

Reclamation District No. 108 Consolidated Pumping Facility and Fish Screen

Project Information

1. Proposal Title:

Reclamation District No. 108 Consolidated Pumping Facility and Fish Screen

2. Proposal applicants:

Luther Hintz, Reclamation District 108

3. Corresponding Contact Person:

Luther Hintz
Reclamation District No. 108 (RD108)
975 Wilson Bend Road P.O. Box 50 Grimes, CA 95950
530 437-2221
luhintz@colusanet.com

4. Project Keywords:

At-risk species, fish
Fish Passage/Fish Screens
Fish, Anadromous

5. Type of project:

Fish Screen

6. Does the project involve land acquisition, either in fee or through a conservation easement?

Yes

If yes, is there an existing specific restoration plan for this site?

No

7. Topic Area:

Fish Screens

8. Type of applicant:

Local Agency

9. Location - GIS coordinates:

Latitude: 38.945
Longitude: -121.837
Datum: WGS 84

Describe project location using information such as water bodies, river miles, road intersections, landmarks, and size in acres.

The project area lies within RD108, 45 miles northwest of Sacramento. The project location for the proposed consolidated pumping plant and fish screen site is at Rivermile 110.5 (right bank looking downstream) on the Sacramento River.

10. Location - Ecozone:

3.4 Colusa to Verona

11. Location - County:

Colusa, Yolo

12. Location - City:

Does your project fall within a city jurisdiction?

No

13. Location - Tribal Lands:

Does your project fall on or adjacent to tribal lands?

No

14. Location - Congressional District:

CD 03

15. Location:

California State Senate District Number: SD 04

California Assembly District Number: AD 02

16. How many years of funding are you requesting?

3 years

17. Requested Funds:

a) Are your overhead rates different depending on whether funds are state or federal?

No

If no, list single overhead rate and total requested funds:

Single Overhead Rate: 0

Total Requested Funds: \$7,200,000

b) Do you have cost share partners already identified?

Yes

If yes, list partners and amount contributed by each:

California Department of Fish and Game \$190,000

c) Do you have potential cost share partners?

Yes

If yes, list partners and amount contributed by each:

U.S. Bureau of Reclamation \$7.2 million

d) Are you specifically seeking non-federal cost share funds through this solicitation?

Yes

If yes, list total non-federal funds requested:

\$7.2 million

If the total non-federal cost share funds requested above does not match the total state funds requested in 17a, please explain the difference:

18. Is this proposal for next-phase funding of an ongoing project funded by CALFED?

No

Have you previously received funding from CALFED for other projects not listed above?

Yes

If yes, identify project number(s), title(s) and CALFED program.

B81569 Wilkins Slough Positive Barrier Fish Screen CVPIA/AFSP

19. Is this proposal for next-phase funding of an ongoing project funded by CVPIA?

Yes

If yes, identify project number(s), title(s) and CVPIA program (e.g. AFRP, AFSP, b(1) other).

7FG2015040 Wilkins Slough Positive Barrier Fish Screen CVPIA/AFSP

Have you previously received funding from CVPIA for other projects not listed above?

No

20. Is this proposal for next-phase funding of an ongoing project funded by an entity other than CALFED or CVPIA?

Yes

If yes, identify project number(s), title(s) and funding source.

01FG200029	Reconnaissance Investigations to Determine Site for Pumping Plant with Positive Barrier Fish Screen	California Department of Fish and Game
-------------------	------------------------------------------------------------------------------------------------------------	-----------------------------------------------

Please list suggested reviewers for your proposal. (optional)

Banky Curtis	California Department of Fish and Game	916/358-2899	BCurtis@dfg.ca.gov
---------------------	-----------------------------------------------	---------------------	---------------------------

Rick Wantuck	National Marine Fishery Service	707/575-6063	Richard.Wantuck@noaa.gov
---------------------	----------------------------------------	---------------------	---------------------------------

**David
Guy**

**Northern California Water
Association**

916/442-8333 dguy@norcalwater.org

21. Comments:

17.a. Overhead Rate. Reclamation District No. 108 will administer the Contract at no cost to CALFED. Therefore, there is no overhead rate. 17.b.CDFG provided RD108 with \$190,000 to prepare a Fish Screen Reconnaissance Investigation, the results of which form the basis of this Grant application.

Environmental Compliance Checklist

Reclamation District No. 108 Consolidated Pumping Facility and Fish Screen

1. CEQA or NEPA Compliance

a) Will this project require compliance with CEQA?

Yes

b) Will this project require compliance with NEPA?

Yes

c) If neither CEQA or NEPA compliance is required, please explain why compliance is not required for the actions in this proposal.

2. If the project will require CEQA and/or NEPA compliance, identify the lead agency(ies). If not applicable, put "None".

CEQA Lead Agency: Reclamation District No. 108

NEPA Lead Agency (or co-lead:) U.S. Bureau of Reclamation

NEPA Co-Lead Agency (if applicable):

3. Please check which type of CEQA/NEPA documentation is anticipated.

CEQA

-Categorical Exemption

☒ Negative Declaration or Mitigated Negative Declaration

-EIR

-none

NEPA

-Categorical Exclusion

☒ Environmental Assessment/FONSI

-EIS

-none

If you anticipate relying on either the Categorical Exemption or Categorical Exclusion for this project, please specifically identify the exemption and/or exclusion that you believe covers this project.

4. CEQA/NEPA Process

a) Is the CEQA/NEPA process complete?

Not Applicable

b) If the CEQA/NEPA document has been completed, please list document name(s):

5. Environmental Permitting and Approvals *(If a permit is not required, leave both Required? and Obtained? check boxes blank.)*

LOCAL PERMITS AND APPROVALS

Conditional use permit

Variance

Subdivision Map Act Required

Grading Permit Required

General Plan Amendment

Specific Plan Approval

Rezone

Williamson Act Contract Cancellation

Other

STATE PERMITS AND APPROVALS

Scientific Collecting Permit

CESA Compliance: 2081 Required

CESA Compliance: NCCP

1601/03 Required

CWA 401 certification Required

Coastal Development Permit

Reclamation Board Approval Required

Notification of DPC or BCDC

Other Required

FEDERAL PERMITS AND APPROVALS

ESA Compliance Section 7 Consultation Required

ESA Compliance Section 10 Permit

Rivers and Harbors Act

CWA 404 Required

Other

PERMISSION TO ACCESS PROPERTY

Permission to access city, county or other local agency land.

Agency Name:

Permission to access state land.

Agency Name: State Lands Commission

Required

Permission to access federal land.

Agency Name:

Permission to access private land.

Landowner Name:

6. Comments.

State Permits and Approvals/Other: State Lands Commission

Land Use Checklist

Reclamation District No. 108 Consolidated Pumping Facility and Fish Screen

1. Does the project involve land acquisition, either in fee or through a conservation easement?

Yes

If you answered yes to #1, please answer the following questions:

a) How many acres will be acquired?

Fee: 50

Easement: 50

Total: 50

b) Will existing water rights be acquired?

No

c) Are any changes to water rights or delivery of water proposed?

Yes If yes, please describe proposed changes.

