

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:)
)
WATER QUALITY STANDARDS AND)
EFFLUENT LIMITATIONS FOR THE) R08-9
CHICAGO AREA WATERWAY SYSTEM) (Rulemaking – Water)
AND THE LOWER DES PLAINES RIVER:)
PROPOSED AMENDMENTS TO 35 ILL.)
Adm. Code Parts 301, 302, 303, and 304)

NOTICE OF FILING

To:

John Therriault, Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph St., Suite 11-500
Chicago, IL 60601

Marie Tipsord, Hearing Officer
Illinois Pollution Control Board
James R. Thompson Center
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1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

Persons included on the attached
SERVICE LIST

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board **PRE-FILED TESTIMONY OF DR. WILLIAM VAN BONN** on behalf of Environmental Groups, Environmental Law and Policy Center, Natural Resources Defense Council, Prairie Rivers Network, Sierra Club – Illinois Chapter, Friends of the Chicago River, and Openlands, a copy of which is herewith served upon you.

Respectfully Submitted,



Albert Ettinger
Senior Staff Attorney
Environmental Law & Policy Center
35 E. Wacker Dr. Suite 1300
Chicago, Il 60601
(312) 795-3707

DATED: August 4, 2008

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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WATER QUALITY STANDARDS AND)
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ADM. CODE PARTS 301, 302, 303, AND 304)

Testimony of Dr. William Van Bonn
John G. Shedd Aquarium
(August 4, 2008)

I. Introduction

My name is Dr. William Van Bonn, and I am Senior Director for Animal Health at the John G. Shedd Aquarium. I am testifying today in support of the regulation proposed by the Illinois Environmental Protection Agency (IEPA) to strengthen water quality standards for the Chicago Area Waterways System (CAWS) and Lower Des Plaines River (LDPR).

Scientists and scholars tell us the Great Lakes basin was created by glacial activity over 10,000 years ago. The glaciers left in their wake a magnificent fresh water ecosystem that contains approximately 20 percent of the globe's total fresh water resources. The Great Lakes basin, including the CAWS and LDPR, remained unimpacted by human activity for nearly ten millennia.

As people settled in the Chicago area, they manipulated and changed the waterways until significant environmental harm to these unique aquatic systems was obvious to the casual observer. One of the most notable human influences on the river systems was the massive influx of effluent from wastewater treatment plants. In addition to reversing the direction of the Chicago River, we introduced dramatic stressors by

altering the waters' natural cycle and flow, and installing massive infrastructure to handle large concentrations of biological waste. Industrial facilities situated along our rivers have also affected the temperature and composition of these river systems.

The stressors caused by altering our waterways can result in serious health implications for the entire ecosystem, from microscopic organisms to humans. People are the only ones that have the choice and capacity to direct and implement change to restore balance to the CAWS and LDPR. The proposed rules mandate that Metropolitan Water Reclamation District of Greater Chicago (MWRD) dramatically reduce pathogens that it discharges into our waters by disinfecting approximately 1.17 billion gallons of effluent daily at its Calumet, Stickney and North Side wastewater treatment plants. Industrial facilities will be required to lower the temperature of their effluent to increase the amount of oxygen in the water for fish and other aquatic life. When evaluating these and other proposed changes, it is important to consider the benefits not only to a particular species, but to all life dependent upon the waterways.

II. Qualifications

I was raised in, on and around the lakes, ponds and rivers of the state of Michigan. I graduated from the College of Veterinary Medicine at Michigan State University in 1986. While employed in traditional private practice, my aquatic interests led me in 1991 to enroll in an inaugural Envirovet program – an intensive, in-residence short course regarding aquatic animal medicine and environmental toxicology.

Following this experience, I was commissioned into the U.S. Army Veterinary Corps, and assigned duty at the U.S. Navy's Marine Mammal Program in San Diego. I spent four years on active duty, followed by an additional eleven years as a civilian with

the program. My last position at that location was as Managing Veterinarian for Research and Advanced Clinical Technologies.

