



## **Economic Impact Analysis Virginia Department of Planning and Budget**

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### **12 VAC 5-585 – Amendments to Biosolids Use Regulations**

#### **Virginia Department of Health**

March 1, 2004

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The Department of Planning and Budget (DPB) has analyzed the economic impact of this proposed regulation in accordance with Section 2.2-4007.G of the Administrative Process Act and Executive Order Number 21 (02). Section 2.2-4007.G requires that such economic impact analyses include, but need not be limited to, the projected number of businesses or other entities to whom the regulation would apply, the identity of any localities and types of businesses or other entities particularly affected, the projected number of persons and employment positions to be affected, the projected costs to affected businesses or entities to implement or comply with the regulation, and the impact on the use and value of private property. The analysis presented below represents DPB's best estimate of these economic impacts.

### **Summary of the Proposed Regulation**

The general assembly mandates in §32.1-164.5 of the Code of Virginia that the State Board of Health, with the assistance of the Department of Environmental Quality (DEQ) and the Department of Conservation and Recreation (DCR), promulgate regulations to ensure that (i) sewage sludge permitted for land application, marketing, or distribution is properly treated or stabilized, (ii) land application, marketing, and distribution of sewage sludge is performed in a manner that protects public health and the environment, and (iii) the escape, flow, or discharge of sewage sludge is not performed in a manner that would cause pollution of state waters. The biosolids use regulations are being amended in response to a petition for rulemaking from entities that have been issued permits for land application of biosolids in various counties across the Commonwealth. §2.2-4007 of the Code of Virginia provides that any person may petition an agency to request the development of a new regulation or an amendment to an existing regulation.

In response to the petition for rulemaking, the State Board of Health has proposed the following amendments to the biosolids use regulations: (1) Entities issued permits for land application of biosolids will be required to provide written evidence of financial responsibility to the Virginia Department of Health (VDH) and to each locality in which it is permitted to land apply biosolids. (2) The permit holder will be required to inform VDH, the affected local governments, and the treatment facility from which the biosolids originated of complaints and begin an investigation within 24 hours of receiving the complaint. All complaints and actions taken in response to the complaints are to be documented by the permit holder and submitted to VDH with the monthly land application report. Copies are also to be submitted to the relevant local governments and the owner of the treatment facility from which the biosolids originated. (3) Permitted entities will be required to provide notification in writing to local governments in whose jurisdiction biosolids are being applied at least 15 days prior to commencing the land application process. The proposed regulation specifies the information to be included in the notification letter. (4) Permitted entities will be required to post signs at all land application sites at least 48 hours prior to the application of biosolids. The signs are to remain in place at least 48 hours after the land application process has been completed. The proposed regulation specifies the type, size, contents, and location of the signs. (5) Permit holders will be responsible for the cleanup and removal of biosolids spilled during transport to the land application site or to and from a storage facility. The operations manual will be required to include a plan for the prevention of spills during transport and for the cleanup and removal of spills when they do occur. All personnel are to be trained in the procedures for spill cleanup and removal. All off-site spills are to be reported to VDH and the affected local governments within 24 hours and a written report including actions taken in response to the spill are to be submitted to VDH and the relevant local governments within five working days.

## **Estimated Economic Impact**

The proposed regulation makes amendments to the existing biosolids use regulations. Sewage sludge is the solid, semisolid, or liquid by-product generated during the treatment of wastewater at sewage treatment plants. Biosolids refer to sewage sludge that has been treated for pathogens, disease vector attraction, and pollutants such that it can be used for land application, marketing, and distribution. The biosolids use regulations establish management practices,

concentration limits and loading rates for chemicals, and treatment and use requirements designed to control and reduce pathogens and the attraction of disease vectors.

Virginia's biosolids use regulations require the same chemical and pathogen standards required under federal regulations. However, VDH believes that the management practices established for land application of biosolids in Virginia are more stringent than those required by federal regulations. Several other states such as Florida, Wisconsin, and New Jersey allow for the land application of biosolids. However, according to VDH, Virginia is the only state that, in effect, limits land application at the agronomic rate to once in three years (classified as infrequent) by requiring extensive soil and groundwater monitoring for all land applications taking place more than once every three years.