No change in water rights. Delivery of water will be consolidated from three diversion points to a single diversion point on the Sacramento River. Therefore, an application for a change in point of diversion will be required.

2. Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?

No

3. Do the actions in the proposal involve physical changes in the land use?

Yes

If you answered yes to #3, please answer the following questions:

a) How many acres of land will be subject to a land use change under the proposal?

50

b) Describe what changes will occur on the land involved in the proposal.

Land use will remain agricultural. Approximately 50 acres will be utilized for irrigation water conveyance and delivery facilities. A portion of the site will be regraded to accommodate the proposed pumping plant.

c) List current and proposed land use, zoning and general plan designations of the area subject to a land use change under the proposal.

Category	Current	Proposed (if no change, specify "none")
Land Use	Agriculture General	None
Zoning	EA-Exclusive Agriculture	None
General Plan Designation	Agriculture	None

d) Is the land currently under a Williamson Act contract?

Yes

e) Is the land mapped as Prime Farmland, Farmland of Statewide Importance, Unique Farmland or Farmland of Local Importance under the California Department of Conservation's Farmland Mapping and Monitoring Program?

Yes

If yes, please list classification:

Irrigated Farmland (I)

f) Describe what entity or organization will manage the property and provide operations and maintenance services.

The property to be acquired will be the site of the proposed pumping plant and conveyance facilities that will be owned and operated by Reclamation District No. 108.

4. Comments.

Conflict of Interest Checklist

Reclamation District No. 108 Consolidated Pumping Facility and Fish Screen

Please list below the full names and organizations of all individuals in the following categories:

- Applicants listed in the proposal who wrote the proposal, will be performing the tasks listed in the proposal or who will benefit financially if the proposal is funded.
- Subcontractors listed in the proposal who will perform some tasks listed in the proposal and will benefit financially if the proposal is funded.
- Individuals not listed in the proposal who helped with proposal development, for example by reviewing drafts, or by providing critical suggestions or ideas contained within the proposal.

The information provided on this form will be used to select appropriate and unbiased reviewers for your proposal.

Applicant(s):

Luther Hintz, Reclamation District 108

Subcontractor(s):

Are specific subcontractors identified in this proposal? Yes

If yes, please list the name(s) and organization(s):

Rich Jenness	Laugenour & Meikle Civil Engineers
Charles Hanson	Hanson Environmental Inc.
Peter Rude	CH2M HILL
Howard Wilson	CH2M HILL
Robert Gatton	CH2M HILL
Kevin O'Brien	Downey Brand Seymour & Rohwer
None	None
None	None
None	None
None	None

Helped with proposal development:

Are there persons who helped with proposal development?

No

Comments:

Budget Summary

Reclamation District No. 108 Consolidated Pumping Facility and Fish Screen

Please provide a detailed budget for each year of requested funds, indicating on the form whether the indirect costs are based on the Federal overhead rate, State overhead rate, or are independent of fund source.

Independent of Fund Source

Year 1												
Task No.	Task Description	Direct Labor Hours	Salary (per year)	Benefits (per year)	Travel	Supplies & Expendables	Services or Consultants	Equipment	Other Direct Costs	Total Direct Costs	Indirect Costs	Total Cost
1	Environmental Documentation						25,000			25000.0		25000.00
2	Design Development						115,000			115000.0		115000.00
3	Design						420,000			420000.0		420000.00
4	Permitting						35,000			35000.0		35000.00
5	Administrative						35,000			35000.0		35000.00
6	Construction						725,000			725000.0		725000.00
7	Services During Construction						25,000			25000.0		25000.00
		0	0.00	0.00	0.00	0.00	1380000.00	0.00	0.00	1380000.00	0.00	1380000.00

Year 2												
Task No.	Task Description	Direct Labor Hours	Salary (per year)	Benefits (per year)	Travel	Supplies & Expendables	Services or Consultants	Equipment	Other Direct Costs	Total Direct Costs	Indirect Costs	Total Cost
1	Administrative						35,000			35000.0		35000.00
2	Construction						3,500,000			3500000.0		3500000.00
3	Services During Construction						250,000			250000.0		250000.00
		0	0.00	0.00	0.00	0.00	3785000.00	0.00	0.00	3785000.00	0.00	3785000.00

Year 3												
Task No.	Task Description	Direct Labor Hours	Salary (per year)	Benefits (per year)	Travel	Supplies & Expendables	Services or Consultants	Equipment	Other Direct Costs	Total Direct Costs	Indirect Costs	Total Cost
1	Administrative						35,000			35000.0		35000.00
2	Construction						1,750,000			1750000.0		1750000.00
3	Services During Construction						120,000			120000.0		120000.00
4	Test and Monitor						130,000			130000.0		130000.00
		0	0.00	0.00	0.00	0.00	2035000.00	0.00	0.00	2035000.00	0.00	2035000.00

Grand Total=7200000.00

Comments.

The tasks listed for all 3 years will be conducted by consultants and a construction contractor hired by RD 108. The Administrative Task will be conducted by Mr. Rich Jenness, long-time RD 108 District Engineer and Mr. Kevin O'Brien, the District's attorney. Their work will be done at the direction of RD 108 for work associated with this project.

Budget Justification

Reclamation District No. 108 Consolidated Pumping Facility and Fish Screen

Direct Labor Hours. Provide estimated hours proposed for each individual.

Reclamation District No. 108 will administer the contract at no cost to CALFED. Therefore, there are no direct costs.

Salary. Provide estimated rate of compensation proposed for each individual.

Reclamation District No. 108 will administer the contract at no cost to CALFED. Therefore, there are no direct costs.

Benefits. Provide the overall benefit rate applicable to each category of employee proposed in the project.

Reclamation District No. 108 will administer the contract at no cost to CALFED. Therefore, there are no direct costs.

Travel. Provide purpose and estimate costs for all non-local travel.

Reclamation District No. 108 will administer the contract at no cost to CALFED. Therefore, there are no direct costs.

Supplies & Expendables. Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

Reclamation District No. 108 will administer the contract at no cost to CALFED. Therefore, there are no direct costs.

Services or Consultants. Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate.

Year 1: Tasks 1, 2, 3, 4, 5, and 7 will be conducted by Consultants. Task 6 will be conducted by a construction contractor. **Year 2:** Tasks 1 and 3 will be conducted by consultants. Task 2 will be conducted by a construction contractor. **Year 3:** Tasks 1, 3, and 4 will be conducted by consultants. Task 2 will be conducted by a construction contractor. At this time, the fees per task have been estimated as a percent of construction and from experience with other large capital improvement projects. The 2001 hourly rates for the six senior consultants on the project are as follows: Richard Jenness \$105 Charles Hanson \$120 Peter Rude \$137 Howard Wilson \$187 Robert Gatton \$174 Kevin O'Brien \$225

Equipment. Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than \$5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

Reclamation District No. 108 will administer the contract at no cost to CALFED. Therefore, there are no direct costs.

Project Management. Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation of costs, report preparation, giving presentations, response to project specific questions and necessary costs directly associated with specific project oversight.

Project Management will be done by RD108 General Manager Lu Hintz and his staff at no cost to the CALFED grant.

Other Direct Costs. Provide any other direct costs not already covered.

