February 28, 2012

Attn: Jane Farwell
Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000
wrhearing@waterboards.ca.gov

VIA EMAIL

Re: Cachuma Project Hearing

Dear Ms. Farwell:

In accordance with the January 23, 2012 Hearing Notice, the Environmental Defense Center, on behalf of California Trout ("CalTrout"), submits the following information regarding its participation at the proceedings noticed for March 29-30, 2012:

1. CalTrout plans to call the following rebuttal witnesses to testify at the hearing –

   - Dr. William Trush
   - Ms. Heather Cooley

   An outline the witnesses' planned testimony is enclosed, along with evidence of qualifications for each witness.

2. Caltrout intends to participate in cross examining the State Water Board's witnesses identified in the Hearing Notice.

In addition, CalTrout requests that the parties be allowed to submit a supplemental closing brief following the March 29-30 proceedings. The August 13, 2003 Hearing Notice provides that the hearing officer will set a schedule for filing briefs or closing statements "[a]t the close of the hearing or at other times if appropriate."[1] It is

[1] August 13, 2003 Notice of Field Orientation Tour and Supplemental Notice of Phase 2 of Public Hearing. Enclosure 1 at 6. See also, CCR Title 23 § 648.5(d) ("After conclusion of the presentation of evidence, all parties appearing at the hearing may be allowed to present a closing statement.")

appropriate to provide an additional opportunity to submit supplemental closing briefs to address how information in the FEIR relates to our case-in-chief.

Sincerely,

Karen M. Kraus
Staff Attorney

Enclosures

CALTROUT – REBUTTAL TESTIMONY

Heather Cooley: Outline of Rebuttal Testimony

Prepared on behalf of CalTrout for
State Water Resources Control Board Cachuma Project Hearing
February 2012

Ms. Heather Cooley is expected to respond to the following topics regarding the Cachuma Project Final Environmental Impact Report ("FEIR") in rebuttal testimony on behalf of CalTrout:

1. The FEIR overestimates future demand and potential shortages under the proposed alternatives, including:

    a. Water demand projections used in the FEIR are based on outdated estimates and ignore more recent water demand projections supplied by the water contractors, including in their 2010 Urban Water Management Plans.

    b. Demand projections in the FEIR fail to integrate mandated water conservation and efficiency improvements, particularly a requirement to reduce per capita demand by 20% by 2020.

        i. Water contractors' current and projected (2020) per capita demand estimates for compliance with SBx7-7.

2. The FEIR does not include cost-effective urban conservation potential available to water contractors, including:

    a. The FEIR improperly disregards that, at least, 5,000 to 7,000 acre-feet of water could be conserved by Cachuma contractors, cost-effectively.

    b. Technological improvements since 2003 indicate that conservation potential could exceed 5,000 to 7,000 acre-feet.

    c. Improved rate structures could capture water conservation and efficiency potential, and the FEIR wrongly concludes that each of the water contractor's water rates provides a strong incentive to conserve.

3. The FEIR does not consider the availability of water through alternative supplies.

    a. For example, recycled water, rainwater harvesting, and stormwater capture are additional sources of water supply that have not been implemented, or could be further implemented, to reduce or eliminate the need for Santa Ynez River water.

4. The FEIR does not consider the potential for reducing agricultural water use.

    a. A 2009 Pacific Institute analysis estimates that there are a variety of technologies and practices that can reduce water requirements for agriculture.

    b. Recycled water can also be used to meet agricultural water demand.

Attachment: Heather Cooley Statement of Qualifications

PACIFIC INSTITUTE

HEATHER COOLEY

Email: hcooley@pacinst.org
Phone: (510) 251- 1600
Fax: (510) 251 - 2203
Address: 654 13th St.
Oakland, CA 94612

EDUCATION

University of California – Berkeley *May 2004*
M.S., Energy and Resources

University of California – Berkeley *May 1998*
B.S., Molecular and Environmental Biology, emphasis in ecology

PROFESSIONAL EXPERIENCE

Pacific Institute, Oakland, CA *November 2004 – present*
Water Program Co-Director

Lawrence Berkeley National Laboratory, Berkeley, CA *October 2000 – September 2004*
Research Associate & Lab Manager

