RECLAMATION

Managing Water in the West

TR-2011-02

Travel to Tracy Office, Byron CA to give project presentations and collect field data regarding TFCF.

Dates of Travel: March 28-30, 2011

U.S. Department of the Interior
Bureau of Reclamation
Technical Service Center
Hydraulic Investigations and Laboratory Services Group
Denver, Colorado

March 2011

BUREAU OF RECLAMATION
Technical Service Center
Denver, Colorado

TRAVEL REPORT

Code: 86-68460 Date: August 1, 2011

To: Manager, Hydraulic Investigations and Laboratory Services Group

From: Bryan Heiner, Brent Mefford & Josh Mortensen

Subject: Travel to Tracy Office, Byron CA to give project presentations and collect field data regarding TFCF.

1. Travel period: 28 Mar 2011 – 30 March 2011

2. Places or offices visited: Tracy Fish Collection Facility (TFCF), Tracy Field Office (TO-410), and Fish Release Sites

3. Purpose of trip: Give presentations to the Tracy Technical Advisory Team (TTAT) on projects that were completed to meet part of the Biological Opinion and collect data for ongoing projects at the Tracy Fish Collection Facility.

4. Synopsis of trip: On 28 March 2011 Brent Mefford and Bryan Heiner traveled by air to Sacramento, CA and by car to Tracy, CA where they met Josh Mortensen who is currently on a rotation assignment with the Sacramento Regional Office. Bryan and Josh met later that evening to review final preparations for the follow day's presentation.

On 29 March 2011 seventeen individuals from different agencies and groups with interest in the Tracy Fish Collection Facility gathered at the Tracy Field Office for presentations by Ron Silva (TO-410), Bryan Heiner (86-68460) and Josh Mortensen (86-68460). Following introductions, Ron gave a brief update of current activities at TFCF. Ron then introduced the need for the two projects that would be presented in the remainder of the TTAT meeting by quoting from the Biological Opinion (NMFS 2009):

> *"By March 31, 2011, Reclamation shall complete studies for the re-design of the secondary channel to enhance the efficiency of screening, fish survival, and reduction of predation within the secondary channel structure and report study findings to NMFS. NMFS shall review study findings and if changes are deemed feasible, Reclamation shall initiate the implementation of the study findings by January 31, 2012."*

Following Ron's introduction, Josh presented a concept design of a fish pump system retrofit that would improve screening efficiency, fish survival and reduce predation. The recommended design includes the construction of a new secondary channel that would be supplied with fish and water off the main bypass pipes with WEMCO-Hidrostal centrifugal pumps (Figure 1). A cofferdam would be built and portions of the primary channel downstream of the louvers would be backfilled to allow a working space for the new secondary channel. Figure 2 provides an overview of the new secondary design (in green) and its location in relation to the existing facility.

Some of the benefits and features of the new existing holding facility are:

- Consistently meet hydraulic criteria in auxiliary channel (independent of primary channel)
- Operational Flexibility (gravity or pumped)
- Additional space (5,500 Sq-ft usable)
- Minimal modification of existing infrastructure
- Increased predator isolation (auxiliary channel)
- Cost: $15 million

