March 1, 2007

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DOMINION NUCLEAR NORTH ANNA, LLC	)	Docket No. 52-008-ESP
	)	
(Early Site Permit for North Anna ESP Site)	)	

AFFIDAVIT OF MICHAEL T. MASNIK CONCERNING NRC STAFF RESPONSE TO THE LICENSING BOARD'S ENVIRONMENT-RELATED QUESTIONS

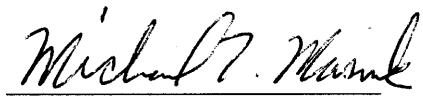
I, Michael T. Masnik, do hereby state as follows:

1. I am a Senior Aquatic Ecologist in the Nuclear Regulatory Commission's ("NRC") Office of New Reactors ("NRO"). A statement of my professional qualifications is attached.

2. As part of the NRC staff's environmental review of the North Anna ESP application, documented in NUREG-1811, the "Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site," December 2006 ("FEIS"), I provided oversight with respect to the preparation of those sections of the FEIS concerning aquatic ecology and hydrology.

3. I am responsible for those responses to Board questions (or portions of questions) in Attachment A to the "NRC Staff Legal Brief in Response to the Licensing Board's Environment-Related Questions" for which I am listed as the author.

4. I attest to the accuracy of those statements, support them as my own, and endorse their introduction into the record of this proceeding. I declare under penalty of perjury that those statements, and my statements in this affidavit, are true and correct to the best of my knowledge, information, and belief.



Michael T. Masnik

Michael T. Masnik

STATEMENT OF PROFESSIONAL QUALIFICATIONS

UNITED STATES NUCLEAR REGULATORY COMMISSION

Washington, D.C.

I am currently employed as a Senior Aquatic Ecologist in the Office of New Reactor Operations, U. S. Nuclear Regulatory Commission (NRC). As a senior member of the staff I am responsible for understanding and assessing the impacts of nuclear power generation on a variety of aquatic environments.

I hold a bachelor of Science in Conservation from Cornell University (1969), a Master of Science in Zoology from Virginia Polytechnic Institute and State University (1971), and a Doctor of Philosophy in Zoology also from Virginia Polytechnic Institute and State University (1975).

While at Virginia Polytechnic Institute and State University, I undertook research in a variety of areas, specializing in zoogeography and distribution of freshwater fishes. Other areas of research which resulted in published papers include thermal studies on fishes, recovery of damaged aquatic ecosystems, and development of sampling methodology for fish and macroinvertebrates. I have authored or co-authored some 16 publications on the above areas or research. My formal education has encompassed and emphasized studies in Zoology, Aquatic Ecology, Ichthyology, and Evolutionary Biology. Prior to joining the Federal government I participated as scientific staff for a Duke University Caribbean cruise conducting oceanographic investigations, and served as a consultant, through Virginia Polytechnic Institute and State University, for American Electric Power Company, Koppers Company, Inc., U.S. Army Corps of Engineers, and the Tennessee Valley Authority. I was also employed by Ichthyological

Associates as a field biologist investigating the fisheries resources of the Delaware Bay.

I joined the Atomic Energy Commission, the predecessor to the NRC, in 1974 as a Fisheries Biologist performing and overseeing NEPA reviews for nuclear power reactor license applications. My principal expertise was in evaluating the impacts of various cooling system designs and intake structures on fish and shellfish in source and receiving waterbodies. In the late 1970s and early 1980s I participated in the initial licensing reviews for more than 10 sites, three alternative site reviews and investigated numerous environmental events occurring at operating nuclear power stations. In 1976, as the NRC representative, I participated in the development of U.S. Environmental Protection Agency's Draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment. I also provided expert testimony at a number of NRC administrative hearings on a variety of environmental topics including shipworms, alternative site reviews, and shortnose sturgeon. I developed the NRC staff's practices related to Commission compliance to the Endangered Species Act.

In 1982 I became the Technical Assistant to the Director of the Three Mile Island (TMI-2) Program Office. For the next 13 years I provided technical oversight on all aspects of the TMI-2 cleanup. I made over 15 containment entries at TMI-2, conducted numerous inspections and surveys, developed custom technical specifications for the damaged facility, and oversaw the preparation of three supplements to the programmatic environmental impact statement on the cleanup. I provided expert testimony at an administrative hearing on the impacts of disposal of the TMI-2 accident generated water. From 1982 to 1995 I served as the Designated Federal Official (DFO) to the NRC sponsored TMI-2 Advisory Panel. During my tenure as the DFO the panel held over 65 public meetings in the Harrisburg, PA area. In 1993, as the TMI-2 cleanup effort neared its conclusion I assumed project management responsibilities for the decommissioning of the Trojan Nuclear Power Plant. Trojan was the first large PWR to

permanently cease operation and immediately begin active decontamination and dismantlement.

