CLEAR WATER COMPLIANCE SERVICES, INC.

Remediation Solutions for the Real World™ – Stormwater, Groundwater, and Waste Water

Date: May 4, 2007

Construction General Permit – Stormwater
Deadline: 5/4/07 5pm

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Ms. Song Her, Clerk to the Board
State Water Resource Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Subject: Comment Letter – Draft Construction Permit

Thank you for the opportunity to provide comments on the Preliminary Draft entitled *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated Construction and Land Disturbance Activities* (General Permit). The state should be commended for its willingness to provide a public format for input.

Clear Water was established in 1998 as an independent company to perform water treatment at construction sites on behalf of the general contractor. Clear Water personnel have professional expertise in environmental science, construction management, chemistry, engineering, soil and water remediation, and industrial water treatment.

Background:

1. With proper equipment design, sizing capabilities, and monitoring – Active Treatment System(s) (ATS) are technically and economically feasible.

    - Discussion: Clear Water has successfully completed more than 65 projects which have treated and discharged hundreds of millions gallons of water. With integrated system design we have generated over a billion data points. We are able to read and record water quality data and evaluate system performance (percent reduction, throughput volume, etc). We have provided a summary of a highway project in Appendix A.

2. Third party review programs should be completed on flow-through ATS technologies. Review programs that would qualify would be the United States Environmental Protection Agency's *Environmental Technology Verification* (ETV) program[1], Washington State Department of Ecology's *Chemical Technology Assessment Protocol* (CTAPE) program[2], or a similar program initiated by the State of California.

    - Discussion: When technologies complete an ETV or CTAPE program the result is a very specific, engineered, peer reviewed

[1] http://www.epa.gov/etv/
[2] http://www.ecy.wa.gov/programs/wq/stormwater/newtech/tape_ctape.html

set of specifications that are not subject to vendor interference. These specifications are easily enforced because the approval process produces guidance in the form of a *use designation* that details specific parameters that must be present to ensure environmental compliance when ATS are implemented.

3. As the number of qualified ATS technologies and service providers grow, the average cost for services will decrease and overall reliability will increase.

    - Discussion: This has occurred in other markets when technologies which show potential are uniformly used, thereby creating competitive bid environments for developers. This creates a responsible industry that can operate treatment systems with close proximity to sensitive waterways.

Comments:

1. Requirements for pH should be simplified for ATS effluent discharge to a range of 6.5 – 8.5 (p. 12 Section VI.7 of the General Permit).

    - Discussion: To maintain a 0.2 pH unit value above or below background would significantly increase cost per gallon because ATS would need to monitor background pH values online and continuously adjust both acid and base which depend on natural receiving water values.

        - Example: If an ATS is operating with an effluent pH value of 7.2 and receiving water happened to have a value of 8.3, this should not justify an effluent base adjustment to a pH range value of 8.1 – 8.5.

2. ATS training requirements (p. 20 Section IX.G.4.a. of the General Permit) should be guided by the *use designation* for flow-through ATS. For batch treatment systems, operational requirements should be simplified to reflect the process of treat, hold, test, release.

    - Discussion: There are two fundamentally different risk categories that are defined by the ATS mode of operation (flow-through or batch treatment). Flow through ATS risks are mitigated by entering into an ETV or CTAPE program and being regulated by stringent criteria produced by that program. Batch Treatment ATS risks are mitigated by having full control over the water allowed to discharge from the treatment system.

3. ATS equipment requirements (p. 20 Section IX.G.4.b. of the General Permit). In the event that water does not meet discharge requirements, the ATS should automatically recycle water back to the

detention basin or shut down automatically with a manual recirculation back to the detention basin.

- Discussion: It is important to have a 'built in' contingency plan for flow-through ATS by including recycle options in the design criteria. The design criteria should be included in the *use designation* assigned by a review program.

4. ATS monitoring requirements (p.62 Section 5.b.i). Flow, pH and turbidity Nephelometric Turbidity Units (NTU) of stormwater effluent should be monitored with real-time instrumentation. Data should be electronically logged on 15 minute intervals.

   - Discussion: Real-time probes with electronic data logging systems provide defensible documentation for effluent discharges. A discharge monitoring report can than be populated from the collected data.

