IN THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF FLORIDA TALLAHASSEE DIVISON

FLORIDA WILDLIFE FEDERATION, INC.; SIERRA CLUB, INC.; CONSERVANCY OF SOUTHWEST FLORIDA, INC.; ENVIRONMENTAL CONFEDERATION OF SOUTHWEST FLORIDA, INC.; & ST. JOHNS RIVERKEEPER, INC.,

Plaintiffs,

v. **Case No. 4:08-cv-00324-RH-WCS**

LISA P. JACKSON, Administrator of the United States Environmental Protection Agency; and THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,

Defendants.

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EXPERT DECLARATION OF DR. DOUGLAS J. DURBIN

My name is Douglas J. Durbin, and I state and declare as follows:

1. This declaration made based upon my own personal knowledge and my review of a consent decree dated August 18, 2009, as executed by legal counsel representing the United States Environmental Protection Agency (EPA) and legal counsel for the environmental advocacy groups participating in this legal action. I am also member of the Florida Department of Environmental Protection (DEP or Department) Numeric Nutrient Criteria Technical Advisory Committee (TAC) and have direct knowledge of the State's efforts to develop numeric nutrient criteria in lieu of EPA.

2. This declaration is provided to assist the Court and I confirm that I have not entered into any arrangement where the amount or payment of my fees is in any way dependent upon the outcome of this action.

3. I have not, without forming an independent opinion, included or excluded anything which has been suggested to me by others including counsel representing the parties by whom I have been retained.

4. I am currently a Vice-President and Technical Director of ENTRIX an environmental consulting and resource management firms with approximately forty offices nationwide. A summary of my qualifications is attached as ***Exhibit I***.

5. I received my Ph.D. in zoology from Clemson University in 1992. I received my M.S. in biology from the University of Louisville in 1987 after receiving my B.A. in biology from the same university in 1985.

6. Since 1992, I have worked as biologist and aquatic ecologist in Florida and have extensive experience performing water quality assessments of Florida waters. I recently served as the Project Officer for a large-scale data collection effort funded by the Florida Department of Environmental Protection to provide information for establishing numeric nutrient criteria, and for the development of pollutant load limitations called total maximum daily loads (TMDLs).

7. I have served as an expert directly related to issues involving nutrients and their impacts upon freshwater and estuarine surface waters in Florida. I have been qualified as an expert in legal proceedings in Florida on a number of occasions. Most recently I was qualified as an expert in Case No.: 08-2727EPP, *In Re: Progress Energy-Florida Levy Nuclear Project, Units 1 and 2*, before the Florida Division of Administrative Hearings.

8. In my capacity as a member of the numeric nutrient criteria TAC for the Florida DEP, I have participated in nearly twenty TAC meetings and reviewed countless technical documents relevant to the State's efforts to develop numeric nutrient criteria. The State's efforts were accelerated after EPA released its January 14, 2009 letter declaring numeric criteria necessary for Florida waters. As a TAC member, I am asked to provide the Department technical advice as to its criteria development efforts.

9. I have heard presentations and reviewed technical documents as to the Department's efforts to establish numeric nutrient criteria and I am familiar with the States database through my work as Project Manager for the Department's statewide data collection effort.

10. I am familiar with, and could testify to, the scientific theories and methodologies that have been applied or are under development by investigators attempting to set nutrient endpoints for nitrogen and phosphorus for purposes of deriving TMDLs and numeric nutrient criteria.

11. For the purposes of this declaration, I was provided a copy of the consent decree which accompanied the motion for entry of consent decree filed by the U. S. Environmental Protection Agency (EPA) in this action. I was also provided a copy of the declaration of another water quality expert and asked if I agree with certain core principals relevant to the development of numeric nutrient criteria in Florida and EPA's ability to establish statewide numeric nutrient criteria for the State.

12. I have reviewed the consent decree and can state with certainty, based upon my seventeen years of Florida experience, and my extensive work with the Florida DEP in trying to establish numeric nutrient criteria, that EPA cannot propose scientifically defensible statewide numeric nutrient criteria for Florida's freshwater lakes and streams

by January 14, 2010. Nor can EPA propose scientifically defensible statewide numeric nutrient criteria for Florida marine and estuarine waters by January 14, 2011.

13. There is no scientifically defensible peer-reviewed methodology for establishing statewide numeric nutrient criteria. Nutrients, which for the purposes of this declaration mean total nitrogen and total phosphorus, are not toxic substances. Nutrients are needed to support healthy well-balanced populations of natural flora and fauna in surface waters.

14. Surface waters have an assimilative capacity and can accept significant quantities of nutrients without an adverse biological effect. However, under certain circumstances, excess nutrients entering a water body can set off a chain reaction of events that lead to undesirable conditions.

15. Excess nitrogen or phosphorus can over stimulate aquatic plant growth, resulting in blooms of microscopic algae and thick mats of readily visible submerged plants called macrophytes. As algae blooms die and decompose, microorganisms use oxygen as they break down the plant material; similarly, mats of macrophytic plants die off and oxygen may be depleted as bacterial decomposition breaks down the dying plants. During extreme events, usually in the heat of summer, the sudden depletion of oxygen can result in fish kills.

16. The effects of nutrients on surface waters are very site specific and influenced by numerous localized factors. The point at which nutrients become excessive, and cause such undesirable conditions, varies from water body to water body. The duration, magnitude and frequency of nutrient related impacts also vary greatly. Consequently, numeric nutrient criteria must be developed on a case-by-case basis using a combination of approaches, different lines of evidence and complex water quality models.

17. Therefore, it is my opinion that statewide numeric nutrient criteria cannot be established for Florida surface waters. The climate, geology and geomorphology of Florida, or most any state, are too diverse to derive statewide criteria. To the extent the consent decree commits EPA to deriving statewide numeric nutrient criteria for the State of Florida, it cannot be done.

18. Even if EPA did choose to pursue numeric criteria on a water body by water body basis, applying mechanistic water quality models that address site specific variables, such a task could not be properly initiated, much less completed, by January 2010 or January 2011.

19. EPA recommends various approaches to developing numeric nutrient criteria through a variety of guidance documents. Of the three major approaches, dose-response, reference waters, and the all-waters approach, only the dose-response approach is scientifically defensible. However, to date, the dose-response methodology has not proven useful for Florida surface waters.

20. I have reviewed materials from the Florida Department of Environmental Protection (DEP or Department) describing the Department's attempt to derive numeric nutrient criteria using the dose-response approach. These data and analyses have been presented to the TAC on a number of occasions. Department scientists familiar with Florida waters and water quality have performed numerous graphical and statistical analyses attempting to demonstrate a relationship between the ambient concentration of nitrogen or phosphorus (the dose) and various biological parameters (the response). Although the Department has a very large database of nutrient data, DEP scientists have been unable to establish a sufficiently strong dose-response relationship from which scientifically defensible numeric criteria may be derived.

21. The reference water and all-waters approaches recommended by EPA are indefensible. Both are based upon statistical distributions of nutrient data depicted on a graph upon which cut-off point is selected at a certain place on the graph representing a proportion of the area (data) under the graph called a percentile.

22. Under the reference stream approach, nutrient data from waters considered to represent natural background water quality conditions, or at least minimally affected by human impacts, is depicted on a graph. EPA recommends drawing a line at the 75th percentile on the graph. The nutrient concentration corresponding with the 75th percentile—either nitrogen or phosphorus— is declared to be the new numeric nutrient criterion.

23. Under the all-waters approach, data from all like waters regardless of condition is plotted on a graph. EPA recommends choosing the nutrient concentration corresponding to the 25th percentile and the new numeric nutrient criterion for nitrogen or phosphorus as the case may be.

24. The reference water and all-waters approaches are inappropriate methods for deriving numeric nutrient criteria for several reasons. First, deciding which percentile to choose for deriving the criterion is totally arbitrary. There is no scientific basis for choosing the 75th percentile of the data from reference waters or the 25th percentile of the data from all like waters in the database. Although the State had proposed using this approach and selected the 90th percentile, in an effort expedite the criteria development process, this approach is simply inappropriate for deriving criteria that will employed in a regulatory context.

