

ILLINOIS POLLUTION CONTROL BOARD
June 17, 1998

IN THE MATTER OF:)
)
AMENDMENTS TO REQUIREMENTS FOR)
LANDSCAPE WASTE COMPOST) R97-29
FACILITIES, 35 ILL. ADM. CODE) (Rulemaking - Land)
830.203(c), 831.107, AND 831.109(b)(3))

Proposed Rule. First Notice.

OPINION AND ORDER OF THE BOARD (by K. M. Hennessey):

In this proceeding, two citizens, Dr. Renuka Desai and Susan Garrett (proponents), ask the Board to require that composting areas at certain landscape waste compost facilities be located at least 1/2 mile from the property line of a hospital, school, athletic field, or public park. Proponents also ask the Board to require existing composting areas located within that setback distance to relocate. Proponents state that the amendments are necessary because these composting areas release spores that present risks to human health, particularly spores of the fungus *Aspergillus fumigatus* (*A. fumigatus*).

Today the Board adopts for first notice a modified version of proponents' proposal. The Board acknowledges that responsible composting is environmentally beneficial and the record indicates that composting has not been shown to increase risks to the general public. Furthermore, the fungus *A. fumigatus* is ubiquitous, and at approximately 500 feet from composting areas, the concentration of *A. fumigatus* spores generally is not higher than its background concentration. However, as a precaution, and consistent with the recommendations of public health experts, this first notice order would extend the 1/8 mile setback from residences that currently applies to composting areas to health care facilities, pre-school and child care facilities, and primary and secondary school facilities. The modified proposal would apply only to composting areas developed or expanded after January 1, 1999. The Board also proposes corresponding changes to requirements for permit applications.

This opinion is organized as follows: first, the Board discusses the current composting setback requirements and proponents' proposal; second, the Board sets forth a summary of its major conclusions in this rulemaking; third, the Board summarizes the rulemaking proceedings to date and addresses several procedural matters; fourth, the Board discusses the evidence in this record on the sources and effects of *A. fumigatus*, followed by the Board's related findings; fifth, the Board discusses the evidence on the need for additional setbacks, followed by the Board's related findings; and lastly, the Board sets forth its conclusions. The opinion is followed by the Board's order, which sets forth the amendments proposed for first notice.

BACKGROUND AND PROPOSAL

Proponents propose that the Board amend the location standards for compost facilities that the Board adopted in 1994,¹ specifically 35 Ill. Adm. Code 830.203(c). Section 830.203(c) implements Section 39(m) of the Illinois Environmental Protection Act (Act), 415 ILCS 5/39(m) (1996), and currently provides as follows:

With the exception of on-farm landscape waste operations, all landscape waste compost facilities subject to this Part shall comply with the following:

* * *

(c) The composting area of the facility must be *located so as to minimize incompatibility with the character of the surrounding area, including at least a 200 foot setback from any residence, and in the case of a facility that is developed or the permitted composting area of which is expanded after November 17, 1991, the composting area shall be located at least 1/8 mile from the nearest residence (other than a residence located on the same property as the facility).* (Note: italicized language is from Section 39(m).)

The legislature defined “landscape waste,” “compost,” and “composting” in the Act, and the Board incorporated the same definitions into its rules. “Landscape waste” means:

all accumulations of grass or shrubbery cuttings, leaves, tree limbs and other materials accumulated as the result of the care of lawns, shrubbery, vines and trees. 415 ILCS 5/3.20 (1996).

“Compost” means:

the humus-like product of the process of composting waste, which may be used as a soil conditioner. 415 ILCS 5/3.69 (1996).

“Composting” means:

the biological treatment process by which microorganisms decompose the organic fraction of the waste, producing compost. 415 ILCS 5/3.70 (1996).

The location standards that the Board adopted in 1994 apply to the “composting areas” of “on-site facilities,” “on-site commercial facilities,” and permitted “landscape

¹ See Regulation of Landscape Waste Compost Facilities 35 Ill. Adm. Code 830-832 (November 3, 1994), R93-29.

waste compost facilities.” They do not apply to “garden compost operations”² or “on-farm landscape waste compost facilities.” See 35 Ill. Adm. Code 830.102 (definitions), 830.104(a) (exemption for garden compost operations), and 830.201 (scope and applicability of Part 830).

Proponents propose that the Board amend the location standards of 35 Ill. Adm. Code 830.203(c) by adding the language underlined below:

With the exception of on-farm landscape waste operations, all landscape waste compost facilities subject to this Part shall comply with the following:

* * *

- (c) The composting area of the facility must be *located so as to minimize incompatibility with the character of the surrounding area, including at least a 200 foot setback from any residence, and in the case of a facility that is developed or the permitted composting area of which is expanded after November 17, 1991, the composting area shall be located at least 1/8 mile from the nearest residence (other than a residence located on the same property as the facility), and a minimum of 1/2 mile from the property line of a hospital, school, an athletic field and a public park. Existing composting operations that are located within 1/2 mile of the above-mentioned facilities shall be relocated to more than 1/2 mile within six months of the effective date of this regulation.*

Proponents maintain that these amendments are necessary because landscape waste compost facilities release spores into the air that present risks to human health. The spores that cause proponents greatest concern are spores of the fungus *A. fumigatus*.

The task of deciding whether to adopt these amendments is the Board’s responsibility under Section 5 of the Act, which provides that the Board “shall determine, define and implement the environmental control standards applicable in the State of Illinois and may adopt rules and regulations in accordance with Title VII of the Act.” 415 ILCS 5/5(b) (1996). Sections 8 and 10 of the Act also authorize the Board to adopt rules regarding air pollution. Section 10 provides:

The Board . . . may adopt regulations to promote the purposes of this Title.
415 ILCS 5/10(a) (1996).

² “Garden compost operation” means “an operation which (1) has no more than 25 cubic yards of landscape waste, composting material or end-product compost on-site at any one time and (2) is not engaging in commercial activity.” 35 Ill. Adm. Code 830.102.

The “Title” to which Section 10 refers is Title II: Air Pollution. Section 8 sets forth the purposes of Title II as follows:

It is the purpose of this Title to restore, maintain, and enhance the purity of the air of this State in order to protect health, welfare, property, and the quality of life and to assure that no air contaminants are discharged into the atmosphere without being given the degree of treatment or control necessary to prevent pollution. 415 ILCS 5/8 (1996).

In adopting or amending regulations, the Board must follow the procedures set forth in Title VII of the Act, including Section 27(a) of the Act, which provides in part:

The Board may adopt substantive regulations as described in this Act. Any such regulations may make different provisions as required by circumstances for different contaminant sources and for different geographical areas . . . may make special provision for alert and abatement standards and procedures respecting occurrences or emergencies of pollution or on other short-term conditions constituting an acute danger to health or to the environment; and may include regulations specific to individual persons or sites. In promulgating regulations under this Act, the Board shall take into account the existing physical conditions, the character of the area involved, including the character of surrounding land uses, zoning classifications, the nature of the existing air quality, or receiving body of water, as the case may be, and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution. 415 ILCS 5/27(a) (1996).

When the Board adopts regulations, it is acting in its quasi-legislative capacity. Granite City Division of National Steel Company v. PCB, 155 Ill. 2d 149, 180, 613 N.E.2d 719, 733 (1993). When acting in that capacity, the Board “has no burden to support its conclusions with a given quantum of evidence.” Granite City, 155 Ill. 2d at 180, 613 N.E.2d at 733. However, before the Board adopts or amends a regulation, Section 27(b) requires the Board to determine whether the new or amended regulation “has any adverse economic impact on the people of the State of Illinois.” 415 ILCS 5/27(b) (1996).

SUMMARY OF CONCLUSIONS

The Board reaches the following major conclusions in this first notice opinion and order. A more complete discussion of each of these issues is included in the Discussion section beginning at page 7.

1. The fungus *A. fumigatus* is ubiquitous. While responsible composting is environmentally beneficial, composting generates elevated levels of *A. fumigatus*. Airborne *A. fumigatus* spores from compost facilities may occur at levels above background in nearby, downwind off-site areas.

2. *A. fumigatus* spores pose little, if any, health threat to healthy individuals in the general public. However, they do pose a potential health threat to persons with asthma, cystic fibrosis, immunocompromised or immunosuppressed conditions, or bioaerosol allergies. Very young children are also potentially at greater risk because their immune systems are immature. No relationship between exposure to certain levels of *A. fumigatus* spores and adverse health effects (*i.e.*, a “dose-response relationship”) has been demonstrated.
3. While operating standards can minimize the off-site distribution of *A. fumigatus* spores, it appears that even good management practices at compost facilities do not necessarily prevent downwind *A. fumigatus* spore concentrations from being above background levels in nearby off-site areas.
4. As a precaution, and consistent with the recommendations of public health experts, compost facilities sited in the future should be set back from the following facilities: (a) health care facilities; (b) primary and secondary schools and their associated recreational areas; and (c) pre-school and child care facilities and their associated recreational areas.
5. Generally, the concentration of *A. fumigatus* spores falls to background within approximately 500 feet of a composting area. The current 1/8 mile (660 feet) setback applied for residences will be extended to these other facilities. The Board also proposes corresponding changes to requirements for permit applications.
6. Since the additional setback requirements would be imposed as a matter of prudence in the face of a potential health threat, and in light of the potential economic costs of relocating or closing existing compost facilities, the Board proposes applying the new setback requirements prospectively. As proposed in this first notice order, the new setbacks will apply only to a composting area developed or expanded after January 1, 1999.

PROCEDURAL MATTERS

Proponents filed their proposal with the Board on May 6, 1997. On June 19, 1997, the Board accepted this proposal for hearing. The Board held two public hearings in this matter: the first, in Chicago, on September 8, 1997; and the second, in Springfield, on October 7, 1997.³ A number of witnesses testified at each hearing. At the first hearing, the following witnesses testified: Susan Garrett, a resident of the City of Lake Forest and one of the proponents; Steven Handler, a resident of the City of Lake Forest; Gloria Loukas, a resident of the City of Lake Forest; Dr. Renuka Desai, a resident of the City of Lake Forest and one of the proponents; Jack Darin of the Sierra Club; William

³ The transcript of the September 8, 1997, hearing is cited as “Tr.1 at _;” the transcript of the October 7, 1997, hearing is cited as “Tr.2 at _.”

Holleman of the Illinois Citizen Action Public Education Committee; Earl Johnson of the Illinois Citizen Action Public Education Committee; Cheryl Doros, a resident of the City of Lake Forest; Peter Mueller, a resident of the City of Lake Forest; Edward Grskovich, a resident of the City of Lake Forest; Jacob Dumelle of the American Lung Association of Metropolitan Chicago; Mary Matthews, a resident of the City of Lake Forest; Scott Garrett, a resident of the City of Lake Forest; Joyce Munie of the Illinois Environmental Protection Agency; Elizabeth Harvey on behalf of Land and Lakes Company; Thomas Naatz, Director of Parks, Forestry, and Public Works for the City of Lake Forest; and Charles Pick of Organics Management Company.

At the second hearing, the following witnesses testified: Dr. Karen Strauss, on behalf of the City of Lake Forest; Dr. Shirley Baer, Joyce Munie, and Edwin Bakowski of the Illinois Environmental Protection Agency; Clyde Wakefield, Director of Public Works and Engineering for the City of Crystal Lake; Dr. Paul Walker of Illinois State University; and Andrew Quigley of the Solid Waste Agency of Lake County.

On December 10, 1997, the hearing officer set a public comment deadline of January 23, 1998. On January 26, 1998, the Illinois Environmental Protection Agency (Agency) filed a motion for leave to file instant its public comment, along with its public comment. No one opposed the motion. The Board grants the motion.

Complete lists of exhibits entered into the record, and public comments filed with the Board, are attached to this opinion and order as Attachment 1 and Attachment 2, respectively.

In adopting the rules that the Board proposes for first notice, the Board considered all matters of record, including the proposal presented by proponents, testimony, exhibits, and public comments. The Board's proposed rules will be published in the *Illinois Register*, upon which a public comment period of at least 45 days will begin.

The Board also notes that the caption of this opinion and order has been changed to reflect the Board's proposed amendments to permit application requirements for site location maps (35 Ill. Adm. Code 831.107) and other information (35 Ill. Adm. Code 831.109(b)(3)). All future filings in this rulemaking must set forth this amended caption.

ADDITIONAL PROCEEDINGS

The Board directs the hearing officer to schedule an additional hearing in this matter. The primary purpose of the hearing is to receive testimony on the first notice version of the proposed rules.⁴

⁴ Another purpose of the hearing is to receive testimony on the decision of the Department of Commerce and Community Affairs, under Public Act 90-489, effective

The Board would like to receive testimony from all interested persons on the following issues: (1) the technical feasibility and economic reasonableness of the proposed rules in this first notice order; (2) if the setbacks proposed in this first notice order were applied to existing compost facilities, should they apply immediately or after some period of time expires; (3) if the setbacks proposed in this first notice order were applied to existing compost facilities, would that render the regulation an invalid retroactive regulation; (4) if the setbacks proposed in this first notice order were applied to existing compost facilities, how many existing compost facilities would have to close or relocate; and (5) of those facilities identified in item (4), how long would it take to amortize the respective investments in those facilities. The Board will receive testimony on other issues if relevant and not repetitive. The Board also welcomes public comments.

DISCUSSION

The Board will first discuss the evidence in the record on the sources and effects of *A. fumigatus*, followed by the Board's related findings. Then the Board will discuss the evidence on the need for additional setbacks, followed by the Board's related findings.

Sources and Effects of *A. Fumigatus*

Sources of *A. Fumigatus*

Participants in this rulemaking generally agreed that composting facilities are associated with higher levels of the fungus *A. fumigatus*. Dr. Elliot Epstein⁵ stated in public comment that the predominant public and worker health concern with composting facilities is the potential impact of bioaerosols:

Bioaerosols are organisms or biological agents that can be dispersed into the air and affect human health. The principal bioaerosols in yard waste composting operations are fungal spores since fungi are present in soils, grass, leaves, and woody material. Although there are numerous fungi and other organisms which are normally found in soils and organic materials, the most common bioaerosols of concern in composting operations from a public health point of view is the fungus *Aspergillus fumigatus* PC 14 at 2.