Reclamation District No. 108 will administer the contract at no cost to CALFED. Therefore, there are no direct costs.

Indirect Costs. Explain what is encompassed in the overhead rate (indirect costs). Overhead should include costs associated with general office requirements such as rent, phones, furniture, general office staff, etc., generally distributed by a predetermined percentage (or surcharge) of specific costs.

Reclamation District No. 108 will administer the contract at no cost to CALFED. Therefore, there are no indirect costs.

Executive Summary

Reclamation District No. 108 Consolidated Pumping Facility and Fish Screen

Consolidating and screening RD 108s diversions from the Sacramento River is specifically listed in the Proposal Solicitation Package as one of the priority projects (SR-6) for this phase of funding (CALFED, 2001a and 2001b). Reclamation District No. 108 (RD108 or District) provides water to approximately 48,000 acres of irrigated agriculture on the west side of the Sacramento River, approximately 45 miles northwest of Sacramento. The District is proposing to consolidate and screen three of its seven Sacramento River diversions to reduce the incidental take of protected fish species. The three pumping plants, listed in order of upstream to down-stream, are Boyers Bend (116 cubic feet per second [cfs]), Howells Landing (71 cfs), and Tyndall Mound (190 cfs). The existing facilities are steel-frame structures that protrude well into the river channel and house vertical mixed-flow pumps and slant pumps. These diversions have been identified as a potential threat to entrainment and mortality to fall-, spring-, and winter-run chinook salmon, and splittail. Consolidating and screening the Districts three diversions would be best accomplished by:

- Constructing a combined pumping plant with a 260-cfs capacity to provide water to the three irrigation service areas
- Constructing a fish screen structure with vertical plate screens
- Connecting the three irrigation service areas canal facilities to the new pumping plant
- Demolishing/salvaging the existing pumping plants at Boyers Bend, Howells Landing, and Tyndall Mound once the new facility is in operation.

The general schedule to implement the recommended project is provided below, and assumes that obtaining the required level of funding is not a constraint:

- Complete the Reconnaissance Investigation August 2001
- Obtain Funding April 2001 to June 2002
- Conduct Preliminary Design October 2001 to March 2002
- Conduct Final Design and Permitting April 2002 to October 2002
- Construction November 2002 to March 2004
- Project on-line April 2004

The estimated cost of the design, construction, and monitoring for the project is \$14,400,00. This CALFED Proposal is requesting \$7,200,000 of the total amount.

Proposal

Reclamation District 108

Reclamation District No. 108 Consolidated Pumping Facility and Fish Screen

Luther Hintz, Reclamation District 108

Reclamation District No. 108 Consolidated Pumping Facility and Fish Screen

A. Project Description: Project Goals and Scope of Work

1. Problem

Reclamation District No. 108 (RD 108) provides water to approximately 48,000 acres of irrigated agriculture on the west side of the Sacramento River, approximately 45 miles north-west of Sacramento, California, shown on Figure 1. RD 108 has seven pumping plants along the river that supply water to a network of irrigation canals. These diversions have been identified as a potential threat to entrainment and mortality to fall-, spring-, and winter-run chinook salmon, and Sacramento splittail.

RD 108 proposes to consolidate and screen three of the seven diversions in addition to the existing screened diversion at Wilkins Slough Pumping Plant (830 cubic feet per second [cfs]) to reduce the incidental take of protected fish species. The three existing unscreened pumping plants, listed in order of upstream to downstream, are Boyers Bend (116 cfs), Howells Landing (71 cfs), and Tyndall Mound (190 cfs). These pumping plant facilities are steel-frame structures that protrude out into the river channel and house vertical mixed-flow pumps and slant pumps. These three pumping plant locations are presented on Figure 2. Consolidating and screening RD 108's diversions from the Sacramento River is specifically listed in the Proposal Solicitation Package as one of the priority projects (SR-6) for this phase of funding (CALFED, 2001a and 2001b).

In 1997, RD 108 signed a Letter of Intent with the California Department of Fish and Game (CDFG), the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Bureau of Reclamation (USBR) in which RD 108 and the resource agencies committed to work cooperatively to develop solutions to prevent the entrainment of fish at RD 108's seven pumping plants on the Sacramento River. The potential solutions were required to benefit the fishery while not adversely impacting water delivery to RD 108. Under the Letter of Intent, RD 108 built a \$12 million Positive Barrier Fish Screen facility at the Wilkins Slough Pumping Plant, the largest of RD 108's seven pumping plants, with federal and state funding assistance. RD 108 contributed over \$1 million to constructing this facility and testing alternative fish barriers.

RD 108 conducted a reconnaissance investigation (CH2M HILL, 2001) to evaluate the engineering feasibility, costs, and benefits to screen three diversion to continue to implement the spirit of the Letter of Intent. The result of the reconnaissance investigation is the project for which this proposal is submitted.

The screening of RD 108's three diversions will best be accomplished by a project that includes the following:

- A new consolidated pumping plant with a 260-cfs capacity that would provide water to the three existing irrigation service areas
- A fish screen structure with vertical plate screens
- Canal facilities to connect the three irrigation service areas to the new pumping plant
- Demolition/salvage of the existing pumping plants at Boyers Bend, Howells Landing, and Tyndall Mound once the new facility is operational

2. Justification

This is a Fish Screen Construction proposal. Response to Item 2 is not required in accordance with the Proposal Solicitation Package (PSP).

3. Approach

The major work items for implementing the recommended project, as identified in the Reconnaissance Investigation Report (CH2M HILL, 2001), are identified below.

Item 1—Preliminary Design

- Conduct topographic survey of project location
- Conduct bathymetry survey in the river
- Conduct water surface modeling of fish screen in the river to meet agency requirements
- Prepare 30 percent design drawings and cost estimate
- Identify temporary and permanent construction easements
- Prepare Preliminary Design Report
- Conduct meetings as necessary with resource and funding agencies

Item 2—Final Design

- Obtain temporary and permanent construction easements
- Prepare 60 percent design drawings and cost estimate
- Prepare 90 percent design drawings, specifications, and cost estimate
- Prepare final design drawings, specifications, and cost estimate

Item 3—Permitting

- California Department of Fish and Game—Section 1601 Stream Bed Alteration Agreement
- California Department of Fish and Game—2081 permit with respect to winter-run Chinook salmon incidental take

- National Marine Fisheries Service–Biological Opinion with respect to winter-run Chinook salmon incidental take
- U.S. Fish and Wildlife Service–Informal consultation with respect to Sacramento Splittail incidental take
- U.S. Army Corps of Engineers–Section 404/Section 10 permit
- Central Valley Regional Water Quality Control Board–Section 401 Water Quality Certification (or waiver of certification) of compliance with state water quality standards
- California State Reclamation Board–Permit
- California State Lands Commission–Permit
- Colusa County–Building Permit
- NEPA (National Environmental Policy Act)
- CEQA (California Environmental Quality Act)

Item 4—Bidding Services

- Advertise for bids
- Issue addendums
- Conduct pre-bid meeting
- Evaluate lowest qualified bidder(s)
- Award Contract

Item 5—Construction

- Build the proposed facility
- Provide services during construction
- Tie in proposed facility to the existing irrigation system
- Decommission three old facilities

While constructing the new consolidated pumping plant, the existing three pumping plants would continue to operate until construction of the new site was completed. Then the new consolidated facility would be connected to the existing irrigation system and the three existing pumping plants would be removed.

