

**Testimony of John Gray, Ph.D.**  
**Before the State Water Resources Control Board on Behalf of the Cachuma Conservation**  
**Release Board and Santa Ynez River Water Conservation District,**  
**Improvement District No. 1.**

**Cachuma Project Hearing, Phase 2, Applications 11331 and 11332**

**1. QUALIFICATIONS**

I am a biologist and environmental scientist employed with URS Corporation in the Santa Barbara office. I have been a professional biologist and environmental consultant in Santa Barbara for 22 years, primarily working on projects and studies for public agencies involving wetlands, sensitive wildlife species, and habitat restoration issues. I have a BA in Biological Sciences and a Ph.D. in Ecology. I began my professional work on the Santa Ynez River in 1992 when I prepared the Environmental Impact Statement/Report (EIS/EIR) for the Cachuma Project Contract Renewal, on behalf of the Bureau of Reclamation (Reclamation) and the Cachuma Member Units. In 2001, I prepared an administrative Draft Environmental Impact Report (EIR) regarding this Cachuma Project water rights hearing under contract with Reclamation. The administrative draft document was submitted to the State Water Resources Control Board (SWRCB) in compliance with WR 94-5 to assist the staff in preparing a public draft EIR for the hearing. I also prepared the recently released EIS/EIR for the Fish Management Plan (FMP) and Biological Opinion (BO) on behalf of Reclamation and the Cachuma Operation and Maintenance Board (COMB). I have conducted environmental and biological studies along various portions of the Santa Ynez River and its tributaries for other clients in the past 22 years. In 1989, I assisted in the preparation of the EIR for the Gibraltar Dam Strengthening Project, and for several years thereafter, managed a study on the population of the endangered least Bell's vireo in the upper watershed. Since 1992, I prepared three EIRs for the Santa Barbara County Flood Control District regarding flood control maintenance along the lower river. I am currently preparing a Resource Management Plan for Cachuma Lake for Reclamation. Through the course of these studies and projects, I have reviewed biological and hydrological reports by other professionals, conducted dozens of field investigations along the river and its tributaries, and conducted analyses regarding the effects of current and future operation of the Cachuma Project on biological resources.

**2. SCOPE AND BASIS OF TESTIMONY**

I will address three public trust issues in my testimony: (1) the effects of the planned surcharge operations at Cachuma Lake on oak trees along the shoreline; (2) the effects of the planned surcharge operations on Cachuma Lake recreational facilities; and (3) the effects of current and future releases from Bradbury Dam, pursuant to Reclamation's water rights permits and the FMP and BO, on sensitive amphibian, reptiles, and birds on the Santa Ynez River downstream of Bradbury Dam.

My professional opinion is based on personal observations and experience with these resources along the lower river and at the lake; information collected regarding these issues while preparing the SWRCB administrative Draft EIR and the FMP/BO Draft EIS/EIR; and my experience with these resources in other watersheds of Santa Barbara and Ventura counties. Most of the information provided below related to lake levels and river flows is based on hydrological simulation modeling of flows below Bradbury Dam and Cachuma Lake levels by Stetson Engineers, using the hydrologic record for the period 1918-1993. This modeling was conducted for the SWRCB Draft EIR and the FMP/BO EIS/EIR, and the results are presented in those documents.

Descriptions of the water rights releases required under Reclamation's permit from the SWRCB, the proposed surcharge, and the flow related management actions along the river downstream of Bradbury Dam pursuant to the FMP and BO are provided in the SWRCB Draft EIR and FMP/BO Draft EIS/EIR, and will not be repeated herein.

### **3. EFFECT OF SURCHARGING ON OAK TREES**

The water level in Cachuma Lake varies depending upon runoff, evaporation, downstream releases, and diversions to the Member Units. The current maximum lake level is 750.75 feet. The peak lake level is typically reached in April or May as the winter runoff has ended and before significant diversions and downstream releases. Under current operations, the median lake level is estimated to be 733.7 feet. The median lake level with the 3-foot surcharge and the releases for fish as required under the BO would be 734.6 feet. With surcharging, future lake levels would exceed the current maximum lake level (750.75 feet) about 16 percent of the time, and would exceed this level for about four months, on average. The lake would reach the new maximum lake level (753 feet) about 9 percent of the time, on average. Hydrologic simulations of reservoir conditions indicate that surcharging would occur, on average, about every three years.

