



STATE OF DELAWARE  
DEPARTMENT OF NATURAL RESOURCES  
AND ENVIRONMENTAL CONTROL

OFFICE OF THE  
SECRETARY

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**Secretary's Order No. 2016-W-0021**

**Re: Kent County Levy Court's Application for an Agricultural Use Permit to Apply Class B Bio-solids at Vineyard Farm, Carpenters Bridge Road, Frederica, Kent County**

**Date of Issuance: May 31, 2016**

**Effective Date: May 31, 2016**

**Procedural History and Findings of Fact**

Pursuant to 7 Del. C. §§6003, 6004(a), 6006(4) and other relevant authority, the Secretary of the Department of Natural Resources and Environmental Control ("Department") issues this Order approving Kent County Levy Court's ("Applicant") October 29, 2014 permit application ("Application") submitted to the Department's Division of Water, Surface Water Discharges Section ("SWDS").

The Application seeks authorization pursuant to the Department's *Guidance and Regulations Governing the Land Treatment of Wastes*, 7 DE Admin. Code 7103, ("Regulations") to apply Class B bio-solids<sup>1</sup> from Applicant's Wastewater Treatment Facility ("WTF") for agricultural use on approximately 120 acres of Applicant's property, known as Vineyard Farm<sup>2</sup> ("Property").

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<sup>1</sup> Section 6.0 of the Regulations sets forth the regulatory specifications for Class B bio-solids, which must comply with Processes to Significantly Reduce Pathogens and requires a permit. Class A undergoes additional heat treatment to comply with Processes to Further Reduce Pathogens and may be land applied without a permit.

<sup>2</sup> Identified as Kent County Tax Parcel No. SM-00-140.00-01-76.00-0001. The Property is located along the east side of Carpenter's Bridge Road near its intersection with Roesville Road approximately one mile southwest of Frederica, Kent County.

*Delaware's Good Nature depends on you!*

The SWDS provided proper notice of an October 15, 2015 public information meeting, which the SWDS held at the Lake Forest East Elementary School, 124 West Front Street, Frederica. Following this meeting, the SWDS provided proper public notice of the Application and a March 10, 2016 public hearing also at the Lake Forest East Elementary School.

Department hearing officer Robert P. Haynes presided over the public hearing, which approximately fifteen people attended. Eight persons spoke and either asked questions that the SWDS answered or expressed concerns with the Property's proposed use for bio-solid land application. The public comment period closed at the conclusion of the public hearing.

Following the public hearing, the SWDS prepared a Technical Response Memorandum ("TRM"), which responded to the public comments and recommended issuance of the Draft Permit attached to the TRM. Mr. Haynes prepared the attached Hearing Officer's Report ("Report"), which reviewed the procedural history, summarized and established the Record, recommended findings of fact, and provided conclusions and reasons consistent with his recommendation that the Department approve the Application and issue the SWDS Draft Permit.

The Department adopts the Report to the extent it is consistent with this Order. The Department finds that the Application meets the requirements, which are set forth in the Department's Regulations. The Regulations impose stringent environmental standards for the land application of bio-solids for agricultural purposes, as shown by the Record's extensive scientific studies. The Application's Project Development Report ("PDR"), prepared by CABE Associates, Inc., thoroughly reviews the environmental

standards set forth in Section 118 of the Regulations, which requires considerable testing of the Property and the bio-solids to determine the suitability of bio-solids land application at the Property. The PDR also includes the ‘Hydrogeologic Technical Report’ prepared by Maser Consulting, P.A., and this Report supports finding that the Property’s hydrogeology is suitable for land application of the bio-solids. In addition, the PDR includes a study entitled ‘Soils Evaluation for Land Application of Biosolids,’ prepared by Atlantic Resource Management, Inc., which supports finding that the Property’s soils are suitable for land application of the bio-solids. The Department finds that the Applicant provided ample support for its Application.

The SWDS’ review of the Application determined that the Applicant should make certain changes to it, which the Applicant agreed to do. The changes increased the distance between the area used for land application and the nearby residences, and added additional groundwater monitoring. These changes are reasonable and approved, which reduces the land application area to approximately 112 acres.

The SWDS TRM recommends approval of the Application and the issuance of the Draft Permit, which will provide the Department with data on the Class B bio-solids, nutrient application rates, soils, and groundwater to allow effective enforcement of the permit’s conditions. The permit approved by this Order will provide the Department with extensive ongoing regulatory oversight and protection for the environment and the public health.

The Draft Permit provides for comprehensive regulation of the Property if and when it is used for land application, which, according to the Applicant as described in the PDR and referenced in the Draft Permit, is expected to be very infrequently. First, Class

B bio-solids would need to be land applied only if the Applicant's production of Class A bio-solids fails, which has only occurred twice in the past ten years. Second, the Property would be added to the Applicant's five other farms that have been approved for land application by Department State Permit No. AGU 1401-K-03.<sup>3</sup> The Applicant has stated that the two farms located closest to the WTF would be used first because they reduce the transportation distance. Indeed, the Record shows that the Applicant only used its other permitted locations only twice in the past ten years and then only for several weeks in duration for each location. The two times land application occurred were because the heat process either was not available due to repairs or it failed to produce Class A bio-solids. Third, any land application at the Property would trigger the permit's monitoring, testing and reporting requirements to protect the environment from any undue risk of harm.

In sum, the Record supports finding that the Applicant has met its regulatory burden to support the Application and comply with the Regulations. The Department's permit provides extensive regulation of any possible future Class B bio-solids applied at the Property. Thus, the Department finds that the Record provides ample scientific support for the Application based upon the Application, the TRM, and the Report.

### **Conclusions and Reasons**

Based upon the above findings of fact, the Department concludes that the Application meets the Department's regulatory requirements for an agricultural use permit to allow the land application of Class B bio-solids at the Property and the

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<sup>3</sup> These locations are the Kent County Bio-Solid farm and the West farm, both near the wastewater treatment plant, the Blessing farm near Houston, the Goldinger farm near Smyrna, and the Nyle Callaway farm near Frederica.

Department will issue the Draft Permit. The Record includes public comments that oppose the Application, but these public comments do not provide meritorious reasons to deny the Application or modify the Draft Permit.

The public comments raised concerns with bio-solid land application in general and at the Property. The concerns included the possible odor or water contamination. The SWDS addressed these concerns at the hearing or in its TRM. The Record includes scientific support for the Application that also addresses these concerns. The permit requires the Applicant to thoroughly screen and test the Class B bio-solids to make sure they meet the Department's standards, as established by the Department's Regulations, and will be applied consistent with the Property's agricultural requirements, and subject to ongoing monitoring, testing and reporting requirements. Based upon this record, the Department concludes that the Property is suitable for Class B bio-solid land application consistent with the Draft Permit.

In sum, the Department concludes as follows:

1. The Department has jurisdiction under *7 Del. C. Section 6006*, and the Regulations to make a determination on the Applicant's Application for a permit to land apply for agricultural use Applicant's Class B bio-solids on the Property;
2. The Department provided proper public notice of the Application and the public hearing, and held the public hearing in a manner required by the law and its regulations;
3. The Department considered all timely and relevant public comments in making this determination;

The SWDS provided proper notice of an October 15, 2015 public information meeting, which the SWDS held at the Lake Forest East Elementary School, 124 West Front Street, Frederica. Following this meeting, the SWDS provided proper public notice of the Application and a March 10, 2016 public hearing also at the Lake Forest East Elementary School.

Department hearing officer Robert P. Haynes presided over the public hearing, which approximately fifteen people attended. Eight persons spoke and either asked questions that the SWDS answered or expressed concerns with the Property's proposed use for bio-solid land application. The public comment period closed at the conclusion of the public hearing.

Following the public hearing, the SWDS prepared a Technical Response Memorandum ("TRM"), which responded to the public comments and recommended issuance of the Draft Permit attached to the TRM. Mr. Haynes prepared the attached Hearing Officer's Report ("Report"), which reviewed the procedural history, summarized and established the Record, recommended findings of fact, and provided conclusions and reasons consistent with his recommendation that the Department approve the Application and issue the SWDS Draft Permit.

The Department adopts the Report to the extent it is consistent with this Order. The Department finds that the Application meets the requirements, which are set forth in the Department's Regulations. The Regulations impose stringent environmental standards for the land application of bio-solids for agricultural purposes, as shown by the Record's extensive scientific studies. The Application's Project Development Report ("PDR"), prepared by CAFE Associates, Inc., thoroughly reviews the environmental

standards set forth in Section 118 of the Regulations, which requires considerable testing of the Property and the bio-solids to determine the suitability of bio-solids land application at the Property. The PDR also includes the 'Hydrogeologic Technical Report' prepared by Maser Consulting, P.A., and this Report supports finding that the Property's hydrogeology is suitable for land application of the bio-solids. In addition, the PDR includes a study entitled 'Soils Evaluation for Land Application of Biosolids,' prepared by Atlantic Resource Management, Inc., which supports finding that the Property's soils are suitable for land application of the bio-solids. The Department finds that the Applicant provided ample support for its Application.

