THE GATEKEEPERS

A Summary of Court Records in Civil Actions Filed by David L. Lewis, Ph.D. , R.A. McElmurray, III and G. William Boyce

Land Application of Sewage Sludge (Biosolids)

1997-2010

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June 25, 2010

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Executive Summary

The Gatekeepers is a comprehensive resource in ongoing proceedings in the two Civil Actions listed below. This material is primarily drawn from Exhibit A to Dr. David Lewis' affidavit dated October 28, 2009, which was submitted to the Court in *USA, ex rel. Lewis, McElmurray and Boyce v. Walker et al*.

Civil Actions

1. *United States of America, ex rel. David L. Lewis, Ph.D., R. A. McElmurray, III, and G. William Boyce v. John Walker, Ph.D., Julia W. Gaskin, Robert B. Brobst, William P. Miller, Ph.D., E. William Tollner, Ph.D., L. Mark Risse, Ph.D., Joe. L. Key and The University of Georgia Research Foundation, Inc*. United States District Court, Middle District of Georgia, Athens Division. Case No. 3:06-CV-16.

2. *Lewis v. United States Environmental Protection Agency*, U.S. Department of Labor. Administrative Law Judges, Case Nos. 2003-CAA-6, 2003-CAA-5; ARB Case No. 04-117; United States Court of Appeals for The Eleventh Circuit, Case No.08-12114HH. Petition for Rehearing and Rehearing En Banc filed April 9, 2010.

Background

In 1977, President Jimmy Carter made controlling water pollution the highest priority of the U.S. Environmental Protection Agency (EPA) when he announced a 10-year program to construct wastewater (sewage) treatment plants for every municipality in the country. Ending with a note of caution, however, he advised Congress:[1]

> *But at the same time, we need to be sure that sewage projects supported by Federal money do not create additional environmental problems…We also must ensure that the systems are operated properly…that there is an effective pretreatment program to remove harmful industrial wastes from these systems; and that we are carefully considering alternative solutions…*

Under the Federal Clean Water Act, industries are required to pre-treat most chemical wastes before they enter sewer lines. At the treatment plants, solids settle out in the form of semi-solid wastes called sewage sludges. Pollutants with low water solubilities, including certain heavy metals, pesticides, and pharmaceuticals, are concentrated in the sludges. Prior to disposal, the Clean Water Act requires that sewage sludges be treated to reduce odors and levels of pathogens. The most common method, called lime stabilization, involves adding lime to raise the pH high enough (>12) to kill most pathogens. Other common methods include anaerobic digestion, composting with

[1] President Jimmy Carter, The Environment Message to the Congress. May 23, 1977. www.presidency.ucsb.edu/ws/index.php?pid=7561

wood chips, and heat-pelletization. Once treated, sewage sludges are buried in landfills, incinerated, or land-applied as fertilizer (biosolids).

In 1978, a soil scientist in EPA's Office of Water (OW), Dr. John L. Walker, advised Associate Deputy Assistant Administrator Henry L. Longest, II that he should promote land application of processed sewage sludges for agricultural purposes. Walker wrote: "The application of some low levels of toxic substances to land for food crop production should not be prohibited."[2] Longest and other EPA administrators liked the idea. Walker was one of several scientists who joined EPA in the mid-1970s, who started promoting land application as the preferred method of sewage sludge disposal. Before that, Walker worked for Dr. Rufus Chaney, an agronomist at USDA who also promotes land application of sewage sludges. Others at OW who promoted this approach from the beginning included Dr. Alan B. Rubin and Mr. Robert K. Bastian. Rubin was a chemist who held the position of VP for Research at Adams Laboratories in Alexandria, VA before coming to EPA. Bastian was a biologist who formerly worked for the U.S. Corps of Engineers.

Bastian, Walker, and Rubin, in close collaboration with Rufus Chaney, developed all of EPA's guidance for land application of sewage sludges, including 40 CFR, Part 503, known as the "503 sludge rule," or "503 rule." The 503 rule, which was promulgated in 1993, currently governs land application of sewage sludges. It is highly controversial, primarily because it does not require that processed sewage sludges be tested for any organic pollutants. Moreover, it only requires testing for nine of the heavy metals found in sewage sludges (As, Cd, Cu, Pb, Hg, Mo, Ni, Se, Zn). Other toxic heavy metals found in sewage sludges, for example thallium, antimony and chromium,[3] are not regulated under the 503 rule. Some states and municipalities have elected to test for certain additional pollutants, such as PCBs.

In 1992, EPA's Office of Research & Development (ORD), which evaluates the scientific basis for the Agency's regulations, conducted an internal peer-review of the proposed 503 sludge rule. ORD scientists concluded that the rule had significant gaps in its scientific basis and was not protective of public health and the environment.[4] OW, in response, agreed to fund ORD at a level of $2 million per year for at least five years to assess these gaps; and it promised to work with ORD to modify the rule. Instead of funding ORD as promised, however, OW established a Cooperative Agreement with an industry trade association, the Water Environment Federation (WEF), to support the rule and silence critics, both inside and outside of EPA. Moreover, OW not only failed to work with ORD to strengthen the 503 rule; it actually weakened the rule in 1994 by

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[2] U.S. Environmental Protection Agency. Memorandum: Walker JM, EPA Municipal Technology Branch to Henry L. Longest II, EPA Assoc. Deputy Asst. Administrator for Water Program Operations. September 12, 1978. www.sludgefacts.org/Ref15.jpg

[3] This includes Cr[VI]), which causes lung cancer. Clinically significant amounts of Cr[VI]) may be present in dusts blowing from land application sites in the Southeastern U.S. where sewage sludges are applied to clay soils.

[4] U.S. Environmental Protection Agency. E-mail. Burnell Vincent to Craig Barber et al. May 6, 1992. www.sludgefacts.org/Ref17.jpg

deregulating chromium and dropping cumulative loading limits for molybdenum. Then Longest became ORD Assistant Administrator over EPA's scientists who had rejected the rule and began to reign in dissent there.

When all was said and done, OW only provided several hundred thousand dollars, which ORD transferred to the Oak Ridge National Laboratory to conduct a multi-year, comprehensive study to evaluate the effects of biosolids on forest ecosystems.[5] In 2009, Lewis and McElmurray obtained a copy of the final report from the Oak Ridge National Laboratory. Based on field tests in different forests across the U.S., Oak Ridge scientists concluded that there would be long-term adverse impacts from land application of sewage sludges — especially those containing high levels of zinc or copper. EPA never released the report for publication, purportedly because of QA/QC problems.

The relationship between OW and ORD vis-à-vis the safety of land application of sewage sludges was contentious long before the 503 rule was promulgated in 1993. Over a decade earlier, ORD funded a 5-year study at the University of Florida to assess the effects of heavy metals and pathogens in processed sewage sludges from several treatment plants in Florida and Illinois on cattle, swine, and poultry. The researchers found that Cd, Cr, Pb, and Ni accumulated in soils, were taken up by bermudagrass and other forage plants, and reached toxic levels in beef cattle and other farm animals that consumed the contaminated forage. (As and Mo were not evaluated.) The authors concluded: *certain metals, including cadmium, lead, nickel, and chromium,* [are] *accumulative in animals consuming forage or grain from sludge-amended soils and therefore have potential hazard to animal health and mankind*.[6] They also found that cattle grazing on fields treated with the sewage sludges acquired parasites commonly found in sewage.

Mean Cd, Cr, and Ni concentrations in some of the sewage sludges used in the EPA-UF study were well below 503 limits published in 1993. Like the Oak Ridge study, however, EPA buried the major findings of this comprehensive study in a government report and never published them in the open scientific literature. EPA did not provide a copy of the EPA-UF study to ORD scientists who reviewed the 503 rule in 1992 or to the National Academy of Sciences when it reviewed the 503 rule in 2001-2002. After being alerted to its existence by an environmental activist searching EPA's publication archives, McElmurray obtained a copy of the EPA-UF study from the U.S. Department of Commerce in 2009.[7]

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[5] U.S. EPA Office of Inspector General Status Report - Land Application of Biosolids, 2002-S-000004, Mar. 28, 2002. www.epa.gov/oig/reports/2002/BIOSOLIDS_FINAL_REPORT.pdf

[6] US EPA Report: EPA-600/S1-81-026, 232 p. (Apr. 1981). "Sewage Sludge – Viral and Pathogenic Agents in Soil-Plant-Animal Systems." G.T. Edds and J.M. Davidson, Institute of Food and Agricultural Systems, University of Florida. An EPA Project Summary is available online at http://nepis.epa.gov/ by searching 600S181026 or key words in the title of the report.

[7] To obtain a copy, contact the National Technical Information Service, Springfield, VA 22161 (Tele. 703-487-4650). Request Order No. PB 81 179 103, EPA-report No. 600S181026 entitled "Sewage Sludge Viral And Pathogenic Agents In Soil-plant-animal Systems (1981)."

McElmurray and Boyce Cases

In separate lawsuits filed in 1998, the McElmurray and Boyce families alleged that hundreds of their dairy cows died from ingesting toxic levels of cadmium, molybdenum and other heavy metals and hazardous organic chemicals taken up by forage crops fertilized with biosolids produced by the City of Augusta, GA. As soon as EPA learned of the lawsuits, Walker, Bastian, and Robert Brobst arranged to fund Ms. Julia Gaskin and others at UGA with a Cooperative Agreement to conduct a field study, which EPA used to discredit the lawsuits.[8] Brobst was an environmental engineer from EPA Region 8, who Walker appointed to head a "Biosolids Incident Response Team." Walker's supervisor, Charles Gross, served as Gaskin's EPA Project Officer.

Gaskin and her coworkers measured the uptake of heavy metals in bermudagrass grown on land treated with Augusta's biosolids and published their results in the *Journal of Environmental Quality* (JEQ) in 2003.[9] Although this study was carried out under severe drought conditions where little water was available for plants to take up heavy metals, Gaskin and her coauthors concluded that Augusta's biosolids did not pose a risk to animal health. When the study was published, UGA issued a national press release quoting Ms. Gaskin: "Some individuals have questioned whether the 503 regulations are protective of the public and the environment. This study puts some of those fears to rest."[10]

Under pressure from Synagro Technology, Inc., the largest U.S. company in the biosolids business, UGA quashed a press release on a research article by other UGA researchers, Prof. David Gattie and Dr. David Lewis, in 2003. Their article, which was published in *Environmental Health Perspectives* (EHP), was critical of the 503 rule.[11, 12] Press materials prepared by Lewis drew attention to a predominantly African-American community in Grand Bay, AL where children developed painful muscle cramps and other symptoms whenever they drank water from wells polluted with Synagro's biosolids. They were often too sick to attend school. Synagro also spread Augusta's biosolids in 1999 when the Gaskin study was conducted.[13, 14]

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[8] U.S. Environmental Protection Agency, Office of Water. [Letter] Assistant Administrator G. Tracy Mehan, III to J. Mendelson, III. Dec. 24, 2003.

[9] J. Gaskin, R. Brobst, W. Miller, and W. Tollner. 2003. Long-term biosolids application effects on metal concentrations in soil and bermudagrass forage. *J. Environ. Qual*. **32**: 146-152. http://jeq.scijournals.org/cgi/reprint/32/1/146.pdf

[10] University of Georgia, "Sludge study relieves environmental fears," by Cat Holmes. Jan. 29, 2003. http://georgiafaces.caes.uga.edu/getstory.cfm?storyid=1770

[11] Deposition of Regina Smith, Ph.D., Apr. 27, 2009, p.81-83. *USA ex rel., Lewis et al. v. Walker et al.* U. S. District Court, Middle District of Georgia, Athens Division. Case No. 3:06-CV-16.

[12] Gattie, D.K. and D. L. Lewis. 2004. A high-level disinfection standard for land-applied sewage sludge (biosolids). *Environ. Health Perspect*. **112**:126-31. [Electronic version published in 2003]

[13] Synagro: "Augusta, Ga Total Applications (Detail) 1/1/99 To 12/31/99." USA *ex rel*. Lewis, McElmurray & Boyce v. Walker *et al*. United States District Court, Middle District of Georgia, Athens Division. Case No. 3:06-CV-16. Exhibit 42L: EPD 19231.

[14] Gaskin *et al*. (2003) *J. Environ. Qual*. Vol. 32, *Materials and Methods*, p. 147: "The area experienced a severe drought throughout the summer of 1999 sampling season."

Documents produced during discovery in the McElmurray and Boyce lawsuits revealed that Gaskin and coworkers failed to report that a UGA pathologist found that two cows from one of the farms in the Gaskin study had kidney damage from toxic levels of zinc. Both cows also contracted a rare type of bacterial infection, which the pathologist associated with immune system depression related to the kidney damage. The pathologist suggested that soil samples be collected on the farm and tested for zinc; but (unaware of the EPA-UF study) the pathologist stated that no cases of cattle poisoning from heavy metals in biosolids have ever been documented. High levels of zinc were known to be present in Augusta's biosolids; and toxic levels of zinc were found in tissue samples collected from several of the sick cows on one of the affected dairy farms. Brobst had Prof. D. H. Gould, an expert pathologist at Colorado State University, review toxicological data from some of the sick cows on the McElmurray and Boyce farms. Gould concluded that copper concentrations in liver and kidney samples on both farms were in the high to toxic range, and that some of the cattle were infected with intestinal parasites commonly found in sewage sludge.

Lewis Cases

In 2001, the 503 rule's most visible critic was Dr. David Lewis, a senior ORD research microbiologist assigned to the University of Georgia to investigate the growing numbers of cases linking illnesses and deaths among humans and animals to land-applied biosolids. Lewis' research team included Dr. David Gattie, a professor of biological and environmental engineering; Dr. Susan Sanchez, a professor of medical microbiology in UGA's School of Veterinary Medicine; and Dr. Charles Pumphrey, a pediatrician treating children exposed to land-applied biosolids in California. Cases investigated by Lewis and his coworkers included illnesses among residents in New Hampshire who experienced severe breathing difficulties when they were exposed to dusts blowing from a field treated with biosolids. One resident, 26-year-old Shayne Conner, stopped breathing and died in his sleep.

Based on cultures and DNA analyses of frozen samples of biosolids spread in Conner's neighborhood at the time of his death, Lewis and his coworkers found that the biosolids were laden with a live pathogen known to cause respiratory failure when inhaled. Conner's mother, Joanne Marshall, sued Synagro, which was responsible for spreading sludge in their neighborhood. EPA approved Lewis, who needed access to Conner's medical records, to serve as an expert witness in his private capacity. Lewis also investigated the McElmurray and Boyce cases, as well as highway workers in Georgia who were treated for severe breathing difficulties, which developed when they spread hay fertilized with Augusta's biosolids.[15]

On July 10, 2001, Synagro's Executive Vice president and General Counsel, Alvin Thomas, complained to EPA Deputy Administrator Linda Fisher that Lewis' investigations of biosolids constituted scientific misconduct and a mismanagement of

[15] Exhibit 1A [Memo] from David L. Lewis, Ph.D. to Dr. Harvey Holm, Research Director, USEPA-Athens Re: Adverse health effects from Augusta-sludged hay. May 8, 2003.

EPA funds.[16] That same day, Walker and his boss, Michael Cook, had lunch with Thomas and another Synagro executive, Robert O'Dette.[17] The purpose of the meeting was to discuss Lewis' research and his upcoming testimony in the *Marshall* case concerning the death of Shayne Conner. Walker, at the time, was peer-reviewing Lewis' research article in which Lewis and his coworkers directly linked pathogens and irritant chemicals in Synagro's biosolids to Conner's death. Walker asked Synagro for information on the *Marshall* case to include in his negative peer-review in which he recommended that EPA not release the paper for publication. Several months later, O'Dette e-mailed Walker and Cook an anonymous "white paper" alleging scientific misconduct against Lewis.

O'Dette also provided a copy of the white paper to the National Academy of Sciences (NAS), which was reviewing the 503 sludge rule as a result of congressional hearings into retaliations against Lewis and his local EPA laboratory director, Dr. Rosemarie Russo. Russo approved a research article published by *Nature* in 1999 in which Lewis criticized the 503 sludge rule.[18] Bastian provided draft versions of Gaskin's UGA study and Gould's report to the NAS, falsely claiming that they proved that the McElmurray and Boyce farms were not harmed by Augusta's biosolids. The NAS cited the two draft documents in its report; and then it removed references to papers published by Lewis and coworkers and concluded that there is no documented evidence that biosolids applied under EPA's 503 rule have ever harmed public health or the environment.[19]

Although the NAS removed all references to the Lewis *et al*. papers, it drew extensively from Lewis' pre-publication and in-press papers to discuss gaps in the science used to support the 503 rule. [See sworn testimony below by NAS panel member Ellen Harrison and excerpts from her letter to *Nature*.] These deliberate and inappropriate omissions by the NAS initially caused editors to reject the EHP paper Gattie and Lewis submitted in 2003. The editors stated: “A major shortcoming of the manuscript is the lack of any reference to the very recent National Research Council report, Biosolids Applied to Land, which addresses virtually all of the issues raised by the authors. A commentary on that report would give the authors ample scope to present their views...” Gattie and Lewis revised their manuscript, referencing their prepublication and in-press articles that they had provided to the NAS in 2001-2002. They also provided the editors with copies

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[16] [Letter] Alvin Thomas, Synagro Technologies, Inc. to EPA Deputy Administrator Linda Fisher, July 10, 2001.
[17] Deposition Transcript of John Walker, *Lewis v. EPA*, U.S. Department of Labor, Case Nos. 2003-CAA-6, 2003-CAA-5; U.S. Court of Appeals for The Eleventh Circuit, Case No.08-12114HH, p. 1117-1119. April 10, 2003.
[18] Committee on Science, U.S. House of Representatives, “EPA’s Sludge Rule: Closed Minds or Open Debate?,” Mar. 22, 2000; “Intolerance at EPA - Harming People, Harming Science?,” Oct. 4, 2000.
[19] National Academy of Sciences, National Research Council. Biosolids Applied to Land: Advancing Standards and Practices, National Academy Press, Jul. 2, 2002. www.nap.edu/books/0309084865/html

of these writings. EHP then published the revised manuscript, which simply stated that the NAS report "echoed" the authors' previous work.[20]

NAS Panel member Ellen Harrison testified to the Labor Department: "David is the only scientist that to that time had raised the scientific issues that might lead to exposure and disease and so David's ideas in that regard, I think, were important to sort of framing the NAS panel in recognizing that… there are a lot of gaps here, there are plausible routes of exposures that we haven't assessed." "[He] was a hero in this regard... turning the whole issue around." Without his involvement, Harrison said, "we wouldn't be at all where we are today in terms of looking at the issues of safety anew." "[He] gave legitimacy to the allegations that has made it impossible to ignore alleged health issues."

Harrison later wrote a letter to the editors of *Nature*, [21] which published an article and editorial supportive of Lewis' research and described EPA's sewage sludge program as "an institutional failure spanning more than three decades — and presidential administrations of both parties."[22] Harrison commented on the intentional removal of the single remaining reference to Lewis' research from the final version of NAS report: "The NAS made this change to the report without permission from the panel. This is a violation of the NAS procedures requiring full committee consensus on reports. I would not have approved the removal of this reference since it was clearly relevant to the work of the committee. ...the unilateral action of NAS to remove the reference was highly inappropriate."

In March of 2003, Synagro filed its white paper allegations with the UGA Research Foundation as a formal scientific misconduct petition against Lewis and Gattie. UGA's Science Integrity Officer characterized the allegations as a "witch-hunt;"[23] however, Synagro hired Georgia Senator Kasim Reed, now Mayor of Atlanta, to pressure UGA not to dismiss the petition.[24] Lewis filed complaints with the U.S. Department of Labor over Walker's interactions with Synagro; but the Department ruled that EPA was not responsible for Walker's actions because Lewis outranked Walker and Walker was not in Lewis' direct chain of command.[25] In May of 2003, EPA headquarters terminated Lewis despite Dr. Russo's objections.[26]

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[20] Gattie, D.K. and D. L. Lewis. 2004. A high-level disinfection standard for land-applied sewage sludge (biosolids). *Environ. Health Perspect*. **112**:126-31.
[21] E-mail from Ellen Z. Harrison to *Nature* (correspondence@nature.com), Jun. 17, 2008.
[22] Editorial, Stuck in the mud - the Environmental Protection Agency must gather data on the toxicity of spreading sewage sludge; Raking through sludge exposes a stink. *Nature*, 2008, Vol. 453, p. 258, 262-3, May 15, 2008.
[23] Deposition of Regina Smith, Ph.D., Apr. 27, 2009, p.73.
[24] Deposition of Regina Smith, Ph.D., Apr. 27, 2009, p.81-83.
[25] *Lewis v. EPA*, U.S. Department of Labor, Case Nos. 2003-CAA-6, 2003-CAA-5; U.S. Court of Appeals for The Eleventh Circuit, Case No.08-12114HH.
[26] In 2000, Administrator Carol Browner awarded Lewis EPA's Science Achievement Award for his 1999 *Nature* article; and, after retiring from EPA, Dr. Russo released the following public statement: *Dr. Lewis' involuntary termination over his research articles was not supported by the local lab management in Athens. He was an excellent researcher and an asset to EPA science*.

In December of 2003, Lewis testified before the City and County Government of Honolulu, which was voting on Synagro's contract to process Honolulu's sewage sludge. To quell public concerns, EPA and Synagro claimed that Synagro's Class A biosolids are sterile. Lewis advised Honolulu Council members to have the University of Hawaii test Synagro's biosolids for pathogens.[27] EPA responded by improperly threatening Honolulu with over $5.5 million in fines if it delayed approval of Synagro's contract to perform the tests.[28] Based on information and documents that a Honolulu council member gave Lewis while he was in Hawaii, Lewis reported to EPA's Criminal Investigations Division that Synagro had allegedly bribed Honolulu officials.[29] EPA reviewed the information but declined to notify the Department of Justice. Six years later, a Synagro executive and City Councilwoman Monica Conyers pleaded guilty to bribery charges involving a similar contract in Detroit.[30, 31] Conyers is the wife of U.S. Representative John Conyers, who chairs the House Judiciary Committee.

