

Contract No:

This document was prepared in conjunction with work accomplished under Contract No. 89303321CEM000080 with the U.S. Department of Energy (DOE) Office of Environmental Management (EM).

Disclaimer:

This work was prepared under an agreement with and funded by the U.S. Government. Neither the U.S. Government or its employees, nor any of its contractors, subcontractors or their employees, makes any express or implied:

- 1) warranty or assumes any legal liability for the accuracy, completeness, or for the use or results of such use of any information, product, or process disclosed; or
- 2) representation that such use or results of such use would not infringe privately owned rights; or
- 3) endorsement or recommendation of any specifically identified commercial product, process, or service.

Any views and opinions of authors expressed in this work do not necessarily state or reflect those of the United States Government, or its contractors, or subcontractors.

12. REFERENCES

10 CFR § 830.3 (2001). Definitions. In "Code of Federal Regulations, Title 10, Chapter III, Part 830, Section 830.3," Washington, DC. January 10, 2001.

40 CFR § 300.440 (2008). Procedures for Planning and Implementing Off-Site Response Actions. In "Code of Federal Regulations, Title 40, Chapter 1, Subchapter J, Part 300, Subpart E, Section 300.440," Washington, DC. July 1, 2008.

Aadland, R. K., Gellici, J. A., and Thayer, P. A. (1995). "Hydrogeologic Framework of West-Central South Carolina." Rep. No. 5. PIT-MISC-0112. Water Resources Division, South Carolina Department of Natural Resources, Columbia, SC.

Aadland, R. K., Harris, M. K., Lewis, C. M., Gaughan, T. F., and Westbrook, T. M. (1991). "Hydrostratigraphy of the General Separations Area, Savannah River Site (SRS), South Carolina." WSRC-RP-91-013. Westinghouse Savannah River Company, Aiken, SC.

Ababou, R., and Wood, E. F. (1990). Comment on "Effective Groundwater Model Parameter Values: Influence of Spatial Variability of Hydraulic Conductivity, Leakance, and Recharge" by JJ Gómez-Hernández and SM Gorelick. *Water Resources Research* **26**(8), 1843-1846.

Abt, S. R., and Johnson, T. L. (1991). Riprap Design for Overtopping Flow. *Journal of Hydraulic Engineering* **117**(8), 959-972.

ACRi (2000). "PORFLOW User's Manual; Version 4.00, Rev. 4." Analytical & Computational Research, Inc., Bel Air, CA.

ACRi (2018). "PORFLOW User's Manual, Keyword Commands Version 6.42.9, Revision 0." Analytical & Computational Research, Inc., Los Angeles, CA. April 23, 2018.

Aleman, S., and Flach, G. (2010). "Acceptance Testing for PORFLOW version 6.30.1 (S. Aleman and G. Flach to B. T. Butcher)." SRNL-L6200-2010-00016. Savannah River National Laboratory, Aiken, SC. September 1, 2010.

Aleman, S. E. (2007). "PORFLOW Testing and Verification Document." WSRC-STI-2007-00150, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Aleman, S. E. (2019). "Savannah River National Laboratory Dose Toolkit." SRNL-TR-2019-00337, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Aleman, S. E. (2021a). "Software Quality Assurance Plan for the SRNL Dose Toolkit, Ver. 1.0." Q-SQP-A-00021, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Aleman, S. E. (2021b). "SRNL Dose Toolkit Software Classification Document." Q-SWCD-A-00047, Rev. 0. Savannah River National Laboratory, Aiken, SC. August 2021.

Aleman, S. E., and Hamm, L. L. (2020). "Groundwater and Intruder Radionuclide Screening." SRNL-STI-2020-00174, Rev. 1. Savannah River National Laboratory, Aiken, SC. August 2020.

Aleman, S. E., and Hamm, L. L. (2021). "E-Area Low-Level Waste Facility Multitiered Groundwater and Intruder Radionuclide Screening." SRNL-STI-2020-00566, Rev. 0. Savannah River National Laboratory, Aiken, SC. January 2021.

Aleman, S. E., Hamm, L. L., Flach, G. P., and Jones, W. F. (1999). "Subsurface Flow and Contaminant Transport Documentation and User's Guide." WSRC-TR-95-0223, Rev. 1. Westinghouse Savannah River Company, Aiken, SC. April 1999.

Aleman, S. E., Hamm, L. L., and Kubilius, W. P. (2021). "E-Area Low-Level Waste Facility Inadvertent Human Intruder Limits and Doses in Support of the PA2022." SRNL-STI-2021-00309, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Almond, P. M., Kaplan, D. I., and Shine, E. P. (2012). "Variability of K_d Values in Cementitious Materials and Sediments." SRNL-STI-2011-00672, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Anderson, M. P., and Woessner, W. W. (1992). "Applied Groundwater Modeling: Simulation of Flow and Advective Transport," Academic Press, San Diego, CA.

Arnett, M. W., Karapatakis, L. K., and Mamatey, A. R. (1993). "Savannah River Site Environmental Report for 1992." WSRC-TR-93-075. Westinghouse Savannah River Company, Aiken, SC.

ASER (2012). "Savannah River Site Environmental Report for 2011." SRNS-STI-2012-00200. Savannah River Nuclear Solutions, Aiken, SC.

ASER (2018). "Savannah River Site Environmental Report for 2017." SRNS-RP-2018-00470. Savannah River Nuclear Solutions, Aiken, SC.

ASER (2020). "Savannah River Site Environmental Report for 2019." SRNS-RP-2020-00064. Savannah River Nuclear Solutions, Aiken, SC.

ASER (2021). "Savannah River Site Environmental Report for 2020." SRNS-RP-2021-00002. Savannah River Nuclear Solutions, Aiken, SC.

ASTM (1997). Standard Practice for Specifying Standard Sizes of Stone for Erosion Control. D6092-97. ASTM International, West Conshohocken, PA. March 10, 1997.

ASTM (2012a). Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)). D1557-12e1. ASTM International, West Conshohocken, PA.

ASTM (2012b). Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³)). D698-12e2. ASTM International, West Conshohocken, PA.

Atkinson, A., Everett, N., and Guppy, R. (1988). "Evolution of pH in a Radwaste Repository: Internal Reactions Between Concrete Constituents." AERE-R-12939. Materials Development Division, UKAEA Harwell Laboratory, Harwell, Oxfordshire, UK.

- Bagwell, L. A., and Bennett, P. L. (2017). "Elevation of Water Table and Various Stratigraphic Surfaces Beneath E-Area Low Level Waste Disposal Facility." SRNL-STI-2017-00301, Rev. 1. Savannah River National Laboratory, Aiken, SC.
- Bagwell, L. A., Bennett, P. L., and Flach, G. P. (2017). "General Separations Area (GSA) Groundwater Flow Model Update: Hydrostratigraphic Data." SRNL-STI-2016-00516. Savannah River National Laboratory, Aiken, SC.
- Bagwell, L. A., and Flach, G. P. (2016). "General Separations Area (GSA) Groundwater Flow Model Update: Program and Execution Plan." SRNL-STI-2016-00261, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Barton, C. D., Blake, J. I., and Imm, D. W. (2005). SRS Forest Management: Ecological Restoration. *In* "Ecology and Management of a Forested Landscape: Fifty Years on the Savannah River Site" (J. C. Kilgo and J. I. Blake, eds.), pp. 479. Island Press, Washington, DC.
- Bates, R. L. (1969). "Geology of the Industrial Rock and Minerals," Dover Publications, New York, NY.
- Bear, J. (1972). "Dynamics of Fluids in Porous Media," Dover Publications, New York.
- Bebbington, W. P. (1990). "History of DuPont at the Savannah River Plant," E. I. duPont de Nemours and Company, Wilmington, DE.
- Bechtel, S. (2005). "Saturated Zone Flow and Transport Model Abstraction." MDL-NBS-HS-000021, Rev. 3. Bechtel SAIC Company, LLC, Las Vegas, NV.
- Bell, E. S. (2020a). "Creation of CAP88 and MAXDOSE Meteorological Datasets (2014-2018) for Regulatory Dose Assessment." SRNL-STI-2020-00259, Rev. 0. Savannah River National Laboratory, Aiken, SC. July 2020.
- Bell, E. S. (2020b). "Summary of Data and Steps for Processing the 2014-2018 SRS Meteorological Database." SRNL-STI-2020-00243, Rev. 0. Savannah River National Laboratory, Aiken, SC. June 2020.
- Bell, E. S. (2021). "Annual Meteorological Averages for the Savannah River Site 2014-2018 Dataset (Technical Memo E. Bell to T. Jannik)." SRNL-L2200-2020-00024, Rev.1. Savannah River National Laboratory, Aiken, SC. May 27, 2021.
- Benson, C. H. (1999). Final Covers for Waste Containment Systems: A North American Perspective. *In* "XVII Conference of Geotechnics of Torino: Control and Management of Subsoil Pollutants," Torino, Italy, November 23-25, 1999.
- Benson, C. H. (2018). "Lessons Learned from Hydrologic Modeling of the Saltstone Cap." *For* Webinar presentation made to the Performance Assessment Community of Practice. University of Virginia/CRESP, Charlottesville, VA. September 27, 2018.

Benson, C. H., and Benavides, J. M. (2018). "Predicting Long-Term Percolation From the SDF Closure Cap." SRRA107772-000009 (UVA Report No. GENV-18-05). University of Virginia School of Engineering, Charlottesville, VA. April 23, 2018.

Berner, U. R. (1992). Evolution of Pore Water Chemistry during Degradation of Cement in a Radioactive Waste Repository Environment. *Waste Management* **12**(2-3), 201-219.

Bethke, C. M. (2005). The Geochemist's Workbench®. Ver. 6.0. University of Illinois, Urbana, IL.

Blake, J. I. (2005). SRS Forest Management: Silviculture and Harvesting Activities. In "Ecology and Management of a Forested Landscape: Fifty Years on the Savannah River Site" (J. C. Kilgo and J. I. Blake, eds.), pp. 479. Island Press, Washington, DC.

Blake, J. I., Hunter, C. H., Jr., and Bayle, B. A. (2005a). The Physical Environment: Climate and Air Quality. In "Ecology and Management of a Forested Landscape: Fifty Years on the Savannah River Site" (J. C. Kilgo and J. I. Blake, eds.), pp. 479. Island Press, Washington, DC.

Blake, J. I., Mayer, J. J., and Kilgo, J. C. (2005b). The Savannah River Site, Past and Present: Industrial Operations and Current Land Use. In "Ecology and Management of a Forested Landscape: Fifty Years on the Savannah River Site" (J. C. Kilgo and J. I. Blake, eds.), pp. 479. Island Press, Washington, DC.

Blount, G., Thibault, J., Millings, M., and Prater, P. (2015). 25 Years Of Environmental Remediation In The General Separations Area Of The Savannah River Site: Lessons Learned About What Worked And What Did Not Work In Soil And Groundwater Cleanup. In "Proceedings of Waste Management 2015 (WM2015), March 15-19, 2015." U.S. Department of Energy, Phoenix, AZ.

BMPC-KAPL (2009a). "Container Approval Request (Large)." CAR-SWE-2009-00004, Rev. 0. Bechtel Marine Propulsion Corporation – Knolls Atomic Power Laboratory, Schenectady, NY. December 2009.

BMPC-KAPL (2009b). "Container Approval Request (Small)." CAR-SWE-2009-00003, Rev. 0. Bechtel Marine Propulsion Corporation – Knolls Atomic Power Laboratory, Schenectady, NY. December 2009.

Bonaparte, R., Daniel, D. E., and Koerner, R. M. (2002). "Assessment and Recommendations for Improving the Performance of Waste Containment Systems." EPA/600/R-02/099. U.S. Environmental Protection Agency, Office of Research and Development, Cincinnati, OH. December 2002.

Bouwer, H. (1991). Simple Derivation of the Retardation Equation and Application to Preferential Flow and Macrodispersion. *Groundwater* **29**(1), 41-46.

Bradbury, M. H., and Sarott, F.-A. (1995). "Sorption Databases for the Cementitious Near-Field of a L/ILW Repository for Performance Assessment " PSI 95-06. Paul Scherrer Institute, Villigen Switzerland. March 1995.

Brooks, R. H., and Corey, A. T. (1964). Hydraulic Properties of Porous Media. In "Hydrology Papers No. 3". Colorado State University, Fort Collins, CO.

Burdine, N. T. (1953). Relative Permeability Calculations from Pore Size Distribution Data. *Journal of Petroleum Technology* 5(3), 71-78.

Butcher, B. T. (2013a). "GoldSimFlows Software Classification Document." B-SWCD-A-00641, Rev. 0. Savannah River National Laboratory, Aiken, SC. June 4, 2013.

Butcher, B. T. (2013b). "PORFLOW Software Classification Document." G-SWCD-A-00063, Rev. 3. Savannah River National Laboratory, Aiken, SC. September 19, 2013.

Butcher, B. T. (2016). "PEST Software Classification Document." Q-SWCD-A-00035, Rev. 0. Savannah River National Laboratory, Aiken, SC. June 6, 2016.

Butcher, B. T. (2017a). "avgVal Software Classification Document." Q-SWCD-A-00036, Rev. 0. Savannah River National Laboratory, Aiken, SC. October 30, 2017.

Butcher, B. T. (2017b). "MESH2D Software Classification Document." B-SWCD-A-00615, Rev. 2. Savannah River National Laboratory, Aiken, SC. October 17, 2017.

Butcher, B. T. (2017c). "PlotConc3d Software Classification Document." Q-SWCD-A-00038, Rev. 0. Savannah River National Laboratory, Aiken, SC. November 14, 2017.

Butcher, B. T. (2017d). "PlotConc3dU Software Classification Document." Q-SWCD-A-00039, Rev. 0. Savannah River National Laboratory, Aiken, SC. November 28, 2017.

Butcher, B. T. (2017e). "PlotConc Software Classification Document." Q-SWCD-A-00037, Rev. 0. Savannah River National Laboratory, Aiken, SC. October 30, 2017.

Butcher, B. T. (2017f). "PlotFlow2d Software Classification Document." Q-SWCD-A-00040, Rev. 0. Savannah River National Laboratory, Aiken, SC. December 18, 2017.

Butcher, B. T. (2018a). "MakeWhole Software Classification Document." Q-SWCD-A-00045, Rev. 0. Savannah River National Laboratory, Aiken, SC. February 9, 2018.

Butcher, B. T. (2018b). "MESH3D Software Classification Document." B-SWCD-A-00582, Rev. 2. Savannah River National Laboratory, Aiken, SC. April 25, 2018.

Butcher, B. T. (2018c). "PlotFlux Software Classification Document." Q-SWCD-A-00041, Rev. 0. Savannah River National Laboratory, Aiken, SC. January 22, 2018.

Butcher, B. T. (2018d). "PlotHist Software Classification Document." Q-SWCD-A-00042, Rev. 0. Savannah River National Laboratory, Aiken, SC. January 30, 2018.

Butcher, B. T. (2018e). "PlotStat Software Classification Document." Q-SWCD-A-00043, Rev. 0. Savannah River National Laboratory, Aiken, SC. February 5, 2018.

Butcher, B. T. (2018f). "Summary of Meeting on Changes in Naval Reactor Component Waste and Container Types since 2008 E-Area Performance Assessment (B. T. Butcher to K. L.

Tempel)." SRNL-L3200-2018-00129. Savannah River National Laboratory, Aiken, SC. October 30, 2018.

Butcher, B. T. (2018g). "Summary of Meeting to Discuss Implementation of Kd Concept in Next Performance Assessment (B. T. Butcher to D. I. Kaplan, G. P. Flach, and L. L. Hamm)." SRNL-L3200-2018-00050. Savannah River National Laboratory, Aiken, SC. April 27, 2018.

Butcher, B. T., Hamm, L. L., and Flach, G. P. (2017). "Unreviewed Disposal Question Evaluation: Waste Disposal in Engineered Trenches 3 and 4." SRNL-STI-2013-00393, Rev. 1. Savannah River National Laboratory, Aiken, SC.

Butcher, B. T., and Hiergesell, R. (2012). "Performance Assessment Interim Measures for Returning E-Area Low-Level Waste Facility Trenches to Operation." SRNL-STI-2012-00320, Rev. 0. Savannah River National Laboratory, Aiken, SC. May 2012.

Butcher, B. T., and Phifer, M. A. (2016a). "Strategic Plan for Next E-Area Low-Level Waste Facility Performance Assessment." SRNL-STI-2015-00620, Rev. 0. Savannah River National Laboratory, Aiken, SC. February 2016.

Butcher, B. T., and Phifer, M. A. (2016b). "Strategic Plan for Next E-Area Low-Level Waste Facility Performance Assessment: Appendix 1.0 Topical Presentations and Team Deliberations." SRNL-STI-2015-00620, Rev. 0. Savannah River National Laboratory, Aiken, SC. February 2016.