Increased maximum lake levels over current conditions will affect the vegetation that currently occurs along the margins of the lake above the current maximum water level. Inundation during surcharge years is likely to degrade upland vegetation types in the new inundation zone over time, depending upon the level and duration of the surcharge. Periodic surcharging events that are separated in time by several years or more are not expected to destroy upland vegetation in the new inundation zone. However, prolonged inundation over one year, or repeated inundation over many years, would likely destroy upland vegetation, including some of the coast live oak trees (*Quercus agrifolia*) and valley oak trees (*Quercus lobata*) that occur along the margins of the lake.

In 2001, I managed a field study to estimate the number of oak trees that could be affected by the surcharge for inclusion in the SWRCB administrative Draft EIR and the FMP/BO EIS/EIR. The number and species of oak trees in the new inundation zone above the current maximum lake level were estimated. The number of trees in a 3-foot wide zone above the new maximum lake levels was also estimated. This zone represents an area subject to wave action during winter storm or windy days, as well as possible storm surcharging which occurs during very high inflows to a lake that is already filled.

Cachuma Lake exhibits a clearly visible high-water line below which oak trees are mostly absent. The few oaks that are rooted below the current maximum lake level are in poor condition due to root flooding, as well as damage from wave action that has caused the trees to become unstable or topple. Oak trees located at or within several feet of the current high-water line often have exposed roots. Many are also located on eroding, undercut banks that have been affected by wave action and storm surcharging. My field observations confirm that oak trees within the new inundation zone would eventually be eliminated over time due to a combination of root flooding and physical disturbance from wave action. The field observations also suggest that some, but not all, of the trees in the wave action zone may be damaged or destroyed due to root flooding and/or wave action. Based on the field investigations, I believe that 25 percent of trees in the indirect impact zone would be destroyed by surcharging, and that all others would persist due to the infrequent nature of the impact in this zone.

I believe that the loss of trees in the direct inundation zone would occur over a period of 15 to 20 years unless there was a significant surcharging event with unusually high and rough wave action that physically topples trees from the direct and indirect impact zones. Some trees may persist for a longer period of time, as evidenced by the presence of trees, albeit unhealthy trees, on or directly below 750 feet, current maximum water level for more than 50 years.

The loss of certain trees in the wave action zone would occur over a longer period of time, probably 20 or more years based on my field observations of trees in the current wave action zone created over 50 years ago.

A summary of the total number of oak trees estimated to be eliminated over time (20 or more years) associated with the proposed surcharging is provided in Table 1.

**TABLE 1  
ESTIMATE OF OAK TREES AFFECTED IN AND ABOVE THE NEW INUNDATION  
ZONE FOR THE 3-FOOT SURCHARGE**

Number of Oak Trees Adversely Affected (All coast live oak except for valley oaks shown in parentheses)		
Direct Inundation (within the new inundation zone)	Indirect Impacts due to Wave Action (above the new inundation zone)	Total
339 (30)	113 (10)	452 (40)

Source: SWRCB Draft EIR (2003) and USBR Draft FMP/BO EIS/EIR (2003)

To offset the loss of these trees, Reclamation and COMB will implement a long-term oak tree replacement program in which coast live and valley oak trees lost due to periodic surcharging would be replaced in a phased manner linked to the incremental loss of oak trees over time. Reclamation has determined that the most desirable and appropriate locations for planting new oak trees would be in portions of the County Park at Cachuma Lake. There is no recruitment of oak trees in the park due to the cumulative disturbance by park visitors over time. Hence, there is a critical need to plant young oak trees in the County Park to replace the mature trees that are expected to suffer future natural mortality. Implementing the oak tree replacement program in the Park would both offset the loss of trees due to surcharging, and benefit recreational uses at the park. The oak trees would be established in undeveloped grassland and existing oak savannah areas of the Park. In the event that additional land is required for planting, Reclamation would use portions of Storke Flats, Santa Ynez Point area, Bradbury Dam, and Live Oak area where suitable conditions are present for oak restoration.

