

ATTACHMENT E: Active Treatment System (ATS) Requirements

1. Dischargers choosing to implement an Active Treatment System (ATS) on their site shall comply with all of the requirements in this attachment below.
2. The discharger shall maintain a paper copy of each ATS Plan onsite in compliance with the record retention requirements of this General Permit, Standard Provision G.1. (Attachment I).
3. ATS Design, Operation and Submittals
 - a. The ATS shall be designed and approved by a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ); a California registered civil engineer; or any other California registered engineer with a minimum of 10 years demonstrated construction storm water treatment systems design experience.
 - b. The discharger shall design the ATS in a manner to preclude the accidental discharge of settled floc¹ during floc pumping or related operations.
 - c. The discharger shall design outlets to dissipate energy from concentrated flows.
 - d. The discharger shall install and operate their ATS using personnel with either a minimum of five years construction storm water experience or are licensed contractors specifically holding a California Class A Contractors license.²
 - e. The discharger shall prepare an ATS Plan that combines the site-specific data and treatment system information required to safely and efficiently operate an ATS. The ATS Plan shall be electronically submitted to the State Water Board at least 14 days prior to the planned operation of the ATS and a paper copy shall be available onsite during ATS operation. At a minimum, the ATS Plan shall include:
 - i. ATS Operation and Maintenance Manual for All Equipment
 - ii. ATS Monitoring, Sampling & Reporting Plan, including Quality Assurance/Quality Control (QA/QC)
 - iii. ATS Health and Safety Plan
 - iv. ATS Spill Prevention Plan

¹ Floc is defined as a clump of solids formed by the chemical action in ATS systems.

² Business and Professions Code Division 3, Chapter 9, Article 4, 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. [see <http://www.cslb.ca.gov/General-Information/library/licensing-classifications.asp>]

- f. The ATS shall be designed to capture and treat a volume equivalent to the runoff from a 10-year, 24-hour storm event in a 72-hour period with a runoff coefficient of 1.0.

4. Treatment – Chemical Coagulation/Flocculation

- a. Jar tests shall be conducted using water samples selected to represent typical site conditions and in accordance with ASTM D2035-80 (2003).
- b. The discharger shall conduct site-specific jar tests each project to determine the proper polymer and dosage. Tests may also be conducted during a project if conditions warrant, for example if construction activities disturb changing types of soils, which consequently cause change in storm water and runoff characteristics.
- c. Attachment J lists examples of the numerous coagulants available.

5. Residual Chemical and Toxicity Requirements

- a. The discharger shall utilize a residual chemical test method that has a method detection limit (MDL) of 10% or less than the maximum allowable threshold concentration³ (MATC) for the **specific coagulant** in use and for the most sensitive species of the chemical used.
- b. The discharger shall utilize a residual chemical test method that produces a result within one hour of sampling.
- c. The discharger shall have a California State certified laboratory validate the selected residual chemical test. Specifically the lab will review the test protocol, test parameters, and the detection limit of the coagulant. The discharger shall electronically submit this documentation as part of the ATS Plan.
- d. If the discharger cannot utilize a residual chemical test method that meets the requirements above, the discharger shall operate the ATS in Batch Treatment⁴ mode.

³ 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 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.

⁴ Batch Treatment mode is defined as holding or recirculating the treated water in a holding basin or tank(s) until treatment is complete or the basin or storage tank(s) is full.

- e. A discharger planning to operate 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 discharge⁵. All bioassays shall be sent to a laboratory certified by the Department of Health Services (DHS) Environmental Laboratory Accreditation Program (ELAP). The required field of testing number for Whole Effluent Toxicity (WET) testing is E113⁶.
 - 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, USEPA-841-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 EPA test method for WET testing.
 - iv. The discharger shall electronically report all acute toxicity testing as required in Attachment B.

6. Filtration

- a. The ATS shall include a filtration step between the coagulant treatment train and the effluent discharge. This is commonly provided by sand, bag, or cartridge filters, which are sized to capture suspended material that might pass through the clarifier tanks.
- b. Differential pressure measurements shall be taken to monitor filter loading and confirm that the final filter stage is functioning properly.

7. Residuals Management

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

8. ATS Instrumentation

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

⁶ http://www.dhs.ca.gov/ps/ls/elap/pdf/FOT_Desc.pdf

- a. The ATS shall be equipped with instrumentation that automatically measures and records effluent water quality data and flow rate.
- b. The minimum data recorded shall be consistent with the Monitoring and Reporting requirements as described in Attachment B, and shall include:
 - i. Effluent Turbidity
 - ii. Effluent pH
 - iii. Residual Chemical
 - iv. Flow rate
 - v. Flow volume
- c. Systems shall be equipped with a data recording system, such as dataloggers or webserver-based systems, which records each measurement on a frequency no longer than once every 15 minutes.
- 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.
- 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.
- f. The system shall also assure that upon system upset, power failure, or other catastrophic event, the ATS will default to a recirculation mode or safe shut down.
- 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 QA/QC plan.
- h. The QA/QC plan shall also specify calibration procedures and frequencies, instrument method detection limit or sensitivity verification, laboratory duplicate procedures, etc.
- i. The instrumentation system shall include a method for controlling coagulant 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.

9. ATS Effluent Discharge

- a. ATS effluent shall comply with all provisions and prohibitions in this General Permit, specifically the NELs.
- b. If ATS effluent discharge is to a sanitary sewer system, the discharger shall comply with any pre-treatment requirements of that system. The discharger shall include any specific criteria required by the municipality in the ATS Plan.

10. Operation and Maintenance Plan

- a. Each Project shall have a site-specific Operation and Maintenance (O&M) Manual covering the procedures required to install, operate and maintain the ATS.⁷
- b. The O&M Manual shall only be used in conjunction with appropriate project-specific design specifications that describe the system configuration and operating parameters.
- c. The O&M Manual shall have operating manuals for specific pumps, generators, control systems, etc.

11. QA/QC Plan

- a. A project-specific QA/QC Plan shall be developed for each project. The QA/QC Plan shall include at a minimum:
 - i. Calibration – Calibration methods and frequencies for all system and field instruments shall be specified.
 - ii. Method Detection Limits (MDLs) – The methods for determining MDLs shall be specified for each residual coagulant measurement method. Acceptable minimum MDLs for each method, specific to individual coagulants, shall be specified.
 - iii. Laboratory Duplicates – Requirements for monthly laboratory duplicates for residual coagulant analysis shall be specified.

12. Personnel Training

- a. Operators shall have training specific to ATS's using liquid coagulants for storm water discharges in California.
- b. The training shall be in the form of a formal class with a certificate and requirements for testing and certificate renewal.

⁷ The manual is typically in a modular format covering generalized procedures for each component that is utilized in a particular system.

- c. Training shall include a minimum of eight hours classroom and 32 hours field training. The course shall cover the following topics:
 - i. Coagulation Basics –Chemistry and physical processes
 - ii. ATS System Design and Operating Principles
 - iii. ATS Control Systems
 - iv. Coagulant Selection – Jar testing, dose determination, etc.
 - v. Aquatic Safety/Toxicity of Coagulants, proper handling and safety
 - vi. Monitoring, Sampling, and Analysis
 - vii. Reporting and Recordkeeping
 - viii. Emergency Response