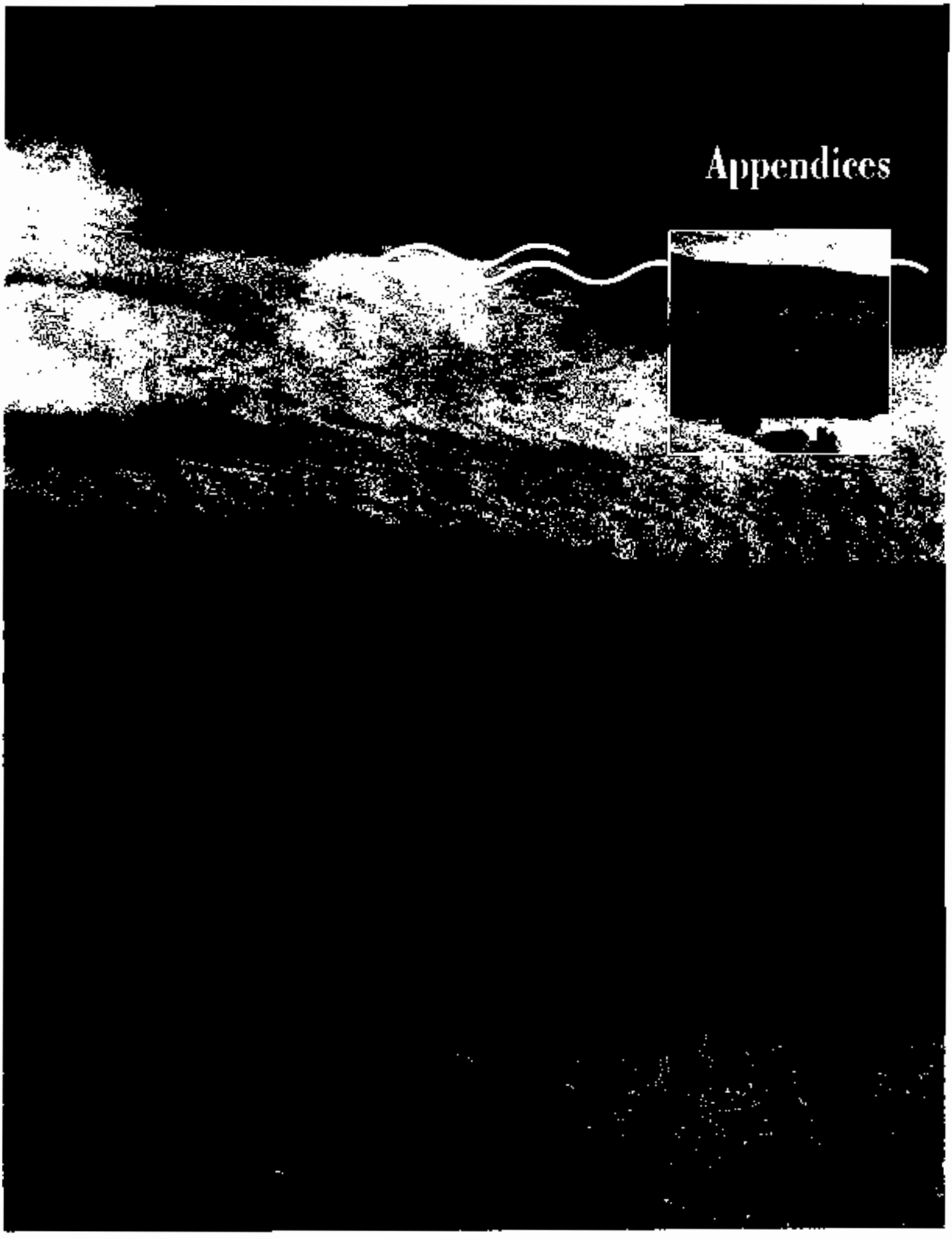
Appendices



Appendix A: Glossary of Key Terms

Above, the number and type of visitors are social attributes of the setting

Below, camping overnight in a quiet cove can be very peaceful

Managerial attributes (setting). Managerial attributes are the features or characteristics of a recreation setting that may define and distinguish the recreation experience. Management attributes may include facilities (e.g., ranging from water markers to full service marinas and campgrounds), rules, regulations, water operations, educational programs, fees and charges, interpretation, signage, law enforcement, design, lighting, concessions, and special use permittees.

Physical attributes (setting). Physical attributes are features or characteristics of a recreation setting that may help to define and distinguish the recreation experience. Physical attributes can be divided into natural features or built structures of a more permanent or fixed nature. Examples of natural resource attributes include water quality, aquatic and terrestrial vegetation, topography, shoreline curvature, fish and wildlife habitat, soil, natural soundscape, and air quality. Examples of built structures include all those municipal, commercial, industrial, residential, agricultural, and major recreation buildings and infrastructure common to any city or community (e.g., dams, water and power conveyances, water control structures, residential subdivisions, industrial complexes, commercial centers, air and ground transportation systems, developed resorts and marinas, theme parks, and shipping and cargo facilities).

Recreation activity. Recreation activity is a leisure-time pursuit that a person participates in voluntarily to secure a pleasurable experience.

Recreation benefits. Recreation benefits are the positive gains or improvements made by people participating in recreation opportunities. The gains may include benefits for the individual, community, economy, or environment.

Recreation diversity. Recreation diversity is the type, variety, distribution, quality, and abundance of outdoor recreation opportunities. Diversity is accommodated through management of a spectrum of recreation opportunity classes, zones, or units named in WROS as urban, suburban, rural developed, rural natural, semi-primitive, and primitive.

Recreation experience. Recreation experience is the psychological and physiological response to participating in a particular recreation activity in a specific recreation setting. Recreationists consume a recreation experience (activity + setting = experience).

Recreation opportunity (RO). Recreation opportunity is the opportunity for a person to participate in a particular activity in a specific setting to realize a particular type of experience and subsequent benefits.
RO = activity + setting = experience >>>> benefits.

Recreation setting. Recreation setting is a geographic location composed of physical, social, and managerial attributes where a person participates in a particular activity to have a specific type of recreation experience. Managers manage the recreation setting.

Social attributes (setting). Social attributes are the features or characteristics of a recreation setting that may define and distinguish the recreation experience. Social attributes may include such features as (1) recreation use and users (e.g., the type, amount, time, location, distribution, origin, behaviors, and quality), (2) non-recreation use and users (e.g., business people, educational groups, agency personnel, scientists, farmers and ranchers, and local residents), and (3) special values associated with the cultural, historical, and spiritual or religious significance.

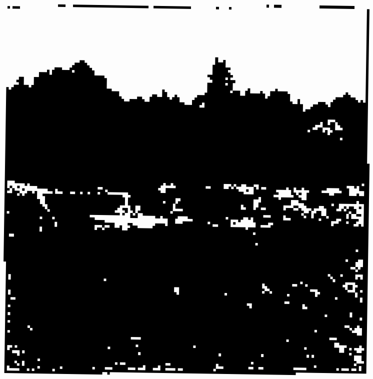
Suitable recreation acres. Suitable recreation acres are those acres within a project or planning area that can or will accommodate some type and level of recreation use. Unsuitable recreation acres may be those acres that include security closures, pose public safety hazards, contain sensitive wildlife habitat or heritage sites, have incompatible industrial activity, or are inaccessible because of topography or private land.

Visitor (recreation) capacity. Visitor capacity is the supply, or prescribed number, of recreation opportunities that can be accommodated in a particular area.

Water resources. Water resources is the term used in this guidebook to refer to the types of water resources to which WROS can be applied, including lakes, reservoirs, wetlands, bays, estuaries, rivers, coastal zones, and marine protected areas.

WROS classes, areas, or zones. WROS is a system of six classes of recreation opportunities ranging from urban to primitive. The word *class* refers to the narrative description of the six classes in this guidebook. When a body of water is mapped or delineated as belonging to one or more WROS classes, they are called WROS areas or zones.

Appendix B: A Directory of Related Systems and Sources of Information



Above, there are many ways to enjoy our great outdoors.

Below, boat safety classes can add to a persons enjoyment.

Bureau of Reclamation Information Sources:

- Recreation Facility Design Guidelines, 2002 [illegible]
- Sign Guidelines for Planning, Design, Fabrication, Procurement, Installation, and Maintenance of Signs for Outdoor Public Use Areas. 2002 [illegible]
- Social Analysis Manual, Vol. 1, 2001
- Public Involvement Manual, 2000
- Resource Management Plan Guidebook, 2003 [illegible]
- Impact of Fluctuating Reservoir Elevation on Recreation Use and Value, 2000
- Concession Management Policy, 2002
- Recreation Management Policy, 2000

U.S. Forest Service Information

- ROS Users Guide, 1982 [illegible]
- Integrating People with Ecosystems: A Planning Technical Guide for Recreation, Heritage, and Wilderness Resources, 2003
- National Visitor Use Monitoring (NVUM) Data Base
- National Survey on Recreation and the Environment (NSRE), [illegible]
- Landscape Aesthetics: A Handbook for Scenery Management, Agriculture Handbook No. 701
- The Built Environment Image Guide for the National Forest and Grasslands, 2002 [illegible]
- Meaningful Measures: Recreation Business Management System of the Forest Service, 2000 User Guide [illegible]
- Floating Trail Bridges and Docks, 2000

Other Sources of Information

- Visitor Capacity on Public Lands and Waters: Making Better Decisions, National Recreation and Parks Association, 2002
- Reservoirs of Opportunity: Report of the National Recreation Lakes Study Commission, 1999
- Recreation Value to the Nation, U.S. Army Corps of Engineers, Institute of Water Resources www.usace.army.mil/recreation

A Sample of Some Field Locations with WROS Experience

- Lake Havasu, AZ, Donald Ellsworth, and Mike Henderson, BLM, (928) 505-1264
- Millerton Lake, CA, Bob Epperson, BOR, (559) 487-5408
- New Melones Lake, CA, Peggy Brooks, BOR, (209) 536-9091
- California State Parks, Wayne Woodmof, CA, (916) 445-8850
- Lake Shasta, CA, Krista Cottam, USFS, (530) 242-5500

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  729 Duke Square
  Fort Collins, Colorado 80525
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- Mr. Verona Lovejoy
  Bureau of Reclamation
  PO Box 25007
  Lakewood, Colorado 80225
  (303) 445-2913
- Mr. Darrell Welch
  Bureau of Reclamation
  PO. Box 25007
  Lakewood, Colorado 80225
  (303) 445-2711

For inservice staff training, orientation, and PowerPoint presentations, please contact the authors.

Attachment 3

Comparison of the Reservoir Area Management Plan and the Water Recreation Opportunity Spectrum Criteria

A table comparing popular recreation features described in the Reservoir Area Management Plan (RAMP) recreation classification system and similar features found in the Water Recreation Opportunity Spectrum are listed below. The WROS has numerous elements for each of the major use categories, however, only those that generally correspond with elements under the RAMP classification system are included here. The Water Recreation Opportunity Spectrum is being adopted by many federal and state land managing agencies and therefore lists recreation facilities and activities that are meant to cover a variety of authorized uses for many different types of federal and state recreation areas. The complete list of the types of facilities and activities that can be applied under WROS is found in Attachment #

WROS Classification System Urban
Visitor center, designated beaches, paved boat ramps, overnight security, marine sanitation devices, wake-less speed, closures, boat fuel sales, boat moorings, docks, community piers, sanitation pump stations, drinking water, electrical hookups, bath houses, picnic shelters, flush toilets, paved parking, fireplace grills, fish cleaning stations, full service resorts, and marinas, life guards, camping reservations, food service, paved trails, wildlife/fisheries habitat improvement, vegetation and wildfire management

Suburban
Visitor center, designated beaches, paved boat ramps, overnight security, marine sanitation devices, wake-less speed, closures, boat fuel sales, boat moorings, docks, community piers, sanitation pump stations, drinking water, electrical hookups, bath houses, picnic shelters, flush toilets, paved parking, fireplace grills, fish cleaning stations, full service resorts, and marinas, life guards, camping reservations, food service, paved trails, wildlife/fisheries habitat improvement, vegetation and wildfire management

RAMP Classification System Class I
High density recreation areas.
Concentrated recreational use includes highly developed marina motel, cottages, maintenance area, designated camping, launch ramps, long-term sites, R V hookups, paved parking, roadways, resort facilities, store, moorage, restaurants

Rural Developed

Visitor centers, designated beach areas, paved boat ramps, security lighting, marine sanitation devices, wake-less speed, closures, floating sanitation dvices, floating camping platforms, boat fuel sales, boat mooring, community piers, sanitation pump stations, drinking water, electrical hookups, bath houses, picnic shelters, flush toilets, paved parking, fireplace grills, fish cleaning stations, full service resort/marina, boat launch/camping reservations, food service, paved/unpaved trails, wildlife/fisheries habitat improvement, vegetation/wildfire management

Rural Natural

Designated beaches, paved boat ramps, marine sanitation devices, floating sanitation platforms, wakeless speed, closures, floating camp platforms, boat fuel sales, boat moorings, boat docks, sanitation pump stations, drinking water, picnic shelters, pit/vault toilets, fireplace grills, fish cleaning stations, rustic campgrounds, camping/boat launch reservations, food service, unpaved trails, wildlife/fisheries improvement, vegetation/wildfire management

Semi-Primitive

Wake-less speed, closures, marine sanitation devices, floating sanitation platforms, floating camping platforms, boat moorings, pit/vault toilets, rustic campgrounds, campsite/boat launch reservations, unpaved trails, wildlife/fisheries habitat improvement, vegetation/wildfire management

Class II

Low Density, Semi-developed Outdoor Recreation Areas

Developed Parking, picnic sites, restrooms, showers, designated campsites, water, paved roads, launch ramps, erosion/vehicle control

Class III

Dispersed Recreation Areas of Moderate Density

Mostly undeveloped with road turnouts for informal parking, minimal sanitary facilities, trail development, erosion control, fencing/barriers to control access, cattle grazing

Primitive

Wake-less speed, closures, marine sanitation devices, camping/boat launch reservations, unpaved trails, wildlife/fisheries habitat improvement, vegetation/wildfire management

Class IV

Semi-Primative Areas of Low Density

Natural undeveloped setting with constrained access, trails, low density boat-in camping fencing to control cattle

Attachment 4

Quail Ridge Reserve
Memorandum of Understanding

EXHIBIT A

to Cooperative Agreement

MEMORANDUM OF UNDERSTANDING

among

THE UNIVERSITY OF CALIFORNIA, NATURAL RESERVE SYSTEM

THE QUAIL RIDGE WILDERNESS CONSERVANCY

THE NAPA COUNTY LAND TRUST

THE U.S. BUREAU OF LAND MANAGEMENT

THE U.S. BUREAU OF RECLAMATION

THE CALIFORNIA DEPARTMENT OF FISH AND GAME

THE WILDLIFE CONSERVATION BOARD

and

THE UNIVERSITY OF CALIFORNIA, DAVIS

I. Purpose

The intent of this Memorandum of Understanding is to establish a cooperative relationship between the University of California, herein called "University," the Quail Ridge Wilderness Conservancy, herein called "Conservancy," the Napa County Land Trust, herein called "Trust," the U.S. Bureau of Land Management, herein called "Bureau," the U.S. Bureau of Reclamation, herein called "Reclamation," the California Department of Fish and Game, herein called "Department," and the Wildlife Conservation Board for management of lands on the Quail Ridge peninsula of Lake Berryessa in Napa County as part of the University's Natural Reserve System. (Exhibit 1)

II. Background

Quail Ridge is an approximately 3,000 acre peninsula of minimally impacted native California oak woodland, chaparral, and grassland extending into Lake Berryessa. The area has considerable wildlife and habitat value, and would provide excellent research and educational opportunities. A group of interested citizens has formed the Quail Ridge Wilderness Conservancy for the purpose of protecting the peninsula and developing an ecological reserve. To this end, the Conservancy has built alliances with other groups and agencies who might assist in achieving these goals. The Conservancy has acquired title to some of the private holdings on the peninsula, and holds purchase options on others. Other land owners on the peninsula include: Bureau, Department, through the Wildlife Conservation Board, Reclamation, and several private parties. The Department has expressed an interest in acquiring several of the privately held parcels using Proposition 70 funds.

All of the parties to this memorandum of understanding have expressed the desire for the University to incorporate Conservancy's property into its Natural Reserve System and undertake, through the Davis Campus, its management. Proposed activities at the reserve would include: 1) preservation and conservation of California native flora and fauna, 2) habitat restoration and management, 3) research and instruction activities, and 4) public education and controlled public access.

III. Planned Actions

In order to establish an ecological reserve that includes lands owned by each of the parties and assure that it is managed according to the joint needs and desires of all the parties, the following actions will occur

A. The University will initiate the process to obtain Regent's approval to incorporate holdings of the Conservancy into its Natural Reserve System. If approval is obtained, the University will assume responsibility for management of the reserve, appoint a management committee that includes representation from the Conservancy, develop a management plan with appropriate consultation and approvals, provide financial and other resources needed to properly manage the reserve, and actively seek funds to acquire inholdings within the peninsula.

