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EXECUTIVE SUMMARY
Positive Barrier Fish Screen Project
Wilkins Slough Pumping Plant
Reclamation District No. 108

DWR WAREHOUSE
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Project Description and Primary Biological Objective

In August 1996, Reclamation District No. 108 (RD 108) made the decision to move forward with planning and design of a positive barrier fish screen at its Wilkins Slough Pumping Plant, after four years of testing alternative fish barrier technologies. The final design was completed in June 1997 and RD 108 is preparing to initiate construction of the positive barrier facilities. Wilkins Slough is located in Colusa County on the west side of the Sacramento River, approximately 45 miles northeast of Sacramento. The fish screen facility will be a large concrete structure positioned along the bank of the River in front of Wilkins Slough forebay. The structure will include 14 bays, each containing 180 ft² screen panels constructed from stainless steel, vertical wedge wires with a 3/32-inch slot size. Hydraulic uniformity across the face of the screens will be ensured by 10 flow distribution louvers placed vertically within each screen bay. The screens will be continuously cleaned with a single mechanical brush moving horizontally across the screens on a frequency of one pass every five minutes.

The primary biological objective of the Project is to reduce the entrainment loss of juvenile Chinook salmon and other fish species by at least 95 percent of historic baseline conditions while continuing to provide a reliable water supply to RD 108 lands.

Approach/Tasks/Schedule

RD 108 is operating under NMFS and CDF&G Biological Opinions which require completion of a fish barrier by 1998. Phases I, II and III (conceptual planning, feasibility analysis and final design) are now completed. Phase IV (construction) and Phase V (performance assessment) are the subject of this Proposal for CALFED funding. A construction contract is scheduled to be awarded during August 1997 and construction completed by October 1998. Performance testing will follow completion of construction and continue for a period of about 12 to 18 months, as needed.

Justification for Project and Funding by CALFED

Installation of fish screen facilities at Wilkins Slough is mandated by the Biological Opinions in order to eliminate significant adverse impacts to winter-run Chinook salmon and other resident and migratory fish species and to continue to provide a reliable water supply to RD 108 lands.

The federal government is providing \$5.8 million (50-percent) of the total project costs of \$11.6 million. CALFED funding in the amount of \$5.1 million is essential in order to allow RD 108 to move forward with construction this fall and to complete the fish screen facility during in 1998.

Budget Costs and Third Party Impacts

The estimated costs for Phases IV and V are:

Phase IV Construction	\$10,372,000
Phase V Performance Assessments	250,000
	<hr/>
Total	\$10,622,000

There are no known third party impacts as a result of implementation of this Project.

Applicant Qualification

RD 108 is a special district under the California Water Code and is a qualified applicant for State and federal funding.

Monitoring and Data Evaluation

Monitoring of fish take and data evaluation were performed by RD 108 during each of the past four years as a part of the alternative barrier studies. These data are set forth in published reports. Further monitoring and data evaluations will be undertaken during performance assessment following completion of construction.

Local Support/Coordination with other Programs Compatibility with CALFED Objectives

RD 108 and its landowners have provided substantial financial support in the development of a fish barrier facility for Wilkins Slough since 1992, when the program was initiated, and are committed to completing the positive barrier fish screen.

The technical staffs of the resource agencies (NMFS, CDF&G, USF&WS and USBR) have been and continue to be involved in planning and coordination of the Project. The close working relationship with resource agency staff has assured that the Project meets the criteria and objectives of each of these agencies.

The Positive Barrier Fish Screen Project at Wilkins Slough is a Group 1 Public Works Construction Project. By reducing the likelihood that fish will be entrained at the Wilkins Slough facility, the Project directly serves to assist in the protection and recovery of priority fish species.

**POSITIVE BARRIER FISH SCREEN PROJECT
WILKINS SLOUGH PUMPING PLANT**

Proposal for Category III Funding

RECLAMATION DISTRICT NO. 108

P.O. Box 50, Grimes, CA 95950
(916)437-2221 Fax:(916)437-2248
e-mail:rd108@colusanet.com

Type of Organization: Public - Tax Exempt (Special District under California Water Code)

Federal Tax Identification No: 94-215 6702

Technical and Financial Contact: Luther P. Hintz, General Manager

Participants In Implementation:

RD 108 - Owner/Project Manager

Construction firm (to be selected by competitive bidding August 1997)

