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For Petitioner California Sportfishing Protection Alliance

BEFORE THE OFFICE OF ADMINISTRATIVE LAW

In the Matter of Improper Underground Regulation; Guidance for Hardness in Waste Discharge Requirements; California Regional Water Quality Control Board – Central Valley Region	)	**PETITION FOR REVIEW**

Pursuant to Section 11340.5 of California Government Code and Title 1 Section 260 of the California Code of Regulations, the California Sportfishing Protection Alliance ("CSPA" or "petitioner") petitions the Office of Administrative Law to review the underground regulations employed by the California Regional Water Quality Control Board for the Central Valley Region ("Regional Board"), as outlined in the *A Procedure for Applying CTR to Derive Effluent*

Limitations for Hardness-Dependent Metals and *Developing Protective Hardness-Based Metal Effluent Limitations* (Policy). The Regional Board has employed the Policy in preparing and adopting Waste Discharge Requirements for numerous wastewater dischargers. The Policy was not adopted pursuant to legally mandated rule-making procedures and, in fact, explicitly contravenes existing state and federal policy and regulation. Application of the Policy has resulted in the degradation of surface water throughout the Central Valley. CSPA requests the Office of Administrative Law to accept the petition and issue a determination, pursuant to Section 270 of the California Code of Regulations that the Regional Board's policy for determining hardness is an illegal underground regulation.

1. Petitioner's Identifying Information:

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2. State agency or department being challenged:

California Regional Water Quality Control Board, Central Valley Region

3. Description of the purported underground regulation.

Summary:

Federal Regulations mandate the use of receiving water (ambient) hardness values in assessing the potential for hardness-dependent metals to violate water quality standards and in developing waste discharge limits for these metals in permits issued pursuant to the federal Clean Water Act. Simply put, the hardness of the receiving water, unaffected by the wastewater discharge, must be used. Dr. Robert Emerick, of Eco:Logic Engineers, developed a different approach for evaluating hardness-dependent metals that used effluent and downstream hardness values in assessing reasonable potential and developing effluent limits. He subsequently presented his approach at the Water Board's Training Academy and the Regional Board has adopted this methodology as a defacto policy in developing and issuing wastewater discharge permits. Dr. Emerick's approach has never been evaluated or adopted through the legally mandated rule-making procedures. The Regional Board's use of the policy has resulted in fewer and less stringent and, consequently, less protective limits in numerous permits.

US EPA requires the use of the upstream lower ambient hardness in part to be conservative since other issues, such as alkalinity or pH can also affect the toxicity of metals and have not been

addressed by the regulations. Dr. Emerick's procedure, utilized by the Regional Board, is not the most conservative approach in regulating hardness dependant metals and would not account for these other parameters, which can affect toxicity. Regardless, as described above, this methodology has not been subjected to the federal rulemaking process required to modify existing federal regulations, which require the use of upstream ambient hardness.

Description:

Priority pollutant water quality criteria were promulgated by the U.S. Environmental Protection Agency (U.S. EPA) through the National Toxics Rule (NTR, 40 CFR 131.36, promulgated on December 22, 1992 and amended on May 4, 1995) and through the California Toxics Rule (CTR, 65 Fed. Register 31682-31719 (May 18, 2000), adding Section 131.38 to 40 CFR). In March 2000, the State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP), which implements criteria for priority toxic pollutants contained in the CTR, as well as other priority toxic pollutant criteria and objectives. The State Water Resources Control Board by Resolution 2005-00129 amended the SIP in February 2005.

These water quality standards are used to develop Effluent Limitations for wastewater discharges to surface waters. Effluent is the treated flow leaving a wastewater treatment plant. Section 122.44(d) of 40 CFR requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water.

The CTR, 40 CFR Section 131.38(b)(2) contains water quality standards for hardness dependant metals (cadmium, copper, chromium III, lead, nickel, silver and zinc). Freshwater aquatic life criteria for these metals are expressed as a function of hardness because hardness can reduce or increase the toxicities of some metals. Increasing the hardness has the effect of decreasing the toxicity of metals. Expressed another way, the lower the hardness the greater the toxicity.