Reclamation would implement the program in a phased approach designed to replace oak trees prior to the impacts to the trees. Under this approach, Reclamation would immediately plant new trees in the Park to replace one half of the estimated total number of trees (251 trees, see Table 1) that would be eliminated over time. Reclamation would then monitor the loss of trees during surcharge events over the next 10 years. The number of downed or dying trees in and above the inundation zone would be counted immediately after surcharging events, as well as during the months when the water level recedes and bank erosion could occur. The number of trees lost during that year would be replaced at the County Park. At the end of 10 years, Reclamation would conduct a final count of trees in and above the inundation zone to determine the remaining number of trees that are likely to be eliminated

over time due to future inundation. Based on this information, the total estimated trees that could be adversely affected (see Table 1) would be revised, and Reclamation would plant trees to complete the replacement process. This phased approach will be used to ensure a precise count of trees affected by surcharging and to allow Reclamation and County Parks opportunity to refine and enhance the oak restoration program over time based on actual planting and maintenance experience.

Reclamation would maintain the replacement trees for a period of 10 years after their planting to ensure successful establishment and evidence of being self-sustaining. Maintenance would include watering, weeding, pest control, protection from human disturbance, and replacement planting. At the end of 10 years, Reclamation would determine if additional special maintenance is required, or if the trees can persist in the Park under current habitat conditions and park maintenance.

Oak trees would be replaced at a ratio that ensures a final 2:1 replacement ratio at the end of 20 years – that is, the target number of mature oak trees at 20 years would be twice the number removed by surcharging. Use of a target replacement ratio greater than 1:1 provides compensation for the loss of mature trees by establishing more trees and wildlife habitat than under current conditions.

Reclamation will conduct a formal evaluation at 20 years to determine if additional plantings are necessary to achieve the 2:1 replacement.

To achieve the target replacement ratio, oak trees will need to be planted at a higher initial replacement ratio to compensate for the expected loss of trees during early development due to predation, drought stress, disease, and vandalism. The mortality observed by County Parks during their recent oak planting efforts at the park was about 33 percent. Based on this observed mortality rate, the initial replacement ratio to account for mortality would be 3:1 (incorporating a 2:1 replacement ratio and factor to account for mortality). Table 2 presents the final target number of replacement trees and the initial number of trees to be planted based on an assumed loss of 452 trees over time. The exact number of trees to be planted will be determined in 10 years after Reclamation has observed the effect of surcharge on shoreline trees. Coast live and valley oak trees would be planted in proportion to their occurrence in the surcharge impact zone.



There are known occurrences along Nojoqui, Salsipuedes, El Jaro, San Miguelito, Alisal, Quioto, Alamo Pintado, San Lucas, Hilton, and Santa Agueda creeks.

### **Southwestern Pond Turtle**

The southwestern pond turtle is a state Species of Special Concern which lives in freshwater rivers, streams, lakes, and ponds where there are permanent pools. Pond turtles may spend extended periods of time on land away from water. The species requires slowly moving water and appropriate basking sites such as logs, banks, or other suitable areas above water level. Habitat for the southwestern pond turtle occurs throughout the Santa Ynez River watershed. Turtles occur in the Long Pool below Bradbury Dam, between Refugio and Alisal Road near Solvang, and at several locations west of Buellton. Suitable turtle habitat exists below the Floradale Bridge west of Lompoc, and turtles were observed in Salsipuedes Creek southeast of Lompoc. Although turtles have been observed along the lower river by the SYRTAC biologist between Bradbury Dam and Buellton, the most suitable habitat occurs downstream from Buellton, where deep pools and dense vegetation occur at several locations along the river.

