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## **CHARLES E. RUSSELL**

Senior Research Scientist - Hydrogeology, Desert Research Institute

### **Research Profile**

- Delineation of groundwater systems through a combination of hydrogeologic and geochemical techniques.
- Development of novel sampling and remediation techniques
- Hydrogeologic and geochemical analysis of environments of endolithic bacteria

### **Employment History**

- 2105 to Present Senior Research Scientist – Hydrogeology, Division of Hydrologic Sciences, Desert Research Institute, Las Vegas, Nevada
- 2002-2015 Associate Research Scientist - Hydrogeology, Division of Hydrologic Sciences, Desert Research Institute, Las Vegas, Nevada.
- 1991-2002 Assistant Research Scientist - Hydrogeology, Water Resources Center, Desert Research Institute, Las Vegas, Nevada.
- 1987-1991 Staff Research Scientist - Hydrogeology, Water Resources Center, Desert Research Institute, Las Vegas, Nevada.
- 1984-1987 Graduate Student/Research Assistant, Water Resources Center, Desert Research Institute, University of Nevada System, Las Vegas, Nevada (Research Advisor: Jack Hess)

### **Education**

- 1987 M.S. in Geosciences, Geosciences Department, University of Nevada-Las Vegas, Las Vegas NV., Sept 1984 – April 1987. Research Advisor: Jack Hess.
- 1984 B.S. in Geology, Geology Department, University of Eastern Washington, Cheney, WA., Sept. 1980 – May 1984.

## Professional Experience

- 2014 – Present Science Advisor to the Department of Energy National Nuclear Security Administration, Nevada Field Office (DOE/NNSA/NFO) - Provide support and advice to Department of Energy (DOE) personnel on technical, regulatory, and stakeholder interactions in order to achieve regulatory closure of areas containing groundwater contamination derived from underground tests
- 2010 – Present Deputy Director of the Division of Hydrologic Sciences, Desert Research Institute – Support the Division Director during annual evaluations, supervising Rank II faculty, represent the division as needed, and promote division research.
- 1987 – Present Principle Investigator/Co-Principle Investigator for Research Activities to include the following: a) determination of depth-discrete estimates of hydraulic conductivity derived from vertically trolled spinner log profiles; b) development and testing of novel deep-well pneumatic pump; c) development and testing of novel groundwater tritium sampler; d) isolation of novel endolithic microorganisms in the vicinity of underground nuclear tests; e) characterization of organic, heavy metal, and radionuclide contaminants of discharge emanating from tunnels used for nuclear testing; f) determining the diversity, abundance and spatial variability of microorganisms in a 24 m<sup>3</sup> block of rock located in the deep subsurface; g) development of reconnaissance-level estimates of recharge based on an elevation-dependent application of the chloride mass-balance approach; h) Pilot-scale evaluation of air-sparging as a viable means for reducing tritium activity in water; and i) characterization of the hydrogeology and geochemistry of subsurface area impacted by underground nuclear tests.
- 2009 – 2014 Corrective Action Unit Lead for the DOE/NNSA/NFO Underground test Area (UGTA) investigations at Rainier and Shoshone Mountain, Nevada Test Site – Define and integrate work scope being conducted by the U.S Geological Survey, two National Laboratories, the Desert Research Institute and federal contractors to ensure it supports regulatory objectives agreed to by DOE and the State of Nevada.
- 1991 – 2014 Contract Manager for all activities conducted by the Desert Research Institute on the DOE/NNSA/NFO Underground Test Area Project.

