

COMPLIANCE TIPS FOR LAGOON FACILITIES

PERMITTED UNDER THE WASTEWATER STABILIZATION LAGOON EFFLUENT PERMIT (NPDES PERMIT MIG580000)

The Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (WRD) has developed this guidance to provide tips for owners and operators of lagoon systems that are authorized to discharge under the [Wastewater Stabilization Lagoon Effluent general permit](#), effective April 1, 2019. This document is not intended to be all-inclusive, but to highlight information that may help permittees maintain compliance with the permit. The sampling and analysis tips are based on the parameters listed in Part I.A.1 -*Final Effluent Limitations* of the permit.

PRE-DISCHARGE SAMPLING

- ✓ Collect all pre-discharge samples as grab samples for all parameters.
- ✓ Due to chemical preservation requirements, use three (3) separate sample bottles:
 1. A sealed bacti-bottle for fecal coliform
 2. A bottle for 5-day biochemical oxygen demand (BOD₅) and total suspended solids (TSS)
 3. A bottle for ammonia as N (NH₃) and total phosphorus (TP), immediately preserved with sulfuric acid (H₂SO₄) to a pH less than 2.
- ✓ Dissolved oxygen (DO) and pH samples should be analyzed in the field because they have a short holding time of 15 minutes from sample collection. Samples taken to another lab for analysis may not meet this short holding time.
- ✓ DO must be measured and reported to WRD no more than 24 hours prior to discharge notification.
- ✓ Refrigerate or store all samples on ice (except pH and DO) until analysis because the sample(s) must be cooled to $\leq 6^{\circ}\text{C}$.
- ✓ Complete a chain-of-custody form for any sample delivered to an outside laboratory.

Sampling Requirements

Samples must be delivered and analyzed within the required hold times. The required hold times, preservation, and sample bottle type can be found in [40 CFR Part 136, Table II – Required Containers, Preservation Techniques, and Holding Times](#). The following is derived from that table.

Parameter	Container	Preservation	Hold Time
<i>5-day Biochemical oxygen demand</i>	Polyethylene (plastic), fluoropolymer, or glass	Cool to 0-6 °C	48 hours
<i>Total suspended solids (TSS)</i>	Polyethylene (plastic), fluoropolymer, or glass	Cool to 0-6 °C	7 days
<i>Ammonia as N</i>	Polyethylene (plastic), fluoropolymer, or glass	Cool to 0-6 °C and H ₂ SO ₄ to pH <2	28 days
<i>Total phosphorus</i>	Polyethylene (plastic), fluoropolymer, or glass	Cool to 0-6 °C and H ₂ SO ₄ to pH <2	28 days
<i>Fecal Coliform</i>	Polypropylene or other autoclavable plastic	Cool to 0-6 °C - Bottle may contain sodium thiosulfate (to dechlorinate sample)	8 hours (Includes lab set-up time)
<i>pH</i>	Polyethylene (plastic), fluoropolymer, or glass	N/A	≤ 15 minutes
<i>Dissolved oxygen</i>	Glass	N/A	≤ 15 minutes

THE LAGOON DISCHARGE REQUEST

A lagoon discharge request must be submitted into MiWaters and approved prior to the start of discharge. Though not required, the lagoon discharge request should be submitted **at least one to two (1-2) days prior** to the requested discharge start date to allow timely review by EGLE’s WRD. The permittee is encouraged to contact the WRD compliance manager after the request is submitted in MiWaters so the compliance manager can review it.

- ✓ Pre-discharge sample results must identify the date and time the samples were collected to determine if sample collection and analysis met the required holding times. Samples that were collected more than 14 days before the requested discharge start date will not be acceptable.

- ✓ Report the draw-down rate as million gallons per day (MGD), not in feet or inches.
- ✓ If the discharge does not begin on the date indicated in the approved discharge request, contact the WRD compliance manager. A new discharge request may need to be submitted.
- ✓ If the new discharge start date exceeds 14 days from the date the pre-discharge samples were collected, new samples must be collected and analyzed. A new lagoon discharge request will be required.