University of California – Berkeley, Berkeley, CA *January 2001 – June 2001*
Teaching Assistant

Pesticide Action Network North America, San Francisco, CA *January 2001 – June 2001*
Cartographer and Database Assistant

Mountain Trail Outdoor School, Hendersonville, NC *February 2000 – June 2000*
Outdoor/Environmental Educator

Silver Lab, University of California - Berkeley, Berkeley, CA and Puerto Rico *June 1998 – December 1999*
Field/Laboratory Technician

Weston Lab, University of California - Berkeley, Berkeley, CA *October 1996 – September 1997*
Field/Laboratory Assistant

SELECT RESEARCH PAPERS AND PUBLICATIONS

- Cooley, H., Christian-Smith, J., Cohen, M., Gleick, P.H., and Heberger, M. *California's Next Million Acre-Feet: Saving Water, Energy, and Money.* Pacific Institute: Oakland, CA. August 2010.
- Cooley, H., J. Christian-Smith, P.H. Gleick, L. Allen, and M. Cohen. 2009. Understanding and Reducing the Risks of Climate Change for Transboundary Waters. United Nations Environment Programme.
- Cooley, H. 2008. Adapting Water Resource Management to a Changing Climate. In Gleick, P.H. et al. The World's Water 2008-2009: The Biennial Report on Freshwater Resources.
- Cooley, H. 2006. Floods and Droughts. In Gleick, P.H., H. Cooley, D. Katz, E. Lee, J. Morrison, M. Palaniappan, A. Samulon, and G.H. Wolff. The World's Water 2006-2007: The Biennial Report on Freshwater Resources.
- Cooley, H., P.H. Gleick, G. Wolff. 2006. Desalination, With a Grain of Salt: A California Perspective. Pacific Institute for Studies in Development, Environment, and Security. Oakland, California.
- Palaniappan, M., H. Cooley, P. Gleick, and G. Wolff. 2006. Assessing the long-term outlook for current business models in the construction and provision of water infrastructure and services. Organization for Economic Co-operation and Development.
- Cooley, H. and P.H. Gleick. 2006. "Water efficiency is key in California." World Water and Environmental Engineering. Vol. 29(1): 27-28.
- Gleick, P.H., H. Cooley, and D. Groves. 2005. California Water 2030: An Efficient Future. Pacific Institute for Studies in Development, Environment, and Security. Oakland, California.
- Cooley et al. 2005. "Impact of agricultural practice on regional climate in a coupled land surface mesoscale model." *Journal of Geophysical Research-Atmospheres*. Vol. 110.

- Cooley, H.S., W.J. Riley, and M.S. Torn. 2003. "Interactions between land cover change and regional climate in a coupled regional climate model." Poster. Annual meeting of the Ecological Society of America, Savannah, Georgia.
- Cooley, H.S., W.J. Riley, and M.S. Torn. 2003. "Agricultural practice and regional climate interactions in a coupled land surface mesoscale model." Poster. American Geophysical Union Fall Meeting, San Francisco, CA.
- Cooley, H.S., W.J. Riley, and M.S. Torn. 2003. "Effect of harvest on regional climate and soil moisture and temperature." Poster. American Geophysical Union conference on ecosystem interactions with land use change. Santa Fe, New Mexico.

SELECT PRESENTATIONS

- Asia Society. "Water Issues in California and China." January 14, 2010. San Francisco, California.
- United State Committee on Irrigation and Drainage. "The Future of Water and Agriculture in California." March 25, 2010. Sacramento, California
- City of Oakland. Sea-Level Rise and the San Francisco Bay. March 30, 2010. Oakland, California.
- State of the Estuary Annual Conference. The Impacts of Sea Level Rise on the San Francisco Bay. September 29, 2009. Oakland, California.
- House Subcommittee on Water and Power. "Extinction is not a Sustainable Water Policy: The Bay-Delta Crisis and the Implications for California Water Management." July 2, 2007. Vallejo, California.
- Multi-State Salinity Coalition. The Environmental Impacts of Seawater Desalination. January 12, 2007.
- Water Education Foundation Board of Directors. California and Floods. December 5, 2006.

