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July 7, 2005

Via U.S. and Electronic Mail

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Ms. Dena McCann
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State Water Resources Control Board
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SUBJECT: Comments on the Proposed Total Residual Chlorine and Chlorine-Produced Oxidants Policy of California - Draft Functional Equivalent Document--SWRCB Public Scoping Meeting July 7, 2005

Dear Ms. McCann:

The Bay Area Clean Water Agencies (BACWA), the Central Valley Clean Water Association (CVCWA), Tri-TAC and the California Association of Sanitation Agencies (CASA) offer the following comments regarding the scope and content of the environmental information to be included in the draft Functional Equivalent Document (FED) for the proposed Total Residual Chlorine and Chlorine-Produced Oxidants of California (Draft Policy) currently being developed by the SWRCB. BACWA is comprised of local governmental agencies that are leaders in urban water resource management and public stewardship of the San Francisco Bay water quality. CVCWA is an association of local public agencies providing wastewater collection, treatment and water recycling services to millions of Central Valley residents and businesses. CASA and Tri-TAC are statewide organizations comprised of members from public agencies and other professionals responsible for wastewater treatment. Tri-TAC is jointly sponsored by CASA, the California Water Environment Association, and the League of California Cities. The constituency base for BACWA, CVCWA, Tri-TAC and CASA collects, treats and reclaims more than two billion gallons of wastewater each day and serves most of the sewerred population of California.

As an initial matter, our organizations note that many of the comments set forth below were offered during the workgroup process organized by the State Water Resources Control Board (SWRCB) during the development of this Policy several years ago (as described on p. 3 of the Informational Document), yet it is not clear how the issues raised by POTW representatives at that time have been accounted for and reflected in the Draft Policy and Informational Document released in June 2005. We have requested from the SWRCB a copy of the report referenced in the Informational Document titled, "*Economic Considerations for Proposed Total Residual Chlorine and Chlorine-Produced Oxidants Policy of California*" (April 2005, SWRCB Contract No. 03-266-250-0), which would lend insight as to the technical assumptions the SWRCB is making about how the draft Policy would be implemented in permits and about the ability for POTWs to comply with the provisions of the draft Policy. Unfortunately, the SWRCB has told us that this report is not available to the public at this time. Given the importance of this information to the SWRCB's ultimate policy decision, we request that the SWRCB provide us with detailed information about its assumptions regarding the issues outlined below. We also request to meet with staff to discuss our comments after we have received that information.

The scoping meeting public notice indicated that comments were to be limited to identifying "the range of actions, alternatives, mitigation measures, and potential significant effects to be analyzed in depth in the draft FED." BACWA, CVCWA, Tri-TAC & CASA are particularly interested in seeing that the FED provide a robust analysis of alternatives to the proposed water quality objectives and implementation measures described in the Informational Document and Draft Policy based on a number of criteria and perspectives including; approaches taken in other states, alternatives to single statewide Water Quality Objectives (WQO), impacts of allowing technically documented mixing zones as allowed for under the Ocean Plan, alternative approaches for compliance determination, and alternative lengths for compliance schedules. We believe it is critical that the alternatives analysis be thorough and sufficiently detailed to allow the SWRCB to consider the full range of alternative objectives and implementation approaches before adopting a final policy.

General Comments

The Draft Policy should include some of the details and intent language that is found in the Scoping Document to facilitate permit writers' and dischargers' understanding of the Policy's requirements. In addition, in order to adequately assess the potential impacts of the proposed Policy, the FED must address the following:

- Whether chlorine acute toxicity is a statewide problem with documented widespread adverse environmental impacts in receiving waters, necessitating additional statewide regulation;
- The necessity to devote statewide resources to address total chlorine residual effluent limits beyond the extent to which they are currently being regulated;

- Whether resources would be more effectively spent focusing on enhancing enforcement actions related to total chlorine residual than adoption of a new objective based upon 1984 criteria;
- Whether statewide effluent limitations for total chlorine residual are appropriate, given the diversity in discharges and receiving water characteristics that are more typically addressed at a regional level;
- The Draft Policy proposes adoption of new water quality objectives, the FED should address how the alternatives under consideration comply with Water Code Section 13241 factors, including economic impacts.

