

1 ROCKARD J. DELGADILLO
City Attorney (SBN 125465)
2 CHRISTOPHER M. WESTHOFF
Assistant City Attorney (SBN 63176)
3 KEITH W. PRITSKER
Deputy City Attorney (SBN 87158)
4 CITY OF LOS ANGELES
1800 City Hall, 200 N. Main Street
5 Los Angeles, CA 90012-4110

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CENTRAL DISTRICT OF CALIFORNIA
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6 BINGHAM MCCUTCHEN LLP
JAMES J. DRAGNA (SBN 91492)
7 THOMAS S. HIXSON (SBN 193033)
MARC R. BRUNER (SBN 212344)
8 355 South Grand Avenue, Suite 4400
Los Angeles, CA 90071-3106
9 Telephone: (213) 680-6400
Facsimile: (213) 680-6499
10 Email: jim.dragna@bingham.com
thomas.hixson@bingham.com
11 marc.bruner@bingham.com
Attorneys for Plaintiffs City of Los Angeles,
12 Responsible Biosolids Management, Inc.,
R&G Fanucchi, Inc. and Sierra Transport,
13 Inc.

BEVERIDGE & DIAMOND P.C.
JAMES B. SLAUGHTER
(D.C. Bar No. 417273)
GARY J. SMITH (SBN 141393)
1350 I Street, N.W., Suite 700
Washington, DC 20005-3311
Telephone: (202) 789-6000
Facsimile: (202) 789-6190
Email: jslaughter@bdlaw.com
gsmith@bdlaw.com

14 UNITED STATES DISTRICT COURT
15 CENTRAL DISTRICT OF CALIFORNIA

16 CITY OF LOS ANGELES; ORANGE
COUNTY SANITATION DISTRICT;
17 COUNTY SANITATION DISTRICT NO. 2
OF LOS ANGELES COUNTY;
18 RESPONSIBLE BIOSOLIDS
MANAGEMENT, INC.; R&G FANUCCHI,
19 INC.; SHAEN MAGAN, both individually
and d/b/a HONEY BUCKET FARMS and
20 TULE RANCH/MAGAN FARMS;
WESTERN EXPRESS, INC.; SIERRA
21 TRANSPORT, INC.; CALIFORNIA
ASSOCIATION OF SANITATION
22 AGENCIES,

23 Plaintiffs,

24 v.

25 COUNTY OF KERN; KERN COUNTY
BOARD OF SUPERVISORS,

26 Defendants.

No. CV 06-5094 GAF (VBKx)

**DECLARATION OF
PROFESSOR ALBERT L.
PAGE, PH.D., IN SUPPORT
OF PLAINTIFFS' MOTION
FOR A PRELIMINARY
INJUNCTION**

Date: October 16, 2006
Time: 9:30 a.m.
Place: 255 East Temple St.,
Los Angeles, CA 90012
Room 740
Judge: Hon. Gary A. Feess

1 4. I specialize in soil chemistry and biogeochemistry of trace elements in the soil
2 environment, such as the metals that are regulated under EPA's Part 503 biosolids regulations.
3 Throughout my career I have researched and taught regarding the environmental fate of trace
4 elements when applied to soils in the form of wastes or organic soil amendments such as biosolids.
5 My work has improved the understanding of the chemistry, mobility, and bioavailability of trace
6 elements in soils.
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8 5. I am the lead or co-author of more than 200 publications and editor or co-editor of
9 eight books on trace elements. One of my more recent books that I co-authored is *Assessing*
10 *Bioavailability of Metals in Biosolids-Treated Soils*, published by the Water Environment Research
11 Foundation in 2003. In 2001-02, I co-authored a 94-page monograph for the World Health
12 Organization entitled *Developing Human Health-Related Chemical Guidelines for Reclaimed Water*
13 *and Sewage Sludge*. My first book on biosolids was published in 1974 by EPA, entitled *Fate and*
14 *Effects of Trace Elements in Sewage Sludge When Applied to Agricultural Land*. I have served as
15 associate editor of two journals that have published extensively on land application of biosolids, the
16 *Journal on Environmental Quality* and the *Soil Science Society of America Journal*. Some of my
17 honors and awards include:
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- 19 • Fellow, American Association for the Advancement of Science (1996)
- 20 • Service on four committees of the National Research Council of the National Academy
21 of Sciences
- 22 • Distinguished Service Award, Soil Science Society of America (1998)
- 23 • Distinguished Service Award, United States Department of Agriculture (1991)
- 24 • Fellow, American Society of Agronomists (1976)
- 25 • Fellow, Soil Science Society of America (1976)
- 26 • Distinguished Service Award, University of California Riverside (2001)
- 27
- 28

