

State Permit No. LTS 5004-90-12
 DEN Number: 359141-05
 Effective Date: July 13, 2012
 Amended Date: October 16, 2012
 Amended Date: March 14, 2013
 Amended Date: October 8, 2015
 Amended Date: October 20, 2015
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5. SOIL MONITORING REQUIREMENTS

Composite soil samples representing each soil series within the wetted spray field should be taken within the upper 12 inches of soil. A minimum of one composite sample for every 20 acres of each soil series is required. Soil sample locations shall be plotted on a scaled drawing and labeled consistent with the sample nomenclature. Each field must also be identified so that sample results may be tracked and properly assessed for field life limiting factors.

Parameter	Unit Measurement	Measurement Frequency	Sample Type
pH	S.U.	Annually	Soil Composite
Organic Matter	%	Annually	Soil Composite
Phosphorus (as P2O5)	mg/kg	Annually	Soil Composite
Potassium	mg/kg	Annually	Soil Composite
Sodium Adsorption Ratio	meq/100g	Annually	Soil Composite
Cadmium	mg/kg	Once per 4 years	Soil Composite
Nickel	mg/kg	Once per 4 years	Soil Composite
Lead	mg/kg	Once per 4 years	Soil Composite
Zinc	mg/kg	Once per 4 years	Soil Composite
Copper	mg/kg	Once per 4 years	Soil Composite
Cation Exchange Capacity	meq/100g	*Only if soil pH changes significantly	Soil Composite
Phosphorus Adsorption	meq/100g	**Only if soil phosphorus levels become excessive for plant growth	Soil Composite
Percent Base Saturation	%	*Only if soil pH changes significantly	Soil Composite

*A significant change in soil pH is defined as a change of one or more standard units from the original value established in the Design Development Report.

** Excessive levels of soil phosphorus are defined by the Delaware Nutrient Management Commission. Soil phosphorus levels must be tested in accordance with the University of Delaware soil testing methods. If the soil phosphorus levels become excessive, the permittee shall perform a Phosphorus Site Index (PSI) study of the site. The results of the PSI study must be submitted to the Ground Water Discharges Section within 30 days of completion of the study. Based on the results of the PSI study, the Ground Water Discharges Section may require the permittee to submit a plan for Ground Water Discharges Section review and approval detailing steps the permittee will take to reduce the phosphorus loading rates at the site to crop uptake levels.

H. Schedule of Compliance

1. The permittee shall submit information necessary for proper operation of the spray irrigation system in accordance with the following schedule:

None
2. The permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance by specified date. In the event of noncompliance, the notice shall include the cause of noncompliance, any remedial action taken, and the probability of meeting the next scheduled requirement.

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I. Monitoring and Reporting

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

The permittee shall automatically resample the wastewater and submit to the Department additional analyses if there has been significant increase (greater than 25%) in the characterization of any one parameter of the effluent wastewater as established in the Design Development Report. The permittee shall then be required to recharacterize the wastewater in order to determine if any change in the land limiting constituent has occurred. Any significant change in wastewater characteristics that affects the land limiting constituent shall be included in a revised Design Development Report 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.

2. Reporting

Monitoring results obtained during the previous one month/quarter shall be summarized for each month/quarter and reported on an approved Spray Effluent Monitoring Report Form 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:

Groundwater Discharges Section
Division of Water
Department of Natural Resources and Environmental Control
89 Kings Highway
Dover DE 19901
Telephone: (302) 739-9948 Office
(302) 542-9735 Cell

a. Additional Monitoring by Permittee

If the permittee monitors any parameter at the location(s) designated herein more frequently than required by this permit, using approved analytical methods specified herein, the results of such monitoring shall be included in the calculation and reporting of the values required in the appropriate Monitoring Report Form. Such increased frequency shall also be indicated.

b. The permittee shall submit to the Department an annual operation report on or before February 1 of each year. The annual operation report shall summarize operational and maintenance activities at the facility along with management and administration of the facility and shall include the following:

- i. The annual volume of wastewater spray irrigated on each field along with the total nitrogen and phosphorus loading applied to each irrigation field in pounds per acre per field as well as total pounds removed;
- ii. A chemical analysis of soils from each field for the constituents identified in Part I.G.5 of this permit;

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- iii. Identification of those portions of the field(s) which have been prone to ponding, pooling or runoff; and
- iv. The vegetative management practices followed during the previous year and anticipated for the coming year.
- v. The type and amount of crop removed under spray irrigation.
- vi. Documentation verifying the calibration of influent and effluent flow meters.
- vii. A summary of all sources of sludge/biosolids, regardless of origin, to all fields permitted for spray irrigation. The summary should at a minimum include the following:
 - (b) For the reporting year:
 - (i) All Nitrogen and Phosphorus sludge/biosolids sources.
 - (ii) The amount of Nitrogen and Phosphorus (lbs/acre) applied to each permitted spray irrigation field. A site map depicting sludge application locations.
 - (c) Proposed for the coming year:
 - (i) The projected Nitrogen and Phosphorus sludge/biosolids sources.
 - (ii) The projected amount of Nitrogen and Phosphorus (lbs/acre) to be applied to each permitted spray irrigation field.
 - (iii) A site map depicting the proposed sludge application locations.
- a. Compliance Monitoring Report