The SWDS' review of the Application determined that the Applicant should make certain changes to it, which the Applicant agreed to do. The changes increased the distance between the area used for land application and the nearby residences, and added additional groundwater monitoring. These changes are reasonable and approved, which reduces the land application area to approximately 112 acres.

The SWDS TRM recommends approval of the Application and the issuance of the Draft Permit, which will provide the Department with data on the Class B bio-solids, nutrient application rates, soils, and groundwater to allow effective enforcement of the permit's conditions. The permit approved by this Order will provide the Department with extensive ongoing regulatory oversight and protection for the environment and the public health.

The Draft Permit provides for comprehensive regulation of the Property if and when it is used for land application, which, according to the Applicant as described in the PDR and referenced in the Draft Permit, is expected to be very infrequently. First, Class

B bio-solids would need to be land applied only if the Applicant's production of Class A bio-solids fails, which has only occurred twice in the past ten years. Second, the Property would be added to the Applicant's five other farms that have been approved for land application by Department State Permit No. AGU 1401-K-03.<sup>3</sup> The Applicant has stated that the two farms located closest to the WTF would be used first because they reduce the transportation distance. Indeed, the Record shows that the Applicant only used its other permitted locations only twice in the past ten years and then only for several weeks in duration for each location. The two times land application occurred were because the heat process either was not available due to repairs or it failed to produce Class A bio-solids. Third, any land application at the Property would trigger the permit's monitoring, testing and reporting requirements to protect the environment from any undue risk of harm.

In sum, the Record supports finding that the Applicant has met its regulatory burden to support the Application and comply with the Regulations. The Department's permit provides extensive regulation of any possible future Class B bio-solids applied at the Property. Thus, the Department finds that the Record provides ample scientific support for the Application based upon the Application, the TRM, and the Report.

### **Conclusions and Reasons**

Based upon the above findings of fact, the Department concludes that the Application meets the Department's regulatory requirements for an agricultural use permit to allow the land application of Class B bio-solids at the Property and the

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Department will issue the Draft Permit. The Record includes public comments that oppose the Application, but these public comments do not provide meritorious reasons to deny the Application or modify the Draft Permit.

The public comments raised concerns with bio-solid land application in general and at the Property. The concerns included the possible odor or water contamination. The SWDS addressed these concerns at the hearing or in its TRM. The Record includes scientific support for the Application that also addresses these concerns. The permit requires the Applicant to thoroughly screen and test the Class B bio-solids to make sure they meet the Department's standards, as established by the Department's Regulations, and will be applied consistent with the Property's agricultural requirements, and subject to ongoing monitoring, testing and reporting requirements. Based upon this record, the Department concludes that the Property is suitable for Class B bio-solid land application consistent with the Draft Permit.

In sum, the Department concludes as follows:

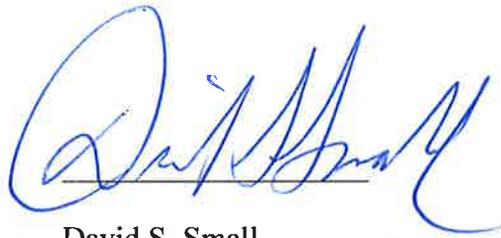
1. The Department has jurisdiction under *7 Del. C. Section 6006*, and the Regulations to make a determination on the Applicant's Application for a permit to land apply for agricultural use Applicant's Class B bio-solids on the Property;
2. The Department provided proper public notice of the Application and the public hearing, and held the public hearing in a manner required by the law and its regulations;
3. The Department considered all timely and relevant public comments in making this determination;

4. The Department considered the Record established in the Report, which is adopted to the extent it is consistent with this Order;

4. The SWDS shall issue the Applicant the agricultural use permit based upon SWDS' Draft Permit provided with the TRM;

5. The Permit approved by this Order contains conditions and terms to protect the environment and public health from the risks associated with the Property's permitted use for Class B bio-solids land application; and

6. The Department shall publish this Order on its web site and provide such public notice of the Order as required by the law, its Regulations, and as the Department determines is appropriate.



David S. Small  
Secretary

## HEARING OFFICER'S REPORT

To: The Honorable David S. Small  
Secretary, Department of Natural Resources and Environmental Control

From: Robert P. Haynes, Esquire  
Senior Hearing Officer, Office of the Secretary  
Department of Natural Resources and Environmental Control

Re: **Kent County Levy Court's Application for an Agricultural Use Permit to Apply Class B Bio-solids at Vineyard Farm, Carpenter Bridge Road, Frederica, Kent County**

Date: April 15, 2016

### I. PROCEDURAL HISTORY

On December 11, 2013, Kent County Levy Court ("Applicant") submitted its letter of intent to the Department of Natural Resources and Environmental Control's ("Department") Division of Water, Surface Water Discharges Section ("SWDS") to apply for a permit to land apply Class B bio-solids on Applicant's property known as Vineyard Farm. ("Property").<sup>1</sup> SWDS received an Application on October 20, 2014.

In a November 13, 2015 letter, SWDS informed the Applicant that it must install an additional down gradient well to provide sufficient groundwater monitoring consistent with the October 16, 2015 memorandum from the Department's Division of Water's Groundwater Protection Branch.

The SWDS provided proper notice of an October 15, 2015 public information meeting, which SWDS held at the Lake Forest East Elementary School, 124 West Front Street, Frederica. After listening to public comments at the October 15, 2015 public

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<sup>1</sup> Kent County Tax Parcel No. SM-00-140.00-01-76.00-0001. The Property is located along the east side of Carpenter Bridge Road near its intersection with Roesville Road approximately one mile southwest of Frederica, Kent County.

information meeting, the SWDS properly published public notice of the Application and the March 10, 2016 public hearing at the Lake Forest East Elementary School.

I presided over the public hearing, which approximately fifteen people attended and eight persons provided public comments. The SWDS provided its Technical Response Memorandum (“TRM”) and a draft permit, attached hereto. The TRM recommended that the Department approve the Application and issue the Applicant the permit that the SWDS provided with the TRM.

## **II. SUMMARY OF THE RECORD<sup>2</sup>**

This Report establishes the following record: 1) the verbatim transcript of the public hearing, as summarized below; and 2) the documents identified as exhibits, as summarized below, and 3) this Report, the attached TRM, and the documents referenced herein.

At the March 10, 2016 public hearing, SWDS’ representative Brian Churchill, Environmental Scientist, made a presentation. He identified the Department’s exhibits as follows:

DNREC Ex. 1- the Application, including the Project Development Report (“PDR”);

DNREC Ex. 2-the legal notice of the public information meeting; and

DNREC Ex. 3-the legal notice of the Application and the public hearing.

Mr. Churchill’s presentation first explained the Applicant’s regional wastewater treatment plant (“WTP”) that produces the bio-solids, which he described as a moist soil-like substance. He indicated that Class A bio-solid production began in 1995 when the Applicant’s began using ovens to heat the bio-solids in order to meet the Department

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<sup>2</sup> This summary does not determine any factual accuracy.

Regulations for ‘Class A Exceptional Quality Bio-solids,’ which he said the Department Regulations allow to be land applied on any farm field with minimal restrictions. Mr. Churchill indicated that the Applicant only produces Class B bio-solids when the ovens used to heat bio-solids to produce Class A are not available, which he said has only occurred twice in the past ten years. Mr. Churchill noted that the Applicant’s Class A and Class B bio-solids are the same except that Class A undergoes a heat process to reduce pathogens. Mr. Churchill indicated that Class B bio-solids must undergo an Environmental Protection Agency (“EPA”) approved ‘Process to Significantly Reduce Pathogens’ (“PSRP”) prior to being land applied. Mr. Churchill also said the Department regulates the Class B bio-solids’ land application, including the fields used and the crops grown on the land. Mr. Churchill further explained that Class B bio-solids also must comply with the Regulation’s Vector Attraction Reduction Method, which ensures that Class B bio-solids do not attract insects or animals. He indicated that EPA recognizes that proper utilization of Class A and Class B bio-solids are equally protective of the environment. The EPA’s risk assessment study also supported the use of Class B bio-solids. He also indicated EPA’s risk assessment study ensured protection of human health, the ecosystem, and the environment. Mr. Churchill stated that the Department’s Regulations are more protective than EPA’s Regulations, and identified the differences in his slide presentation, which is in the record as DNREC Ex. 4.

Mr. Churchill stated that Class B bio-solids must be land applied to permitted fields after the fields undergo an extensive review process and the Department approves their use in a permit application proceeding, which is unlike Class A that may be land applied without any permit. In addition, the Department permits Class B bio-solids to be

land applied based upon a permitted agricultural use. He said the land application would occur only if the Applicant is unable to produce Class A bio-solids. He said that land application was an economic use that provided agricultural benefits because the bio-solids contain nutrients for the soil and can help improve the soil and crop yields.