Outcomes and Recommendations

From 1997-2000, EPA paid Lewis a total of $205,000 to settle all but one of his U.S. Department of Labor cases. His final case, which was filed in 2001, is currently before the United States 11th Circuit Court of Appeals as a *Petition for Rehearing En Banc*.[32] Pending the outcome of this Petition, Lewis plans to raise support to take his case to the U.S. Supreme Court.[33] In 2003, the Boyce family won a jury verdict against Augusta-Richmond County for $550,000. The McElmurray family settled with Augusta-Richmond County for $1.5 million in 2007. Finally, in 2008, Judge Anthony Alaimo in the Southern District of Georgia ordered the USDA to compensate the McElmurray family for crops that they could not grow because parts of their land were contaminated by hazardous wastes from Augusta's biosolids. In his Decision, Judge Alaimo stated that

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[27] The tests detected high levels of heterotrophic bacteria (a large group that includes all plant and animal pathogens). Fujioka, R., G. Vithanage, and B. Yoneyama. May 2004. Analysis of proposed biosolids pellets applied to Hawaiian soil for detection and growth of *Salmonella*. Water Resources Research Center, University of Hawaii at Manoa. http://www.sludgefacts.org/Ref49.pdf

[28] U.S. Environmental Protection Agency. Letter. Alexis Strauss, Director, Water Division, EPA Region IX, San Francisco, to Frank J. Doyle, P.E., Director, Department of Environmental Services, Honolulu, HI. December 2, 2003. http://www.sludgefacts.org/Ref48.jpg

[29] [Redacted Letter] Lewis to EPA Region 1 Criminal Investigation Division, Boston, MA. Dec. 5, 2003.

[30] J. Peebles, *Texas Watchdog*. "Houston's sludge processor Synagro Technologies tied to Detroit bribery scandal," Jan. 27, 2009. http://www.texaswatchdog.org/2009/01/houstons-sludge-processor-tied-to-detroit-bribery-scandal/

[31] B. Schmitt and J. Swickard, *Detroit Free Press* - MI, "Monica Conyers Gets 37 Months in Prison in Synagro Bribery Scandal in Detroit." March 10, 2010. http://www.organicconsumers.org/articles/article_20379.cfm

[32] United States Court of Appeals for The Eleventh Circuit, Case No.08-12114HH. *Petition for Rehearing and Rehearing En Banc*. April 9, 2010.

[33] Individuals and organizations interested in supporting this effort should contact Attorney Ed Hallman of Hallman & Wingate, LLC, 166 Anderson Street, SE, Marietta, GA 30060. Tele. (404) 588 2530; E-mail: ehallman@hallmanwingate.com

data used by Brobst and his collaborators at UGA to argue that Augusta's biosolids did not pose a risk to the dairy farms were fudged and were widely known to be unreliable.[34] He also commented on the EPA's handling of Lewis' research: "senior EPA officials took extraordinary steps to quash scientific dissent, and any questioning of the EPA's biosolids program."

EPA's illegal efforts to prevent public access to − or even acknowledge the existence of − the University of Florida, Oak Ridge National Laboratory, and EPA Region IV-Athens studies are completely consistent with what can only be described as an ongoing National Biosolids Public *Deception* Campaign. During discovery in the Lewis, McElmurray and Boyce cases, there were indications that EPA and USDA have also carried out and then covered up numerous other studies that contradict the body of "science" created under the watchful eyes of their strategically funded gatekeepers. Such an organized effort on the part of the United States Government to secretly and covertly expose the public to hazardous wastes and cover up their effects is hardly even conceivable, and yet the proof is incontrovertible and overwhelming. It is the type of behavior that most Americans associate with fascist and communist governments during WW II and the Cold War Era − but *never* our own Government.

In 2001, the Maryland Court of Appeals appropriately likened the lead abatement experiments conducted by Johns Hopkins Kennedy Krieger Institute in predominately African-American inner-city neighborhoods of Baltimore to the infamous Tuskegee study in Alabama and Nazi war crimes.[35] Those experiments, however, were only a precursor to the biosolids lead-abatement study that Rufus Chaney conducted in these same neighborhoods with the Kennedy Krieger Institute in 2005.[36, 37] The disturbing truth is that the U.S. Government's biosolids programs in their entirety − run by a national network of Gatekeepers − undermine the most basic principles of academic freedom and a free society and should not be allowed to exist anywhere in the United States.

Clearly, independent investigations are needed to determine the actual levels of heavy metals and priority pollutants present in biosolids and in forages fertilized with biosolids. Farm animals and wildlife feeding on plants grown in biosolids-amended soils also need to be independently tested. Such studies could be reliably performed by the federal Centers for Disease Control & Prevention. Commercial composts prepared from biosolids should also be labeled as such; and labels should identify the municipalities that

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[34] *McElmurray v. United States Department of Agriculture,* United States District Court, Southern District of Georgia, Case No. CV105-159, Order issued Feb. 25, 2008, p.17.

[35] Erika Crimes v. Kennedy Krieger Institute, Inc., Circuit Court for Baltimore City, Case Nos. 24-C-99-000925, 24-C-95066067/CL193461. Order dated Oct. 11, 2001. http://www.courts.state.md.us/opinions/coa/2001/128a00.pdf

[36] Farfel, M.R., Orlova, A.O., Chaney, R.L., Lees, P.S., Rohde, C., and Ashley, P. 2005. Biosolids compost amendment for reducing soil lead hazards: A pilot study in urban yards. *Science of the Total Environment* **340**:81-95.

[37] [Letter] D. Lewis to Carl O. Snowden, Gerald G. Stansbury, Marvin L. "Doc" Cheatham, Sr., and Michael E. Johnson. Re.: Lewis, McElmurray, Boyce cases; Johns Hopkins/Kennedy Krieger experiments. Jun. 8, 2008. 9 pp.

produced the biosolids. Finally, municipalities should be required to maintain a complete list of hazardous and toxic chemicals discharged into their facilities and, upon request, provide this information to farmers and other landowners using their biosolids.

In closing, *The Gatekeepers* is the unbelievable but true story of how the U.S. Environmental Protection Agency and University of Georgia willfully published false and misleading scientific data to protect their own political and financial interests. In the process, they destroyed two of Georgia's oldest and most productive dairy farms and a leading research scientist who was working in the public interest. Yet, what happened in Georgia is only the proverbial tip of an iceberg below which hides a concerted national effort by EPA, USDA, the wastewater industry, and a network of land grant universities to literally farm out disposal of the Nation's hazardous wastes by disguising them as environmentally beneficial organic nutrients. EPA's biosolids programs are built on a foundation of false claims and scientific fraud − shielded by special interests reaping untold profits from concealing the toxic ingredients in processed sewage sludges.

The biosolids industry is run by a coalition of federal and state regulatory agencies, private industries and leading universities so powerful that no Branch of Government is willing or able to clean it up. Government scientists and private citizens who investigate and report the pervasive fraud and deception that underpins this industry, and the toll it takes on public health and the environment, are afforded no tangible protection against retaliations from entities with vested interests within government, industry and academia.[38, 39, 40] Amidst growing concerns over the safety of America's food supply, no one with any authority to act is concerned that federal and state agencies

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[38] The United States Court of Appeals for The Eleventh Circuit ruled that EPA is not responsible for adverse actions taken by Walker and others who collaborated with Synagro to retaliate against Lewis and end his career as a research scientist.

[39] After holding hearings into retaliations against Lewis and others targeted by EPA's gatekeepers, Congress passed the Notification and Federal Employee Antidiscrimination and Retaliation Act of 2002 ("No Fear Act"), which was signed into law by President George W. Bush. It passed, however, only after the U.S. Senate inserted specific language guaranteeing that senior government managers who retaliate against employees for blowing the whistle on fraud and other misconduct "should not be adversely affected." Thus, senior managers may continue to retaliate with impunity. *See*, Shaw, G.J. 2002. "SEA secures vital changes to 'No Fear' bill." *Senior Executive*. Legislative Update. May 2002, p. 3. http://www.sludgefacts.org/Ref32.jpg

[40] In 2008, Senator Barbara Boxer, Environment Public Works (EPW) Committee Chair, scheduled a briefing to hear testimony by Lewis, McElmurray and others concerning fraud and misconduct involved with EPA's biosolids programs. Republicans, led by Ranking Minority Member James Inhofe, supported the biosolids industry and threatened to boycott the briefing. Boxer cancelled the briefing after UGA Defendants in *USA, ex rel. Lewis, McElmurray & Boyce et al. v. Walker et al.* leaked Plaintiffs' confidential settlement proposal to EPW Committee member Senator Johnny Isakson (R-GA). Lewis testified in the case (US District Court, Middle District of Georgia, Athens Division. Case No. 3:06-CV-16) that Plaintiffs and their attorneys agreed to settle at no cost if the EPA and UGA authors of the Gaskin *et al*. JEQ article, who published false and unreliable data concerning Augusta's biosolids, would correct the scientific record. UGA refused to discuss the settlement offer. Boxer promised to reschedule the briefing in 2009, but never did.

are looking the other way as wastewater treatment plants provide a veritable witches' brew of hazardous industrial chemicals for use on commercial farms, home gardens and other public and private lands. Based on thousands of scientific studies that were part of a National Biosolids Public *Deception* Campaign sponsored by the wastewater industry, people are expected to believe that this black box of chemical wastes, which are too dangerous for EPA to allow to enter the Nation's waterways, are safe to spread on farmland and feed to our children.[41, 42]

Suggested Reading

1. Kuehn, R. 2004. Suppression of Environmental Science, *American Journal of Law & Medicine*, 30:333-69. http://www.uow.edu.au/~bmartin/dissent/documents/Kuehn04.pdf

2. Snyder, C. 2005. The Dirty Work of Promoting Recycling of America's Sewage Sludge. *IJOEH* 2 (4): 415-27. http://www.sludgefacts.org/IJOEH_1104_Snyder.pdf

3. Tollefson, J. 2008. "Raking through sludge exposes a stink;" Editorial, "Stuck in the mud." *Nature*, Vol. 453, p. 258, 262-3. May 15, 2008.

[41] J. Harkinson. "Did Sewage Sludge Lace the White House Veggie Garden With Lead?" *Mother Jones*. Jun. 17, 2009.

[42] Based on independent analyses performed by the Georgia Environmental Protection Division and a private consulting firm, potentially harmful levels of thallium and other hazardous wastes were found in milk samples collected on one dairy farm treated with Augusta's sewage sludge, and in milk cartons pulled from the shelf in area grocery stores. Lewis Responses to Interrogatories by UGA Research Foundation: "Milk Contamination Cover-Up," p. 145-149. May 4, 2009. *USA, ex rel. Lewis, McElmurray & Boyce et al. v. Walker et al.* Case No. 3:06-CV-16.

CONTENTS

Section I. "Biosolids Science"

A. The Gatekeepers…….. 2
B. Biosolids Acceptance Programs in Academia……..……. 8
C. The Science of Public Acceptance…….…… 11
D. Rufus Chaney, USDA.....……. 14
E. Potential Civil Rights Violations…….... 19

Section II. Letter by EPA Assistant Administrator G. T. Mehan, III

A. Summary……..……..... 22
B. The McElmurray and Boyce Cases…..…….……. 22
C. False Information on Human Deaths……. 25

Section III. Lewis' Involvement with Biosolids Issues

A. Summary..... 26
B. Timeline 27
C. Postscripts
(a) NAS Responds to Pennocks, McElmurray..... 32
(b) Public Statement by Rosemarie C. Russo, Ph.D..... 34
(c) The Gulf Oil Disaster..... 34

Section IV. Silencing Scientific Debate

A. (2002) NAS Deletes References..... 35
B. (2003) GA Senator Pressures UGA..... 38

Section V. Hidden Studies Question Biosolids Safety

Summary..... 43

Appendix I. 1981 University of Florida Study…… 45
Appendix II. 1998 Oak Ridge National Laboratory Study…… 50
Appendix III. 1999 EPA Region 4-Athens Diagnostic Evaluation…… 56

Exhibit List……..... 58

Section I: "Biosolids Science"

A. The Gatekeepers

In 1977, President Jimmy Carter announced a 10-year program to construct municipal sewage treatment plants and made controlling water pollution EPA's highest priority. When announcing these steps, he advised Congress:[1]

> *But at the same time, we need to be sure that sewage projects supported by Federal money do not create additional environmental problems…We also must ensure that the systems are operated properly…that there is an effective pretreatment program to remove harmful industrial wastes from these systems; and that we are carefully considering alternative solutions…*

John Walker and Robert Bastian began working at EPA's Office of Water (OW) in the mid-1970s. Their responsibilities included developing regulations for converting sewage sludge into fertilizer for agricultural use. Sewage sludges are the semi-solid wastes in sewage that enter sewerage lines and are separated from water at municipal wastewater treatment plants by settling. They are comprised of complex mixtures of human feces, household products and industrial wastes and must be treated to meet federal Clean Water Act standards prior to disposal. In 1978, Walker advised OW Assoc. Deputy Asst. Administrator Henry Longest: "The application of some low levels of toxic substances to land for food crop production should not be prohibited …"[2]

Bastian, Walker, and their colleagues in OW, in collaboration with Rufus Chaney at the United States Department of Agriculture (USDA), developed various regulations and interim agency guidance for land application of sewage sludge from the late 1970s through the early 1990s. In 1992, Dr. Alan Rubin led OW's effort to develop EPA's current 503 sludge rule.[3] Again, Rufus Chaney was their primary collaborator.[4]

Scientists in EPA's Office of Research & Development (ORD) in Athens, Georgia and elsewhere rejected the proposed 503 rule, primarily because of the lack of scientific studies supporting claims by Rubin, Chaney and other biosolids promoters that pharmaceuticals, heavy metals, pesticides, PCBs, and a myriad of other constituents in biosolids are rendered harmless by virtue of what Rubin called "sludge magic."[5, 6] OW

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[1] President Jimmy Carter, The Environment Message to the Congress. May 23, 1977. www.presidency.ucsb.edu/ws/index.php?pid=7561

[2] Memorandum: Walker JM, EPA Municipal Technology Branch to Longest II HL, EPA Assoc. Deputy Asst. Administrator for Water Program Operations. September 12, 1978. www.sludgefacts.org/Ref15.jpg

[3] Deposition Transcript of John Walker, p. 10-11. Oct. 4, 1999. Lewis v. EPA, U.S. Department of Labor Case No. 99-CAA-12.

[4] Deposition transcript of Rufus L. Chaney, Ph.D., Beltsville, Maryland, Jun. 26, 2009, p. 19-21.

[5] Rufus Chaney, USDA. "Sludge Mess in EPA's Back Yard," USCC March 26, 2002.

[6] Deposition transcript of Alan Rubin, Ph.D., Apr. 27, 1999, p. 168-169.

promised ORD a minimum of $10 million to conduct research studies that would be used to render the rule more protective of public health. OW reneged on its promise to ORD. [7] In doing so, OW completely thwarted ORD's authority and responsibility to ensure that EPA's regulations are scientifically reliable.[8] Rather than allow ORD scientists to conduct unbiased research, Walker, Bastian and their directors in the Office of Wastewater Management (Michael Cook, Michael J. Quigley and others) established a cooperative agreement with the Water Environment Federation (WEF) to establish a "National Biosolids Public Acceptance Campaign."[9]

The EPA-WEF agreement provided the WEF with congressional earmarks and EPA in-house funds to support the 503 rule. The WEF was eager to cooperate because the 503 rule is highly favorable toward the wastewater industry and all of the companies that discharge hazardous wastes into wastewater treatment plants. It regulates only a handful of pollutants and requires little oversight and enforcement on the part of EPA and the states. In short, OW used the WEF to silence critics of the 503 rule at ORD[10] and create its own body of scientific studies, albeit highly biased and sometimes outright fraudulent, to support OW's policies.

Quigley described the EPA-WEF Cooperative Agreement as an "important project" needed to gain "acceptance of the science and the substance of the Part 503 Rule" and overcome "misinformation" spread by opponents.[11, 12] The ultimate goal of the

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[7] EPA Office of Inspector General (OIG), "Land Application of Biosolids," Status Report 2002-S-000004, p. 18. Mar. 28, 2002. This report represents the OIG's investigation into allegations Lewis filed with the OIG through the National Whistleblower Center.

[8] That same year (1993), the Clinton Administration eliminated the veto power over EPA regulations held by ORD and other EPA offices since the Agency was created in 1970. Prior to 1993, every EPA regulation required approval by all Assistant Administrators before it could be promulgated.

[9] Exhibit B to Lewis' Affidavit dated October 28, 2009. *USA, ex rel. Lewis, McElmurray and Boyce v. Walker et al.* To counter the negative impact of ORD's criticisms and public concerns over adverse health effects, Walker and Bastian established a cooperative agreement with the Water Environment Federation (WEF) from 1992-1999 to run the National Biosolids Public Acceptance Campaign. The WEF represents municipalities and industries with a strong financial interest in defending EPA's 503 sludge rule. The 503 rule gives them a way to dispose of hazardous wastes on land with little risk of becoming accountable for any damages. This is because the rule exempts all organic chemicals, including priority pollutants, and some toxic heavy metals widely used by industry, *e.g*., thallium, antimony, barium and chromium. Also, enforcement of federal pretreatment regulations has historically been lax; states rarely monitor land application programs or audit environmental data submitted by wastewater treatment plants; and there is no system for tracking adverse health effects. EPA no longer regulates composted Class A biosolids or requires that it be tracked or identified as biosolids (Deposition transcript of Dr. Rufus Chaney, Jun. 26, 2009, p. 221, 226-228).

[10] Exhibit 2J. [Letter] WEF Dep. Exec. Dir. Albert Gray to EPA Admin. Christy Whitman repeating Synagro's false allegations of scientific misconduct against Lewis. [Copied to L. Fisher, H. Longest, T. Mehan, M. Cook, others at EPA] http://www.sludgefacts.org/ref42.html

[11] Exhibit B to Lewis' Affidavit, EPA-WEF Cooperative Agreement, page 56.

[12] Exhibit B to Lewis' Affidavit, EPA-WEF Cooperative Agreement Decision Memorandum from Michael J. Quigley to Michael B. Cook, July 28, 1992.

National Biosolids Public Acceptance Campaign, according to Walker's EPA Branch Chief, Robert E. Lee,[13] was to make "beneficial use of biosolids non-controversial by the Year 2000."[14] To eliminate independent research, and thereby quell any controversy surrounding biosolids, EPA and the WEF focused on debunking "unsubstantiated claims" of adverse health effects from biosolids:[15]

> *Unsubstantiated claims of horror stories that have been attributed to the use of biosolids are an important weapon of groups that are opposed to the use of biosolids. WEF will assemble and evaluate information that fully explains what really occurred and translate this information into facts sheets that are readily understandable to the general public.*

In 1995, Walker amended the EPA-WEF Cooperative Agreement to "establish a Biosolids Cooperative Research and Development (R&D) Coordination Project."[16] Under this project, Walker and his supervisors funded land grant universities to create a body of science supportive of the 503 sludge rule. According to the Cooperative Agreement, EPA and the WEF also used these universities to create a national database of all biosolids research projects throughout academia. Land grant universities, such as the University of Georgia, have agricultural extension services that work with local farmers. This link was essential to EPA employees involved with OW's efforts to promote biosolids. With it, they were able to fund scientists supportive of the 503 rule in geographical areas where problems have occurred and then work hand-in-hand with universities and local farmers to debunk reports of adverse effects from biosolids. It also gave EPA and the wastewater industry a network of supportive scientists who, for a little funding, were willing to serve as protectors of the 503 rule and help silence its critics.

In 1998, Walker created the Biosolids Incident Response Team (BIRT) headed by Robert Brobst to investigate "horror stories," including the cattle deaths on the McElmurray and Boyce farms, and tell "what really occurred." According to Brobst's sworn testimony, BIRT was never recognized by the EPA as an official EPA organization and has never had any standing as an actual operational unit of the EPA.[17] After discovery closed in *Lewis, McElmurray, and Boyce v. Walker, et al*, Brobst turned over an internal EPA memo in which OW Assistant Administrator Robert Perciasepe requested funds to create BIRT. Perciasepe stated that BIRT's mission was to investigate "alleged problems associated with biosolids" in order to "provide additional assurances to the public about the integrity and soundness of biosolids management in the United States."[18] Needless to say, reports concluding that biosolids had caused any public health

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[13] Deposition transcript of John Walker, Apr. 11, 2009, p. 37.
[14] Exhibit B to Lewis' Affidavit, EPA-WEF Cooperative Agreement, page 90.
[15] Exhibit B to Lewis' Affidavit, EPA-WEF Cooperative Agreement, page 61.
[16] Exhibit B to Lewis' Affidavit, EPA-WEF Cooperative Agreement, pages 65-72.
[17] Deposition transcript of Robert Brobst, p. 13, Apr. 14, 2009.
[18] [Memorandum] EPA Office of Water Assistant Administrator Robert Perciasepe to Steven A. Herman, Assistant Administrator, Office of Enforcement and Compliance Assurance. Subject: Request for Additional OECA Resources for the Biosolids Program. Apr. 29, 1998. Robert Brobst produced this document on Sep. 23, 2009 after discovery ended in *Lewis, McElmurray*

or environmental problems could not possibly "provide additional assurances" of "the integrity and soundness of biosolids management in the United States." Hence, Perciasepe created BIRT to cover up problems linked to biosolids regardless of how damaging the facts may be. We certainly see this mission fulfilled in the Gaskin study where Brobst and his UGA coauthors published a research article containing fabricated data and concluded that long-term application of biosolids "should not pose a risk to animal health."

The EPA-WEF Cooperative Agreement created a national network of "gatekeepers" to support the 503 rule. It is clear from the Agreement that gatekeepers were expected to control the flow of technical and scientific information to the public. Information supporting the safety of biosolids passed through the gate while negative information, especially about adverse health effects, was stopped. Regardless of how overwhelming the evidence may be to the contrary, gatekeepers were given the same mission that Perciasepe gave BIRT: all information about biosolids would provide "additional assurances" of "the integrity and soundness of biosolids management in the United States."

To create an effective gatekeeper network, EPA identified professors at research universities who were true believers in biosolids and made sure they had ample funding to conduct and publish research. The gatekeeper concept works primarily because editors of scientific journals choose reviewers who are most prolifically published in the area. To guarantee success, federal and state agencies and the wastewater industry worked closely with academia to attack the credibility of scientists who raised concerns, and undermine their ability to obtain research funding. A well-funded gatekeeper network controls the flow of scientific information at both ends – by determining who gets funded and which research papers are published in the scientific literature. Even when accomplished scientists are willing to risk their careers and pay for research out of their own pockets – which few scientists are willing or able to do – they cannot beat the system. One only has to look at how EPA and Synagro ended Lewis' career as a research scientist with only $12,000 in research funding for the Gaskin study at UGA, a few phone calls and letters to EPA and UGA administrators from a Synagro executive, and a little cash paid to a local state senator.

For reviewing research proposals and recommending whether they should be funded, organizations that fund research typically choose from among the most prolifically published scientists in a particular area of research. When the Federal Government establishes and funds a national network of supportive gatekeepers to promote certain viewpoints and silence dissent, it pretty much ensures that the most prolifically published scientists will be those who support the Government's position. In cases where economically powerful industries join with the Government and add their resources to such an effort, as is the case with land application of sewage sludge, independent scientists have little chance of ever being funded. Hence, a well-organized national network of gatekeepers dispersed throughout government, industry and academia

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and Boyce v. Walker, Gaskin, Brobst et al. US District Court, Middle District of Georgia, Athens Division. Case No. 3:06-CV-16.

can effectively control the flow of scientific information to the public by controlling the flow of research funding to scientists.

