

CHAPTER 63
MONITORING, ANALYTICAL AND REPORTING REQUIREMENTS

[Prior to 7/1/83, DEQ Ch 18]

[Prior to 12/3/86, Water, Air and Waste Management[900]]

567—63.1(455B) Guidelines establishing test procedures for the analysis of pollutants. Only the procedures prescribed in this chapter shall be used to perform the measurements indicated in an application for an operation permit submitted to the department, a report required to be submitted by the terms of an operation permit, and a certification issued by the department pursuant to Section 401 of the Act.

63.1(1) Identification of test procedures.

a. The following is adopted by reference: 40 Code of Federal Regulations (CFR) Part 136, revised as of July 1, 2007.

b. All parameters for which testing is required by a wastewater discharge permit, permit application, or administrative order, except operational performance testing, must be analyzed using approved methods specified in 40 CFR Part 136.3 or, under certain circumstances, by other methods that may be more advantageous to use when such other methods have been previously approved by the director pursuant to 63.1(2). Samples collected for operational testing pursuant to 63.3(4) need not be analyzed by approved analytical methods; however, commonly accepted test methods should be used.

63.1(2) Application for alternate test procedures.

a. Any person may apply to the EPA regional administrator through the director for approval of an alternate test procedure.

b. The application for an alternate test procedure may be made by letter and shall:

(1) Provide the name and address of the responsible person or firm holding or applying for the permit (if not the applicant) and the applicable ID number of the existing or pending permit and type of permit for which the alternate test procedure is requested and the discharge serial number, if any.

(2) Identify the pollutant or parameter for which approval of an alternate testing procedure is being requested.

(3) Provide justification for using testing procedures other than those specified in 40 CFR Part 136.3.

63.1(3) Required containers, preservation techniques and holding times. All samples collected in accordance with self-monitoring requirements as defined in an operation permit shall comply with the container, preservation techniques, and holding time requirements as specified in Table VI. Sample preservation should be performed immediately upon collection, if feasible.

63.1(4) All laboratories conducting analyses required by this chapter must be certified in accordance with 567—Chapter 83. Routine on-site monitoring for pH, temperature, dissolved oxygen, total residual chlorine, other pollutants that must be analyzed immediately upon sample collection, settleable solids, physical measurements such as flow and cell depth, and operational monitoring tests specified in 63.3(4) are excluded from this requirement. All instrumentation used for conducting any analyses required by this chapter must be properly calibrated according to the manufacturer's instructions.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.2(455B) Records of monitoring activities and results.

63.2(1) The permittee shall maintain records of all information resulting from any monitoring activities required in its operation permit.

63.2(2) Any records of monitoring activities and results shall include for all samples:

a. The date, exact place and time of sampling.

b. The dates analyses were performed.

c. Who performed the analyses.

d. The analytical techniques or methods used, and

e. The results of such analyses.

63.2(3) The permittee shall retain for a minimum of three years all paper and electronic records of monitoring activities and results including all original strip chart recordings for continuous monitoring

instrumentation and calibration and maintenance records. This retention includes but is not limited to monitoring and calibration records from pH meters, dissolved oxygen meters, total residual chlorine meters, flow meters, and temperature readings from any composite samplers. The period of retention shall be considered to be extended during the course of any unresolved litigation or when requested by the director or the regional administrator.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.3(455B) Minimum self-monitoring requirements in permits.

63.3(1) *Monitoring by organic waste dischargers.* The minimum self-monitoring requirements to be incorporated in operation permits for facilities discharging organic wastes shall be the appropriate requirements in Tables I, II, and IV. Additional monitoring may be specified in the operation permit based on a case-by-case evaluation of the impact of the discharge on the receiving stream, toxic or deleterious effects of wastewaters, industrial contribution to the system, complexity of the treatment process, history of noncompliance or any other factor which requires strict operational control to meet the effluent limitations of the permit, as described in the Supporting Document for Permit Monitoring Frequency Determination, August 2008, located on the NPDES Web site.

63.3(2) *Monitoring by inorganic waste dischargers.* The self-monitoring requirements to be incorporated in the operation permit for facilities discharging inorganic wastes shall be determined on a case-by-case evaluation of the impact of the discharge on the receiving stream, toxic or deleterious effects of wastewaters, complexity of the treatment process, history of noncompliance or any other factor which requires strict control to meet the effluent limitations of the permit, as described in the Supporting Document for Permit Monitoring Frequency Determination, August 2008, located on the NPDES Web site.

63.3(3) *Monitoring of significant industrial users of publicly owned treatment works.* Monitoring for significant industrial users as defined in 567—60.2(455B) shall be determined as described in the Supporting Document for Permit Monitoring Frequency Determination, August 2008, located on the NPDES Web site. Results of such monitoring shall be submitted to the department in accordance with the reporting requirements in the operation permit. The monitoring program of a publicly owned treatment works with a pretreatment program approved by the department may be used in lieu of the supporting document.

