UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
Florida Power & Light Company	)	Docket No. 50-250-LA
	)	50-251-LA
(Turkey Point Units 3 and 4)	)	
	)	ASLBP No. 15-935-02-LA-BD01

DECLARATION OF PETER F. ANDERSEN

I, Peter F. Andersen, do hereby state as follows:

1. I am employed by Tetra Tech, Inc., an environmental consulting firm, where I am a Principal Engineer and Operations Manager at the Alpharetta, GA office. In this position, I am responsible for project management, conceptual designs of remedial engineering systems for hazardous waste sites, analysis of subsurface systems using numerical models, and evaluation of water supply potential and prediction of impacts of water supply development. A statement of my professional qualifications is attached.

2. I am responsible for the paragraphs in the direct testimony on Contention 1 filed today that are marked with my initials.

3. I attest to the accuracy of those statements to the best of my knowledge, information, and belief, support them as my own, and endorse their introduction into the record of this proceeding.

4. I declare under penalty of perjury that the foregoing is true and correct. Executed on November 10, 2015.

Executed in Accord with 10 CFR 2.304(d)

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Peter F. Andersen
Tetra Tech, Inc.
1165 Sanctuary Parkway
Suite 270
Alpharetta, GA 30009

Peter F. Andersen, P.E.

Principal Engineer

35 years experience in groundwater hydrology and civil engineering. Professional expertise with numerical methods in hydrology, groundwater hydrology, contaminant transport, surface water hydrology, computer programming, saltwater intrusion and aquifer water quality, wellfield analysis, and aquifer thermal energy storage

Education:

M.S., Civil Engineering, Department of Civil Engineering, Auburn University, 1980

B.C.E., Civil Engineering, Department of Civil Engineering, Auburn University, 1977

Registrations/Certifications:

Professional Engineer:
VA #014511
GA #028802
AL #26482
FL #62133

Office:

Atlanta

Years of Experience:

Thirty five

Years with Tetra Tech:

Thirty three

RELEVANT PROJECT EXPERIENCE

Florida Power and Light Company, Florida City – Project Manager for technical analysis for certification of a 125 mgd backup water supply for two new nuclear units at the Turkey Point electrical power plant. Conducted numerical modeling using MODFLOW and SEAWAT to assess the feasibility of infiltrating ocean water through a series of laterals extending beneath Biscayne Bay from on-shore caissons. The model was also used to design and analyze a 10,000 gpm aquifer test and to predict the environmental impact of operating the radial collector system. Provided peer review of another contractor's work related to the regional impact of the radial collector wells. Testified in the Site Certification hearing on nature of the impacts and compliance with State and County statuates and codes.

Florida Power and Light Company, Florida City – Provided support to the development of a groundwater, surface water, and ecological monitoring plan for the cooling canal system at the Turkey Point site as a part of the "Uprate Project". Developed a comprehensive water and solute balance of the cooling canal system. Evaluated the effectiveness of adding Floridan Aquifer water to the cooling canal system to reduce salinity.

Lockheed Martin Corporation, California – Task Manager for development and execution of groundwater flow and solute transport modeling of perchlorate and TCE plumes in the Redlands area. The modeling is being used to make decisions regarding implementation of water treatment at wellheads and blending to attain water quality objectives. Various basin-wide pumping scenarios have been evaluated to optimize containment and minimize costs. Successfully identified wells that would be affected by a slug release from the industrial facility based on an analytical screening model, BIOCHLOR.

New York Office of the Attorney General, New York. As a consulting expert, developed a conceptual model of groundwater flow and solute transport for the OU-3 off-site groundwater of the New Cassel Industrial Area (NCIA) on Long Island. Oversaw development of an EVS/MVS visualization of chemical data. Presented results to the Office of the Attorney General and Department of Environmental Conservation. Later, as a testifying expert, developed opinions for the purpose of cost recovery regarding extent of TCE and PCE contamination resulting from three sites in the NCIA. Gave a deposition regarding these opinions.