According to a study by the National Academy of Sciences<sup>1</sup>, approximately 5.6 million dry tons of sewage sludge are used or disposed of annually in the United States. Of this, approximately 60% or 3.36 million dry tons are used for land application. In Virginia, 200,000 dry tons of biosolids were land applied on 42,000 acres of land in 2002.

Regulations governing the use of biosolids have been in place in Virginia since 1979. The proposed regulation amends the existing biosolids use regulations to include financial responsibility requirements, additional sign-posting and notification requirements, procedures for handling complaints, and the development and implementation of a spill prevention and response plan during the transportation of biosolids by permitted entities. The proposed amendments were developed by the biosolids use regulations advisory committee (BURAC) that included state and local government representatives, representatives of biosolids land applicators, representatives of farm and agriculture interests in Virginia, and other interested parties. While a majority of BURAC members were in favor of the draft amendment language, two members requested more stringent requirements be included in the regulation and filed a minority report to the State Board of Health. According to VDH, some of the minority report recommendations have been incorporated into the proposed regulation.

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<sup>1</sup> "Biosolids Applied to Land: Advancing Standards and Practices", National Academy of Sciences, 2002

(1) Entities issued permits for land application of biosolids will be required to provide evidence of financial responsibility, including both current liability insurance and pollution insurance, to VDH and to each locality in which they are permitted to land apply biosolids. The regulation requires all permitted entities to provide financial assurance of at least \$1,000,000 per occurrence. In addition to the per occurrence amount, permitted entities will also be required to provide an minimum aggregate amount of financial assurance: \$1,000,000 for entities with less than \$5,000,000 in annual gross revenue and \$2,000,000 for entities with over \$5,000,000 in annual gross revenue. The coverage is to be maintained during the entire time the entity is permitted to transport, store, or land apply biosolids in Virginia. The funds are to be available to pay for cleanup costs, personal injury claims, and property damage resulting from the transport, storage, and land application of biosolids.

Under the existing regulation, permit holders are not required to provide any form of financial assurance. The proposed change is in response to amendments to the Code of Virginia during the 2003 session of the general assembly (senate bill 1088) that now requires all permit-holders to provide written evidence of financial responsibility to VDH, to be used to pay for claims for cleanup costs, personal injury, and property damage resulting from the land application of biosolids. VDH is not aware of any instances of contractors being unable to pay for the cost of cleanup and the cost of third party claims arising out of the land application of biosolids in Virginia. However, according to VDH, there have been lawsuits filed against contractors in states such as California, Pennsylvania, and Florida in order to recoup damages arising out of the land application of biosolids.

VDH does not believe that the proposed regulation will impose significant additional costs on permit holders. According to VDH, most contractors land-applying biosolids currently have sufficient insurance to meet the minimum financial responsibility requirements. For these contractors, there is no additional cost associated with the proposed change. However, for contractors not currently meeting the financial responsibility requirements being proposed, the proposed change is likely to impose additional costs.

The cost of getting the required coverage will depend on the market's assessment of the risk posed by the permitted entity to public health and the environment from the transportation, storage, and land application of biosolids. While the precise cost associated with getting the

required financial assurance is not known, conversations with existing land applicators provided a range of costs. According to a large biosolids land applicator currently meeting the proposed requirements, the cost of purchasing the required insurance coverage is approximately \$55,000 a year. Based on conversations with a small biosolids land applicator, smaller operations can expect to pay around \$30,000 to purchase the required insurance coverage.

Contractors not currently meeting the proposed financial responsibility requirements are likely to have chosen not to carry the required coverage because the costs associated with getting the coverage outweigh the benefits of insuring against the risk of injury and damage resulting from transporting, storing, and land applying biosolids. There are two possible reasons for this: (i) the market's perception of the risks associated with transporting, storing, and land-applying biosolids is less than the actual risk or (ii) the minimum insurance requirement being proposed is too high. In the former case, the proposed change is likely to produce a net positive economic impact by correcting a market imperfection and requiring biosolids land applicators to have coverage commensurate with the risk posed to public health and the environment from their activities. In the latter case, the proposed change is likely to produce a net negative economic impact by requiring biosolids land applicators to obtain coverage higher than what would be required based on the risk they pose.