PUBLIC AND PROFESSIONAL SERVICE

- California Urban Water Conservation Council, Vice-President of the Board of Directors
- Urban Stakeholder Committee, convened by the California Department of Water Resources
- Water Education Foundation, Water Leaders.
- California Water Plan (B160-05) Public Advisory Committee

CALTROUT – REBUTTAL TESTIMONY

Dr. William Trush: Outline of Rebuttal Testimony

Prepared on behalf of CalTrout for
State Water Resources Control Board Cachuma Project Hearing
February 2012

Dr. William Trush is expected to respond to the following topics regarding the Cachuma Project Final Environmental Impact Report ("FEIR") in rebuttal testimony on behalf of CalTrout:

1. The FEIR contains erroneous and inconsistent findings and conclusions with respect to Santa Ynez River steelhead population status and trends, including:

    a. Steelhead population status and trends in the Santa Ynez River are inconsistent with the FEIR's conclusion that flows implemented under the National Marine Fisheries' Service 2000 Biological Opinion ("2000 BO") will support the continued survival of *O. mykiss* in the Santa Ynez River.

        i. Review and analysis of data (e.g., FEIR Appendix G) demonstrates that flows implemented under the 2000 BO will threaten the continued survival of the Santa Ynez River anadromous *O. mykiss* – i.e., steelhead – population.

    b. Steelhead population status and trends in the Santa Ynez River are inconsistent with the FEIR's conclusion that flows implemented under the 2000 BO have resulted in increased abundance of *O. mykiss*.

        1. Review and analysis of data (e.g., FEIR Appendix G) demonstrates that implementation of the 2000 BO has not resulted in increased abundance of anadromous *O. mykiss* – i.e., steelhead – in the Santa Ynez River.

    c. Steelhead population status and trends in the Santa Ynez River are inconsistent with the FEIR's conclusion that flows required by the 2000 BO will protect steelhead as a public trust resource or restore steelhead to "good condition."

        i. Review and analysis of data (e.g., FEIR Appendix G) demonstrates that 2000 BO is not adequate to protect public trust or restore "good condition."

2. The FEIR does not adequately evaluate the effects of Alternatives 5B and 5C for steelhead.

a. For example, the FEIR scoring system does not adequately assess Alternatives 5B and 5C in relation to the 2000 BO-based alternatives.

b. The FEIR's failure to adequately evaluate the effects of Alternatives 5B and 5C undercuts its findings and conclusions that the provisions of the 2000 BO protect steelhead as a public trust resource and maintain steelhead in "good condition."

3. None of the FEIR alternatives, including the alternatives based on the 2000 BO, include provisions for steelhead passage around Bradbury Dam.

    a. New information addresses need for steelhead passage around Bradbury Dam

    b. The 2000 BO does not require passage around Bradbury Dam. The FEIR's failure to include alternatives that provide for steelhead passage around Bradbury Dam undercuts findings and conclusions that the provisions of the 2000 BO protect steelhead as a public trust resource.

4. The FEIR contains erroneous and misleading findings and conclusions regarding the alternatives' adverse effects on the condition of Santa Ynez River steelhead, including:

    a. The FEIR does not evaluate the adverse impacts of Water Rights 89-18 releases.

Attachment: William Trush Statement of Qualifications

William J. Trush, PhD

McBain & Trush, Inc.
980 7th St.
Arcata, CA 95521
Bill@mcbaintrush.com

BACKGROUND

William Trush has been senior ecologist for McBain & Trush, Inc., an environmental consulting firm in Arcata since 1995. As an adjunct professor to the Humboldt State University Fisheries Department, he has taught courses in stream ecology, river restoration, and coastal stream management since 1990. He specializes in integrating fluvial and ecological processes in river ecosystems: particularly floodplain/riparian dynamics, aquatic vertebrate and invertebrate life history requirements, the snowmelt hydrograph, and channelbed dynamics. McBain & Trush helped develop maintenance flow recommendations for the Trinity River and has formulated guidelines prescribing annual flow releases in regulated rivers for the USFS. Dr. Trush was on the Scientific Review Team (1999) for NMFS and the CA Resources Agency evaluating current California Forest Practice Rules with respect to anadromous salmonids in northern California, and has testified for the North Coast Regional Water Quality Control Board on establishing water quality standards related to cumulative watershed impacts. He is one of two scientists directing a stream restoration plan approved by SWRCB for Los Angeles Department of Water and Power on two tributaries to Mono Lake. This plan has focused on recovering shallow groundwater processes in floodplains and side-channels to restore cottonwood forests along Rush Creek. Dr. Trush is working on a steelhead restoration plan for Alameda Creek and developing instream flows for the Shasta River that will restore salmon habitat and facilitate red willow re-colonization. He has co-instructed with Dr. Luna Leopold and Scott McBain a 3-day course on river channels at the Teton Science School in Wyoming from 1990 up to Luna's death in 2006. Dr. Trush recently completed a geomorphic/ecological study funded by the SWRCB on the role of the snowmelt hydrograph in maintaining healthy river ecosystems in steep bedrock dominated rivers of the Sierra Nevada.