At least 180 days before the expiration date of this permit, the permittee must submit a five year Compliance Monitoring Report (CMR) with the application for renewal. The CMR must be in accordance with current Department Guidelines. CMR requirements are currently outlined in the November 13, 2008 amendment to the *Wastewater Treatment and Disposal System Siting, Design, and Operation: Supplemental Guidance to the Existing Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems and the Regulations Governing the Land Treatment of Wastes*. Please check with the Department prior to completing the CMR for the most current Guidelines regarding the CMR.

3. Test Procedures

Test procedures for analysis of pollutants shall conform to the applicable test procedures identified in 40 C.F.R., Part 136 or the most recently adopted copy of Standard Methods unless otherwise specified in this permit.

Soil chemical testing should be in accordance with Methods of Soil Analysis published by the American Society of Agronomy, Madison, Wisconsin.

4. Recording of Results

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

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- 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 date(s) the analyses were performed and the time the analyses were begun;
- d. The person(s) who performed the analyses; and
- e. The results of each analysis.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed, calibration and maintenance of instrumentation and recording from continuous monitoring instrumentation shall be retained for five 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.

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6. Quality Assurance Practices

The permittee is required to show the validity of all effluent monitoring and ground water monitoring data by requiring its laboratory to adhere to the following minimum quality assurance practice:

- a. Duplicate⁽¹⁾ and spiked⁽²⁾ samples must be run for each effluent monitoring and ground water monitoring constituent in the permit on 5% of the samples, or at least on one sample per quarter, whichever is greater. If the analysis frequency is less than one sample per quarter, duplicate and/or spiked samples must be run for each analysis;
- b. For spiked samples, a known amount of each constituent is to be added to the discharge sample. The amount of constituent added should be approximately the same amount present in the unspiked sample, or must be approximately that stated as maximum or average in the discharge permit;
- c. The data resulting from a and b shall be summarized in the annual report submitted pursuant to Part I.I.2.b of this permit in terms of precision; percent recovery; number of duplicate and spiked samples run; date and laboratory log number of samples run, and name of analyst;
- d. Precision shall be calculated by the standard deviation (s) formula $s = (\sum d^2/k)^{1/2}$, where d is the difference between duplicate results, and k is the number of duplicate pairs used in the calculations;
- e. Percent recovery (R) shall be reported on the basis of the formula $R = 100 (F-I)/A$, where F is the analytical result of the spiked sample, I is the result before spiking of the sample, and A is the amount of constituent added to the sample;
- f. The percent recovery in Quality Assurance Practice e above shall be summarized yearly in terms of mean recovery and standard deviation from the mean. The formula, $s = [\sum(x_{\text{mean}} - x)^2 / (n-1)]^{(1/2)}$, where s is the standard deviation around the mean x-x, x is an individual recovery value, and n is the number of data points, shall be applied;
- g. The permittee or contract laboratory is required to annually analyze an external quality control reference sample for each pollutant. These are available through the EPA regional quality assurance coordinator. Results shall be included in the annual report, Quality Assurance Practice c above;
- h. The permittee and/or contract laboratory is required to maintain an up-to-date and continuous record of the method used, any deviations from the method or options employed in the reference method, reagent standardization, equipment calibration and the data obtained in Quality Assurance Practices a, b and f above; and
- i. If a contract laboratory is utilized, the permittee shall report the name and address of the laboratory and the parameters analyzed together with the monitoring data required.

⁽¹⁾ Duplicate samples are not required for the following parameters: color, temperature, and turbidity.

⁽²⁾ Spike samples are not required for the following parameters: Acidity, Alkalinity, Bacteriological, Benzidine, Chlorine, Color, Dissolved Oxygen, Hardness, pH, Oil & Grease, Radiological, Residues, Temperature, Turbidity, BOD₅ and Total Suspended Solids.