## Publications in Refereed Journals

- Reeves, D., R. Parashar, K.F. Pohlmann, C.E. Russell and J.B. Chapman, 2014. Development and Calibration of Dual-Permeability Flow Models with Discontinuous Fault Networks, *Vadose Zone Journal*, 13 (8), 1-23.
- Zhang, Y., E.M. LaBolle, C.E. Russell and D. Reeves, 2013. Direct numerical simulation of matrix diffusion across the fracture/matrix interface, *Water Sciences and Engineering*, 6 (4), 365-379.
- Zhu, J., K. Pohlmann, J. Chapman, C. Russell, R. Carroll and D. Shafer, (2011). "Sensitivity to Formation Porosity of Contaminant Transport from Nevada Test Site to Yucca Mountain." *J. Hazard. Toxic Radioact. Waste*, 15(4), 219-227.
- Zhu, J., K.F. Pohlmann, J.B. Chapman, C.E. Russell, R.W. Carroll and D.S. Shafer, 2010: Sensitivity of Solute Advective Travel Time to Porosities of Hydrogeologic Units, *Ground Water*, 48.
- Minor, T. B., C.E. Russell and S.A. Mizell, 2007. Development of a GIS-based Model for Extrapolating Mesoscale Groundwater Recharge Estimates using Integrated Geospatial Data Sets, *Hydrogeology Journal*, 15:183-195.
- Oberlander, P. L. and C.E. Russell, 2006. Process Considerations for Trolling Borehole Flow Logs, *Ground Water Monitoring & Remediation*, 26, 3, 60-67.
- Charalambis, P. W. Um, C.E. Russell and J.B. Chapman. 2003. Measuring the specific surface area of natural and manmade glasses: effects of formation process, morphology, and particle size. *Colloids and Surfaces: Phyicochem. Eng Aspects* 215:221-239.
- Haldeman, D.L., P.S. Amy, C.E. Russell and R. Jacobson. 1995, Comparison of Drilling and Mining as Methods for obtaining Microbiological Samples from the Deep Subsurface. *Journal of Microbiological Methods* 21:305-316.
- Russell, C.E., R. Jacobson., D.L. Haldeman and P.S. Amy. 1994. Heterogeneity of Deep Subsurface Microorganisms and Correlations to Hydrological and Geochemical Parameters at Rainier Mesa, Nevada Test Site. *Journal of Geomicrobiology*. 12:37-51.
- Hokett, S.L., J.B. Chapman and C.E. Russell. 1992. Potential Use of Time Domain Reflectometry for Measuring Water Content in Rock. *Journal of Hydrology* 138:89-96.
- Amy, P.S., D.L. Haldeman, D. Ringelberg, D.H. Hall and C.E. Russell. 1992. Comparison of Identification Systems for the Study of Water and Endolithic Bacterial Isolates from the Subsurface. *Appl. Environ. Microbiol.* 58:3367-3373.

## Books and Monographs

- Russell, C.E. 1997. Sampling by Mining. Chp 4. In Amy, P.S. and D.L. Haldeman, eds. *The Microbiology of the Deep Terrestrial Subsurface*. Lewis Press, New York, New York.

- Russell, C.E., J.W. Hess, and S.W. Tyler, 1987. Hydrogeologic Investigations of Flow in Fractured Tuffs, Rainier Mesa, Nevada Test Site; in Evans, D.D., and Nicholson, T.J., [eds.], 1987, Flow and Transport through Unsaturated Fractured Rock, American Geophysical Union Monograph 42 1st and 2nd edition, p. 43-50.

## Proceedings and Published Abstracts

- Farnham, I. M., Andres, C., Russell, C. E., Wilborn, B., 2017: Peer Review Lessons Learned - DOE and Regulator perspectives, Waste Management Symposia 2017 Proceedings: Phoenix, AZ, March 6, 2017-March 9, 2017, #17140.
- Russell, C. E., Denovio, N., Farnham, I. M., Wurtz, J. A., 2017: ER-20-12: A Case Study of Corrective Action Investigation in a Challenging Environment, Waste Management Symposia 2017 Proceedings: Phoenix, AZ, March 6, 2017-March 9, 2017, #17236.
- Hokett, S.L., C.E. Russell, and D.R. Gillespie. 1994. Water-Level Detection during Drilling using Time Domain Reflectometry; in Symposium and Workshop on Time Domain Reflectometry in Environmental, Infrastructure, and Mining Applications. U.S. Dept. of Interior, Bureau of Mines Special Publication SP. 19-94:259-268.
- Hess, J.W., C.E. Russell and S. Tyler. 1988. Hydrologic Effects of Nuclear Testing in Fractured and Zeolited Tuffs, Rainier Mesa, Nevada Test Site. Symposium Proceedings of International Conference on Fluid Flow in Fractured Rocks, Atlanta, Georgia, p. 610.
- Russell, C.E., J.W. Hess and S.W. Tyler. 1986. Hydrologic Investigations of Flow in Fractured Tuffs in Rainier Mesa, Nevada Test Site. EOS: Trans. A60, 67:44, p. 963.
- Wheatcraft, S.W., J.W. Hess, T.M. Morris, C.E. Russell and L.G. McMillion. 1985. Applicability of a GroundWater Flow Meter to Hazardous Waste Site Characterization and Monitoring. Proceedings of the Second NWWA Conference on Surface and Borehole Geophysical Methods in Ground Water Investigations, Fort Worth, Texas, February 1985.

