



California Sportfishing Protection Alliance

"An Advocate for Fisheries, Habitat and Water Quality"

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9 March 2012

Mr. Ken Landau, Assistant Executive Officer
Ms. Diana Messina, Supervising WRCE
Ms. Elizabeth Thayer,
Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6144

VIA: Electronic Submission
Hardcopy if Requested

RE: Renewal of Waste Discharge Requirements (NPDES No. CA0085171) for State of California, Department of Parks and Recreation, Empire Mine State Historic Park, Nevada County

Dear Mr. Landau and Mesdames Messina and Thayer,

The California Sportfishing Protection Alliance (CSPA) has reviewed the proposed Waste Discharge Requirements (NPDES No. CA0085171) for Empire Mine State Historic Park (Permit) and submits the following comments.

CSPA requests status as a designated party for this proceeding. CSPA is a 501(c)(3) public benefit conservation and research organization established in 1983 for the purpose of conserving, restoring, and enhancing the state's water quality and fishery resources and their aquatic ecosystems and associated riparian habitats. CSPA has actively promoted the protection of water quality and fisheries throughout California before state and federal agencies, the State Legislature and Congress and regularly participates in administrative and judicial proceedings on behalf of its members to protect, enhance, and restore California's degraded water quality and fisheries. CSPA members reside, boat, fish and recreate in and along waterways throughout the Central Valley, including Nevada County.

- 1. The proposed Permit fails to utilize valid, reliable, and representative effluent data in conducting a reasonable potential and limits derivation calculations contrary to U.S. EPA's interpretation of Federal Regulations, 40 CFR 122.44(d), and should not be adopted in accordance with 40 CFR 122.4 (a), (d) and (g) and CWC Section 13377.**

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the

discharge; the “new” treatment system was not installed until November 2011—after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification.

The proposed Permit, page F-4, states that: *“In 2002, residents from the City of Grass Valley complained that Wolf Creek was running orange. The City staff investigated the source of the discharge and traced it upstream to the Facility.”* (Underline emphasis added)

The NPDES permit, Order No. R5-2006-0058, page F-5, more thoroughly and accurately explains that:

“The discharge of mine drainage from the Empire Mine State Historic Park’s Magenta Drain to surface water was discovered by Regional Water Board and City of Grass Valley staff following an investigation into a complaint by downstream residents that Wolf Creek was discolored.”

On 17 January 2002, Regional Water Board staff received a call from City of Grass Valley staff relaying a complaint received from a resident downstream of the City’s wastewater treatment plant (WWTP) that Wolf Creek was running orange. City staff stated that the mine at the WWTP was contained and not contributing to discoloration, and that Wolf Creek was discolored upstream of the WWTP discharge as well. City staff investigated the source of the discharge and traced it upstream to the Empire Mine; according to City staff, the mine was discharging “brilliant red water”.

Copies of photographs taken the day of the complaint were transmitted to Regional Water Board staff. In a letter dated 5 February 2002, Regional Water Board staff advised the Discharger that if water from the mine had been discharged, a report of waste discharge was required in accordance with California Water Code section 13376.

On 25 February 2002, Regional Water Board staff received the Discharger’s laboratory results of a sample of the water from the Magenta Drain collected on 30 January 2002. The analytical results showed that the sample of water from the Magenta Drain contained 77.2 ug/L of total recoverable arsenic, 5,870 ug/L of total recoverable iron and had a pH of 6.8 pH units.

On 5 March 2002, Regional Water Board staff visited the site. It was determined that the discolored water in the Magenta Drain originated from the Empire Mine State Park property and that the headwaters of the Magenta Drain originate within the Park.” (Underline emphasis added)

The Regional Board staff conducting the investigation were Melissa Hall, Water Resource Control Engineer, and Richard McHenry, Senior Water Resource Control Engineer. It is critical information that the investigation was based on discolored water being discharged to surface waters as this is an unusual event. The drainage, both in terms of flow rates and the concentrations of pollutants, from Empire Mine is hydraulically dependant. The mine drainage wastewater discharge is typically not discolored under normal flow conditions. The discolored

discharge is due to extreme hydraulic conditions caused by excessive rainfall and saturated conditions. During these conditions the flow rate is significantly increased as are the pollutant concentrations. The orange to red discoloration is believed to be principally caused by significant concentrations of iron.

The above is confirmed by *SAMPLING AND MONITORING PROGRAM FOR THE MAGENTA DRAIN TUNNEL AT THE EMPIRE MINE STATE HISTORIC PARK GRASS VALLEY, CALIFORNIA, JULY 2006, Prepared by: MFG, INC. consulting scientists and engineers:*

Page 1: *“The flow from the Magenta Drain Tunnel occurs year-round. However, the flow is responsive to storm events (CDPR, 2005a). The tunnel is believed to drain groundwater associated with historic underground mine workings and intercepts shallow groundwater flow along its length. The lower reach of the Magenta Drain Tunnel may intercept shallow groundwater recharge from Woodpecker Ravine. Historical and recent monitoring data of the tunnel flow are summarized by Tetra Tech EM Inc. (TTEMI, 2005). Based on limited measurements, flows from the tunnel at or near the portal have ranged from 623 to 982 gpm. The limited data set identifies that arsenic, iron, manganese, and thallium concentrations in the water from the Magenta Drain Tunnel at the portal and in the drainage ditch and creek downstream from the portal may exceed current water quality criteria (TTEMI, 2005).”*

Page 2: *“Sediment samples were collected at two locations by Tetra Tech EM Inc. (TTEMI, 2005): from the drainage ditch at the Magenta Drain Tunnel portal and from the creek just upstream of Memorial Park. The arsenic concentrations of both samples exceeded the state soluble threshold limit concentration (STLC) criteria.” (Underline emphasis added)*

Arsenic had accumulated to hazardous levels from the discharge along the banks of the discharge stream.

Page 3 of Attachment 1: *“The quality of the water draining from the Magenta Drain Tunnel is expected to be flow dependent. Water quality is expected to be relatively stable during summer and fall except for variations caused by significant precipitation events. Based on previous sampling, dissolved metals concentrations during low flow conditions were higher than during high flow conditions, suggesting dilution of groundwater intercepted by the tunnel during storm events (TTEMI, 2005). However, it is expected that the total metals concentrations may be higher relative to dissolved concentrations during high flow conditions caused by storm events due to an increase in particulate (suspended solids) content.” (Underline emphasis added)*

<u>Constituent</u>	<u>2006 Max Effluent Concentration used</u> (from R5-2006-0058, Table F-3)	<u>2012 Max Effluent Concentration used</u> (from Tentative Order, Attachment G, RP analysis sheet)	<u>2012 Max Effluent Concentration</u> (from Tent Order Table F-2, not used in RP analysis)	<u>Reasonable potential assessed?</u> (Effluent limit, Y or N)
Total suspended solids (TSS)	1,840 mg/l		5,000	N

Settleable Solids (SS)			7.48 ml/l	N
pH (minimum value)	6.45 pH units		5.51	Y
Turbidity		21 NTU	41	Y
Color		83 (color units)	160	Y
Aluminum	36,100 ug/l	22.3	32	N
Antimony	98.9 ug/l	0.24	0.24	N
Arsenic	35,400 ug/l	840	840	Y
Barium	2,480 ug/l	67	67	N
Cadmium	494 ug/l	0.17	0.28	N
Chromium III	53.4 ug/l	0.82	11	N
Cobalt	257 ug/l	2.6	3.1	N
Copper	41.5 ug/l	2.6	20	N
Iron	4,760,000 ug/l	11,333	86,000	Y
Lead	146 ug/l	0.73	1.1	N
Manganese	22,600 ug/l	3,023	5,800	Y
Mercury	1.2 ug/l	0.0082	0.0253	N
Nickel	15.6 ug/l	2.7	6.2	N
Thallium	361 ug/l	0.33	<0.1	N
Vanadium	229 ug/l	5.6	5.6	N
Zinc	878 ug/l	12	1,300	N
Dissolved Oxygen	4.9 mg/l (min)		2.81	Y
Total Dissolved Solids (TDS, mg/l)	461	453		N
Specific Conductance (EC, umhos/cm)	685	1,304		N
Bis-2(phthalate)		1.8		N

Page F-17 of the proposed Permit states that:

“Effluent and Ambient Background Data. The reasonable potential analysis (RPA), as described in section IV.C.3 of this Fact Sheet, was based on data from May 2008 through April 2011, which includes effluent data submitted in SMRs and the ROWD. Additional data outside of this range was also analyzed where there was inadequate data to perform an analysis. For priority pollutants and other constituents of concern that were not monitored on a routine basis, the RPA was based on quarterly monitoring data submitted between November 2006 and August 2007. Since the discharge constitutes the headwaters of Magenta Drain Channel, there is no physical upstream receiving water monitoring location. Therefore, only effluent data was used for the RPA.”

As can be seen in the above table and the citation from page F-17 of the proposed Permit; the Regional Board failed to use data collected from the discharge collected prior to May 2008. Zinc is a prime example where a valid data point at 1,300 ug/l was discarded and 12 ug/l was used instead resulting in an absence of an effluent limitation for zinc. This is also the case for numerous of the above listed constituents. There is no explanation or rationale presented for excluding valid, representative data.

Empire Mine is well documented to have limited periods of a discolored discharge with high flows and an accompanying high level of pollutant concentrations. The elevated concentrations listed in the above Table under the 2006 data set and some from Table F-2 represent a period when the mine was discharging discolored water containing high level of pollutants. The Regional Board's intentional exclusion of data discards the worst case conditions representative of the mine drainage. There is no indication or documentation in the proposed Permit that the periods of discolored discharge, which represent a periods when maximum, worst-case pollutant concentrations would occur, was evaluated or used to develop effluent limitations. To the contrary, the significantly higher concentrations of pollutants documented from the mine discharge were intentionally discarded without any technical or legal justification.

Federal Regulations, 40 CFR 122.44(d), requires that limits must be included in permits where pollutants will cause, have reasonable potential to cause, or contribute to an exceedance of the State's water quality standards. US EPA has interpreted 40 CFR 122.44(d) in *Central Tenets of the National Pollutant Discharge Elimination System (NPDES) Permitting Program* (Factsheets and Outreach Materials, 08/16/2002) that although States will likely have unique implementation policies, there are certain tenets that may not be waived by State procedures. These tenets include that "where valid, reliable, and representative effluent data or instream background data are available they MUST be used in applicable reasonable potential and limits derivation calculations. Data may not be arbitrarily discarded or ignored." The Regional Board has failed to use valid, reliable and representative data in developing limitations, contrary to the cited Federal Regulation.

The *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries Of California* (SIP), Section 1.2 requires that: "When implementing the provisions of this Policy, the RWQCB shall use all available, valid, relevant, representative data and information, as determined by the RWQCB. The RWQCB shall have discretion to consider if any data are inappropriate or insufficient for use in implementing this Policy. Instances where such consideration is warranted include, but are not limited to, the following: evidence that a sample has been erroneously reported or is not representative of effluent or ambient receiving water quality; questionable quality control/quality assurance practices; and varying seasonal conditions."

The Regional Board failed to use valid, reliable, and representative effluent data evaluating reasonable potential and limits derivation calculations. Data was arbitrarily discarded and ignored. The Regional Board has failed to use valid, reliable and representative data in developing limitations, contrary to the cited Federal Regulation and the SIP. The RWQCB abused its discretion since there is no evidence that a sample had been erroneously reported or is not representative of effluent or of questionable quality control/quality assurance practices. As a

result the proposed Permit fails to include effluent limitations necessary to protect the beneficial uses of the receiving stream.

2. The proposed Permit contains Effluent Limitations less stringent than the existing permit contrary to the Antidegradation requirements of the Clean Water Act and Federal Regulations, 40 CFR 122.44 (l)(1).

The wastewater discharge from Empire Mine is currently regulated under NPDES Order No. R5-2006-0058. Order No. R5-2006-0058 contains effluent limitations for:

Total suspended solids (TSS), settleable solids (SS), pH, turbidity, color, aluminum, antimony, arsenic, barium, cadmium, chromium (III), cobalt, copper, iron, lead, manganese, mercury, nickel, thallium, vanadium, zinc, acute toxicity and dissolved oxygen.

The proposed NPDES permit contains effluent limitations for:

pH, arsenic, acute and chronic toxicity, color, dissolved oxygen, iron, manganese and turbidity.

Effluent Limitations for TSS, SS, aluminum, antimony, arsenic, barium, cadmium, chromium III, cobalt, copper, lead, mercury, nickel, thallium, vanadium and zinc which were contained in Order No. R5-2006-0058 have been removed.

The Effluent Limitations for color, iron, manganese and turbidity have been greatly relaxed by making the limitations an annual average.

The Regional Board does not provide any explanation or defense for removing or relaxing the effluent limitation other than to state that their reasonable potential analysis does not show that an effluent limitation is necessary. As is shown in the preceding comment, the Regional Board failed to use valid, reliable and representative data in preparing the proposed Permit. The Regional Board also failed to cite any of the allowed conditions contained in 40 CFR 122.44 which would allow for relaxation or removal of effluent limitations.

Under the Clean Water Act (CWA), point source dischargers are required to obtain federal discharge (NPDES) permits and to comply with water quality based effluent limits (WQBELs) in NPDES permits sufficient to make progress toward the achievement of water quality standards or goals. The antidegradation and antidegradation rules clearly spell out the interest of Congress in achieving the CWA's goal of continued progress toward eliminating all pollutant discharges. Congress clearly chose an overriding environmental interest in clean water through discharge reduction, imposition of technological controls, and adoption of a rule against relaxation of limitations once they are established.

Upon permit reissuance, modification, or renewal, a discharger may seek a relaxation of permit limitations. However, according to the CWA, relaxation of a WQBEL is permissible only if the requirements of the antidegradation rule are met. The antidegradation regulations prohibit EPA

from reissuing NPDES permits containing interim effluent limitations, standards or conditions less stringent than the final limits contained in the previous permit, with limited exceptions. These regulations also prohibit, with some exceptions, the reissuance of permits originally based on best professional judgment (BPJ) to incorporate the effluent guidelines promulgated under CWA §304(b), which would result in limits less stringent than those in the previous BPJ-based permit. Congress statutorily ratified the general prohibition against backsliding by enacting §§402(o) and 303(d)(4) under the 1987 Amendments to the CWA. The amendments preserve present pollution control levels achieved by dischargers by prohibiting the adoption of less stringent effluent limitations than those already contained in their discharge permits, except in certain narrowly defined circumstances.

