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Re: PROPOSED AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE
LAHONTAN REGION: PESTICIDE PROHIBITION WITH EXEMPTION CRITERIA

We are filing these comments on the proposed amendments to the Lahontan Basin Plan as private citizens, in the public interest. We have been reviewing government documents on the use of rotenone formulations to remove unwanted fish species from the waters of California, and many other parts of the country, for the past 16 years. We have reviewed much of the published and unpublished literature on the impacts of rotenone to non-target species. We have reviewed over the last 10 years many documents in the Lahontan Regional Water Quality Control Board (LRWQCB) files and have filed comments on the proposed project to poison most of the remaining parts of the Silver King Creek basin. We have also filed comments with the

Environmental Protection Agency (EPA) on the impacts of fish poisons on the non-target aquatic animal community (Erman and Erman, 2005, 2006, 2007).

Our detailed comments refer largely to the use of rotenone formulations to remove fish from aquatic systems. The more general comments apply also to other forms of government poison applications in and over water for such things as eliminating plants in water and for mosquito abatement, etc. The documentation supporting the statements we are making are found in LRWQCB and EPA files and are available from us upon request.

The proposed Lahontan Basin Plan change is an attempt by the staff of the LRWQCB to relinquish their responsibility for oversight of government poisoning projects using pesticides in and over water, to lower the standards of the Clean Water Act Antidegradation Policy, and to reduce or remove the role of the public members of the LRWQC Board in assessing government poisoning projects in the Lahontan region.

The changes define water poisoning by government agencies as in the public interest by definition. The draft revisions remove much of the regulatory authority and responsibility of the LRWQCB where government agencies are the parties seeking to poison water. They can remove the need for individual NPDES permits and give full authority to the Executive Officer to permit poisoning projects without going to the public Board and without holding public hearings to grant individual NPDES permits. As long as government agencies are doing the poisoning, for whatever reason, the LRWQCB staff will not make judgments about need for poisons or impacts of poisons. They will merely require that "monitoring" be conducted by the agencies before and after the completion of poisoning.

The U. S. Fish and Wildlife Service has been added to the list of government agencies who can now poison water in the Lahontan Basin. Private entities will also be allowed to apply poisons into and over water for a variety of reasons.

Perhaps the chief reason for the staff's proposed changes is to protect the LRWQCB and State Water Board from legal responsibility for the many failures and

misrepresentations that have occurred in poisoning projects conducted by the California Department of Fish and Game in the Lahontan region over the past 25 years. We suspect the staff foresees a significant increase in aquatic poison applications in the region in the future including poisoning in more visible and popular areas like Lake Tahoe, Fallen Leaf Lake, and other high mountain lakes and streams for a variety of reasons deemed essential by various agencies.

At present the LRWQCB is not enforcing the current requirements of the Basin Plan, and therefore of the Clean Water Act, where rotenone formulations are concerned, and so the easiest route for the staff is to just get rid of those requirements through redefinition. The intent of the proposed changes is to weaken the Basin Plan rather than to protect the aquatic resources and beneficial uses in the Lahontan Basin. We think they also violate the required standards of the Antidegradation Policy of the Clean Water Act.

It is unclear from the proposed revisions whether or not individual NPDES permits will be required in the future or whether a blanket permit will be given for all projects. It is not clear whether or not public hearings will be held or that the citizen Board will even be involved in future projects. One possibility listed in the policy changes suggests that the Executive Officer alone could grant permission for individual projects.

Rotenone projects in the Lahontan basin serve as a useful example of what to expect from future poisoning projects in the Lahontan basin when requirements are less strict than they are now, should these proposed changes be adopted.

The rotenone picture has changed significantly in the last few years. Many studies over the past 10 years have shown a connection between rotenone and Parkinson's disease. Two of the principle pesticides that will be used under this proposed revision of the Basin Plan are rotenone and the herbicide paraquat—both approved for use in California. Both pesticides are documented in laboratory studies as mitochondrial Complex I inhibitors that lead to Parkinson's Disease-like symptoms. Both pesticides have been shown in a recent study to be definitively associated with

Parkinson's Disease in humans. The authors concluded "The current study helps connect the dots between basic research and human populations." (Tanner and 19 others. 2011. Rotenone, paraquat and Parkinson's Disease. *Envir. Health Perspectives*, available at ehponline.org).