The three existing diversion points give operators flexibility in delivering water to the three separate service areas. The new combined site has been located to continue to provide that flexibility so that water delivery would not be delayed beyond what is experienced with the existing system.

4. Feasibility

The above approach has proven successful for other major fish screen construction projects on the Sacramento River, including the Wilkins Slough Positive Barrier Fish Screen, the Glenn-Colusa Irrigation District's Interim and Long-term Fish Screens, and the Anderson-Cottonwood Irrigation District's Fish Screen and Ladders projects.

The reconnaissance investigation, completed in September 2001, evaluated seven alternatives. The seven alternatives included the following:

- Boyers Bend—Screen existing pumping facility
- Howells Landing—Screen existing pumping facility
- Tyndall Mound—Screen existing pumping facility
- Tyndall Mound—Screen new pumping facility
- Boyers Bend and Howells Landing Pumping Facility combined
- New Combined Facility—Alternative 1 (pumps on river side of levee)
- New Combined Facility—Alternative 2 (pumps on land side of levee)

In lieu of constructing three fish screens and one new pumping plant, an alternative was developed that combines the existing Boyers Bend Pumping Plant, Howells Landing Pumping Plant, and Tyndall Mound Pumping Plant into one facility with a maximum capacity of 260 cfs. This pumping plant would be located approximately halfway between the Boyers Bend Pumping Plant and the Howells Landing Pumping Plant on a relatively straight section of the Sacramento River (Figure 2). Approximately 4.3 miles of concrete-lined canal would be installed that would connect the new pumping plant to the Boyers Bend, Howells Landing, and Tyndall Mound canal distribution systems. Once the new combined facility was operational, the existing pumping plants would be abandoned and removed.

The screen would be similar to the existing Wilkins Slough Pumping Plant. It would include a vertical plate screen with a brush cleaning system, a blowout panel, an access road to the fish screen facility both upstream and downstream of the screen, a log boom, and a sediment removal system. The fish screen would consist of five bays with a 15-foot-wide by 12-foot-high screen located in each bay. Each of the bays would be connected to a single pump. Solid panels would be located above the screens to an elevation above the high water mark. Figure 3 shows an overall site plan for the new combined pumping plant and a cross-section view is presented in Figure 4. The sediment buildup directly behind the screens would be removed by a pressure nozzle jetting system or by a flushing tank.

The new combined pumping plant would be sized to pump 260 cfs, or approximately 30 percent less than the combined total of the three individual pumping plants. The pumping plant would include five 250-hp, 52-cfs vertical turbine pumps (with variable frequency drive capability) and a control building. The electrical control system for the screen cleaning system would be housed in a new building.

The pumps, located on the river side of the levee immediately adjacent to the fish screens, would pump water over the levee to a settling basin. Most of the sediment that would be discharged from the pumps would settle in a settling basin prior to entering the canal. The basin would be constructed with soil cement so that equipment could move into the basin to remove the silt. A 0.7-mile-long canal would connect the settling basin to the Boyers Bend

distribution canals to the north, and a 3.6-mile-long canal would connect it south to the Howells Landing and Tyndall Mound distribution canals.

5. Performance Measures

A monitoring program will be established in coordination with CDFG and NMFS to evaluate the effectiveness of the screen. It is anticipated that the fish screen will need to meet the following CDFG and NMFS criteria for the species of concern, which include salmonids and splittail, in this reach of the Sacramento River:

- Average approach velocity (water velocity perpendicular to the screen), less than or equal to 0.33 feet per second (fps)
- Minimum sweeping velocity (water velocity parallel to the screen) of two times the approach velocity
- Exposure time (the time a fish might be exposed to the screen = length of screen ÷ sweeping velocity), less than 60 seconds - waiver may be required
- Screen slot opening size, 1.75 mm

Once the fish screen is operational, the screen will be tested using water velocity probes at the maximum diversion rate to check for compliance. The monitoring program will be similar to that conducted at RD 108 Wilkins Slough Positive Barrier Fish Screen.

6. Data Handling and Storage

For this project, we will use a broad range of information management tools and systems. The following are general examples of the types of tools available to manage and provide access to project data:

- E-mail with file attachments (Microsoft Exchange server with Microsoft Outlook client)
- Microsoft Office suite of desktop applications (Word, Excel, Access, PowerPoint)
- Additional desktop applications (e.g., Visio, Acrobat Reader, Internet Explorer, Microsoft Project, CADD, and GIS)
- Internet-deployed reference material and project-specific website, if appropriate and desired

7. Expected Products/Outcomes

The expected products are the reports, design documents, and contractor documents outlined in Item 3, Approach. The final product will be a new 260-cfs capacity screened pump station facility that replaces the existing 377-cfs capacity of the three unscreened diversions.

The outcome of this project, with the new screen and consolidated diversion on the Sacramento River, will be a dramatic reduction in fish mortality. Estimates were calculated of the cumulative (hypothetical) entrainment loss of (1) juvenile chinook salmon (all races); (2) Sacramento splittail; and (3) a composite list of native fish vulnerable to entrainment at unscreened RD 108 diversions over a 20-year period (2001-2020).

Estimates of the cumulative entrainment losses were calculated assuming construction of a consolidated pumping plant and positive barrier fish screen to be completed by 2005. It was assumed that entrainment losses after completion of a positive barrier fish screen would be reduced by 95 percent from the unscreened baseline condition. On the basis of the resulting cumulative entrainment loss over the 20-year period of operations, a percentage reduction in fish losses was calculated for the two alternative options including fish screening compared to unscreened baseline conditions.

Results of the entrainment loss and percentage reduction calculations (Table 1) show that the cumulative entrainment losses would be reduced by 76 percent over the 20-year period, assuming construction of a consolidated pumping plant and fish screen facility completed by 2005. The magnitude of fishery benefits (i.e., percentage reduction in entrainment losses) depends, to a large extent, on the schedule of implementing positive barrier fish screens.

TABLE 1

Summary of Estimated (hypothetical) Fish Losses at the Consolidated Pumping Facility and Fish Screen Diversions over the 20-year Period of 2001 to 2020

Taxon	Baseline	Cumulative Fish Losses	Percentage Reduction in Losses from Baseline
Chinook Salmon	18,580	4,459	76
Splittail	1,920	461	76
Composite of Selected Species	45,260	10,862	76

Notes:

Fish densities are based on average monthly entrainment monitoring data observed at the unscreened RD 108 Wilkins Slough Pumping Plant during 1996.

Positive barrier fish screens are assumed to reduce fish losses by 95 percent from baseline conditions.

Results of this analysis show that the consolidation of pumping plants and fish screen offer substantial biological benefit in reducing the mortality of both migratory and resident fish species inhabiting the Sacramento River.