In 1997 I became first Acting, then Section Chief, of the Decommissioning Section in NRR. I was responsible for the project management of 19 permanently shutdown reactors. I also oversaw the implementation of NRC's 1996 final rule on decommissioning and the development of the 2002 Generic Environmental Impact Statement on the decommissioning of nuclear power reactors. During my tenure as Section Chief I made numerous presentations on the subject before industry, trade, and professional society meetings. In 1997, along with two coworkers, I developed and taught a one week course on reactor decommissioning at the University of Kiev, Ukraine. During my assignment to the TMI-2 cleanup effort and then as Chief of the Decommissioning Section I continued to periodically assist the NRC in the specialized areas of aquatic impact assessment and compliance with the Endangered Species Act. In the early 1990s I assisted in the development of the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, and the Final Environmental Impact Statement, Operating License Stage, for the Watts Bar Nuclear Station Unit 1.

In 2001, with the transfer of the responsibility for decommissioning within the NRC to NMSS, I joined the license renewal effort in NRR, again as an expert in environmental impact assessment. Since 2001 I has served as the license renewal environmental project manager for the St. Lucie, Browns Ferry, and the Oyster Creek nuclear stations, worked on numerous other license renewals as well as several early site permits serving as the Commission's expert in aquatic and terrestrial ecology, hydrology, and water intake design. I also was responsible for or assisted in conducting formal and informal endangered species consultations for a number of nuclear power stations including Crystal River, Hatch, Saint Lucie, and Turkey Point. I oversaw the preparation of the aquatic and in some cases the hydrological sections of the supplemental environmental impact statements for license renewal for the following nuclear stations:

Arkansas, Turkey Point , Saint Lucie, Fort Calhoun, North Anna, Surry, Catawba, Ginna, Summer, Cook, Quad Cities, Millstone, Vermont Yankee, Nine Mile Point, Monticello, FitzPatrick and Wolf Creek. I have also provided oversight to the aquatic ecology and hydrology sections for the preparation of the environmental impact statements for the North Anna, Clinton, and Grand Gulf ESP sites. I am a member of the American Fisheries Society.

March 1, 2007

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DOMINION NUCLEAR NORTH ANNA, LLC	)	Docket No. 52-008-ESP
	)	
(Early Site Permit for North Anna ESP Site)	)	

AFFIDAVIT OF JAMES VANNER RAMSDELL, JR. CONCERNING THE NRC STAFF RESPONSE TO THE BOARD'S ENVIRONMENT-RELATED QUESTIONS

I, James Vanner Ramsdell, Jr., do hereby state as follows:

1. I am employed as a Staff Scientist with the Atmospheric Chemistry and Meteorology Technical Group at the Pacific Northwest National Laboratory, managed by Battelle Memorial Institute's Pacific Northwest Division. I am providing responses to the Licensing Board's questions under a technical assistance contract with the staff of the U.S. Nuclear Regulatory Commission ("NRC"). A statement of my professional qualifications is attached.

2. As part of the NRC staff's environmental review of the North Anna ESP application, documented in NUREG-1811, the "Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site," December 2006, I assisted the NRC staff as the technical team member that provided input to the FEIS in the areas related to meteorology, air quality, noise, electromagnetic fields, reactor accident analysis, and alternatives.

3. I am responsible for those responses to Board questions (or portions of questions) in Attachment A to the "NRC Staff Legal Brief in Response to the Licensing Board's Environment-Related Questions" for which I am listed as the author.

4. I attest to the accuracy of those statements, support them as my own, and endorse their introduction into the record of this proceeding. I declare under penalty of perjury that those statements, and my statements in this affidavit, are true and correct to the best of my knowledge, information, and belief.

James Vanner Ramsdell, Jr.

RESUME

JAMES V. RAMSDELL, JR.

Staff Scientist
Applied Atmospheric Science
FUNDAMENTAL SCIENCE DIRECTORATE
Battelle, Pacific Northwest Laboratories

EDUCATION

B.S.	General Sciences, Oregon State University, Corvallis, Oregon	1961
M.S.	Meteorology, Oregon State University	1962
	Graduate Study, Atmospheric Sciences, University of Washington, and Joint Center for Graduate Study, Richland, Washington	1968-1976

EXPERIENCE

Mr. Ramsdell has been a member of the Battelle staff since 1967. He has worked as an individual contributor, as a member of intra- and interdisciplinary research teams, and as a project leader for intra- and interdisciplinary research teams. His areas of expertise include: research planning and organization, dispersion modeling, and applied atmospheric boundary layer description. He has reviewed manuscripts for the editors of: *Science*, *Journal of Climate and Applied Meteorology*, *Atmospheric Environment*, *Health Physics*, *Nuclear Technology*, *Solar Energy*, and the *Journal of Energy*, and he has been on review teams for the U.S. Department of Energy, the U.S. Nuclear Regulatory Commission, the U.S. Environmental Protection Agency, and the National Research Council. In addition, he has made presentations to National Academy of Sciences Review Panels and to the U.S. Nuclear Regulatory Commission's Advisory Committee on Reactor Safeguards.