CH2M Hill - design and construction management

Dr. Charles Hanson, Hanson Environmental, Inc. - environmental documentation

Mr. Richard Jenness, Laugenour and Meikle - consulting engineers

Mr. Kevin O'Brien, Downey, Brand, Seymour, & Rowher - legal counsel

RFP Project Group: Group I - Public Works/Construction Project

PROJECT DESCRIPTION

Project Description and Approach

Reclamation District No. 108 (RD 108) has committed to install a positive barrier fish screen facility at its Wilkins Slough Pumping Plant, which is located on the Sacramento River about 45 miles northwesterly of Sacramento. The general location is shown on the enclosed map of the area, Figure 1. The detailed planning work for this important fish protection facility began in 1996 and RD 108 recently completed the final design and advertised bids for construction. Bids are to be opened on July 29, 1997 and a construction contract awarded in early August 1997. The overall Project cost is \$11,600,000, of which the federal Government is providing fifty percent cost sharing under the Central Valley Project Improvement Act (\$5,800,000). RD 108 is seeking \$5,100,000 in Category III funding for construction and performance testing. RD 108 is funding approximately \$500,000 of the Project capital costs and will pay all costs of operation and maintenance. Category III funding assistance in the amount of \$100,000 was utilized in the Feasibility Study and \$100,000 of Proposition 70 (CDF&G) funding assisted in the cost of final design.

When completed in 1998, the Positive Barrier Fish Screen structure will be one of the largest fish screening facilities on the Sacramento River. The screen facility was designed for a capacity of 700 cfs. Figure 2 shows a plan view of the site and proposed fish screen facilities. The overall structure will be over 300 feet in length and approximately 45 feet in height. The screen will be comprised of 14 screen panels constructed from stainless steel, vertical wedge-wires with 3/32 inch slot size, each providing 180 square feet of screened area, for a total of about 2,500 square feet. Hydraulic uniformity, satisfying the 0.33 ft/sec approach velocity criteria, will be ensured by 10 flow distribution louvers placed vertically within each screen bay. The screens will be continuously cleaned with a single mechanical brush moving horizontally across the screen on a frequency of one pass every 5 minutes. The fish screen has been designed to comply with CDF&G/NMFS criteria. State and federal resource agencies have been involved through out the design of the screen.

Since the timing "window-of-opportunity" for performing construction work within the River during the remainder of 1993 is limited to the months of September, October and November, a sheet pile cofferdam must be installed during these months in order to isolate the work area so that the concrete structure can be installed in the dry. This procedure will minimize disturbance to the riverine conditions and will allow for uninterrupted diversion of water as needed.

Sheet piling of the type required for this work is not manufactured in the United States and must be obtained from manufacturers in Europe. In order to meet the construction schedule and have the materials on hand for the contractor, RD 108 had to pre-order and prepurchase the necessary sheet piles and commit to a payment of approximately \$1.1 million upon delivery in August. With-out this advance commitment by RD 108, construction would have been delayed by one