Butcher, B. T., and Seitz, R. R. (2007). "Evaluation of Software Quality Assurance for Codes and Applications Used in Performance Assessment Process." WSRC-RP-2007-01243, Rev. 0. Washington Savannah River Company, Aiken, SC. October 2007.

C-CDL-E-00001 (2010). E-Area Burial Ground Conceptual Grading Plan – Slit Trenches 3, 6-9 – Second 100 Acres – Sheets 1 through 6. U.S. Department of Energy, Savannah River Site, Aiken, SC.

C-CT-E-00083 (2016). Preliminary E-Area Low Level Waste Facility (ELLWF) Conceptual Closure Cap – Overall Site Plan (Sheets 1 of 5 through 5 of 5, Rev. A). Savannah River Nuclear Solutions, Aiken, SC. July 20, 2016.

C-CT-E-00084 (2016). Preliminary E-Area Low Level Waste Facility (ELLWF) Conceptual Closure Cap – Details (Sheet 1 of 4 through 4 of 4, Rev. A). Savannah River Nuclear Solutions, Aiken, SC. July 20, 2016.

C-CV-E-0070 (2012). Central E-Area Slit Trenches #1, #2, #3, & #4 and 643-26E Location Plan, Section 8 Detail, Rev. 10 (Sheet 1 of 3). Savannah River Site, Aiken, SC. June 5, 2012.

C-CV-E-00207 (2016). West E-Area Slit Trenches & 643-26E Location Plan, Section & Details (Revision 7). Savannah River Nuclear Solutions, Aiken, SC. September 21, 2016.

C-DCF-E-00367 (2013). Design Change Form for Solid Waste Disposal Facility Layout Drawing: Add 643-7E NRCDA to Drawing (Page 3 of 3). Savannah River Nuclear Solutions, Aiken, SC.

Cahill, J. M. (1982). "Hydrology of the Low-Level Radioactive-Solid-Waste Burial Site and Vicinity near Barnwell, South Carolina." Open-File Report 82-863. U. S. Geological Survey, Columbia, SC.

Carey, S. (2005). "Low Activity Waste (LAW) Vault Structural Degradation Prediction." T-CLC-E-00018, Rev. 1. Westinghouse Savannah River Company, Aiken, SC. October 27, 2005.

Chandler, G. T. (1998). "Corrosion Evaluation of Accelerator Production of Tritium and Tritium Extraction Facility Low-Level Waste Forms and Disposal Boxes in the E-Area Vaults." SRT-MTS-98-2028. Washington Savannah River Company, Aiken, SC. August 7, 1998.

Clarke, J. S., and West, C. T. (1997). "Ground-Water Levels, Predevelopment Ground-Water Flow, and Stream-Aquifer Relations in the Vicinity of the Savannah River Site, Georgia and South Carolina." Report 974197. U.S. Geological Survey, Reston, VA.

Clarke, J. S., and West, C. T. (1998). "Simulation of Ground-Water Flow and Stream-Aquifer Relations in the Vicinity of the Savannah River Site, Georgia and South Carolina, Predevelopment through 1992." Water-Resources Investigations Report 98-4062. United States Geological Survey, Denver, CO.

Collard, L. B. (2000). "Special Analysis for Disposal of High-Concentration I-129 Waste in the Intermediate-Level Vaults at the E-Area Low-Level Waste Facility." WSRC-RP-99-01070, Rev. 1. Westinghouse Savannah River Company, Aiken, SC. July 31, 2000.

Collard, L. B. (2001). "Special Analysis for Disposal of High-Concentration I-129 Waste in Slit Trenches at the E-Area Low-Level Waste Facility." WSRC-TR-2001-00021, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Collard, L. B. (2003). "Special Analysis: Disposal of ETF Activated Carbon Vessels in Slit Trenches at the E-Area Low-Level Waste Facility." WSRC-TR-2003-00255, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Collard, L. B., and Hamm, L. L. (2008). "Special Analysis of Operational Stormwater Runoff Covers over Slit Trenches." SRNL-STI-2008-00397, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Collard, L. B., and Hamm, L. L. (2012). "Alternatives Analysis for Selecting ET #3 Site." SRNL-STI-2012-00047, Rev. 0. Savannah River National Laboratory, Aiken, SC. February 2012.

Collard, L. B., Hamm, L. L., and Smith, F. G. (2011). "Dose Assessment of the Final Inventories in Center Slit Trenches One through Five." SRNL-STI-2010-00760. Savannah River National Laboratory, Aiken, SC.

Colquhoun, D. J., Woollen, I. D., Van Nieuwenhuis, D. S., Padgett, G. G., Oldham, R. W., Boylan, D. C., Bishop, J. W., and Howell, P. D. (1983). "Surface and Subsurface Stratigraphy, Structure and Aquifers of the South Carolina Coastal Plain." ISBN 0-9613154-0-7.

Cook, J. R. (2001). "Special Analysis: Updated Analysis of the Effect of Wood Products on Trench Disposal Limits at the E-Area Low-Level Waste Facility." WSRC-RP-2000-00523. Westinghouse Savannah River Company, Aiken, SC.

Cook, J. R., and Hunt, P. D. (1994). "Radiological Performance Assessment for the E-Area Vaults Disposal Facility." WSRC-RP-94-218, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. April 15, 1994.

Cook, J. R., McDowell-Boyer, L., and Roddy, N. S. (2011). "Methods for Estimating Inventory Uncertainty in SRS Performance Assessments." SRNL-STI-2010-00666, Rev. 0. Savannah River National Laboratory, Aiken, SC. May 2011.

Cook, J. R., McDowell-Boyer, L., Yu, A. D., Kocher, D. C., Wilhite, E. L., Holmes-Burns, H., and Young, K. E. (1999). "Special Analysis for Disposal of Cement-Stabilized Encapsulated Waste at the E-Area Low-Level Waste Facility." WSRC-RP-99-00596, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. December 8, 1999.

Cook, J. R., Phifer, M. A., Wilhite, E. L., Young, K. E., and Jones, W. E. (2004). "Closure Plan for the E-Area Low-Level Waste Facility." WSRC-RP-2000-00425 Rev. 4. Westinghouse Savannah River Company, Aiken, SC.

Cook, J. R., and Yu, A. D. (2002). "Special Analysis: Disposal of M-Area Glass in Trenches." WSRC-TR-2002-00337, Rev. 1. Westinghouse Savannah River Company, Aiken, SC.

Cooney, T. W., Drewes, P. A., Ellisor, S. W., Lanier, T. H., and Melendez, F. (2006). "Water Resources Data, South Carolina, Water Year 2005, Volume 1." Report SC-05-1. U. S. Geological Survey.

Cothran, E. G., Smith, M. H., Wolff, J. O., and Gentry, J. B. (1991). "Mammals of the Savannah River Site." SRO-NERP-21. Savannah River Ecology Laboratory, Aiken, SC.

Crawford, K. C. (2021). "Maintenance Plan for the E-Area Low-Level Waste Facility (ELLWF) Performance Assessment (PA)." SRNS-N3000-2021-00016. Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC. April 20, 2021.

CRC Handbook (2021). Physical Constants of Organic Compounds. *In* "CRC Handbook of Chemistry and Physics, 102nd Edition (Internet Version 2021)" (J. R. Rumble, ed.). CRC Press/Taylor & Francis, Boca Raton, FL.

Cumbest, R. J., Wyatt, D. E., Stephenson, D. E., and Maryak, M. (2000). "Comparison of Cenozoic Faulting at the Savannah River Site to Fault Characteristics of the Atlantic Coast Fault Province: Implications for Fault Capability." WSRC-TR-2000-00310, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Daniels, D. L., Zietz, I., and Popenoe, I. (1983). Distribution of Subsurface Lower Mesozoic Rocks in the Southeaster United States, as Interpreted from Regional Aeromagnetic and Gravity Maps. *In* "Studies Related to the Charleston, South Carolina, Earthquake of 1886--Tectonics and Seismicity" (G. S. Gohn, ed.). U. S. Geological Survey.

Danielson, T. (2017). "Software Quality Assurance Plan for Aquifer Model Refinement Tool (MESH3D)." Q-SQP-G-00003, Rev. 2. Savannah River National Laboratory, Aiken, SC.

Danielson, T. L. (2019a). "A Limited-In-Scope Comparison of Subsidence Scenarios for 3D Vadose Zone PORFLOW Trench Models." SRNL-STI-2019-00636, Rev. 1. Savannah River National Laboratory, Aiken, SC.

Danielson, T. L. (2019b). "A Monte Carlo Rectangle Packing Algorithm for Identifying Likely Spatial Distributions of Final Closure Cap Subsidence in the E-Area Low-Level Waste Facility." SRNL-STI-2019-00440, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Danielson, T. L. (2019c). "PORFLOW Implementation of Vadose Zone Conceptual Model for Slit and Engineered Trenches in the E-Area Low Level Waste Facility Performance Assessment." SRNL-STI-2019-00193. Savannah River National Laboratory, Aiken, SC.

Danielson, T. L. (2020a). "A Case Study Using ST06 for Slit and Engineered Trench Model Implementation in the E-Area Low-Level Waste Facility Performance Assessment." SRNL-STI-2019-00750, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Danielson, T. L. (2020b). "Comparison of Slit Trench and Engineered Trench 3D Vadose Zone Conceptual Models." SRNL-STI-2019-00637, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Danielson, T. L. (2020c). "Component-In-Grout Model Implementation for the E-Area Low-Level Waste Facility's Performance Assessment." SRNL-STI-2020-00365, Rev. 0. Savannah River National Laboratory, Aiken, SC. September, 2020.

Danielson, T. L. (2021). "PORFLOW Implementation of Special Waste Form Models for Slit and Engineered Trenches in the E-Area Low Level Waste Facility Performance Assessment (T. L. Danielson to D. A. Crowley)." SRNL-STI-2020-00162, Rev. 1. Savannah River National Laboratory, Aiken, SC.

Datovech, R. J. (1994). "Disposal Container Corrosion Issues (Attachment 2 to WAPD-SEA(RE)MD-23)." October 17, 1994.

Davis, C. E., and Janecek, L. L. (1997). "DOE Research Set-Aside Areas of the Savannah River Site." SRO-NERP 25. Savannah River Ecology Laboratory, Aiken, SC. 31 August 1997.

DCS (2003). "Mixed Oxide Fuel Fabrication Facility Environmental Report, Revision 1-3." Docket Number 070-03098. Duke Cogema Stone & Webster, Charlotte, NC. June 2003.

de Marsily, G. (1986). "Quantitative Hydrogeology," Academic Press, Orlando, FL.

Dean, J. A. (1992). "Lange's Handbook of Chemistry," 14th/Ed. McGraw-Hill, Inc., New York, NY.

Denham, M. E. (1999). "SRS Geology/Hydrogeology Environmental Information Document." WSRC-TR-95-0046. Westinghouse Savannah River Company, Aiken, SC.

Denham, M. E. (2009). "Conceptual Model of Waste Release from the Contaminated Zone of Closed Radioactive Waste Tanks." WSRC-STI-2007-00544, Rev. 1. Savannah River National Laboratory, Aiken, SC. October 2009.

Denham, M. E. (2010). "Vapor-Aqueous Solution Partition Coefficients for Radionuclides Pertinent to High Level Waste Tank Closure." SRNL-TR-2010-00096. Savannah River National Laboratory, Aiken, SC.

Dennehy, K. F., and McMahon, P. B. (1989). Water Movement in the Unsaturated Zone at a Low-Level Radioactive-Waste Burial Site Near Barnwell, South Carolina. In "U.S. Geological Survey Water-Supply Paper 2345" (U.S. Geological Survey, ed.). United States Government Printing Office,, Denver, Colorado.

Dennehy, K. F., Prowell, D. C., and McMahon, P. B. (1989). "Reconnaissance Hydrogeologic Investigation of the Defense Waste Processing Facility and Vicinity, Savannah River Plant, South Carolina." U. S. Geological Survey Water-Resources Investigations Report 88-4221. U. S. Geological Survey.

Desbarats, A. J. (1992). Spatial Averaging of Hydraulic Conductivity in Three-Dimensional Heterogeneous Porous Media. *Mathematical Geology* **24**(3), 249-267.

DiPrete, D. P. (2021). Personal Communication of Uncertainty in Waste Package Activity Measurement to T. S. Whiteside on June 2, 2021. Savannah River National Laboratory, Aiken, SC.

Dixon, K. L. (2014). "RETC Software Classification Document." G-SWCD-G-00040, Rev. 3. Savannah River National Laboratory, Aiken, SC. March 4, 2014.

Dixon, K. L. (2017). "HELP 4.0 Documentation and Software QA." SRNL-STI-2017-00104, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Dixon, K. L. (2018). "E-Area Corrosion Coupon Recovery and Evaluation (K. L. Dixon to B. T. Butcher)." SRNL-STI-2018-00038. Savannah River National Laboratory, Aiken, SC. May 10, 2018.

Dixon, K. L., and Jannik, G. T. (2021). "Air Pathway Dose Modeling for the E-Area Low-Level Waste Facility." SRNL-STI-2016-00512, Rev. 3. Savannah River National Laboratory, Aiken, SC. August 2021.

Dixon, K. L., and Minter, K. M. (2017). "Air Pathway Dose Modeling for the E-Area Low-Level Waste Facility." SRNL-STI-2016-00512, Rev. 1. Savannah River National Laboratory, Aiken, SC.

Dixon, K. L., and Phifer, M. A. (2006). "Hydraulic and Physical Properties of Cementitious Materials Used at the Component-in-Grout Waste Trenches and the Intermediate Level Vault." WSRC-STI-2006-00199, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Dixon, K. L., and Phifer, M. A. (2007). "Cementitious Material Selection for Future Component-In-Grout Waste Disposals." WSRC-STI-2007-00207, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Dixon, K. L., and Phifer, M. A. (2008). "Hydraulic and Physical Properties of MCU Saltstone." WSRC-STI-2007-00649, Rev. 0. Savannah River National Laboratory, Aiken, SC.

DOE-ID (2019). "Performance Assessment for the INTEC Calcined Solids Storage Facility at the INL Site (Draft)." DOE/ID-12008, Rev. B. Idaho Falls, ID. September 2019.

DOE LFRG (2008). "DOE Low-Level Waste Disposal Facility Federal Review Group, Review Team Report for the E-Area Low-Level Waste Facility, DOE 435.1 Performance Assessment at the Savannah River Site." U.S. Department of Energy, Aiken, SC. February 4, 2008.

Doherty, J. E., and Hunt, R. J. (2010). "Approaches to Highly Parameterized Inversion: A Guide to Using PEST for Groundwater-Model Calibration." Scientific Investigations Report 2010–5169. U.S. Geological Survey, Reston, VA.

Dragoset, R. A., Musgrove, A., Clark, C. W., Martin, W. C., and Olsen, K. (2017). "Periodic Table: Atomic Properties of the Elements (Version 12), NIST SP 966." Retrieved September 19, 2017 from <http://physics.nist.gov/pt> National Institute of Standards and Technology, Gaithersburg, MD.

Dunbar, P. (2009). "LLW SC Low Level Waste Stream Characterizations - EAV / 2673." B-SWCD-E-00002. Waste Management Area Project, Savannah River Site, Aiken, SC. April 2, 2009.

Dunn, K. A. (2002). "B-25 Corrosion Evaluation Summary Report (U)." WSRC-TR-2001-00587. Westinghouse Savannah River Company, Aiken, SC.

DuPont (1987). "Comprehensive Cooling Water Study Final Report, Volumes I-VIII." DP-1739. Savannah River Laboratory, Aiken, SC.

Dutro, J. T., Dietrich, R. V., and Foose, R. M. (1989). AGI Data Sheets for Geology in the Field, Laboratory, and Office. American Geological Institute, Alexandria, VA.

Dyer, J. A. (2017a). "Air and Radon Pathways Screening Methodologies for the Next Revision of the E-Area PA." SRNL-STI-2017-00568. Savannah River National Laboratory, Aiken, SC.

Dyer, J. A. (2017b). "Conceptual Modeling Framework for E-Area PA HELP Infiltration Model Simulations." SRNL-STI-2017-00678. Savannah River National Laboratory, Aiken, SC.

Dyer, J. A. (2017c). "E-Area Low-Level Waste Facility Vadose Zone Model: Confirmation of Water Mass Balance for Subsidence Scenarios." Rep. No. 10.2172/1411194. SRNL-STI-2017-00728. Savannah River National Laboratory, Aiken, SC.

Dyer, J. A. (2017d). "Recommended Henry's Law Constants for Non-Groundwater Pathways Models in GoldSim." SRNL-STI-2017-00331. Savannah River National Laboratory, Aiken, SC.