In their own words…

Dr. Eliot Epstein was the Chief Environmental Scientist for Tetra Tech, Inc., who held a position with the WEF and was funded by EPA's Office of Water. He was an exemplary gatekeeper who frequently published scientific articles dismissing health and environmental concerns attributed to biosolids. In 2001, Epstein wrote to the head of Boston University's Department of Environmental Health to protest David Lewis being invited to speak at a conference on biosolids:[19]

> *I feel that the way the conference is arranged will diminish Boston University School of Public Health's credibility. The selection of speakers is extremely poor… Dr. Lewis has absolutely no standing in the scientific community in this area; he has been involved in several sensational legal cases. Dr. John Walker or Bob Bastian of EPA would have been much more credible than David Lewis.*
>
> *… In the future, if the Boston University School of Public Health is interested in seeking funds for research on health aspects on this subject, it must have the reputation of a credible scientific institution. There are numerous sources of funds for research available. University of New Hampshire, Pittsburg University, Tulane University, University of Arizona, Johns Hopkins University, and numerous others have received considerable grants on this subject.*

In 2002, Synagro Vice President Robert O'Dette sent the same message to Tom Stavinoha, a commissioner in Fort Bend County, TX.[20] Mr. O'Dette defended Synagro's funding of special projects as a Board Member of the University of Arizona's Water Quality Center, and the company's efforts to end Lewis' research at UGA:[21]

> *What we don't need are more so-called scientists whose research findings are predetermined by scientific or personal bias. These people will find their work rightly discredited and their funding will disappear while credible researchers continue to have funding.*

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[19] Exhibit 4. [Letter] Dr. Eliot Epstein to Prof. D. Ozonoff, Chair, Dept. Environmental Health, Boston University School of Public Health. Sep. 28, 2001.

[20] [Letter] R. O'Dette, Vice President, Synagro Technologies, Inc. to Tom D. Stavinoha, Commissioner Precinct 1, Fort Bend County, TX. Nov.18, 2002. http://sludgefacts.org/ref45.html

[21] In Oct. of 2000, R. O'Dette offered to fund Lewis' research, but Lewis declined. Instead, Lewis personally covered all costs of his research on sewage sludge conducted at UGA from 1998 to 2003. Coverage of Lewis' work by *Time* magazine (Sep. 27, 1999, p. 26), and the resulting congressional hearings, prompted the CDC to issue guidelines for protecting workers handling Class B biosolids (Cocalis, J., et al. 2000). Workers exposed to Class B biosolids during and after field application. DHHS (NIOSH) Pub. No. 2000-158).

The body of "science" created by a national network of gatekeepers funded through the National Biosolids Public Acceptance Campaign yielded the following three overarching scientific conclusions that are continually advanced today, all of which are completely FALSE:

1. Nine regulated metals (As, Cd, Cu, Pb, Hg, Mo, Ni, Se, Zn) are the only chemical pollutants in sewage sludge that should be regulated to protect public health and the environment.

2. Pollutants of all kinds, including metals and organic chemicals, are no longer bioavailable once they are mixed with sewage sludge; *i.e.*, they cannot be taken up by plants or animals in harmful amounts.

3. The peer-reviewed scientific literature and a lack of documented cases prove that land application of biosolids under the 503 rule presents little, if any, risk to public health and the environment.

EPA and the wastewater treatment industry argue in effect that they have created the perfect solution to industrial pollution: just flush chemical and biological wastes into sewer lines, treat them with any of a variety of cheap chemical or biological processes, and then spread them on farmland for growing crops. However, the evidence gathered in lawsuits filed by Lewis and the dairy farmers prove that industrial wastes are just as toxic on farmlands as they are in the air or water. They do not all magically become innocuous just by adding lime, running them through an anaerobic digester, or composting them with wood chips. All of the data supporting EPA's 503 sludge rule were produced by EPA working hand-in-hand with the wastewater treatment industry to support land application of sewage sludge through any means, including by destroying independent researchers and covering up reports of adverse health effects. "Biosolids science" is nothing but a monopoly on scientific research created to support a National Biosolids Public Acceptance Campaign, which is run by bullies. It is not based upon real science.

Science and marketing, in this case marketing biosolids, have nothing whatsoever in common. Lewis testified: "Science is intentionally designed to eliminate bias and has an uncertain outcome, while marketing is inherently biased and has a predetermined outcome. The two are also equally different in purpose. The objective of the scientific method is to answer a particular question correctly. The purpose of marketing is to persuade others to accept a particular answer, which is oftentimes incorrect. While science is grounded in full disclosure, marketing often involves deception concerning a product's true attributes. Although cleverly marketing certain government policies and commercial products through the peer-reviewed scientific literature is becoming increasingly common, this practice, too, is rooted in deception."

With regard to a lack of documented cases, Lewis stated: "When scientists who document adverse effects on public health and the environment are eliminated from the process of scientific inquiry, the absence of documented cases is rendered completely meaningless. [It is] is comparable to someone shooting a criminal investigator and then claiming that the absence of his report proves that no crime was committed."

B. Biosolids Acceptance Programs in Academia

Walker amended the EPA-WEF Cooperative Agreement in 1995 to promote biosolids research in academia.[22] According to the WEF,[23] the objective was to "provide scientifically credible results that can serve as the basis for future rulemaking efforts by EPA and state agencies." The EPA-WEF Cooperative Agreement specifically targeted land grant universities with agricultural extension services to promote biosolids and included a "strategic alliance" with Colorado State University (CSU).[24] Robert Brobst is currently a Ph.D. candidate at CSU while working at EPA-Region 8 in Denver.[25] This effort to provide a scientific basis "for future rulemaking efforts by EPA" was completely illegal because the Federal Grants and Cooperative Agreement Act of 1977 specifically prohibits the use of Federal assistance agreements (grants and cooperative agreements) to support Federal rulemaking efforts.

Walker, Bastian, Brobst and Rufus Chaney also developed a strategic alliance with the University of Georgia in 1998 when the McElmurray and Boyce cases surfaced and EPA transferred Lewis to UGA. Reflecting UGA's commitment, UGA President Michael Adams selected Jay Scott Angle, who coauthored research articles on biosolids with Rufus Chaney, as dean of the UGA College of Agricultural and Environmental Sciences. When announcing the appointment, Adams and UGA Provost Arnett Mace praised Angle for his research dispelling concerns over land application of biosolids.[26]

In 2001, EPA funded the NAS to reevaluate the scientific basis supporting the 503 sludge rule. EPA took this action in response to Congressional hearings into retaliations against Lewis and his local EPA Director, Dr. Rosemarie Russo, by EPA employees managing the Agency's biosolids programs. In 2002, the NAS published a report concluding: *There is no documented scientific evidence that the Part 503 rule has failed to protect public health*.[27] To discredit the McElmurray and Boyce cases, Robert Bastian provided the NAS with draft reports from CSU Veterinary Pathologist Dan Gould and

[22] Exhibit B to Lewis Affidavit, EPA-WEF Cooperative Agreement, p. 66-74.
[23] Exhibit B to Lewis Affidavit, EPA-WEF Cooperative Agreement, p. 67.
[24] Exhibit B to Lewis' Affidavit, EPA-WEF Cooperative Agreement, p. 44.
[25] Deposition transcript of Robert Brobst, Apr. 14, 2009. p. 7-8.
[26] U. of Maryland administrator named dean of UGA College of Agricultural and Environmental Sciences, Jun 3, 2005. www.uga.edu/news/artman/publish/050603angle.shtml
[27] Exhibit 103 and National Research Council. Biosolids Applied to Land: Advancing Standards and Practice, p. 4. National Academy Press. Washington, DC, 2002. www.nap.edu/books/0309084865/html

Julia Gaskin at the University of Georgia in March of 2001.[28] The NAS report (p. 52) states:

- *There have been several allegations of human deaths and illnesses caused by land application of biosolids. However, there has been no documented scientific evidence to substantiate those claims.*

- *There have also been several allegations of animal deaths caused by land application of biosolids (e.g., cases in Colorado and Georgia). Supporting evidence to substantiate these allegations has not been documented in the scientific literature, but EPA did investigate them and has produced reports on their findings.[2,3] It found no substantiation for the allegations.*

  > *[2] D.H. Gould, G.H. Loneragan, Integrated Livestock Management Group; G.K. Beck, and H.D. Fraleigh, Colorado State University; and R.B. Brobst, EPA, unpublished data, no date.*
  >
  > *[3] J.W. Gaskin and E.W. Tollner, University of Georgia, unpublished data, no date.*

The NAS provided Lewis with a copy of the unpublished UGA report that Bastian provided to the NAS in 2001.[29] It is an outdated draft version of Gaskin's EPA report, which contains some significant errors. The Academy referenced it in its 2002 report to dismiss the cattle deaths on the Plaintiffs' dairy farms and conclude that there is no evidence that the 503 sludge rule has ever failed to protect public health. Bastian provided this draft version to the NAS in March of 2001, approximately six months after Gaskin submitted the corrected version of her report to EPA in October of 2000. The draft version Bastian provided to the NAS falsely stated that *no* toxic levels of heavy metals were found in soil and forage samples in the Gaskin study and that no other study like the Gaskin study has ever been done. The final version of Gaskin's report, which Bastian did not provide to the NAS, does not contain these key false statements.

Attorneys representing Lewis and the dairy farmers requested copies of the two draft reports submitted to the NAS by Robert Bastian and any veterinary data associated with the reports. EPA and UGA never produced any copies; and they refused to release veterinary records.[30, 31] One UGA veterinary record, however, did turn up among

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[28] Exhibit 103, E-mail from Robert Bastian to National Academy of Sciences panel. March 13, 2001. Subject: "Investigations into allegations of health effects caused by exposure to biosolids."
[29] Metals Assessment for Burke and Richmond County Hay Fields Receiving Biosolids. Julia W. Gaskin, Biological & Agricultural Engineering Dept., Univ. of Georgia; William P. Miller, Crop & Soil Science, Univ. of Georgia; Ernest W. Tollner, Biological & Agricultural Engineering Dept., Univ. of Georgia; Myron Fowler, Burke County Cooperative Extension. Contains the handwritten word "DRAFT" in upper right hand corner of title page. As indicated in the NAS report, Gaskin's and Tollner's names appear to the far left such that, at first glance, it appears that they are the only authors.
[30] Deposition transcript of Robert Brobst, Apr. 14, 2009. p. 138-140.

documents produced by authors of the Gaskin paper. It showed that a UGA pathologist concluded that two cows from one of the farms in the Gaskin study had kidney damage from toxic levels of zinc. Both of these cows had contracted a rare type of bacterial infection, which the pathologist associated with immune system depression related to the kidney damage. The pathologist suggested that soil samples should be collected on the farm and tested for zinc.[32] High levels of zinc were present in Augusta's sewage sludge. Toxic levels of zinc were also found in tissue samples from several of the Boyce's sick cows tested by UGA's diagnostic laboratory in Tifton and Michigan State University.

In discovery in *Lewis, McElmurray and Boyce v. Walker et al*., EPA Region 8 provided plaintiffs a draft report from Gould and others who reviewed data collected by the City of Augusta and experts hired by the McElmurray and Boyce families.[33] In this draft report, which is not the one cited by the NAS, Gould *et al*. concluded that some liver and kidney copper concentrations in cows from the McElmurray and Boyce farms were in the high to toxic range (p. 2-3). Gould also concluded that cattle on the two dairy farms were infected with intestinal parasites commonly found in sewage sludge (*Sarcosporidia, Trichostrongylus and Eimeria*, p. 22, 33-34).

Like the McElmurray herd, the Boyce herd also experienced increased morbidity and mortality rates and declining milk production after being fed on forage fertilized with Augusta's sewage sludge. Gould attributed their poor overall condition to herd expansion and a lack of good hygiene (p. 28). Gould, however, failed to address a comprehensive study of the Boyce herd conducted by animal nutritionist Dr. Holly Ballantine, which was carried out in cooperation with the UGA dairy sciences department and Mr. Boyce. This study found that sewage sludge alone was responsible for the Boyce herd's poor health. In Ballantine's study, approximately 500 cows were monitored after removing sludge-fertilized forage from the herd's diet. Within approximately two years, milk production recovered and morbidity and mortality rates dropped below that of a group of approximately 100 healthy cattle that were added to the Boyce herd at the beginning of the study.

One thing that is clear from Gould's and Gaskin's draft reports (a.k.a. "EPA's investigation") is that they do not comport with Bastian's description published by the NAS. Specifically, the NAS stated that "EPA's investigation" found *no substantiation* for the McElmurray and Boyce allegations. Gould's draft report clearly substantiates the McElmurray and Boyce allegations that their cattle absorbed toxic levels of metals from ingesting forage grown on fields treated with Augusta's sewage sludge.

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[31] Deposition transcript of Arthur Leed, Jan. 28, 2009. p. 10.
[32] David L. Lewis' Responses to Dr. Joe L. Key and UGA Research Foundation, Inc.' s Interrogatories, Requests for Production, and Requests for Admission, May 4, 2009. p. 32-33.
[33] "Evaluation Of Suspected Problems On Two Georgia Dairy Farms" by Daniel H. Gould, DVM, PhD; Department of Pathology; Franklyn Garry, DVM, MS; Page Dinsmore, DVM, MS; Dept. of Clinical Sciences. College of Veterinary Medicine and Biomedical Sciences. Colorado State University, Fort Collins, CO 80523 USA. Jun. 2001.

Moreover, the outdated draft version of Gaskin's EPA report that Bastian provided the NAS falsely stated that *no* toxic levels of heavy metals were found in soil and forage samples in the Gaskin study. It also stated that no other study like the Gaskin study had ever been done, which is also false. Gaskin's final EPA report states that forage grown in three fields in the Gaskin study contained cadmium at or near the maximum tolerable level (MTL) for beef cattle.[34] Gaskin also reported that two fields were also near the MTL for molybdenum.[35]

Gaskin testified about EPA using her study to dismiss the McElmurray and Boyce cases:[36] *There is certainly data in here that could have been used to support them as well… The fact that we had high cadmium and molybdenum in three fields … and forages in three fields that had been greater than six years. The fact we saw a reduction in copper and molybdenum ratios with long-term biosolids application.* Bastian submitted Gaskin's outdated draft report to the NAS approximately six months after Gaskin had provided EPA a copy of her final report, with the goal being to portray the Gaskin study as being completely supportive of the 503 sludge rule. Bastian, therefore, clearly intended to mislead the NAS, which used the outdated draft of Gaskin's report to conclude that EPA found *no substantiation* for the McElmurray and Boyce cases.

Bastian's mischaracterizations of the projects EPA funded at Colorado State University and the University of Georgia cleared the way for the NAS to conclude in its 2002 report that there is no evidence that the 503 rule has ever failed to protect public health. The purpose of the two projects was the same, which was to provide EPA with false and misleading reports, which EPA's Office of Water could use to protect the 503 rule by discrediting the McElmurray and Boyce cases.

C. The Science of Public Acceptance

The University of Arizona (UA) Water Quality Center (WQC) is the academic hub for biosolids science. It is run by Ian Pepper, and Charles Gerba, a microbiologist. EPA's response to the 2002 National Academy of Sciences report, which was drafted by John Walker,[37] restated EPA's commitment to support the WQC for addressing scientific issues related to the 503 rule.[38]

The WQC receives Federal research grants from EPA, the National Science Foundation and other Federal and state agencies and then sells "votes" to private companies, industrial firms and others to "influence research areas." Members who purchase $30,000 or more worth of votes may appoint representatives to an Industrial

[34] Exhibit 19C, p.12. Gaskin, Miller, Tollner, Fowler. Metals Assessment for Burke County Hay Fields Receiving Biosolids, A report prepared to fulfill grant No. 827759-01-0. Oct. 2000.
[35] Exhibit 69, p. 150. Gaskin, J.W., *et al*., 2003. *J. Environ. Qual*. **32**: 146-152.
[36] Deposition of Julia Gaskin Jan. 20, 2009, p. 140.
[37] USEPA. 2003. "Standards for the Use or Disposal of Sewage Sludge; Agency Response to the National Research Council Report on Biosolids Applied to Land and the Results of EPA's Review of Existing Sewage Sludge Regulations." *Fed. Reg*. 68: 17379-17395.
[38] Exhibit 21B. EPA draft response to National Research Council.

Membership Board to direct the design and publication of special research projects carried out on their behalf by the WQC.[39] These industry representatives pay only direct costs and are not charged overhead for using facilities paid for, maintained and staffed with Federal funds.

Synagro VP Robert O'Dette explained the inner workings of the WQC as follows:[40]

> *Synagro or any individual member contributes a very small percentage of the overall research monies which total in the millions of dollars. I know that NSF contributes a fairly large sum and I believe that the State of AZ has Prop 301 monies that go into these research projects…*
>
> *Essentially, the way the process works is that all monies are put into a pot and the advisory board rates and votes on projects. There is no guarantee that any one project will get funded unless a large number of the members believe it has merit. This process is similar to what was done at the WERF Research Summit.*

In other words, the WQC sells control over its research to private companies and others with vested interests in the outcome. When publishing the results of special projects funded by industry board members, the WQC acknowledges only the National Science Foundation (NSF) Water Quality Center as the funding source. This gives the appearance that special industry projects were funded by the NSF and were subject to strict Federal requirements regarding QA/QC, open competition, and the elimination of financial conflicts of interest, when the opposites are the true situation.

For example, Pepper and Gerba published a peer-reviewed journal article in *Environmental Science & Technology* (*ES&T*) in 2003 to demonstrate that *Staphylococcus aureus* is not found in biosolids. The paper purportedly debunked Lewis' research at UGA linking *S. aureus* infections to irritation of the skin, eyes, and respiratory tract.[41]

In a 4-page article entitled: "Biosolids Safe for Land Application, UA Researchers Find," Susan McGinley summarized the Center's findings on the university's website "Information For News Media from the College of Agriculture and Life Sciences, University of Arizona."[42] Nowhere does the article acknowledge the fact that Synagro, which was being sued over illnesses and deaths linked to biosolids, funded the study.

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[39] *See*, http://wqc.arizona.edu/ Link: Member Benefits. Last accessed 10/21/08.
[40] Exhibit 6E. E-mail from Robert O'Dette to National Research Council (NRC) panel member Ellen Harrison. Aug. 2, 2005.
[41] Exhibit 1C Renner, R., "Staphylococcus not found in sludge, but controversy continues." *ES&T* Aug. 21, 2008.
[42] Exhibit 6C. S. McGinley. Sep. 3, 2003.

In McGinley's article, the University of Arizona press office states:

> *Biosolids are frequently applied to cropland, pastures or timberland, where they decompose, furnishing nitrogen, phosphorus and potash to growing plants. The method offers a more ecologically sound and practical alternative to domestic waste disposal than landfills or incineration, that may result in water or air pollution.*
>
> *Over the past 18 months questions have arisen over whether Staphylococcus aureus, a human disease pathogen present in raw sewage, remains in treated biosolids with the potential for causing illness…*
>
> *The center has gained national recognition, with the EPA using WQC studies on land application of biosolids as a response to a 2002 National Academy of Sciences report on land application….*
>
> *"We detected S. aureus in samples of raw sewage and undigested primary sewage sludge," the scientists state in their report. "However, we did not detect S. aureus in Class A or Class B biosolids after aerobic or anaerobic digestion, lime stabilization, heat-dry pelleting and/or composting." These are conventional methods that treatment plants use to remove disease-causing organisms from raw sewage.*

In this press release, Pepper expressed his opinion that allegations regarding the safety of biosolids are often not based on good science. "Overall we need more scientific studies to resolve potential issues of concern. Our study was science-based and indicates that biosolids are an unlikely source of *S. aureus*."

In 2004, EPA John Walker worked with microbiologists at USDA and discovered that *Staphylococcus aureus* was present in biosolids and aerosols samples collected at a land application site. These results were presented at a conference in Orlando, Florida in 2004.[43] Selected conference papers, including papers by Charles Gerba, Rufus Chaney, Alan Rubin, Robert Bastian, and Robert Brobst, were published in 2005 by the *Journal of Environmental Quality*.[44] The paper by Walker and his USDA colleagues, which found *Staphylococcus aureus* is present in biosolids, was not included.

Also in 2004, scientists at Bowling Green State University conducted a study of aerosols downwind of a land application site and found persistently high concentrations of *Staphylococcus aureus* in biosolids particulates that could potentially present a health

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[43] Millner, P.D., McConnell, L.L., Harper, L.A., Walker, and J., Giani, R. "Bioaerosol and VOC emissions measurements associated with land application of biosolids." Proceedings of the Sustainable Land Application Conference, Jan. 4-8, 2004, Orlando, Florida. www.ars.usda.gov/research/publications/publications.htm?SEQ_NO_115=153820

[44] *J Environ Qual*. Vol. 34, 2005.

risk as far as one mile away from the site.[45] While concentrations of other bacteria dropped, levels of *Staphylococcus aureus* in the air continued to rise for 13 days after sludge was applied, thus demonstrating regrowth of *Staphylococcus aureus* after the sludge was treated at the wastewater treatment plant to reduce pathogen levels:

> *All of the data show higher numbers of bacteria colonies collected from the downwind direction than from upwind. Compared to the data collected on the day of application, total bacteria, Staphylococcus aureus, and gram-negative bacteria were elevated 2 days after biosolids application. Levels decreased to control level 13 days after application, except for S. aureus, which was highest 13 days after application. It can be concluded that pathogenically non-treated class B biosolids are capable of generating potential pathogens in the air. This increased content might be responsible for reported health problems in nearby residents during the post-application period. Also there is a possibility that the finer particles, which constitute approximately 50% of the total bioaerosols generated from the fields, can be transported some distance away from the class B biosolids-applied field. These finer particles containing pathogens might be responsible for health problems in residents a mile away from the field.*

Pepper, who was one of the authors of the 2002 NAS report, cited preliminary results from his and Gerba's preliminary study at the University of Arizona to dismiss "speculation" that *S. aureus* infections are linked to land application of sewage sludge. The NAS report also cited a draft version of the Gaskin JEQ article as its basis for dismissing allegations made by the McElmurray and Boyce families that Augusta's sewage sludge killed their cattle. Both studies were also used by EPA Assistant Administrator G. Tracy Mehan to dismiss a public petition, which called for a moratorium on land application of sewage sludge until questions about the cattle deaths in Augusta and three human deaths, which were the subject of Lewis' research at UGA, could be resolved.[46]

D. Rufus Chaney, USDA

Rufus Chaney oversaw most of the research that EPA uses to support the 503 sludge rule.[47] When deposed by Attorney Ed Hallman in 2009, Chaney provided the following sworn testimony concerning his position at USDA:[48]

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[45] Ghosh, J. 2005. Bioaerosols Generated From Biosolids Applied Farm Fields In Wood County, Ohio. Master of Science Thesis, Graduate College of Bowling Green State University. Abstract by Robert K Vincent, Advisor. Downloaded Aug. 24, 2009. www.ohiolink.edu/etd/send-pdf.cgi/Ghosh%20Jaydeep.pdf?bgsu1131322484

[46] Exhibit 22. U.S. Environmental Protection Agency. Office of Water. [Letter] Assistant Administrator G. Tracy Mehan, III to J. Mendelson, III. December 24, 2003. p. 10-13.