25. Secondly, when a line is drawn on the graph, those waters with nutrient concentrations greater than the 75th percentile of the reference waters, now fail to meet the new criterion. In other words, 25% of the near pristine reference waters, used to set the criterion, now fail to meet the criterion. Even under an early state proposal, using the 90th percentile, 10% of the State's best waters would fail to meet the newly derived criterion.

26. Waters that fail to meet the criterion are considered to be impaired waters in need of pollutant reductions under the total maximum daily load (TMDL) program. By

selecting the 75th percentile of the data from the reference waters, the affected State—in this case Florida—must now take action to restore 25% of its minimally disturbed near pristine waters to meet a target concentration that the data suggest those waters would never have attained under natural conditions. In short, the State must now restore its reference waters to better than natural conditions to meet arbitrarily derived target nutrient concentrations.

27. Under the all-waters approach, by selecting the 25th percentile, 75% of the State's waters will automatically be declared in violation of the new numeric criterion. In Florida, with over four thousand named water bodies, several thousand surface waters must be restored under the TMDL program. The TAC was briefed on an effort by EPA to generate regional numbers in Florida using this all-waters approach; the TAC could not support use of the EPA criteria based upon this approach; in addition, serious data quality errors were identified such as negative numbers appearing in the database used by EPA.

28. The third and most important deficiency underlying the all-waters and reference waters approaches it that there is absolutely no demonstrable relationship between the nitrogen or phosphorus concentration derived from choosing the line of the graph of the data, and the health of the surface water. As noted, State scientists with years of experience studying Florida's waters have, to date, been unable to isolate a sufficiently strong relationship between nutrient concentrations (dose) and the health of the water body (response) from which to derive meaningful numeric nutrient criteria. Realistically, if DEP scientists with decades of experience assessing Florida water quality cannot derive defensible criteria with their own data, EPA staff members cannot do so from desktop exercises in Atlanta or Washington, D.C.

29. The reference stream approach in an attempt to back into criteria by reversing the process and identifying what appear to be biologically healthy waters (good response) and then look at the concentration of nutrients in those waters (dose). The observed nutrient concentrations using the reference water approach tell the investigators nothing about how much of a nutrient the surface water may assimilate or at what point, and under what conditions, nutrients in that particular water body may manifest negative impacts.

30. The reference water approach leads to a waste of resources in that millions of dollars are shifted from more viable environmental projects to accomplish pollutant reductions to meet scientifically indefensible criteria. Probabilistic approaches to setting criteria for nutrients—which are required for a healthy well balanced community of flora or fauna—are simply inappropriate.

31. For the foregoing reasons, I agree that the consent decree proposed by EPA and the environmental interests sets arbitrary and unattainable deadlines and commits EPA to doing the impossible. Statewide numeric nutrient criteria are not feasible based on the approaches and information utilized thus far, and certainly cannot be established by the deadlines set forth in the consent decree.

32. I support employing the State's watershed management/rotating basin approach, as is used for developing TMDLs, as a reasonable approach to developing site specific numeric criteria for Florida's several thousand surface waters. A list of priority waters could be developed to assure that resources are focused on the waters in the most need of immediate attention. Data analysis and modeling of nutrient loading to these priority waters would result the development of an initial set of scientifically defensible numeric nutrient criteria. As a nutrient TAC member, I would encourage such an approach in lieu of attempting to impose scientifically indefensible criteria upon all Florida surface waters.

I DECLARE under penalty of perjury under the Laws of the United States and the Laws of the State of Florida that the foregoing is true and correct.

Dated this 3rd day of October, 2009 DECLARANT:

Douglas J. Durbin, Ph.D.

Douglas J. Durbin, Ph.D.

Vice President/Technical Director

ENTRIX
Down to Earth. Down to Business.

Discipline/Specialty

- Environmental Assessment and Management
- Environmental Permitting
- Litigation Support

Education

- Ph.D., Zoology, Clemson University, 1992
- M.S., Biology, University of Louisville, 1987
- B.A., Biology, University of Louisville, 1985

Certifications

- FDEP, Habitat Assessment and Periphyton Sampling Certification, 2005
- FDEP, Stream Condition Index Certification, 2004

Associations

- American Water Resources Association- Florida Section Board Member
- American Society of Limnology and Oceanography
- North American Lake Management Society

Summary of Qualifications

Dr. Durbin has a very broad educational background in the sciences with particular focus in the disciplines of aquatic ecology, water quality, and ecosystems analysis. His Masters work centered on the effects of urbanization and land-use changes on fish communities, and his Ph.D. work involved the development of a microcosm system to simulate aquatic ecosystem dynamics. Dr. Durbin has conducted numerous studies on stream, lake, estuarine, and upland and wetland systems in Florida. These projects have dealt with habitat suitability analyses, restoration of upland and wetland habitats, minimum flows and levels in streams and lakes, marina assessments and permitting, and the effects of stormwater and industrial and domestic waste water discharges on aquatic communities. Other areas of expertise include geographic information systems and wetland treatment for water quality improvement.

Relevant Experience

Environmental Assessment and Management

- **Surface Water Monitoring Services for the FDEP Strategic Monitoring Program, Florida.** This effort provided assistance to the Florida Department of Environmental Protection for its Strategic Monitoring Program as part of Florida's Total Maximum Daily Load (TMDL) rule development. In 2006, approximately 150 water body segments (WBIDs) of springs, streams, rivers, canals, lakes, and estuaries listed as Impaired Waters by the FDEP were sampled throughout the state as part of this logistically demanding project, and more than 130 WBIDS were sampled during 2007. Data from this study will be used to determine if a particular WBID should be removed from the Impaired Waters List or if it must have a TMDL established. Dr. Durbin acted as Project Officer and Quality Assurance Officer. Florida Department of Environmental Protection. 2006-2007.

- **Water Quality Based Effluent Limitation Study for Mosaic Four Corners Mine.** This effort was undertaken to evaluate the potential effects of a new industrial wasterwater discharge to a small tributary in the Little Manatee River Basin in Hillsborough County, Florida. The project included acquisition and compilation of historical data, collection of new water quality and physical data from the stream, and a water quality modeling effort to predict the affects of the proposed discharge. Nutrient loading was an issue of primary concern, as well as maintaining compliance with rigorous water quality standards in the Little Manatee River associated with its designation as Outstanding Florida Waters. Dr. Durbin served as Project Officer and Senior Project Manager for this effort. Mosaic Fertilizer Company. 2006-2007.

- **Sediment Quality Evaluation of Coral Bay, St. John, US Virgin Island.** A sediment quality evaluation was performed in Coral Bay as part of an evaluation process for a proposed marina development. This assessment targeted the presence and prevalence of several heavy metals in sediments associated with the segment of Coral Bay where the marina would be constructed. The evaluation provided for sediment grain size analysis, as well as a comparison of heavy metals levels with various toxicological

thresholds and investigation of proportional relationships to evaluate potential enrichment by selected metals. Moffatt & Nichol Engineers, Inc. 2007.

- **Dissolved Oxygen-Nutrient Study for the Florida Department of Environmental Protection.** This multi-faceted 12-month study focused on water quality sampling at nearly 350 locations throughout Florida on a variety of stream, river and lake types, as well as canals. In addition to water quality sampling, habitat assessments were performed and biological samples (benthic invertebrates, phytoplankton and periphyton) were collected, along with sediment samples. This overall effort required a substantial field reconnaissance component, extensive data review, and resulted in well over 500,000 individual data values. The information is to be used by DEP to facilitate the establishment of numerical nutrient criteria and the possible refinement or revision of the current dissolved oxygen standard. The effort involved constant communication with technical staff at DEP and strict adherence to all applicable quality control requirements. Dr. Durbin acted as Project Officer and Senior Project Manager for this massive project. Florida Department of Environmental Protection. 2005-2006.