Federal Regulation 40 CFR 131.38(c)(4) states that: "For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters with a hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations." (Emphasis added).

The dictionary definition of *ambient* is "in the surrounding area", "encompassing on all sides". It is reasonable to assume, after considering the definition of ambient, that EPA is referring to the hardness of the receiving stream before it is potentially impacted by an effluent discharge. Confirming this definition, the SIP Sections 1.4.3.1 *Ambient Background Concentration as an Observed Maximum* and 1.4.3.2 state in part that: "If possible, preference should be given to

ambient water column concentrations measured immediately upstream or near the discharge, but not within an allowed mixing zone for the discharge. The RWQCB shall have discretion to consider if any samples are invalid for use as applicable data due to evidence that the sample has been erroneously reported or the sample is not representative of the ambient receiving water column that will mix with the discharge."

Also, the Federal Register, Volume 65, No. 97/Thursday, May 18th 2000 (31692), adopting the California Toxics Rule in confirming that the ambient hardness is the upstream hardness, absent the wastewater discharge, states that:

> *"A hardness equation is most accurate when the relationship between hardness and the other important inorganic constituents, notably alkalinity and pH, are nearly identical in all of the dilution waters used in the toxicity tests and in the surface waters to which the equation is to be applied. If an effluent raises hardness but not alkalinity and/or pH, using the lower hardness of the downstream hardness might provide a lower level of protection than intended by the 1985 guidelines. If it appears that an effluent causes hardness to be inconsistent with alkalinity and/or pH the intended level of protection will usually be maintained or exceeded if either (1) data are available to demonstrate that alkalinity and/or pH do not affect the toxicity of the metal, or (2)* ***the hardness used in the hardness equation is the hardness of upstream water that does not include the effluent.*** *The level of protection intended by the 1985 guidelines can also be provided by using the WER procedure."* (Emphasis added) Ambient conditions are in-stream conditions unimpacted by the discharge.

To assess the toxic impacts of varying hardness on hardness dependant metals, Dr. Robert Emerick prepared a paper titled *Developing Protective Hardness-Based Metal Effluent Limitations* (Attachment 1). Dr. Emerick's paper was updated for presentation at the California Water Board's Training Academy *A Procedure for Applying CTR to Derive Effluent Limitations for Hardness-Dependent Metals* (Attachment 2). Dr. Emerick's conclusions are: (1) for acute and chronic copper, acute and chronic chromium III, acute and chronic nickel, acute and chronic zinc, and chronic cadmium make use of the lowest recorded effluent hardness when developing water quality objectives; (2) for acute cadmium, acute and chronic lead, and acute silver make use of the following equation, inserting the lowest recorded effluent hardness and highest recorded receiving water hardness. Note: the highest recorded receiving water hardness increases the difference between the hardness of the two waters and leads to the development of more restrictive water quality criteria.

$$Effluent\ Limitation = \left(\frac{m\left(H_e - H_{rw}\right)\left(e^{m\{\ln(H_{rw})\}+b}\right)}{H_{rw}} \right) + e^{m\{\ln(H_{rw})\}+b}$$

Where
H_e = *hardness of the effluent*
H_{rw} = *hardness of the receiving water*
M = criterion-specific constant from CTR
B = criterion-specific constant from CTR

Dr. Emerick's paper (Proposed Implementation section) recommends use of the effluent and/or the effluent and the highest receiving water hardness in determining whether hardness dependant metals present a reasonable potential to exceed the CTR water quality standards. Recall: Federal Regulation 40 CFR 131.38(c)(4) states that: "For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters with a hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations." (Emphasis added).

4. Description of the agency actions you believe demonstrate that it has issued, used, enforced, or attempted to enforce the purported underground regulation.