The EPA conducted a review of rotenone in 2006. Subsequently, the manufacturers of rotenone withdrew it for all terrestrial use (insect and/or invertebrate control) in the U.S., Canada, and the European Union. The Environmental Protection Agency (EPA) asked the companies that produce rotenone to submit evidence on the neurotoxic effects of rotenone on humans. The companies chose to withdraw from the market the products containing rotenone rather than supply the data. (EPA website: www.epa.gov/oppsrrd1/reregistration/rotenone Docket ID: EPA-HQ-OPP-2005-0494)

In 2009, the EPA banned rotenone for use in marine and estuarine habitats.

The only use of rotenone now is as a freshwater poison to kill unwanted fish. It is, as the revision has stated, a non-specific poison that also kills aquatic insects, other aquatic invertebrates, and amphibians at the same time it kills fish. As a consequence, rotenone poisoning disrupts aquatic and terrestrial food webs for many years and affects many other species. These effects have been acknowledged by the EPA (see Erman and Erman, Silver King Creek, Draft EIS/EIR Comments, 2009). These proposed amendments to the Basin Plan admit the immediate, the long-term, the many-years and the probably permanent impact of rotenone poisons on aquatic invertebrates (Chapter 4).

Once poison has been applied to water, monitoring of either the poison or the animal life, no matter how thorough, cannot change the impacts of the poison, of the mistakes that were made, of information that was not known, revealed, or understood, or of species that were lost. And, yet, the LRWQCB has refused to require inventories of non-target species prior to rotenone projects. The assurances that "monitoring" will be "robust" and "rigorous" mean little based on past staff actions (e.g., see NPDES permit for Silver King Creek rotenone poisoning, 2010).

Monitoring is not mitigation. The monitoring being conducted by the agencies can and has documented the losses of broad taxonomic groups of organisms that represent many species, but it cannot bring back species that are permanently lost through poisoning. Many of the stream basins in the Lahontan region are isolated and likely contain endemic invertebrate species that are present nowhere else. The following two sentences in the proposed revision have no meaning : “Biological monitoring will be designed and conducted as long as needed, to effectively demonstrate that non-target macroinvertebrate populations have been fully restored to pre-project assemblages. These data will help determine realistic timelines for species recovery after treatment with aquatic pesticides.” Species and populations of species that are lost through poisoning may never return to the stream or lake and may be permanently extinguished. No amount of monitoring will change that reality. There is no mitigation for extinguishing a species.

Even the above requirement is later revised in the proposed revisions to say that an agency can apply for release from the obligation to monitor after five years.

The statement is misleading in another way as well: the monitoring being done by government agencies is not precise enough to identify species. Adult forms of invertebrates are not collected or identified. The “metrics” being used by the agencies are too crude to determine what species or how many are lost through poisoning. The LRWQCB staff passes off its responsibilities by leaving monitoring designs up to proponents and outside peer reviews selected by proponents.

The Clean Water Act allows the lowering of water quality under specified times and circumstances, but if and only if, such lowering assures protection of beneficial uses fully.

The following example from the EPA Water Quality Handbook is key (2nd Edition, updated through 2009, Appendix G, Questions and Answers:

Antidegradation): The question is asked and answered:

“THE WATER QUALITY STANDARDS REGULATION STATES THAT ‘EXISTING USES AND THE LEVEL OF WATER QUALITY NECESSARY TO PROTECT THE

EXISTING USES SHALL BE MAINTAINED AND PROTECTED.' HOW FULLY AND AT WHAT LEVEL OF PROTECTION IS AN EXISTING USE TO BE PROTECTED IN ORDER TO SATISFY THE ABOVE REQUIREMENT?