- **Participation in the development and implementation of the Horse Creek Stewardship Program in the Peace River basin.** This program was designed to serve as an indicator system to ensure that phosphate mining in the Horse Creek watershed does not adversely affect water quality and ecological conditions in the stream. The program accumulates and analyzes a large volume of data in three areas – water quantity, water quality and aquatic biology – including some data types with little precedent from this stream (fish community monitoring, for example). Mosaic Fertilizer. 2000-present.

- **Water Quality Based Effluent Limitation Study of Proposed Discharge from a Phosphate Mine to Long Branch.** This study combined an evaluation of water quality with an aquatic biological investigation to determine the existing condition of a tributary to the Little Manatee River in Hillsborough County, Florida, and to predict the effects of introducing discharge from active mining areas through an NPDES permitted control structure. Mosaic Fertilizer. 2002-2004.

- **North Prong Alafia River data analysis.** This effort comprised an analysis of, and comment upon, a long-term (5-year) data set from a series of stations in western Polk and eastern Hillsborough Counties. The review found a net improvement in water quality through the sampling period. Florida Phosphate Council. 2004.

- **Evaluation of dissolved oxygen distribution in MiraBay lagoon.** This study investigated the behavior of oxygen in an artificially created 130-acre coastal waterbody. The investigation showed that the lagoon is permanently stratified at about 3.5 meters by a sharp salinity gradient. This stratification results in depressed dissolved oxygen levels in the deeper portion of the lagoon. MiraBay Community Development District. 2004.

- **Madison Blue Spring Ecological Monitoring.** Assistance in developing, and then coordinating and participating in the implementation of, a monitoring program for Madison Blue Spring in Madison County, Florida. The monitoring is required under a water use permit issued for groundwater withdrawals from the springshed above Madison Blue Spring, a tributary to the Withlacoochee River in the Suwannee River basinn. Monitoring includes visual transects by cave divers in the caverns leading to the spring, and biological sampling in the spring boil, spring run, and the Withlacoochee River upstream and downstream of the spring run. Sampling in the river is conducted according to the Florida Stream Condition Index (SCI) protocol. The sampling in the spring boil and spring run uses a modification of the SCI protocol where Surber samplers are used instead of dip nets to provide more thorough sampling of the limestone walls and boulders in those areas. Water quality is also sampled in conjunction with the biological sampling. Nestle Waters USA 2003-present.

- **Preparation of a draft Environmental Impact Statement (EIS) for a proposed phosphate mine in Hardee County, Florida.** This effort included the compilation and review of environmental information and potential effects of phosphate mining on wetlands, listed species and their habitats, surface and groundwater quality and hydrology, air quality, noise, historic resources, economic and sociologic issues. The EIS was a requirement of the U.S. Army Corps of Engineers as part of its permit review process for a Section 404 Dredge and Fill permit for the proposed mine. Farmland Hydro, L.P. 2001-2002.

- **Evaluation of the relationship between water quality and phosphate mining in the Peace River watershed.** This review included production of an annotated list of the major published and unpublished literature on water quality in the basin making some mention or having other logical connection to mining activities or effects. Florida Phosphate Council. 2002.

- **Evaluation of toxicological data from wading bird eggs collected in Lake Apopka and several reference locations.** In the late 1990's, a large number of wading birds died in the Lake Apopka area, presumably as a result of the reflooding of agricultural lands near the lake as part of a large restoration program. This effort was focused on determining differential levels of organochlorine contaminants in eggs laid by birds in the vicinity of Lake Apopka, relative to those from other areas in the Central Florida region. U.S. Natural Resource Conservation Service, 2002-2003.

- **Evaluation of the effects of intermittent, short-term discharge of treated industrial wastewater to English Creek.** This study was necessitated by an NPDES permit condition which requires assessment of the impacts of discharges if monitoring indicates exceedence of permit criteria. The plan of study was reviewed in detail and formally approved by the Florida Department of Environmental Protection. The effort included water and sediment quality analysis and benthic invertebrate and phytoplankton community evaluation. Coronet Industries, Plant City, Florida. 2000-2001.

- **Water quality assessment for MiraBay, a coastal residential development on the eastern shore of Tampa Bay.** Key issues were manatee protection (the project resulted in the designation of a large portion of the eastern Tampa Bay shoreline as a "manatee protection zone") and preservation of water quality both in an existing canal network system and in Tampa Bay adjacent to the project. All necessary approvals were issued. The effort included the development of an ongoing water quality monitoring program to detect any effects of the development on the canals leading to Tampa Bay. Hillsborough County, Florida, Terrabrook, 1999-2001.

- **Development of a comprehensive lake management program for Mountain Lake.** This ±80-acre lake in Polk County experienced declining water levels as a result of changes in the regional water table. To maintain the aesthetic value of this residential lake, it has been augmented with groundwater from the Floridan aquifer for approximately ten years. During that period, the ecology of the lake changed, primarily through the proliferation of submergent and emergent aquatic vegetation. To provide for ecologically appropriate and effective control of this problem, a limnological investigation was conducted on the lake and a management program devised to meet both the desires of the lakefront property owners and the requirements of the Florida Department of Environmental Protection Aquatic Plant Management Section. Polk County, Florida, Mountain Lake Corporation. 2000.

- **Assistance with aquatic toxicity issues at industrial NPDES outfalls.** Provided data analysis and interpretation, as well as recommendations for modified testing protocols, to identify the potential causes of toxicity test failures. This ongoing effort has targeted the identification of factors leading to seasonal toxicity test failures where no causative agent is apparent. Polk County, Florida, CF Industries, Inc. 1999-2000.

- **Ecological assessment for the re-dredging of navigational channel through Hurricane Pass in Dunedin, Florida.** This effort involved assessing the optimal channel location and configuration in a high energy

pass subject to marked erosion and shoaling. One of the primary issues of concern was protection of seagrasses which are present across much of the shallow bottom in the pass. The effort also included a review of possible spoil disposal scenarios, including beach nourishment at Honeymoon Island State Park. Pinellas County, Florida, Moffatt & Nichol Engineers, 1999-2000.

- **Supervision, fieldwork and data management for the application of the Wetland Rapid Assessment Protocol (WRAP) to proposed phosphate mining area.** This assessment tool, developed by the South Florida Water Management District to over 1,200 wetlands located on a 15,000-acre phosphate mine. Farmland Hydro, L. P. 1999-2000.

- **Training program to instruct environmental consultants how to implement the WRAP evaluation methodology.** The purpose of this training was to provide consistency in the wetland evaluation process for a group of consultants from various firms during the permitting of a series of water supply projects. Greeley and Hanson for Tampa Bay Water. 1999.

- **Site assessment to determine the likelihood of environmental effects as a result of proposed residential development of a canal system on a Caribbean Island.** This investigation was necessary to demonstrate to the Cayman Islands Department of Environment that the effects of a proposed residential development along a pre-existing canal would be negligible. The assessment included consideration of mangrove swamp, submerged limestone outcroppings and seagrass beds. Grand Cayman, Kaibo Yacht Club. 1999.

- **Educational program on technical and regulatory aspects of water quality for regulatory agency personnel.** A course was devised and conducted to provide information and guidance to approximately 15 regulatory agency staff members covering a broad array of water quality considerations, including key ecological parameters, commonly encountered water quality problems, regulatory mechanisms and constraints and considerations for data interpretation and analysis. Orange County Environmental Protection Division. 1999.

- **Participation in the development of a comprehensive Hydrobiological Monitoring Program.** The Southwest Florida Water Management District required that such a program be developed by Tampa Bay Water to document changes which may be brought about by the diversion of water from the Hillsborough, Alafia and Palm rivers during periods of high flow for potable use. The final plan included methods for data collection on water quality, sediment quality, adult and juvenile fishes, benthic invertebrates and emergent vegetation. Hillsborough County, Florida, City of Tampa Water Department. 1999.