When attempting to backslide from WQBELs under either the antidegradation rule or an exception to the antibacksliding rule, relaxed permit limits must not result in a violation of applicable water quality standards. The general prohibition against backsliding found in §402(o)(1) of the Act contains several exceptions. Specifically, under §402(o)(2), a permit may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant *if*: (A) material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation; (B)(i) information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance; or (ii) the Administrator determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under subsection (a)(1)(B) of this section; (C) a less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy [(e.g., Acts of God)]; (D) the permittee has received a permit modification under section 1311(c), 1311(g), 1311(h), 1311(i), 1311(k), 1311(n), or 1326(a) of this title; or (E) the permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit, and has properly operated and maintained the facilities, but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

Even if a discharger can meet either the requirements of the antidegradation rule under §303(d)(4) or one of the statutory exceptions listed in §402(o)(2), there are still limitations as to how far a permit may be allowed to backslide. Section 402(o)(3) acts as a floor to restrict the extent to which BPJ and water quality-based permit limitations may be relaxed under the antibacksliding rule. Under this subsection, even if EPA allows a permit to backslide from its previous permit requirements, EPA may never allow the reissued permit to contain effluent limitations which are less stringent than the current effluent limitation guidelines for that pollutant, or which would cause the receiving waters to violate the applicable state water quality standard adopted under the authority of §303.49.

Federal regulations 40 CFR 122.44 (l)(1) have been adopted to implement the antibacksliding requirements of the CWA:

(1) Reissued permits. (1) Except as provided in paragraph (1)(2) of this section when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under Sec. 122.62.)

(2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.

(i) Exceptions--A permit with respect to which paragraph (1)(2) of this section applies may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant, if:

(A) Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation;

(B)(1) Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance; or (2) The Administrator determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b);

(C) A less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy;

(D) The permittee has received a permit modification under section 301(c), 301(g), 301(h), 301(i), 301(k), 301(n), or 316(a); or

(E) The permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

(ii) Limitations. In no event may a permit with respect to which paragraph (1)(2) of this section applies be renewed, reissued, or modified to contain an effluent limitation which is less stringent than required by effluent guidelines in effect at the time the permit is renewed, reissued, or modified. In no event may such a permit to discharge into waters be renewed, issued, or modified to contain a less stringent effluent limitation if the implementation of such limitation would result in a violation of a water quality standard under section 303 applicable to such waters.

The proposed Permit's sole discussion regarding backsliding is presented on Pages F-47 and 48:

"Satisfaction of Anti-Backsliding Requirements. The Clean Water Act specifies that a revised permit may not include effluent limitations that are less stringent than the previous permit unless a less stringent limitation is justified based on exceptions to the

anti-backsliding provisions contained in Clean Water Act sections 402(o) or 303(d)(4), or, where applicable, 40 CFR 122.44(l).

The effluent limitations in this Order are at least as stringent as the effluent limitations in the existing Order, with the exception of effluent limitations for aluminum, antimony, barium, cadmium, chromium III, cobalt, color, copper, iron, lead, manganese, mercury, nickel, settleable solids, thallium, TSS, turbidity, vanadium, and zinc. The effluent limitations for these pollutants are less stringent than those in Order No. R5-2006-0058. As described in section IV.C.3.b of this Fact Sheet, based on updated monitoring data that was not available at the time Order No. R5-2006-0058 was issued and the installation of the new passive treatment system, aluminum, antimony, barium, cadmium, chromium III, cobalt, copper, lead, mercury, nickel, settleable solids, thallium, vanadium, and zinc do not exhibit reasonable potential to cause or contribute to an exceedance of water quality objectives in the receiving water. For aluminum, antimony, barium, cadmium, chromium III, cobalt, copper lead, nickel, mercury, settleable solids, thallium, vanadium and zinc, effluent limitations are not retained in this Order. The AMELs contained in Order No. R5-2005-0139 for color, iron, manganese, and turbidity have been revised to annual average effluent limitations consistent with input from DPH and the fact that MCLs are designed to protect human health over long exposure periods. Removal of the WQBELs in the previous permit is in accordance with CWA sections 303(d)(4) and 402(o), which allow for the removal of WQBELs for attainment waters where antidegradation requirements are satisfied. Removal of the WQBELs is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Therefore, the modifications to these effluent limitations do not violate anti-backsliding requirements. Any impact on existing water quality will be insignificant.

Order No. R5-2006-0058 established technology-based effluent limitations for TSS based on BPJ and applying the ELGs at 40 CFR Part 440 which applies to active mining areas. As described in section IV.B.2 of this Fact Sheet, the Facility is not an “active mining area” as defined in CFR Part 440. CWA sections 402(o)(2)(A) and (B)(ii) provide exceptions to anti-backsliding requirements for effluent based on BPJ where material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation and where technical mistakes or mistaken interpretations of law were made. The Discharger has installed a passive treatment system designed to remove TSS, which constitutes a material and substantial alteration to the Facility. Additionally, because the Facility is not an active mining area as defined in 40 CFR Part 440, the effluent limitations representing BPT and BAT for an active mine are not applicable to this Facility. Therefore, this Order discontinues effluent limitations for TSS in accordance with CWA sections 402(o)(2)(A) and (B)(ii).” (Underline Emphasis added)

Page F-5 of the proposed Permit states that:

“The Discharger constructed a new passive treatment system, which began operation in November 2011.”

To attempt to state that this new treatment system changed the character of the wastestream is, at best, misleading. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011—after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit, the Regional Board discarded these high concentration values without any technical or legal justification.

Finding 6 of the proposed Time Schedule Order, accompanying the proposed Permit, confirms the fact that not only was the wetlands treatment system installed after all the used sampling data was collected, but also that the wetlands treatment system will not be capable of achieving compliance for several more years, if at all, for some constituents:

TSO, Finding 6: “The Discharger installed a new passive treatment system that began operation in November 2011. Due to the nature of the passive treatment system, the Discharger anticipates that additional time is necessary for wetland vegetation and biogenic processes to become established and for the system to reach its design capacity for removal of arsenic, iron, manganese, and turbidity. Additionally, the Discharger indicated that the discharge may not be able to comply with the concentration-based effluent limitation for dissolved oxygen during the summer when the effluent flow is low and ambient heat could raise the temperature of the discharge within the conveyance pipe from the wetlands to the drainage channel, which could reduce the dissolved oxygen concentration. Therefore, the Discharger proposed a schedule to achieve compliance with the final effluent limitations for arsenic, dissolved oxygen, iron, manganese, and turbidity by 1 June 2015.”

A not-yet-functional treatment system cannot be used to justify backsliding; there is no documented change in the character of the discharge and the treatment systems technology has not been demonstrated capable of achieving compliance with water quality standards.

The proposed Permit’s Antibacksliding discussion as cited above states that backsliding is allowed since the permit was:

“...based on updated monitoring data that was not available at the time Order No. R5-2006-0058 was issued...”

Again, the Regional Board fails to utilize data from beyond an arbitrary three year period, excluding all other valid, representative and reliable data. There is no technical or legal justification for eliminating the data prior to the last three years of data collection or the data used to generate R5-2006-0058. To the contrary, the drainage, both in terms of flow rates and the concentrations of pollutants, from Empire Mine is hydraulically dependant. The mine drainage wastewater discharge is typically not discolored under normal flow conditions. The discolored discharge is due to extreme hydraulic conditions caused by excessive rainfall and saturated conditions. During these conditions the flow rate is significantly increased as are the pollutant concentrations. There is no information contained in the proposed Permit to indicate that these high flow/pollutant events occurred during the very limited period of sampling that was used by the Regional Board to conduct the reasonable potential analysis.

The proposed Permit’s Antibacksliding discussion as cited above states that backsliding is allowed since:

“The AMELs contained in Order No. R5-2005-0139 for color, iron, manganese, and turbidity have been revised to annual average effluent limitations consistent with input from DPH and the fact that MCLs are designed to protect human health over long exposure periods.”

First, DPH’s regulatory responsibility with regard to the Secondary MCLs is different than that of the Water Boards. The Water Boards purview is the protection of waters of the state and the associated beneficial uses. The statement regarding long term human health impacts the statement is simply wrong. With regard to protection of human health from secondary contaminants, please see the following definition of secondary drinking water standards from DPH and a table of secondary constituent impacts from US EPA:

(d) “Secondary drinking water standards” means standards that specify maximum contaminant levels that, in the judgment of the department, are necessary to protect the public welfare. Secondary drinking water standards may apply to any contaminant in drinking water that may adversely affect the odor or appearance of the water and may cause a substantial number of persons served by the public water system to discontinue its use, or that may otherwise adversely affect the public welfare. Regulations establishing secondary drinking water standards may vary according to geographic and other circumstances and may apply to any contaminant in drinking water that adversely affects the taste, odor, or appearance of the water when the standards are necessary to ensure a supply of pure, wholesome, and potable water.” (Emphasis added)

Table I. Secondary Maximum Contaminant Levels

(<http://water.epa.gov/drink/contaminants/secondarystandards.cfm>)

Contaminant	Secondary MCL	Noticeable Effects above the Secondary MCL
Aluminum	0.05 to 0.2 mg/L*	colored water
Chloride	250 mg/L	salty taste
Color	15 color units	visible tint
Copper	1.0 mg/L	metallic taste; blue-green staining
Corrosivity	Non-corrosive	metallic taste; corroded pipes/ fixtures staining
Fluoride	2.0 mg/L	tooth discoloration
Foaming agents	0.5 mg/L	frothy, cloudy; bitter taste; odor
Iron	0.3 mg/L	rusty color; sediment; metallic taste; reddish or orange staining
Manganese	0.05 mg/L	black to brown color; black staining; bitter metallic taste
Odor	3 TON (threshold odor number)	"rotten-egg", musty or chemical smell
pH	6.5 - 8.5	<i>low pH</i> : bitter metallic taste; corrosion

		<i>high pH</i> : slippery feel; soda taste; deposits
Silver	0.1 mg/L	skin discoloration; graying of the white part of the eye
Sulfate	250 mg/L	salty taste
Total Dissolved Solids (TDS)	500 mg/L	hardness; deposits; colored water; staining; salty taste
Zinc	5 mg/L	metallic taste
* mg/L is milligrams of substance per liter of water		

The proposed Permit’s Antibacksliding discussion as cited above states that backsliding is allowed since:

“Removal of the WQBELs in the previous permit is in accordance with CWA sections 303(d)(4) and 402(o), which allow for the removal of WQBELs for attainment waters where antidegradation requirements are satisfied.”

Page F-48 of the proposed Permit contains the following Antidegradation Finding:

“Satisfaction of Antidegradation Policy, **Surface Water**. This Order does not allow for an increase in flow or mass of pollutants to the receiving water. Therefore, a complete antidegradation analysis is not necessary. The Order requires compliance with applicable federal technology-based standards and with WQBELs where the discharge could have the reasonable potential to cause or contribute to an exceedance of water quality standards. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.”

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“This Order imposes effluent limitations on the existing discharge for the first time. The primary means of compliance are (1) treatment of waste stream to comply with effluent limitations and (2) cessation of discharge. Implementation of either alternative would result in improved water quality downstream of the existing discharge, thereby complying with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution 68-16.”

Order No. R5-2006-0058 was the first NPDES permit for this discharge and the proposed Permit will be the second. There has been no Antidegradation Analysis conducted for this discharge. Not a single item in the State and Regional Board’s Antidegradation Policy or the Antidegradation requirements contained in the NPDES federal regulations has been addressed. The Antibacksliding argument that the discharge is in compliance with the Antidegradation Policy has no merit. Specific and detailed antidegradation comments will follow.

3. **The proposed Permit contains an inadequate antidegradation analysis that does not comply with the requirements of Section 101(a) of the Clean Water Act, Federal Regulations 40 CFR § 131.12, the State Board's Antidegradation Policy (Resolution 68-16) and California Water Code (CWC) Sections 13146 and 13247.**

CWC Sections 13146 and 13247 require that the Board in carrying out activities which affect water quality shall comply with state policy for water quality control unless otherwise directed by statute, in which case they shall indicate to the State Board in writing their authority for not complying with such policy. The State Board has adopted the Antidegradation Policy (Resolution 68-16), which the Regional Board has incorporated into its Basin Plan. The Regional Board is required by the CWC to comply with the Antidegradation Policy.

Section 101(a) of the Clean Water Act (CWA), the basis for the antidegradation policy, states that the objective of the Act is to "restore and maintain the chemical, biological and physical integrity of the nation's waters." Section 303(d)(4) of the CWA carries this further, referring explicitly to the need for states to satisfy the antidegradation regulations at 40 CFR § 131.12 before taking action to lower water quality. These regulations (40 CFR § 131.12(a)) describe the federal antidegradation policy and dictate that states must adopt both a policy at least as stringent as the federal policy as well as implementing procedures.

California's antidegradation policy is composed of both the federal antidegradation policy and the State Board's Resolution 68-16 (State Water Resources Control Board, Water Quality Order 86-17, p. 20 (1986) ("Order 86-17"); Memorandum from Chief Counsel William Attwater, SWRCB to Regional Board Executive Officers, "federal Antidegradation Policy," pp. 2, 18 (Oct. 7, 1987) ("State Antidegradation Guidance")). As a state policy, with inclusion in the Water Quality Control Plan (Basin Plan), the antidegradation policy is binding on all of the Regional Boards (Water Quality Order 86-17, pp. 17-18).

Implementation of the state's antidegradation policy is guided by the State Antidegradation Guidance, SWRCB Administrative Procedures Update 90-004, 2 July 1990 ("APU 90-004") and USEPA Region IX, "Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12" (3 June 1987) ("Region IX Guidance"), as well as Water Quality Order 86-17.

The Regional Board must apply the antidegradation policy whenever it takes an action that will lower water quality (State Antidegradation Guidance, pp. 3, 5, 18, and Region IX Guidance, p. 1). Application of the policy does not depend on whether the action will actually impair beneficial uses (State Antidegradation Guidance, p. 6). Actions that trigger use of the antidegradation policy include issuance, re-issuance, and modification of NPDES and Section 404 permits and waste discharge requirements, waiver of waste discharge requirements, issuance of variances, relocation of discharges, issuance of cleanup and abatement orders, increases in discharges due to industrial production and/or municipal growth and/or other sources, exceptions from otherwise applicable water quality objectives, etc. (State Antidegradation Guidance, pp. 7-10, Region IX Guidance, pp. 2-3). Both the state and federal policies apply to point and nonpoint source pollution (State Antidegradation Guidance p. 6, Region IX Guidance, p. 4).