- Review of Early Site Permit Applications. Mr. Ramsdell is the manager of a project assisting the U.S. Nuclear Regulatory Commission in reviewing applications and preparing environmental impact statements for Early Site Permits (ESP) for new nuclear power plants. These permits are authorized in a part of the NRC's regulations that has not been tested. Three ESP applications were submitted in the fall of 2003. Draft EISs for public comment were completed in late 2004 and early 2005. More than 1,000 sets of comments were received on each the first two EISs. Final EISs will be completed in 2006.

- Generic Environmental Impact Statement for License Renewal of Nuclear Plants. Mr. Ramsdell is the manager of a project that is performing the 10-year update of the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*, NUREG-1437. This document lists and evaluates environmental issues related to renewal of operating licenses for nuclear power plants. Where possible, the document reaches generic conclusions on the environmental impacts. These conclusions, along with the conclusions reached in site specific supplements, form the bases for staff recommendations to the Nuclear Regulatory Commission on the environmental acceptability of renewing nuclear power plant operating licenses.

- Environmental Impact Statements for Nuclear Power Plant License Renewal. Mr. Ramsdell is the manager of a project that is preparing site specific supplements to the *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*, NUREG-1437. Seventeen of these supplements have been completed, and work is underway on supplements for several more nuclear plants. These supplements contain site-specific reviews of environmental issues related to renewal of nuclear power plant operating licenses for which generic conclusions could not be reached in NUREG-1437. In addition, the supplements address issues that were not considered previously, or for which there is new information.

- Tornado Climatology. In April 2005, Mr. Ramsdell completed an update of the 1986 climatology of tornadoes in the contiguous United States that was prepared for the U.S. Nuclear Regulatory Commission. The climatology, which covers more than 46,000 tornado segments observed between 1950 and August 2003, estimates tornado strike probabilities for 1°, 2°, and 4° latitude and longitude boxes. Design wind speeds with probabilities of being exceeded of 10^{-5}, 10^{-6}, and 10^{-7} per year are also estimated for these boxes. Design wind speeds are also estimated for three regions of the country at the three probability levels.

- Generic Environmental Impact Statements for Decommissioning Nuclear Power Plants. Mr. Ramsdell was part of a PNNL team that reviewed the environmental impacts of decommissioning nuclear power reactors. Based on the results review, the team prepared an update to NRC's *Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities*, NUREG-0586.

- Dispersion Modeling. Mr. Ramsdell is a lead scientist in development of applied atmospheric dispersion models at Battelle. He specializes in development of models for atypical applications. He has developed and validated models for dispersion under low wind speed conditions and for dispersion in the vicinity of buildings. He developed a set of models to evaluate potential consequences of a release of material associated with a potential collapse of the shelter covering the Chernobyl Unit 4 reactor. He developed and validated the dispersion model used in Hanford Environmental Dose Reconstruction (HEDR) Project, which examined the consequences of the release of ^{131}I from the Hanford Site, and he developed the atmospheric dispersion model that is part of the U.S. Nuclear Regulatory

Commission's Radiological Assessment System for Consequence AnaLysis (RASCAL).

Each of these models represented an advance in the state of the art of applied dispersion modeling. The models of dispersion in low wind speed conditions and in the vicinity of buildings are being considered by the U.S. Nuclear Commission for use as standard models for regulatory purposes. The Chernobyl model included multiple plumes with variation of particle sizes and densities as a function of distance within a Gaussian model framework. The RATCHET code, developed for the Centers for Disease Control and Prevention as part of the HEDR Project, explicitly treats uncertainty in the input data to produce a range of estimates of concentration in the environment that are consistent with the available data and has become the standard dispersion model for use in Dose Reconstruction Studies for DOE sites. RASCAL is used by the U.S. Nuclear Regulatory Commission and others to estimate source terms, atmospheric dispersion, and doses during emergencies at nuclear power plants. Version 3.0 of RASCAL includes a model for UF_6 releases at fuel cycle facilities. This new model combines a dense-gas dispersion model with a thermodynamic model of the reaction of UF_6 and water.

Mr. Ramsdell also assisted in upgrading the atmospheric dispersion models in the GENII code; upgrading the atmospheric dispersion models used for assessing nuclear power plant control room habitability; and development of a Monte Carlo model to estimate release rates from environmental monitoring data.

- Environmental Impacts of Extending Reactor Fuel Burnup Above 60 GWd/MTU. Mr. Ramsdell led a study to evaluate the environmental impacts of increasing the burnup of reactor fuel (increasing the energy extracted from the fuel). This study included evaluation of changes in the radionuclide inventory in the fuel and releases of radionuclides to the gaps in fuel rods as burnup increases, changes in impacts associated with the front-end of the nuclear fuel cycle and normal reactor operations, changes in potential impacts of postulated reactor accidents, changes in impacts of transportation of spent nuclear fuel, and the economic effects of increasing fuel burnup.