Composting generates heat through microbial activity, and unlike many other organisms, *A. fumigatus* can "survive the high temperatures generated during composting." PC 14 at 4; Exh. 34, Att. 2 at 4. *A. fumigatus* is "an integral and

January 1, 1998, to not perform an economic impact study on proponents' proposed rules.

⁵ Dr. Epstein is the president of E&A Environmental Consultants, Inc. and an Adjunct Professor of Public Health at the Boston University School of Public Health's School of Medicine. PC 14 at 2, Att. (*curriculum vitae*).

unavoidable part of composting” Exh. 34, Att. 2 at 4; see also Exh. 36, Att. 4 at 11 (“One should recognize that composting facilities do represent sites where there is a massive culturing of *Aspergillus fumigatus* organisms in relatively small areas compared to most ‘natural’ or background circumstances.”).

Furthermore, *A. fumigatus* spores generated at composting facilities may become airborne.⁶ Dr. Epstein explained that “[s]creening, mixing, and other activities in which material is moved or agitated allow the spores to become airborne.” PC 14 at 4; see also Exh. 34, Att. 2 at 5 (“turning and mixing the compost is ideal for getting the spores airborne”). These airborne spores may travel downwind of the facilities. The Haines report⁷ states:

AF⁸ spores from compost will be in the air currents downwind from composting facilities. How much and how far depends on the volume of compost, its age, temperature, and moisture, the method and frequency of mixing, the obstacles the wind meets, the speed and direction of the wind, and possibly factors we haven’t thought of yet. There is a point at which the level of AF spores from a compost source reaches a level indistinguishable from the natural level for the region. Exh. 34, Att. 2 at 5.

Supporters and opponents of proponents’ proposal also agreed that while compost facilities are associated with elevated levels of *A. fumigatus*, the fungus can be found in many places. Dr. Karen Strauss,⁹ testifying on behalf of the City of Lake Forest, explained that *A. fumigatus* participates in natural decay processes and is ubiquitous. She noted that most urban and suburban residential exposures result from common sources, for example:

digging in one’s yard, earth moving or activities that disturb the soil, construction dust, lawn mowing, particularly with a mulching lawn mower, gardening and landscaping, raking leaves, household plants, walking through an arboretum or along a nature trail, animal feces, bird nests, household pets, contaminated air conditioners or ventilation systems, household dust, bathroom mold, basements or crawl spaces, particularly those with dirt floors, gas stoves, and heating systems Tr.2 at 14; Exh. 34 at 4-5; see also PC 26 at 11, n.18; Exh. 34, Att. 2 at 5; Tr.2 at 259.

Effects of *A. Fumigatus* on Human Health

⁶ “Spores” are “one of the stages of the fungus’ life cycle” and are the form of the fungus “responsible for dispersal in the ambient environment.” Exh. 36, Att. 4 at 4.

⁷ Haines, Aspergillus in compost: Straw man or fatal flaw?, BioCycle (Apr. 1995).

⁸ *A. fumigatus* is also referred to as “AF.”

⁹ See Exh. 35 (*curriculum vitae* of Dr. Strauss).

Diseases. Both supporters and opponents of proponents' proposal also agree that *A. fumigatus* is an organism that can invade and infect humans, or a "pathogen." It is considered a secondary or opportunistic pathogen. As Dr. Epstein explained:

Unlike primary pathogens (bacteria, viruses, or parasites) which can invade and infect healthy persons, *A. fumigatus* generally only invades and infects highly debilitated or immuno-suppressed individuals. PC 14 at 3; see also Exh. 34, Att. 2 at 6-7, Att. 4 at 104-106; Exh. 36, Att. 4 at 6-8.

The diseases that *A. fumigatus* causes are referred to generally as "aspergillosis." Exh. 34, Att. 2 at 6-7; see also Exh. 36, Att. 4 at 6-8; PC 26, Supp. (Maritato report (see footnote 14) at 42). The Ault and Schott report¹⁰ describes the different types of aspergillosis. Initially, it notes that approximately 3 to 5% of the U.S. population suffers from extrinsic (allergic) asthma and that approximately 20% of the U.S. population is genetically predisposed to react to allergens in the environment:

In the first type of aspergillosis illness [extrinsic (allergic) asthma], people with this predisposition may develop this form of asthma upon becoming sensitized to *Aspergillus*¹¹ species. Asthmatics may find their asthmatic condition aggravated upon exposure to *A. fumigatus*. Exh. 36, Att. 4 at 8; see also Exh. 34, Att. 2 at 6.

The second type of aspergillosis, allergic bronchopulmonary aspergillosis, is a condition in which:

Aspergillus spores germinate and the resultant . . . growth can potentially block the bronchi There is no invasion of tissue. However, the patient may suffer lung fibrosis and may, over time, become more susceptible to other lung diseases. Exh. 36, Att. 4 at 8; see also Exh. 34, Att. 2 at 7.

The link between allergic bronchopulmonary aspergillosis and asthma has been documented since 1952. The link is so well established that allergic bronchopulmonary

¹⁰ Ault and Schott, Aspergillus, Aspergillosis, and Composting Operations in California, Local Enforcement Agency Advisory (Dec. 16, 1993). The California Integrated Waste Management Board published this report to provide information on *A. fumigatus* and to address the potential health effects of *A. fumigatus* from compost facilities. The report is based upon a review of scientific information available in the literature. Exh. 36, Att. 4.

¹¹ *Aspergillus* is one of the largest genera of molds. *A. fumigatus* is one of many species of *Aspergillus*. Exh. 34, Att. 2 at 4. *A. fumigatus* is "the *Aspergillus* species most pathogenic to humans" Exh. 36, Att. 4 at 6. Participants in this rulemaking occasionally use the more general term "*Aspergillus*." As expressed throughout the record of this rulemaking, however, the primary bioaerosol of concern with compost facilities is the *Aspergillus* species known as "*A. fumigatus*."

aspergillosis is considered a complication of bronchial asthma. Tr.2 at 23-24; Exh. 34 at 11.

The third type of aspergillosis, extrinsic allergic alveolitis (hypersensitivity pneumonitis) “is often associated with repeated exposure to an identified—often occupational—source of high levels of antigen.” Exh. 36, Att. 4 at 8; see also Exh. 34, Att. 2 at 6-7 (This disease is “characterized by coughing, difficulty in breathing, and sometimes a fever about six hours after exposure. . . . This condition is more serious than extrinsic asthma, but not life threatening.”). Lastly, invasive aspergillosis “is seen in people whose normal immune systems are compromised In [invasive aspergillosis], there is an actual invasion of lung tissue or skin, and often dissemination by means of blood to other parts of the body. The prognosis for [invasive aspergillosis] is grave.” Exh. 36, Att. 4 at 8; see also Exh. 34, Att. 2 at 7.

Population at Risk. Dr. Strauss acknowledged that it is widely recognized that there are particularly susceptible individuals “who may be at greater risk for developing health complications from exposure to bioaerosols.” Tr.2 at 22-23; see also Tr.2 at 37 (Dr. Strauss read the following from the Millner report (see footnote 12): “There are subpopulations within the general population and work force that may be at increased risk from exposure to composting bioaerosols.”).

Dr. Strauss quoted the Millner report’s¹² description of the class of susceptible individuals:

Of particular concern, immunocompromised and/or immunosuppressed individuals (*e.g.*, chemotherapy recipients, organ transplant recipients, AIDS patients, individuals with congenital defects, and children with cystic fibrosis who may be at increased risk of infection) may have greater susceptibility to colonization and infection by *A. fumigatus*. Atopic/asthmatic individuals may be at increased risk for developing allergic reactions to various components of composting bioaerosols. A variety of common components of aerosols (*e.g.*, pollen, fungal spores, household dust) are associated with allergic reactions or can induce asthmatic reactions. Exh. 34 at 10; see also Tr.2 at 48-50, 89, 91-92 (related testimony of Dr. Strauss).

¹² Millner, *et al.*, Bioaerosols Associated With Composting Facilities, Compost Science and Utilization (1994). This report is a result of a workshop convened by the United States Environmental Protection Agency, the United States Department of Agriculture, and the National Institute of Occupational Safety and Health with the assistance of the Composting Council to address the issue of whether bioaerosols associated with composting operations endanger public health and the environment. The primary goal of the collaborative workshop was to evaluate the results from the few available quantitative studies to address the issue of what levels of bioaerosols are safe and what levels of protection are adequate for occupational and public health. Exh. 36, Att. 7.

Dr. Renuka Desai, one of the proponents and a resident of Lake Forest, testified that there is adequate evidence of a potential health risk for individuals who have allergies or asthma, or who are immunocompromised. Tr.1 at 46-47. She also testified that children are especially at risk from bioaerosols because children's immune systems are not mature. Tr.1 at 180; see also Exh. 20 at 1 (Dr. Rita Messing, Environmental Toxicologist for the Minnesota Department of Health stated that "the very young are also at risk since their immune systems are immature."). Jacob Dumelle, Chairman of the Environmental Health Committee, American Lung Association of Metropolitan Chicago, testified that "mold spores, irritant gases, and odors generated by large compost piles may pose a serious health risk for children, hospital patients, and other sensitive individuals." Tr.1 at 102.

Dose-Response Relationship. Both supporters and opponents of proponents' proposal also agree that no relationship between exposure to certain levels of *A. fumigatus* spores and adverse health effects (*i.e.*, a "dose-response relationship") has been demonstrated. PC 14 at 3; see also Exh. 34, Att. 2 at 6-7, Att. 4 at 104-106; Exh. 36, Att. 4 at 6-8, Att. 7 at 10 (the Millner report states that, at present, neither minimum threshold levels nor dose-response data are available for *A. fumigatus* and other biological constituents in compost feed stock that stimulate inflammatory, allergic, asthmatic, or infectious processes in humans). Dr. Desai also acknowledged that levels of exposure to *A. fumigatus* spores that would be considered significant have not been defined. Tr.1 at 142. The Illinois Department of Public Health acknowledged that there is no dose-response relationship, as did Dr. Strauss and Dr. Paul Walker.¹³ Exh. 21-A at 1; Tr.2 at 63-64, 250.

The Haines report similarly states that "we don't know how much AF is 'too much.' We can measure the spores in air, but, except for very high or very low figures, we don't know whether it is dangerous or safe. . . . [W]e don't have a scale that tells safe from dangerous levels." Exh. 34, Att. 2 at 6, 8. The Maritato report¹⁴ states:

The precise does(s) of *A. fumigatus* required to elicit adverse health effects in either healthy or sensitive individuals has not been determined. [] As described by EPA, "Humans vary in their susceptibility to pathogens, depending on route of exposure, age of exposed individuals, quality of normal bodily defense systems, existing microbial populations in the host, and other poorly defined properties." PC 26, Supp. (Maritato report at 43).

¹³ Dr. Walker is a Professor of Animal Science at Illinois State University. Tr.1 at 240.

¹⁴ Maritato, *et al.*, Potential Human Health Concerns from Composting, BioCycle (Dec. 1992). Mr. Maritato of ChemRisk is a co-author of the Millner report. See Exh. 36, Att. 7.

The Maritato report states that *A. fumigatus* appears to present widely different potential health hazards depending upon the segment of the population at issue:

In humans, the potential hazards associated with *A. fumigatus* appear to vary widely. In the general population, Wyngaarden and Smith report that although spores (or conidia) of *Aspergillus* are frequently identified in the air of many indoor and outdoor environments, and therefore are inhaled routinely, the rarity of disease attributable to these fungi emphasizes the apparent effectiveness of host organism (human) immune responses against their potency in healthy individuals. For individuals whose immune systems may be sensitive or inadequate to protect against the presence of inhaled *A. fumigatus* spores, a range of possible health effects, from allergic responses to chronic pulmonary disease, may result. [] For individuals whose immune systems are severely compromised, such as those undergoing treatment for cancer or recipients of organ transplants, even a single colony forming unit (CFU) per cubic meter of air may lead to the onset of “aspergillosis.” . . . In analyzing the public health risks associated with sewage sludge composting, it is important to recognize that *A. fumigatus* is a naturally-occurring, pervasive organism that, in individuals predisposed to allergies or aspergillosis, is capable of disease induction at background environmental concentrations. . . . While we know that severely immunocompromised individuals may become ill from exposure to even a single *A. fumigatus* conidia, healthy individuals in the general population appear to show no significant health impacts from exposure to ambient concentrations. PC 26, Supp. (Maritato report at 42-43).

Board Findings on Sources and Effects of *A. Fumigatus*

The Board recognizes that *A. fumigatus* is ubiquitous. However, compost facilities generate greater concentrations of *A. fumigatus* than typically occur in nature. The Board also finds that *A. fumigatus* is a secondary pathogen that causes invasive aspergillosis, allergic bronchopulmonary aspergillosis, and hypersensitivity pneumonitis. *A. fumigatus* is also a common fungal allergen source and can induce asthma. While *A. fumigatus* spores pose little, if any, health risk to healthy individuals in the general public, it is widely recognized that *A. fumigatus* spores pose a potential health threat to persons with asthma, cystic fibrosis, immunocompromised or immunosuppressed conditions, or bioaerosol allergies. Very young children also are sensitive receptors because their immune systems are immature.

The Board also recognizes that no dose-response relationship has been established for *A. fumigatus* spores. Obviously, such information would be helpful. Nevertheless, there are portions of the population at greater risk of health impacts from some level of *A. fumigatus* spore exposure.

Need for Additional Setbacks

Participants in this rulemaking vigorously contest whether the Board should require compost facilities to be set back 1/2 mile from hospitals, schools, public parks, and athletic fields. As further discussed below, proponents argue that: (1) the existing regulations do not adequately address *A. fumigatus* spores released from compost facilities; (2) scientific evidence suggests that additional setbacks of 1/2 mile are necessary and prudent; (3) consistency in regulation requires the additional setbacks; and (4) the 1/2 mile setback is technically feasible and economically reasonable, both for existing and new compost facilities.