B. University and Conservancy will execute an agreement that will designate the University as manager of Conservancy lands within the peninsula and will turn over any such lands to University in the event the Conservancy dissolves. The agreement will provide for Conservancy to participate in the development of the management plan and maintain an active role in the management of the reserve through membership on an advisory committee and other community oriented activities at the reserve such as docent tours, community educational activities, and other activities as agreed upon. Conservancy will continue to maintain good relationships with private land owners within the reserve and promote the concept of an ecological reserve on the peninsula

C. Trust holds conservation easements on certain privately owned property within the proposed boundaries of the reserve. University and Trust will execute an agreement that guarantees that those easements will either be maintained or transferred to the University.

D. Bureau will initiate the process to designate United States land administered by Bureau and not withdrawn for Solano Project purposes as an Area of Critical Environmental Concern (ACEC) in their Resource Management Plan process. University and Bureau will execute a long term use and management agreement that will designate the University as manager of Bureau property located on the peninsula subject to Bureau approval of the management plan for its portion of the land within the reserve.

E. Department through the Wildlife Conservation Board will attempt to acquire selected private holdings on the peninsula and will designate those lands as an Ecological Reserve. The University and Department will execute a long term use and management agreement that will designate the University as manager of the Department property located on the peninsula subject to Department approval of the management plan for its portion of the land within the reserve. Department will participate in management of the Reserve through membership on an advisory committee.

F. Reclamation will execute a long term use and management agreement with University to designate University as manager of United States land administered by Reclamation located on the peninsula subject to Reclamation approval of the management plan for its portion of the land within the reserve but with the knowledge and understanding that Reclamation will continue to maintain its radio relay station located on the peninsula.

IV Special Considerations

The provisions in this memorandum will be supplemented by individual agreements executed between the University and the individual parties to this agreement. The intent of this Memorandum of Understanding will be included in those agreements.

Whenever notice is required or provided for herein, it shall be given in writing by first class U.S. mail, sent to the following addresses or to such other addresses as any party may so notify the others from time to time.

University of California
Natural Reserve System
300 Lakeside Drive, 6th Floor
Oakland, Ca 94612-3560

Napa County Land Trust
P.O. Box 2903
Yountville, Ca 94599

U.S. Bureau of Reclamation
Lake Berryessa Recreation Office
P.O. Box 9352
Napa, Ca 94558

Wildlife Conservation Board
1416 9th Street
Sacramento, Ca 95814

Quail Ridge Wilderness Conservancy
35344 County Road 95
Davis, Ca 95616-9735

U.S. Bureau of Land Management
Ukiah District Office
555 Leslie Street
Ukiah, Ca 95482

Cal. Department of Fish & Game
P.O. Box 47
Yountville, Ca 94599

University of California, Davis
Office of the Chancellor
Davis, Ca 95616

V Signatures

University of California
Natural Reserve System — Date

Quail Ridge Wilderness Cons — Date

Napa County Land Trust — Date

U.S. Bureau of Land Management — Date

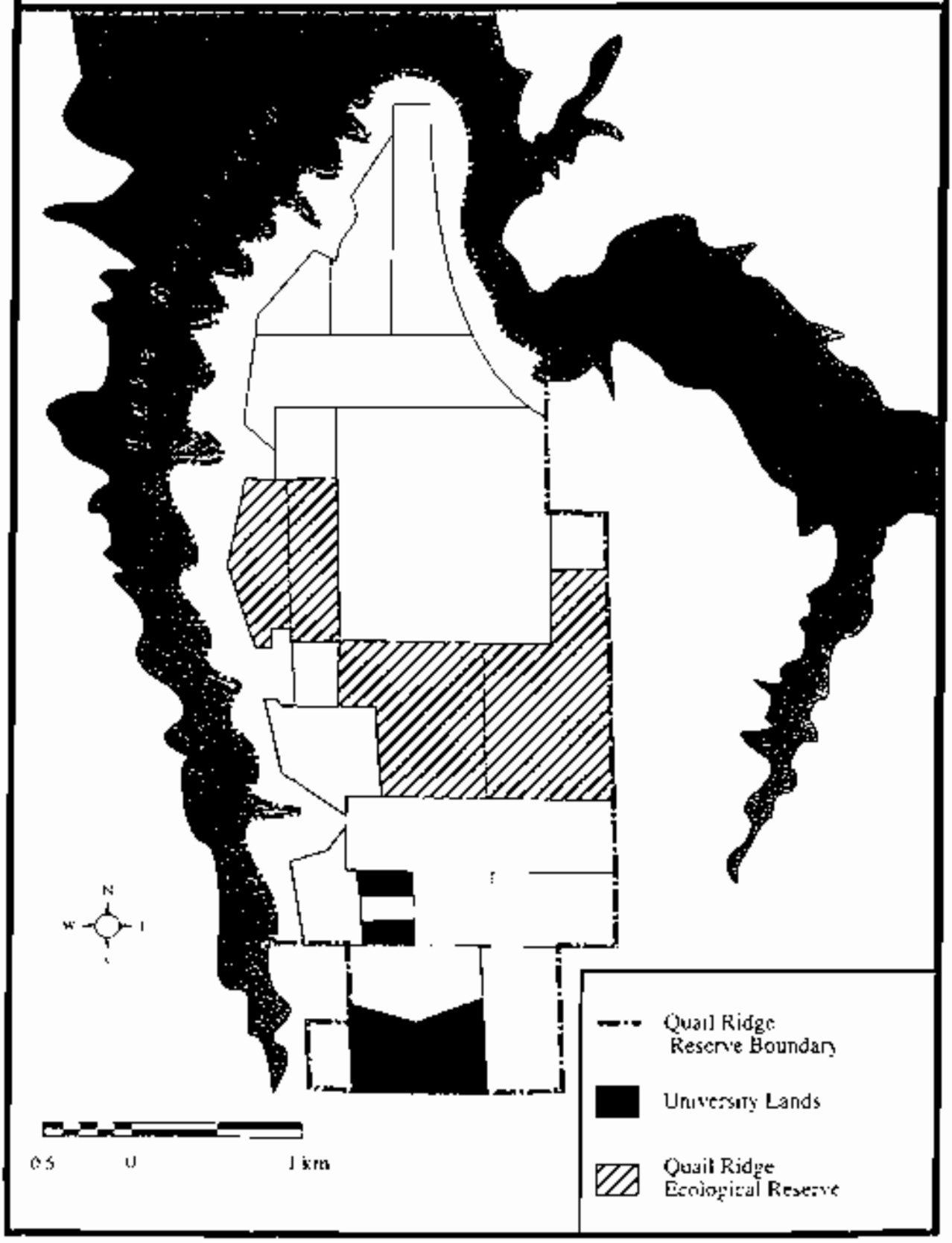
U.S. Bureau of Reclamation — Date

Cal. Department of Fish & Game — Date

Wildlife Conservation Board — Date

University of California, Davis — Date

Exhibit B to Cooperative Agreement



Attachment 5

Comparison of Preferred Actions in the RAMP/ROD and Preferred Actions in the VSP/FEIS

RAMP vs. VSP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
1. **Land Acquisition**: Acquire additional lands to provide recreational access and services to public lands and minimize impacts to adjoining lands. Priority acquisitions include the following sites: Private lands between Putah and Eticuera Creeks southeast of the Knoxville-Berryessa Road. (Two parcels involving 200 acres may ultimately be involved); Private land south of Spanish Flat Resort adjacent to Knoxville-Berryessa Road. (Two parcels totaling approximately 2-1/2 acres may ultimately be involved).	Not affected by this Visitor Services Plan	Not affected by this Visitor Services Plan	Not affected by this Visitor Services Plan	Not affected by this Visitor Services Plan
2. **Land Disposal**: Dispose of or exchange lands around Lake Berryessa not required for either the operation of the Solano Project, watershed protection, or recreational or wildlife purposes. Only lands separated from the lake by highways would be considered in this action. As lands are identified for disposal, appropriate public involvement and environmental documentation procedures will be followed. Approximately 500 acres could ultimately be involved.	Not affected by this Visitor Services Plan	Not affected by this Visitor Services Plan	Not affected by this Visitor Services Plan	Not affected by this Visitor Services Plan
3. **Dispersed Recreation Area Improvements**: Develop and or improve dispersed recreation areas (Class III) which could include access trails, sanitation facilities, garbage collection, parking, visitor information signing, etc. to provide for the health and safety of the public and protection of resources. In some cases, improvements would only involve a replacement of existing deteriorated facilities. Sites to be developed and/or improved generally would include areas with existing improvements and those areas being used frequently by the public which lack any improvements.	Same as RAMP EIS ROD. (Implemented at Pope Creek)	No longer uses Class III ("Dispersed") zoning. Developments, improvements would occur at areas such as Eticuera, Pope Cr., and Steele Canyon, and in conjunction with trail development.	Same as Alt B	Same as Alt B
4. **Administration Point Day Use Area**: Improve access to Administration Point to provide a dispersed/semi-primitive	Same as RAMP EIS ROD.	Same as Alt A	Same as Alt A	Same as Alt A

RAMP vs. LSP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
day use experience. Access will normally be limited to walk-in users. Provision for limited motor vehicle access will be available for special needs populations. The site totals 30 acres of which only a small portion of the land would be disturbed for site development.	(Implemented as Senior Fishing Access)			
5. **Smittle Creek Day Use Area**: Maintain Smittle Creek Day Use Area in accordance with the Oak Shores Plan which retains it as a day use area. No campground development would be allowed.	Same as RAMP EIS ROD. (Implemented)	Same as Alt A	Same as Alt A	Same as Alt A
6. **Facilities for Special Needs Populations**: Improve accessibility for special needs populations in all facilities at Lake Berryessa including concession areas. In some cases, retrofitting of appropriate facilities may be required in accordance with Section 504 of the Rehabilitation Act of 1973, as amended.	Same as RAMP EIS ROD. (Minimally implemented at Acorn Beach Restroom.)	Implement Alt A through new facilities and services especially within concession areas	Implement Alt A through new facilities and services especially within concession areas	Implement Alt A through new facilities and services especially within concession areas
7. **Trail Development**: Develop a predominantly unsurfaced multi-purpose riding and hiking trail system (30 to 50 miles) in dispersed recreation (Class III) and semi- primitive areas (Class IV). Trails could accommodate a variety of uses, but would not be available to motorized vehicles. Any development of trails on the eastside would have to conform with a management plan for that area to be developed as a result of preferred action 13.	Same as RAMP EIS ROD. (Not implemented.)	Class restriction no longer applies. Plan for regional and shoreline trail system	Class restriction no longer applies. Plan for regional and shoreline trail system	Class restriction no longer applies. Plan for regional and shoreline trail system
8. **Boat Access Camping**: Establish a boat access camping program for areas designated as semi-primitive (Class IV) and dispersed recreation (Class III) which will be administered by Reclamation. Under a permit system, resorts could provide parking and launching for a fee. Initially, only 50-100 sites would be established.	Same as RAMP EIS ROD. (Not implemented.)	No longer necessary if this alternative is implemented	Same as Alt B	Same as Alt B
9. **Island Uses and Improvements**: Provide dispersed recreation area improvements such as boat access camping sites on Small and Big Island (450 + acres). This would change the existing land-use classification from	Same as RAMP EIS ROD. (Not implemented due to wildlife	Revert to status prior to RAMP EIS ROD. No development	Same as Alt B	Same as Alt B

RAMP vs. VSP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
semi-primitive (Class IV) to dispersed recreation (Class III).	impact concerns especially T&E species.)	allowed on Big or Small Island. Zone as Rural Natural with Wildlife Protection		
10. **North Area Campground**: Develop a low density, high quality campground and day use area on the west shore, north of Potuk Creek. The exact location would be made in consideration of minimizing potential impacts to bald eagles. Approximately 50-100 individual sites plus a group site on 30-40 acres of rolling grass oak woodland would be provided for tent camping and or recreational vehicles. This would result in a land-use classification change from dispersed recreation (Class III) to general outdoor recreation (Class II) for the actual campground site. The remaining north shore lands would continue to be in the dispersed recreation classification	Same as RAMP EIS ROD (Not implemented)	No longer necessary if this alternative is implemented	Same as Alt B	Same as Alt B
11. **Boat Launching**: Develop additional boat launching opportunities in conjunction with the proposed north shore campground to disperse use. It will be utilized by day users and campground users. Fees may be charged, depending upon applicable policies or legislation at the time of construction.	Same as RAMP EIS ROD (Not implemented)	No longer necessary if this alternative is implemented	Same as Alt B	Same as Alt B
12. **User Fees**: Where legally authorized, charge user fees in areas where improvements have been made or a special service is provided. Semi-primitive (Class IV) and dispersed recreation (Class III) areas around the lake will remain open to the public at no charge. Fees could be charged for. Houseboat inspections Boat access camping program services Special events Special permit processing	Same as RAMP EIS ROD (Minimally implemented for Special Use Permits; not implemented fully because fees cannot be kept/used on-site.)	Same as Alt A. Continue to use as a management tool especially if fees can be used onsite	Same as Alts A & B	Same as Alts A & B

RAMP vs. LSP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
13. Fish and Wildlife Management Area. Plan and establish a fish and wildlife management area under an agreement with the California Department of Fish and Game (DFG) for lands on the eastshore of Lake Berryessa, extending from Eticuera Creek to the Monticello Dam (approximately 1,400 acres) excluding the existing reserved grazing rights area (Gunn Ranch). This action will be coordinated with the F&WS. A special Focus Group will be established and may consist of representatives from the US Fish and Wildlife Service (USF&WS), Reclamation, adjacent landowners, and special interest groups. For the remainder of the lake, management of fish and wildlife resources will be retained by Reclamation with technical input provided by DFG. As a fish and wildlife area, a variety of actions could be implemented such as: Cattle enclosures and/or cattle grazing restrictions Waterfowl nesting habitat Roosting and nesting sites for eagles, ospreys, great blue herons, etc. Native tree planting Fertilization and seeding of the fluctuation zone to provide waterfowl food Establish riparian vegetation along water courses Continue fishery related management efforts and habitat improvement projects	Same as RAMP EIS ROD (Implemented with MOU and Wildlife Area Management Plan. Ongoing)	Same as Alt A. Continue implementation of Wildlife Area Management Plan. See recreation proposal for Eticuera	Same as Alts A & B	Same as Alts A & B
14. Visitor Information Services: Expand visitor information services which could include: Interpretive center facilities and activities Develop mini interpretive center in the dam area Overlooks at appropriate locations along roads Interpretive trails Interpretive displays in developed access points and concession areas Additional signing	Same as RAMP EIS ROD Minimally implemented at Dam area and with additional signing	Same as Alt A but include development of environmental education and outreach programs	Same as Alts A & B	Same as Alts A & B

RAMP vs. VSP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
15. Limited Special Uses of Lands: Allow limited special uses of Reclamation lands around Lake Berryessa, including those shoreline areas exposed due to extreme drawdowns, only if such uses are not exclusive nor incompatible with other recreational activities. Off road vehicle use will continue to be prohibited. Lands may not be closed to the public to accommodate limited special uses. However, general public access to an area where limited special uses have been approved may be restricted temporarily for reasons of public health and safety. Specific guidelines and procedures and mitigation measures may be developed for each special use to minimize impacts on resources including water supplies.	Same as RAMP EIS ROD Implemented through CCAO Special Use Permit Policy	Same as Alt A	Same as Alt A	Same as Alt A
16. Special Events on Land: Allow special events and or activities (equestrian activities, races, bicycling events, etc.) which may temporarily displace other recreational uses on a limited irregular basis through a permit system. The temporary closure of lands to the general public for reasons of public health and safety may be authorized for the duration of the event. Specific guidelines and procedures and mitigation measures may be developed for each special use, to minimize impacts on resources, including water supplies.	Same as RAMP EIS ROD Implemented through CCAO Special Use Permit Policy	Same as Alt A	Same as Alt A	Same as Alt A
17. Water Surface Zoning and Restrictions: Establish and implement (after coordination with the Napa County Sheriff's Dept.) specific zoning and/or restrictions for water surface uses and activities to promote public health and safety, foster compatibility of recreational uses, and protect and enhance natural resources, including water supplies, wetlands, and riparian habitats. Activities or areas subject to zoning restrictions could include, but are not limited to, the following: Water skiing and similar activities in Neither Cove Parasailing around power lines in the Narrows, Wragg	Same as RAMP EIS ROD Partially implemented through cove closure at Big Island, additional 5 mph zones, additional buoys and signs, and administrative use	Used WROS to zone water surface (see specifics in alt description).	Used WROS to zone water surface (see specifics in alt description).	Used WROS to zone water surface (see specifics in alt description)