63.3(4) *Operational monitoring.* The minimum operational monitoring to be incorporated in permits shall be the appropriate requirements in Table III. These requirements reflect minimum indicators that any adequately run system must monitor. The department recognizes that most well-run facilities will be monitored more closely by the operator as appropriate to the particular system. However, the results of any monitoring beyond the requirements in Table III need not be reported to the department, but shall be maintained in accordance with 63.2(3). Additional operational monitoring may be specified in the operation permit based on a case-by-case evaluation of the impact of the discharge on the receiving stream, toxic or deleterious effects of wastewaters, complexity of the treatment process, history of noncompliance or any other factor that requires strict control to meet the effluent limitations of the permit.

63.3(5) *Modification of minimum monitoring requirements.* Monitoring requirements may be modified or reduced at the discretion of the director when requested by the permittee. Adequate justification must be presented by the permittee that the reduced or modified requirements will accurately reflect actual wastewater characteristics and will not adversely impact the operation of the facility. Requests for modification or reduction of monitoring requirements in an existing permit are considered variance requests and must follow the procedures in 567—paragraph 60.4(2)“b.” All reductions or modifications of monitoring incorporated into an operation or NPDES permit by amendment or upon reissuance of the permit are only effective until the expiration date of that permit.

63.3(6) *Impairment monitoring.* If a wastewater treatment facility is located in the watershed of an impaired water body that is listed on Iowa’s most recent Section 303(d) list (as described in 40 CFR

130.7), additional monitoring for parameters that are contributing to the impairment may be included in the operation or NPDES permit on a case-by-case basis.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.4(455B) Effluent toxicity testing requirements in permits.

63.4(1) Effluent toxicity testing. All major municipal and industrial dischargers shall be required to carry out effluent toxicity testing. Minor dischargers may be required to conduct effluent toxicity tests based on a case-by-case evaluation of the impact of the discharge on the receiving stream or industrial contribution to the system. All dischargers required to conduct effluent toxicity tests shall conduct, at a minimum, one valid effluent toxicity test annually. The testing requirements will be placed in the operation permit for each discharger required to conduct this testing. Additional monitoring may be specified in the operation permit based on a case-by-case evaluation of the impact of the discharge on the receiving stream, toxic or deleterious effects of wastewaters, industrial contribution to the system, complexities of the treatment process, history of noncompliance or any other factor which requires strict operational control to meet the effluent limitations of the permit. Any effluent toxicity test completed by the department or other agency and conducted according to procedures stated or referenced in this rule may be used to determine compliance with an operational permit.

63.4(2) Testing procedures. Dischargers shall be required to conduct effluent toxicity tests in accordance with the following general requirements:

a. The effluent toxicity tests shall be performed using a 24-hour composite sample of the effluent collected at the location stated in the operation permit. All composite samples shall be delivered to the testing laboratory within a reasonable time (approximately 24 hours) after collection and all tests must commence within 36 hours following sample collection. The results of all effluent toxicity tests conducted using approved procedures, including any tests performed at a greater frequency than required in the operation permit, shall be submitted to the department, on Form 542-1381 provided by the department, within 30 days of completing the test.

b. All effluent toxicity tests shall be conducted using the test methodologies and protocols described within “Standard Operating Procedure: Effluent Toxicity Testing, Iowa Department of Natural Resources,” March 1991. This procedure is adopted as part of this subrule and is filed as part of this subrule with the administrative rules coordinator. This procedure is an essential part of the testing procedures and is available upon request to the department although not printed in this subrule. Laboratories performing the effluent toxicity tests shall also have a quality assurance plan.

c. All effluent toxicity tests shall be performed using the water flea (*Ceriodaphnia dubia*), and the fathead minnow (*Pimephales promelas*).

d. Effluent toxicity tests shall include, at a minimum, two different concentrations of effluent. One test shall consist of 100 percent effluent, and a second test shall be a diluted effluent sample as defined. A control test, consisting of 100 percent culture water for each respective organism shall also be used. The test shall last for 48 hours at which time the mortality will be determined for all tests.

e. All effluent toxicity tests shall be of the pass/fail type.

63.4(3) If there is a positive toxicity test result in the diluted effluent sample from a valid effluent toxicity test, the following requirements apply unless the exception in paragraph “c” of this subrule is applicable.

a. At a minimum, the discharger shall be required to conduct quarterly effluent toxicity tests until three successive tests are determined not to be positive, after which the normal annual testing shall be resumed.

b. If the discharger has two successive positive valid diluted effluent toxicity test results or three positive test results out of five valid diluted effluent toxicity tests, the discharger shall be required to conduct a toxicity reduction evaluation (TRE). The discharger may be required to carry out instream monitoring or other analysis in conjunction with the TRE. At any time during the course of conducting a TRE there are three consecutive follow-up toxicity test results for the diluted sample which are not positive, the facility will be considered in compliance and work on the TRE may cease. Annual testing

for effluent toxicity shall then resume. Nothing in these rules shall preclude the department from taking enforcement action beyond that described in these rules.

c. When the pretest chemical analysis for un-ionized ammonia nitrogen (NH₃-N) or total residual chlorine (TRC) on the diluted effluent sample exceeds the concentrations given below, a positive test result is likely to have been caused by high concentrations of NH₃ or TRC, and the test result will not be used to determine if follow-up testing is needed.