### **Two-Striped Garter Snake**

The two-striped garter snake is a State Species of Special Concern that is typically found near slowly moving creeks and streams, ponds, and coastal lagoons where water is permanent. These snakes are often found in areas of barren soil or short grass near the aquatic sites, and individuals may use large boulders for basking. The two-striped garter snake occurs in the upper Santa Ynez River above Gibraltar Reservoir and elsewhere in the watershed. It is unlikely that the species occurs at Cachuma Lake. This species has been occasionally observed along the mainstem of the river downstream of Bradbury Dam and in several tributaries. Suitable habitat for the species is abundant in the area around Buellton. Lack of permanent water upstream from Buellton may limit the two-striped garter snake in this portion of the river

### **Southwestern Willow Flycatcher**

The southwestern willow flycatcher is a state and federal endangered species. It is a small bird that occurs in riparian habitats along rivers and streams where there are dense growths of willows, coyote brush, tamarisk, and Russian olive. The southwestern willow flycatcher nests in thickets of trees and shrubs approximately 10-25 feet or more in height, with dense foliage throughout the canopy. Nest site vegetation is usually dense and structurally homogeneous. Nesting willow flycatchers virtually always nest near surface water or saturated soil.

The southwestern willow flycatcher breeds along the lower Santa Ynez River, which represents its northern geographic limit. In 2000, I managed a field investigation of this species to determine the distribution of the southwestern willow flycatcher from Cachuma Lake to the ocean for the SWRCB administrative Draft EIR and Reclamation's EIS/EIR for the FMP/BO. The following information is based on that survey, as well as information from other field investigators studying this species on the river.

There are two known breeding populations along the lower Santa Ynez River. The largest occurs about three miles west of the Avenue of the Flags bridge in the City of Buellton, extending to Santa Rosa Creek. That population consists of 15-20 breeding pairs. The second population occurs downstream of Floradale Bridge, primarily near the 13<sup>th</sup> Street Bridge and VAFB waterfowl ponds

near the river. The number of flycatchers recorded during the 2000 surveys was 27-30, with the largest population near Buellton (approximately 15-17 birds). The UCSB Museum of Systematics and Ecology performed annual surveys over portions of the river downstream of Buellton in 1994, 1996, 1997, and 2000. The number of flycatchers observed during these surveys ranged from 33-39 in 1996 to 26-28 in 1997.

Most of the river from Bradbury Dam downstream to below Solvang (i.e., to about 1.3 miles downstream of Alisal Road) contains poor habitat for the flycatcher due to the lack of well developed and continuous riparian woodland. The most suitable habitat on the lower river begins about 1.3 miles downstream from Alisal Road, and consists of scattered reaches with well developed riparian woodland.

On the Santa Ynez River, willow flycatchers tend to breed in willow-dominated habitat, usually with a dense understory that may include native and exotic species. Flycatchers may breed at sites with openings in the canopy where a dense growth of herbaceous plants occurs, sites with height heterogeneity in the canopy, or sites at the edge of the riparian canopy.

Water is a crucial element of southwestern willow flycatcher habitat on the Santa Ynez River, as elsewhere. Typically, the flycatchers choose sites in dense riparian vegetation next to the river channel. Flycatchers breeding on the river often choose sites with standing water or moist surface soils away from the main channel. Thus, split channels and low-lying areas at the base of the riparian vegetation but away from the main channel can provide good habitat, such as at the area approximately 0.5 mile downstream of the confluence of the Santa Ynez River and Santa Rosa Creek where shallow pools and moist soil lie at the base of the south bank. Willow flycatchers on the Santa Ynez River often choose sites near beaver dams, as near Buellton in 2000. Effluent from the Lompoc wastewater treatment facility provides excellent conditions for breeding southwestern willow flycatchers along the river west of Lompoc. The year-round discharge supports lush willow growth in the river channel.

### **Least Bell's Vireo**

The least Bell's vireo is a state and federal endangered species that breeds in the upper Santa Ynez River (above Gibraltar Reservoir) and lower Mono Creek. A breeding population is not present along the lower river, although there have been many recent sightings of transients. Suitable habitat along the river in the Santa Ynez Valley occurs in patches from Alisal Road to Highway 101. Further downstream, good quality riparian habitat begins again at Gardner Ranch. Extensive riparian habitat where other vireo species, thrushes, warblers, and finches are present occurs for about 0.7 mile downstream of Gardner Ranch. Suitable habitat is present between Highway 101 and 1 mile upstream of Santa Rosa Creek, and below Sweeney Road between Salsipuedes Creek and Route 246. In the Lompoc Valley, suitable habitat occur between the Lompoc wastewater treatment plant and Union Sugar Avenue; immediately downstream of Floradale Bridge; immediately upstream of Union Sugar Avenue; and between Union Sugar Avenue and 13<sup>th</sup> Street on VAFB.