RAMP vs. SP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
Canyon, and Neither Cove Jet skiing in Oak Shores Closure of specific areas because of water supply intakes, endangered species issues, approved construction projects, etc. Aircraft operations Speed zones for specific areas Floating structures Establishment of boat traffic patterns on lake surface	zones at the Reclamation Office cove and Dam.			
18. Limited Special Uses of the Water Surface: Allow limited special uses (such as water skiing instruction or slalom courses) of designated coves and other specific water surface areas only if such uses are not exclusive nor incompatible with other recreational activities. The closure of coves or other areas for limited special uses is prohibited. However, general public access to an area where limited special uses have been approved may be restricted temporarily for reasons of public health or safety. Additional public involvement and necessary environmental documentation may be required prior to restricting public access for limited special uses.	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD
19. Special Water Use Events: Allow special water use events and/or activities (races, regattas, swims, fishing derbies, etc.) which may temporarily displace other recreational uses on a limited irregular basis through a permit system. The temporary closure of coves or other areas for reasons of public health and safety may be authorized for the duration of the event.	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD
20. Watercraft Carrying Capacity: Limit the total launching, marina capacity, and storage capabilities of water craft (power boats, sail boats, etc.) on Lake Berryessa to 3,000 based upon recommendations presented in the 1959 Public Use Plan. The carrying capacity will be revised if planned research shows that additional watercraft may be safely	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD

RAMP vs. VSP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
accommodated. The additional launching capabilities of the north shore boat ramp (preferred action No. 1) are to be included in the carrying capacity limit of 3,000.				
21. **Establish Law Enforcement Capabilities**: Obtain additional law enforcement support to fully administer Public Law 93-493. This may involve contracting with Napa County to increase enforcement activities at the lake and establishing specific Federal rules and regulations.	Same as RAMP EIS ROD and includes additional capabilities through the implementation of P.L.107-69	Same as Alt A	Same as Alt A	Same as Alt A
22. Floodproofing and/or Anchoring of Structures and Facilities in the Base Floodplain: Generally, all structures and facilities, including those for long-term uses, located in the Base Floodplain (440 feet to 450 feet mean sea level) (the study report reflecting base floodplain levels is attached to this ROD as Appendix 2) will be floodproofed per Reclamation Instructions or removed. However, mobile homes travel trailers and their additions which cannot be easily floodproofed per Reclamation Instructions will, as a minimum, be securely anchored and have all sewage systems floodproofed. Criteria for floodproofing and or anchoring of all structures and facilities, including mobile homes, travel trailers, and their additions, will be determined in a subsequent Operational Policy to be developed after appropriate public involvement and environmental documentation procedures. Within one year after issuance of the Operational Policy, any structure or facility failing to meet the requirements of the Operational Policy must be removed or relocated above the reservoir floodplain (455 foot elevation). Resort operators shall develop a Reclamation approved emergency floodproofing plan for securing water, sewage and utility systems within the reservoir floodplain against contamination due to high water. Structures and facilities	Same as RAMP EIS ROD implemented through Operational Policy #15.	Not applicable	Mobile homes would not be allowed and travel trailers and their additions would be relocated out of the Reservoir Floodplain.. Otherwise, flood proofing resort facilities below 455 feet mean sea level would remain in effect.	Same as Alt B

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
which are floodproofed and/or anchored may remain in the Base Floodplain provided: (1) their value is amortized over a period no longer than that remaining until a resort-wide reorganization (period varies with individual concessions); and, (2) all applicable leases and agreements (including rental agreements) are modified to contain a "hold harmless" provision removing Reclamation from liability in case of a base or greater flood.				
23. Prohibit Construction and Placement of Facilities in Reservoir Floodplain: Prohibit the construction or placement of new or additional permanent structures and facilities, including those for long-term uses to be located within the Reservoir Floodplain (440 feet to 455 feet mean sea level), except items which have been authorized in master plans for water or related activities. This prohibition does not apply to normal routine maintenance required for existing structures and facilities. Temporary facilities serving day and short-term uses may be allowed in the Reservoir Floodplain provided they can be floodproofed or removed on short notice.	Same as RAMP EIS ROD Implemented through Operational Policy #15.	Same as Alt A	Same as Alt A	Same as Alt A
24. Limitation on Long-term Uses: Prohibit any increase in the total number of long-term uses within any resort. Uses eliminated due to other actions may be relocated, provided space is available and approved by Reclamation (see Action 37).	Same as RAMP EIS ROD	Not applicable	Same as Alt B	Same as Alt B
25. Removal of Structures and Facilities for Environmental Causes: Structures and facilities, including long-term uses, will be eliminated in unstable or environmentally unacceptable areas, provided no effective mitigation measures can be implemented. This action will be implemented through periodic reviews of each resort. Affected long-term sites may be relocated, provided space is available and approved by Reclamation (see Action 37).	Same as RAMP EIS ROD Implemented where appropriate (i.e., dry sites, unstable retaining wall sites, and facilities).	Same as RAMP EIS ROD Implemented where appropriate (i.e., dry sites, unstable retaining wall sites, and facilities).	Same as RAMP EIS ROD Implemented where appropriate (i.e., dry sites, unstable retaining wall sites, and facilities).	Same as RAMP EIS ROD Implemented where appropriate (i.e., dry sites, unstable retaining wall sites, and facilities)

RAMP vs. VSP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
26. Storage in Shoreline Areas: Prohibit storage of solid wastes, materials, equipment, and other inappropriate items in shoreline areas to protect water supplies, eliminate clutter and aesthetic incompatability, improve public access, and minimize safety hazards, unless specifically approved by Reclamation.	Same as RAMP EIS ROD Implemented in some areas (i.e., dry sites)	Same as RAMP EIS ROD Implemented in some areas (i.e., dry sites)	Same as RAMP EIS ROD Implemented in some areas (i.e., dry sites)	Same as RAMP EIS ROD Implemented in some areas (i.e., dry sites)
27. Resort Master Plans and Limitation on Development: No development actions which require significant environmental documentation and public involvement will be approved prior to completion of an approved Master Plan for the resort. This limited moratorium will not preclude development actions which: Are needed to alleviate health and safety problems or are the result of emergency situations. Involve the general maintenance or replacement of deteriorated facilities Could be approved as per the "Decisions for Lake Berryessa Actions" dated April 14, 1987. Are required by actions in this document and are otherwise directed by Reclamation.	Same as RAMP EIS ROD Minimally implemented????	Not applicable	Not applicable	Not applicable
28. Land Planning and Development Criteria: All new projects within concession special use areas will generally adhere to the basic planning and development criteria included in Appendix C of the Final EIS. Such criteria will minimize the impacts of new development on existing resources and will require some changes over the previous patterns of development occurring within concession special use areas.	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD
29. Facility Development and Design Standards: Whenever feasible, establish and implement facility development and design standards for resorts including size restrictions, density, architectural styles, lot development, resort motif, and utility service standards to upgrade facilities.	Same as RAMP EIS ROD	Not applicable VSP establish new standards	Not applicable VSP establish new standards	Not applicable VSP establish new standards

RAMP vs. LSP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
These would supplement existing State of California "Title 25" Standards.				
30. Commercial Houseboats/Overnight Occupancy Vessels (OOVs): Allow 75 commercial houseboats or other types of commercial OOVs to occupy Lake Berryessa. A higher quota may be imposed if supported by sufficient studies.	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD
31. Sewage and Gray Water Holding Facilities: All vessels, including houseboats, cruisers, patio boats, etc., capable of discharging sewage and gray water shall be equipped with holding tanks that can be discharged by vacuum pumping only. Resorts having moored vessels capable of holding and discharging sewage and gray water shall provide sufficient pumpout facilities. All existing houseboats/OOVs on Lake Berryessa shall fully comply with sewage and gray water holding criteria within three years after adoption of a houseboat/OOV operational policy. Houseboats/OOVs to be placed on the lake in the future, for short-term or long-term use shall fully comply with this action.	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD
32. Private Houseboats/Overnight Occupancy Vessels (OOVs): A maximum of 75 privately owned houseboats (noncommercial vessels) will be allowed at Lake Berryessa. Houseboats will be authorized for placement on the lake by permit issued by Reclamation and moorage agreements with those resorts capable of providing pumpout services. Houseboats and OOVs will be regulated by size, sewage and gray water holding capabilities, etc.	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD
33. Limitations on Shoreline Modifications Below 440 Feet Mean Sea Level: Modifications of the shoreline (dredging, filling, earth shaping, revetment work) below 440 feet mean sea level will only be allowed as required for maintenance of existing facilities, to improve aesthetics.	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD

RAMP vs. VSP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
day-use public access, or to alleviate health and safety problems. Modifications could include improvements to provide for additional day use activities such as swimming, picnicking, shoreline access and minor marina facilities. The original shoreline configuration will not be altered to accommodate additional overnight facilities, storage areas, etc. Reclamation approval is subject to receipt of appropriate Napa County, DFG, Army Corps. of Engineers, or other Federal or state agency permits as may be required.				
34. Removal of Long-term Uses from Base Floodplain Area, and Floodproofing and/or Anchoring Long-term Uses between 450 – 455 feet: Remove all structures and facilities used for tenant occupancy or habitation (long-term uses) from the Base Floodplain (440 feet to 450 feet mean sea level) within one year after resort reorganization. Long-term uses located at elevations 450 feet to 455 feet may remain so long as they are: (1) floodproofed and or securely anchored per Reclamation Instructions; and (2) are not subject to removal for other reasons. This action applies to all mobile homes, travel trailers, and their additions and improvements located in the base or reservoir floodplain. Per Action No. 23, no new long-term uses will be constructed or placed in the Reservoir Floodplain (440 to 455 feet mean sea level).	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD	Same as RAMP EIS ROD
35. Floodproof or Remove Permanent Structures and Facilities in the Reservoir Floodplain: All existing permanent structures and facilities located in the Reservoir Floodplain (440 to 455 feet mean sea level), other than those associated with long-term uses (covered in Action No. 34), will be floodproofed per Reclamation Instructions or removed. Per Action No. 23, no new permanent structures or facilities will be constructed within the Reservoir Floodplain	Same as RAMP EIS ROD Implemented through Operational Policy #15	Same as RAMP EIS ROD Implemented through Operational Policy #15	Same as RAMP EIS ROD Implemented through Operational Policy #15	Same as RAMP EIS ROD Implemented through Operational Policy #15

RAMP vs. √SP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
(440 to 455 feet mean sea level).				
36. Create Short-term Sites from Existing Long-term Sites: Provide additional short-term facilities (day use, camping, etc.) in designated shoreline locations (cluster concept) currently occupied by long-term uses. Locations which are desirable for conversion from long-term to short-term uses will be determined during master planning and resort reorganizations. Conversions to short-term will be based upon a number of criteria and not just on where the sites are located. Per Action No. 37, relocations of displaced long-term sites may be permitted provided space is available and is approved by Reclamation. This action does not preclude the development of needed short-term facilities at other undeveloped areas within the resort.	Same as RAMP EIS ROD Minimally implemented	Same as RAMP EIS ROD Minimally implemented	Same as RAMP EIS ROD Minimally implemented	Same as RAMP EIS ROD Minimally implemented
37. Relocation of Long-term Sites: Long-term uses (mobile homes, travel trailers, etc.) which are eliminated during a reorganization may be relocated to another site in the resort provided space is available and approved by Reclamation. Sites may be identified in subsequent resort master plans or reorganization plans. No net increase in the total number of long-term sites will be allowed. The number of relocation opportunities will depend upon existing situations at each resort.	Same as RAMP EIS ROD Minimally implemented since few reorganizations occurred	Not applicable	Applicable	Same as Alt B
38. Facility Development and Design Standards: Establish and implement facility development and design standards for resorts including size restrictions, density, architectural styles, lot development, resort motif, and utility service standards to upgrade facilities. This would supplement portions of existing State of California "Title 25" Standards.	Same as RAMP EIS ROD	Development of Concession and government operations would follow Reclamation's "Recreation Facility Design Guidelines," thematic styles,	Same as Alt B and includes guidelines for long-term trailer villages.	Same as Alt B

RAMP vs. VSP Actions Table

RAMP EIS and ROD Action	Alternative A	Alternative B	Alternative C	Alternative D
		building and life safety codes. ADA regs. as appropriate		
39. Deletion of Land from Concession Area: Delete undeveloped, unused, and/or inappropriately used recreation land and water areas from within the concession boundaries and modify concession agreements as appropriate.	Same as RAMP EIS ROD Not implemented	Applicable	Same as Alt B	Same as Alt B
40. Variable Rate Franchise Fees. Establish and implement variable rate franchise fees within concession areas as an incentive to emphasize capital investment, health and safety, maintenance levels, public access and/or other Reclamation recreation objectives.	Same as RAMP EIS ROD Implemented or not	Same as Alt A Not applicable superseded by concession policy	Same as Alt A Not applicable superseded by concession policy	Same as Alt A Not applicable superseded by concession policy
41. Fee Reviews and Approvals: Adjustment of long-term use fees will not require review and approval by Reclamation. Long-term use fees may be reviewed and approved by Reclamation at the request of a concessionaire provided all administrative costs involved are reimbursed. Adjustment of fees and charges for other resort services would continue to be subject to Reclamation review and approval prior to implementation.	Same as RAMP EIS ROD Implemented through Operational Policy #13	Not applicable since long-term use would not occur under this alternative	Under the new concession contract, long-term use fees would be subject to Reclamation review and approval	Same as Alt B

Attachment 6

An Engineering Report of the
Slope Failure at
Capell Cove Launch Ramp

REGIONAL GEOLOGY SECTION
SACRAMENTO, CALIFORNIA

March 15, 1995

MEMORANDUM TO THE TECHNICAL FILES

FROM: Steven G. Sherer

SUBJECT: Capell Cove Boat Ramp Parking Lot Slide - Site Visits on January 27, February 2, 14, 15 and 24, 1995 - Subsurface Geologic Investigations - Capell Cove Boat Ramp, Lake Berryessa–Solano Project, California.

The Capell Cove Boat Ramp parking lot site was visited, mapped and photographed on Jan. 27 and Feb 2, 1995 at the request of Reclamation's North Central California (NCC) Office. Employees of the county roads department, Bill Sanford and Richard Kristoff from the NCC Office, the local Reclamation Park Rangers, Jack Mellor, Reclamation's Lake Berryessa Park Manager, Bill Curry from the Department of Boating and Waterways and the author all met on site Thursday Feb. 2, 1995.

On January 27, 1995 cracks had developed in the south side of the parking lot about 12 feet north of the south side curb between base stations 5+75 and 8+25. These cracks were up to 4 inches wide (horizontal movement) with little to no settlement across the cracks (vertical movement). However, a small sag, with up to 6 inches of vertical settlement did occur between the cracks and slope below the south side curb.

Apparently on Sunday, January 29, 1995, the slide started to move vertically. At about 7 AM some vertical movement was noted. By 9 AM about a foot of vertical movement had occurred. By 1 PM vertical movement of about 3.5 feet had occurred. Also substantial additional cracks had developed downslope with additional horizontal movement throughout the slide mass. Additional slides had developed in the lower 20 feet of slope above the reservoir (El. 408) that resulted in slope failures with very steep scarps along about two thirds of the toe of the larger slide mass.

The area of cracking and settlement increased in size in both the upstream and downstream directions between Jan. 27 and Feb. 2, 1995. Since February 2, 1995 this area has not grown in size but has experienced significant movements. The over all area of cracking and settlement, shown on Figure 1, as of March 15, 1995, is about 243 feet wide, along the south curb, between stations 6+00 and 8+43 and over 425 feet wide at reservoir water surface El. 409. The slide plane is interpreted to daylight from the slope under the reservoir water surface which was at elevation 408 on February 2, 1995, see Figures 2 through 6.

On February 2, 1995, the local authorities wished to keep the facility open to the public. Therefore recommendations were made to increase the area barricaded to include the new areas of crack and slide development, to inspect the area visually every two hours when open to the public, and to measure survey points at least weekly. This monitoring schedule was to be increased in frequency if significant changes take place. If significant hazards to the public develop, this facility would be closed.

Slide Description

To aid in the description of crack and slide development in the parking lot and downslope areas, three areas of differential movement have been designated as Areas A, B, and C (Figure 1). These areas are described as follows, and shown on the attached map. Aerial photography from 1991 and topography prepared from these photographs was used to construct a plan view map and five sections through the slide mass. The map and the sections were used to calculate the slide mass. Current topography along the sections was obtained on February 24, 1995 using the reservoir elevation for a base elevation, a

stadia rod and a bubble site level for elevation changes, and a chain was used to measure distances between the measured elevations

Area A is the area of the parking lot that first developed slide movement, has the greatest amount of surface failure, and continues to have the greatest amounts of total movement throughout the mass to date. The crown scarp (top) of this portion of the slide is located 14 feet north of the south curb at it's greatest encroachment into the parking lot. The crown scarp encroaches into the parking lot along the south curb between Stations 6+00 and 7+03. The toe of area A is located between Stations 5+50 and 9+00 below the reservoir water surface. On February 2, 1995 the maximum amount of movement at the crown scarp of the Area A slide was verbally reported by the surveyor to be 5.0 feet of vertical movement and 2.4 feet of horizontal movement. On February 10, 1995 the vertical settlement had increased to a maximum of 8.9 feet at the crown scarp. On February 24, 1995 the settlement in this area had increased to a total of 9.8 feet in the crown scarp area.

Superficially, Area A is about 100 feet wide at the top and about 350 feet wide at the base. The surface area is 4,200 yd^2. The slide has an estimated thickness of 10 yards, and a total volume of about 42,000 yd^3.

Area B is the area of the parking lot located mostly upslope of, and downstream (east) of Area A. This is an area that had some cracking and settlement on January 27, 1995 but did not begin to settle and crack significantly until about February 10, 1995.