8. Work Schedule

The general schedule to implement the recommended project is provided below, with the assumption that obtaining the required level of funding is not a constraint:

- Completed Reconnaissance Study – September 2001
- Obtain Funding – April 2001 to June 2002
- Conduct Preliminary Design – October 2001 to March 2002
- Conduct Final Design and Permitting – April 2002 to October 2002
- Construction – November 2002 to March 2004
- Project on-line – April 2004

B. Application to CALFED and ERP Science Program Goals and Implementation Plan and CVPIA Priorities

1. ERP, Science Program, and CVPIA Priorities

This project is linked directly to CALFED's Ecosystem Restoration Program (ERP) restoration priorities for the Sacramento Region. As listed on page 61 of the *ERP Draft Stage 1 Implementation Plan* and on page 29 of the *2002 ERP Proposal Solicitation*, consolidating and screening RD 108's diversions from the Sacramento River would help achieve Strategic Goal 1, protecting at-risk fish species. Consolidating and screening RD 108's diversions from the Sacramento River is specifically listed in the Proposal Solicitation Package as one of the priority projects (SR-6) for this phase of funding (CALFED, 2001b).

This fish screen project will help achieve recovery of at-risk native fish species as a step toward establishing large, self-sustaining populations of these species. This project will directly help contribute to the resolution of the conflict between protecting endangered species and providing reliable supplies of water for agriculture. This project will help achieve the recovery of the following at-risk fish species: all runs of chinook salmon, steelhead trout, and Sacramento splittail (Ecosystem Restoration Projects and Programs, 2002 Proposal Solicitation Package, Page 27, Goal SR-2). In addition to the above-mentioned, at-risk species, this project will also contribute to the goal of doubling the other anadromous fish species named in the Central Valley Project Improvement Act (CVPIA), specifically, white and green sturgeon, American shad, and striped bass.

The successful downstream migration season for juvenile chinook salmon depends on weather and water temperatures among other factors. Some of the migration periods coincide with the normal season for irrigation water diversion at RD 108. Construction of the consolidated pumping facility and fish screen meeting federal and state agencies' design criteria will protect fish species by eliminating the entrainment of juvenile fish into the pump intakes during their migration and protecting the fish from predators in the area of the diversion and screen facilities.

Construction of a consolidated pumping facility and fish screen and eliminating the three currently unscreened diversions is consistent with the identified stressors and priorities for project funding by CALFED. The prevention of at-risk fish species entrainment will result in a significant improvement in the aquatic habitat of the Sacramento River and Bay-Delta system. In addition, the project will ensure a reliable supply of water to agriculture, which also provides significant migratory waterfowl wetland habitat.

2. Relationship to Other Ecosystem Restoration Projects

This project has been discussed and coordinated with the USFWS and USBR under the Central Valley Project Improvement Act Anadromous Fish Screen Program (CVPIA/AFSP). Discussions and consultation have also been held with the NMFS and CDFG in terms of their respective fish screen project development and regulatory programs. The project permitting, design, and construction will be performed in consultation and coordination with the technical team and regulatory agencies designated in the CVPIA/AFSP.

3. Requests for Next-phase Funding

This is not a request for next-phase funding.

4. Previous Recipients of CALFED Program or CVPIA Funding

RD 108 received \$2.5 million of CALFED funding for the Wilkins Slough Positive Barrier Fish Screen Project (CALFED Program No. B81569). Construction was completed in 1999 and Wilkins Slough Positive Barrier Fish Screen is currently operational.

5. Systemwide Ecosystem Benefits

This project is located on the Sacramento River. This project will enhance the protected fish passage on the Sacramento River. This project will help achieve CALFED and CVPIA objectives by helping to improve the aquatic environment of several fish species, while concurrently providing needed water supply for the applicant. This project provides synergistic Sacramento River system benefits by allowing more fish to reach the upstream restoration projects now implemented or planned for the future. The project will not conflict with CALFED non-ecosystem objectives, such as water quality for in-stream and Delta flows, but may benefit water supply reliability for the applicant as it will reduce the entrainment of fish at the diversion facility. No impacts to third parties are anticipated.

6. Additional Information for Proposals Containing Land Acquisition

The reconnaissance investigation identified approximately 50 acres that would be required for permanent easement. RD 108 has spoken to the landowners potentially involved and they have indicated their willingness to work with RD 108. However, the precise amount of land and its location will not be known until design is completed.

C. Qualifications

RD 108 has an extensive history of successfully implementing large, complex capital improvements with the cooperation and funding support of state and federal agencies. This has been most recently demonstrated by the construction of the 830-cfs Wilkins Slough Positive Barrier Fish Screen. RD 108 is currently working with the CDFG, NMFS, USFWS, and USBR to develop solutions to prevent the entrainment of fish at three of RD 108's pumping plants on the Sacramento River, which is the subject of this proposal.

RD 108's District Manager, Luther Hintz, will be the project manager. He will be assisted by Rich Jennes/Laugenour & Meikle; long-time reclamation district consulting engineer, Charles Hanson/Hanson Environmental who will be the senior fishery biologist and environmental permit coordinator; and fishscreen/pumping plant engineers, Peter Rude/CH2M HILL, Howard Wilson/CH2M HILL, and Robert Gatton/CH2M HILL. Following are brief biographical sketches of the principal participants.

Luther Hintz, P.E., RD 108 General Manager

Mr. Hintz joined Reclamation District 108 as the General Manager on January 1, 1994. Prior to accepting the General Manager position with RD 108, he worked as a consulting engineer, specializing in water resource development with the firm of Bookman-Edmonston Engineering, Inc. During his 32-year tenure with Bookman-Edmonston, Mr. Hintz was the man

ager and principal engineer in conceptual planning, design, construction management, and startup of large-scale irrigation distribution system projects in California, Arizona, and Utah.

Mr. Hintz has extensive experience in planning, construction, and operation of major water facilities involving close coordination and cooperation with federal, state, and local resource agencies. He is a graduate of the University of California, Davis, and is a registered professional engineer in California and several other western states.

Richard Jenness, P.E., RD 108 Engineer

Mr. Jenness is a Registered Civil Engineer in the State of California, Consulting Engineer for RD 108, and President of Laugenour & Meikle, Civil Engineers. Mr. Jenness has more than 30 years of experience in the planning, design, and construction of water resource projects. He has been involved with planning and has designed fish guidance facilities on the Sacramento River and has been responsible for preparation of fish screen appraisal studies and assists in project management of fish screen projects.

Mr. Jenness will work on behalf of RD 108 in reviewing the design, engineering drawings, and specifications for construction.

Charles Hanson, Ph. D., Senior Fishery Biologist

Dr. Hanson has more than 25 years of experience in freshwater and marine biological studies and is the Senior Biologist and Principal for Hanson Environmental, Inc. Dr. Hanson has been the senior fishery biologist and environmental permit coordinator for RD 108's 830-cfs Wilkins Slough Positive Barrier Fish Screen, and RD 108's recent Fish Screen Reconnaissance Investigation.