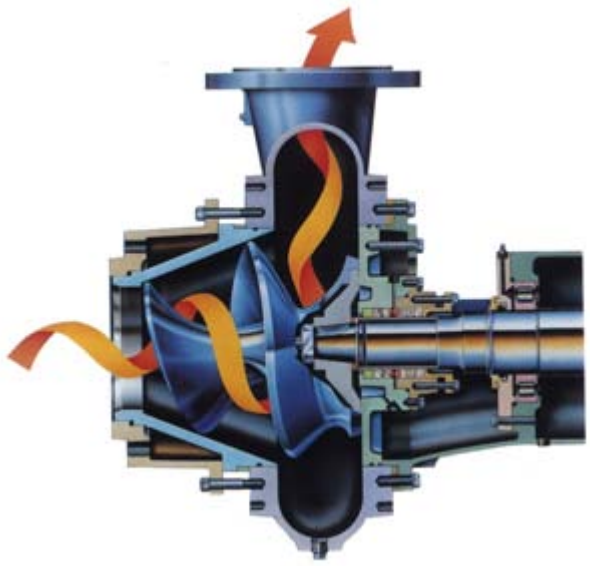

Figure 1 - WEMCO-Hidrostal centfigugal pump cutaway view

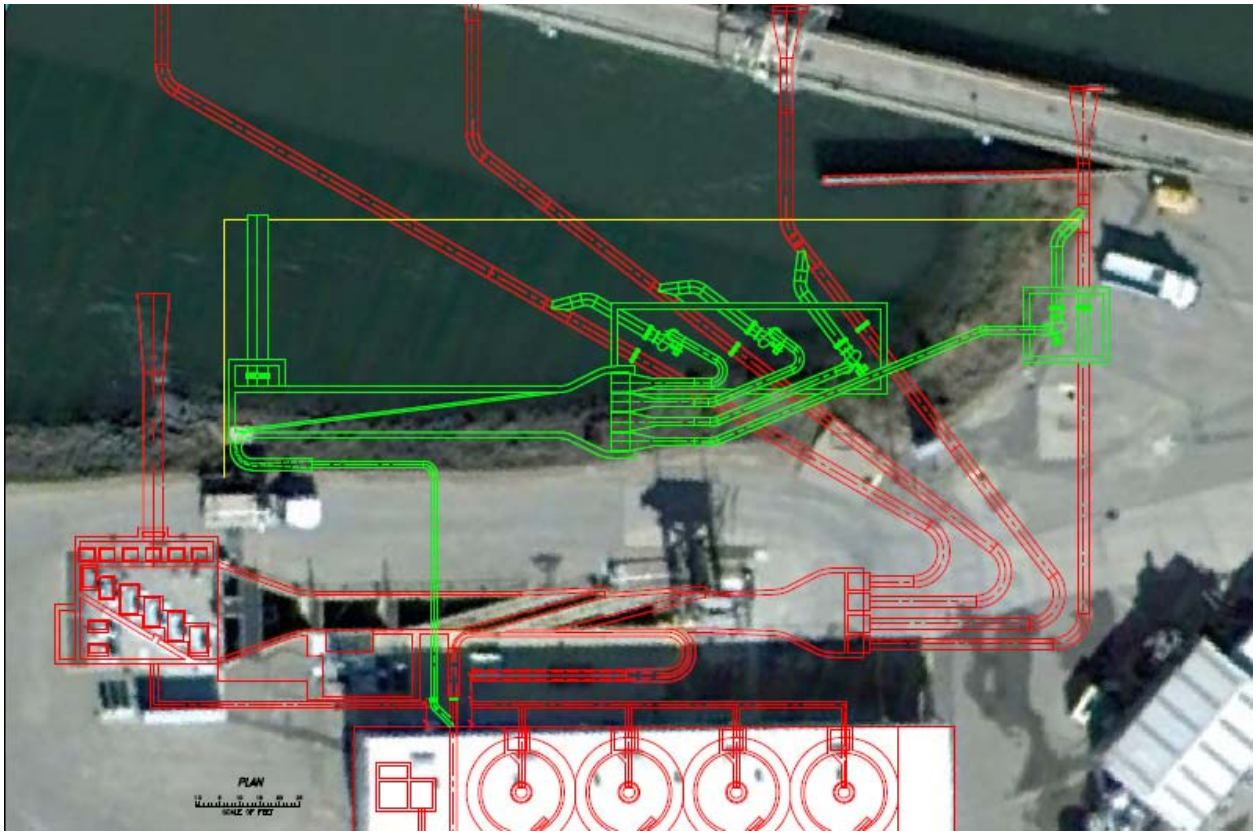

Figure 2 - Overview of the new secondary facility at Tracy Fish Collection Facility

Following the presentation of the new secondary channel, Bryan presented a concept design of an additional holding tank at the TFCF. This design was intended to meet the same criteria of the biological opinion to increase fish salvage, survival and reduce predation. It is expected that the following improvements at TFCF will require the additional holding tank to increase salvage efficiency:

- Trash rack cleaner (complete)
- Secondary traveling screens (2013)
- Primary traveling screens (future)
- WEMCO-Hidrostal pumps and new secondary (future – Josh)

As a result a new holding tank is recommended which will take fish from the existing 20-inch holding tank supply line through a 16-inch WEMCO-Hidrostal pump and into a new raceway type holding tank. Figure 3 provides an overview of the tank and its location in relation to existing infrastructure.