The federal antidegradation regulations delineate three tiers of protection for waterbodies. Tier 1, described in 40 CFR § 131.12(a)(1), is the floor for protection of all waters of the United States (48 Fed. Reg. 51400, 51403 (8 Nov. 1983); Region IX Guidance, pp. 1-2; APU 90-004, pp. 11-12). It states that “[e]xisting instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.” Uses are “existing” if they were actually attained in the water body on or after November 28, 1975, or if the water quality is suitable to allow the use to occur, regardless of whether the use was actually designated (40 CFR § 131.3(e)). Tier 1 protections apply even to those waters already impacted by pollution and identified as impaired. In other words, already impaired waters cannot be further impaired.

Tier 2 waters are provided additional protections against unnecessary degradation in places where the levels of water quality are better than necessary to support existing uses. Tier 2 protections strictly prohibit degradation unless the state finds that a degrading activity is: 1) necessary to accommodate important economic or social development in the area, 2) water quality is adequate to protect and maintain existing beneficial uses and 3) the highest statutory and regulatory requirements and best management practices for pollution control are achieved (40 CFR § 131.12(a) (2)). Cost savings to a discharger alone, absent a demonstration by the project proponent as to how these savings are “necessary to accommodate important economic or social development in the area,” are not adequate justification for allowing reductions in water quality (Water Quality Order 86-17, p. 22; State Antidegradation Guidance, p. 13). If the waterbody passes this test and the degradation is allowed, degradation must not impair existing uses of the waterbody (48 Fed. Reg. 51403). Virtually all waterbodies in California may be Tier 2 waters since the state, like most states, applies the antidegradation policy on a parameter-by-parameter basis, rather than on a waterbody basis (APU 90-004, p. 4). Consequently, a request to discharge a particular chemical to a river, whose level of that chemical was better than the state standards, would trigger a Tier 2 antidegradation review even if the river was already impaired by other chemicals.

Tier 3 of the federal antidegradation policy states “[w]here high quality waters constitute an outstanding national resource, such as waters of national and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water shall be maintained and protected (40 CFR § 131.12(a)(3)). These Outstanding National Resource Waters (ONRW) are designated either because of their high quality or because they are important for another reason (48 Fed. Reg. 51403; State Antidegradation Guidance, p. 15). No degradation of water quality is allowed in these waters other than short-term, temporary changes (Id.). Accordingly, no new or increased discharges are allowed in either ONRW or tributaries to ONRW that would result in lower water quality in the ONRW (EPA Handbook, p. 4-10; State Antidegradation Guidance, p. 15). Existing antidegradation policy already dictates that if a waterbody “should be” an ONRW, or “if it can be argued that the waterbody in question deserves the same treatment [as a formally designated ONRW],” then it must be treated as such, regardless of formal designation (State Antidegradation Guidance, pp. 15-16; APU 90-004, p. 4). Thus the Regional Board is required in each antidegradation analysis to consider whether the waterbody at issue should be treated as an ONRW. It should be reiterated that waters cannot be excluded from consideration as an ONRW simply because they are already “impaired” by some constituents. By definition, waters may be “outstanding” not only because of pristine quality, but also because of recreational significance, ecological significance or other reasons (40 CFR §131.12(a)(3)). Waters need not

be “high quality” for every parameter to be an ONRW (APU 90-004, p. 4). For example, Lake Tahoe is on the 303(d) list due to sediments/siltation and nutrients, and Mono Lake is listed for salinity/TDC/chlorides but both are listed as ONRW.

The State Board’s APU 90-004 specifies guidance to the Regional Boards for implementing the state and federal antidegradation policies and guidance. The guidance establishes a two-tiered process for addressing these policies and sets forth two levels of analysis: a simple analysis and a complete analysis. A simple analysis may be employed where a Regional Board determines that: 1) a reduction in water quality will be spatially localized or limited with respect to the waterbody, e.g. confined to the mixing zone; 2) a reduction in water quality is temporally limited; 3) a proposed action will produce minor effects which will not result in a significant reduction of water quality; and 4) a proposed activity has been approved in a General Plan and has been adequately subjected to the environmental and economic analysis required in an EIR. A complete antidegradation analysis is required if discharges would result in: 1) a substantial increase in mass emissions of a constituent; or 2) significant mortality, growth impairment, or reproductive impairment of resident species. Regional Boards are advised to apply stricter scrutiny to non-threshold constituents, i.e., carcinogens and other constituents that are deemed to present a risk of source magnitude at all non-zero concentrations. If a Regional Board cannot find that the above determinations can be reached, a complete analysis is required.

Even a minimal antidegradation analysis would require an examination of: 1) existing applicable water quality standards; 2) ambient conditions in receiving waters compared to standards; 3) incremental changes in constituent loading, both concentration and mass; 4) treatability; 5) best practicable treatment and control (BPTC); 6) comparison of the proposed increased loadings relative to other sources; 7) an assessment of the significance of changes in ambient water quality and 8) whether the waterbody was a ONRW. A minimal antidegradation analysis must also analyze whether: 1) such degradation is consistent with the maximum benefit to the people of the state; 2) the activity is necessary to accommodate important economic or social development in the area; 3) the highest statutory and regulatory requirements and best management practices for pollution control are achieved; and 4) resulting water quality is adequate to protect and maintain existing beneficial uses.

Any antidegradation analysis must comport with implementation requirements in State Board Water Quality Order 86-17, State Antidegradation Guidance, APU 90-004 and Region IX Guidance. The conclusory, unsupported, undocumented statements in the Permit are no substitute for a defensible antidegradation analysis.

The antidegradation review process is especially important in the context of waters protected by Tier 2. See EPA, Office of Water Quality Regulations and Standards, *Water Quality Standards Handbook*, 2nd ed. Chapter 4 (2nd ed. Aug. 1994). Whenever a person proposes an activity that may degrade a water protected by Tier 2, the antidegradation regulation requires a state to: (1) determine whether the degradation is “necessary to accommodate important economic or social development in the area in which the waters are located”; (2) consider less-degrading alternatives; (3) ensure that the best available pollution control measures are used to limit degradation; and (4) guarantee that, if water quality is lowered, existing uses will be fully protected. 40 CFR § 131.12(a)(2); EPA, Office of Water Quality Regulations and Standards,

Water Quality Standards Handbook, 2nd ed. 4-1, 4-7 (2nd ed. Aug. 1994). These activity-specific determinations necessarily require that each activity be considered individually.

For example, the APU 90-004 states:

“Factors that should be considered when determining whether the discharge is necessary to accommodate social or economic development and is consistent with maximum public benefit include: a) past, present, and probably beneficial uses of the water, b) economic and social costs, tangible and intangible, of the proposed discharge compared to benefits. The economic impacts to be considered are those incurred in order to maintain existing water quality. The financial impact analysis should focus on the ability of the facility to pay for the necessary treatment. The ability to pay depends on the facility’s source of funds. In addition to demonstrating a financial impact on the publicly – or privately – owned facility, the analysis must show a significant adverse impact on the community. The long-term and short-term socioeconomic impacts of maintaining existing water quality must be considered. Examples of social and economic parameters that could be affected are employment, housing, community services, income, tax revenues and land value. To accurately assess the impact of the proposed project, the projected baseline socioeconomic profile of the affected community without the project should be compared to the projected profile with the project...EPA’s Water Quality Standards Handbook (Chapter 5) provides additional guidance in assessing financial and socioeconomic impacts”

There is nothing resembling an economic or socioeconomic analysis in the Permit. The evaluation contains no comparative costs. In the Water Quality Standards Handbook, USEPA interprets the phrase “necessary to accommodate important economic or social development” with the phrase “substantial and widespread economic and social impact.”

There is nothing in the Permit resembling an alternatives analysis evaluating less damaging and degrading alternatives. A proper alternatives analysis would cost out various alternatives and compare each of the alternatives’ impacts on beneficial uses.

There is nothing in the Permit resembling an analysis that ensures that existing beneficial uses are protected. While the Permit identifies the constituents that are included on the 303(d) list as impairing receiving waters, it fails to discuss how and to what degree the identified beneficial uses will be additionally impacted by the discharge. Nor does the Permit analyze the incremental and cumulative impact of increased loading of non-impairing pollutants on beneficial uses. In fact, there is almost no information or discussion on the composition and health of the identified beneficial uses. Any reasonably adequate antidegradation analysis must discuss the affected beneficial uses (i.e., numbers and health of the aquatic ecosystem; extent, composition and viability of agricultural production; people depending upon these waters for water supply; extent of recreational activity; etc.) and the probable effect the discharge will have on these uses.

Alternatively, Tier 1 requires that existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. By definition, any increase in the discharge of impairing pollutants to impaired waterways unreasonably degrades

beneficial uses and exceeds applicable water quality standards. Prohibition of additional mass loading of impairing pollutants is a necessary stabilization precursor to any successful effort in bringing an impaired waterbody into compliance.

The State Board has clearly articulated its position on increased mass loading of impairing pollutants. In Order WQ 90-05, the Board directed the San Francisco Regional Board on the appropriate method for establishing mass-based limits that comply with state and federal antidegradation policies. That 1990 order stated “[I]n order to comply with the federal antidegradation policy, the mass loading limits should also be revised, based on mean loading, concurrently with the adoption of revised effluent limits. The [mass] limits should be calculated by multiplying the [previous year’s] annual mean effluent concentration by the [four previous year’s] annual average flow (Order WQ 90-05, p. 78). USEPA points out, in its 12 November 1999 objection letter to the San Francisco Regional Board concerning Tosco’s Avon refinery, that ‘[a]ny increase in loading of a pollutant to a water body that is impaired because of that pollutant would presumably degrade water quality in violation of the applicable antidegradation policy.’”

Effluent Limitations for TSS, SS, aluminum, antimony, arsenic, barium, cadmium, chromium III, cobalt, copper, lead, mercury, nickel, thallium, vanadium and zinc which were contained in Order No. R5-2006-0058 have been removed. The Effluent Limitations for color, iron, manganese and turbidity have been greatly relaxed by making the limitations an annual average. The proposed Permit’s Antidegradation discussion as cited above states that backsliding is allowed since:

“Removal of the WQBELs in the previous permit is in accordance with CWA sections 303(d)(4) and 402(o), which allow for the removal of WQBELs for attainment waters where antidegradation requirements are satisfied.”

Page F-48 of the proposed Permit contains the following Antidegradation Finding:

“Satisfaction of Antidegradation Policy, **Surface Water**. This Order does not allow for an increase in flow or mass of pollutants to the receiving water. Therefore, a complete antidegradation analysis is not necessary. The Order requires compliance with applicable federal technology-based standards and with WQBELs where the discharge could have the reasonable potential to cause or contribute to an exceedance of water quality standards. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.”

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“This Order imposes effluent limitations on the existing discharge for the first time. The primary means of compliance are (1) treatment of waste stream to comply with effluent limitations and (2) cessation of discharge. Implementation of either alternative would result in improved water quality downstream of the existing discharge, thereby

complying with the antidegradation provision of 40 CFR §131.12 and State Water Board Resolution 68-16.”

Order No. R5-2006-0058 was the first NPDES permit for this discharge and the proposed Permit will be the second. There has been no Antidegradation Analysis conducted for this discharge. Not a single item in the State and Regional Board’s Antidegradation Policy or the Antidegradation requirements contained in the NPDES federal regulations has been addressed. The Antibacksliding argument that the discharge is in compliance with the Antidegradation Policy has no merit.

The Antidegradation finding in the proposed Permit does not discuss the removal and relation of effluent limitations compared with Order No. R5-2006-0058. The following are but a few examples where removal of the effluent limitations will allow a significant increase in the mass of pollutants discharged where best practicable treatment and control (BPTC) of the discharge has been ignored and where no Antidegradation analysis has been conducted.

Total Suspended Solids (TSS): The effluent limitation for total suspended solids (TSS) has been removed from the permit. Order No. R5-2006-0058 contained an effluent limitation of 20 mg/l as a monthly average and 30 mg/l as a daily maximum. The limitation for TSS has simply been removed in the proposed Permit. The proposed Permit, Table F-2, shows that TSS concentrations in the discharge have been measured as high as 5,000 mg/l. Typical TSS levels as described in Wastewater Engineering, Treatment and Reuse, Metcalf & Eddy, Fourth Edition, pages 186 through 191, are up to 400 mg/l for high strength raw sewage, up to 760 mg/l during the peak season for a tomato cannery and up to 101 mg/l for stormwater discharges. Surely it is evident that allowing a daily maximum discharge of TSS at 4,970 mg/l greater than was allowed under R5-2006-0058 and more than 6 times stronger than a tomato cannery wastewater will impact the beneficial uses of the receiving water. Suspended solids levels are documented in Water Quality Criteria, McKee and Wolf, Publication A3, State Water Resources Control Board, to cause significant harm to numerous beneficial uses of surface waters, specifically domestic water treatment plants are designed for a percent removal of suspended solids with a total loading rate of 500 mg/l; suspended solids may kill fish and shellfish by causing abrasive injuries, by clogging the gills and respiratory passages and by blanketing the stream bottom, killing eggs, and young food organisms, and destroying spawning beds. Tests on the survival of rainbow trout in suspensions of inert solids showed that 30 mg/l had no observable impact; a few fish died at 90 mg/l, while at 270 mg/l more than half the fish died (McKee & Wolf, page 280). Surely if half the tested fish died at 270 mg/l of suspended solids; a discharge of up to 5,000 mg/l would have a devastating impact on the aquatic life beneficial use of the receiving stream, yet the proposed Permit contains no effluent limitation for TSS. It would appear that the technically based 30 mg/l limitation for TSS would have been protective of the receiving stream beneficial use based on the available literature values. It would also seem critical to discuss best practicable treatment and control (BPTC) of the discharge which is a requirement of the Antidegradation Policy. Order No. R5-2006-0058 stated that the effluent limitations for TSS were based on 40 CFR 440.102 which represents the degree of effluent reduction attainable by the application of the best practicable control

technology (BPT) for mines. Even if one argues that the mine is inactive, the best practicable treatment technology would be applicable under the Antidegradation Policy. Despite the allowance to discharge massive additional amounts of suspended solids the Regional Board's Antidegradation Policy discussion is silent with regard to TSS and BPTC.

