

Heather Cooley: Rebuttal Testimony

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

March 2012

My name is Heather Cooley, and I am co-director of the Pacific Institute’s Water program. I have conducted extensive research on urban and agricultural water conservation and efficiency potential in California and abroad. I hold a B.S. in Molecular Environmental Biology from University of California, Berkeley and an M.S. in Energy and Resources from UC Berkeley. My testimony focuses on the water supply and demand projections presented in the 2011 Final Environmental Impact Report for the Cachuma Project.

The December 2011 Final Environmental Impact Report for the Cachuma Project (“FEIR”) identifies the Project Objectives to include protecting public trust resources, “taking into consideration (1) the water supply impacts of measures designed to protect public trust resources, and (2) the extent to which any water supply impacts can be minimized through implementation of water conservation measures” (FEIR, Vol. II, p. 3.0-2). Our analysis of the FEIR finds several critical deficiencies that affect its conclusions about potential water supply impacts and feasibility of water conservation measures:

- The FEIR overestimates future demand and potential shortages under the proposed alternatives:
 - Water demand projections used in the FEIR are based on outdated estimates and ignore more recent water demand projections supplied by the water contractors, including in their 2010 Urban Water Management Plans.
 - 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.
- The FEIR does not include cost-effective urban conservation potential available to water contractors:
 - The FEIR improperly disregards that, at least, 5,000 to 7,000 acre-feet of water could be conserved by Cachuma contractors, cost-effectively.

- Technological improvements since 2003 indicate that conservation potential could exceed 5,000 to 7,000 acre-feet.
- 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.
- The FEIR does not consider the availability of water through alternative supplies. 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.
- The FEIR does not consider the potential for reducing agricultural water use.
 - A 2009 Pacific Institute analysis estimates that there are a variety of technologies and practices that can reduce water requirements for agriculture.
 - Recycled water can also be used to meet agricultural water demand.

Each of these deficiencies is discussed in detail in my testimony, below.

The FEIR overestimates future demand and potential shortages under the proposed alternatives.

California's urban water agencies that either provide over 3,000 acre-feet of water annually or serve more than 3,000 or more connections are required to submit Urban Water Management Plans to the Department of Water Resources every 5 years. The most recent plans were due in December 2010, although agencies were given a six-month extension in order to comply with new requirements.¹ Three Cachuma contractors have submitted their 2010 UWMPs: Carpinteria Valley Water District (submitted July 29, 2011), City of Santa Barbara (submitted July 15, 2011), and Goleta Water District (submitted December 7, 2011). For these agencies, water demand projections are considerably less than are included in the FEIR (Table 1). Two contractors (Montecito Water District and Santa Ynez River Water Conservation District, ID #1)

¹The 2010 UWMPs must be adopted by July 1, 2011 and submitted to DWR by August 1, 2011.

have not yet submitted their 2010 UWMPs to DWR, although Montecito has indicated that they plan to do so in the next few months. Even if we assume that demand projections for Montecito and Santa Ynez are the same as is included in the FEIR, total demand for the Cachuma contractors in 2020 would be 44,828 – 46,236 acre-feet, approximately 3,500 – 4,900 acre-feet less than the estimate included in the FEIR. Indeed, the updated estimates from the 2010 UWMPs suggest that water demand in 2020 could be less than 2000 demand, identified in the FEIR at 46,000 acre-feet. Thus, the water demand projections in the FEIR are based on outdated estimates and ignore more recent, lower, projections developed by the water contractors themselves.