[47] Deposition transcript of Rufus L. Chaney, Ph.D., Beltsville, Maryland, Jun. 26, 2009, p. 19-21.

[48] Deposition transcript of R. Chaney, Jun. 26, 2009, p. 13-17.

My official job title is senior research agronomist. I've been appointed in a category which is above GS-18 called senior scientific research service. Within that, there are no sub-grades. There is a group -- there is only about ten of us in all of my agency that have reached that level… I would say I'm the U.S. Department of Agriculture's most knowledgeable scientist about biosolids.

Regarding his level of authority, Chaney stated: "[Scientifically,] I represent USDA (ARIS) to EPA, Food and Drug, state regulatory agencies, and so on … and I don't have to have a supervisor come and tell me what I can say."

Chaney staunchly defended the Gaskin study and brought more than a dozen research articles to support his position.[49] He believes that the results and conclusions of the Gaskin study, and the data upon which they are based, are scientifically accurate. The reason is, according to Chaney, that they are consistent with the fundamental principles of biosolids science that he developed. He is not aware of any evidence to the contrary; and, he believes that any such evidence, if it exists, is false because it would contradict the body of biosolids science derived largely from his own work.

Chaney believes that biosolids are safe regardless of which pollutants enter wastewater treatment systems and regardless of whether treatment plants are working properly, if at all. And, he claims that a lack of documented cases of adverse effects proves his case.

Below are selected examples from Chaney's deposition supporting his position on biosolids.

DEPOSITION OF RUFUS L. CHANEY, PH.D., BY F. EDWIN HALLMAN, JR., ESQ., 26 JUN 2009

Page 53

[Hallman] Q. And you believe that all the studies you've seen, including the ones that you have co-authored and worked on, indicate that the land application of sewage sludge in accordance with 503 is safe ... and is not a danger to human health and welfare, is that correct, if it's applied in accordance with those regulations...?
[Chaney] A. I won't disagree with that. …

Biosolids has become remarkably less contaminated because of what we've done with the 503 and because of the publications, such as mine, which

[49] Exhibits 230-232, 235-238, 242-248.

22 showed adverse effects of previous practices.

Page 187

6 Q. Do you have any literature that supports
7 your position that plants, alfalfa, Bermuda grass,
8 whatever, growing on a contaminated property does not
9 take the contaminants into those plants?
10 A. I could give you a hundred papers, but –
11 you can calculate it for yourself.

Page 194

3 Q. How do we ever know that [biosolids are] not
4 dangerous –
5 A. How do you know that the Chinese dog food
6 was dangerous? Only after the fact. We have a lot of
7 experience with biosolids across the United States,
8 thousands of cities, without having adverse effects.
9 Tens of thousands of farms with dairy cattle without
10 having the kind of problems that occurred on those
11 farms.
12 Q. And you don't know what's in it other than
13 these nine metals and the pathogens; isn't that
14 correct?
15 A. We know from the – we talked earlier about
16 what goes into the biosolids and what goes into the
17 effluent. We know a lot about what gets into
18 biosolids. We know a lot about the rarity of certain
19 contaminants reaching biosolids. And the fact that,
20 if many of them did reach biosolids, it wouldn't
21 matter a damn in the first place because they are not
22 bioavailable.

In 2008, Rick Stevens in EPA's Office of Water took Biosolids Science to its ultimate conclusion. In a series of postings on the U.S. Composting Council's blog, Dr. Chaney first took issue with industry pressure to drop all 503 requirements once sewage sludge is composted and allow the material to be spread without anyone having to identify it as biosolids. After Chaney contacted EPA officials including Rick Stevens, Robert Bastian and James Smith, he reversed his opinion just two weeks later.

[Exhibit 251]

May 15, 2008: Bob Engel posted:

Subject: [USCC] Composted biosolids vs. biosolids under 503

I have a question that I have not been able to find in the EPA 503 regulations. At least not stated real clearly! Once biosolids are composted at a approved facility and have undergone treatment are the land application guidelines for biosolids still applied?

It is my feeling that once composted they are not biosolids anymore but a complete new product bearing no resemblance to the feedstock used to make the compost…

May 16, 2008: Chaney replied:

503 is clear that once biosolids, always biosolids… So, no matter how much the material is changed/improved by composting, it technically remains a biosolids product which requires labeling and compliance with 503.

Knowing what we know about composting, it is not unreasonable to feel that a material that has been composted properly is so changed that it should not be considered in the same thought as the smelly, germy feedstocks. …But the law is clear, once a biosolids, always a biosolids….

[Exhibit 252]

May 28, 2008: Chaney corrects his previous response:

At the request of several participants, I contacted EPA officials (Rick Stevens, Bob Bastian, Jim Smith) who manage the biosolids regulator program to obtain a clear statement on the questions raised about whether a proper biosolids compost was still biosolids.

The bottom line: If a biosolids meets the APL requirements, has undergone a Class A pathogen reduction treatment and a vector reduction treatment complying with the rule, it no longer has any of the management or other requirements of the 503 Rule. It is no longer biosolids, but a commercial product derived from biosolids…

The significance of this decision can hardly be overstated. Composting sewage sludge never destroys heavy metals; and recalcitrant organic chemicals can take years, even decades or longer, to completely biodegrade. Moreover, biodegradation products are often more carcinogenic and more toxic than the parent compounds. EPA's Office of Water has, through fraud and deception, created an escape hatch to the Clean Water Act. Hazardous municipal and industrial wastes, according to EPA, can simply be removed from wastewater, concentrated in sewage sludge, and magically deemed to be

non-toxic and environmentally beneficial once they are composted with wood chips or other vegetable matter. Now, municipalities and home garden stores can provide the public with compost containing the same levels of toxic heavy metals and hazardous organic chemicals that destroyed the McElmurray and Boyce farms and not be required to inform anyone. President Franklin Roosevelt once famously warned: "The nation that destroys its soil destroys itself."

When questioned under oath, Chaney agreed with his "once biosolids always biosolids" opinion posted on the USCC website on May 16, 2008.[50] In other words, biosolids are still biosolids after they are composted; therefore, they still must be tracked and regulated under the 503 sludge rule. But, when Chaney was presented a copy of the retraction he posted two weeks later,[51] he blamed an ill-informed EPA Office of Water official, Rick Stevens, for making him reverse his opinion:

> **DEPOSITION OF RUFUS L. CHANEY, PH.D., BY F. EDWIN HALLMAN, JR., ESQ., 26 JUN 2009**
>
> Page 221
>
> 5 Q [Hallman] Okay. And do they have to label this
> 6 material as being from sewage sludge or biosolids?
> 7 A [Chaney] The best of my understanding there needs to
> 8 be a label somewhere that says that the feedstock was
> 9 biosolids. The products that I've seen in the
> 10 marketplace disclose that it's manufactured from
> 11 biosolids.
> 21 Q And do you stand by this statement today?
> 22 A I can't imagine any reason why I wouldn't.
> 23 I mean, that's a simple statement of fact.
>
> Page 227
>
> 14 Q In your e-mail, which is Exhibit 251, you
> 15 say, 503 is clear, once biosolids, always biosolids.
> 16 A Yep. I was wrong.
>
> Page 228
>
> 1 Q Okay. And do you typically make decisions
> 2 about plant application of biosolids or sewage sludge
> 3 based upon what Mr. Smith, Mr. Stevens and/or

[50] Exhibit 251. Chaney, R., [USCC] "Compost made with biosolids vs. biosolids." May 16, 2006.
[51] Exhibit 252. Rufus Chaney to Compost Discussion List re: "Composted Biosolids vs. Biosolids under 503." May 28, 2008.

4 Mr. Bastian say to you is the law?
5 A You asked about whether I make my own
6 opinion about that. My opinion is always based on the
7 whole body of information. My opinion is not
8 congruent with those gentlemen. As it happens, my
9 opinion is nearly always congruent with Dr. Smith.
10 He's an authority. He's a scientist. He looks at it
11 as carefully as I do.
12 Mr. Stevens is less well informed. And I asked
13 him information about specific EPA policy and
14 interpretation. That's what I was asking for.

As demonstrated in the following account, Rufus Chaney is a master at obfuscation and adulteration of the truth. In official USDA e-mails sent to Julia Gaskin, UGA Dean Jay Scott Angle, Robert Brobst and others,[52] Chaney claimed that *Nature*'s coverage of Lewis' research and the McElmurray and Boyce cases in 2008 was based on misleading articles published by John Heilprin, an Associated Press reporter. According to Chaney, AP punished Heilprin for misstating facts about biosolids and planned to publish a retraction. Mr. Hallman, however, presented Chaney with an e-mail Hallman received from AP Managing Editor Mike Silverman, which categorically denied Chaney's claims. Hallman also showed Chaney news coverage of Heilprin being awarded a gold medal after being assigned to the United Nations and promoted to the position of international reporter. The news coverage coincided with the time when Chaney claimed that Heilprin was being punished by AP. Despite being shown proof that his attacks on Heilprin's character and credibility were unfounded, Chaney would not recant his testimony. In perfect harmony with his eminent position as the founding father of "biosolids science," Chaney never lets the truth stand in the way of a good lie.

E. Potential Civil Rights Violations

Lewis reviewed one of Rufus Chaney's studies for the Civil Rights Division of the State of Maryland.[53] In the study, which was published in 2005, Chaney designed experiments that potentially exposed children in African-American neighborhoods in Baltimore, MD to lead-contaminated dusts.[54] The study was funded by USDA and HUD and carried out by Johns Hopkins' Kennedy Krieger Institute. Chaney claims that the study proved that biosolids can reduce risks of lead poisoning in children.[55] In a lawsuit

[52] Exhibit 225. E-mails from R. Chaney to J. Gaskin, Scott Angle and others. Nov. 20, 2008.
[53] [Letter] D. Lewis to Carl O. Snowden, Gerald G. Stansbury, Marvin L. "Doc" Cheatham, Sr., and Michael E. Johnson. Re.: Lewis, McElmurray, Boyce cases; Johns Hopkins/Kennedy Krieger experiments. Jun. 8, 2008. 9 pp.
[54] Farfel, M.R., Orlova, A.O., Chaney, R.L., Lees, P.S., Rohde, C., and Ashley, P. 2005. Biosolids compost amendment for reducing soil lead hazards: A pilot study in urban yards. *Science of the Total Environment* **340**:81-95.
[55] Relator McElmurray's Responses to Dr. Joe L. Key and University of Georgia Research Foundation, Inc.' s Interrogatories, Requests for Production, and Requests for Admission, May 4, 2009. p. 215-218.

filed in Maryland's Court of Appeals, however, the Court likened earlier lead abatement experiments, which were conducted by Chaney's coworkers at the Kennedy Krieger Institute, to the USDA's infamous Tuskegee experiments and Nazi war crimes.[56] The lawsuit at issue was filed by parents alleging that their children developed lead poisoning as a result of the experiments.

Managers of biosolids programs throughout government, industry and academia harbor a profound and callous disregard for federal requirements applicable to the protection of minorities. This should come as no surprise since land application of sewage sludge involves collecting human and industrial wastes from urban areas and dumping them in rural areas that are primarily occupied by economically and educationally disadvantaged segments of the population. To comply with the Federal Grants and Cooperative Agreement Act, for example, EPA requires that all applicants for Federal assistance certify that they will "ensure, to the fullest extent possible" that a fair share of the Federal funds for contracts and subcontracts for supplies, construction, equipment or services goes to certain disadvantaged groups. But EPA and UGA made no efforts whatsoever to fulfill these requirements by subcontracting any of the field work or laboratory analyses in the Gaskin study to disadvantaged groups.

Specifically, EPA requires that a fair share must go to organizations owned or controlled by "socially and economically disadvantaged individuals, women, disabled Americans, Historically Black Colleges and Universities, Colleges and Universities having a student body in which 40% or more of the students are Hispanic, minority institutions having a minority student body of 50% or more, and private and voluntary organizations controlled by individuals who are socially and economically disadvantaged"[57] When questioned about this during her deposition, Ms. Gaskin callously responded that none of the work was offered to any other groups because it was "understood that we would be using our labs."[58] She even joked that she is a woman, as if that somehow gave her the right to disregard the civil rights of others.

Walker, Gaskin and others knew that environmental justice was a major theme of the research conducted by Lewis and his coworkers. Minorities and other economically disadvantaged populations lacking the resources necessary for redressing adverse effects are often disproportionately targeted by land application of sewage sludge. Lewis *et al*. highlighted this problem in the peer-reviewed scientific literature and recommended that EPA take steps to "ensure that land application practices do not disproportionately target low-income and minority subpopulations in rural communities."[59,60]

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[56] Erika Crimes v. Kennedy Krieger Institute, Inc., Circuit Court for Baltimore City, Case Nos. 24-C-99-000925, 24-C-95066067/CL193461. Order dated Oct. 11, 2001. http://www.courts.state.md.us/opinions/coa/2001/128a00.pdf

[57] Exhibit 9K, Attachment A. Memo from Ed Gross to Julia Gaskin and Bob Brobst re: UGA Grant Award, Aug. 26, 1999.

[58] Deposition transcript of Julia Gaskin, Jan. 20, 2009, p. 228-229.

[59] Lewis, D.L. & D. K. Gattie. 2002. Pathogen risks from applying sewage sludge to land. *Environ. Sci. & Technol.* **36**:286A-293A.

On the one hand, EPA and UGA never made any attempt to involve disadvantaged groups in the Gaskin study. And, on the other hand, they thwarted efforts by Lewis and his coworkers to address the disproportionate impact land application of sewage sludge has on educationally, economically and socially disadvantaged groups. For example, the UGA Research Foundation quashed a national press release on the article written by Professor Gattie and Lewis and published in the National Institutes of Health's environmental health journal, *Environmental Health Perspectives*.[61] It was prepared by Professor Alan Flurry in UGA's engineering department where Professor Gattie and Ms. Gaskin work. The article called upon EPA to address environmental justice problems with land application of sewage sludge. Materials associated with the press release, which Lewis prepared, described a rural African-American community in Grand Bay, Alabama where Synagro disposed of sewage sludge.[62]

Children living in the community, who drank water from wells close to the sludge-treated land, experienced gastrointestinal problems and had difficulty walking from painful cramps in their legs. They could not attend school for weeks at a time and their symptoms recurred whenever sewage sludge was reapplied around their homes where the wells were located. They also had severe respiratory problems from inhaling dusts blowing from sludged fields that spread out in all directions from their homes and reached as far as the eye could see. Parents and grandparents stayed cooped up in houses with no air conditioning in hot summers and breathed through rags to filter the dusts. Actions taken by UGA, under pressure from Georgia Senator Kasim Reed and other Synagro attorneys, went beyond just failing to comply with Civil Rights requirements in research grants and cooperative agreements. They were part of a longstanding effort to support EPA's 503 sludge rule by silencing dissent.

Lewis later reviewed a similar situation involving the Louisiana Office of Public Health.[63, 64] EPA Region 6 and state public health officials dismissed health problems reported by 185 residents, primarily African-Americans, living near land-applied sewage sludge in Convent, LA. Biosolids produced by the City of Kenner, LA, was spread in fields of sugar cane from 2000 through 2004 and residents began complaining of "burning skin, boils and rashes" when the spreading started. Health officials identified *S. aureus* as causing skin and eye infections, but, with no evidence to support their decision, ruled out biosolids as playing any role. Instead, they blamed poor personal hygiene and addressed the complaints by holding a "health fair" to instruct residents, who were

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[60] Exhibit 3A. Gattie, D.K. and D. L. Lewis. 2004. A high-level disinfection standard for land-applied sewage sludge (biosolids). *Environ. Health Perspect*. **112**:126-31.
[61] Exhibit 3A. Gattie, Lewis 2004. A High-Level Disinfection Standard for Land-Applied Sewage Sludges (Biosolids), *Environ. Health Perspect*. 112: 126-31.
[62] Exhibit 52. Relator Lewis E-mail to Kim Carlyle, National Press Coordinator, UGA Office of Public Information. Nov. 16, 2003.
[63] Exhibit 54B Environmental Public Health Review prepared by Louisiana Department of Health and Hospitals, Jul. 19, 2005.
[64] Exhibit 55 [E-mail] Ellen Harrison to The Rubins ... re: "Louisiana Convent - more sludge victims?," Aug. 12, 2005.

predominantly African-Americans, in proper bathing and cleanliness. EPA and state health officials did not assess the personal hygiene habits of affected versus unaffected residents in the area and did not acknowledge any of Lewis' published research linking *S. aureus* infections to biosolids.

Section II. Letter by EPA Assistant Administrator G. Tracy Mehan, III

Section Summary

In 2003, Robert Bastian worked with Madolyn Dominy at EPA Region 4 to draft a letter issued by EPA Assistant Administrator G. Tracy Mehan, III, which represented EPA's response to a public petition filed by the Center for Food Safety in Washington, DC.[65] The petition called for a moratorium on land application of sewage sludge until scientific issues raised by several deaths linked to biosolids and a jury verdict in favor of the Boyce family could be resolved. The three deaths (Tony Behun, Shayne Conner and Daniel Pennock) were the subject of David Lewis' research at UGA.

Robert Brobst, who headed EPA's BIRT, used the Mehan letter in an attempt to defeat an application for preventive planting credits, which the McElmurray family submitted to the USDA. The family applied for the credits in order to recover losses suffered from not being able to plant food-chain crops on portions of their land contaminated by Augusta's sewage sludge. The USDA rejected the McElmurrays' application based on Brobst's testimony and the Mehan letter. The McElmurray family filed suit against the USDA; and, in 2008, Judge Anthony Alaimo in the United States District Court for the Southern District of Georgia ruled in favor of the Plaintiffs, the McElmurray family.[66] Judge Alaimo determined that Brobst's based his arguments on data that were widely known to be unreliable and "invented."

The McElmurray and Boyce Cases

Morbidity and mortality rates among dairy herds began to increase on two dairy farms in Georgia, which were owned by the McElmurray and Boyce families and had received large amounts of sewage sludge from the City of Augusta, Georgia. These effects occurred first on the McElmurray farm in 1987 and then on the Boyce farm in 1996. The families worked with experts that they hired to test soils and forages on their farms and analyze milk and tissue samples from their cattle.

Hugh B. Kaufman, Chief Investigator for the EPA Ombudsman, investigated the history of sludge applications on the McElmurray farm for several years in his official

[65] Exhibit 22. U.S. Environmental Protection Agency. Office of Water. [Letter] Assistant Administrator G. Tracy Mehan, III to J. Mendelson, III. Dec. 24, 2003. p. 10-13.
[66] Exhibit 63. *McElmurray v. United States Department of Agriculture*, United States District Court, Southern District of Georgia, Case No. CV105-159, p. 17, Order issued Feb. 25, 2008.

EPA capacity beginning in 1998.[67] Based on his review of the information collected by the McElmurray and Boyce families and City of Augusta, Kaufman concluded:

> *All of this material demonstrated conclusively to me that the City of Augusta violated numerous rules applicable to the creation, management and proper disposal and land application of sewage sludge. My investigation further concluded that the City's records which do exist show high and excess levels of many hazardous materials, including cadmium, were in the sewage sludge which went on to the McElmurray lands, without the McElmurrays' prior knowledge.*
>
> *Based upon my review of all of this data, it is my opinion that the McElmurrays' lands which received sewage sludge applications are unsuitable for the growing of food chain crops.*

By 1998, the McElmurray and Boyce families had determined beyond any reasonable doubt that their cattle had died from ingesting hazardous wastes originating in Augusta's biosolids. These wastes included high levels of heavy metals and organic industrial chemicals, such as chlordane and PCBs. Both families filed separate lawsuits against Augusta that year. And, in 2003, a jury in Augusta, GA, awarded the Boyce family $550,000 in damages caused by hazardous wastes in the city's sewage sludge.[68] This was the first legal judgment ever to link land-applied sewage sludge under EPA's sludge regulations to adverse health and environmental effects.

The McElmurray case was dismissed by the Richmond County Superior Court and appealed to the Georgia Court of Appeals. On July 27, 2005, the appeals court reversed the lower court's dismissal and ordered that the case proceed to jury trial. Based on analyses of soil samples from the McElmurray farm, the Court found that "there were unquestionably concentrations of at least some of the metals at issue exceeding state and federal regulatory limits at levels so high as to classify the tested soil as containing hazardous wastes."

The Georgia Court of Appeals also ruled that the McElmurrays established a reasonable causal connection between hazardous wastes in Augusta's sewage sludge and the cattle deaths. Specifically, the Court ruled that the McElmurrays' experts presented reasonable evidence that forage contaminated by Augusta's sewage sludge caused liver damage and other adverse health effects, which impaired the dairy cows' defenses to infection and other diseases. The McElmurrays agreed on September 11, 2007, to settle the case for $1.5 million.

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[67] Exhibit 131 Affidavit of Hugh Kaufman (EPA) re. Contamination of McElmurray and Boyce farms, Dec. 31, 2003.

[68] *Boyce v. Augusta, Georgia*, Civil Action File No. 2001-RCCV-111, Richmond County Superior Court, Augusta, GA, Jury Verdict. Jun. 24, 2003.

In February of 2008, Judge Anthony Alaimo of the Southern District of Georgia ruled in *McElmurray v. USDA*, in which Plaintiffs sought compensation for damages associated with not being able to plant crops on parts of their lands contaminated with hazardous wastes from Augusta's biosolids. Judge Alaimo described Brobst's attempts to use Augusta's false and fabricated data to deny the McElmurray family's request for financial assistance:[69]

> *USDA employees Ronald Carey and Tommy Weldon also asked Robert Brobst, a member of the EPA's Biosolids Incident Response Team ("BIRT"), about the contamination averments made by the McElmurrays. AR 1227-1229. In response, Brobst opined in a letter that the McElmurrays' land was not contaminated." AR 1230-1240.* (p. 33)… *Because Brobst concedes that his conclusion is based on Augusta's unreliable, and to some extent invented, data, Brobst's finding has little merit on its own.* (p. 35)

Judge Alaimo further concluded (p. 17):

> *There is also evidence that the City fabricated data from its computer records in an attempt to distort its past sewage sludge applications. … In January 1999, the City rehired* [former supervisor Allen] *Saxon to create a record of sludge applications that did not exist previously*.