- Environmental Review Plans. Mr. Ramsdell managed a project to review and update the U.S. Nuclear Regulatory Commission's *Environmental Standard Review Plans for the Environmental Review of Construction Permit Applications for Nuclear Power Plants.* These environmental standard review plans (ESRPs) had not been updated since they were written in the late 1970s. The updated document, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants*, NUREG-1555, was published for public comment in October 1997. The final document was published in March 2000. A supplement to the ESRPs, dealing specifically with environmental reviews associated with nuclear power plant license renewal, was also published in March 2000.

  As part of this project, PNNL assisted the NRC staff in preparation of a supplement to its *Final Environmental Statement Related to the Operation of the Watts Bar Nuclear Plant, Units 1 and 2.* Another portion of the project involved assisting the NRC staff in

identification of the measures necessary to ensure that activities in and around nuclear power plants comply with and further the purposes of the Endangered Species Act.

- Emergency Response Planning. Mr. Ramsdell has been an NRC observer for nuclear power plant emergency exercises and a member of emergency response facility appraisal teams. He has been involved in several studies related to emergency response planning. He led a team that reviewed criteria used by NRC to evaluate dispersion models for emergency response applications. The review covered the areas of: non-buoyant releases from buildings and building vents, elevated release diffusion rates, and identification of fumigation conditions and fumigation climatology.

- Extreme Wind Analyses. Mr. Ramsdell was lead scientist in the development of techniques for estimating extreme winds for use by the NRC in probabilistic risk assessments. This work has led to new techniques for adjusting extreme winds to a standard measurement height and computation of tornado strike probabilities. Published products include a tornado climatology for the contiguous United States and a report that describes a procedure for estimating extreme winds using readily available wind data.

- Environmental Impact Statements. Mr. Ramsdell has contributed to both the preparation of environmental impact statements for Battelle's industrial customers and the review of statements submitted to the Nuclear Regulatory Commission. In 1974 he wrote a detailed review of the instrumentation for meteorological monitoring programs at nuclear power plant sites. Mr. Ramsdell is involved in the continuing evaluation of the environmental impacts of the development of the Department of Energy's Hanford Area.

- Wind-Induced Bridge Motions. The Federal Highway Administration sponsored a Battelle study of wind-induced motions of the cable-stayed bridge between Pasco and Kennewick, Washington. Mr. Ramsdell was responsible for the installation and maintenance of wind instruments and the data collection and analysis for this study. Data analysis included description of winds associated with bridge motion in terms of threshold speeds, critical approach angles for the onset of motion and gust spectra. Coherence of the horizontal and vertical wind components along the span was also examined.

- Wind Energy Conversion. Battelle provided technical and management support for the Wind Characteristics Program Element of the Department of Energy's Wind Energy Program. From Battelle's initial involvement in February 1976 through June 1977, Mr. Ramsdell was the Principal Investigator of the Program Element. In that capacity, he coordinated the wind characteristics research funded through the Program Elements. He participated in the program as a scientist and contract monitor. He has organized and conducted several wind characteristics workshops.

- Wind Measurement. As a part of the research for the Department of Energy's Wind Energy Program, Mr. Ramsdell pursued various aspects of wind measurement. He has helped develop a short course on selection of sites for the installation of wind energy conversion systems; he has written chapters on wind instrumentation and measurement for several books and reports; he has conducted a wind tunnel evaluation of inexpensive anemometer systems, and he has examined strategies for efficient use of a limited number of instruments for estimating the wind recourse at a large number of locations.

- Wind Speed Time Series Simulation. The economic evaluation of large wind energy conversion systems requires the matching of available wind energy with energy demand on an hour-by-hour basis. Mr. Ramsdell developed a Monte Carlo simulation model to generate wind speed time series that have the correct statistical characteristics. The model is capable of duplicating known seasonal and diurnal variations in the mean wind, as well as the hour-to-hour correlation between wind speed observations.

- Nuclear Energy Center Evaluations. In the middle and late 1970s, Mr. Ramsdell was involved in the evaluation of the energy center concept. He concentrated on the environmental impact of the energy releases from energy center cooling systems, and has considered both wet and dry cooling systems. He also examined the meteorological factors associated with multiple-reactor contamination following an accidental release of radioactive material in a nuclear energy center. In 1976, Mr. Ramsdell was the project leader for an interdisciplinary study of the postulated weather modification effects of large energy releases. That study examined the potential ecological and economic effects that might result from the weather modification as well as estimated the magnitude of the modification.

- V/STOL Air Craft Operations in an Urban Area. From 1972 through 1974, Mr. Ramsdell was principal investigator for an extensive state-of-the-art review and analytical and experimental study of meteorological problems associated with terminal area operations of Vertical/Short Take-Off and Landing (V/STOL) aircraft. The first phase of this study included identification of those meteorological parameters that significantly affect V/STOL operation. In the second phase of the study, an extensive data collection program was completed that included the measurements of both temporal and spatial features of models of turbulence below an altitude of 200 feet. Analysis of these data led to models of turbulence in an urban area.

