

1 LAW OFFICES OF DAVID YOUNG
 2 David Young, SBN 55341
 3 11845 W. Olympic Boulevard, Suite 1110
 4 Los Angeles, CA 90064
 Telephone: (310) 575-0308
 Facsimile: (310) 575-0311
 Email: dyounglaw@verizon.net

5 *Attorney for Plaintiffs/Petitioners*

6 JAMES L. BUCHAL (SBN 258128)
 7 MURPHY & BUCHAL LLP
 8 3425 SE Yamhill Street, Suite 100
 Portland, OR 97214
 Telephone: (503) 227-1011
 Facsimile: (503) 573-1939

9 *Attorney for Plaintiffs The New 49'ers Inc. et al.*

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 12 SUPERIOR COURT OF THE STATE OF CALIFORNIA
 13 FOR THE COUNTY OF SAN BERNARDINO

<p>14 Coordination Proceeding 15 Special Title (Rule 1550(b))</p> <p>16 SUCTION DREDGE MINING CASES</p>	<p>Judicial Council Proceeding No. JCPDS 4720</p> <p>REPLY DECLARATION OF CLAUDIA J. WISE IN SUPPORT OF MINERS' JOINT MOTION FOR INJUNCTION AGAINST DEFENDANTS</p> <p>Judge: Hon. Gilbert G. Ochoa Dept.: S36 Date: June 23, 2015 Time: 8:30 a.m.</p>
<p>24 Related Actions:</p> <p>25 <i>Karuk Tribe of California, et al. v. California</i> 26 <i>Department of Fish and Game</i></p> <p>27 <i>Hillman, et al. v. California Department of</i> 28 <i>Fish and Game</i></p>	<p>RG 05211597 – Alameda County</p> <p>RG 09434444 – Alameda County</p>

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Karuk Tribe of California, et al. v. California Department of Fish and Game

RG 1263796 – Alameda County

Kimble, et al. v. Kamala Harris, Attorney General of California, et al.

CIVDS 1012922 – San Bernardino County

Public Lands for the People, et al. v. California Department of Fish & Game, et al.

CIVDS 1203849 – San Bernardino County

The New 49'ers, et al. v. State of California; California Department of Fish and Game, et al.

SCCVCV 120048 – Siskiyou County

Foley, et al. v. State of California; California Department of Fish and Wildlife, et al.

SCSCCV 13-00804 – Siskiyou County

Walker v. Harris, et al.

34-2013-80001439 – Sacramento County

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Claudia J. Wise declares:

1. I make this Declaration in further support of the Miners’ request for an injunction in this action, and specifically to provide additional information on the issue of mercury as it relates to suction dredging.

2. In response to Dr. Monahan’s testimony that it is a “myth” that mercury hotspots are not generally prevalent throughout California (Monahan Decl. at 5), there is no reason to believe that Dr. Monahan has any knowledge concerning this issue. I am not aware of any study the purpose of which was to locate hotspots of mercury throughout the State of California, whether or not associated with suction dredge mining areas.

3. In fact, suction dredge miners are the only persons qualified to testify that mercury hotspots are not generally prevalent throughout California, based on extensive experience sampling California waterways. I have experience and expertise both through such direct sampling, and discussions with other miners in the field, and note that few miners report seeing any significant quantity of mercury sufficient to constitute a “hot spot”—that being an area with pools of mercury that will continue to leach into the environment. Most miners report only observing gold amalgamated (stuck to) to very small quantities of mercury, if any.

4. An important suction dredge study (Prussia *et al* 1999), commissioned by the USEPA, looked at cumulative mercury values using an 8 and 10-inch dredge, actually operating in a flowing river. This study should dispel misconceptions concerning the disturbance of mercury hotspots by dredgers. The operator in that study reported observing deposits of liquid mercury within the sediments he was working. This study utilized an extensive sampling grid pattern around the operating dredge, as set forth in this illustration from the study:

