

ALTEMIS Publications and Reports

Journal Publications

2023

- Wainwright, H. and Eddy-Dilek, C. **2023**. *Importance of Environmental Monitoring for Consent-Based Siting of Nuclear Facilities*. Nuclear News, American Nuclear Society, 58-63.

2022

- Meray, A., Sturla, S., Siddiquee, M., Serata, R., Uhlemann, S., Gonzalez-Raymat, H., Denham, M., Upadhyay, H., Lagos, L., Eddy-Dilek, C., and Wainwright, H. **2022**. *PyLEnM: A Machine Learning Framework for Long-Term Groundwater Contamination Monitoring Strategies*. Environmental Science & Technology. 56: p.5973-5983. DOI: 10.1021/acs.est.1c07440.
- Xu, Z., Serata, R., Wainwright, H., Denham, M., Molins, S., Gonzalez-Raymat, H., Lipnikov, K., Moulton, J. D., and Eddy-Dilek, C. **2022**. *Reactive Transport Modeling for Supporting Climate Resilience at Groundwater Contamination Sites*. Hydrol. Earth Syst. Sci., 26, 755-773. DOI: 10.5184/hess-26-755-2022.

2021

- Xu, Z., Serata, R., Wainwright, H., Denham, M., Molins, S., Gonzalez-Raymat, H., ... & Eddy-Dilek, C. **2021**. *Reactive Transport Modeling for Supporting Climate Resilience at Groundwater Contamination Sites*. Hydrology and Earth System Sciences Discussions, 1-29.
- Zexuan Xu, Serata R., Wainwright H., Denham M., Molins S., Gonzalez-Raymat H., Lipnikov, David Moulton K., and Eddy-Dilek, C, *Reactive Transport Modeling for Supporting Climate Resilience at Groundwater Contamination Sites*. Hydrology and Earth Systems Sciences, **2021**. 2021-338

2020

- Denham, M.E., Amidon, M.B., Wainwright, H.M., Dafflon, B., Ajo-Franklin, J., Eddy-Dilek, C.A. *Improving Long-term Monitoring of Contaminated Groundwater at Sites where Attenuation-based Remedies are Deployed*. Environmental Management, **2020**. 66: p. 1142-1161.

2019

- Libera, A., F.P.J. de Barros, B. Faybishenko, C. Eddy-Dilek, M. Denham, K. Lipnikov, D. Moulton, B. Maco, and H. Wainwright, *Climate Change Impact on Residual Contaminants Under Sustainable Remediation*. Journal of Contaminant Hydrology, **2019**. 226: p. 103518.

2018

- Arora, B., Davis, J.A., Spycher, N.F., Dong, W., Wainwright, H.M., *Comparison of Electrostatic and Non-Electrostatic Models for U(VI) Sorption on Aquifer Sediments*. Groundwater, **2018**. 56(1): p. 73-86.
- Gonzalez-Raymat, H., V. Anagnostopoulos, M. Denham, Y. Cai, and Y.P. Katsenovich, *Unrefined Humic Substances as a Potential Low-Cost Amendment for the Management of Acidic Groundwater Contamination*. Journal of Environmental Management, **2018**. 212: p. 210-218.
- Schmidt, F., Wainwright, H.M., Faybishenko, B., Denham, M., Eddy-Dilek, C., *In Situ Monitoring of Groundwater Contamination Using the Kalman Filter*. Environmental Science & Technology, **2018**. 52(13): p. 7418-7425.
- Vetter, K., R. Barnowski, A. Haefner, T.H.Y. Joshi, R. Pavlovsky, and B.J. Quiter, *Gamma-Ray Imaging for Nuclear Security and Safety: Towards 3-D Gamma-Ray Vision*. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, **2018**. 878: p. 159-168.
- Wainwright, H.M., Arora, B., Hubbard, S., Lipnikov, K., Moulton, D., Flach, G., Eddy-Dilek, C., Denham, M., **2018**. *Sustainable Remediation in Complex Geologic Systems*, in *Encyclopedia of Inorganic and Bioinorganic Chemistry*.