On February 10, 1995 there were sags in Area B of the parking lot that had from 2 inches of settlement on the north side to as much as a foot of settlement (in local areas) in the downstream portion of Area B, south of the parking lot planters. On February 24, 1995 settlement and cracking had progressed in Area B to increase the area of sliding. At the crown scarp, the Area B slide mass encroaches into the parking lot to about 25 to 28 feet north of the south curb, and crosses the south curb at curb stations 6+65 and 8+43. Settlement in this area was a maximum of about 1.4 feet near Station 8+00 on February 24, 1998. It was reported that by March 1, 1995 settlement in Area B is as much as 1.5 feet across the crown scarp and may be as much as 3 feet near Station 8+00. Another report received from Reclamation's Lake Berryessa Personnel indicated that by March 15, 1995 settlement of about 4 feet has occurred across the crown scarp in this area and settlement along the curb near Station 8+00 is 4 to 5 feet. Area B is currently deforming and failing slowly. The volume of area B, upslope of area A, is estimated to be 20,000 yd^3

Area C is the area of the parking lot located upslope of Areas A and B and upstream of Area A. Cracks in this area are located as much as 50 feet north of the south curb of the parking lot between Stations 6+20 and 8+00 and cross the south curb at Stations 5+50 and 8+40. Area C has cracks with only slight amounts of settlement.

Since the January 27, 1995 inspection, new cracks have formed in the south side of the lot (Area C) that are as much as 50 feet north of the south curb. These cracks are up to 4.5 inches wide and have settled as much as 3 inches (down to the south). Many other cracks with lesser amounts of horizontal and vertical movement occur between these cracks and the south curb of the parking lot. This movement appears to indicate further additional progression of slide development. This area has a volume estimated to be 12,000 yd^3.

Monitoring Points

Monitoring points were established across the crown area of the slide by the Park Authorities prior to the major movement that started on January 29, 1995. On February 2, 1995 the author recommended many additional points above and across the top of the slide that the surveyor agreed to install and monitor for vertical and horizontal movements. These points are currently being read at least weekly. Also on February 15, the surveyor was asked to install two lines of points (cross-sections) perpendicular to the slope of the slide. These lines should start above the Boat Ramp Parking Lot, include some of the

established points across the parking lot, and continue downslope to the reservoir. Water elevation of the reservoir, can be used as a (known) base elevation, to calculate the vertical movements of the points in the cross sections. These points should be read weekly until the slide stabilizes. At that time monitoring should continue either monthly or quarterly until it is sure slide movement has stopped for at least a year. The Data from the monitoring of these points should be transmitted to the Mid-Pacific Regional Geology Office on a monthly basis.

GEOLOGIC INVESTIGATIONS

The topography of the slope above the boat ramp facility is bowl-like, resembling the upper portions of a failed slope (landslide). The natural bench of the boat ramp facility may be the failed material from this slope failure. The geologic investigation was carried out to determine the composition and competency of the material under the boat ramp facility.

Test Pit No. 1 at Station 6+00 to 6+38

On February 14, 1995 a large test pit was excavated across the crown scarp between Stations 6+00 and 6+38. This pit was 38 feet long, 18 feet deep on the north wall and about 20 feet wide. At total depth of the pit the crown scarp slide plane was still dipping at a 80^0 angle.

Test Pit No. 2 at Station 6+65 to 6+90

On February 24, 1995 a second large test pit was excavated across the crown scarp between Stations 6+70 and 6+85. This pit was 25 feet wide, 30 feet deep on the north wall and about 30 feet long. At total depth of the pit the crown scarp slide plane was still dipping at a 70^0 angle.

Log of Test Pits

Soils encountered in both of the test pits are similar. The north wall of each test pit was logged (attached Figures 7 & 8). The following is a combined description of the materials encounter.

Both pits exposed about 3 inches of asphalt and 4 inches of sand and fine gravel road bedding. Beneath the road bedding there is either a 1.1- to 1.3-foot-thick layer of yellow-brown sandy lean clay to fat clay fill material and/or a one-foot-thick greenish-gray fat clay with about 10 percent fine gravel metashale fragments.

Underlying both the fill and/or the fat clay is a brecciated rock mass composed of metashale. This rock mass is mostly (90%) cobble and boulder size fragments to 26-inch maximum length that are elongated, slickensided and coated with a thin film of greenish-gray fat clay. About 10% of this rock is angular gravel size fragments. The rock mass occurs to a depth of 6.6 feet at the west end of Pit No. 1 (Sta. 6+00) and to a depth of 11.0 feet at the east end of Pit No. 2 (Sta. 6+90).

Underlying the rock mass is a sandy lean clay with gravel layer that is mottled gray-black to greenish-gray. The clay contains 10 to 15 percent by volume cobble and boulder size metashale fragments in Pit No. 2. Most of the cobbles and boulders dip downstream or downslope. This clay layer extends to a depth of 13.2 feet at the west end of Pit No. 1 (Sta 6+00) and to a depth of 16.2 feet at the east end of Pit No. 2 (Sta. 6+90).

Underlying the black to gray clay is an interval of mottled yellow-brown to greenish-gray sandy lean clay with gravel. In Pit No. 2 the clay contains about 5 percent by volume cobble and boulder size metashale fragments. Most of the cobbles and boulders dip downstream or are flat lying. Water seeped out of this layer near its lower contact with the underlying blue-green clay. This clay layer extends to a depth of 18.0-feet near Station 6+10 in Pit No. 1 (the pits total depth) and to a depth of 22.2 feet at the east end of Pit No. 2 (Sta. 6+90).

Underlying the brown to gray clay layer is another layer of sandy lean clay that is blue-green to black. At the lower limits of this layer there was rotten wood resembling former trees trunks. This layer may be the slide plane from an ancient slide that created the natural bench that the boat ramp facility was built on. This clay layer extends to a depth of 23.3 feet in Pit No. 2.

Underlying the blue-green clay layer is a layer of medium brown colored fat clay with scattered roots throughout and some rotten wood at the upper contact. This layer of fat clay extended to the total depth of the pit (29.8 feet)

The contacts between each of the layers of materials in the pit were linear surfaces with no apparent zones of mixing. There is a thickening of the rock mass and clay layers above the blue-green clay in the downstream direction between Stations 5+00 and 6+90.

Cause of Slide Development

The test pits revealed that clayey materials extend to a great depth under the parking lot. The surface features of the slide that include a high angle back scarp to at least 30.0 feet of depth, wide blocks of material between cracks near the top of the slide, uplift along the lower half of the slope and a slide plane that has to day-light at or near the toe of the slope all indicate a deep-seated slide.

During the geologic investigation local inhabitants and Reclamation personnel were interviewed and Reclamation's construction and geological files were researched for historical information on this area. The information revealed that the slopes above the facility had periodically experienced movement in localized areas since at least the early 1970's. In 1992, many of the slopes near the reservoir rim in Capell Cove had slope failure. Apparently when the reservoir is low, flows are significant enough to cause excessive erosion along the toes of the slope, along Capell Creek.

The aerial photographs taken of the facility in 1991, when the cove was dry, reveal that during the rainfall season, when flows from Capell Creek are high and the reservoir is low, the creek had been eroding the toe of the slope below the current slide. This erosion oversteepened the lower portion of the slope enough that small slope failures started to occur below elevation 420 in 1992 during heavy rains in the area. As the toe of the slope was eroded away the upper slope became more and more unstable.

During heavy rainfall events the sheet flow off of the county highway above the boat ramps parking lot has been "jumping the curb." This curb is in place to direct this flow to drop inlet drains. The errant sheet flow has eroded small gullies in the hillside below the county road to the point that the water has been sinking into holes in the hillside. Holes were eroded into the hillside by water as it carried the soil cover down into the underlying (boulder size) rock fill by way of rodent holes. The 1.5- to 3.0-foot-diameter holes have been allowing water to infiltrate quickly and deeply into the hillside above the boat ramp parking lot.

There is an elaborate system of drains in place along and above the county road in a portion of the slope above the parking lot that failed during construction, and along the northern, upslope edge of the parking lot. With the exception of the sheet flow passing over the gutters described above, these drains seem to be functioning. The efficiency of these drains is undeterminable at this time.

An older landslide, composed of clay and rock material, that has previously failed, exists beneath the boat ramp parking lot. Because of this years very heavy rainfall, water has reached and saturated these materials and reduced their shear strength. These factors combined with the destabilization and erosion of the toe area of the slope, and the saturation of the slope itself, all combined to cause the current slope failure.

Safety of Keeping the Facility Open to the Public

The Cape I Cove Boat Ramp parking lot slide has failed at a rate that has not exceeded more than 3 5 feet in a single day. There are numerous slides in the local vicinity that have exhibited similar past rates of failure The historical and geomorphic evidence from these numerous local slides in the vicinity of Capell Cove Boat Ramp facility indicate that these slides should not represent a threat to life by sudden rapid failure. Events that could trigger a sudden failure are as follows: 1) a large magnitude nearby earthquake, or 2) sudden rapid drawdown of the reservoir and 3) by a prolonged period of very heavy rainfall.

The earthquake or rapid reservoir drawdown have only a small and remote probability of happening The prolonged period of very heavy rainfall has a higher probability of occurrence. However, in this type of event there should be adequate warning evidenced by the from rapidly developing cracks prior to failure and the facility could be closed before lives are endangered.

Recommended Repair

On March 1, 1995 the author and Dave Sparks from Reclamation's MP-Regional Office met with Bill Sanford, of Reclamation's Northern Central California Office and with Jack Mellor and Jim Peterson of Reclamation's Berryessa Office to discuss the findings from the geologic exploration and to recommend a repair for the facility. The following is a synopsis of the recommended repair.

The geologic exploration revealed that the facility was built on an old landslide. To FIX this facility and assure that no additional movement would occur, would require excavation of slide and replacement with suitable, compacted material and installation of drains This type of fix would cost in excess of $750,000 dollars. Current budget constraints and practicality of this option rule out this type of fix at this time.

If left alone the failure will get larger and the facility which at present is in partial use, will be lost. The southern, outside portion of the parking lot and the area downslope of it will continue to move until the mass reaches a new equilibrium and excess pore pressures driving the failure, drain off. The portion of the parking lot that is failing could be repaired periodically to return the facility to full operation

It is suggested that a multi-phased repair (not an **ENGINEERED FIX**) be undertaken to quickly place the facility into maximum use and to maintain that use for the future is as follows.

Phase 1) It is recommended that in the failed portion of the parking lot, using Reclamation forces and equipment that

A.) The asphalt pavement in the area that is cracking and deforming be removed and stockpile off location to later be recycled.
B.) The road bed material, underlying the asphalt pavement composed of sandy gravel, be removed (if possible) and stockpiled nearby for later reuse.
C.) The failed area needs to be graded and compacted prior to
D) beginning repair work The grading and compaction should be extended down the slope to elevation 435.
D) Place acceptable fill material in the graded area of the parking lot to it's former elevation in lifts of 6-inches. The fill should be placed out to the former curb location (Reference Figures 2 through 6). The last 4-inches of fill should be road base sand and gravel. The outside slope of the fill should be constructed to a 1 1/2:1 or flatter slope.
E.) Additional fill material should be stockpiled nearby (possibly near the boat ramp) to fill in areas of additional settlement with compacted fill.
E) The parking area should be filled with additional material to
F) maintain grade periodically till settlement stops

It is estimated that 1,600 yd^3 of suitable fill will be required to backfill the slide area to its original elevation An additional 400 yd^3 of suitable fill should be stockpiled to be used for continuing repairs.

The fill should be constructed with any material free of organic matter, serpentinite, or fat clay. Crushed shale with lean clay or silty sand found locally are suitable. According to local suppliers the cost of fill material delivered to the site is $ 9.00/yd^3

To cover the parking lot fill 4-inches thick will require 33 yd^3 of sand and gravel. Approximately 50 yd^3 of road base sand and gravel should be purchased and stock piled for this use. The cost of sand and gravel delivered to the site is approximately $ 25.00/yd^3

The total estimated cost for Phase 1 backfill and roadbase sand and gravel materials is approximately $ 19,200.

Phase 2.) When the toe of the slide is exposed above reservoir water, the slope failure can be stabilized by compacting a portion of the failed material at the toe and by "loading" the toe area with additional suitable compacted fill material. Once the water in the reservoir recedes below elevation 395 the toe area of the slide should be:

A.) Photographed and geologically inspected.
B.) Graded and compact the lower slope as much as possible.
C.) For additional stability a twenty-foot-wide berm should be constructed in the slide toe area that catches the existing slope at elevation 420, see Figures 2 through 6. This berm should have an 1.5:1 outside slope angle to the bottom of the cove (approximate elevation 403 on the east and 394 on the west).
D.) To prevent the berm from being eroded by flows in Capell Creek the outside slope
E.) should be covered with coarse gravel bedding (0.3 foot thick) and rip-rapped (1.0-foot-thick). The velocity of the stream flows in Capell Creek is very high when the reservoir is low. Rip-rap should be sized to resist erosion from these flash flood type flows.

To accomplish Phase 2 it is estimated that 8,600 yd^3 of suitable fill will be required to build the berm. The fill material should be free of organic matter, serpentinite, or fat clay. Crushed shale with lean clay or silty sand found locally are suitable. Approximately 680 yd^3 of riprap and 135 yd^3 of coarse gravel will be required to armor the berm.

Estimated cost of fill material delivered to site is approximately $ 77,400. The estimated cost for rip-rap material delivered to site is $30.00/yd^3 for cost of $ 20,400. The estimated cost for coarse gravel delivered to site is
$ 23.80/yd^3 for a cost of $ 3,200.

The total estimated cost of Phase 2 slide stabilization is $ 101,000

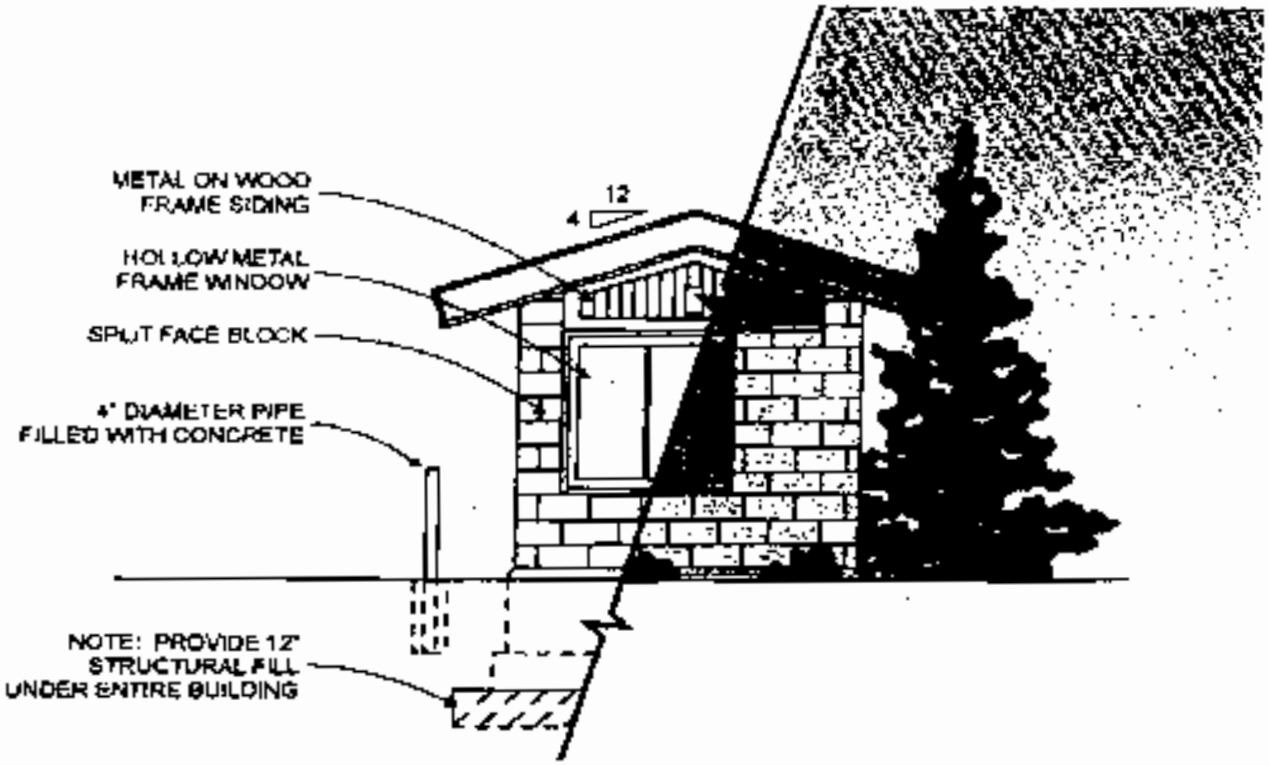
Phase 3.) After perhaps three years of no settlement in the parking lot area, the slide area could be repaved with asphalt.