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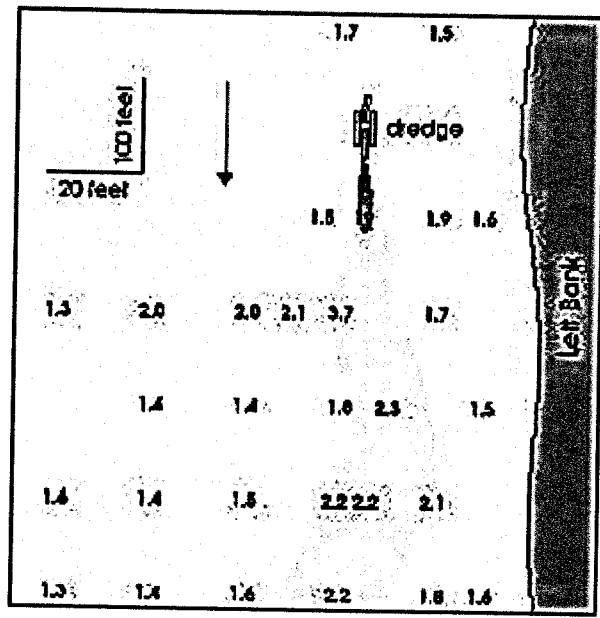


Figure 2. Results of turbidity survey behind an operating 10-inch suction dredge (site #1 on fig. 1). All numbers shown are in NTU, or nephelometric turbidity units; the standard unit of turbidity. The right bank of the river is off the edge of the figure. The approximate shape of the plume is shown in gray. Note that the figure is exaggerated 5x horizontally, so the plume is actually much narrower than it appears in the figure. To comply with State regulations, dredges may not increase the turbidity of the river by more than 5 NTU, 500 feet behind the dredge.

13 5. The analysis produced values of dissolved mercury that were actually greater
 14 upstream of the dredge, suggesting that any effect of the dredge was likely within the range of
 15 natural variation. This is the most relevant piece of scientific evidence addressing dredging at
 16 intensity beyond that typically experienced in California.

17 6. There should be no dispute that mercury continues to move down waterways by
 18 natural mechanism, as seen by Humphreys, 2005 and Singer *et al.* 2013. For this reason, it
 19 remains obvious that removing 98 percent of the mercury (Humphreys 2005), if located, will
 20 significantly reduce the amount of mercury making its way downstream to areas where
 21 methylation would occur more readily creating a net benefit to the environment.

22
 23 Humphreys, R. 2005. Mercury Losses and Recovery, During a Suction Dredge Test in
 the South Fork of the American River. In House Report, California Water Board.

24 Prussian, A. M., Royer, T. V., and G. W. Minshall. 1999. Impact of suction dredging on
 25 water quality, benthic habitat, and biota in the Fortymile River and Resurrection Creek, Alaska.
 Final Report. For the U. S. Environmental Protection Agency, Region 10, Seattle, WA. 72pp.

26 Singer, M.B., Aalto, R., James, L.A., Kilham, N.E., Higson, J.L., Ghoshal, S., 2013,
 27 Enduring legacy of a toxic fan via episodic redistribution of California gold mining debris:
 Proceedings of the National Academy of Science of the United States of America, v. 110, i. 46,
 28 p. 18436–18441, doi: 10.1073/pnas.1302295110.

1 <http://www.pnas.org/content/110/46/18436.full>

2 7. It remains true that mercury releases from suction dredging, if any, would not
3 present appreciable harm to human health effects because most fish contain more selenium than
4 mercury and selenium is protective of the health of all living organisms including humans and
5 wildlife. Eating fish containing mercury of any form including methylmercury (Ganther et
6 al.1973) is not harmful if the selenium to mercury molar ratio is greater than 1:1 (Parizek 1978;
7 Peterson et al 2009).

8
9 8. Dr. Monahan's attacking of the "myth" that "all fish contain more selenium than
10 mercury" (Monahan Decl. at 9) sets up a "straw man" argument. There are some fish for which
11 this statement is not true, but they are not relevant to the dispute before this Court. This Court is
12 concerned with California fish and California conditions. Peterson *et al.* 2009, found 100% of
13 fish tissue sampled across California to have adequate selenium to be protective.

14 9. The Water Board's report, Contaminants in Fish from California Rivers and
15 Streams, 2011 (released in 2013 and available at
16 http://www.waterboards.ca.gov/water_issues/programs/swamp/rivers_study.shtml, also
17 concludes that "[r]iver and stream locations outside of the Delta region all had low or moderate
18 methylmercury contaminations". (Report at 2.)

19 10. With regard to those reservoirs and lakes identified by Ms. Monohan as
20 containing particularly high levels of mercury, it should be noted that under the 1994
21 regulations (§ 228(d)), no suction dredging was allowed within any lakes or reservoirs without
22 special, additional permits, so the relief sought by the miners herein would not involve such
23 areas. The same is true of most other areas where the California Office of Environmental Health
24 Hazard Assessment (OEHHA) has issued fish consumption advisories for Sierra waterways
25 (OEHHA, 2009).

