

ATTACHMENT F

ACTIVE TREATMENT SYSTEM REQUIREMENTS

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR STORMWATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES
(GENERAL PERMIT)

A. GENERAL ACTIVE TREATMENT SYSTEM REQUIREMENTS

- A.1. The discharger choosing to implement an active treatment system on its site shall comply with all the requirements in this Attachment.
- A.2. Active treatments systems are treatment technologies that employ chemical coagulation, chemical flocculation, or electrocoagulation to reduce turbidity caused by fine suspended sediment, and/or to control pH levels. An active treatment system relies on enclosed computerized systems with pumps, filters, and real-time controls.
- A.3. The discharger shall assign a lead person (or project manager) who has either a minimum of five years construction stormwater experience or who is a licensed contractor specifically holding a California Class A Contractors license¹ to oversee the operation of the active treatment system.
- A.4. An active treatment system may be bypassed if the discharger has met the following conditions:
- a. The discharger demonstrates all discharges from the watershed area that the active treatment system was designed to treat are in compliance with the numeric action levels, numeric effluent limitations, and receiving water limitations established by this General Permit through the applicable monitoring requirements in Attachments D or E; and
 - b. If dewatering is occurring as part of the bypass, the discharger shall comply with the dewatering requirements in Attachment J.
- A.5. The discharger shall comply with applicable local pre-treatment requirements per the local sanitation agency if the active treatment system effluent is locally authorized to be discharge into a sanitary sewer system. The discharger shall include proof of authorization and specific criteria required by the local sanitation agency in its Active Treatment System Plan.

¹ [Business and Professions Code Division 3, Chapter 9, Article 4](http://www.cslb.ca.gov/About_Us/Library/Licensing_Classifications/A_-_General_Engineering_Contractor.aspx), Class A Contractor: A general engineering contractor is a contractor whose principal contracting business is in connection with fixed works requiring specialized engineering knowledge and skill. Web. <http://www.cslb.ca.gov/About_Us/Library/Licensing_Classifications/A_-_General_Engineering_Contractor.aspx>. [as of May 20, 2021].

B. DESIGN CRITERIA AND SPECIFICATIONS

B.1. Design Criteria

- B.1.a. The active treatment system shall be designed to capture and treat (within a 72-hour period) a volume equivalent to the runoff from a 10-year, 24-hour storm event using a watershed coefficient of 1.0.
- B.1.b. The watershed runoff coefficient used to size the active treatment system shall be 1.0.
- B.1.c. All discharges from the active treatment system must comply with numeric effluent limitations as specified in Section D.4 below.
- B.1.d. Runoff in excess of the design storm used to size the active treatment system shall not be routed through the active treatment system and must meet the bypass requirements in Section A.4, above.
- B.1.e. The discharger shall design the active treatment system to preclude the discharge of treatment chemicals or settled floc² from the system.
- B.1.f. The discharger shall design outlets to dissipate energy from concentrated flows.
- B.1.g. The discharger shall design the bypass conveyance to dissipate energy from concentrated flows.

B.2. Treatment Chemicals for Coagulation and Flocculation

- B.2.a. The discharger shall select, for use within the active treatment system, treatment chemical(s) capable of complying with the technology-based numeric effluent limitations by using one of the following methods:
 - i. The discharger shall conduct, at minimum, six site-specific jar tests (per treatment chemical with one test serving as a control) for each site to determine the proper treatment chemical and dosage levels for their active treatment system. The discharger shall conduct the jar tests using water samples that represent typical site conditions and in accordance with the current version of ASTM D2035.³
 - ii. Single field jar tests may also be conducted during a project if conditions warrant; an example includes, if construction activities disturb changing types of soils, which consequently cause change in stormwater and runoff characteristics.

² Floc is defined as a clump of solids formed by a chemical action.

³ ASTM D2035 is the standard test practice used for coagulation-flocculation jar testing of water, which assists in the evaluation of a treatment to reduce dissolved, suspended, colloidal, and nonsettleable matter in water via chemical coagulation-flocculation.

B.3. Filtration

- B.3.a. The active treatment system shall include a filtration step between the coagulant treatment train and the effluent discharge. This is commonly provided by sand, bag, or cartridge filters.
- B.3.b. The discharger shall remove, dispose of, or recirculate (to the beginning of the treatment process) all backwash water.

