ANADROMOUS FISH EVALUATION PROGRAM
Fish Facility Design Review Work Group
Minutes
April 23 and 24, 2003

Name	Organization
Noah Adams	United States Geological Survey (USGS), Biological Research Division
Jim Cain	U.S. Army Corps of Engineers (Corps)
Scott Dunmire	Corps
Kim Fodrea	Bonneville Power Administration (BPA)
Alden Foote	Corps
Carolyn Foote	Corps
Gary Fredricks	National Oceanic and Atmospheric Administration (NOAA) [previously known as National Marine Fisheries Service (NMFS)]
Kenneth Ham	Pacific Northwest National Laboratories (PNNL) (formerly known as Battelle Pacific Northwest Laboratory)
Bill Hevlin	NMFS
Fred Higginbotham	Corps
Dave Hurson	Corps
Rebecca Kalamasz	Corps
Dan Katz	Corps
Mark Lindgren	Corps
Tom Lorz	Columbia River Inter-Tribal Fisheries Commission (CRITFC)
Jerry McCann	Fish Passage Center
Sean Milligan	Corps
Paul Ocker	Corps
Steve Pettit	Idaho Department of Fish and Game (IDFG)
Cary Rahn	Corps
Steve Rainey	NMFS
Lynn Reese	Corps
Dennis Rondorf	USGS
Mark Smith	Corps
Larry Swenson	NMFS
Tim Wik	Corps
Tonia Elsey	Corps

The Fish Facility Design Review Work Group (FFDRWG) meeting was held in the Castle Room on April 23 and 24, 2003, at the U.S. Army Corps of Engineers (Corps), Walla Walla District (District), 201 North Third Avenue, Walla Walla, Washington. Paul Ocker facilitated the meeting, and Tonia Elsey served as note taker. The meeting was audio taped in order to facilitate completion of the minutes.

Paul Ocker distributed the agenda (see appendix A. handout 1) and asked if there was anything to be added to the agenda for discussion. Bill Hevlin stated that through the course of the meeting they needed to develop a list of the research that was going to be needed for fiscal year 2004.

1. Lower Monumental Lock and Dam (Lower Monumental) Barge-loading Flume. Dan Katz stated that the contracted construction people and the Corps spent the winter rerouting the barge-loading flume at Lower Monumental from the raceways down to the barge loading area. Approximately 150 to 200 feet was added to lengthen the barge-loading flume. The slope was lowered from an 18-percent slope to an approximate 3.3-percent slope. He stated that velocities went from an approximate 20 feet per second (fps) (in the very steepest section) down to a measured 11 fps. He stated that the 11 fps was measured with the flume approximately half full. With the flume at approximately three quarters full, the velocities ran at approximately 14 fps. He stated that the project would be able to control the velocities at a more predictable level once the dewatering units have been installed. He stated that the goal is to get the velocities down to approximately 11 fps. The other facilities are down to approximately 9 or 10 fps. He stated that the next step is to find a dewatering design that the Corps likes. It appears that a side dewatering unit, controlled by weirs, would be more predictable, stable, and less labor intensive than the valve dewatering that is currently at Lower Monumental. Mark Smith asked if the schedule for installing a new dewatering system was set for this fall. Dan stated that he thought it was scheduled for next spring. There was discussion on the availability of funding for the design and installation of the dewatering system and funding for the actual barge-loading flume. Dave Hurson stated that the funding for the barge-loading flume came from the Columbia River Fish Mitigation Program (CRFMP).

Steve Rainey asked Dan if he was comfortable with the smoothness of the joints in the barge-loading flume. Dan stated that he was not sure what construction did to ensure smooth joints, but that he had reviewed all the shop drawings. He stated that the construction crew had devised a way to feel the joints after the installation of each new piece of flume. There was discussion on the new barge-loading flume and the availability of past fish data to use as a comparison to fish data that could be obtained.

Steve Rainey asked if the Corps had done any preliminary investigations on the dewatering needs for the new barge-loading flume. Dan Katz stated that the dewatering unit would probably be more like the unit at McNary Lock and Dam (McNary). There was discussion on the design and funding of the new dewatering unit. It was determined that the dewatering unit needs to be recommended as a line item for the System Configuration Team (SCT). Bill Hevlin stated that the Corps would need to supply a cost estimate.