As also discussed below, those opposing proponents' proposal argue that: (1) existing regulations adequately address the increased concentrations of *A. fumigatus* spores that compost facilities produce; (2) scientific studies do not show any increased health risks from compost facilities; (3) both general and sensitive populations are more likely to be exposed to *A. fumigatus* spores from sources other than compost facilities; (4) imposing additional setbacks would be inconsistent with Illinois' regulatory scheme generally; (5) no scientific studies justify a 1/2 mile setback; and (6) the 1/2 mile setback is not technically feasible or economically reasonable, especially for existing compost facilities.

Proponents' Position

Existing Regulations. Proponents assert that compost facilities pose a public health risk even if they are operated in compliance with existing Illinois regulations. Tr.1 at 186-187. Proponents maintain that a setback is the best means of addressing their concerns. Tr.1 at 186, 187, 192-193.

Scientific Evidence. Dr. Desai testified that while health studies are inconclusive regarding health risks posed by compost facilities, there is adequate evidence of a potential health risk to surrounding communities to justify additional setbacks. Tr.1 at 46-47. She noted that this evidence is especially strong for individuals who have allergies or asthma, or who are immunocompromised. Tr.1 at 46-47. Dr. Desai testified that not only are *A. fumigatus* spore concentrations from compost facilities much greater than occur from common sources, but "I can take care of the certain circumstances like home or a pet . . . but I don't have control over the composting facility" Tr.1 at 137-139.

While proponents acknowledge that there are few reported cases linking compost facilities to adverse health effects, William Holleman, President of Illinois Citizen Action,¹⁵ stated that there may be thousands of unidentified cases. Tr.1 at 151. In this regard, he testified that while aspergillosis has been previously recognized, it is very often

¹⁵ Illinois Citizen Action describes itself as a "public education committee . . . of concerned citizens" whose mission is to "protect public health and welfare and preserve the environment." Exh. 8; Tr.1 at 75.

misdiagnosed since physicians are not aware of the disease. Tr.1 at 152. One of those opposing the amendments, Dr. Epstein, acknowledged that:

exposure to *A. fumigatus* can result in allergic-type symptoms, such as irritation to the eyes, nose, and throat. It is difficult to isolate the effect of *A. fumigatus*, since many of these symptoms are similar to those caused by other common allergies and smoking. PC 14 at 3; see also Exh. 34, Att. 2 at 6.

In addition, Mr. Holleman testified that the lack of reliable scientific information concerning *A. fumigatus* levels in the vicinity of compost sites is mainly due to difficulty in collecting the data and the high cost associated with the monitoring. Tr.1 at 75, 78.

Dr. Desai also noted that even scientists who do not believe that compost facilities pose a health threat recommend a buffer zone between compost operations and schools, hospitals, and public parks. Tr.1 at 47. For example, proponents rely on the Islip study.¹⁶ The State of New York Department of Health conducted the Islip study to address citizen concerns about bioaerosol emissions from a yard waste composting facility in the town of Islip, New York. The study included environmental monitoring and a health impact assessment. The study concluded that average *A. fumigatus* spore levels in the study neighborhood when it was downwind of the facility were four times the average background levels. The frequency of elevated *A. fumigatus* spore levels was also higher in the study neighborhood than in a reference neighborhood. However, the health study could not establish any correlation between elevated *A. fumigatus* spore levels and an increased incidence of allergy or asthma symptoms. Exh. 36, Att. 5. Nevertheless, the study concludes that:

[h]ospitals with the most severely immuno-compromised patients (*e.g.*, bone-marrow transplant wards) must take extreme precautions to prevent infection of these patients. If outdoor *A. fumigatus* spore levels at such a hospital were more frequently elevated than normally occurs, the risk of life-threatening infection could be increased. . . . [C]omposting facilities should not be sited close to hospitals or other health care facilities where extreme precautions are being taken to prevent infection of severely immunocompromised patients, unless bioaerosol emissions can be controlled. Exh. 36, Att. 5 at 45-46

Similarly, a medical advisory panel of various health officials, doctors, and experts was formed to address the health concerns of residents about exposure to bioaerosols from a composting operation at a San Jose, California landfill. The panel reported in 1994 that there:

¹⁶ State of New York Department of Health, *A Prospective Study of Health Symptoms and Bioaerosol Levels Near a Yard Waste Composting Facility*, (Mar. 1994). See Exh. 36, Att. 5.

is no evidence that composting at the . . . landfill will result in an increase in aspergillosis among residents living near the landfill. But there is a *potential* risk of increased exposure to *Aspergillus* spores in areas located downwind from a composting area. An increase in aspergilli exposure has the potential to cause disease.

To be certain that there is no increase in health risk, efforts should be made to ensure that spore concentrations in the neighborhoods near the composting facility do not increase above baseline levels during the time of composting operations. PC 5, Att. 2 at 57 (emphasis in original).

Likewise, the Ault and Schott report recommends buffer zones to reduce the exposure of neighboring communities to *A. fumigatus* spores from compost facilities. It recognizes that “[n]o one has yet demonstrated a clear dose-response curve[,] . . . a threshold spore concentration, or duration of sensitization needed to cause” extrinsic (allergic) asthma, allergic bronchopulmonary aspergillosis, hypersensitivity pneumonitis, or invasive aspergillosis, but states:

However, in microbiology, like toxicology, “the dose makes the poison.” Thus, while we [] do not have good data on infective doses of these organisms, it is reasonable to expect that increasing the potential dose increases the likelihood of eliciting a response, even in otherwise normal people. Exh. 36, Att. 4 at 6-8.

Dr. Strauss testified that she supports having a setback—although not a 1/2 mile setback—between compost facilities and hospitals, including health care facilities that house immunocompromised individuals.¹⁷ Tr.2 at 33-34, 47, 75, 77. She also supports a buffer zone for schools, athletic fields, and public parks. Tr.2 at 72, 74-76. She supports a setback for these facilities not because of odor concerns but because of the potential for exposure to elevated levels of *A. fumigatus* spores generated by composting facilities. Tr.2 at 97, 120-122.

In her testimony, Dr. Strauss read from the Ault and Schott report, which set forth the findings on buffer zones of several other reports:

Some scientists have recommended that buffer zones may be considered between certain types of composting facilities and nearby residences, hospitals, or schools to reduce the risk of exposure to odors and air contaminants. Millner, *et al.*, in their 1977 study, noted “in consideration

¹⁷ Dr. Strauss’ 1994 Winnetka report (see footnote 20) on potential health hazards from compost facilities states: “Although pulmonary aspergillosis is not a health threat to the public, siting criteria should include guidelines for the proximity of composting facilities to health care facilities.” Exh. 34, Att. 1 at 3.

of off-site health matters related to air dispersal of spores, a buffer distance between a composting operation and health care facilities and residential areas may be needed.” Olver noted the “buffer zones that should normally be provided around the composting site for odor control should work equally well to confine the highest candida levels of the fungus to the processing area.” . . . Diaz, et al. noted in a 1992 study, “prudence indicates that an open air compost plant should not be sited in close proximity to human habitations.” Tr.2 at 69-70.

The Haines report states that “[c]ommon sense, and government recommendations in some states, should curtail the siting of compost facilities near health care facilities that house aspergillosis susceptible individuals.” Exh. 34, Att. 2 at 7; see also Tr.2 at 43-45. The Millner report states that:

[w]hen siting new facilities, critical evaluations should be made of several factors including the proximity to residences and public facilities The proximity to residences and public places should also be a key consideration when upgrading composting facilities. . . . The layout of composting activities associated with bioaerosolization, particularly material handling processes, should be located downwind or as far as possible from sensitive receptors. Exh. 36, Att. 7 at 37.

Several other participants also favored additional setbacks on health grounds. Mr. Dumelle testified that the American Lung Association of Metropolitan Chicago supports proponents’ proposed amendments. Tr.1 at 101. Jack Darin, field representative of the Sierra Club, Illinois Chapter, testified that because of the potential health impacts, his organization supports proponents’ proposed setbacks “with regard to schools, hospital, and other public areas, particularly for large scale facilities.” Tr.1 at 66-68. The Will County Land Use Department, Waste Services Division stated in public comment that it “recognizes the need to set a reasonable setback from hospitals and other entities housing low immunity patients.” PC 23 at 1.

Dr. Desai explained that proponents proposed a 1/2 mile setback in part because the Islip report shows elevated *Aspergillus* spore levels at 2,200 feet from the compost facility. Tr.1 at 128; Exh. 36, Att. 5 at 45 (note that the study neighborhood in the Islip report showing elevated *A. fumigatus* spore levels was actually 1,775 feet away from the compost facility). Dr. Desai noted that some scientists and physicians advocate a two mile buffer because studies show that pollen spores can travel up to two miles. She added that *Aspergillus* spores are lighter than pollen spores and she suspects they can travel farther than two miles. Tr.1 at 127-128.

Consistency. Those supporting proponents’ proposal also argued that the current regulation arbitrarily protects only residences, while hospitals, schools, athletic fields, and public parks are equally deserving of protection. Tr.1 at 26-27, 31. Mr. Steven Handler, a resident of Lake Forest, stated that there is no reason to distinguish between residences

and these public facilities “because people with asthma, people with immune system deficiencies are as likely, if not more likely, to use some of the facilities like hospitals or schools than are likely to be in residences.” Tr.1 at 31. Mr. Handler and Susan Garrett, one of the proponents and a resident of Lake Forest, testified that concerns with compost facilities about nuisance noise, odors, dust, and quality of life apply to these other facilities as well as residences. Tr.1 at 26-27, 31-32. Mr. Handler added:

Our point is it doesn't make sense to say you can't locate a residence within 600 and some feet of a composting facility, but you can have kids playing [on a school's athletic fields] within 50 feet of the windrows. So the same policy reasons in terms of both quality of life and health that support a buffer zone for residents also support a buffer zone for these other facilities. Tr.1 at 32.

He and Peter Mueller, a resident of Lake Forest, also noted that the Board has established setbacks from putrescible and chemical waste landfills for occupied dwellings, schools, and hospitals. Tr.1 at 33, 89; Exh. 4; Exh. 11 at 1.

Ms. Garrett and others testified that students generally do not have a choice over where they go to school and that athletic fields are often connected to schools. Tr.1 at 173; see also Tr.1 at 107. Mary Matthews, a resident of Lake Forest, testified that children are more at risk at school than at home because at home parents can close windows and use air filters. She added that children at home are more at rest and not breathing as heavily as when they are playing at school. Tr.1 at 108. Mr. Mueller testified that people spend substantial amounts of time in hospitals and schools and “are exposed to the same environment that a person in a residence would be exposed to.” Tr.1 at 185; see also Tr.1 at 25.

Proponents also introduced a letter to them from Dr. John R. Lumpkin, Director of the Illinois Department of Public Health, dated August 7, 1997:

[Y]ou may consider the following statement as this Department's position on your proposal: Compost facilities have the potential to release bioaerosols into the environment and expose individuals to microorganisms. Insufficient data are available to establish dose-response relationships for bioaerosols among populations that reside near these facilities. Nonetheless, it would be prudent public health policy to site new compost facilities away from populations. We also concur that the siting of compost facilities with regard to schools, hospitals, athletic fields and public parks should be at least as protective as that provided for residences. Exh. 21-A at 1.

Similarly, State Representative Lauren Beth Gash stated in public comment:

I find it noteworthy that current regulations require a setback from residences but not from schools, hospitals, athletic fields, public parks and other settings where individuals might be exposed to airborne pollutants emanating from landscape waste facilities. I understand that in particular there is growing concern about the harmful potential of aspergillus fungi.

I urge the Illinois Pollution Control Board to make every effort to protect Illinoisians from harmful exposures from landscape waste facilities. PC 3 at 1.

Proponents also supported the distance proposed for the setback, 1/2 mile, on consistency grounds. Dr. Desai noted that the current regulations (referring to 35 Ill. Adm. Code 830.203(d)) require that “landscape waste must be processed by the end of the operating day on which it was received if . . . [the] composting area is located within one-half mile of the nearest platted subdivision or facility boundaries are located within one-half mile of more than ten residences.” Tr.1 at 129-130, 135 -136. However, the City of Lake Forest noted that the 1/2 mile distance in that section relates to the processing of landscape waste and is not a setback distance. PC 26 at 7.

Technical Feasibility and Economic Reasonableness. Those supporting proponents’ proposal argued that “[c]ost becomes a non-issue when . . . the quality of life for citizens improves dramatically.” Tr.1 at 123; Exh. 15 at 4. Scott Garrett, a resident of the City of Lake Forest who testified for proponents on technical feasibility and economic reasonableness, asserted that the proponents’ proposed amendments will save hundreds of thousands of dollars annually “through reduced needs for medical care, less absenteeism by teachers, and better health for susceptible students attending school and participating in school-related sports activities. At the same time, we should see an increase in the quality of life standards for the community in general.” Tr.1 at 117; Exh. 15 at 2.

Mr. Garrett argued further that “[r]equiring a greater distance between compost areas and schools, athletic fields, public parks, and hospitals will not require additional funds. It will require instead [that] proper siting be a greater priority and included with other criteria when establishing a compost operation.” Tr.1 at 117-118. He recommended that municipalities adopt programs to offset the cost of closing facilities, including: making residents responsible for their own yard waste disposal; having municipalities provide yard waste services on a pay-as-you-go basis; or having municipalities “work with their respective county governments to establish either a small number of properly located facilities to handle yard waste or contract on a county-wide basis to secure a low-cost alternative with a private refuse company.” Tr.1 at 120-121; Exh. 15 at 3-4.

Mr. Garrett asserted that these alternatives render proponents’ proposal technically feasible. Tr.1 at 119. He noted that only 20% of municipalities in Illinois operate compost facilities, and argued that “it cannot be a hardship to adopt a practice currently in use by 80% of the communities in the State.” Exh. 15 at 4.