- **Sampling and analysis of macroinvertebrate and algal communities in selected streams in Hardee, DeSoto and Sarasota Counties.** This effort involved wet season and dry season sampling of the benthic and periphyton communities at ten different stations on six streams as part of the data collection effort for two proposed phosphate mines. Data analysis included a series of statistical and ecological indices to characterize the communities and allow for comparison among stations and between pre-mining and post mining conditions. IMC-Agrico. 1999.

- **Development of a Plan of Study to determine the effects of treated industrial wastewater releases on English Creek**. This effort included negotiations with the Florida Department of Environmental Protection regarding appropriate timing and locations for sampling of biological, physical and chemical parameters in the receiving stream. Hillsborough County, Florida, Coronet Industries, Inc. 1999.

- **Assessment of over 2,000 wetlands utilizing the WRAP method for determining functional value of wetlands.** This effort involved field work and project management/oversight of a team of ten ecologists to provide accurate, repeatable assessments of wetlands located on two large parcels proposed for phosphate mining. A detailed database was developed which contained information on every wetland assessed and

allowed for integration of that information into a geographic information system (GIS). IMC-Agrico Company, Hillsborough County, Florida, 1998-1999.

- **Ecological and water quality evaluation of canal system in Cape Coral, Florida.** This effort was designed to determine whether stormwater inflows from a group of concrete manufacturing facilities had caused alterations in the ecological conditions and/or water quality in several man-made freshwater canals and lakes in Cape Coral. Lee County, Florida, Oldcastle Precast, Inc. 1998.

- **Ecological and water quality assessment of two marinas as part of a feasibility study for renovating and upgrading the marinas.** The effort included diel water quality sampling and surveys for living aquatic resources. The investigation indicated that the proposed upgrades could be accomplished with very minimal impact to the aquatic systems. Hillsborough County, Florida, Moffatt & Nichol Engineers, 1998.

- **Minimum Negative Impact study for wet weather discharge of treated domestic wastewater.** Designed and conducted a study to evaluate the potential effects of wet weather releases from two private utilities to an unnamed tributary to Whitaker Bayou. This investigation included field sampling and computer modeling of projected water quality conditions under various discharge scenarios. Sarasota County, Florida, Kensington Park Utilities and Dolomite Utilities, 1997-98.

- **Feasibility study of use of restored wetlands for industrial wastewater treatment.** Provided preliminary evaluation of the efficacy of wetland areas to polish process water from a fruit juice processing facility prior to discharge to a tributary of the Withlacoochee River. This included several conceptual design alternatives and expected water quality provided by the system. Pasco County, Florida, Lykes Pasco, 1997.

- **Water quality assessment of man-made canals.** This investigation was conducted to provide baseline information in support of permit applications for residential development of land along dredged canals in Apollo Beach, Florida. Shimberg-Cross Company., Hillsborough County, Florida. 1997.

- **Establishment of minimum flow for a river.** Served on a Technical Advisory Committee facilitated by the Tampa Bay National Estuary Program to provide recommendations to the Southwest Florida Water Management District for establishing minimum scientifically appropriate flows in the lower Hillsborough River. The effort included analysis of river flows, water quality data and ecological information for the lower river. City of Tampa Water Department, 1997.

- **Establishment of minimum levels for lakes.** This effort centered around active participation on a Technical Advisory Committee with the goal of determining scientifically appropriate water regime for lakes in northern Hillsborough and Pasco Counties. The purpose was to provide the Southwest Florida Water Management District with a sound technical basis for adopting lake levels into its rules. Tasks included analysis of lake levels and ecological data for a large number of lakes in the area, as well as coordination with technical experts to refine a methodology for establishing lake levels. Pinellas County Water Department, 1997.

- **Water and sediment quality assessment of Seddon and Garrison Channels.** This investigation was conducted to provide information as part of a permit application for a boat slip expansion for this urban facility. Harbour Island, Inc., Hillsborough County, Florida. 1996-1997.

- **Water quality assessment of three lakes augmented with groundwater to maintain acceptable lake levels.** A similar study had been conducted by BRA during the mid-1970's when the augmentation was initiated. This effort provided comparative data to reveal any long-term changes in water quality. Hillsborough County, Florida, Pinellas County Water Department, 1996.

- **Analysis and revision of wetland evaluation methodology prepared for a 14,000-acre wetland mitigation bank.** Florida Power and Light, Dade County, Florida. 1996.

- **Water quality assessment of natural ponds following their use for disposal and storage of secondarily treated domestic wastewater.** The assessment consisted of in-depth review of water quality and quantity records and additional sampling to examine alterations in water and sediment quality resulting from effluent introduction. VLX Properties, Inc., Volusia County, Florida. 1995.

- **Water quality assessment of Tenmile Lake to determine potential sources of pollutant inputs.** The purpose of assessment was to differentiate between inputs from commercial and residential land uses adjacent to the lake. Havertys, Inc., Hillsborough County, Florida. 1995.

- **Water quality assessment and diagnosis of aquascaped stormwater retention ponds.** These ponds were experiencing dense algal blooms in spite of lake management efforts. This investigation collected the information necessary to refine management efforts and allow for better control of these water bodies. American Automobile Association, Seminole County, Florida. 1995.

- **Ecological Assessment of Trout Creek pursuant to its designation as an Outstanding Florida Water.** Southern Property Holdings Corporation and Southwest Development Corporation, Hillsborough County, Florida. 1995.

- **Coordination and moderation of symposium on upland habitat restoration.** This two-day symposium assembled a group of recognized experts in native upland habitat management, creation and restoration. The goal of the workshop was the development of a restoration strategy for a large agriculturally-altered parcel. CF Industries, 1995.

- **Development of a Conceptual Restoration Plan and a Detailed Restoration Plan for a holistic ecological restoration of 1,900 acres of agricultural land.** These plans included upland restoration and management as well as wetland creation, restoration and enhancement. CF Industries, Inc., Hillsborough County, Florida. 1995-1996.

- **Application preparation for funding of purchase of an 800-acre parcel by Florida Communities Trust.** The application contained justification for the purchase, applicability of state, county and local comprehensive plan components and a conceptual management plan for the site. City of Plant City, Hillsborough County, Florida. 1995.

- **Ecological assessment of, and preparation of nomination materials for, an 800-acre parcel nominated for purchase by the Hillsborough County Environmental Lands Acquisition and Protection Program (ELAPP).** City of Plant City, Hillsborough County, Florida. 1995.

- **Water quality monitoring and reporting for a large residential development.** The monitoring program was implemented to meet Development Order conditions. APU Cross Creek, Inc. Hillsborough County, Florida. 1994 to 2000.

- **Water quality assessment of East Canal to determine the potential effects of discharge from the City of Plant City wastewater treatment facility.** The assessment included collection and analysis of physical, chemical and biological data, as well as analysis of historical data on the stream. Smith and Gillespie Engineers, Inc. Hillsborough County, Florida. 1994-1995.

- **Development of a water balance for a 130-acre manmade wetland treatment system.** This system was created for industrial stormwater runoff and was performed to determine the feasibility of introducing treated domestic waste water for additional treatment. This effort included a comprehensive review and analysis of hydrological and meteorological data collected in and around the treatment system and

extending more than 25 years into the past. Smith and Gillespie Engineers, Inc. Hillsborough County, Florida. 1994.

- **Identification, assessment and prioritization of environmentally sensitive lands within Sarasota County, Florida.** This effort was used to support potential future acquisition by the County as conservation areas. This included the revision of land use/land cover mapping of Sarasota County to provide a current habitat map for natural resource planning. Natural Resources Department, Sarasota County, Florida. 1993-1995.

- **Assessment of Wood Stork (*Mycteria americana*) foraging habitat in coastal wetlands.** Investigation consisted of ichthyofauna sampling and determination of wetland condition. 951 Land Holdings Joint Venture, Collier County, Florida. 1994.

- **Alternatives analysis to facilitate the selection of a location for a future gypsum stack.** This analysis considered environmental, sociologic and economic factors and provided suitability rankings for each site based upon these three prime criteria. CF Industries, Inc., Hillsborough County, Florida. 1994.