EDUCATION

- **Doctor of Philosophy (1991), Wildland Resource Science**
  Department of Forestry and Natural Resources, University of California, Berkeley
  Dissertation Title: *The Influence of Channel Morphology on Spawning Steelhead Trout in South Fork Eel River Tributaries*.

- **Master of Science (1979), Zoology,**
  Center for Environmental Studies, Virginia Polytechnic Institute and State University, Blacksburg, VA
  Thesis Title: *The Effects of Area and Surface Complexity on the Structure and Formation of Stream Benthic Communities*.

- **Bachelor of Science (1974), Zoology**
  Pennsylvania State University, University Park, PA

EXPERIENCE

- **Senior Ecologist and CEO (1995-present), McBain and Trush, Inc.**
  - Mono Lake Restoration, Los Angeles Department of Water and Power (1993-present). Served as a court-appointed member to the Mono Lake Restoration Technical Committee to advise restoration strategies and biological sampling programs for several tributaries entering Mono Lake (1993-

1995). Presently serving as a senior scientist for Los Angeles Department of Water and Power directing the stream restoration and monitoring with another senior scientist.

- Mad River Gravel Mining Assessment, Humboldt County (1992-present). Conducted geomorphic and anadromous fish habitat evaluation of instream gravel mining on the Mad River, Humboldt County. Presently serving on the Scientific Design and Restoration Committee.

- Trinity River Maintenance Flow Study, Hoopa Valley Tribe (1991-1997). Developed flow and sediment management recommendations downstream of Trinity and Lewiston dams to rehabilitate channel morphology and reverse negative impacts caused by the dams. Applies the approach of restoring a scaled-down dynamic alluvial river as a foundation for salmon recovery to be used as the long-term solution for dams coexisting with healthy salmon populations.

- Trinity River Scientific Framework Process, Trinity River Restoration Program (2001-present). After signing of the ROD and prior to staffing the new Restoration Program, assisted the Program during the interim period to continue improving the scientific components of the program. Organized and led two workshops. First workshop (June 2001) gathered agency, tribal, and stakeholder technical participants to refine scientific uncertainties in order to prioritize FY 2002 funding for the Restoration Program. Then assembled the results of the workshop, developed the draft FY 2002 budget ($11 million), and presented budget to the agency and tribal managers for review and approval. Second workshop (February 2002) gathered outside and internal scientists to review primary uncertainties and begin developing an overall Sampling and Monitoring Strategy for the Restoration Program. Currently participating as a member of the planning team for conducting the Scientific Framework Process, which will result in completing the Sampling and Monitoring Strategy.

- Klamath River Expert Testimony for Klamath River Settlement, Northcoast Environmental Center (2007-present). Participated as part of the Klamath Independent Review Process to conduct analysis of models and assumptions used to develop management scenarios in the Klamath River Settlement to determine how well Klamath River flows anticipated under both interim and long-term conditions are likely to support restoration of sustainable fisheries for Chinook salmon and other native fishes. Analyses include hydrograph analysis, future flow predictions, physical habitat availability, fluvial geomorphology and channel condition, water temperature and other water quality parameters, and impacts of fish diseases on current and future Chinook populations.

- Clackamas River FERC Relicensing Project, Portland General Electric (2001-2006). Conducted fluvial geomorphology, hydrology, and fish habitat evaluations to help develop instream flow and coarse sediment management strategies as part of the FERC relicensing process on the Clackamas River and Oak Grove Fork of the Clackamas River. Collected and analyzed field data, integrated for applicability in management strategies, and assisted collaborative relicensing group (agencies, NGO's, stakeholders) with technical components of relicensing effort.