Proponents did not dispute that at least some facilities would have to close if the Board adopts their proposal, but argued that the benefits of their proposal outweigh the cost of relocating. For example, Dr. Desai testified that the cost of treating an aspergillus patient was 1.8 million, and “I don’t think relocating these facilities is going to cost \$2 million.” Tr.1 at 179.

Although supporters of proponents’ proposal questioned how many facilities would have to close (Tr.1 at 179), Mr. Garrett did not speak to compost site operators or owners to find out how the proposal would affect them, or to municipalities (other than the City of Lake Forest). Tr.1 at 166. He also stated that he is not aware of: how many compost sites there currently are in Illinois, how many would be closed by the proposal, the current capacity of facilities that would remain open, whether they would accept landscape waste from the facilities that would be closed, the distance in additional miles traveled to reach these facilities, the cost of opening a new facility, the cost of going through the permit/zoning process, the length of time required for closure, the cost to municipalities if all citizens implemented backyard composting, the cost of training individuals to do backyard composting, or any municipality that has had a successful backyard composting program with no backstop for municipal waste disposal. Tr.1 at 166-168. Mr. Garrett had not calculated the economic impact of relocation on private compost companies. Tr.1 at 190.

Supporters of proponents’ proposal also did not agree that the proposal would be considered a regulatory taking, or an invalid retroactive regulation, if applied to existing facilities (see pages 32-34). Mr. Handler, an attorney and a resident of the City of Lake Forest, stated that the Board’s general authority regarding public health and welfare supported a rule that existing composting areas be relocated. Tr.1 at 33. He argued that the Board can respond to new information about health risks, and that if there is a health risk, there is no taking. Tr.1 at 38.

Opponents’ Position

Existing Regulations. Dr. Shirley Baer, Environmental Specialist with the Agency,¹⁸ testified that operational standards are more important than siting requirements. Tr.2 at 174, 207. She testified that Illinois’ current operational standards minimize the dispersal of *Aspergillus* spores because they include requirements for moisture, turning, and wind direction. They also require that the facility address odor complaints. Tr.2 at 203, 221-222.

When asked if at risk individuals face greater risk by attending a public school, playing in a sports field or public park, or spending time in a hospital that abuts a composting facility, Dr. Baer testified that, in light of Illinois’ operational standards, “I don’t think they are at any additional risk than what is already there in the background.”

¹⁸ See Exh. 36, Att.1 (*curriculum vitae* of Dr. Baer).

Tr.2 at 206. She also testified that the operational requirements of 35 Ill. Adm. Code 830.202 take into account not only residences but also all public facilities because the requirements are designed “to protect the surrounding receptors.” Tr.2 at 203-205. Similarly, Joyce Munie, Manager of the Solid Waste Unit of the Permit Section, Division of Land Pollution Control of the Agency, testified that these provisions of the regulations contain requirements to control odors and other nuisances. Tr.2 at 196-197.

Dr. Strauss also testified that recommended management practices for composting sites can minimize not only odors and noise pollution, but also bioaerosol distribution. Tr.2 at 96-97. Other participants pointed out that if a particular compost facility does not follow composting regulations or creates air pollution, the State or any citizen can bring an enforcement action against the facility under the Act. Tr.1 at 220, 241-242; Exh. 31 at 3 (Elizabeth Harvey on behalf of the Land and Lakes Company); PC 21 at 1 (Illinois Composting Council); PC 24 at 5 (National Solid Waste Management Association, Illinois Chapter).

Scientific Studies. Several participants in the rulemaking testified or commented that there is no scientific evidence that compost facilities present a public health threat, including Dr. Epstein; Dr. Baer; Dr. Strauss; Dr. Walker; the Illinois Composting Council; the Illinois Chapter of the National Solid Wastes Management Association; and the Solid Waste Agency of Lake County. Their testimony or comments are briefly outlined below.

Dr. Elliot Epstein. Dr. Epstein stated that:

[a] review of the medical literature (Medline, 1966-1997) shows 1,273 citations regarding *A. fumigatus* and health effects. Based on the literature, 98 percent of the reported cases of *A. fumigatus*-related infections occur in hospitals. Nearly all of the reports on infection due to *A. fumigatus* have been from hospitals where people are already severely debilitated (due to heart and kidney transplants, leukemia, AIDS, and other very debilitating diseases). PC 14 at 3.

He also stated that there is no published or documented evidence of worker health being impaired from yard waste composting facilities in the U.S.:

Workers are the most exposed individuals; not only are they more frequently exposed to high levels of *A. fumigatus* and other spores, but they are also exposed to much higher levels of bioaerosols than the public surrounding composting sites. PC 14 at 4.

Dr. Epstein concluded that there is “no scientific or technical evidence warranting modification of the setback requirements in 35 Ill. Adm. Code 830.203(c).” PC 14 at 5.

Dr. Shirley Baer. Dr. Baer of the Agency testified that it is her “professional opinion that the current landscape waste regulation[] is protective of public health as it is

written.” Tr.2 at 135. She stated that there is nothing in proponents’ proposal that “scientifically and technically demonstrates that a landscape waste compost setback greater than what is currently set in the regulation is necessary.” Exh. 36 at 2.

Further, she stated that in the original compost facility rulemaking,¹⁹ the Agency reviewed many scientific and technical papers concerning the impact of bioaerosols from composting operations. Based on the review, Dr. Baer noted that the Agency concluded that:

Aspergillus and other fungi or molds are ubiquitous and should not be regarded as an off-site or product related problem for healthy individuals.
Exh. 36 at 2-3.

She added that the Agency literature review for the prior rulemaking showed that “properly operated composting facilities should not present a health risk.” Exh. 36 at 3. Dr. Baer testified that based on her professional opinion, there is no need based on health risks to establish a setback for schools, public facilities, or hospitals. Tr.2 at 184, 219-221. She also stated that “based on the information that we have obtained,” the existing rules are “protective of children.” Tr.2 at 218-219. Nevertheless, Dr. Baer admitted that the Agency’s expertise is in chemical risks and that for an evaluation of health risks posed by compost facilities, the Agency would probably defer to the Illinois Department of Public Health. Tr.2 at 145.

Dr. Karen Strauss. While Dr. Strauss favors setbacks for certain additional facilities, as discussed at pages 15-16, she disagreed with other aspects of proponents’ proposal. Dr. Strauss testified that the proposal “ignores or dismisses the majority of conclusions from scientific peer review and literature.” Tr.2 at 13-14, 17; Exh. 34 at 7. She stated that proponents also have failed to present “thorough scientific, peer-reviewed literature demonstrating a health risk from exposure to yard waste composting operations” or any “formal epidemiological evidence linking composting sites to human disease.” Tr.2 at 17; see also PC 26 at 5, 8.

Dr. Strauss stated that she investigated and analyzed “the medical and scientific literature pertaining to the public health effects of landscape waste composting” and that her conclusions (discussed below) are based on “peer-reviewed, well-documented studies,” including epidemiological studies. Tr.2 at 10. She testified that based on her literature review, “landscape waste poses virtually no infectious hazard to the general public.” Tr.2 at 11. She also testified that the “international expert consensus,” based on the body of literature over the past two decades, is that yard waste composting “is not a threat to healthy individuals” Tr.2 at 13.

Referring to the Millner report, Dr. Strauss testified that in 1994:

¹⁹ See Regulation of Landscape Waste Compost Facilities 35 Ill. Adm. Code 830-832, R93-29.

a panel of composting experts from many disciplines and backgrounds, such as government, academia, industry, and environmental groups, concluded, quote, “composting facilities do not pose any unique endangerment to the health and welfare of the general public,” end quote. That panel further elaborated, quote, “there is little reason for concern about the risk of potential infections from exposure to *Aspergillus fumigatus* among healthy individuals in either the general population that is defined as nonoccupational exposure, or the work force exposure to composting bioaerosols,” end quote. Tr.2 at 20-21; Exh. 34 at 9; see also Tr.2 at 39.

Dr. Strauss also noted that the Ault and Schott report reached a similar conclusion. Tr.2 at 13, 21; Exh. 34 at 9.

Dr. Strauss also relied upon a report she prepared in 1994 for the Village of Winnetka on the health hazards of yard waste composting.²⁰ She testified that she recently reviewed the relevant literature to update her Winnetka report. Tr.2 at 12; PC 26, Supp. Her update revealed:

no reports of health effects in the populations around the more than 3,000 yard waste composting sites in the United States nor around the thousands of operating sites on the European continent. The absence of new findings substantiates prior conclusions and those of the consensus of recognized experts in the field. Tr.2 at 12-13.

Dr. Strauss testified that a survey of the medical literature reveals “only four cases in the United States and Europe of bioaerosol-related disease that experts have associated with any form of composting, including composting of yard waste.” Tr.2 at 18-19; Exh. 34 at 7. She stated that the most relevant of these four cases for this rulemaking involved “an asthmatic young man who was being treated with immunotherapeutic agents and developed aspergillosis.” Tr.2 at 19; Exh. 34 at 7-8. Specifically, he developed allergic bronchopulmonary aspergillosis. Tr.2 at 23-24. Dr. Strauss stated that the individual lived 250 feet from a leaf composting facility and across the street from a heavily forested

²⁰ Strauss, Investigation of Potential Public Health Effects from Yard Waste Composting Operations in Winnetka, IL, (Nov. 10, 1994). See Exh. 34, Att. 1. Dr. Strauss described the conclusion of her 1994 Winnetka report: “there is abundant scientific evidence, from testing at dozens of yardwaste composting sites similar to Winnetka’s, that there is no substantiated public health hazard from spores of *Aspergillus fumigatus* released outside site boundaries from composting operations. Strauss (1994). Occupational exposures vary and may necessitate protective ventilation equipment.” Exh. 34 at 3; see also Tr.2 at 45-46.

area. She criticized the report (Kramer report²¹) that linked this case of aspergillosis to compost exposure because “the authors failed to investigate other potential background sources of aspergillus.” Tr.2 at 19, 24, 82; Exh. 34 at 8; see also Exh. 34, Att. 1 at 3 (referring to Kramer report as “methodologically flawed”); PC 26 at 6, n.6.

Dr. Strauss described the other three cases as involving occupational exposure, one of which involved an individual working directly in the compost industry. Tr.2 at 19; Exh. 34 at 8. She stated that the four individual cases “bear attention but do not represent the general population.” Tr.2 at 19. She concluded that despite all of the occupational and potential residential exposure to *Aspergillus* from the more than 3,000 compost facilities currently operating in the U.S., along with hundreds of other compost facilities that process sewage sludge, kitchen waste, and other organic material and farms that compost organic material:

only four cases of the disease have been discussed in the past 30 years of medical literature review. Given the volume of material that is composted in the United States and Europe, the literature would be replete with references to compost-related illness if composting posed a general health threat asserted by the proponents of this rulemaking. Just the opposite is true. Tr.2 at 19-20; Exh. 34 at 8; see also PC 14 at 4 (Dr. Epstein stated that if “composting was such a serious threat and caused illness to the public and workers, one would expect to find much more evidence in the medical or public health literature reporting cases or warnings to the public.”)

Regarding the Islip study, Dr. Strauss testified that the New York State Department of Public Health searched for a connection between the Islip facility’s composting operations and increased incidences of allergy and asthma around the facility. Tr.2 at 24. She stated that:

[a]fter reviewing medical reports of over 100 individuals with a previous history of allergic or asthmatic reactions, the study concluded, quote, “aspergillus and other mold spores were not observed to be associated with increased allergy and asthma symptoms reported. However, the occurrence of these symptoms was associated with ragweed pollen, ozone, temperature, and the time since start of the study period. Allergy and asthma symptoms could also have been influenced by exposures that were not measured or accounted for in the study,” end quote. Tr.2 at 24-25; see also Tr.2 at 51 (Dr. Strauss testified that the Islip study “is perhaps the best

²¹ Kramer, *et al.*, Allergic Bronchopulmonary Aspergillosis from a Contaminated Dump Site, *Am. Rev. Respir. Dis.* (1989). See Exh. 34, Att. 5.

representative study in the United States, and that was an epidemiological study. . . .”), 55.²²

Dr. Paul Walker. Dr. Walker, who conducted a literature review of available scientific information, stated that proponents’ proposal is not supported by the current scientific information. He testified that there is “a preponderance of evidence in the literature that there is no substantial public health risk from the spores of *aspergillus fumigatus* released from composting operations.” Tr.2 at 241-242; Exh. 43 at 1.

Other Participants. The City of Lake Forest argued that “adopting the [proponents’] proposal would be arbitrary, capricious, and unreasonable largely because the speculative health risks raised by Proponents have not been observed around the thousands of operating compost facilities.” PC 26 at 12. Scott Smith, Chair of the Illinois Composting Council, stated that “[s]tudies have been conducted across the nation and to my knowledge, nothing substantive has been discovered that would lead to the conclusions made by the proponents for this overly broad change.” PC 21 at 1.

Similarly, the Illinois Chapter of the National Solid Wastes Management Association stated that proponents’ proposed amendments are “premised upon alleged adverse health impacts that result from composting,” but that “[a]t best, the scientific evidence on this point is inconclusive.” PC 24 at 4. Andrew Quigley, Executive Director of the Solid Waste Agency of Lake County, Illinois, testified that a technical consultant for the Solid Waste Agency of Lake County conducted a literature search on the impacts of bioaerosols and compost facilities. Tr.2 at 258. Mr. Quigley testified that only the Islip study began to examine the potential health effects of compost facilities and that study concluded that despite the level of *A. fumigatus* in a neighborhood near a compost facility being well above background, “there was no evidence of the facility impacting the nearby neighborhood.” Tr.2 at 259-260. In asserting the importance of conducting comprehensive health evaluations prior to changing setback requirements, he testified that “there is not enough information available which links [compost facilities] or even home composting to increased health risk.” Tr.2 at 260-261. The Will County Land Use

²² In a January 12, 1995, letter to the City of Lake Forest City Manager, Dr. Patricia Millner (co-author of the Millner report), Research Leader, Soil Microbial Systems Laboratory, Natural Resources Institute, United States Department of Agriculture, recounted a conversation she had with Dr. Desai regarding the compost facility in the City of Lake Forest: “Dr. Desai asked me if I’d agree that the compost site was a public health hazard. I told her then (and I stand by that now), that until there is substantive[] documentation of hazard, there is no reasonable basis for that conclusion. Such documentation would consist of 1) airborne concentrations of bioaerosols that are significantly above background and concurrent 2) evidence that the pulmonary or irritated membrane responses of neighborhood residents are specifically directed toward the agents or groups of agents in the air transported from the compost site.” PC 1, Att. 1 at 2.