Estimated cost of suitable (class 2) road-base delivered to the site is
$ 25.00/yd^3. The estimated repair is of 2975 ft^2 of asphalt parking lot. This will require approximately 33 yd^3 of road-base material to place a 0.3-foot-thick layer for a cost of $ 830. To have 2975 ft^2 of asphalt pavement supplied and placed is estimated to cost $ 0.80/ft^2 for a cost of $ 2,400.

The total estimated cost for Phase 3 materials is $ 3,230

Attachment 7

Bureau of Reclamation
Facility Design
Guidelines



RECREATION FACILITY DESIGN GUIDELINES

U.S. Department of the Interior
Bureau of Reclamation

September 2002

No overhead power lines are to be located over the parking area, launching ramp, approach roads to the ramp, or any other areas where a vehicle towing a boat trailer loaded with a fully rigged boat can travel.

7. **Boat Ramp Accessibility.**—Accessibility at a boat ramp focuses on three main areas of consideration: (1) parking, (2) toilet facilities, and (3) boat ramp/dock systems. Accessible parking spaces are to be the closest spaces to the activity the parking lot serves and are recommended to be within 300 feet of that activity. If this is not possible, a dropoff area should be located within 100 feet of the activity. Boat ramps are to conform to requirements of UFAS and ADAAG.

G. **Fishing Facilities:** New or rehabilitated fishing facilities built by Reclamation shall be accessible and comply with the standards in UFAS and ADAAG. (See Appendix F - Fishing Facilities.)

H. **Foot Trails:** Foot trails at Reclamation sites are to function primarily as paths connecting recreation facilities. The primary users are expected to be pedestrians traveling short to medium distances. Trails should be designed to connect one facility element to another with the least amount of environmental impact. As such, trails are to be sited to minimize soil erosion, damage to vegetation and wildlife, degradation of streams, cost of maintenance, and circulation conflicts between pedestrians and vehicles, while maximizing user safety and esthetic experience.

1. **General Layout Criteria.**—Trails should be designed to avoid the following areas:

   - Where there are threatened or endangered species
   - Where there is critical or sensitive habitat
   - Where there are wetlands or permanently soggy soil conditions
   - Where a trail would cause increased soil erosion, such as on excessively steep slopes

A trail may cross a wetland for the specific purpose of interpretation, and a trail may cross a wetland if the trail is raised on a walkway above the ground (for short distances only.) Trails should be aligned to avoid crossing roads, except very low-volume roads that service local circulation. If crossing a road is necessary, adequate and clearly visible signs must be posted on the road to give drivers approaching from either direction adequate warning of the crossing. When possible, trails should be aligned to avoid crossing streams. However, if crossing streams is necessary, the trail should be contained on a footbridge or other raised crossing facility. When a stream is crossed, the trail should be hard surfaced for 10 feet past the point of high soil moisture. If trails are located in wetlands or sensitive areas for the purpose of interpreting those landscapes, the trail should be raised and handrails should be incorporated on sections that are more than 30 inches off of the ground.

To minimize soil erosion, trails should be located in areas that favor.

- Coarse or gravelly soil rather than clay and silty soil
- Vegetation composed of grasses rather than forbs or shrubs
- The toe of a slope rather than a side slope
- Flat slopes rather than steep slopes
- Low soil moisture rather than high soil moisture
- South and west exposures rather than north and east exposures

Surveying tools should be used to determine final alignment and grades; grades are not to be determined solely on visual judgement.

Foot trails are to include any short spurs that are necessary to access nearby destination points, in order to provide logical site circulation. Trails should be clearly marked and signed at access points, and distances to destinations should be posted.

2. Design Criteria.—

a. *Gradient:* Trail grades should be no more than 10 percent and, preferably, less than 7 percent. On slopes over 25 percent, steps should be used, but only for short stretches. (See Appendix G - Trails.) Trails should be cross-sloped to drain at not less than 2 percent or more than 4 percent. Switchbacks should be as level as practicable.

b. *Trail Width and Surface Material:* Trails should be sized and surfaced to accommodate their expected level of use and to minimize soil erosion and vegetation trampling. Connecting trails that link nonlocal destination points that are a considerable distance apart should be 18 to 24 inches wide. These trails should be soil surfaced. In localized areas where the soil cannot support foot traffic, the trail should be surfaced with compacted decomposed granite or aggregate base course (class 6.) If foot traffic on these trails is very heavy, the entire length of the trail should be surfaced with compacted aggregate base course. (See Appendix G - Trails.) In extremely heavy use areas, the trail should be paved with an accessible surface or concrete. Local trails within a campground or marina area should be a minimum of 60 inches wide and surfaced with decomposed granite or aggregate base course.

Boardwalks over wet areas and footbridges should be a minimum of 60 inches wide and include handrails on both sides. Railings are required for bridges higher than 30 inches off the ground and should be designed to meet codes and comply with UFAS and ADAAG. Footbridges on accessible trails are to be accessible and should include edge protection for security of wheelchairs at any turnouts. (See Appendix G - Trails.)

3. **Accessible Trails.**—All trails on Reclamation sites that are designated as accessible are to comply with UFAS and ADAAG.

I. Recreation Area Roads:

1. **Internal Vehicular Circulation.**—Reclamation should use the design standards for roads established by the U.S. Army Corps of Engineers and set forth in *Design of Recreation Areas and Facilities - Access and Circulation*. Consult that publication for a complete description of road layout and circulation criteria.

   The preferred layout of a recreation area is one that features a main access road with secondary side roads. The side roads may lead to campgrounds, service or administrative areas, a trailer dump station, or other site amenities such as boat launching ramps. To minimize traffic through the campground, circulation throughout the recreation area should be designed to ensure that day-use facilities do not share the same roads with campground loops. Gates should be sited along the main access road so that all side roads may be closed, while allowing any combination of other roads to remain open. (See Appendix H - Recreation Areas Roads and Utilities.) Refer to the *Manual of Uniform Traffic Control Devices* for reflective warning symbols.

   If possible, the main road for a campground should be located along an uphill edge of the site, with campground loop roads located between the main campground road and any focal landscape feature (such as a water body.) This layout minimizes unnecessary vehicular traffic on the loop roads and vehicle/pedestrian conflicts between campsites and the shoreline.

2. **Design Criteria.**—Reclamation adopts the road standards established by the U.S. Army Corps of Engineers and set forth in *Design of Recreation Areas and Facilities - Access and Circulation*. Consult that publication for a complete description of road design criteria. Reclamation recreation roads typically should be designed to be two-way, two-lane, gravel or asphalt paved roads. Driving lanes should be 12 feet wide, and shoulders should be a minimum of 1 foot wide, gravel or asphalt. Where traffic is very heavy, the need for additional driving lanes should be evaluated. Grades on roads should be as level as possible, while allowing for positive drainage. Roads should be planned carefully to preserve major trees and clumps of vegetation, while considering safety factors. Campground roads should be one-way roads that are 14 feet wide. Shoulders should be a minimum of 1 foot wide, gravel or asphalt.

3. **Parking Lot Design Criteria.**—Reclamation should use the standards presented by SOBA in its *Handbook for the Location, Design, Construction, Operation, and Maintenance of Boat Launching Facilities*, and *Guidelines for the Design of Barrier-Free Recreational Boating and Fishing Facilities*, except where larger spaces are described in this document.

Attachment 8

US District Court
Decision on Critical Habitat
for the
California Red-Legged Frog

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

HOME BUILDERS ASSOCIATIONS OF NORTHERN CALIFORNIA, et al.,

Plaintiffs,

and

EL DORADO COUNTY, CALIFORNIA,

Intervenor-Plaintiff,

v.

GALE A. NORTON, Secretary of the Department of Interior, et al.,

Defendants,

and

JUMPING FROG RESEARCH INSTITUTE, et al.,

Intervenor-Defendants.

Case Number 01-1291 (RJL)

MEMORANDUM ORDER
(November 6, 2002) (#56)

Plaintiffs and intervenor-plaintiff brought the instant action under, *inter alia*, the Administrative Procedure Act (APA) and the Endangered Species Act (ESA), seeking

(N)

#76

review of a decision by the Secretary of the Interior to designate approximately 4.1 million acres in California as critical habitat of the California red-legged frog ("frog").

Now before the Court is the Proposed Consent Decree of plaintiffs Home Builders Association of Northern California, et al.; intervenor-plaintiff El Dorado County; and defendants Gale A. Norton, Secretary of the Department of Interior, et al. The aforementioned parties have reached settlement of all issues and claims in the instant action. The Proposed Consent Decree provides that the current critical habitat designation be vacated and remanded to the agency for a new rulemaking.

Intervenor-defendants, Jumping Frog Institute ("Institute"), et al., are not a party to the settlement, and have filed several objections to the Proposed Consent Decree. The primary issue in dispute among the parties is the methodology the Department of Interior will use during the new rulemaking to determine the critical habitat of the frog. The Consent Decree specifies that the economic impact analysis conducted during the new rulemaking must include *all* economic impacts of designating a critical habitat, in accordance with *New Mexico Cattlegrowers Ass'n v. U.S. Fish & Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001). The Institute, however, contends that the economic impact analysis set forth in the Consent Decree, and approved by the court in *New Mexico Cattlegrowers*, is contrary to the Endangered Species Act. Only those economic impacts resulting from the critical habitat designation, and not from the species listing, according

to the Institute, should be considered.[1]

When determining whether or not to enter a proposed consent decree, trial courts "need only determine that the settlement is fair, adequate, reasonable and appropriate under the particular facts and that there has been valid consent by the concerned parties." *Citizens for a Better Environment, et al. v. Gorsuch*, 718 F.2d 1117, 1126 (D.C. Cir. 1983)(quoting *Metropolitan Housing Development Corp. v. Village of Arlington Heights*, 616 F.2d 1006, 1014 (7th Cir. 1980).

Here, intervenor-defendants have not consented to the Proposed Consent Decree, and have filed their objections as well as presented oral argument to the Court to that effect. Although intervenor-defendants have withheld their consent, this does not prevent this Court from entering the Proposed Consent Decree. *See Local No. 93 v. City of Cleveland*, 478 U.S. 501, 529 (1986). Consent decrees, as the Supreme Court explained in *Local No. 93*, are "primarily a means by which parties settle their disputes," and, as such, "[i]t has never been supposed that one party ... could preclude other parties from settling their own disputes and thereby withdrawing from litigation." *Id.* at 529. So long as a party is given the opportunity to "air its objections," as the intervenor-defendants were in this instance through both written briefs and oral argument before the Court, and the district court has determined that the settlement is fair and reasonable, a party's lack of consent will not block the entry of the consent decree. *Id.*

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[1] *See* Intervenor-Defs.'s Objections to Proposed Consent Decree at 17-19.

Upon review of the intervenor-defendants objections, and the responses of the parties to the Consent Decree, the Court finds that the Proposed Consent Decree is fair, adequate, and reasonable under the facts, and should be entered.

In particular, the Court has closely reviewed the parties' arguments regarding the validity of the economic impacts analysis advanced by the Tenth Circuit in *New Mexico Cattlegrowers*,[2] and adopted thereafter by the Fish and Wildlife Service as its policy in this case and all others throughout the country. While the D.C. Circuit has not specifically addressed whether or not it agrees with the *New Mexico Cattlegrowers* case, one member of this Court has recently faced that issue. In *National Association of Home Builders v. Evans*, Civ. No. 00-2799, 2002 WL 1205743, at *2, *3 (D.D.C. Apr. 30, 2002) Judge Colleen Kollar-Kotelly endorsed the Tenth Circuit's approach in *New Mexico Cattlegrowers*, finding the opinion to be "persuasive," "well- reasoned," and "comport[ing] with the express statutory language of Congress." *Id.* at *3. Judge Kollar-Kotelly found that while economic costs cannot be considered at the listing stage, an

[2] Intervenor-defendants, Jumping Frog Research Institute, et al., argues that an "incremental baseline approach" is required by the ESA. Under the baseline approach, only those economic impacts associated with designating critical habitat may be considered when determining the critical habitat of a listed species; economic costs resulting from the listing of the species itself must be ignored, according to intervenor-defendants, because decisions to list species must be made solely on the basis of scientific and commercial data, and not economic cost data. Parties to the Proposed Consent Decree, however, while acknowledging that economic impacts are not relevant to listing decisions, argue that Congress clearly intended that economic impacts be considered when determining critical habitat. The decision of the Department of Interior to adopt the methodology of *New Mexico Cattlegrowers*, is "fair and reasonable," and consistent with the ESA. *See* Home Builders Association of Northern California, et al., Resp. to Intervenor-Defs.' Objections to Proposed Consent Decree at 16.

economic impacts analysis is required at the critical habitat designation stage. Considering only economic impacts stemming from listing was a "narrow construction of what 'economic impact' the agency should consider in designating a critical habitat." *Id.* Recognizing that there was disagreement over the proper economic methodology, Judge Kollar-Kotelly deferred to the agency, and vacated and remanded the rule.[3]

The Court agrees with Judge Kollar-Kotelly's opinion in *National Homebuilders*. Clearly, the Department of Interior, in its expertise, has decided to adopt the economic impact methodology of *New Mexico Cattlegrowers* and apply it to all critical habitat determinations nationwide. While economic costs cannot be considered at the listing stage, the language of the Endangered Species Act specifically contemplates that an economic analysis be conducted when determining critical habitat. *See* 16 U.S.C. § 1533 (b)(2). Under the "baseline approach" advocated by intervenor-defendants, however, all economic costs resulting from the listing of a species fall below "the baseline" and are, essentially, disregarded when analyzing the economic impact of critical habitat

[3]One other judge in this Court has addressed this issue, but did so *prior* to the *New Mexico Cattlegrowers* case. Judge Norma Holloway Johnson in *Trinity County Concerned Citizens v. Babbitt*, Civ. No. 92-1194, 1993 WL 650393, at *4 (D.D.C. Sept. 20, 1993) adopted the baseline approach when she found that only those economic costs incurred as a result of making a critical habitat designation – and not those costs incurred as a result of listing a species – could be considered when determining critical habitat. Judge Kotelly in *National Association of Homebuilders* recognized that "[i]n agreeing with the Tenth Circuit, the Court realizes it is disagreeing with a trial judge from this District. In *Trinity County*, Judge Norma Holloway Johnson wrote that consideration of economic costs ... was improper in making the critical habitat designation. While the Court respects Judge Johnson's opinion, it is not bound by it because District Court decisions do not establish binding precedent." *National Association of Homebuilders* at *2 (citations omitted).

designation. The Court does not find that the language of the ESA supports such an interpretation to the exclusion of the economic impact methodology of *New Mexico Cattlegrowers*. As the Department of Interior has represented to the Court its intention to apply the *New Mexico Cattlegrowers* methodology to all critical habitat determinations, the Court will, in the words of Judge Kollar-Kotelly, "leave it to the agency's wisdom and institutional knowledge to remedy the problem" regarding the methodology to apply under the ESA. *National Association of Home Builders*, at *3.

Moreover, the Court is convinced that the Proposed Consent Decree is, in all other respects, fair, reasonable, and adequate. Vacating and remanding the critical habitat designation of the California red-legged frog, pursuant to the Proposed Consent Decree, will in no way disturb the considerable protections, both civil and criminal, afforded to the California red-legged frog as a listed species under the ESA . During oral argument regarding the Proposed Consent Decree, counsel for the intervenor-defendants, in essence, acknowledged the same. Additionally, vacating the rule, rather than leaving it in place pending a new rule, is fair and reasonable in light of the Department of Interior's decision to vacate all critical habitat designations in order to conduct new rulemakings consistent with the methodology of *New Mexico Cattlegrowers*. Finally, a consent decree is not only a contract between the parties to the decree, but is also a "judicial act." *Citizens for a Better Government, et al. v. Gorsuch*, 718 F.2d 1117, 1125 (D.C. Cir. 1983)(quoting *United States v. Swift & Co.*, 286 U.S. 106, 115 (1932)). As such, the

Court does not find that the notice and comment requirements of 5 U.S.C. §553 apply before the Court's adoption of a consent decree, as adoption of a consent decree is not an agency act under the APA.

For the reasons stated above, it is hereby ORDERED that the Joint Motion by plaintiffs, intervenor-plaintiff, and defendants for entry of the consent decree is hereby GRANTED.

SO ORDERED.

RICHARD J. LEON
UNITED STATES DISTRICT JUDGE

Attachment 9

Environmental Assessment
for the
Olive Orchard Wetland

NEPA Document No. EA-LB-00-02

ENVIRONMENTAL ASSESSMENT
FOR

WETLAND DEVELOPMENT PROJECT
OLIVE ORCHARD

LAKE BERRYESSA

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
CENTRAL CALIFORNIA AREA OFFICE
LAKE BERRYESSA

AUGUST 2000

ENVIRONMENTAL ASSESSMENT

I. OVERVIEW

Date: August 10, 2000

Project Title: Olive Orchard Wetland Development Project

Name and Address of Applicant: Bureau of Reclamation
Lake Berryessa Field Office
5520 Knoxville Road
Napa, CA 94558

Contact Person: Arnold Roessler, Natural Resource Specialist (707) 966-2111

Project Location: Napa County; T8NR3W Section 30; USGS Lake Berryessa Quadrangle

Land Status Verified: Yes

Affected Surface Area: Approximately 5 acres

Authorization for the Action: Reclamation Development Act of 1974 (PL 93-493), Floodplain and Wetlands executive Orders 11988 and 11990, Endangered Species Act (16 USC Sec.1531 et seq.), Fish and Wildlife Coordination Act (16 USC Sec. 661 et seq.), Environmental Impact Statement Lake Berryessa Reservoir Area Management Plan February 1993.