2017

- Anagnostopoulos, V.A., Y. Katsenovich, and M. Denham, *Sodium Silicate Treatment for the Attenuation of U(VI) by Iron-Bearing Sediments in Acidic Groundwater Plumes*. Journal of Chemical Technology & Biotechnology, **2017**. 92(8): p. 1919-1927.
- Haefner, A., R. Barnowski, P. Luke, M. Amman, and K. Vetter, *Handheld Real-Time Volumetric 3-D Gamma-Ray Imaging*. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, **2017**. 857: p. 42-49.

2016

- Tran, A.P., B. Dafflon, S.S. Hubbard, M.B. Kowalsky, P. Long, T.K. Tokunaga, and K.H. Williams, *Quantifying Shallow Subsurface Water and Heat Dynamics Using Coupled Hydrological-Thermal-Geophysical Inversion*. Hydrol. Earth Syst. Sci., **2016**. 20(9): p. 3477-3491.

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- Barnowski, R., A. Haefner, L. Mihailescu, and K. Vetter, *Scene Data Fusion: Real-time Standoff Volumetric Gamma-Ray Imaging*. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, **2015**. 800: p. 65-69.

2014

- Kaplan, D.I., M.E. Denham, S. Zhang, C. Yeager, C. Xu, K.A. Schwehr, H.P. Li, Y.F. Ho, D. Wellman, and P.H. Santschi, *Radioiodine Biogeochemistry and Prevalence in Groundwater. Critical Reviews in Environmental Science and Technology*, **2014**. 44(20): p. 2287-2335.
- Wainwright, H.M., J. Chen, D.S. Sassen, and S.S. Hubbard, *Bayesian Hierarchical Approach and Geophysical Data Sets for Estimation of Reactive Facies over Plume Scales*. *Water Resources Research*, **2014**. 50(6): p. 4564-4584.

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- Bea, S.A., H. Wainwright, N. Spycher, B. Faybishenko, S.S. Hubbard, and M.E. Denham, *Identifying Key Controls on the Behavior of an Acidic-U(VI) Plume in the Savannah River Site Using Reactive Transport Modeling*. *Journal of Contaminant Hydrology*, **2013**. 151: p. 34-54.
- Dafflon, B., Y. Wu, S.S. Hubbard, J.T. Birkholzer, T.M. Daley, J.D. Pugh, J.E. Peterson, and R.C. Trautz, *Monitoring CO₂ Intrusion and Associated Geochemical Transformations in a Shallow Groundwater System Using Complex Electrical Methods*. *Environmental Science & Technology*, **2013**. 47(1): p. 314-321.

2012

- Johnson, T.C., R.J. Versteeg, M. Rockhold, L.D. Slater, D. Ntarlagiannis, W.J. Greenwood, and J. Zachara, *Characterization of a Contaminated Wellfield using 3D Electrical Resistivity Tomography Implemented with Geostatistical, Discontinuous Boundary, and Known Conductivity Constraints*. *GEOPHYSICS*, **2012**. 77(6): p. EN85-EN96.
- Sassen, D.S., S.S. Hubbard, S.A. Bea, J. Chen, N. Spycher, and M.E. Denham, *Reactive Facies: An Approach for Parameterizing Field-Scale Reactive Transport Models Using Geophysical Methods*. *Water Resources Research*, **2012**. 48(10).
- Tokunaga, T.K., J. Wan, and M.E. Denham, *Estimates of Vadose Zone Drainage from a Capped Seepage Basin, F-Area, Savannah River Site*. *Vadose Zone Journal*, **2012**. 11(3): p. vzt2011.0131.
- Wan, J., T.K. Tokunaga, W. Dong, M.E. Denham, and S.S. Hubbard, *Persistent Source Influences on the Trailing Edge of a Groundwater Plume, and Natural Attenuation Timeframes: The F-Area Savannah River Site*. *Environmental Science & Technology*, **2012**. 46(8): p. 4490-4497.