Dyer, J. A. (2018a). "Impact of Different Vegetative Cover Scenarios on Infiltration Rates for the E-Area PA Intact Case." SRNL-STI-2018-00141, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Dyer, J. A. (2018b). "Method for Including Uncertainty in Infiltration Rates in the E-Area PA System Model." SRNL-STI-2018-00121, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Dyer, J. A. (2019a). "E-AREA LLWF Final Closure Cap Design - Constructability Evaluation Criteria for the Plot 8 and NR07E Disposal Areas." SRNL-STI-2019-00722, Rev. 1. Savannah River National Laboratory, Aiken, SC.

Dyer, J. A. (2019b). "Infiltration Data Package for the E-Area Low-Level Waste Facility Performance Assessment." SRNL-STI-2019-00363, Rev. 0. Savannah River National Laboratory, Aiken, SC. November 2019.

Dyer, J. A. (2019c). "Justification for Use of the HELP Model to Estimate Infiltration Rates for the E-Area Low-Level Waste Facility Performance Assessment." SRNL-STI-2019-00362, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Dyer, J. A., and Flach, G. P. (2017). "E-Area LLWF Vadose Zone Model: Probabilistic Model for Estimating Subsided-Area Infiltration Rates." SRNL-STI-2017-00729, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Dyer, J. A., and Flach, G. P. (2018). "Infiltration Time Profiles for E-Area LLWF Intact and Subsidence Scenarios." SRNL-STI-2018-00327, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Eckerman, K. F., and Leggett, R. W. (2013). "User Guide to DCFPAK 3.0." Oak Ridge National Laboratory, Oak Ridge, TN.

Eckerman, K. F., and Ryman, J. C. (1993). "External Exposure to Radionuclides in Air, Water, and Soil." Federal Guidance Report No. 12 (EPA-402-R-93-081). Prepared for U.S. Environmental Protection Agency by Oak Ridge National Laboratory, Washington, DC. September 1993.

Efron, B. (1982). The Jackknife, the Bootstrap and Other Resampling Plans. In "CBMS-NSF Regional Conference Series in Applied Mathematics." Society for Industrial and Applied Mathematics, Monograph 38, Philadelphia, PA.

Egloffstein, T. A. (2001). Natural Bentonites—Influence of the Ion Exchange and Partial Desiccation on Permeability and Self-Healing Capacity of Bentonites used in GCLs. *Geotextiles and Geomembranes* **19**(7), 427-444.

Fallaw, W. C., and Price, V. (1995). Stratigraphy of the Savannah River Site and Vicinity. *Southeastern Geology* **35**, 21-58.

Fallaw, W. C., Price, V., and Thayer, P. A. (1990). Stratigraphy of the Savannah River Site, South Carolina. In "Savannah River Region: Transition Between the Gulf and Atlantic Coastal Plains" (V. A. Zullo, W. B. Harris and V. Price, eds.), pp. 144, University of North Carolina at Wilmington.

Fetter, C. W. (1993). "Contaminant Hydrogeology," MacMillan Publishing, New York.

- Finfrock, S. H. (2021a). "MCNP 6.1 Software Quality Assurance Plan." N-SQP-G-00009, Rev. 2. Savannah River Nuclear Solutions, Aiken, SC. February 2021.
- Finfrock, S. H. (2021b). "MCNP 6.1 Software Test Plan." N-STP-G-00003, Rev. 2. Savannah River Nuclear Solutions, Aiken, SC. February 2021.
- Flach, G. (2017a). "Overall Conceptual Approach to Uncertainty Quantification and Sensitivity Analysis for the E-Area PA Revision (Greg Flach to Tom Butcher)." SRNL-STI-2017-00062. Savannah River National Laboratory, Aiken, SC. February 2, 2017.
- Flach, G. P. (2004). "Groundwater Flow Model of the General Separations Area Using PORFLOW (U)." WSRC-TR-2004-00106, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.
- Flach, G. P. (2012). Effective Porosity Implies Effective Bulk Density in Sorbing Solute Transport. *Ground Water* **50**(5), 657-658.
- Flach, G. P. (2015a). "Code Selection for General Separations Area Flow Simulation and Model Calibration." SRNL-STI-2015-00061, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Flach, G. P. (2015b). "Velocity Field Calculation For Non-Orthogonal Numerical Grids." SRNL-STI-2015-00115, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Flach, G. P. (2017b). "Mesh2d Grid Generator Design and Use." SRNL-STI-2012-00005, Rev. 1. Savannah River National Laboratory, Aiken, SC. October 2017.
- Flach, G. P. (2017c). "Method for Modeling the Gradual Physical Degradation of a Porous Material (Greg Flach to Tom Butcher)." SRNL-STI-2017-00525. Savannah River National Laboratory, Aiken, SC. September 20, 2017.
- Flach, G. P. (2018). "Recommended Aquifer Grid Resolution for E-Area PA Revision Transport Simulations." SRNL-STI-2018-00012, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Flach, G. P. (2019). "Updated Groundwater Flow Simulations of the Savannah River Site General Separations Area." SRNL-STI-2018-00643, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Flach, G. P., Bagwell, L. A., and Bennett, P. L. (2017). "Groundwater Flow Simulation of the Savannah River Site General Separations Area." SRNL-STI-2017-00008, Rev. 1. ; Savannah River Site (SRS), Aiken, SC (United States).
- Flach, G. P., and Butcher, B. T. (2013). "Software Quality Assurance Plan for PORFLOW Flow-Field Extraction Tool (GoldSimFlows)." Q-SQP-A-00008, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Flach, G. P., Collard, L. B., Phifer, M. A., Crapse, K. P., Dixon, K. L., Koffman, L. D., and Wilhite, E. L. (2005). "Preliminary Closure Analysis for Slit Trenches #1 and #2." WSRC-TR-2005-00093. Westinghouse Savannah River Company, Aiken, SC.

- Flach, G. P., Crisman, S. A., and Molz, F. J. (2004). Comparison of Single-Domain and Dual-Domain Subsurface Transport Models. *Ground Water* **42**(6), 815-828.
- Flach, G. P., Hamm, L. L., Harris, M. K., Thayer, P. A., Haselow, J. S., and Smits, A. D. (1996). "Groundwater Flow and Tritium Migration from the SRS Old Burial Ground to Fourmile Branch (U)." WSRC-TR-96-0037. Westinghouse Savannah River Company, Aiken, SC. April 1996.
- Flach, G. P., and Harris, M. K. (1997). "Corrective Measures Study Modeling Results for the Southwest Plume - Burial Ground Complex/Mixed Waste Management Facility (U)." WSRC-TR-96-0411. Westinghouse Savannah River Company, Aiken, SC. January 1997.
- Flach, G. P., and Harris, M. K. (1999). "Integrated Hydrogeological Model of the General Separations Area (U), Volume 2: Groundwater Flow Model (U)." WSRC-TR-96-0399, Rev. 1. Westinghouse Savannah River Company, Aiken, SC.
- Flach, G. P., Harris, M. K., Hiergesell, R. A., Smits, A. D., and Hawkins, K. L. (1999). "Regional Groundwater Flow Model for C, K, L, and P Reactor Areas, Savannah River Site, Aiken, South Carolina (U)." WSRC-TR-99-00248, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.
- Flach, G. P., and Jones, W. E. (2010). "Unreviewed Disposal Question Evaluation: Disposal of Tall Used Equipment Storage Boxes in Slit Trench Numbers 8, 9 and 10." SRNL-STI-2010-00799, Rev. 0. Savannah River National Laboratory Aiken, SC.
- Flach, G. P., Kaplan, D. I., Nichols, R. L., Seitz, R. R., and Serne, R. J. (2016). "Solid Secondary Waste Data Package Supporting Hanford Integrated Disposal Facility Performance Assessment." SRNL-STI-2016-00175, Rev. 0. Savannah River National Laboratory, Aiken, SC. May 2016.
- Flach, G. P., Smith, F. G., Hamm, L. L., and Butcher, B. T. (2014). "Unreviewed Disposal Question Evaluation: Impact of New Information since 2008 PA on Current Low-Level Solid Waste Operations." SRNL-STI-2013-00011, Rev. 1. Savannah River National Laboratory, Aiken, SC.
- Flach, G. P., and Whiteside, T. S. (2016). "Interpretation of Vadose Zone Monitoring System Data near Engineered Trench 1." SRNL-STI-2016-00546, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Fredlund, D. G., and Rahardjo, H. (1993). "Soil Mechanics for Unsaturated Soils," John Wiley & Sons, New York, NY.
- Freeze, R. A., and Cherry, J. A. (1979). "Groundwater," Prentice-Hall, Inc., Englewood Cliffs, NJ.
- Gelhar, L. W. (1997). Perspectives on Field-Scale Application of Stochastic Subsurface Hydrology. In "Subsurface Flow and Transport: A Stochastic Approach" (G. Dagan and S. P. Neuman, eds.), pp. 157-176. Cambridge University Press, New York.
- Gelhar, L. W., Welty, C., and Rehfeldt, K. R. (1992). A Critical Review of Data on Field-Scale Dispersion in Aquifers. *Water Resour. Res* **28**(7), 1955-1974.

Geosynthetic Research Institute (2016). Test Methods and Properties for Nonwoven Geotextiles Used as Protection (or Cushioning) Materials (ASTM). GRI GT12(a), Rev. 2. Geosynthetic Research Institute, Folsom, PA. March 3, 2016.

Geosynthetic Research Institute (2017). Test Methods and Properties for Geotextiles Used as Separation Between Subgrade Soil and Aggregate (ASTM Version). GRI GT13(a), Rev. 4. Geosynthetic Research Institute, Folsom, PA. June 20, 2017.

Geosynthetic Research Institute (2019a). Test Methods, Required Properties, and Testing Frequencies of Geosynthetic Clay Liners (GCLs). GRI GCL3, Rev. 5. Geosynthetic Research Institute, Folsom, PA. November 21, 2019.

Geosynthetic Research Institute (2019b). Test Methods, Test Properties and Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes. GRI GM13, Rev. 15. Geosynthetic Research Institute, Folsom, PA. September 9, 2019.

Gibbons, J. W., McCourt, W. D., Knight, J. L., and Novak, S. S. (1986). "Semi-aquatic Mammals and Herpetofauna of the Savannah River Plant." SREL-29. Savannah River Ecology Laboratory, Aiken, SC.

Giroud, J. P. (1997). Equations for Calculating the Rate of Liquid Migration Through Composite Liners Due to Geomembrane Defects. *Geosynthetics International* 4(3-4), 335-348.

Giroud, J. P., and Bonaparte, R. (1989). Leakage through Liners Constructed with Geomembranes—Part I. Geomembrane Liners. *Geotextiles and Geomembranes* 8(1), 27-67.

Giroud, J. P., and Houlihan, M. F. (1995). Design of Leachate Collection Layers. In "Proceedings of the Fifth International Landfill Symposium," Vol. 2, pp. 613-640.

Giroud, J. P., Zhao, A., Tomlinson, H. M., and Zornberg, J. G. (2004). Liquid Flow Equations for Drainage Systems Composed of Two Layers including a Geocomposite. *Geosynthetics International* 11(1), 43-58.

Giroud, J. P., Zornberg, J. G., and Zhao, A. (2000). Hydraulic Design of Geosynthetic and Granular Liquid Collection Layers. *Geosynthetics International* 7(4-6), 285-380.

Goldman, S. J., Jackson, K., and Bursztynsky, T. A. (1986). "Erosion and Sediment Control Handbook," McGraw-Hill Publishing Company, New York.

GoldSim Technology Group (2018a). GoldSim User's Guide. Ver. 12.1. Retrieved June, 2018 from <https://www.goldsim.com/Web/Customers/Education/Documentation/>. GoldSim Technology Group LLC, Seattle, WA.

GoldSim Technology Group (2018b). GoldSim Version 12.1 Contaminant Transport Module User's Guide. Ver. 7.1. Retrieved June, 2018 from <https://www.goldsim.com/Web/Customers/Education/Documentation/>. GoldSim Technology Group LLC, Seattle, WA.

Gorensek, M. B. (2021). "Updated Estimate of Tritium Permeation from TPBAR Disposal Containers in ILV (U)." SRNL-TR-2020-00298, Rev. 1. Savannah River National Laboratory, Aiken, SC. December 7, 2021.

Gray, D. (2012). "Truck Scale Accuracy: A Weighty Issue Revealed." Retrieved June 7, 2021 from <https://fifthwheelst.com/commercial-truck-scales-vs-portable-scales-for-weighing-rvs.html>. Last Updated 9/17/2012. Fifth Wheel Street.

Greenwood, N. N., and Earnshaw, A. (1998). "Chemistry of the Elements," Butterworth Heinemann, Oxford, UK.

Grogan, K. P. (2008). Spatial Variability of Radionuclide Distribution Coefficients at the Savannah River Site and the Subsurface Transport Implications, Clemson University, Clemson, SC.

Grogan, K. P., Fjeld, R. A., Kaplan, D., DeVol, T. A., and Coates, J. T. (2010). Distributions of Radionuclide Sorption Coefficients (Kd) in Sub-Surface Sediments and the Implications for Transport Calculations. *Journal of Environmental Radioactivity* **101**(10), 847-853.

Haby, J. (2020). "What Are Straight-Line Winds?" The Ultimate Weather Education Website. Retrieved October 27, 2020 from <http://www.theweatherprediction.com/habyhints2/406/#:~:text=Straight%2Dline%20wind%20is%20wind,downdraft%20region%20of%20a%20thunderstorm>.

Halverson, N. V., Wike, L. D., Patterson, K. K., Bowers, J. A., Bryan, A. L., Chen, K. F., Cummins, C. L., del Carmen, B. R., Dixon, K. L., Dunn, D. L., Friday, G. P., Irwin, J. E., Kolka, R. K., Mackey, H. E., Mayer, J. J., Nelson, E. A., Paller, M. H., Rogers, V. A., Specht, W. L., Westbury, H. M., and Wilde, E. W. (1997). "SRS Ecology Environmental Information Document." WSRC-TR-97-0223. Westinghouse Savannah River Company, Aiken, SC.

Hamm, B. A. (2006). "Savannah River Site High-Level Waste Tank Farm Closure Radionuclide Screening Process (First-Level) Development and Application." CBU-PIT-2005-00228, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. November 7, 2006.

Hamm, L. L. (2019). "Confirmation of Disposal Unit Footprints for Use in E-Area Performance Assessment Revision." SRNL-STI-2019-00205, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Hamm, L. L., and Aleman, S. E. (2000). "FACT (Version 2.0) - Subsurface Flow and Contaminant Transport Documentation and User's Guide." WSRC-TR-99-00282, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Hamm, L. L., Aleman, S. E., and Danielson, T. L. (2019). "Preliminary Assessment for Continued Use of Plume Interaction Factors and Other Options for Revised Performance Assessment Methodology." SRNL-STI-2019-00149, Rev. 0. Savannah River National Laboratory, Aiken, SC. March 7, 2019.

- Hamm, L. L., Aleman, S. E., Danielson, T. L., and Butcher, B. T. (2018). "Special Analysis: Impact of Updated GSA Flow Model on E-Area Low-Level Waste Facility Groundwater Performance." SRNL-STI-2018-00624, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hamm, L. L., Collard, L. B., Aleman, S. E., Gorenssek, M. B., and Butcher, B. T. (2012). "Special Analysis for Slit Trench Disposal of the Reactor Process Heat Exchangers." SRNL-STI-2012-00321, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hamm, L. L., Dixon, K. L., Wilhite, E. L., Cook, J. R., and Phifer, M. A. (2007). "Special Study: Impacts of Operational History on Performance of E-Area Component-in-Grout Trenches." WSRC-TR-2007-00177, Rev. 0. Savannah River National Laboratory, Washington Savannah River Company, Savannah River Site, Aiken, SC. May 2007.
- Hamm, L. L., and Smith, F. G. (2010). "Special Analysis for Slit Trench Disposal of the Heavy Water Components Test Reactor." SRNL-STI-2010-00574, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hamm, L. L., Smith, F. G., Flach, G. P., Hiergesell, R. A., and Butcher, B. T. (2013). "Unreviewed Disposal Question Evaluation: Waste Disposal In Engineered Trench #3." SRNL-STI-2013-00393, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hang, T. (2007). "PORFLOW Software Quality Assurance Plan." G-SQP-A-00012, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.
- Hang, T. (2012). "PORFLOW Software Test Plan." G-STP-A-00009, Rev. 1. Savannah River National Laboratory, Aiken, SC. August 2012.
- Hang, T. (2017a). "Software Quality Assurance Plan for avgVal." Q-SQP-A-00009, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hang, T. (2017b). "Software Quality Assurance Plan for MESH2D." G-SQP-G-00015, Rev. 1. Savannah River National Laboratory, Aiken, SC.
- Hang, T. (2017c). "Software Quality Assurance Plan for PlotConc." Q-SQP-A-00010, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hang, T. (2017d). "Software Quality Assurance Plan for PlotConc3d." Q-SQP-A-00011, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hang, T. (2017e). "Software Quality Assurance Plan for PlotConc3dU." Q-SQP-A-00012, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hang, T. (2017f). "Software Quality Assurance Plan for PlotFlow2d." Q-SQP-A-00013, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hang, T. (2018a). "Software Quality Assurance Plan for MakeWhole." Q-SQP-A-00017, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Hang, T. (2018b). "Software Quality Assurance Plan for PlotFlux." Q-SQP-A-00014, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Hang, T. (2018c). "Software Quality Assurance Plan for PlotHist." Q-SQP-A-00015, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Hang, T. (2018d). "Software Quality Assurance Plan for PlotStat." Q-SQP-A-00016, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Hang, T. (2019a). "GSA Aquifer Cutouts for E-Area PA Revision Transport Simulations." SRNL-STI-2019-00736, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Hang, T. (2019b). "Survey of Software Quality Assurance Documentation for Codes and Applications Being Used in the Next Performance Assessment Revision." SRNL-STI-2019-00145, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Hang, T. (2021a). "PlotFlow3dS Software Classification Document." Q-SWCD-A-00046, Rev. 1. Savannah River National Laboratory, Aiken, SC. December 2021.