- (1) Un-ionized Ammonia Nitrogen—0.9 mg/l
- (2) TRC—0.1 mg/l

567—63.5(455B) Self-monitoring and reporting for animal feeding operations.

63.5(1) The following self-monitoring requirements may be imposed on an animal-feeding operation in any operation permit issued for such an operation.

- a.* Measurement of liquid level in a waste storage facility on a periodic basis.
- b.* Measurement of daily precipitation, as appropriate.
- c.* Sampling and analysis of groundwater as necessary to determine effects of wastewater application.
- d.* Other measurements necessary to evaluate the adequacy of a waste disposal system.

63.5(2) Reports of the self-monitoring results shall be submitted to the appropriate regional field office of the department quarterly. The quarterly reports shall cover the periods January through March, April through June, July through September, and October through December. The quarterly report for each period shall be submitted by the tenth day of the month following the quarter being reported.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.6(455B) Bypasses and upsets.

63.6(1) Prohibition. Bypasses from any portion of a treatment facility or from a sanitary sewer collection system designed to carry only sewage are prohibited. The department may not assess a civil penalty against a permittee for a bypass if the permittee has complied with all of the following:

- a.* The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- b.* There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
- c.* The permittee submitted the information required in 63.6(2), 63.6(3), and 63.6(5).

63.6(2) Request for anticipated bypass. Except for bypasses that occur as a result of mechanical failure or acts beyond the control of the owner or operator of a waste disposal system (unanticipated bypasses), the owner or operator shall obtain written permission from the department prior to any discharge of sewage or wastes from a waste disposal system not authorized by a discharge permit. The director may approve an anticipated bypass after considering its adverse effects if the director determines that it will meet the conditions in 63.6(1).

- a.* The request for a bypass shall be submitted to the appropriate regional field office of the department at least ten days prior to the expected date of the event.
- b.* The request shall be submitted in writing and shall include all of the following:
 - (1) The reason for the bypass;
 - (2) The date and time the bypass will begin;
 - (3) The expected duration of the bypass;
 - (4) An estimate of the amount of untreated or partially treated sewage or wastewater that will be discharged;
 - (5) The location of the bypass;
 - (6) The name of any body of surface water that will be affected by the bypass; and
 - (7) Any actions the owner or operator proposes to take to mitigate the effects of the bypass upon the receiving stream or other surface water.

63.6(3) Notification of unanticipated bypass or upset and public notices. In the event that a bypass or upset occurs without prior notice having been provided pursuant to 63.6(2) or as a result of mechanical failure or acts beyond the control of the owner or operator, the owner or operator of the treatment facility or collection system shall notify the department by telephone as soon as possible but not later than 12 hours after the onset or discovery.

a. Notification shall be made by contacting the appropriate field office during normal business hours (8 a.m. to 4:30 p.m.) or by calling the department at (515)281-8694 after normal business hours.

b. Notification shall include information on as many items listed in subparagraphs 63.6(3) “d”(1) through (6) as available information will allow.

c. When the department has been notified of an unanticipated bypass, the department shall determine if a public notice is necessary. If the department determines that public notification is necessary, the owner or operator of the treatment facility or the collection system shall prepare a public notice.

d. Bypasses shall be reported with the monthly operation report, as a separate attachment, that includes:

(1) The reason for the bypass, including the amount and duration of any rainfall event that may have contributed to the bypass;

(2) The date and time of onset or discovery of the bypass;

(3) The duration of the bypass;

(4) An estimate of the amount of untreated or partially treated sewage or wastewater that was discharged;

(5) The location of the bypass; and

(6) The name of any body of surface water that was affected by the bypass.

63.6(4) Monitoring, disinfection, and cleanup. The owner or operator of the treatment facility or collection system shall perform any additional monitoring, sampling, or analysis of the bypass or upset requested by the regional field office of the department and shall comply with the instructions of the department intended to minimize the effect of a bypass or upset on the receiving water of the state. The following requirements for disinfection and cleanup apply to all bypasses:

a. The department may require temporary disinfection depending on the volume and duration of the bypass, the classification of the stream affected by the bypass, and the time of year during which the bypass occurs; and

b. The department may require cleanup of any debris and waste materials deposited in the area affected by the bypass. In conjunction with the cleanup, the department may require lime application to the ground surface or disinfection of the area with chlorine solution.