Table 1. Cachuma Contractors’ Water Demand (Acre-Feet per Year) in 2010 and Projected to 2020

	2000 (Actual) ¹	2020/2030 Water Demand Projections ²		Source of Updated Estimates
		FEIR ¹	Updated Estimates ³	
Carpinteria Valley Water District	4,300	4,600 ⁴	4,212	2010 UWMP (p. 21); submitted July 29, 2011
Montecito Water District	6,073	6,500	6,500	FEIR; UWMP has not been submitted yet
City of Santa Barbara	14,342	14,500	12,576	2010 UWMP (Table 6, p. 14); submitted July 15, 2011
Goleta Water District	14,000	15,890 ⁵	13,267-14,675	2010 UWMP (p.2-9); submitted December 7, 2011
Santa Ynez River Water Conservation District, ID#1	7,292	8,273	8,273	FEIR; UWMP has not been submitted
Total	46,007	49,763	44,828 – 46,236	

Notes:

- (1) Table 4-19 of the FEIR; page 4.3-21.
- (2) Projections for Montecito are for 2030; projections for Santa Ynez are for 2025. The remaining projections are for 2020.
- (3) Updated estimates for Carpinteria Valley Water District, City of Santa Barbara, and Goleta Water District are from each agency’s 2010 Urban Water Management Plan. Montecito and Santa Ynez have not submitted Urban Water Management Plans to the California Department of Water Resources, and thus we assume estimates from the FEIR are the most updated estimates available.
- (4) Kennedy/Jenks Consultants. July 2007. Carpinteria Valley Water District Urban Water Management Plan 2005 Update. Ventura, California.
- (5) Goleta Water District. 2005. Final Urban Water Management Plan.

Furthermore, 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. In November of 2009, the California legislature enacted the Water Conservation Act of 2009 (SBx7-7), which requires all water suppliers to reduce per capita water demand, as measured in gallons per capita per day (gpcd), by 20% by the end of the year 2020. Urban water suppliers were required to have developed interim and final water use targets for compliance with SBx7-7 by July 2011 and include them in their 2010 UWMPs. These gpcd targets, in many cases, formed the basis of future demand projections. Thus while the 2010 UWMPs include compliance with state-mandated efficiency improvements, the demand projections in the FEIR were higher than those in the 2010 UWMPs, and therefore the FEIR failed to include state mandated water conservation and efficiency improvements.

The availability of updated water demand estimates and the failure to comply with state mandated conservation was raised in our comments on the 2011 2nd Revised DEIR (“RDEIR”). In response, the FEIR states: “The water demand estimates included in the 2011 2nd RDEIR were provided by the Member Units in 2010 and reflect the latest information available at the time. Where warranted and available, information provided has been updated in the 2011 2nd RDEIR” (FEIR, Vol. I, p. 2.0-243). The FEIR further states that “Whether or not the Member Units achieve a 20 percent reduction is yet to be determined and will be subject of future reporting to the DWR. At present, the 2009 legislation does not include any penalty other than exclusion from certain state grants if the 20 percent reduction by 2020 is not achieved” (FEIR, Vol. I, p. 2.0-245).

The 2010 UWMPs reflect the latest and best available demand projections from the water districts. The FEIR uses prior UWMP projections,² and prior iterations of the EIR have used

² Demand estimates for Goleta Valley Water District and Carpinteria Water District are based on their 2005 UWMPs.

UWMP demand projections.³ Furthermore, Table 4-15 (“Annual Water Deliveries by the Member Units to Their Customers”) (FEIR, Vol. II, 4.3-12) of the FEIR uses data on water deliveries from the Member Units’ 2010 UWMPs, highlighting inconsistent use of the UWMPs within the FEIR. There is no basis to preclude from consideration the demand projections that are now available in the 2010 UWMPs. Two districts had submitted their 2010 UWMPs to DWR in July 2011, and information from a third submitted (Dec. 2011) UWMP is now available for the Board to consider for its public trust decision. The Board should be utilizing demand estimates from the 2010 UWMPs prepared by the Member agencies to assess potential water supply impacts. Further, demand estimates should include, at a minimum, state mandated conservation. Regardless of the severity of the penalty, California water agencies should be in compliance with state law, and the fact that water districts are ineligible for state grants if they do not comply with the 20% reduction is a strong incentive for compliance.