1. Alternative Water Quality Objectives

We recommend that the FED include an analysis of the quality of the data used to derive the 1984 USEPA 304(a) chlorine residual criteria, based on currently available information. The “Informational Document” states the number of organisms used to derive the criteria in 1984, and that the information had been peer reviewed. There is no information provided on what additional related testing has been conducted since 1984, and whether updating the 1984 dataset would change the criteria.

2. Analysis of Alternative Objectives for Subcategories of Waterbodies or Uses

We recommend that the FED include an alternative in which the SWRCB would adopt subcategories of objectives to address waterbodies of different types or with different beneficial use designations (e.g. WARM versus COLD, etc) or of applying the proposed objectives differentially depending on waterbody type and beneficial use designations in addition to providing an option for dischargers or regional water quality control boards (RWQCBs) to develop site specific objectives (SSOs). An approach similar to this can be found in Ohio’s water quality standards, where the EPA 304(a) criteria have been adopted into the State’s standards but do not apply uniformly to all waterbodies. (*See* Ohio Regulation 3745-1-07, Table 7-1, effective 12-31-2002. By way of example, in Ohio’s standards, for “limited resource waters,” only the 1-hour average criteria of 19 µg/l is applied, while for areas designated as “seasonal salmonid habitat,” no chlorine may be discharged during a designated time period.)

Additionally, we are concerned that providing only SSOs as an avenue to modify standards is inefficient and unlikely to be a viable option in the amount of time allowed (i.e. within a maximum 2-year compliance schedule), since the administrative approval process alone can easily take a year or more (which does not account for the time necessary to develop and approve a workplan and for conducting the necessary scientific studies). SSOs are very resource intensive to develop, and the need for them could potentially be reduced to the extent subcategories of beneficial uses and objectives protective of those subcategories of uses could be adopted for different waterbody types by the SWRCB.

Impacts of chlorine residual are very dependent upon the nature and qualities of the receiving waters. For example, the impact of chlorine residual on aquatic life would vary greatly if the discharge is to a mountain stream in Northern California compared to an agricultural slough in the Central Valley. In addition to possible species-specific differences in sensitivity to chlorine for species that live in agricultural sloughs, for instance, the chlorine demand in an agricultural slough would likely immediately consume a transient chlorine spike, where this may not be case in a pristine mountain stream. Likewise, fully concrete-lined channels in urban areas provide extremely limited potential for aquatic life habitat, and may not warrant the same water quality objectives as pristine mountain streams.

3. Alternative Implementation Measures

We recommend that the SWRCB consider including alternative implementation measures in the FED based on a survey of practices used in other states. The EPA criteria were established in 1984 and if the criteria have been adopted by other States, there should be a good deal of experience throughout the country on the many issues we have identified regarding implementation. We would be pleased to work with SWRCB staff to assist in the compilation of this information for their consideration.

4. Mixing Zone Analysis

We recommend that the SWRCB include at least one alternative in the FED that allows for the application of technically defensible mixing zones for dischargers when chlorine residual limits are implemented in permits, consistent with other SWRCB Water Quality Control Policies and Plans such as the State Implementation Policy (SIP) and the California Ocean Plan (COP). For instance, Section 1.4.2 of the SIP states that “With the exception of effluent limitations derived from TMDLs, ... the RWQCB may grant mixing zones and dilution credits to dischargers in accordance with the provision of this section.” The COP is also directly applicable, in that it already contains water quality objectives and implementation procedures for total chlorine residual. Under the COP, total chlorine residual is a Table B constituent and ocean dischargers are allowed to use dilution in calculating their total chlorine residual effluent limits. We therefore request that the FED consider an alternative that allows calculation of total chlorine residual effluent limits consistent with the approach allowed in the Ocean Plan for calculating Table B limits (i.e. under Section III.C.4, “Calculation of Effluent Limitations”).

5. Detection Limits

We recommend that the SWRCB include in the FED a survey and analysis of operating and functional on-line continuous monitoring chlorine residual systems to determine the range and validity of detection limit capabilities. We can provide some case study examples of on-line continuous chlorine residual monitoring systems and their detection limit capabilities. The Chlorine Policy requires that “On-line devices must have a manufacturer’s stated detection limit,

scale range, or sensitivity of 1 part per billion." The capabilities and performance of the overall chlorination/dechlorination monitoring and control system need to be addressed rather than simple reliance on manufacturer's analyzer specifications.

