Permitting Wastewater Spray Irrigation Systems in Delaware

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Letter of Intent

- Department response. Identifies need for:
  - Site Selection and Evaluation Report
  - Site Inspection
  - Design Development Report
  - Permit Application and Public Notice
  - Plans and Specifications
  - Plan of Operation and Management
  - Trust Indenture or CPCN for privately owned facilities

Site Selection and Evaluation Report

- Submitted for Department review
- Provides preliminary site details
- Department conducts site inspection
- Site concurrence or denial issued by Division
- Table 201-2 of the Regulations

Design Development Report

- Submitted for Department review
- Detailed Soils Report, Wastewater Treatment details, Vegetative Management Plan, LLC
- Accepted by Department as the basis for facility design
- Table 202-1 of the Regulations

Plans and Specifications

- Submitted by owner for Department review
- Checked against accepted Design Development Report
- Approved by Department for construction and incorporated into final LTS permit
- Should be of "Biddable" quality
- As-Built Drawings must be submitted following construction

Application for permit

- Permit application sent to owner
- Permit application completed and submitted to Department
- Application reviewed and checked against Design Development Report
- Permit application placed on Public Notice

Land Treatment System (LTS) Permit drafted

- Limits on influent flow; effluent BOD, TSS, Fecal Coliforms, hydraulic loading rates, and Nitrogen/Phosphorus loading rates
- Ground water monitoring required
  - Background ground water quality is established
  - Monitoring wells placed upgradient, downgradient and within the wetted perimiter

Typical Ground Water Monitoring Requirements

Parameter	Unit Measurement	Measurement Frequency	Sample Type
Depth to Water	hundredths of a foot	Monthly	In-Situ
Ammonia as Nitrogen	mg/L	Quarterly	Grab
Chloride	mg/L	Quarterly	Grab
Dissolved Oxygen	mg/L	Quarterly	Field
Fecal Coliform	Col/100mL	Quarterly	Grab
Nitrate + Nitrite as Nitrogen	mg/L	Quarterly	Grab
pH	S.U.	Quarterly	Field
Sodium	mg/L	Quarterly	Grab
Specific Conductance	µS/cm	Quarterly	Field Test
Temperature	°C	Quarterly	Field
Total Dissolved Solids	mg/L	Quarterly	Grab
Total Nitrogen	mg/L	Quarterly	Grab
Total Phosphorus	mg/L	Quarterly	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at each monitoring well in accordance with procedures approved by the Department and listed in the State of Delaware, Field Manual for Groundwater Sampling (Custer, 1988).

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  - Monitoring wells placed upgradient, downgradient and within the wetted perimeter
- Soil monitoring required

Typical Soil Monitoring Requirements

. SOIL MONITORING REQUIREMENTS

Composite soil samples representing each soil series within the wetted spray field should be taken at 15 to 30 inch depths. 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 T
pH	S.U.	Annually	Soil Comp
Organic Matter	%	Annually	Soil Comp
Phosphorus (as P2O5)	mg/kg	Annually	Soil Comp
Potassium	mg/kg	Annually	Soil Comp
Sodium Adsorption Ratio	meq/100g	Annually	Soil Comp
Cadmium	mg/kg	Once per 4 years	Soil Comp
Nickel	mg/kg	Once per 4 years	Soil Comp
Lead	mg/kg	Once per 4 years	Soil Comp
Zinc	mg/kg	Once per 4 years	Soil Comp
Copper	mg/kg	Once per 4 years	Soil Comp
Cation Exchange Capacity	meq/100g	*Only if soil pH changes significantly	Soil Comp
Phosphorus Adsorption	meq/100g	**Only if soil phosphorus levels become excessive for plant growth	Soil Comp
Percent Base Saturation	%	*Only if soil pH changes significantly	Soil Comp

*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 herein as any soil phosphorus level deemed excessive by the Delaware Nutrient Management Commission.

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- Ground water monitoring required
  - Background ground water quality is established
  - Monitoring wells placed upgradient, downgradient and within the wetted perimeter
- Soil monitoring required
- Surface Water Quality Sampling may be required upgradient and downgradient

Typical Surface Water Monitoring Requirements

SURFACE WATER MONITORING *
Monitoring Requirements

Parameter	Unit Measurement	Measurement Frequency	Sample Type
pH	S.U.	Semi-Annually	Grab
Total Dissolved Solids	mg/l	Semi-Annually	Grab
Nitrate Nitrogen	mg/l	Semi-Annually	Grab
Ammonia Nitrogen	mg/l	Semi-Annually	Grab
Total Phosphorus	mg/l	Semi-Annually	Grab
Sodium	mg/l	Semi-Annually	Grab
Chlorides	mg/l	Semi-Annually	Grab
Fecal Coliform	Col/100 ml	Semi-Annually	Grab
Enterococcus	Col/100ml	Semi-Annually	Grab

- Surface Water samples shall be obtained from Gills Branch and the Eli Walls Ditch at the four locations indicated in Drawing # 1 of the December 2002 Design Development Report.

Annual Report Requirements

- Volume of water applied to each field
- Total Nitrogen and Phosphorus load applied to each field (lbs./acre)
- Pounds of Nitrogen and Phosphorus removed through crop uptake
- Details on Vegetative Management Plan
- Type and amount of crop removed
- Operational Issues

Thank-you

QUESTIONS?

COMMENTS