Mississippi Department of Environmental Quality, Jackson, Mississippi – Conducted a peer review of a groundwater flow model developed by the MDEQ of the Mississippi Delta Alluvial Aquifer. Attended meetings with the MDEQ and USGS and conducted a review of the modeling assumptions and implementations. Authored a report on the findings and made suggestions for model improvements and aquifer management strategies.

ATK Launch Systems, Magna, Utah – Project Manager for a Corrective Measures Study at a solid-fuel rocket motor research, development, and production facility. Oversaw the development of a plan submitted to the Utah Department of Environmental Quality that identified corrective action objectives, developed various alternatives for meeting the objectives, and provided details on the selected remedy. Constituents of interest included perchlorate, TCE, and 1,1-DCE.

Westinghouse Savannah River Company, South Carolina - Program Manager for a task order contract for groundwater modeling services. The tasks ranged from determining the extent and risk of groundwater and soil contaminated with solvents, metals, and/or radioactive byproducts to evaluating the effectiveness of various remedial alternatives Contaminants of concern for these analyses included solvents, metals, and radionuclides (tritium, uranium, plutonium, radium). Conducted or managed work using MODFLOW, MT3DMS, MODFLOW-T, MODPATH, HELP, FTWORK, GMS, VZCOML, GOLDSIM, ArcView/GIS, ZONEBUDGET, TRAMP.

U.S. Army Corps of Engineers, Sacramento District– Project Manager for a solute transport modeling study at the Tooele Army Depot (TEAD) in Utah. Evaluated the development of a large TCE plume and the operation of a 5000 gpm groundwater extraction/injection system. Provided technical justification for the temporary shutdown of the system. Continue to provide annual updates to the model, advice on monitoring and management of the plume, and present results to regulators and the public.

U.S. Army Corps of Engineers, Mobile District - Evaluated groundwater capture zone modeling for containment of an explosives (TNT, RDX, HMX) plume at the Milan Army Ammunition Plant in Milan Tennessee. Selected locations of additional extraction wells and designed the groundwater monitoring network to verify containment and restoration at the O-line facility. Performed numerical modeling to verify capture zones of the operating system and evaluated alternative operational strategies. Performed modeling in support of a base-wide risk assessment. Used numerical modeling to design a groundwater extraction system and associated monitoring network at the X-line facility. Presented results at several Restoration Advisory Board (RAB) meetings.

U.S. Army Corps of Engineers, Kansas City District – Provided guidance on correcting and modifying an existing groundwater flow and contaminant transport model at the former Nebraska Ordnance Plant in Mead, Nebraska for the purposes of cost recovery. Oversaw development of programs to compute factors relevant to cost recovery, such as relative mass in place of various constituents and duration of remediation. Presented results to U.S. Army Corps technical staff, EPA, Department of Justice attorneys, and representatives of potentially responsible parties.

Nicolet Minerals Company, through Foth and Van Dyke, Inc., Northern Wisconsin - Project Manager for groundwater modeling and studies in support of an Environmental Impact Report (EIR) for a proposed underground zinc mine. The study involved using numerical modeling to predict mine inflows and effects on the groundwater system and surface waters due to mining operations. Solute transport modeling to assess the magnitude and extent of metals migration from a proposed tailings management area was also performed. The results of the study were used to design water handling and water treatment facilities and to demonstrate compliance with regulatory requirements. Participated in over 50 public meetings with state and federal regulators, the U.S.G.S., Native American Tribes, and citizen groups.

U.S. Army Corps of Engineers, Mobile District - Task manager for groundwater flow and transport modeling being conducted in support of a focused feasibility study at the Anniston Army Depot, Anniston, Alabama –. Challenging aspects regarding the site are the combination of its setting in a karst limestone aquifer and the presence of DNAPLs in the subsurface.

Westinghouse Savannah River Company, South Carolina - Performed numerical modeling in preparation of an Environmental Impact Statement (EIS) for a new production reactor at the Savannah River Site. Also developed and calibrated a regional three-dimensional groundwater flow model of the hydrogeologic system. Used parameter estimation techniques to calibrate and evaluate the model. In addition, performed numerical modeling of RCRA closure options for two seepage basins. Contaminants of concern included solvents, metals, and radionuclides (uranium, plutonium, radium, tritium).