Dr. Hanson has contributed to the study design, analysis, and interpretation of fisheries, stream habitat, and stream flow (hydraulic) data collected in the evaluation of in-stream flow requirements and potential fishery impacts on salmonid spawning, production, survival, and migration success associated with water project development and operations. Dr. Hanson has conducted site-specific evaluations of the effectiveness of various water diversion screening systems, passage facilities, and operational modifications in reducing organism losses while maintaining operational reliability of the system. Dr. Hanson has been extensively involved in incidental-take monitoring and investigations of endangered species, development of recovery plans, consultations, and preparation of aquatic Habitat Conservation Plans. Dr. Hanson has also participated in the development of adaptive management programs including real-time monitoring and management of power plant cooling water and other diversion operations, and the San Joaquin River Vernalis Adaptive Management Plan (VAMP).

Peter Rude, P.E., Project Manager

Mr. Rude has more than 14 years of experience as an agricultural/civil engineer. He is responsible for managing multidiscipline teams for a variety of fish screen, irrigation, agricultural water supply, water reclamation, and watershed management projects.

Mr. Rude has been the Project Manager for the RD 108 Fish Screen Reconnaissance Investigation. He was the design manager for a 10-month, fast-track effort from preliminary design through award of construction contract for RD 108's 830-cfs Wilkins Slough Positive Barrier

Fish Screen project. He also managed the construction effort and subsequent hydraulic monitoring and sediment removal facility design. For Tulare Irrigation District, Mr. Rude was the project manager for design, environmental documentation and permitting support, contract documents, bid services, and construction management for lining 9.7 miles of the Main Intake Canal.

Howard Wilson, P.E., Senior Consultant

Mr. Wilson possesses more than 34 years of engineering experience, including project management and lead design experience on large fish screens and agricultural water conveyance systems.

Mr. Wilson was the senior consultant on the RD 108 Fish Screen Reconnaissance Investigation. He was the senior consultant for the feasibility study, alternatives analysis, agency and stakeholder coordination, and design of the 830-cfs Wilkins Slough Positive Barrier Fish Screen for RD 108. Mr. Wilson managed the design of Glenn-Colusa Irrigation District's (GCID) 450-foot-long flat-plate interim fish screen and served as GCID's project manager for elements of the 3,000-cfs "final solution" screen extension project. Mr. Wilson managed preliminary design of the M&T Ranch pump station relocation and fish screens. He also managed design of the 200-cfs Crooked River pumping facility and fish screens for the North Unit Irrigation District on the Deschutes River. Some of his other fish screen designs include the Westpac Utilities Orr Ditch diversion of the Truckee River, Nevada; Clear Lake intake for the Geysers Water Supply Project, Lake County; and the Yakima-Tieton Irrigation Company intake screens, Yakima, Washington.

Robert Gatton, P.E., Senior Consultant

Mr. Gatton is an expert in fisheries engineering specializing in the design of fish screens, fish ladders, fish collection, and fish hatchery facilities. He has managed some of the largest fisheries projects in the Sacramento River basin and the Pacific Northwest. Mr. Gatton was the Project Manager for the final design of the 830-cfs Wilkins Slough Positive Barrier Fish Screen project for RD 108. He has also been involved with the recent RD 108 Fish Screen Reconnaissance Investigation. Mr. Gatton was senior consultant for the Anderson-Cottonwood Irrigation District's (ACID) Fish Passage Improvement Project on the Sacramento River in Redding. This project included a new 450-cfs fish screen and two fish ladders at the ACID Diversion Dam to improve both upstream and downstream passage of listed anadromous fish species.

Mr. Gatton managed design and agency coordination for the 2,000-cfs and 5,000-cfs ganged fish screens at the Rocky Reach Dam on the Columbia River and for fish screens associated with the Yelm Hydropower project (800 cfs), North Shore Dalles Hydro (800 cfs), and Dryden Canal (210 cfs). For all of these projects, Mr. Gatton worked closely with the federal and state resource agencies and tribes in developing the design criteria. Mr. Gatton designed new fish ladders on the Wenatchee River Dryden and Tumwater dams and the modification of fish ladders on the Yelm diversion dam. These projects included hydraulic modeling to produce more fish-friendly attraction flows.

D. Cost

1. Budget

Funding estimates for this project provide a total construction budget of \$12,000,000 with a total program cost of \$14,400,000. The total 3-year grant request is \$7,200,000 from CALFED.

RD108 estimates a total need of \$2,760,000 for FY 2002 (October 1, 2001 through September 30, 2002) as follows:

• Final Environmental Documentation	\$ 50,000
• Design Development/Modeling	230,000
• Final Design and Specifications	840,000
• Permitting	70,000
• Administration	70,000
• Construction	\$1,450,000
• Services During Construction	<u>\$ 50,000</u>
Total	\$2,760,000 (\$1,380,000 CALFED \$1,380,000 USBR)

RD108 estimates a total need of \$7,570,000 for FY 2003 (October 1, 2002 through September 30, 2003) as follows:

• Administration	\$ 70,000
• Construction	\$7,000,000
• Services During Construction	<u>\$ 500,000</u>
Total	\$7,570,000 (\$3,785,000 CALFED \$3,785,000 USBR)

RD108 estimates a total need of \$4,070,000 for FY 2004 (October 1, 2003 through September 30, 2004) as follows:

• Administration	\$ 70,000
• Construction	\$3,500,000
• Services During Construction	\$ 240,000
• Testing and Monitoring	<u>\$ 260,000</u>
Total	\$4,070,000 (\$2,035,000 CALFED \$2,035,000 USBR)

2. Cost-sharing

The federal cost share through the USBR is expected to be 50 percent of the total project cost. The USBR has committed \$7.2 million to this project.

E. Local Involvement

Our approach involves working with district landowners, the public, and affected agencies, thereby maximizing project success and minimizing any surprises to decisionmakers. Development of the project is proceeding with the regular participation and input from the USBR, USFWS, CDFG, and NMFS. Public meetings have been held and the project appears to have public support.