The net economic impact of the proposed change will depend on whether public health and environmental risks are not being set at the optimal level through market forces or whether the insurance requirement being proposed is excessive. There is no data available at this time to make a precise determination. While VDH and the land applicators represented on the BURAC believe that most, if not all, contractors are currently carrying insurance that meets the proposed requirements, there was no survey done on the current insurance coverage of all permitted entities. However, conversations with a two of the nine contractors currently permitted to land apply biosolids indicated that they carried insurance that met most of the requirements being proposed. Thus, the net economic impact of the proposed change is not likely to be very large.

(2) The permit holder will be required to inform VDH, the affected local governments, and the treatment facility from which the biosolids originated of all complaints and begin an investigation into the complaints within 24 hours of receiving them. All complaints and actions taken in response to the complaints are to be documented by the permit holder and submitted to

VDH with the monthly land application report. Copies are also to be submitted to the relevant local governments and the owner of the treatment facility from which the biosolids originated.

The existing biosolids use regulations do not specify how complaints are to be handled and, according to VDH, the practice varies across localities. The proposed change is based on typical VDH policy on handling complaints. It is being made in response to amendments to the Code of Virginia during the 2003 session of the General Assembly (senate bill 1088) that now requires that VDH develop procedures for the prompt investigation and disposition of complaints concerning the land application of biosolids. It is also intended to standardize the manner in which complaints are recorded and handled.

The proposed change is likely to impose some additional costs. Permit holder will be required to follow a standard procedure when handling complaints. They will be required to report the complaint in a timely manner and provide written documentation of the complaint and any actions taken in response to VDH, the local government, and the treatment facility where the biosolids originated.

However, the proposed change is also likely to produce economic benefits. It will allow for better enforcement of the biosolids use regulations by ensuring that complaints are documented and handled in a consistent and reliable manner. Moreover, it will help reduce some of the health-related uncertainty associated with the land application of biosolids. There has been some public uncertainty regarding potential health impact of exposure to land-applied biosolids. The National Academy of Sciences study found that there was no documented scientific evidence that the federal regulations governing the land application of biosolids had failed to protect public health<sup>2</sup>. However, the study went on to state that additional scientific work was needed to reduce persistent uncertainty about the potential for adverse human health effects from exposure to biosolids. Based on anecdotal reports of adverse health effects, public concerns, and the lack epidemiological investigation, the study recommended that the Environmental Protection Agency (EPA) conduct studies or promote and support studies that examine exposure and potential health risks to worker and residential populations. The study recommended that a procedural framework be established to implement human health

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<sup>2</sup> Virginia's regulations are based on 40 CFR 503, federal standards for the use and disposal of sewage sludge.

investigations. A report issued by EPA<sup>3</sup> concurred and stated that a system of tracking odor and health complaints at the state or local level would be of tremendous help to regional and state enforcement personnel. By requiring all complaints, including health-related complaints, to be handled in a well-documented and consistent manner, the proposed change will allow for further investigation into and help reduce uncertainty regarding potential health implications of land application of biosolids.

The net economic impact of the proposed change will depend on whether the additional cost of notifying authorities of complaints, promptly investigating the complaints, and submitting written documentation of the complaints and actions taken in response to the required authorities and entities are outweighed by the benefits of better enforcement of the existing regulation and a possible reduction in the uncertainty regarding the impact of biosolids exposure on public health.

(3) Permitted entities will be required to provide the notification in writing to the local governments in whose jurisdiction biosolids are being applied at least 15 days prior to commencing the land application process. The proposed regulation specifies what the contents of the notification are to be. The notification is to include the name, address, and phone number of the permit holder, the treatment facility from which the biosolids originated, and the VDH contact person. It is also to include the identification of parcels of land on which biosolids are to be applied and the dates on which the land application is to take place. No notification is required under the existing biosolids use regulations. Some local government ordinances currently require notification prior to land application. However, these requirements vary across localities, with some localities requiring notification up to 30 days prior to land application. The proposed change is intended to establish minimum notification requirements that provide the required degree of protection to public health and to standardize these requirements across localities.