Department, Waste Services Division stated that “no convincing evidence has been brought forward to support setbacks from schools, athletic fields or public parks.” PC 23 at 1.

Background Exposure. Opponents also argued that proponents ignored information on background sources of *Aspergillus*. Tr.2 at 17. Dr. Strauss testified that measurements at multiple locations in the U.S. and Europe show that residential exposure to *Aspergillus* spores from compost facilities is generally negligible because the time and distance of spore dispersion is short. Tr. 2 at 15; Exh. 34 at 5. She concluded that individuals live and work in much closer proximity to “more significant” sources of *Aspergillus* than a compost facility:

In a community like Lake Forest, for example, which prizes manicured lawns, mulched shrubs and trees, natural vegetative spaces, and family pets, residents may well be exposed to levels of aspergillus that exceed levels from the compost facility [in the City of Lake Forest]. Tr.2 at 16; Exh. 34 at 6.

She testified that this conclusion is supported by the following findings of a report prepared on a compost facility in the City of Lake Forest:²³ (1) outdoor fungal concentrations in the City of Lake Forest community adjacent to the compost facility were similar to those in communities with no known point source of bioaerosol emissions; and (2) bioaerosol concentrations upwind of the compost facility were comparable to downwind concentrations. Tr.2 at 16; Exh. 34 at 6; see also PC 26 at 12-13, n.23.

According to Dr. Strauss, Dr. John Haines²⁴ best summarizes the potential for residential exposure from compost facilities:

²³ Hryhorczuk, *et al.*, Environmental Characterization of Bio-Aerosol Emissions from the DK Recycling Systems, Inc. Composting Facility in Lake Forest, Illinois, (Apr. 15, 1996). At the request of the City of Lake Forest, the Great Lakes Center for Occupational and Environmental Safety and Health at the University of Illinois at Chicago and the Illinois Department of Public Health performed a hazard evaluation study of a compost facility in the City of Lake Forest, Illinois. The main objective of the study was to determine whether the composting facility posed a health risk to on-site workers, community residents, and children attending a middle school located adjacent to the facility. The study was designed to characterize the on-site and off-site concentrations of bioaerosols, and determine the impact of the facility on community bioaerosol concentrations. The report states that the data collected “do not demonstrate an imminent hazard to community residents,” but cautions that the “data, however, are not sufficient to fully characterize the bioaerosol emissions from the site.” Exh. 32, Att. 1.

²⁴ Dr. Haines (see footnote 7) is a mycologist with the New York State Biological Survey. He participated in the Islip study and is a co-author of the Millner report.

simply filling a bird feeder, raking the lawn, digging in the garden, or sweeping the basement may give greater exposure to aspergillus fumigatus than a day near a compost facility Tr.2 at 16-17; Exh 34 at 6.

Dr. Strauss also relied upon the following from the Millner report:

immunocompromised individuals are at increased risk to infections by various opportunistic pathogens, such as aspergillus fumigatus which occurs not only in compost but also in other organic materials present in the natural environment. . . . [A]sthmatic and allergic individuals are at increased risk to responses from bioaerosols from a variety of environmental and organic dust sources including compost. Tr.2 at 39; see also PC 26 at 9, 11 (similar comment from the City of Lake Forest).

Consistency with Illinois' Regulatory Scheme. The City of Lake Forest argued that proponents' proposal also is unreasonable because it is more stringent than existing Illinois standards for air emissions from activities that "arguably present greater risks to human health than landscape waste composting." PC 26 at 15. The City of Lake Forest asserted that Illinois' air pollution regulations have no setback requirements for air emission sources:

As a result, fully permitted organic chemical companies, polymer manufacturing plants, printing operations, and similar operations that emit several tons per year of hazardous air pollutants may be located directly adjacent to a residential neighborhood, school, hospital, athletic field or public park. Moreover, automobiles and trucks that emit particulate matter, which has been implicated as a cause of increased incidents of childhood asthma and other respiratory problems, drive in residential neighborhoods, or idle near schools, hospitals, athletic fields or public parks without being subject to environmental regulations that limit their destinations. PC 26 at 15.

The City of Lake Forest argued that where the Board has imposed air pollution regulations on these activities, it has relied on "management standards that limit or control emissions, rather than on standards that proscribe the location of these activities in particular areas." PC 26 at 15-16.

Several participants also claimed that proponents' proposal is ambiguous. Dr. Walker asked whether the use of the term "school" would mean that universities could not operate compost sites on their property. Tr.2 at 245; Exh. 43 at 1. He testified that because Illinois State University operates a compost facility on campus, he would not want the definition of "school" to include the entire campus area. Tr.2 at 247-248, 253.

Waste Management stated in public comment that proponents' proposal fails to define athletic field or public park:

Certainly, these terms can be used to describe a number of facilities such as race tracks, stadiums, private recreation facilities, golf courses, state conservation areas, state parks, and other natural greenbelt areas that are used by local planning bodies to transition compost facilities from other land uses. PC 9 at 1.

Evidence on the 1/2 Mile Setback. The City of Lake Forest noted that the physicians' letters submitted by proponents repeatedly refer to a two mile setback and "never mention, much less advocate, the 1/2 mile setback that Proponents presented to the Board." PC 26 at 5. The City of Lake Forest argued that the letters also fail to provide "any technical foundation" for the 1/2 mile setback of proponents' proposal. PC 26 at 7.

Land and Lakes Company and the City of Lake Forest argued that proponents' proposed amendments are inconsistent with the current setback requirements because they would create a larger setback for hospitals, schools, athletic fields, and public parks (1/2 mile) than for residences (1/8 mile). They asserted that proponents have not explained the reason for this difference. PC 26 at 8; Exh. 31 at 3.

Dr. Strauss recommended a 500 foot buffer, which she based on the literature addressing the fall off of spore exposure. Tr.2 at 72-73, 76. She explained that studies of commercial compost facilities have found that "concentrations of aspergillus tend to fall off sharply within 500 feet of the operational site." Tr.2 at 15; Exh. 34 at 5. The 500 feet should be measured from the area at a facility where the compost is located or handled because that is where bioaerosols would be generated, not from the facility's property line, according to Dr. Strauss. Tr.2 at 107-108, 117-119. Dr. Walker agreed that the property line is immaterial to this issue. Tr.2 at 251.

While acknowledging that there is some variation in the distances from compost sites to locations where background levels are reached, Dr. Strauss testified that the consensus of the literature has determined that *A. fumigatus* spore exposure drops to background within 500 feet from compost sites. Tr.2 at 40, 73, 79, 95, 101-102, 115-117; PC 26, Supp. In other words, at the 500 foot boundary, the composting facility does not add substantially to exposure that persons might otherwise encounter in a play field, forest preserve, or school yard, according to Dr. Strauss. Tr.2 at 102. In her testimony, she quoted the Ault and Schott report:

[T]he concentrations fell off sharply within 500 feet of the operational site. If the nearest human receptor is located beyond the point at which concentrations fall to background levels, there is no elevated exposure occurring. Tr.2 at 15, 111-112; Exh. 34 at 5.

She also quoted the Millner report:

When the exposure is within or below the average range of background concentrations found in the natural environment, compost bioaerosols do not constitute additional exposure. Tr.2 at 15; Exh. 34 at 5-6.

Similarly, Dr. Epstein stated that a “majority of the studies on the dispersion of *A. fumigatus* and other bioaerosols from composting facilities indicates that background levels are achieved within 250 to 500 feet of a composting site (Millner, *et al.*, 1993).” PC 14 at 4. He added that his environmental consulting company has done studies that have produced similar results. PC 14 at 4.

Dr. Walker’s literature review corroborated the 500 foot figure. Tr.2 at 248-249. In addition, Dr. Strauss testified that the literature supports the additional distance provided by the current 1/8 mile (660 feet) setback in Illinois’ regulations. Tr.2 at 78-79.

Dr. Strauss testified that proponents’ proposed setback distance of 1/2 mile “is not warranted based on what is known about spore distribution and public health risks.” Tr.2 at 77-78. She also disagreed with the conclusion of the Kramer report that these facilities should be sited more than two miles from residential areas. She testified that a two mile buffer is not supported from a scientific, environmental, or medical standpoint. Tr.2 at 70-73, 80-82, 88; see also Exh. 34, Att. 5.

Dr. Baer of the Agency also disagreed with the Kramer report’s recommendation of a setback greater than two miles. Tr.2 at 195. The Agency stated in public comment that:

[it] would not, as a matter of public policy, oppose the prospective application of a setback of one-eighth of a mile from schools, public parks, athletic fields and hospitals if the Board finds and the record supports that such a setback is necessary to protect human health and the environment. PC 27.

Technical Feasibility. Several witnesses testified that proponents’ proposal was not technically feasible. For example, Land and Lakes Company operates five compost facilities in Chicago: one in Deerfield, Dolton, and Romeoville, and two in Chicago. PC 25 at 2. Land and Lakes stated that each of these facilities is within 1/8 mile of a medical facility, athletic field, public park, or proposed park²⁵ and therefore would be affected by a setback of 1/8 mile or more, if applied to existing facilities. PC 25 at 2.

Ms. Harvey argued that proponents’ proposed amendments are not technically feasible because “there is no method by which an existing facility can comply with the proposed regulation, no control equipment or operational change the facility could use to

²⁵ One of the facilities in Chicago is within 1/8 of a mile of a proposed park. This particular facility is not within 1/8 of a mile of a medical facility or athletic field. PC 25, Att. 1.

comply.” Tr.1 at 219; Exh. 31 at 1. She also noted that relocating these facilities might not be feasible. Tr.1 at 221.

Several other witnesses also testified or commented that proponents’ proposal would require many existing facilities to close down. Ms. Munie of the Agency estimated that 35 out of the 68 currently operating and permitted facilities would have to close. Exh. 30 at 3. She based this estimate on discussions with other personnel in her unit. Tr.1 at 207. Charles Pick, Vice President of Business Development for Organics Management Company, a national owner and operator of composting and compost-related businesses, estimated that at least 50% of the facilities in Chicago would have to be closed. Tr.1 at 274. The Illinois Chapter of the National Solid Wastes Management Association, the Illinois Composting Council, the Solid Waste Agency of Lake County, and the Will County Land Use Department, Waste Services Division all commented that proponents’ proposed amendments would require many composting facilities to close. See PC 9 at 1 (comments of Waste Management); PC 21 at 1 (comments of the Illinois Composting Council); PC 23 at 1 (comments of the Will County Land Use Department, Waste Services Division); PC 24 at 5 (comments of the National Solid Wastes Management Association, Illinois Chapter); Exh. 45 at 1 (comments of Andrew Quigley, Executive Director of the Solid Waste Agency of Lake County).

The municipalities of Crystal Lake, Elgin, Evanston, Lake Forest, and Normal stated that proponents’ proposal would force their facilities to close. See Tr.2 at 233 (testimony of Clyde Wakefield, Director of Public Works and Engineering for the City of Crystal Lake); PC 10 at 1 (comments of the City of Elgin); PC 7 at 1 (comments of the City of Evanston); Tr.1 at 246 (testimony of Thomas Naatz, Director of Parks, Forestry, and Public Works for the City of Lake Forest); PC 15 at 1 (comments of the Town of Normal).

Economic Reasonableness. Several participants argued that proponents’ proposal was not economically reasonable based on investments in existing facilities that would have to be closed under the proposal; the costs of relocating facilities; the costs of the closures and relocations to the State of Illinois; and the costs of various alternatives to existing facilities (including relocating facilities and other measures). The Board discusses the evidence on these issues below.

Investments in Existing Facilities. Land and Lakes Company has invested \$7,678,200 in its five compost facilities in the Chicago area. PC 25 at 2, Att. 1. This figure includes land acquisition costs, capital costs for equipment, permitting expenses, and other costs associated with developing and operating a compost facility in compliance with regulations. PC 25 at 2-3. As Land and Lakes Company noted earlier, each of these facilities is within 1/8 mile of a medical facility, athletic field, public park, or proposed park, and therefore would be affected by a setback of 1/8 mile or more, if applied to existing facilities. PC 25 at 2.

Mr. Naatz testified that the City of Lake Forest's facility would have to close if proponents' proposal is adopted. Tr.1 at 246. He testified that the facility has had permits since July 11, 1989. Its current permit expires on July 17, 2002. Tr.1 at 245; Exh. 32 at 2. Since 1993, the City of Lake Forest has invested \$120,000 in site improvements. Tr.1 at 245, Exh. 32 at 3. It incurred additional costs between 1989 and 1993 that Mr. Naatz did not quantify. PC 2 at 7.

Mr. Wakefield testified that the City of Crystal Lake's facility would have to close if proponents' proposal is adopted. Exh. 42 at 2. The City of Crystal Lake has invested over \$800,000 in its compost site: \$375,000 to acquire land, and \$450,000 for developing the site, obtaining equipment, and related costs. Exh. 42 at 1-2. Several residents of the City of Crystal Lake also filed comments opposing the proposal on economic grounds and noting that the City of Crystal Lake's facility works well. See PC 16 at 1 (comments of Cathy Mueller); PC 17 at 1 (comments of Franklin Pease); PC 18 at 1-2 (comments of Barbara Zimmerman); PC 19 at 1 (comments of Carolyn Schaper); PC 20 at 1 (comments of Keith and Libby Leman).