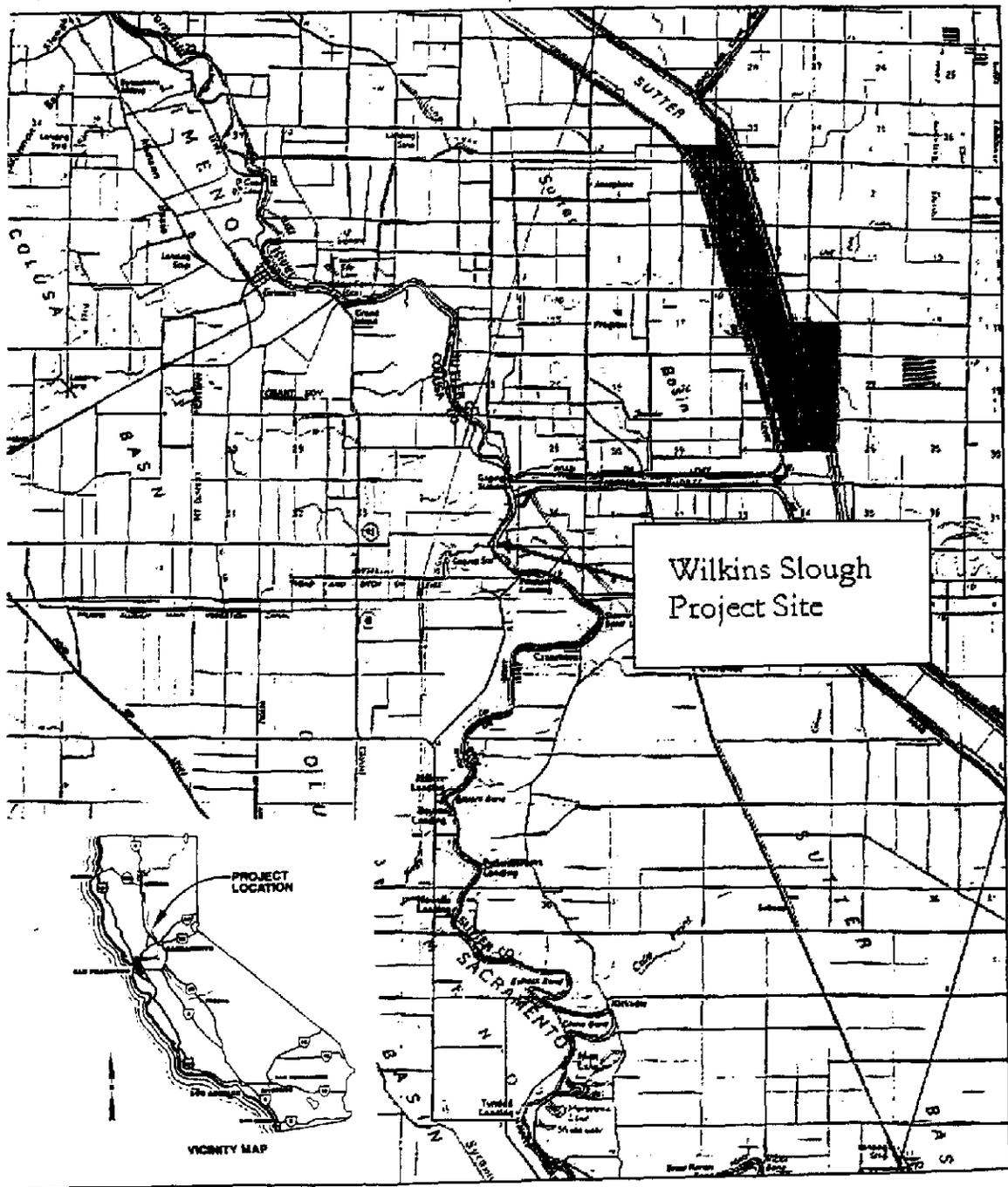
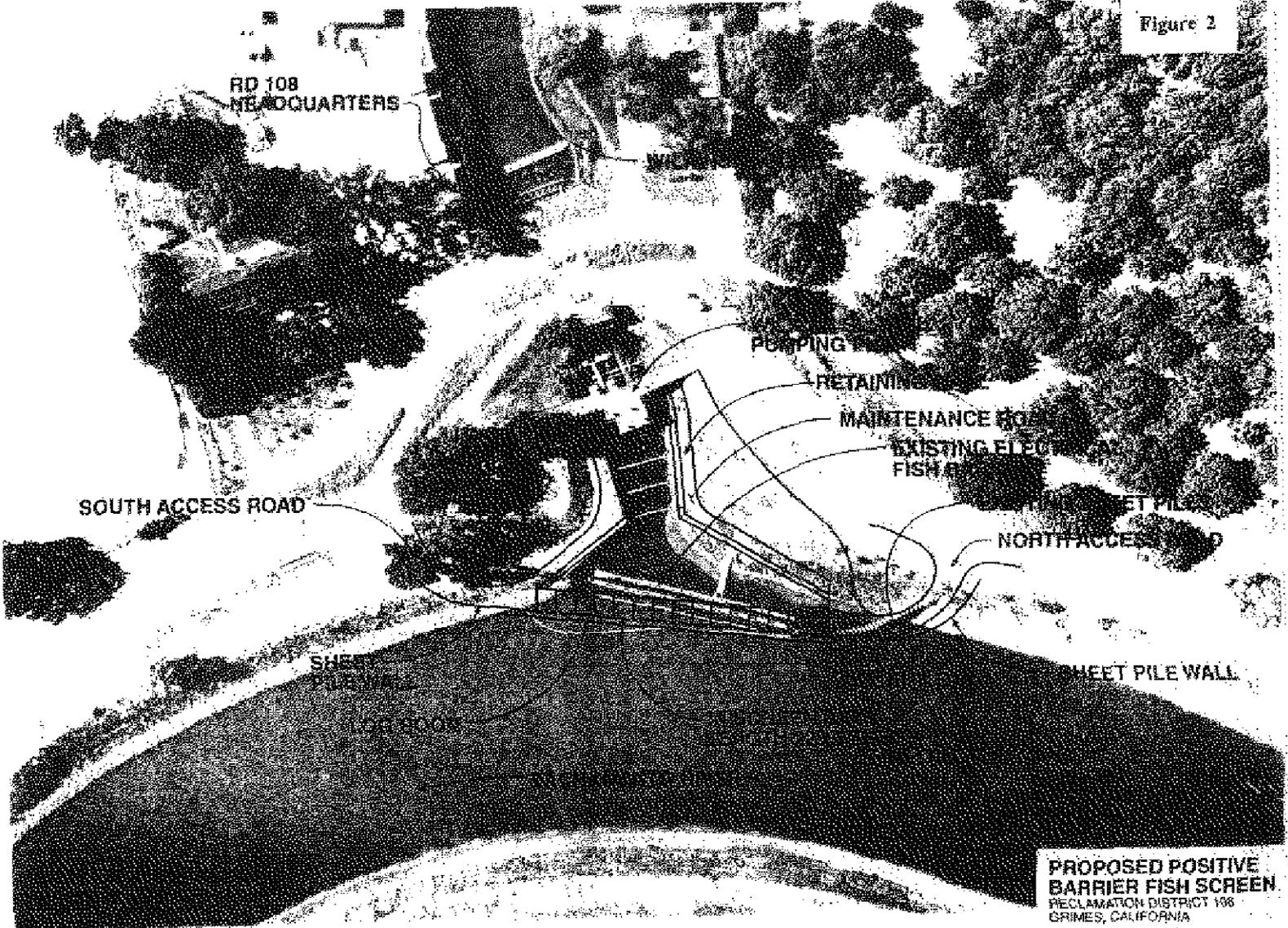