Iron: The effluent limitation for iron in Order No. R5-2006-0058 was 300 ug/l as a monthly average. The effluent limitation for iron has been relaxed in the proposed permit to 300 ug/l as an annual average. The limitations in the existing and proposed Permits are based on the secondary drinking water maximum contaminant level (MCL). Not thoroughly discussed however is that the secondary MCL is based on esthetics, taste and staining of laundry and porcelain fixtures. Certainly the staining of laundry would be instantaneous and an annual (or monthly) average limitation would not protect this domestic use. The esthetics and taste effects would also be experienced instantaneously, again degrading domestic beneficial uses. Esthetics would also impact the entire receiving stream as the iron would tend to discolor (orange to red) the entire receiving stream. Non-contact recreation is a beneficial use that relies on esthetic enjoyment of the receiving stream which would be degraded by a bright orange or red surface water stream. The increased averaging period will allow for greater short term peak concentrations that are likely to degrade the aquatic life beneficial use of the receiving stream. Iron was reported in the mine drainage discharge as high as 4,760,000 ug/l in Order No. R5-2006-0058; 11,333 ug/l in Attachment G of the proposed Permit and 86,000 ug/l in Table F-2 of the proposed Permit. As stated above the effluent limitation for iron in the proposed Permit is 300 ug/l as an annual average. The effect of annual averaging will allow for extremely high short term peak concentrations. These short term concentrations could easily exceed 1,000 ug/l as a 4-day average, which is US EPA's recommended *Ambient Criteria for the Protection of Fresh water Aquatic Life*. Iron at the sampled concentrations up to 4,760,000 ug/l presents a reasonable potential to exceed the level necessary to protect aquatic life in the receiving stream. *Water Quality Criteria, McKee and Wolf, Publication A3, State Water Resources Control Board* recommends that the levels of iron necessary to protect industrial uses ranges from 100 ug/l to 2,000 ug/l. Included industrial uses include baking, food canning and laundry where the recommended threshold value is 200 ug/l; these uses are also associated with domestic water supplies, a documented beneficial use of downstream uses. *McKee and Wolf* also report a threshold concentration of iron for lethality to three types of fish at 200 ug/l and a complete upper limit for fish life at 50,000 ug/l. The Antidegradation Policy discussion in the proposed Permit fails to mention any of the designated beneficial uses other than a very limited and incorrect discussion of the secondary drinking water MCL. The discussion regarding the MCL is incorrect in stating that a long-term health impact is attributed to iron and the assertion is not supported by any facts or documentation.

Turbidity: The effluent limitation for turbidity has been relaxed in the proposed Permit from the monthly average contained in Order No. R5-2006-0058 to an annual average. As shown in Table F-2 to the proposed Permit, turbidity was sampled in the mine drainage discharge at least as high as 41 NTU; however there is no indication that this value was collected during a period when the mine drainage was discolored and

containing higher concentrations of pollutants. Turbidity is associated with suspended and settleable solids values which have been recorded at significantly high concentrations. The Regional Board did not conduct a pollutant variability Reasonable Potential analysis which is required by 40 CFR 122.44(d)(1)(ii) which would have projected a maximum turbidity level. An annual average limitation will allow for high peak levels of turbidity. High instantaneous levels of turbidity are particularly relevant since US EPA has issued an Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The 1986 Quality Criteria for Water recommends the following criterion which will prevent the deterioration of water quality and aquatic life: *“Settleable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm for aquatic life.”* *Water Quality Criteria, McKee and Wolf, Publication A3, State Water Resources Control Board* recommends that the levels of turbidity not exceed 10 NTU for bathing and 5 NTU for ice making which are domestic uses of water. Domestic uses of the receiving stream have been documented (page F-16 (i)). Individual home water intakes are not subject to the surface water treatment rule and levels of turbidity above the recommended levels will degrade the domestic beneficial use of the receiving stream. The impacts to the beneficial uses of the receiving stream for aquatic life and domestic uses are not protected by the annual average limitation for turbidity and have not been discussed or addressed in an Antidegradation analysis.

The Basin Plan contains a water quality objective for turbidity which requires that wastewater discharges shall not cause changes in turbidity that cause nuisance or adversely affect beneficial uses and that turbidity shall not exceed the following:

- A. Shall not exceed 2 Nephelometric Turbidity Units (NTU) where natural turbidity is less than 1 NTU;
- B. Shall not increase more than 1 NTU where natural turbidity is between 1 and 5 NTUs;
- C. Shall not increase more than 20 percent where natural turbidity is between 5 and 50 NTUs;
- D. Shall not increase more than 10 NTU where natural turbidity is between 50 and 100 NTUs; nor
- E. Shall not increase more than 10 percent where natural turbidity is greater than 100 NTUs.

It has been shown above that the discharge threatens to degrade the aquatic life and domestic uses of the receiving stream. The discharge from the mine site has also been the subject of complaints due to discoloration and turbidity (high settleable and suspended solids). Aesthetic enjoyment is a part of the non-contact beneficial use of the receiving stream that is also impacted by the discolored and turbid mine drainage discharges—hence the complaints. The discharge of discolored and turbid mine drainage discharges also threaten to violate the Basin Plan water quality objective for turbidity by

causing downstream waters, Wolf Creek, to exceed the established NTU allowable increases.

Best Practicable Treatment and Control (BPTC): The proposed Permit's Antidegradation Policy statement, cited above, states that:

“Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.”

However, the proposed Time Schedule Order (TSO) accompanying the proposed Permit states that:

“The Discharger installed a new passive treatment system that began operation in November 2011. Due to the nature of the passive treatment system, the Discharger anticipates that additional time is necessary for wetland vegetation and biogenic processes to become established and for the system to reach its design capacity for removal of arsenic, iron, manganese, and turbidity. Additionally, the Discharger indicated that the discharge may not be able to comply with the concentration-based effluent limitation for dissolved oxygen during the summer when the effluent flow is low and ambient heat could raise the temperature of the discharge within the conveyance pipe from the wetlands to the drainage channel, which could reduce the dissolved oxygen concentration.”

The Discharger acknowledges that the proposed treatment system will not be capable of achieving compliance with Permit limitations for dissolved oxygen. A non-compliant system cannot be considered best practicable treatment and control (BPTC) of the discharge as is required by the Antidegradation Policy.

Numerous water quality issues would have to be addressed in the California Environmental Quality Act (CEQA) document that was prepared for the “new” passive treatment system. However, the proposed Permit does not contain any mention of any such CEQA document having been completed or whether such a document was reviewed by Regional Board staff as an interested agency.

Beneficial Uses and BPTC: The Discharger's proposed treatment system is a passive wetlands. As is acknowledged in the above citation, a wetlands treatment system is dependent on the establishment of mature vegetation. Neither the proposed Permit nor the accompanying documents discuss in significant detail the design parameters of the wetlands treatment system or its capability to achieve compliance with all of the effluent and receiving water limitations. There is no indication that a constituent by constituent treatability analysis was conducted. *Recommended Maximum Concentrations of Trace Elements in Irrigation Water, Water Quality for Agriculture, RS Ayers and DW Westcot, FAO Irrigation and Drainage Paper No. 29, Rev 1* contains recommended maximum concentrations for trace elements used in irrigation.

<u>Constituent</u>	<u>2006 Max Effluent Concentration used</u> (from R5-2006-0058, Table F-3)	<u>2012 Max Effluent Concentration used</u> (from Tentative Order, Attachment G, RP analysis sheet)	<u>2012 Max Effluent Concentration</u> (from Tent Order Table F-2, not used in RP analysis)	<u>A&W Agricultural Goal</u>
Aluminum	36,100 ug/l	22.3	32	5,000
Arsenic	35,400 ug/l	840	840	100
Cadmium	494 ug/l	0.17	0.28	10
Cobalt	257 ug/l	2.6	3.1	50
Iron	4,760,000 ug/l	11,333	86,000	5,000
Manganese	22,600 ug/l	3,023	5,800	200
Vanadium	229 ug/l	5.6	5.6	100
Zinc	878 ug/l	12	1,300	2,000

Numerous metals and trace elements found in the mine drainage discharge exceed the recommended level for agriculture and may be toxic to plants, thereby inhibiting the necessary plant growth required for the wetlands to be a viable treatment process. There is no indication in the proposed Permit of the accompanying documents that the toxicity of metals was evaluated in the design of a wetlands treatment process. Furthermore, US EPA (<http://www.epa.gov/aml/tech/appenc.pdf>) found that constructed wetlands for treating mine waste are not fully understood and that metal removal efficiencies were less during cold weather. Cold wet weather is the period when Empire Mine has been documented to discharge the highest concentration of metals. The Finding that the proposed treatment process will be capable of achieving compliance with effluent and receiving water limitations and providing BPTC is questionable and should be documented in a proper Antidegradation analysis.

Hazardous Sediment Accumulation: Hazardous levels of arsenic have been found to be accumulating along the receiving stream as shown in the *SAMPLING AND MONITORING PROGRAM FOR THE MAGENTA DRAIN TUNNEL AT THE EMPIRE MINE STATE HISTORIC PARK GRASS VALLEY, CALIFORNIA, JULY 2006*, Prepared by: MFG, INC. consulting scientists and engineers:

Page 2: “*Sediment samples were collected at two locations by Tetra Tech EM Inc. (TTEMI, 2005): from the drainage ditch at the Magenta Drain Tunnel portal and from the creek just upstream of Memorial Park. The arsenic concentrations of both samples exceeded the state soluble threshold limit concentration (STLC) criteria.” (Underline emphasis added)*

The accumulation of sediments from the mine drainage discharge were the subject of a Proposition 65 hazardous materials warning letter issued by Regional Water Board staff during the preparation of Order No. R5-2006-0058. There is no discussion of the mine drainage discharge accumulating to hazardous levels within the proposed treatment wetlands. Wetlands treatment processes are documented to accumulate metals concentrations and the existing discharge has been documented to have caused

accumulations of arsenic to hazardous concentrations. While the proposed Permit states that the settling pond will occasionally be cleaned of sediments; there is no such statement with regard to the wetlands. It is likely impossible to clean the wetlands of sediments since they are lined with a membrane and the removal of sediments would likely destroy the root structure of the wetlands plants. The Antidegradation analysis is silent with regard to the possibility of metals accumulations to hazardous levels and the possible associated impacts.

The quantity of pollutants discharged:

The proposed Permit fails to include a flow limitation or mass limitations for individual pollutants. Table F-2 of the proposed Permit does include a design flow of 2.3 mgd. Why isn't a flow limit of 2.3 mgd included?

The proposed Permit cannot control the amount of pollutants discharged without flow or mass limitations. An antidegradation analysis is based on the amount of pollutants discharged to surface waters; without knowledge of either the flow or the mass of pollutants discharged an Antidegradation analysis could not have been conducted. The proposed Permit and accompanying Time Schedule Order (TSO) state that a passive treatment system was installed in November 2011. Any properly designed treatment system is based on flow and the loading rate of pollutants. The proposed Permit fails however to include any limitations for flow or mass of pollutants. The mass of pollutants would be based on the treatment systems design loading rate. The proposed Permit fails to include any discussion of the capability or design parameters for the passive treatment system. The proposed Permit also fails to contain any certification statement, by the registered design Civil Engineer, that the treatment system was designed to meet discharge limitations and is capable of achieving such.

The antidegradation analysis in the proposed Permit is not simply deficient, it is literally nonexistent. Order No. R5-2006-0058 was the first NPDES permit issued for this discharge and an Antidegradation analysis was not conducted for that permit. An Antidegradation analysis has never been conducted for this discharge. Any Findings with regard to Antidegradation are pure speculation by Regional Board staff. The brief discussion of antidegradation requirements, in the Findings and Fact Sheet, consist only of skeletal, unsupported, undocumented, conclusory statements totally lacking in factual analysis. The proposed Permit fails to properly implement the Basin Plan's Antidegradation Policy.

4. The proposed Permit contains NO Reasonable Potential Analysis for total suspended solids (TSS) and fails to contain an Effluent Limitation in accordance with Federal Regulations 40 CFR 122.44 and California Water Code, Section 13377.

Federal Regulations, 40 CFR 122.44(d), requires that limits must be included in permits where pollutants will cause, have reasonable potential to cause, or contribute to an exceedance of the State's water quality standards. 40 CFR 122.44 (d)(vi)(A) requires that where a state has not established a water quality criterion that is present at a concentration that causes an excursion above a narrative criterion, a limitation must be established that will fully protect the beneficial uses of the receiving stream. The presence of TSS in significant concentrations threatens to

exceed the water quality objective for suspended material and the narrative toxicity objective. 40 CFR 122.44 (a) requires the application of applicable technology based effluent limitations.

The proposed Permit, Table F-2, shows that total suspended solids (TSS) concentrations in the discharge have been measured as high as 5,000 mg/l. Typical TSS levels as described in *Wastewater Engineering, Treatment and Reuse, Metcalf & Eddy, Fourth Edition, pages 186 through 191*, are up to 400 mg/l for high strength raw sewage, up to 760 mg/l during the peak season for a tomato cannery and up to 101 mg/l for stormwater discharges. Surely it is evident that allowing a daily maximum discharge of TSS at 4,970 mg/l greater than was allowed under R5-2006-0058 and more than 6 times stronger than a tomato cannery wastewater will impact the beneficial uses of the receiving water. Yet a reasonable potential analysis for TSS was not conducted and presented in the proposed Permit.

Suspended solids levels are documented in *Water Quality Criteria, McKee and Wolf, Publication A3, State Water Resources Control Board*, to cause significant harm to numerous beneficial uses of surface waters. Specifically, domestic water treatment plants are designed for a percent removal of suspended solids with a maximum loading rate of 500 mg/l. In addition, suspended solids may kill fish and shellfish by causing abrasive injuries, by clogging the gills and respiratory passages, and by blanketing the stream bottom, killing eggs, and young food organisms, and destroying spawning beds. Tests on the survival of rainbow trout in suspensions of inert solids showed that 30 mg/l had no observable impact; a few fish died at 90 mg/l, while at 270 mg/l more than half the fish died (McKee & Wolf, page 280). Surely if half the tested fish died at 270 mg/l of suspended solids, a discharge of up to 5,000 mg/l would have a devastating impact on the aquatic life beneficial use of the receiving stream, yet the proposed Permit contains no effluent limitation for TSS. It would appear that the technically based 30 mg/l limitation for TSS would have been protective of the receiving stream beneficial use based on the available literature values. It would also seem critical to discuss best practicable treatment and control (BPTC) of the discharge which is a requirement of the Antidegradation Policy.