5. Technologies that have not received the scrutiny of a program such as the ETV or CTAPE process should not operate in a flow-through mode. These technologies should operate in a batch treatment mode and be subject to aquatic toxicity tests listed in the General Permit (p.63 Section 5.c.iii).

   - Discussion: ATS technologies without *use designations* can operate in a controlled mode to ensure aquatic environments are not being impacted. New technologies can use this platform to gather field data for review and to establish performance claims. In addition, batch design lends to smaller projects due to less infrastructure and mobilization cost.

Thank you for the opportunity to submit our comments.

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Appendix A

This particular ATS process utilizes pumps, tanks, chitosan, a sand media filter and a computerized monitoring and data collection system (control system) to continuously reduce turbidity in construction stormwater. Stormwater is first pumped from the stormwater retention pond to the control system where an initial dose of chitosan is added as pretreatment measure. The stormwater is then routed to settling tanks for bulk solids removal. From the tanks, pretreated stormwater is pumped through the control system where turbidity, pH and flow are measured. As the water passes through the control system, another dose of chitosan is added prior to sand filtration. The effluent from the sand filter is routed to the control unit where turbidity, pH and flow are measured again to ensure compliance with NPDES permit requirements and water quality discharge standards. In the unlikely event that the effluent does not meet requirements, the control system automatically re-circulates the water to the point of origin for reprocessing.

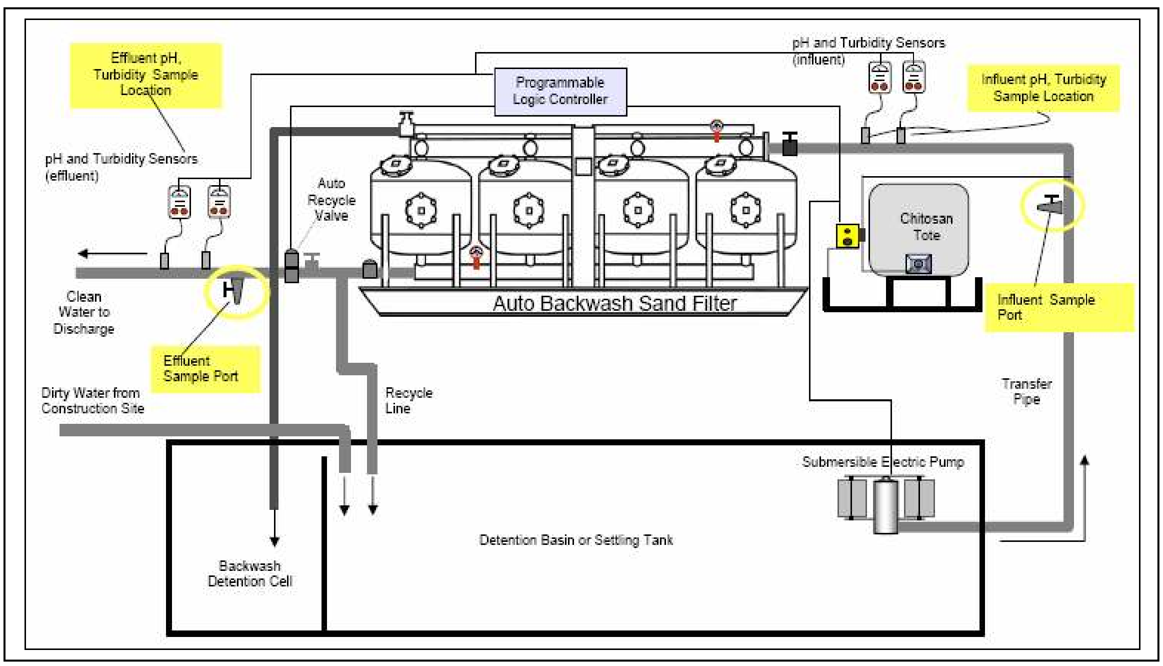

Figure 1

The ATS system has a unique programmable logic controller (PLC) which is utilized to monitor influent and effluent water quality parameters. The PLC also monitors external factors, such as pond level and rainfall data. System pumps, the chemical metering system and sand filtration unit are all controlled by using a touch screen on the PLC. The control system is equipped with remote telemetry capable of transmitting operational data to a secure website or initiating operational alarm text messages to system technicians. This feature allows project personnel to remotely monitor system performance, pond levels and rainfall from any location with an internet connection.