The City of Augusta falsified environmental monitoring data concerning its sewage sludge land application program for over two decades and reported the false data to the State of Georgia. When Brobst worked on the Gaskin study in 1999, Augusta fabricated a completely different − but equally false − historical record, which EPA published as part of the Gaskin study. These data were falsified to create the illusion that levels of heavy metals in Augusta's biosolids dramatically decreased after EPA promulgated the 503 rule in 1993. Employees of Augusta's wastewater treatment plant were deposed in the McElmurray and Boyce cases and asked to explain how the levels of metals decreased even though local industries were still in non-compliance with pretreatment regulations for heavy metals and other hazardous wastes after 1993, and no changes had ever been made in Augusta's waste treatment facilities or treatment processes. Only then did they admit to creating the false records.

The data Augusta fabricated in 1999 were used by Gaskin *et al*. to argue that Augusta's biosolids could not have poisoned any cattle after the 503 rule was promulgated in 1993.[70] Bastian and Brobst also used these fabricated data in the Mehan letter to argue that Augusta's biosolids were not responsible for killing the McElmurray and Boyce cattle. Falsifying environmental monitoring data required under the Clean Water Act is a violation of Federal law, and is punishable by fines and imprisonment. No

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[69] *R.A. McElmurray III et al. v. United States Department of Agriculture*. U.S. District Court, Southern District of Georgia. Case No. CV105-159. Order issued Feb. 25, 2008.

[70] Gaskin *et al*. (2003) *J. Environ. Qual*. Vol. 32, *Biosolids Characterization*, p. 149; *Conclusions*, p. 151 (last paragraph).

action, however, has ever been taken against any of Augusta's employees who admitted fabricating the data. Neither has any action been taken against anyone at EPA or UGA who knowingly published these false data, which they needed for the Gaskin study in order to conclude that Augusta generally complied with the 503 rule.

False Information on Human Deaths

As with Mehan's use of false and fabricated data in the Gaskin JEQ article, the Mehan letter issued in 2003 also used false and fabricated information to dismiss three human deaths: Shayne Conner (26 yrs old) in New Hampshire; Tony Behun (11 yrs old) in Pennsylvania; and Daniel Pennock (17 yrs old), also in Pennsylvania. In Lewis' study published in *BMC-Public Health*,[71] Lewis and coworkers examined family medical records and land application data associated with these three deaths.

Shayne Conner died in his sleep of unknown causes while having difficulty breathing. His family and neighbors were being treated for these same symptoms and for *S. aureus* infections. Workers at the wastewater treatment plant that produced the biosolids applied in Conner's neighborhood built enclosures to protect workers who complained that the sludge made them ill. Tony Behun developed *S. aureus* infections and died within days after riding a three-wheeler through a field of biosolids used for mining reclamation. Workers exposed to this sewage sludge filed complaints with the CDC after developing skin infections.

Bastian, Walker, and Brobst all served as internal reviewers of Lewis' manuscript documenting these deaths and were highly critical of the research.[72] Despite their efforts to discredit the work, ORD approved the paper and it was published in *BMC-Public Health*.[73] In addressing the three human deaths linked to land application of sewage sludge, nowhere did Mehan's letter mention Lewis' *BMC-Public Health* article or address any of the Lewis *et al.* findings. Mehan, for example, ignored Lewis' finding that Shayne Conner's family and other residents in his neighborhood received medial treatment for severe breathing difficulties and *S. aureus* infections from inhaling sewage sludge dusts. Mehan also ignored Lewis' DNA analyses, which showed that an unusual type of bacteria, *Brevundimonas diminuta*, was proliferating in the sludge applied in Conner's neighborhood at the time of his death. This organism is known to cause rapid death when inhaled.

Instead of using Lewis' peer-reviewed research article based on medical records from Shayne Conner and members of his family, Mehan quoted a medical examiner's preliminary report that incorrectly stated that no one else in Conner's family experienced symptoms at the time of his death and that the sewage sludge had been treated to kill any pathogens. To dismiss Daniel Pennock's death, Mehan ignored Lewis' peer-reviewed

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[71] Exhibit 59. *BMC Public Health* **2**:11 (28 Jun) www.biomedcentral.com/1471-2458/2/11

[72] Exhibit 58 Draft of "Adverse interactions of irritant chemicals and pathogens with land-applied sewage sludge" by Lewis, Gattie, Novak, Pumphrey, and Sanchez reviewed by Brobst, Bastian, and Walker, 2001.

[73] Exhibit 59. *BMC Public Health* **2**:11 (28 Jun).

research based on Daniel's medical records. Lewis and coworkers found that Daniel frequently traversed the sludge-treated fields and that his pneumonia grew out of a rotavirus infection. Rotavirus is contracted from contact with feces or sewage. Mehan, instead, quoted a Pennsylvania newspaper article, which stated "The cause of death for Daniel Pennock was viral pneumonia combined with staph pneumonia." Mehan also quoted Pennsylvania officials who claimed, falsely, that Daniel Pennock never came in contact with the treated land and that the Pennock family would not release Daniel's medical records. The Pennock family released them to Lewis as an EPA researcher investigating the case, and gave Lewis permission to make the records available to appropriate public health officials at EPA and elsewhere.

To dismiss Tony Behun's death, Mehan ignored Lewis' findings in *BMC Public Health* that exposure to certain chemicals in biosolids can lead to an increased susceptibility to *Staphylococcus aureus* infections. Instead, Mehan quoted Joel Hersh at the PA Department of Health, who speculated that "the death had as a probable underlying cause a pathogen, which is not known to be found in biosolids, nor is the biosolids environment known to be a suitable media for propagation of this pathogen."

Section III. Lewis' Involvement with Biosolids Issues

A. Section Summary

Acting EPA Asst. Administrator Henry Longest, who developed EPA's polices on biosolids in the Office of Water before transferring to the Office of Research & Development where David Lewis worked, dead-ended Lewis' career for publishing research questioning the 503 sludge rule. In 1998, Longest offered Lewis an opportunity to continue his research at UGA under an Intergovernmental Personnel Act (IPA) assignment for four years if Lewis would resign his EPA position at his first eligible date. Lewis accepted the offer when UGA promised to seek a tenured full professorship for him in the Department of Marine Sciences. Congress held two hearings into retaliations against Lewis and others by Alan Rubin, the primary author of the 503 sludge rule. Under pressure from Georgia Senator Kasim Reed (now Mayor of Atlanta) and other attorneys hired by Synagro Technologies, Inc., UGA reneged on its offer to hire Lewis.

When deposed in 1999, Attorney Stephen Kohn asked Rubin:[74] "Do you feel, in any way, hurt or upset to have someone like Dr. Lewis criticizing [the 503 rule]?" Rubin explained: "Well, I think my professional reputation, to a large extent, is based on my association with biosolids, 503 and its technical basis. So I feel my reputation would be somewhat disparaged if the basis of the rule, and the scientific findings were shown to be in error." Rubin's answer revealed what was at stake not only for him, but for all of the EPA Office of Water officials who built their careers on the premise that biosolids are safe and environmentally beneficial. This includes Henry Longest, Michael Cook, John Walker, Robert Bastian, Bob Brobst and others. It also shows the sheer folly of giving employees who develop federal regulations control over scientific studies aimed at

[74] Deposition transcript of Dr. Alan Rubin, p. 149. *Lewis v. EPA*, US Dept. Labor, Office of Administrative Law Judges. Case No.99- CAA-12, Apr. 27, 1999.

evaluating their work. When these employees are given free reign to harass scientists who question their regulations, provide federal grants to universities to publish scientific studies supporting their regulations, and tap into the lobbying power of industry trade associations to have Congress fund these activities with earmarks, scientific fraud will abound.

B. *Timeline*

June 1996

Henry L. Longest, II, Deputy Asst. Adm. of EPA's Office of Research & Development (ORD), initiated ethics and criminal investigations against Dr. David Lewis for publishing a commentary in *Nature* titled "EPA Science: Casualty of Election Politics." (*Nature* **381**:731-2) In interviews with the news media, Lewis focused on EPA's sewage sludge (biosolids) regulations as the prime case of poor science. The regulations were developed by **John Walker** and others working for Longest when Longest was a deputy assistant administrator in the Office of Water. Walker later became EPA's biosolids spokesperson in the Office of Wastewater Management. Lewis filed a complaint over Longest's actions with the U.S. Department of Labor (*Lewis v. EPA* CA 97-CAA-7). The Labor Department found that Longest retaliated over Lewis' protected activities; and EPA agreed to pay Lewis $40,000 to settle.[75]

October 1998

Longest, as ORD's Acting Assistant Administrator, had all personnel matters regarding Lewis referred to his office. The Labor Department ruled in another Complaint (*Lewis v. EPA* CA 98-CAA-13) that Lewis was denied a promotion to GS-15 because of his *Nature* commentary. To settle this case, Longest offered Lewis a 4-yr appointment to the University of Georgia to continue his research - *if* he would agree to resign his EPA position afterwards. With his career at EPA dead-ended, Lewis agreed to Longest's proposal when the UGA Department of Marine Sciences promised to seek a tenured, full professorship. Using funds EPA paid to settle his Labor Department cases, Lewis transferred to UGA and assembled a research team to begin investigating illnesses and deaths linked to biosolids.

November 1998

The McElmurray and Boyce families, whose dairy cattle were poisoned by hazardous wastes from Augusta's sewage sludge, which contaminated their lands and forage crops, filed suit against the City of Augusta. Walker and **Robert Brobst**, who headed Walker's Biosolids Incident Response Team, contacted **Julia Gaskin** at UGA and offered her an EPA grant to investigate the McElmurray and Boyce cases.

[75] EPA paid Lewis a total of $205,000 to settle all of his Labor cases between 1997-2000, not counting legal fees and costs, which EPA paid separately to Lewis' attorneys at Kohn, Kohn, & Colapinto in Washington, DC.

October 1999

Longest recommended the removal of Lewis' lab director, **Rosemarie Russo**, for approving a second article Lewis published in *Nature* (*Nature* **401**:898-901), which was also critical of EPA's sewage sludge regulations.

March-October 2000

The U.S. House of Representatives held hearings into EPA's retaliations against Lewis and Russo in March and October; and EPA cancelled Russo's removal as lab director. As a result of the hearings, EPA called on the National Academy of Sciences to reassess the science behind EPA's current sludge regulations (the 503 Sludge Rule). In April of 2000, EPA Administrator **Carol Browner** awarded Lewis the Science Achievement Award for his second *Nature* article. Lewis was later promoted to GS-15.

July 2001

Michael Cook, Director of EPA's Office of Wastewater Management, invited Walker (whom Cook supervised) to lunch with two executives from Synagro Technologies, Inc., **Alvin Thomas** and **Robert O'Dette**. The purpose of the meeting was to discuss one of Lewis' research articles and his testimony in a toxic tort lawsuit, *Marshall v. Synagro*. Walker was peer-reviewing the article, which linked Synagro's biosolids to the death of a 26-yr-old New Hampshire man, Shayne Conner. The lawsuit was filed by Conner's mother, Joanne Marshall. That same day, Thomas sent a letter to EPA Deputy Administrator **Linda Fisher**, which accused Lewis of misusing federal funds at UGA to investigate Conner's death. Thomas and others representing Synagro also communicated with UGA President **Michael Adams** and the university's lawyers. Walker followed up by having dinner with O'Dette a week later. Walker informed O'Dette that he "tore up" Lewis' paper; and requested information on the *Marshall* case to use in his peer-review. Like Alvin Thomas, Robert Brobst, who was one of the other internal peer-reviewers chosen by EPA, also objected to Lewis publishing any information concerning Conner's death while servving as an expert witness in the *Marshall* case. Investigators in EPA's Office of Inspector General asked Walker whether he and others in the Office of Water were "in cahoots" with Synagro. Walker replied: "We are not in cahoots with Synagro. I see we do have an appearance problem.[76]

September 2001

O'Dette e-mailed to Walker and his EPA supervisors, including Michael Cook, a "white paper" titled "Analysis of David Lewis' Theories Regarding Biosolids." This paper, which analyzed Lewis' research and testimony in *Marshall v. Synagro*, was printed on Synagro letterhead (28 pages) but listed no authors. It alleged that Lewis misused his UGA position and committed scientific misconduct by investigating Conner's death.

[76] [Transcript] EPA Office of Inspector General interview of J. Walker by J. Vanderhoef and R. Donaldson. Sep. 4, 2001. *Lewis v. EPA* U.S. Department of Labor Case Nos. 2003-CAA-6, 2003-CAA-5. Exhibit 109, p. 13.

O'Dette also sent a copy to **Greg Kester,** a member of the **National Academy of Sciences** (NAS) panel investigating EPA's 503 sludge rule, who included it in the panel's deliberations. Walker immediately forwarded Synagro's white paper to **Carol Geiger** for distribution at public hearings where Lewis and Gaskin were presenting their research on biosolids. Geiger was an Atlanta attorney representing the wastewater industry. She also defended the City of Augusta against the McElmurray and Boyce lawsuits over cattle deaths caused by hazardous wastes in its biosolids. Walker also provided Geiger a letter defending biosolids, which was approved by his supervisors, to present at the hearings. A lawyer working for Geiger's firm waved Synagro's white paper and Walker's official EPA letter at the hearings saying: "This white paper, prepared by one of the parties in the *Marshall v. Synagro* litigation and provided to us by EPA, asserts substantial weaknesses in the substance of Dr. Lewis' opinions and his qualifications to render them."

June-July 2002

Despite the fact that EPA approved Lewis serving as an expert so that he would have access to Conner's medical records, Lewis complied with Robert Brobst's unwarranted peer-review comments, which supported Synagro's position, and removed information in his manuscript linking Conner's death to Synagro's biosolids. The Lewis *et al*. research article was then published in a peer-reviewed medical journal, *BMC Public Health* (biomedcentral.com/1471-2458/2/11). As soon as the article was published, Julia Gaskin and her coworkers vehemently protested Lewis and his coworkers linking biosolids to public health problems. In a meeting with Lewis' department head, Gaskin objected to Lewis even working on biosolids at UGA. Prof. David Gattie, who attended the meeting, testified to the Labor Department: "Julia made the comment that John Walker could handle the national issues and she would handle the state issues."

The National Academy of Sciences' panel released its report on biosolids (www.nap.edu/books/0309084865/html), claiming that there is no documented evidence that biosolids applied under EPA's 503 sludge rule has ever harmed public health or the environment. The panel drew heavily upon Lewis' prepublication and in-press papers to write sections dealing with gaps in the science used to support the safety of biosolids. All credits to Lewis' contributions, however, disappeared before the final version of the report was published. The last citation was removed after NAS panel member Greg Kester, Wisconsin's Biosolids Coordinator, complained to Panel Chair Thomas Burke that Lewis' work should not be "elevated," and EPA should not be "criticized."

January 2003

Gaskin and Brobst published the results of their study of forage crops grown on Augusta's biosolids in the *Journal of Environmental Quality* (*JEQ*) and concluded: "Overall, forage quality from fields with long-term application of biosolids was similar to that having only commercial fertilizer and should not pose a risk to animal health." UGA issued a national press release quoting Gaskin: "Some individuals have questioned whether the 503 regulations are protective of the public and the environment. This study puts some of those fears to rest."

Professor **Robert Hodson**, former director of the UGA School of Marine Sciences, testified to the Labor Department that UGA dropped its interest in hiring Lewis because EPA would not clear up the white paper allegations; and UGA was afraid that hiring Lewis would hurt UGA's funding from EPA and industry. UGA administrators, Hodson testified, were "kind of leery of being involved in anything that has sides to it … in other words an industrial side…such as the Synagro thing … I mean, basically, people whose livelihoods depended on contracts." People in the College of Agricultural and Environmental Sciences also told him to "stay away from things that could end up biting us in the rear-end…because we're dependent on this money … grant and contract money…money either from possible future EPA grants or [from] connections there might be between the waste-disposal community [and] members of faculty at the university."

March 2003

EPA Asst. General Counsel **David Guerrero** stipulated to the U.S. Department of Labor that all of Synagro's allegations concerning Dr. Lewis were without merit, and were not based in any facts. EPA's Office of General Counsel, however, never informed Lewis' supervisors or anyone at UGA of these findings. Several days later, Synagro filed its white paper allegations with the UGA Research Foundation as a formal petition to investigate scientific misconduct, and provided copies of the petition to Gaskin and one of her coworkers. UGA forwarded them to Lewis' EPA lab director, Dr. Russo. Lewis' EPA branch chief formally investigated the allegations and, based on EPA policies concerning scientific misconduct, dismissed them. Synagro hired Georgia Senator **Kasim Reed** (currently Mayor of Atlanta) to use his position to pressure the UGA Research Foundation into not dismissing the allegations. As a result, the misconduct allegations still hang over Lewis to this day almost seven years after Synagro filed its petition.

May 2003

EPA unilaterally processed Lewis' resignation on his 55th birthday. Dr. Russo retired several years later and provided the following statement: "Dr. Lewis' involuntary termination over his research articles was not supported by the local lab management in Athens. He was an excellent researcher and an asset to EPA science." William Boyce won a jury verdict in *Boyce v. Augusta* and was awarded $550,000 in damages.

December 2003

Lewis spoke to the City and County Council of Honolulu, which was voting on whether to approve Synagro's contract to process and distribute Class A biosolids. He recommended that the University of Hawaii perform some simple tests concerning the presence and regrowth of pathogens to either validate or disprove Synagro's claims that its Class A biosolids are sterile and present no risk of infection. Regrowth occurs when pathogens remain at levels too low to detect, and then grow back to high levels when biosolids are stored or spread on land. It is the same thing that happens when someone

thoroughly cooks a ham or turkey and then leaves it out of the refrigerator for a day or two.

EPA Region IX's Biosolids Coordinator, Lauren Fondahl, supported Synagro's claims; and, when the Council voted in favor of conducting the tests Lewis recommended, Fondahl's Division Director, **Alex Strauss**, responded by threatening Honolulu with over $5 million in fines if approval of Synagro's contract was delayed. EPA also put Hawaii's biosolids coordinator in contact with Julia Gaskin to obtain information about Lewis and his research at UGA. The Council, however, ignored EPA's threats and reached a compromise with dissenting members by limiting the scope of the tests. Under the compromise, Synagro's biosolids were tested for *Salmonella* and certain indicator bacteria, but not re-growth of pathogens.

Documents that UGA requested from Lewis in discovery revealed that Lewis filed a report with EPA's Criminal Investigation Division based on information provided to him by a Council member. According to Lewis' source, a Council member in Honolulu was offered $5,000 to vote in favor of approving Synagro's contract.[77] The source also alleged that other Council members were offered larger bribes, which some accepted; and documents provided to Lewis suggested that a City employee had rigged the bidding in favor Synagro. EPA, however, declined to inform the Justice Department. Several years later, however, a Synagro executive did plead guilty to bribing council members in Detroit, MI. Monica Conyers, wife of Michigan Congressman John Conyers, was sentenced to 37 months for accepting a $6,000 bribe to vote for a Synagro contract reportedly worth $2.1 billion.[78]

May 2007

While investigating the Augusta cattle deaths, Lewis learned that Walker and Brobst had established the Gaskin study to defend the 503 sludge rule by debunking the McElmurray and Boyce lawsuits against Augusta. Walker's supervisor, Charles Gross, served as Gaskin's EPA project officer; and Synagro applied Augusta's biosolids during the Gaskin study.[79,80] Walker and Gaskin both communicated with Synagro and copied Gross. Synagro VP Robert O'Dette also sent Synagro's white paper allegations against

[77] Exhibit 133. Letter Lewis to Michael Hubbard, EPA Region 1 Criminal Investigation Division, Boston, MA. re Allegations by Honolulu Council Member that a Synagro official offered bribes to Council members. Dec. 5, 2003.
[78] B. Schmitt and J. Swickard. "Monica Conyers Gets 37 Months in Prison in Synagro Bribery Scandal in Detroit," *Detroit Free Press - MI*, Mar. 10, 2010.
[79] Synagro: "Augusta, Ga Total Applications (Detail) 1/1/99 To 12/31/99." USA *ex rel*. Lewis, McElmurray & Boyce v. Walker *et al*. United States District Court, Middle District of Georgia, Athens Division. Case No. 3:06-CV-16. Exhibit 42L: EPD 19231.
[80] Gaskin *et al*. (2003) *J. Environ. Qual*. Vol. 32, *Materials and Methods*, p. 147: "The area experienced a severe drought throughout the summer of 1999 sampling season."

Lewis, which they filed at UGA as a scientific misconduct complaint, to Gaskin and one of her coworkers and copied Alvin Thomas.[81]

Judge Jeffrey Tureck had dismissed Lewis' case on the basis that Lewis was unable to produce any evidence that any of Walker's supervisors were aware of his interactions with Synagro, and his distribution of Synagro's white paper in Georgia. Based on this new evidence, which EPA had withheld, Lewis submitted a Motion to Re-open the record in his Labor Department case. EPA countered that Lewis should have suspected Walker's direct involvement at UGA when Gaskin remarked at the meeting with Lewis and his UGA department head in 2002 that Walker would handle the national issues and she would handle the state issues. Judges Oliver Transue and Cynthia Douglass of the Department of Labor's Administrative Review Board denied the Motion.

November 2007

The McElmurrays settled their lawsuit against Augusta for $1.5 million.

February 2008

Judge **Anthony Alaimo** of The United States District Court for the Southern District of Georgia ruled in favor of the McElmurray family in the USDA case. Judge Alaimo determined that data, which Brobst and Gaskin represented as valid in their JEQ article, were widely known to be unreliable and false: “Although there is a broad consensus that Augusta’s reports were unreliable, incomplete, and in some cases fudged, the City’s information is an integral part of this case.” Alaimo commented on EPA's handling of Lewis: “senior EPA officials took extraordinary steps to quash scientific dissent, and any questioning of the EPA’s biosolids program.”

May 2008

The prestigious British science journal *Nature* covered Alaimo's ruling in an editorial and news article, pointing out that a multi-university study in Ohio had confirmed Lewis' research findings at UGA. The editors called EPA's sewage sludge program “an institutional failure spanning more than three decades — and presidential administrations of both parties.” (*Nature* 453: 258; 262-3, 15 May 2008) Later that year, UGA's Department of Marine Sciences informed Lewis that he could no longer use any of the Department's laboratory space and must vacate his office by the end of the year.

C. Postscripts

(a) NAS Responds to Pennocks, Andy McElmurray

On February 27, 2004, Russell and Antoinette Pennock of Robesonia, PA, and Andy McElmurray of Hepzibah, GA, filed a misconduct petition with Johns Hopkins

[81] Exhibit 39. [E-mail] Robert O’Dette to Bill Segars, Alvin Thomas, and Julia Gaskin Re: Petition for Scientific Misconduct. Apr. 22, 1993.

University's School of Public Health, which was 27 pages long and included 35 exhibits. They formally requested that Johns Hopkins University have NAS Panel Chair Thomas Burke rectify the plagiarism that resulted from removing references to Dr. Lewis' prepublication and in-press manuscripts from the NAS report while using Lewis' information in the manuscripts to address gaps in the science used to support EPA's 503 sludge rule. Included among the exhibits were Lewis' prepublication and in-press papers, which the NAS used without attribution. Various e-mails from Susan Martel of the NAS were also included, which confirmed that Lewis' materials were used to write portions of the report.