Hang, T. (2021b). "Software Quality Assurance Plan for PlotFlow3dS, Ver. 1.0." Q-SQP-A-00020, Rev. 0. Savannah River National Laboratory, Aiken, SC. December 2021.

Hang, T., Collard, L. B., and Phifer, M. A. (2005). "Unreviewed Disposal Question Evaluation: Subsidence Study for Non-Crushable Containers in Slit Trenches (U)." WSRC-TR-2005-00104. Savannah River National Laboratory, Aiken, SC.

Hang, T., and Flach, G. P. (2016). "E-Area Low-Level Waste Facility Cover Overhang Analysis." SRNL-STI-2016-00251, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Hang, T., and Hamm, L. L. (2022). "PORFLOW Implementation of Vadose Zone Conceptual Model for Naval Reactor Component Disposal Areas in the E-Area Low Level Waste Facility Performance Assessment." SRNL-STI-2019-00357, Rev. 1. Savannah River National Laboratory, Aiken, SC. January 2022.

Hanson, K. L., Bullard, T. F., Dewit, M. W., and Stieve, A. L. (1993). Applications of Quaternary Stratigraphic, Soil-Geomorphic, and Quantitative Geomorphic Analyses to the Evaluation of Tectonic Activity and Landscape Evolution in the Upper Coastal Plain, South Carolina. *In* "4th DOE Natural Phenomena Hazards Mitigation Conference", Atlanta, GA.

Hiergesell, R. A. (2004). "Special Analysis: Re-Evaluation of the Slit Trench Uranium Disposal Limits with Implications for Disposal of the Paducah Demonstration Cask." WSRC-TR-2003-00521, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Hiergesell, R. A. (2005). "Special Analysis: Production TPBAR Waste Container Disposal Within the Intermediate Level Vault." WSRC-TR-2005-00531. Westinghouse Savannah River Company, Aiken, SC.

- Hiergesell, R. A., and Taylor, G. A. (2011). "Special Analysis: Air Pathway Modeling of E-Area Low-Level Waste Facility." SRNL-STI-2011-00327, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hiergesell, R. A., and Taylor, G. A. (2015). "General Separations Areas (GSA) Groundwater Level Measurement Analysis." SRNL-STI-2015-00034, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hiergesell, R. A., Taylor, G. A., Phifer, M. A., Whiteside, T. S., and Flach, G. P. (2015). "General Separations Areas (GSA) Groundwater Model Calibration Targets." SRNL-STI-2015-00351, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Hillel, D. (1982). "Introduction to Soil Physics," Academic Press, Inc., San Diego, CA.
- HNUS (1997). "Socioeconomic Characteristics of Selected Counties and Communities Adjacent to the Savannah River Site." Halliburton NUS Corporation, Aiken, SC. June 1997.
- Hsu, R. H., and Roddy, N. S. (1997). "Response to Naval Reactor Comments on WSRC-RP-94-218, Appendix L, 'NR Waste Disposal Performance Assessment'." SRT-WED-97-0159. Washington Savannah River Company, Aiken, SC. February 18, 1997.
- Hsuan, Y. G., and Koerner, R. M. (1998). Antioxidant Depletion Lifetime in High Density Polyethylene Geomembranes. *Journal of Geotechnical and Geoenvironmental Engineering* **124**(6), 532-541.
- Hubbard, J. E. (1986). "An Update on the SRP Burial Ground Area Water Balance and Hydrology." DPST-85-958. E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC. January 9, 1986.
- Hubbard, J. E., and Emslie, R. H. (1984). "Water Budget for SRP Burial Ground Area." DPST-83-742. E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC. March 19, 1984.
- Hubbard, J. E., and Englehardt, M. (1987). "Calculation of Groundwater Recharge at the Old SRP Burial Ground Using the CREAMS Model (1961-1986)." DPST-83-742. State University of New York, Brockport, NY (prepared for E. I. du Pont de Nemours and Company, Savannah River Site).
- IAEA (2004). "Safety Assessment Methodologies for Near Surface Disposal Facilities, Results of a Coordinated Research Project, Volume 1: Review and Enhancement of Safety Assessment Approaches and Tools." IAEA-ISAM-1. International Atomic Energy Agency, Vienna, Austria. July 2004.
- ICRP (2008). Nuclear Decay Data for Dosimetric Calculations. ICRP Publication 107. *Ann. ICRP* **38**(3).
- Imm, D. W. (2005). Threatened and Endangered Species: Smooth Purple Coneflower. In "Ecology and Management of a Forested Landscape: Fifty Years on the Savannah River Site" (J. C. Kilgo and J. I. Blake, eds.), pp. 479. Island Press, Washington, DC.

INEL (1995). "A Comprehensive Inventory of Radiological and Nonradiological Contaminants in Waste Buried or Projected to be Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1984-2003, Vol. 1." INEL/95-0135. Idaho National Engineering Laboratory, Idaho Falls, ID.

INTERA Technologies Inc. (1986). "Z-Area Site Assessment." DPST-86-426. Savannah Research Laboratory, E. I. du Pont de Nemours & Company, Inc., Aiken, SC.

Jannik, G. T. (2013). "Recommended Exposure Parameters for Acute Intruder Scenarios at the Portsmouth OH Disposal Facility (Memo from G. T. Jannik to F. G. Smith III and M. A. Phifer)." SRNL-L4310-2013-00016, Rev. 0. Savannah River National Laboratory, Aiken, SC. August 6, 2013.

Jannik, G. T. (2014). "Facility Area Coordinates and Grade Elevations for the Savannah River Site (U)." SRNL-L4310-2014-00027. Savannah River National Laboratory, Aiken, SC. August 21, 2014.

Jannik, G. T. (2018). "Software Quality Assurance Plan for Environmental Dosimetry." Q-SQP-A-00002, Rev. 5. Savannah River National Laboratory, Aiken, SC.

Jannik, G. T., and Stagich, B. H. (2017). "Land and Water Use Characteristics and Human Health Input Parameters for use in Environmental Dosimetry and Risk Assessments at the Savannah River Site - 2017 Update." SRNL-STI-2016-00456, Rev. 1. Savannah River Site, Aiken, SC. May 2017.

Jannik, G. T., and Trimor, P. P. (2017). "MAXDOSE-SR and POPDOSE-SR: Routine-Release Atmospheric Dose Models used at SRS." SRNL-STI-2013-00722, Rev. 1. Savannah River National Laboratory, Aiken, SC. July 2017.

Jenkins, J. F. (1993). "Corrosion Behavior of HY-80 Steel, Type 304 Stainless Steel, and Inconel Alloy 500 at 218-E-12B Burial Ground, Hanford, WA." TR-2001-SHR. Naval Facilities Engineering Service Center, Port Hueneme, CA.

Jo, H. Y., Benson, C. H., Shackelford, C. D., Lee, J.-M., and Edil, T. B. (2005). Long-Term Hydraulic Conductivity of a Geosynthetic Clay Liner Permeated with Inorganic Salt Solutions. *Journal of Geotechnical and Geoenvironmental Engineering* **131**(4), 405-417.

Johns, P. E., and Kilgo, J. C. (2005). Harvestable Natural Resources: White-Tailed Deer. *In* "Ecology and Management of a Forested Landscape: Fifty Years on the Savannah River Site" (J. C. Kilgo and J. I. Blake, eds.), pp. 479. Island Press, Washington, DC.

Johnson, T. L. (2002). "Design of Erosion Protection for Long-Term Stabilization." NUREG-1623. U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, Washington, DC. September 2002.

Jones, W. E. (2005). "E-Area B-25 and SeaLand Container Corrosion Monitoring Program (U)." WSRC-TR-2005-00404, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. October 2005.

Jones, W. E. (2007). "Software Quality Assurance Plan for the RETC (REtention Curve) Computer Code." Q-SQP-A-00006, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Jones, W. E., Millings, M. R., and Rambo, B. H. (2010). "Hydrogeologic Data Summary in Support of the H-Area Tank Farm Performance Assessment." SRNL-STI-2010-00148, Rev. 0. Savannah River National Laboratory, Aiken, SC. February 2010.

Jones, W. E., and Phifer, M. A. (2002). "Corrosion and Potential Subsidence Scenarios for Buried B-25 Waste Containers (U)." WSRC-TR-2002-00354. Westinghouse Savannah River Company, Aiken, SC.

Jones, W. E., and Phifer, M. A. (2007). "E-Area Low-Activity Waste Vault Subsidence Potential and Closure Cap Performance (U)." WSRC-TR-2005-00405. Washington Savannah River Company, Aiken, SC.

Jones, W. E., Phifer, M. A., and Kukreja, J. (2004). "Unreviewed Disposal Question Evaluation: Components-In-Grout Options for Structural Stability – Component Filling, Component Stability, or Concrete Mat Cover." WSRC-TR-2004-00039, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Jones, W. E., Wilhite, E. L., and Butcher, B. T. (2009). "Unreviewed Disposal Question Evaluation: Disposal of Tall Used Equipment Storage Boxes Number 5 and Number 42 in Slit Trench Number 8." SRNL-TR-2009-00236, Rev. 0. Savannah River National Laboratory, Aiken, SC. August 6, 2009.

Kaplan, D. I. (2003). Influence of Surface Charge of an Fe-oxide and an Organic Matter Dominated Soil on Iodide and Pertechnetate Sorption. *Radiochemica Acta* **91**(3), 173-178.

Kaplan, D. I. (2005). "Estimate of Gaseous ¹⁴C Concentrations Emanating from the Intermediate-Level Vault Disposal Facility (U)." WSRC-TR-2005-00222, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Kaplan, D. I. (2006). "Geochemical Data Package for Performance Assessment Calculations Related to the Savannah River Site." WSRC-TR-2006-00004, Rev. 0. Washington Savannah River Company, Aiken, SC. February 28, 2006.

Kaplan, D. I. (2007a). "Geochemical Data Package for Performance Assessment Calculations Related to the Savannah River Site." WSRC-TR-2006-00004, Rev. 1. Washington Savannah River Company, Aiken, SC. September 30, 2007.

Kaplan, D. I. (2007b). "A Review of Technetium Values for SRS Sediments." WSRC-STI-2007-00698. Savannah River National Laboratory, Washington Savannah River Company, Aiken, SC. December 13, 2007.

Kaplan, D. I. (2010). "Geochemical Data Package for Performance Assessment Calculations Related to the Savannah River Site." SRNL-STI-2009-00473, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Kaplan, D. I. (2012). "Revised Guidelines for using Cellulose Degradation Product-Impacted Kd Values for Performance Assessments and Composite Analyses." SRNL-STI-2012-00138, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Kaplan, D. I. (2016a). "Geochemical Data Package for Performance Assessment and Composite Analysis at the Savannah River Site – Supplemental Radionuclides." SRNL-STI-2016-00267, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Kaplan, D. I. (2016b). "Geochemical Data Package for Performance Assessment Calculations Related to the Savannah River Site." SRNL-STI-2009-00473, Rev. 1. Savannah River National Laboratory, Aiken, SC.

Kaplan, D. I. (2021). "Geochemical Data Package for Performance Assessment Calculations Related to the Savannah River Site." SRNL-STI-2021-00017, Rev. 0. Savannah River National Laboratory, Aiken, SC. February 2021.

Kaplan, D. I., and Coffey, C. (2002). "Distribution Coefficients (Kd Values) for Waste Resins Generated from the K & L Disassembly Basin Facilities." WSRC-TR-2002-00349, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. August 9, 2002.

Kaplan, D. I., and Iversen, G. (2001). "Free-Moisture Content and ¹²⁹I-Kd Values of Filtercake Material Generated from the F-Area Groundwater Treatment Unit." WSRC-TR-2001-00253, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. August 17, 2001.

Kaplan, D. I., and Millings, M. R. (2006). "Early Guidance for Assigning Distribution Parameters to Geochemical Input Terms to Stochastic Transport Models." WSRC-STI-2006-00019. Savannah River National Laboratory, Aiken, SC.

Kaplan, D. I., Roberts, K., Shine, E. P., Grogan, K. P., Fjeld, R. A., and Seaman, J. C. (2008). "Range and Distribution of Technetium Kd Values in the SRS Subsurface Environment." SRNS-STI-2008-00286, Rev. 1. Savannah River National Laboratory, Aiken, SC. October 28, 2008.

Kaplan, D. I., and Serkiz, S. M. (2000). "¹²⁹Iodine Desorption from Resin, Activated Carbon, and Filtercake Waste Generated from the F- and H-Area Water Treatment Units." WSRC-TR-2000-00308, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. October 26, 2000.

Kaplan, D. I., and Serkiz, S. M. (2006). "Influence of Dissolved Organic Carbon and pH on Iodide, Perrhenate, and Selenate Sorption to Sediment." WSRC-STI-2006-00037. Savannah River National Laboratory, Aiken, SC.

Kaplan, D. I., Serkiz, S. M., and Bell, N. C. (1999). "I-129 Desorption from SRS Water Treatment Media from the Effluent Treatment Facility and the F-Area Groundwater Treatment Facility." WSRC-TR-99-00270. Westinghouse Savannah River Company, Aiken, SC. August 24, 1999.

Kaplan, D. I., and Serne, R. J. (1998). Pertechetate Exclusion from Sediments. *Radiochimica Acta* **81**, 117-124.

Kennedy, W. E., Jr., and Peloquin, R. A. (1988). "Intruder Scenarios for Site-Specific Low-Level Waste Classification." DOE/LLW-71T. Idaho Operations Office, U. S. Department of Energy, Idaho Falls, ID. September 1988.

Koerner, R. M. (1998). "Designing with Geosynthetics," 4th/Ed. Prentice Hall, Upper Saddle River, NJ.

Koerner, R. M., and Hsuan, Y. G. (2003). Lifetime Prediction of Polymeric Geomembranes Used in New Dam Construction and Dam Rehabilitation. *In* "Proceedings of the Association of State Dam Safety Officials Conference," Lake Harmony, PA, June 4-6, 2003.

Krupka, K. M., Kaplan, D. I., Whelan, G., Serne, R. J., and Mattigod, S. V. (1999). "Understanding Variation in Partition Coefficient, K_d , Values. Volume II: Review of Geochemistry and Available K_d Values for Cadmium, Cesium, Chromium, Lead, Plutonium, Radon, Strontium, Thorium, Tritium (^3H), and Uranium." EPA-402-R-99-004B. Office of Air and Radiation, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, DC. August 1999.

Kubilius, W. P., and Joyce, W. D. (2018). "Optimization of the Groundwater Monitoring Program at the E-Area Low-Level Waste Facility (ELLWF)." SRNS-RP-2018-01123, Rev. 0. Savannah River National Laboratory, Aiken, SC. December 2018.

LaBone, E. D., Butcher, B. T., Dixon, K. L., and Stewart, I. J. (2021). "FY2020 Performance Assessment Annual Review for the E-Area Low-Level Waste Facility." SRNL-STI-2020-00588, Rev. 0. Savannah River National Laboratory, Aiken, SC. February 2021.

LaBone, E. D., Mayer, J. J., Dixon, K. L., and Stewart, I. J. (2022). "FY2021 Performance Assessment Annual Review for the E-Area Low-Level Waste Facility." SRNL-STI-2022-00018, Rev. 0. Savannah River National Laboratory, Aiken, SC. March 2022.

Lanning, D. D., and Gilbert, E. R. (2005). "Long-Term Release Estimate for TEF Disposal Containers (U)." PNN-TTP-5-683, Rev. 0, S/RD (Extracted information is unclassified). Pacific Northwest National Laboratory, Richland, WA. August 2005.