As noted earlier, other municipalities argued that proponents' proposal would force them to close their facilities. See PC 10 at 1 (comments of the City of Elgin); PC 7 at 1 (comments of the City of Evanston); PC 15 at 1 (comments of the Town of Normal). However, these municipalities did not state how much they had invested in these facilities. Similarly, other witnesses estimated that the proposal would force some compost facilities in Illinois to close, but did not provide estimates of how much had been invested in these facilities. See Exh. 30 at 3 (prefiled testimony of Joyce Munie of the Agency); Tr.1 at 274 (testimony of Charles Pick of Organics Management Company); PC 9 at 1 (comments of Waste Management); PC 21 at 1 (comments of the Illinois Composting Council); PC 23 at 1 (comments of the Will County Land Use Department, Waste Services Division); PC 24 at 5 (comments of the National Solid Wastes Management Association, Illinois Chapter); Exh. 45 at 1-2 (comments of Andrew Quigley, Executive Director of the Solid Waste Agency of Lake County).

Costs of Relocating Facilities. Mr. Pick testified that relocating these facilities would be expensive in high-density areas. "The cost of land alone for a typical industrial property in a high density population area often exceeds \$200,000 per acre." Tr.1 at 259; Exh. 33 at 2. He also noted that many other location standards (regarding flood zones, archeological sites, and the like) apply to these facilities that make them difficult to site. Exh. 32 at 2. For the City of Lake Forest's compost facility, he estimated the administrative costs of getting a new permit at \$80,000 to \$90,000. Tr.1 at 307.

Mr. Pick also testified that the cost of developing a ten-acre facility, which could handle 70,000 cubic yards/year, would be approximately three million dollars. Tr.1 at 312-314. That capacity is larger than average, but he believes that developers would look to develop larger sites under proponents' proposed amendments because if they have to be in a rural area, they will want to have a lot of capacity. He believes that if proponents'

proposal is adopted, new sites would be approximately about 40 acres in size. Tr.1 at 315.

Land and Lakes Company also argued that proponents' proposed amendments would make it very difficult to develop new composting facilities in urban areas. Tr.1 at 221. The Illinois Chapter of the National Solid Wastes Management Association also commented:

The proposed amendment will increase the difficulty of developing new composting facilities in metropolitan areas. As discussed above, landscape waste has been banned from landfills since July 1, 1990.²⁶ 415 ILCS 5/22.22. Moreover, the burning of landscape waste is prohibited in counties with a population of more than 400,000. 415 ILCS 5/9. Many municipalities throughout the State have adopted ordinances prohibiting the burning of landscape waste. Thus, composting facilities remain the only viable option for handling landscape waste in many metropolitan areas. PC 24 at 4-5.

While the City of Crystal Lake did not provide cost estimates for relocating its facility, Mr. Wakefield testified that the City and its taxpayers would face serious financial harm if the Board adopted proponents' proposal. Exh. 42 at 2. Several of the City of Crystal Lake residents who submitted public comments concurred. See PC 16 at 1 (comments of Cathy Mueller); PC 17 at 1 (comments of Franklin Pease); PC 18 at 1-2 (comments of Barbara Zimmerman); PC 19 at 1 (comments of Carolyn Schaper); PC 20 at 1 (comments of Keith and Libby Leman).

Costs of Closures and Relocations to the State of Illinois. Ms. Munie of the Agency testified about the cost of closures and relocations to the State of Illinois if proponents' proposed amendments are adopted. She testified that there would be administrative costs to the Agency if proponents' proposed setback is applied retroactively and some facilities are forced to close. Tr.1 at 205-206. The cost of informational workshops on the new requirements would result in a total cost of between \$2,830 and \$7,104. Exh. 30 at 2. The cost of meetings with existing facilities to determine the effect of the new requirements on them would cost a total of between \$1,415 and \$1,776. Exh. 30 at 2.

Her unit estimated that 35 new facilities would need to be built to make up for those that would have to be closed because of proponents' proposal. Exh. 30 at 3. She estimated that the Agency's cost of reviewing 35 closure reports would be between \$3,962 and \$6,216. Exh. 30 at 3.

²⁶ The Board notes that there are exceptions to this ban. See, e.g., Pub. Act 90-266, eff. July 30, 1977 (amended 415 ILCS 5/22.22).

Ms. Munie stated that closures may result in some additional illegal dumping of landscape waste, but the cost of additional field work for inspections and enforcement would be hard to quantify. Exh. 30 at 3. Assuming that at least five facilities would close only in response to enforcement, she estimated that the total costs for inspection and trial preparation would be between \$9,472 and \$25,110. Exh. 30 at 2.

Ms. Munie explained that new facilities would require public hearings and new permit applications. Exh. 30 at 3. Each public hearing costs between \$15,000 to \$20,000. Exh. 30 at 3. Her cost estimate includes costs of reviewing new permit applications. Tr.1 at 213-214. If 35 new facilities were needed, total costs to the Agency would be between \$525,000 and \$700,000 during the first few years after proponents' proposal became effective. Exh. 30 at 3. However, Ms. Munie did state that the Agency "does not believe that adding a non-retroactive setback requirement would have any impact on our administrative cost." Exh. 30 at 2.

Several opponents also argued that if facilities were forced to close because of proponents' proposed amendments, the amendments would be considered a regulatory taking. These opponents also argued that the U.S. and Illinois constitutions would require the State of Illinois to compensate those whose facilities would be closed because of proponents' proposal.

The proposed regulation may force the State of Illinois to pay millions of dollars as compensation for a regulatory taking. Regulations that substantially interfere with the value of property interests can constitute an impermissible regulatory taking under the Fifth and Fourteenth Amendments to the U.S. Constitution. PC 25 at 3, citing Browning-Ferris Industries v. City of Maryland Heights, Missouri, 747 F. Supp. 1340, 1347 (E.D. Mo. 1990), citing Nollan v. California Coastal Commission, 483 U.S. 825, 107 S. Ct. 3141, 97 L. Ed. 2d 677 (1987). The remedy is either the payment of compensation or the invalidation of the regulation. PC 25 at 3, citing Williamson County Regional Planning Commission v. Hamilton Bank of Johnson City, 473 U.S. 172, 197, 105 S. Ct. 3108, 3122, 87 L. Ed. 2d 126 (1985), Browning-Ferris Industries, 747 F. Supp. at 1346-1351. See also Tr.1 at 219-221, 236.

The City of Lake Forest, the City of Crystal Lake, the Illinois Chapter of the National Solid Wastes Management Association, the Solid Waste Agency of Lake County, and Land and Lakes Company raised a similar argument. See PC 26 at 22 (comments of the City of Lake Forest); Tr.2 at 232-234 (testimony of Mr. Wakefield on behalf of the City of Crystal Lake); Tr.2 at 264 (testimony of Mr. Quigley on behalf of the Solid Waste Agency of Lake County); PC 24 at 6-7 (comments of the National Solid Wastes Management Association, Illinois Chapter); Exh. 31 at 2 (testimony of Ms. Harvey on behalf of Land and Lakes Company).

In a related argument, the City of Lake Forest also argued that proponents' proposal is unconstitutional because it is retroactive:

Retroactive application of a standard is prohibited under the due process clauses of both the United States and Illinois Constitutions if such application impermissibly eliminates or impairs vested rights acquired under existing laws, or creates new obligations, imposes new duties, or attaches new disabilities with respect to past transactions or issues. PC 2 at 6, citing First of America Trust Company v. Armstead, 171 Ill. 2d 282, 664 N.E.2d 36 (1996); United States Steel Credit Union v. Knight, 32 Ill. 2d 138, 142, 204 N.E.2d 4 (1965); Chemrex, Inc. v. PCB, 257 Ill. App. 3d 274, 628 N.E.2d 963, 966 (1st Dist. 1993).

In deciding whether to invalidate a retroactive rule, Illinois courts consider “whether the agency action would result in injury or substantial prejudice; whether the regulation represents an abrupt departure from well-established practice; the extent to which the party against whom the regulation is applied relied on the former regulation; and the degree of burden imposed upon that party.” PC 2 at 8, citing Gonzales-Blanco, 110 Ill. App. 3d at 197; Cartwright v. Civil Service Commission, 80 Ill. App. 3d 787, 400 N.E.2d 581 (1st Dist. 1980), citing Retail, Wholesale and Department Store Union v. NLRB, 466 F.2d 380 (D.C. Cir. 1972) and International Association of Machinists v. United Aircraft Corp., 534 F.2d 422 (2d Cir. 1975).

The City of Lake Forest argued that an Illinois court is likely to invalidate proponents' proposed rule upon consideration of these factors. It noted that existing facilities have made expenditures in reliance on the existing regulations, and that they could not have anticipated this change. PC 2 at 8-9. The City of Lake Forest conceded that a government may enact an “amortization” regulation that will gradually eliminate existing, non-complying facilities, but only upon a clear finding that the public welfare requires it. PC 26 at 29. According to the City of Lake Forest, the balance of interests in this situation favors the compost facilities, which have spent considerable sums to develop their facilities and would incur substantial relocation costs to comply with proponents' proposal, as opposed to proponents, who have not shown a scientific consensus that these facilities pose a public health threat. PC 26 at 30.

The City of Lake Forest argued that even if the regulation applied to existing facilities only upon the expiration of their current permits, it would be an invalid retroactive rule. The City noted that under the Board's current regulations, an application for permit renewal need address only changed circumstances, and as long as those changed circumstances do not result in a violation of the Act, the facility is entitled to renewal of its permit. PC 26 at 24, citing 35 Ill. Adm. Code 831.116(a), 832.106(a). The City stated that the Agency may modify “operating standards” at the time of permit renewal as necessary to prevent violations of the Act but these changes “only impact facility operation and not location.” PC 26 at 24 (emphasis in original), citing 415 ILCS

5/21(d), 35 Ill. Adm. Code 832.106. The City argued that the current regulations create an expectation that permits will be renewed if they meet these requirements. PC 26 at 25.

Costs of Alternatives. Mr. Pick argued that even those facilities that can successfully relocate will incur higher costs because they would be situated at greater distances from landscape waste sources and would incur greater transportation costs to reach those more remote sites. Tr.1 at 260. He testified that he expects transportation and tipping fees to rise 30 to 40% if proponents' proposal is adopted. Tr.1 at 303-304. Higher prices would result, according to Mr. Pick. Tr.1 at 261. Furthermore, since the profit margin on compost is low, "private operators would have little incentive to start over and accept lower margins [as compared to the higher margins on peat moss and wood mulches]. A disposal capacity vacuum would likely result." Tr.1 at 262; Exh. 33 at 3.

Mr. Naatz testified that the cost of managing landscape waste would increase by at least \$100,000 per year for the City of Lake Forest if proponents' proposal is adopted. Tr.1 at 246, 247; Exh. 32 at 5. Several opponents of proponents' proposal also argued that it will increase open dumping or burning of landscape waste, or encourage backyard compost piles that could become a nuisance. See PC 23 at 1 (comments of Will County Land Use Department, Waste Services Division); Tr.2 at 237 (testimony of Mr. Wakefield on behalf of the City of Crystal Lake); Tr.1 at 263 (testimony of Charles Pick of Organics Management Company); Exh. 45 at 2 (testimony of Mr. Quigley on behalf of the Solid Waste Agency of Lake County). One opponent noted that the proposal could lead to a need for more landfills. PC 8 at 1 (comments of Lois Grimm, resident of Chicago).

Board Findings on the Need for Additional Setbacks

The Board finds that compost facilities may increase the concentrations of airborne *A. fumigatus* spores in nearby, downwind off-site areas. The Board recognizes that mowing the lawn, sweeping the basement, and other activities may expose some people to higher levels of *A. fumigatus* spores than they would be exposed to from being near a compost facility. However, individuals typically have greater control over limiting the former types of exposures and they often do not face such exposures on a daily basis. The Board also recognizes that even very low levels of *A. fumigatus* spores from any source may adversely affect certain individuals. Nevertheless, there is a potential risk of increased exposure to *A. fumigatus* spores in areas downwind of compost facilities and *A. fumigatus* spores can harm some people. The Board finds that it would be prudent to minimize the opportunities for compost facilities to expose surrounding sensitive populations to levels of *A. fumigatus* spores above background.

The Board acknowledges that compost facilities may be sued if they do not comply with operational requirements or if they cause air pollution in violation of Section 9(a) of the Act (415 ILCS 5/9(a) (1996)). The Board notes that citizens may bring such enforcement actions before the Board. See 415 ILCS 5/31(d) (1996); 35 Ill. Adm. Code

103.120. This option remains available regardless of setback requirements, but is not an adequate substitute for setback requirements.

The Board finds that while operational standards are important for minimizing the off-site distribution of *A. fumigatus* spores from compost facilities, it appears that even good management practices at compost facilities do not necessarily prevent *A. fumigatus* spore concentrations downwind from being above background levels in nearby off-site areas. The Board also notes that procedures already exist (*e.g.*, adjusted standards, site-specific rules) to allow individual facilities the opportunity to demonstrate site-specific circumstances calling for site-specific relief from general requirements, including setback requirements.

As stated above at page 13, persons potentially at greater risk from higher exposure to *A. fumigatus* spores are (a) persons with asthma, cystic fibrosis, immunocompromised or immunosuppressed conditions, or bioaerosol allergies, and (b) very young children. The Board believes that health care facilities, child care facilities, and schools are locations where these susceptible individuals have greater opportunities for extended exposure. These are also locations that these individuals typically have little choice about frequenting. Setback protection for these facilities is consistent with the Illinois Department of Public Health's position on this issue. It is also consistent with the recommendations of various experts, including those who acknowledge the lack of epidemiological studies linking compost facilities to human disease and the lack of a dose-response relationship for *A. fumigatus* spores.

Accordingly, while responsible composting is environmentally beneficial, the Board finds that the following facilities should have setback protection: (a) health care facilities; (b) primary and secondary schools and their associated recreational areas;²⁷ and (c) pre-school and child care facilities and their associated recreational areas.

The Board declines to include setback protection for public parks at this time. Besides the potential ambiguity of the term "public parks" and the fact that such places are often rich sources of *A. fumigatus*, persons typically have control over whether they frequent a particular public park. On this record, the case for providing a setback at this time for public parks due to potential *A. fumigatus* spore exposure is less compelling.