### **Effects of Current and Future Releases for Fish**

Due to the current and planned releases from Bradbury Dam for fish, the low flows along the river downstream of Cachuma Lake will occur for a longer duration and over a longer portion of the river than under the recent historic operations. The increase in downstream low flows will attenuate with

distance from the dam, such that there will be very little difference in the frequency of low-flows near Alisal Road.

It is my professional opinion that the increase in low flows will likely increase the density, vigor, and extent of riparian vegetation in the river channel over time due to greater moisture availability, particularly during the early summer when water is generally absent from the river channel upstream of Alisal Road under current conditions. The availability of water throughout the year in portions of the channel affected by releases for rearing flows would enhance habitat for the two-striped garter snake and western pond turtle. The greater riparian cover would increase nesting and foraging areas for riparian breeding birds in general. The increased and more reliable aquatic and riparian habitats created by the releases for fish could also expand the range and number of sensitive species along the river, particularly upstream of Alisal Road, including the willow flycatcher and least Bell's vireo.

The increased flows below Bradbury Dam due to releases for fish may also enhance habitat conditions for the red-legged frog along portions of the mainstem. The current and planned releases will increase the extent of aquatic habitats, including pools that red-legged frogs could utilize. In particular, the releases from Hilton Creek have the potential to create high quality habitat for the red-legged frog immediately downstream of the creek.

Predatory non-native fish and the introduced bullfrog are common along the river downstream of Bradbury Dam. These species prey on red-legged frogs. The current and planned releases for fish will also enhance aquatic habitat for these species. There is no available evidence or method of investigation that can reliably predict whether the enhanced aquatic habitats would have a disproportionate effect on non-native predators or red-legged frogs. However, it is my professional opinion that an increase in the amount and quality of aquatic habitat along the river downstream of Bradbury Dam would provide more opportunities for native species, such as the red-legged frog, to find refuge and withstand the pressures of predators. As such, the releases may be beneficial to this sensitive species.

In conclusion, it is my professional opinion that the current and planned releases for fish from Bradbury Dam will enhance and expand aquatic and riparian habitats for sensitive wildlife species downstream of the dam.

### **Impacts to Flycatcher Nesting from Water Rights Releases**

Water rights releases for the Below Narrows Account (i.e., for the Lompoc Basin) pass through a portion of the river where the endangered southwestern willow flycatcher nests, as described above. The population has been expanding over the past 10 years due to increased riparian cover from a series of wet years and a lack of major flood events. Water rights releases often occur during the nesting period of the birds. The water passing through the breeding habitat could affect riparian vegetation used by birds for perching and nesting. However, this impact is not expected to cause nest failures or to degrade the nesting habitat as described in the SWRCB Draft EIR, and summarized below.

Flows from the water rights releases pass through the breeding habitat for the willow flycatcher, from Buellton to near the Narrows. These flows may occur during the breeding period when nests have eggs or fledglings – late-May to early July. These flows may impinge upon vegetation where nests are built, potentially disturbing the nests due to physical movement of the stems holding the nests. Nests are



typically constructed in the fork of a branch or on a horizontal branch, about 3.2 to 15 feet above the ground. The nests are usually placed on small willow or mulefat trees with dense vegetation surrounding it. Nests are typically placed near or adjacent to open water.

A hydraulic analysis of the expected rise in water surface elevation in flycatcher habitat downstream of Buellton was conducted for the SRWCB Draft EIR. There are multiple braided channels in the areas occupied by the flycatcher, which is a very wide portion of the river (500 to 1000 feet wide). Hence, increases in river flows result in smaller water surface changes. The hydraulic analysis indicates that water rights releases in the flycatcher habitat areas would typically increase water surface elevations less than 12 inches, and that flows due to water rights releases would not inundate flycatcher nests. Beaver dams are present in this reach, which can exacerbate the effect of water rights releases on nests by temporarily creating a surcharge behind their dams.