Lee, P. L. (2006). "Air Pathway Dose Modeling for the E-Area Low Level Waste Facility at the Savannah River Site." WSRC-STI-2006-00262, Rev. 0. Savannah River National Laboratory, Washington Savannah River Company, Aiken, SC. October 31, 2006.

Lee, P. L., and Coffield, T. W. (2008). "Baseline Parameter Update for Human Health Input and Transfer Factors for Radiological Performance Assessments at the Savannah River Site " WSRC-STI-2007-00004, Rev. 4. Westinghouse Savannah River Company, Aiken, SC.

Leigh, D. S. (2008). Late Quaternary Climates and River Channels of the Atlantic Coastal Plain, Southeastern USA. *Geomorphology* **101**(1-2), 90-108.

LFRG (2008). "Review Team Report for the E-Area Low-Level Waste Facility DOE 435.1 Performance Assessment at the Savannah River Site." Department of Energy Low-Level Waste Disposal Facility Federal Review Group Review Team. February 4, 2008.

- Li, J., You, K., Zhan, H., and Huang, G. (2012). Analytical Solution to Subsurface Air Pressure in a Three-Layer Unsaturated Zone with Atmospheric Pressure Changes. *Transport in Porous Media* **93**(3), 461-474.
- Lin, L. C., and Benson, C. H. (2000). Effect of Wet-Dry Cycling on Swelling and Hydraulic Conductivity of GCLs. *Journal of Geotechnical and Geoenvironmental Engineering* **126**(1), 40-49.
- Logan, K. H. (1939). Engineering Significance of National Bureau of Standards Soil Corrosion Data, J. Research NBS 22, 109 (1939) RP1171. *Underground Corrosion* **273**(274), 441-443.
- Logan, W. R., and Euler, G. M. (1989). "Geology and Groundwater Resources of Allendale, Bamberg, and Barnwell Counties and Part of Aiken County, South Carolina." South Carolina Water Resources Commission Report 155. South Carolina Water Resources Commission.
- Looney, B. B., Eddy, C. A., Ramdeen, M., Pickett, J., Rogers, V., Scott, M. T., and Shirley, P. A. (1990). "Geochemical and Physical Properties of Soils and Shallow Sediments at the Savannah River Site (U)." WSRC-RP-90-1031. Westinghouse Savannah River Company, Aiken, SC.
- Looney, B. B., Grant, M. W., and King, C. M. (1987). "Estimation of Geochemical Parameters for Assessing Subsurface Transport at the Savannah River Plant." DPST-85-904. Savannah River Laboratory, Aiken, SC. March 1987.
- Loveland, W. D., Morrissey, D. J., and Seaborg, G. T. (2017). "Modern Nuclear Chemistry," 2nd/Ed. John Wiley & Sons, Inc.
- Low, M. (2016). "MCNP6 Ver. 6.1 Monte Carlo N-Particle Software Classification Document." B-SWCD-C-00057, Rev. 2. Savannah River National Laboratory, Aiken, SC. July 12, 2016.
- Lowry, W., Dunn, S. D., and Neeper, D. (1996). Barometric Pumping with a Twist: VOC Containment and Remediation without Boreholes. In "Industry Partnerships to Deploy Environmental Technology, October 22-24, 1996, Morgantown, WV." Science and Engineering Associates, Inc., Santa Fe, NM.
- Madabhushi, S., and Talwani, P. (1993). Fault Plane Solutions and Relocations of Recent Earthquakes in Middleton Place Summerville Seismic Zone Near Charleston, South Carolina. *Bulletin of the Seismological Society of America* **83**(5), 1442-1466.
- Mamatey, A. R. (2006). "Savannah River Site Environmental Report for 2005." WSRC-TR-2006-00007. Washington Savannah River Company, Aiken, SC.
- Marcinowski, F. (2008). "Revision of the Disposal Authorization Statement for the Savannah River Site's E-Area Low-Level Waste Facility (Memorandum dated July 17, 2008 from Frank Marcinowski, Deputy Assistant Secretary for Regulatory Compliance, to Terry Spears, Assistant Manager for Waste Disposal Projects, Savannah River Operations Office)." SRNS-OS-2008-00077. Office of Environmental Management, U. S. Department of Energy, Washington, DC.

Marcy, B. C., Jr. (2005). Biotic Communities: Fishes. *In* "Ecology and Management of a Forested Landscape: Fifty Years on the Savannah River Site" (J. C. Kilgo and J. I. Blake, eds.). Island Press, Washington, DC.

Masson, O., Steinhauser, G., Zok, D., Saunier, O., Angelov, H., Babić, D., Bečková, V., Bieringer, J., Bruggeman, M., and Burbidge, C. I. (2019). Airborne Concentrations and Chemical Considerations of Radioactive Ruthenium from an Undeclared Major Nuclear Release in 2017. *Proceedings of the National Academy of Sciences* **116**(34), 16750-16759.

Mayer, J. J. (2005). Harvestable Natural Resources: Wild Hog. *In* "Ecology and Management of a Forested Landscape: Fifty Years on the Savannah River Site" (J. C. Kilgo and J. I. Blake, eds.). Island Press, Washington, DC.

Mayer, J. J., and Wike, L. D. (1997). "SRS Urban Wildlife Environmental Information Document." WSRC-TR-97-0093. Westinghouse Savannah River Company, Aiken, SC.

McAllister, C., Beckert, H., Abrams, C., Bilyard, G., Cadwell, K., Friant, S., Glantz, C., Mazaika, R., and Miller, K. (1996). "Survey of Ecological Resources at Selected U.S. Department of Energy Sites." DOE/EH-0534. Pacific Northwest National Laboratory, Richland, WA.

McDowell-Boyer, L., Phifer, M. A., and Cook, J. R. (2011). "Data Package for HELP Models used in the E-Area Low-Level Waste Facility Performance Assessment." SRNL-STI-2010-00618, Rev. 0. Savannah River National Laboratory, Aiken, SC.

McDowell-Boyer, L., Yu, A. D., Cook, J. R., Kocher, D. C., Wilhite, E. L., Holmes-Burns, H., and Young, K. E. (2000). "Radiological Performance Assessment for the E-Area Low-Level Waste Facility." WSRC-RP-94-218, Rev. 1. Westinghouse Savannah River Company, Aiken, SC.

McKenzie, D. H., Cadwell, L. L., Kennedy, W. E., Jr., Prohammer, L. A., and Simmons, M. A. (1986). "Relevance of Biotic Pathways to the Long-Term Regulation of Nuclear Waste Disposal, Phase II, Final Report." NUREG/CR-2675, PNL-4241. Pacific Northwest Laboratory, Richland, WA. November 1986.

Mehta, S., Kozak, M. W., Hasan, N., Khaleel, R., Morgans, D. L., McMahon, W. J., Sun, B., Bergeron, M. P., Field, J. G., Singleton, K. M., and Connelly, M. P. (2016). "Performance Assessment of Waste Management Area C, Hanford Site, Washington." RPP-ENV-58782, Rev. 0. Washington River Protection Solutions, Richland, WA. September 2016.

Merriam-Webster (2021). "Bias." Merriam-Webster Online Dictionary. Retrieved June 25, 2021, from <https://www.merriam-webster.com>. Merriam-Webster, Incorporated, Springfield, MA.

Millings, M., Bagwell, L., Amidon, M., and Dixon, K. (2011). "Sediment Properties: E Area Completion Project." SRNL-STI-2011-00095, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Mizzell, H., Griffin, M., and Murray, G. (2021). "SC Hurricanes Comprehensive Summary (Last Updated: July 2021)." Retrieved March 29, 2022 from <https://www.dnr.sc.gov/climate/sco/hurricanes/pdfs/SCHurricanesExecutiveSummary.pdf>. South

Carolina State Climatology Office, Land, Water, and Conservation Division, SC Department of Natural Resources, Columbia, SC.

Moos, D., and Zoback, M. D. (1992). "In Situ Stress Measurements in the NPR Hole, Volume 1 - Results and Interpretations." WSRC-TR-2001-00499. Westinghouse Savannah River Company, Aiken, SC.

Moos, D., and Zoback, M. D. (1993). Near Surface "Thin Skin" Reverse Faulting Stresses in the Southeastern United States. *International Journal of Rock Mechanics and Mining Sciences & Geomechanics* **30**(7), 965-971.

Morcillo, M., Chico, B., Díaz, I., Cano, H., and De la Fuente, D. (2013). Atmospheric Corrosion Data of Weathering Steels. A Review. *Corrosion Science* **77**, 6-24.

Mualem, Y. (1976). A New Model for Predicting the Hydraulic Conductivity of Unsaturated Porous Media. *Water Resour. Res.* **12**(3), 513-522.

Mualem, Y. (1986). Hydraulic Conductivity of Unsaturated Soils: Prediction and Formulas. In "Methods of Soil Analysis: Part 1, Physical and Mineralogical Methods" (A. Klute, ed.), Vol. 5, pp. 799-823. American Society of Agronomy, Madison, WI.

Mueller, W., and Jakob, I. (2003). Oxidative Resistance of High-Density Polyethylene Geomembranes. *Polymer Degradation and Stability* **79**(1), 161-172.

NCRP (1996). "Screening Models for Releases of Radionuclides to Atmosphere, Surface Water and Ground." NCRP Report No. 123 I and II. National Council on Radiation Protection and Measurements, Bethesda, MD. Jan. 22, 1996.

NCRP (2009). "Ionizing Radiation Exposure of the Population of the United States." No. 93. Bethesda, MD.

NDAA (2004). Subpart C of 10 CFR Part 61, Licensing Requirements for Land Disposal of Radioactive Waste. In "Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, Section 3116," Washington, DC. October 2004.

NDAA (2014). "Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005." Section 3116, Defense Site Acceleration Completion, Public Law 108-375, October 28, 2004.

NEA (2012). "Methods for Safety Assessment of Geological Disposal Facilities for Radioactive Waste – Outcomes of the MeSA Initiative." NEA No. 6923. Organization for Economic Cooperation and Development – Nuclear Energy Agency, Paris, France.

Needham, A., Gallagher, E., Peggs, I., Howe, G., and Norris, J. (2004). "The Likely Medium to Long-Term Generation of Defects in Geomembrane Liners." R&D Technical Report P1-500/1/TR. Environment Agency, Bristol, England.

Neeper, D. A. (2002). Investigation of the Vadose Zone using Barometric Pressure Cycles. *Journal of Contaminant Hydrology* **54**(1-2), 59-80.

- Nelson, E. A. (2005). "Assessment of the Biological Basis of Bamboo as the Final Vegetation Option for Closure Caps at SRS." WSRC-TR-2005-00424. Savannah River National Laboratory, Westinghouse Savannah River Company, Aiken, SC. September 2005.
- Nelson, E. A. (2009). "Re-assessment of the Condition of the Bamboo Nursery at SRS." SRNL-TR-2009-00383. Savannah River National Laboratory, Aiken, SC. October 2009.
- Nevada Test Site (2006). "Addendum 2 to the Performance Assessment for the Area 5 Radioactive Waste Management Site at the Nevada Test Site, Nye County, Nevada, Update of Performance Assessment Methods and Results." DOE/NV11718—176-ADD2. Bechtel Nevada and Neptune and Company, Las Vegas, NV.
- Nichols, R. L. (2020). "Hydraulic Properties Data Package for the E-Area Soils, Cementitious Materials, and Waste Zones - Update." SRNL-STI-2019-00355, Rev. 0. Savannah River National Laboratory, Aiken, SC.
- Nichols, R. L., and Butcher, B. T. (2020). "Hydraulic Properties Data Package for the E-Area Soils, Cementitious Materials, and Waste Zones - Update." SRNL-STI-2019-00355, Rev. 1. Savannah River National Laboratory, Aiken, SC.
- Nimmo, J. R., Deason, J. A., Izicki, J. A., and Martin, P. (2002). Evaluation of Unsaturated Zone Water Fluxes in Heterogeneous Alluvium at a Mojave Basin Site. *Water Resources Research* **38**(10), 33-1 to 33-13.
- NIST (2019). Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices as Adopted by the 104th National Conference on Weights and Measures 2019. NIST Handbook 44, 2020 Edition. (J. Barton, B. Blackwell, T. G. Butcher, R. A. Harshman and G. D. Lee, eds.). National Institute of Standards and Technology, U. S. Department of Commerce, Washington, DC.
- NOAA (2019). "Comparative Climatic Data for the United States through 2018." National Centers for Environmental Information, Asheville, NC.
- NOAA (2022). "A History of Twisters: Tornadoes in South Carolina since 1950." [Tornado Archive](https://data.greenvilleonline.com/tornado-archive/). Retrieved March 28, 2022 from <https://data.greenvilleonline.com/tornado-archive/>. National Oceanic and Atmospheric Administration, Storm Prediction Center, Norman, OK.
- NSSL (2020). "Severe Weather 101: Damaging Winds Basics." Retrieved October 27, 2020 from <https://www.nssl.noaa.gov/education/svrwx101/wind/>. NOAA National Severe Storms Laboratory, Norman, OK.
- Nystrom, P., Widoughby, R., and Price, L. K. (1991). Cretaceous and Tertiary Stratigraphy of the Upper Coastal Plain, South Carolina. *The Geology of the Carolinas*.
- Oblath, S. B. (1982). "Migration of TeO_4^- in SRP Soils." DPST-82-815. E. I. du Pont de Nemours and Company, Aiken, SC. August 27, 1982.
- Ochs, M., Mallants, D., and Wang, L. (2016). "Radionuclide and Metal Sorption on Cement and Concrete," Springer, Heidelberg, Switzerland.

Oztunali, O. I., and Roles, G. W. (1986). "Update of Part 61 Impacts Analysis Methodology." NUREG/CR-4370. Envirosphere Company and U. S. Nuclear Regulatory Commission, Washington, DC. January 31, 1986.

Parizek, R. R., and Root, R. W. (1986). "Development of a Ground-Water Velocity Model for the Radioactive Waste Management Facility Savannah River Plant, South Carolina." Prepared for E. I. du Pont de Nemours and Company, Savannah River Plant, DuPont Rpt. No. DPST-86-658. The Pennsylvania State University, University Park, PA. June 1986.

Pelowitz, D. B. (2013). "MCNP6TM Users Manual." LA-CP-13-00634, Rev. 0. Los Alamos National Laboratory, Los Alamos, NM. May 2013.

Peregoy, W. (2006a). "Structural Evaluation of Component-in-Grout Trenches." T-CLC-E-00026, Rev. 0. Washington Savannah River Company, Aiken, SC.

Peregoy, W. (2006b). "Structural Evaluation of Intermediate Level Waste Storage Vaults for Long-Term Behavior." T-CLC-E-00024, Rev. 0. Washington Savannah River Company, Aiken, SC. June 27, 2006.

Phifer, M. A. (2003a). "Saltstone Disposal Facility Mechanically Stabilized Earth Vault Closure Cap Degradation Base Case: Institutional Control To Pine Forest Scenario." WSRC-TR-2003-00523. Westinghouse Savannah River Company, Aiken, SC.

Phifer, M. A. (2003b). "Unreviewed Disposal Question Evaluation: Uncontaminated Lifting Attachments and Rigging within Four-foot Slit Trench 'Clean Backfill'." WSRC-TR-2004-00139. Westinghouse Savannah River Company, Aiken, SC. March 8, 2003.

Phifer, M. A. (2004a). "Preliminary E-Area Trench Closure Cap Closure Sequence, Infiltration, and Waste Thickness (U)." WSRC-TR-2004-00119, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Phifer, M. A. (2004b). "Unreviewed Disposal Question Evaluation: Low Strength Containers with Compressible Waste in Component-In-Grout Trenches." WSRC-TR-2004-00475, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Phifer, M. A. (2006). "Software Quality Assurance Plan for the Hydrologic Evaluation of Landfill Performance (HELP) Model." Q-SQA-A-00005, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Phifer, M. A. (2007). "HELP Software Classification Document." K-SWCD-A-00001, Rev. 2. Savannah River National Laboratory, Aiken, SC. October, 17, 2007.

Phifer, M. A. (2010). "Slit Trench Waste Representation (M. A. Phifer to D. A. Crowley)." SRNL-L6200-2010-00018. Savannah River National Laboratory, Aiken, SC.

Phifer, M. A. (2014). "E-Area Vault Concrete Material Property And Vault Durability/Degradation Projection Recommendations." SRNL-STI-2013-00706, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Phifer, M. A., Crapse, K. P., Millings, M. R., and Serrato, M. G. (2009). "Closure Plan for the E-Area Low-Level Waste Facility." SRNL-RP-2009-00075, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Phifer, M. A., and Jones, W. E. (2007). "CIG-1 Segments 1 through 8 Infiltration Estimates." Washington Savannah River Company LLC, Aiken, SC. November 2007.