1 11. These advisories do not take into account selenium levels, and if based on sound
2 science would take account of the Selenium Health Benefit Value (Se-HBV) that takes the
3 protective role of selenium into account before issuing warnings.

4 12. Many mercury toxicologists are not up to date on the current science relative to
5 recognizing the benefits of selenium in the food chain. Long ago, at the USEPA, we stopped
6 determining cause and effect based on a single test species or single chemical, in a lab or
7 greenhouse, because we recognized the complex interactions that were occurring in the natural
8 environment. The same is true with mercury interactions in a lab that cannot take into account
9 environmental interactions or sloppy sampling in the field that only analyzes for a single
10 chemical. Other natural chemical constituents present in a waterway will affect the end result. If
11 you do not look at the whole ecosystem you will miss what may really be going on. This is
12 absolutely true with mercury and selenium antagonism.

13 13. In mercury-contaminated areas fish are taking in mercury but also other
14 constituents such as selenium, which is an extremely good antioxidant that is sequestered to
15 mercury. This chemical interaction is a major game changer. Measuring only mercury
16 eliminates any chances of one getting to the correct answer of how this affects the food chain and
17 those eating the fish.

18 14. Understanding of the science of mercury:selenium interaction within the food
19 chain continues to move forward. Over the last 40 plus years of researching the antagonistic
20 reaction between mercury and selenium scientists have changed from believing the bond
21 between mercury and selenium protected living biota from mercury toxicity. Today the
22 researchers believe the harm is not due to mercury toxicity at all. Current scientific thought is
23 that mercury binds with selenium causing a lack of bioavailability of selenium which living
24 bodies require for selenoenzyme processes.

25 15. Sormo (2011) researched the question of “whether or not toxic effects accompany
26 exposure to Hg depends upon the tissue Se:Hg molar ratio of the organism... Selenium has a
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1 prominent protective effect against mercury toxicity. Measuring mercury in animals may
2 therefore provide an inadequate reflection of the potential health risks to humans and wildlife if
3 the protective effects of selenium are not considered.”

4 16. More recently, Ralston *et al.* (2012), found that “Selenoenzymes are required to
5 prevent and reverse oxidative damage in the brain and neuroendocrine system, but these enzymes
6 are vulnerable to irreversible inhibition by methylmercury (MeHg). Selenoenzyme inhibition
7 appears likely to cause most if not all of the pathological effects of mercury toxicity.” According
8 to Ralston (2004), “nutritionally relevant amounts of selenium can replace the selenium
9 sequestered by methylmercury (MeHg) and maintain normal selenoenzyme activities, thus
10 preventing oxidative brain damage and other adverse consequences of MeHg toxicity.”

11 17. Dr. Monohan’s reference to a lack of significant epidemiological studies proving
12 selenium rich diets counter the negative health effects of eating mercury-contaminated fish is far
13 from correct. Many studies have been completed, but care must be used in their interpretation.
14 Ralston (2008), reviewed a large group of studies with varying results concerning effects of
15 maternal methylmercury (MeHg) exposure from fish consumption on child developmental
16 outcomes in population groups from New Zealand (Crump *et al.*, 1998), Faroe Islands
17 (Grandjean *et al.*, 1997), Seychelle Islands (Myers *et al.*, 1998, 2000), United Kingdom (Hibbeln
18 *et al.*, 2007), United States (Lederman *et al.*, 2008), and most recently, Denmark (Oken *et al.*,
19 2008).

20 18. Evidence from these epidemiological studies have variously reported clinically
21 relevant harmful effects on child health outcomes (New Zealand, Faroes), no harmful effects on
22 child outcomes (Seychelles, United Kingdom, United States, Denmark), or substantial beneficial
23 effects on child neurodevelopment and IQ (United Kingdom, United States, Denmark).”

24 19. To compare these studies, a selenium Human Benefit Value (SE-HBV) was
25 incorporated. The Se-HBV incorporates consideration of both the absolute and the relative
26 amounts of selenium and mercury in the diet to provide an index that is easily interpreted.
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1 20. Seafood consumed in the New Zealand and Faroe Island studies had greater
2 methylmercury to selenium content (shark meat, pilot whale) and thus a negative Se-HBV value
3 in the harmful range. While the Seychelle Islands population consumed on average 12 fish
4 meals per week, no harmful outcome to children tracked prenatal to 9 years old; because the Se-
5 HBV of the MeHg source was in the beneficial range instead of the harmful range. Therefore,
6 benefits instead of harms would have been expected.