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

In a 2003 analysis, the Pacific Institute estimated that between 5,000 and 7,000 acre-feet per year (AFY) could be conserved cost-effectively, allowing the Cachuma contractors to “reduce their take of water from Santa Ynez River without a loss of service or quality of life.” Measures considered in the analysis included installing high-efficiency clothes washers and low water-use landscapes in homes, and installing ultra-low-flow toilets in homes and businesses. These conclusions remain valid and are still relevant to determining water conservation potential, as the FEIR has identified no basis to disregard this potential. The FEIR dismisses the Pacific Institute’s 2003 analyses without addressing the merits, stating only that

“The Member Units presented rebuttal testimony, however, that disputed the testimony of CalTrout’s witnesses” (FEIR, Vol. II, p. 4.3-36).

³ Demand estimates for Santa Ynez Water Conservation District, ID No. 1 are based their 2005 UWMP.

In response to the 2007 Revised Draft EIR, the Pacific Institute submitted a point by point response to the Member Units' rebuttal testimony, identifying errors, omissions and incorrect conclusions. The FEIR does not discuss, address, or respond to this submission (FEIR, Vol. II, p. 4.3-36; Vol. 1, 2.0-533 – 2.0-544). Thus, the conclusions from the 2003 Pacific Institute testimony – that 5,000 to 7,000 acre-feet of water could be conserved by Cachuma contractors, cost-effectively – remain valid and are still relevant to determining water conservation potential.

Furthermore, technological improvements since 2003 suggest that the conservation potential may be even larger. The 2003 analysis, for example, evaluated the savings if everyone were using a 1.6 gallon per flush (gpf) toilets. Today, high-efficiency toilets (HET) using 1.28 gpf or less are widely available, and in 2014, will be required in all new or remodeled developments.

Additionally, in 2003, a typical high-efficiency clothes washer used 25 gallons per load. Today, high-efficiency models use 15 gallons per load or less. Thus, technological improvements suggest that the water conservation potential likely exceeds 5,000-7,000 acre-feet per year.

During a critical drought period, additional measures could be taken to reduce demand. During droughts, it is not uncommon for communities to cut water use by 10-20% through behavioral measures, such as reducing or even eliminating outdoor irrigation and taking shorter showers. Such measures are not included in the 5,000 – 7,000 AF savings identified in the 2003 Pacific Institute analysis but could help reduce the likelihood and/or severity of future water shortages.

Improved rate structures could also capture some of the 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. The FEIR states that "water rates are some of the highest in the state and constitute a strong incentive to conserve water" (FEIR, Vol. II, p. 4.3-37). Water rates among the Cachuma contractors are generally high as a result of investment in capital-intensive water supply projects, such as the desalination plant in Santa Barbara and the Coastal Branch of the State Water Project, but these rates do not consistently include designs that encourage customers to reduce their water use (Table 2). Of all of the Cachuma contractors, the City of Santa Barbara has a rate design that encourages conservation with a steep increase of \$2.73 per thousand gallons between the first and second tiers at a relatively low water use rate of

about 3,000 gallons per month. This design places an early premium on water uses and sends a strong price signal to customers to reduce their water use. The remaining Cachuma contractors, however, have rate designs that send a weak price signal to their customers. For example, the Santa Ynez River Water Conservation District, ID#1 remains on a uniform rate structure with high fixed costs. The Montecito Water District recently adopted inclining block rates; however, households only move into the second tier after using 18,700 gallons, equivalent to more than 620 gallons per day, and the rate increase between tiers is small. These agencies could improve their rate structures, and significantly encourage conservation, by instituting inclining block rates with high price differentials between blocks. Additionally, the size of the block should be such that first and second tiers cover essential uses of water.

The water conservation potential estimates (5,000 – 7,000 AF) and the ability to use rate structures as one of the methods to capture the conservation potential were raised in our comments on the 2011 RDEIR. The FEIR completely ignored these comments. Yet, water conservation and efficiency are key options for minimizing or even eliminating any water supply impacts.

For its final decision, the Board should consider that 5,000 – 7,000 AFY of water can be cost-effectively conserved by the Member agencies and would minimize or eliminate potential water supply impacts. In addition, the Board should require a detailed analysis of the Member agencies' ability to reduce demand through water conservation and efficiency. This analysis should include market penetration studies to provide clear direction to the Member agencies about where the greatest savings can be achieved and how to capture them.