63.6(5) Reporting of subsequent findings and additional information requested by the department. All subsequent findings and laboratory results concerning a bypass shall be submitted in writing to the appropriate regional field office of the department as soon as they become available. Any additional information requested by the department concerning the steps taken to minimize the effects of a bypass shall be submitted within 30 days of the request.

63.6(6) Upset. An upset is an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

a. An upset constitutes an affirmative defense to the assessment of a civil penalty for noncompliance with technology-based effluent limitations if the requirements of paragraph “b” of this subrule are met.

b. A permittee that wishes to establish an affirmative defense of upset shall demonstrate, through properly signed operation logs or other relevant evidence, that:

(1) An upset occurred and that the permittee can identify the cause(s) of the upset;

(2) The permitted facility was at the time of upset being properly operated;

(3) The permittee submitted notice of upset in accordance with 63.6(3); and

(4) The permittee completed any remedial measures required by the department, including monitoring, sampling, or analysis of the upset requested by the department and any instructions from the department calculated to minimize the effect of the upset on the receiving water of the state.

c. In any enforcement action proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.7(455B) Submission of records of operation. Except as provided in subrules 63.3(4) and 63.5(1), records of operation shall be submitted to the appropriate regional field office of the department within 15 days following the close of the reporting period specified in 63.8(455B) and in accordance with monitoring requirements derived from this chapter and incorporated in the operation permit. The permittee shall report all instances of noncompliance not reported under 63.12(455B) at the time monitoring reports are submitted. If a permittee becomes aware that it failed to submit any relevant facts in any report to the director, the permittee shall promptly submit such facts or information.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.8(455B) Frequency of submitting records of operation. Except as provided in subrules 63.3(4) and 63.5(1), records of operation required by these rules shall be submitted at monthly intervals. The department may vary the interval at which records of operation shall be submitted in certain cases. Variation from the monthly interval shall be made only under such conditions as the department may prescribe in writing to the person concerned.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.9(455B) Content of records of operation. Records of operation shall include the results of all monitoring specified in or authorized by this chapter and incorporated in the operation permit. The results of any monitoring not specified in the operation permit performed at the compliance monitoring point and analyzed according to 40 CFR Part 136 shall be included in the calculation and reporting of any data submitted in accordance with this chapter and the operation permit.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.10(455B) Records of operation forms. Records of operation forms shall be those provided by the department unless its forms are not applicable and in such case the records of operation shall be submitted on such other forms as are agreeable to the department.

567—63.11(455B) Certification and signatory requirements in the submission of records of operation. All records of operation as required by these rules shall include certification which attests that all information contained therein is representative and accurate. Each record of operation shall contain the signature of a duly authorized representative of the corporation, partnership or sole proprietorship, municipality, or public facility which has proprietorship of the wastewater treatment or disposal system as specified in 567—subrule 64.3(8). For electronic submissions of records of operation, a signed paper copy of the record that was submitted electronically must be maintained at the facility for a minimum of three years.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.12(455B) Twenty-four-hour reporting. All permittees shall report any permit noncompliance that may endanger human health or the environment including, but not limited to, violations of maximum daily limits for any toxic pollutant (listed as toxic under 307(a)(1) of the Act) or hazardous substance (as designated in 40 CFR Part 116 pursuant to 311 of the Act). Information shall be provided orally to the appropriate regional field office of the department within 24 hours from the time the permittee becomes aware of the circumstances. In addition, a written submission that includes a description of noncompliance and its cause; the period of noncompliance including exact dates and times; whether the noncompliance has been corrected or the anticipated time it is expected to continue; and the steps taken

or planned to reduce, eliminate, and prevent a reoccurrence of the noncompliance must be provided to the regional field office within 5 days of the occurrence.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.13(455B) Planned changes. The permittee shall give notice to the appropriate regional field office of the department 30 days prior to any planned physical alterations or additions to the permitted facility. Notice is required only when:

1. Notice has not been given to any other section of the department;
2. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source as defined in 567—60.2(455B);
3. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices; or
4. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in the permit.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

567—63.14(455B) Anticipated noncompliance. The permittee shall give notice to the appropriate regional field office of the department of any activity which may result in noncompliance with permit requirements. Notice is required only when previous notice has not been given to any other section of the department.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

Table I Minimum Self-Monitoring in Permits for Organic Waste Dischargers
Controlled Discharge Wastewater Treatment Plants

Wastewater Parameter	Sampling ⁵ Location	Sample Type ⁴	Frequency by P.E. ^{1,5,6}			
			< 100	101-500	501-1,000	>1,001
Flow ²	Raw	24-Hr Total	1/Week	Daily	Daily	Daily
	Final	Instantaneous	2/Week During Drawdown	Daily During Drawdown		
BOD ₅	Raw	24-Hr Composite	–	–	–	1/3 Months
CBOD ₅ ³	Final	Grab	1/Drawdown ⁷	Twice during drawdown		
Total Suspended Solids (TSS) ³	Raw	24-Hr Composite	–	–	–	1/3 Months
	Final	Grab	1/Drawdown ⁷	Twice during drawdown		
Ammonia Nitrogen	Final	Grab	1/Drawdown	Twice during drawdown		
<i>E. coli</i>	Final	Grab	1/Drawdown	1/Drawdown	Twice During Drawdown	
pH	Raw	Grab	–	–	–	1/3 Months
	Final	Grab	1/Drawdown	1/Drawdown	Twice During Drawdown	1/Week During Drawdown