F. Compliance with Standard Terms and Conditions

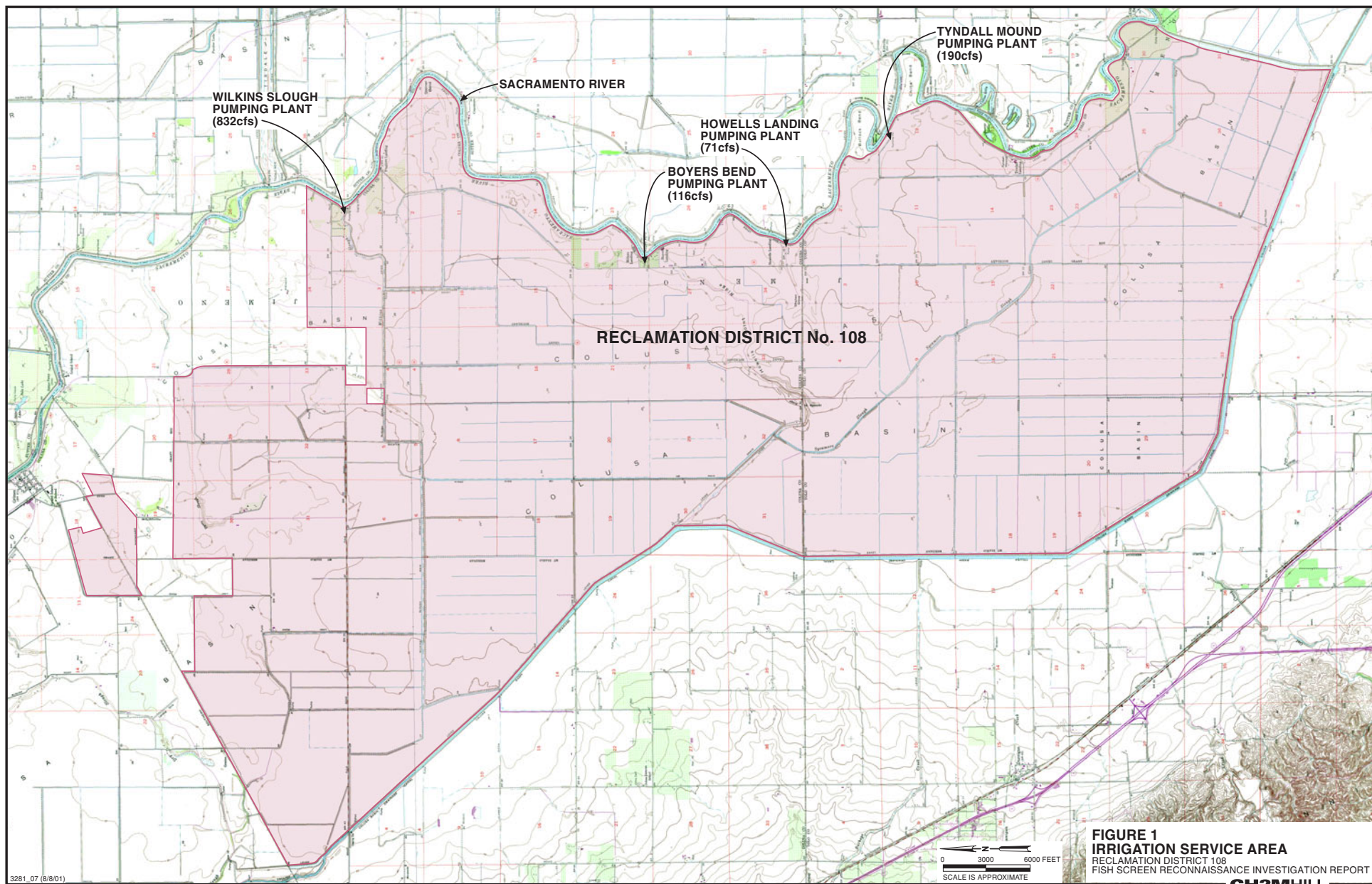
RD 108 will comply with the standard terms and conditions specified in the proposal solicitation package.