Russell and Antoinette were the parents of Daniel Pennock, who contracted a rotavirus infection (which is transmitted by sewage) and then died from complications with staphylococcal (*S. aureus*) pneumonia. All but one family member experienced recurring *S. aureus* infections, which began when biosolids were spread close to their home and continued until after the applications stopped. Lewis' *BMC Public Health* paper described each case. The Pennocks were understandably upset when documentation of their son's death in the peer-reviewed scientific literature was removed to support the NAS' claim that there is no documented evidence that biosolids have harmed public health.

In the cover letter to the Petition, the Pennocks wrote:

> *We are the parents of Danny Pennock, who died in 1995 from a lung infection caused by Staphylococcus aureus. Our family, and relatives who frequently visited our home in Robesonia, PA developed chronic skin and respiratory irritation from sewage sludge dusts blowing from land next to our home. Tons per acre of sludge were applied to the land five days per week for seven years (Exhibit 12). Almost everyone who lived in, or regularly visited, our household developed large S. aureus boils over all parts of our bodies. Dozens of cats living near our home also developed the boils; many of them died.*
>
> *Our cases were part of the Lewis et al. studies published in BMC-Public Health and ES&T... On December 24, 2003, EPA dismissed any connection between our S. aureus infections and our exposure to sludge (Exhibit 33, the Mehan Letter). To support its position, EPA quoted Dr. Burke's report: "Alleged adverse health effects were also considered by the National Research Council (NRC) of the National Academy of Sciences in its review of EPA's sludge program. ..." The NRC report noted that there are anecdotal reports attributing adverse health effects to biosolids exposures, "ranging from relatively mild irritant and allergic reactions to severe and chronic health outcomes" and concluded that a causal association between biosolids exposures and adverse health effects has not been documented." (Exhibit 33, p. 4)*
>
> *EPA specifically addressed our cases in the section (of the Mehan Letter) titled "Death of Daniel Pennock" (Exhibit 33, p.7-9). In it, EPA admitted that it did not have access to Danny's medical records and, instead, cited information from newspaper stories and other non-peer-reviewed, non-scientific sources. EPA gave incomplete and misleading information about our son's death, and even went so far as to state that there was no evidence that Danny ever even entered*

the sludge treated land. This information is clearly contradicted by accurate information published in peer-reviewed articles in scientific journals by Lewis et al. (Exhibits 12, 13). The data published by Lewis and co-workers were based on Danny's medical records and other reliable documentation.

The only reason EPA was free to use false and misleading information to dismiss any link between Danny's death and his exposure to sewage sludge is because Dr. Burke chose to eliminate all references to the Lewis et al. studies, including their studies on S. aureus infections associated with biosolids.

On March 17, 2004, Dean Alfred Sommer responded to the petition from Daniel Pennock's parents and Mr. R. A. McElmurray. He stated that the evidence mostly had to do with "the conduct and procedures of the National Academies of Sciences/National Research Council" and forwarded the petition to the NAS. Two months later, NAS Executive Director Warren Muir concurred with Johns Hopkins University in a letter stating that Burke had done nothing wrong. Muir falsely claimed that the final NAS report was unanimously approved by all committee members. With no condolences for the loss of their son, Dean Sommer forwarded Muir's letter to the Pennocks. It expressed the National Academy's "deep regrets" for any "inconvenience or "discomfort" that the allegations may have caused Dr. Burke.

(b) Public Statement by Rosemarie C. Russo, Ph.D.

After retiring from EPA, former EPA-Athens laboratory director Dr. Rosemarie Russo issued the following public statement on March 6, 2008: "Dr. Lewis' involuntary termination over his research articles was not supported by the local lab management in Athens. He was an excellent researcher and an asset to EPA science."

(c) The Gulf Oil Disaster

One negative impact of EPA and the University of Georgia getting rid of Dr. Lewis was that it left EPA unprepared to deal with the oil spill disaster that developed in the Gulf of Mexico in the spring of 2010. Research on the environmental impact of oil spills has been largely confined to studying how to clean up shorelines. Lewis wanted to understand how to mitigate the impact of oil spewing into the sea from offshore oil rigs. He first became interested in the potential for offshore oil rigs to catastrophically pollute the marine environment when he lived in Mobile, AL. There he met a contractor who supplied pipes to oil rigs in the Gulf of Mexico. Lewis' brother in Louisiana also supplies offshore oil rigs in the Gulf.

EPA assigned Lewis to UGA's Department of Marine Sciences in 1998 to apply his microbiological research to EPA's mission, including studying oil spills in the marine environment. His EPA Assignment Agreement specifically states that his research would directly apply to "petroleum products that may travel great distances in oil spills and outfalls in marine environments." Lewis wanted to develop strains of oil-digesting marine bacteria that could be freeze-dried and injected, along with nutrients and non-toxic dispersants, in large quantities directly into leaking well heads. These "super-bugs," and

the concentrated nutrients that they need to degrade crude oil, would permeate plumes as they develop underwater. Once the plumes have developed, however, it is too late to treat them because they are too large and may be impossible to locate. Left untreated, some of the more recalcitrant components of the complex mixtures of crude oil and other contaminants in the plumes (*e.g*., compounds with high molecular weights) will remain largely unaltered for years or longer.

Eventually, any non-biodegraded contaminants will find their way to deep currents and upwell years to decades later along the coastlines of North and South America, Northern Europe, Africa and elsewhere. Even trace levels of some of the plumes' contaminants may inhibit the growth of phytoplankton that drives the food chain in and around upwellings. Half of the world's fishing industries depend mainly upon upwellings. Lewis' groundbreaking research on biodegradation was used to clean up the Exxon Valdez spill in 1989;[82] and EPA Administrator Carol Browner awarded him the Science Achievement Award in Biology & Ecology in recognition of his research on biodegradation published in 1999 in *Nature*. Because EPA, academia and the industry joined forces to shut down his research at UGA, however, Lewis was unable to conduct any of the research he planned on oil spills in the marine environment.

Section IV. Silencing Scientific Debate

A. NAS Deletes References (2002)

In response to Congressional hearings into EPA retaliations against scientists and private citizens who link biosolids to illnesses and deaths, [83] EPA called upon the National Academy of Sciences (NAS) in 2001 to reevaluate the scientific basis supporting the 503 sludge rule.[84] NAS Panel Member Ellen Harrison provided the panel

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[82] Lewis and coworkers discovered that levels of inorganic nitrogen and phosphorus determine how quickly microbes adapt to breaking down organic chemicals. His results were confirmed by scientists at Cornell University (Wiggins, *et al*. 1987. *Appl. Environ. Microbiol*. **53**:791-796; Jones and Alexander. 1988. *Appl. Environ. Microbiol*. **54**:3177 3179; Zaidi, *et al*. 1988. *Environ. Sci. Tech*. 22:14-19) and the University of North Carolina (Swindoll, et al. 1988. *Appl. Environ. Microbiol*. **54**:212-217); and the application of these nutrients to oil spills became standard practice. Lewis' research on the ecology of bacteria in deep sea currents and upwellings was first published by the American Society of Microbiology in 1991. Lewis, D.L. and D.K. Gattie. 1991. Ecology of quiescent microbes. *ASM News* feature article. **57**:27-32.

[83] U. S. House of Representatives, Committee on Science. EPA's Sludge Rule: Closed Minds or Open Debate? March 22, 2000. No. 106-95; U.S. House of Representatives, Committee on Science. Intolerance at EPA - Harming People, Harming Science? Oct. 4, 2000. No. 106-103. As a result, Congress passed the Notification and Federal Employee Antidiscrimination and Retaliation Act of 2002 (Public Law 107-174). Retaliations against Lewis and his local EPA director by government officials in charge of EPA's biosolids programs are specifically cited in Law, which was signed by President George W. Bush. The Lexington Institute awarded Lewis its 2000 Leadership Award at a dinner held at the Hay Adams Hotel in Washington, DC to recognize his impact on public policy.

[84] *See*, p. 12 of ALJ Recommended Decision: www.oalj.dol.gov/PUBLIC/WHISTLEBLOWER/DECISIONS/ALJ_DECISIONS/CAA/03CAA

with copies of Lewis' presentations and two in-press peer-reviewed journal articles (*BMC Public Health*, 2002; and *ES&T*, 2002). Harrison, who was Director of Cornell University's Waste Management Institute, was part of a group of NAS panel members selected to brief EPA on the Academy's findings when their report was electronically released on July 2, 2002.

DEPOSITION OF ELLEN HARRISON BY STEPHEN M. KOHN, ESQ., 21 MAR 2003

Pages 34-35, 76

Q. [Kohn] …I'm looking for a larger picture questions here, what would you state would be Dr. Lewis' major contribution in terms of the concerns he was raising to the National Academy review process?

A. [Harrison] I think, as I mentioned, David is the only scientist that to that time had raised the scientific issues that might lead to exposure and disease and so David's ideas in that regard, I think, were important to sort of framing the National Academy panel's in recognizing that…there are a lot of gaps here, there are plausible routes of exposures that we haven't assessed.

So David's role was – I mean in my book David was a hero in this regard basically. Despite the incredible flack he was getting, [he] put forward reasonable scientific theories, backed by some research to suggest that there were plausible routes of exposure and that in fact illness might be resulting. He, I mean as far as I'm concerned, he kind of turned the whole thing around...

I think without David's involvement we wouldn't be at all where we are today in terms of looking at the safety issues anew. David raised – David gave a legitimacy to the allegations that has made it impossible to ignore the alleged health issues... So I think David has probably been the most important player in all this.

Despite Harrison's favorable opinions of Lewis' research at UGA, the NAS report deleted references to his peer-reviewed research articles and presentations. The electronic version of the report still cited his 2002 *ES&T* article.[85, 86] This reference was removed when a member of the NAS panel, Wisconsin biosolids coordinator Greg Kester, sent an

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05A.HTM *Lewis v. EPA*, Department of Labor Case Nos. 99-CAA-12, 2000-CAA-10, 2000-CAA-11.

[85] Lewis, D.L. & D. K. Gattie. 2002. Pathogen risks from applying sewage sludge to land *ES&T* **36**:286A-293A.

[86] Exhibit 20B National Academy of Sciences, National Research Council. Biosolids Applied to Land: Advancing Standards and Practices, Advance Copy, Jul. 2, 2002.

e-mail to Thomas Burke at Johns Hopkins School of Public Health and Susan Martel at the NAS. [87]

Burke chaired the NAS panel. Kester was a member of John Walker's Biosolids Program Implementation Team (BPIT). While serving on the NAS panel, Kester urged EPA's Office of Research & Development to "respond to the public's health concerns" about sewage sludge and "do more to proactively confirm safety of land applied biosolids."[88] Kester also supported the Synagro white paper, which contained false allegations of scientific misconduct against Lewis. Kester e-mailed it to numerous EPA officials, writing: *This paper presents many of the issues raised by Dr. Lewis in the New Hampshire case and provides compelling refutation. It was written by Bob O'Dette of Synagro.* [89]

In Kester's e-mail copied to his fellow NAS panel members, he wrote:

> *Hi Tom and Susan – In contrast to your message that the briefings went well, I am quite disturbed by what I have heard transpired at the EPA briefing this morning. Among other items, I heard that EPA staff in the biosolids program were referred to as 'the usual suspects' and basically denigrated for their work in the program. The message was also taken that their work should be devalued and the work of David Lewis should be elevated. I did not agree to such representation nor do I believe much of the committee did. We specifically noted that EPA should not be criticized for the work they did. … While EPA may not have been moved by the criticism, there are those on the Hill who would love nothing more than to criticize EPA.*

In 2008, *Nature* published a correction to its editorial concerning Alaimo's ruling and Lewis' research, stating:[90] "the NAS panel voted to remove the reference [to Lewis' work] before final publication. An NAS spokesman[91] said the panel decided the information was not relevant as the panel was not charged with evaluating health impacts." Harrison responded to *Nature.com*:[92] "I am compelled to correct an error that was contained in *Nature News* (*Nature* **453**, 577; 2008). ... the "correction" stated that the NAS panel "voted to remove" [the reference to Lewis' work] because it was not relevant

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[87] E-mail: Susan Martel, National Academy of Sciences, to Ellen Harrison, Cornell Waste Management Institute. Mar. 5, 2003.
[88] Exhibit 249. Russo e-mail to Lewis dated 10/03/02 and titled "Notes from 9/25 Biosolids Implementation Team (BPIT) meeting," p. 2.
[89] Exhibit 42H, E-mail from Greg Kester to the following 23 EPA officials: A. Rubin, A. Hais, A. Roufael, A. Carkuff, A. Sajjad, R. Bastian, B. Brobst, C. Sans, D. Hamilton, D. Hetherington, C. Gross, A. Lindsey, J. Home, J. Ryan, J. Smith, J. Colletti, J. Dombrowski, J. Dunn, J. Walker, L. Fondahl, M. Dominy, M. Meckesand T. Murphy. Subject: "FW: Dr. David Lewis," 09/24/01.
[90] *Nature* Vol. 453, p. 577. May 28, 2008.
www.nature.com/news/2008/080528/full/453577d.html
[91] William J. Skane, Executive Director, Office of News and Public Information, National Academy of Sciences, 500 Fifth St. N.W., Washington, D.C. 20001.
[92] E-mail from E. Harrison to Correspondence@nature.com. June 17, 2008.

to the committee's charge. ... The NAS made this change to the report without permission from the panel. This is a violation of the NAS procedures requiring full committee consensus on reports. I would not have approved the removal of this reference since it was clearly relevant to the work of the committee. ... the unilateral action of NAS to remove the reference was highly inappropriate." Thus, the NAS' removal of references to Lewis' research represented gross academic dishonesty and more horrific evidence of the lengths EPA's network of gatekeepers will go to in order to create false and misleading information in the scientific literature to support EPA's land application program.

A reporter who interviewed NAS panel chair Thomas Burke at Johns Hopkins in 2008 asked Burke why references to Lewis' papers were airbrushed from the final version of the 2002 report. Burke claimed that Lewis' studies did not include any controls and that Lewis did not include residents that were asymptomatic. The source of this misinformation was Synagro's white paper,[93] which was deemed by EPA to lack credibility.[94] Instead of using "exposed" and "unexposed" controls, Lewis used dose-response curves,[95] which consider changes in responses over a wide range of exposures, rather than just comparing only two groups. Dose-response curves are considered to be the gold standard in controlled studies. To produce these curves, Lewis and coworkers evaluated the proportions of family members who did and did not experience symptoms with distances the families lived from the treated field and with total exposure times.[96] A similar approach was employed in a multi-university study published in 2007,[97] which independently confirmed the findings Lewis *et al.* published in *BMC-Public Health*.

B. Georgia Senator Pressures UGA (2003)

On January 29, 2003, UGA issued a national press release announcing the publication of the Gaskin study in the *Journal of Environmental Quality*.[98] In the press release, which was titled "Sludge study relieves environmental fears," Gaskin was quoted:

> *"Some individuals have questioned whether the 503 regulations are protective of the public and the environment," said UGA scientist Julia Gaskin, who headed the research team. "This study puts some of those fears to rest."*

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[93] "Analysis of David Lewis' Theories Regarding Biosolids" printed on Synagro letterhead, September 20, 2001. *Lewis v. EPA*, Department of Labor Case Nos. 99-CAA-12, 2000-CAA-10, 2000-CAA-11, Exhibit 93. See also, Exhibit 105 in Plaintiffs' qui tam case against EPA and UGA employees.

[94] Exhibit 42G. Joint Stipulation, *Lewis v. EPA*, Case Nos. 2003-CAA-5, 2003-CAA-6, Mar. 04, 2003.

[95] Lewis DL, Gattie DK, Novak ME, Sanchez S, Pumphrey C. 2002. Interactions of pathogens and irritant chemicals in land applied sewage sludges (biosolids). *BMC Public Health* 2:11. www.biomedcentral.com/1471-2458/2/11

[96] Lewis *et al*. *BMC Public Health* 2:11. www.biomedcentral.com/1471-2458/2/11

[97] Khuder, S. *et al*. (2007) *Arch. Environ. Occup. Health* **62**: 5–11.

[98] University of Georgia. Sludge study relieves environmental fears. Cat Holmes, Georgia Faces. Jan. 29, 2003. http://georgiafaces.caes.uga.edu/getstory.cfm?storyid=1770

Eleven months later, UGA Associate VP Regina Smith, who is the UGA Research Foundation's Scientific Integrity Officer, telephoned Dr. Lewis. The purpose was to inform Dr. Lewis that she had quashed UGA's press release on a research article Professor Gattie and Dr. Lewis had just published in *Environmental Health Perspectives*.[99] Smith explained that she objected to the article linking sewage sludge to illness.[100] She also told Lewis that Synagro's scientific misconduct petition against Lewis and Gattie "was by no means a dead issue."

Smith's remark was a reference to pressure that Georgia Senator Kasim Reed was putting on UGA not to drop Synagro's petition. According to letters Reed sent to UGA, including one on official Georgia Senate letterhead, Reed was hired by Synagro to handle the matter.[101] Other attorneys representing Synagro also pressured UGA President Michael Adams and other UGA officials, alleging that it was improper for UGA to allow Lewis to investigate Shayne Conner's death in New Hampshire, which was linked to Synagro's biosolids.[102, 103, 104] Smith's conduct, especially given the fact that she is UGA's Science Integrity Officer charged with investigating scientific misconduct, represents some of the most abhorrently reprehensible scientific and academic misconduct imaginable.

In March of 2003, Curry forwarded Synagro's petition, which was based on its "white paper" allegations concerning Dr. Lewis, to Dr. Rosemarie Russo, director of EPA's research laboratory in Athens, GA.[105] By this time, EPA's Office of General Counsel had already informed the U.S. Department of Labor that Synagro's white paper allegations against Lewis were not based in any facts.[106] Dr. Curry placed a follow-up call to Russo; and Russo took notes of the conversation, which she provided to Lewis.[107] Regina Smith was questioned under oath concerning this matter. Relevant portions of the transcript of her deposition follow.

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[99] Exhibit 3A. Gattie, D.K. and D. L. Lewis. 2004. A high-level disinfection standard for land-applied sewage sludge (biosolids). Environ. Health Perspect. 112:126-31.
[100] Exhibit 53A. Record of communication by D. Lewis of telephone conversation with R. Smith, Nov. 21, 2003.
[101] Exhibit 53B. Letters from Sen. Kasim Reed to Judy Curry, UGA Research Foundation dated Apr. 18, 2003; May 16, 2003; Jun. 2, 2003.
[102] Exhibit 42F [Letter] Dr. Judy Curry (UGA) to James Slaughter (Beveridge & Diamond representing Synagro) re: Petition to Investigate Alleged Research Misconduct, Jul. 17, 2003.
[103] Exhibit 96 [Letter] Dvosha Roscoe (Synagro) to Michael Adams (UGA), Sep. 28, 2000.
[104] Exhibit 97 [Letter] Alvin Thomas (Synagro) to Arthur Leed (UGA), Jul. 27, 2001.
[105] Exhibit 42N [Letter] Dr. Judy Curry (UGA) to Dr. Rosemarie Russo re: Allegations raised by Synagro Technologies against David Lewis, Apr. 8, 2003.
[106] Exhibit 42G. Joint Stipulation, *Lewis v. EPA*, Case Nos. 2003-CAA-5, 2003-CAA-6, Mar. 04, 2003.
[107] Exhibit 42P Handwritten notes by R. Russo of conversations with Judy Curry, Apr. 9 and 16, 2003.

DEPOSITION OF REGINA SMITH, PH.D., BY ZACHARY WILSON, ESQ., APR. 27, 2009

Page 66

Q. [Wilson] So what is this?
A. [Smith] These are handwritten notes of Dr. Russo of a telephone call she had with Ms. Curry.
A. Okay.
Q. Have you ever seen this document before?
A. No.
Q. All right. You can see Ms. Russo indicates that, quote: We're under some pressure from Synagro to give them a decision.

Page 67

Q. What does that mean, what pressure?
A. Doesn't mean a thing to me. That's not my words. That's Judy Curry's words, according to you.
Q. Did you receive any pressure from Synagro to give them a decision?
A. No. I was never in touch with any of -- anybody directly, I don't believe.
Q. Do you know if Ms. Curry was ever in touch with anybody directly?
A. I believe she was.
Q. Do you know who?
A. No.
Q. Do you know if she was under pressure from Synagro?
A. No.

Dr. Smith later contradicted this testimony:

Page 81

[Mr. WILSON:] I believe you said, in your statement just a few seconds ago, that you were under pressure from Synagro. You remember saying that?
[Dr. SMITH:] No.
MR. WILSON: I would like to have the court reporter read back her answer.
(Court reporter read as follows:
Answer: Somehow Gordhan Patel got a phone call from either external -- public affairs, or maybe

the Provost, again, I do not remember, and said look at this because they were aware that there was activity and we were still getting pressure from Synagro.)
MR. WILSON: Thank you. That's good.
BY MR. WILSON:
Q. So you were still receiving pressure from Synagro?
A. I'm sorry. I wasn't listening. What did you say?
Q. You were still receiving pressure from Synagro?

Page 82-83

A. Are you repeating something that I said earlier?
Q. Yes, ma'am.
A. Read it again, please.
(Court reporter read as follows:
Answer: Somehow Gordhan Patel got a phone call from either external -- public affairs, or maybe the Provost, again, I do not remember, and said look at this because they were aware that there was activity and we were still getting pressure from Synagro. I read the article, and I read the press release, and Gordhan Patel and I talked, I think, and my conclusions were just because you publish an article in some little-known journal is no reason to put out a press release.)
THE WITNESS: All right. Read it over again, the very first part of it.
(Court reporter read as follows:
Answer: Somehow Gordhan Patel got a phone call from either external -- public affairs, or maybe the Provost, again, I do not remember, and said look at this because they were aware that there was activity and we were still getting pressure from Synagro.)
THE WITNESS: All right. Forget that, that was a misspoke. I shouldn't have said that. There was still activity going on, the issue was not completely dead. From our perspective, we had done everything we needed to do, but attorneys were still pushing.

EPA investigated Synagro's allegations of scientific misconduct at the ORD research laboratory in Athens, GA, and at EPA Headquarters in Washington, DC. They determined that Synagro's allegations were not based in any facts and did not merit investigating Lewis for scientific misconduct. UGA, however, crumbled under pressure from Kasim Reed and Beveridge & Diamond and never dismissed Synagro's allegations, which sprung forth from meetings that Walker's boss, Michael Cook, had with Walker and Synagro executives in 2001.