In 2005, I accepted the position of Senior Director for Animal Health at the John G. Shedd Aquarium in Chicago, coming home to the Great Lakes. As part of my responsibilities, I oversee the preventative medicine program for more than 25,000 individual animals, with over 2,500 species housed in intensively managed aquatic systems.

Overall, my duties and professional interests are focused on preventative medicine and enhanced clinical veterinary services for aquatic animals under human care. I am Past-President of the International Association for Aquatic Animal Medicine, an elected member of the World Aquatic Veterinary Medical Association executive board, and invited member of that association's Ethics and Governance Committee. I have authored numerous scientific articles, abstracts and several book chapters.

I am founding faculty of Marvet, a short course in marine veterinary medicine regarding both animals under human care and free-ranging populations. I hold Adjunct Clinical Assistant Professor status at both the University of Illinois' College of Veterinary Medicine and Northwestern University's Feinberg School of Medicine. I also serve as client mentor under a master agreement with the Robert R. McCormick School of Engineering and Applied Science at Northwestern University.

III. Background: Healthy Ecosystems Require Balance

Optimal health is all about balance. Natural systems are complex and subject to multiple factors. All wildlife share their immediate environment with organisms that

may be detrimental to their health if conditions “tip the balance” in favor of one species over another.

Discharging over a billion gallons of effluent into the CAWS every day influences this balance, and may place the health of resident wildlife at risk. This massive amount of effluent can lead to a significant influx of pathogens in the waterways, increasing the opportunity for disease to strike. From this perspective, it is not hard to appreciate how disinfecting wastewater will lead to a more natural, balanced healthy ecosystem.

IV. Potential Effects of Pathogens in Effluent from Wastewater Treatment Plants on Wildlife Dependent Upon the CAWS and LDPR – the Otter Example

The Shedd Aquarium hosts both sea otters (*Enhydra lutris*) and river otters (*Lontra canadensis*) at its facility. Otters attract a lot of attention. They are often characterized in Zoological and Aquarium facilities as “charismatic mustelids.” Most of us are familiar with the devastation associated with the Exxon Valdez disaster in 1989. Sea otters were among the most visible and publicized animals negatively impacted by that event.

During the follow up to this incident, specific programs were established to better survey and understand the sea otter and its health status. As a result, a significant amount of data has been collected and published in scientific literature. Of note, studies found that several parasites introduced into the environment by human activity, specifically effluent from wastewater treatment plants, are recognized as the most common causes of disease and death in free ranging sea otters off the California coast.

Sea otters are closely related to North American River Otters, which are indigenous to the CAWS and LDPR. Although river otters once flourished in the region, they were heavily impacted by human exploitation, such as fur trade, loss of habitat and degraded

water quality. Kimber, Kollias, *Infectious and Parasitic Diseases and Contaminant-Related Problems of North American River Otters (Lontra Canadensis): A Review*, J Zoo and Wildlife Medicine, 2000: 31(4):452. In the late 1970's, the Illinois Department of Natural Resources (IDNR) estimated that fewer than 100 river otters remained statewide. In 1989, they were placed on the Illinois state-endangered species list.

To help reverse this trend, in 1994, IDNR reintroduced 300 river otters from Louisiana to wetlands in Illinois. Reported results have been promising. River otters were delisted in Illinois in February 2004. According to the Forest Preserve District of Cook County, a river otter was sighted in December 2007 in the Chicago River near the back steps of the Lyric Opera House. Their presence is important because such fish eating wildlife are environmental sentinels, reflecting the water quality and aquatic habitat in their ecosystem. See e.g. Kimber, Kollias, *Infectious and Parasitic Diseases and Contaminant-Related Problems of North American River Otters (Lontra Canadensis): A Review*, J Zoo and Wildlife Medicine, 2000: 31(4):465-67. If we want otters and other native species to successfully return to the area and once again be a part of our life experience, it is important to understand what organisms threaten their health, and how we can avoid needlessly tipping the balance in favor of those threats.