CESF SYSTEM PERFORMANCE

Measuring and tracking the performance of the ATS is a critical portion of the overall stormwater treatment effort. During more than two years of operation the following occurred at the site:

- 115 inches of rainfall were recorded with three storms in excess of the 10-yr, 24-hr event (3.0”) including one that was near the 100-yr, 24-hr event (4.0”).
- More than 100 million gallons of construction stormwater were treated.
- The treatment systems were operated for nearly 4,800 hours, including over 30 days of non-stop operations.
- More than 148,000,000 data points were collected and processed by the PLC system.
- ATS was effective throughout the project with no violations of the NPDES permit or water quality standards.

The overall project area consisted of 246 acres including over 70 acres of disturbed area and 23.43 acres of new impervious surfaces. These factors in combination with periodic and often intensive groundwater dewatering resulted in an inconsistent correlation between rainfall quantity and gallons of stormwater treatment as shown in Figure 2.

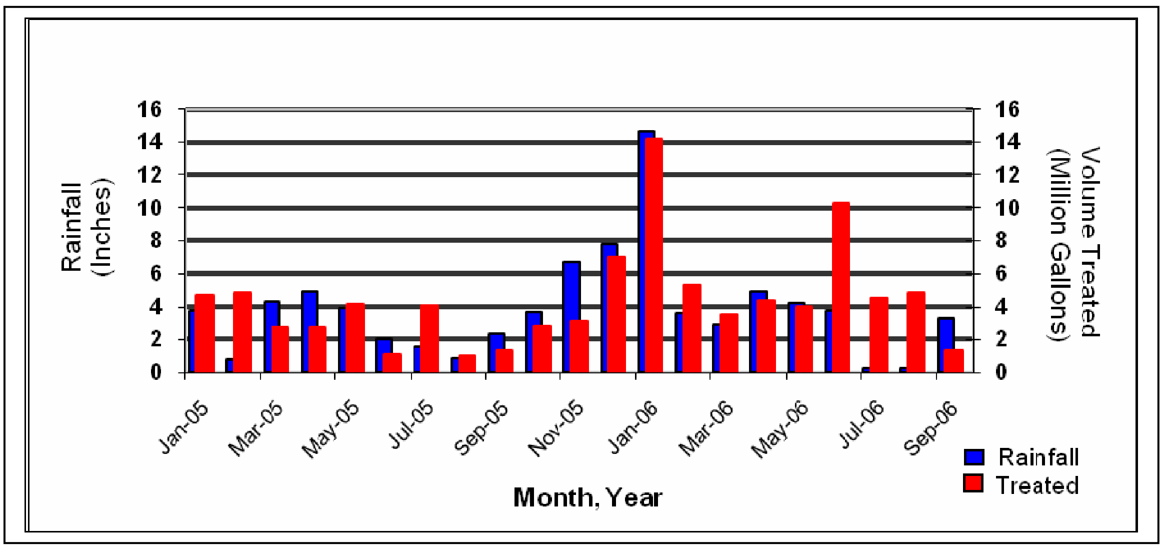

Figure 2

The system PLC analyzed influent and effluent turbidity levels by taking a reading once per second and then averaging those readings into a time-weighted composite data point every 15 minutes. The average pond turbidity was 236 NTU, which was reduced by over 82% during pretreatment to an average of 42.4 NTU. Discharge turbidity averaged 1.04 NTU for an average total turbidity reduction of 99.6%, as shown in Figure 3.