In proposing these amendments, the Board notes that it is not persuaded by the City of Lake Forest's argument that it is arbitrary for the Board to regulate the proximity of compost facilities to schools and hospitals while not imposing a similar restriction on other sources of air pollution that may operate near schools and hospitals. First, the Board notes that unlike various designated hazardous air pollutants, *A. fumigatus* spores from compost facilities do not have requirements for specific control technologies or

²⁷ Because the Board's proposed amendments are limited to primary and secondary schools, it does not present the ambiguities that Dr. Walker raised regarding universities.

emission rates based on ambient air quality standards. Second, “it has been recognized that evils in the same field may be of different dimensions and reform may take place one step at a time. The legislature may address itself to one stage of a problem and not take action at the same time as to other phases.” Illinois Coal Operators Association v. PCB, 59 Ill. 2d 305, 312-313, 319 N.E.2d 782, 786 (1974) (upholding the Board’s decision to exempt equipment used in construction, but not similar equipment used in mining, from certain noise regulations); see also Chicago National League Ball Club v. Thompson, 108 Ill. 2d 357, 367, 483 N.E.2d 1245, 1250 (1985) (“The legislature need not choose between legislating against all evils of the same kind or not legislating at all.”). The same principles apply to the Board when it adopts rules in its quasi-legislative capacity.

The Board finds that proponents’ proposed 1/2 mile setback distance is not supported by the record. Most studies show that *A. fumigatus* spore concentrations from compost facilities generally decrease to background levels within approximately 500 feet of the composting area. Accordingly, at that distance, the compost facility typically would not expose people to elevated levels of *A. fumigatus* spores.

In lieu of a 1/2 mile setback, the Board proposes that the current 1/8 mile (660 feet) setback distance applied for residences be extended to the following facilities: (a) health care facilities; (b) primary and secondary schools and their associated recreational areas; and (c) pre-school and child care facilities and their associated recreational areas. As Dr. Strauss testified, the literature supports an additional 160 foot buffer distance

Consistent with the current 1/8 mile setback for residences, the setback distance should be measured not from the property line of the compost facility, but from the “composting area.” See 35 Ill. Adm. Code 830.203(c). “Composting area” is defined as:

the area of a composting facility in which waste, composting material or undistributed end-product compost is unloaded, stored, staged, stockpiled, treated or otherwise managed. 35 Ill. Adm. Code 830.102.

As was pointed out at hearing, this is the relevant area from which to measure because that is the potential source of the airborne *A. fumigatus* spores. The setback should be measured from the nearest edge of the composting area to the nearest property line of the protected facilities listed above.

The Board also proposes to amend 35 Ill. Adm. Code 831.107 and 831.109(b)(3). Section 831.107 currently requires that permit applications contain a site location map showing certain items. The Board proposes to add a requirement that this map also reflect any of the additional facilities within 1/8 mile of the nearest edge of the composting area. Section 831.109 currently requires that permit applications contain various information, including proof that the facility complies with location standards. The Board proposes to add a requirement that this information include proof of compliance with the proposed 1/8 mile setback.

Given that the additional setback requirements would be imposed as a matter of prudence in light of a potential health threat, and given the potential economic costs of relocating or closing existing compost facilities, the Board proposes applying the new setback requirements prospectively. Consistent with the current language of Section 830.203(c), the new setback requirements would apply only to a compost facility developed or the permitted composting area of which is expanded after January 1, 1999.²⁸ The Board reiterates that while the proposed setback amendments in this first notice order will only apply prospectively, existing compost facilities must comply with applicable performance standards and must not cause air pollution in violation of Section 9(a) of the Act (415 ILCS 5/9(a) (1996)).

The Board will receive testimony and comment on whether it would be appropriate to apply the Board's proposed 1/8 mile setback to existing facilities, either immediately or after some period of time, such as when a facility's permit, if any, expires. In that regard, the Board notes that it does not agree that the application of such a setback to existing facilities would constitute a taking. A taking occurs in two ways. First, a taking occurs when "there is an actual physical invasion by the government onto an individual's property . . ." Forest Preserve District of DuPage County v. West Suburban Bank, 161 Ill. 2d 448, 456, 641 N.E.2d 493, 497 (1994), citing Lucas v. South Carolina Coastal Council, 505 U.S. 1003, 1014-1015, 112 S. Ct. 2886, 2892-93 (1992). Second, a taking occurs "where governmental regulation radically curtails a property owner's rights such that 'all economically beneficial or productive use of land' is denied." Forest Preserve, 161 Ill. 2d at 457, 641 N.E.2d at 497, quoting Lucas, 505 U.S. at 1015, 112 S. Ct. at 2893.

In this case, the application of a new setback to existing compost facilities would not involve any physical invasion of the facilities. Furthermore, the amendments proposed in this first notice order, if applied to existing facilities, would not so radically curtail a compost facility owner's rights so that all economically beneficial or productive use of the land is denied. In Forest Preserve, for example, the Illinois Supreme Court held that an injunction barring defendants from building a parking lot on their land did not deprive defendants of all economically viable uses of the property because defendants could use the property for other activities, including farming and storing equipment. Forest Preserve, 161 Ill. 2d at 457, 641 N.E.2d at 497. Similarly, even if the Board's proposed amendments were to apply to existing compost facilities and require some of those facilities to close, the amendments would not bar the owners of those facilities from

²⁸ The City of Lake Forest argues that proponents' proposal is ambiguous because it is unclear whether a compost facility that "complies with the location standard at the time the facility is permitted will be in violation of the standard once a school or hospital is subsequently constructed within the 1/2 mile setback." PC 26 at 17. To clarify, the proposed first notice amendments to 35 Ill. Adm. Code 830.203(c) are siting requirements. A compost facility sited in compliance with these requirements would not violate them because a health care facility, for example, is thereafter constructed within 1/8 mile.

erecting other facilities or conducting other operations on their properties. See also Tim Thompson, Inc. v. Hinsdale, 247 Ill. App. 3d 863, 888-889, 617 N.E.2d 1227, 1245 (2d Dist. 1993) (holding a change in a local zoning ordinance, which decreased the number of houses a developer could put in a subdivision, did not substantially deprive the developer of all economically viable use of the property and did not constitute a taking).

The Board acknowledges, however, that the question remains of whether such a regulation would constitute an invalid retroactive regulation. As noted earlier, the Board seeks testimony and comment on how long it would take to amortize investments in those facilities.

CONCLUSION

The Board acknowledges that responsible composting is environmentally beneficial. Nevertheless, airborne *A. fumigatus* spores from compost facilities may occur at levels above background in nearby off-site areas downwind of compost facilities. *A. fumigatus* spores pose a potential health threat to persons with asthma, cystic fibrosis, immunocompromised or immunosuppressed conditions, or bioaerosol allergies. Very young children are also potentially at greater risk because their immune systems are immature.

Based on the presence of these susceptible individuals, the Board proposes that the following additional facilities have setback protection: (a) health care facilities; (b) primary and secondary schools and their associated recreational areas; and (c) pre-school and child care facilities and their associated recreational areas. Because the consensus of studies shows that *A. fumigatus* spore concentrations from compost facilities generally decrease to background levels within approximately 500 feet of the composting area, the current 1/8 mile (660 feet) setback applied for residences will be extended to these other facilities. The Board also proposes corresponding changes to requirements for site location maps and other information in permit applications.

Since the additional setback requirements would be imposed as a matter of prudence in the face of a potential health threat, and in light of the potential economic costs of relocating or closing existing compost facilities, the Board at this time proposes applying the new setback requirements only to a compost facility developed or the permitted composting area of which is expanded after January 1, 1999. The Board requests testimony and comment, however, on the technical feasibility and economic reasonableness of its proposed 1/8 mile setback on both a retroactive and prospective basis.

ORDER

The Board proposes for first notice the following amendments to 35 Ill. Adm. Code 830.203(c), 831.107, and 831.109(b)(3). The Clerk of the Board is directed to file these proposed rules with the Secretary of State.

TITLE 35: ENVIRONMENTAL PROTECTION
 SUBTITLE G: WASTE DISPOSAL
 CHAPTER I: POLLUTION CONTROL BOARD
 SUBCHAPTER i: SOLID WASTE AND SPECIAL WASTE HAULING

PART 830
 STANDARDS FOR COMPOST FACILITIES

SUBPART A: GENERAL PROVISIONS

Section	
830.101	Purpose, Scope and Applicability
830.102	Definitions
830.103	Incorporations by Reference
830.104	Exempt Operations and Activities
830.105	Permit-Exempt Facilities and Activities
830.106	On-Farm Landscape Waste Compost Facility
830.107	Compliance Dates
830.108	Severability

SUBPART B: STANDARDS FOR OWNERS AND OPERATORS OF LANDSCAPE
 WASTE COMPOST FACILITIES

Section	
830.201	Scope and Applicability
830.202	Minimum Performance Standards and Reporting Requirements for Landscape Waste Compost Facilities
830.203	Location Standards for Landscape Waste Compost Facilities
830.204	Additional Stormwater and Landscape Waste Leachate Controls at Permitted Landscape Waste Compost Facilities
830.205	Additional Operating Standards for Permitted Landscape Waste Compost Facilities
830.206	Operating Plan for Permitted Landscape Waste Compost Facilities
830.207	Salvaging at Permitted Landscape Waste Compost Facilities
830.208	Access Control at Permitted Landscape Waste Compost Facilities
830.209	Load Checking at Permitted Landscape Waste Compost Facilities
830.210	Personnel Training for Permitted Landscape Waste Compost Facilities
830.211	Recordkeeping for Permitted Landscape Waste Compost Facilities
830.212	Contingency Plan for Permitted Landscape Waste Compost Facilities
830.213	Closure Plan for Permitted Landscape Waste Compost Facilities

SUBPART E: QUALITY OF END-PRODUCT COMPOST

Section	
830.501	Scope and Applicability
830.502	Compost Classes
830.503	Performance Standards for General Use Compost
830.504	Testing Requirements for End-Product Compost Derived from Landscape Waste
830.507	Sampling Methods
830.508	Off-Specification Compost

SUBPART F: FINANCIAL ASSURANCE

Section	
830.601	Scope and Applicability
830.602	Financial Assurance Plan
830.603	Written Cost Estimate
830.604	Financial Assurance Fund
830.605	Financial Assurance Mechanism
830.606	Financial Assurance Certification
Appendix A	Early Detection and Groundwater Monitoring Program
Appendix B	Performance Test Methods
Table A	Inorganic Concentration Limits for General Use Compost
Table B	Sampling and Handling Requirements
Table C	Seed Germination Record Sheet

AUTHORITY: Implementing Sections 5, 21, 22.33, 22.34, 22.35 and 39 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/5, 21, 22.33, 22.34, 22.35, 27 and 39].

SOURCE: Adopted at 18 Ill. Reg. 17017, effective November 15, 1994; amended in R97-29 at _____ Ill. Reg. _____, effective _____.

BOARD NOTE: This Part implements the Illinois Environmental Protection Act as of July 1, 1994.

NOTE: In this Part, superscript numbers or letters are denoted by parentheses; subscript are denoted by brackets.

Section 830.203 Location Standards for Landscape Waste Compost Facilities

With the exception of on-farm landscape waste operations, all landscape waste compost facilities subject to this Part shall comply with the following:

- a) The composting area of the facility must include *a setback of at least 200 feet from the nearest potable water supply well*. (Section 39(m) of the Act.)
- b) The composting area of the facility must be *located outside the boundary of the 10-year floodplain or the site shall be floodproofed*. (Section 39(m) of the Act.)
- c) The composting area of the facility must be *located so as to minimize incompatibility with the character of the surrounding area, including at least a 200 foot setback from any residence, and in the case of a facility that is developed or the permitted composting area of which is expanded after November 17, 1991, the composting area shall be located at least 1/8 mile from the nearest residence (other than a residence located on the same property as the facility)*. (Section 39(m) of the Act.) In addition, in the case of a facility that is developed or the permitted composting area of which is expanded after January 1, 1999, the composting area shall be located at least 1/8 mile from each of the following:
- 1) health care facilities;
 - 2) primary and secondary schools and their associated recreational areas; and
 - 3) pre-school and child care facilities and their associated recreational areas.
- d) If, at the time the facility permit application is deemed complete by the Agency pursuant to 35 Ill. Adm. Code 832, the composting area of the facility is located within 1/4 mile of the nearest off-site residence or within 1/2 mile of the nearest platted subdivision containing a residence, or if more than 10 residences are located within 1/2 mile of the boundaries of the facility, in order to minimize incompatibility with the character of the surrounding area, landscape waste must be processed by the end of the operating day on which the landscape waste is received into windrows, other piles or a contained composting system providing proper conditions for composting.
- e) The composting area of the facility must be designed *to prevent any compost material from being placed within 5 feet of the water table, to adequately control runoff from the site, and to collect and manage any landscape waste leachate that is generated on the site*. (Section 39(m) of the Act.) Compliance with the water table distance requirement may be demonstrated by either of the following means:

- 1) Using published water table maps or other published documentation to establish the location of the water table in relation to site elevation; or
 - 2) Actual measuring of the water table elevation at least once per month for three consecutive months.
- f) The facility must meet all requirements under the Wild and Scenic Rivers Act (16 U.S.C. 1271 et seq.).
- g) The facility must not restrict the flow of a 100-year flood, result in washout of landscape waste from a 100-year flood, or reduce the temporary water storage capacity of the 100-year floodplain, unless measures are undertaken to provide alternative storage capacity, such as lagoons, holding tanks, or provision of drainage around structures at the facility.
- h) The facility must not be located in any area where it may pose a threat of harm or destruction to the features for which:
- 1) An irreplaceable historic or archaeological site has been listed pursuant to the National Historic Preservation Act (16 U.S.C. 470 et seq.) or the Illinois Historic Preservation Act [20 ILCS 3410];
 - 2) A natural landmark has been designated by the National Park Service or the Illinois State Historic Preservation Office; or
 - 3) A natural area has been designated as a Dedicated Illinois Nature Preserve pursuant to the Illinois Natural Areas Preservation Act [525 ILCS 30].
- i) The facility must not be located in any area where it may jeopardize the continued existence of any designated endangered species, result in the destruction or adverse modification of the critical habitat for such species, or cause or contribute to the taking of any endangered or threatened species of plant, fish or wildlife listed pursuant to the Endangered Species Act (16 U.S.C. 1531 et. seq.), or the Illinois Endangered Species Protection Act [520 ILCS 10].