For the Central Valley Regional Water Quality Control Boards two most recent public meeting agendas for April 2009 and February 2009 (http://www.swrcb.ca.gov/centralvalley/board_info/meetings/0904ag.pdf and http://www.swrcb.ca.gov/centralvalley/board_info/meetings/0902ag.pdf.) NPDES permits were considered for:

- Nevada County Sanitation District No. 1, Lake of the Pines Wastewater Treatment Plant, Nevada County, pages F 14 and 15.
  http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/nevada/r5-2009-0031_npdes.pdf

- Donner Summit Public Utilities District wastewater Treatment Plant, Nevada County
  http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/nevada/r5-2009-0034.pdf

- Dicalite Minerals Corporation, Diatomaceous Earth Mine, Shasta County
  http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/shasta/r5-2009-0043_npdes.pdf

- Wheelabrator Shasta Energy Company, Inc., and Wheelabrator Lassen, Inc., Electrical Power Generation Facilities, Shasta County
  http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/shasta/r5-2009-0044_npdes.pdf

- Nevada County Sanitation District No. 1, Lake Wildwood WWTP, Nevada County http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/nevada/r5-2009-0004.pdf

- San Andreas Sanitary District Wastewater Treatment Plant, Calaveras County http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/calaveras/r5-2009-0007.pdf

- City of Turlock Water Quality Control Facility, Stanislaus County – removed from the agenda without consideration.

- Maxwell Public Utilities District Wastewater Treatment Facility, Colusa County http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/colusa/r5-2009-0009.pdf

- City of Woodland Water Pollution Control Facility, Yolo County http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/yolo/r5-2009-0010.pdf

- Collins Pine Co., Chester Sawmill, Plumas County – Order not posted.

- Aerojet-General Corporation, Interim Groundwater Extraction and Treatment Systems, ARGET, GET E/F, GET H, INTERIM GET H, GET K, INTERIM GET K, GET L, GET L1, Sailor Bar Park Well, Chettentham Well and Low Threat Discharges, Sacramento County, amendment – hardness not discussed. http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/sacramento/r5-2009-0016_res.pdf

- City of Davis Wastewater Treatment Plant, Yolo County http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/yolo/r5-2007-0132-01.pdf

Each of the cited permits utilizes a version of the "Emerick" approach, modified by the Regional Board, in determining whether the wastewater discharge presented a reasonable potential to exceed water quality standards and, if so to establish Effluent Limitations. Regardless of the merits of the "Emerick" Paper, this would have to go through an extensive public process in order to modify the CTR requirements for hardness; the Regional Board's modified approach does not faithfully follow the prescribed procedure. Each of the cited permits contains the following or similar language in the Fact Sheet:

"*Hardness. While no effluent limitation for hardness is necessary in this Order, hardness is critical to the assessment of the need for, and the development of, effluent limitations for certain metals. The California Toxics Rule and the National Toxics Rule, contain water quality criteria for seven metals that vary as a function of hardness, the lower the hardness the lower the water quality criteria.*

The hardness-dependent metals include cadmium, copper, chromium III, lead, nickel, silver, and zinc. The equation describing the general formulation of the criteria is as follows CTR Criterion (expressed as dissolved) = WER x CF x em[ln(H)]+b (Equation 1)

Where: WER = water-effect ratio (default of 1.0 used in this Order) CF = total to dissolved conversion factor

m = criterion-specific constant
H = Hardness
b = criterion-specific constant

The constants "m" and "b" are specific to both the metal under consideration, and the type of criterion (i.e. acute or chronic) Effluent limitations for the discharge must be set to protect the beneficial uses of the receiving water for all discharge conditions. In the absence of the option of including condition-dependent, "floating" effluent limitations that are reflective of actual conditions at the time of discharge, effluent limitations must be set using a reasonable worst-case condition in order to protect beneficial uses for all discharge conditions. Recent studies indicate that using the receiving water lowest hardness for establishing water quality criteria is not the most protective for the receiving water. The Regional Water Board has evaluated these studies and concurs that for some parameters the beneficial uses of the receiving water are best protected using the lowest hardness value of the effluent, while for some parameters, the use of both the lowest hardness value of the receiving water and the lowest hardness value of the effluent is the most protective, provided sufficient hardness data for the effluent and receiving water are available. Because of the non-linearity of the Criterion equation, the relationship can be either concave downward or concave upward depending on the criterion-specific constants. For those contaminants whereby the regulatory criteria exhibit a concave downward relationship as a function of hardness (e.g. acute and chronic copper, chromium III, nickel, and zinc, and chronic cadmium), use of the lowest recorded effluent hardness for establishment of water quality objectives is fully protective of all beneficial uses regardless of whether the effluent or receiving water hardness is higher. For purposes of establishing WQBELs, water quality criteria for acute and chronic copper, acute and chronic chromium III, acute and chronic nickel, acute and chronic zinc, and chronic cadmium were developed using the lowest effluent hardness value 55 mg/L. Water quality criteria for acute cadmium, acute and chronic lead, and acute silver were developed using the lowest receiving water hardness value 78 mg/L."