- **Assessment of ecological impacts to Tilghman Branch and Little Payne Creek resulting from failure of a mine tailings pond dam.** The investigation included collection and analysis of data on vertebrate and invertebrate communities and physical impacts caused by increased suspended solids and augmented flow in the stream. Cargill Fertilizer. Hardee County, Florida. 1994.

- **Assessment of ecological impacts to Hickey Branch and Payne Creek resulting from failure of a clay settling pond dam.** The investigation included collection and analysis of data on vertebrate and invertebrate communities and physical impacts caused by increased suspended solids and augmented flow in the stream. IMC-Agrico Company. Hardee County, Florida. 1994.

- **Experimental determination of ammonia contribution to stream water by blue tilapia (*Tilapia aurea*).** A laboratory experiment was conducted to determine whether this species is capable of significantly increasing the level of ammonia in its environment. IMC-Agrico Company. Polk County, Florida. 1994.

- **Field investigation of ammonia production in stream water by teleosts.** Based upon the results of a laboratory study, this investigation assessed the potential for fish to significantly increase the ammonia concentration in the stream environment. IMC-Agrico Company. Polk County, Florida. 1994.

- **Development and implementation of a Water Quality-Based Effluent Limitation (WQBEL) Study to determine effects of industrial wastewater on English Creek.** This study entailed the review of historical information and collection of water quality and quantity data to determine the potential effects of discharges to a small stream. Consolidated Minerals, Inc., Hillsborough County, Florida. 1993-94.

- **Comparison of aquatic vertebrate and invertebrate communities in pickerelweed (*Pontederia cordata*) marsh and torpedograss (*Panicum repens*) marsh.** Information was collected on vertebrates, invertebrates and vegetation in a created marsh and analyzed to establish the value of these two marsh vegetation types. Disney Development Corp., Orange County, Florida. 1993.

- **Comparison of benthic invertebrate communities in natural streams and wetlands and in streams and wetlands reclaimed after phosphate mining.** CF Industries, Inc., Hardee County, Florida. 1993.

- **Vegetation assessment of wetland areas proposed for phosphate mining and reclamation.** CF Industries, Inc., Hardee County, Florida. 1993.

- **Review of, and comment upon, U.S. EPA Wetland Impact Study on wetlands identified as potentially affected by hazardous waste from a Superfund (CERCLA) site.** This effort included site assessments and

agency negotiations leading to a finding of smaller impacts than originally reported. Williams Reed, Hillsborough County, Florida. 1993.

- **Assessment of options for re-use of domestic wastewater.** This effort included evaluating the potential use of " 200 acres of natural and man-made wetlands as wastewater treatment areas for both industrial and domestic wastewater. Analyses included the review of extensive historical data and subsequent development of a computer model to predict water quality and quantity following the introduction of treated wastewater into an industrial stormwater treatment system. CF Industries, Inc., Hillsborough County, Florida. 1993.

- **Investigation of low-level bacterial contamination of a natural springs area used for public recreation.** Crystal Springs Recreational Preserve, Pasco County, Florida. 1993.

- **Analysis of industrial effluent water quality to determine most appropriate method for its reuse/disposal.** BRA conducted a water quality analysis of refrigeration unit condensate from a large grocery warehouse which led to its use for landscape irrigation. Following permit issuance, BRA conducted monthly monitoring of the condensate to ensure continued compliance with permit conditions. A. Epstein and Sons, International., Hillsborough County, Florida. 1993.

- **Assessment of aquatic fauna and habitat quality in selected natural and reclaimed wetlands and streams.** This investigation involved the collection and analysis of information on vertebrate and invertebrate utilization of streams and wetlands to compare the ecological status of natural wetlands with that of reclaimed areas. CF Industries, Inc., Hardee County, Florida. 1992-1995.

- **Assessment of benthic community for the Hillsborough River Riverwalk Project.** David Volkert & Associates, Inc., Hillsborough County, Florida. 1992.

- **Water quality monitoring at proposed location of the Waters Avenue Business Park.** Towermarc Corporation, Hillsborough County, Florida. 1992.

- **Limnological data review of Taylor Creek Reservoir.** Hopping, Boyd, Green and Sams, Osceola County, Florida. 1992.

Environmental Permitting

- **Permitting of a New Industrial Wastewater Discharge for the Mosaic Lonesome Mine.** This effort included collecting water quality and biological data from a small tributary to the Alafia River in Hillsborough County, Florida. It also provided for the preparation of agency application materials for the renewal of the existing Lonesome Mine NPDES permit, as well as a supplemental discharge point associated with the tributary. Dr. Durbin served as Project Officer for this effort. Mosaic Fertilizer Company. 2007.

- **Environmental Permitting of an Industrial Facility in Citrus County, Florida.** This project provided standard environmental permitting for a new industrial facility, but included several interesting features. The proposed facility produces gypsum wall board and the subject site was selected because of the adjacent power plant whose newly installed air scrubbers produce large amounts of synthetic gypsum, thus providing a beneficial reuse of what otherwise would be a waste product. The site was also previously a fully permitted limerock mine, which meant the proposed industrial development actually provided for a lesser degree of wetland impact than the prior permits allowed. Dr. Durbin served as Project Officer on this effort. U.S. Gypsum Corporation. 2006-2007.

- **Local Government Approvals Associated with the Sighting of a New Nuclear Power Generating Facility.** This work involved performing a site assessment on a 3,500-acre parcel in Levy County, Florida, along with

a review of historical ecological information associated with this rural property. Dr. Durbin served as Project Officer and Senior Project Manager for this effort, as well as providing testimony before the county government regarding the nature of the parcel and the potential affects of the proposed nuclear plant. Progress Energy, Florida. 2007.

- **Coordination of permitting efforts for a ±6,000-acre phosphate mining area.** This effort included extensive physical, ecological and water resource assessments in preparation of applications for a Hardee County Development Order and Development of Regional Impact Approval, Florida Environmental Resource Permit and Conceptual Reclamation Plan Approval, and a US Army Corps of Engineers dredge and fill permit. CF Industries, Hardee County, Florida, 2004-present.

- **Permitting support for a marina facility associated with a new residential development on Tampa Bay.** This effort included a water and sediment quality evaluation as well as negotiations with environmental regulatory agencies regarding the potential effects of a marina on water quality and aquatic resources in a portion of Old Tampa Bay. WCI Communities. 2002.

- **Permitting support for state and federal approvals required to conduct beach nourishment on a gulf coast barrier island.** This effort also included a feasibility study to determine the most appropriate beach nourishment scenario for Honeymoon Island State Park. Based upon the selected alternative, conducted habitat evaluation and aquatic resources assessment to determine the potential for adverse impacts from the project. Pinellas County, Florida, Moffatt & Nichol Engineers, 2001-present.

- **Permitting and construction support of a municipal marina.** Permitting and construction support services are being provided to the City of Tampa for the renovation of its Marjorie Park Marina. Major permitting factors included water and sediment quality, as well as potential secondary impacts to manatees by boating activity. Moffatt & Nichol Engineers. 2000-2001.

- **Permitting of beach nourishment on a Gulf coast Florida State Park.** Environmental assessment and permitting services were provided to assist Pinellas County in obtaining approvals to nourish a portion of the beach at Honeymoon Island State Park. Significant permitting issues included sea turtle nesting habitat and use of the Honeymoon Island benches by listed shorebirds. The County co-funded this project with the Florida Department of Environmental Protection to improve recreational opportunities at this popular facility. Moffatt & Nichol Engineers, 2001-present.

- **Assistance with environmental permitting of a residential development on Tampa Bay.** This project proposed a series of modifications to an existing, but undeveloped, canal system in the Apollo Beach area on eastern Tampa Bay. Because the canal system was proposed to be opened to the bay, and development plans included excavation of a 130-acre lake, water quality was a significant permitting issue. Water quality concerns led to the development of a detailed, long-term monitoring plan which was ultimately approved by the Southwest Florida Water Management District. Terrabrook, 2000-2001.