2. Lower Monumental Deflectors and Stilling Basin Repair. Dan Katz stated that the stilling basin repair and deflector installation was completed this spring. The project is currently spilling with a new spill pattern, powerhouse unit priority, and powerhouse

spillway split. He stated that the new spills are based on model observations of spill tested over the last 1 1/2 years.

Steve Rainey stated that good juvenile fish egress could be obtained at the bypass outfall and the downstream eddy if the flow was started out at the blocks with a 50-percent spill. He stated that Fish Passage Advisory Committee (FPAC) had a concern that the 50-percent spill would compromise forebay collection. Because there is spill on the Lower Snake River, there was a small spillway survival study at Lower Monumental that allowed a peek at what spillway survival would look like. He stated that it appears that a 50-percent spill will not be feasible at Lower Monumental because of gas levels in the forebay at Ice Harbor Lock and Dam (Ice Harbor). There was discussion on the flow and spill patterns. Lynn Reese stated that the Corps wants to go out and video tape each project and try to capture the range of spill versus what is being seen in the models. Discussion continued. Dan Katz stated that some spill pattern changes had been made in the model before funding was cut off. He stated that the project has not yet initiated those changes to see if they make any difference in the gas levels. It was determined that a divider wall investigation in the hydraulic model of Lower Monumental needs to be reinitiated as a line item for SCT.

3. Lower Monumental Tailrace Phase II. Dan Katz stated that Phase II is a study to determine whether a divider wall (of uncertain length) between the powerhouse and the spillway would be beneficial or not, and the possible relocation of the juvenile fish outfall. He stated that the goal is to obtain good juvenile fish egress and low gas levels in the powerhouse flows into the spillway. He stated there could be a trade off between divider wall length and how far the juvenile fish outfall would have to be relocated. Part of the study would be to observe the cost savings of not installing a divider wall and extending the juvenile fish outfall well beyond the influence of any powerhouse operation changes or the potential installation of a divider wall. He stated the divider wall could be necessary for the abatement of gas, so the divider wall issue could be completely separate of the juvenile fish egress issues. Lynn Reese stated that the flow levels have to be restricted because of the gas levels, not the bad eddies. There was discussion on the juvenile fish egress and gas issues at Lower Monumental.

Dan Katz stated that the main issue is that funding has been cut, and the project is on hold. Steve Rainey asked if these issues were important enough to try and find the money or if they could wait until 2004 money was available. Bill Hevlin stated that 2003 money is a done deal. If savings and slippage does not come in August, then SCT will take as much as $5 million out of 2004 budget to pay for what has not been paid for from the 2003 budget.

4. Studies needed at Lower Monumental. Bill Hevlin stated that it would be helpful to obtain a survival study at Lower Monumental under the 2004 operating schedule. The 2003 survival study had to be canceled. Paul Ocker asked if he was referring to a survival study on the project or spillway. Bill stated that it was needed on project

survival using radio telemetry fish to obtain specific route survivals and distribution. There was discussion on the upcoming release of fish into the spillbays at Lower Monumental. Paul Ocker stated that a project survival study at Lower Monumental should be added to the SCT agenda for 2004.

5. High Velocity Separator - High Fish Density Test. Fred Higginbotham stated that all funding for this project had been cut, and the project was on hold. He stated that the construction on the holding tanks (over the flume) had been started. Some of the logistics (to dip the gatewells) have been worked out for the operations at Lower Granite Lock and Dam (Lower Granite). The remainder of the project will be on hold until funding becomes available. It was determined that this high fish density test needs to remain on the SCT agenda as a high priority for 2004.