We asked the Instrumentation Testing Association (ITA) to review the Draft Policy and to give us its assessment of current system capabilities. ITA is a national, non-profit, technical and educational association that has been serving the water, wastewater and industrial trades since 1984. ITA's goal is to develop and disseminate instrumentation and automation research and educational programs to the water and wastewater. ITA provided us with a great deal of information summarized below, that highlights some of the practical limitations of these systems that needs to be assessed in the FED relative to being able to reliably measure at a level necessary to demonstrate compliance with the proposed WQO based effluent limits.

1. ITA contacted manufacturers and was told: "Existing technologies do not provide detection at the ppb level in a matrix as complex as wastewater."
2. Display resolution may be 1 ppb but the accuracy at best is +/- 3 ppb.
3. "Measurements below 100 ppb are affected by levels of dissolved oxygen"
4. The response time for the most accurate instruments is 1.5 to 2 minutes for 90% of the reading.
5. "How does the State expect publicly owned treatment plant's to calibrate these low level analyzers when the accepted standard laboratory method has a detection limit of only 10 ppb as noted in their proposed regulation?"
6. ITA evaluated Cl₂ residual analyzers in 1984, 1990, and 1999 and is currently in the process of beginning to test currently available chlorine residual analyzers. They are interested in discussing participation by the state in this process.

Unlike other toxic pollutants that have compliance requirements, continuous instrumentation for chlorine residual does not have established minimum detection levels (MDLs) or reporting levels (RLs). Furthermore, there are no EPA 40 CFR Part 136 approved methods that are specific to on-line continuous monitoring instruments. RLs and MDLs are a necessary and important element to insure confidence in analytical data used in compliance and enforcement. It is essential that the Draft Policy provide guidance on how on-line system MDLs and RLs, in a wastewater matrix, can and should be derived and how the resultant values are to be used in compliance reporting.

We recommend that the Draft Policy be modified to be consistent with the Section 2.4 of the State Implementation Plan for Toxics (SIP). Specifically, there is a need to develop for on-line analyzers the equivalent to a Minimum Level (ML) with appropriate method specific factors (to account for matrix effects and other effects unique to on-line versus laboratory benchtop type analyzers). If the proposed WQO based effluent limits are below the MLs so derived, compliance would be evaluated relative to the MLs, as is done for other toxics (such as DDE and dieldrin in Region 2 permits).

6. Monitoring and Reporting Requirements

The Draft Policy defines continuous monitoring as one or more data points every minute. Some continuous monitoring systems may have the capability to record measurements every few seconds. The definition of terms for “One-hour Average” should include the use of all data points measured in a one-hour interval and should not be limited to 60 data points as currently defined. Generalized mathematical formulas should be provided to ensure consistency in calculation of hourly averages. The FED should assess alternatives for what data are to be reported in paper and electronic Self-Monitoring Reports and how compliance is to be calculated. One alternative to consider is allowing this to be addressed at Regional Board staff discretion within individual Self-Monitoring Programs, given the range of analytical and data collection systems present.

7. Compliance Determination

Chlorination/dechlorination processes are sophisticated systems. Even with redundant systems, it takes time to switch over or isolate a system. Power can be momentarily interrupted along with any number of things that are outside the direct control of the operator. Treatment processes are subject to transient conditions, such as those that occur when valves or gates are operated, pumps come on line, chemical dosing rates are varied, etc. The demand for chlorine can vary from minute to minute for a number of reasons, including varying ammonia and particularly nitrite concentrations (for plants that partially nitrify). Even the most highly sensitive and responsive instrument/control systems require a finite time to measure and respond to changing conditions, and the response itself may generate a transient condition. Thus, short duration “nuisance excursions” in chlorine residual are likely unless significant excess dechlorination agent is present at all times. USEPA and the courts have recognized that technology, particularly continuous monitoring technology, is fallible and subject to failure.