Permit holders operating in localities not currently requiring notification will incur the additional cost of complying with the notification requirements contained in the proposed regulation. Permit holders operating in localities that already require some form of notification will now have to meet the notification requirements specified in the regulation. Thus, while the

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<sup>3</sup> “Land Application of Biosolids”, Status Report, Office of Inspector General, Environmental Protection Agency, March 28, 2002.

proposed change is likely to impose more stringent requirements on some permit holders, it is also likely to ease these requirements for others. VDH does not have information regarding the notification requirements of all the various localities that allow land application of biosolids. The proposed change is also likely to produce some economic benefits by establishing a standard notification requirement across localities. Local officials and residents will be provided with relevant information about the land application 15 days prior to the application and be in a better position to deal with any threats to public health that might arise from the land application. Some localities currently requiring notification more than 15 days prior to land application will now have less time between notification and application. However, the advantages of requiring notification 30 days prior to application versus 15 days prior to application are not clear and are not likely to be very significant. Moreover, according to VDH, local notification requirements have been a source of friction and litigation between biosolids land applicators and localities where biosolids are being applied. By standardizing these requirements, the proposed change removes a potentially expensive source of conflict.

The net economic impact will depend on whether the additional costs imposed on some permit holders of meeting these notification requirements are greater than or less than the benefits of requiring notification and standardizing the requirements across all localities. There are not data or studies currently available that would allow us to estimate the precise economic impact of the proposed change.

(4) Permitted entities will be required to meet the signposting requirements being proposed in this regulation. The regulation requires that signs be posted at all land application sites at least 48 hours prior to the application of biosolids and that the signs remain in place at least 48 hours after the land application process has been completed. The regulation specifies that the location of the sign be such that it is visible and legible from the nearest public right-of-way. The regulation also specifies that the sign is to be at least four square feet in size, made of weather resistant material, and mounted such that it remains in place for the required length of time. Any signs that have been removed or damaged are to be promptly replaced by the permit holder. The contents of the signs are also specified in the regulation. All signs are to include the permit holder's and VDH's contact information and a statement that biosolids are being applied at the site. The proposed regulation allows VDH to provide waivers or alternative sign-posting options in extenuating circumstances.



While some local government ordinances currently require signposting, it is not required under the existing biosolids use regulations. The sign-posting requirements vary across localities, with some localities requiring sign-posting 30 days prior to and 30 days following the land application of biosolids. The proposed change is intended to establish signposting requirements that provide the required degree of protection to public health and standardize these requirements across localities.

Permit holders operating in localities that do not currently require signposting will have to incur the additional cost of complying with the notification requirements contained in the proposed regulation. Permit holders operating in localities that already require some form of signposting will now have to meet the signposting requirements specified in the regulation. Thus, while the proposed change is likely to impose more stringent requirements on some permit holders, it is also likely to ease these requirements for others. VDH does not have information regarding the sign-posting requirements of all the various localities that allow land application of biosolids.

While some contractors may have to purchase additional signs, others will be able to use their existing signs to meet the proposed requirement. According to VDH, signs meeting the requirements of the regulation cost between \$30 and \$50 each and biosolids land applicators may need three to five signs per county (up to a maximum of 60). Comments from the applicators indicate that some already have the number and type of signs required by the proposed regulation. The proposed change is also likely to produce some economic benefits by establishing standard sign-posting requirements across localities. Requiring sign-posting will allow local officials and residents to better protect themselves against any inadvertent exposure to the biosolids. Some localities currently requiring sign-posting more than 48 hours prior and following a land application will see these requirements being made less stringent. However, the advantages of requiring sign-posting 30 days prior and following an application compared to 48 hours prior to and following an application are not clear. Moreover, according to VDH, local notification requirements have been a source of friction and litigation between biosolids land applicators and localities where biosolids are being applied. By standardizing these requirements, the proposed change removes a potentially expensive source of conflict.

The net economic impact of the proposed change will depend on whether the additional cost on some permit holders of meeting these sign-posting requirements is greater than or less than the benefits of requiring sign-posting and standardizing these requirements across localities. There are not data or studies currently available that would allow us to estimate the precise economic impact of the proposed change.

(5) Permit holders will be responsible for the cleanup and removal of biosolids spilled during transport to the land application site or transport to and from a storage facility. The operations manual will be required to include a plan for the prevention of spills during transport and for the cleanup and removal of spills when they do occur. The regulation requires that biosolids land applicators train their employees in spill cleanup and removal procedures. If material has been tracked onto a paved or public road surface, the permit holder is required to clean the road surface no later than the end of each day. All off-site spills are to be reported to VDH and a written report, including actions taken in response to the spill, are to be submitted to VDH, local governments, and the owner of the treatment facility from which the biosolids originated within five working days.