He stated that when EPA adopted its regulations, it conducted an extensive risk assessment to protect public health and the environment from any undue risks from Class B bio-solids' land application. He stated that the Department requires that a certified soil scientist to assess proposed fields to ensure that they are suitable for Class B bio-solids utilization. He continued that if the Department's experts determine that an area is not suitable for land application, then the area would not be included in the Department's permit. In addition, the Department regulates the bio-solids' application to a field, including at a rate which limits the nutrients the soil requires for proper crop rotation. The application of bio-solids at or below the required "agronomic rate" helps ensure protection of groundwater from any harm. He explained that the Department requires the Applicant to undertake a detailed analysis of the bio-solids, soil, and install wells to provide extensive groundwater monitoring data for water quality analysis. He also explained how the Class B bio-solids land application relied on the agricultural requirements. He described the Department's regulation that restricts applying bio-solids during certain time of the year and when it is raining or snowing. He noted that the Applicant would be required to maintain the soils' pH at least 6.2, which he said reduces the potential for metal to leach into the groundwater. He described the buffer area for the Property, which is the area where the bio-solids land application area and adjacent properties. He said that the Applicant had accepted a setback, of 140' set back from the

right-of-way on the east side of Carpenter Bridge Road, which is more stringent than the Department's regulations. He said the Department also required an additional buffer on the Property's southeast side to ensure that storm water run-off from the bio-solids application area will not run onto neighboring properties. He said that the Property currently has five groundwater monitoring wells installed and that two additional wells would be installed, to ensure adequate groundwater monitoring, prior to the utilization of the Property. He indicated that the groundwater beneath the property flowed to the northeast away from domestic drinking water wells. Finally, he said that the Department routinely inspects the farms when bio-solids are land applied to ensure compliance with the Regulations.

Andrew Jakubowitch, the Applicant's Director of Public Works, spoke next and he began by explaining the Applicant's history of land application. He noted that Class B land application occurred in 2011 when the wastewater treatment plant underwent a major upgrade and in 2012 when the solar dryer used to heat bio-solids to make Class A did not achieve the Department's standards for Class A bio-solids. He indicated that Class B bio-solids were land applied to two fields nearest to the WTP for about two weeks each time.

Scott Hoffman, P.E., the Applicant's consultant with CAFE, spoke next and stated that the WTP produces 7,000 tons a year of Class A bio-solids under normal operating conditions. He indicated that the Applicant produces Class B bio-solids only when it cannot produce pathogen reductions to meet Class A standards.

He stated that the process of approving the Property began by identifying the Property's area suitable for land application of Class B Bio-solids, or and the Property's

survey showed 147.88 acres, of which 132 acres are used for farming. The Regulations' buffer requirements reduced the land application area to the Property's north field's 59 acres and the south field's 53 acres. He further determined that the north field could accept 215 tons a year of Class B bio-solids and the south field could accept 193 tons a year of Class B bio-solids. He indicated that the farming would grow corn, soybeans, and small grains in a typical Delaware crop rotation.

Tom Dwyer of Management Consulting, the Applicant's hydrogeologic consultant, spoke next and described his work in the spring and summer of 2014 when he augured five soil borings to analyze the soils. The sites selected were at each corner of the Property and at a central and high point. He directed that groundwater monitoring wells be drilled at these locations, which allowed him to determine the suitability of the soils at the Property and the groundwater flow direction. Overall, he determined that the Property's soils had good infiltration capacity under natural conditions and that the Property's groundwater was 11' to 22' feet deep and that he estimated the seasonal high condition would be a foot higher, or 10' to 21' feet. He said the groundwater flow goes northeast away from Carpenter Bridge Road. He concluded that the Property was well suited for Class B bio-solids' land application.

Laf Erickson, the Applicant's soil scientist with Atlantic Resources Management, Inc., spoke next and described his soil mapping, testing, sampling, testing the soil permeability, measuring the weekly fluctuations in the groundwater during the 2013-2014 wet season, and mapping the wells within a half mile of the Property. He said he used a double ring infiltrometer testing method, which he said was a very conservative method of percolation testing. He said he used 14 test pits and took 150 soil samples for

analysis. He noted the Property's nearly flat topography with range of slope between zero and five percent within the proposed land application area. He said the soils were Sassafras, Downer, and Hamburg and that the percolation tests revealed percolation rates between 4 and 60 minutes per inch, or well within the Regulation's regulatory limits. According to Mr. Erickson, the Regulations require almost 2' of unsaturated soil beneath the land application area to allow for adequate renovation of byproducts and pathogen absorption. He said he found groundwater at an average of 13' below the surface, which provided six times the distance to groundwater than the Regulations require. He stated that the Property's soils pH ranged from 5.6 to 7.0, which is above average for Delaware's coastal soils. In conclusion, he stated that the Property would provide year round suitability for land application, with the exception of the Regulation's December 7 through February 15 blackout period.

The Application includes the PDR, prepared by CUBE Associates, Inc. The PDR analyzed the Property's suitability for the proposed land application of Class B bio-solids. The PDR included a 'Hydrogeologic Technical Report' prepared by Masser Consulting, P.A. This Report supported the Property's proposed use to land apply Class B bio-solids based upon its extensive testing and analysis of the groundwater. The PDR also includes the 'Soils Evaluation for Land Application of Biosolids,' prepared by Atlantic Resource Management, Inc., which supports finding that the Property's soils are suitable for land application of the bio-solids.

The first public speaker was William Moffett, who is a landowner adjacent to the Property. He said the Property is in a high growth area. He cited a University of Georgia study that found land application caused public health problems near where bio-solids are

land applied. He said land application began after the former water disposal method ended in the late seventies and early eighties. He read from an article by Dr. Caroline Snyder, which cited that bio-solids include thousands of synthetic industrial chemicals, some of them highly toxic, and only a few regulated. He said you can only test what you know to test for and the bio-solids may contain unknown pollutants. He cited the prohibition that children should not use the Property after land application to support his claim that the land application is a risk to public health.

The second public speaker was Joseph Moran, who expressed his concern with the future quality of drinking water. He said his understanding was that the Property's proposed use was for a solar farm, and he stated he was not happy about the proposed use to land apply bio-solids. He asked about a cancer study. Mr. Churchill answered his question by citing the EPA risk assessment had looked at over possible 200 pollutants. The study concluded that land application, in accordance with EPA regulations, was safe to the public health.

The third public speaker was Theresa Bailey, who asked about the "Facility" that would be used and I clarified that the Facility was the WTP. She also was concerned with air emissions and odor.

The fourth public speaker was Carla Moffett, who mentioned a 2014 cancer cluster study for the Lake Forest East Elementary School.

The fifth public speaker was Gary Mason, who said he was on the Roesville Advocacy Committee. He asked about history of the Applicant's land application and the Applicant answered him by stating that Class B bio-solids were applied twice in the past 10 years, once in 2011 and once in 2012. He asked why the Applicant selected this field,

and the Applicant explained that originally it was going to use the field for a solar farm, but now decided to use it to add it to the farms where it can land apply Class B bio-solids.

The sixth public speaker was Bob Bailey, who asked about the Class A and Class B production process. Mr. Churchill explained that all the WTP's bio-solids go through a belt filter press, which remove most of the liquids. Mr. Churchill explained that the only difference between the Applicant's Class A and Class B bio-solids is that Class A has less pathogens after the heat process. Mr. Bailey asked about the Class B's pathogens, and Mr. Churchill answered that they were germs and bacteria, and that the sun and soil reduce the pathogens, and that the EPA's risk assessment shows that this method is safe.

The seventh public speaker was Jack Mulia, who asked about the land application history. Mr. Churchill answered that since 1995 the Applicant has almost exclusively produced Class A bio-solids. According to Mr. Churchill, Class B bio-solids had only been land applied twice in the past decade. The Applicant indicated that the WTP began operating in 1973, and explained that the 2011 land application occurred due to the relocation of electric equipment. In 2012, Class B land application also occurred when the WTP's passive solar greenhouses failed to produce Class A bio-solids that met the Department's standards.

Mr. Moran spoke again and raised his concerns with odor if the Property was used. Keith Powell, Applicant's Assistant Director of Public Works, addressed his concern by explaining that the Applicant adds lime that reduces any odors, and also that the Regulations require that the Applicant till Class B bio-solids into the soil within six hours after application, which further controls any possible odors. In contrast, he noted farms that apply manure do not add lime or are required to cover the manure with soil.

He also asked how close the Applicant's other farms are to houses. The Applicant answered by stating that the field next to the WTP adjoins several developed properties. Mr. Powell also indicated that the Applicant would install a new dryer system at the WTP to make Class A bio-solids.

Following the public hearing, SWDS provided me with their expert advice on the Application in the attached Technical Response Memorandum ("TRM"), which recommends issuing the permit that SWDS provided with the TRM should the Secretary decide to issue the Applicant the permit.

### **III. FINDINGS OF FACT**

I find that the Record, as established above, supports adopting SWDS' recommendation and issuing the Applicant an agricultural use permit for the land application of bio-solids on the Property, subject to reasonable conditions.