6. McNary Spill Pattern - Hoist Status. Jim Cain stated that there were some problems with hoists at McNary. He stated that the Corps obtained four new hoists last year. He stated that McNary now has 20 gate hoists and two crane operated bays. During the process of checking all the gates, it was determined that the force required to lift the gates was greater than what was anticipated. The four new hoists have been adjusted to enable the lifting of the gates. Because the crane was not designed to lift the load of the gate, spillbays 21 and 22 are not operable this year. The spill pattern was readjusted to compensate for the lack of crane usage. With the spill pattern change, it was found that Spillbay 12 was not functioning, so the new spill pattern is currently in temporary mode. McNary is being operated with three bays out. There was discussion on the current operation of McNary and the possible changes that could be made to the spill patterns. Jim stated that spill pattern is currently being initiated at the operator's choice. Discussion continued on the spill patterns at McNary. Dave Hurson stated that the spill pattern for McNary should to be formalized and sent to FPAC as soon as possible. There was discussion on the spill schedule and pattern at McNary. It was decided to develop a new spill pattern, analyze it, and send it to FPAC.

7. Little Goose Lock and Dam (Little Goose) Dissolved Gas Abatement Study (DGAS) Fast Track. Sean Milligan stated that all work progress on the DGAS fast track has stopped because funding has stopped. Sean stated that when funding stopped, all the Video Tracking System (VTS) work and overhead camera work (includes the die/confetti documentation) had been finished. He stated that his crew had not started work on any of the velocity transects between the powerhouse and spillway (will be used for measuring entrainment velocities or discharges).

Steve Rainey emphasized that Little Goose is the single biggest gasser in the river and does have poor juvenile fish tailrace egress. He stated that hopefully the divider wall/end bay deflector option (which helps juvenile fish egress), and gas could be looked at very closely in the action plan that the Walla Walla District is going to put together. The other option would be to look at the Removable Spillway Weir (RSW) option. The RSW would provide better juvenile fish egress than the divider wall/end bay

deflector option and would be a water quality and power benefit. Steve stated that there should be a high priority in 2004 for a spillway survival study at Little Goose. There was discussion on the divider wall/end bay deflector and RSW options at Little Goose.

Paul Ocker pointed out that a comparative survival study was done at Little Goose in the early 1990's. Discussion continued.

Bill Hevlin stated that there are several different options at Little Goose. He asked what studies needed to be conducted and should be on the list for SCT in 2004. Dave Hurson stated that there should be an Ice Harbor-style radio tracking study. There was discussion on the different studies that could be conducted at Little Goose to obtain valuable information. Sean Milligan stated that the continuance of model studies should definitely be on the list for 2004. Discussion continued on which studies were needed for Little Goose. Bill Hevlin stated that his summation of the whole Little Goose discussion is to go forward and continue with the modeling in 2004. Discussion continued.

8. McNary Snake Action Plan. Lynn Reese stated that there has not been much progress on the action plan since the last FFDRWG meeting. He stated that the team's intent is to pull together what needs to be done and where by the July/August timeframe.

9. Lower Granite Behavioral Guidance System (BGS) Location Shift and Ice Harbor RSW Concept Development. Lynn Reese gave an overview on the BGS shift at Lower Granite, Ice Harbor RSW work, and some (could not understand) work. He stated that funding is available for the BGS shift work at Lower Granite to complete approximately 30 percent of the plans and specifications level of design. He stated that some Computational Fluid Dynamics (CFD) modeling has been done on the BGS shift work.

Lynn stated that the Corps just received money to start the RSW effort at Ice Harbor. He stated that it is going to be very challenging in terms of what needs to be done. Serious plans and specifications need to be completed by this summer in order to make the spring of 2005 installation timeframe. Steve Pettit asked if the Corps was going to take a parallel side by side look at the RSW to see if it needs to be removable or not. There was discussion on what has been done so far on the RSW study at Ice Harbor and the differences between Ice Harbor and Lower Granite. Lynn Reese stated that the team is trying to take the work done at Lower Granite, develop a preliminary analysis summary, and recommend which applications of the Lower Granite RSW would be feasible for final designs at Ice Harbor. There was discussion on the tests that the Corps wanted to conduct on the Lower Granite model at Engineering Research Development Center (ERDC). It was determined that the Corps would like to conduct the same studies as last year using a curtain. Bill Hevlin stated that he would propose it to SCT.