1 My curriculum vitae is attached as Exhibit 2 for a more complete record of my professional
2 experience.

3 6. Public service devoted to improving the science and practice of the land application
4 of biosolids has always played a prominent role in my career. I participated in the development of
5 modern federal biosolids regulations in the 1980s and 1990s. I co-chaired a major peer review
6 committee that evaluated the EPA Part 503 regulations and hence am well-versed in what these rules
7 require and their scientific basis.

9 7. In the mid-1990s, I led a major review of the safety of land application of biosolids
10 under the auspices of the National Academy of Sciences. I was chair of a Committee of the National
11 Research Council of the National Academy of Sciences Committee that reviewed the science and
12 safety of land application in a 178-page report entitled *Use of Reclaimed Water and Sewage Sludge*
13 *in Food Crop Production* (1996).

15 8. I have visited and am familiar with wastewater treatment plants that generate
16 biosolids, including plants like those of the City of Los Angeles that generate Class A biosolids
17 through thermophilic digestion. I am familiar with pretreatment programs used in American cities,
18 including the City of Los Angeles, to reduce the metals and other contaminants in influents that are
19 treated by the plants. I have visited and studied numerous farms where biosolids are used as soil
20 amendments to aid crop production, improve soil quality and recycle the nutrients in biosolids. I am
21 familiar with the typical land application and farming practices (which are used at Green Acres Farm
22 and described in the documents that I have reviewed), including the spreading and incorporation of
23 biosolids into the soil, calculation of the agronomic rate for determining the amount of biosolids to
24 land apply, flood irrigation using wastewater effluent, and the planting and harvesting of forage
25 crops.
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1 **Evidence Relied On For This Declaration**

2 9. I reviewed and relied upon numerous documents concerning the generation of
3 biosolids by the City of Los Angeles and their recycling at Green Acres Farm, which are listed in
4 Exhibit 1. I also spoke with Steve Stockton, Vice-President of Responsible Biosolids Management,
5 Inc. (RBM), who oversees data monitoring and reporting at Green Acres and participates in the
6 supervision of biosolids operations. Documents and data I reviewed included summary and
7 cumulative reports from the last five years of land application of biosolids at Green Acres, as well as
8 field-by-field reports specifying the quantity of applied biosolids, calculation of agronomic rates, and
9 metals loading data. In addition, I reviewed data on organic and inorganic chemicals, pathogens,
10 and rare elements (California Title 22 compounds and pesticides) monitored for in the Los Angeles
11 biosolids. Green Acres Farm has an unusually robust amount of data concerning its biosolids and
12 operations, which helps support my opinions that the land application operations there are
13 professionally conducted, are in compliance with regulatory requirements, and present negligible
14 risk to public health and the environment.

17 **EPA's Part 503 Regulations**

18 10. Systematic land application of sewage sludge for agricultural purposes has a 150-year
19 history and is practiced worldwide. Use of biosolids as a fertilizer and soil amendment is a modest
20 component of modern agriculture but does benefit many farms. More importantly, land application
21 of biosolids serves a critical role in the infrastructure of wastewater treatment in the United States.
22 Beginning in the late 1980s, EPA began a formal risk assessment of land application and other
23 biosolids management practices and began a rulemaking process to regulate biosolids at the federal
24 level. As part of this risk assessment, EPA reviewed data on the presence in sewage sludge of trace
25 amounts of various constituents and elements and then applied toxicological screening criteria to
26 identify those chemicals that warranted regulation. Certain chemicals were targeted for a formal risk
27 assessment, which examined the quantities of the chemicals in biosolids, their toxicity, routes of
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1 potential exposure to humans and the environment, and many other factors. The risk assessment
2 used conservative assumptions to develop highly protective limits. The risk assessment eventually
3 determined that limits were advisable for eight trace elements (the metals arsenic, cadmium, copper,
4 lead, mercury, nickel, selenium, and zinc), primarily to protect against toxic effects to plants and
5 entry into the food chain. See EPA, *A Guide to the Biosolids Risk Assessments for the Part 503*
6 *Rule* (1995). For pathogens (bacteria and viruses that can cause disease), EPA decided to mandate
7 certain technical controls and management practices at land application sites to greatly reduce or
8 eliminate the amount of pathogens in biosolids and limit human and animal exposure to them. As
9 noted above, I helped lead the formal peer review by non-EPA scientists of the Part 503 Rule that
10 endorsed EPA's process for assessing risks from chemicals and pathogens.
11