Order No. R5-2006-0058 stated that the effluent limitations for TSS were based on 40 CFR 440.102 which represents the degree of effluent reduction attainable by the application of the best practicable control technology (BPT) for mines. Even if one argues that the mine is inactive the best practicable treatment technology would be applicable under the Antidegradation Policy. The effluent limitation for total suspended solids (TSS) has been removed from the permit. Order No. R5-2006-0058 contained an effluent limitation of 20 mg/l as a monthly average and 30 mg/l as a daily maximum. The limitation for TSS has simply been removed in the proposed Permit.

The proposed Permit's only discussion of TSS is found on Page F-14:

“Applicable Technology-Based Effluent Limitations. ELGs were established at 40 CFR Part 440, Subpart J for the Copper, Lead, Zinc, Gold, Silver, and Molybdenum Ores Subcategory of the Ore Mining and Dressing Point Source Category, which is applicable to discharges from mines that produce gold bearing ores from open-pit or underground operations, among others. For the purposes of 40 CFR Part 440, “mine” is defined as an active mining area used in or resulting from the work of extracting metal ore or minerals from their natural deposits by any means or method, and “active mining area” is defined

as a place where work or other activity related to the extraction, removal, or recovery of metal ore is being conducted. The Facility consists of land and property previously used in and resulting from the work of extracting metal ore or minerals, specifically gold, from their natural deposits by any means or method. The discharge from the Magenta Drain is water drained from Empire Mine, an inactive mine. Therefore, the Facility is not an “active mining area” as defined in 40 CFR Part 440. Order No. R5-2006-0058 established effluent limitations for total suspended solids (TSS) based on BPJ and applied the ELGs from 40 CFR Part 440. Because the Facility is not an active mining area as defined in 40 CFR Part 440 and the Discharger has installed a passive treatment system designed to remove TSS, the effluent limitations representing BPT and BAT for an active mine are not applicable and this Order does not contain effluent limitations for the constituents contained in the ELGS at 40 CFR Part 440. This Order does, however, require monitoring for these constituents which include cadmium, copper, lead, mercury, pH, TSS, and zinc.” (Emphasis added)

Order No. R5-2006-0058, which was adopted by the Regional Board, contains a lengthy discussion, pages F-15 through F-17, of why the federal technical limitations for mines are applicable to the Empire Mine discharge. Empire Mine has been maintained as a working mine by the California Department of Parks and Recreation. The mine has not been closed. The mine drainage has not been eliminated. “Mine” is defined in 40 CFR 440.132(g) as “an active mining area, including all land and property placed under, or used above the surface of such land, used in or resulting from the work of extracting metal ore or minerals from their natural deposits by any means or method, including secondary recovery of metal ore from refuse or other storage piles, wastes, or rock dumps and mill tailings derived from the mining, cleaning, or concentration of metal ores.” “Mine drainage” is defined in 40 CFR 440.132(h) as “any water drained, pumped, or siphoned from a mine”. The Empire Mine State Historic Park consists of land and property used in or resulting from the work of extracting metal ore or minerals, specifically gold, from their natural deposits by any means or method. The Fact Sheet to the proposed Permit, at IV.B.2 correctly states that “[t]he Facility consists of land and property previously used in and resulting from the work of extracting metal ore or minerals, specifically gold, from their natural deposits by any means or method.” The discharge from the Magenta Drain is water drained from the Empire Mine. The federal regulations also establish best practicable control technology (BPT) is may be considered as BPTC under the Antidegradation Policy.

The California Water Code (CWC), Section 13377 states in part that: “...the state board or the regional boards shall...issue waste discharge requirements... which apply and ensure compliance with ...water quality control plans, or for the protection of beneficial uses...” 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. Failure to include an effluent limitation for TSS in the proposed permit violates 40 CFR 122.44 and CWC 13377.

- 5. The proposed Permit fails to contain an Effluent Limitation for Turbidity that is Protective of the Beneficial Uses of the Receiving Stream and the Proposed Limitation is not established as a Weekly and Monthly Average as Prescribed by the Regulations.**

The effluent limitation for turbidity has been relaxed in the proposed Permit to an annual average from a monthly average which was contained in Order No. R5-2006-0058. As shown in Table F-2 to the proposed Permit, turbidity was sampled in the mine drainage discharge as high as 41 NTU; however, there is no indication that this high value was collected during a period when the mine drainage was discolored and containing higher concentrations of pollutants. Turbidity is associated with suspended and settleable solids values which have been recorded at significantly high concentrations. The Regional Board did not conduct a pollutant variability reasonable potential analysis which is required by 40 CFR 122.44(d)(1)(ii) which would have projected a maximum turbidity level. An annual average limitation will allow for high peak levels of turbidity. High instantaneous levels of turbidity are particularly relevant since US EPA has issued an *Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life*. The 1986 Quality Criteria for Water recommends the following criterion which will prevent the deterioration of water quality and aquatic life: “*Settleable and suspended solids should not reduce the depth of the compensation point for photosynthetic activity by more than 10 percent from the seasonally established norm for aquatic life.*” *Water Quality Criteria, McKee and Wolf, Publication A3, State Water Resources Control Board* recommends that the levels of turbidity not exceed 10 NTU for baking and 5 NTU for ice making which are domestic uses of water. Domestic uses of the receiving stream have been documented (page F-16 (i)). Individual home water intakes are not subject to the surface water treatment rule and levels of turbidity above the recommended levels will degrade the domestic beneficial use of the receiving stream. The impacts to the beneficial uses of the receiving stream for aquatic life and domestic uses are not protected by the annual average limitation for turbidity and have not been discussed or addressed in an Antidegradation analysis.

The Basin Plan contains a water quality objective for turbidity which requires that wastewater discharges shall not cause changes in turbidity that cause nuisance or adversely affect beneficial uses and that turbidity shall not exceed the following:

- F.** Shall not exceed 2 Nephelometric Turbidity Units (NTU) where natural turbidity is less than 1 NTU;
- G.** Shall not increase more than 1 NTU where natural turbidity is between 1 and 5 NTUs;
- H.** Shall not increase more than 20 percent where natural turbidity is between 5 and 50 NTUs;
- I.** Shall not increase more than 10 NTU where natural turbidity is between 50 and 100 NTUs; nor
- J.** Shall not increase more than 10 percent where natural turbidity is greater than 100 NTUs.

It has been shown above that the discharge threatens to degrade the aquatic life and domestic uses of the receiving stream. The discharge from the mine site has also been the subject of complaints due to discoloration and turbidity (high settleable and suspended solids). Aesthetic

enjoyment is a part of the non-contact beneficial use of the receiving stream that is also impacted by the discolored and turbid mine drainage discharges—hence the complaints. The discharge of discolored and turbid mine drainage discharges also threaten to violate the Basin Plan water quality objective for turbidity by causing downstream waters, Wolf Creek, to exceed the established NTU allowable increases.

Federal Regulations, 40 CFR 122.44(d), requires that limits must be included in permits where pollutants will cause, have reasonable potential to cause, or contribute to an exceedance of the State's water quality standards. The California Water Code (CWC), Section 13377 states in part that: "...the state board or the regional boards shall...issue waste discharge requirements...which apply and ensure compliance with ...water quality control plans, or for the protection of beneficial uses..." 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. Where numeric water quality objectives have not been established, 40 CFR §122.44(d) specifies that WQBELs may be established using USEPA criteria guidance under CWA section 304(a), proposed State criteria or a State policy interpreting narrative criteria supplemented with other relevant information, or an indicator parameter. Failure to include a protective effluent limitation for turbidity in the proposed Permit violates 40 CFR 122.44 and CWC 13377. Federal Regulation 40 CFR 122.45 (d)(2) requires that permit for POTWs establish Effluent Limitations as average weekly and average monthly unless impracticable. The proposed Permit establishes Effluent Limitations for turbidity as an annual average contrary to the cited Federal Regulation. Establishing the Effluent Limitations for turbidity in accordance with the Federal Regulation is not impracticable. Proof of impracticability is properly a steep slope and the Regional Board has not presented any evidence that properly and legally limiting turbidity is impracticable.

6. The proposed Permit fails to contain an Effluent Limitation for aluminum in accordance with Federal Regulations 40 CFR 122.44, U.S. EPA's interpretation of the regulation, and California Water Code, Section 13377.

Federal Regulations, 40 CFR 122.44 (d)(i), requires that; "Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality." The Basin Plan contains a narrative water quality objective for toxicity that states in part that "[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life" (narrative toxicity objective). Where numeric water quality objectives have not been established, 40 CFR §122.44(d) specifies that WQBELs may be established using U.S. EPA criteria guidance under CWA section 304(a), proposed State criteria or a State policy interpreting narrative criteria supplemented with other relevant information, or an indicator parameter. U.S. EPA developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum to prevent toxicity to freshwater aquatic life. The recommended ambient criteria four-day average (chronic) and one-hour average (acute) criteria for aluminum are 87 mg/l and 750 mg/l, respectively.

As described in Table F-3 of Order No. R5-2006-0058, aluminum in the effluent has been measured as high as 36,100 µg/l. More recently, acid-soluble aluminum was detected in an effluent sample collected in October 2006 at a concentration of 2,000 mg/l and in an effluent sample collected 5 May 2011 at a concentration of 160 mg/l. This level of aluminum exceeds not only the chronic criteria value but also the acute criteria. Freshwater aquatic habitat is a beneficial use of the receiving stream. The proposed Permit, page F-26, reports the maximum effluent concentration for aluminum at 22.3 mg/l. Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011—after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification.

U.S. EPA’s 87 mg/l chronic criterion was developed using low pH and hardness testing. California Central Valley waters, the Sacramento River, at the Valley floor, have been sampled to have hardnesses as low as 39 mg/l CaCO₃ by the USGS in February 1996 for the *National Water Quality Assessment Program*. Contributory streams, especially foothill streams, have also been sampled and shown to contain even lower hardness levels. US EPA recognized in their ambient criteria development document, (Ambient Water Quality Criteria for Aluminum, EPA 440/5-86-008) that the pH was in the range 6.5 to 6.6 and that the hardness was below 20 mg/l. Typical values for pH and hardness in the Central Valley alone warrant use of the chronic ambient criteria for aluminum. Despite the hardness and pH values used in the development of the criteria, U.S. EPA’s conclusions in their *Ambient Criteria for the Protection of Freshwater Aquatic Life* recommends that application of the ambient criteria as necessary to be protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria.

The drinking water maximum contaminant level (MCL), which is included as a Basin Plan Water Quality Chemical Constituents Objective, for aluminum is 1,000 as a primary MCL and 200 µg/l as a secondary MCL.

The effluent data has exceeded the ambient criteria and the drinking water MCL. Based on information included in analytical laboratory reports submitted by the Discharger, aluminum in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life, and, therefore to violate the Basin Plan’s narrative toxicity objective and the drinking water MCL

Federal Regulations, 40 CFR 122.44 (d)(i), requires that; “Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.” U.S. EPA has interpreted 40 CFR 122.44(d) in *Central Tenets of the National Pollutant Discharge Elimination System (NPDES) Permitting Program* (Factsheets and Outreach Materials, 08/16/2002) that although States will likely have unique implementation policies there are certain tenets that may not be waived by State procedures.

These tenets include that “where valid, reliable, and representative effluent data or instream background data are available they MUST be used in applicable reasonable potential and limits derivation calculations. Data may not be arbitrarily discarded or ignored.” The California Water Code (CWC), Section 13377 states in part that: “...the state board or the regional boards shall...issue waste discharge requirements... which apply and ensure compliance with ...water quality control plans, or for the protection of beneficial uses...” 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. A water quality standard for Failure to include an effluent limitation for aluminum in the proposed permit violates 40 CFR 122.44 and CWC 13377.

- 7. The proposed Permit establishes Effluent Limitations for metals based on the hardness of the effluent as opposed to the ambient instream receiving water hardness and fails to use the mandated equations as required by Federal Regulations, the California Toxics Rule (CTR, 40 CFR 131.38(c)(4)).**

Introduction

Several toxic metals are currently regulated in the California Toxics Rule (CTR) based on the hardness of the water column. This regulation is based on the fact that these metals exhibit greater toxicity to aquatic life in lower hardness waters. To reflect the hardness/toxicity relationship, U.S. EPA developed an equation for metals limitations using hardness as a variable. Use of the CTR equation with the lowest observed hardness will result in the most protective limitation for hardness dependant toxic metals. In most instances, the upstream surface water hardness is lower than the effluent hardness. Hence, U.S. EPA in writing the CTR (40 CFR 131.38(c)(4) stated 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.”* Clearly, by stating that the ambient hardness of the surface water shall be used in the equations to develop metals limitations; the CTR prohibits the use of the effluent hardness.

Confirming that U.S. EPA requires use of the upstream (ambient) hardness the Federal Register, Volume 65, No. 97/Thursday, May 18th 2000 (31692), adopting the California Toxics Rule states that: *“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.”*

In their biological opinion of the CTR, the U.S. Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) concluded that: *“The CTR should clearly state that to obtain a site hardness value, samples should be collected upstream of the effluent source(s).”*

Following adoption of the CTR, a local consulting engineer, Dr. Robert Emerick, worrying whether his newly designed and constructed treatment plant at Lincoln would be able to comply with stringent metals limitations developed a technical paper evaluating the metal

toxicity/hardness relationship. The “Emerick” paper concluded that hardness values other than the most restrictive surface water values could be used with modified equations to establish less restrictive metals limitations. The “Emerick” paper concluded that the metals limitations could be less restrictive while protecting aquatic life and the method eliminated the development of overly protective limitations.