Some of the features and benefits of the new holding tank include:

- Hold fish 2 weeks or longer if feeders are added
- Can operate in conjunction or independent of:
  - Existing operations
  - New pumped secondary (Josh Mortensen)
- 5 feet water depth with 20 ft^3/sec of continuous oxygenated water

  - Possible visualization of fish in holding tank
- Can incorporate an active separator to reduce predation
- Fish will be crowded and removed with a Transvac type pump
  - Can salvage a portion of the fish at a time
- Cost: $2.5 million

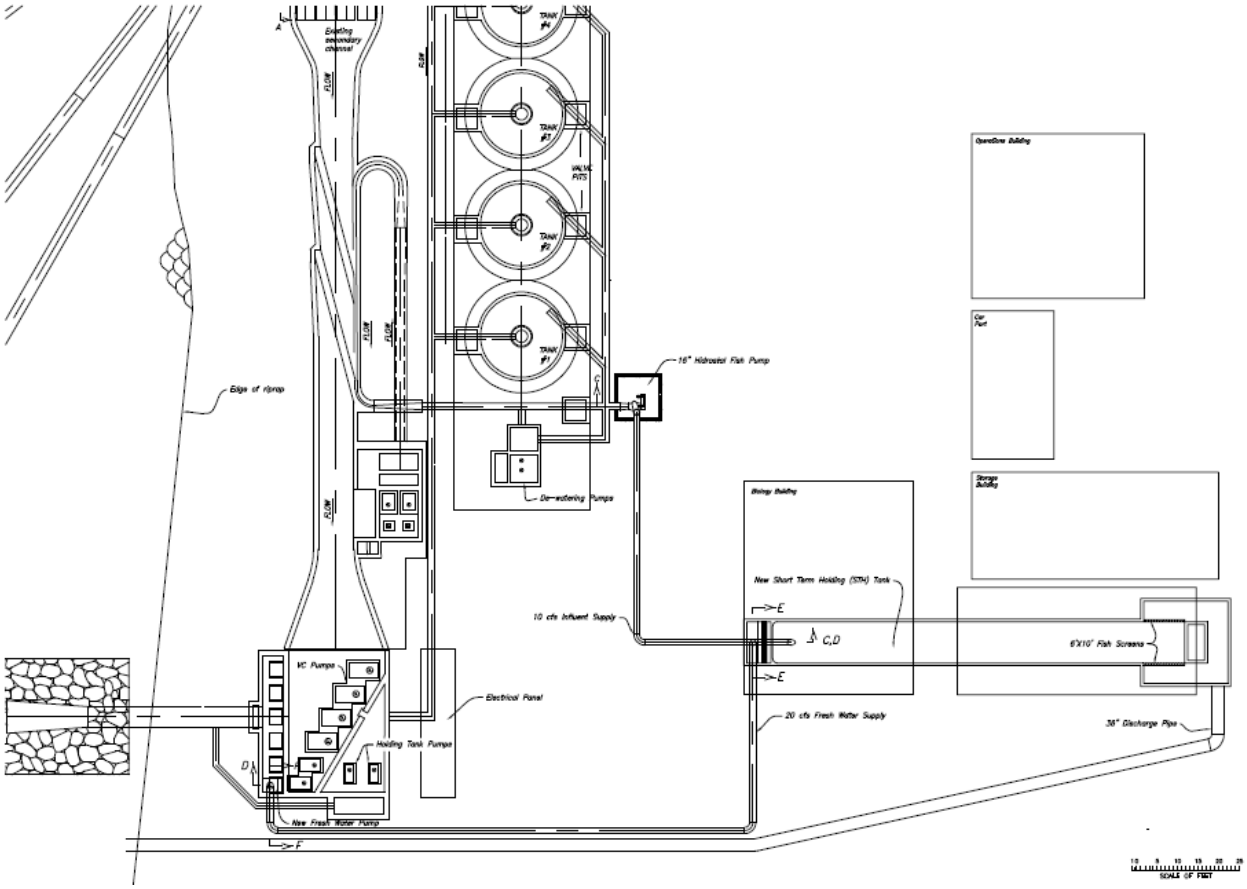

Figure 3 - Design and layout of an additional holding tank at the TFCF

After the presentations, Bryan, Josh and Brent visited the TFCF to collect data on various projects they have been asked to work on. One project is to construct a new small haul tank that can be situated on the back of an existing F450 facility truck (Figure 4). To accomplish this project the following data was collected on the truck:

- Model: Ford Superduty F450 XL Turbo Diesel
- VIN: 1FDXF47P43EC82864
- GVWR: 15,000 lbs
- GAWR (Rear): 11,000 lbs
- GAWR (Front): 6,000 lbs
- BED: fixed dump 8'x14', 3.5' high front fence, 3.55' deck height from ground