- Atmospheric Diffusion and Transport. Mr. Ramsdell has been involved in atmospheric transport and diffusion studies since 1967. His experience includes collection and analysis of diffusion data from Hanford, Vandenberg Air Force Base in California, and Plowshare nuclear cratering experiments at the Nevada Test Site. He published the diffusion data collected at Hanford between 1959 and 1974.

PROFESSIONAL AFFILIATIONS

American Meteorological Society
Health Physics Society

March 1, 2007

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DOMINION NUCLEAR NORTH ANNA, LLC	)	Docket No. 52-008-ESP
	)	
(Early Site Permit for North Anna ESP Site)	)	

AFFIDAVIT OF MICHAEL R. SACKSCHEWSKY CONCERNING THE NRC STAFF RESPONSE TO THE BOARD'S ENVIRONMENT-RELATED QUESTIONS

I, Michael R. Sackschewsky, do hereby state as follows:

1. I am employed as a Senior Research Scientist at the Pacific Northwest National Laboratory, managed by Battelle Memorial Institute's Pacific Northwest Division. I am providing responses to the Licensing Board's questions under a technical assistance contract with the staff of the U.S. Nuclear Regulatory Commission ("NRC"). A statement of my professional qualifications is attached.

2. As part of the NRC staff's environmental review of the North Anna ESP application, documented in NUREG-1811, the "Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site," December 2006, I assisted the NRC staff in its analysis of the aspects of the applicant's Environmental Report that concerned terrestrial ecology and threatened and endangered species issues.

3. I am responsible for those responses to Board questions (or portions of questions) in Attachment A to the "NRC Staff Legal Brief in Response to the Licensing Board's Environment-Related Questions" for which I am listed as the author.

4. I attest to the accuracy of those statements, support them as my own, and endorse their introduction into the record of this proceeding. I declare under penalty of perjury that those statements, and my statements in this affidavit, are true and correct to the best of my knowledge, information, and belief.

Michael R. Sackschewsky

Resumé

Michael R. Sackschewsky

Ecology Group
Battelle / Pacific Northwest National Laboratory
P.O. Box 999 K6-84
Richland, WA. 99352
(509) 376-2554 (509) 372-3515 (Fax)
michael.sackschewsky@pnl.gov

Education:

Ph.D. in Botany, Washington State University, 1987
Dissertation: Factors Affecting Species Distribution and Coexistence in the Colorado Shortgrass Steppe.

B.A. in Biology, University of Colorado, 1983 Graduated with Distinction.
Independent Research: Heavy metal tolerance in *Heterotheca villosa*.

Employment History:

Senior Research Scientist (1994 - present) Battelle, Pacific Northwest National Laboratory, Richland, WA.

Manager for Hanford Site Ecological Compliance Assessment, including day to day task oversight, performance and evaluation of field surveys for rare plant and animal species, perform wetland delineation, work with projects to develop and implement of mitigation actions. Developed the Hanford Site biological resource mitigation strategy.

Technical team leader for the preparation of NRC licensing-action Environmental Impact Statements. Responsible for all aspects of technical coordination, supervision of document production, budget, and resource planning.

Technical lead for terrestrial ecology and threatened and endangered species evaluations portions of Environmental Impact Statements for the Nuclear Regulatory Commission, the Department of Energy, and Federal Energy Regulatory Commission.

Task manager and technical leader for the evaluation of Endangered Species Act Compliance of all NRC licensed commercial nuclear power generating facilities.

Provide botanical and ecological support, such as the field analysis of plant communities at the National Training Center (Ft. Irwin, CA), the Hanford Site, and other locations; taxonomic support to various projects; and preparation of biological assessments and NEPA support documents.

Project manager for Hanford Site Habitat Mitigation Project, including the development and application of methods for habitat analysis and mapping using HEP and GIS based approaches, and develop and evaluate revegetation and habitat restoration techniques.

Project manager for the development of the Environmental Quality Profiling Tool (EQPT), and the Health and Ecological Risk Management and Evaluation System (HERMES) - GIS based environmental decision support tool to predict and evaluate impacts to biological resources.

Senior Scientist (1989 - 1994) Westinghouse Hanford Company, Richland, WA.

Lead scientist for projects supporting environmental remediation and restoration. Planned and performed ecological evaluations and rare plant surveys for NEPA documentation and RCRA/CERCLA remedial investigations, development and evaluation of soil surface stabilization and revegetation enhancement techniques, performing and managing ecological and human health risk assessments, and operating a lysimeter facility as part of the permanent isolation barrier development program.

Instructor (1988 - 1989) Department of Mathematics, Lycoming College. Williamsport, PA.

Taught undergraduate level introductory Statistics.

Post-Doctoral Fellow (1988) Biology Dept., Bucknell University, Lewisburg, PA.

Performed research on the effects of gall forming insects on carbon allocation in goldenrod using C-14 labeling techniques, responsible for the design and execution of experimental and analytical procedures, and performed all subsequent data analysis and interpretation.

