37(11) 2582-2587.
12. Beck, F.P., P.J. Clark, and R.W. Puls. 2002. Direct Push Methods for Locating and Collecting Cores of Aquifer Sediment and Zero-Valent Iron from a permeable Reactive Barrier. *Ground Water Monitoring and Remediation*, 22(3):165-168.
13. Wilkin, R.T., R. W. Puls, and G.W. Sewell. 2001. Long-term Performance of Permeable Reactive Barriers Using Zero-Valent iron: Geochemical and Microbiological Effects. *Groundwater*, 41:493-503
14. Khan, F.A., and R.W. Puls. 2001. In Situ Abiotic Detoxification of Hexavalent Chromium in the Capillary Fringe Zone. *Ground Water Monitoring and Remediation*, 23(1):77-84.
15. Su, C. and R.W. Puls. 2001. Arsenate and Arsenite Removal by Zero-Valent iron: Effects of Phosphate, Silicate, Carbonate, Borate, Sulfate, Chromate, Molybdate, and Nitrate, Relative to Chloride. *Environmental Science and Technology*, 35(22) 4562-4568.
16. Li Wilkin, R.T., R. W. Puls, and G.W. Sewell. 2001. Long-term Performance of Permeable Reactive Barriers Using Zero-Valent iron: Geochemical and Microbiological Effects. *Groundwater*, 41:493-503
17. Khan, F.A., and R.W. Puls. 2001. In Situ Abiotic Detoxification of Hexavalent Chromium in the Capillary Fringe Zone. *Ground Water Monitoring and Remediation*, 23(1):77-84.
18. Lin, Z. and R.W. Puls. 2000. Adsorption, Desorption and Oxidation of Arsenic Affected by Clay Minerals and Aging Process. *Environ mental Geology*, 39(7):753-759.
19. Liang, L., N. Korte, B. Gu, R. Puls, C. Reeter. 2000. Geochemical and Microbial Reactions Affecting the Long-term Performance of in situ "Iron Barriers", *Advances in Environmental Research,* 4(2000):273-286.
20. Beck, F.P., P.J. Clark, and R.W. Puls. 2000. Location and Characterization of Subsurface Anomalies Using a Soil Conductivity Probe. *Ground Water Monitoring and Remediation*, 2:55-59.
21. Chattopadhyay, S. and R.W. Puls. 2000. Forces Dictating Colloidal Interactions Between Viruses and Soil. *Chemosphere*, 41:1279-1286.
22. Puls, R.W., D.W. Blowes, R.W. Gillham. 1999. Long-Term Performance Monitoring for Permeable Reactive Barrier at the USCG Support Center, Elizabeth City, NC, *Journal of Hazardous Materials*, 68:109-124.
23. Lin, Z. and R.W. Puls. 1999. Effect of Impurities Associated with Aluminosilicates on Arsenic Sorption and Oxidation. *Hydrological Science and Technology*, 15:130-137.
24. Chattopadhyay, S. and R.W. Puls. 1999. Adsorption of Bacteriophages on Clay Minerals. *Environ. Sci. Technol*. 33(20):3609-3614.
25. Puls, R.W., C.J. Paul, and R.M. Powell. 1999. The Application of In-Situ Permeable Reactive Barrier Technology for the Remediation of Chromate-Contaminated Groundwater. *Journal Applied Geochemistry*, 14:989-1000.
26. Su, C. and R.W. Puls. 1999. Kinetics of Trichloroethene Reduction of Zero-valent Iron and Tin: Pretreatment Effect, Apparent Activation Energy, and Intermediate Products. *Environ. Sci. Technol.* 33(1): 163-168.
27. Puls, R.W. and C.J. Paul. 1998. Discrete-Level Ground-Water Monitoring System for Contaminant and Remedial Performance Objectives. *Journal of Environmental Engineering*, 124(6): 549-553.
28. Puls, R.W. and C.J. Paul. 1997. Multi-Layer Sampling in Conventional Monitoring Wells for Improved Estimation of Vertical Contaminant Distributions and Mass. *Journal of Contaminant Hydrology,* **25**(1-2): 85-111.

SYNERGISTIC ACTIVITIES

- **Relevant cross-disciplinary grant activity**
    - Office of Water, Public-Supply Wellhead Arsenic Remediation in Western Cleveland County, Oklahoma 2005-2008, (smart drilling/siting new wells), $700,000.
    - U.S. Coast Guard, Cleveland, OH, Immobilization and Detoxification of Chromate in Soils, 1997 -1999, $400,000.
    - U.S. Coast Guard, Cleveland, OH, "Use of Permeable Reactive In-Situ Barrier Walls to Remediate Chromium Contaminated Groundwater", 1994-1997, $225,000.
    - U.S. Coast Guard, Cleveland, OH, "Remediation of Chromium-Contaminated Soils and Ground Water", 1992-94, $350,000.
    - U.S. Environmental Protection Agency, Office of Research and Development, Innovative Research Grant, "Remediation of Chromium-Contaminated Ground Water Using Surfactants", 1991-92, $50,000.
- **National Technical Lead**, EPA National Study on the relationship between hydraulic fracturing for oil and gas resources and protection of drinking water resources. Jan 2010- Dec 2011.
- **Chair**, Interagency Ground Water Research Coordination Work Group (EPA, DoD, DOE, NSF, NIEHS), 2006 – 08
- U.S. Department of the Interior ***National Partners in Conservation Award*** for aquifer storage and recharge research collaboration with Bureau of Reclamation, Chickasaw Indian Tribe, Oklahoma Water Resources Board, Oklahoma Department of Environmental Quality, Oklahoma Climatological Survey, National Oceanic and Atmospheric Administration and Oklahoma State University. May 7, 2009.
- **USEPA Bronze Medal 2012**. For rollout of USEPA National Study Plan on "Hydraulic Fracturing and Drinking Water Resources".