Figure 1. Regional location of the RD108 Wilkins Slough Pumping Plant.

Figure 2



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year. Federal funding under CVPIA will be utilized to meet these early payment costs for the piling.

Location of Project

RD 108 comprises approximately 48,000 acres of irrigated agricultural land west of and adjacent to the Sacramento River in northern Yolo County and southern Colusa County in the Colusa Basin Watershed. RD 108 owns and operates an irrigation system which annually diverts approximately 200,000 acre-feet of water from the Sacramento River under a water right settlement contract with the U.S. Bureau of Reclamation. The majority of water used for irrigation by RD 108 is diverted at the Wilkins Slough facility. Six smaller pumping plants also divert water from the River to serve RD 108 lands. Water diversions for irrigation of crops typically begins in April, reaches a maximum volume in July, and ends about mid-September. Water diversions are also made during the Fall for flooding of rice fields to enhance rice straw decomposition and provide habitat for migrating waterfowl.

Expected Benefits

Wilkins Slough has been identified as a high priority facility for fish protection by CDF&G, USF&WS, and NMFS. The high priority ranking for screening at Wilkins Slough is based on: (1) the magnitude of peak diversions and the corresponding percentage of the Sacramento River flow rate diverted; (2) the diversion season typically extending from April through December, with peak diversion occurring during the spring and early summer; and (3) the location being within an area of the Sacramento River which serves as a migratory corridor for a variety of anadromous fish including the winter-run, spring-run and late fall-run Chinook salmon, and steelhead, and also serves as a spawning and nursery ground for Sacramento splittail, and other resident and migratory species. Wilkins Slough is located within the area of the Sacramento River designated by NMFS as critical habitat for winter-run Chinook salmon. Wilkins Slough operations are currently under State and federal Biological Opinions, and permits issued by NMFS and CDF&G which, through incidental take monitoring, have documented entrainment losses of juvenile winter-run Chinook salmon.

Operation of the fish screen at Wilkins Slough will contribute directly to a reduction in entrainment and mortality for juvenile winter-run Chinook salmon, steelhead, and a variety of other resident and anadromous fish. The fish screen is expected to reduce entrainment mortality of juvenile and adult fish by more than 95 percent from current conditions. The reduction in entrainment losses is considered to be a significant long-term environmental benefit.