NO activity is allowable under the antidegradation policy which would partially or completely eliminate any existing use whether or not that use is designated in a State's water quality standards. The aquatic protection use is a broad category requiring further explanation. **Species that are in the water body and which are consistent with the designated-use (i.e., not aberrational) must be protected, even if not prevalent in number or importance. Nor can activity be allowed which would render the species unfit for maintaining the use. Water quality should be such that it results in no mortality and no significant growth or reproductive impairment of resident species.** (See Question 16 for situation where an aberrant sensitive species may exist.) Any lowering of water quality below this full level of protection is not allowed. A State may develop subcategories of aquatic protection uses but cannot choose different levels of protection for like uses. The fact that sport or commercial fish are not present does not mean that the water may not be supporting an aquatic life protection function. An existing aquatic community composed entirely of invertebrates and plants, such as may be found in a pristine alpine tributary stream, should still be protected whether or not such a stream supports a fishery. Even though the shorthand expression "fishable/swimmable" is often used, the actual objective of the act is to "restore and maintain the chemical, physical, and biological integrity of our Nation's waters (Section 101(a)(1). The term "aquatic life" would more accurately reflect the protection of the aquatic community that was intended in Section 101(a)(2) of the Act." (Emphasis added in bold).

The Department of Fish and Game (CDFG) has recently begun using a new rotenone formulation of rotenone called CFT Legumine. It was used for the first time in California in the 2007 poisoning of the Lake Davis and the surrounding streams and springs. It did not perform as expected. The CDFG was unable to apply the rotenone in CFT Legumine at target levels. Levels were far above the target levels (> 1000% above target levels at some stations in the first poisoning), and high concentrations were even more common in the second poisoning than in the first. These results indicate the inability of CDFG to deliver, under field conditions, the poison rotenone in CFT Legumine at designed concentrations (see Erman and Erman, 2010, Comments on Draft

NPDES permit, Silver King Creek; Erman and Erman, 2010, Comments on Final EIR/EIS Silver King Creek). Based on the Lake Davis watershed results, we think it highly likely that the Agencies will exceed the EPA/FIFRA label requirement for normal use of 50 μ g/L in Silver King Creek if this project is allowed.

The proposed new language in the basin plan eliminates monitoring of pesticide application during the treatment phase of a project. In so doing, the Regional Board staff eliminates any means of verifying pesticide label restrictions for maximum allowed rates of application.

Independent monitoring of rotenone projects is essential. The Department of Fish and Game (CDFG) has a poor record of compliance. In the Lahontan Region alone, 6 of 11 rotenone projects between 1988 and 1994 violated water quality standards. Rotenone, rotenolone, or naphthalene were detected downstream or persisted longer than limits established in the basin plan (LRWQCB files).

CFT Legumine contains 5% rotenone and 5% other cube resins (primarily deguelin and tephrosin) as active ingredients. Cube resins have not been analyzed and it is unknown if they are neutralized by potassium permanganate (verbal testimony by Bruce Warden, LRWQCB staff, April 14, 2010, NPDES hearing). Breakdown of deguelin and tephrosin, unlike rotenone, does not produce rotenolone (Caboni et al. 2004). Therefore, monitoring of either rotenone or rotenolone will not account for other cube resins in the active ingredients. Deguelin also has been shown in laboratory tests to elicit the same Parkinson's Disease-like changes in cells as rotenone (Caboni et al. 2004).

In other words, half of the active ingredients in CFT Legumine have not been analyzed or considered in any government document. We notice the same omission has appeared again in this proposed document (p. 4 pp 4.9-2125). It is assumed that the only active ingredient in rotenone formulations is rotenone. That is false. The statement is correct, however, in stating that many other chemicals are in the formulations. But the revision has omitted the information that some of these so-called "inert" chemicals are known carcinogens, or have other deleterious properties.

For example, N-methyl pyrrolidone (NMP) is 10% of the composition of CFT Legumine (i.e., twice the amount of rotenone). NMP is considered a Substance of Very High Concern by the European Union authorities and is on the candidate list for banning as of February 2011. The concern is over its toxicity to reproduction—teratogenic in children. (wiki.answers.com/Q/Will_N-methyl_pyrrolidone_be_banned_in_Europe). The California Department of Health Services issued a Health Hazard Advisory in October 2006 to workers exposed to NMP. "You should treat NMP as a potential human reproductive hazard".(www.cdph.ca.gov/programs/hesis/Documents/nmp.pdf)

There often is a delay in officially recognizing harm in chemicals used in our environment. In the case of rotenone, NMP and others, the evidence is accumulating about their harm. One of the reasons we enacted a Clean Water Act was so that we do not pollute our water systems and then find out later it was a mistake.