B.4. Instrumentation

- B.4.a. The active treatment system shall be equipped with instrumentation that automatically measures and records effluent water quality data and flow rate.
- B.4.b. The minimum data recorded shall be consistent with the monitoring and reporting requirements below, and shall include:
 - i. Influent turbidity;
 - ii. Effluent turbidity;
 - iii. Influent pH;
 - iv. Effluent pH;
 - v. Residual chemical;
 - vi. Effluent flow rate;
 - vii. Effluent flow volume;
 - viii. Total volume; and
 - ix. Freeboard on storage.
- B.4.c. Systems shall be equipped with a data recording system, such as data loggers or webserver-based systems, which records each measurement on a frequency no longer than once every 15 minutes.
- B.4.d. Cumulative flow volume shall be recorded daily. The data recording system shall have the capacity to record a minimum of seven days continuous data.
- B.4.e. Instrumentation systems shall be interfaced with system control to provide auto shutoff or recirculation in the event that effluent measurements exceed turbidity or pH numeric action levels or numeric effluent limitations.
- B.4.f. The system shall also assure that upon system upset, power failure, or other catastrophic event, the active treatment system will default to a recirculation mode or safe shut down.
- B.4.g. Instrumentation (flow meters, probes, valves, streaming current detectors, controlling computers, etc.) shall be installed and maintained per manufacturer's recommendations, which shall be included in the discharger's Quality Assurance/Quality Control plan.
- B.4.h. The Quality Assurance/Quality Control plan shall specify calibration procedures and frequencies, instrument method detection limit or sensitivity verification, laboratory duplicate procedures, and other pertinent procedures.

- B.4.i. The instrumentation system shall include a method for controlling coagulant or flocculant dose, to prevent potential overdosing. Available technologies include flow/turbidity proportional metering, periodic jar testing and metering pump adjustment, and ionic charge measurement controlling the metering pump.

C. ACTIVE TREATMENT SYSTEM MAINTENANCE REQUIREMENTS

C.1. Operation and Maintenance

- C.1.a. The discharger shall operate and maintain the active treatment system in accordance with the site-specific Operation and Maintenance Manual.
- C.1.b. The Operation and Maintenance Manual shall only be used in conjunction with appropriate site-specific design specifications that describe the system configuration and operating parameters.

C.2. Residuals Management

- C.2.a. Sediment shall be removed from the storage or treatment cells as necessary to ensure that the cells maintain their required water storage, sediment storage, and settling zone capacity.
- C.2.b. Handling and disposal of all solids generated during active treatment system operations shall be done in accordance with all local, state, and federal laws and regulations.

D. ACTIVE TREATMENT SYSTEM MONITORING REQUIREMENTS

D.1. Visual Observations

- D.1.a. The discharger shall visually observe the active treatment system for proper performance during each day of operation, including but not limited to:
 - i. All instrumentation; and
 - ii. Filter loading to confirm that the final filter stage is functioning properly.
- D.1.b. The discharger shall visually observe the active treatment system through either of the following two options:
 - i. A designated responsible person who is on-site at all times during treatment operations to visually observe all portions of the active treatment system.

OR

- ii. An operator continuously monitoring the active treatment system off-site. The active treatment system must be able to conduct a safe shut down autonomously when the operator connection is lost and/or the system is discharging above levels specified by this Attachment. The active treatment system shall have redundant monitoring of dosing amounts, influent, and effluent pollutant monitoring. The system shall be able to perform self-diagnostics for safe system shut down when one or more sensors is not performing as desired. All data relevant to system operation shall be collected, monitored, and recorded.

D.2. Water Quality Monitoring

- D.2.a. The discharger shall continuously monitor and record flow at not greater than 15-minute intervals for total volume treated and discharged.
- D.2.b. The discharger shall continuously monitor and record influent and effluent pH at 15-minute intervals if not more frequently.
- D.2.c. The discharger shall continuously monitor and record influent and effluent turbidity (expressed in NTU) at 15-minute intervals if not more frequently.
- D.2.d. The discharger shall monitor and record the type and amount of chemical(s) used for pH adjustment, if any.
- D.2.e. The discharger shall monitor and record the dose rate of chemical used in the active treatment system (expressed in mg/L) 15-minutes after startup and every eight hours of operation.
- D.2.f. The discharger shall monitor the effluent for residual all chemical(s) and/or additive levels, performing monthly laboratory duplicates for residual coagulant analysis.