Significant Scientific Awards and Recognition:

Phi Beta Kappa National Honor Society
American Botanical Society Young Botanist Award - 1983

Experience:

- Laboratory Team Leader, Southern Nuclear Company Early Site Permit Application Environmental Impact Statement and Browns Ferry Nuclear Plant, License Renewal Supplemental Environmental Impact Statement.

- Prepared terrestrial ecology and threatened and endangered species sections and prepared Biological Assessments to support the Oconee, St. Lucie, Turkey Point, Peach Bottom, Ginna, and Brunswick Nuclear Plant license renewal supplemental EIS's, the North Anna Early Site Permit EIS, the Watts Bar full-power license EIS, and the commercial nuclear power plant decommissioning generic EIS (NRC).

- Terrestrial ecology and threatened and endangered species technical lead for the Spokane River Hydropower license renewal Environmental Impact Statement (FERC).

- Prepared terrestrial ecology and threatened and endangered species impacts analysis for the Moab Uranium Mill Tailings Remediation EIS (DOE).

- Management of the Hanford Site Ecological Compliance Assessment Project. This program evaluates the potential impacts of all Hanford Site projects and provides assurance to DOE that potential impacts of Hanford projects on State and Federally listed threatened and endangered species and important habitats are identified and minimized through early field investigations.

- Task manager for the evaluation of the status of Endangered Species Act compliance at all NRC licensed nuclear power generating facilities. Perform ESA compliance reviews and prepared biological assessments at commercial nuclear facilities such as San Onofre, Diablo Canyon, and Columbia Generating Station.

- Primary Contributor to the NRC Environmental Standard Review Plan for license renewal and new license applications.

- Lead an interdisciplinary team of biologists, risk assessors, economists, and GIS specialists in the development of EQPT, an integrated environmental decision support tool based on GIS technology. This tool allows the user to evaluate multiple aspects of environmental decisions, including ecological risk, habitat loss, and monetary costs.

- Prepared Biological Assessment of the potential impacts on Bald eagle, Gray wolf, Grizzly bear, Peregrine falcon, Marbled Murrelet, and Northern Spotted Owl resulting from construction and operation of hatchery facilities and acclimation ponds for the Yakima Fisheries Project, Kittitas County, Washington.

- Lead author of "Vascular Plants of the Hanford Site", which is the most extensive compilation available of the local flora of the Hanford Site near Richland, WA.

- Completed U.S. Army Corps of Engineers Wetland Delineation Training Program.

- Developed the use of natural polysaccharides as soil fixatives for use in radioactive or hazardous waste clean-up settings. Products evaluated included potato starch, wood processing by-products, and sugar beet by-products. These materials were shown to be effective soil stabilizers that did not interfere with in-field contaminant screening or with soil treatment processes.

- Conducted research in support of the development of permanent isolation barriers for radioactive and hazardous waste sites. Tasks included investigating the effects of vegetation and soil surface treatments on soil water balance and assessing the potential long-term impacts of plants on barrier functionality and the effects of long- and short-term successional changes on barrier function and integrity.

Bilyard, G. R., M.R. Sackchewsky, S.A. Tzemos. 2002. Hanford Site Ecological Quality Profile. PNNL-13745, Pacific Northwest National Laboratory, Richland, WA.

Sackschewsky, M.R. and J.L. Downs (2001) Vascular Plants of the Hanford Site. PNNL-13688, Pacific Northwest National Laboratory, Richland, WA.

Sackschewsky, M. R., C. A. Duberstein, and J. M. Becker (2001) 200 Areas Ecological Data Compilation. Letter Report for CH2M Hill Hanford Company. July 2001.

Durham, R.E., Lewinsohn, J.S., & Sackschewsky, M.R. (2001). W-519 Sagebrush Mitigation Project FY 2001 Status Report. PNNL-14123, Pacific Northwest National Laboratory, Richland, WA..

Sackschewsky M. R. and L. Stull (2001) Biological Assessment for Endangered and Threatened species potentially affected by the continued operation of the Turkey Point Nuclear Plant and Associated Transmission lines. Biological Assessment prepared for the U. S. Nuclear Regulatory Commission. July, 2001.

Becker, J.M. and M. R. Sackschewsky (2001) Addendum to the 200 West Area Dust Mitigation Strategy. Letter Report to CH2M Hill Hanford Group. June 2001. PNNL-13884, Pacific Northwest National Laboratory, Richland, WA.

Sackschewsky, M. R. and J. M. Becker (2001) 200 West Area Dust Mitigation Strategy. Letter Report to CH2M Hill Hanford Group. April 2001. PNNL-13883, Pacific Northwest National Laboratory, Richland, WA.

Sackschewsky, M. R., J. S. Lewinsohn, and R. E. Durham. (2000) W-519 Sagebrush Mitigation Project, FY 2000 Status Report. Letter Report to U.S. Department of Energy. September 2000.