Northwest Florida Water Management District – Project manager for a study of water supply development potential on St. George Island, Florida. Developed screening level models to evaluate various levels of development and their impact in terms of drawdown and saltwater upconing.

Northwest Florida Water Management District - Provided technical review and advice on the development of a groundwater flow and saltwater transport model of the coastal area of Okaloosa and Santa Rosa Counties in Florida. Considerations for the conceptual model, a pre-development model, and sensitivity/uncertainty analysis were presented to the District and later incorporated into the model.

Escambia County, Florida – Reviewed a petition for a waiver to the County's wellhead protection ordinance for an expansion to a construction debris landfill. Performed technical analyses to refute claims regarding the influence of a public water supply well on groundwater flow directions on the landfill property. Gave a deposition on the findings and provided support for attorneys representing the County.

South Florida Water Management District, Florida – Served as chairman of two peer review teams for groundwater models of the Lower East Coast of Florida and East Central Florida. The models were of significant complexity and included groundwater/surface water interactions. Led weekly teleconferences and was in charge of developing reports on the findings of the peer review teams.

St. Johns River Water Management District, Florida - Provided peer review of groundwater modeling projects being conducted by District staff and outside consultants. Models and studies that have been reviewed include: 1) Northeast Florida, 2) East Central Florida, 3) Volusia County, 4) Palm Coast, 5) Rationale for minimum flows and levels at Blue Spring, and 6) North Central Florida. Provided input to the District for modification to the models. Participated in the Northeast Florida Water Supply Planning Area Groundwater Modeling Subgroup meetings and discussions.

Northwest Florida Water Management District, Florida. Provided peer review of groundwater flow model of a proposed new wellfield in Bay County. Participated in meetings and discussions to refine the model. Provided testimony and assisted attorneys in cross-examination of witnesses for parties opposing the wellfield at an administrative hearing.

Northwest Florida Water Management District - Prepared a data package for inclusion in a dredge and fill permit application for Bayou Chico (Pensacola, FL). The impact of a wellhead protection ordinance was evaluated, as well as the potential for saltwater migration from the dredge pond under variable climatic conditions. The SEAWAT model was applied to evaluate the potential for migration of a saltwater plume to a public water supply well. A groundwater monitoring plan was developed to set triggers for when dredging should be curtailed and for verification that saltwater was not migrating from the pond. Participated in negotiations between the regulatory agency, water management district, and a water supplier to gain issuance of the permit, which was eventually granted.

Hillsborough County, Florida – Member of the County's Water Team, which evaluated various water supply projects and their effect on the County's interests. Provided litigation and arbitration support as required. Provided review of SWFWMD proposed rule on minimum flows and levels. Gave a deposition on opinions on validity and applicability of the rule. Evaluated environmental impacts due to the proposed Cone Ranch wellfield. Reviewed a plan for optimal operation of wellfields in the Northern Tampa Bay area. Quantified expected environmental impacts from a proposed above-ground off-stream storage reservoir. Participated in an arbitration regarding the impacts due to the reservoir. Provided review of an integrated groundwater/surface water model of the Northern Tampa Bay area.

Oldcastle Materials, Opelika Alabama – Developed a conceptual model to evaluate allegations of spring depletion due to dewatering of a quarry. Collected and evaluated data from sonic flow meters, water level transducers, precipitation gages, and other sources to develop the conceptual understanding. Gave a deposition on the findings in anticipation of a jury trial.

Kennecott Eagle Minerals Company, Upper Peninsula, Michigan – Reviewed groundwater modeling performed as a part of mine permit application to assess the impact of bedrock mine dewatering on a surficial aquifer and streams. Modeling performed by the client's consultant and parties opposed to the mine were reviewed and expert testimony prepared in preparation of a contested case hearing.

Coastal Bend/Coastal Plains Groundwater Conservation Districts, Texas. Technical reviewer for work related to the Lower Colorado River Authority (LCRA) and San Antonio Water System (SAWS) Water Project (LSWP). The initial focus of this support was to review for the Districts the numerical groundwater flow model that was developed as part of the LSWP by URS Corporation and others.

