

Ohio EPA Policy	<b>Design Criteria; Wastewater Treatment Lagoons</b>	
DSW-0400.023  <b>Removed</b>	Statutory reference: Rule reference:	Ohio EPA, Division of Surface Water Revision 0, October 30, 1989 Removed, April 30, 2003
<p><b>THIS POLICY DOES NOT HAVE THE FORCE OF LAW</b> Pursuant to Section 3745.30 of the Revised Code, this policy was reviewed and removed.</p>		

This policy does not meet the definition of policy contained in Section 3745.30 of the Ohio Revised Code. Ohio EPA is removing this document from the Division of Surface Water Policy Manual and is considering addressing this topic in a future rulemaking.

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# THIS POLICY DOES NOT HAVE THE FORCE OF LAW

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## Design Criteria; Wastewater Treatment Lagoons

PURPOSE: To define requirements for design and operation of lagoons (ponds) used for secondary treatment of sanitary wastewater, as well as to specify mandatory discharge procedures for controlled discharge lagoons. Design of tertiary lagoons is to be addressed separately on a case-by-case basis.

### BACKGROUND: Types of Lagoons

From a biological aspect, there are three types:

Aerobic  
Anaerobic  
Facultative

With regard to discharge, there are two types:

Flow-through  
Controlled

### Applicability

This policy, in general, applies to any combination of types listed above; some provisions apply only to controlled discharge lagoons. It also applies to publicly owned, semi-public, and industrial sanitary wastewater lagoons constructed after the initial effective date of the policy.

### POLICY: Design

#### A. The following design requirements are applicable to both controlled discharge and flow-through lagoons

1. A minimum of three cells must be provided. Innovation as to the number of cells and methods of algal control is encouraged.
2. Sufficient valving should be provided to permit a variety of flow patterns with capability to isolate any cell.
3. Drawdown facilities shall be provided to accomplish withdrawal at different elevations as needed for the purpose of discharging and maintenance.
4. The installation of disinfection facilities is not mandatory. However, the design should allow for the addition of such facilities, should bacteriological studies so indicate the need.
5. The permissible organic loading is 15 BOD<sub>5</sub> per acre per day for each cell. The maximum permissible loading could be increased on a case-by-case basis dependent on

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climatic conditions and shall be established for each facility with approval of the Ohio EPA.

6. The maximum operating depth should be 7 feet with the minimum depth 18 inches.
7. Retention time should be based on calculated loading rates.
8. Provisions must be made for groundwater protection and erosion control.
9. The design shall provide capability to achieve the following minimum effluent limitations:

CBOD<sub>5</sub> 25 mg/l for 30-day average, 45 mg/l for 7-day average.  
TSS 65 mg/l for 30-day average, 90 mg/l for 7-day average.  
(applicable to all lagoons)

More stringent effluent limits may be imposed dependent on water quality requirements.

10. Other features pertaining to siting, design, or construction should be based on chapter 100 of the most recent edition of the Ten States Standards.

B. Additional design requirement limited to flow-through discharge lagoons

1. A retention time of 90 to 120 days should be provided.

C. Additional design requirement limited to controlled discharge lagoons

1. A retention time of at least 180 days should be provided. Actual retention time should be based on receiving stream flow analysis.
2. Provisions must be made for a permanent means of measuring and recording receiving stream flow above the discharge point.

Controlled Discharge Criteria

- A. Achieved retention time shall be controlled based upon stream flow/plant flow and loading rates.
- B. Discharge during the controlled release mode shall be limited based on the upstream flow so as not to violate water quality standards with a discharge of secondary effluent (the stream effluent dilution ration will generally be at least 5:1). This discharge condition will be specified in the NPDES permit.
- C. Recommended Discharge Operating Procedure for Controlled Discharge Lagoons

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1. Isolate the cell to be discharged, usually the final one in the series, by valving off the inlet line from the preceding cell.
2. Analyze contents of cell to be discharged for dissolved oxygen, noting turbidity, color, and any unusual conditions. Analysis for other chemical and bacteriological parameters specified in the NPDES permit are also required.
3. Note conditions in the stream to receive the effluent. Measure the receiving stream flow.
4. Commence discharge and continue so long as receiving stream flow and other conditions are acceptable.

NOTE: The discharge pattern usually consists of drawing down the last two cells to about 18 to 24 inches after isolation, interrupting the discharge for a week or more to divert raw waste to the last cell and resting the number one cell before its discharge. When this cell is drawn down to about 24 inches or so, the usual series flow pattern is resumed.

#### Management

1. An operation and maintenance (O&M) plan shall be developed together with an operation and maintenance manual which covers items such as procedures, inspections, and record keeping.
2. Implementation of the plan and adherence to the manual requirement is necessary.