Explanation of Superscripts

- 1 - The P.E. shall be computed on the basis of the original engineering design criteria for the facility and any modifications thereof. Where such design criteria are not available, the P.E. shall be computed using 0.167 pounds of BOD₅ per capita per day.
- 2 - Facilities serving a population equivalent less than 100 are not required to provide continuous flow measurement but are required to provide manual flow measurement at the specified frequency. Facilities serving a population equivalent greater than 100 are required to provide continuous flow measurement of the raw waste but need only provide manual flow measurement on the final effluent. Acceptable flow measurement and recording techniques shall be those described in "Iowa Wastewater Facilities Design Standards," Chapter 14 (14.7.2).
- 3 - In addition to the sampling required above, a grab sample of the lagoon cell contents collected at a point near the outlet structure shall be analyzed at least two weeks prior to an anticipated discharge to demonstrate that the wastewater is of such quality to meet the effluent limitations in the permit. The permittee must have the sample analyzed for 5-day carbonaceous biochemical oxygen demand (CBOD₅) and total suspended solids (TSS). The results must be compared with the 30-day average effluent limits. If the results are less than the 30-day average limits, the permittee may isolate the final cell and draw down the lagoon cell. If the pre-discharge sample results exceed the 30-day average effluent limits for either CBOD₅ or TSS, the permittee must contact the local DNR Field Office for guidance before beginning to discharge.
- 4 - Sample types are defined as:

"Grab Sample" means a representative, discrete portion of sewage, industrial waste, other waste, surface water or groundwater taken without regard to flow rate.

"24-Hour Composite" means:

 - a. For facilities where no significant industrial waste is present, a sample made by collecting a minimum of six grab samples taken four hours apart and combined in proportion to the flow rate at the time each grab sample was collected. (Generally, grab samples should be collected at 8 a.m., 12 a.m. (noon), 4 p.m., 8 p.m., 12 p.m. (midnight), and 4 a.m. on weekdays (Monday through Friday) unless local conditions indicate another more appropriate time for sample collection.)
 - b. For facilities where significant industrial waste is present, a sample made by collecting a minimum of 12 grab samples taken two hours apart and combined in proportion to the flow rate at the time each grab sample was collected. (Generally, grab samples should be collected at 8 a.m., 10 a.m., 12 a.m. (noon), 2 p.m., 4 p.m., 6 p.m., 8 p.m., 10 p.m., 12 p.m. (midnight), 2 a.m., 4 a.m., and 6 a.m. on weekdays (Monday through Friday) unless local conditions indicate another more appropriate time for sample collection.)
 - c. An automatic composite sampling device may also be used for collection of flow-proportioned or time-proportioned composite samples.

- 5 - Raw wastewater samples shall be taken continuously (year-round) at the specified frequency. Final effluent wastewater samples shall be taken only during the drawdown period. The first final effluent sample shall be taken the third day after the drawdown begins, and subsequent samples shall be taken at the specified frequencies. For final effluent samples that are required to be taken twice during drawdown, the first sample shall be taken the third day after the drawdown begins, and the second sample shall be taken between three (3) and five (5) days before the drawdown ends.
- 6 - If a facility has a P.E. greater than 3000 or a significant industrial contributor, additional monitoring may be required.
- 7 - One-cell controlled discharge lagoons with a P.E. less than 100 will be required to perform final effluent sampling for 5-day carbonaceous biochemical oxygen demand (CBOD₅) and total suspended solids (TSS) twice during drawdown in accordance with superscript #5.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

Table II Minimum Self-Monitoring in Permits for Organic Waste Dischargers
Continuous Discharge Wastewater Treatment Plants