Meridian Gold, Chile – Developed a groundwater flow model to assess the impacts of mine dewatering, in particular changes to a groundwater divide upon which the proposed mine is situated. Drawdown, impacts to surface water flows, and potential contaminant pathways were also assessed.

Smurfit-Stone Corporation, Fernandina Beach, Florida – Conducted groundwater modeling in support of the facility's consumptive use permit renewal. Developed a wellfield management plan as guidance for operation, monitoring, and reporting.

NewFields, Inc., Muskegon, Michigan - Performed a particle tracking evaluation of proposed remedial alternatives at the Bofors-Nobel Superfund Site for a PRP group. Evaluated mechanisms for the fate and transport of benzidine contamination.

NewFields, Inc., Aberdeen, North Carolina - Performed solute transport modeling and technical analysis in support of a natural attenuation demonstration at the Aberdeen Pesticide Dump Sites for a PRP group. The modeling helped demonstrate the ineffectiveness of a proposed pump-and-treat remedy and that natural attenuation and phyto-remediation would prevent off-site migration of contamination.

JIS Performing Group, New Jersey - Provided peer review of a groundwater flow and solute transport model for a PRP group. Modeling was performed to assess merits of various pump-and-treat and monitored natural attenuation scenarios. Recommendations were made for all aspects of the study, including development of the conceptual model, model calibration, and construction of scenarios.

Florida Power and Light Company, Florida City – Reviewed groundwater modeling conducted in support of site certification under the State of Florida's Power Plant Siting Act of the Turkey Point Unit 5 Expansion Project. Performed independent groundwater modeling to evaluate impacts to existing legal users of groundwater (irrigation and aquifer storage and recovery ASR facilities) and presented expert testimony at the site certification hearing.

Pinellas County Utilities, Florida - Evaluated a groundwater model study developed by the state regulatory agency. Performed inverse modeling to evaluate the effect of parameter uncertainty on drawdown impact predictions. Also evaluated the technical basis for environmental protection standards developed by the state. Provided integrated groundwater/surface water modeling using a linked HSPF/MODFLOW model in support of a consumptive use permit for the Cross Bar Ranch wellfield.

Addington Environmental Services, Macon, Georgia - Performed numerical modeling to evaluate groundwater flow trajectories and solute concentrations resulting from a leak scenario for a proposed landfill expansion.

Pinellas County Utilities, Florida - Technical analysis of water use permit renewals at four wellfields in the northern Tampa Bay area. Gave two depositions in anticipation of an administrative hearing.

Peace River Manasota Regional Water Supply Authority, Florida (through Carey, Whittaker, O'Malley, and Manson, P.A.) – Evaluated the effectiveness of a proposed reservoir in southwest Florida for meeting environmental goals (minimum stream flows) and water-supply demand.

South Florida Water Management District, Florida - Provided review of technical issues relating to development of minimum water flows and levels criteria for the Lower East Coast Planning Area as a member of the SFWMD Expert Assistance Pool.

Deseret Ranches/EEE Corporation/NNN Corporation, Osceola County, Florida - Evaluated hydrogeological data and their implementation into numerical flow and transport models for a proposed wellfield. Presented expert testimony regarding results of the analysis at an administrative hearing.

South Florida Water Management District, Florida - Project Manager for the development of a groundwater withdrawal optimization module for the MODFLOW model. This module allows determination of optimal pumpage rates and locations given constraints on head, drawdown, or hydraulic gradients.

Foth and Van Dyke, Inc., Southern Illinois - Provided technical review and oversight of flow and transport modeling performed in support of two proposed landfill expansions.

St. Johns River Water Management District, Florida - Served on a panel that provided recommendations for assessment of future needs and sources of groundwater to the St. Johns River Water Management District of Florida.

St. Johns River Water Management District, Florida - Served as project manager for a project involving development of a three-dimensional flow and transport model of the Wekiva River Basin in east-central Florida. The model was used to assess the potential for salt-water intrusion into the aquifer and river system due to future pumpage increases.