The Regulations impose stringent environmental standards for the land application of bio-solids for agricultural purposes, as shown by the Record's extensive scientific studies. The PDR, prepared by CABE Associates, Inc., thoroughly reviews the environmental standards set forth in Section 118 of the Regulations, which requires considerable testing of the Property and the bio-solids to determine the suitability of bio-solids land application at the Property. The PDR also includes the 'Hydrogeologic Technical Report' prepared by Maser Consulting, P.A., and this Report supports finding that the Property's hydrogeology is suitable for land application of the bio-solids. In addition, the PDR includes a study entitled 'Soils Evaluation for Land Application of Biosolids,' prepared by Atlantic Resource Management, Inc., which supports finding that

the Property's soils are suitable for land application of the bio-solids. I find that the Applicant provided ample support for its Application.

The SWDS' review of the Application determined that the Applicant should make certain changes to it, which the Applicant agreed to do. The changes increased the distance between the area used for land application and the nearby residences, and added additional groundwater monitoring wells. These changes are reasonable and approved.

The SWDS TRM recommends approval of the Application and the issuance of a permit that SWDS prepared, which will provide the Department with information from the groundwater monitoring to allow effective enforcement of the permit's conditions.

The Applicant currently has a Department permit No. AGU 1401-K-03 to land apply Class B bio-solids to five other locations. The Applicant's land application at these locations has complied with the Regulations. The Applicant also has stated that the locations closest to the wastewater treatment plant would be used first, particularly the location adjacent to the WTP. Consequently, the Applicant will use the Property only after the other closer locations are used. Indeed, the Record shows that the Applicant rarely uses any of its permitted locations.

In sum, the Record supports finding that the Applicant has met its regulatory burden to support the Application and comply with the Regulations. Thus, the Department finds that the Record provides ample scientific support for the Application based upon the Application, the TRM, and the Report.

#### **IV. CONCLUSIONS AND REASONS**

Based upon the above findings of fact, I conclude that the Applicant satisfied its burden to provide sufficient support for its Application and to comply with the

Regulations. Consequently, I conclude that SWDS should issue the Applicant a permit based upon the permit in this Record. The permit will allow the Applicant to land apply Class B bio-solids at the Property subject to numerous conditions that impose monitoring, testing and reporting requirements.

The Record includes public comments that oppose the Application, but these public comments do not provide reasons sufficient to deny the Application or modify the SWDS draft permit. The public comments raised concerns with the land application of bio-solids in general, and specifically the possible odor and water contamination. The SWDS TRM addressed these concerns at the public hearing and Record's scientific support also support that the land application should not adversely affect the environment or public health.

Based on the information summarized in this Report, the Property is suitable for land application of the Class B bio-solids. The Department requires that the Applicant apply the bio-solids at a specified rate and thoroughly screen and test its bio-solids, the soils at the Property, and the groundwater beneath the Property to ensure they comply with the Department's Regulations. Indeed, the environmental protections ensured by the permit exceed that of the commonly used fertilizer based or animal wastes. Thus, the Department's permit will regulate the Property and the land application of Class B bio-solids and require compliance with the Department's Regulations. In sum, I recommend the Department enter the following conclusions:

1. The Department has jurisdiction under its state authority pursuant to *7 Del. C. Section 6003 and 6006*, and the Regulations to make a determination on the

Applicant's Application for a permit to land apply Class B bio-solids on the Property for agricultural use;

2. The Department provided proper public notice of the Application and the public hearing, and held the public hearing in a manner required by the law and its regulations;

3. The Department considered all timely and relevant public comments in making this determination,

4. The Department considered the Record established in the Report, which is adopted to the extent it is consistent with this Order;

5. The SWDS shall issue the Applicant the Agricultural Use Permit based upon SWDS' draft permit provided with the TRM;

6. The Permit approved by this Order contains conditions and terms to protect the environment and public health from the risks associated with the Property's permitted use for Class B bio-solids land application; and

7. The Department shall publish this Order on its web site and provide such public notice of the Order as required by the law, its Regulations, and as the Department determines is appropriate.

  
Robert P. Haynes, Esq.  
Senior Hearing Officer  
Office of the Secretary

**MEMORANDUM**

**TO:** Robert P. Haynes, Esq. Senior Hearing Officer, Office of the Secretary

**THROUGH:** Virgil Holmes, Director, Division of Water  
Bryan A. Ashby, Program Manager, Surface Water Discharges Section (SWDS)

**FROM:** Brian Churchill, Environmental Scientist, SWDS

**RE:** Technical Response Memorandum Regarding the March 10, 2016 Public Hearing on the Draft Agricultural Utilization Permit for Kent County Vineyard Farm

**DATE:** April 10, 2016

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SWDS prepared this Technical Response Memorandum (TRM) to assist the presiding hearing officer for his Report to the Secretary of the Department of Natural Resources and Environmental Control (Department) and the final decision on issuance of the draft Vineyard Farm agricultural utilization (AGU) permit.

The Department's Division of Water, Surface Water Discharges Section (SWDS), received an application from Kent County Levy Court to obtain additional land to apply Class B biosolids under Part III, B. of The Guidance and Regulations Governing the Land Treatment of Waste (the Biosolids Regulations). The proposed additional land, known as the Vineyard Farm consists of one parcel of land totaling approximately 148 acres, of which approximately 112 acres are suitable for land application. The Vineyard Farm is located on the east side of Carpenter Bridge Road (Road #35) approximately 1 mile southwest of Frederica.

As part of the Department's review and approval process, in a letter dated September 21, 2015 the Department notified all landowners that owned property contiguous to the proposed Vineyard Farm AGU site of Kent County's intentions to utilize the farm as a Class B biosolids land application location. On October 15, 2015, the Department held a public information meeting. At the meeting, the Department gave a presentation which reviewed the Department's biosolids regulations and the safeguards in place to protect human health and the environment at Class B biosolids AGU sites. Approximately 10 interested residents that own property or live near the proposed Vineyard Farm AGU site attended the public information meeting. During the meeting, several residents voiced their disapproval of the proposed AGU site and indicated that they would like to request a public hearing on the approval of the proposed Vineyard Farm site.

On February 10, 2016, the Department placed a legal notice of the Application in the News Journal, the Delaware State News and that a public hearing would be held on March 10, 2016 to provide the public an opportunity to comment on the permit application and the draft permit. The Department also provide notice on the Delaware public meeting calendar and by email to its public notice subscribers.

On March 10, 2016 a public hearing was held at Lake Forest East Elementary School located at 124 Front St, Frederica, DE 19946. Approximately 16 person attended including one member of the press attended the hearing. Several individuals provided comments and raised concerns related to the proposed use of Vineyard Farm to land apply bio-solids. SWDS representative Brian Churchill thoroughly addressed the majority of the comments at the public hearing in response to questions, which are set forth in the hearing transcript. This TRM focuses on the two public comments that were not comprehensively answered during the Department's March 10, 2016 public hearing, and provides SWDS's recommendation to issue the draft permit prepared by SWDS if the Secretary decides approve the application and issue a permit.

### Response to Public Comments

1. **A members of the public voiced concern with the application of biosolids onto the Vineyard farm related to "certain things in the air" affecting her asthma.**

*The agricultural utilization of biosolids occurs throughout the State of Delaware on a continual basis. Biosolids are utilized throughout the State on many farm fields as fertilizer similarly to chicken manure. Like chicken manure application, when Kent County biosolids are applied, the biosolids are surface applied followed by incorporation into the soil. Typically the application of chicken manure or biosolids onto a farm field occurs over a short period of time (usually during a time period of a few days up to a couple of weeks depending on the field size). While some dust may be produced during the application of Kent County biosolids, the amount of dust produced during the application would likely be less than the amount produced during the application of a drier materials such as chicken manure. After application is complete when the biosolids are incorporated into the soil, additional dust comprised mostly of soil particles may be released into the air. Any dust created would be carried with the prevalent wind direction and would be minimal upon the completion of application activities.*

*Upon the disturbance of native soil, chicken manure, and biosolids, bioaerosols (airborne particles that contain living or dead organisms or were released from living organisms) and other potential irritants are released into the air and travel downwind from the farming activities. Individuals that are sensitive to airborne irritants should make effort to be aware of their surroundings. When farming activities occur related or unrelated to biosolids application, any individual that is aware that they are sensitive to farming activities should reduce their exposure to the dust. While the Department is unaware of any individuals being affected by biosolids application, every individual is different and the Department cannot definitively determination as to the potential of biosolids affecting an individual's asthma. Reasonable precautions to avoid dust from the farming activities could include but not be limited to keeping their windows closed*

*and remaining indoors during the farming activities, to reduce exposure to airborne irritants.*

*It should be noted that the County does not anticipate using the Vineyard regularly and permitting of the Vineyard Farm is not expected to increase the frequency of farming activities that occur at this location compared to traditional farming.*

2. An individual indicated that Lake Forest East Elementary School is part of a cancer cluster study in 2014 and that “they are trying to get it checked on again”. According to the individual, “there has been a resurgence in the cancer within this very school”.