Background and Biological/Technical Justification

During summer 1992, the USBR offered a funding program for fish screening demonstration projects at water diversion sites along the Sacramento River to protect the endangered winter-run Chinook salmon. RD 108 voluntarily responded and was selected for installation and testing of a prototype guidance system during 1993. RD 108 researched several alternative technologies

and agreed to test both an acoustic barrier and an electric barrier. These technologies were chosen because of their economic feasibility and their promising results during tests performed elsewhere.

Because winter-run Chinook salmon might be affected by the fish guidance systems, a Biological Assessment under both the Federal and State Endangered Species Acts was prepared to describe the possible effects of the project on out-migrating salmon in the Sacramento River. In response to the Biological Assessment, both NMFS and CDF&G issued Biological Opinions that approved the project, given that certain conditions were met. Those conditions included a requirement that the presence of winter-run chinook salmon in the River at Wilkins Slough and their entrainment be monitored from initiation of seasonal diversions through May 15th and again during late summer through completion of the diversion season. Sampling in late summer was to begin within one week after the first winter-run fry was captured in the CDF&G rotary-screw trap near Hamilton City, 87 miles upstream from Wilkins Slough.

Fishery studies were conducted over the past four years to document and quantify the species composition and numbers of fish entrained at Wilkins Slough and to evaluate the level of fish protection achieved through operation of alternative fish protection technologies. Although results of testing and analysis from the 1996 experimental investigations indicated a substantial (greater than 90%) reduction in juvenile Chinook salmon entrainment losses attributable to a flow distribution/electric barrier when compared to statistical predictions of salmon entrainment at Wilkins Slough without a barrier or screen, the testing did not confirm that the efficiency criteria established by NMFS and CDF&G could be achieved at this site with the prototype flow distribution/electric barrier being utilized.

Following is a summary of the costs which were incurred in the alternative barrier demonstration Project:

Federal Funds	\$2,074,395	75
RD 108 Funds	686,527	25
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Total	\$2,760,922	100

On August 16, 1996, after meeting with involved fishery agencies, RD 108's Board of Trustees decided to terminate further work on experimental fish barrier testing and proceed with feasibility studies, design and construction of a Positive Barrier Fish Screen Project. A letter dated October 18, 1996, from NMFS Regional Director Hilda Diaz-Soltero to Ms. Nancy Quan, Category III Steering Committee, states that "Screening the Wilkins Slough Diversion should protect up to 50,000 juvenile salmon per year from entrainment".

With federal financial assistance, RD 108 has compiled extensive biological and engineering data and operation experience within the Sacramento River at Wilkins Slough. Concurrent with the 1996 alternative barrier testing, RD 108 undertook analysis of a conceptual plan for a positive

barrier fish screen. Field studies at the site demonstrated the difficulty of achieving uniform approach velocities and the need for engineering evaluation of a flow distribution system. With the assistance of USBR's Denver Hydraulics Laboratory, a physical model of the Wilkins Slough site was constructed to test and evaluate the hydraulic performance of a conceptual barrier with flow distribution baffles and traditional screen design.

In September 1996, RD 108 retained the engineering firm of CH2M Hill to design a positive barrier fish screen for Wilkins Slough. CH2M Hill, working in conjunction with technical staff from CDF&G, NMFS, USBR and USF&WS, has completed design of a fish screen that fully meets the CDF&G and NMFS screening criteria. It is now anticipated that the Project should, as stated by Ms. Diaz-Soltero, "protect up to 50,000 juvenile salmon per year from entrainment" at Wilkins Slough.

Proposed Scope of Work

The Positive Barrier Fish Screen Project is being managed in five phases. The first three Phases are now completed. Phase I included the development of a preliminary design concept, cost estimate and hydraulic modeling. Velocity and bathymetry measurements, compiled as part of the 1995-96 field studies were used in developing the conceptual design and hydraulic model.

Phase II was a Feasibility Study which included (1) analysis of a design that meets RD 108 water requirements as well as NMFS/CDF&G design criteria; (2) assessment of operational constraints and reliability; (3) quantification of the capital, operating and maintenance costs; (4) development of a design and construction schedule; and (5) identification of specific construction impacts for completing all environmental documentation and permitting in advance of construction. Phase III consisted of final engineering design, and preparation of specifications and drawings of the fish screen facilities, and completion of environmental documentation and permitting. Phase III was completed in July 1997.