Martin Marietta Energy Systems, Paducah, Kentucky - Project Manager for the development of a three-dimensional groundwater flow model at the Paducah Gaseous Diffusion Plant. Provided recommendations for a field data collection program. Used optimization techniques to evaluate efficiency of various remedial designs.

South Florida Water Management District, Florida - Technical reviewer of modeling studies prepared for Water Supply Planning Initiative: Broward Co., Martin Co., Hendry Co., Lee Co., Jensen Beach.

Harloff Farms, Southwestern Florida - Evaluated and modified existing numerical models of drawdown impact resulting from a large agricultural concern. Provided expert witness testimony on the results of the analysis.

Hudson County, New Jersey (through SCS Engineers) - Performed three-dimensional numerical modeling in support of a permit application for a new landfill.

Southwest Florida Water Management District, Florida - Managed a project involving development of cross-sectional and three-dimensional variable density numerical models of the groundwater system on the Pinellas County, Florida peninsula. Alternative conceptual models were evaluated to assess the potential for salt-water intrusion due to pumpage and natural effects. Extensive sensitivity analysis was conducted to evaluate parameter uncertainty.

South Florida Water Management District, Florida - Managed a project involving assessment of the causes of saltwater intrusion into the Hallandale wellfield in south Florida. Cross-sectional and three-dimensional modeling of variable density groundwater flow was performed to aid in development of a comprehensive water management plan.

Westinghouse Savannah River Company, South Carolina - Project Manager involving environmental performance and groundwater modeling at the Savannah River Site. Performed modeling in support of exposure assessments for baseline and remedial alternative risk assessments. Determined Alternate Concentration Limits (ACLs) from a large mixed waste facility. Used numerical modeling to design a groundwater recirculating system for containment of a tritium plume.

U. S. EPA, Kerr Labs, Oklahoma - Developed a manual of instructional problems for the MODFLOW groundwater model.

Long Island Water Conference, New York - Conducted an investigation on the current status of groundwater availability and potential for saltwater intrusion. The results were presented at a NYDEC regulatory hearing.

Prices Pit Landfill, New Jersey - Performed numerical modeling of alternative remedial measures.

Auburn University, Alabama - Developed methodology and performed numerical simulation of solute transport in a two-well tracer test in a stratified aquifer.

Developed pre-processors to facilitate data preparation for the USGS two-dimensional model, USGS modular model, and a proprietary saltwater intrusion model.

Nesbit Law Firm, Northwestern Indiana - Conducted numerical modeling to conceptualize flow in a multilayer aquifer system. Assessed the possibility that lowered water levels in the surficial aquifer were the result of pumpage in an underlying aquifer.

Bureau of Indian Affairs, New Mexico - Participated in investigation of available groundwater resources in the San Juan Basin for litigation purposes. Compiled existing data, conducted numerical modeling, and served as project manager.

BCM, Inc., Lipari Landfill, New Jersey - Performed computer modeling of alternative remedial measures, including capping, drains, cutoff walls, and groundwater extraction. The results of this study were published in a peer-reviewed journal.

U.S. Attorney's Office, Albuquerque, New Mexico – Conducted numerical modeling and provided expert witness testimony for a hearing concerning water appropriation for an electrical generation facility.

USGS, Houston, Texas - Extensively modified the USGS two-dimensional groundwater flow model to include effects of varying principle directions of anisotropy, layered systems and barriers for modeling of the Edwards Aquifer.

South Florida Water Management District, Florida - Evaluated water use permit applications for withdrawals greater than 100,000 gal/day for municipal, industrial, and agricultural use, and wrote reports citing staff recommendations. Also coordinated water quality monitoring with water utilities, and assisted in establishing programs to manage saltwater intrusion.