12 11. The resulting Part 503 regulations, promulgated in 1993, set baseline management
13 practices and provide specific numerical limits for selected chemical pollutants and indicator
14 organisms for pathogens (biosolids do not necessarily contain pathogens, so controlling for the
15 amount of indicator organisms also controls for pathogens). States like California have built on the
16 Part 503 program to develop further controls, such as California's detailed General Order that
17 requires Regional Water Board approval of land application sites and specifies a minimum depth to
18 groundwater under a site, among many other regulations. To qualify for land application, biosolids
19 must be certified as either Class A (pathogens are reduced to undetectable levels and are safe for any
20 land application) or Class B (pathogens are reduced by over 99% and management controls such as
21 limiting human contact with sites minimizes risks). For the eight metals regulated under Part 503,
22 biosolids that are land applied must not exceed set quantities (set at the parts per million level) and
23 the fields where biosolids are land applied must be monitored to ensure that the cumulative amounts
24 of trace metals from repeated applications remain below levels considered to be safe. Biosolids that
25 have a content of trace metals below a certain threshold qualify as Exceptional Quality ("EQ")
26 biosolids and can be bagged and used by homeowners and others for gardening and landscaping.
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1 Based on the Part 503 risk assessment and many studies done subsequent to then, Class A EQ
2 biosolids are considered a safe organic material.

3 12. My review of the data and reports provided me confirms that the City of Los Angeles
4 generates and land applies at Green Acres Farm biosolids that qualify as Class A, EQ biosolids. In
5 Los Angeles, like many other cities, the amount of trace metals in biosolids has declined markedly
6 since the 1980s because of the success of municipal pretreatment programs in reducing the
7 contributions to sewers of metals and other contaminants from industrial dischargers.

9 **Scientific Work on Biosolids Subsequent to Part 503**

10 13. The Part 503 Rule provided a strong scientific and regulatory foundation for land
11 application of biosolids and the practice expanded in the early and mid-1990s. Many communities
12 adopted land application as an alternative to land filling sewage sludge and other practices that do
13 not recycle the nutrients in biosolids. The growth of recycling sewage sludge as a fertilizer and soil
14 amendment raised the visibility of the practice with the public, and EPA asked the National
15 Academy of Sciences to conduct an independent study of the safety and practicality of biosolids use
16 for human food crop production. I was selected to help lead this effort, as Chairman of the
17 Committee on the Use of Treated Municipal Wastewater Effluents and Sludge in the Production of
18 Crops for Human Consumption, which produced the report *Use of Reclaimed Water and Sludge in*
19 *Food Crop Production* (1996).

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22 14. Our Committee reviewed the scientific literature and federal and state regulations on
23 beneficial reuse of both wastewater effluent and biosolids for agricultural purposes, and prepared
24 analyses and recommendations regarding land application. The Committee, including myself,
25 conducted on-site field visits and conducted interviews with researchers, citizens, farmers, city and
26 state planners, and others over a 17-month period, and solicited wide input into meetings during the
27 development of the report. We concluded that land application of biosolids and use of reclaimed
28 water (sewage treatment plant effluent), when done pursuant to Part 503 requirements, presented a