Table 2. Residential Water Rates, March 2012.

Municipality [Water Provider]	Rate Structure Type	Fixed Monthly Service Charge	Unit Rate per 1,000 Gallons of Water Consumed
Carpinteria Valley Water District ⁽¹⁾	Increasing Block Rate (three blocks)	\$30.79	\$4.01 - avg. winter use (base) \$5.15 - base to 2xbase \$6.48 - over 2xbase
Montecito Water District ⁽²⁾	Increasing Block Rate (four blocks)	\$30.95	\$5.21 – up to 18,700 gal \$5.55 – 19,448 to 44,800 \$6.55 – 45,628 to 89,760 \$7.89 – over 90,508
Goleta Water District ⁽³⁾	Increasing Block Rate (two blocks)	\$10.68 - \$32.05	\$5.55 – up to 2,992 gal \$5.75 – over 2,992 gal
City of Santa Barbara ⁽⁴⁾	Increasing Block Rate (three blocks)	\$12.74 (5/8") \$19.15 (3/4")	\$4.05 - up to 2,992 gal \$6.78 - 2,993 to 14,960 gal \$7.14 - over 11,968 gal
Santa Ynez River Water Conservation District, ID#1 ⁽⁵⁾	Uniform	\$31.00 (5/8") \$37.10 (3/4")	\$3.62

Note: gal=gallons

Source:

(1): Carpinteria Valley Water District Website: http://www.cvwd.net/water_rates.htm

(2): Montecito Water District Website: http://www.montecitowater.com/fees_charges.htm

(3): Goleta Water District Website: <http://www.goletawater.com/rates-bills-and-budget/water-rates-and-meter-charges/>

(4): City of Santa Barbara Website: <http://www.santabarbaraca.gov/Government/Departments/PW/Rates.htm>

(5): Santa Ynez River Water Conservation District Website: <http://www.syrwd.org/view/53>

The FEIR fails to adequately consider alternative water supplies.

The FEIR recognizes the use of the recycled and reclaimed water as a reliable source of water.

The Cachuma contractors, however, meet very little of their demand with recycled water.

Currently, the Cachuma contractors collectively produce and use 1,800 acre-feet of recycled water per year in a normal year, or about 3% of their total supply, and 1,860 acre-feet, or 4.5% of supply, in a critical drought year (Table 3). Of the five Cachuma contractors, only Goleta Water District and the City of Santa Barbara use recycled water (Table 3).

Table 3. Recycled Water Use Among Cachuma Contractors

	Recycled Water-Normal Year	Total Supply - Normal Year	% supply from Recycled Water	Recycled water-Critical Drought	Total Supply – Critical Drought	% supply from Recycled Water
Carpinteria Valley Water District	0	5,699	0%	0	5,077	0%
Montecito Water District	0	7,305	0%	0	2,920	0%
City of Santa Barbara	800	17,493	5%	800	9,945	8%
Goleta Water District	1,000	16,471	6%	1,060	9,922	11%
Santa Ynez River Water Conservation District, ID#1	0	7,241	0%	0	6,279	0%
Total	1,800	54,209	3%	1,860	34,143	5%

Source: Tables 4-10, 4-11, 4-12, 4-13, and 4-14 in the FEIR.

The FEIR assumes no expansion in recycled water supplies in the future. Yet, Goleta and Santa Barbara currently have significant unused recycled water capacity. Santa Barbara has an *additional* treatment and distribution capacity of 300 acre-feet per year,⁴ and the Goleta Water District has an *additional* treatment and distribution capacity of 2,000 acre-feet per year.⁵ Note that the FEIR incorrectly states that Goleta Water District has a recycled water capacity of 1,500 acre-feet per year (FEIR, Vol. II, p. 4.3-5) – the 2011 Goleta Water District Water Supply Management Plan reports a total treatment and distribution capacity of 3,000 acre-feet per year. This error was raised in our comments on the 2nd RDEIR but was not corrected in the FEIR. Thus,

⁴ City of Santa Barbara Water Resources Division, Public Works Department. (2011). DRAFT City of Santa Barbara Long-Term Water Supply Plan. <http://www.santabarbaraca.gov/NR/rdonlyres/D9F28872-C779-4947-8428-56D9A678C8E6/0/LTWSP2011Draft472011.pdf> .