Professor Robert E. Hodson, former director of the UGA School of Marine Sciences, testified in Lewis' U.S. Department of Labor case that UGA's handling of the allegations undermined support for Lewis' research and employment at UGA. UGA administrators, Hodson testified, were "kind of leery of being involved in anything that has sides to it … in other words an industrial side…such as the Synagro thing … I mean, basically, people whose livelihoods depended on contracts." See, Exhibit 42 I, p. 29-30. Hodson also explained that the College of Agricultural and Environmental Sciences told him to "stay away from things that could end up biting us in the rear-end…because we're dependent on this money … grant and contract money…money either from possible future EPA grants or [from] connections there might be between the waste-disposal community [and] members of faculty at the university."

Then, on February 5, 2004, Attorney F. Edwin Hallman, Jr., sent Julia Gaskin and her UGA co-authors various documents proving that the data Robert Brobst provided for their JEQ article had been fabricated by the City of Augusta. (*See*, Exhibit 53C.) Regina Smith investigated Mr. Hallman's allegations and, on April 19, 2004, notified Dr. Gordhan Patel, the head of the Research Foundation, and other UGA officials including UGA Senior VP and Provost Dr. Arnett Mace, of her findings that Ms. Gaskin was innocent of any wrongdoing. Smith excused Ms. Gaskin's use of the fabricated data based on the fact that they were fabricated by third parties independently of Ms. Gaskin.

Gaskin later admitted under oath that she knew there were problems with the data when she submitted the paper; but Brobst assured her that they were not "totally fabricated:"

DEPOSITION OF JULIA GASKIN BY F. EDWIN HALLMAN, JR., ESQ., 20 JAN 2009

Page 269

9 [Gaskin] All I can say is what I have said before.
10 When we published this paper, Bob Brobst pulled
11 together this data summary. There was discussion
12 about the data, because we knew that there were some
13 problems, and we were -- you know, I was assured that
14 it had been looked at and evaluated so that it was
15 not totally fabricated.

Brobst admitted under oath that he knew the data were "sloppy," "poor quality" and "bad." [108] Judge Anthony Alaimo, in fact, threw out Brobst's testimony in *McElmurray v. USDA* in 2008, stating that Brobst based his opinions about Augusta's biosolids on Augusta's data, which were widely known to be unreliable and fabricated: [109]

> *Brobst opined in a letter that the McElmurrays' land was not contaminated." AR 1230-1240.* (p. 33)… *Because Brobst concedes that his conclusion is based on Augusta's unreliable, and to some extent invented, data, Brobst's finding has little merit on its own.*

By excusing Gaskin's role in publishing Augusta's fabricated data, Regina Smith thereby endorsed and became a party to the academic fraud and scientific misconduct. EPA and UGA continue to defend Brobst's and Gaskin's scandalous scientific misconduct, even refusing to require that they correct the scientific record by submitting an erratum to JEQ. In doing so, EPA and UGA are reaffirming that they are still fully committed to defending the 503 rule by any means necessary, including through fraud and corruption.

Section V. Hidden Studies Question Biosolids Safety

Section Summary

EPA has funded and then covered up a number of important studies, which clearly demonstrate that levels of heavy metals and other pollutants permitted under the current 503 sludge rule can pose a risk to human health and the environment. Lewis and McElmurray located three such studies, which are summarized in Appendices I-III below. The first hidden study was a multi-year, comprehensive study performed by the Oak Ridge National Laboratory to evaluate the effects of biosolids on forest ecosystems.[110] In 2009, Lewis and McElmurray obtained a copy of the final report from the Oak Ridge National Laboratory. Based on field tests in different forests across the U.S., Oak Ridge scientists concluded that there would be long-term adverse impacts from land application of sewage sludges. EPA never released this report for publication, purportedly because of QA/QC problems.

The second hidden study is a 5-year investigation completed by EPA and the University of Florida in 1981, which found that Cd, Cr, Pb, and Ni accumulated in soils. They were all taken up in high concentrations by bermudagrass and other forage plants and reached toxic levels in beef cattle and other farm animals that consumed the forage. Mean Cd, Cr, and Ni concentrations in some of the sewage sludges used in the study were well below 503 limits published in 1993. For obvious reasons, EPA and its

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[108] Deposition transcript of Robert Brobst, Apr. 14, 2009, p. 269.
[109] *R.A. McElmurray III et al. v. United States Department of Agriculture*. U.S. District Court, Southern District of Georgia. Case No. CV105-159. Order issued Feb. 25, 2008, p. 35.
[110] U.S. EPA Office of Inspector General Status Report - Land Application of Biosolids, 2002-S-000004, Mar. 28, 2002. www.epa.gov/oig/reports/2002/BIOSOLIDS_FINAL_REPORT.pdf

collaborators never published these two critically important studies in the scientific literature. Like the research by Lewis and his coworkers at UGA, these studies clearly linked land application of biosolids to public health and environmental problems. They also directly contradicted the Gaskin study, which EPA and UGA published in 2003 to cover up the uptake of harmful levels of heavy metals by plants observed in these studies, and the resulting adverse effects that heavy metals had on animals feeding on the contaminated forage.

EPA did not provide either of these studies to the National Academy of Sciences to consider before it concluded in 2002 that there is no documented evidence that sewage sludge (biosolids) applied under the 503 rule poses a risk to public health or the environment. In fact, the draft version of the Gaskin study,[111] which Robert Bastian provided to the NAS to use a basis for dismissing the McElmurray and Boyce cases, falsely states that no studies like the Gaskin study had ever been conducted.

Finally, former EPA Region IV Biosolids Coordinator Madolyn Dominy disclosed during her deposition in September of 2009 that EPA's Region IV laboratory in Athens, GA, evaluated Augusta's wastewater treatment plant in 1999.[112] EPA initially refused to allow Dominy to be deposed but reversed its position when ordered to do so by Judge Clay Land of the U.S. District Court in Athens, GA. After Dominy disclosed the existence of this report during her deposition, Lewis and McElmurray filed a Freedom of Information Act (FOIA) request and EPA produced a copy of the report on October 28, 2009. The report shows that EPA's regional laboratory in Athens sampled Augusta's biosolids at its Messerly Wastewater Treatment Facility in 1998 and found that they contained very high levels of a wide variety of priority pollutants. [113]

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[111] Metals Assessment for Burke and Richmond County Hay Fields Receiving Biosolids. Julia W. Gaskin, Biological & Agricultural Engineering Dept., Univ. of Georgia; William P. Miller, Crop & Soil Science, Univ. of Georgia; Ernest W. Tollner, Biological & Agricultural Engineering Dept., Univ. of Georgia; Myron Fowler, Burke County Cooperative Extension. [Document is marked "DRAFT;" and Gaskin's and Tollner's names are written such that it appears that they are the sole authors as suggested in the 2002 NAS report.]

[112] Exhibit G to Lewis' Affidavit. USEPA Region 4 Enforcement and Investigations Branch, 980 College Station Road, Athens, GA 30605. Memorandum from Mike Bowden, Air and Water Enforcement Section, to Mike Hom, Clean Water Act Enforcement Section. Subject: Diagnostic Evaluation of Sludge Facilities for Messerly Wastewater Treatment Plant, Augusta, Georgia. July 1, 1999. The existence of this document was first disclosed by Madolyn Dominy in her deposition taken on Sep. 3, 2009 (p. 24).

[113] Currently, EPA Region 4 in Atlanta is studying approximately 5,000 acres of privately owned agricultural fields in Lawrence, Morgan and Limestone Counties near Decatur, AL.[113] The land is contaminated with perfluorinated chemicals (PFCs) from treated sewage sludge (biosolids) applied by the Dry Creek Wastewater Treatment Plant over the past ten years. To conduct the study, EPA collaborated with USDA and organized an in-house research effort called the "Decatur AL Reconnaissance Study." Principal Investigators include scientists at EPA's ORD in Athens, GA (where Lewis worked), Region 4 laboratories in Athens and EPA's Human Exposure and Atmospheric Science Division in Research Triangle Park, NC. EPA is collecting and analyzing biosolids, soil, tissue and milk samples from beef and dairy farms. Drinking water samples are also being collected and analyzed.

EPA's illegal efforts to prevent public access to − or even acknowledge the existence of − the three important studies described above are completely consistent with what can only be described as an ongoing National Biosolids Public *Deception* Campaign. During discovery in the Lewis, McElmurray and Boyce cases, there were indications that EPA and USDA have carried out and then covered up numerous other studies that contradict the body of "science" created under the watchful eyes of their strategically funded gatekeepers. Such an organized effort on the part of the United States Government to secretly and covertly expose the public to hazardous wastes and cover up their effects is hardly even conceivable, and yet the proof is incontrovertible and overwhelming. It is the type of behavior that most Americans associate with fascist and communist governments of the Cold War Era − but *never* our own Government.

In 2001, the Maryland Court of Appeals appropriately likened the lead abatement experiments conducted by Johns Hopkins Kennedy Krieger Institute in inner-city neighborhoods of Baltimore to the infamous Tuskegee study in Alabama and Nazi war crimes. [114] Those experiments, however, were only a precursor to the biosolids lead-abatement study in Baltimore that Rufus Chaney conducted with the Kennedy Krieger Institute in 2005. [115] The disturbing truth is that the U.S. Government's biosolids programs in their entirety − run by a national network of Gatekeepers − undermine the most basic principles of academic freedom and a free society and should not be allowed to exist anywhere in the United States.

APPENDIX I. **1981 University of Florida (UF) Study**

The UF Study was a 5-year, multidisciplinary project concerning the effects of heavy metals and pathogens in land-applied sewage sludge on cattle, swine, and poultry. [116] It was conducted by the University of Florida's Institute of Food and Agricultural Sciences from 1976-80 and funded by the EPA Office of Research & Development's Health Effects Research Laboratory in Cincinnati, OH. [117]

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[114] Erika Crimes v. Kennedy Krieger Institute, Inc., Circuit Court for Baltimore City, Case Nos. 24-C-99-000925, 24-C-95066067/CL193461. Order dated Oct. 11, 2001. http://www.courts.state.md.us/opinions/coa/2001/128a00.pdf

[115] Farfel, M.R., Orlova, A.O., Chaney, R.L., Lees, P.S., Rohde, C., and Ashley, P. 2005. Biosolids compost amendment for reducing soil lead hazards: A pilot study in urban yards. *Science of the Total Environment* **340**:81-95.

[116] Exhibit 259 US EPA Report: EPA-600/S1-81-026, 232 p. (Apr. 1981). "Sewage Sludge – Viral and Pathogenic Agents in Soil-Plant-Animal Systems." G.T. Edds and J.M. Davidson, Institute of Food and Agricultural Systems, University of Florida. Project Summary available online at http://nepis.epa.gov/ by searching 600S181026 or key words in the title of the report.

[117] To counter this study, the U.S. EPA Municipal Environmental Research Laboratory in Cincinnati, OH, issued a contract to the City of Denver to test the effects of Denver's sewage sludge on cattle. The primary author was J.C. Baxter, who worked for the Metropolitan Denver Sewage Disposal District (District No. 1). The City reported to EPA that no adverse effects occurred from feeding cattle forage grown on its sewage sludge. *See*, J.C. Baxter, D. Johnson, W.D. Burge, E. Kienholz and W.N. Cramer. Effects on cattle of exposure to sewage sludge. EPA-600/S2-83-012. Apr., 1983.

UF researchers tested the effects of sewage sludges on soil nutrient compositions and measured their uptake by corn, bahiagrass, sorghum, and bermudagrass grown on sludge-treated fields. They also evaluated beef cattle, swine, and poultry fed sludges and feed grown on fields treated with sewage sludge. They also fed steers recycled manure from cattle exposed to sewage sludge. Biosolids, animal feed, grasses, animal tissues, soil and groundwater samples were tested for bacteria, viruses and protozoa.

The sludges were obtained from waste treatment plants in Pensacola, Florida, the UF in Gainesville, and Chicago, Illinois. Seven of the ten metals that were later regulated under the 503 rule (Cd, Cr, Cu, Pb, Hg, Ni, Zn) were evaluated. Metals concentrations in these sludges are presented in Table 1 and compared with the metals concentrations listed in Table 2 of the Gaskin paper and 503 limits.

Table 1. Comparison of sewage sludge metal concentrations (ppm) in University of Florida Study, Gaskin Study, and 503 Sludge Rule[118]

Metal	Pensacola Mean[a]	UF Mean[a]	Chicago Mean[a]	Augusta Mean/Max.[b]	503 Mean[c]	503 Max.[d]
Cd	12	13	163	88/1200	39	85
Cr	220	218	2888	--	[1200][e]	[3000][e]
Cu	548	517	1365	431/1243	1500	4300
Pb	485	465	774	199/828	300	840
Hg	7.9	82	5	8/38	17	57
Ni	35	32	376	126/657	420	420
Zn	2440	1217	2501	1705/3469	2800	7500

[a]1981 EPA-University of Florida Study, Table 1, p. xi. Mean Concentrations.
[b]2003 Gaskin *et al*., *J. Environ. Qual*., Table 2. 1987-1993 Monthly Mean/Maximum Concentrations. Note: Data were falsified to appear lower.
[c]1993 EPA 40 CFR, Part 503.13, Table 3. Monthly Mean Concentration Limits.
[d]1993 EPA 40 CFR, Part 503.13, Table 1. Maximum (Ceiling) Concentration Limits.
[e] Cr was deregulated in 1994.

G.T. Edds in the University of Florida's College of Veterinary Medicine and Assistant Dean J.M. Davidson prepared the EPA report, which was internally peer-reviewed by EPA's Health Effects Research Laboratory in Cincinnati. Altogether, the UF study had 14 project leaders.

According to UF's final report to EPA, the researchers found:

- *Cadmium levels in forage from soils pretreated with certain sludges resulted in high levels in liver and kidney tissues of cattle consuming such forage… Clinical chemistry tests and pathogenic lesions suggested*

[118] Source: Personal Communication. Lewis Goodroad, Ph.D., August 20, 2009.

cumulative toxic effects including liver damage. [Production measurements, *e.g.*, carcass weights, were unaffected.]

- *The 1979 steer trial, where animals grazed on forage from soils pretreated with Pensacola sludge and spraying of the sludge on growing plants, resulted in presence of Sarcosporidia sp. In the cardiac and skeletal muscles. This may be of public health significance.*

- *Having demonstrated that increased cadmium levels occurred in tissues from cattle and swine consuming feeds from sludge-amended soils, these liver and kidney tissues were dried, ground, and incorporated into mouse diets. The finished diets contained a 15 percent level of protein and five percent levels of kidney and liver tissue. Metals were translocated through the cattle and swine tissues with increased levels of cadmium, nickel, chromium, and lead in liver and kidney tissues of mice. These increases in mice were associated with decreases in number of mice weaned in the treated versus control groups.*

- *Incorporation of dried sewage sludge at ten to 20 percent of swine rations produced depressed weight gains and the 21 day weaning weights were lower in pigs from sows consuming the sludge-containing diets. The kidney cadmium levels of sows receiving the ten and 20 percent sludge levels were increased significantly, i.e., four ppm for controls and 17 and 24 ppm for the sludge rations; both lead and cadmium were increased in the liver and kidneys of weanling pigs. Reproductive performance was more suppressed in the second generation sows than in the first.*

- *Growth trials with Cobb broiler chicks compared the effects of poultry rations with 0, three, and six percent dried Chicago sludge. Increased levels of cadmium in the liver and kidneys occurred in those chicks receiving the increased levels of the sludge.* [Production measurements, *e.g.*, body and egg weights, were unaffected.]

Authors of the UF report concluded that EPA guidelines in effect at the time (40 CFR Part 257) would assure that urban sludges could be used for crop or forestlands. However, they cautioned that sewage sludge may not be safe for certain crops and meat producing animals, and urged that additional studies be undertaken to protect animal and human health:

> *Since certain metals, including cadmium, lead, nickel, and chromium, have been shown to be accumulative in animals consuming forage or grain from sludge-amended soils and therefore have potential hazard to animal health and mankind, it is proposed that further research be done to establish safe guideline levels in feeds intended for meat producing animals.*

The presence of Sarcocystis sp. in muscle from cattle and swine consuming forage and grain fertilized with sewage sludge incorporated into their diets suggest that this potential animal and human health hazard may be associated with consumption of urban sludges. Methods to eliminate this hazard or prevent its infectivity must be established prior to utilization of sludges for crop or animal production.

Sarcocystis (*Sarcosporidia*) was found in cardiac tissue of one of the Boyce cows; and, other intestinal parasites commonly found in sewage sludge were discovered in cattle from both Plaintiffs' dairy farms.

Staphylococcus aureus (1 sample), *Streptococcus pyogenes* (2 samples) and group B *Salmonella enteritides* (2 samples) were isolated in the UF study; but, because of their rare occurrence, the researchers dismissed them as posing a risk from any of the sludges. However, they did not test the sludges for regrowth of these pathogens. For example, a study conducted by Bowling Green State University in 2004 found high concentrations of *S. aureus* in dusts blowing from a land application site at increasing concentrations for approximately two weeks after application of sewage sludge.[119]

The UF researchers also did not investigate whether *S. aureus* infections could be induced by chemicals in sewage sludge that impair the immune system. This phenomenon was addressed in Lewis' research as well as in the expert reports on the McElmurray and Boyce cases and the autopsies that UGA performed on two beef cows that contracted infections in the Gaskin study and exhibited kidney damage from zinc toxicity. UGA's diagnostic laboratory in Tifton and Michigan State University tested several of the Boyce cows and also found toxic levels of zinc, copper and cadmium in kidney and liver samples.

Four of the seven metals later regulated under 503 (Cd, Cr, Pb, and Ni) accumulated in soils, were taken up in high concentrations by bermudagrass and other forage plants, and accumulated to toxic levels in beef cattle and other farm animals that consumed the forage. Mean Cd, Cr, and Ni concentrations in the Florida sludges were well below 503 limits while Ni was below 503 limits in the Chicago sludge as well. Hence, the UF study provides strong evidence that the 503 sludge rule is not protective of public health in the southeastern United States.

Lead concentrations in the Florida sludges were approximately one and one-half times the 503 limits for mean concentrations but well under the maximum (ceiling) concentration. There again, the UF study produced clear evidence that the 503 rule may not be protective of public health. At a minimum, it completely undercuts the fundamental precepts of biosolids science created under the National Biosolids Public Acceptance Campaign that heavy metals in biosolids cannot be taken up in toxic amounts by plants or absorbed at toxic levels when ingested by humans or animals.

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[119] *See*, excerpts from the Bowling Green study Section I C, "The Science of Public Acceptance."

The UF study found that the toxic effects observed in farm animals were not manifested in productivity measurements such as carcass weights. This outcome probably reflected the fact that the five-year study involved multiple experiments in which farm animals ingested metals over short periods lasting for only several months. Nevertheless, beef cattle are often cycled in and out of farms over short periods. Consequently, meat products from animals fed forage crops fertilized with biosolids for several months could contain toxic levels of heavy metals even though the animals appear healthy when processed for public consumption.

The lack of documented cases of sick farm animals, especially in an environment in which such cases are easily ignored or dismissed, does not mean that the 503 rule is protective of public health. Instead, it only means that the 503 standards may be set at levels that usually just hide the problems associated with heavy metals. If true, then only in cases where the 503 standards are grossly exceeded would increases in animal morbidity and mortality rates likely draw attention. Problems would most likely show up on farms with brood or dairy cows, such as the McElmurray and Boyce farms, where cattle are exposed to sewage sludge for many years.[120]

The Acting Director of EPA's Health Effects Research Laboratory, James B. Lucas, commented in the *Foreword* to the UF report:

> *The U.S. Environmental Protection Agency was created because of increasing public and governmental concern about the dangers of pollution to the health and welfare* [of] *the American people…Recycling digested municipal sludges in agricultural systems is an attractive alternative method for their utilization if "safe" management techniques can be devised that do not adversely affect plant productivity or animal and human health.*

Various results of the EPA-sponsored UF study were presented at agricultural research society meetings from 1977-1981 and published in proceedings and in specialty journals, such as the *Animal Science Research Report* and *Crop Science Society of Florida*. Basically, the entire study was buried in the grey literature and obscure journals.

Although the UF study directly related to the Gaskin study, it was not acknowledged by Gaskin and her coauthors in their final report to EPA or the JEQ article. When publishing scientific data, it is considered scientific misconduct whenever authors knowingly fail to acknowledge other data, published or unpublished, that contradict any of their conclusions. At least Robert Brobst, who coauthored the JEQ article, certainly knew about the UF study, which was funded by EPA's Office of Research & Development.

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[120] *See,* Augusta data in Table 1 above, "Comparison of sewage sludge metal concentrations…" Cd, Cr, Pb, and Ni, which accumulated to toxic levels in beef cattle in the UF study, were present at similar or higher levels in sewage sludge spread on the McElmurray and Boyce farms. This comparison is based on data that Brobst provided in the JEQ article, which Plaintiffs' proved were falsified by the City of Augusta to make metals concentrations in Augusta's biosolids appear to be lower than they really were.

The 1981 UF report provided EPA's Office of Water with ample reliable data from EPA's Health Effects Research Laboratory to strengthen the Agency's existing regulations (40 CFR, Part 257[121]) to better protect public health and the environment from pathogens and industrial pollutants, such as cadmium, chromium, and lead, in sewage sludge (biosolids). Instead, EPA raised the cumulative loading limits for cadmium, deregulated chromium, and eliminated the cumulative loading limits for molybdenum.

The UF study also found that corn plants took up heavy metals to potentially toxic levels, and a number of studies had shown that plant uptake is driven by soil pH and cation exchange capacity (CEC). Yet, soil pH and CEC requirements included in 40 CFR Part 257[122] were eliminated when the 503 rule was promulgated in 1993. Molybdenum and cadmium were of particular concern in the McElmurray and Boyce cases, as was soil pH and CEC. EPA's Office of Water eliminated other important safeguards in 40 CFR Part 257, such as soil pH and CEC requirements. Then Bastian, Walker, Cook and others established the National Biosolids Public Acceptance Campaign to publish misleading studies, including even using fabricated data, to support the 503 rule and cover up adverse effects on public health and the environment.

APPENDIX II. **1998 Oak Ridge National Laboratory Study**

The "Oak Ridge Study" was the only major project EPA's Office of Water (OW) ever funded out of the $10 million in research funding promised ORD in 1992 if ORD would approve the proposed 503 sludge rule.[123] In 2002, the EPA Inspector General (IG) issued a report based on EPA's investigations into allegations that Lewis filed with the IG in March of 2001 through the National Whistleblower Center.[124] Specifically, Lewis alleged that OW had reneged on its promises to have ORD assess risks associated with land application of sewage sludge and, instead, had funded the Water Environment Federation to promote biosolids. The IG agreed and concluded that because OW failed to do the research, EPA could not assure the public that land application of biosolids is safe. Page 18 of the IG report states that the Oak Ridge Study was not peer reviewed, exists only in draft form, and is not endorsed by EPA.