- **Ecosystem Management/Team Permitting for a 15,000-acre phosphate mining area.** This effort includes extensive ecological and water quality assessments in preparation of a Consolidated Development Application which will be submitted to more than ten agencies and review panels. Required approvals for this new phosphate mine include: Development of Regional Impact, DEP Environmental Resource Permit, Hardee County approval and a US Army Corps of Engineers (404) dredge and fill permit. Farmland Hydro L.P., Hardee County, Florida, 1998-present.

- **Environmental permitting of improvements to a Gulf Coast navigational channel.** Permitting services were provided to Pinellas County, Florida, for the re-dredging of a navigational channel through Hurricane Pass from the intracoastal waterway to the Gulf of Mexico. Primary environmental factors requiring consideration included: potential impacts to seagrasses, hard bottom sea turtles and manatees, water and

sediment quality and stability of the pass and channel configuration. Moffatt & Nichol Engineers. 2000-2001.

- **Permitting support services for a new private marina.** This effort included assessment of water quality and submerged resources, data collection and preparation of related portions of an environmental resource permit application to the Florida Department of Environmental Protection. The marina site was located on a manmade canal adjacent to the Gulf of Mexico in Hernando County, Florida. Sterling Marina. 1998-1999.

- **Florida's first "Ecosystem Management" permit.** Preparation of environmental portions of application materials for permitting of a phosphogypsum stack system expansion on 585 acres; required approvals included: Development of Regional Impact, DEP Environmental Resource Permit, County Comprehensive Plan Amendment, Zoning and Land Use Designation changes, Land Alteration/Landscaping Permit and Federal (404) dredge and fill permit. This project was the pilot for the Hillsborough River and Bay Ecosystem Demonstration Project legislation which utilized a "team permitting" approach to avoid duplication of efforts during the permitting process and also incorporated the concept of "net ecosystem benefit". Final approvals were granted in early 1997, including the issuance of the state's first permit under its voluntary "Ecosystem Management" approach. CF Industries, Inc., Hillsborough County, Florida, 1995-1996.

- **Development of environmental portions of a site plan for the re-zoning of a 950-acre parcel proposed for residential development.** This effort included working with agencies and local environmental groups to develop a site plan configuration which would meet all applicable regulatory constraints and maintain a viable upland/wetland preserve and wildlife corridor within the parcel, while providing the maximum possible area for development. SDD Trust, Hillsborough County, Florida, 1996.

Litigation Support

- Peace River Manasota Regional Water Supply Authority et al. vs. IMC-Phosphates Company and Florida Department of Environmental Protection. Site investigations, hearing preparation, depositions, exhibit preparation and expert witness testimony for a Chapter 120 (Florida Statutes) Administrative Hearing over the proposed issuance of an Environmental Resource Permit, and Conceptual Reclamation Plan approval for phosphate mining of a 4,197-acre parcel in northwestern Hardee County. Accepted as an expert in biology, general ecology, limnology, aquatic ecology, stream ecology, water quality, ichthyology and environmental permitting. Hillsborough County, Florida. IMC Phosphates, 2003-2004.

- Charlotte County. vs. IMC-Phosphates Company and Florida Department of Environmental Protection. Hearing preparation, deposition, exhibit preparation and expert witness testimony for a Chapter 120 (Florida Statutes) Administrative Hearing over the proposed issuance of an Environmental Resource Permit for phosphate mining of a 2,367-acre parcel in northeastern Manatee County. Accepted as an expert in biology, general ecology, limnology, aquatic ecology, stream ecology, water quality, ichthyology and environmental permitting. Manatee County, Florida. IMC Phosphates, 2003.

- Manasota 88, Inc. et al. vs. IMC Phosphates Company and Florida Department of Environmental Protection. Hearing preparation, deposition, exhibit preparation and expert witness testimony for a Chapter 120 (Florida Statutes) Administrative Hearing over the proposed issuance of an Environmental Resource Permit for phosphate mining of a 2,800-acre parcel in eastern Manatee County. Accepted as an expert in biology, general ecology, limnology, aquatic ecology, stream ecology, water quality, microbiology and environmental permitting. Manatee County, Florida. IMC Phosphates, 2001.

- City of Tampa vs. Southwest Florida Water Management District. Hearing preparation, deposition and exhibit preparation for a Chapter 120 (Florida Statutes) Administrative Hearing regarding the City of Tampa's challenge of the minimum flow rule for the lower Hillsborough River (40D-8 and 40D-80, Florida Administrative Code). As an extension of other work provided to the City of Tampa Water Department

related to the lower Hillsborough River, these expert witness services were provided, however the case was settled immediately prior to commencement of the hearing. City of Tampa Water Department. 2000.

- Laura Johnson vs. City of Tarpon Springs and Florida Department of Community Affairs. Testimony and litigation support were provided to the City of Tarpon Springs in a Chapter 120 (Florida Statutes) Administrative Hearing regarding the consistency of language in the City's Comprehensive Plan with respect to the location of swimming pools and other accessory structures on waterfront lots with seawalls. Accepted as an expert in: general ecology and estuarine ecology. Pinellas County, Florida, City of Tarpon Springs, 1998.

- Teat vs. Apalachicola. Provided testimony and litigation support for the City of Apalachicola in civil suit over alleged damages to private property as a result of treated domestic wastewater discharge to a wetland (Huckleberry Swamp) and the receiving stream (Huckleberry Creek). Accepted as an expert in: limnology, stream ecology, general ecology, water quality and microbiology. Franklin County, Florida, City of Apalachicola, 1997-98.

- Slater et. al. vs. Orange County. Testimony and litigation support were provided to Orange County in a Chapter 120 (Florida Statutes) Administrative Hearing regarding the permittability of a public boat ramp on the Butler Chain of Lakes. Accepted as an expert in: limnology, lake ecology, aquatic ecology, water quality and environmental permitting. Orange County, Florida, Orange County Parks and Recreation Department, 1997-98.

- VLX Properties/CV Reit vs. Southern States Utilities. Provided testimony in a civil suit over alleged damages to golf course/subdivision ponds resulting from input of treated domestic wastewater. Accepted as an expert in limnology and aquatic ecology. Volusia County, Florida, VLX Properties, Inc., 1995.

- Charlotte County et. al vs. Southwest Florida Water Management District. Chapter 120 (Florida Statutes) Administrative Hearing. Provided litigation support and expert testimony in a challenge over the Water Management District's water use permitting rules. Accepted as an expert in biology, ecology, aquatic ecology, stream ecology, lake ecology, and limnology. Charlotte County, Florida, 1995.

- Pinellas County et. al vs. Southwest Florida Water Management District. Chapter 120 (Florida Statutes) Administrative Hearing. Provided litigation support and expert testimony in a challenge over the Water Management District's water use permitting rules. Accepted as an expert in biology, ecology, aquatic ecology, stream ecology, lake ecology, and limnology. Pinellas County, Florida, 1995.