However, it is possible for water rights releases to pass under nests and physically disturb the nests or change the underlying substrate from dry to wet. The frequency and magnitude of this impact cannot be predicted because of the presence of many complex variables, including the difficulty in predicting where flows will occur during water rights releases, and whether they will be concentrated in one channel or spread among many braided channels. The location and height of nests also cannot be predicted, and will vary from year to year. The effects of beaver dams are highly unpredictable. Finally, the physical disturbance of a stem supporting a nest due to higher flows does not necessarily result in nest abandonment or lessened reproduction success.

It is my opinion that water rights flows in the river do not cause a significant impact on flycatchers in light of the observation that the flycatcher population is healthy and expanding in this portion of the river, that water rights flows do not inundate nests, and that most water rights releases are made after breeding season. Furthermore, the releases provide additional water to support aquatic insects and provide more riparian growth – both beneficial impacts to the population.

## **5. EFFECTS OF SURCHARGING ON CACHUMA LAKE RECREATION**

### **Overview of Cachuma Lake County Park**

The Cachuma Lake Recreation Area (Recreation Area) is federal land designated for recreational uses. It includes Cachuma Lake and the surrounding land, which encompasses about 6,448 acres. After Reclamation constructed Bradbury Dam, the County of Santa Barbara (County) agreed to manage recreation at the federally owned reservoir. A 50-year contract between Reclamation and the County was executed in January 1953. According to the contract, the County will develop, maintain and administer recreation at the lake. The contract also requires that County facilities accommodate operational needs at the lake. The contract expired in January 2003. Reclamation issued an interim 2-year contract to the County to provide time to negotiate a new contract and complete a Resource Management Plan for the lake.

Recreational area facilities are concentrated in the 375-acre County Park on the south side of the lake. Most of the remainder of the property is not accessible to the public. Recreational facilities located in the County Park include the following: campsites, general store, gas station, marina and launch ramp,

private docks, bait and tackle shop, amphitheater, trailer storage yard, short-term mobile home park, nature center, swimming pools, and snack shop. There are 500 campsites at the Park.

Cachuma Lake is widely known for its natural, scenic qualities. The primary attractions to the lake are fishing and camping. Boats for fishing and sightseeing are allowed on the lake all year. Boats are available for rent at the marina, which also provides private boat mooring facilities. Cachuma Lake provides large and diverse recreational fisheries, supporting smallmouth and largemouth bass, rainbow trout, bullhead, channel catfish, bluegill, sunfish, and crappie. Bass tournaments are held frequently during spring. Trout fishing is also very popular at Cachuma Lake. The Park Department and State Department of Fish and Game regularly stock Cachuma Lake with trout during the spring and summer.

Most of the visitors go to Cachuma Lake for fishing and boating. Camping is the second most popular attraction, followed by day use and special events (especially on weekends). Over 40 percent of annual visitation occurs during the summer months of June, July and August. The peak attendance month is August. Attendance is lighter in the spring and fall months and drops to about five percent of annual visitation during the winter months. Attendance varies from year to year.

### **Potential Impacts Due to Surcharging**

Higher lake levels due to surcharging would affect recreational facilities at the County Park, which could disrupt recreational activities and possibly cause a public safety hazard. Surcharging would initially occur in the late winter and early spring months when visitors and recreational activities at Cachuma Lake are at low levels. However, the maximum lake level can persist for many months under certain circumstances, and could conflict with early summer recreation. The magnitude and significance of the impact on recreational uses depends on the facilities affected, and the duration of impact that causes disruption of recreation. For example, temporary closure of an overflow parking lot during the winter months due to a higher lake level would not be considered significant. In contrast, closure of the boat launch or marina due to higher lake levels could be considered significant.

I conducted assessments of the potential effect on facilities for the SWRCB administrative draft EIR and Reclamation's FMP/BO Draft EIS/EIR. In the assessments, I compared the base elevations of various facilities to determine if higher lake levels could flood the facilities or otherwise affect their functions. My analysis addressed the need to protect or relocate Park facilities under "still water" conditions (that is, maximum water levels of 753 feet), and due to wave action with a full reservoir (that is, 753 plus 3 feet = 756 feet).