*The Cancer Investigation conducted by Batta Environmental Associates, Inc. focused on the Lake Forest East Elementary School and the possibility of indoor air pollutants creating an increased incidence of cancer for staff. For more information on the November 24, 2014 investigation, please visit:*

*<http://www.lf.k12.de.us/wp-content/uploads/2014/12/Redacted-2014-12-08-Cancer-Incident-Investigation-Report.pdf>*

*Lake Forest East Elementary school is located approximately 1 mile northeast of the proposed Vineyard Farm agricultural utilization (AGU) site. The application of biosolids would not have any impact on Lake Forest East Elementary nor has any bearing on the cancer cluster mentioned by the aforementioned individual that attended the Department’s public hearing.*

Also the SWDS attaches the Applicant’s response to the presiding hearing officer’s request for additional information on past land applications.

### **Conclusions:**

The permit application, project development report, soils work, and groundwater information submitted by Kent County meets Department requirements for an AGU permit under the Biosolids Regulations. Additionally, the combination of the Department’s responses during the March 10, 2016 public hearing on the draft Vineyard Farm AGU permit and responses in this technical response document address public concerns raised to the Department.

The SWDS recommends that the Kent County Vineyard Farm AGU permit be issued without any modification from the draft permit.



AUTHORIZATION TO OPERATE A LAND TREATMENT SYSTEM  
FOR THE  
AGRICULTURAL UTILIZATION OF SLUDGE

**Pursuant to the provisions of 7 Del. C., §6003**

Kent County Levy Court  
555 Bay Road  
Dover, Delaware 19901

is hereby granted a permit to operate land treatment systems for the agricultural utilization of Class B sludge generated by the Kent County Wastewater Treatment Facility. This permit is limited to the application of stabilized Class B sludge from the Kent County Wastewater Treatment Facility at agronomic rates to the site designated in this permit known as the Vineyard Farm.

Should Class A sludge from the Kent County Wastewater Treatment Facility be utilized on the Vineyard Farm, the Class A sludge shall be prepared and applied in accordance with State Distribution and Marketing (DM) Permit Number DM 1404-K-03, the Kentorganite Class A Biosolids Fertilizer Product label, and in accordance with applicable requirements in this permit.

The application rates, monitoring requirements and other permit conditions are set forth in Parts I, II and III hereof.

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Bryan A. Ashby, Program Manager  
Surface Water Discharges Section  
Division of Water  
Department of Natural Resources  
and Environmental Control

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Date Signed

## Part I

### GENERAL DESCRIPTION OF OPERATION

The operation involves the land application of Class B stabilized sludge from the Kent County Wastewater Treatment Facility onto the site location listed below. Class B sludge generated at the Kent County Waste Water Treatment Plant may also be land applied to site locations listed in State Permit Number AGU 1401-K-03 (as amended). Class B sludge shall be delivered to the site in accordance with Delaware Waste Transporters Permit No. OH-11.

Sludge stabilization of Class B sludge will be achieved by an approved alternative found in Part III, (B), Section 133 or 134 of the Guidance and Regulations Governing The Land Treatment of Wastes, and Title 40 Code of Federal Regulations, Part 503, Standards for the Use or Disposal of Sewage Sludge. Should Class A sludge be utilized at the Vineyard Farm, stabilization of Class A sludge shall be in accordance with State Permit Number DM 1404-K-03.

## SITE LOCATION

### 1. The Vineyard Farm North and South Fields Site Description:

The site consists of one parcel of land consisting of approximately 148 acres, of which approximately 119 acres are suitable for land application. The Vineyard Farm is located on the east side of Carpenter Bridge Road (Road #35) approximately 1 mile southwest of Frederica.

Tax parcel number: SM-00-140.00-01-76.00-000



**Note:** Refer to land application map in Exhibit V-3 sheet 1 of the March 2016 project development report (PDR) for the specific land application area, seasonally restricted areas, monitoring well locations and exclusion areas. Refer to Exhibit I-1 for a map showing land application acreages, setback areas and sensitive areas. The sensitive area in the northeast part of the north field shall not have sludge applied to the surface without incorporation and shall never have sludge applied if rainfall is forecast within 72 hours of a predicted rain event. The sensitive area noted in the southeast area of the of the south field shall be limited to seasonal application (May through August) unless the groundwater level is confirmed to be at least 20 inches below the depth of tillage prior to sludge application in this area.

**REGULATORY AND SUPPORTING DOCUMENTS:**

The land treatment operations shall be conducted in accordance with the following documents:

1. The Department of Natural Resources and Environmental Control's Guidance and Regulations Governing the Land Treatment of Wastes, Part III, (B); (October 1999 Revision);
2. Title 40 of the Code of Federal Regulations Part 503, Standards for The Use and Disposal of Sewage Sludge, Final rule date February 19, 1993;
3. Title 3, Chapter 22, The Department of Agricultural Nutrient Management Law
4. State Permit Number DM 1404-K-03;
5. The Letter of Intent dated December 11, 2013;
6. Hydrogeologic Evaluation for Land Application of Biosolids at the Vineyard Farm dated July 28, 2014;
7. The Soils Evaluation for Land Application of Biosolids for Vineyard Farm, Carpenters Bridge Road dated August 4, 2014.; and,
8. The revised Project Development Report (PDR) for the Vineyard Farm, dated March, 2016.

## A.1 SLUDGE APPLICATION LIMITATIONS

During the period beginning on the effective date and lasting through the expiration date the permittee is authorized to operate land treatment site as identified on page 3 of this permit for the application of stabilized sludge at agronomic rates. The timing of sludge application to the site, as well as the quantity and quality of sludge to be land applied is specified below:

Sludge may be applied up to a rate to meet, but not exceed, the Plant Available Nitrogen (PAN) requirement for the crop(s) grown. The calculated PAN application rates shall also include any residual mineralized nitrogen from previously applied organic nitrogen. Sludge analysis, the cropping plan, the nutrient requirement for each crop and the proposed nitrogen and phosphorus application rates shall be submitted to the Department, prior to sludge application, for written review and approval.

If supplemental fertilizers (i.e., commercial fertilizer, manure, Class A biosolids, etc.) are used on those portions of the field which have received sludge, the total amount of PAN applied shall not exceed the amounts specified for the crop listed in the approved nutrient management plan.

When any of the limits specified above have been achieved, no additional sludge may be applied to the site.

Fields must be planted with appropriate vegetation or a cover crop within one (1) month of completing sludge application, unless prohibited by weather conditions in which case vegetation must be established as soon as practicable.

Fields with "high" phosphorus soil levels as defined by Title 3, Chapter 22 of the Delaware Code (the Nutrient Management Law) and the Delaware Nutrient Management Commission shall be in compliance with a current Nutrient Management Plan and phosphorus management requirements in the Nutrient Management Law. Utilization of the phosphorus site index (PSI) and phosphorus management strategies, as recommended by the University of Delaware Cooperative Extension, may also be utilized to comply with the Nutrient Management Law.

For any portions of the sludge application area where the depth to seasonal high water table is less than 20 inches but greater than 12 inches, application is limited to May, June July or August. Sludge shall only be applied when the actual water table depth is at least 20 inches below the maximum depth of tillage as defined in Part I, G. 3 and pursuant to Part III, (B), Subsection 138.6 of the Guidance and Regulations Governing the Land Treatment of Wastes.

The depth to water of all observation wells and/or monitoring wells surrounding application fields must be monitored and the results recorded, before land application begins each calendar year. Groundwater level measurements shall continue monthly until land application activities cease. The frequency of water-level monitoring must increase to weekly in any monitoring well containing a depth to water reading that is within 3 feet of the ground surface. Should water-level readings indicate that areas of the sludge field have or likely have a water table that

is within 20 inches of the ground surface, sludge application in these areas must cease immediately and be discontinued until the limiting situation has passed. Annual water-level monitoring can resume once the DTW readings drops to less than 3 feet below ground surface.

## **A.2 OTHER LIMITATIONS**

Only sludge, which has been treated by a Process to Significantly Reduce Pathogens (PSRP), as defined in Part III, (B), of the Guidance and Regulations Governing the Land Treatment of Wastes, shall be applied to any of the land treatment sites.

A sufficient amount of lime to adjust the soil pH to a value of 6.2 or above shall be applied to the site prior to sludge application. If lime stabilized sludge is to be utilized for land application, a sufficient amount of lime stabilized sludge shall be added to the application site to raise the pH to 6.2 or above at the time of application.

Sludge may not be applied when the ground is frozen, saturated or covered with snow or during periods of rain or runoff. Sludge may not be applied from December 7 through February 15 unless the permittee receives written approval from the Department to land apply sludge during this period.

The sludge shall be applied so that the application is uniform. As long as no till farming is continued to be practiced at the Vineyard Farm, applied sludge may remain unincorporated provided that sludge migration from the application area does not occur and odors and nuisances are not created by the sludge.