Phases IV and V are the subject of this proposal. Phase IV is construction and operational start-up of the Positive Barrier Fish Screen. The final Phase (V) of the Project will include performance testing and evaluation of the fish screen facilities to demonstrate compliance with NMFS/CDF&G design criteria, and long-term operations and maintenance capabilities. A Performance Testing Report and an Operations and Management Manual will be prepared upon completion of construction of the fish screen facilities.

Monitoring and Data Evaluation

RD 108 has been working with a Technical Advisory Committee (TAC) composed of representatives from CDF&G, NMFS, USBR and USF&WS since 1993 when the demonstration project began. The TAC has continuously "brainstormed" and reviewed issues associated with construction, operation and monitoring of fish protection facilities at Wilkins Slough, and will continue to do so throughout the construction, performance testing and evaluation of the Positive

Barrier Fish Screen Project. Dr. Charles Hanson provides leadership and coordination for the group.

Implementability

Prior to the start of construction, all permits required under CEQA and NEPA will have been secured by RD 108. RD 108 is serving as the State lead agency for compliance with CEQA and the USBR is serving as the federal lead agency for compliance with NEPA. A Biological Assessment of the Project was prepared by Dr. Charles Hanson. The Environmental Assessment/Initial Study, Finding of No Significant Impact (FONSI) and the Negative Declaration for the Project are also completed. The CEQA Negative Declaration for the Project was certified by the RD 108 Board of Trustees in July 1997. RD 108 has applied for: (1) a Section 401 Permit from the California Regional Water Quality Control Board to dredge and dispose of material; (2) Section 1601 Permit from CDF&G; and (3) Section 10 and 404 Permits from the U.S. Army Corps of Engineers for dredging and construction of the Project and long term maintenance as needed. A request was made for a State Reclamation Board permit for construction, dredging and disposal of material. RD 108 has also prepared an outline of a Habitat Conservation Plan which is currently being reviewed by the resource agencies.

COSTS AND SCHEDULE TO IMPLEMENT PROPOSED PROJECT

Budget Costs

The total estimated cost of all five phases of the Project is \$11,600,000. Phase I (conceptual planning), Phase II (feasibility), and Phase III (final design and construction contract documents) are essentially completed and were fully funded. The costs for this work and the funding sources are set forth below:

Source of Funding	Phase I	Phase II	Phase III	Total
Federal (CVPIA)	\$101,000	\$ 76,000	\$555,000	\$732,000
Category III (MWD)		100,000		100,000
CDF&G (Prop 70)			100,000	100,000
RD 108	46,000			46,000
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Total	\$147,000	\$176,000	\$655,000	\$978,000

RD 108 is seeking \$5,100,000 of CALFED funding under Category III for a shared cost of Phase IV (Construction) and Phase V (Field Documentation and Performance Assessment). Estimated costs for Phases IV and V are set forth in Table 1.

RD 108 is currently in the final stages of entering into a contract with the federal government for reimbursement of a portion of the costs incurred by RD 108 in Phase III and for 50 percent cost-share funding grant for Phases IV and V. The total amount under this contract is \$5,600,000 since \$200,000 federal funds have been provided to date. The federal government has agreed to advance funds to RD 108 on a quarterly basis in amounts sufficient to cover anticipated costs to be incurred during the quarter. The federal government has also agreed that the cost-share commitment entered into with RD 108 will provide for payment of costs in advance of RD 108 obtaining CALFED funding under Category III and funds from other sources, if any. This recognition of urgency and the length of time required in the CALFED funding process will allow construction of the Project to move forward during 1997 and avoid disruption of the schedule which would involve a delay of one year and substantially increase the cost. The design and construction schedule is shown in Figure 3.

All Project operation and maintenance costs will be funded by RD 108.

RECLAMATION DISTRICT NO. 108

Positive Barrier Fish Screen Project Estimated Costs of Phases IV and V

Phase IV Construction (1997 - 1998)

Cost Items	Estimated Costs \$ x 1000
Construction Contract (pending)	7,500
Sheet and H-Piles Supply Contract (completed)	1,250
Sluice Gates Supply Contract (pending)	375
Operation and Maintenance Equipment	240
Construction Management Engineering Services Agreement (CH2M Hill)	675
Fishery Biologist Service Agreement (Hanson Environmental, Inc.)	90
Engineering Services Agreement (Laugenour & Meikle)	120
General Administration and Legal Services	122