A summary of Park facilities and potential impacts from surcharging is summarized in Table 3. Facilities that would be inundated by a 3-foot surcharge (to elevation 753 feet) with no wave action include: (1) three critical facilities: water treatment plant and intake, marina path and floating docks, and boat launch ramp; and (2) two non-critical facilities: Barona Shores path and Teepee Island footbridge. All other facilities would not be inundated by a 3-foot surcharge if there were no waves. These facilities include marina overflow parking lot, Mohawk Road, Harvey's Cove path, bait shop, snack bar, sewer lift stations 2 and 3, Harvey's picnic grove, Sweetwater trail, boat works shop, and Mohawk overflow parking. The need to relocate these facilities to protect from wave action must be determined by County Parks based on the level of risk that they are willing to take regarding each

facility. For many facilities located at or near 753 feet elevation, inundation due to a 3-foot surcharge with wave action could be tolerated because the facilities would not be destroyed and the duration of the wave action would be limited to hours or a day, and because the public can be excluded from these areas of the park during the storm period when there are high waves. Lake levels reached the surcharge elevations during the storms of 1978 (753 feet), 1998 (754 feet) and 2001 (753 feet), caused the Park to take emergency measures to avoid or reduce facility damage.

County Parks has initiated actions to accommodate a 3-foot surcharge. In 2000, they completed an engineering feasibility study to identify preliminary facility relocation concepts and costs. They have applied for, and received, several grants from Reclamation and the State of California to design and/or construct certain facility modifications to accommodate surcharging. For example, the two sewer lift stations will be relocated in 2004 using a combination of grant funds (from Reclamation and Proposition 12) and County funds. County Parks recently initiated preliminary design of a new drinking water treatment plant, to be located above the new inundation zone. Finally, County Parks has state grant funds to construct a new boat launch, and is currently modifying the design plans to accommodate the surcharge using grant funds from Reclamation for the additional engineering effort.

Reclamation, COMB, and County Parks are currently exploring an approach to avoid or reduce the impacts of the planned 3-foot surcharging on recreational facilities and uses at the park. At the time that this testimony was prepared, this approach involved limiting surcharging to a 1.8-foot level over a specified number of years while County Parks completed the final design and relocation of critical facilities. Under this approach, County Parks may need to institute some interim measures to avoid or minimize impacts of the smaller surcharging on recreational facilities and uses.

**TABLE 3  
CACHUMA LAKE RECREATIONAL FACILITIES POTENTIALLY AFFECTED BY SURCHARGING**

<b>Facility</b>	<b>Current Base Elevation (Est. in feet)</b>	<b>Affected by 3-foot Surcharge and No Wave Run Up? (753')</b>	<b>Affected by 3-foot Surcharge and 3' Wave Run Up? (756')</b>	<b>Notes</b>	<b>Requirement to Accommodate Surcharge</b>	<b>County Parks Funding Status</b>	<b>Status of Design and Construction</b>
Drinking Water Intake Pump	755	No	Yes	The facility flood elevation is about 755'.	Need to construct floodwall around pump house	Included in preliminary design for relocated water treatment plant	Included in preliminary design for relocated water treatment plant
Drinking Water Treatment Plant	753	Yes	Yes	This facility includes five structures: two buildings and three tanks. The lowest structures are the northernmost building and tank at about 753'	Need to relocate or build possible flood wall (if feasible). Relocation is needed to improve long-term reliability	\$50,000 is currently available for preliminary design (\$25K from County, \$25K from USBR)	Preliminary design to begin in October 2003
Sewer Lift No. 2	759	No	Yes	The aboveground portion of this facility is at 760'. Below ground elevation is unknown. This facility must be moved under 3' surcharge to maintain 50' horizontal distance from open water	Need to relocate	Construction funds from Prop. 12 grant are available	Design complete. Construction pending
Sewer Lift No. 3	758	No	Yes	The aboveground portions of this facility are between 759 and 758'. This facility must be moved under 3' surcharge to maintain 50' horizontal distance from open water	Need to relocate	Construction funds from County and USBR are available	Design complete. Construction scheduled for 2004, pending permits
Marina Path and Stairs and Floating Docks	753	Yes	Yes	The existing walkway is at 753' and the floating docks are at 750'.	Need to relocate upslope	No funds identified to date	Not initiated or scheduled
Boat Launch Ramp	750	Yes	Yes	The top of the launch ramp is at 750' and the turning and	Need to relocate and remodel	Construction Funds available	Design needs to be modified to