The existing regulation does not specifically state that permit holders are responsible for the cleanup of any spills that occur during the transportation of biosolids and does not establish any requirements for spill prevention and cleanup. The proposed change is intended to address the issue of mud and biosolids being tracked onto roadways by trucks leaving a biosolids land application site. According to VDH, the lack of clarity in the existing regulations has led to a few instances when spills have not been cleaned up promptly.

While VDH does not believe that the proposed change will impose any significant additional costs on biosolids land applicators, permitted entities were not surveyed regarding whether they had the required equipment to meet the requirements of the regulation. The two biosolids land applicators who commented on the proposed change concurred with VDH, indicating that most contractors already had the equipment to respond to spills and cleanups. Equipment such as front-end loaders, tractors, hand shovels, and brooms are typically used for cleaning spills. One biosolids land applicator estimated that if a contractor did not have the necessary equipment it would cost that contractor between \$23,000 and \$25,000 to purchase a tractor, broom, and trailer (to move the tractor from site to site).

However, the proposed change is likely to produce some economic benefits by limiting the transfer of biosolids out of land application sites. By requiring permit holders to have a spill prevention and spill response plan, to train their employees to deal with spills when they do occur, to clean up spills (especially on paved and public roads) promptly, and to report all spills in a timely manner, the proposed change is likely to allow for better enforcement of the biosolids use regulations and minimize the likelihood of public exposure to biosolids. Moreover, by clearly stating that the permit holder is responsible for the clean up of spills during transport to the application site or the storage facility and clarifying existing policy, the proposed change is likely to produce some additional economic benefits.

The net economic impact of the proposed change will depend on whether the costs associated with implementing the proposed change are outweighed by the benefits of doing so. While some permit holders may incur additional costs in purchasing the required equipment, developing a spill prevention and response plan, and training their personnel, the proposed change clarifies existing policy and reduces the risk of exposure to biosolids.

*BURAC Minority Report:*

The BURAC minority opinion report submitted to the State Board of Health suggests that stricter requirements need to be implemented in order to minimize the likelihood of public exposure to biosolids. It suggests more stringent financial responsibility requirements, more extensive notification and signposting requirements, and additional requirements relating to the documentation and investigation of complaints. The report also suggests that nutrient management plans for nitrogen and phosphorous be required for all sites where biosolids are applied and that, in addition to VDH certification, DEQ and DCR certification that the application is not expected to harm surface or ground water be required prior to the land application of biosolids at pollution sensitive sites.

Conversation with the primary author of the minority report indicated that the author was concerned about possible health risks to individuals, especially immune compromised individuals, from being exposed to land applied biosolids. According to the author, a majority of BURAC members were representatives of the industry (generators, applicators, and users of biosolids) and did not include enough representatives from rural counties where a majority of the

land application takes place<sup>4</sup>. The author believes that having stricter requirements are essential in order to reduce the public health risk arising from exposure to land-applied biosolids.

Most of the recommendations of the minority report arose out of concerns regarding the lack of information and studies on possible health risks arising out of exposure to land applied biosolids and the lack of adequate enforcement of existing biosolids use regulations.

*The lack of any comprehensive epidemiology studies on workers and residential populations exposed to these biosolids was a major cause for concern.* The author was particularly concerned about potential health risks posed by bioaerosols (pathogens stirred into the air by wind). However, according to studies done to date, biosolids when applied in accordance with state and federal regulations have not been known to increase the risk to public health. Specifically, researchers at Texas A&M University studied the extent to which applied biosolids are moved off-site by wind erosion. The study found that the overall amounts of mineral and organic material being moved onto and off the application areas is almost too small to measure and that the population in Sierra Blanca, Texas (a town 4 miles from the land application site) was not being affected by the application of biosolids.