## Presentations and Proceedings

- Farnham, I. M., Andres, C., Russell, C. E., Wilborn, B., 2017: Peer Review Lessons Learned - DOE and Regulator perspectives, Waste Management Symposia 2017: Phoenix, AZ, March 6, 2017-March 9, 2017, #17140.
- Russell, C. E., Denovio, N., Farnham, I. M., Wurtz, J. A., 2017: ER-20-12: A Case Study of Corrective Action Investigation in a Challenging Environment, Waste Management Symposia: Phoenix, AZ, March 6, 2017-March 9, 2017, #17236.
- Russell, C.E., 2015. Evolution of the Community Environmental Monitoring Program (CEMP), 2015 Waste Management Symposia, Phoenix, AZ., March 18<sup>th</sup>, 2015, Session 72.

- Reeves, D., R. Parashar, K.F. Pohlmann, Y. Zhang, C.E. Russell, E. LaBolle and J.B. Chapman, 2014. Radionuclide Containment Properties of Fractured and Faulted Volcanic Tuff Units at the T-Tunnel Complex, Rainier Mesa, Nevada National Security Site, Waste Management 2014: Phoenix, Arizona. March 2nd – 6th, 2014.
- Reeves, D., R. Parashar, K.F. Pohlmann, C.E. Russell and J.B. Chapman, 2013. Development and Calibration of Dual-Permeability Models in Complex Hydrogeologic Settings: An Example from the T-Tunnel Complex, Rainier Mesa, Nevada National Security Site, MODFLOW and MORE 2013: Translating Science into Practice: Golden, Colorado. June 2nd – 5th, 2013.
- Chapman, J. B., K.F. Pohlmann and C.E. Russell, 2013. Use of a Regional Model to Support Site-Scale Groundwater Flow Modeling at Pahute Mesa, Nevada, Devil's Hole Workshop: Furnace Creek, Death Valley, California. May 1st – 3rd, 2013.
- Moser, D.P., S. Hamilton-Brehm, J.C. Fisher, J.C. Bruckner, A. Wheatley, C. Russell, T.C. Onstott, K. Czerwinski; B. Sherwood Lollar, M. Zavarin. S. Roberts, L.M. Pratt and S. Young. 2013. Radiochemically-Supported Microbial Communities: A Potential Mechanism for Biocolloid Production of Importance to Actinide Transport. Subsurface Biogeochemical Research (SBR) meeting: Washington, D.C. May 16th, 2013.
- Moser, D.P. , J.C. Bruckner, C. Russell; T.C. Onstott; K. Czerwinski; B. Sherwood Lollar and M. Zavarin, 2011. Radiochemically-Supported Microbial Communities: A Potential Mechanism for Biocolloid Production of Importance to Actinide Transport. Subsurface Devils Hole Workshop: Pahrump, Nevada. May 5th, 2011.
- Reeves, D., R. Parashar, K.F. Pohlmann, E.M. LaBolle, Y. Zhang, C.E. Russell and J.B. Chapman, 2011. Predictions of Long-Term Radionuclide Transport at Rainier Mesa, Nevada National Security Site, 242nd American Chemistry Society National Meeting: Denver, Colorado. August 28th – September 1st, 2011.
- Reeves, D., R. Parashar, K.F. Pohlmann, Y. Zhang, E.M. LaBolle, C.E. Russell and J.B. Chapman, 2011. Predictions of Long-Term Radionuclide Transport at Rainier Mesa, Nevada National Security Site, 2011 AGU Fall Meeting: San Francisco, California. December 5th – 9th, 2011.
- Pohlmann, K. F., J. Zhu, J.B. Chapman, C.E. Russell, D.S. Shafer and R.W. Carroll, 2010. Effect of Porosity Correlations on Sensitivity of Contaminant Travel Time, AGU Fall Meeting: San Francisco, California. December 13th – 17th, 2010.
- Bruckner, J. C. Fisher, R. Lindval, M. Zavarin, K. Czerwinski, C. Russell and D. P. Moser, 2009. Microbial Communities of Underground Nuclear Blast Cavities, 109th General Meeting of the American Microbiology Society: Philadelphia, Pennsylvania. May 17th – May 21st, 2009, Poster N-124.
- Chapman, J. B., K.F. Pohlmann, C.E. Russell and G.M. Pohll, 2009. Role of Groundwater Monitoring for Closure of Underground Nuclear Tests on the Nevada Test Site, American Geophysical Union: San Francisco, California. December 14th – 18th, 2009. Session: H71 Environmental Remediation and Confirmatory Monitoring.
- Pohlmann, K.F, J. Zhu, J. B. Chapman, C. E. Russell, R. W. H. Carroll and D. S. Shafer, 2008. Sensitivity of Contaminant Travel Times from the Nevada Test Site to Yucca Mountain to Hydrogeologic Unit Porosities, AGU Fall Meeting: San Francisco, California. December 15th – 19th, 2008. Poster H31F-0962.