Figure 4 - Ford Superduty F450 XL Turbo Diesel with temporary haul tanks

In addition to designing a new haul fish haul tank for the F450, the travelers are involved in evaluating the fish release sites being used in the TFCF salvage process. To better understand these sites and improve fish releases Bryan and Brent met with Joel Imai (TO-460) to discuss each site, their use, and any problems they might have. As part of the evaluation the supplement pumped flows were needed. Joel provided keys and access remotes to the sites and Bryan and

Brent and visited each site to obtain the needed pump flows. Josh was able to visit the Emmaton site to help with the data collection. The following data were collected:

Emmaton Fish Release Site:

- Pipe Slope: 20.7 degrees
- Release Pipe: 1 ft dia. lined n~0.010
- Pump Supply Pipe: 4" nominal carbon steel pipe. Wall Thickness Measurement = 0.25"
- Flew Pipe: stolen
- Acoustic Velocity = 1420 m/s
- Pump 1: left pump when looking down pipes
  - 160 gpm
  - 48 AER reading
- Pump 2: right pump when looking down pipes
  - 500 gpm
  - 7 AER reading
- Pipe allows both pumps to be on at the same time but electrical doesn't.
- Truck Slope: an estimate of the truck slope is 4.5 degrees
- WS Elevation to where pipe discharges: 8.4 ft (measurement estimate)
- Date/Time: 2/29/2011 4:45 pm

Antioch Fish Release Site:

- Pipe Slope: 14.8 degrees
- Release Pipe: 1 ft dia. lined n~0.010
- Pump Supply Pipe: 4" nominal carbon steel pipe. Visual verification
- Flex Pipe: 0.77'-0.8' inside diameter
- Acoustic Velocity = 1467 m/s
- Pump 1: left pump when looking down pipes
  - 450 gpm
  - 48 AER reading
- Pump 2: right pump when looking down pipes
  - 280 gpm
  - 7 AER reading
- Pipe allows both pumps to be on at the same time but electrical doesn't.
- Truck Slope: 3.0 degrees measured
- Date/Time: 3/30/2011 10:00 am
- Antioch truck empty rate measured from top of the seal:

Drop (ft)	Time (sec)
0	0.00
1	23.00
1.2	35.00
2	45.00
2.5	57.00
3	70.00
3.5	90.00
4	112.00
4.2	-

Figures 5-10 provide an overview of the release sites, transducer setups and fresh water supply line setups for both the Emmaton and Antioch release sites. At the Antioch site no ideal location was available for installing the flow meter, as a result the red arrows point to the only available location to obtain measurements.

Figure 5 - Emmaton overview

Figure 6 - Emmaton flow meter setup

Figure 7 - Emmaton supply location (looking down pipe)

Figure 8 - Antioch overview

Figure 9 - Antioch flow meter setup

Figure 10 - Antioch supply location

5. Conclusions: During the trip Josh and Bryan were able to give presentations to the Tracy Technical Advisory Team (TTAT) on projects that were completed to meet part of the Biological Opinion. The meeting was well attended and feedback was helpful for future improvements to the concept designs presented. Bruce Oppenheim from NMFS indicated that the deadline required by the Biological Opinion (NMFS 2009) of March 31, 2011 had been met. To aid NMFS and TTAT review the designs, reports for each of the projects will be completed and sent to the both parties by mid May 2011. In addition to giving the presentations data were successfully collected as part of ongoing projects at the Tracy Fish Collection Facility. Necessary information was gathered which will help design a new haul truck tank and improve the fish release sites at Emmaton and Antioch.

6. Action correspondence initiated or required: Josh Mortensen and Bryan Heiner will complete design reports for the new secondary channel and additional holding tanks by May 16, 2011.

7. Client feedback received: Not Required

cc: via email: Ron Silva (TO-410) rsilva@usbr.gov
Brent Bridges (TO-411) bbridges@usbr.gov
Joel Imai (TO-460) jimai@usbr.gov
Carl Dealy (TO-406) jcdealy@usbr.gov

bc: none:

SIGNATURES AND SURNAMES FOR:

Travel to: Tracy Office, Byron CA

Date or Dates of Travel: 28 Mar 2011 – 30 March 2011

Names and Codes of Travelers: Bryan Heiner (86-68460), Josh Mortensen (86-68460), Brent Mefford, (86-68460)

Travelers

Signature — 4/14/2011 Date

Signature — 4/8/2011 Date

Signature — 4/8/2011 Date

Noted and Dated by:

Signature — Manager - 86-6840 Title — 5/3/11 Date