Sackschewsky, M. R. (1999) Safe Interim Storage Project (Project W-058) Sagebrush Mitigation FY 1999 Monitoring Report. Letter Report to U.S. Department of Energy. PNNL-14122, Pacific Northwest national Laboratory. September 1999.

Sackschewsky, M. R. (1999) Biological Assessment for Endangered and Threatened species potentially affected by the continued operation of the Oconee Nuclear Station and Associated Transmission lines. Biological Assessment prepared for the U. S. Nuclear Regulatory Commission. June 1999.

Brandt, C. A. and M. R. Sackschewsky (1999) Ecological Compliance Assessment Project Implementation Plan. Draft DOE/RL-95-11 Rev 2.

Sackschewsky, M. R. (1998) Safe Interim Storage Project Sagebrush Mitigation 1998 Monitoring Report. Letter Report to U.S. Department of Energy. July 1998.

Sackschewsky, M. R. (1998) Mitigation Implementation Plan for the Tank Waste Privatization Phase I, Infrastructure Development. Letter Report to Numatec Hanford Corporation, June 1998.

Sackschewsky, M.R. (1997) Threatened and Endangered Species Evaluation for 75 Licensed Commercial Nuclear Power Generating Plants. Prepared for the U.S. Nuclear Regulatory Commission. PNNL-11524, Pacific Northwest National Laboratory, Richland, WA.

Kemp, C.J. and M.R. Sackschewsky (1997) Vegetation and Moisture Performance on a Resource Conservation and Recovery Act - Equivalent Landfill Cap at the Hanford Site. BHI-00980, Bechtel Hanford Inc., Richland WA.

Brandt, C.A., J.M. Becker, N.A. Cadoret, J.A. Hall, M.R. Sackschewsky, and B.L. Tiller (1995) National Training Center, Ft. Irwin Expansion Area Ecological Resource Assessment - Draft. Prepared for the U.S. Army, National Training Center

Link, S.O., L.L. Cadwell, K.L. Petersen, M.R. Sackschewsky, and D.S. Landeen (1995) The Role of Plants and Animals in Isolation Barriers at Hanford, Washington. PNL-10788, Pacific Northwest Laboratory, Richland, WA.

Kemp, C.J. and M.R. Sackschewsky (1994) Revegetation Enhancement Demonstration Project, Fiscal Year 1994. BHI-00059, Bechtel Hanford, Inc., Richland, WA.

Kemp, C.J., W.M. Hayward, and M.R. Sackschewsky (1994) Surface Stabilization and Revegetation Test Plots, fiscal year 1994 technical report. BHI-00082. Bechtel Hanford Inc. Richland, WA.

Landeen, D.S., R.M. Mitchell, A.R. Johnson, and M.R. Sackschewsky (1994) Comparison of radionuclide levels in Soil, Sagebrush, plant litter, cryptogams, and small mammals. WHC-EP-0771. Westinghouse Hanford Company, Richland, WA.

Sackschewsky, M.R. (1993) Fixation of Soil Surface Contamination Using Natural Polysaccharides. WHC-EP-0688, Westinghouse Hanford Company, Richland, WA.

Sackschewsky, M.R., C.J. Kemp, and W.M. Hayward (1993) Surface Stabilization and Revegetation Test Plots, fiscal year 1993 status report. WHC-EP-0684, Westinghouse Hanford Company, Richland, WA.

Smith, J. L., C. J. Kemp, and M. R. Sackschewsky (1993) Residual Herbicide Study on Selected Hanford Site Roadsides. WHC-MR-0426, Westinghouse Hanford Company, Richland, WA.

Landeen, D.S., M.R. Sackschewsky, and S. Weiss (1993) 100 Areas CERCLA Ecological Investigations. WHC-EP-0620, Westinghouse Hanford Company, Richland, WA.

Sackschewsky, M.R., C.J. Kemp, and L.L. Cadwell (1993) Status report for the small-tube lysimeter facility, Fiscal Year 1992. WHC-EP-0592, Westinghouse Hanford Company, Richland, WA

Sackschewsky, M.R., G.I. Baird, D.S. Landeen, J.L. Downs, and W.H. Rickard (1992) Vascular Plants of the Hanford Site. WHC-EP-0554, Westinghouse Hanford Company, Richland, WA.

Sackschewsky, M.R. (1992) Biological Assessment for Rare and Endangered Plant Species, Related to CERCLA characterization activities. WHC-EP-0526, Westinghouse Hanford Company, Richland, WA.

Sackschewsky, M.R. and D.S. Landeen (1992) Fiscal Year 1991 100 Areas CERCLA Ecological Investigations. WHC-EP-0448, Westinghouse Hanford Company, Richland, WA.

Sackschewsky, M.R.; J.C. Chatters; S.O. Link; and C.A. Brandt (1991) Protective Barrier Development Program: Test Plan for Plant Community Dynamics. WHC-EP-0380. Westinghouse Hanford Co., Richland, WA.