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- Kaplan, D.I., K.A. Roberts, K.A. Schwehr, M.S. Lilley, R. Brinkmeyer, M.E. Denham, D. DiPrete, H.-P. Li, B.A. Powell, C. Xu, C.M. Yeager, S. Zhang, and P.H. Santschi, *Evaluation of a Radioiodine Plume Increasing in Concentration at the Savannah River Site*. *Environmental Science & Technology*, **2011**. 45(2): p. 489-495.

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- Johnson, T.C., R.J. Versteeg, A. Ward, F.D. Day-Lewis, and A. Revil, *Improved Hydrogeophysical Characterization and Monitoring Through Parallel Modeling and*

Inversion of Time-Domain Resistivity and Induced-Polarization Data. Geophysics, **2010**. 75(4): p. WA27-WA41.

Conference Papers

2023

- Eddy-Dilek, C., Wainwright, H., Gonzalez-Raymat, H., Danielson, T., Fabricatore, E., Quiter, B., Johnson, T., Xu, Z., and Denham, M. **2023**. The DOE-EM ALTEMIS (Advanced Long-Term Environmental Monitoring Systems) Program: Innovative Approaches to Improve the Efficacy of Monitoring Systems for Complex Radioactive Groundwater Plumes. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Vavrek, J., Quiter, B., Hellfeld, D., Szornel, J., Pavlovsky, R., Gonzalez-Raymat, H., Wainwright, H., and Eddy-Dilek, C. **2023**. *Free-moving Mapping of Radioactive Contaminants at the Savannah River Site F-Area Wetlands*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Wainwright, H., Gonzalez-Raymat, H., Danielson, T., Xu, Z., Dafflon, B., Uhlemann, S., Praveen, S., Vetter, K., Quiter, B., Meray, A., Siddiquee, M., Upadhyay, H., Johnson, T., Denham, M., and Eddy-Dilek, C. **2023**. *ALTEMIS Project: Overview of the Artificial Intelligence and Machine Learning Capability Development*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Xu, Z., Wainwright, H., Fabricatore, E., Praveen, S., Arora, B., Meray, A., Wang, L., Kurihana, T., Mastilovic, I., and Eddy-Dilek, C. **2023**. *HPC-Based Integrated Hydrology and Reactive Transport Modeling for SRS*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

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- Denham, M., Gonzalez-Raymat, H., Eddy-Dilek, C., and Daniel, A. **2022**. *Vertical Dynamics of Contaminant Plumes over Long-Term Monitoring Timeframes*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Meray, A., Wainwright, H., Siddiquee, M., Upadhyay, H., Sturla, S., Serata, R., Uhlemann, S., Denham, M., Gonzalez-Raymat, H., Lagos, L., and Eddy-Dilek, C. **2022**. *pyLEnM: An Open-Source Machine Learning Framework for Long-term Water Quality Monitoring*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Wainwright, H., Gonzalez-Raymat, H., Danielson, T., Xu, Z., Dafflon, B., Uhlemann, S., Praveen, S., Vetter, K., Quiter, B., Meray, A., Siddiquee, M., Upadhyay, H., Johnson, T., Denham, M., and Eddy-Dilek, C. **2022**. *Advanced Long-Term Environmental Monitoring Systems (ALTEMIS) for Sustainable Remediation*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

- Xu, Z, Arora, B., Denham, M., Serata, R., Gonzalez-Raymat, H., Wainwright, H. and C. Eddy-Dilek. **2022**. *Reactive transport modeling for Nuclear Waste Sites*. WM2022 Conference, March 6-10, 2022, Phoenix, Arizona.