Rotenone persisted in the bottom sediments of Lake Davis for at least six months following the 2007 poisoning. Rotenone was measured in stream water 14 days after it had been applied. It had apparently persisted in bottom sediments and was being released back into the stream. These results indicate that CFT Legumine behaves in some unexplained and unknown ways. It is unknown if rotenone persisted in streams longer than this measured period. Monitoring was apparently not conducted beyond two weeks in streams (Erman and Erman, Comments on Draft NPDES permit, Silver King Creek, 2010).

The persistence of rotenone in stream sediments and ground water is a significant environmental concern that has not been analyzed by the LRWQCB. Hyporheic invertebrate life will be affected by the residual rotenone in the substrate. Ground water should also be monitored. The Agencies are assuming that hyporheic invertebrates will re-populate streams that are poisoned (Silver King Creek, Final EIS/EIR p. 5.1-45; 5.1-19; Response to Comments, pp. F-50, F-80). They seem to assume that the rotenone in bottom sediments will not affect these invertebrates. (Incidentally, even assuming they would not also be poisoned, these would only be the hyporheic invertebrates in the upper part of stream bottom sediments. Invertebrates lower in the

hyporheos are restricted to that habitat.) But the LRWQCB did not consider the effects of rotenone in the stream sediments and hyporheos in the NPDES permit issued in 2010 for poisoning Silver King Creek.

If the lower Silver King Creek rotenone project is carried out, rotenone concentrations in the stream water will be 2 to 4.6 times the mean concentration that was measured in the 1991–93 poisoning of the upper part of Silver King Creek. It is likely that even greater losses of invertebrate life will occur than did as a result of the 1991–93 poisoning. (Incidentally, this proposed revision gives the false impression that fish poisoning was conducted for only one year the last time on Silver King Creek. In fact, the poisoning was done twice a year for three consecutive years. The 2010 NPDES permit allows poisoning for the same duration.)

We note that all of the wording on the problems the CDFG has of applying potassium permanganate (another poison that kills aquatic animal life) to neutralize rotenone has been eliminated in the revisions, thus omitting the information that fish kills from potassium permanganate have occurred far below project boundaries in past poisoning episodes in the Lahontan Region.

The proposed revision to the Basin Plan ignores or incompletely or incorrectly states the provisions of the Clean Water Act Antidegradation Policy.

For example, new LRWQCB staff language in Exemption Criteria for Aquatic Pesticide Use, Purpose and Need for Exemption, paragraph 4, summarizes and re-words the federal Antidegradation Policy as "...that water quality shall be preserved unless it is determined that the lowering of water quality is necessary to accommodate important economic or social development. Additionally, it requires that water quality be maintained at levels capable of supporting existing beneficial uses." This last sentence changes the wording and meaning of the Antidegradation Policy which is, "In allowing such degradation or lower water quality, the State shall **assure water quality adequate to protect existing uses fully (40 CFR 131.12(a)(2)).**" (Our emphasis added).

The LRWQCB staff is using their creative interpretation of the Policy to claim that after water has been poisoned, even if species have been lost and the biological community has been altered, the water is still **capable** of supporting species once the poison is gone and, therefore, the staff maintains the revised plan is in compliance with the Antidegradation Policy.

The Antidegradation Policy says that the beneficial uses themselves must be fully protected in any project that proposes lowering of water quality “necessary to accommodate important economic or social development.” This distinction between the two components: 1) lowering of water quality under certain circumstances and 2) fully protecting beneficial uses if water quality is lowered, is fundamental to the Antidegradation Policy. The latest version of the EPA Water Quality Handbook (Section 4, 2nd Edition, last updated on 11/06/2009) provides ample discussion of these two distinct components.

Elsewhere, in Chapter 4, the proposed revision states that “Similarly, the federal Antidegradation Policy (40 CFR Section 131.12) dictates that water quality shall be preserved unless degradation is necessary to accommodate important economic or social development.” The section quoted conveniently leaves out the next sentence (40 CFR Section 131.12(2)) of the policy, which is “In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully.”