This Policy is contrary to Federal Regulation 40 CFR 131.38(c)(4) which states, "For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of

this section, for waters with a hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations." Instead, the Regional Board's Policy utilizes the effluent hardness to establish water quality based effluent limitations for hardness dependant metals.

5. The legal basis for believing that the guideline, criterion, bulletin, provision in a manual, instruction, order, standard of general application, or other rule or procedure is a regulation as defined in Section 11342.600 of the Government Code AND that no express statutory exemption to the requirements of the APA is applicable.

The Regional Board is utilizing a rule or standard of general application to develop permits for wastewater discharges based on effluent hardness contrary to Federal Regulation 40 CFR 131.38(c)(4) which requires the "actual ambient hardness of the surface water" be used to develop effluent limitations for hardness dependant metals.

Use of the Policy also violates the SIP section 1.4.2 (*Mixing Zones and Dilution Credits)*, 1.4.2.1 (*Dilution Credits*) and 1.4.2.2 (*Mixing Zone Conditions*) by utilizing mixing of ambient and effluent hardness in conducting reasonable potential analyses and establishing effluent limits.

The Regional Board's use of the effluent hardness as opposed to the required "actual ambient hardness of the surface water" essentially revises the requirements of 40 CFR 131.38(c)(4) contrary to Government Code section 11342.600. Section 11342.600 states that: ""Regulation" means every rule, regulation, order, or standard of general application or the amendment, supplement, or revision of any rule, regulation, order or standard adopted by any state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure."

6. Information demonstrating that the petition raises an issue of considerable public importance requiring prompt resolution.

Generally, hardness values in receiving water are lower than wastewater effluent discharges to that water body. As is cited above, the lower the hardness the greater the aquatic toxicity exhibited by hardness dependant metals. In the case: use of the higher effluent hardness will result in fewer effluent limitations and the limitations, which are established, will be a higher numeric value. An example of this situation is the currently proposed amendment to the City of Grass Valley's NPDES permit (http://www.swrcb.ca.gov/centralvalley/board_decisions/tentative_orders/cityofgrassvalley/grass valley_wwtp_npdes.pdf).

The proposed Grass Valley Permit amendment Fact Sheet contains the following hardness dependant metals analysis:

> Copper. The proposed permit amendment using the worst-case measured hardness from the effluent (90 mg/L), the default conversion factors, and the WER of 6.49, the applicable chronic criterion (maximum 4-day average concentration) is 53 ug/l and the applicable acute criterion (maximum 1-hour average concentration) is 79 ug/l, as dissolved concentrations. As discussed in section IV.C.2.e of this Fact Sheet, the applicable translator values for copper are 1.05 (1/fD) for acute freshwater and 1.19 (1/fD) for chronic freshwater. Using the site-specific translators to translate the dissolved criteria to total criteria, the applicable acute criterion is 83 µg/L and the applicable chronic criterion is 63 µg/L, as total recoverable.

If however the Regional Board utilized the lowest actual ambient hardness of the surface water of 21 mg/l, the default conversion factors, and the WER of 6.49, the applicable chronic criterion (maximum 4-day average concentration) is 2.3 ug/l and the applicable acute criterion (maximum 1-hour average concentration) is 3.2 ug/l, as dissolved concentrations. Using the Board's conversion factors the total recoverable copper criteria would be 2.76 ug/l (4-day average) and 3.36 ug/l (1-hour average)

The maximum effluent concentration for total copper was 18 ug/l, based on 43 samples collected between 1 January 2005 and 6 March 2008. Therefore, the proposed permit amendment found that the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for copper. Cleary using the receiving water hardness, the maximum observed effluent concentration would have exceeded the criteria and effluent Limitations would be mandated in accordance with 40 CFR 122.44. The difference between using the effluent and receiving water hardness is that the higher effluent hardness results in removal of the previously existing effluent limitation for copper.