⁵ Bachman, S. (2011). Goleta Water District Water Supply Management Plan. Page 37, http://www.goletawater.com/assets/documents/water_supply/Water_Supply_Management_Plan_Final_3-31-11.pdf.

these agencies are currently using less than 50% of the *existing* capacity, an indication that there is potential to expand the use of recycled water without significant capital investment.

Additionally, the relatively low rate of recycled water use among the Cachuma contractors suggests there is potential to expand capacity and use above existing capacity in order to mitigate any identified potential water supply impacts. In response to our comments about the potential to expand recycled water capacity, the FEIR states that “local agencies have limited ability to legally compel existing customers to convert from the use of potable water to recycled water” (FEIR, Volume I, 2.0-245).

Yet, there are a variety of ways to encourage the adoption of recycled water, including public education, regulations, and incentives. For example, facilities or developments that use recycled water could be offered reduced water rates, lower permit fees, a streamlined processing and permitting timeline, and/or reduced monitoring and reporting requirements. In addition to these incentives, regulations could include prohibitions on using groundwater or even potable water if recycled water is available.

While there can be challenges to implementing recycled water projects, these can be overcome. Water reuse is becoming an increasingly important component of the water-supply portfolios of water districts throughout California. For example:

- The Irvine Ranch Water District, in Southern California, met 22% of its total demand with recycled water in 2010⁶
- In West Basin, recycled water accounted for about 7% of its water supply portfolio in 2008, but is expected to account for 15% of the water supply portfolio by 2020.⁷
- In the 2009/2010 fiscal year, recycled water for direct use and recharge purposes accounted for 33% of the total available supply of the Inland Empire Utilities Agency.⁸

⁶ Irvine Ranch Water District. “Your Water: Supply.” Accessed on May 3, 2011 at <http://www.irwd.com/your-water/water-supply.html>.

⁷ West Basin Municipal Water District. 2011. Water Reliability 2020. Accessed on April 28, 2011 at <http://www.westbasin.org/water-reliability-2020/planning/water-reliability>.

- Additionally, the Orange County Sanitation District practices large-scale indirect potable reuse, with approximately 35 million gallons per day pumped into percolation basins where the water naturally filters through the earth and into the groundwater supply.⁹

In addition to recycled water, other alternative supply options are available. For example, rainwater is an alternative supply option that can be used for a variety of purposes, including landscaping, flushing water closets and urinals, and cooling towers. Rainwater collection systems range in size from small 55-gallon barrels that rely on the force of gravity to complex multi-million gallon reservoirs equipped with pumps and sensors. Rainwater harvesting can be employed in residential settings and by businesses, industry, and public institutions. In Ingleside, Texas, for example, Reynolds Metals uses rainwater as process water in its metal-processing plant.¹⁰

The FEIR does not consider the potential for rainwater to augment supplies or mitigate potential water supply impacts. Water suppliers in other parts of the country, however, have taken steps to promote and expand the use of rainwater through education programs and by providing rebates to customers for installing rainwater harvesting systems. In San Francisco, for example, the local water utility provided rebates to customers ranging in value from \$80 to \$480, depending on the volume of the container. The City of Tucson has moved beyond education and financial incentives, requiring commercial developers to install rainwater harvesting systems to meet 50% of landscaping water requirements. The City of Los Angeles, working with the group TreePeople has installed large-scale cisterns in schools to meet landscape water needs.