If objectionable odors, vectors or other nuisance conditions from land application activities regulated under this permit impact neighboring properties, the Department may require the addition of lime (or another odor mitigating substance) to the land application fields after application of sludge and/or require lime to be added to sludge prior to land application. In addition, if nuisance vectors from land application activities as outlined above, as determined by the Department, impact neighboring properties, pest management practices shall be immediately implemented by the utilization of appropriate pesticides in accordance with State and Federal requirements. The Department may require additional odor, vector, and/or nuisance control measures to be taken for any sludge application under this permit, if deemed necessary.

After application of Class B sludge:

Livestock shall not be allowed to graze on land application fields for at least thirty (30) days subsequent to application of sludge.

Feed and fiber crops removed from the sludge land application site shall not be harvested until at least thirty (30) days after the application of sludge.

Food crops may not be harvested from the sludge application area for at least 24 months after the application of sludge.

Food crops with harvested parts below the surface of the land shall not be harvested for 38 months after application of sewage sludge.

Public access to the sludge application area must be restricted for at least twelve (12) months after sludge application, unless all applied sludge has been treated by an approved process to further reduce pathogens (PFRP).

At minimum, buffer zones established pursuant to Part III, (B), of the Guidance and Regulations Governing the Land Treatment of Wastes and the 2014 PDR (as amended), whichever are more stringent, shall be maintained at all times for sludge application. A minimum application setback distance of 200 feet from western edge of the right away on Carpenter Bridge Road will be maintained. Additionally, an application setback in accordance with engineering drawing V-3 Sheet 1 must be maintained from Carpenter Bridge Road and the southeast corner of the South Field. During the "Pre Start Up" inspection as required in Part III, 6., of this permit, the Department may require increased buffer zones as allowed in Section 138.2.2 of Part III, (B), of the Guidance and Regulations Governing the Land Treatment of Wastes. Considerations may include adjacent land use, type of sludge, sludge application method, sludge application rate, sludge quality and level of treatment, land slopes, vegetative cover used the nature of surrounding bodies of water and any other factors considered relevant by the Department.

No sludge shall be applied if sample analysis yields pollutant concentrations in excess of the following values:

Arsenic	75 mg/kg	Cadmium	85 mg/kg	Chromium	3000 mg/kg
Copper	4300 mg/kg	Lead	840 mg/kg	Mercury	57 mg/kg
Molybdenum	75 mg/kg	Nickel	420 mg/kg	Selenium	100 mg/kg
Zinc	7500 mg/kg	PCB	5 mg/kg		

### A.3 GROUNDWATER LIMITATIONS

Application of sludge to the designated fields shall not cause groundwater to be in violation of applicable Federal or State drinking water standards on an average annual basis. If down-gradient water supply wells (public or private) are impacted above applicable Federal or State drinking water standards from the land application of sludge, the permittee shall be required to provide a free Department approved alternative potable water supply to the affected parties.

**B. MONITORING REQUIREMENTS**

During the period beginning on the effective date and lasting through the expiration date the permittee is authorized to apply stabilized sludge at agronomic rates to the sludge application sites found in Part I, of this permit. Such applications shall be monitored by the permittee as specified below:

**B.1 STABILIZED SLUDGE**

**B.1.a.** During periods when Class B sludge is not land applied and sludge is prepared in accordance with State Permit Number DM 0902-K-03 (as amended) the monitoring and reporting requirements of that permit will fulfill the monitoring and reporting requirements of part B.1, B.2 and B.3 of this permit.

**B.1.b.** When Class B sludge is prepared for land application in accordance with this permit, monitoring is required as specified below:

<b>Parameter</b>	<b>Unit Measurement</b>	<b>Minimum Frequency</b>	<b>Sample Type</b>
Moisture Content	percent	Monthly	Composite
Total Nitrogen as N (Moist & Dried)	percent	Monthly	Composite
Organic Nitrogen as N (Moist & Dried)	percent	Monthly	Composite
Ammonium and Nitrate Nitrogen as N (Moist & Dried)	percent	Monthly	Composite
pH	S.U.	Monthly	Composite
Volatile Solids	percent	Monthly	Composite
Phosphorus as P (dry weight basis)	percent	Monthly	Composite
Potassium (dry weight basis)	percent	Monthly	Composite
Aluminum (dry weight basis)	mg/kg	Monthly	Composite
Arsenic (dry weight basis)	mg/kg	Monthly	Composite
Cadmium (dry weight basis)	mg/kg	Monthly	Composite
Chlorides (dry weight basis)	mg/kg	Monthly	Composite
Chromium (dry weight basis)	mg/kg	Monthly	Composite
Copper (dry weight basis)	mg/kg	Monthly	Composite
Lead (dry weight basis)	mg/kg	Monthly	Composite
Mercury (dry weight basis)	mg/kg	Monthly	Composite
Molybdenum (dry weight basis)	mg/kg	Monthly	Composite
Nickel (dry weight basis)	mg/kg	Monthly	Composite
Selenium (dry weight basis)	mg/kg	Monthly	Composite
Sodium (dry weight basis)	mg/kg	Monthly	Composite
Zinc (dry weight basis)	mg/kg	Monthly	Composite
Fecal Coliform (MPN dry wt. basis)	colonies/g	Monthly	Composite
PCB's (dry weight basis)	mg/kg	Monthly	Composite
Priority Pollutant Scan	-----	Every 3 years	Composite

Sludge samples shall be collected following dewatering from a location that allows for representative sampling of the sludge. All sludge samples shall be taken and analyzed in accordance with Section 151 of the Department's Guidance and Regulations Governing the Land Treatment of Wastes. See Part I F, for reporting frequencies.

**NOTE:** The 126 priority pollutants list can be found in 40 CFR, Part 423, Appendix A, 1987

## **B.2 SLUDGE STABILIZATION PROCESS MONITORING**

All Class B sludge prepared for land application at the site approved in this permit must meet the requirements in Part III, Section 133.1.2.5 (lime stabilization) of the Guidance and Regulations Governing the Land Treatment of Wastes. The permittee must obtain approval for to utilize a different Class B stabilization process. If Class B sludge for application under this permit is not produced in a calendar year, the permittee shall be exempt from the sludge stabilization process monitoring requirements of this permit. See Part I, F. for reporting requirements.

## **B.3 VECTOR ATTRACTION REDUCTION**

Vector attraction reduction must be achieved by pH adjustment, "pH of sewage sludge shall be raised to 12 or higher by alkaline addition and, without the addition of more alkali shall remain at 12 or higher for two hours and then at 11.5 or higher for an additional 22 hours" or other alternative methods for achieving vector attraction reduction found in Subsection 135 of Part III, (B), of the Guidance and Regulations Governing the Land Treatment of Wastes, may be employed with prior Departmental approval.

## B.4 SOIL MONITORING

Soil monitoring shall commence at least thirty (30) days prior to land application at the locations and frequency outlined below. The permittee shall be exempt from the requirements of this section if no sludge is land applied. A copy of all soil monitoring results required by this permit shall be submitted to the Department in accordance with Part I, F.2 of this permit.

Parameter	Unit Measurement	Minimum Frequency	Sample Type
pH	S.U.	Annually	Composite
Phosphorus as P (dry weight basis)	mg/kg	Annually	Composite
Potassium (dry weight basis)	mg/kg	Annually	Composite
% Organic Matter	percent	Annually	Composite
Arsenic (dry weight basis)	mg/kg	*	Composite
Cadmium (dry weight basis)	mg/kg	*	Composite
Copper (dry weight basis)	mg/kg	*	Composite
Chromium (dry weight basis)	mg/kg	*	Composite
Lead (dry weight basis)	mg/kg	*	Composite
Mercury (dry weight basis)	mg/kg	*	Composite
Molybdenum (dry weight basis)	mg/kg	*	Composite
Nickel (dry weight basis)	mg/kg	*	Composite
Selenium (dry weight basis)	mg/kg	*	Composite
Zinc (dry weight basis)	mg/kg	*	Composite
Aluminum (dry weight basis)	mg/kg	Annually	Composite
Magnesium (dry soil basis)	mg/kg	Annually	Composite
Manganese (dry soil basis)	mg/kg	Annually	Composite
Iron (dry weight basis)	mg/kg	Annually	Composite
Sodium (dry soil basis)	mg/kg	Annually	Composite
% Organic Matter	Percent	Annually	Composite

**NOTE:** Composite soil samples representing each soil series identified within each sludge application area shall be collected in accordance with the Kent County Sludge Management Manual. Soil chemistry testing must be in accordance with the Methods of Soil Analysis published by the American Society of Agronomy, and in accordance with Part III, (B), Section 151 of the Department's Guidance and Regulations Governing the Land Treatment of Wastes. See Part I, F.1. for reporting requirements.

\* If Class B sludge is applied during the effective period of this permit, the parameters above marked with a \* shall be monitored at least once during the effective period of this permit. Parameters marked with a \* are not required to be sampled if only "Class A" "EQ" sludge is applied during the effective period of this permit.

The Department may modify the sampling frequency based upon review of continuing or additional analyses.