D.3. Residual Chemical and Toxicity Monitoring

- D.3.a. The discharger shall utilize a residual chemical test method that has a method detection limit of 10 percent or less than the maximum allowable threshold concentration⁴ for the specific coagulant in use and for the most sensitive species to the chemical used.
- D.3.b. The discharger shall utilize a residual chemical test method that produces a result within one hour of sampling.
- D.3.c. The discharger shall have a State Water Board Environmental Laboratory Accreditation Program (ELAP) accredited laboratory validate the selected residual chemical test is appropriate for the coagulant or flocculant used. Specifically, the laboratory will review the test protocol, test parameters, and the detection limit of the coagulant or flocculant. The discharger shall electronically certify and submit this documentation as part of the Active Treatment System Plan through SMARTS.

4 The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. A typical MATC would be:

The MATC is equal to the geometric mean of the No Observed Effect Concentration and Lowest Observed Effect Concentration Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

- D.3.d. The discharger shall operate the active treatment system in batch treatment mode if the discharger cannot utilize a residual chemical test method that meets the requirements above, Section D.3.a through D.3.c.
- D.3.e. The discharger shall not cause adverse physical impacts on receiving waters through the use of active treatment system batch storage and treatment, including but not limited to, inadequate storage volume, sudden released of the batches, and improperly designed discharge points.
- D.3.f. The discharger operating in batch treatment mode shall perform toxicity testing in accordance with the following:
- i. The discharger shall initiate acute toxicity testing on effluent samples representing effluent from each batch prior to discharge.⁵ All bioassays shall be sent to a laboratory accredited by the State Water Board Environmental Laboratory Accreditation Program.⁶
 - ii. Acute toxicity tests shall be conducted with the following species and protocols. The methods to be used in the acute toxicity testing shall be those outlined for a 96-hour acute test in “Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms, U.S. EPA-821-R-02-012” for Fathead minnow, *Pimephales promelas* or Rainbow trout, *Oncorhynchus mykiss* may be used as a substitute for Fathead minnow.
 - iii. All toxicity tests shall meet quality assurance criteria and test acceptability criteria in the most recent versions of the U.S. EPA test method for whole effluent toxicity testing.⁷
 - iv. All toxicity tests and analysis shall be consistent with statewide requirements for acute and chronic toxicity, including implementation requirements. See Toxicity Provisions.
- D.4. Active Treatment System Numeric Effluent Limitation Requirements
- D.4.a. Effluent at the point of discharge from the active treatment system shall comply with the technology-based numeric effluent limitations established for active treatment system.
- D.4.b. Numeric effluent limitations for discharges from an active treatment system are listed below and in Table 1:
- i. pH of all active treatment system discharges shall be within the range of 6.0 to 9.0.

5 This requirement only requires that the test be initiated prior to discharge.

6 Addition information can be found on the [ELAP webpage](https://www.waterboards.ca.gov/drinking_water/certlic/labs/).
<https://www.waterboards.ca.gov/drinking_water/certlic/labs/>

7 [U.S. EPA. Whole Effluent Toxicity \(WET\)](https://www.epa.gov/npdes/whole-effluent-toxicity-wet). Web. <<https://www.epa.gov/npdes/whole-effluent-toxicity-wet>>. [as of May 20, 2021].

- ii. Turbidity of all active treatment system discharges shall be less than 10 NTU for daily flow-weighted average of all samples and 20 NTU for any single sample.
- iii. Residual Chemical shall be < 10 percent of Maximum Allowable Threshold Concentration⁸ for the most sensitive species to the chemical used.

Table 1 – Numeric Effluent Limitations, Test Methods, Method Detection Limits, and Reporting Units for Active Treatment System Discharges

Parameter	Test Method	Method Detection Limit	Reporting Units	Numeric Effluent Limitation
pH	Field test with calibrated portable instrument	0.2	pH Units	Lower = 6.0 Upper = 9.0
Turbidity	EPA 0180.1 and/or field test with a calibrated portable instrument	1	NTU ⁹	10 NTU for Daily Flow-Weighted Average & 20 NTU for Any Single Sample
Residual Chemicals	U.S. EPA-approved test method for the specific pollutant parameter	Less than 10 percent of MATC for most sensitive species to the chemical used	Dependent on the test method	Less than 10 percent of MATC for most sensitive species to the chemical used

D.4.c. If an analytical effluent sampling result is outside the range of pH numeric effluent limitations (i.e., is below the lower numeric effluent limitation for pH or exceeds the upper numeric effluent limitation for pH), exceeds the turbidity numeric effluent limitation, or exceeds the residual chemical numeric effluent limitation, the discharger shall cease discharge from the active treatment system and comply with the reporting requirements in Section E.3 of this Attachment.