As part of its final decision, the Board should require a comprehensive analysis be completed to evaluate the potential of alternative water supply options as a way to reduce or eliminate the identified water supply gap. This analysis should explicitly evaluate ways to expand the use of

⁸ Inland Empire Utilities Agency. (2010). Accessed on May 3, 2011 at <http://www.ieua.org/recycled/docs/FY09-10AnnualReport/index.html>.

⁹ Groundwater Replenishment System. (undated). Accessed on May 3, 2011 at <http://www.gwrsystem.com/images/stories/pdfs/GWRS.E-PressKit.FactsFiguresSection.11.17.10.pdf>.

¹⁰ Texas Water Development Board. 2005. The Texas Manual on Rainwater Harvesting. Page 2. Third Edition. Austin, Texas.

recycled water, including through the development of a regional project and a groundwater recharge project. It should also look at the potential to capture rainwater and stormwater for direct use or for groundwater recharge.

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

While urban use makes up the majority of total water demand from the Cachuma contractors, agricultural use also comprises a significant portion. Among the five contractors, approximately 7,500 acre-feet,¹¹ or around 16% of total demand, was delivered to agricultural users in 2010 (Table 4). In the Carpinteria Valley Water District and the Santa Ynez River Water Conservation District, ID#1, agriculture accounts for around 40% of total water demand.

As within the urban sector, water use in the agricultural sector can often be reduced through increased efficiency while maintaining the same level of service, i.e., without reducing crop yields or area irrigated. In a 2009 report on the potential for increased water use efficiency in California agriculture, the Pacific Institute estimated that agricultural demand could be reduced by 17% by adopting efficient irrigation technologies, improved irrigation scheduling, and regulated deficit irrigation.¹²

Additionally, recycled water can be used to meet many agricultural water demands. At Sea Mist Farms in Salinas Valley, California, for example, recycled water makes up approximately two-thirds of total farm water use; groundwater is only used when irrigation demands exceed recycled water supply.¹³ Using recycled water to meet irrigation requirements in the Cachuma contractors' service areas would reduce the need to secure additional potable supplies.

¹¹ Estimate based on agricultural use reported in 2010 Urban Water Management Plans for Carpinteria Valley Water District, Montecito Water District, and Santa Barbara. Goleta Water District, and the 2000 Urban Water Management Plan (because a 2005 Urban Water Management Plan is not available). Agricultural use in the City of Santa Barbara is minimal, and not included here.

¹² Cooley, H., J. Christian-Smith, and P.H. Gleick. 2009. Sustaining California Agriculture in an Uncertain Future. Pacific Institute. http://www.pacinst.org/reports/california_agriculture/final.pdf.

¹³ Christian-Smith, J., L. Allen, M.J. Cohen, P. Schulte, C. Smith and P.H. Gleick. 2010. California Farm Water Success Stories. http://www.pacinst.org/reports/success_stories/success_stories.pdf

Table 4. Agricultural Water Demand Among the Cachuma Contractors

	Agricultural Water Demand (AFY)	Year of Estimate	Data Source
City of Santa Barbara	106	2010	p. 16, 2010 UWMP
Goleta Water District	2,387	2010	p. 2-3, 2010 UWMP
Carpinteria Valley Water District	1,582	2010	p. 18, 2010 UWMP
Montecito Water District	550	2005	p. 28, 2005 UWMP
Santa Ynez River Water Conservation District, ID#1	2,848	2000	p. 7-2, 2000 UWMP
Total	7,473		

Note: Agricultural demand estimates based on the most recent data available for each of the Cachuma contractors. Data sources are indicated in the table.

The failure to include strategies to reduce agricultural water demand was raised in our comments on the 2011 RDEIR. In response, the FEIR states that “The analysis reflects the independent review of water supply and demand, and conservation measures that can be feasibly implemented” (FEIR, Vol. 1, 2.0-247). The FEIR provides no information about the water conservation potential within the agricultural sector, a major user of water in the area. As part of its final decision, the Board should require a detailed analysis of the potential to decrease agricultural demand for potable water supplies in the Cachuma Contractors’ service areas, both through increased water-use efficiency and the use of recycled water, and as a potential mitigation strategy.