## B.5 PLANT TISSUE AND GRAIN ANALYSIS

None is required at this time.

**B.6 GROUNDWATER MONITORING**

Parameter	Unit Measurement	Minimum Frequency	Sample Type
Depth to Water	hundredths of a foot	Monthly	In-Situ
Dissolved Oxygen	mg/l	Quarterly	Field Test
pH	S.U.	Quarterly	Field Test
Specific Conductivity	UMHOS/CM	Quarterly	Field Test
Temperature	°C	Quarterly	Field Test
Ammonium as N	mg/l	Quarterly	Grab
Nitrate Nitrogen as N	mg/l	Quarterly	Grab
Total Nitrogen as N	mg/l	Quarterly	Grab
Total Phosphorus	mg/l	Quarterly	Grab
Total Dissolved Solids	mg/l	Quarterly	Grab
Chloride	mg/l	Quarterly	Grab
Sodium	mg/l	Quarterly	Grab

- i. Groundwater samples shall be collected and analyzed individually from all monitoring wells (MW-1 = 246596, MW-2 = 246598, MW-3 = 246597, MW-4 = 246599, MW-5 = 246600 add in new wells MW A and MW B once DNREC ID's are issued). All groundwater samples shall be taken in compliance with the monitoring requirements specified above and shall be taken at each monitoring well in accordance with procedures approved by the Department and listed in the Department's Field Manual for Groundwater Sampling (March, 1988). Once a baseline is established (a minimum of 4 quarterly sampling events), the permittee can request in writing to reduce the sampling frequency. A request to suspend groundwater monitoring may be made when sludge has not been applied for three or more consecutive years.
- ii. Groundwater monitoring results for each monitoring well shall be reported using the State of Delaware Well Identification Tag Number that is required on all wells in accordance with the Delaware Regulations Governing the Construction and use of Wells, Section 10, A.
- iii. After notice and opportunity for a hearing the Department may modify the list of parameters to be monitored or the frequency of monitoring by the permittee based upon observations of ground water quality trends in the area.

**C. SCHEDULE OF COMPLIANCE**

1. The pH shall be adjusted to 6.2 or higher before land application occurs on any field in this permit.
2. Prior to land application begins, monitoring wells (DNREC ID) 246596, 246598, 246597, 246599, and 246600 246600 add in new wells MW A and MW B once DNREC ID's are issued shall be monitored for the parameters listed in Part I, B.6 of this permit.

**D. BONDING**

Not Required

**E. MONITORING**

1. Representative Sampling:

Samples and measurements taken as required herein shall be representative of

the volume and nature of the sludge to be land applied.

2. The permittee shall automatically resample the sludge and submit to the Department and landowner additional analyses if there has been a significant change (greater than 25%) in the quality of sludge. The permittee shall then be required to recharacterize the sludge in order to determine if any change in the land limiting constituent has occurred. Any change in sludge characteristics that affects the land limiting constituent shall be included in revised Project Development Reports which shall be submitted to the Department. After a review of these results, the Department may invoke the provisions of Part II, B.6 of this permit.

3. **Recording of Results:**

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

- a. The exact place, date and time of sampling and/or measurement;
- b. The person(s) who performed the sampling and/or measurement;
- c. The dates and times the analyses were performed;
- d. The person(s) who performed the analyses; and,
- e. The results of each analysis.

4. **Records Retention:**

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recording from continuous monitoring instrumentation shall be retained for five (5) years. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the permittee, or as requested by the Department.

## **F. REPORTING**

1. The permittee shall submit to the Department and landowners an annual operation report on or before February 1 of each year for the previous calendar year. The annual report shall be in a format acceptable to the Department. The annual operation report shall include the following:
  - a. If no sludge is applied, the annual operation report shall consist of a letter to the Department by the permittee stating that no land application of sludge occurred in the previous calendar year and include information required in d., g., and i. below.
  - b. The daily operational record (as specified in Part II, A.1);
  - c. The weight (wet and dry tons) and volume of sludge utilized at the land

application site;

- d. Any changes in ownership of the land where the operation is conducted or any change in any lease agreement for the use of such land that may affect or alter the operator's rights upon such land;
  - e. A chemical analysis of soil from each field for the constituents identified in Part I, B.4. The results shall be compared to the corresponding soils data submitted as a part of the Project Development Reports. The procedure for soil analysis shall be consistent with Department guidance;
  - f. Groundwater analysis from monitoring wells for the constituents identified in Part I, B.6.
  - g. Site maps of the same scale and contour interval as the maps submitted with the Project Development Reports, showing the boundaries within each field where sludge has been applied during the previous year;
  - h. For each site: the cropping scheme followed during the previous year and anticipated for the coming year; Crop yield data and an explanation of which portions of the plants were harvested; Results of plant tissue and grain analyses, if required; Identification of fields to be used during the coming year; Sludge application rates for the coming year based on nitrogen mineralization calculations from previous sludge application practices;
  - i. Septage application rate adjustments, if necessary (See Part I, A.1), and;
  - j Any other information required by the Department.
2. Sludge analytical and stabilization process monitoring data obtained during the previous reporting period shall be summarized for each period and postmarked no later than the 28th day of the month following the completed reporting period. Signed copies of these, and all other reports required herein, shall be submitted to the Department at the following address:

**DELAWARE DEPARTMENT OF NATURAL RESOURCES AND  
ENVIRONMENTAL CONTROL, DIVISION OF WATER RESOURCES,  
SURFACE WATER DISCHARGES SECTION, 89 KINGS HIGHWAY,  
DELAWARE 19901; TELEPHONE: (302) 739-9946**

When submitting monitoring results, copies of the original laboratory sheets should be included. If more than one sample is analyzed during any month, a table showing the range of constituent concentration values shall be prepared and included with the submittal.

3. The permittee shall submit copies of all monitoring results required in condition F.2 above to the landowner of each site.
4. The permittee shall maintain monthly sludge inventory data. This data shall

include at a minimum (a) the quantity of sludge generated, (b) quantity of sludge stored on site, and (c) quantity of sludge transported off site. Transportation records shall include the date, quantity, carrier used, and the final destination of each shipment. The inventory data shall be maintained at the facility and be made available to the Department in accordance with Part I, E.4 of this permit.

5. Test Procedures

Test procedures for all analyses shall conform to the applicable test procedures identified in Part III, (B), Section 151 of the Department's Guidance and Regulations Governing the Land Treatment of Wastes, unless otherwise specified in this permit.

## G. DEFINITIONS

1. "Agricultural Utilization" means the application rate of wastes or sludge or sludge products which shall not exceed the nutrient needs of the crop grown on the particular soil plus the other assimilative pathways in soils (e.g. immobilization with organic material, volatilization, and leachate in compliance with drinking water standards). This term may be used interchangeably with "agronomic rate".
2. "Composite" means a series of grab samples which have been collected in a manner such that the final sample is representative of the volume and characteristics of the material to be analyzed.
3. "Depth of Tillage" means the maximum depth at which sludge can be found after injection or incorporation into the soil.
3. "Feed crops" are crops produced primarily for consumption by animals.
4. "Fiber crops" are crops such as flax, cotton, and hemp.
5. "Food crops" are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.
7. "Land application" means the placement of sludge, treated sludge, or any other product containing these materials within 2 feet below the surface of land used to support vegetative growth.
8. "PFRP" means Process to Further Reduce Pathogens. This term means the same as Class A sludge or Class A biosolids.
9. "PSRP" means Process to Significantly Reduce Pathogens. This term means the same as Class B sludge.
10. "Sewage" means water-carried human or animal wastes from septic tanks, water closets, residences, buildings, industrial establishments, or other places, together with such groundwater infiltration, subsurface water, admixture of industrial wastes or other wastes as may be present.
11. "Sewage sludge" means sludge which derives in whole or in part from sewage.
12. "Sludge" means the accumulated semi-liquid suspension, settled solids, or dried residue of these solids that is deposited from (a) liquid waste in a municipal or industrial wastewater treatment plant, (b) surface or ground water treated in a water treatment plant, whether or not these solids have undergone treatment. Septage is included herein as sludge.
13. "Treatment" means a process which alters modifies or changes the biological, physical, or chemical characteristics of sludge or liquid waste.
14. "Vector Attraction" is the characteristic of sewage sludge that attracts rodent, flies, mosquitoes, or other organisms capable of transporting infectious agents.

## Part II

### A. MANAGEMENT REQUIREMENTS

#### 1. Land Application of Sludge

The permittee shall prepare and maintain an operational record for each day that sludge is applied and when any other management activities are conducted at the land application sites. The daily operational record shall include the following:

- a. The date, type, and wet and dry weights of the sludge applied;
- b. The facility from which the sludge originated;
- c. A record of any major deviations from the operating plan;
- d. General daily weather conditions;
- e. The application rate for sludge;
- f. A map for each site showing the area of daily activity;
- g. A record of all actions taken to correct violations of the Delaware Environmental Protection Act and the Department's Regulations; and,
- h. Management undertaken, such as planting and harvesting of crops, fertilizers and chemicals added, irrigation frequency, techniques used, etc.