SAMPLING FREQUENCY AND TYPE DURING DISCHARGE

Parameter	Frequency	Sample Type
<i>Flow</i>	Daily	Measured or calculated
<i>BOD₅</i>	First day, every other day, last day	Composite *
<i>TSS</i>	First day, every other day, last day	Composite *
<i>Ammonia as N</i>	First day, every other day, last day	Composite *
<i>Total phosphorus</i>	First day, every other day, last day	Composite *
<i>Fecal Coliform</i>	First day, every other day, last day	Grab
<i>pH</i>	First day, every other day, last day	Grab
<i>DO</i>	Daily	Grab

Composite *- A 24-hour composite and a 3-part composite must be temperature controlled throughout compositing (e.g. sample bottle must be kept at 0-6 °C from the time of first aliquot collection until sample analysis). If the sample is not a 24-hour composite, then a 3-part composite must be used. The 3-part composite is made up of three equal portions (aliquots), collected during the same day, at equal times (e.g. 8:00 am, 12:00 pm, and 4:00 pm), over an eight (8) hour period. Each aliquot is placed in the same single container and the date and time of each aliquot recorded. After the last aliquot is added to the container, mix well and then pour into two smaller bottles; one bottle for the BOD₅ and TSS analyses and a second bottle for the ammonia and total phosphorus analyses which is then chemically preserved.

SAMPLING AND ANALYSIS DURING DISCHARGE

- ✓ When using a contract laboratory, be sure the discharge start-to-end date is managed in conjunction with the contract laboratory's schedule for acceptance of samples for analysis to ensure hold times are not exceeded for any samples.
- ✓ Sampling hold times begin at the time the last aliquot of the 3-part composite sample is collected. For example, the third part of the 3-part composite sample was collected at 4:00 PM on Monday. The 48-hour hold time for BOD5 starts at 4:00 on Monday and ends at 4:00 PM on Wednesday.
- ✓ Fecal coliform grab samples must be collected directly from the discharge into the bacti-sample bottle and not poured off from the 3-part composite sample.
- ✓ A completed chain of custody form must be used for any sample delivered to an outside laboratory.
- ✓ Sample results must be reported on the Discharge Monitoring Report (DMR) on the day the sample was collected (not the lab delivery date or analysis date).
- ✓ All test methods used to analyze samples must be United States Environmental Protection Agency (USEPA) approved and be sufficiently sensitive to determine compliance with the permit. USEPA approved test methods can be found in [40 CFR Part 136.3 in Table IA—List of Approved Biological Methods for Wastewater and Sewage Sludge](#) and [Table IB—List of Approved Inorganic Test Procedures](#).
- ✓ If the analysis fails to meet test method requirements, that sample result must be reported on the Daily DMR using the non-numeric code *C (lab problem/error)

ADDITIONAL COMPLIANCE TIPS

- ✓ Flow meters must be calibrated in accordance with manufacturers specifications at a frequency sufficient to assure accuracy in measurements. Most manufacturers require annual calibration.
- ✓ Weirs or flume structures must be evaluated to assure proper function and accurate measurement. This includes appropriate calibration, which should be conducted annually.
- ✓ Muskrat holes and/or other damage to the berm or liner must be repaired immediately to prevent an unpermitted groundwater discharge.
- ✓ Duckweed or other floating material and/or water perimeter emergent rooted aquatic plants in the lagoon may not exceed forty (40) percent cover. If the vegetation is skimmed off, it should be placed on the lined berms where the water can run back into the lagoon. If the material is placed on unprotected soils, it will be treated as a discharge of untreated or partially treated sewage to waters of the State (which is a violation of the NPDES Permit and Part 31 of the Natural Resources and Environmental Protection Act, as amended).

- ✓ The NPDES permit requires in Part I.A.3-*Facility Operation and Maintenance* three-times weekly (year-round) inspections of the lagoon system. To facilitate documentation of these inspections, EGLE's WRD developed a [monthly operational report \(MOR\) form](#). Select one of the two lagoon hyperlinks and then select the worksheet tab labelled *Lagoon O&M*. Unless the permittee has been told otherwise, the completed forms may be maintained on site; but they must be available upon request.
- ✓ Water treatment additives must be approved prior to use if the chemical is going to be added to the water. If an herbicide or pesticide is applied only to the vegetation above the water line, then WRD approval is not needed.

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