Total	10,372
 Source of Funds	
Federal - CVPIA	4,943
CALFED - Category III	5,000
RD 108	429

Total	10,372

Phase V Performance Assessment (1998 - 1999)

Cost Items	
Fishery Biologist Services Agreement (Hanson Environmental, Inc.)	200
Engineering Services Agreement (Laugenour & Meikle)	25
General Administration and Legal Services	25

Total	250
 Source of Funds	
Federal - CVPIA	125
CALFED - Category III	100
RD 108	25

Total	250

APPLICANT QUALIFICATIONS

RD 108 has been responsible for administrative management of all aspects of the Project. Mr. Luther P. Hintz, PE (RD 108 General Manager) is the Project Manager. Mr. Hintz is a registered engineer in the State of California, with over 35 years experience in managing contracts for design and construction of large water supply projects. Mr. Hintz will be assisted by Mr. Richard Jenness (Laugenour & Meikle), RD 108's consulting engineer.

Following the August 1996 decision to move forward with the Project, RD 108 selected CH2M Hill, a large engineering firm, experienced in fish screen design and construction on the Sacramento River and elsewhere, to plan, design and provide services during construction of the positive barrier fish screen. On June 29, 1997, CH2M Hill completed final design and construction contract documents of the fish screen facilities in cooperation with the Technical Advisory Committee. Bids will be opened on July 29th and a construction contract is scheduled to be awarded in early August 1997.

CH2M Hill has a team of registered professional engineers who worked on the design and have been assigned to provide engineering services during construction. All individuals who will be working on construction of the Project have extensive experience in similar work. These individuals and their responsibilities are as follows:

Mr. Howard Wilson	Construction Project Director
Mr. Bob Gatton	Construction Project Manager
Mr. Peter Rude	Contract Administration and Inspection
Mr. Chris Adamo	Contract Administration and Inspection

These individuals will be assisted by the following design team members to periodically observe the progress and quality of the work and to determine if the work is proceeding in accordance with the intent of the contract documents:

Mr. Ken Iceman	Hydraulic Engineer
Mr. John Livingston	Geotechnical Engineer
Mr. Kevin Porter	Geotechnical Engineer
Mr. Mark Randall	Structural Engineer
Mr. Steve Patterson	Structural Engineer
Mr. Dave Barnes	Mechanical Engineer
Mr. Kurt Vollmers	Electrical Engineer

Dr. Charles Hanson (Hanson Environmental, Inc.), cooperating with the staffs of USFWS, NMFS, CDF&G, USBR, and DWR is responsible for environmental documentation, and State and federal permits. Under the construction Phase IV, Dr. Hanson and Mr. Rude will monitor the environmental and permit compliance. The biological evaluation during performance analysis (Phase V) will be directed by Dr. Hanson.

District's legal counsel, Downey, Brand, Seymour & Rowher will continue to provide legal advice and oversight.

There are no known conflicts of interest involving RD 108's Trustees, staff and consultants.

COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

The terms and conditions specified in Attachment D of the CALFED RFP package for "Public Agency" are acceptable to RD 108. (Contract Forms Attached)

Contract Requirements

Two standard clauses/proposal requirements in Table D of the RFP apply to RD 108.

1. Non-Discrimination Compliance (Item 8 of RFP chart)
2. Non-Collusion (Item 11 of RFP chart)

These completed forms are attached.

NONDISCRIMINATION COMPLIANCE STATEMENT

COMPANY NAME

Reclamation District No. 108

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME

Luther P. Hintz

DATE EXECUTED

7/28/97

EXECUTED IN THE COUNTY OF

Colusa

PROSPECTIVE CONTRACTOR'S SIGNATURE

PROSPECTIVE CONTRACTOR'S TITLE

General Manager

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

Reclamation District No. 108

**NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY
 BIDDER AND SUBMITTED WITH BID FOR PUBLIC WORKS**

STATE OF CALIFORNIA)
)ss
 COUNTY OF Colusa)

Luther P. Hintz, being first duly sworn, deposes and
 (name)

says that he ~~is~~ is General Manager and Secretary of
 (position title)

Reclamation District No. 108
 (the bidder)

the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

DATED: July 28, 1997 By Luther P. Hintz
 (person signing for bidder)



(Notarial Seal)

Subscribed and sworn to before me on

July 28, 1997

Catherine L. Busch
 (Notary Public)