- Zhu, J., K. F. Pohlmann, J. B. Chapman, C. E. Russell, R. W. H. Carroll, and D S. Shafer, 2008. Uncertainty and Sensitivity of Contaminant Travel Times from the Nevada Test Site to Yucca Mountain. Devils Hole Workshop: Pahrump, Nevada. May 7th to 9th, 2008.
- Reeves, D., R. Schultz, C. Bingham, K. Pohlmann, C. Russell and J. Chapman, 2007. Characterization of Preferential Flowpaths at the T-Tunnel Complex, Rainier Mesa, Nevada. AGU Fall Meeting: San Francisco, California. December 10th – 14th, 2007. Abstract #H33H-1721.
- Pohlmann, K. F., J. Zhu, M. Ye, R.W. Carroll, J.B. Chapman, C.E. Russell and D.S. Shafer, 2006. Evaluation of Groundwater Pathways and Travel Times From the Nevada Test Site to the Potential Yucca Mountain Repository: AGU Fall Meeting: San Francisco, California. December 11th – 15th, (H23C-1528)
- Murray, P.A., and C.E. Russell, P. Nevins and M. Morgan, 2005. Field Deployment of a Novel Approach for the Acquisition of Deep Groundwater Samples at Nevada Test Site and Nye County Nevada. 31st Annual Waste Management Symposium: Tucson, Arizona. March 1st, 2005, Session 33d, WM-5183.
- Murray, P.A. and C.E. Russell, 2005. Field Deployment of Novel Approach in Acquiring Deep Groundwater Samples at Sandia National laboratories, Nevada Test Site, and Nye County Nevada. AGU Fall Conference: San Francisco, California. December 5th – 9th, 2005.
- Shafer, D.S., C. Martin, K.F. Pohlmann, C.E. Russell, M. Ye, J. Engelbrecht, T. Minor and L. Bishop, 2005. Establishing Baseline Environmental Conditions for the Proposed Yucca Mountain Repository, Nevada U.S.A. 10th International Conference on Environmental Remediation and Radioactive Waste Management: Glasgow, Scotland (GB). September 4th – 8th, 2005.
- Gillespie, D.R. and C.E. Russell, 2003. Temperature Profiles and Hydrologic Implications from the Nevada Test Site Area. American Geophysical Union Fall Meeting: San Francisco, California. December 9th, 2003.
- Russell, C.E. and T. Minor. 1999. Reconnaissance Estimate of Recharge based upon an Elevation Dependent Chloride Enrichment Method and Comparison to Previous Reconnaissance Methods for Estimating Recharge, Oral Presentation at Nevada Water Resource Association Recharge Symposium, Reno Nevada, Sept, 1999.
- Russell, C.E., D.R. Gillespie, S.L. Hokett, and J.D. Donithan. 1997. A Field-Scale Demonstration of Air-Sparging to Remediate Tritiated Fluids, American Chemical Society, September 10th, 1997, Las Vegas, NV.
- Gillespie, D., S. Hokett and C. Russell, 1995. Estimation of moisture flux rates in nuclear subsidence craters using the annual temperature pulse. Presentation at: Geological Society of America Conference - 1995, New Orleans, Louisiana.
- Amy, P.S. and C.E. Russell, 1993. Sampling Methods for the Isolation of Indigenous Deep Subsurface Endolithic Microorganisms fro Tunnel Systems within Rainier Mesa, Nevada Test Site. University of Nevada, Las Vegas and the Desert Research Institute, Las Vegas, Nevada. Paper presented at the Biology Section of the Arizona-Nevada Academy of Science, April, 1993.