8 The Maximum Allowable Threshold Concentration (MATC) is the allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity testing conducted by an independent, third-party laboratory. The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

9 Nephelometric Turbidity Unit

- D.4.d. Discharges from active treatment system shall comply with applicable numeric effluent limitations (above) unless the precipitation event causing the discharge is determined, after the fact, to be equal to or larger than the compliance precipitation event (expressed in inches of rainfall). The compliance precipitation event for active treatment system discharges is the 10-year, 24-hour storm, as determined using the National Weather Service's Hydrometeorological Design Studies Center Precipitation Frequency Data Server¹⁰ or equivalent.
- D.4.e. The discharger may resume operation of the active treatment system if corrective actions were implemented to prevent future exceedances of the numeric effluent limitations.

E. ACTIVE TREATMENT SYSTEM REPORTING REQUIREMENTS

E.1. Active Treatment System Plan

- E.1.a. The discharger shall prepare an Active Treatment System Plan that combines the site-specific data and treatment system information required to safely and efficiently operate an active treatment system.
- E.1.b. The Active Treatment System Plan shall be electronically certified and submitted through SMARTS as an attachment to the SWPPP, at least 14 days prior to the planned operation of the active treatment system, and a copy shall be available on-site during active treatment system operation.
- E.1.c. At a minimum, the Active Treatment System Plan shall include:
 - i. Contact information of all personnel responsible for monitoring and maintaining the active treatment system;
 - ii. A map depicting the watershed area treated by the active treatment system, shown in acres;
 - iii. Specifications of any storage ponds, tanks, or other stormwater containment associated with the active treatment system;
 - iv. The treatment capacity of the active treatment system, defined as the number of hours needed to treat the captured volume from a given design storm (e.g., 5-year, 24-hour) using a watershed runoff coefficient of 1.0;
 - v. An Active Treatment System Operation and Maintenance Manual for all equipment that at minimum:
 - 1. Covers the procedures required to install, operate, and maintain the active treatment system;¹¹

10 NOAA's National Weather Service. Web.

https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html [as of May 20, 2022].

11 The operation and maintenance manual is typically in a modular format addressing generalized operating and maintenance procedures for each system-specific component.

2. Includes information for specific pumps, generators, control systems, and other equipment used to operate the active treatment system; and
 3. Includes a failure plan that gives procedural details on when (failure indicators) and how to shut the system down (procedure), and who at the Regional Water Board to contact.
- vi. A monitoring and sampling plan, including quality assurance and quality control documentation that at minimum specifies:
1. Calibration methods and frequencies for all system and field measurement instruments;
 2. The methods for determining method detection limits for each residual coagulant measurement method;
 3. Acceptable minimum method detection limits for each method, specific to individual coagulants; and
 4. Specific procedures for monthly laboratory duplicates for residual coagulant analysis.
- vii. An Active Treatment System Health and Safety Plan; and
- viii. An Active Treatment System Spill Prevention and Response Plan.

E.2. Visual Observations

- E.2.a. The discharger shall keep all completed inspections checklists and related documentation with the SWPPP on-site or electronically.

E.3. Water Quality Monitoring

- E.3.a. At a minimum, every 30 days the Legally Responsible Person representing the discharger shall electronically certify and submit active treatment system field data through SMARTS.
- E.3.b. The discharger shall report any indications of toxicity or other violations of water quality objectives to the appropriate regulatory agency as required by this General Permit.
- E.3.c. The system operator shall immediately report any measurements exceeding water quality standards to the discharger, who shall notify the Regional Water Board.
- E.3.d. Dischargers in violation of any of the active treatment system numeric effluent limitations shall electronically certify and submit through SMARTS the analytical results within 24-hours of obtaining the results.
- E.3.e. The discharger shall electronically certify and submit a Numeric Effluent Limitation Violation Report in SMARTS with 14 days after the numeric effluent limitation exceedance has been identified for any monitoring data exceeding an applicable numeric effluent limitation in this General Permit.

- E.3.f. The discharger shall include in the Numeric Effluent Limitation Violation Report:
- i. The analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as “less than the method detection limit”);
 - ii. The date, place, time of sampling, visual observation (inspections), and/or measurements, including precipitation; and
 - iii. An assessment of what caused the active treatment system to exceed the numeric effluent limitation, and the proposed corrective actions taken to prevent future exceedances.
- E.3.g. The active treatment system dischargers shall report the on-site rain gauge reading and nearby governmental rain gauge readings for verification if an applicable numeric effluent limitation has been exceeded during a precipitation event equal to or larger than the compliance precipitation event.