1 negligible risk to humans and the environment while providing many benefits. We also noted that
2 “there have been no reported outbreaks of infectious disease associated with a population's
3 exposure—either directly or through food consumption pathways—to adequately treated and
4 properly distributed reclaimed water or sludge applied to agricultural land.” This observation
5 remains accurate. In the case of Green Acres Farm, the crops grown there -- corn silage, alfalfa,
6 milo, Sudan grass, and wheat -- are grown solely for feed use, primarily the cows in the many dairy
7 farms in the lower San Joaquin Valley. This removes humans from direct contact with any potential
8 contaminants that may be in the crops grown on biosolids amended fields and increases the margin
9 of safety.
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11 15. Since we published our report in 1996, significant work has occurred that has
12 strengthened the foundation for land application of biosolids and our understanding of the issues. In
13 2002, another committee of the National Research Council of the National Academy of Sciences
14 reviewed the scientific methodology supporting Part 503 and other issues regarding land application.
15 Its report, *Biosolids Applied to Land: Advancing Standards and Practices*, identified a number of
16 areas where the science of risk assessment had advanced since the late 1980s when the bulk of the
17 work on Part 503 was conducted. *Biosolids Applied to Land* recommended additional research to
18 strengthen the basis for Part 503's conclusions regarding the safety of land application. It did not
19 identify any problems with or recommend changes in current land application regulations and
20 practices.
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23 16. In 2004, the State of California finalized a comprehensive Environmental Impact
24 Review (EIR) of biosolids land application practices. California State Water Resources Control
25 Board, *2004 Final Statewide Environmental Impact Report for Biosolids Land Application*. This
26 EIR thoroughly examined concerns regarding land application, including trace metals, pathogens,
27 and potential impacts to groundwater from biosolids. It concluded that the protections of Part 503,
28 coupled with the state-specific controls under California's General Order, provided a sufficient

1 margin of safety for both Class A and Class B biosolids. I am unaware of any published literature or
2 data that call into question this conclusion.

3 17. My review of the specific data regarding the biosolids generated by the City of Los
4 Angeles and land applied at Green Acres Farm indicates that the operations are in compliance with
5 regulatory requirements. In particular, the trace metals in the EQ biosolids are well below Part 503
6 limits, and the soils at Green Acres Farm are many years away from approaching the cumulative
7 limits on metal loading. The principles underpinning the safety of these limits -- trace metals will
8 bind to soil particles and become relatively immobile, not endangering plants or groundwater -- hold
9 true for Green Acres Farm. In regard to other chemicals and elements not regulated by Part 503, the
10 monitoring the City of Los Angeles does for numerous other trace contaminants under California's
11 Title 22 provisions and Kern County requirements is instructive. As with the regulated metals, these
12 contaminants are either undetected in the biosolids or appear in low numbers consistent with a
13 successful pretreatment program. The fact that certain potentially toxic chemicals are not required to
14 be monitored for under Part 503 or other regulations does not provide a basis for challenging the
15 safety of a land application operation. Numerous processes in wastewater treatment and in the soil
16 environment would act to eliminate or mitigate the potential harms of other chemicals that may exist
17 in minute quantities in biosolids. I am unaware of any data or literature that has indicated that other
18 chemicals are present in biosolids in sufficient quantities that would call into question the
19 protectiveness of Part 503 for public health and the environment.
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23 18. In summary, the conclusion that my Committee reached nearly ten years ago for the
24 National Academy of Sciences remains just as true today: application of biosolids to farmland,
25 "when practiced in accordance with existing federal guidelines and regulations, presents negligible
26 risk to the consumer, to crop production, and to the environment. Current technology to remove
27 pollutants from wastewater, coupled with existing regulations and guidelines governing the use of
28 reclaimed wastewater and sludge in crop production, are adequate to protect human health and the

1 environment.” The data and reports I have reviewed for Green Acres Farm demonstrate a history of
2 safe and successful land application of biosolids. If the Court issues a preliminary injunction, the
3 continued application at the Farm of Class A EQ biosolids from the City of Los Angeles presents no
4 discernable threat from metals loading, organic or inorganic chemicals.

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6 I declare under penalty of perjury that the foregoing facts are true and correct and if called upon
7 to do so, I could and would competently testify thereto.

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9 Executed on September 8, 2006, in Riverside, California.

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14 ALBERT L. PAGE, Ph.D.
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