Aquifer Thermal Energy Storage (ATES) Projects, Auburn University – Contributed to the design, construction, operation, and data analysis of a field experiment to demonstrate the feasibility of storing thermal energy in aquifers for the purpose of leveling the demand/availability cycle for thermal energy. The project involved pumping water from a shallow aquifer, heating it using a boiler, injection of the hot water to a deeper aquifer, storing it for a period of 2-3 months, and pumping to recover the stored water and heat. The project successfully demonstrated during two six-month cycles of operation that 65 to 74 percent of the injected heat could be recovered for later reuse. Approximately one half of the work involved data processing, and data analysis; the other half involved operating

pumps and a hot water boiler, in-the-field troubleshooting and modifications, as well as collecting temperature, water level, and flow rate data from monitoring and production/recovery wells.

PROFESSIONAL WORK HISTORY

Tetra Tech / Tetra Tech GEO / GeoTrans, Inc., Atlanta, Georgia, (1994-Present), *Principal Engineer*/*Vice President*
GeoTrans, Inc., Sterling, Virginia, (1982-1994), *Staff* to *Principal Engineer/Vice President*
South Florida Water Management District, Water Use Division, Resource Control Department (1981), *Water Resource Engineer*
Department of Civil Engineering, Auburn University (1981), *Instructor*
Department of Civil Engineering, Auburn University (1979-1980), *Graduate Research /Teaching Assistant*
Water Resources Research Institute, Auburn, Alabama (1978-1979), *Field Engineer*

TEACHING EXPERIENCE

Short Courses, GeoTrans / Tetra Tech

Basics of Groundwater Flow and Pollution (USGS2D, MODFLOW):
Georgia Southwestern College, July 1982
International Groundwater Modeling Center, Indianapolis Indiana, 1983, 1984, 1985, 1986, 1987(2), 1988, 1989(2), 1990(2), 1991(2)
International Groundwater Modeling Center, Golden, Colorado, 1992(3), 1993(2), 1994(2), 1995
USEPA Region IV, February 1985
Roy F. Weston, Inc., May 1985
Southwest Florida Water Management District, July 1986
Tipton and Kalmbach, Inc., May 1987
BP America, May 1988
Mississippi DEQ, June 1990
U.S. Army Corps of Engineers, August 1993
South Florida Water Management District, August 1995
Shell Oil Company, July 1997
Sonoma County Water Agency, February 2011

Advanced Groundwater Flow Modeling (MODFLOW, MODPATH, associated modules):
International Ground Water Modeling Center, July 1995, June 1998

Polishing Your Groundwater Modeling Skills (MODFLOW, MODPATH, associated modules):
International Ground Water Modeling Center, June 1999, June 2000, March 2001, May 2002, September 2003, November 2004, May 2006, May 2008, May 2009, May 2010, June 2011, March 2012, June 2013, November 2014; May 2015.

Groundwater Modeling Module of *PROSPECT Groundwater Hydrology Course*:
U.S. Army Corps of Engineers, August 1994, August 1996, September 1997, August 1999, August 2002

PROSPECT Course on *Groundwater Modeling*
U.S. Army Corps of Engineers, July 1998

Groundwater Modeling for Non-Modelers
St. Johns River Water Management District, April 2007
International Ground Water Modeling Center, May 2008
St. Johns River Water Management District, October 2014

Introduction to the U.S.G.S. Three-Dimensional Groundwater Flow Model:
St. Johns River Water Management District, October 1983

Introduction to DAFI2D, a Pre-processor for the U.S.G.S. Two-Dimensional Groundwater Flow Model:
South Florida Water Management District, October 1983

Saturated Zone Modeling (U.S.G.S. Method of Characteristics):
USEPA, Region VI, November, 1988
USEPA, Region VIII, November, 1988
USEPA, Region IX, December, 1988
USEPA, Region X, December, 1988

Introduction to Modeling Saltwater Intrusion (SWICHA):
Southwest Florida Water Management District, October 1984
South Florida Water Management District, February 1986
St. Johns River Water Management District, November 1986

Instructor, Auburn University, 1981

Computer Methods in Civil Engineering (CE202)
Theory of Structures I (CE304)
Hydraulics (CE308)
Hydrology (CE312)

Graduate Teaching Assistant, Auburn University, 1979-80

Computer Methods in Civil Engineering (CE202)

LITIGATION EXPERIENCE

Deposition concerning hydrologic impacts of a modification to conditions of certification for the Turkey Point Power Plant Units 3-5 (June 2015).