- Amy, P.S., D.L. Haldeman, C.E. Russell, D. Ringelberg, and D.C. White. 1993. Microbiological Spatial Heterogeneity in Rainier Mesa, Nevada Test Site. International Symposium on Subsurface Microbiology, Sept. 19-24, 1993, Bath, U.K.
- Russell, C.E. and Jacobson, 1991. Spatial Variability of Deep Subsurface Microbiology in Relatively Homogeneous Ash-Fall Tuffs and Correlation to Hydrogeologic and Geochemical parameters, Geological Society of America, October 22nd, 1991, San Diego, CA.
- Russell, C.E., J.W. Hess, and S.W. Tyler, 1988. Hydrogeologic Investigations of Flow in Fractured Tuffs, Rainier Mesa, Nevada Test Site, Geologic Society of America, Oral presentation, October, 1988, Denver CO

## Institutional Reports

- U.S. Dept. Of Energy, 2018. Rainier Mesa/Shoshone Mountain Flow and Transport Model Report Nevada National Security Site, Nevada: Appendix C.4.0 Environmental Radionuclide Data and Observations, U.S. Dept of Energy Report DOE/NV—1588.
- U.S. Dept. of Energy, 2018. Case Study Analyses of Radionuclide Transport in Variably Saturated Media at Rainier Mesa, K. Birdsell, C. Russell, and A. Tompson (eds.). U.S. Dept. of Energy Report DOE/NV—1595.
- Mission Support and Test Services, 2018. Nevada National Security Site Environmental Report 2017: Section 7.2. CEMP Surface and Groundwater Monitoring, Mission Support and Test Services Report DOE/NV/03624--0270, Mission Support and Test Services LLC, Las Vegas, Nevada.
- National Security Technologies, 2017. Nevada National Security Site Environmental Report 2016: Section 7.2. CEMP Surface and Groundwater Monitoring. National Security Technologies Report DOE/NV/25946--3334, National Securities Technologies, Las Vegas, Nevada.
- National Security Technologies, 2016. Nevada National Security Site Environmental Report 2015: Section 7.2. Offsite Surface and Groundwater Monitoring. National Security Technologies Report DOE/NV/25946--2950, National Securities Technologies, Las Vegas, Nevada.
- National Security Technologies, 2015. Nevada National Security Site Environmental Report 2014: Section 7.2. Offsite Surface and Groundwater Monitoring. National Securities Technologies Report DOE/NV/25946--2566, National Securities Technologies, Las Vegas, Nevada.
- Lyles, B., G. McCurdy, C. Russell and J. Healey, 2014. Timber Mountain Precipitation Monitoring Station 2013 Annual Report. DRI Letter Report DOE/NV/0000939-16, Desert Research Institute, Las Vegas and Reno, NV.
- National Security Technologies, 2014. Nevada National Security Site Environmental Report 2013. Section 7.2. Offsite Surface and Groundwater Monitoring. National Securities Technologies Report DOE/NV/25946--2182, National Securities Technologies, Las Vegas, Nevada.