A. Toxoplasmosis

Toxoplasma gondii, a widely studied protozoan parasite found in cat feces, has caused toxoplasmosis in sea otters. "Warmblooded" animals, such as otters, that ingest the infective parasite, can develop brain lesions, seizures, severe depression and death. Colleagues at the Wildlife Health Center at the School of Veterinary Medicine, University of California at Davis (and others) concluded the parasite was most likely

transported by freshwater runoff into the marine ecosystem. Conrad et al., Int J Parasitol, 2005 Oct; 35(11-12):1155-68; see also Miller et al., Int J Parasitol, 2008 Feb 26 [Epub ahead of print]. Scientists involved in these studies have expressed that sea otters are more vulnerable to parasites and bacteria, such as *Toxoplasma Gondii* because pollution and other disturbances have weakened their immune systems.

Although less is known about toxoplasmosis in river otters, a study in North Carolina showed that 45% of 103 live trapped river otters had antibodies for *Toxoplasma gondii*, showing that river otters are susceptible to this parasite. Kimber, *Serologic Survey for Toxoplasmosis in River Otters*, J Wildlife Diseases, 1997; 33(3): 649-652.

B. Giardia and Cryptosporidium

“Environmental pollution with human and domestic animal fecal material is recognized as a potential pathogen pathway for wildlife infections with zoonanthropomorphic protozoan parasites such as *Giardia* and *Cryptosporidium*; such infections can put wildlife populations at risk.” Applebee, et al., Giardia and Cryptosporidium in mammalian wildlife – current status and future needs (*Giardia and Cryptosporidium in mammalian wildlife*), TRENDS in Parasitol, 2005 Aug; 21(8):370. “To date, *Giardia* of human origin appears to be the main source of water contamination and as such may impact negatively on ecosystem health leading to infections in aquatic wildlife.” Thompson, *The zoonotic significance of molecular epidemiology of Giardia and giardiasis*” Vet Parasitol 2004;126:17. In determining the effect on sea otters, the study found that, “in addition to the impact that chemical pollution has on marine mammal immunocompetency, the discharge of agricultural waste and raw or improperly

treated sewage can introduce pathogens into the environment.” *Giardia and Cryptosporidium in mammalian wildlife*, TRENDS in Parasitol, 2005 Aug; 21(8):374.

“Both *Giardia* cysts and *Cryptosporidium* oocysts have been detected in marine water samples from areas of treated-sewage disposal.” *Id.* Although few studies have been done to investigate infection of *Giardia* and *Cryptosporidium* in river otters, *Cryptosporidium* and *Giardia* oocysts have been detected in marine-foraging river otter fecal samples. “Four of 57 or 7% of river otters in the marine waters of the Puget Sound region were shedding *Cryptosporidium* sp. at the time of sampling, and 11 of 57 or 19% were shedding *Giardia* sp. in Washington.” Gaydos, et al., *Cryptosporidium and Giardia in Marine-Foraging Otters*, *J Parasitol*, 2007 Feb; 93(1):200.

C. Bacteria: Salmonella, Streptococcus, and Mycobacteria-Tuberculosis

Otters in reintroduction programs have manifested bacteria-associated problems “on the basis of prevalence and pathogenicity, includ[ing] *Clostridium perfringens*-related enterotoxemia, *Streptococcus* species related wound abscesses [otherwise known as Strep], *Salmonella* species-related enterotoxemia, and *Mycobacterium* species-related exposure in captivity.” Kimber, Kollias, *Infectious and Parasitic Diseases and Contaminant-Related Problems of North American River Otters (Lontra Canadensis): A Review*, J Zoo and Wildlife Medicine, 2000: 31(4):459. Species of *Salmonella* have been isolated from wild and captive river otters throughout the United States. “Although infected animals may be asymptomatic, salmonellosis can be fatal in North American river otters.” *Id.* According to the Kimber and Kollias study, “otters are susceptible to *Mycobacterium avium*, *Mycobacterium bovis*, and *Mycobacterium Tuberculosis var. hominis*. Tuberculosis was listed in necropsy reports from 4 of 88 unidentified zoo

otters....” Tuberculosis due to *M. Tuberculosis* var. *hominis* was reported in a European river otter from a Swedish zoo. Kimber, Kollias, *Infectious and Parasitic Diseases and Contaminant-Related Problems of North American River Otters (Lontra Canadensis): A Review*, J Zoo and Wildlife Medicine, 2000: 31(4):461.