- Member of Science Panel for recommending changes to the California Forest Practice Rules as part of a Memorandum of Understanding between California Resources Agency and NMFS (1998-1999).

♦ **Director (1991-1995), Humboldt State University Institute for River Ecosystems**

The Institute mission is to further our understanding, preservation, and management of river ecosystems. My duties include fiscal management, proposal development, and research. The River

Institute managed the following projects:

1) Development of a new assessment procedure and handbook for designing culvert systems on logging roads.
2) Evaluation of geomorphic indices for detecting cumulative impacts to northern California streams.
3) Maintenance flow recommendation procedures for a Sierra Nevada river.
4) Facilitate review of a proposed USFS maintenance flow methodology.
5) Effects of suspended sediment on stream ecology.

Research projects (with Dr. Terry Roelofs as co-principal investigator) with the Fisheries Department of Humboldt State University included:

1) Assessment of Benbow Dam effects on anadromous fish populations in the South Fork Eel River.
2) Limnological and fisheries investigation of Stone Lagoon, CA.
3) Cutthroat trout restoration program for McDonald Creek, Humboldt County, CA (for the Department of Parks and Recreation).
4) Salmon fisheries investigation for the lower Smith River, CA.

TEACHING EXPERIENCE

- **Adjunct Professor (1989-present), Fisheries Dept., Humboldt State University, Arcata, CA**
  Instructor for the following courses: Coastal Stream Management, Technical Writing for Fisheries, Restoration of Aquatic Ecosystems, Watershed Dynamics and Restoration, Conflict Resolution in Natural Resources Management, Marsh Ecology, Stream Ecology, Graduate Fisheries Seminar, and Fisheries Techniques.

- **Instructor (1990-2005), Teton Science School, Kelly, WY**
  Co-instructor for a three day workshop on fluvial processes and stream restoration with Dr. Luna Leopold.

- **Instructor (1987-1988), Landscape Architecture Dept., University of California Berkeley**
  Instructor for: Hydrology for Environmental Planners and Ecological Analysis.

REFERENCES

- **Dr. Terry Roelofs, HSU Fisheries Department**
- **Dr. Andre Lehre, HSU Geology Department**
- **Dr. Robert Gearheart, HSU Department of Environmental Resources Engineering**

PUBLICATIONS

McBain and Trush, Inc. 2007. Pulse Flow Guidelines: Managing the Annual Snowmelt Hydrograph and Winter Floods in Regulated Boulder-Bedrock Sierra Nevada Rivers. California Energy Commission, PEIR Energy-Related Environmental Research.

McBain and Trush, Inc. 2007. Draft Tuolumne River Flow Evaluation from O'Shaughnessy Dam to Early Intake. Proposed Study Plan and Methods. Prepared for San Francisco Public Utilities Commission, USFWS, and Yosemite National Park. 15 p. July 12, 2007.

McBain and Trush, Inc. 2000. Allocating Streamflows to Protect and Recover Threatened Salmon and Steelhead Populations in the Russian River and other North Coast Rivers of California. Prepared for Trout Unlimited. 38 p. plus appendices. July 27, 2000.

Trush, W.J., McBain, S.M., and L.B. Leopold. 2000. Attributes of an alluvial river and their relation to

water policy and management. *Proceedings of the National Academy of Science* 97: 11858-11863.

Ligon, F., Rich, A., Rynearson, G., Thornburgh, and W. Trush. 1999. *Report of the Scientific Review Panel on California Forest Practice Rules and Salmonid Habitat*. Prepared for: The Resources Agency of California and the National Marine Fisheries Service, June 1999. 92 p. with appendices

McBain, S. and W. Trush. 1997. *Trinity River Maintenance Flow Report*. Prepared for: Hoopa Valley Tribe, Fisheries Department, P.O. Box 417, Hoopa, CA 95546, November 1997. 316 p.

McBain, S. and W. J. Trush. 1996. Thresholds for managing regulated river ecosystems. *Proceedings of the Sixth Biennial Watershed Management Conference*, University of California Water Resources Center Report No. 92, pp.11-13, April 1997.