The state and LRWQCB are not at liberty to rewrite the Clean Water Act or change the plain meaning of the words used to define the regulations except “States may adopt antidegradation statements more protective than the Federal requirement.” (EPA Water Quality Handbook, 2nd Edition, Section 4.3)

It is also not at the discretion of a regional board to decide to vacate portions of the Clean Water Act Antidegradation Policy in favor of other acts of the state or federal government unless such acts so dictate. The Endangered Species Act, for example, does not specify what methods are necessary to carry out its provisions or claim superiority

over the Clean Water Act. The purpose of the Regional Boards (among other things) is to implement the provisions of the Clean Water Act and Porter-Cologne Act.

In section 4.4.2 of the Water Quality Handbook, the meaning of protection of beneficial uses is expanded.

“No activity is allowable under the antidegradation policy which would partially or completely eliminate any existing use whether or not that use is designated in a State’s water quality standards. The aquatic protection use is a broad category requiring further explanation. Non-aberrational resident species must be protected, even if not prevalent in number or importance. Water quality should be such that it results in no mortality and no significant growth or reproductive impairment of resident species.”

The intent of allowing lowering of water quality while fully protecting existing uses was reviewed and further explained in the Preamble by the EPA during the last revisions of rules for the Clean Water Act: “In Sec. 131.12(a)(2) a phrase was added that ‘In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully’. This means that the full use must continue to exist even if some change in water quality may be permitted” (Federal Register Vol 48, No. 217, Tuesday, November 8, 1983/ Rules and Regulations. (51402).

“In its entirety, the antidegradation policy represents a three-tiered approach to maintaining and protecting various levels of water quality and uses. At its base (Section 131.12(a)(1): all existing uses and the level of water quality necessary to protect those uses must be maintained and protected. This provision establishes the absolute floor of water quality in all waters of the United States” (Federal Register Vol 48, No. 217, Tuesday, November 8, 1983/ Rules and Regulations. (51402).

Further, in response to comments not discussed in the Preamble to the proposed rule, EPA discussed three options for changes in the existing antidegradation policy. “Option 3 would have allowed changes in an existing use if maintaining that use would effectively prevent any future growth in the community or if the benefits of maintaining

the use do not bear a reasonable relationship to the costs.” EPA response was “...commenters believed that allowances should be made for carefully defined exceptions to the absolute requirement that uses attained must be maintained. EPA rejects this contention as being totally inconsistent with the spirit and intent of both the Clean Water Act and the underlying philosophy of the antidegradation policy.” (Federal Register Vol 48, No. 217, Tuesday, November 8, 1983 / Rules and Regulations (51409))

The proposed new language on fisheries management recognizes the violation of Antidegradation Policy (Draft Waste Discharge Prohibition and Exemption Criteria Language: Pesticide Basin Plan Amendment, p. 4): “*It is not appropriate or possible for the Regional Board to find that discharges within the zone of impact comply with federal and state antidegradation policies.*” Not only is the use of rotenone formulations at odds with the policies during the period of treatment, the Regional Board acknowledges (Chapter 4, p. 4.9-21–25 revised Plan) such use has long-term and permanent adverse effects on aquatic invertebrates and frogs – beneficial uses protected by the state. The staff’s justification for approving such a project anyway, is that the purpose of the project is of value to the people of the State.

What the Regional Board staff is doing by these proposed revisions is to eliminate the elements of the Antidegradation Policy that fully protect beneficial uses when government agencies, and some private entities, claim they need to lower water quality through use of aquatic pesticides. They have chosen to focus on the aspect of the Federal policy that allows, under limited circumstances, the lowering of water quality, while ignoring or redefining the simultaneous requirement of fully protecting resident aquatic life.

In conclusion, these proposed revisions by the staff of the Lahontan Basin Plan seem to reduce the responsibility and liability of the LRWQCB for all poison applications in the basin by public agencies and to permit an increase in poisoning by private agencies. The public will have to decide whether it serves the purposes of protecting health, safety and the environment, as claimed

repeatedly in this staff document, to spray or pour an increasing amount of poison over or into water for an ever-expanding variety of reasons, under the banner of “in the public interest.” We urge the Regional Board to deny these suggested revisions to the Lahontan Basin Plan.