Wastewater Parameter	Sampling Location	Sample Type ^{3,11}	Frequency by P.E. ^{1,6}						
			≤ 100	101-500	501-1,000	1,001-3,000	3,001-15,000	15,001-105,000	> 105,000
Flow ²	Raw or Final	24-Hr Total	1/week	Daily	Daily	Daily	Daily	Daily	Daily
BOD ₅	Raw	24-Hr Comp.	1/6 Months	1/3 Months	1/Week	1/Week	2/Week	2-5/Week ⁵	Daily
CBOD ₅	Final	24-Hr Comp.	1/3 Months	1/Month	1/Week	1/Week	2/Week	2-5/Week ⁵	Daily
Total Suspended Solids (TSS)	Raw	24-Hr Comp.	1/6 Months	1/3 Months	1/Month	1/2 Weeks	1/Week	2-5/Week ⁵	Daily
	Final	24-Hr Comp.	1/3 Months	1/3 Months	1/Month	1/2 Weeks	1/Week	2-5/Week ⁵	Daily
Ammonia Nitrogen ¹⁰	Final	24-Hr Comp.	1/Month	1/Month	1/Week	1/Week	2/Week	2-5/Week ⁵	Daily
TKN ⁸	Raw	24-Hr Comp.	—	—	—	1/2 Months	1/Month	1/Month	1/2 Weeks
Total Nitrogen ⁹	Final	24-Hr Comp.	—	—	—	1/3 Months	1/3 Months	1/2 Months	1/2 Months
Total Phosphorus ⁹	Final	24-Hr Comp.	—	—	—	1/3 Months	1/3 Months	1/2 Months	1/2 Months
pH	Raw	Grab	—	—	1/Week	1/Week	2/Week	2-5/Week ⁵	Daily
	Final	Grab	1/3 Months	1/Month	1/Week	1/Week	2/Week	5/Week	Daily
<i>E. coli</i> ^{4,7}	Final	Grab	5 samples, 1/3 Months	5 samples, 1/3 Months	5 samples, 1/3 Months	5 samples, 1/3 Months	5 samples, 1/3 Months	5 samples, 1/3 Months	5 samples, 1/3 Months
Temperature	Raw	Grab	—	—	1/Week	1/Week	2/Week	2-5/Week ⁵	Daily
	Final	Grab	1/3 Months	1/Month	1/Week	1/Week	2/Week	2-5/Week ⁵	Daily

Explanation of Superscripts

1 - See Superscript #1, Table I.

2 - See Superscript #2, Table I. Both raw and final flow monitoring may be required if the raw and final wastewater flows may be different for any reason.

3 - See Superscript #4, Table I.

4 - Analysis is required only when the facility discharges directly to a stream designated as Class A1, A2, or A3 or there is a reasonable potential for the discharge to affect a stream designated as Class A1, A2, or A3.

5 - The frequency of sample collection and analysis shall be increased by 1/week according to the following: 15,001 to 30,000 – 2/week; 30,001 to 45,000 – 3/week; 45,001 to 75,000 – 4/week; 75,001 – 105,000 – 5/week.

6 - The requirements for significant industrial users shall be those specified in the permit for final effluent monitoring.

7 - Bacteria Monitoring. All facilities must collect and analyze a minimum of five *E. coli* samples in one calendar month during each three-month period (quarter) during the appropriate recreation season associated with the receiving stream designation as specified in 567—subrule 61.3(3). For sampling required during the recreational season, March 15 to November 15, the three-month periods are March – May, June – August, and September – November. For year-round sampling, the three-month periods are January – March, April – June, July – September, and October – December. For each three-month period, the operator must take five samples during one calendar month, resulting in 15 samples in one year for sampling required during the recreation season and 20 samples per year for sampling required year-round. The following requirements apply to the individual samples collected in one calendar month:

- Samples must be spaced over one calendar month.
- No more than one sample can be collected on any one day.
- There must be a minimum of two days between each sample.
- No more than two samples may be collected in a period of seven consecutive days.

The geometric mean must be calculated using all valid sample results collected during a month. The geometric mean formula is as follows: Geometric Mean = (Sample one x Sample two x Sample three x Sample four x Sample five... Sample N)^(1/N), which is the Nth root of the result of the multiplication of all of the sample results where N = the number of samples. If a sample result is a less than value, the value reported by the lab without the less than sign shall be used in the geometric mean calculation.

8 - Additional Total Kjeldahl Nitrogen (TKN) monitoring may be required if the facility has one or more significant industrial users or has effluent ammonia violations.

9 - Total nitrogen shall be determined by testing for Total Kjeldahl Nitrogen (TKN) and nitrate + nitrite nitrogen and reporting the sum of the TKN and nitrate + nitrite results (reported as N). Nitrate + nitrite can be analyzed together or separately. Total phosphorus shall be reported as P.

10 - Ammonia nitrogen monitoring is only required for facilities with ammonia nitrogen effluent limitations.

11- For aerated lagoons, 24-hour composite samples are not required on the final effluent; grab samples are acceptable.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

Table III Operational Monitoring Requirements in Permits

LAGOONS

Parameter	Sampling Location	Sample Type ²	Frequency by P.E. ¹						
			< 100	101-500	501-1,000	1,001-3,000	3,001-15,000	15,001-105,000	> 105,000
Cell Depth	Each Cell	Measurement	1/Week	1/Week	1/Week	2/Week	2/Week	2/Week	2/Week

AERATED LAGOONS

Dissolved Oxygen	Cell Contents	Grab	1/Month	1/2 Weeks	1/2 Weeks	1/Week	2/Week	2/Week	2/Week
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TRICKLING FILTERS