- Lyles, B., G. McCurdy, C. Russell and J. Healey, 2013. Timber Mountain Precipitation Monitoring Station 2012 Annual Report. DRI Letter Report DOE/NV/NA0000939-LTR2012-01, Desert Research Institute, Las Vegas and Reno, NV.
- National Security Technologies, 2013. Nevada National Security Site Environmental Report 2012. Section 7.2. Offsite Surface and Groundwater Monitoring. National Securities Technologies Report DOE/NV/25946--1856, National Securities Technologies, Las Vegas, Nevada.
- National Security Technologies, 2012. Nevada National Security Site Environmental Report 2011. Section 7.2. Offsite Surface and Groundwater Monitoring. National Securities Technologies Report DOE/NV/25946--1604, National Securities Technologies, Las Vegas, Nevada.
- Zhang, Y., E.M. LaBolle, D. Reeves and C.E. Russell, 2012. Development of RWHet to Simulate Contaminant Transport in Fractured Porous Media, Desert Research Institute Publication 45244, Desert Research Institute, Las Vegas and Reno, NV.
- McGraw, D. and C.E. Russell, 2011. Evaluation of Borehole Flow Logging for Underground Test Area Well ER-EC-11, Desert Research Institute letter Report DOE/NV/26383-LTR2011-02, Desert Research Institute, Las Vegas and Reno, NV.
- National Security Technologies, 2011. Nevada National Security Site Environmental Report 2010. Section 7.2. Offsite Surface and Groundwater Monitoring. National Securities Technologies Report DOE/NV/25946--1305, National Securities Technologies, Las Vegas, Nevada.
- Russell, C.E. and D. McGraw, 2011. Evaluation of Borehole Flow Logging for Underground Test Area Well ER-20-8 #2, Desert Research Institute Letter Report DOE/NV/26383-LTR2011-01, Desert Research Institute, Las Vegas and Reno, NV.
- Bruckner, J., Fisher, J., Czerwinski, K., Lindvall, R., Russell, C. E., Moser, D. P., 2010: Characterization of Microbial Communities in subsurface Nuclear Blast Cavities of the Nevada Test Site, ERSP Final Technical Report, April, 2010.
- National Security Technologies, 2010. Nevada Test Site Environmental Report 2009. Section 7.2. Offsite Surface and Groundwater Monitoring. National Securities Technologies Report DOE/NV/25946-1067, National Securities Technologies, Las Vegas, Nevada.
- Zhu, J. K.F. Pohlmann, J.B. Chapman, C.E. Russell, R.W.H. Carroll, and D. Shafer, 2009. Uncertainty and Sensitivity of Contaminant Travel Times from the Up-gradient Nevada Test Site to the Yucca Mountain Area, Desert Research Institute Report 45230, Las Vegas, Nevada.
- National Security Technologies, 2009. Nevada Test Site Environmental Report 2008. Section 6.2. Offsite Surface and Groundwater Monitoring. National Securities Technologies Report DOE/NV/25946-790, National Securities Technologies, Las Vegas, Nevada.
- National Security Technologies, 2008. Nevada Test Site Environmental Report 2007. Section 6.2. Offsite Surface and Groundwater Monitoring. National Securities Technologies Report DOE/NV/25946-543, National Securities Technologies, Las Vegas, Nevada.
- Mizell, S.A., C.E. Russell and T.L. Kluesner, 2007. Reconnaissance Estimation of Groundwater Recharge to Selected Hydrographic Basins of Eastern Nevada and



Western Utah using the Chloride Mass-balance Method. Desert Research Institute Publication 41232. Desert Research Institute, Las Vegas and Reno, NV.