I am not aware of any similar published studies concerning the CAWS and LDPR. However, river otters (as well as humans) are clearly threatened by many of these same pathogens.

V. The Source – the Origin of Organisms Found in Effluent

Pathogens in effluent from wastewater treatment plants are clearly a global threat to public health. Disease outbreaks are often associated with contaminated water. Ingesting pathogens is arguably one of the most effective and common routes of contracting and transmitting disease. Pathogens originate from human and animal feces (both wild and domestic) in partially treated sewage and terrestrial waste carried in stormwater runoff.

According to MWRD, it has tested for several of the pathogens discussed above, and has verified their presence in effluent discharged from its wastewater treatment plants. Of note, MWRD reported finding enteric viruses, *Cryptosporidium Parvum*, *Giardia lamblia*, *Salmonella*, *Pseudomonas aeruginosa*, *Escherichia coli* and Enterococci. Since cat feces in discarded litter has been found to contaminate wastewater, the effluent discharged by MWRD’s three plants could also pose a risk of toxoplasmosis to resident river otters in the CAWS and LDPR. For a broader viewpoint, Yan and Sadowsky with the University of Minnesota recently wrote an excellent review

of fecal bacterial sources in waterways, and methods to determine these sources. Yan and Sadowsky, *Environ Monit Assess* (2007) 129:97-106.

VI. Conclusion

Health is all about balance. Natural waterways are not sterile. They are teeming with trillions of organisms that potentially threaten the health of other native species when conditions tip the natural balance in their favor. Dr. Mark Jerome Walters, a veterinary colleague and trained journalist, eloquently describes the human influence on the natural world and resulting disease in his book, Six Modern Plagues and How We are Causing Them Shearwater Books, Washington, DC, USA, 2003, ISBN: 155963992X . Dr. Walters discusses the rate of change in the natural environment today as result of human activities. In his words, "...microscopic predators are taking full advantage of the instability."

If effluent from wastewater treatment plants is not disinfected, it will contain pathogens that potentially cause disease in both wildlife and humans. Wastewater that is collected, concentrated and discharged by the billions of gallons into the CAWS artificially tips the balance in their favor. By controlling the level of pathogens in our wastewater to what is found in a healthy river system, we can minimize stressors on resident species. Human beings are uniquely positioned to exercise this control.

Submitted by: Dr. William Van Bonn
Senior Director for Animal Health
John G. Shedd Aquarium

Date: August 4, 2008

Curriculum Vitae
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Senior Director for Animal Health
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EXPERIENCE:

March 2005- Present, John G. Shedd Aquarium, Chicago, Illinois 60605, Animal Health Department, Senior Director. Supervisor: Jeffery R. Boehm, DVM. Senior Vice President, Conservation and Veterinary Services, 312-692-3232. Serve as team lead for daily operations of three divisions, Environmental Quality, Microbiology and Veterinary Services. Develop and direct contemporary comprehensive preventive medicine program designed to reduce animal morbidity, mortality and the cost of doing so. Provide management and leadership oversight to three Division Managers and eleven direct reporting team members. Serve as department liaison to other departments and extramural program leads to include University of Illinois Zoological Pathology Program and the Chicago Zoo and Aquatic Animal Residency. Mentor junior clinical staff, visiting veterinary student externs, interns and residents. Focus on prevention, advancement and excellence.