Further reading of the Service’s and NMFS biological however shows that the lower limits obtained using the lowest observed hardness were not “overly protective: *“The CTR should clearly state that to obtain a site hardness value, samples should be collected upstream of the effluent source(s). Clearly stating this requirement in the CTR would avoid the computation of greater-than-intended site criteria in cases where samples were collected downstream of effluents that raise ambient hardness, but not other important water qualities that affect metal toxicity (e.g., pH, alkalinity, dissolved organic carbon, calcium, sodium, chloride, etc.). Clearly, it is inappropriate to use downstream site water quality variables for input into criteria formulas because they may be greatly altered by the effluent under regulation.”*

Using the latest available science to develop new copper criteria U.S. EPA concluded that the use of the hardness alone often resulted in limitations that were not fully protective of aquatic life even using the most restrictive hardness and that one could not predict whether the hardness based equations would result in limitations that were overly or under restrictive. U.S. EPA’s latest ambient criteria for copper (*Aquatic Life Ambient Freshwater Quality Criteria—Copper 2007 Revision*), utilizes the other constituents that affect metal toxicity. Since EPA published the hardness-based recommendation for copper criteria in 1984, new data have become available on copper toxicity and its effects on aquatic life. The Biotic Ligand Model (BLM) – a metal bioavailability model that uses receiving water body characteristics to develop site-specific water quality criteria – utilizes the best available science and serves as the basis for the new national recommended criteria. The BLM requires ten input parameters to calculate a freshwater copper criterion (a saltwater BLM is not yet available): temperature, pH, dissolved organic carbon (DOC), calcium, magnesium, sodium, potassium, sulfate, chloride, and alkalinity. The BLM is used to derive the criteria rather than as a post-derivation adjustment as was the case with the hardness-based criteria. This allows the BLM-based criteria to be customized to the particular water under consideration. EPA states in the Federal Register (Federal Register / Vol. 72, No. 35 / Thursday, February 22, 2007 / Notices, 7985) that: *“Unlike the empirically derived hardness-dependent criteria, the BLM explicitly accounts for individual water quality variables and addresses variables that EPA had not previously factored into the hardness relationship. Where the previous freshwater aquatic life criteria were hardness-dependent, these revised criteria are dependent on a number of water quality parameters (e.g., calcium, magnesium, dissolved organic carbon) described in the document. BLM-based criteria can be more stringent than the current hardness-based copper criteria and in certain cases the current hardness-based copper criteria may be overly stringent for particular water bodies”*.

The water quality standard and aquatic toxicity specialists from the Service, NMFS and U.S. EPA determined that the metals limitations based solely on hardness could not be shown to be overly protective. This conclusion is contrary to the central premise of the “Emerick” paper which relies solely on hardness. Hardness based toxic metal limitations cannot be shown to be overly protective without evaluating the discharge specific impacts of temperature, pH, dissolved

organic carbon (DOC), calcium, magnesium, sodium, potassium, sulfate, chloride, and alkalinity. The Regional Board has relied on the “Emerick” methodology to develop limitations for hardness dependent toxic metals in NPDES permits citing that use of the lowest observed hardness and use of the CTR equation would result in overly protective limitations. The Regional Board has commented that the Services’ and NMFS comments were directed at CTR development and have ignored the science. The Regional Board has also refused to use U.S. EPA’s new criteria for copper (a CTR toxic metal) that utilizes all the parameters that can impact the toxicity of a metal. The “Emerick” method and the Regional Board’s adherence to that method does not eliminate “overly protective” limitations but instead develops limits that are less restrictive than prescribed by the CTR and are in most instances not protective of aquatic life.

The Regional Board rarely requires NPDES wastewater dischargers to sample for of dissolved organic carbon (DOC), calcium, magnesium, sodium, potassium, sulfate or chloride. Each of these parameters can be significantly altered in the receiving stream by wastewater discharges. Therefore, based on the latest science and advice from the water quality standards and toxicity experts they could not even make an intelligent guess whether limitations for toxic hardness dependant metals are overly protective. This complete lack of data also precludes the Regional Board from using U.S. EPA’s latest ambient criteria for copper, a hardness dependant toxic metal. The Regional Board’s dependence on a single study (Emerick) that only evaluates hardness with regard to metals toxicity to reach a conclusion that using the lowest observed hardness and the CTR equations is overly protective is without merit and is not supported by the latest available science.

The “Emerick” paper, page 4, states that: *“As depicted, because of the concave downward relationship between the copper water quality objective and hardness, assimilative capacity is always produced when two waters of differing hardness are mixed. Therefore, it is appropriate and protective to assign copper (and any other contaminant exhibiting a concave downward relationship) water quality objectives based on the hardness of the effluent.”* As is detailed by the U.S. Fish and Wildlife Service, the National Marine Fisheries and U.S. EPA in their updated copper criteria, using hardness alone one cannot state that the hardness based metals limitations are sufficiently stringent, let alone to conclude that there is “assimilative capacity” within the receiving stream. Since the “Emerick” paper is solely based on hardness and does not evaluate all the other parameters that can impact toxicity, the conclusions that metals limitations are overly stringent and there is assimilative capacity for metals is simply wrong. The Regional Board has no knowledge that hardness based limitations are overly restrictive when using the CTR equations and the lowest observed hardness to develop discharge limitations for metals. The single and sole reason for using the “Emerick” method is to relax discharge limitations for toxic metals.

The California Toxics Rule (CTR) 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 CTR is quite clear that when developing effluent limitations for hardness-dependant metals that:

- (1) The hardness of the surface water must be used;
- (2) Use of the effluent hardness is prohibited; and
- (3) The term ambient means that the hardness must be taken from outside the area where the effluent mixes with the receiving stream.
- (4) Only the upstream surface water hardness may be used to develop effluent limitations for hardness dependant metals.

The Effluent Hardness was Used in the Revised Permit

WDR Order No. R5-2006-0058 uses an ambient instream hardness of 15 mg/l as reported on page F-25, restated throughout the Order, and detailed on pages F-19 and F-20. The proposed Permit reports to also use the ambient hardness from Wolf Creek, yet fails to utilize the 15 mg/l hardness used to develop Order R5-2006-0058. In preparing the proposed Permit the Regional Board discarded these low hardness values without any technical or legal justification. The result of using a higher hardness is that effluent limitations would be less restrictive and fewer constituents would exhibit a reasonable potential to exceed the water quality standards. The proposed Permit is not protective of the aquatic life beneficial use of the receiving steam since the reasonable potential analysis used for hardness dependant metals failed to use the lowest recorded ambient hardness of 15 mg/l and the mandated CTR equation.

Proposed Permit, pages F-21 and F-22, state that:

“ECA for Chronic Cadmium, Chromium III, Copper, Nickel, and Zinc – The effluent hardness ranged from 95 mg/L to 360 mg/L, based on 36 samples from May 2008 to April 2011. Since the discharge constitutes the headwaters of Magenta Drain Channel, there is no physical upstream receiving water monitoring location. Therefore, hardness data for South Fork Wolf Creek upstream of the confluence of Magenta Drain Channel was used for this evaluation. The hardness in South Fork Wolf Creek upstream of the confluence with Magenta Drain Channel varied from 38 mg/L to 160 mg/L, based on 36 samples from May 2008 to April 2011. Under the effluent dominated condition, the reasonable worst-case downstream ambient hardness is 95 mg/L. As demonstrated in the example shown in Table F-4, below, using this hardness to calculate the ECA for all Concave Down Metals will result in WOBELs that are protective under all flow conditions, from the effluent dominated condition to high flow condition.”

Proposed Permit, pages F-23 and F-24, state that:

“ECA for Acute Cadmium, Lead, and Acute Silver – The ECA, as calculated using Equation 4, is based on the reasonable worst-case upstream receiving water hardness, the lowest observed effluent hardness, and assuming no receiving water assimilative capacity for metals (i.e., ambient background metals concentrations are at their respective CTR criterion). Equation 4 is not used in place of the CTR equation (Equation 1). Rather, Equation 4, which is derived using the CTR equation, is used as a direct approach for calculating the ECA. This replaces an iterative approach for calculating the ECA. The CTR equation has been used to evaluate the receiving water downstream

of the discharge at all discharge and flow conditions to ensure the ECA is protective (e.g., see Table F-5)."

Comparing the results for copper of using the lowest recorded ambient hardness of 15 mg/l and the CTR equation as reported in R5-2006-0058 to the Regional Board's use of a 95 mg/l effluent hardness and the "Emerick equations in the proposed Permit:

Copper

Order R5-2006-0058: Chronic 1.8 ug/l and acute 2.3 ug/l.

Proposed Permit: Chronic 8.9mg/l and acute 13 ug/l.

Obviously, the methodology used as prescribed by the "Emerick Method" in developing the proposed Permit is significantly less stringent than that using the lowest observed ambient hardness and the CTR equation. The proposed Permit fails to use the hardness and equations specified in the CTR.

The effluent hardness, as described by the Regional Board, was 95 mg/l. The Regional Board changes from calling this hardness the effluent hardness to the "*reasonable worst-case downstream ambient hardness*". This change of calling the 95 mg/l effluent hardness the ambient hardness is intentionally made to mislead one to believe that the ambient hardness of the receiving stream is being used as is required by the CTR. There was no instream measurement of hardness at 95 mg/l presented in the proposed Permit; the instream hardness is reported to have varied from 38 mg/l to 160 mg/l. Even quoting from the often cited "Emerick Paper", page 1, "The preamble to the California Toxics Rule states that should the effluent cause the hardness to exceed 400 mg/L, then "the hardness used in the hardness equation is the hardness of upstream water that does not contain the effluent."" Not only does the Regional Board's relabeled hardness of 95 mg/l contain the effluent hardness, it is 100% effluent hardness.

As is cited from the proposed Permit: "*The hardness in South Fork Wolf Creek upstream of the confluence with Magenta Drain Channel varied from 38 mg/L to 160 mg/L, based on 36 samples from May 2008 to April 2011.*" Even if the Regional Board were appropriate in not using the 15 mg/l hardness documented in Order R5-2006-0058; the 38 mg/l hardness is the worst case ambient instream hardness, not the effluent hardness of 95 mg/l. The Regional Board's use of a hardness of 95 mg/l results in reasonable potential not being assessed from several hardness dependant metals.

Confirming that U.S. EPA requires use of the upstream (ambient) hardness the Federal Register, Volume 65, No. 97/Thursday, May 18th 2000 (31692), adopting the California Toxics Rule states that: "*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 Wrong Equations Were Used

The California Toxics Rule (CTR) 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 CTR requires the use of the equations presented in paragraph (b)(2) of 40 CFR 131.38 for the development of effluent limitations for hardness dependant metals. The required CTR equation is:

$$\text{CTR Criterion} = \text{WER} \times (\exp(m[\ln(H)]+b))$$

where: H = hardness (mg/L as CaCO₃), WER = water-effect ratio (with a default value of 1) and m, b = metal and criterion specific constants.

The CTR equation is cited as “equation 1” in the proposed Permit (page F-18). The proposed Permit cites a 2006 technical paper prepared by Robert Emerick (see footnote 7 on page F-18) as the source of the equations used by the Regional Board in developing the Permit effluent limitations for some hardness dependant metals (see Table F-6 footnote 2). Dr. Emerick’s equation 4 is presented on page F-23 of the proposed Permit. Equation 4 is not the same as equation 1 which is prescribed by the CTR. An equation derived from another equation will yield different results; they are not the same and are not equivalent.

Evaluating the Regional Board’s statement: *“Equation 4 is not used in place of the CTR equation (Equation 1). Rather, Equation 4, which is derived using the CTR equation, is used as a direct approach for calculating the ECA. This replaces an iterative approach for calculating the ECA. The CTR equation has been used to evaluate the receiving water downstream of the discharge at all discharge and flow conditions to ensure the ECA is protective.”* First, equation 4 was used to calculate the effluent concentration allowance (ECA). The CTR equation is not an indirect and iterative approach. Using the CTR equation (CTR Criterion = WER x $(\exp(m[\ln(H)]+b))$), the lowest observed instream ambient hardness is plugged into the equation along with the appropriate water effect ratio (default value of 1) and the specified values for the variables m and b and the CTR criterion is directly calculated; there is no iterative approach. The Regional Board then compared their limitation based on equation 4 with the limitation based on the CTR equation; hence equation 4 was indeed used in place of the CTR equation. The proposed Permit appears to contain the cited statement in an attempt to justify use of the “Emerick” method which was manipulated the CTR equation to allow for the use of assimilative capacity which results in less stringent limits for hardness dependant metals. If the proposed Permit had actually used the CTR equation to develop the limitation for hardness dependant metals there would be no need to discuss the “Emerick” method. The use of equations other than those prescribed by the CTR for development of effluent limitations for hardness dependant metals is contrary to the regulatory requirements of the CTR.

The “ambient” hardness was not used

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 common dictionary definition of *ambient* is “in the surrounding area”, “encompassing on all sides”.

The common definition of ambient of surrounding would eliminate any areas that included the wastewater effluent in consideration of the hardness used in determining criteria for hardness dependant metals. 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. It is also reasonable to make this assumption based on past interpretations and since EPA, in permit writers’ guidance and other reference documents, generally assumes receiving streams have dilution, which would ultimately “encompass” the discharge. Ambient conditions are in-stream conditions unimpacted by the 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.”

CSPA’s view regarding the term ambient is also supported by a biological opinion issued by the US Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) on March 24th 2000. On March 24, 2000 the US Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) issued a biological opinion on the effects of the final promulgation of the CTR on listed species and critical habitats in California in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.; Act). The biological opinion was issued to the U.S. Environmental Protection Agency, Region 9, with regard to the “Final Rule for the Promulgation of Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California” (CTR)”. The document represented the Services’ final biological opinion on the effects of the final promulgation of the CTR on listed species and critical habitats in California in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.; Act). The biological opinion contains the following discussion, beginning on page 205, regarding the use of hardness in developing limitations for toxic metals:

“The CTR should more clearly identify what is actually to be measured in a site water to determine a site-specific hardness value. Is the measure of hardness referred to in the CTR equations a measure of the water hardness due to calcium and magnesium ions only? If hardness computations were specified to be derived from data obtained in site water calcium and magnesium determinations alone, confusion could be avoided and more accurate results obtained (APHA 1985). Site hardness values would thus not

include contributions from other multivalent cations (e.g., iron, aluminum, manganese), would not rise above calcium + magnesium hardness values, or result in greater-than-intended site criteria when used in formulas. In this Biological opinion, what the Services refer to as hardness is the water hardness due to calcium + magnesium ions only.

The CTR should clearly state that to obtain a site hardness value, samples should be collected upstream of the effluent source(s). Clearly stating this requirement in the CTR would avoid the computation of greater-than-intended site criteria in cases where samples were collected downstream of effluents that raise ambient hardness, but not other important water qualities that affect metal toxicity (e.g., pH, alkalinity, dissolved organic carbon, calcium, sodium, chloride, etc.). Clearly, it is inappropriate to use downstream site water quality variables for input into criteria formulas because they may be greatly altered by the effluent under regulation. Alterations in receiving water chemistry by a discharger (e.g., abrupt elevation of hardness, changes in pH, exhaustion of alkalinity, abrupt increases in organic matter etc.) should not result, through application of hardness in criteria formulas, in increased allowable discharges of toxic metals. If the use of downstream site water quality variables were allowed, discharges that alter the existing, naturally-occurring water composition would be encouraged rather than discouraged. Discharges should not change water chemistry even if the alterations do not result in toxicity, because the aquatic communities present in a water body may prefer the unaltered environment over the discharge-affected environment. Biological criteria may be necessary to detect adverse ecological effects downstream of discharges, whether or not toxicity is expressed.”