Several courts, including the Ninth Circuit, have ruled that some sort of upset defense must be provided for any technology-based effluent limits, because technology is inherently fallible (See *FMC Corp. v. Train*, 539 F.2d 973 (4th Cir. 1976) and *Marathon Oil v. EPA*, 564 F.2d 1253 (9th Cir. 1977)). While the proposed water quality objectives and resulting effluent limits are arguably water quality-based, the requirement for the use of continuous monitoring equipment (with mandated specifications) is a technology-based requirement, and the SWRCB is therefore required to provide an upset defense. We request that this be added to the draft Policy and analyzed in the draft FED.

Additionally, there are other alternative compliance determination strategies to address the fallibility of continuous monitoring equipment that should be considered by the SWRCB, and at a minimum these must be examined in the draft FED.

As we have previously commented (during the SWRCB ad-hoc workgroup process as well as in discussions with the SWRCB designed to address compliance determination issues in the San Francisco Bay Region (Region 2).), the FED should provide an evaluation of alternative compliance determination strategies that account for short term excursions that are unlikely to have any discernable water quality impact and that account for potential false positives. Specifically, to address the issue of very short term excursions that inevitably occur with the use of continuous monitoring equipment, we support inclusion in the policy of a compliance determination strategy, based on the strategy originally adopted by USEPA in 1982 for pH,¹ and modified for application to effluent limits for chlorine residual by the Santa Ana RWQCB. We also suggest that language be included in the draft Policy to allow dischargers to stoichiometrically demonstrate that an excursion is a false positive.

In 2000, an ad hoc committee of SWRCB and RWQCB staff was formed to address chlorine residual continuous monitoring issues that had arisen in Region 2. The issues were also discussed with the SWRCB's Compliance Assurance and Enforcement Unit and with the Office of Chief Counsel. In an August 10, 2000 SWRCB letter from Stan Martinson to then-Tri-TAC chair Phil Bobel, two options were suggested for use by RWQCBs in crafting permits where continuous monitoring is required. The first option, relevant to pH, cited 40 CFR 401.17:

“Pursuant to 40 CFR 401.17, the discharger shall be in compliance with the pH limitation specified in the Order, Section _____, provided that both of the following conditions are satisfied:

- *The total time during which the pH values are outside the required range of 6.5 – 8.5 shall not exceed 7 hours and 26 minutes in any calendar month;*
- *No individual excursion from the range of pH values shall exceed 60 minutes.”*

The second option recommended by the SWRCB staff regarding chlorine residual was a two part approach based on the Santa Ana Region language plus the stoichiometric approach to documenting excess dechlorinating agent developed by BACWA and Tri-TAC:

“Compliance determinations for total chlorine residual shall be based on 99% compliance. To determine 99% compliance with the effluent limitation specified in Section _____ for total chlorine residual, the following conditions shall be satisfied:

- (1) *The total time during which the total chlorine residual values are above _____ mg/L (instantaneous maximum value) shall not exceed 7 hours and 26 minutes in any calendar month;*

¹ Federal Register Volume 47, Number 108, pp. 24534 – 24538.

- (2) *No individual excursion from ___mg/L shall exceed __ minutes; and*
- (3) *No individual excursion shall exceed ___ mg/L.”*

The stoichiometric approach language that should be included in the Draft Policy to provide an affirmative defense to address the occurrence of false positives is as follows:

“The discharger may elect to use continuous on-line monitoring system(s) for measuring flows, chlorine, and sodium bisulfite dosage (including a safety factor) and concentration to prove the chlorine residual exceedances are false positives. If convincing evidence is provided, RWQCB staff may use best professional judgment to conclude that these false positive chlorine residual exceedances are not violations of this permit.”

8. Back-up Systems

We support the concept that when continuous monitoring systems are off-line for calibration and maintenance, a back-up system must be in place to show compliance. However, we do not believe it is reasonable or necessary to require receiving water grab samples at 30 minute intervals until the continuous monitoring system is back on-line in addition to effluent grab samples. Discharge locations may be miles away from the treatment plant and may only be accessible by boat. Grab sample effluent monitoring alone is sufficient to determine compliance with effluent limits.

We recommend that a bisulfite or sulfite analyzer be allowed as part of a backup system design to demonstrate compliance when chlorine analyzers are taken offline and or to refute false positive chlorine residual excursions that are recorded. Similarly, we also recommend adding to the Chlorine Policy the above language regarding demonstration of a stoichiometric excess of dechlorinating chemical as another acceptable backup measure for demonstrating compliance when continuous monitoring systems are off-line.