Recirculation	—	Measurement	1/Week	1/Week	1/Week	2/Week	3/Week	5/Week	7/Week
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ACTIVATED SLUDGE

MLSS	Aeration Basin Contents	Grab	1/Month	1/Week	1/Week	2/Week	3/Week	5/Week	7/Week
Dissolved Oxygen	Aeration Basin Contents	Grab	1/Week	1/Week	2/Week	2/Week	3/Week	5/Week	7/Week
Temperature	Aeration Basin Contents	Grab	1/Week	1/Week	2/Week	2/Week	3/Week	5/Week	7/Week
30-Minute Settleability	Aeration Basin Contents	Grab	1/Week	1/Week	2/Week	2/Week	3/Week	5/Week	7/Week

ANAEROBIC DIGESTER

Temperature	Digester Contents	Grab	1/Week	1/Week	2/Week	2/Week	3/Week	5/Week	7/Week
pH	Digester Contents	Grab	1/Week	1/Week	2/Week	2/Week	3/Week	5/Week	7/Week
Alkalinity	Digester Contents	Grab	—	—	—	1/Week	1/Week	2/Week	2/Week
Volatile Acids	Digester Contents	Grab	—	—	—	1/Week	1/Week	2/Week	2/Week

AEROBIC DIGESTER

Dissolved Oxygen	Digester Contents	Grab	—	—	1/Week	2/Week	3/Week	5/Week	7/Week
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CHLORINATION FACILITIES

Total Residual Chlorine	Final Effluent	Grab	1/Week	1/Week	2/Week	2/Week	3/Week	5/Week	7/Week
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SEQUENCING BATCH REACTORS

Total Suspended Solids	Aeration Basin Effluent	Grab ³	1/Week	1/Week	2/Week	2/Week	3/Week	5/Week	7/Week
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CLARIFIERS

Settleable Solids	Effluent after final clarifier	Grab	1/Week	1/Week	2/Week	2/Week	3/Week	5/Week	7/Week
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Explanation of Superscripts

1 - See Superscript #1, Table I.

2 - Alternative test methods for operational monitoring:

Dissolved Oxygen	—	Pao Titration
MLSS	—	Spectrophotometric, Centrifuge
pH	—	Colorimetric Comparator, Meter
30-Minute Settleability	—	Standard Methods Test 213C
Alkalinity	—	Standard Methods Test 403
Volatile Acids	—	Standard Methods Test 504A
Residual Chlorine	—	Colorimetric Comparator, Meter

3 - The TSS grab sample of the aeration basin effluent should be taken at the point of maximum effluent turbidity.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

Table IV Minimum Self-Monitoring in Permits for Land Application Systems

Wastewater Parameter	Sampling Location	Sample Type ²	Flow in Million Gallons Per Day ¹		
			< 0.5	0.5 - 2.0	> 2.0
Nitrate Nitrogen	Monitoring Wells ³	Grab	1/3 Months	1/2 Months	1/Month
Dissolved Solids	Monitoring Wells ³	Grab	1/3 Months	1/2 Months	1/Month
Fecal Coliform	Monitoring Wells ³	Grab	1/3 Months	1/2 Months	1/Month

Volume Applied	Final ⁴	24-Hr Total	Daily	Daily	Daily
Total Nitrogen	Final ⁴	24-Hr Comp.	1/3 Months	1/2 Months	1/Month
Total Phosphorus	Final ⁴	24-Hr Comp.	1/3 Months	1/2 Months	1/Month

Explanation of Superscripts

- 1 - The flow to be used for determining sample frequency shall be the original engineering design, average wet weather flow, or any modifications thereof. The design flow shall be the raw wastewater flow prior to any treatment units.
- 2 - See Superscript #4, Table I.
- 3 - Monitoring wells shall be sampled according to the procedures described in Table V.
- 4 - Final shall be the final effluent from the storage facility prior to land application.

[ARC 7625B, IAB 3/11/09, effective 4/15/09]