Phifer, M. A., Jones, W. E., Nelson, E. A., Denham, M. E., Lewis, M. R., and Shine, E. P. (2007). "FTF Closure Cap Concept and Infiltration Estimates." WSRC-STI-2007-00184, Rev. 2. Savannah River National Laboratory, Washington Savannah River Company, Aiken, SC.

Phifer, M. A., Millings, M. R., and Flach, G. P. (2006). "Hydraulic Property Data Package for the E-Area and Z-Area Vadose Zone Soils, Cementitious Materials, and Waste Zones." WSRC-STI-2006-00198, Rev. 0. Washington Savannah River Company, Aiken, SC.

Phifer, M. A., and Nelson, E. A. (2003). "Saltstone Disposal Facility Closure Cap Configuration and Degredation Base Case: Institutional Control to Pine Forest Scenario (U)." WSRC-TR-2003-00436, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. September 22, 2003.

Phifer, M. A., Sappington, F. C., and Jones, W. E. (2000). "DCB-8C Step and Constant Rate Pump Tests D-Area Unconfined Aquifer Hydraulic Parameter Estimation." SRT-EST-2000-00226. Westinghouse Savannah River Company, Aiken, SC. July 18, 2000.

Phifer, M. A., Seitz, R. R., and Suttora, L. C. (2014). "Consideration of Liners and Covers in Performance Assessments." SRNL-STI-2014-00409, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Phifer, M. A., and Wilhite, E. L. (2001). "Waste Subsidence Potential versus Supercompaction." WSRC-RP-2001-00613. Westinghouse Savannah River Company, Aiken, SC.

Powell, K. R., Kaplan, D. I., and Fondeur, F. (2002). "Resin Longevity Studies." WSRC-TR-2002-00091. Westinghouse Savannah River Company, Aiken, SC.

Project Number S2889 (1990a). "Civil-Structural-Architectural Design Criteria - ILNTV Disposal Vaults." S2889-306-25-8, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. April 1990.

Project Number S2889 (1990b). "Civil-Structural-Architectural Design Criteria - ILTV Disposal Vaults." S2889-306-25-8, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. April 1990.

Project Number S2890 (1990c). "Civil-Structural-Architectural Design Criteria - LAW Disposal Vaults." S2890-306-25-001, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. April 1990.

Rengard, K. G., Foster, G. R., Weesies, G. A., McCool, D. K., and Yoder, D. C. (1997). "Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE)," Agriculture Handbook No. 703, U.S. Department of Agriculture, Tucson, AZ.

Rivera-Giboyeaux, A. M. (2018). "Savannah River Site Annual Meteorology Report for 2017." SRNL-RP-2018-00868. Savannah River National Laboratory, Aiken, SC. September 2018.

Rogers, V. C., and Nielson, K. K. (1991). Correlations for Predicting Air Permeabilities and ^{222}Rn Diffusion Coefficients of Soils. *Health Physics* **61**(2), 225-230.

Romanoff, M. (1957). "Underground Corrosion." Circular 579. National Bureau of Standards, US Government Printing Office, Washington, DC.

Rosenberger, K. (2007). "Potential Dose to F-Tank Farm Closure Cap Geomembrane (K. Rosenberger to M. A. Phifer)." SRS-REG-2007-00001. Washington Savannah River Company, Aiken, SC. June 1, 2007.

Routson, R. C., Jansen, G., and Robinson, A. V. (1977). ^{241}Am , ^{237}Np , and ^{99}Tc Sorption on Two United States Subsoils from Differing Weathering Intensity Areas. *Health Physics* **33**, 311-317.

Ruffner, J. A. (1985). "Climate of the States," 3rd/Ed. Gale Research Company, Detroit, MI.

SAIC (2000). "Analysis of FY99 Aquifer Testing at the F-Area Seepage Basins Hazardous Waste Management Facility." WSRC-RP-99-4202, Rev. 0. Scientific Applications International Corporation, Aiken, SC. January 2000.

Salvo, S. K., and Cook, J. R. (1993). "Selection and Cultivation of Final Vegetative Cover for Closed Waste Sites at the Savannah River Site, SC." WSRC-MS-92-513. Westinghouse Savannah River Company, Aiken, SC.

Sánchez-Vila, X., Girardi, J. P., and Carrera, J. (1995). A Synthesis of Approaches to Upscaling of Hydraulic Conductivities. *Water Resources Research* **31**(4), 867-882.

Sangam, H., and Rowe, R. (2002). Effects of Exposure Conditions on the Depletion of Antioxidants from High-Density Polyethylene (HDPE) Geomembranes. *Canadian Geotechnical Journal* **39**(6), 1221-1230.

Saraiya, R. (1990a). "ILNT Concrete Vault Design - 2 (Final Closure)." S2889-306-25-007, Rev. 0. The Ralph M. Parsons Company, Aiken, SC. October 25, 1990.

Saraiya, R. (1990b). "ILNT Concrete Vault Structure Design - 1." S2889-306-25-001, Rev. 0. The Ralph M. Parsons Company, Aiken, SC. October 25, 1990.

Saraiya, R. (1990c). "UBC Seismic Analysis for ILNT Concrete Vaults." S2889-306-25-003, Rev. 0. The Ralph M. Parsons Company, Aiken, SC. May 1, 1990.

Sarris, T. S., and Paleologos, E. K. (2004). Numerical Investigation of the Anisotropic Hydraulic Conductivity Behavior in Heterogeneous Porous Media. *Stochastic Environmental Research and Risk Assessment* **18**(3), 188-197.

Savannah River Remediation (2009). "Performance Assessment for the Saltstone Disposal Facility at the Savannah River Site." LWO-RIP-2009-00011. Savannah River Remediation LLC, Aiken, SC. March 2009.

Savannah River Remediation (2010). "Performance Assessment for the F-Tank Farm at the Savannah River Site." SRS-REG-2007-00002, Rev. 1. Savannah River Remediation, LLC, Aiken, SC. March 31, 2010.

Savannah River Remediation (2012). "Performance Assessment for the H-Area Tank Farm at the Savannah River Site." SRR-CWDA-2010-00128. Savannah River Remediation LLC, Aiken, SC. November 2012.

Savannah River Remediation (2014). "Dose Calculation Methodology for Liquid Waste Performance Assessments at the Savannah River Site." SRR-CWDA-2013-00058, Rev. 1. Savannah River Remediation LLC, Aiken, SC. July 2014.

Savannah River Remediation (2017). "Consolidated General Closure Plan for F-Area and H-Area Waste Tank Systems." SRR-CWDA-2017-00015, Rev. 0. Savannah River Remediation LLC, Aiken, SC. February 2017.

Savannah River Remediation (2020). "Performance Assessment for the Saltstone Disposal Facility at the Savannah River Site." SRR-CWDA-2019-00001, Rev. 0. Savannah River Remediation LLC, Aiken, SC. March 2020.

SC RFA (2021). "Decennial Census 2020 Data Release." Retrieved March 29, 2022 from http://www.dnr.sc.gov/climate/sco/ClimateData/cli_table_tornado_stats.php. South Carolina Revenue and Fiscal Affairs Office, Columbia, SC.

SCDHEC (2003). "Regulation 61-58, State Primary Drinking Water Regulations." South Carolina Department of Health and Environmental Control, Columbia, SC.

SCDHEC (2020). "Environmental Surveillance and Oversight Program: 2019 Data Report." CR-004111. Aiken Environmental Affairs Office, South Carolina Department of Health and Environmental Control, Aiken, SC. November 2020.

SCGS (2008). "7.5 Minute Geologic Quadrangle Data." Retrieved Spring/Summer, 2017 from <https://www.dnr.sc.gov/geology/digital-data.html>. South Carolina Geological Survey, Columbia, SC.

Schroeder, P. R., Dozier, T. S., Zappi, P. A., McEnroe, B. M., Sjostrom, J. W., and Peyton, R. L. (1994a). "The Hydrologic Evaluation of Landfill Performance (HELP) Engineering Documentation for Version 3." EPA/600/R-94/168b. Office of Research and Development, United States Environmental Protection Agency (EPA), Cincinnati, Ohio. September 1994.

Schroeder, P. R., Lloyd, C. M., Zappi, P. A., and Aziz, N. M. (1994b). "The Hydrologic Evaluation of Landfill Performance (HELP) Model User's Guide for Version 3." EPA/600/R-94/168a. Office of Research and Development, United States Environmental Protection Agency (EPA), Cincinnati, Ohio. September 1994.

Schroeder, P. R., and Peyton, R. L. (1987a). "Verification of the Hydrologic Evaluation of Landfill Performance (HELP) Model Using Field Data." EPA/600/2-87/050. Office of Research and Development, United States Environmental Protection Agency (EPA), Cincinnati, Ohio. July 1987.

Schroeder, P. R., and Peyton, R. L. (1987b). "Verification of the Lateral Drainage Component of the HELP Model Using Physical Models." EPA/600/2-87/049. Office of Research and Development, United States Environmental Protection Agency (EPA), Cincinnati, Ohio. July 1987.

SCS (1990). "Soil Survey of Savannah River Plant Area, Parts of Aiken, Barnwell, and Allendale Counties, South Carolina." PIT-MISC-0104. Soil Conservation Service, U.S. Department of Agriculture, Washington, DC. June 1990.

Seitz, R. R. (2020). "Safety Functions and Features, Events and Processes for the E-Area Performance Assessment." SRNL-STI-2020-00039, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Shah, D. C. (1990). "Seismic Analysis and Design of ILT/ILNT Vault Structures." S2889-306-25-004, Rev. 0. The Ralph M. Parsons Company, Aiken, SC. October 1990.

Shah, D. C. (1991). "LAW Analysis and Design Analysis/Design Calculations and Force Summary." S2890-306-25-002, Rev. 0. The Ralph M. Parsons Company, Aiken, SC. January 1991.

Shine, E. P. (2007). "F-Area Tank Farm Closure Cap Probability Model of Pine Tree Tap Root Penetrations of HDPE Geomembrane (U)." WSRC-TR-2007-00369, Rev. 0. Savannah River National Laboratory, Aiken, SC. September 11, 2007.

Shipmon, J. C., and Dyer, J. A. (2017). "Analysis of Factors that Influence Infiltration Rates using the HELP Model." SRNL-STI-2017-00506, Rev. 0. Savannah River National Laboratory, Aiken, SC.

SIMCO (2012). "E-Area Concrete Long-Term Durability Simulations Final Report." Prepared under subcontract No. RA00097 to Washington Savannah River Company. SIMCO Technologies Inc., Aiken, SC. January 25, 2012.

Sink, D. F. (2007). "ELLWF Low Level Waste (LLW) Disposed Inventories at Facility Closure." CBU-GEN-2007-00063, Rev. 1. Washington Savannah River Company, Aiken, SC.

Sink, D. F. (2010). "Percentage Waste Volumes in Slit Trenches (e-mail message from D. F. Sink to B. T. Butcher)." Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC. June 7, 2010.

Sink, D. F. (2016a). "643-26E Naval Reactor Component Disposal Area - Revised Radionuclide Inventories at Closure (D. F. Sink to J. L. Mooneyham and M. G. Looper)." SRNS-N4222-2016-00004. Savannah River Nuclear Solutions, Aiken, SC. May 2, 2016.

Sink, D. F. (2016b). "EAV Low Level Waste Facilities - Projected Radionuclide Inventories at Closure (D. F. Sink to D. A. Crowley and B. T. Butcher)." SRNS-N4222-2016-00007. Savannah River Nuclear Solutions, Aiken, SC. May 16, 2016.

Sink, D. F. (2016c). "FY16 SWMF Low Level Waste Plan and Disposal Strategies." SRNS-RP-2016-00162, Rev. 0. Savannah River Nuclear Solutions, Aiken, SC. April 2016.

Siple, G. E. (1967). "Geology and Ground Water of the Savannah River Plant and Vicinity, South Carolina." Geological Survey Water Supply Paper 1841.

Skibo, A. Z. (2018). "SRNL Bamboo (*Phyllostachys* Species) Planting Site Assessment, Savannah River Site." SRNL-STI-2017-00638, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Smith, F. G. (2015). "Review of Soil Dilution Factors used in Intruder Analysis (F.G. Smith to B.T. Butcher)." SRNL-L3200-2015-00123, Rev. 0. Savannah River National Laboratory, Aiken, SC. October 22, 2015.

Smith, F. G. (2020). "GoldSim Modeling of Vadose Zone Transport for E-Area Naval Reactor Component Disposal Areas: Model Description and Benchmarking." SRNL-STI-2020-00214, Rev. 0. Savannah River National Laboratory, Aiken, SC. July 2020.

Smith, F. G., Butcher, B. T., Phifer, M. A., and Hamm, L. L. (2015). "Dose Calculation Methodology and Data for Solid Waste Performance Assessment and Composite Analysis at the Savannah River Site." SRNL-STI-2015-00056, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Smith, F. G., III (2021a). "PORFLOW Modeling of Vadose Zone Flow and Transport for the E-Area Intermediate Level Vault." SRNL-STI-2020-00410, Rev. 1. Savannah River National Laboratory, Aiken, SC. December 2021.

Smith, F. G., III (2021b). "PORFLOW Modeling of Vadose Zone Flow and Transport for the E-Area Low Activity Waste Vault." SRNL-STI-2021-00063, Rev. 0. Savannah River National Laboratory, Aiken, SC. February 2021.

Smith, F. G., III, Butcher, B. T., Hamm, L. L., and Kubilius, W. P. (2019). "Dose Calculation Methodology and Data for Solid Waste Performance Assessment and Composite Analysis at the Savannah River Site." SRNL-STI-2015-00056, Revision 1. Savannah River National Laboratory, Aiken, SC. August 2019.

Smith, F. G., and Phifer, M. A. (2014). "All-Pathways Dose Analysis for the Portsmouth On-Site Waste Disposal Facility (OSWDF)." SRNL-STI-2014-00130, Rev. 0. Savannah River National Laboratory, Aiken, SC. April 2014.

Smits, A. D., Harris, M. K., Hawkins, K. L., and Flach, G. P. (1997). "Integrated Hydrogeological Model of the General Separations Area, Volume 1: Hydrogeologic Framework." WSRC-TR-96-0399, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

Snider, B. T. (2007). "TEF Waste Containers (U)." M-SPP-H-00418, Rev. 2. Washington Savannah River Company, Aiken, SC. October 8, 2007.

South Carolina State Climatology Office (2022). "South Carolina Tornado Climatology." Retrieved March 28, 2022 from http://www.dnr.sc.gov/climate/sco/ClimateData/cli_table_tornado_stats.php. Land, Water, and Conservation Division, SC Department of Natural Resources, Columbia, SC.

SRNL (2010). "Savannah River DOE 435.1 Composite Analysis." SRNL-STI-2009-00512, Rev. 0. Savannah River National Laboratory, Aiken, SC. June 10, 2010.

SRNL (2016). "E-Area Low-Level Waste Facility Performance Assessment Maintenance Program: FY2016 Implementation Plan." SRNL-STI-2016-00399, Rev. 0. Savannah River National Laboratory, Aiken, SC. August 2016.

SRNL (2017). "The Hydrostratigraphic Surfaces Data Package [Change Control Rev1 and Rev0 dataset (Appendix 5 to SRNL-STI-2017-00301).xlsx]." Rev. 1. Retrieved August, 2020 from \\godzilla-01\hpc_project\projwork50\QA\Data\ELLWF\SubsurfaceElevDepth. *Last Updated* November 3, 2017. SRNL High Performance Computing File Server Network, Savannah River National Laboratory, Aiken, SC.

SRNL (2018). "The Geochemical Data Package (GeochemPackage_Ver3.1_4-27-18_FINAL.xls)." Version 3.1. Retrieved December, 2018 from \\godzilla-01\hpc_project\projwork50\QA\Data\ELLWF\Rad-Dose. *Last Updated* April 27, 2018. SRNL High Performance Computing File Server Network, Savannah River National Laboratory, Aiken, SC.

SRNL (2019a). "The Infiltration Data Package (Infiltration-Data-Package_Ver1.0_10-16-2019_DRAFT.xlsx)." Version 1.0. Retrieved August, 2020 from \\godzilla-01\hpc_project\projwork50\QA\Data\ELLWF\Infiltration. *Last Updated* October 25, 2019. SRNL High Performance Computing File Server Network, Savannah River National Laboratory, Aiken, SC.

SRNL (2019b). "RadDosePackage_Version-2.0_CLEAN_8-13-19_FINAL.xlsx." Version 2.0. Retrieved August, 2019 from \\godzilla-01\hpc_project\projwork50\QA\Data\ELLWF\Rad-Dose\Current\Rev1Report_Ver2.0-Database. SRNL High Performance Computing File Server Network, Savannah River National Laboratory, Aiken, SC.