The proposed Grass Valley permit amendment contains similar calculations for zinc and the resultant removal of previously existing effluent limitations. The effluent limitations for zinc would remain utilizing the ambient surface water hardness.

The proposed permit amendment for Grass Valley clearly reveals that the use of the effluent hardness, rather than the lower ambient surface water hardness, results in substantially less restrictive discharge limitations or removal of the effluent limitations altogether. Federal Regulation 40 CFR 131.38(c)(4) states that: "For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters with a

hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations." (Emphasis added).

For the most common case where hardness values in receiving water are lower than wastewater effluent discharges to that water body. For each of the NPDES permits adopted by the Regional Board utilizing effluent hardness rather than receiving water hardness, the effluent limitations for hardness dependant metals are less restrictive if found to be necessary. Metals are more toxic in lower hardness water. Therefore in this case it must follow that metals would be more toxic in the receiving water than in the effluent. For example, if the receiving water hardness is 25 mg/l and the effluent hardness is 50 mg/l a corresponding chronic discharge limitation for copper based on the different hardness's would be 2.9 ug/l and 5.2 ug/l, respectively. Obviously, the limitation based on the ambient receiving water hardness is more restrictive. For this case however the Regional Board's argues that the higher effluent hardness or the downstream hardness is protective of all beneficial uses.

Dr. Emerick's paper(s) analyses are also based upon the downstream impacts on the blended effluent and receiving water. Since an effluent limitation based on the upstream lower ambient hardness is more restrictive; the argument regarding protection of beneficial uses can only be made if in-stream mixing is considered. Mixing zones may be granted in accordance with extensive requirements contained in the SIP and the Basin Plan to establish Effluent Limitations. Mixing zones cannot be considered in conducting a reasonable potential analysis to determine whether a constituent will exceed a water quality standard or objective. The Regional Board's approach in using the effluent or downstream hardness to conduct a reasonable potential analysis and consequently establish effluent limitations can only be utilized if mixing is considered; otherwise the ambient (upstream) hardness results in significantly more restrictive limitations. A mixing zone allowance has not been discussed with regard to development of effluent limitations for hardness dependant metals and the requirements of the SIP and Basin plan have been ignored.

The more rare case is where the receiving water hardness is greater than the wastewater effluent hardness and even rarer when the discharge is located at the headwaters of a stream and there is no ambient (upstream) flow. A realistic case in California's Central Valley is during periods when ephemeral stream are dry. The CTR, 40 CFR 131.38(c)(4), does not however differentiate between the different types of discharges in requiring use of the actual ambient hardness of the surface water hardness.

7. Additional relevant information that will assist OAL in evaluating your petition.

Petitioner has described the technical and legal issues involved in this petition as succinctly as possible. If you have any questions, please don't hesitate to contact us. For technical matters,

we suggest you contact Richard McHenry at 916-851-1500. Mr. McHenry was a long-time supervising engineer with the Regional Board in charge of developing NPDES permits for the Sacramento Valley.

8. Certifications:

I certify that I have submitted a copy of this petition and all attachments to the state agency which has issued, used, enforced, or attempted to enforce the purported underground regulation:

Name of person in agency to whom petition was sent:

Ms. Pamela Creedon, Executive Officer
California Regional Water Quality Control Board, Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-6114
(916) 464-4839.

If you have any questions regarding this petition, please contact Bill Jennings at (209) 464-5067 or Andrew Packard at 707-763-7227.

I certify that all of the above information is true and correct to the best of my knowledge.
Dated: 9 June 2009

Bill Jennings, Executive Director
California Sportfishing Protection Alliance

Attachment: 1. Developing Protective Hardness-Based Metal Effluent Limitations
2. A Procedure for Applying CTR to Derive Effluent Limitations for Hardness-Dependent Metals