Some of the author's concerns regarding the public health risks from the land application of biosolids are likely to have been addressed through amendments to the Code of Virginia made during the 2003 session of the General Assembly. According to these amendments, VDH is now required to establish procedures for the prompt investigation and disposition of complaints concerning the land application of sewage sludge. As mentioned above, some of the changes being proposed are intended to establish a standardized procedure for documenting and dealing with complaints, including health-related complaints. VDH is also required by law to maintain a searchable electronic database of complaints received during the current and preceding calendar year, including information detailing each complaint and how it was resolved. Collecting data on complaints will provide VDH and other researchers the opportunity to conduct further studies on the potential health risks from working with and living in proximity to land applied biosolids and reduce the health-related uncertainty associated the land application of biosolids.

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<sup>4</sup> The local monitor representative (a code enforcement officer from Louisa county) was second author on the minority report.

*Lack of adequate enforcement was cited by the author of the minority report as another reason for concern and another reason for having more stringent requirements.* The author believes that existing biosolids use regulations are not being enforced properly. According to the author, the chemical and pathogen content in biosolids are not appropriately tested for and reported. Moreover, the loading rate of biosolids during land application is not adequately monitored and reported. Consequently, the author believes that the health and environmental risks from the land application of biosolids are greatly increased. However, VDH believes that existing measures are being enforced adequately and that all relevant information regarding pathogen and chemical content of biosolids and loading rates are available in the monthly land application reports submitted by the permit-holder to VDH.

Some of the author's concerns regarding the public health and environmental risks from the land application of biosolids arising from the lack of adequate enforcement are likely to be addressed through amendments to the Code of Virginia made during the 2003 session of the General Assembly. These amendments require the preparation of nutrient management plans (although they do not specify nutrient management of phosphorous, one of the issues of concern to the members preparing the BURAC minority report) by individuals certified by DCR for all land application sites regardless of the frequency of application. Under existing regulations, nutrient management plans are required only for sites where biosolids were applied more than once every three years. Moreover, the Code of Virginia now requires that nutrient management plans get DCR approval for sites where land application occurs more than once every three years at more than 50% of the agronomic rate.

As regards the chemical and pathogen content in biosolids being land applied, there is no evidence currently that biosolids being land applied are not meeting EPA-established limits. Studies done to-date do not indicate that chemicals and pathogens are present in biosolids in quantities that would pose a risk to public health. For example, in response to concerns that *Staphylococcus Aureus* (a human disease pathogen found in raw sewage) remains in treated biosolids, researchers at the University of Arizona collected biosolids and bioaerosol samples from 15 sites across the United States. They did not find the pathogen in the biosolids after it had been treated using aerobic or anaerobic digestion, lime stabilization, heat-dry pelleting, or composting (conventional methods that treatment plants use to remove disease-causing organisms from raw sewage).

Thus, while some of the concerns underlying the recommendations of the minority report may have been addressed by the proposed regulation and by amendments made to the Code of Virginia, uncertainty remains regarding the potential health effects of being exposed to land-applied biosolids. All scientific evidence and studies conducted to-date do not indicate any serious health risks from exposure to biosolids. Pending more information and further research on the subject, there is no evidence to suggest that more stringent requirements than those being proposed would provide any significant additional benefits, while imposing additional costs on the generators, applicators, and users of biosolids.

### **Businesses and Entities Affected**

The proposed regulation affects all land applicators of biosolids operating in Virginia. According to VDH, there are nine contractors currently permitted to land apply biosolids in Virginia. By requiring that these contractors demonstrate a minimum level of financial assurance, meet minimum notification and signage requirements, follow required procedure when handling complaints, and be responsible for the cleanup of spills that occur during the transport of biosolids, the proposed regulation is likely to impose additional costs. However, by providing additional protection to public health and the environment, the proposed regulation is also likely to produce economic benefits. Standardizing and clarifying operating practices across localities are also likely to produce some additional economic benefits.

### **Localities Particularly Affected**

The proposed regulation is likely to affect all localities in the Commonwealth.

### **Projected Impact on Employment**

The proposed regulation is not likely to have a significant impact on employment.

### **Effects on the Use and Value of Private Property**

To the extent that the additional requirements being proposed in this regulation increase the cost of operation for the producers, applicators, and users of biosolids, the proposed regulation will lower asset values for these businesses and have a negative impact on the use and value of private property. However, by clarifying and standardizing operating procedures the proposed regulation is likely to lower operating costs and raise the asset values for companies and entities involved in biosolids land application. Moreover, to the extent that the proposed changes

increase the protection provided to public health, it is likely to have a positive impact on property values located in the vicinity of land application sites.