Employment History

- Biological Research Associates, Vice President/Technical Director, 2007-Present
- Biological Research Associates, Vice President/Senior Ecologist, 2000-2007
- Biological Research Associates, Senior Ecologist, 1992-2007
- Clemson University, Graduate Teaching Assistant in Limnology, Aquatic Ecology, Ichthyology, Systems Physiology, and General Biology, 1987-1992
- Greenville Technical College, Lecturer in Human Physiology, 1990
- University of Louisville, Graduate Teaching Assistant in Entomology, Microbiology, and Organismal Biology, 1985-1987
- United States Department of Agriculture, Field Technician, Gypsy Moth Distribution Survey, 1984

Publications

Technical Reports and Publications

- Robbins, K.M.N. and D.J. Durbin. 2007. Horse Creek Stewardship 2005 Annual Report. Biological Research Associates prepared report for The Mosaic Company.
- Durbin, D.J. and K.M.N. Raymond. 2006. Horse Creek Stewardship 2004 Annual Report. Biological Research Associates prepared report for The Mosaic Company.
- Campbell, K.R. and D.J. Durbin. 2007. Madison Blue Spring Fourth Annual Monitoring Report. Biological Research Associates prepared report for Nestlé Waters North America, Inc.
- Hammond, D.G. and D.J. Durbin. 2007. Coral Bay Sediment Quality Assessment. Biological Research Associates prepared report for Moffatt & Nichol.
- Hammond, D.G. and D.J. Durbin. 2007. MiraBay Post Construction Water Quality Monitoring, January 2007. Biological Research Associates prepared report for MiraBay Community Development District.
- Campbell, K.R. and D.J. Durbin. 2006. Madison Blue Spring Third Annual Monitoring Report. Biological Research Associates prepared report for Nestlé Waters North America, Inc.
- Campbell, K.R. and D.J. Durbin. 2005. Madison Blue Spring Baseline/First Annual Monitoring Report. Biological Research Associates prepared report for Nestlé Waters North America, Inc.
- Campbell, K.R. and D.J. Durbin. 2004. Madison Blue Spring Second Annual Monitoring Report. Biological Research Associates prepared report for Nestlé Waters North America, Inc.
- Durbin, D.J. and K.M.N. Raymond. 2005. Horse Creek Stewardship Program Summary of Historical Information on Water Quantity, Quality and Aquatic Biology. Biological Research Associates prepared report for The Mosaic Company.
- Durbin, D.J. and K.M.N. Raymond. 2005. Horse Creek Stewardship 2003 Annual Report. Biological Research Associates prepared report for The Mosaic Company.
- Durbin, D. and J.S. Lancaster. 2004. Water Quality Based Effluent Limitation Study of Proposed Discharge from the Mosaic Company Four Corners Mine to Long Branch in the Little Manatee River Drainage Basin. Biological Research Associates report prepared for the Mosaic Company.
- Durbin, D. and J.S. Lancaster. 2004. Supplemental Investigation of Dissolved Oxygen in MiraBay Lagoon. Biological Research Associates report prepared for the MiraBay Community Development District.
- Campbell, K.R. and D.J. Durbin. 2004. North Prong Alafia River Data Analysis. Biological Research Associates report prepared for the Florida Phosphate Council.
- Durbin, D.J. and J.H. Kiefer. 2004. Stream Restoration Plan. Technical guide to the post-mining replacement of numerous intermittent tributaries to Horse Creek prepared for IMC Phosphates Ona Fort Green Extension mining area in Hardee County, Florida. Included in supplemental information provided to the Florida Department of Environmental Protection for the mining area.
- Durbin, D.J. and J.S. Lancaster. 2003. Ecological assessment of Horse Creek on IMC Phosphates Fort Green Mine. Biological Research Associates report prepared for IMC Phosphates.

- Walton, L.M., S.M. Gonzalez, D.J. Durbin and J.S. Godley. 2003 Wading bird egg content study, Lake Apopka North Shore Restoration Area, Year 1. Biological Research Associates report prepared for the U.S. Natural Resource Conservation Service.
- Durbin, D.J. and J.S. Lancaster. 2002. Assessment of English Creek pursuant to Coronet Industries, Inc. NPDES Permit No. FL0034657. Biological Research Associates report prepared for Coronet Industries, Inc.
- Durbin, D.J. and J.S. Lancaster. 2002. Review of water quality conditions in the Peace River Basin with respect to the Phosphate Mining Industry. Biological Research Associates report prepared for the Florida Phosphate Council.
- Durbin, D.J. and S.M. Gonzalez. 2002. Ecological evaluation of wetlands on reclaimed clay settling areas. Biological Research Associates report prepared for IMC Phosphates.
- Durbin, D.J. and J.S. Lancaster. 2002. Ecological assessment of representative low-order streams in Hardee County, Florida using the BioRecon methodology. Biological Research Associates report prepared for CF Industries.
- Lancaster, J.S. and D.J. Durbin. 2002. Surface water quality survey of water bodies on the Transcend Development Corp. Plant City parcel. Biological Research Associates report prepared for Transcend Development Corp.
- Lancaster, J.S. and D.J. Durbin. 2002. Water and sediment quality assessment of the Westinghouse Site, Tampa, Florida. Biological Research Associates report prepared for WCI Communities, Inc.
- Walton, L.M., S.M. Gonzalez, D.J. Durbin and J.S. Godley. 2002 Wading bird egg content study, Lake Apopka North Shore Restoration Area. Biological Research Associates report prepared for the U.S. Natural Resource Conservation Service.
- Lancaster, J.S. and D.J. Durbin. 2001. Macroinvertebrate assessment of the IMC Phosphates Manson-Jenkins Tract West Fork of Horse Creek. Biological Research Associates report prepared for IMC Phosphates.
- Lancaster, J.S. and D.J. Durbin. 2001. Mountain Lake limnological evaluation and lake management alternatives. Biological Research Associates report prepared for Mountain Lake Corporation.
- Lancaster, J.S. and D.J. Durbin. 2000. Aquatic biological analysis for the Sawgrass Lake Contamination Assessment Report. Report prepared for SCS Engineers.
- Durbin, D.J. and J.S. Lancaster. 1999. Supplemental report: Biological assessment of Horse Creek. Biological Research Associates report prepared for IMC-Agrico Company.
- Durbin, D.J. and J.S. Lancaster. 1999. Supplemental minimal negative impact study of backup discharge of reclaimed water to an unnamed tributary to Whitaker Bayou. Biological Research Associates report prepared for Dolomite Utilities Corp.
- Durbin, D.J. and J.S. Lancaster. 1999. Water, sediment and aquatic resource assessment of Sterling Marina, Hernando Beach, Florida. Biological Research Associates report prepared for Civil-Tech Consulting Engineers, Inc.
- Lancaster, J.S. and D.J. Durbin. 1999. Biological assessment of the IMC-Agrico Ona Mine. Report prepared for IMC-Agrico Company.

- Lancaster, J.S. and D.J. Durbin. 1999. Biological assessment of the IMC-Agrico Pine Level Mine. Report prepared for IMC-Agrico Company.
- Durbin, D.J. and D.E. Sanders. 1998. Biological assessment of Horse Creek: Fall 1997 event. Biological Research Associates report prepared for IMC-Agrico.
- Durbin, D.J. and J.S. Lancaster. 1998. Cape Coral Unit 17/Lake Seminole system: Ecological assessment. Biological Research Associates report prepared for Oldcastle Precast, Inc.
- Durbin, D.J. and J.S. Lancaster. 1998. Water and sediment quality assessment of Bayshore Marina and Marjorie Park Marina, Tampa, Florida. Biological Research Associates report prepared for Moffatt & Nichol Engineers.
- Durbin, D.J. and D.E. Sanders. 1997. Baseline water quality investigation at proposed Bayside Development, Apollo Beach, Florida. Biological Research Associates report prepared for Shimberg Cross Company.
- Durbin, D.J. and D.E. Sanders. 1997. Level I water quality-based effluent limitation study of discharge from IMC-Agrico Four Corners Mine to Payne Creek. Biological Research Associates report prepared for IMC-Agrico Company.
- Denton, S.R. and D.J. Durbin. 1996. Identification of sites of high ecological value in Sarasota County, Florida. Biological Research Associates report prepared for Sarasota county Natural Resources Department.
- Durbin, D.J. and S.R. Denton. 1996. General limnological assessment of three augmented lakes in Northwest Hillsborough County, Florida. Biological Research Associates report prepared for Pinellas County Water System.
- Durbin, D.J. and J.S. Godley. 1996. Water quality assessment of waterways adjacent to Harbour Island, Tampa, Florida. Biological Research Associates report prepared for Harbour Island, Inc.
- Durbin, D.J. and T.L. Neldner. 1996. Plan of Study for a supplemental minimal negative impact study of an unnamed tributary to Whitaker Bayou. Biological Research Associates report prepared for Dolomite Utilities Corp. and Kensington Park Utilities, Inc.
- Bailey, E.E. and D.J. Durbin. 1995. Summary of ecological conditions in the area proposed for construction of new gypsum storage facility. Biological Research Associates report prepared for CF Industries, Inc.
- Durbin, D. J. and J.S. Godley. 1995. Assessment of ecological impacts to Hickey Branch and Payne Creek (Hardee County, Florida) resulting from failure of a clay settling pond dam. Biological Research Associates report prepared for IMC-Agrico Company.
- Durbin, D.J. and J.S. Godley. 1995. Assessment of ecological impacts to Tilghman Branch and Little Payne Creek (Hardee County, Florida) resulting from a mine tailings water release. Biological Research Associates report prepared for Cargill Fertilizer and Lewis Environmental Services, Inc.
- Durbin, D.J. and J.S. Godley. 1995. Assessment of Trout Creek, north of C.R. 581 pursuant to Outstanding Florida Waters designation. Biological Research Associates report prepared for Southern Property Holdings Corporation and Southwest Development Corporation.