2021

- Upadhyay, H. **2021**. *Artificial Intelligence & Machine Learning Framework for DOE-EM Problem Sets*. Waste Management Symposium 2021. Phoenix, Arizona.
- Xu, Z, R. Serata, H. Wainwright, M. Denham, and C. Eddy-Dilek. **2021**. *Reactive transport modeling for supporting climate resilience*. WM2021 Conference, March 8-12, 2021, Phoenix, Arizona.

2020

- Eddy-Dilek, C., Denham, M., and Gonzalez-Raymat, H., **2020**. The Challenge of Achieving Site Closure of a Complex Groundwater Plume. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Gudavalli, R., Emerson, H., Garcia, S., Gonzalez-Raymat, H., Katsenovich, Y., Lagos, L. **2020**. *Impact of UV-light and pH on the Fate of Tc, I, and U in Wetlands at Savannah River Site*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Wainwright, H., Serata, R., Denham, M., Eddy-Dilek, C. **2020**. *Big Data and AI at DOE's Legacy Sites*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

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- Libera, A., de Barros, F., Faybishenko, B., Eddy-Dilek, C., Denham, M., Lipnikov, K., Moulton, D., Maco, B., Wainwright, H., **2019**. *Hydrological Controls on Residual Contaminants Under Sustainable Remediation*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

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- Gudavalli, R., Smoot, A., Katsenovich, Y., Denham, M., **2018**. Study of Synergetic Interactions between Uranium, Humic Acid, Silica Colloids and SRS Sediments. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Haefner, A., Barnowski, R., Barton, P., Hellfeld, D., Joshi, T.H., Pavlovsky, R., Sanada, Y., Shikaze, Y., Torii, T., Vetter, K., **2018**. *3-D Radiation Mapping and Data Fusion for Environmental Remediation and Cleanup*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Haefner, A., Pavlovsky, R., Joshi T.H., Negut, V., Suzuki, E., Vetter, K., **2018**. *3-D Gamma-ray Mapping from Unmanned Aerial Systems for Nuclear Decommissioning*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

- Wainwright, H., Schmidt, F., Libera, A., Faybishenko, B., De Barros, F., Maco, B., Denham, M., Eddy-Dilek, C., **2018**. *Technical Advances for Sustainable Remediation: In Situ Monitoring and Climate Resiliency*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Wainwright, H.M., Schmidt, Faybishenko, B., Denham, M., Eddy-Dilek, C., **2018**. *In Situ Monitoring of Groundwater Contamination for Sustainable Remediation Using the Kalman Filter*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

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- Eddy-Dilek, C., and Denham, M., **2017**. *Influences on Effective Decay Rates of Radionuclides in Groundwater: FArea Seepage Basins, Savannah River Site*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Eddy-Dilek, C., and Kostelnik, K., **2017**. *Use of Test Beds to Facilitate Implementation of Innovative Technologies at Complex Sites*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- *Monitoring*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Wainwright, H.M., Faybishenko, B., Molins, S., Pau, G., Denham, M., Amidon, M., Moulton, D., Lipnikov, K., Freedman, V., Freshley, M., Eddy-Dilek, C., **2017**. *Coupling Big Data Analytics and Reactive Transport Modeling for Cost-effective Groundwater 2020*

2016

- Denham, M., and Eddy-Dilek, C., **2016**. *Sustainable Remediation of Radionuclides By a Common Sense Approach to Enhanced Attenuation*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Eddy-Dilek, C., Kostelnik, K., Denham, M., **2016**. *The Challenge of Moving Science into Practice: Lessons Learned and New Approaches*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Wainwright, H., Faybishenko, B., Molins, S., Davis, J., Arora, B., Shu Heng Pau, G., Johnson, J., Flach, G., Denham, M., Eddy-Dilek, C., Moulton, D., Lipnikov, K., Gable, C., Miller, T., Barker, E., Freedman, V., Freshley, M., **2016**. *Effective Long-term Monitoring Strategies by Integrating Reactive Transport Models with In Situ Geochemical Measurements*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