7
8 21. In the United States, United Kingdom and Denmark they all eat seafood similar to
9 that available in the United States and achieve higher IQ results to show for it. Ralston found
10 that maternal seafood consumption (and greater methylmercury (MeHg) exposure) was
11 associated with improved child outcomes. Again this was because the Se-HBV of the
12 methylmercury (MeHg) source was in the beneficial instead of the harmful range. It is thus
13 apparent that instead of being avoided, ocean fish consumption should be encouraged during
14 pregnancy.

15 22. Ralston has also looked at freshwater fish data throughout the United States, 98
16 percent of which had beneficial selenium to mercury ratios. California sportfish have beneficial
17 selenium to mercury values (personal communication with Ralston 2015). Thus instead of being
18 avoided, freshwater fish consumption should be encouraged during pregnancy. It is a health
19 benefit for pregnant women to eat 2-3 fish meals per week.

20 23. Not only is the protection provided by selenium not controversial, it has been used
21 by the federal government in public relations campaigns to overcome irrational prejudices
22 against eating fish. For example, a selenium and mercury fact sheet prepared to promote public
23 awareness by the National Oceanic and Atmospheric Administration of the U.S. Department of
24 Commerce is available at <http://www.undeerc.org/fish/pdfs/Selenium-Mercury.pdf>

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Book: Methylmercury and Neurotoxicity

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I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on June 17, 2015.

Claudia J. Wise

Claudia J. Wise

1
2 PROOF OF SERVICE

3 I, Carole Caldwell, hereby declare under penalty of perjury under the laws of the State of
4 California that the following facts are true and correct:

5 I am a citizen of the United States, over the age of 18 years, and not a party to or
6 interested in the within entitled cause. I am an employee of Murphy & Buchal, LLP and my
business address is 3425 SE Yamhill Street, Suite 100, Portland, Oregon 97214.

7 On June 17, 2015, I caused the following document to be served:

8 REPLY DECLARATION OF CLAUDIA J. WISE IN SUPPORT OF MINERS' JOINT
9 MOTION FOR INJUNCTION AGAINST DEFENDANTS

10 by transmitting a true copy in the following manner on the parties listed below:

11 Honorable Gilbert Ochoa
12 Superior Court of California
13 County of San Bernardino
14 San Bernardino Justice Center
247 West 3rd Street
San Bernardino, CA 92415-0210
Via U.S. Mail

Chair, Judicial Council of California
Administrative Office of the Courts
Attn: Court Programs and Services Division
(Civil Case Coordination)
455 Golden Gate Avenue
San Francisco, CA 94102
Via U.S. Mail

15 Bradley Solomon
16 Deputy Attorney General
17 455 Golden Gate Avenue, Suite 11000
18 San Francisco, CA 94102-7004
E-mail: Bradley.Solomon@doj.ca.gov
Via E-mail

Marc Melnick
Office of the Attorney General
1515 Clay Street, Suite 2000
Oakland, CA 94612
E-mail: Marc.Melnick@doj.ca.gov
Via E-mail

19 John Mattox
20 Department of Fish & Game
21 1416 Ninth Street, 12th Floor
22 Sacramento, CA 95814
E-mail: jmattox@dfg.ca.gov
Via E-mail

James R. Wheaton
Environmental Law Foundation
1736 Franklin Street, 9th Floor
Oakland, CA 94612
E-mail: wheaton@envirolaw.org
E-mail: elfservice@envirolaw.org
Via E-mail

23 Glen Spain
24 Pacific Coast Federation of Fisherman's
25 Association
26 Southwest Regional Office
P.O Box 11170
Eugene, OR 97440
27 E-mail: fishlifr@aol.com
28 *Via E-mail*

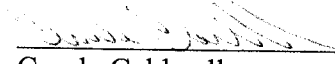
Jonathan Evans
1212 Broadway, Suite 800
Oakland, CA 94612
E-mail: jevans@biologicaldiversity.org
Via E-mail & U.S. Mail

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E. Robert Wright
Friends of the River
1418 20th St., Suite 100
Sacramento, CA 95811
E-mail: bwright@friendsoftheriver.org
Via E-mail

Lynne R. Saxton
Saxton & Associates
912 Cole Street, #140
San Francisco, CA 94117
E-mail: lynne@saxtonlegal.com
Via E-mail

Keith Robert Walker
9646 Mormon Creek Road
Sonora, CA 95370
Via U.S. Mail



Carole Caldwell
Declarant