<b>Facility</b>	<b>Current Base Elevation (Est. in feet)</b>	<b>Affected by 3-foot Surcharge and No Wave Run Up? (753')</b>	<b>Affected by 3-foot Surcharge and 3' Wave Run Up? (756')</b>	<b>Notes</b>	<b>Requirement to Accommodate Surcharge</b>	<b>County Parks Funding Status</b>	<b>Status of Design and Construction</b>
				loading area at the top of the ramp is at 752'.		from the State, expire in 12/2005. USBR to provide \$90,000 to modify current design for surcharging.	accommodate surcharge. Re-design not initiated or scheduled
Bait and Tackle Shop, Snack Bar, retaining wall	756	No	Yes	The bait and tackle shop and retaining wall are at 756'.	Possible need to relocate or raise existing retaining wall	No funds identified to date	Not initiated or scheduled
Marina Overflow Parking	753	No	Yes	The lowest point of the parking lot is 753' at the far western end, near the lake's edge. The lot gradually slopes upward towards the east to 765'.	Possible need to raise, or accept periodic outage and post-flooding clean up	No funds identified to date	Not initiated or scheduled
Mohawk Road	756	No	Yes	The lowest point in the road is at 756', just south of sewer pump station #3.	Need to raise	Included in Lift Station 3 work	Included in Lift Station 3 work
Harvey's Cove Picnic Area	755	No	Yes	The lowest point of this picnic area is 755', just above the dock ramp. The area slopes gradually upward towards the south to approx. 758' before the slope becomes steeper.	Possible need to raise, or accept periodic outage and post-flooding clean up	No funds identified to date	Not initiated or scheduled
Harvey's Cove Path	754	No	Yes	The lowest point of the path is at 754', both on the way to the picnic area and just before the floating ramp to the fishing dock.	Possible need to relocate or accept periodic outage and post-flooding clean up	No funds identified to date	Not initiated or scheduled
Barona Shores Trail	755	Yes	Yes	The low point on the trail is near 750'	Possible need to relocate or accept periodic outage and post-flooding	No funds identified to date	Not initiated or scheduled

<b>Facility</b>	<b>Current Base Elevation (Est. in feet)</b>	<b>Affected by 3-foot Surcharge and No Wave Run Up? (753')</b>	<b>Affected by 3-foot Surcharge and 3' Wave Run Up? (756')</b>	<b>Notes</b>	<b>Requirement to Accommodate Surcharge</b>	<b>County Parks Funding Status</b>	<b>Status of Design and Construction</b>
					clean up		
Teepee Island foot bridge	752	Yes	Yes	The bridge abutments are located at 752'	Possible need to relocate or accept periodic outage and post-flooding clean up	No funds identified to date	Not initiated or scheduled
Sweetwater Trail	755	No	Yes	At its lowest point, the trail drops down to 755'	Possible need to relocate or accept periodic outage and post-flooding clean up	No funds identified to date	Not initiated or scheduled
Boat Works Shop	760	No	Yes?	The shop is near 760' on a flat ground surface. Construction of a berm may be needed under 3' surcharge to provide more boat laydown area	Construct small berm	No funds identified to date	Not initiated or scheduled
Picnic Area Adjacent to Shop	751	Yes	Yes	The lowest point of the picnic area is at 751'	Possible need to relocate	No funds identified to date	Not initiated or scheduled
UCSB Crew Building and Ramp	756	No	Yes	The building is at 756'	Possible need to relocate	No funds identified to date	Not initiated or scheduled
Mohawk Overflow Area and Road	754	No	Yes	The lowest point of the picnic area/overflow is 754'. The road leading to the shore currently reach 754'	Possible need to relocate	No funds identified to date	Not initiated or scheduled