2015

- Denham, M., Millings M., Amidon, M., Looney, B., Hyde, W., Walker, R., Gonzalez Raymat, H., **2015**. *Evaluation of a Low Cost Humate Solution as an In Situ Amendment to*

Enhance Attenuation of Uranium in an Acidic Plume. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

- Freshley, M., Flach, G., Wainwright, H., Rockhold, M., Freedman, V., Moulton, D., Dixon, P., Morse, J., **2015**. *Applications Using the Advanced Simulation Capability for Environmental Management Toolset*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.
- Wainwright, H., Molins, S., Davis, J., Arora, B., Faybishenko, B., Krishnan, H., Hubbard, S., Flach, G., Denham, M., Eddy-Dilek, C., Moulton, D., Lipnikov, K., Gable, C., Miller, T., Freshley, M., **2015**. *Using ASCEM and Visualization to Inform Stakeholders of Contaminant Plume Evolution and Remediation Efficacy at F-Basin Savannah River, SC*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

2014

- Eddy-Dilek, C., Millings, M.R., Looney, B.B., Denham, M., **2014**. *Innovative Strategy for Long Term Monitoring of Metal and Radionuclide Plumes*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

2013

- Eddy-Dilek, C., Looney, B., Gaughan, T., Kmetz, T., Seaman, J., **2013**. *Shifting the paradigm for Long Term Monitoring at Legacy Sites to Improve Performance while Reducing Costs*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

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- Meza, J., Hubbard, S., Freshley, M., Gorton, I., Moulton, J., Denham, M., **2011**. *Advanced Simulation Capability for Environmental Management: Early Site Demonstration*. Full paper in the Waste Management Symposia proceedings, Phoenix, Arizona.

Selected Laboratory Technical Reports

2023

- Dafflon, B., Wang, C., Rossi, L., Uhlemann, S., Gonzalez-Raymat, H., Eddy-Dilek, C., and Wainwright, H. **2023**. *Report on the on-going monitoring of soil temperature in the SRNL F-Area riparian zone for improving the understanding of shallow thermo-hydrological processes and groundwater dynamics*.
- Danielson, T. and Upadhyay, H. **2023**. *Advanced Long-Term Environmental Monitoring Systems (ALTEMIS) Artificial Intelligence Data Management Plan*. SNRL-STI-2023-00432.
- Eddy-Dilek, C., Nyman, J., Belli, K., Fabricatore, E. **2023**. *Workshop Report: Innovative Strategies for Long-Term Monitoring of Complex Groundwater Plumes at DOE's Legacy Sites*. SNRL-STI-2023-00103.

- VerMeulen, H. H and Gonzalez-Raymat, H. **2023**. *Iodine Air Sampling: Installation and Preliminary Results*. SRNL-STI-2023-00480.
- VerMeulen, H. H. and Gonzalez-Raymat, H. **2023**. *Cation Exchange Capacity, Anion Exchange Capacity, and Mineralogy of F-Area Aquifer Sediments*. SRNL-STI-2023-00481.

2021

- Charles, S., Wainwright, H., Gonzalez-Raymat, H., Gudavalli, R., Lagos, L. **2021**. *Characterization of Surface Water Dynamics within Fourmile Branch and its Linkages with Groundwater and I-129 Geochemistry*.
- Gonzalez-Raymat, H., J. Kidd, H. Vermeulen, and M.E. Denham. **2021**. *Spatial Distribution and Temporal Variation of ¹²⁹I in Groundwater and Surface Water at the F-Area*. SRNL-TR-2021-00667. Savannah River National Laboratory, Aiken, SC.
- Gonzalez-Raymat, H., J. Kidd, and M.E. Denham. **2021**. *Baseline Study Report of the Vertical Distribution of Contaminants within the F-Area Wetlands*. SRNL-TR-2021-00632. Savannah River National Laboratory, Aiken, SC.
- Fabricatore, E.D and H.H. VerMeulen. **2021**. *Well Inventory of DOE-EM and DOE-LM Sites*. SRNL-RP-2021-03159. Savannah River National Laboratory. Aiken, SC.
- Gonzalez-Raymat, H., C. Eddy-Dilek, and M.E. Denham. **2021**. *Evaluation of the Silver Chloride Injection Campaigns at the Central Gate of the F-Area Subsurface Barrier*. SRNL-TR-2021-00625. Savannah River National Laboratory, Aiken, SC.
- Pham, P., Gonzalez-Raymat, H., Gudavalli, R., Lagos, L. **2021**. *Sorption of Iodine Species on SRS Wetland Soils*.