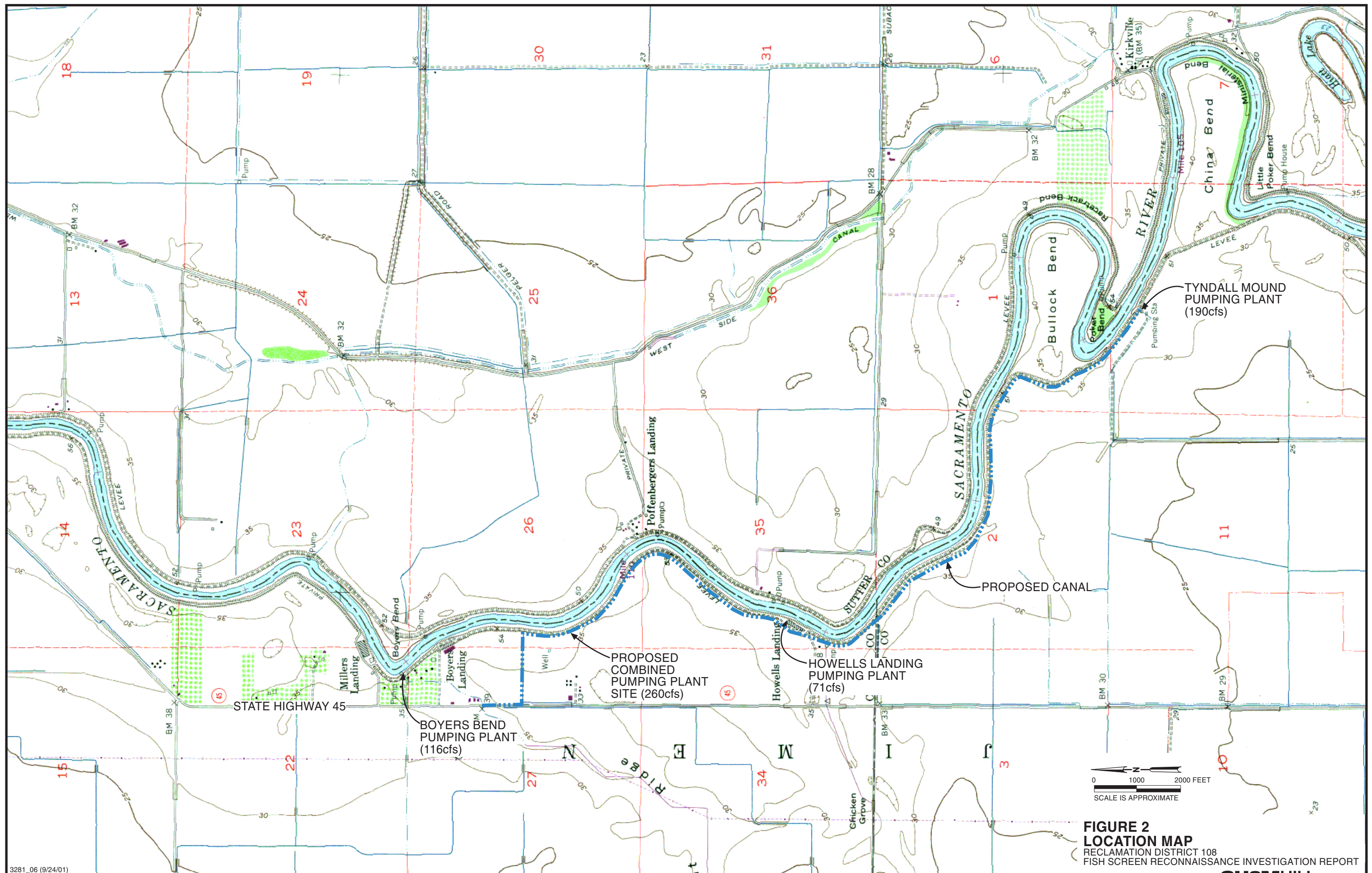
G. Literature Cited

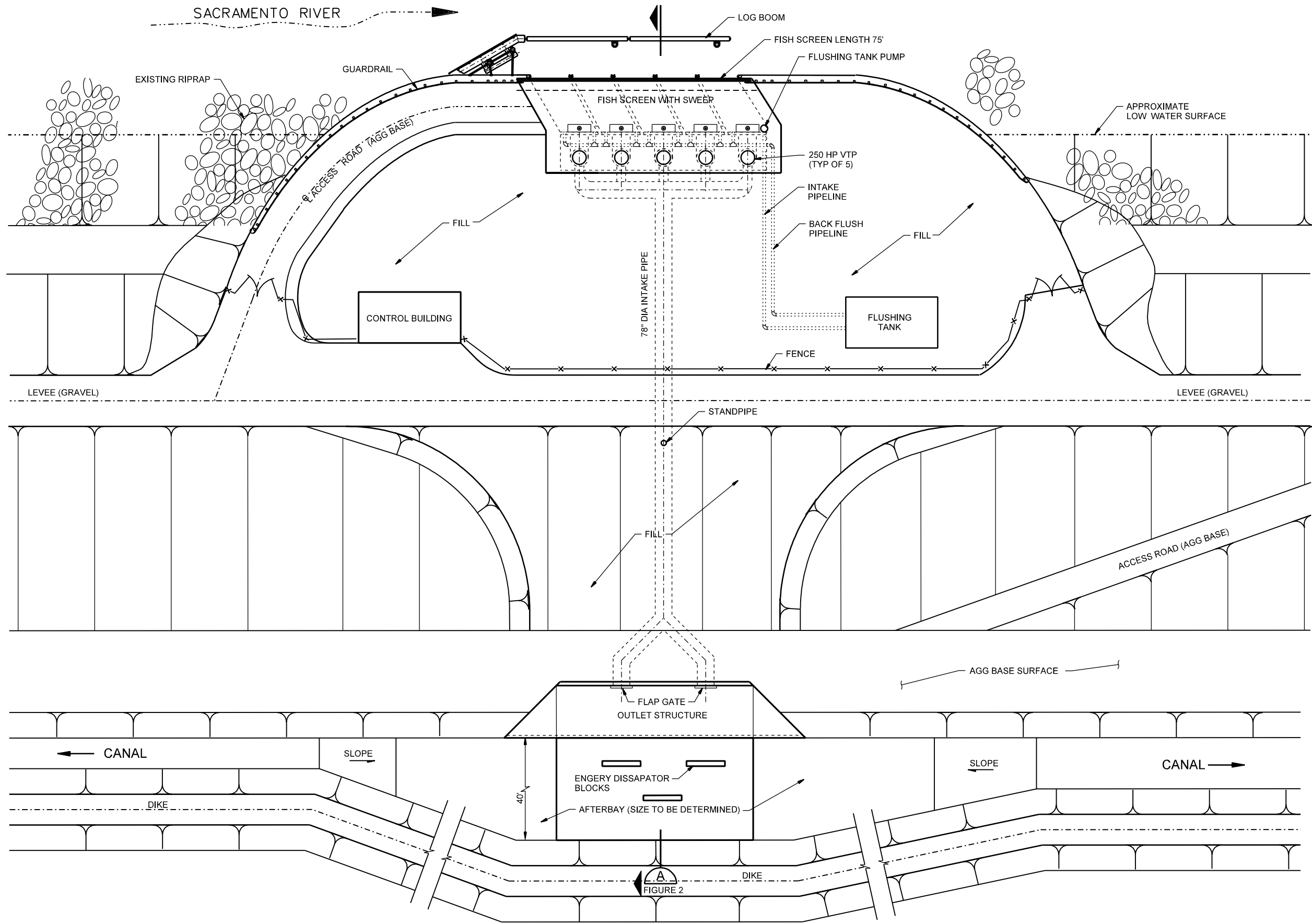
CALFED. 2001a. Ecosystem Restoration Program *Draft Stage 1 Implementation Plan*. August.

CALFED. 2001b. Ecosystem Restoration Program *2002 Proposal Solicitation Package*. August.

CH2M HILL. 2001. RD108 Fish Screen Reconnaissance Investigation Report. September.







DSGN	H WILSON				
DR	E McClelland				
CHK	P. RUDE				
APVD	X	NO.	DATE	REVISION	BY

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



CH2MHILL
2525 AIRPARK DRIVE
REDDING, CALIFORNIA 96001

RECLAMATION DISTRICT No. 108
GRIMES, CALIFORNIA
FISH SCREEN
RECONNAISSANCE STUDY

FIGURE 3
COMBINED PUMPING PLANT
OVERALL SITE PLAN

SHEET	
DWG NO.	
DATE	AUGUST 2001
PROJ NO.	162258.RI.DS

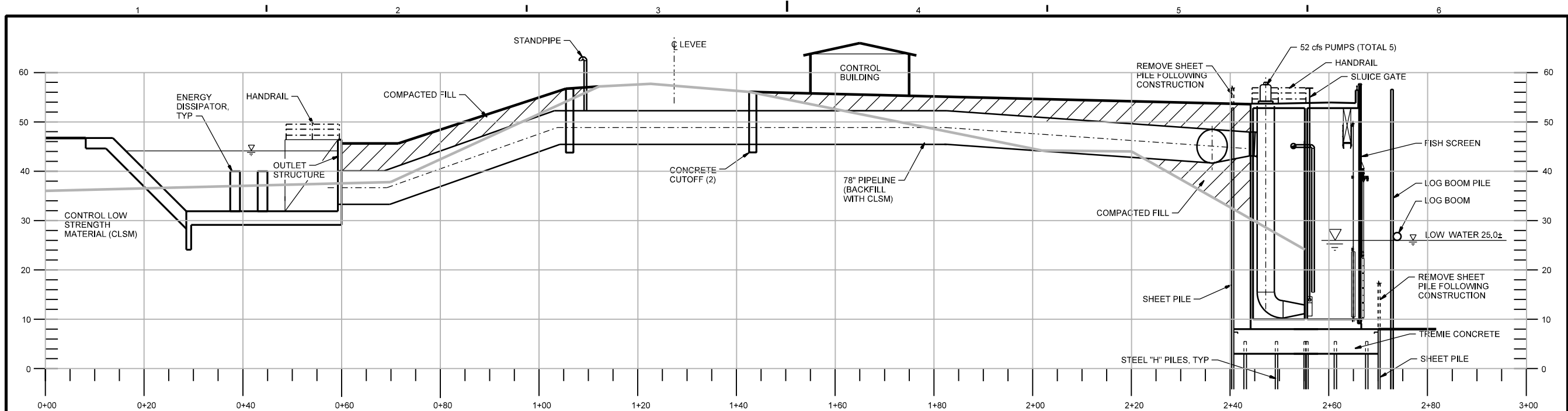
15:36:20

17-SEP-2001

2258c002.dlv

PRELIMINARY

REUSE OF DOCUMENTS: THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF CH2M HILL AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2M HILL.



DSGN	H WILSON	NO.	DATE	REVISION	BY	APVD	VERIFY SCALE BAR IS ONE INCH ON ORIGINAL DRAWING. 0' 1"	 CH2MHILL 2525 AIRPARK DRIVE REDDING, CALIFORNIA 96001	RECLAMATION DISTRICT No.108 GRIMES, CALIFORNIA FISH SCREEN RECONNAISSANCE STUDY	FIGURE 4 COMBINED PUMPING PLANT OVERALL SECTION		SHEET NO. DATE AUGUST 2001 PROJ NO. 162258.RI.DS
DR	E McClelland											
CHK	P RUDE											
APVD	X											

REUSE OF DOCUMENTS: THIS DOCUMENT AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF CH2M HILL AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2M HILL.