

Attachment I

OVERVIEW OF THE PLANNED NEW TRACY FISH FACILITY PROGRAM (TFF)

February 26, 1999

Introduction and Background

The purpose of this document is to provide an overview of the new Tracy Fish Facility (TFF) program. The TFF program involves planning, design, construction, operation and evaluation of new fish screens and fish salvage facilities at Tracy, California. This program will expedite implementation of best available technology screening for 2,500 cfs at the Tracy diversion facility with short term fisheries benefits while, developing critical information required to optimize new fish protection facilities at Clifton Court Bay, Tracy, and the North Delta. The TFF, unlike conventional fish screening facilities, requires fish screening, fish holding, and fish transport and stocking capabilities. The program is likely to lead to development of new technologies as well as application of appropriate existing techniques. The major impetus for the TFF program is provided by the critical need of CALFED for fish protection facilities in the Delta that meet modern fish criteria, and by requirements under the 1992 Central Valley Project Improvement Act to improve the Tracy facilities, CVPIA Section 3406 (b)(4).

The existing Tracy Fish Collection Facility (TFCF) was completed during the 1950's as a fish salvage facility employing louvers to intercept and remove fish from water diverted through the Delta-Mendota Intake Channel by the Tracy Pumping Plant (see Figure 1 for location). Similar louver technology is also still employed nearby at the SWP Banks Pumping Plant intake channel (California Aqueduct). Together, these two water delivery systems may eventually divert up to approximately 15,000 cfs.

Developments of new fish protection and salvage facilities for the south Delta that meet modern criteria require testing in both laboratory and field conditions, and face many challenges including:

- Heavy debris loadings from physical, aquatic plant, and aquatic animal origins,
- Tidal influences,
- Requirements for maintaining specific screen approach velocities and channel sweeping velocities, while the channel depths (and cross-section) changes continuously due to tidal action,
- A complex of some 51 fish species, with many life history stages present, some of which are listed as threatened and/or endangered, and the
- Presence of fish predators ahead of and within the facility.

Areas believed to require additional study include:

- A need to investigate the benefits of separating small from large fish during screening, collection, holding and transportation,
- A need to investigate the feasibility of means to prevent the build-up of fish in the near-field environment upstream of the facilities,
- A need to investigate the availability of more effective and flexible fish transport and distribution systems,
- A need to develop methods of separating debris from the salvaged fish, or of dealing with the combination effectively,
- A means of excluding predator populations from being established within the facility without compromising the salvage system,
- A more effective fish collection system, to both move fish to the transport system, and to allow precise estimates of salvage.

A draft planning and TFF feasibility report, now under interagency review, was developed by the Bureau of Reclamation in 1998 to bring together comprehensive information on the existing Tracy facility, and on concepts and evaluation suggestions for a new facility¹.

Overview of New Tracy Fish Facility

The TFF will be developed near the existing Tracy facility, and will be constructed and operated to minimize interference with on-going fish salvage activities and water deliveries. The old facility will be maintained and improved to allow for uninterrupted fish salvage throughout the TFF developments. The draft feasibility report¹ provides conceptual designs for the new TFF, and includes evaluation recommendations. These details are now under review by interagency technical staff, and are subject to alteration and improvement as the TFF program evolves. The current TFF plan is summarized below:

The new facilities are planned to eventually screen and salvage fish from about 2,500 cfs at screen approach velocity of 0.2 fps and will meet all other appropriate fish agency criteria. The facility will have the structural and operational flexibility to optimize screening and salvage for multiple species. The old facility, with improvements, will remain in place to screen the remainder of the flow. Major anticipated advances in the design for the new facility, which will be evaluated, include:

- Automated debris cleaners,
- Louvers and positive barrier screens in series to assist early sorting of fish and debris by size, and to salvage more small fish,
- Two main intake and screening channels, independently capable of operation and drawdown,
- Mechanical fish crowders,

- Enhanced hydraulic control of channel flows,
- Bypass lines driven by "fish friendly" lifts or gravity flow,
- Development of above-ground holding tanks with dewatering screens and fish size sorting and debris removal capability, and
- Improved in fish transport and release equipment and procedures will be made.
- Improved fish release sites.

A schematic plan for a 2,500 cfs TFF is provided in Figure 2. The location of the existing facility is at the very top of Figure 2. TFF would be constructed immediately to the north and would attach to the present intake channel, taking advantage of the surface debris removing system now in place. This is presently the preferred location for the new TFF, however, other sites immediately east towards Old River are being studied. The large size of the TFF results primarily from the 0.2 fps screen approach velocity criteria.

Major components of the TFF currently under consideration, from upstream to downstream within the facility, include:

- **Trash Boom and Near Field Area** - intercepts and removes floating debris
- **Trash Rack and Trash Rack Forebay Area** - further intercepts and removes debris, including both floating and submersed material; will include automated cleaners
- **Intake Channels Downstream of Trash Racks, Including Deflector (Leaky Louver)/Positive Barrier Screen Combinations with Bypasses** - directs larger fish and debris to first bypass, then smaller fish and debris particles to second bypass; mobile fish crowders included to assist fish movement (**Note** - control flow pumps would be positioned at the downstream end of the channels to maintain hydraulic control through the channels)
- **Fish Lifts between Ends of Bypass Pipes and Holding Tanks** - lifts create the bypass flows and introduce water, fish and any remaining debris into the holding tanks (**Note** -an alternative to the lifts under consideration would use gravity bypass flows to move the fish into much deeper holding tanks.)
- **Holding/Separation/Counting Tanks** - tanks which would hold and assist separation of small and large fish prior to transfer to hauling trucks; debris would be removed by rotating screens.
- **Fish Transport Vehicles, Stocking Sites and Operations** - serves to reduce mortality during transport, distribute fish into more favorable habitats away from the influence of the Delta pumps, and reduces predation at release sites.