2020

- Danielson, T., **2020**. *Sensor Recommendations for LongTerm Monitoring of the F-area Seepage Basins (Draft Report)*. SRNL-STI-2020-00208. Savannah River National Laboratory, Aiken, SC 29808.
- Denham, M.E. **2020**. *Modeling a Field-Scale Acid Titration in an Unconsolidated Sandy Aquifer*. PanEnv-2020-001. Panoramic Environmental Consulting, Aiken, SC 29802.
- Denham, M.E. **2020**. *Vertical Dynamics of Contaminant Plumes Over Long-Term Monitoring Timeframes*. PanEnv-2019-002. Panoramic Environmental Consulting, Aiken, SC 29802.
- Denham, M.E., H. Gonzalez-Raymat, and C.A. Eddy-Dilek, **2020**. *Assessment of the Use of Amendments to Treat Sr-90 and I-129 Near or Within Wetlands Associated with the F-Area and H-Area Seepage Basins*. SRNL-RP-2020-00626. Savannah River National Laboratory, Aiken, SC 29808.
- Gonzalez-Raymat, H., M.E. Denham, and C.A. Eddy-Dilek. **2020**. *A Review of Methods of Amendment Deployment in Groundwater and Soil*. SRNL-RP-2020-00627. Savannah River National Laboratory, Aiken, SC 29808.

- Johnson, T.C. **2020**. *Electrical Resistivity Topography Monitoring of F-Area Closure Caps: Feasibility and Performance Assessment*. PNNL-30470.

2019

- Denham, M.E., C.A. Eddy-Dilek, H.M. Wainwright, J. Thibault, and K. Boerstler, **2019**. *A New Paradigm for Long Term Monitoring at the F-Area Seepage Basins, Savannah River Site*. SRNL-STI-2019-00019. Savannah River National Laboratory, Aiken, SC 29808.
- Denham, M.E., H. Gonzalez-Raymat, and C.A. Eddy-Dilek, **2019**. *Applied Science Investigations to Facilitate Closure of the F-Area and H-Area Seepage Basins*. SRNL-TR-2019-00224. Savannah River National Laboratory, Aiken, SC 29808.
- Nichols, R.L. and J.O. Dickson. **2019**. *Evaluation of Constituents of Concern Above Primary Drinking Water Standards at the F- and H-Area Wetlands (Phase 2b Corrective Action Goal)*. SRNL-STI-2019-00234. Savannah River National Laboratory. Aiken, SC.

2018

- Pavlovsky, R., A. Haefner, T. Joshi, V. Negut, K. McManus, E. Suzuki, R. Barnowski, and K. Vetter. **2018**. *3-D Radiation Mapping in Real-Time with the Localization and Mapping Platform LAMP from Unmanned Aerial Systems and Man-Portable Configurations*.

2017

- Denham, M. **2017**. *Observations on Acidic Rebound Following Base Injection at the F-Area Central Gate*. SRNL-L3200-2017-00090. Savannah River National Laboratory, Aiken, SC 29808.

2016

- Denham, M.E. and M.B. Amidon. **2016**. *Analysis of Concentration Versus Time Trends for Select Contaminants in Groundwater and Wetland Surface Water Associated with the F-Area and H-Area Seepage Basins*. SRNL-STI-2016-00558, Savannah River National Laboratory. Aiken, SC
- Millings, MR, RL Nichols, KL Dixon, M.E. Denham. **2016**. *Test Plan for Column Studies and Batch Tests for Optimizing the AgCl Technology for ¹²⁹I Treatment*. SRNL-RP-2016-00011. Savannah River National Laboratory, Aiken, SC.