October 1998- September 2005, U.S. Navy Space and Naval Warfare Systems Center (SPAWARSYSCEN) San Diego, CA, 92152-5000, Code 2351 as DP-0701-03 (GS-14 equivalent) Scientist/Veterinarian. Supervisor: Mr. Patrick Moore, SPAWARSYSCEN San Diego Code 2351, 619-553-0888. Provided state-of-the-art clinical care to all Navy marine mammals in San Diego as well as numerous continental United States (CONUS) and outside the continental United States (OCONUS) animal movements. Interacted with host-nation Convention on International Trade in Endangered Species (CITES) Management Authorities enabling Navy Marine Mammal Program (NMMP) participation in NATO sponsored training exercises. Designed, procured, outfitted and deployed multiple mobile marine mammal clinics (3MC) that are now standard of care for veterinary support to deployed NMMP animals. Directed completion of custom relational database for all aspects of medical record keeping. Drafted Memorandum of Understanding (MOU) with Virginia-Maryland Regional College of Veterinary Medicine's Center for Corporate and Government Veterinary Medicine establishing veterinary student preceptorship program at NMMP. Served as Managing Veterinarian for Research and Advanced Clinical Technologies. Established research project to conduct first formal infectious disease risk assessment for NMMP and development of specific DNA vaccines against identified threats to animal health. Served as Principal Investigator on project, Research Advisor to three Post-Doctoral Associates (two of whom have been hired by 235) and secured over \$ 1 million in extra and intramural funding over the life of the project. Acted as Technical POC on "VetLab" Technical Direction Letter (TDL) under existing animal care contract. Intermittently served as acting Branch Head 2351.

November 1995- September 1998, Self-employed and Upstream Associates, P.O. Box 60680 San Diego, CA 92166. General Partner, consultant specializing in advanced clinical care of marine mammals under contract to U.S. NMMP. Established accounting methods, invoicing and Contract Deliverables Requirements List methodology in support of contract with NMMP. Wrote and conducted annual training course "Concepts in Marine Mammal Medicine" offered to upperclassmen veterinary students and recent graduate veterinarians.

December 1991- October 1995, Captain (0-3), U.S. Army Veterinary Corps, with duty at Naval Command, Control and Ocean Surveillance Center, RDT&E Division (NRaD). Chief, Clinical Veterinary Services. Supervisor: Dr. Sam H. Ridgway, SPAWARSYSCEN Code 235, 619-553-1374. Sole active duty military veterinarian providing clinical care to all Navy animals housed in San Diego and on over 50 animal transports to both CONUS and OCONUS locations with zero animal casualties. Provided direct veterinary input to procedures development and direct animal care during first ever Shipboard Forward Deployment of Navy marine mammals. Completed first annual Command DoD Animal Use and Cost Survey and ensured command readiness for DoD and Navy IG inspections of animal use facilities. Served as advisor to commanding admiral Space and Naval Warfare Systems during congressionally directed negotiations with the Humane Society of the United States. Wrote MOU between commanding officer NRaD and District Commander, Veterinary Services, Fort Jackson for provision of veterinary care to Navy animals assigned to Explosive Ordnance Mobile Unit Six (EODMU6) in Charleston, S.C. Wrote first program description leading to successful accreditation by the Association for Accreditation and Assessment of Laboratory Animal Care International (AAALAC) in accordance with DoD Directive 3216.1 of 17 April 1995. Established monthly all hands "Animal Care Briefs" training that has now become Division standard to meet mandatory training requirements.

September 1988- December 1991, Professional Veterinary Hospitals of America, Inc. Chief of Staff Veterinarian at Farmington Hills, Michigan location. Supervisor: Dr. Andrew Dworkis. Served as lead clinical veterinarian in busy companion animal facility. Responsible for hospital productivity and oversight to staff of six veterinary technicians and affiliated clerical personnel.

June 1986- July 1988. Dr. R.J. Keeran, D.V.M., P.C. New Hudson, Michigan. Associate Veterinarian. Provided full spectrum of medical and surgical services for referral equine surgical practice including emergency care and ambulatory services. Established arthroscopic surgical capability for practice. Established Herd Health Program for practice.