The Regional Board has argued however that they had discretion to redefine “ambient” and were not constrained by common dictionary definitions. The Regional Board’s definition of “ambient” included the wastewater effluent.

The Superior Court (Superior Court of California (Case number 34-2009-80000309) (County of Sacramento, Judge Timothy M. Frawley, 26 January 2011) ruled that the common dictionary definition of ambient was applicable, While the Regional Board states that the Court’s ruling is not applicable to any other cases, it does confirm “...*the hardness used in the hardness equation is the hardness of upstream water that does not include the effluent.*”

The Regional Board in the proposed Permit continues to use the effluent as “ambient” in their calculation of criteria for hardness dependant metals contrary to common definition, the language in the SIP, guidance from the US Fish and Wildlife Service and the National Marine Fisheries Service and a ruling by the Superior Court.

Use of the “Surface Water Hardness”

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).

Since the proposed Permit clearly states that the “Emerick” method was utilized in developing effluent limitations for hardness dependant metals, one only needs to read the “Emerick” paper to clearly see that in each and every derived equation the “effluent hardness” is used. The wastewater effluent is not “surface water”. The Regional Board has not argued this point directly, but instead attempts to relabel the effluent hardness as receiving water hardness. In this case there is no documentation of any receiving water sampling that shows the receiving water hardness at 95 mg/l, but clearly such is the case for the effluent hardness. The proposed Permit is again based on the hardness of the effluent, not surface water, for hardness dependant metals.

The “Emerick” Paper cannot be used

The proposed Permit relies on the “Emerick” paper in developing effluent limitations for hardness dependant metals. The “Emerick” paper is inappropriate for use based on the following:

- The “Emerick” paper does not utilize the hardness of the surface water but also heavily relies on the effluent hardness. Recall that 40 CFR 131.38 requires use of the actual ambient hardness of the surface water.
- The “Emerick” paper does use the sole allowed equation specified in 40 CFR 131.38(c)(4) but derives numerous different equations.
- The “Emerick” paper does not utilize the ambient hardness heavily relies on the effluent hardness.
- The “Emerick” paper ignores the other important water qualities that affect metal toxicity (e.g., pH, alkalinity, dissolved organic carbon, calcium, sodium, chloride, etc.) and focuses solely on hardness. As can be seen the U.S. EPA’s latest ambient criteria for copper (*Aquatic Life Ambient Freshwater Quality Criteria—Copper 2007 Revision*), the latest science utilizes these other quality that affect metal toxicity. Since EPA published the hardness-based recommendation for copper criteria in 1984, new data have become available on copper toxicity and its effects on aquatic life. The Biotic Ligand Model (BLM) – a metal bioavailability model that uses receiving water body characteristics to develop site-specific water quality criteria – utilizes the best available science and serves as the basis for the new national recommended criteria. The BLM requires ten input parameters to calculate a freshwater copper criterion (a saltwater BLM is not yet available): temperature, pH, dissolved organic carbon (DOC), calcium, magnesium, sodium, potassium, sulfate, chloride, and alkalinity. The BLM is used to derive the criteria rather than as a post-derivation adjustment as was the case with the hardness-based criteria. This allows the BLM-based criteria to be customized to the particular water under consideration. The Regional Board failed to utilize the latest science in developing the proposed Permit.
- The Regional Board’s use of the “Emerick” method for developing limitations for hardness dependant metals in each and every NPDES permit they issue could be considered an underground regulation.

Establishing a protective limitation

For the great majority of wastewater discharges to surface waters the hardness of the effluent is much greater than that of the upstream surface water. In such cases, use of the higher hardness of the effluent to calculate discharge limitations for hardness dependant metals results in significantly less stringent discharge limitations. The “Emerick” method uses the higher effluent hardness to determine criteria as the effluent mixes with surface water. The Regional Board has used the “Emerick” method to generate these less stringent limitations stating that the methodology only eliminates what would have otherwise been overly protective limitations¹. Adherence to the required CTR methodology using the lower surface water hardness would, under these circumstances, produce more stringent criteria. In reviewing the Central Valley Regional Board’s NPDES permits it can be seen that use of the “Emerick” method is used by default, ignoring the mandated CTR method of calculating criteria for hardness dependant metals. It has been questioned whether the Regional Board’s default use of the “Emerick” method constitutes an underground regulation. "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.” (Government Code section 11342.600).

The Regional Board cannot produce a technical defense that use of the CTR prescribed methods is overly protective. To the contrary, the US Fish and Wildlife Service and the National Marine Fisheries Service in their biological opinion and U.S. EPA in developing new ambient criteria for copper, all state that the use of hardness alone, ignoring temperature, pH, dissolved organic carbon (DOC), calcium, magnesium, sodium, potassium, sulfate, chloride, and alkalinity, may not be protective of water quality. The agencies, in their biological opinion, state that only the lower upstream hardness should be used to account for the inaccuracies of using hardness alone. The Regional Board does not present any technical information to rebut the technical fisheries and water quality standards development experts at US Fish and Wildlife Service, the National Marine Fisheries Service or U.S. EPA. The Regional Board has refused to discuss the technical merits of the opinions given by the US Fish and Wildlife Service, the National Marine Fisheries Service and U.S. EPA, stating only that the opinions address the CTR and are not applicable to individual permitting actions.

¹ See permits for Sacramento Regional (http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/sacramento/r5-2010-0114_npdes.pdf, at pages F-22 and 23), The City of Auburn (http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/placer/r5-2010-0090-01.pdf, page F-23 “An ECA based on a lower hardness (e.g., lowest upstream receiving water hardness) would also be protective, but would result in unreasonably stringent effluent limits considering the known conditions.”), Placer County SMD-1 (http://www.swrcb.ca.gov/centralvalley/board_decisions/adopted_orders/placer/r5-2010-0092.pdf, page F-26, “Use of a lower ECA (e.g., calculated based solely on the lowest upstream receiving water hardness) is also protective, but would lead to unreasonably stringent effluent limits considering the known conditions.”)

8. The proposed Permit fails to contain an Effluent Limitation for antimony in accordance with Federal Regulations 40 CFR 122.44 and California Water Code, Section 13377.

Federal Regulations, 40 CFR 122.44 (d)(i), requires that; “Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.” Drinking water maximum contaminant levels (MCLs) are included in the Basin Plan Chemical Constituents objectives. An MCL exists for antimony at 6 ug/l. The discharge has a reasonable potential to cause or contribute to an instream excursion above the Primary Maximum Contaminant Level (MCL) for antimony of 6 ug/l. The observed antimony MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 98.9 ug/l. Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for antimony is required.

The California Water Code (CWC), Section 13377 states in part that: “...the state board or the regional boards shall...issue waste discharge requirements... which apply and ensure compliance with ...water quality control plans, or for the protection of beneficial uses...” 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. A water quality standard for Failure to include an effluent limitation for antimony in the proposed permit violates 40 CFR 122.44 and CWC 13377.

9. The proposed Permit fails to contain an Effluent Limitation for Barium in accordance with Federal Regulations 40 CFR 122.44 and California Water Code, Section 13377.

Federal Regulations, 40 CFR 122.44 (d)(i), requires that; “Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.” Drinking water maximum contaminant levels (MCLs) are included in the Basin Plan Chemical Constituents objectives. The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Primary Maximum Contaminant Level (MCL) for barium of 1,000 ug/l. The observed barium MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 2,480 ug/l. The observed MEC is greater than the water quality criteria; therefore, an Effluent Limitation for barium is required.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for antimony is required.

The California Water Code (CWC), Section 13377 states in part that: “...the state board or the regional boards shall...issue waste discharge requirements... which apply and ensure compliance with ...water quality control plans, or for the protection of beneficial uses...” 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. A water quality standard for Failure to include an effluent limitation for barium in the proposed permit violates 40 CFR 122.44 and CWC 13377.

10. The proposed Permit fails to contain an Effluent Limitation for cadmium in violation of the California Toxics Rule, Federal Regulations (40 CFR 122.44), the California Water Code (CWC), Section 13377 and the State’s Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP).

The discharge has a reasonable potential to cause or contribute to an instream excursion above the CTR criteria for cadmium. The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for cadmium. The criteria for cadmium are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for cadmium in freshwater are $1.101672 - [0.041838 \times \ln(\text{hardness})]$ for the chronic criteria and $1.136672 - 0.041838 \times \ln(\text{hardness})$ for the acute criteria. The observed cadmium MEC was detected in a sample collected 9 June 2003 at a concentration of 494 ug/L. Using the worst-case ambient (lowest receiving water) measured hardness of (15 mg/L), the applicable chronic criterion (maximum four-day average concentration) is 0.56 ug/L and the applicable acute criterion (maximum one-hour average concentration) is 0.53 ug/L. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for cadmium are required.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for cadmium is required.

In accordance with Federal Regulations, 40 CFR 122.44, the Regional Board is required to establish an effluent limitation if a pollutant is measured in the effluent which presents a reasonable potential to exceed a water quality standard of objective. In accordance with the SIP, Section 1.3, since the maximum effluent concentration exceeded a water quality standard, an effluent limitation is required. California Water Code, section 13377, requires that:

“Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

11. The proposed Permit fails to contain an Effluent Limitation for chromium III in violation of the California Toxics Rule, Federal Regulations (40 CFR 122.44), the California Water Code (CWC), Section 13377 and the State’s Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP).

The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for chromium III. The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for chromium III. The criteria for chromium (III) are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for chromium III in freshwater are 0.316 and 0.860 for the acute and the chronic criteria, respectively. The Discharger did not provide any information regarding the levels of chromium III in the discharge. The Discharger did, however, provide data for total chromium in the effluent. No data were provided for chromium VI in the effluent. Chromium can exist in eight valence states, ranging from -2 to +6. Chromium III is the most stable valence state, followed by chromium VI. Total chromium in the effluent is likely to be in the chromium III state. The observed chromium III MEC was detected in a sample collected 9 June 2003 at a concentration of 53.4 ug/L. Using the worst-case ambient (lowest receiving water) measured hardness of (15 mg/L), the applicable chronic criterion (maximum four-day average concentration) is 44 ug/L and the applicable acute criterion (maximum one-hour average concentration) is 367 ug/L. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for chromium III are required.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the

discharge; the “new” treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for chromium III is required.

In accordance with Federal Regulations, 40 CFR 122.44, the Regional Board is required to establish an effluent limitation if a pollutant is measured in the effluent which presents a reasonable potential to exceed a water quality standard of objective. In accordance with the SIP, Section 1.3, since the maximum effluent concentration exceeded a water quality standard, an effluent limitation is required. California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

12. The proposed Permit fails to contain an Effluent Limitation for cobalt in violation of Federal Regulations (40 CFR 122.44) and the California Water Code (CWC), Section 13377.

Cobalt in the discharge has a reasonable potential to cause or contribute to an instream excursion above a level necessary to protect the beneficial use of agricultural irrigation, and, therefore to violate the Basin Plan’s narrative toxicity and chemical constituents objectives. *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985), recommends that the cobalt concentration in waters used for agricultural irrigation not exceed 50 ug/L. Applying the Basin Plan “Policy for Application of Water Quality Objectives”, the numeric standard that implements the narrative objective is the Agricultural Water Quality Goal of 50 ug/L. The observed cobalt MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 257 ug/L. The recommended maximum concentration for protection of agricultural uses is 50 ug/L. The observed MEC is greater than the water quality standard; therefore, an Effluent Limitation for cobalt is required.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011 after the period

used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for cobalt is required.

In accordance with Federal Regulations, 40 CFR 122.44, the Regional Board is required to establish an effluent limitation if a pollutant is measured in the effluent which presents a reasonable potential to exceed a water quality standard of objective. California Water Code, section 13377, requires that: "Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

13. The proposed Permit fails to contain an Effluent Limitation for copper in violation of the California Toxics Rule, Federal Regulations (40 CFR 122.44), the California Water Code (CWC), Section 13377 and the State's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP).

The observed copper MEC was detected in a sample collected 9 June 2003 at a concentration of 41.5 ug/l. More recently, copper was detected in an effluent sample collected 3 June 2009 at a concentration of 20 ug/l. Using the worst-case ambient (lowest receiving water) measured hardness from the effluent and receiving water (15 mg/L), the applicable chronic criterion (maximum four-day average concentration) is 1.8 ug/L and the applicable acute criterion (maximum one-hour average concentration) is 2.3 ug/L. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for copper are required.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the "new" treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis. In addition, the Regional Board arbitrarily and inappropriately discarded the 20 ug/l result from inclusion in its reasonable potential analysis, claiming that the value was an outlier, despite prior detections at higher levels and the characteristically episodic nature of the discharge. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal

justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for copper is required.

In accordance with Federal Regulations, 40 CFR 122.44, the Regional Board is required to establish an effluent limitation if a pollutant is measured in the effluent which presents a reasonable potential to exceed a water quality standard of objective. In accordance with the SIP, Section 1.3, since the maximum effluent concentration exceeded a water quality standard, an effluent limitation is required. California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

14. The proposed Permit fails to contain an Effluent Limitation for lead in violation of the California Toxics Rule, Federal Regulations (40 CFR 122.44), the California Water Code (CWC), Section 13377 and the State’s Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP).

The CTR includes hardness-dependent standards for the protection of freshwater aquatic life for lead. The observed lead maximum effluent concentration was detected in an effluent sample collected June 2003 at a concentration of 146 ug/l. More recently, lead was detected in an effluent sample collected 2 April 2009 at a concentration of 0.73 ug/l. Using the worst-case ambient (lowest receiving water) measured hardness of (15 mg/L), the applicable chronic criterion (maximum four-day average concentration) is 0.28 ug/L and the applicable acute criterion (maximum one-hour average concentration) is 7.3 ug/L. The observed MEC is greater than the water quality criteria and Effluent Limitations for lead are required.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for lead is required.