General Evaluation Program for TFF

A technical interagency group has tentatively agreed that the major issues to be evaluated should include:

- ◆ Debris management
- ◆ Fish Lift Systems
- ◆ Fish Collection, Sorting, Counting, and Holding Facilities
- ◆ Effective Operation and Maintenance, and Inter-facility Compatibility
- ◆ Predator Management
- ◆ The proposed use of fish crowders to move fish quickly to the bypass system

To expedite gathering information on these issues evaluations are already underway at the old Tracy facility for:

- Testing of a "fish friendly" lift,
- Louver hydraulics and fish louvering efficiencies,
- Debris management using a rotating drum screen designed for 0.2 fps,
- Operation of a working "above-ground" holding tank, and
- Tests for mitten crab removal with a "fish leaky" traveling screen.

In addition, evaluations are underway in the Denver research flumes for:

- Physical modeling of the above-ground holding tanks,
- Debris management with vertical traveling screens, and
- Testing the "leaky louver" concept to assist design engineers and to gain early experience with future facility components.

A comprehensive report on all aspects of the debris problem will be completed in March, 1999. A report is under preparation that summarizes the world's experiences with fish crowders and separators, and will provide draft recommendations for appropriate methods to investigate at the TFF.

Extensive data on the fish passage experiments at Reclamation's Red Bluff Research Pumping Plant are also available for design engineers, and provide information to support the evaluation of fish lifts and alternatives at Tracy². A report describing the biological testing

results focused on fish survival through the Archimedes screw and the helical pumps is planned for completion in September 1999.

Time Frame

Construction and major evaluations of TFF are planned for completion in time to allow expanded improvement of Tracy and/or new fish facilities at CCF by the end of CALFED Stage 1 (the end of Stage 1 is intended to be 7 years following a Record of Decision which is scheduled for June, 2000). It is anticipated that critical functions of the TFF may require further refinement through testing beyond Stage 1. Reclamation's pre-TFF research and development will continue up to completion of construction. Engineering and fisheries evaluations will continue during initial years of operations of TFF in Stage 1.

The general design and construction schedule for TFF is planned as follows:

Approval to start detailed design with agency coordination	January, 1999
Design data package complete	March 1, 1999
50 % Design Review	August 1, 1999
100% Design Review	December 14, 1999
Solicit Bids	March 1, 2000
Open Bids	April 15, 2000
Award Contract	June 1, 2000
Complete Construction	Fall, 2002

Cost Estimates

Cost estimates are approximate and are determined for a 2,500 cfs TFF and include engineering design, environmental compliance, program management, construction, and, tests and evaluations.

**New Tracy Facility Budget Estimates
FY99 - FY2007***

FY	Engineering Designs	Environmental Compliance (EA/EIS)	Tests and Evaluations/ Modifications	Program Management; New On-Site Staff	Construction	TOTAL
99	\$2.0M	\$0.1M	\$1.5M	\$0.4M		\$4M
00	\$1.5	\$0.1M	\$2.0M	\$0.4M	\$10M	\$14M
01	\$0.5M		\$2.0M	\$0.5M	\$50M	\$53M
02	\$0.2M		\$2.5M	\$0.8M	\$40M	\$43.5M
03	\$0.3M		\$2.5M	\$0.9M	\$1M	\$4.7M
04	\$0.2M		\$2.5M	\$0.9M	\$1M	\$4.6M
05	\$0.2M		\$2.5M	\$1M	\$1M	\$4.7M
06	\$0.2M		\$2.5M	\$1M	\$1M	\$4.7M
07	\$0.2M		\$2.0M	\$1M	\$1M	\$4.2M
Sub-Totals	\$5.3M	\$0.2M	\$20M	\$6.9M	\$105	\$137.4M
Total Estimate	\$137.4M9M					

*Federal fiscal year runs from Oct 1 to the following Sept 30

Project Management

For details of the Project Management Plan, please refer to the attachment entitled "Proposed Project Management Organization Agreement".

References

¹Liston, C., R. Christensen, H. Ng, L. Hess, P. Johnson, B. Mefford, W. Frizell, S. Wynn, and R. Raines. 1998.

A proposed technology development facility to support improvement and/or replacement of fish salvage facilities at Tracy and other large fish screen sites in the Sacramento-San Joaquin Delta, CA: Draft Feasibility Report. Bureau of Reclamation, Denver Technical Service Center and Mid-Pacific Region. 90 pp + figures and appendices.

²McNabb, C., C. Liston, and S. Borthwick. 1998. In-plant biological evaluation of the Red Bluff Research Pumping Plant on the Sacramento River in Northern California: 1995-1996. Red Bluff Pumping Plant Report Series, Vol. 3. U. S. Bureau of Reclamation, Denver Technical Service Center and Mid-Pacific Region. 76 pp.