EDUCATION:

Doctor of Veterinary Medicine, with high honor, June 1986 from Michigan State University College of Veterinary Medicine, East Lansing, Michigan 48824.

Bachelors of Science in Veterinary Science, with high honor, June 1984 from Michigan State University. East Lansing, Michigan 48824.

OTHER TECHNICAL TRAINING:

October 1999 University of California, San Diego, Innovations in Vaccine Development

March 1996 University of California, Irvine Pentax Precision Instrument Co., A Swine Model for Teaching Endoscopic Ultrasonography and Endoscopic Ultrasound Guided Fine Needle Aspiration

October 1993 Extron-Intron, Inc. Columbia MD, Polymerase Chain Reaction Methodology

March 1992 AMEDD Center & School, Fort Sam Houston TX, U.S. Army Medical Department Officer Basic Course, Honor Grad

July 1991 University of Illinois/University of Wisconsin, Envirovet- aquatic animal medicine and environmental toxicology

REPRESENTATIVE ORGANIZATIONAL TRAINING:

October 2005, Conflict Management and Resolution in the Workplace.

July 2005, Staff Diversity Awareness, The Kaleidoscope Group L.L.C.

Guidelines for Successful Teams, SEPO SSC San Diego, 2004

December 2002, High Performance Organizations

October 2002, 7-Habits of Highly Effective People

2002, SAP/ERP Project Reporting Course

September 1995, Contracting Officer's Representative (COR) course

PERFORMANCE & AWARDS:

Invited member Shedd Aquarium Leadership Council 2007, 2008

All Federal performance ratings have been Superior or Outstanding

Meritorious Service Medal, March 1996; Navy Achievement Medal, June 1994; National Defense Medal, March 1992; Army Service Ribbon, March 1992.

AVMA Outstanding Student Award, April 1992; BG Charles Elia Veterinary Excellence Medallion, 1992.

LICENSES & CERTIFICATES:

Licensed to practice veterinary medicine, State of Michigan, Board of Veterinary Medicine

Licensed to practice veterinary medicine, State of Illinois, Department of Financial and Professional Regulation

Controlled Substance license holder, State of Michigan, Board of Pharmacy

Controlled Substance license holder, State of Illinois, Department of Financial and Professional Regulation

DEA Controlled substance licensee

Federally accredited, United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services (USDA APHIS VS).

ADDITIONAL PROFESSIONAL ACTIVITIES:

Invited member Ethics and Governance Committee of World Aquatic Veterinary Medical Association 2008

Advisor, Northwestern University, Institute of Design Engineering and Applications, McCormick school of Engineering. IDEA 298/398, Multidisciplinary Design Projects I & II. 2006, 2007, 2008

Adjunct Professor, University of Illinois, College of Veterinary Medicine, Department of Clinical Medicine. 2005, 2006, 2007, 2008

Invited instructor *9th Marine Mammal Medicine Workshop*, Valencia Spain, September 2007

National Research Council, Research Advisor, SPAWARSYSCEN. 2001, 2002, 2003, 2004, 2005

Elected Executive Board Member for Education, International Association for Aquatic Animal Medicine, 2001, 2002, 2003, 2004

President-Elect, International Association for Aquatic Animal Medicine, 2005

President, International Association for Aquatic Animal Medicine, 2006

Immediate Past-President, International Association for Aquatic Animal Medicine, 2007

Principal Investigator, Nucleic Acid Transfection Technology Development in Navy Marine Mammals. 1999, 2000, 2001, 2002, 2003, 2004, 2005

Consultant to Navy Marine Mammal Program IACUC 2000, 2001, 2002, 2003, 2004, 2005

Invited lecturer at *Aquamed* an Aquatic Animal Pathobiology Course sponsored by the Gulf States Consortium for Aquatic Pathobiology at Louisiana State University 1996, 1997, 1998, 1999, 2001

Adjunct Professor/instructor at *Concepts in Marine Mammal Medicine* VAPH-948-304 Texas A & M University 1998, 1999

Invited Instructor at 7th *Marine Mammal Medical Workshop* March 1999 in Paris, France