- National Security Technologies, 2007. Nevada Test Site Environmental Report 2006. Section 6.2. Offsite Surface and Groundwater Monitoring. National Securities Technologies Report DOE/NV/25946-259, National Securities Technologies, Las Vegas, Nevada.
- Nevins, P. and C.E. Russell, 2007. Groundwater Tritium Sampler Test Report, NuVision Engineering Inc. Report 2198-4-001, Nuvision Engineering Inc., 184-B Rolling Hill Road, Mooresville, NC, 74 p.
- Oberlander, P., D. McGraw and C. Russell, 2007. Hydraulic Conductivity with Depth for Underground Test Area (UGTA) Wells, Division of Hydrologic Sciences, Desert Research Institute Report 45228, Desert Research Institute, Las Vegas and Reno, NV.
- Russell, C.E., S.M. Mizell and T.B. Minor, 2007. Estimation of Groundwater Recharge in Steptoe Valley, Nevada, by the Elevation-dependent Chloride Mass-balance Approach, Desert Research Institute Report 41241, 53 p. Desert Research Institute, Las Vegas and Reno, NV.
- National Security Technologies, 2006. Nevada Test Site Environmental Report 2005. Section 6.2. Offsite Surface and Groundwater Monitoring. National Securities Technologies Report DOE/NV11718-1214, National Securities Technologies, Las Vegas, Nevada.
- Oberlander, P.L. and C.E. Russell, 2006. Borehole Flow and Horizontal Hydraulic Conductivity with Depth at Well ER-12-4. DRI Letter Report DOE/NV/13609-LTR2005-003. Desert Research Institute, Las Vegas and Reno, NV.
- Bechtel Nevada, 2005. Nevada Test Site Environmental Report 2004. Section 6.2. Offsite Surface and Groundwater Monitoring. Bechtel Nevada Report DOE/NV11718-1080, Bechtel Nevada, Las Vegas, Nevada.
- Oberlander, P.L. and C.E. Russell, 2005. Borehole Flow and Horizontal Hydraulic Conductivity with Depth at Well ER-12-3. DRI Letter Report DOE/NV/13609-LTR2005-002. Desert Research Institute, Las Vegas and Reno, NV.
- Bechtel Nevada, 2004. Nevada Test Site Environmental Report 2003. Section 5.7. Offsite Surface and Groundwater Monitoring. Bechtel Nevada Report DOE/NV11718-971, Bechtel Nevada, Las Vegas, Nevada.
- Oberlander, P.L. and C.E. Russell, 2004. Hydraulic Conductivity Profile with Depth at Wells ER-6-1 and ER-6-1 #2. DRI Letter Report. Desert Research Institute, Las Vegas and Reno, NV.
- Wolfsberg, A.V., A.F.B. Tompson, R.K. Waddell, A.E. Hassan, K.R. Rehfeldt and C.R. Russell, 2004. Heterogeneity and Scaling: Technical Basis Document for Nevada Test Site Underground Test Area Projects, Los Alamos Report LA-14161. Los Alamos National Laboratory, Los Alamos, New Mexico
- Bechtel Nevada, 2003. Annual Site Environmental Report ~ 2002. Section 8.5. Groundwater Monitoring Oversight Activities. Bechtel Nevada Report DOE/NV11718-842, Bechtel Nevada, Las Vegas, Nevada.
- Oberlander, P. and C. Russell, 2003. Depth Specific Hydraulic Testing of Yucca Flat and Frenchman Flat Environmental Restoration Wells. Desert Research Institute,

Division of Hydrologic Sciences Publication 45199. Desert Research Institute, Las Vegas and Reno, NV.