Ridenhour, R.L., Hunter, C., and W.J. Trush. 1995. *Mono Basin Stream Restoration Work Plan*, prepared for Los Angeles Department of Water and Power, October 4, 1995. 228 p.

Trush, W.J., Franklin, R., and S. McBain. 1995. Assessing downstream variation of fluvial processes for recommending maintenance flows in regulated rivers. pp. 122-131, in Cassidy, J.J.(ed.), *Waterpower'95 Volume 1, Proceedings of the International Conference on Hydropower*, American Society of Civil Engineering, San Francisco, CA

McBain, S. and W.J. Trush. 1995. Channel bed mobility and scour on a regulated, gravel-bed river. pp. 1941-1950, in Cassidy, J.J. (ed.), *Waterpower'95 Volume 3, Proceedings of the International Conference on Hydropower*, American Society of Civil Engineering, San Francisco, CA

Ligon, F.K., Dietrich, W.E., and W.J. Trush. 1995. Downstream ecological effects of dams: A geomorphic perspective. *BioScience* 45(3):183-192.

McBain, S. and W.J. Trush. 1995. *River Channel Morphological and Sediment Changes in the Klamath Basin, Oregon and California*, prepared for the Technical Working Group, Klamath Fisheries Task Force, May 1995. 13 p. and appendices

Trush, W.J. and S. McBain. 1995. Preliminary channel maintenance flow recommendations for the mainstem Trinity River below Lewiston Dam. pp. 8-13, in Ridenhour, R.L. (ed.) *Proceedings of the Trinity River Restoration Colloquium*, Humboldt Chapter of the American Fisheries Society, funded by the U.S. Bureau of Reclamation, 36 p.

Trush, W.J. 1994. *A Review of the Mt. Hood National Forest Fish Habitat Restoration Program for Mt. Hood National Forest*, USFS, October 15, 1994.

McBain, S., W. Trush, and W. Smith. 1994. *Developing a Maintenance Flow Methodology: A Sample Plan for Steep Bedrock-Controlled Sierra Rivers*. Humboldt State University Institute for River Ecosystems, IRE-08-94-01, 95 p.

Trush, W.J. 1994. Should the primary goal for anadromous salmonid restoration in the Klamath Basin be geomorphic? pp.38-42, in Hassler, T.J. (ed.) *Klamath Basin Fisheries Symposium, Proceedings of a symposium held in Eureka, California, 23-24 March 1994*, California Cooperative Fishery Research Unit, 237 p.

Trush, W.J. 1994. Understanding riparian dynamics: A management imperative. pp. 7-8, in *Inter-*

disciplinarian Perspectives of Riparian Ecosystems, Humboldt State University, Arcata, CA. September 24, 1994.

Ligon, F., Dietrich, W.E., Power, M., and W.J. Trush. 1993. *Variable Ecological Responses of Large Rivers to Dams*. Presented at the Ecological Society of America Annual Meeting, Symposium for Ecological Approaches to the Study of Large Rivers, University of Wisconsin, Madison, August, 1993.

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

In the Matter of: Hearing to Review the U.S. Bureau of Reclamation Water Rights Permits (Applications 11331 AND 11332) - Cachuma Project Phase 2	**CERTIFICATE OF SERVICE**

I am employed in the County of Santa Barbara, California. I am over the age of 18 and not a party to the within action. My business address is 906 Garden Street, Santa Barbara, CA 93101. On February 28, 2012, I served the:

FEBRUARY 28, 2012 LETTER FROM KAREN M. KRAUS TO JANE FARWELL RE CACHUMA PROJECT HEARING

on the following parties: U.S. Bureau of Reclamation; National Marine Fisheries Service NOAA Office of General Counsel; Santa Barbara County CEO's Office; Department of Fish and Game; County of Santa Barbara, County Counsel, by placing a true and correct copy thereof in a sealed envelope with first class postage thereon fully prepaid in the United States mail at Ventura, California and addressed according to the attached Service List; and on the remaining parties by sending a true and correct copy electronically addressed according to the attached service list.

I declare under penalty of perjury that the foregoing is true and correct and executed on February 28, 2012 at Ventura, California.

Karen M. Kraus