II. PURPOSE AND NEED FOR ACTION

The purpose of this project is to construct a wetland habitat area on Reclamation land totaling approximately 5 acres. The project includes construction of a control structure on an existing culvert to control water flow and create a ponding basin. The project is a joint effort between Ducks Unlimited and the Bureau of Reclamation. Goals for the project include increasing riparian and wetland vegetation in the region and to use the completed project area as a means to educate the public on the benefits of riparian and wetland habitats. Current lake fluctuations leave areas such as these dry during summer and drought periods causing any vegetation which may have naturally become established to dry up and disappear. The proposed project will help maintain water levels in the area and help establish riparian vegetation on a more permanent basis. Projects such as these will assist in the restoration of seasonal/permanent freshwater wetland habitats and provide areas for waterfowl

breeding, wading bird feeding and wildlife nesting, and support other wildlife such as various amphibians, reptiles, neotropical birds, and numerous small mammals in the Lake Berryessa area.

II. PROPOSED ACTION

The proposed Federal action is to authorize construction of a wetland development project on Reclamation land. The location of the proposed action is near Capell Creek in the area known as the Olive Orchard T8NR3W Section 30 Lake Berryessa Quad (see Maps A and B).

The project consists of constructing a concrete control structure on an existing culvert which is on Berryessa Knoxville Road. The existing culvert is 72" in diameter. The structure will be a concrete standpipe with an opening on top for an emergency spillway. A manually controlled 24" valve will be built into the structure to control flows during "normal" lake levels. Once lake levels drop below the desired water level, the valve will be closed to prevent the draining of the pond. Details regarding design standards and engineering for the proposed action are further outlined in the Ducks Unlimited Technical Specifications BOR Wetlands Lake Berryessa "DU Project No. CA-0122-012." (see attached).

Water Control Barrier: The maximum level of the retained water would be near 440' fmsl. The standpipe structure is approximately 14 feet tall and 72" wide.

Heavy Equipment Use/Access: The type of equipment which will be used for construction of the control structure and contouring may include: backhoe, 10 yard dump, excavator, D6 dozer, sheepsfoot, front-end loader, road-grader, scraper, and water-tanker truck. Access to the site would be obtained from the north side of the area from Berryessa/Knoxville Road. This area is mostly fill material currently covered with annual grasses and yellow star thistle.

Wetland Area Contouring: In addition to the control structure some earth moving within the lake bottom and upland areas will take place to deepen, enlarge and contour the area which will be flooded. Island areas will be created and excess sediment will be removed from the site. The amount of material to be cut or stripped is approximately 4113 cubic yards. The amount of fill material would be approximately 662 cubic yards. The island areas will be created by using material excavated from the site.

Revegetation: Wetland plant species such as willow, cottonwood, elderberry, and tule grass will be planted throughout the area once construction activities and contouring are completed. In addition to wetland species some riparian and upland species will also be planted. A revegetation plan will be completed prior to completion of the project.

III. NO ACTION ALTERNATIVE

The no action alternative would be to not create the wetland area and continue to manage the area as a fluctuating lake zone. This action would be a continuation of existing conditions with no wildlife habitat improvements other than minor planting or other vegetation management.

IV. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

A. Existing Environment:

The area consists of an ephemeral creek flowing from Sugarloaf and Little Sugarloaf Peaks. The creek contains running water for much of the year, and supports a healthy riparian corridor for a significant distance down the canyon. The creek bed is gravelly, and during the drier months the creek will become mostly subterranean, occasionally forming small pools on the surface.

At a lake elevation of 440' msl a portion of the lake forms west of the road and has a surface area of approximately 2 acres and is about 15' deep at its deepest. However, because the ponded area is connected to the lake directly by an open culvert, its level drops as the lake recedes. When the lake has dropped 10' below 440', the wetland pond is reduced to less than ¼ acre.

The surrounding area is mostly open grassland dominated by annual grasses and forbs. The upland slopes are mostly comprised of woody vegetation such as oak, chamise, ceanothus, and other similar chaparral species. Some riparian species do exist close to the creek but disappear a short distance up slope.

B. Impacts of the proposed action:

General

The development of the proposed action would lead to minor disruption of the area during construction. Heavy equipment working in the area would disturb wildlife populations and cause minor inconveniences to recreational uses. The disturbances would not be long term and other areas adjacent to the project site and would be available to wildlife and the recreating public. The proposed action would not establish a precedent for future actions; is not related

to other actions with individuality insignificant but cumulatively significant environmental effects; and will not disproportionately affect minority or low income populations.

Impoundment/Water Rights
Reclamation currently has water rights for fish and wildlife purposes for storage of 1,500 acre feet of water. The impoundment resulting from the proposed action will be intermittent and total approximately 2 acre feet.

Water Quality/Erosion/Sedimentation
Minor erosion and sedimentation will occur in the construction area as a result of this project. However, due to the gradual slope, vegetative cover, and period of construction, the effects of the erosion and subsequent sedimentation will be minimal and within acceptable amounts. The site will be revegetated after construction is completed.

Streamflow
Construction activities may affect the streamflow of the intermittent tributary flowing into Lake Berryessa. To prevent disruption of stream flows the construction activity within the stream will take place during no flow periods and will be monitored by Reclamation and DFG for streambed alteration requirements and Clean Water Act requirements.

Wetlands
The proposed project will result in the creation of a small wetland habitat area. The wetlands will benefit wildlife and assist in improving water quality by filtering the sediment from upland of the pond.

Endangered Species/Sensitive Plants
The project area is comprised of lake shore area which fluctuates seasonally. The site is often dry with annual plants colonizing the once flooded area. The open and wooded grasslands surrounding the area contain mostly annual grass species mixed with large concentrations of noxious and invasive weed species. A few remnants of riparian plant species are established in some locations.

Reclamation has reviewed the current California Department of Fish and Game Rare Find List and found no threatened or endangered plant or animal species listed within the project areas. A visual inspection of the site by Reclamation, DFG, and DU personnel also found no evidence of rare or endangered plant or animal species within the area. No known negative impacts are likely to occur to species listed or proposed to be listed as endangered or threatened as a result of these actions. Some established riparian and upland plant species may be damaged during

construction and contouring, however the revegetation plan would mitigate for any destruction of plant species.

Cultural Resources
The Bureau of Reclamation Regional Office Archaeologist conducted two separate cultural resource investigations at the site and found that there was no visible signs of major cultural or historical resources within the proposed project area.

The first survey was conducted in spring of 1998 and the second after a wildfire which removed all vegetative cover from the area in June of 2000. Some obsidian chips were found during the second site visit, but no major evidence of the area being a significant cultural resource site was found.

The area was previously part of a ranch and foundations and other remnants of a house and other out buildings are present in the area. None of these foundations are located within the area which will be disturbed.

Construction activities within the streambed will be dealing mostly with fill material and the occurrence of cultural resource values within this area would be very slight. Recommendations by the Archaeologist were to monitor the site during the construction phase to inspect for evidence of cultural resources and to stop activities if cultural resources are disturbed as a result of the proposed action.

The cultural resource investigation determined that the proposed action would not have a negative affect any properties listed or eligible to be listed in the National Register of Historic Places; will not threaten to violate Federal, State, Local, or Tribal law or requirements imposed for protection of the environment; and will not affect Indian Trust Assets (see attachment).

Unique Resources
The proposed project would not have uncertain environmental effects or involve unique or unknown environmental risks; and would not have an adverse effect on unique geological features such as wild or scenic rivers, refuges, flood plains, rivers placed on the nationwide inventory, or prime or unique farmlands. The areas have been previously disturbed through past ranching and agricultural practices.

Construction
The construction activities will take place during low or no water flow periods in the Fall depending on the amount of soil moisture. The construction activities will minimally interfere

with recreational use activities. Construction activities will be coordinated with local landowners so as not to interfere with their operations. The duration of the construction activities will be approximately 45 days with revegetation projects occurring when weather and moisture conditions are favorable for planting. Best management practices will be used during the construction period.

Access

Vehicle and heavy equipment access to the site will be off of Berryessa Knoxville Road North of the pond site. This area is predominantly fill material which was placed during the construction of the Capell Cove Launch Ramp. Most of the area is covered in annual grasses and yellow-star thistle. A temporary dirt roadway will be created to allow access to the pond area. The road will be routed in such a way to avoid impacts to desired vegetation as much as possible. The area will be restored and a minimally used roadway will be maintained as a trail and to allow for equipment access to the site in the future if needed.

Recreational Use

General public access and recreational opportunities in the area are slight. Access to the area is by foot from a parking area across Berryessa/Knoxville Road. Bank fishing is currently the highest use of the area, and then only during high lake levels. Use would probably increase with the development of better habitat, but that increase is not expected to be significant. Recreational use of the area will be enhanced by improving watchable wildlife opportunities.

Viewshed/Esthetics

The viewshed esthetic qualities of the area will be minimally affected by the creation of the wetland and then only during the construction phase. Once vegetation covers the project area it will blend into the existing natural landscape. The projects will be constructed during low use periods by the public.

Air Quality

Due to the size and techniques used during construction of the ponds the proposed project will minimally affect the air quality. The soil moisture will be sufficient to reduce the amount of dust created from the excavation and will not have a significant effect on the quality of the human environment.

Soil Survey

On August 28, 1997, a Mid-Pacific Regional Soil Scientist augured a series of three test holes for soil profile analysis. All three sites showed some sign of some type of loam material suitable for retention of water. One of the site had a very high content and thick layer of clay and clay loam.

Educational Uses

Reclamation intends to use the area as part of an environmental education program. Students from UC Davis and CSU Chico both have expressed interest in observing the process, and the possibility exists of establishing a more permanent relationship with one of these institutions toward the goal of environmental education.

C. Mitigation Measures for the Proposed Action

The following mitigation measures have already been incorporated or will be incorporated into the proposed action during construction. They are presented here as a convenient summary listing:

V. CONSULTATION AND COORDINATION

Department of Fish and Game Review

Section 1601 of the California Department of Fish and Game Code requires a Streambed Alteration Permit for construction activities causing removal of materials and /or alteration of lake, river, or streambed bottom or margins. Reclamation will consult with the Department of Fish and Game and obtain any necessary permits prior to starting the proposed project. (See Attached Correspondence)

Clean Water Act Compliance

Reclamation has coordinated with the U.S. Army Corps of Engineers and the Regional Water Quality Control Board regarding actions below the high water mark as required by sections 401 and 404 of the Clean Water Act. Reclamation will obtain any necessary permits or waivers prior to starting the proposed project. Work will comply with the general conditions of COE Nationwide Permit General Conditions and Nationwide Permit #27 Stream and Wetland Restoration Activities. (See Attached Permit)

Encroachment Permit

An encroachment permit from Napa County for construction activities done in the right-of-way along Berryessa/Knoxville Road. The Napa County Works Department has been briefed on the project and have had no reservations with the concept of the project. A copy of the plan will be provided and the Department will be advised before any activities will take place. Work will comply with the General Permit Regulations and any special requirements outlined in any improvement plans. (See attached Permit)

People/Agencies Contacted:

Lance Heidi, Napa County Public Works
Justin Cutler, Corps of Engineers, Sacramento District
Fred Botti, California Department of Fish and Game
Matthew Reischman, Regional Water Quality Control Board
Vincent Orlando, Adjacent Land owner

ENVIRONMENTAL ASSESSMENT
Signature Sheet

Title of Project: Olive Orchard Wetland Development Project

Preparing Office: Bureau of Reclamation, Lake Berryessa

Project Leader: Arnold Roessler **Title:** Natural Resource Specialist

List of Preparers:

Preparer: _____ _____ **Date:** ___ ____ Natural Resource Specialist, CCAO Berryessa

Attachment 10

Results of Selected Water Samples
From Lake Berryessa/Putah Creek
by Reclamation and
the State of California

Baseline

.ation ID BS_MN_06 Putah Crk below Monticello Dm

BHP059 12/11/97

CollectionDate by Quarter Q4 1997

Group	Analyte	Result	Units	RL	Qualifier
inorg	Ammonia as N	<100	ug/l	100	
inorg	Chloride	20000	ug/l	1000	
inorg	COD	<10000	ug/l	10000	
inorg	Hardness, total as CaCO3	177500	ug/l	3300	
inorg	Nitrate + Nitrite as N	270	ug/l	50	
inorg	Phosphorus, Total as P	<50	ug/l	50	
inorg	Sulfate	39600	ug/l	10000	
inorg	TDS	250000	ug/l	10000	
inorg	TSS	<5000	ug/l	5000	
m	Aluminum	<100	ug/l	100	
m	Arsenic	<2	ug/l	2	
m	Barium	56	ug/l	10	
m	Beryllium	<2	ug/l	2	
m	Boron (dissolved)	360	ug/l	100	
m	Cadmium	<1	ug/l	1	
m	Calcium (dissolved)	28700	ug/l	500	
m	Chromium	<10	ug/l	10	
m	Copper	<20	ug/l	20	
m	Iron	140	ug/l	100	
m	Lead	<1	ug/l	1	
m	Magnesium (dissolved)	25700	ug/l	500	
m	Manganese	17	ug/l	10	
m	Mercury	<0.005	ug/l	0 005	
m	Molybdenum	<20	ug/l	20	
m	Nickel	<40	ug/l	40	
m	Potassium (dissolved)	1500	ug/l	50	
m	Selenium	<2	ug/l	2	
m	Silver	<1	ug/l	1	
m	Sodium (dissolved)	20100	ug/l	5000	
m	Thallium	<1	ug/l	1	
m	Zinc	<20	ug/l	20	

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP082 2/19/98

CollectionDate by Quarter Q1 1998

Group	Analyte	Result	Units	RL	Qualifier
inorg	Ammonia as N	<100	ug/l	100	
inorg	Chloride	4200	ug/l	1000	
inorg	COD	<10000	ug/l	10000	
inorg	Hardness, total as CaCO3	136200	ug/l	3300	
inorg	Nitrate + Nitrite as N	99	ug/l	50	
inorg	Phosphorus, Total as P	<50	ug/l	50	
inorg	Sulfate	18800	ug/l	1000	
inorg	TDS	171000	ug/l	10000	
inorg	TSS	<5000	ug/l	5000	
m	Aluminum	2800	ug/l	100	
m	Arsenic	<2	ug/l	2	
m	Barium	72	ug/l	10	
m	Beryllium	<2	ug/l	2	
m	Boron (dissolved)	170	ug/l	100	
m	Cadmium	<1	ug/l	1	
m	Calcium (dissolved)	18100	ug/l	500	
m	Chromium	<10	ug/l	10	
m	Copper	<20	ug/l	20	
m	Iron	3400	ug/l	100	
m	Lead	<1	ug/l	1	
m	Magnesium (dissolved)	22100	ug/l	500	
m	Manganese	58	ug/l	10	
m	Mercury	<0.005	ug/l	0.005	
m	Molybdenum	<20	ug/l	20	
m	Nickel	<40	ug/l	40	
m	Potassium (dissolved)	1300	ug/l	50	
m	Selenium	<2	ug/l	2	
m	Silver	<1	ug/l	1	
m	Sodium (dissolved)	10000	ug/l	5000	
m	Thallium	<1	ug/l	1	
m	Zinc	<20	ug/l	20	

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP102 5/19/98

CollectionDate by Quarter Q2 1998

Group	Analyte	Result	Units	RL	Qualifier
inorg	Ammonia as N	<100	ug/l	100	
inorg	Chloride	15500	ug/l	1000	
inorg	COD	<10000	ug/l	10000	
inorg	Hardness, total as CaCO3	206000	ug/l	3300	
inorg	Nitrate + Nitrite as N	100	ug/l	50	
inorg	Phosphorus, Total as P	<50	ug/l	50	
inorg	Sulfate	62000	ug/l	5000	

inorg	TDS	284000	ug/l	10000
m	Aluminum	120	ug/l	100
m	Arsenic	<2.0	ug/l	2
m	Barium	50	ug/l	10
m	Beryllium	<2.0	ug/l	2
m	Boron (dissolved)	480	ug/l	100
m	Cadmium	<1.0	ug/l	1
m	Calcium (dissolved)	36100	ug/l	500
m	Chromium	<10	ug/l	10
m	Copper	<20	ug/l	20
m	Iron	110	ug/l	100
m	Lead	<1.0	ug/l	1
m	Magnesium (dissolved)	28100	ug/l	500
m	Manganese	<10	ug/l	10
m	Mercury	0.025	ug/l	0.005
m	Molybdenum	<20	ug/l	20
m	Nickel	<40	ug/l	40
m	Potassium (dissolved)	1500	ug/l	50
m	Selenium	<2.0	ug/l	2
m	Silver	<1.0	ug/l	1
m	Sodium (dissolved)	28800	ug/l	5000
m	Thallium	<1.0	ug/l	1
m	Zinc	<20	ug/l	20