Sackschewsky, M.R.; C.J. Kemp; L.L. Cadwell; M.E. Thiede; and W.J. Waugh (1991) Status Report for the Small-Tube Lysimeter Facility, FY 1990. WHC-EP-0381. Westinghouse Hanford Co., Richland, WA.

Relyea, J.F.; M.R. Sackschewsky; and W.J. Waugh (1990) Small-Tube Lysimeter Facility Status Report for Fiscal Year 1989. WHC-EP-0297. Westinghouse Hanford Company, Richland, WA.

Professional Presentations:

Sackschewsky, M. R. 2004. "Rare Plant Monitoring on the Hanford Site." Washington State Weed Conference, Yakima, WA. PNNL-SA-42931, Pacific Northwest National Laboratory, Richland, WA..

Sackschewsky, M. R. and R. E. Durham. 2003. "Restoration Efforts After Wildfire at Hanford." Repairing Pacific Northest Rangelands – Reality Checks and Realistic Tools. The 32nd Annual Pacific Northwest Range Management Shortcourse. Spokane, WA. PNNL-SA-38356, Pacific Northwest National Laboratory, Richland, WA.

Durham, R. E. and M. R. Sackschewsky. 2002. "Cheating the Odds in Sagebrush Restoration." Ecological Society of America, Tucson, AZ. PNNL-SA-36067, Pacific Northwest National Laboratory, Richland, WA.

Tzemos, S. M.R. Sackschewsky, and G. R. Bilyard. 2002. "EQPT: Ecological Quality Profiling Tool." 2002 ESRI Users Conference, San Diego, CA. PNNL-SA-36741, Pacific Northwest National Laboratory, Richland, WA.

Lewinsohn JS, R. Alan Black and Sackschewsky MR. (2001) "Germination Ecology of *Astragalus Sclerocarpus* and *Astragalus Succumbens* in South-Eastern Washington." Ecological Society of America, Madison WI, August 2001. PNNL-SA-35136, Pacific Northwest National Laboratory, Richland, WA.

Sackschewsky, M. R. S. Tzemos, and G. R. Bilyard (2001) "EQPT: A GIS-Based Tool for Assessing Environmental Quality." Eco-Informa 2001, May 2001, Chicago, Ill. PNNL-SA-34895, Pacific Northwest National Laboratory, Richland, WA.

Lewinsohn JS, and Sackschewsky MR. (2001) "Germination and Establishment of Native Forbs from the Columbia Basin Sagebrush Steppe." Society for Ecological Restoration, NW Chapter, Bellevue, WA. April 2001. PNNL-SA-34510, Pacific Northwest National Laboratory, Richland, WA.

Durham RE, Sackschewsky MR, and Zamora BA. (2001) "Tubling and Bare-root Survival of Wyoming Big Sagebrush on the Shrub Steppe of South-central Washington." Society for Ecological Restoration, NW Chapter, Bellevue, WA. April 2001. PNNL-SA-34532, Pacific Northwest National Laboratory, Richland, WA.

Durham, R. E., B. A. Zamora, and M. R. Sackschewsky (2000) Survival and growth of *Artemisia tridentata*: A comparative study of tube-grown and bare-root propagule types across varying soil textures and community structures in south-central Washington. Wildland Shrub Symposium, Shrubland Ecosystem genetics and biodiversity. Provo, UT. 13- 15 June, 2000. PNNL-SA-34896, Pacific Northwest National Laboratory, Richland, WA.

Rogers, W. J., J. W. Bickman, T. M. Bolwahnn, and M. R. Sackschewsky (1998) Spatial Weight-of-evidence Integrated Risk Assessment. Presented to the Society for Environmental Toxicology and Chemistry, Charlotte, NC. Nov. 1998.

Scott, M. J., G. R. Bilyard, M. R. Sackschewsky, S. Tzemos, and B. A. Walker (1998) HERMES: Methods for including Ecological Values in Environmental Restoration. Presented to the Society for Environmental Toxicology and Chemistry, Charlotte, NC. Nov. 1998.

Sackschewsky, M.R., T.K. O'Neil, S. Tzemos, M.J. Scott, C.A. Brandt, and P.G. Doctor (1996) Integrated Environmental Decision Support Tool Based on GIS Technology. Presented to the Society for Environmental Toxicology and Chemistry. Washington, DC. Nov. 1996

Sackschewsky, M.R. (1993) Identification and protection of sensitive plant species and unique habitats at the U.S. Department of Energy's Hanford Site. Presented to the Ecological Society of America. Bull. Ecol. Soc. Amer. 74(2):422

Sackschewsky, M.R., D.S. Landeen, and L.L. Cadwell (1992) Designing Protective Barriers for the Long-term Isolation of Radioactive Wastes. Presented to the Ecological Society of America. Bull. Ecol. Soc. Amer. 73(2).

Sackschewsky, M.R. and R.K. Monson (1989) Seasonal water relations and physiological response to water stress in *Agropyron smithii* Rydb. Presented to the Ecological Society of America. Bull. Ecol. Soc. Amer. 70:251.