- Russell, C.E., R.H. French, R. A. Nicholson, J. S. Miller and S. Benner, 2003. Evaluation of Monitoring Data from Impounded Water within U12n and U12t Tunnel- Rainier and Aqueduct Mesas, Nevada Test Site. Desert Research Institute Letter Report
- Russell, C.E. and T. Minor, 2003. Reconnaissance Estimates of Recharge based on an Elevation Dependent Chloride Mass Balance Approach. Desert Research Institute Publication 45164. Desert Research Institute, Las Vegas and Reno, NV.
- Bechtel Nevada, 2002. Nevada Test Site Annual Site Environmental Report for Calendar - 2001. Section 8.5. Groundwater Monitoring Oversight Activities. Bechtel Nevada Report DOE/NV11718-747, Bechtel Nevada, Las Vegas, Nevada.
- Oberlander, P.L., B.F. Lyles and C. E. Russell. 2002. Borehole Testing and Characterization of Western Pahute Mesa – Oasis Valley ER-EC Wells. DRI Report 45195. Desert Research Institute, Las Vegas and Reno, NV.
- Bechtel Nevada, 2001. Nevada Test Site Annual Site Environmental Report for Calendar Year 2000. Section 8.5. Groundwater Monitoring Oversight Activities. Bechtel Nevada Report DOE/NV11718-605, Bechtel Nevada, Las Vegas, Nevada.
- Bourcier, W.L., S. Roberts, D. K. Smith, S. Hulsey, L. Newton, A. Sawvel, C. Bruton, C. Papelis, W. Um, C. Russell, J. Chapman: 2000. Determination of Reactive Surface Area of Melt Glass. Lawrence Livermore National Laboratory Report UCRL-ID-145181, 87 p.
- Russell, C.E., D.R. Gillespie, S.L. Hokett, and J.D. Donithan. 1997. A Field-Scale Demonstration of Air-Sparging to Remediate Tritiated Fluids. Desert Research Institute Report 45142, Las Vegas and Reno, NV.
- Russell, C.E. D.R. Gillespie, J.C. Cole, S.L. Drellack, L.B. Prothro, P.H. Thompson, R.L. McCall, G.A. Pawloski, and R. Carlson. 1995. ER-12-1 Completion Report. U.S. Dept of Energy Report DOE/NV/10845-36. 155 p
- Russell, C.E., L. Gillespie, and D. Gillespie, 1992. Geochemical and Hydrologic Characterization of the Effluent Draining from the U12e, U12n, and U12t Tunnels, Area 12, Nevada Test Site. Water Resources Center, Desert Research Institute Report 45105, Las Vegas and Reno, NV.
- Russell, C.E., 1990. DOE/DNA Tunnel Effluent Quality Assurance Plan. Water Resources Center, Desert Research Institute Letter Report.
- Cochran, G.F., S. Hokett, J.M. Jackson, C.E. Russell, and M.R. Whitbeck, 1989. Installation Restoration Program Phase I - Preliminary Assessment: Nellis Air Force Range, Nye, Lincoln, and Clark Counties, Nevada. 273 p.
- Russell, C.E., 1989. Assessment of the Nevada Test Site Monitoring Well System, Water Resources Center, Desert Research Institute, Publication No. 45072, 44 p.
- Russell, C.E., 1989. Annotated Bibliography of the Physical Data of Rainier Mesa and Yucca Mountain. Nevada Waste Project Office Report NWPO-TR-012-89, 54 p.
- Russell, C.E., J.W. Hess, and P. Patterson, 1988. Groundwater Resource Evaluation of Sunset Park, Water Resources Center, Desert Research Institute Letter Report, 25 p.
- Russell, C.E., J.W. Hess, and S.W. Tyler, 1987. Hydrogeologic Investigations of Flow in Fractured Tuffs, Rainier Mesa, Nevada Test Site, Water Resources Center, Desert Research Institute, Publication No. 45062, 71 p.

- Russell, C.E., S.W. Tyler, R.D. McArthur, T.M. Mihevc, and S.L. Hokett, 1987. CERCLA Preliminary Assessment of DOE's Nevada Operations Office, Nuclear Weapons Testing Areas, Volumes I and II, Water Resources Center, Desert Research Institute, 817 p.

## Funded Grants and Contracts

- 1991 to 2015. PI of the Underground Test Area Activity funded by Department of Energy National Nuclear Security Administration, Nevada Field Office (DOE/NNSA/NFO) - \$32,600,000
- 2000 to 2015. Author of the proposal that expanded the Community Environmental Monitoring Project funded by the Department of Energy National Nuclear Security Administration, Nevada Field Office (DOE/NNSA/NFO). Total Project Funding \$23,500,000. Portion of total attributable to my efforts at expanding the project - \$11,250,000.
- 2009 to 2011. Minor co-PI of the Microbial Biogeochemistry of Subsurface Nuclear Blast Cavities of the Nevada Test Site Project funded by U.S. DOE ERSP. - \$139,500.
- 2007 to 2008. Co-PI of the Characterization of Microbial Communities in Subsurface Nuclear Blast Cavities of the Nevada Test Site funded by U.S. DOE EMSP - \$200,000.
- 2002 to 2007. PI of the AEA Deep Well Sampler and AEA Tritium Sampler Projects funded through the DOE Environmental Management UK-EU-US Technology Transfer Program - \$208,000
- 2004 to 2006. Co-PI of the Yucca Mountain Monitoring Initiative funded by U.S. Department of Energy, Office of Civilian Radioactive Waste Management. - \$3,400,000.