(Source: Amended at ___ Ill. Reg. _____, effective _____)

TITLE 35: ENVIRONMENTAL PROTECTION
 SUBTITLE G: WASTE DISPOSAL
 CHAPTER I: POLLUTION CONTROL BOARD
 SUBCHAPTER i: SOLID WASTE AND SPECIAL WASTE HAULING

PART 831
 INFORMATION TO BE SUBMITTED IN A COMPOST FACILITY PERMIT
 APPLICATION

SUBPART A: GENERAL INFORMATION REQUIRED FOR ALL COMPOST
 FACILITIES

Section

831.101	Scope and Applicability
831.102	Severability
831.103	Certification by Professional Engineer
831.104	Application Fees
831.105	Required Signatures
831.106	Site Identification
831.107	Site Location Map
831.108	Site Plan Map
831.109	Narrative Description of the Facility
831.110	Legal Description
831.111	Proof of Land Ownership and Certification
831.112	Closure Plan
831.113	Financial Assurance
831.114	Operator-Initiated Modification of an Approved Permit
831.115	Modification to Obtain Operating Authorization
831.116	Permit Renewal

AUTHORITY: Implementing Sections 5, 21, 22.33, 22.34, 22.35 and 39 and authorized by Section 27 of the Environmental Protection Act [415 ILCS 5/5, 21, 22.33, 22.34, 22.35, 27 and 39].

BOARD NOTE: This Part implements the Illinois Environmental Protection Act as of July 1, 1994.

SOURCE: Adopted at 18 Ill. Reg. 16942, effective November 30, 1994; amended in R97-29 at ____ Ill. Reg. _____, effective _____.

Section 831.107 Site Location Map

All permit applications shall contain a site location map on the most recent United States Geological Survey ("USGS") quadrangle of the area from the 7 1/2 minute series (topographic), or on such other map whose scale clearly shows the following information:

- a) The permit area and all adjacent property, extending at least 1/2 mile beyond the boundary of the facility;
- b) The prevailing wind direction;
- c) All rivers designated for protection under the Wild and Scenic Rivers Act (16 U.S.C. 127 et seq.);
- d) The limits of all 10-year floodplains;
- e) All natural areas designated as a Dedicated Illinois Nature Preserve pursuant to the Illinois Natural Areas Preservation Act [525 ILCS 30];
- f) All historic and archaeological sites designated by the National Historic Preservation Act (16 U.S.C. 470 et seq.) and the Illinois Historic Preservation Act [20 ILCS 3410];
- g) All areas identified as a critical habitat pursuant to the Endangered Species Act (16 U.S.C. 1531 et seq.) and the Illinois Endangered Species Protection Act [520 ILCS 10];
- h) All main service corridors, transportation routes, and access roads to the facility;
- i) All residences and areas in which people congregate within 1/2 mile of the facility boundaries;
- j) The locations of all on-site potable water supply wells and all potable water supply wells within 1/8 mile of the boundaries of the facility; ~~and~~
- k) The types of land use for the properties immediately adjacent to the facility (i.e., residential, commercial, industrial, agricultural, etc.). This must include any zoning classifications of these properties and the location (and function) of all buildings within 1/2 mile of the facility; ~~and-~~
- l) In the case of a facility that is developed or the permitted composting area of which is expanded after January 1, 1999, all of the following within 1/8 mile of the nearest edge of the composting area:
 - 1) health care facilities;

- 2) primary and secondary schools and their associated recreational areas; and
- 3) pre-school and child care facilities and their associated recreational areas.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

Section 831.109 Narrative Description of the Facility

The permit application must contain a written description of the facility with supporting documentation describing the procedures and plans that will be used at the facility to comply with the requirements of this Part and any other applicable Parts of 35 Ill. Adm. Code: Chapter I. Such description must include, but not be limited to, the following information:

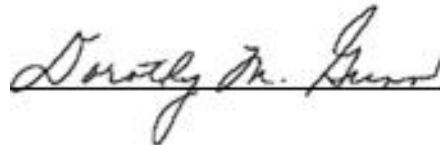
- a) An estimate of the maximum annual volume and peak daily volume of landscape waste the facility will be able to process;
- b) Proof of the following:
 - 1) *The facility includes a setback of at least 200 feet from the nearest potable water supply well;*
 - 2) *The facility is located outside the boundary of the 10-year floodplain or the site will be floodproofed;*
 - 3) *The facility is located so as to minimize incompatibility with the character of the surrounding area, including at least a 200 foot setback from any residence and in the case of a facility that is developed or the permitted composting area of which is expanded after November 17, 1991 the composting area is located at least 1/8 mile from the nearest residence (other than a residence located on the same property as the facility). In addition, in the case of a facility that is developed or the permitted composting area of which is expanded after January 1, 1999, the composting area is located at least 1/8 mile from each of the following:*
 - A) health care facilities;
 - B) primary and secondary schools and their associated recreational areas; and
 - C) pre-school and child care facilities and their associated recreational areas; and

- 4) *The design of the facility will prevent any compost material from being placed within 5 feet of the water table, will adequately control runoff from the site, and will collect and manage any leachate that is generated on the site* (Section 39(m) of the Act);
- c) An operating plan, satisfying the requirements set forth in 35 Ill. Adm. Code 830.206;
- d) An early detection or groundwater monitoring system design, in accordance with 35 Ill. Adm. Code 830.Appendix A, if required pursuant to 35 Ill. Adm. Code 830.205(b)(1)(A)(iii) or 830.205(b)(2)(A)(iii);
- e) A contingency plan, satisfying the requirements set forth in 35 Ill. Adm. Code 830.212;
- f) Specification of the operating hours of the facility;
- g) The types of landscape waste that are proposed to be received by the facility;
- h) Descriptions of the storage areas (including their capacities) that will be used to stage the waste before windrowing, to store bulking agent(s) or additives and to store the end-product compost; and
- i) Description of personnel training procedures, satisfying the requirements of 35 Ill. Adm. Code 830.210.

(Source: Amended at ____ Ill. Reg. _____, effective _____)

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above opinion and order was adopted on the 17th day of June 1998 by a vote of 6-0.



Dorothy M. Gunn, Clerk
Illinois Pollution Control Board

ATTACHMENT 1**EXHIBITS R97-29**

- Exh. 1:** Prefiled testimony of Susan Garrett.
- Exh. 2:** Additional testimony of Susan Garrett.
- Exh. 3:** Prefiled testimony of Steven Handler.
- Exh. 4:** Additional testimony of Steven Handler.
- Exh. 5:** Prefiled testimony of Gloria Loukas.
- Exh. 6:** Prefiled testimony of Renuka Desai.
- Exh. 7:** Prefiled testimony of Jack Darin of the Sierra Club.
- Exh. 8:** Prefiled testimony of William Holleman of the Illinois Citizen Action Public Education Committee.
- Exh. 9:** Prefiled testimony of Earl Johnson of the Illinois Citizen Action Public Education Committee.
- Exh. 10:** Prefiled testimony of Cheryl Doros.
- Exh. 11:** Prefiled testimony of Peter Mueller.
- Exh. 12:** Prefiled testimony of Edward Grskovich.
- Exh. 13:** Prefiled testimony of Jacob Dumelle of the American Lung Association of Metropolitan Chicago.
- Exh. 14:** Prefiled testimony of Mary Matthews and two lung diagrams.
- Exh. 15:** Prefiled testimony of Scott Garrett.
- Exh. 16:** NIOSH Alert, "Request for Assistance in Preventing Organic Dust Toxic Syndrome."
- Exh. 17:** *Curriculum Vitae* of Stephen Charles Edberg.

Exh. 18: Proponents' binder of miscellaneous materials forwarded to various persons and responses received from various persons, including persons in the health field.

Exh. 19-A: National Institute of Allergy and Infectious Disease, "Asthma and Allergy Statistics," February 1996.

Exh. 19-B: "Data Watch, The case for managing asthma care."

Exh. 19-C: "An Economic Evaluation of Asthma in the United States," Weiss, Gergen, and Hodgson, March 26, 1992.

Exh. 20: Letter of August 30, 1994, from Rita Messing of the Minnesota Department of Health to Jerry Johnson.

Exh. 21-A: Letter of August 7, 1997, from John Lumpkin of the Illinois Department of Public Health to Susan Garrett and Renuka Desai.

Exh. 21-B: Letter of July 8, 1997, from Clinton Mudgett of the Illinois Department of Public Health to Renuka Desai.

Exh. 22: Letter of July 25, 1997, from Colin Thacker of the Lake County Health Department to Renuka Desai.

Exh. 23: "Allergic Bronchopulmonary Aspergillosis from a Contaminated Dump Site," Kramer, Kurup, and Fink.

Exh. 24: "Locally invasive pulmonary aspergillosis occurring in a gardener: an occupational hazard?," Zuk, King, Zakhour, and Delaney, 1989.

Exh. 25-A: "Hypersensitivity pneumonitis from residential composting: residential composter's lung," Brown, Masood, Couser, and Patterson, January 1995.

Exh. 25-B: "Hypersensitivity pneumonitis due to *Aspergillus fumigatus* in compost," Vincken and Roels.

Exh. 26-A: "Comparisons of Organic Dust Exposures in Agricultural Occupations and Waste Processing Industries," Clark, 1986.

Exh. 26-B: "Organic Dust Exposure From Compost Handling: Response of an Animal Model," Frazer, Jones, Petsonk, Kullman, Barger, Afshari, Jones, and Castranova, 1993.

Exh. 26-C: "Organic Dust Exposures From Compost Handling: Case Presentation and Respiratory Exposure Assessment," Weber, Kullman, Petsonk, Jones, Olenchock, Sorenson, Parker, Marcelo-Baciu, Frazer, and Castranova, 1993.

Exh. 27: “Respiratory pathophysiologic responses, Effect of environmental molds on risk of death from asthma during the pollen season,” Targonski, Persky, and Ramekrishnan.

Exh. 28: “Medical Issues related to Municipal Waste Composting,” Johanning, Olmsted, and Yang.

Exh. 29 reserved by hearing officer.

Exh. 30: Prefiled testimony of Joyce Munie of the Illinois Environmental Protection Agency.

Exh. 31: Prefiled testimony of Elizabeth Harvey on behalf of Land and Lakes Company.

Exh. 32: Prefiled testimony of Thomas Naatz and two color maps (one map entitled “Aspergillosis Cases by Zip Code Primary or Secondary Diagnosis 1993 Cases per 100,000 Population” and the other map entitled “Allergic Alveolitis Cases by Zip Code Primary or Secondary Diagnosis 1993 Cases per 100,000 Population”) from a report entitled “Environmental Characterization of Bio-Aerosol Emissions from the DK Recycling Systems, Inc. Composting Facility in Lake Forest, Illinois,” dated April 15, 1996, which is included with Mr. Naatz’s prefiled testimony.

Exh. 33: Prefiled testimony of Charles Pick.

Exh. 34: Prefiled testimony of Karen Strauss.

Exh. 35: *Curriculum Vitae* of Karen Strauss.

Exh. 36: Prefiled testimony of Shirley Baer of the Illinois Environmental Protection Agency.

Exh. 37: “Asthma Mortality and Hospitalization Among Children and Young Adults—United States, 1980-1993,” May 22/29, 1996.

Exh. 38: “Environmental Risk Factors of Childhood Asthma in Urban Centers,” Malveaux and Fletcher-Vincent, September 1995.

Exh. 39: “Observations on Asthma,” Bates, September 1995.

Exh. 40: “Guidelines for the Diagnosis and Management of Asthma, National Heart, Lung, and Blood Institute, National Asthma Education Program, Expert Panel Report,” September 1991.

Exh. 41: Illinois Environmental Protection Agency’s “Comparison of Landscape Waste Standards.”

Exh. 42: Comments of the City of Crystal Lake.

Exh. 43: Comments of Paul Walker and Timothy Kelley of Illinois State University.

Exh. 44 reserved by hearing officer.

Exh. 45: Comments of Andrew Quigley of the Solid Waste Agency of Lake County, Illinois.

ATTACHMENT 2**PUBLIC COMMENTS R97-29**

- PC 1 Comments of Robert Gillespie of DK Recycling Systems, Inc.
- PC 2 Comments of the City of Lake Forest
- PC 3 Comments of Lauren Beth Gash, State Representative
- PC 4 Comments of the City of Crystal Lake
- PC 5 Comments of the Chicago Recycling Coalition
- PC 6 Comments of the Lake County Conservation Alliance
- PC 7 Comments of the City of Evanston
- PC 8 Comments of Lois Grimm
- PC 9 Comments of Waste Management
- PC 10 Comments of the City of Elgin
- PC 11 Comments of Mark Teegen
- PC 12 Comments of Proponents
- PC 13 Comments of Proponents
- PC 14 Comments of Eliot Epstein, Ph.D., of E&A Environmental Consultants, Inc.
- PC 15 Comments of the Town of Normal
- PC 16 Comments of Cathy Mueller
- PC 17 Comments of Franklin Pease
- PC 18 Comments of Barbara Zimmerman
- PC 19 Comments of Carolyn Schaper
- PC 20 Comments of Keith and Libby Leman
- PC 21 Comments of the Illinois Composting Council
- PC 22 Comments of Gloria Loukas
- PC 23 Comments of Will County Land Use Department, Waste Services Division
- PC 24 Comments of the National Solid Wastes Management Association, Illinois Chapter
- PC 25 Comments of Land and Lakes Company
- PC 26 Comments of the City of Lake Forest with Karen Strauss' Supplemental Information
- PC 27 Comments of the Illinois Environmental Protection Agency