Member of steering committee for *Bottlenose Dolphin Breeding Workshop* June 1999 in San Diego CA

Steering Committee member and Session Chair *Dolphin Neonatal and Reproduction Symposium* October 2005 Indianapolis Zoo

Invited founding faculty for *MarVet* week long marine mammal medicine short course at Mote Marine Laboratory, Sarasota, Florida 1999, 2000, 2001, 2002, 2003, 2005, 2007

PROFESSIONAL AFFILIATIONS:

American Association of Human Animal Bond Veterinarians

American Veterinary Medical Association

International Association for Aquatic Animal Medicine

Association of Zoos and Aquariums

World Aquatic Veterinary Medical Association

SELECT REPRESENTATIVE PUBLICATIONS:

Van Bonn, W. Extra-articular surgical stifle stabilization of an American bullfrog (*Rana catesbeiana*) J Exotic Pet Medicine. In Review

Nollens HH, Wellehan JF, Saliki JT, Caseltine SL, Jensen ED, **Van Bonn W**, Venn-Watson S. Characterization of a parainfluenza virus isolated from a bottlenose dolphin (*Tursiops truncatus*). Vet Microbiol. 2008 Apr 30;128(3-4):231-42. Epub 2007 Oct 16. PMID: 18031960 [PubMed - in process]

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J Vet Path. In Review

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Functional imaging of dolphin brain metabolism and blood flow.
J Exp Biol. 2006 Aug;209(Pt 15):2902-10.
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Structural and functional imaging of bottlenose dolphin (*Tursiops truncatus*) cranial anatomy.
J Exp Biol. 2004 Oct;207(Pt 21):3657-65.
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Vet Parasitol. 2003 Oct 30;116(4):275-96.
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PMID: 12185537 [PubMed - indexed for MEDLINE]

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J Clin Microbiol. 2002 Feb;40(2):721-4.
PMID: 11826007 [PubMed - indexed for MEDLINE]

Dover, S. H., **Van Bonn, W**. 2001. Principles of Endoscopy in Marine Mammals. In: Dierauf, L., F. Gulland (eds.) Marine Mammal Medicine 2nd Edition. CRC Press. Boca Raton, FL. pp.621-641.

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Denys, L., **Van Bonn, W.** 2001. A second species in the epizoic diatom genus Epipellis. E. heptunei sp. Nov In: Lange-Bertalot-Festschrift: Studies on Diatoms edited by Regine Jahn, John P. Kociolek, Andrzej Witkowski & Pierre Compère Gantner, Ruggell. – ISBN 3-904144-26-X. (distributed by Koeltz Scientific Books, Koenigstein)Beihefte zu Nova Hedwigia.

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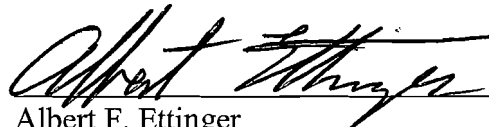
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STATE OF ILLINOIS)
)
COUNTY OF COOK)

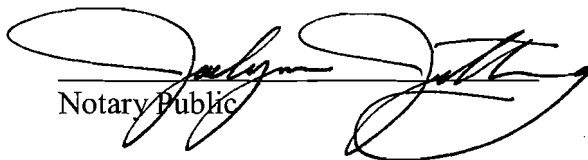
PROOF OF SERVICE

I, Albert Ettinger, on oath state that I have served the attached **PRE-FILED TESTIMONY OF DR. WILLIAM VAN BONN** via U.S. Mail, first class postage prepaid, from 35 East Wacker Drive, Illinois to All Counsel of Record on the attached Service List, on this 4th day of August, 2008

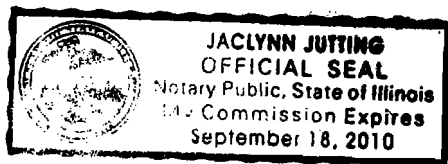


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Subscribed and sworn to before me
This 4th Day of August, 2008



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