Deposition concerning PCE and TCE contamination at the New Cassell Industrial Area of Long Island, New York for a cost recovery case. Testifying expert for the New York State Office of Attorney General (May 2015).

Expert witness in a comprehensive administrative hearing regarding certification of two new nuclear units at a power plant in south Florida. Testified on the expected impacts of a 125 mgd backup water supply and its compliance with state and local codes and regulations (July, 2013).

Expert witness for the Northwest Florida Water Management District in an administrative hearing regarding a proposed consumptive use permit for a new wellfield in Bay County, Florida (October 2011).

Deposition concerning compliance with and technical details of a wellhead protection ordinance in northwest Florida (February 2009, Rapid Management Company v. Board of County Commissioners, Escambia County, Florida).

Deposition concerning alleged environmental impacts of pumping to dewater a marble quarry in east-central Alabama (December 2006, Lee County Commission v. Oldcastle Materials Southeast, Inc).

Expert witness (pre-filed written testimony) in a site certification hearing for the Florida Power and Light West County Energy Center, Palm Beach County, Florida (September, 2006).

Expert witness in a site certification hearing for the Florida Power and Light Turkey Point (Unit 5) Expansion Project, Florida City, Florida (September, 2004).

Expert witness in an arbitration, Environmental Protection Commission of Hillsborough County and Hillsborough County vs. Tampa Bay Water, A Regional Water Supply Authority, regarding seepage and environmental issues related to a proposed above-ground reservoir (March, 2001).

Deposition concerning a minimum flows and levels rule challenge in southwest Florida. Hillsborough County Florida and Environmental Protection Commission of Hillsborough County vs Southwest Florida Water Management District. (February, 2000).

Depositions concerning groundwater modeling and technical analysis performed to assess propriety of proposed pumpage restrictions and environmental protection standards in southwest Florida (West Coast Regional Water Supply Authority, et al, vs. Southwest Florida Water Management District and Thomas W. Reese, et al. (March and May 1996).

Expert witness (pre-filed written testimony) in an administrative hearing, Mullis Tree Services, for an appeal to a permit for a proposed municipal landfill in Bibb County, Georgia (November 1994).

Expert witness in an administrative hearing, Osceola County/Deseret Ranches/EEE Corporation/ NNN Corporation vs. South Brevard Water Authority and the St. Johns River Water Management District (Florida), regarding a proposed municipal water use permit (September 1991).

Expert witness in an administration hearing, City of Sarasota, Florida vs. Roger Harloff and Southwest Florida Water Management District, regarding an agricultural water use permit (August 1989).

Technical support and preparation of testimony for a regulatory hearing by the NYDEC in the matter of the proposed modification of water supply permits of the Long Island Water Corporation (September 1987).

Deposition concerning groundwater modeling performed to assess drawdowns in an upper aquifer created by irrigation pumping in northwestern Indiana by Prudential Company of America (September 1983).

Expert witness for U.S. Attorney's Office, Albuquerque, New Mexico. Hearing before the New Mexico State Engineer concerning groundwater appropriations near Gallup, New Mexico for Plains Electric (September 1982 and January 1983).

PUBLICATIONS

Peer Reviewed Journals

Andersen, P.F. and G.W. Council, 2008. Practical methods and metrics for calibration of transient groundwater flow models. In *Calibration and Reliability in Groundwater Modeling: Credibility of Modeling*, IAHS Publication 320: 305-309. ISBN 978-1-901502-49-7

Andersen, P.F. and S. Lu, 2003. A post-audit of a model-designed ground water extraction system. *Ground Water* 41(2): 212-218.

Andersen, P.F., J.W. Mercer, and H.O. White, Jr., 1988. Numerical modeling of saltwater intrusion at Hallandale, Florida, *Ground Water,* 26(5): 619-630.

Huyakorn, P.S., J.W. Mercer, P.F. Andersen, and H.O. White, Jr., 1986. Saltwater intrusion in aquifers: Development and testing of a three-dimensional finite-element model, *Water Resources Research,* 23(2): 293-312.