2015

- Denham, M. E., Amidon, M. B., Millings, M. R., and R. Nichols, **2015**. *Evaluation of Contingencies and Opportunities to Optimize the Silver Chloride Technology to Treat ¹²⁹I in Groundwater*. SRNL-TR-2015-00214. Savannah River National Laboratory, Aiken, SC, 29808.
- Denham, M.E. Shehadeh, A. Millings, M. R. **2015**. *Results of preliminary experiments on in situ precipitation of silver chloride for treatment of ¹²⁹I contamination in groundwater*. SRNL-RP-2015-00516. Savannah River National Laboratory, Aiken, SC 29808.

- Denham, M.E., M.B. Amidon, M.R. Millings, and R.L. Nichols, **2015**. *Evaluation of Contingencies and Opportunities to Optimize the Silver Chloride Technology to Treat ¹²⁹I in Groundwater*. SRNL-TR-2015-00214. Savannah River National Laboratory, Aiken, SC.

2013

- Denham, M., **2013**. *Reassessment of Monitoring Data for I-129 Remediation by the Silver Chloride Treatment Zone. Memorandum to G. Blount*, SRNL-L3200-2013-00011. Savannah River National Laboratory, Aiken, SC.
- Denham, M.E., M.B. Amidon, M.R. Millings, K.A. Roberts, H. Gonzalez Raymat, B.B. Looney, and C.A. Eddy-Dilek, **2013**. *A Single Well Field Injection Test of Humate to Enhance Attenuation of Uranium and Other Radionuclides in an Acidic Plume*. SRNL-STI-2014-00427, Savannah River National Laboratory, Aiken, SC 29808.
- Millings, MR., B.B. Looney, M.B. Amidon, and M.E. Denham. **2013**. *Test Plan for the Deployment of Long Term Monitoring Sensors at the F-Area Field Research Site, Savannah River Site (U)*. SRNL-TR-2013-00232. Savannah River National Laboratory, Aiken, SC 29808.
- Millings, MR., M.B. Amidon, M.E. Denham, and B.B. Looney, **2013**. *Preliminary Data Report: Humate Injection as an Enhanced Attenuation Method at the F-Area Seepage Basins, Savannah River Site (U)*. SRNL-STI-2013-00514, Savannah River National Laboratory, Aiken, SC 29808.

2012

- Kaplan, D.I., C. Yeager, M.E. Denham, S. Zhang, C. Xu, K.A. Schwehr, H.P. Li, R. Brinkmeyer, and P.H. Santschi, **2012**. *Biogeochemical Considerations Related To The Remediation Of I-129 Plumes*. Savannah River National Laboratory, Aiken, SC 29808.

2011

- Denham, M. **2011**. *Base Injection: An Assessment of Opportunities for Optimization*. SRNL-TR-2011-00009. Savannah River National Laboratory, Aiken, SC 29808.

2010

- Denham, M., M. Millings, and J. Noonkester, **2010**. *Post-Injection Assessment of the Silver Chloride Field Demonstration for Treatment of I-129 in Groundwater at the F-Area Seepage Basins*. SRNL-TR-2010-00367. Savannah River National Laboratory, Aiken, SC 29808.
- Denham, M., R. Nichols, M. Bach, and M. Millings. **2010**. *Laboratory Tests of an Injectible Silver Chloride Amendment for Treatment of I-129 in Groundwater*. SRNL-STI-2010-00179. Savannah River National Laboratory, Aiken, SC 29808.

2008

- Denham, M., R. Nichols, M. Bach, and M. Millings, **2008**. *Removal of Iodide from Groundwater Using Silver Chloride – White Paper*. SRNL-STI-2008-00459. Savannah River National Laboratory, Aiken, SC, 29808.