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J. DEFINITIONS

1. Bypass - The intentional diversion of wastes from any portion of a treatment facility.
2. Composite sample - A combination of individual samples obtained at intervals over a time period. Either the volume of each individual sample is proportional to discharge flow rates or the sampling interval (for constant volume samples) is proportional to the flow rates over the time period used to produce the composite. For a 8-24 hour discharge, a minimum of 24 individual grab samples shall be collected and combined to constitute a composite sample. For intermittent discharges of 4-8 hours duration, a minimum of 12 grab samples shall be collected and combined to constitute the composite sample for the discharge. For intermittent discharges of less than 4 hours, a minimum of individual grab samples shall be collected and combined to constitute the composite samples collected equal to the duration of the discharge in hours times 3 but not less than 3 samples.
3. Grab sample - An individual sample collected in less than 15 minutes.
4. In-situ – Data is collected in stream or in place without interrupting the normal flow process.
5. Field Test – A test or measurement performed in the field using a calibrated water-quality instrument. Such tests include, but are not limited to, pH, specific conductance, and temperature. For ground water sampling purposes, these parameters must be monitored during well purging and allowed to stabilize prior to the collection of samples for laboratory analysis.
6. Daily average concentration - The daily average concentration shall be determined by the summation of all the measured daily concentrations obtained from composite samples divided by the number of days during the calendar month when the measurements were made.
7. Daily maximum concentration - The concentration of a pollutant in terms of milligrams per liter which represents the value obtained from a composite sample of an effluent over a 24 hour period.
8. Land Treatment - A technology for the intimate mixing or dispersion of wastes into the upper zone of the plant-soil system with the objective of microbial stabilization, immobilization, selective dispersion, or crop recovery leading to an environmentally acceptable assimilation of the waste.
9. Spray Irrigation - the controlled application of treated wastewater to a vegetated soil surface.
10. Soil composite - At least ten individual cores which have been mixed together to form one sample. The cores shall be collected in a manner such that the final sample is representative of the soils found on the field.
11. Treatment - A process which alters, modifies, or changes the biological, physical, or chemical characteristics of sludge or liquid waste.

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PART II

A. MANAGEMENT REQUIREMENTS

1. Spray Irrigation of Wastewater

An operator log must be kept on site at all times. Each spray system section shall be numbered and referred to by number in the operator log. All records and reports shall also be kept on site at all times. This log shall, at a minimum, include the following:

- a. Time spent at the treatment facility on any date;
- b. Details of the operation and maintenance performed on the wastewater treatment and spray irrigation facility on any date;
- c. The volume of wastewater sprayed on each field on any date and the acreage over which the wastewater was sprayed;
- d. Identification of those portions of the field(s) that were ponding on any date;
- e. A record of any deviations from the operation and maintenance manual;
- f. General daily weather conditions;
- g. A site map showing the spray area with each center pivot or solid set spray zone numbered;
- h. A record of all actions taken to correct violations of the Delaware Environmental Protection Act and the Department's regulations; and
- i. A record of all site management activities undertaken such as planting, reseeding, harvesting of crops, commercial fertilizer applications and any other chemical additions or applications.

2. Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

Any anticipated facility expansions, production increases, or process modifications which will result in new, different, or increased discharges of pollutants must be submitted to the Ground Water Discharges Section for approval in accordance with Part II. B. Subsection 203 (4) (b) [Major Modifications] of the Regulations. The procedure for making major modifications shall be the same as that used for a new permit under the regulations.

Any other activity which would constitute cause for modification or revocation and reissuance of this permit as described in Part II.B.6 of this permit shall be reported to the Ground Water Discharges Section. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

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3. Non-compliance Notification

The permittee shall report to the Department's Enforcement Section at (800) 662-8802 any unpermitted release or discharge of any contaminant into the air, or a pollutant, including petroleum substances, into surface waters, ground water, or onto land as soon as the permittee has knowledge of the release or discharge.

The permittee shall report to the Ground Water Discharges Section orally within 24 hours from the time the permittee became aware of any noncompliance that may endanger the public health or the environment by contacting the Department at the telephone numbers cited in Part I.I.2 of this permit.

If for any reason the permittee does not comply with, or will be unable to comply with, any effluent limitations or other conditions specified in this permit, the permittee shall provide the Department with the following information in writing within 5 days of becoming aware of any actual or potential non-compliance:

- a. A description and cause of the non-compliance with any limitation or condition;
- b. The period of non-compliance including exact dates and times; or, if not yet corrected, the anticipated time the non-compliance is expected to continue; and
- c. The steps being taken or planned to reduce, eliminate and/or prevent recurrence of the non-compliant condition.

4. Facilities Operation

The permittee shall at all times properly maintain and operate as efficiently as possible all structures, systems and equipment for treatment control and monitoring which are used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes, but is not limited to, effective performance based on designed facility removals, adequate funding, effective management, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures.

5. Facility and Operation Changes

The permittee shall submit a written report to the Department for review and approval, of any changes to the facility or operation of the system within the following time periods:

- a. Thirty days before any planned activity, physical alteration to the permitted facility or addition to the permitted facility if that activity, alteration or addition would result in a change in information that was previously submitted to the Department;
- b. Thirty days before any anticipated change which would result in noncompliance with any permit condition or the regulations; or
- c. Immediately after the permittee becomes aware of relevant facts omitted from, or incorrect information submitted in, a permit application or report to the Department. Omitted facts or corrected information shall be submitted as soon as possible and will be included as part of the report.