SRNL (2020). "The Hydraulic Properties Data Package (HydraulicProperties_Rev3_12-01-2020.xlsm)." Rev. 3. Retrieved December, 2020 from \\godzilla-01\hpc_project\projwork50\QA\Data\ELLWF\Material\Current. *Last Updated* December 1, 2020. SRNL High Performance Computing File Server Network, Savannah River National Laboratory, Aiken, SC.

SRNS (2015). "Savannah River Site Ten Year Site Plan FY2016-2025." SRNS-RP-2015-00001. Savannah River Nuclear Solutions, Aiken, SC. June 2015.

SRNS (2017a). "Annual Corrective Action Report for the F-Area Hazardous Waste Management Facility, the H-Area Hazardous Waste Management Facility, and the Mixed Waste Management Facility (U)." SRNS-RP-2017-00134, Volume I. Savannah River Site, Aiken, SC. April 2017.

SRNS (2017b). "Fifth Five-Year Remedy Review Report for Savannah River Site Operable Units with Geosynthetic or Stabilization/Solidification Cover Systems (U)." SRNS-RP-2016-00610, Rev. 1.1. Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC. December 2017.

SRNS (2018a). "Savannah River Site (SRS) Management and Operations (M&O) Quality Assurance Management Plan (QAMP)." SRNS-RP-2008-00020, Rev. 9. Savannah River Nuclear Solutions, Aiken, SC.

SRNS (2018b). "Savannah River Site Groundwater Protection Program (U)." SRNS-TR-2009-00076, Rev. 4. Savannah River Nuclear Solutions, Aiken, SC. October 2018.

SRNS (2020a). "Current ELLWF Inventory for 177 Radionuclides from WITS Database (Tom Butcher-Inventory for UDQE March 2020.xlsx)." Retrieved March, 2020. Solid Waste Management, Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC.

SRNS (2020b). "Federal Facility Agreement Annual Progress Report for Fiscal Year 2020." SRNS-RP-2020-00712. Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC. November 2020.

SRNS (2020c). "Software Classification Document (SWCD)." OSR 19-337, Build Ver. 1.3.3. Savannah River Nuclear Solutions, Aiken, SC. June 15, 2020.

SRNS (2021). "Savannah River Site (SRS) Management and Operations (M&O) Quality Assurance Graded Approach Plan." G-QP-G-00002, Rev. 4, October 4, 2021. Savannah River Nuclear Solutions, Aiken, SC.

SRS (2005). "Savannah River Site End State Vision." PIT-MISC-0089. United States Department of Energy, Aiken, SC. July 26, 2005.

SRS (2006a). "420-D Low Level Waste Stream Characterization." N-CLC-D-00005, Rev. 1. Savannah River Site, Aiken, SC. May 8, 2006.

SRS (2006b). "RBA and CA Waste Characterization for SDD Facilities." G-CLC-M-00002. Savannah River Site, Aiken, SC. July 19, 2006.

SRS (2014a). "Savannah River Site Land Use Plan." SRNS-RP-2014-00537. U.S. Department of Energy - Savannah River, Aiken, SC. November 2014.

SRS (2014b). "SRS-DTC Software Quality Assurance Plan." B-SQP-G-00030, Rev. 1. Savannah River Site, Aiken, SC. April 14, 2014.

SRS (2016). "Savannah River Site Nuclear Materials Management Plan FY 2016-2030." SRNL-RP-2016-00362, Rev. 0. Savannah River National Laboratory, Aiken, SC. June 23, 2016.

SRS (2018). "SRS ALARA Manual: SRS ALARA Program." SCD-6, Rev. 1. Savannah River Site, Aiken, SC. Effective January 25, 2018.

SRS (2019a). Facts from the Savannah River Site. Savannah River Nuclear Solutions, Aiken, SC.

SRS (2019b). Low-Level Waste Stream Characterization. OSR 29-82 (Rev. 08-20-2019). Savannah River Site, Aiken, SC.

SRS (2019c). "Requirements Specification for Software for the Waste Information Tracking System (WITS) (U) v5.093." B-RS-E-00018, Rev. 5. Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC. January 15, 2019.

SRS (2020a). "Area Completion Projects." *Savannah River Site Programs*. Retrieved May 18, 2020 from <http://www.srs.gov/general/programs/soil/extpage.html>. *Last Updated 02/10/2020*. Savannah River Nuclear Solutions, Aiken, SC.

SRS (2020b). "Savannah River Site: Real Property, Five-Year Site Plan, FY 2020-2024." SRNS-RP-2020-00077, Rev. 0. Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC. February 2020.

SRS (2021a). Engineering Calculations. *In* "Manual E7, Conduct of Engineering," Procedure 2.31, Rev. 18, December 16, 2021, pp. 1-30. Savannah River Site, Aiken, SC.

SRS (2021b). Quality Assurance Program. *In* "Manual 1Q, Quality Assurance Manual," Procedure 2-1, Rev. 15, June 2, 2021, pp. 1-35. Savannah River Site, Aiken, SC.

SRS (2021c). "Requirements Specification for Software for the Consolidated Waste Tracking System (CWTS)." B-RS-G-00107, Rev. 2. Savannah River Nuclear Solutions, Savannah River Site, Aiken, SC.

SRS (2021d). "SRS Radioactive Waste Requirements Manual: Low-Level Waste." SRS Manual 1S, Chapter 5, Rev. 2. Savannah River Site, Aiken, SC. February 11, 2021.

SRS (2021e). "SRS Radioactive Waste Requirements: Waste Characterization Program." SRS Manual 1S, Chapter 3, Rev. 5. Savannah River Site, Aiken, SC.

SRS (2021f). Technical Reviews. *In* "Manual E7, Conduct of Engineering," Procedure 2.60, Rev. 20, November 9, 2021, pp. 1-27. Savannah River Site, Aiken, SC.

SRS (2022a). Radiological Control Manual (Chapters 1 through 7). *In* "Manual 5Q," April 28, 2022. Savannah River Site, Aiken, SC.

SRS (2022b). Training and Qualification. *In* "Manual 5Q, Radiological Control Manual," Procedure Chapter-6, Revision 13, April 28, 2022, pp. 1-15. Savannah River Site, Aiken, SC.

SRS (2022c). Software Quality Assurance. *In* "Manual 1Q, Quality Assurance Manual," Procedure 20-1, Revision 23, January 27, 2022, pp. 1-48. Savannah River Site, Aiken, SC.

SRS GDMS (2017). "Savannah River Site Geological Data Management System." Retrieved Spring/Summer, 2017 from http://sqlsan1/reports/srs1_p/Pages/Report.aspx?ItemPath=/GDMS/GDMS-Web/SearchResultsReport.

Stagich, B., and Jannik, T. (2020). "Exposure Pathways and Scenarios for the E-Area Low-Level Waste Facility Performance Assessment." SRNL-STI-2020-00007, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Stagich, B. H. (2020). "CAP88-PC Version 4.1 Verification (Technical Memo: B. H. Stagich to Environmental Dosimetry Files)." SRNL-L3200-2020-00028, Rev. 0. Savannah River National Laboratory, Aiken, SC. March 17, 2020.

Stagich, B. H. (2021). "Clean Air Act Assessment Package 1988 PC Version/CAP88 PC, Software Ver. 4.1." Q-SWCD-A-00010, Rev. 6. Savannah River National Laboratory, Aiken, SC. September 30, 2021.

Stagich, B. H., Jannik, G. T., LaBone, E., and Dixon, K. L. (2021). "Radiological Impact of 2020 Operations at the Savannah River Site." SRNL-STI-2021-00284, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Stephenson, D. E. (1988). "August 1988 Savannah River Plant Earthquake." DPST-88-841. E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC.

Stephenson, D. E., Talwani, P., and Rawlins, J. (1985). "Savannah River Plant Earthquake of June 1985." DPST-85-583. E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC.

Stevenson, D. A., and Talwani, P. (2004). 2001-2002 Upper Three Runs Sequence of Earthquakes at the Savannah River Site, South Carolina. *Seismological Research Letters* **75**(1), 107-116.

Stewart, I. J. (2021). "SWM Engineering LLW Review of EAV Limits - March 2021 (Memorandum: I. J. Stewart to J. L. Mooneyhan, April 6, 2021)." SRNS-N4222-2021-00004. Savannah River Nuclear Solutions, Aiken, SC. March 2021.

Stieve, A. L., Coruh, C., and Costain, J. (1994). "Confirmatory Drilling Project Final Report." WSRC-RP-94-0136. Westinghouse Savannah River Company, Aiken, SC.

Stieve, A. L., and Stephenson, D. E. (1995). Geophysical Evidence for Post Late Cretaceous Reactivation of Basement Structures in the Central Savannah River Area. *Southeastern Geology* **35**, 1-20.

Stieve, A. L., Stephenson, D. E., and Aadland, R. (1991). "Pen Branch Fault Program: Consolidated Report on the Seismic Reflection Surveys and the Shallow Drilling." WSRC-TR-91-87. Westinghouse Savannah River Company, Aiken, SC.

Stone, D. K., and Jannik, G. T. (2013). "Site Specific Reference Person Parameters and Derived Concentration Standards for the Savannah River Site." SRNL-STI-2013-00115. Savannah River Site, Aiken, SC. March 2013.

Stricker, V. A. (1983). "Base Flow of Streams in the Outcrop Area of Southeastern Sand Aquifer: South Carolina, Georgia, Alabama, and Mississippi." Water Resources Investigations Report 83-4106. United States Geological Survey, Denver, CO.

Swingle, R. F. (2012). "Special Analysis: Revised Groundwater Protection and All-Pathways Limits for E-Area Low-Level Waste Facility Trenches." SRNL-STI-2012-00466, Rev. 0. Savannah River National Laboratory, Aiken, SC. August 2012.

Swingle, R. F., and Phifer, M. A. (2006). "Unreviewed Disposal Question Evaluation: Increased Disposal Volume in Slit and Engineered Trenches." WSRC-TR-2006-00186, Rev. 0. Savannah River National Laboratory, Aiken, SC.

SWM (2021). "Savannah River Site Solid Waste Management Facility Documented Safety Analysis." WSRC-SA-22, Rev. 31. Savannah River Site, Aiken, SC. July 2021.

Talwani, P. (1982). An Internally Consistent Pattern of Seismicity Near Charleston, South Carolina. *Geology* **10**(12), 654-658.

Talwani, P., Rawlins, J., and Stephenson, D. E. (1985). The Savannah River Plant, South Carolina, Earthquake of June 9, 1985 and its Tectonic Setting (DPST-85-583). *Seismological Research Letters* **56**(4), 101-106.

Talwani, P., and Schaeffer, W. T. (2001). Recurrence Rates of Large Earthquakes in the South Carolina Coastal Plain Based on Paleoliquefaction Data. *Journal of Geophysical Research* **106**(B4), 6621-6642.

Tarr, A. C., Talwani, P., Rhea, S., Carver, D., and Amick, D. (1981). Results of Recent South Carolina Seismological Studies. *Bulletin of the Seismological Society of America* **71**(6), 1883-1902.

Taylor, J. R. (1997). "An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements," 2nd/Ed. University Science Books, Sausalito, CA.

Taylor, S., and Whiteside, T. S. (2022). "E-Area Low Level Waste Generator Inventory Uncertainty Estimation." SRNL-STI-2021-00276, Rev. 0. Savannah River National Laboratory, Aiken, SC. January 2022.

Tecplot (2021). "Tecplot 360 EX User's Manual." Tecplot, Inc., Bellevue, WA.

Tempel, K. L. (2002). "Radionuclide Inventory Calculation for 643-7E Naval Reactor Component Storage Area." N-CLC-E-00085, Rev. 0. Solid Waste Engineering, Savannah River Site, Aiken, SC. October 16, 2002.

Thermo Fisher Scientific (2007). "Micro Rem/Micro Sievert Product Specification." <https://assets.thermofisher.com/TFS-Assets/LSG/Specification-Sheets/D10492~.pdf>. Thermo Fisher Scientific, Franklin, MA.

Tian, K., Benson, C. H., Tinjum, J. M., and Edil, T. B. (2017). Antioxidant Depletion and Service Life Prediction for HDPE Geomembranes Exposed to Low-Level Radioactive Waste Leachate. *Journal of Geotechnical and Geoenvironmental Engineering* **143**(6), 04017011.

Tillman, F. D., and Weaver, J. W. (2005). "Review of Recent Research on Vapor Intrusion." EPA/600/R-05/106. Office of Research and Development, U. S. Environmental Protection Agency, Washington, DC.

TRSWA (2020). "Regional Landfill." from <https://trswa.org/landfill.shtml>. Three Rivers Solid Waste Authority, Jackson, SC.

U.S. DOE (1987). "Waste Management Activities for Groundwater Protection, Savannah River Plant, Aiken, South Carolina." DOE/EIS-0120, Vol. 1. U.S. Department of Energy, Savannah River Operations Office, Aiken, SC. December 1987.

U.S. DOE (1988). "Radioactive Waste Management." DOE O 5820.2A. U. S. Department of Energy, Washington, DC. September 26, 1988.

U.S. DOE (1993a). "Federal Facility Agreement for the Savannah River Site, Savannah River Site." Administrative Document Number 89-05-FF (WSRC-OS-94-42). U.S. Department of Energy, Aiken, SC. August 16, 1993.

U.S. DOE (1993b). "Radiation Protection of the Public and the Environment." DOE Order 5400.5 Chg 2: 1-7-93. U.S. Department of Energy, Washington, DC. January 7, 1993.

U.S. DOE (1995a). Record of Decision; Savannah River Site Waste Management, Savannah River Operations Office, Aiken, SC. Federal Register, October 30, 1995, 60 (209) FR 55249. U. S. Department of Energy, Washington, DC.

U.S. DOE (1995b). "Savannah River Site Waste Management Final Environmental Impact Statement." DOE/EIS-0217. Savannah River Operations Office, Aiken, SC.

U.S. DOE (1997a). "Final Environmental Impact Statement: Shutdown of the River Water System at the Savannah River Site." DOE/EIS-0268. U.S. Department of Energy Savannah River Operations Office, Aiken, SC.

U.S. DOE (1997b). Supplemental Record of Decision; Savannah River Site Waste Management, Savannah River Operations Office, Aiken, South Carolina. Federal Register, May 19, 1997, 62 (96) FR 27241. U. S. Department of Energy, Washington, DC.

U.S. DOE (1999a). "Environmental Impact Statement: Accelerator Production of Tritium at the Savannah River Site." DOE/EIS-0270D. Savannah River Operations Office, Aiken, SC.

U.S. DOE (1999b). "Final Environmental Impact Statement for the Production of Tritium in a Commercial Light Water Reactor." DOE/EIS-0288F. United States Department of Energy, Washington, DC. March 1999.

U.S. DOE (1999c). "Format and Content Guide for U.S. Department of Energy Low-Level Waste Disposal Facility Closure Plans." U.S. Department of Energy, Washington, DC. November 10, 1999.

U.S. DOE (1999d). "Surplus Plutonium Disposition Final Environmental Impact Statement." DOE/EIS-0283. Office of Fissile Materials, Washington, DC.

U.S. DOE (2001). Amended Record of Decision; Savannah River Site Waste Management, Savannah River Operations Office, Aiken, South Carolina. Federal Register, June 28, 2001, 66 (125) FR 34431. U. S. Department of Energy, Washington, DC.

U.S. DOE (2002a). "Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities." DOE-STD-1020-2002. U. S. Department of Energy, Washington, DC. January 2002.

U.S. DOE (2002b). "Savannah River Site High-Level Waste Tank Closure Final Environmental Impact Statement." DOE/EIS-0303. Savannah River Site, Aiken, SC.

U.S. DOE (2005). Quality Assurance Requirements. *In* "10 CFR Ch. III, Part 830, Subpart A (1-1-05 Edition)", pp. 516-518. U. S. Department of Energy, Washington, DC.

U.S. DOE (2007). "Format and Content Guide for U.S. Department of Energy Low-Level Waste Disposal Facility Performance Assessments and Composite Analyses." U.S. Department of Energy, Washington, DC. May 2007.

U.S. DOE (2008). "Interim Action Proposed Plan for the E-Area Low Level Waste Facility, 643-26E (Slit Trench Disposal Units 1 and 2) Draft A." WSRC-RP-2008-4083. United States Department of Energy, Savannah River Site, Aiken, SC. December 2008.

U.S. DOE (2011a). "DOE Standard: Derived Concentration Technical Standard." DOE-STD-1196-2011. U. S. Department of Energy, Washington, DC. April 2011.

U.S. DOE (2011b). "Quality Assurance." DOE O 414.1D. U. S. Department of Energy, Washington, DC. April 25, 2011.

U.S. DOE (2011c). "Radioactive Waste Management Manual." DOE M 435.1-1, Chg 2: 6-8-11. U. S. Department of Energy, Washington, DC. June 8, 2011.

U.S. DOE (2014). "DOE Handbook: Optimizing Radiation Protection of the Public and the Environment for Use with DOE O 458.1, ALARA Requirements." DOE-HDBK-1215-2014. U.S. Department of Energy, Washington, DC. October 2014.