R.A. McElmurray and David Lewis obtained a copy of the report from the Oak Ridge National Laboratory for the first time in October of 2009. The report, dated September 30, 1998, shows that the Oak Ridge National Laboratory's Environmental

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[121] A Guide to Regulations and Guidance for the Utilization and Disposal of Municipal Sewage Sludge. EPA 430/9-80-015. Sep. 1980.
[122] *Federal Register*, Vol. 44, No. 170, p. 53452. Thursday, Sep. 13, 1979.
[123] Exhibit D to Lewis' Affidavit. Efroymson, Rebecca A., Bradley E. Sample, Robert J. Luxmoore, M. Lynn Tharp, and Lawrence W. Barnthouse. Final Report: Evaluation of Ecological Risks Associated with Land Application of Municipal Sewage Sludge. Oak Ridge National Laboratory. ORNL/TM-13703. Sep. 30, 1998.
[124] U.S. EPA Office of Inspector General Status Report - Land Application of Biosolids, 2002-S-000004, Mar. 28, 2002.

Sciences Division transmitted it to EPA Assistant Administrator for Water, G. Tracy Mehan, III, Acting EPA Assistant Administrator for Enforcement and Compliance, Sylvia K. Lowrance and Acting ORD Assistant Administrator Henry Longest, II. Thus, EPA's Office of Water received the Oak Ridge report several weeks before Walker and Brobst first contacted Julia Gaskin and discussed their interests in UGA helping EPA with its investigations of the McElmurray and Boyce cases.

According to page ii of the Oak Ridge report, a *Peer Review Team* consisting of 14 national experts[125] reviewed the Study in 1995 and 1997; and, the Oak Ridge National Laboratory submitted its *FINAL REPORT* to EPA in September of 1998.[126] The 2002 IG Report does not reference the source of its information that the Oak Ridge report was never peer-reviewed or finalized.

The Oak Ridge report lists Dr. Rufus Chaney as a member of the Study's peer-review team and a contributor of data. Also, according to the report, Robert Bastian and two other EPA Office of Water employees, Cynthia Nolt and Robert Southworth, participated in workshops that reviewed the Study. In addition to William P. Miller, Wade Nutter at UGA is listed as having contributed to the Oak Ridge Study. And, as it turns out, the Oak Ridge Study included a risk assessment of land application of biosolids in Georgia. The assessment was based on data that the Oak Ridge National Laboratory gathered from land application sites near Augusta; and the authors' findings contradict the Gaskin study. William P. Miller, who coauthored Gaskin's EPA report and journal article, is listed in the Oak Ridge report as a contributor. Miller, however, did not acknowledge the Oak Ridge study in Gaskin's EPA report or journal article.

Based on the Oak Ridge National Laboratory's assessments of four major ecosystems across the United States, authors of the Oak Ridge report (p.197) drew the following conclusions regarding the 503 regulatory limits in place in 1998 when the Gaskin study was done:

> ***Regulatory Levels of Contaminants.*** *There is a substantial uncertainty associated with estimates of the quantity of elements that remain in surface soils after a number of years (or for different periods of time in the*

[125] Oak Ridge Peer Review Team: Mary Benninger-Truax, Hiram College; Anthony Carpi, Cornell University; Rufus Chaney, U.S. Department of Agriculture; David Chrohn, University of California, Riverside; Anne Fairbrother, ecological planning and toxicology; Philip Frequez, Los Alamos National Laboratory; Charles L. Henry, University of Washington; Charles M. Knapp, independent consultant; Sam Loftin, U.S. Forest Service, Albuquerque, NM; John Schmidt, former postdoctoral fellow, USEPA; William Sopper, Pennsylvania State University; Ronald Sosebee, Texas Tech University; Sylvia Talmage, Oak Ridge National Laboratory; and David Wester, Texas Tech University.

[126] The Environmental Sciences Division (ESD) of the Oak Ridge National Laboratory, Oak Ridge, TN, prepared the Oak Ridge Study's Final Report for the U.S. Environmental Protection Agency's Office of Research & Development (ORD) in Cincinnati, OH. The study was sponsored by ORD under Interagency Agreement DW89936514-01-1 (DOE1824-H085-A1) and under Lockheed Martin Energy Research Corp. Contract DE-AC05-96OR22464 with the U.S. Department of Energy.

case of multiple applications)…The bioavailability of elements that were applied in sewage sludge to soils decades ago is not easily estimated. An ecological risk assessment of cumulative loading limits for the application of municipal sewage sludge in forests and rangeland would not be very definitive at this time.

A risk assessor could attempt to estimate protective cumulative loading limits based on multiple lines of evidence (single toxicity, ambient media toxicity, and field surveys), but such estimates would also not be definitive. These lines of evidence come from different ecosystems, soils, sludges, application rates, and organisms, and any estimate of protective loading limits would not be very precise.

After carefully reviewing the Oak Ridge report, Lewis found it to be an exhaustive scientific effort to address risks that biosolids pose to plants, animals, and critical environmental processes at both the individual species and ecosystem level. The science, in Lewis' opinion, is superb. To Lewis' knowledge, no other attempt has ever been made to conduct such a study. The EPA ORD laboratory where Lewis worked in Athens was prepared to do very similar studies; however, managers and scientists at Lewis' laboratory "gracefully bowed out" of this area once they concluded that certain individuals in EPA's Office of Water were disingenuous about letting ORD address important gaps in the science used to support the 503 rule.

The Oak Ridge Study, in Lewis' opinion, would have dealt a devastating blow to Walker's and Bastian's National Biosolids Public Acceptance Campaign; and, in retrospect, it particularly focuses a bright light on the false and misleading data and conclusions of the Gaskin study. It even draws attention to potential problems with zinc, which turned out to be problematic in the Boyce herd and with at least two cows on one of the farms in the Gaskin study, which Gaskin chose not to report.

The Oak Ridge Study is based on a combination of field studies and mathematical modeling to predict the transport, fate, and effects of pollutants in biosolids for decades to centuries. Such an approach is essential to understanding the risks that land application of biosolids pose to public health and the environment. At EPA, predictive mathematical modeling of the transport, fate and effects of pollutants was one of Lewis' main area of expertise.[127]

From 1991-1993, Lewis served on the Editorial Board of the peer-reviewed journal *Environmental Toxicology and Chemistry*, which published papers dealing with predictive mathematical models. The approach, methodology and conclusions in the Oak Ridge Study, according to Lewis, are scientifically sound. As with the University of Florida Study and Lewis' research at UGA, EPA silenced the objectionable science and funded the Gaskin study and similar projects to defend the 503 sludge rule.

[127] Exhibit 126 *Curriculum Vita* for David L. Lewis, Ph.D., Jan. 29, 2009.

Much of the harm associated with applying biosolids to land, according to the Oak Ridge report may not manifest itself for decades or even centuries. By then, it may be too late to prevent most of the damage to public health and the environment and too costly to clean it up. The study suggests that many of the agricultural benefits attributed to organic nutrients in biosolids will dissipate in time as adverse effects begin to manifest themselves in many ways, some expected and some unexpected.

The Oak Ridge Study in Detail

The Oak Ridge National Laboratory stated in its Final Report to EPA dated September of 1998[128] that the purpose of the Oak Ridge Study was to provide a detailed, ecosystem-specific evaluation of the risks that certain pollutants in sewage sludge present to a wide variety of terrestrial ecological receptors. Terrestrial features associated with the following four ecosystems were emphasized:

(1) A northwestern Douglas-fir forest near Eatonville, Washington

(2) A southeastern loblolly pine forest in Athens, Georgia

(3) An eastern deciduous forest (the Hubbard Brook Experimental Forest) in central New Hampshire

(4) Southwestern semiarid rangelands in the Rio Puerco Valley and the Sevilleta National Wildlife Refuge of New Mexico

Pollutants of concern included the 503 metals (As, Cd, Cu, Pb, Hg, Mo, Ni, Se, Zn), chlorinated dioxins, chlorinated dibenzofurans, PCBs and nitrogen. Risks were assessed both qualitatively and quantitatively based on treating field plots with biosolids and using predictive mathematical models to predict the transport, transformation and effects of pollutants in biosolids over decades to centuries.

Inputs to the models included baseline ecosystem data concerning vegetation, wildlife, geography, soils, nutrient cycles, and management practices. Sources of data included, for example, field studies undertaken by the U.S Forest Service Rocky Mountain Forest and Range Experiment Station, the University of Washington, Texas Tech University, Colorado State University and the Savannah River Plant as well as information about sewage sludge gathered from the 1988 National Sewage Sludge Survey (EPA, 1990). Biosolids application rates covered a range that was expected for municipalities and commercial operations.

To ensure that all modeling data met high standards for QA/QC, the authors performed rigorous uncertainty analyses on the various databases and model outputs (Section 2.5). For example, when assessing the effects of biosolids on three kinds of

[128] Exhibit D to Lewis' Affidavit. Efroymson, Rebecca A., *et al*. Final Report: Evaluation of Ecological Risks Associated with Land Application of Municipal Sewage Sludge. Oak Ridge National Laboratory. ORNL/TM-13703. Sep. 30, 1998.

forests in the Northwest and Eastern United States, the authors determined how various nutrient and pollutant levels in biosolids affected their model outputs. They also determined how growth rates responded to variations in biosolids composition, vegetation and soil properties by comparing computer simulations of biosolids applications with control plots.

To determine the range of uncertainty associated with these input variables, the authors used the Latin hypercube sampling method by combining the PRISM code (Gardner *et al*., 1983) with the LINKAGES model employed in their risk analyses. To perform this analysis, they divided input distributions of the variables into 200 equal-probability classes. Then they used PRISM to generate 200 sets of input values by sampling each input distribution without replacement. Finally, the authors executed the LINKAGES model 200 times using the 200 input datasets for each of seven biosolids scenarios with the three forest types.

In their Executive Summary (p. xvi), the authors listed the following specific findings:

- ***Wildlife*** Individual foxes, shrews, American robins and meadow larks and their populations in the four forest ecosystems are not likely to be at risk from a single application of 40 metric tons of biosolids per hectare (Mg/ha). However, white-tailed deer living in the eastern deciduous forest may be at risk from copper and/or zinc in this application.

  In addition to potentially toxic pollutants, biosolids contain nutrients that have been shown to alter plant community composition and structure. These effects can indirectly affect wildlife communities present at sites treated with biosolids.

- ***Plant community*** Although short-term tests show no adverse effects on plant growth from high levels of zinc in biosolids, the Oak Ridge study suggests that, long-term, zinc may present a hazard to plant growth in the three forests studied.

  Zinc, copper, cadmium and nitrogen-catalyzed growth combined with drought were identified as potential biosolids-related hazards to plant growth and survival in the rangeland ecosystem.

  Herbaceous community composition and biomass are likely to change with biosolids application to forests.

- ***Soil invertebrate community*** Because of nutrient impacts, biosolids applications have the potential to alter the soil invertebrate community in all three forest ecosystems.

- ***Microbial processes*** The total biomass of soil microorganisms is likely to increase with biosolids applications. Changes in the balance of processes comprising the nitrogen cycle would be similar in the Douglas-fir and eastern deciduous forests but less certain in the loblolly pine plantation and rangeland.

Specific conclusions contained in the body of the Oak Ridge National Laboratory's Final Report include the following:

- Due to their high nitrogen content, biosolids applications would cause substantial increases in aboveground growth and net primary productivity (photosynthesis) for Douglas-fir forests in the state of Washington. These increases would more than double within 50 years after seven applications of at least 10 Mg/ha. (Tables 2.4, 2.5; 95% confidence intervals, $n = 100$)

- Increased growth rates for Loblolly pines in Athens, GA, however, would be only about half of that predicted for Douglas fir in the Northwest. (Table 2.6; 95% confidence intervals, $n = 100$)

- Eastern deciduous forests would receive even less benefit, exhibiting only a small (14.8%) increase in growth rates after 200 years, which would dissipate by 350 years. (Table 2.8 and associated text; 95% confidence intervals, $n = 500$)

- High rates of biosolids application would cause significant changes in community structure of Eastern deciduous forests by enhancing the growth rates of species that readily respond to increases in available nitrogen, ***e.g.***, yellow birch (*Betula allegheniensis*), compared with sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*) trees, which would remain largely unaffected by the nitrogen increases (p.50). This effect would cause a decline of some tree species, ***e.g.***, red spruce (*Picea rubens*).

- Increases in soil organic matter from biosolids would be temporary. Generally, they would decline during the first two decades, rapidly increase for a time, and then dissipate completely after 400 years. (p. 49)

In a field study in Rio Puerco Valley, NM (Section 2.6.1, p. 52-53), authors of the Oak Ridge Study reported that applications of municipal biosolids from the City of Albuquerque resulted in statistically significant decreases in plant density, species richness and species diversity with increasing rates of application. The number of plant species decreased from 16 to 10 with the 90 Mg/ha treatment and these effects continued through the fourth growing season following biosolids application (Fresquez *et al*. 1990b).

In a similar study of the effects of Albuquerque biosolids at the Sevilleta National Wildlife Refuge, NM (Section 2.6.2, p. 53-54), the authors reported that a single application of 45 Mg/ha caused plant cover to decrease compared with control plots (Loftin and Agulilar, 1994). Plant root growth was much lower on plots treated with biosolids compared with control plots.

Little if any beneficial plant growth occurred at various biosolids application rates in similar studies at Meadow Springs Ranch, Larimer County, CO; Wolcott, CO, and Sierra Blanca Ranch, TX. (p. 54) Growth failure at one application rate (90 Mg/ha) was attributed to biosolids absorbing what little rainfall occurred, preventing plants from taking up the water.

In conclusion, the authors pointed out that nutrients in biosolids applied to semi-arid rangeland have numerous effects, many of which are dependent upon precipitation. Plant density, species diversity, species richness and diversity of soil fungi decreased with biosolids amendments. The colonization of sagebrush roots by mycorrhizae, which the plants need to absorb nutrients, was also adversely impacted by biosolids. "There are indications that plant response depends on seasons of application, number of years of application, growing condition during the year of application, and growing conditions following application."

APPENDIX III. **1999 EPA Region 4-Athens Diagnostic Evaluation**

Former EPA Region 4 Biosolids Coordinator Madolyn Dominy disclosed in her deposition in September of 2009 that EPA's Region 4 laboratory in Athens, GA, evaluated Augusta's wastewater treatment plant in 1999.[129] Many mechanical components of the digesters, however, were non-functional and the final sewage sludge (biosolids) was contaminated with high levels of priority pollutants.

Specifically, the Region 4 report contains the following results concerning organic pollutants in grab samples of the Messerly Plant's final sludge (biosolids) collected on February 23 and 24, 1999:

> *One* [priority pollutant] *purgeable organic compound (toluene) and 32 extractable organic compounds were detected in the final sludge, of which 13 were listed priority pollutants. Toluene was detected at estimated concentrations of 264,151 and 227,698 ug/kg, respectively. The highest priority pollutant extractable organic compound detected was bis (2-ethyhexyl) phthalate at 6,918 and 8,422 ug/kg, respectively.*

[129] Exhibit G to Lewis' Affidavit. USEPA Region 4 Enforcement and Investigations Branch, 980 College Station Road, Athens, GA 30605. Memorandum from Mike Bowden, Air and Water Enforcement Section, to Mike Hom, Clean Water Act Enforcement Section. Subject: Diagnostic Evaluation of Sludge Facilities for Messerly Wastewater Treatment Plant, Augusta, Georgia. July 1, 1999. The existence of this document was first disclosed by Madolyn Dominy in her deposition taken on Sep. 3, 2009 (p. 24). It was produced to Plaintiffs through FOIA on Oct. 28, 2009.

Other priority pollutants found in the final sewage sludge and their concentrations (ug/kg, U = undetected) were: 2,4-dimethylphenol (535; 655), acenaphthene (692; 686), benzo(a)anthracene (440; 343), benzo(b)fluoranthene (409; U), benzo(a)pyrene (377; U), chrysene (472; 374), fluoranthene (818; 624), fluorene (597; 593), naphthalene (2,547; 2,620), phenanthrene (1,226; 1,216), pyrene (786; 686). One priority pollutant pesticide, dieldrin, was also detected (0.3, 0.21 ug/l). Except for molybdenum (15, 14 mg/l), all EPA regulated metals were below 1988 national mean concentrations. Some non-regulated metals were present in high concentrations, including Al, Ba, Cr, and Mn. Rare metals, including Yt and Va, were present in the elevated ppm range.

Whether the levels of non-regulated metals in Augusta's biosolids posed a risk to public health depends primarily on which chemical species were present. For example, high concentrations of Cr [VI] in clay dusts blowing from treated fields in the southeastern U.S. could present a significant risk of lung cancer. Barium sulfate, which is widely used as an x-ray contrast medium, is found in all sewage sludges and is generally non-toxic. Barium chloride, however, which has been used to poison rats and mice, can be quite toxic to humans. Sewage sludge containing high levels of this form of barium, therefore, could pose a risk to public health. But, under the 503 rule, EPA does not require any determinations of which chemical species are present in biosolids.

No reference to the Athens Diagnostic Evaluation appears in any documents produced in discovery or provided under FOIA and Georgia Open Records. We would never have known the report existed had the Court not ordered Madolyn Dominy to be deposed.

EXHIBIT LIST

Lewis, McElmurray & Boyce v. Walker, et al. [130]

1A	05/08/03	Memorandum from David Lewis to Harvey Holm re: adverse health effects from Augusta-sludged hay.
1B	06/26/03	Lee, J., Sewer Sludge Spread on Fields is Fodder for Lawsuits, *New York Times*.
1C	08/21/03	Renner, R., *Staphylococcus* not found in sludge, but controversy continues, *Environmental Science & Technology*
1D	04/14/05	E-mail from Julia Gaskin re: Committee Meeting Minutes for GWPCA Residuals Recycling Committee
2A	10/__/05	Snyder, C., The Dirty Work of Promoting "Recycling" of America's Sewage Sludge, Int. J. Occup. Environ. Health, 2005, 11:415-427
2B	1999-2000	National Biosolids Partnership Annual Report
2C	10/13-17/01	Presentation to WEF Residuals and Biosolids Committee - Overview of WERF and WERF's Research Program in Biosolids and Residuals Management
2D	2001.	New England Biosolids and Residuals Association (NEBRA) website re. mission.. (Currently, "North East Biosolids and Residuals Association")
2E	01/22/01	NEBRA Information Update
2F	04/10-11/00	Proceedings of the Workshop: Biosolids Management in the 21st Century
2G	07/23/01	Affidavit of Robert O'Dette
2H	03/28/02	Letter from Alvin Thomas (Synagro) to Alexandra Dapolito Dunn (AMSA) re: letter to EPA on biosolids issues
2I	04/02/02	Letter from Ken Kirk (AMSA) to Henry Longest (EPA) re: research article on *Staphylococcus aureus* infections among residents reporting chemical irritation with land-applied Class B biosolids
2J	02/13/02	Letter from Albert Gray (WEF) to Christine Todd Whitman (EPA) re: article on Class B biosolids

[130] Deposition exhibits are indicated with boldfaced type.

3A 02/__/04 Gattie, Lewis, A High-Level Disinfection Standard for Land-Applied Sewage Sludges (Biosolids), Environmental Health Perspectives, Vol. 112, num. 2 (Feb. 2004)

3B 10/28/99 Lewis, Garrison, Wommack, Whittemore, Steudler, Melillo, Influence of environmental changes on degradation of chiral pollutants in soils, *Nature*, Vol. 401, p. 898 (1999)

3C 09/__/04 E-mail exchanges between Carolyn Snyder, Rufus Chaney, and David Lewis

4 09/28/01 Letter from Eliot Epstein (Tetra Tech) to David Ozonoff (Boston University) re: Public Health Sludge Conference

5 1992-99 EPA Cooperative Agreement CR-820725-01-01 and renewals

6A 08/02/05 E-mail from Ellen Harrison to Bob O'Dette re: bioaerosols paper

6B [Redacted, Undated] Letter to the Editor Environmental Science & Technology from Paul Chrostowski, Sarah Foster, Robert McClellan, Ian Pepper, Charles Gerba, and Gale Hoffnagle.

6C 09/03/03 McGinley, S., Biosolids Safe for Land Application, UA Researchers Find, Information for News Media from the College of Agriculture and Life Sciences, University of Arizona

6D 12/20/00 Letter from Charles Gerba (University of Arizona) to James Slaughter and Barry Needleman (Beveridge & Diamond) re: microbial pathogens being transmitted by aerosol route from the land application of Class B biosolids

6E 08/23/05 E-mail from Bob O'Dette to Ellen Harrison and H. Shields re: membership list for the National Science Foundation's Water Quality Centers in Arizona

7A 01/15/03 Curriculum Vitae for L. Mark Risse UGA 04067

7B 10/26/98 Curriculum Vitae for Julia Gaskin UGA 00159

7C 04/28/03 Curriculum Vitae for Ernest W. Tollner UGA 04005

7D Curriculum Vitae for William P. Miller

8A 08/07/03 E-mail from Julia Gaskin re: Residuals Recycling Committee for 2003-2004 UGA 03461

8B 01/23/04 E-mail from Julia Gaskin to Bob Bastian re: nonylphenol UGA 03510

8C 11/24/03 E-mail from Julia Gaskin to K Xia, Cling Truman, Jim Ippolito, and Bob Brobst re: NP Grant UGA 04108

8D 02/21/05 E-mail from Julia Gaskin re: voluntary certification for biosolids UGA 03560

8E 12/12/05 E-mail from H. Shields to Carolyn Snyder, Ellen Harrison, and Paul Adams re: Maryland Synagro burning sludge pellets in cement kiln

9A 08/24/99 Letter from Melissa Brock (UGA) to EPA Grants Administration Division re: executed copy of agreement CX 827759-01-0

9B 12/14/98 Memorandum from Julia Gaskin to Bobby Tyson re: Augusta biosolids summary. UGA 00062

9C 05/27/99 Memorandum from Charles Gross to Julia Gaskin re: application for federal assistance - Metals Assessment for Burke and Richmond County Hayfields Receiving Biosolids including grant application kit. UGA 00066, etc.

9D 05/27/99 Memorandum from Charles Gross to Julia Gaskin re: application for federal assistance - Metals Assessment for Burke and Richmond County Hayfields Receiving Biosolids UGA 00066

9E 06/28/99 Preaward Compliance Review Report for all Applicants Requesting Federal Financial Assistance - Metals Assessment for Burke and Richmond County Hay Fields Receiving Biosolids

9F 07/19/99 E-mail from Charles Gross to Julia Gaskin and Bob Brobst re: UGA Grant. UGA 00129

9G 06/16/99 E-mail from Bob Brobst to Julia Gaskin re: EPA Metals Grant. UGA 00135

9H 06/28/99 Application for Federal Assistance - Metals Assessment for Burke and Richmond County Hay Fields Receiving Biosolids. UGA 01146

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