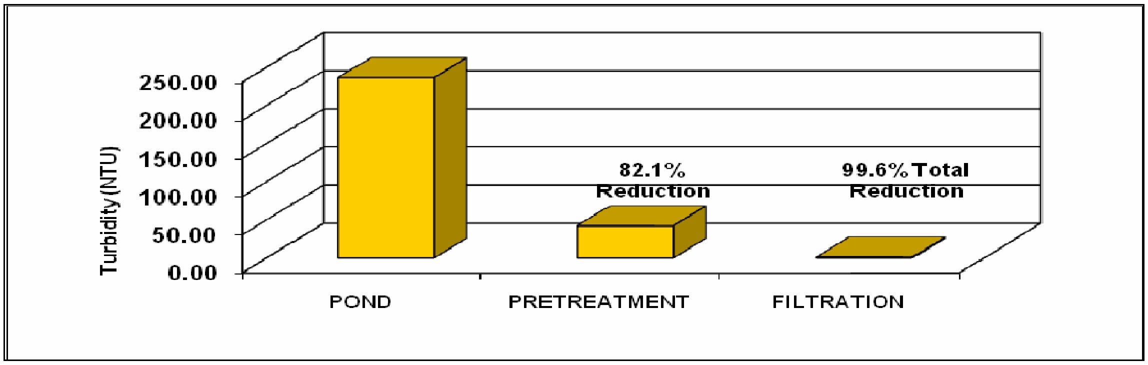

Figure 3

Initial turbidities fluctuated at each location due to topography, soil type, condition of BMPs and other environmental variables. Pond turbidities ranged from less than 50 NTU to over 2,000 NTU. Influent turbidities above 600 NTU require pretreatment to ensure the majority of suspended sediment is removed prior to final filtration. Pretreatment reduced sand filtration influent turbidities and improved the overall ATS performance. (Figure 4)

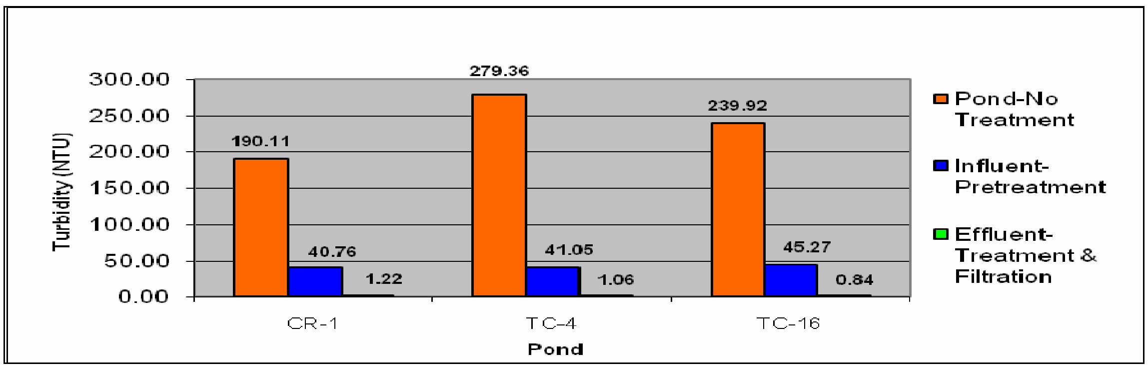

Figure 4

The total project cost for stormwater treatment utilizing ATS was approximately $1,460,000, or about 1.2% of the overall project $126,300,000 budget. Equipment accounted for only 31% of the overall budget. The remaining costs were influenced by rainfall, use of BMPs, soil type and other unpredictable factors. The average cost per gallon treated from the project was $0.017 per gallon. The cost breakdown for individual categories is shown in Figure 5.

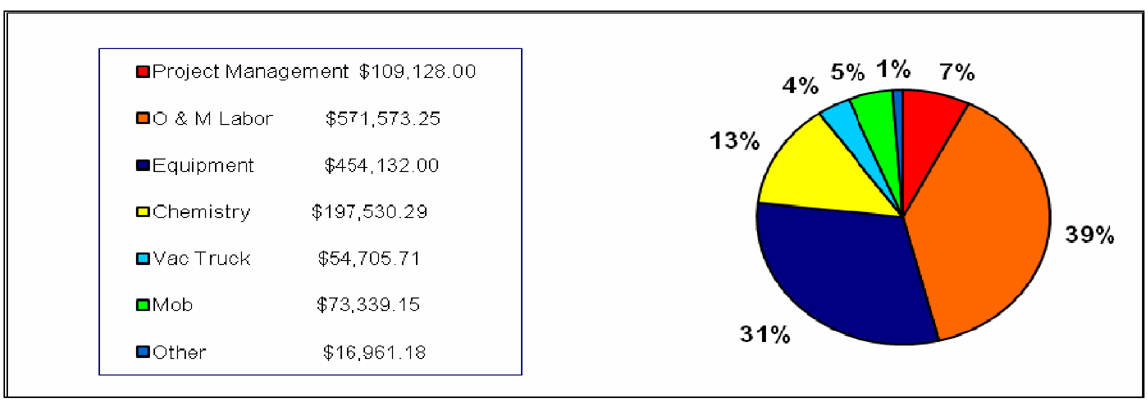

Figure 5