In accordance with Federal Regulations, 40 CFR 122.44, the Regional Board is required to establish an effluent limitation if a pollutant is measured in the effluent which presents a reasonable potential to exceed a water quality standard of objective. In accordance with the SIP, Section 1.3, since the maximum effluent concentration exceeded a water quality standard, an effluent limitation is required. California Water Code, section 13377, requires that:

“Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

15. The proposed Permit fails to contain an Effluent Limitation for nickel in violation of the California Toxics Rule, Federal Regulations (40 CFR 122.44), the California Water Code (CWC), Section 13377 and the State’s Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP).

The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR standards for nickel. The CTR includes hardness-dependent standards for the protection of both freshwater and saltwater aquatic life for nickel. The observed nickel MEC was detected in an effluent sample collected 9 June 2003 at a concentration of 15.6 ug/L. Using the worst-case ambient (lowest receiving water) measured hardness of (15 mg/L), the applicable continuous concentration (maximum four-day average concentration) is 10 ug/L and the applicable maximum concentration (maximum one-hour average concentration) is 94 ug/L. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for nickel are required.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for nickel is required.

In accordance with Federal Regulations, 40 CFR 122.44, the Regional Board is required to establish an effluent limitation if a pollutant is measured in the effluent which presents a

reasonable potential to exceed a water quality standard of objective. In accordance with the SIP, Section 1.3, since the maximum effluent concentration exceeded a water quality standard, an effluent limitation is required. California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

16. The proposed Permit fails to contain an Effluent Limitation for vanadium in violation of Federal Regulations (40 CFR 122.44) and the California Water Code (CWC), Section 13377.

Vanadium in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect the beneficial use of agricultural irrigation, and, therefore to violate the Basin Plan’s narrative toxicity objective. *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985), recommends that the vanadium concentration in waters used for agricultural irrigation not exceed 100 ug/L. Applying the Basin Plan “Policy for Application of Water Quality Objectives”, the numeric standard that implements the narrative objective is the Agricultural Water Quality Goal of 100 ug/L. The observed vanadium MEC was detected in a sample collected 9 June 2003 at a concentration of 229 ug/L. The recommended maximum concentration for protection of agricultural uses is 100 ug/L. The observed vanadium MEC is greater than the water quality standard; therefore, an Effluent Limitation for vanadium is required.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for vanadium is required.

In accordance with Federal Regulations, 40 CFR 122.44, the Regional Board is required to establish an effluent limitation if a pollutant is measured in the effluent which presents a reasonable potential to exceed a water quality standard of objective. California Water Code,

section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

17. The proposed Permit fails to contain an Effluent Limitation for zinc in violation of the California Toxics Rule, Federal Regulations (40 CFR 122.44), the California Water Code (CWC), Section 13377 and the State’s Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP).

The discharge has a reasonable potential to cause or contribute to an in-stream excursion above the NTR criteria for zinc. The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for zinc. The observed zinc MEC was detected in a sample collected 9 June 2003 at a concentration of 878 ug/L. The Fact Sheet to the proposed permit, at IV.C.3.xv, states that the MEC [maximum effluent concentration] for zinc was 12 ug/l. Even using the inappropriately limited data set indicated in the Fact Sheet, the MEC is 42 ug/l, from a sample collected 15 June 2011. Using the worst-case ambient (lowest receiving water) measured hardness of (15 mg/L), the applicable chronic criterion (maximum four-day average concentration) and the applicable acute criterion (maximum one-hour average concentration) are both 24 ug/L. The observed zinc MEC is greater than the water quality criteria; therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for zinc and Effluent Limitations for zinc are required.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for zinc is required.

In accordance with Federal Regulations, 40 CFR 122.44, the Regional Board is required to establish an effluent limitation if a pollutant is measured in the effluent which presents a reasonable potential to exceed a water quality standard of objective. In accordance with the SIP,

Section 1.3, since the maximum effluent concentration exceeded a water quality standard, an effluent limitation is required. California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

18. The proposed Permit fails to include mass limitations for pollutants as required by 40 CFR 122.46(f) and fails to include any limiting parameters based on the design of the wastewater treatment process.

The proposed Permit fails to include a flow limitation or mass limitations for individual pollutants. The proposed Permit cannot control the amount of pollutants discharged without flow or mass limitations. An antidegradation analysis is based on the amount of pollutants discharged to surface waters; without knowledge of either the flow or the mass of pollutants discharged an Antidegradation analysis could not have been conducted. The proposed Permit and accompanying Time Schedule Order (TSO) state that a passive treatment system was installed in November 2011. Any properly designed treatment system is based on flow and the loading rate of pollutants. The proposed Permit fails however to include any limitations for flow or mass of pollutants. The mass of pollutants would be based on the treatment systems design loading rate. The proposed Permit fails to include any discussion of the capability or design parameters for the passive treatment system. The proposed Permit also fails to contain any certification statement, by the registered design Civil Engineer, that the treatment system was designed to meet discharge limitations and is capable of achieving such.

19. The proposed Permit fails to include the requirements of the Basin Plan, *Implementation, Policy for Application of Water Quality Objectives* regarding additive Toxicity.

The proposed Permit regulates metals and the past Order (No. R5-2006-0058) shows a reasonable potential for numerous additional metals. The cited metals have a potential for exhibiting additive toxic effects. The Basin Plan, *Implementation, Policy for Application of Water Quality Objectives* requires that: “Where multiple toxic pollutants exist together in water, the potential for toxicologic interactions exists. On a case by case basis, the Regional Water Board will evaluate available receiving water and effluent data to determine whether there is a reasonable potential for interactive toxicity. Pollutants which are carcinogens or which manifest their toxic effects on the same organ systems or through similar mechanisms will generally be

considered to have potentially additive toxicity.” The proposed Permit fails to include any assessment of additive toxicity as is required by the Basin Plan.

20. The proposed permit contains an inadequate reasonable potential by using incorrect statistical multipliers as required by Federal regulations, 40 CFR § 122.44(d)(1)(ii).

Federal regulations, 40 CFR § 122.44(d)(1)(ii), state “when determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, **the variability of the pollutant or pollutant parameter in the effluent**, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water.” Emphasis added. The reasonable potential analysis fails to consider the statistical variability of data and laboratory analyses as explicitly required by the federal regulations. The procedures for computing variability are detailed in Chapter 3, pages 52-55, of USEPA’s *Technical Support Document For Water Quality-based Toxics Control*. The State and Regional Boards do not have the authority to override and ignore federal regulation. A statistical analysis results in a projected maximum effluent concentration (MEC) based on laboratory variability and the resulting MEC is greater than was obtained from the actual sampling data. The result of using statistical variability is that a greater number of constituents will have a reasonable potential to exceed water quality standards and therefore a permit will have a greater number of effluent limitations. The intentional act of ignoring the Federal regulation has a clear intent of limiting the number of regulated constituents in an NPDES permit. The fact that the SIP illegally ignores this fundamental requirement does not exempt the Regional Board from its obligation to consider statistical variability in compliance with federal regulations, especially for non-SIP regulated pollutants. The failure to utilize statistical variability results in significantly fewer Effluent Limitations that are necessary to protect the beneficial uses of receiving waters. The reasonable potential analyses are flawed and must be recalculated.

21. The proposed Permit fails to contain an Effluent Limitation for Settleable Solids (SS) in violation of Federal Regulations (40 CFR 122.44) and the California Water Code (CWC), Section 13377.

For inland surface waters, the Basin Plan states that “[w]ater shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.” Order No. R5-2006-0096 established an average monthly effluent limitation (AMEL) of 0.1 ml/L and a maximum daily effluent limitation (MDEL) of 0.2 ml/L for settleable solids to implement the Basin Plan’s narrative objective. Settleable solids were detected in four samples at concentrations ranging from 0.115 ml/L to 7.48 ml/L based on 34 samples. It is interesting that a settleable solids test would be capable of achieving a level of confidence to three significant figures. There is no information in the proposed Permit regarding the “new” treatment system capability or design parameters with regard to settleable solids, or any other individual pollutants.

“Settleable Solids settle to the stream bottom smothering bottom organisms, covering and destroying spawning beds, blanketing bacteria, fungi, and decomposing organic wastes and in general trapping and maintaining offensive and deleterious stream conditions. Deposits of solids interfere with recreation, navigation, fish and shellfish production, and destroy esthetic values of water.” (Water Quality Criteria, McKee and Wolf, Publication A3, State Water Resources Control Board)

Order No. R5-2006-0058 found that: “*Discolored sediments are visible in the streambed from the Magenta Drain Tunnel portal, through the length of the City of Grass Valley’s Veterans Memorial Park to a point where the stream has been diverted underground*” and established effluent limitations for settleable solids. The discharge has exceeded the limitations established as necessary to protect the beneficial uses of the receiving stream in Order no. R5-2006-0058.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis.

In accordance with Federal Regulations, 40 CFR 122.44, the Regional Board is required to establish an effluent limitation if a pollutant is measured in the effluent which presents a reasonable potential to exceed a water quality standard of objective. California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

22. The proposed Permit fails to contain an Effluent Limitation for thallium in violation of the California Toxics Rule, Federal Regulations (40 CFR 122.44), the California Water Code (CWC), Section 13377 and the State’s Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP).

Order No. R5-2006-0058 states that:

“The discharge has a reasonable potential to cause or contribute to an instream excursion above the NTR criteria for thallium. The NTR includes a thallium criterion of 1.7 ug/L for the protection of human health, based on a one-in-a-million cancer risk for waters from which both water and aquatic organisms are consumed. Thallium was detected in an effluent sample collected 9 June 2003 at a concentration of 361 ug/L. The observed MEC is greater than the water quality criteria; therefore, Effluent Limitations for thallium are required. Effluent Limitations for thallium are included in this Order and are based on the NTR criterion for the protection of human health.”

It must also be noted that thallium was detected in the mine drainage discharge on 7 January 2009 with a J-flaged value of 0.22 mg/l. OEHHA’s recommended public health goal in drinking water is 0.1 ug/l.

Empire Mine discharges mine drainage wastewater to surface waters. There are limited periods when high flow rates cause the mine drainage to be discolored and contain significantly increased concentrations of pollutants. There is nothing in the record of anything that has occurred during the life of the permit that would have resulted in a change in the character of the discharge; the “new” treatment system was not installed until November 2011 after the period used to conduct the reasonable potential analysis. In preparing the proposed Permit the Regional Board discarded these high concentration values without any technical or legal justification. The observed maximum effluent concentration (MEC) is greater than the water quality criteria; therefore, an Effluent Limitation for thallium is required.

In accordance with Federal Regulations, 40 CFR 122.44, the Regional Board is required to establish an effluent limitation if a pollutant is measured in the effluent which presents a reasonable potential to exceed a water quality standard of objective. In accordance with the SIP, Section 1.3, since the maximum effluent concentration exceeded a water quality standard, an effluent limitation is required. California Water Code, section 13377, requires that: “Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance.”

Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA.

- 23. The proposed Permit fails to acknowledge that the Discharger threatens to violate the Receiving Water Limitation for dissolved oxygen which is based on a Basin Plan Water Quality Objective and compliance is not required in “the shortest practicable time”.**

The proposed Permit, pages 11, 12 and 13, contains Effluent and Receiving Water Limitations for dissolved oxygen. The Effluent and Receiving Water Limitations are based on a Basin Plan water quality objective and are necessary for the protection of freshwater aquatic life. However the accompanying time schedule order TSO, Finding 6, states that:

“The Discharger installed a new passive treatment system that began operation in November 2011. Due to the nature of the passive treatment system, the Discharger anticipates that additional time is necessary for wetland vegetation and biogenic processes to become established and for the system to reach its design capacity for removal of arsenic, iron, manganese, and turbidity. Additionally, the Discharger indicated that the discharge may not be able to comply with the concentration-based effluent limitation for dissolved oxygen during the summer when the effluent flow is low and ambient heat could raise the temperature of the discharge within the conveyance pipe from the wetlands to the drainage channel, which could reduce the dissolved oxygen concentration. Therefore, the Discharger proposed a schedule to achieve compliance with the final effluent limitations for arsenic, dissolved oxygen, iron, manganese, and turbidity by 1 June 2015.”

Failure to comply with the limitations for dissolved oxygen threatens the aquatic life beneficial use of the receiving stream. Numerous wastewater treatment systems within the Central Valley have added reaeration facilities at the end of their treatment systems to provide additional dissolved oxygen. The nearby City of Grass Valley is a prime example of a wastewater treatment facility that has added reaeration facilities at the end of their treatment processes. Reaeration facilities may therefore be considered BPTC. There is no valid reason that a reaeration system could not be provided in period considerably shorter than the “requested” 3-years. The Discharger’s statement requesting a time schedule allowance discusses arsenic, iron, manganese, and turbidity with regard to the establishment of plants within the wetlands, yet fails to provide any such projected means of compliance for dissolved oxygen within the requested 3-year period.

U.S. EPA publication No. 440/5-86-001, *Quality Criteria 1986, Dissolved Oxygen*, Table 2 contains the following:

Dissolved Oxygen Concentrations (mg/L) Versus Quantitative Level of Effect.

1. Salmonid Waters

a. Embryo and Larval Stages

No Production Impairment = 11* (8)

Slight Production Impairment = 9* (6)

Moderate Production Impairment = 8* (5)

Severe Production Impairment = 7* (4)

Limit to Avoid Acute Mortality = 6* (3)

(* Note: These are water column concentrations recommended to achieve the required intergravel dissolved oxygen concentrations shown in parentheses. The 3 mg/L difference is discussed in the criteria document.)

b. Other Life Stages

No Production Impairment = 8
Light Production Impairment = 6
Moderate Production Impairment = 5
Severe Production Impairment = 4
Limit to Avoid Acute Mortality = 3

The Regional Board's Basin Plan requires that:

For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily dissolved oxygen (*DO*) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. The dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time:

Waters designated WARM 5.0 mg/l
Waters designated COLD 7.0 mg/l
Waters designated SPWN 7.0 mg/l

Failure to comply with the limitations for dissolved oxygen threatens the aquatic life beneficial use of the receiving stream. Note that both EPA's and the Basin Plan criteria for dissolved oxygen are instantaneous maximums. The cold water aquatic life beneficial use will be degraded by any allowance for a compliance time schedule. Any allowance for a compliance time schedule is unwarranted since reaeration can be effectively accomplished in a significantly shorter period of time.

Thank you for considering these comments. If you have questions or require clarification, please don't hesitate to contact us.

Sincerely,



Bill Jennings, Executive Director
California Sportfishing Protection Alliance