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP112 9/11/98

CollectionDate by Quarter Q3 1998

Group	Analyte	Result	Units	RL	Qualifier
inorg	Ammonia as N	<100	ug/l	100	
inorg	Chloride	13500	ug/l	1000	
inorg	COD	<10000	ug/l	10000	
inorg	Hardness, total as CaCO3	170000	ug/l	3300	
inorg	Nitrate + Nitrite as N	84	ug/l	50	
inorg	Phosphorus, Total as P	<50	ug/l	50	
inorg	Sulfate	35400	ug/l	5000	
inorg	TDS	235000	ug/l	10000	
inorg	TSS	<5000	ug/l	5000	
m	Aluminum	<100	ug/l	100	
m	Arsenic	<2.0	ug/l	2	
m	Barium	42	ug/l	10	
m	Beryllium	<2.0	ug/l	2	
m	Boron (dissolved)	300	ug/l	100	
m	Cadmium	<1.0	ug/l	1	
m	Calcium (dissolved)	24600	ug/l	500	
m	Chromium	<10	ug/l	10	

m	Copper	<20	ug/l	20
m	Iron	110	ug/l	100
m	Lead	<1.0	ug/l	1
m	Magnesium (dissolved)	26400	ug/l	500
m	Manganese	<10	ug/l	10
m	Mercury	<0.005	ug/l	0.005
m	Molybdenum	<20	ug/l	20
m	Nickel	<40	ug/l	40
m	Potassium (dissolved)	1300	ug/l	50
m	Selenium	<0.0004	ug/l	0.000
m	Silver	<1.0	ug/l	1
m	Sodium (dissolved)	18800	ug/l	5000
m	Thallium	<1.0	ug/l	1
m	Zinc	<20	ug/l	20

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP142 11/20/98

CollectionDate by Quarter Q4 1998

Group	Analyte	Result	Units	RL	Qualifier
	Gross Alpha (pCi/L)	<1.34	pCi/L	1.34	
inorg	Ammonia as N	<100	ug/l	100	
inorg	Chloride	3700	ug/l	1000	
inorg	COD	<10000	ug/l	10000	
inorg	Cyanide	<10	ug/l	10	
inorg	Fluoride	<500	ug/l	500	
inorg	Hardness, total as CaCO3	137000	ug/l	3300	
inorg	Nitrate + Nitrite as N	160	ug/l	50	
inorg	Phosphorus, Total as P	<50	ug/l	50	SUSPECT (Sample
inorg	Sulfate	14400	ug/l	1000	
inorg	TDS	128000	ug/l	10000	
m	Aluminum	190	ug/l	100	
m	Antimony	<2.0	ug/l	2	
m	Arsenic	<2.0	ug/l	2	
m	Barium	39	ug/l	10	
m	Beryllium	<2.0	ug/l	2	
m	Boron (dissolved)	130	ug/l	100	
m	Cadmium	<1.0	ug/l	1	
m	Calcium (dissolved)	15600	ug/l	500	
m	Chromium	<10	ug/l	10	
m	Copper	<20	ug/l	20	
m	Iron	200	ug/l	100	
m	Lead	<1.0	ug/l	1	
m	Magnesium (dissolved)	23600	ug/l	500	
m	Manganese	<10	ug/l	10	
m	Mercury	0.003	ug/l	0.000	

m	Molybdenum	<20	ug/l	20
m	Nickel	<40	ug/l	40
m	Potassium (dissolved)	1300	ug/l	50
m	Selenium	<0 4	ug/l	0 4
m	Silver	<1 0	ug/l	1
m	Sodium (dissolved)	8400	ug/l	5000
m	Thallium	<1.0	ug/l	1
m	Uranium	<5 0	ug/l	5
m	Zinc	<20	ug/l	20

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP169 2/17/99

CollectionDate by Quarter Q1 1999

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0 1	Organ/L	+<0 1/	
bio	Fecal Coliform	2	MPN/100	2	
bio	Giardia	< 0.1	Organ/L	+<0 1/	
bio	Total Coliform	2	MPN/100	2	
inorg	Ammonia as N	<100	ug/l	100	
inorg	Chloride	4,600	ug/l	1000	
inorg	COD	<10,000	ug/l	10000	
inorg	Cyanide	<10	ug/l	10	
inorg	Fluoride	<500	ug/l	500	
inorg	Gross Alpha	<1 22	pCi/L	1 22	
inorg	Hardness, total as CaCO3	152 000	ug/l	3300	
inorg	Nitrate + Nitrite as N	55	ug/l	50	
inorg	Phosphorus, Total as P	<50	ug/l	50	
inorg	Sulfate	21,000	ug/l	1000	
inorg	TDS	183,000	ug/l	10000	
m	Aluminum	200	ug/l	100	
m	Antimony	<2	ug/l	2	
m	Arsenic	<2	ug/l	2	
m	Barium	51	ug/l	10	
m	Beryllium	<2	ug/l	2	
m	Boron (dissolved)	170	ug/l	100	
m	Cadmium	<0 5	ug/l	0 5	
m	Calcium (dissolved)	16,700	ug/l	500	
m	Chromium	<2	ug/l	2	
m	Copper	1.9	ug/l	1	
m	Iron	240	ug/l	100	
m	Lead	<1	ug/l	1	
m	Magnesium (dissolved)	26,700	ug/l	500	
m	Manganese	<10	ug/l	10	
m	Mercury	0 01	ug/l	0 001	
m	Molybdenum	<1	ug/l	1	

m	Nickel	<40	ug/l	40
m	Potassium (dissolved)	1,200	ug/l	50
m	Selenium	<0 4	ug/l	0 4
m	Silver	<1	ug/l	1
m	Sodium (dissolved)	9 000	ug/l	5000
m	Thallium	<1	ug/l	1
m	Uranium	<5	ug/l	5
m	Zinc	<20	ug/l	20

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP177 5/17/99

Collection Date by Quarter Q2 1999

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0.1	Organ/L	+<0 1/	
bio	Fecal Coliform	<2	MPN/100	2	
bio	Giardia	<0 1	Organ/L	+<0 1/	
bio	Total Coliform	4	MPN/100	2	
inorg	Ammonia as N	<100	ug/l	100	
inorg	Chloride	6,600	ug/l	2000	
inorg	COD	<10,000	ug/l	10000	
inorg	Cyanide	<10	ug/l	10	
inorg	Fluoride	<500	ug/l	500	
inorg	Gross Alpha	<1 55	pCi/L	1.55	
inorg	Hardness, total as CaCO3	149,000	ug/l	3300	
inorg	Nitrate + Nitrite as N	89	ug/l	50	
inorg	Phosphorus, Total as P	<50	ug/l	50	
inorg	Sulfate	29,400	ug/l	1000	
inorg	TDS	195,000	ug/l	10000	
m	Aluminum	<100	ug/l	100	
m	Antimony	<2	ug/l	2	
m	Arsenic	<2	ug/l	2	
m	Barium	47	ug/l	10	
m	Beryllium	<2	ug/l	2	
m	Boron (dissolved)	200	ug/l	100	
m	Cadmium	<0.5	ug/l	0 5	
m	Calcium (dissolved)	19,200	ug/l	500	
m	Chromium	1 7	ug/l	1	
m	Copper	1 4	ug/l	1	
m	Iron	<100	ug/l	100	
m	Lead	<1	ug/l	1	
m	Magnesium (dissolved)	24,500	ug/l	500	
m	Manganese	<10	ug/l	10	
m	Mercury	<0.01	ug/l	0.01	
m	Molybdenum	<1	ug/l	1	
m	Nickel	<40	ug/l	40	

m	Potassium (dissolved)	1,100	ug/l	50
m	Selenium	<0.4	ug/l	0.4
m	Silver	<1	ug/l	1
m	Sodium (dissolved)	11,500	ug/l	5000
m	Thallium	<1	ug/l	1
m	Uranium	<5	ug/l	5
m	Zinc	<20	ug/l	20

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP197 8/25/99

CollectionDate by Quarter Q3 1999

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0.1	Organ/L	0.1	
bio	Fecal Coliform	2	MPN/100	2	
bio	Giardia	<0.1	Organ/L	0.1	
bio	Total Coliform	8	MPN/100	2	
inorg	Ammonia as N	100	ug/l	100	
inorg	Chloride	5,000	ug/l	2000	
inorg	COD	<50,000	ug/l	50000	
inorg	Cyanide	<10	ug/l	10	
inorg	Fluoride	100	ug/l	100	
inorg	Gross Alpha	<0.913	pCi/L	0.913	
inorg	Hardness, total as CaCO3	143,000	ug/l	3300	
inorg	Nitrate + Nitrite as N	270	ug/l	100	
inorg	Phosphorus, Total as P	<100	ug/l	100	
inorg	Sulfate	20,000	ug/l	1000	
inorg	TDS	170,000	ug/l	10000	
m	Aluminum	<100	ug/l	100	
m	Antimony	<2	ug/l	2	
m	Arsenic	<2	ug/l	2	
m	Barium	46	ug/l	10	
m	Beryllium	<2	ug/l	2	
m	Boron (dissolved)	100	ug/l	100	
m	Cadmium	<0.5	ug/l	0.5	
m	Calcium (dissolved)	16,000	ug/l	500	
m	Chromium	2.2	ug/l	2	
m	Copper	1.6	ug/l	1	
m	Iron	<100	ug/l	100	
m	Lead	<1	ug/l	1	
m	Magnesium (dissolved)	25,000	ug/l	500	
m	Manganese	<10	ug/l	10	
m	Mercury	0.01	ug/l	0.01	
m	Molybdenum	<1	ug/l	1	
m	Nickel	<40	ug/l	40	
m	Potassium (dissolved)	<1,000	ug/l	1000	

m	Selenium	<0 4	ug/l	0 4
m	Silver	<1	ug/l	1
m	Sodium (dissolved)	9,000	ug/l	1000
m	Thallium	<1	ug/l	1
m	Uranium	<5	ug/l	5
m	Zinc	<20	ug/l	20

Station ID BS_MN_06 Pulah Crk below Monticello Dm

BHP217 11/9/99

Collection Date by Quarter Q4 1999

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	0 4	Organ/L	0.1	
bio	Fecal Coliform	2	MPN/100	2	
bio	Giardia	0.2	Organ/L	0.1	
bio	Total Coliform	30	MPN/100	2	
inorg	Ammonia as N	<100	ug/l	100	
inorg	Chloride	4,000	ug/l	1000	
inorg	COD	<10,000	ug/l	10000	
inorg	Cyanide	<10	ug/l	10	
inorg	Fluoride	<100	ug/l	100	
inorg	Gross Alpha	<1 39	pCi/L	1 39	
inorg	Hardness, total as CaCO3	143,000	ug/l	3300	
inorg	Nitrate + Nitrite as N	140	ug/l	100	
inorg	Phosphorus, Total as P	<100	ug/l	100	
inorg	Sulfate	20,000	ug/l	500	
inorg	TDS	170,000	ug/l	10000	
m	Aluminum	110	ug/l	100	
m	Antimony	<2	ug/l	2	
m	Arsenic	<2	ug/l	2	
m	Barium	45	ug/l	10	
m	Beryllium	<2	ug/l	2	
m	Boron (drssolved)	100	ug/l	100	
m	Cadmium	<0 5	ug/l	0.5	
m	Calcium (dissolved)	16,000	ug/l	500	
m	Chromium	2	ug/l	1	
m	Copper	2 2	ug/l	1	
m	Iron	190	ug/l	100	
m	Lead	<1	ug/l	1	
m	Magnesium (dissolved)	25,000	ug/l	500	
m	Manganese	<10	ug/l	10	
m	Mercury	<0.01	ug/l	0 01	
m	Molybdenum	<1	ug/l	1	
m	Nickel	<40	ug/l	40	
m	Potassium (dissolved)	<1,000	ug/l	1000	
m	Selenium	<0 4	ug/l	0 4	

m	Silver	<1	ug/l	1
m	Sodium (dissolved)	9,000	ug/l	1000
m	Thallium	<1	ug/l	1
m	Uranium	<5	ug/l	5
m	Zinc	<20	ug/l	20

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP238 3/7/00

Collection/Date by Quarter Q1 2000

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0.1	org/L	<0.1
bio	Feca Coliform	3	CFU/100	-
bio	Giardia	<0.1	org/L	<0.1
bio	Total Coliform	63	CFU/100	-
inorg	Ammonia as N	<300	ug/l	300
inorg	Chloride	9000	ug/l	1000
inorg	COD	<10000	ug/l	10000
inorg	Cyanide	<20	ug/l	20
inorg	Fluoride	<100	ug/l	100
inorg	Gross Alpha	<1.0	pCi/L	1.0
inorg	Hardness, total as CaCO3	170000	ug/l	3300
inorg	Nitrate + Nitrite as N	<50	ug/l	50
inorg	Phosphorus, Total as P	<10	ug/l	10
inorg	Sulfate	23000	ug/l	1000
inorg	TDS	190000	ug/l	15000
m	Aluminum	48	ug/l	10
m	Antimony	<1	ug/l	1
m	Arsenic	<1	ug/l	1
m	Barium	52	ug/l	5
m	Beryllium	<1.1	ug/l	1.1
m	Boron (dissolved)	190	ug/l	20
m	Cadmium	<0.5	ug/l	0.5
m	Calcium (dissolved)	20000	ug/l	100
m	Chromium	<2.1	ug/l	2.1
m	Copper	1.2	ug/l	0.3
m	Iron	55	ug/l	20
m	Lead	0.22	ug/l	0.1
m	Magnesium (dissolved)	29000	ug/l	100
m	Manganese	5.3	ug/l	5
m	Mercury	<0.01	ug/l	0.01
m	Molybdenum	<1.5	ug/l	1.5
m	Nickel	1.5	ug/l	1
m	Potassium (dissolved)	1400	ug/l	500
m	Selenium	<0.4	ug/l	0.4
m	Silver	<1	ug/l	1

m	Sodium (dissolved)	9400	ug/l	100
m	Thallium	<0 1	ug/l	0 1
m	Uranium	<1	ug/l	1
m	Zinc	<20	ug/l	20

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP259 5/16/00

Collection/Date by Quarter Q2 2000

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0 1	org/L	0.1	
bio	Fecal Coliform	4	CFU/100	-	
bio	Giardia	<0 1	org/L	0.1	
bio	Total Coliform	13	CFU/100	-	
inorg	Ammonia as N	<300	ug/l	300	
inorg	Chloride	5500	ug/l	500	
inorg	COD	<10000	ug/l	10000	
inorg	Cyanide	<20	ug/l	20	
inorg	Fluoride	<100	ug/l	100	
inorg	Gross Alpha	<1 0	pCi/L	1 0	
inorg	Hardness, total as CaCO3	150000	ug/l	3300	
inorg	Nitrate + Nitrite as N	58	ug/l	50	
inorg	Phosphorus, Total as P	<10	ug/l	10	
inorg	Sulfate	22000	ug/l	500	
inorg	TDS	210000	ug/l	15000	
m	Aluminum	59	ug/l	10	
m	Antimony	1.1	ug/l	1	
m	Arsenic	<1	ug/l	1	
m	Barium	50	ug/l	5	
m	Beryllium	<1	ug/l	1	
m	Boron (dissolved)	150	ug/l	25	
m	Cadmium	<0 5	ug/l	0 5	
m	Calcium (dissolved)	18000	ug/l	100	
m	Chromium	2 4	ug/l	1	
m	Copper	15	ug/l	0 3	
m	Iron	84	ug/l	20	
m	Lead	0 1	ug/l	0.1	
m	Magnesium (dissolved)	26000	ug/l	100	
m	Manganese	<5	ug/l	5	
m	Mercury	<0 005	ug/l	0 005	
m	Molybdenum	1 8	ug/l	1 5	
m	Nickel	<10	ug/l	10	
m	Potassium (dissolved)	<100	ug/l	100	
m	Selenium	<0 4	ug/l	0 4	
m	Silver	<1	ug/l	1	
m	Sodium (dissolved)	8900	ug/l	100	

m	Thallium	<0 1	ug/l	0.1
m	Uranium	<5	ug/l	5
m	Zinc	<20	ug/l	20

Station ID BS_MN_06 Putah Crk below Monticello Dm

SHP280 8/15/00

Collection Date by Quarter Q3 2000

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0 1	org/L	+<0 1/	
bio	Fecal Coliform	<2	MPN/100	2	
bio	Giardia	<0 1	org/L	+<0.1/	
bio	Total Coliform	23	MPN/100	2	
inorg	Ammonia as N	<300	ug/l	300	
inorg	Chloride	10000	ug/l	1000	
inorg	COD	110000	ug/l	10000	
inorg	Cyanide	<20	ug/l	20	
inorg	Fluoride	<100	ug/l	100	
inorg	Gross Alpha	<2	pCi/L	2	
inorg	Hardness, total as CaCO3	160000	ug/l	3300	
inorg	Nitrate + Nitrite as N	160	ug/l	50	
inorg	Phosphorus, Total as P	10	ug/l	10	
inorg	Sulfate	49000	ug/l	5000	
inorg	TDS	240000	ug/l	15000	
m	Aluminum	120	ug/l	10	
m	Antimony	<1	ug/l	1	
m	Arsenic	<1	ug/l	1	
m	Barium	52	ug/l	5	
m	Beryllium	<0 5	ug/l	0 5	
m	Boron (dissolved)	170	ug/l	25	
m	Cadmium	<0 5	ug/l	0.5	
m	Calcium (dissolved)	18000	ug/l	100	
m	Chromium	1 6	ug/l	1	
m	Copper	1 8	ug/l	0 3	
m	Iron	88	ug/l	20	
m	Lead	<1	ug/l	1	
m	Magnesium (dissolved)	29000	ug/l	100	
m	Manganese	<5	ug/l	5	
m	Mercury	<0 005	ug/l	0.005	
m	Molybdenum	<1 5	ug/l	1.5	
m	Nickel	1.9	ug/l	1	
m	Potassium (dissolved)	1600	ug/l	500	
m	Selenium	<0 4	ug/l	0 4	
m	Silver	<1	ug/l	1	
m	Sodium (dissolved)	9400	ug/l	100	
m	Thallium	<0.1	ug/l	0 1	