9. Compliance Schedule

The Draft Policy mandates that compliance schedules not exceed two years from the date that a permit is issued, reissued, or modified. The policy states that a “two-year time frame seems reasonable for acquiring the necessary continuous monitoring equipment, train personnel with its use, and to begin necessary protocols to comply with the chlorine effluent limits.” However, many dischargers throughout the state will have problems complying with these new effluent limits. If a discharger needs to consider new treatment processes and obtain the necessary funds to undertake capital improvement projects to meet these limits, a two-year schedule for implementation will not be adequate, as the SWRCB itself acknowledges in implementing the

SRF program that capital improvement projects can take significantly longer than 2 years to complete.

In the State Board's "Policy for Implementing the State Revolving Fund for Construction of Wastewater Treatment Facilities," as amended June 18, 1998, the State Board estimated that a *minimum* of 3.3 years is required to take a project from design to the initiation of operation, and that *some projects may take as long as 12 years to complete*. Additionally, the SWRCB has issued a "SRF Loan Program Flow Chart" that chronicles the process of obtaining State loan funding for facility upgrades. In this chart, the SWRCB recognizes that it could take 11.8 years to complete the funding process. The State Board should allow the Regional Boards to consider longer compliance schedules (up to 5 years) in cases where a discharger can provide supporting information to document the steps needed to achieve compliance, including the possibility of developing site specific objectives, which, as discussed above, often take 2 years or more to develop. In addition, we ask that the compliance schedule provision include flexibility in timing, such that it need not begin until a discharger is aware that it cannot comply with the proposed objectives.

10. Analysis of Environmental Effects of Increased Usage of Dechlorination Chemical

Most dischargers that are required to meet tertiary (filtered) recycled water requirements use chlorine to meet the Title 22 pathogen (<2.2 MPN) criteria. Sufficient chlorine must be injected at the front end of the chlorine contact chamber to assure pathogen destruction and to maintain a chlorine residual at the end of the chamber. The demand for chlorine can vary from minute to minute for a number of reasons, one being varying levels of ammonia in the waste stream. This requires that the dechlorination chemical addition system be controlled to very closely follow these fluctuations in chlorine residual.

Wastewater treatment plant operators are encouraged to conserve chemical usage, not only because of the high cost of chemicals, but because of the concern for potential environmental impacts associated with the addition of any chemicals to receiving waters. Wastewater inherently has a high chlorine demand, and even slight chlorine excursions are likely depleted within the discharge pipe before reaching receiving waters. However when faced with relying on continuous instrument measurements in a wastewater matrix that may not achieve reliable detection limits, operators will have a tendency to overdose the effluent with much more than the stoichiometric amount of dechlorinating agent needed to fully remove any remaining chlorine residual to avoid any potential for "nuisance" chlorine residual excursions.

Therefore, we request that the State Board's CEQA document consider the potential environmental impact of increase usage of chemicals for dechlorination which might be implemented by wastewater agencies to ensure that the final effluent chlorine residual requirements can be met. Although the State Board believes that the relocation of dechlorination facilities is not expected to have any adverse impacts on the environment as stated on page 21 of

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the informational document, we believe that the potential use of excess chemicals for dechlorination needs to be considered in the environmental documentation for this policy. The types of environmental impacts that should be considered in the draft FED include transportation and associated air quality emissions for transport and delivery of greater amounts of dechlorination agents, environmental risks associated with the delivery/transfer of extra shipments of these chemicals (e.g. risk of spills), and potential water quality impacts associated with dosing at higher levels of dechlorination agents.

We were very encouraged by Board Member Silva's commitment to engage stakeholders on issues associated with the draft policy by convening future workshops. We are confident that many of these technical challenges can be satisfactorily addressed if interested parties have the opportunity to work cooperatively with the SWRCB in developing a final policy.

Thank you for your consideration of our comments. If you have any questions, please contact Ben Horenstein, Tri-TAC Water Committee Co-Chair at (510) 287-1846 or Marlaigne Hudnall of the CASA staff at (916) 446-0388.

Very truly yours,



Michele Pla
Executive Director, BACWA



Sharon Green
Chair, Tri-TAC

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Warren Tellefson
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cc: Peter S. Silva, Vice Chair, SWRCB
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