#### 2. Change in Operation

The application of sludge to the sites authorized herein shall be consistent with the terms and conditions of this permit. The application of sludge at levels in excess of the amount necessary to provide plant available nitrogen for the crop being grown, in accordance with the limits identified in Part I, A.1, 2, and 3 of this permit, shall constitute a violation of the permit. Any anticipated facility expansion, production increase, or change in site conditions which would affect the land limiting constituent, create a new land limiting constituent, or adversely affect site conditions must be reported to the Department. Upon review of this information, the Department may invoke the provisions of Part II, B.6 of this permit.

#### 3. Noncompliance Notification

The permittee shall report to the Department:

- a. In writing thirty (30) days before any planned physical alteration or addition to the permitted facilities or activities, if that alteration or addition would result in any significant change in information that was submitted during the permit application process;

- b. In writing thirty (30) days before any anticipated change which would result in noncompliance with any permit condition or Part III, (B), of the Guidance and Regulations Governing the Land Treatment of Wastes;
- c. Orally within twenty-four (24) hours from the time the permittee became aware of any noncompliance which may endanger the public health or the environment, at (800) 662-8802. In addition, a call must be placed at (302) 739-9946 during normal business hours, and;
- d. In writing as soon as possible but within five (5) days of the date the permittee knows or should know of any noncompliance unless extended by the Department;

This report shall contain:

- 1) A description of the noncompliance and its cause;
  - 2) The period of noncompliance including to the extent possible, times and dates and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
  - 3) Steps taken or planned to reduce or eliminate reoccurrence of the noncompliance.
- e. In writing as soon as possible after the permittee becomes aware of relevant facts not submitted or incorrect information submitted, in a permit application or any report to the Department. Those facts or the correct information shall be included as a part of this report.

#### 4. Minimize Impacts

The permittee shall take all necessary actions to eliminate and correct any adverse impact on the public health or the environment resulting from permit noncompliance.

## B. RESPONSIBILITIES

### 1. Renewal Responsibilities

At least one hundred eighty (180) days before the expiration date of this permit, the permittee shall submit a new application for a permit or notify the Department of the intent to cease operation by the expiration date. **When submitting a new permit application, updated Project Development Reports (PDRs) for all sludge application sites must be included.** In the event that a timely and sufficient reapplication has been submitted and the Department is unable, through no fault of the permittee, to issue a new permit before the expiration date of this permit, the terms and conditions of this permit are automatically continued and remain fully effective and enforceable.

### 2. Entry and Access

The permittee shall allow the Department, consistent with 7 Del. C., Chapter 60, to:

- a. Enter the permitted facilities;
- b. Inspect any records that must be kept under this permit;
- c. Inspect any facility, equipment, practice, or operation permitted or required by this permit;
- d. Sample or monitor for the purpose of assuring permit compliance, any substance or any parameter at the facility or land application site.

### 3. Provide Information

The permittee shall furnish to the Department within a reasonable time, any information requested, including copies of records, which may be used by the Department to determine whether cause exists for modifying, revoking, reissuing, or terminating the permit, or to determine compliance with the permit or Part III, (B), of the Guidance and Regulations Governing the Land Treatment of Wastes.

### 4. Transfer of Ownership or Control

This permit shall be transferable to a new owner or operator provided that the permittee notifies the Department by requesting a minor modification of the permit before the date of transfer and provided that the transferee shows evidence of a legal right to use the site and is otherwise in compliance with all applicable provisions of Part III, (B), of the Department's Guidance and Regulations Governing the Land Treatment of Wastes.

5. Operation of Facility

The permittee shall at all times properly maintain and operate all structures, systems, and equipment for treatment, control and monitoring, which are installed or used by the permittee to achieve compliance with this permit or Part III, (B), of the Guidance and Regulations Governing the Land Treatment of Wastes.

6. Permit Revocation and Modification

a. After notice and opportunity for a hearing, this permit may be modified or revoked in whole or in part during its term for cause including, but not limited to, the following:

- 1) Violation of any terms or conditions of this permit;
- 2) Obtaining this permit by misrepresentation or failure to disclose fully all of the relevant facts;
- 3) Any change in operating conditions that requires either a temporary or permanent permit modification; or
- 4) If the Department finds that the public health, safety or welfare requires emergency action, the Department shall incorporate findings in support of such action in a written notice of emergency revocation issued to the permittee. Emergency revocation shall be effective upon receipt by the permittee. Thereafter, if requested by the permittee in writing, the Department shall provide the permittee a revocation hearing and prior notice thereof. Such hearings shall be conducted in accordance with 7 Del. C., Chapter 60.

b. The Department may revoke this permit if the permittee violates any permit condition, any provisions of Part III, (B), of the Guidance and Regulations Governing the Land Treatment of Wastes, or fails to pay applicable Department fees.

7. Permit Closure Report

a. All land approved for the Agricultural Utilization of sludge is required to have a closure report when the land is no longer being utilized as described in permit application. The report must be submitted to the Department within four (4) months of determination that the field will no longer be utilized for sludge application. The closure report will have the following:

- 1) Letter from permittee stating the application site (with tax parcel number(s)) will no longer receive sludge approved by this Permit.
- 2) Copy of the last sludge monitoring results as required in Part 1, B.1 of this permit.

- 3) Copy of the last soil monitoring results as required in Part 1, B.4 of this permit. A soil test is required after the last land application of sludge.
- 4) Copy of the last groundwater monitoring well results as required in Part 1, B.6 of this permit. A groundwater test is required after the last land application of sludge (If monitoring was previously required).

8. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under 7 Del. C., Chapter 60.

9. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation.

10. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

11. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application or any provision of this permit to any circumstances is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

12. Compliance Required

The permittee shall comply with all conditions of the permit.

13. Reopener

In the event that the Part III, B, of the Guidance and Regulations Governing the Land Treatment of Wastes or applicable Federal Regulations are revised, this permit may be reopened and modified accordingly after notice and opportunity for a public hearing.

## Part III

### A. SPECIAL CONDITIONS

The permittee must ensure that the following conditions are met:

1. Monitoring wells
  - a. Groundwater shall be sampled at the following locations at the frequencies indicated.
    - 1) Groundwater shall be sampled per the frequency listed in Part I, Subsection B.6. at monitoring wells (DNREC ID) 246596, 246598, 246597, 246599, and 246600.
  - b. All monitoring wells samples shall be analyzed for the parameters listed in Part I, Subsection B.6.
  - c. Copies of the laboratory reports for all groundwater analytical data and the corresponding sampling logs shall be submitted to the Department within thirty days of receipt of the analytical data. In addition, the elevation of the top of the casing (TOC) for each monitoring well shall be surveyed in reference to a permanently marked, stationary point. After notice and opportunity for a hearing, the Department may modify the list of parameters specified above based on observations of groundwater quality trends in the area.
  - d. The monitoring frequency for groundwater will be increased to semi-annually at any of the above sites, when sludge is applied.
2. Only sludge meeting the requirements for stabilization and that has been processed to significantly reduce pathogens, by methods approved by the Department and as specified in this permit, may be land applied.
3. Sludge shall be transported to the land treatment sites in accordance with Delaware Non Hazardous Waste Transporters Permit No. OH-11.
4. Based upon the information provided in the Project Development Report for each approved site, the permittee can achieve the nitrogen loading rate specified in the crop management plan by applying stabilized sludge. Subsequent annual sludge application rates can be adjusted by the Department based on annual nitrogen mineralization calculations submitted to the Department by the permittee as required in Part I, F.1 (f) of this permit.

6. Pre Start Up

- a. Prior to the application of sludge, buffer zones, sensitive areas and the areas on which sludge is to be applied must be clearly marked with stakes, flags or other suitable markers acceptable to the Department.
- b. The permittee must notify the Department at (302) 739-9946 at least two (2) working days prior to the application of sludge to any field.
- c. Before the permittee can begin to apply sludge to the designated site, a pre start-up inspection may be conducted by the Department to verify that proper buffer zones and non-application areas are suitably marked. Based on the results of the pre start-up inspection, the Department will either:
  - 1) Grant approval for sludge application operations to begin or;
  - 2) Require the permittee to perform additional site preparation (such work must be performed and approved prior to sludge application).

7. Application Measures

If at any time during the sludge application period the depth to groundwater is less than twenty (20) inches from the depth of tillage, all sludge application activities shall immediately cease and the Department shall be notified. Departmental approval shall then be required before sludge application operations can continue.

8. Post Application Measures

- a. The facility must provide the Department with a crop plan for the year in which stabilized sludge are to be applied to lands specified in this permit. Any changes to the crop rotation plan must be approved by the Department prior to implementation.
- b. The Annual Report shall be submitted to the Department as required in Part I, F.1 of this permit. Should the permittee fail to supply the required documents on or before the deadline specified, the Department may revoke this permit.

9. If, for any reason, any of the contracts or agreements specified in the Project Development Report any one of the approved sites is cancelled or amended, approval granted for use of that site shall be void.