m	Uranium	<1	ug/l	1
m	Zinc	4 3	ug/l	1

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP301 11/7/00

Collection/Date by Quarter Q4 2000

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0.1	Org/L	+<0 1/	
bio	Fecal Coliform	22	CFU/100	2	
bio	Giardia	<0 1	Org/L	+<0 1/	
bio	Total Coliform	22	CFU/100	2	
inorg	Ammonia as N	<300	ug/l	300	
inorg	Chloride	5200	ug/l	200	
inorg	COD	<10000	ug/l	10000	
inorg	Cyanide	<20	ug/l	20	
inorg	Fluoride	<100	ug/l	100	
inorg	Gross Alpha	<2	pCi/L	2	
inorg	Hardness, total as CaCO3	160000	ug/l	3300	
inorg	Nitrate + Nitrite as N	110	ug/l	50	
inorg	Phosphorus, Total as P	18	ug/l	10	
inorg	Sulfate	21000	ug/l	500	
inorg	TDS	200000	ug/l	15000	
m	Aluminum	110	ug/l	10	
m	Antimony	<1	ug/l	1	
m	Arsenic	<1	ug/l	1	
m	Barium	52	ug/l	5	
m	Beryllium	<0 5	ug/l	0 5	
m	Boron (dissolved)	170	ug/l	20	
m	Cadmium	<0.5	ug/l	0.5	
m	Calcium (dissolved)	17000	ug/l	100	
m	Chromium	1 3	ug/l	1	
m	Copper	2	ug/l	0.3	
m	Iron	200	ug/l	20	
m	Lead	<1	ug/l	1	
m	Magnesium (dissolved)	28000	ug/l	100	
m	Manganese	7 7	ug/l	5	
m	Mercury	<0.005	ug/l	0 005	
m	Molybdenum	<1 5	ug/l	1 5	
m	Nickel	3 2	ug/l	1	
m					

m	Zinc	4	ug/l	1

Station ID BS_MN_06 Putah Crk below Monticello Dm

SHP323 2/27/01

collectionDate by Quarter Q1 2001

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0.1	Org/L	<0.1	
bio	Fecal Coliform	2	CFU/100	<2	
bio	Giardia	<0.1	Org/L	<0.1	
bio	Total Coliform	23	CFU/100	<2	
inorg	Ammonia as N	<300	ug/l	300	
inorg	Chloride	12000	ug/l	100	
inorg	COD	<10000	ug/l	10000	
inorg	Cyanide	<20	ug/l	20	
inorg	Fluoride	130	ug/l	100	
inorg	Gross Alpha	<1.16	pCi/L	1.16	
inorg	Hardness, total as CaCO3	174500	ug/l	3300	
inorg	Nitrate + Nitrite as N	<50	ug/l	50	
inorg	Phosphorus, Total as P	16	ug/l	10	
inorg	Sulfate	40000	ug/l	1000	
inorg	TDS	220000	ug/l	15000	
m	Aluminum (dissolved)	<10	ug/l	10	
m	Antimony (dissolved)	<1	ug/l	1	
m	Arsenic (dissolved)	<1	ug/l	1	
m	Barium (dissolved)	48	ug/l	5	
m	Beryllium (dissolved)	<1	ug/l	1	
m	Boron	290	ug/l	20	
m	Cadmium (dissolved)	<0.5	ug/l	0.5	
m	Calcium (dissolved)	27000	ug/l	100	
m	Chromium (dissolved)	1.2	ug/l	0.3	
m	Copper (dissolved)	1.8	ug/l	1	
m	Iron (dissolved)	<20	ug/l	20	
m	Lead (dissolved)	<1	ug/l	1	
m	Magnesium (dissolved)	26000	ug/l	100	
m	Manganese (dissolved)	12	ug/l	5	
m	Mercury (dissolved)	0.0055	ug/l	0.005	
m	Molybdenum	<1	ug/l	1	
m	Nickel (dissolved)	<1	ug/l	1	
m	Potassium (dissolved)	<100	ug/l	100	
m	Selenium	0.420	ug/l	<0.4	
m	Silver (dissolved)	<1	ug/l	1	
m	Sodium (dissolved)	19000	ug/l	100	
m	Thallium (dissolved)	<1	ug/l	1	
m	Uranium (dissolved)	<1	ug/l	1	
m	Zinc (dissolved)	<1	ug/l	1	

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP348 5/16/01

Collection Date by Quarter Q2 2001

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0 1	Org/L	<0 1	
bio	E Coli	2	MPN/100	2	
bio	Fecal Coliform	2	MPN/100	2	
bio	Giardia	<0.1	Org/L	<0 1	
bio	Total Coliform	4	MPN/100	2	
inorg	Ammonia as N	450	ug/l	300	
inorg	Chloride	6600	ug/l	1000	
inorg	COD	<10000	ug/l	10000	
inorg	Cyanide	<20	ug/l	20	
inorg	Fluoride	<100	ug/l	100	
inorg	Gross Alpha	<1.03	pCi/L	1.03	
inorg	Hardness, total as CaCO3	171000	ug/l	3300	
inorg	Nitrate + Nitrite as N	<50	ug/l	50	
inorg	Phosphorus, Total as P	24	ug/l	10	
inorg	Sulfate	26000	ug/l	1000	
inorg	TDS	190000	ug/l	15000	
m	Aluminum (dissolved)	<10	ug/l	10	
m	Antimony (dissolved)	<1	ug/l	1	
m	Arsenic (dissolved)	<1	ug/l	1	
m	Barium (dissolved)	51	ug/l	5	
m	Beryllium (dissolved)	<1	ug/l	1	
m	Boron	200	ug/l	10	
m	Cadmium (dissolved)	<0 5	ug/l	0 5	
m	Calcium (dissolved)	19000	ug/l	100	
m	Chromium (dissolved)	<1	ug/l	1	
m	Copper (dissolved)	<0.3	ug/l	0.3	
m	Iron (dissolved)	<20	ug/l	20	
m	Lead (dissolved)	<1	ug/l	1	
m	Magnesium (dissolved)	30000	ug/l	100	
m	Manganese (dissolved)	7 1	ug/l	5	
m	Mercury (dissolved)	<0 005	ug/l	0 005	
m	Molybdenum	<1	ug/l	1	
m	Nickel (dissolved)	<1	ug/l	1	
m	Potassium (dissolved)	2200	ug/l	500	
m	Selenium	<0 4	ug/l	0.4	
m	Silver (dissolved)	<1	ug/l	1	
m	Sodium (dissolved)	10000	ug/l	100	
m	Thallium (dissolved)	<1	ug/l	1	
m	Uranium (dissolved)	<1	ug/l	1	
m	Zinc (dissolved)	<1	ug/l	1	

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP373 8/7/01

SectionDate by Quarter Q3 2001

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0 1	Org/L	0 1	
bio	E Coli	2	MPN/100	2	
bio	Fecal Coliform	2	MPN/100	2	
bio	Giardia	<0 1	Org/L	0.1	
bio	Total Coliform	110	MPN/100	2	
inorg	Ammonia as N	<300	ug/l	300	
inorg	Chloride	5200	ug/l	500	
inorg	CO3	<10000	ug/l	10000	
inorg	Cyanide	<20	ug/l	20	
inorg	Fluoride	<100	ug/l	100	
inorg	Gross Alpha	<1 01	pCi/L	1 01	
inorg	Hardness, total as CaCO3	172600	ug/l	15000	
inorg	Nitrate + Nitrite as N	<50	ug/l	50	
inorg	Phosphorus, Total as P	16	ug/l	10	
inorg	Sulfate	18000	ug/l	2000	
inorg	TDS	190000	ug/l	15000	
m	Aluminum (dissolved)	<10	ug/l	10	
m	Antimony (dissolved)	1 5	ug/l	1	
m	Arsenic (dissolved)	1.1	ug/l	1	
m	Barium (dissolved)	51	ug/l	5	
m	Beryllium (dissolved)	<1	ug/l	1	
m	Boron	180	ug/l	20	
m	Cadmium (dissolved)	<1	ug/l	1	
m	Calcium (dissolved)	18000	ug/l	100	
m	Chromium (dissolved)	<1	ug/l	1	
m	Copper (dissolved)	<1	ug/l	1	
m	Iron (dissolved)	<20	ug/l	20	
m	Lead (dissolved)	<1	ug/l	1	
m	Magnesium (dissolved)	31000	ug/l	100	
m	Manganese (dissolved)	<5	ug/l	5	
m	Mercury (dissolved)	<0 005	ug/l	0 005	
m	Molybdenum	<1	ug/l	1	
m	Nickel (dissolved)	1	ug/l	1	
m	Potassium (dissolved)	1600	ug/l	500	
m	Selenium	<0 4	ug/l	0 4	
m	Silver (dissolved)	<1	ug/l	1	
m	Sodium (dissolved)	9900	ug/l	100	
m	Thallium (dissolved)	<1	ug/l	1	
m	Uranium (dissolved)	<1	ug/l	1	
m	Zinc (dissolved)	<1	ug/l	1	

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP398 11/7/01

CollectionDate by Quarter Q4 2001

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0.1	Org/L	0.1	
bio	E Coli	<2	MPN\100	2	
bio	Fecal Coliform	<2	MPN\100	2	
bio	Giardia	<0.1	Org/L	0.1	
bio	Total Coliform	4	MPN\100	2	
inorg	Ammonia as N	<300	ug/l	300	
inorg	Chloride	5000	ug/l	500	
inorg	COD	<10000	ug/l	10000	
inorg	Cyanide	<20	ug/l	20	
inorg	Fluoride	110	ug/l	100	
inorg	Gross Alpha	<1.73	pCi/L	1.73	
inorg	Hardness, total as CaCO3	151100	ug/l	700	
inorg	Nitrate + Nitrite as N	76	ug/l	50	
inorg	Phosphorus, Total as P	<10	ug/l	10	
inorg	Sulfate	21000	ug/l	1000	
inorg	TDS	190000	ug/l	15000	
m	Aluminum (dissolved)	<10	ug/l	10	
m	Antimony (dissolved)	<1	ug/l	1	
m	Arsenic (dissolved)	1.1	ug/l	1	
m	Barium (dissolved)	44	ug/l	5	
m	Beryllium (dissolved)	<1	ug/l	1	
m	Boron	140	ug/l	20	
m	Cadmium (dissolved)	<0.5	ug/l	0.5	
m	Calcium (dissolved)	16000	ug/l	100	
m	Chromium (dissolved)	<1	ug/l	1	
m	Copper (dissolved)	1.2	ug/l	0.3	
m	Iron (dissolved)	<20	ug/l	20	
m	Lead (dissolved)	<1	ug/l	1	
m	Magnesium (dissolved)	27000	ug/l	100	
m	Manganese (dissolved)	<5	ug/l	5	
m	Mercury (dissolved)	<0.005	ug/l	0.005	
m	Molybdenum	<1	ug/l	1	
m	Nickel (dissolved)	1.6	ug/l	1	
m	Potassium (dissolved)	2200	ug/l	500	
m	Selenium	<0.4	ug/l	0.4	
m	Silver (dissolved)	<1	ug/l	1	
m	Sodium (dissolved)	10000	ug/l	100	
m	Thallium (dissolved)	<1	ug/l	1	
m	Uranium (dissolved)	<1	ug/l	1	
m	Zinc (dissolved)	<1	ug/l	1	

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP424 2/11/02

Collection Date by Quarter Q1 2002

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0.1	Org/L	0.1	
bio	E Coli	<2	MPN/100	2	
bio	Fecal Coliform	<2	MPN/100	2	
bio	Giardia	<0.1	Org/L	0.1	
bio	Total Coliform	<2	MPN/100	2	
inorg	Ammonia as N	<50	ug/l	50	
inorg	Chloride	12000	ug/l	1000	
inorg	COD	<3000	ug/l	3000	
inorg	Cyanide	<3	ug/l	3	
inorg	Fluoride	<50	ug/l	50	SUSPECT LOW BIAS
inorg	Gross Alpha	<1.57	pCi/L	1.57	
inorg	Nitrate + Nitrite as N	1860	ug/l	50	
inorg	Phosphorus, Total as P	120	ug/l	50	
inorg	Sulfate	31000	ug/l	2000	
inorg	TDS	203000	ug/l	2000	
m	Aluminum (dissolved)	7.7	ug/l	0.5	
m	Antimony (dissolved)	<0.5	ug/l	0.5	
m	Arsenic (dissolved)	1.0	ug/l	0.5	
m	Barium (dissolved)	51.7	ug/l	0.5	
m	Beryllium (dissolved)	<0.5	ug/l	0.5	
m	Boron	295	ug/l	2	
m	Cadmium (dissolved)	<0.25	ug/l	0.25	
m	Calcium (dissolved)	20000	ug/l	1000	
m	Chromium (dissolved)	2.9	ug/l	0.5	
m	Copper (dissolved)	1.2	ug/l	0.5	
m	Iron (dissolved)	12	ug/l	10	
m	Lead (dissolved)	<0.5	ug/l	0.5	
m	Magnesium (dissolved)	26000	ug/l	1000	
m	Manganese (dissolved)	7.1	ug/l	0.5	
m	Mercury (dissolved)	<0.005	ug/l	0.005	OUT OF HOLD TIME, BIASED
m	Molybdenum	0.62	ug/l	0.25	
m	Nickel (dissolved)	2	ug/l	1	
m	Potassium (dissolved)	1000	ug/l	1000	
m	Selenium	<0.4	ug/l	0.4	
m	Silver (drssolved)	<0.25	ug/l	0.25	
m	Sodium (dissolved)	13000	ug/l	1000	
m	Thallium (dissolved)	<1	ug/l	1	
m	Uranium (dissolved)	<0.5	ug/l	0.5	
m	Zinc (dissolved)	7	ug/l	1	

Station ID BS_MN_06 Putah Crk below Monticello Dm

BHP458 5/20/02

CollectionDate by Quarter Q2 2002

Group	Analyte	Result	Units	RL	Qualifier
bio	Cryptosporidium	<0.1	Org/L	0.1	
bio	E Coli	2	MPN\100	2	
bio	Fecal Coliform	2	MPN\100	2	
bio	Giardia	<0.1	Org/L	0.1	
bio	Total Coliform	8	MPN\100	2	
inorg	Ammonia as N	<50	ug/l	50	
inorg	Chloride	5300	ug/l	1000	
inorg	COD	<10000	ug/l	10000	
inorg	Cyanide	<10	mg/l	10	
inorg	Fluoride	<400	ug/l	400	
inorg	Gross Alpha	<0.632	pCi/L	0.632	
inorg	Nitrate + Nitrite as N	93	ug/l	10	
inorg	Phosphorus, Total as P	24	ug/l	10	
inorg	Sulfate	19000	ug/l	1000	
inorg	TDS	190000	ug/l	15000	
m	Aluminum (dissolved)	<10	ug/l	10	
m	Antimony (dissolved)	<1	ug/l	1	
m	Arsenic (dissolved)	1.4	ug/l	1	
m	Barium (dissolved)	48	ug/l	5	
m	Beryllium (dissolved)	<5	ug/l	5	
m	Boron	69	ug/l	20	
m	Cadmium (dissolved)	<0.5	ug/l	0.5	
m	Calcium (dissolved)	17000	ug/l	100	
m	Chromium (dissolved)	<1	ug/l	1	
m	Copper (dissolved)	1.1	ug/l	0.3	
m	Iron (dissolved)	<20	ug/l	20	
m	Lead (dissolved)	0.11	ug/l	0.1	
m	Magnesium (dissolved)	28000	ug/l	100	
m	Manganese (dissolved)	<5	ug/l	5	
m	Mercury (dissolved)	<0.005	ug/l	0.005	
m	Molybdenum	<1	ug/l	1	
m	Nickel (dissolved)	<40	ug/l	40	
m	Potassium (dissolved)	1100	ug/l	500	
m	Selenium	<0.4	ug/l	0.4	
m	Silver (dissolved)	<1	ug/l	1	
m	Sodium (dissolved)	9200	ug/l	100	
m	Thallium (dissolved)	<0.4	ug/l	0.4	
m	Uranium (dissolved)	<1	ug/l	1	
m	Zinc (dissolved)	<20	ug/l	20	