Huyakorn, P.S., P.F. Andersen, F.J. Molz, O. Guven, and J.G. Melville, 1986. Simulations of two-well tracer tests in stratified aquifers at the Chalk River and Mobile Sites, *Water Resources Research,* 22(7): 1016-1030.

Huyakorn, P.S., P.F. Andersen, O. Guven, and F.J. Molz, 1986. A curvilinear finite-element model for simulating two-well tracer tests and transport in stratified aquifers, *Water Resources Research,* 22(5): 663-678.

Huyakorn, P.S., B.G. Jones, and P.F. Andersen, 1986. Finite-element algorithms for simulating three-dimensional groundwater flow and solute transport in multilayer systems, *Water Resources Research,* 22(3): 361-374.

Andersen, P.F., C.R. Faust, and J.W. Mercer, 1984. Analysis of conceptual designs for remedial measures at Lipari Landfill, New Jersey, *Ground Water,* 22(2): 176-190.

Molz, F.J., A.D. Parr, and P.F. Andersen, 1981. Thermal energy storage in a confined aquifer-second cycle, *Water Resources Research,* 17(3): 641-645.

Molz, F.J., A.D. Parr, P.F. Andersen, V.D. Lucido, and J.C. Warman, 1979. Thermal energy storage in a confined aquifer-experiment results, *Water Resources Research,* 15(6): 1509-1514.

Conference Proceedings and Presentations

Ross, J.L. and P.F. Andersen, 2015. Use of a Spreadsheet-Based Water / Salt Balance for Data Integration at a Large Cooling Canal System; MODFLOW and More 2015: Modeling a Complex World. Golden CO. May 31-June 3.

Andersen, P.F., J.P. Fenske, J.L. Ross, and R.M. Greenwald, 2014. Evolution of a groundwater model over 20 years; World Environmental and Water Resources Congress 2014. Portland, OR. June 1-5.

Ross, J.L. and P.F. Andersen, 2014. Evaluation of the effect of initial conditions on parameter estimation in a groundwater flow and transport model; World Environmental and Water Resources Congress 2014. Portland, OR. June 1-5.

Andersen, P.F. and J. L. Ross, 2013. Toward making better predictions with groundwater models, MODFLOW and More 2013: Translating Science into Practice Conference. Golden CO. June 3-5.

Andersen, P.F. and R.M. Greenwald, 2011. Observations on calibration of a model of a perfectly understood aquifer, MODFLOW and More 2011: Integrated Hydrologic Modeling Conference, Golden CO.

Andersen, P.F., 2010. An Industry Perspective on Water Management / Optimization Applications, Invited presentation to the World Environmental and Water Resources Congress 2010, Providence RI, May 16-20.

Andersen, P.F., L.M. Grogin, and R.L. Bartel, 2008. Modeling of the potential for vertically downward saltwater migration from a dredge pond. 20th Saltwater Intrusion Meeting. Naples, FL June 23-27.

Andersen, P.F. and G.W. Council, 2008. Making calibration targets consistent with expectations for model predictions. MODFLOW and More: 2008. Groundwater and Public Policy Conference. Golden, CO May 18-21.

Andersen, P.F. and G.W. Council, 2007. Practical methods and metrics for calibration of transient groundwater flow models. Sixth International Conference on Calibration and Reliability in Groundwater Modeling. Copenhagen, Denmark, September 9-13.

Andersen, P.F., 2003. Post audits of three groundwater models for evaluating plume containment. Invited presentation at the American Geophysical Union (AGU) meeting, San Francisco CA, December 8-12.

Andersen, P.F. and Grogin, L.M., 2003. The effect of groundwater infiltration rate variability on regulated impacts. Presented at the American Institute of Hydrologists (AIH) Meeting. Atlanta GA, October 19-22.

Council, G.W., Andersen, P.F. and Stieve, A.L., 2003. Groundwater modeling to evaluate remediation alternatives at the Savannah River Site. Proceedings of the NGWA Mid-South Focus Conference, Nashville, TN. September 18-19.

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