U.S. DOE (2017). "Disposal Authorization Statement and Tank Closure Documentation." DOE-STD-5002-2017. U.S. Department of Energy, Washington, DC.

U.S. DOE (2019). "Natural Resources Management Plan for the Savannah River Site." Prepared for U.S. Department of Energy by the U.S. Department of Agriculture Forest Service-Savannah River, New Ellenton, SC. November 2019.

U.S. DOE (2020a). "Final Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina." DOE/EIS-0541F. United States Department of Energy, Savannah River Site, Aiken, SC. September 2020.

U.S. DOE (2020b). Radiation Protection of the Public and the Environment. DOE O 458.1 Chg 4. U. S. Department of Energy, Washington, DC. September 15, 2020.

U.S. DOE (2021a). "Radioactive Waste Management." DOE O 435.1, Chg 2: 1-11-2021. U. S. Department of Energy, Washington, DC. Approved: July 9, 1999.

U.S. DOE (2021b). "Radioactive Waste Management Manual." DOE M 435.1-1, Chg 3: 1-11-2021. U. S. Department of Energy, Washington, DC. January 11, 2021.

U.S. EPA (2000). "National Primary Drinking Water Regulations; Radionuclides; Final Rule." 40 CFR Parts 141 and 142. U. S. Environmental Protection Agency, Washington, DC.

U.S. EPA (2002). Appendix I: Comparison of Derived Values of Beta and Photon Emitters. *In* "Implementation Guidance for Radionuclides", EPA 816-F-00-002. U. S. Environmental Protection Agency, Washington, DC. March 2002.

U.S. EPA (2006). National Emissions Standards for Hazardous Air Pollutants, Subpart H (Title 40 CFR Part 61). 54 FR 51695, Dec. 15, 1989, as amended at 65 FR 62156, Oct. 17, 2000; 67 FR 57166, Sept. 9, 2002. United States Environmental Protection Agency, Washington, DC.

U.S. EPA (2008). "Notice of Acceptability under the CERCLA Off-Site Rule: E-Area Slit Trenches, Savannah River Site, Aiken, South Carolina. Letter to Mr. Jeff Allison, Manager." U. S. Environmental Protection Agency, Washington, DC. January 17, 2008.

U.S. EPA (2015). "OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air." OSWER Pub. 9200.2-154. Office of Solid Waste and Emergency Response, U. S. Environmental Protection Agency, Washington, DC.

U.S. EPA (2018). "Region 4 Ecological Risk Assessment Supplemental Guidance (March 2018 Update)." Scientific Support Section, Superfund Division, EPA Region 4, U. S. Environmental Protection Agency, Washington, DC. Originally published November 1995 and updated March 2018.

U.S. EPA (2020). "CAP88-PC Version 4.1 User Guide." United States Environmental Protection Agency, Office of Radiation and Indoor Air, Washington, DC.

U.S. EPA (2022). "National Recommended Water Quality Criteria - Aquatic Life Criteria Table." Retrieved August 22, 2022 from <https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table>. U.S. Environmental Protection Agency, Washington, DC.

U.S. NRC (1981). "Draft Environmental Impact Statement on 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste"." NUREG-0782. U.S. Nuclear Regulatory Commission, Washington, DC. September 1981.

U.S. NRC (2000). "A Performance Assessment Methodology for Low-Level Radioactive Waste Disposal Facilities." NUREG-1573. U.S. Nuclear Regulatory Commission, Washington, DC. October 2000.

U.S. NRC (2005). "Environmental Impact Statement on the Construction and Operation of a Proposed Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina." NUREG-1767, Vol. 1. U.S. Nuclear Regulatory Commission, Washington, DC. January 2005.

USFS-SR (2018). "Fiscal Year 2018 Savannah River Site Environmental Report." USDA Forest Service-Savannah River, New Ellenton, SC.

USGS (1987). Digital Line Graphs from 1:24,000-Scale Maps. U. S. Geological Survey, Reston, VA.

Valocchi, A. J. (1985). Validity of the Local Chemical Equilibrium Assumption for Describing Sorbing Solute Transport through Homogeneous Soils. *Water Resour. Res.* **21**(6), 808-820.

van Genuchten, M. T. (1978). "Calculating the Unsaturated Hydraulic Conductivity with a New Closed-Form Analytical Model." Research Report No. 78-WR-08. Department of Civil Engineering, Princeton University, Princeton, NJ.

van Genuchten, M. T. (1980). A Closed-Form Equation for Predicting the Hydraulic Conductivity of Unsaturated Soils. *Soil Science Society of America Journal* **44**(5), 892-898.

van Genuchten, M. T., Leij, F. J., and Yates, S. R. (1991). "The RETC Code for Quantifying the Hydraulic Functions of Unsaturated Soils." EPA/600/2-91/065. Robert S. Kerr Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Ada, OK. December 1991.

Verst, C. (2021a). "Calculated Gamma Factors at Human Receptor Locations Near HWCTR and NR Cask Special Waste Forms in E-Area." SRNL-STI-2021-00307. Savannah River National Laboratory, Aiken, SC. June 2021.

Verst, C. (2021b). "Effect of Modeled Source Uniformity in a B25 Waste Box on Calculated Dose Rates and Estimated Activity." SRNL-STI-2021-00291, Rev. 0. Savannah River National Laboratory, Aiken, SC. October 2021.

Vinson, D. W., Reboul, S. H., Hamm, L. L., and Webb, R. L. (2010). "Disposition of the Heavy Water Components Test Reactor (HWCTR)." Q-CLC-A-00033, Rev. 1. Savannah River Nuclear Solutions, Aiken, SC. October 2010.

Vinson, D. W., Subramanian, K. H., and Clark, E. A. (2004). "Containment Materials Performance for TPBAR Disposal." WSRC-TR-2004-00374. Savannah River National Laboratory, Westinghouse Savannah River Company, Aiken, SC.

Virtanen, P., Gommers, R., Oliphant, T. E., Haberland, M., Reddy, T., Cournapeau, D., Burovski, E., Peterson, P., Weckesser, W., Bright, J., van der Walt, S. J., Brett, M., Wilson, J., Millman, K. J., Mayorov, N., Nelson, A. R. J., Jones, E., Kern, R., Larson, E., Carey, C. J., Polat, İ., Feng, Y., Moore, E. W., VanderPlas, J., Laxalde, D., Perktold, J., Cimrman, R., Henriksen, I., Quintero, E. A., Harris, C. R., Archibald, A. M., Ribeiro, A. H., Pedregosa, F., and van Mulbregt, P. (2020). SciPy 1.0: Fundamental Algorithms for Scientific Computing in Python. *Nature Methods* **17**(3), 261-272.

Visvanathan, T. R. (1980). Earthquakes in South Carolina, 1698-1975. *South Carolina Geological Survey Bulletin* **40**, 61.

Wang, L., Martens, E., Jacques, D., Decanniere, P., Berry, J., and Mallants, D. (2009). "Review of Sorption Values for the Cementitious Near Field of a Near Surface Radioactive Waste Disposal Facility." NIRAS-MP5-03/NIROND-TR-2008-23E. ONDRAF/NIRAS, Mol, Brussels.

Watermark Numerical Computing (2016). "PEST, Model-Independent Parameter Estimation, User Manual Part I: PEST, SENSAN and Global Optimisers," 6th/Ed.

Webb, R. L. (1994). "Production Limits for Fission Product Ratios." EPD-CTG-94-0006. June 15, 1994.

Weber, A. H. (1998). "Tornado, Maximum Wind Gust, and Extreme Rainfall Event Recurrence Frequencies at the Savannah River Site." WSRC-TR-98-00329. Westinghouse Savannah River Company, Aiken, SC.

Werth, D., Weber, A., and Shine, G. (2013). "Probabilistic Hazard Assessment for Tornadoes, Straight-line Wind, and Extreme Precipitation at the Savannah River Site." SRNL-STI-2013-00664, Rev. 0. Savannah River National Laboratory, Aiken, SC. November 2013.

Whiteside, T., Hang, T., and Flach, G. P. (2009). "Evaluation of HELP Model Replacement Codes." SRNL-STI-2009-00572, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Whiteside, T. S. (2016a). "PORFLOW 6.42.3 Testing and Verification Document." SRNL-STI-2016-00724, Rev. 0. Savannah River National Laboratory, Aiken, SC. December 2016.

Whiteside, T. S. (2016b). "Software Quality Assurance Plan for PEST." Q-SQP-G-00004, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Whiteside, T. S. (2017a). "Characterizing the Uncertainty in Generator Inventory Estimates, Part 1." SRNL-STI-2017-00740, Rev. 0. Savannah River National Laboratory, Aiken, SC. November 8, 2017.

Whiteside, T. S. (2017b). "PORFLOW 6.42.4 Testing and Verification Document." SRNL-STI-2017-00167, Rev. 0. Savannah River National Laboratory, Aiken, SC. March 2017.

Whiteside, T. S. (2020). "PORFLOW 6.43.0 Testing and Verification Document." SRNL-STI-2020-00219, Rev. 0. Savannah River National Laboratory, Aiken, SC. June 2020.

Whiteside, T. S. (2021). "Uncertainty and Bias Calculation Check (Memorandum: T. S. Whiteside to J. J. Mayer dated October 25, 2021)." SRNL-L4120-2021-00003. Savannah River National Laboratory, Aiken, SC.

Wike, L. D., Martin, F. D., Nelson, E. A., Halverson, N. V., Mayer, J. J., Paller, M. H., Riley, R. S., Serrato, M. G., and Specht, W. L. (2006). "SRS Ecology: Environmental Information Document." WSRC-TR-2005-00201. Washington Savannah River Company, Aiken, SC. March 2006.

Wilhite, E. L. (2002). "Evaluation of Proposed New LLW Disposal Activity: Disposal of Multiple Components as Cement-Stabilized Encapsulated Waste." WSRC-RP-2002-00047. Westinghouse Savannah River Company, Aiken, SC. February 12, 2002.

Wilhite, E. L., Butcher, B. T., Phifer, M. A., and Reed, S. R. (2009). "Unreviewed Disposal Question Evaluation: Engineered Trench Sump Closure and Replacement." SRNL-TR-2009-00042, Rev. 0. Savannah River National Laboratory, Aiken, SC. March 11, 2009.

Wilhite, E. L., and Flach, G. P. (2004). "Evaluation of Proposed New LLW Disposal Activity: In-Place Disposal of Naval Reactor Components at the 643-7E Naval Reactor Component Storage Area." WSRC-RP-2004-00443, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. June 29, 2004.

Wilson, L. G. (1980). "Monitoring in the Vadose Zone: A Review of Technical Elements and Methods." EPA-600/7-80-134. Environmental Monitoring Systems Laboratory, U.S. Environmental Protection Agency, Las Vegas, NV. June 1980.

Witt, K. J., and Siegmund, M. (2001). Laboratory Testing of GCL under Changing Humidity. *In* "Proceedings of the 8th International Waste Management and Landfill Symposium, Sardinia Second Conference, Euro Waste," Sardinia, Italy.

Wohlwend, J. L. (2017). "Atmospheric Release Model for the E-Area Low-Level Waste Facility: Updates and Modifications." SRNL-STI-2017-00592. Savannah River National Laboratory, Aiken, SC.

Wohlwend, J. L. (2018). "Updated General Separations Areas (GSA) Groundwater Model Calibration Targets." SRNL-STI-2018-00336, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Wohlwend, J. L. (2020). "E-Area Low-Level Waste Facility GoldSim System Model." SRNL-STI-2020-00079, Rev. 0. Savannah River National Laboratory, Aiken, SC. April 2020.

Wohlwend, J. L. (2021a). "GoldSim Software Classification Document." Q-SWCD-A-00002, Rev. 3. Savannah River National Laboratory, Aiken, SC.

Wohlwend, J. L. (2021b). "Software Quality Assurance Plan for GoldSim." G-SQA-A-00011, Rev. 1. Savannah River National Laboratory, Aiken, SC.

Wohlwend, J. L., and Aleman, S. E. (2020). "GoldSim E-Area Low-Level Waste Facility Vadose Zone Model Benchmarking." SRNL-STI-2020-00372, Rev. 0. Savannah River National Laboratory, Aiken, SC. October 2020.

Wohlwend, J. L., and Butcher, B. T. (2018). "Proposed NRCDA Groundwater Pathway Conceptual Model." SRNL-STI-2018-00633, Rev. 0. Savannah River National Laboratory, Aiken, SC.

Wohlwend, J. L., and Hamm, L. L. (2020). "GoldSim E-Area Low-Level Waste Facility Aquifer Zone Model Calibration Methodology." SRNL-STI-2020-00346, Rev. 0. Savannah River National Laboratory, Aiken, SC. October 2020.

WSRC (1992). "Radiological Performance Assessment for the Z-Area Disposal Facility." WSRC-RP-92-1360, Rev. 0. Westinghouse Savannah River Company, Aiken, SC. December 18, 1992.

WSRC (1997). "Composite Analysis, E-Area Vaults and Saltstone Disposal Facilities." WSRC-RP-97-311, Rev. 0. Westinghouse Savannah River Company, Aiken, SC.

WSRC (2000). "White Paper for In Situ pH Adjustment, F-Area Seepage Basins." WSRC-RP-2000-4169. Westinghouse Savannah River Company, Aiken, SC. November 2000.

WSRC (2004). "Technical Report Design Check Guidelines." WSRC-IM-2002-00011, Rev. 2. Savannah River National Laboratory, Westinghouse Savannah River Company, Savannah River Site, Aiken, SC. August 2004.

WSRC (2007). "E-Area Low-Level Waste Facility (100-Acre) Expansion (U)." WSRC-RP-2006-04056, Rev. 0. Washington Savannah River Company LLC, Aiken, SC. February 2007.

WSRC (2008). "E-Area Low-Level Waste Facility DOE 435.1 Performance Assessment." WSRC-STI-2007-00306, Rev. 0. Washington Savannah River Company, Savannah River Site, Aiken, SC.

Wyatt, D. E. (2000). "Natural Phenomena Hazards (NPH) Design Criteria and Other Characterization Information for the Mixed Oxide (MOX) Fuel Fabrication Facility at Savannah River Site (U)." WSRC-TR-2000-00454. Westinghouse Savannah River Company, Aiken, SC. November 2000.

Wyatt, D. E., Aadland, R. K., and Syms, F. H. (2000). Overview of the Savannah River Site Stratigraphy, Hydrostratigraphy and Structure. *In* "Carolina Geological Society 2000 Field Trip Guidebook: Savannah River Site Environmental Remediation Systems in Unconsolidated Upper Coastal Plain Sediments - Stratigraphic and Structural Considerations" (D. E. Wyatt and M. K. Harris, eds.). WSRC-MS-2000-00606. Westinghouse Savannah River Company, Aiken, SC.

Wyatt, D. E., and Harris, M. K. (2004). Overview of the History and Geology of the Savannah River Site. *Environmental Geosciences* **11**(4), 181-190.

Young, M. H., and Pohlmann, K. F. (2001). "Analysis of Vadose Zone Monitoring System: Computer Simulation of Water Flux: E-Area Disposal Trenches." Task Order GA0074 (KG43360-0). Division of Hydrologic Sciences, Desert Research Institute, Las Vegas, NV. August 2001.

Young, M. H., and Pohlmann, K. F. (2003). "Analysis of Vadose Zone Monitoring System: Computer Simulation of Water Flux under Conditions of Variable Vegetative Cover: E-Area Disposal Trenches." Publication No. 41188. Division of Hydrologic Sciences, Desert Research Institute, Las Vegas, NV. August 2001.

Yu, A. D., and Hsu, R. H. (1997). Appendix L: Naval Reactor Waste Disposal. *In* "Radiological Performance Assessment for the E-Area Low Level Waste Disposal Facility", pp. L1-L67. Westinghouse Savannah River Company, Savannah River Technology Center, Aiken, SC.

Yu, A. D., Langton, C. A., and Serrato, M. G. (1993). "Physical Properties Measurement Program." WSRC-RP-93-894. Westinghouse Savannah River Company, Aiken, SC. June 30, 1993.

Yu, A. D., McDowell-Boyer, L. M., Cook, J. R., and Young, K. E. (2002). "Special Analysis: Naval Reactor Waste Disposal Pad (U)." WSRC-RP-2001-00948, Rev. 2. Westinghouse Savannah River Company, Aiken, SC. December 2002.

Yu, C., Zielen, A. J., Cheng, J. J., LePore, D. J., Gnanapragasam, E., Kamboj, S., Arnish, J., Wallo
lii, A., Williams, W. A., and Peterson, H. (2001). "Users Manual for RESRAD Version 6."
Environmental Assessment Division, Argonne National Laboratory, Chicago, IL. July 2001.