- Durbin, D.J. and J.S. Godley. 1995. Assessment of water quality and ecological condition of James Pond and Irrigation Holding Pond as related to the input of treated domestic wastewater. Biological Research Associates report prepared for VLX Properties, Inc.
- Durbin, D.J. and J.S. Godley. 1995. Assessment of water quality in Tenmile Lake, Brandon, Florida. Biological Research Associates report prepared for Stang & Newdow, Inc.
- Durbin, D.J. and J.S. Godley. 1995. Camp Creek study: Field investigation of the effect of fish harvest on ammonia concentration. Biological Research Associates report prepared for IMC-Agrico.
- Durbin, D.J. and J.S. Godley. 1995. East Canal water quality assessment: Supplemental wet weather sampling. Biological Research Associates report prepared for City of Plant City, Florida.
- Durbin, D.J. and J.S. Godley. 1995. Faunal investigation of selected reclaimed and natural aquatic systems at the CF Industries, Inc. Hardee County Phosphate Complex. Biological Research Associates report prepared for CF Industries, Inc.
- Durbin, D.J. and J.S. Godley. 1995. General assessment of water quality in Blackwater Creek and Big Ditch. Biological Research Associates report prepared for CF Industries, Inc.
- Durbin, D.J. and J.S. Godley. 1995. Second assessment of water and sediment quality in James Pond and the Irrigation Holding Pond as related to the input of treated domestic wastewater. Biological Research Associates report prepared for VLX Properties, Inc.
- Durbin, D.J. and J.S. Godley. 1995. Water quality assessment of AAA stormwater/irrigation ponds. Biological Research Associates report prepared for American Automobile Association.
- Bailey, E.E. and D.J. Durbin. 1994. Marco Shores Unit 30: wood stork (*Mycteria americana*) foraging habitat assessment. Biological Research Associates report prepared for 951 Land Holdings Joint Venture.
- Bailey, J.J., D.J. Durbin and S.R. Denton. 1994. Ecological comparison of two areas proposed for land trade between CF Industries, Inc. and Hillsborough County, Florida. Biological Research Associates report prepared for CF Industries, Inc.
- Carey, W.B., D.J. Durbin and S. R. Denton. 1994. Alternatives analysis to facilitate the selection of a location for a future gypsum stack. Biological Research Associates report prepared for CF Industries, Inc.
- Durbin, D.J. and J.S. Godley. 1994. Camp Creek study: Experimental determination of ammonia production by teleost fishes. Biological Research Associates report prepared for IMC-Agrico.
- Durbin, D.J. and J.S. Godley. 1994. East Canal water quality assessment. Biological Research Associates report prepared for City of Plant City, Florida.
- Durbin, D.J. and J.S. Godley. 1994. Habitat quality of torpedograss (*Panicum repens*) marsh in the L-403 created wetland system. Biological Research Associates report prepared for Disney Development Company.
- Durbin, D.J. and J.S. Godley. 1994. Level I water quality basted effluent limitation study of discharge to English Creek: Sampling event 1 of 2. Biological Research Associates report prepared for Florida Department of Environmental Protection and Coronet Industries, Inc.
- Durbin, D. J. and J. S. Godley. 1994. Hillsborough River considered for OFW designation. Florida Real Estate Journal, Nov. 16-30.

- Durbin, D.J. and J.S. Godley. 1993. Assessment of CF Industries, Inc. water treatment system. Draft Biological Research Associates report prepared for CF Industries, Inc.
- Durbin, D.J. and J.S. Godley. 1993. Limnological assessment of IMC-Agrico Achan Reclamation Lakes. Biological Research Associates report prepared for IMC-Agrico Company.
- Durbin, D. J. and J.S. Godley. 1993. Water quality based effluent limitation study of industrial discharge to English Creek. Biological Research Associates report prepared for Florida Department of Environmental Protection and Coronet Industries, Inc.
- Durbin, D.J. 1992. Investigation of an energy-regulated steady-state in simple aquatic systems. Ph.D. Dissertation. Clemson University.
- Durbin, D.J. and W.D. Pearson. 1988. The Fishes of Bullitt County, Kentucky. Transactions of the Kentucky Academy of Sciences. 51(1-2):6-13.
- Durbin, D.J. 1987. The Fishes of Bullitt County, Kentucky, as affected by 36 years of changes in human activities and land use. Masters Thesis. University of Louisville.

Oral Presentations and Posters

- Durbin, D.J. 2003, 2004, 2005, and 2006. Environmental Permitting of Docks and Marinas. Presentation at National Conference on: Docks and Marinas. College of Engineering, University of Wisconsin – Madison.
- Durbin, D.J. 2006. What the Numeric Nutrient Standards Might Mean to FMCC. Florida Minerals and Chemistry Council, Fall Technical Conference, 25 October 2006, White Springs, Florida.
- Durbin, D.J. 2006. New Requirements in Mine Reclamation - Better Reclamation? Florida Association for Water Quality Control. Annual Conference, Naples, Florida.
- Durbin, D.J., S.M. Gonzalez and S.C. Riedl. 2004. Fish Assemblages as an Indicator of Biological Function in Aquatic Systems Restored after Phosphate Mining. First National Conference on Ecosystem Restoration. Orlando, Florida.
- Moore, R.D., S.M. Gonzalez, E.D. McCoy, H.R. Mushinsky and D.J. Durbin. 2004 Wildlife Utilization of Phosphate Mined Lands. First National Conference on Ecosystem Restoration. Orlando, Florida.
- Durbin, D.J. 2002. Mining and Water Quality. Presentation at the annual meeting of the Florida Association for Water Quality Control. Naples, FL.
- Denton, S.R. and D.J. Durbin. 1999. Environmental Considerations for Implementation of Minimum Flows and Levels: A Scientific Perspective. Seminar presented at the CLE Conference in Tampa, Florida. 18 June, 1999.
- Durbin, D.J. 1997. The Art and Science of Managing Natural Areas. Florida Watchable Wildlife Symposium, May 1997, Crystal River, Florida.
- Durbin, D.J. April 1996. Large-Scale Pine Flatwoods Restoration Effort on Land Converted to Improved Pasture. Ecological Restoration Workshop co-sponsored by the Florida Institute for Phosphate Research and the Society for Ecological Restoration. Lakeland, Florida.

- Durbin, D.J. 1995. Identification of Environmentally Sensitive Lands Using Geographic Information System. Invited presentation to the Florida Department of Environmental Protection Coastal Management Workshop, 6 October 1995, University of South Florida - St. Petersburg Campus.
- Durbin, D.J. 1994. The Hillsborough River Greenways Task Force. Third Annual Meeting of the Southeastern Lake Management Society. Columbia, SC.
- Durbin, D.J. and J.E. Schindler. 1991. Establishment of a Biogeochemical Steady-state in *Chlamydomonas reinhardtii* Cultures. Southeastern Phycology Colloquy. Clemson, SC.
- Durbin, D.J. and J.E. Schindler. 1992. Microcosm Investigations of a pH Steady-state in Aquatic Communities. Fifty-third Annual Meeting of the American Society of Limnology and Oceanography. Williamsburg, Virginia.