Table V Required Containers, Preservation Techniques, and Holding Times

PARAMETER	CONTAINER ¹	PRESERVATIVE ²	MAXIMUM HOLDING TIME ³
<u>Bacterial Tests</u>			
1. Coliform, fecal and total	P,G	Cool, 4°C 0.008% Na ₂ S ₂ O ₃ ⁴	6 hours
2. <i>Escherichia coli</i> (<i>E. coli</i>)	P,G	Cool, 4°C	6 hours
3. Fecal streptococci	P,G	Cool, 4°C 0.008% Na ₂ S ₂ O ₃ ⁴	6 hours
<u>Chemical Tests</u>			
4. Acidity	P,G	Cool, 4°C	14 days
5. Alkalinity	P,G	Cool, 4°C	14 days
6. Ammonia	P,G	Cool, 4°C H ₂ SO ₄ to pH < 2	28 days
7. Biochemical oxygen demand	P,G	Cool, 4°C	48 hours
8. Biochemical oxygen demand, carbonaceous	P,G	Cool, 4°C	48 hours
9. Bromide	P,G	None required	28 days
10. Chemical oxygen demand	P,G	Cool, 4°C H ₂ SO ₄ to pH < 2	28 days
11. Chloride	P,G	None required	28 days
12. Chlorine, total residual	P,G	None required	Analyze immediately
13. Color	P,G	Cool, 4°C	48 hours
14. Cyanide, total and amenable to chlorination	P,G	Cool, 4°C NaOH to pH > 12 0.6g ascorbic acid ⁴	14 days ⁵
15. Cyanide, free	P,G	Cool, 4°C NaOH to pH > 12 0.6g ascorbic acid ⁴	4 hours
16. Fluoride	P	None required	28 days
17. Hardness	P,G	HNO ₃ to pH < 2	6 months
18. Hydrogen ion (pH)	P,G	None required	Analyze immediately
19. Kjeldahl and organic nitrogen	P,G	Cool, 4°C H ₂ SO ₄ to pH < 2	28 days
<u>Metals</u>			
20. Chromium VI	P,G	Cool, 4°C	24 hours
21. Mercury	P,G	HNO ₃ to pH < 2	28 days
22. Metals, except above	P,G	HNO ₃ to pH < 2	6 months
23. Nitrate	P,G	Cool, 4°C	48 hours
24. Nitrate-nitrite	P,G	Cool, 4°C H ₂ SO ₄ to pH < 2	28 days
25. Nitrite	P,G	Cool, 4°C	48 hours
26. Oil and grease	G	Cool, 4°C H ₂ SO ₄ to pH < 2	28 days
<u>Metals</u>			
27. Organic carbon	P,G	Cool, 4°C Cl or H ₂ SO ₄ to pH < 2	28 days
28. Orthophosphate	P,G	Filter immediately Cool, 4°C	48 hours
29. Oxygen, dissolved probe	G Bottle and top	None required	Analyze immediately
Winkler	G Bottle and top	Fix on site and store in dark	8 hours
30. Phenols	G only	Cool, 4°C H ₂ SO ₄ to pH < 2	28 days
31. Phosphorus (elemental)	G	Cool, 4°C	48 hours
32. Phosphorus, total	P,G	Cool, 4°C H ₂ SO ₄ to pH < 2	28 days

PARAMETER	CONTAINER ¹	PRESERVATIVE ²	MAXIMUM HOLDING TIME ³
33. Residue, total	P,G	Cool, 4°C	7 days
34. Residue, filterable	P,G	Cool, 4°C	7 days
35. Residue, Nonfilterable (TSS)	P,G	Cool, 4°C	7 days
36. Residue, settleable	P,G	Cool, 4°C	48 hours
37. Residue, volatile	P,G	Cool, 4°C	7 days
38. Silica	P	Cool, 4°C	28 days
39. Specific conductance	P,G	Cool, 4°C	28 days
40. Sulfate	P,G	Cool, 4°C	28 days
41. Sulfide	P,G	Cool, 4°C, add zinc acetate plus sodium hydroxide to pH > 9	7 days
42. Sulfite	P,G	None required	Analyze immediately
43. Surfactants	P,G	Cool, 4°C	48 hours
44. Temperature	P,G	None required	Analyze immediately
45. Turbidity	P,G	Cool, 4°C	48 hours
46. Sampling Procedures for Monitoring Wells			
A. Measure depth from top of well head casing to water table			
B. Calculate quantity of water to be flushed from well using the formula:			
Gallons to be pumped = 0.221 d ² h, where			
d = well diameter in inches			
h = depth in feet of standing water in well prior to pumping			
C. Pump well			
D. Measure depth from well hand casing to water table after pumping			
E. Wait for well to recharge to or near static water level prior to sampling			

Table V Notes

1. Polyethylene (P) or Glass (G).
2. Sample preservation should be performed immediately upon sample collection. For composite samples, each aliquot should be preserved at the time of collection. When use of an automated sampler makes it impossible to preserve each aliquot, then samples may be preserved by maintaining at 4°C until compositing and sample splitting is completed.
3. Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before analysis and still be considered valid. Samples may be held for longer periods only if the permittee, or monitoring laboratory, has data on file to show that the specific types of samples under study are stable for the longer time, and has received a variance from the executive director. Some samples may not be stable for the maximum time period given in the table. A permittee, or monitoring laboratory, is obligated to hold the sample for a shorter time if knowledge exists to show this is necessary to maintain sample stability.
4. Should only be used in the presence of residual chlorine.
5. Maximum holding time is 24 hours when sulfide is present. Optionally, all samples may be tested with lead acetate paper before the pH adjustment in order to determine if sulfide is present. If sulfide is present, it can be removed by the addition of cadmium carbonate powder until a negative spot test is obtained. The sample is filtered and then NaOH is added to pH 12.
6. Samples should be filtered immediately onsite before adding preservative for dissolved metals.

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