Dan Katz stated that the trip to ERDC was going to be spent observing several of

the same things in both the Lower Granite and Ice Harbor models. He stated that the Corps would observe the BGS in both models, rudimentary RSW at the Ice Harbor model, and the existing RSW at the Lower Granite model. Dan showed a diagram of Lower Granite with BGS alignments that were tested at ERDC last year. He stated the Corps was in the process of developing similar tests that will be run on the Ice Harbor CFD and physical model this year. He stated that the diagram showed structural and velocity criteria. Dan showed a profile view of the BGS at Lower Granite and explained the different criteria on the graph. He explained that the graph shows the different configurations of testing on the BGS that was done at ERDC last June. There was discussion on the upcoming testing and past testing at the Lower Granite and Ice Harbor CFD and physical models.

Dan Katz stated that (while at ERDC) the Corps wants to cover the physical model in the forebay at Lower Granite, the new CFD results (with people from Iowa and CH2M Hill), review the CFD results, and discuss different configurations and operations for next year at Lower Granite. He stated that at the Ice Harbor model the Corps wants to cover something similar to Lower Granite's BGS and RSW to obtain information that will be helpful in the design and location of the RSW at Ice Harbor. There was discussion on the upcoming trip to ERDC and the different design concepts between Ice Harbor and Lower Granite.

10. Lower Granite RSW Study Update. Tim Wik stated that the RSW test at Lower Granite was started on April 14, 2003, and currently has a 46-day test planned. The U.S. Geological Survey (USGS) asked to have a few days added to that test so they could surgically tag their fish instead of gastrically tagging them. Tim stated that there are acoustic-tagged and radio-tagged fish in the water, and that the team will not be doing a hydro-acoustic test this year, mostly due to a lack of funding. The test conditions will be the same as last year [minimum operating pool (MOP)+1] to be consistent. Tom Lorz asked if the MOP+1 was for the test or for navigational purposes. Tim stated that last year the tests were run at MOP+1 because of navigational purposes, and his team wanted to conduct the tests under the same conditions. There was discussion on the MOP+1 conditions. Paul Ocker stated that the tow boat people had requested MOP+1, not the Corps. Discussion continued on the MOP+1 condition and the elimination of inconsistencies in the RSW test. Steve Pettit asked when the last testing date was. Tim stated that May 30 would be the last test day. Steve Pettit stated that they would be pushing to beat the peak runoff. He stated that the latest forecast for spring runoff is June 1. Tim explained how the testing has been conducted so far this year. There was discussion on the current testing. Bill Hevlin stated that SCT was going to have their meeting at Lower Granite on May 22 and asked if the RSW might be running that day. Tim stated that he did not have a schedule of which days would be RSW days. Tim stated that there was a draft report of last year's acoustic tag tracking available for distribution.

11. Lower Granite Kelts. Tim Wik stated that the Corps is doing similar work with the kelts as they did last year. He stated they are conducting a transport study (putting some fish on a barge and some back into the river) and Passive Integrated Transponder

(PIT)-tagging approximately 1,000 fish for each group. The Corps is also conducting the final year of radio telemetry study with approximately 200 fish. He stated that 212 in-river fish have been radio tagged and tracked via adult antennas all the way to the 205 bridge. There was discussion on the radio telemetry study.

12. Lower Monumental and Little Goose Emergency Auxiliary Water Supply (EAWS) Numerical Modeling Phase. Cary Rahn stated that this phase covered an alternative to the construction with a one pump redundant emergency standby pumping plan. Two years ago the Corps conducted some numerical modeling to achieve some alterations in the way the system was configured, intermediate standby modes for configuration of the fishways in the event of a lost pump, and preclude construction of standby pumping plants. He stated that the hydraulic design section and some computer-skilled people have reviewed the reports that were received, and comments have been sent back to the consultants. They have received a final version of the numerical models for Little Goose, Lower Granite, and Lower Monumental fishways. He stated that the consultants were able to keep the fishway in criteria over a fairly broad range of tailrace elevations using two of the three turbine pumps at Lower Monumental. Cary stated that even though the models are proving that operation is within criteria there may be something internally within the algorithims of the models that need to be further investigated and explained before the Corps can completely accept them. Cary stated that using the models should be a quicker way of determining some of the what-if scenarios in the fishways. He stated that most of the schedule is complete, and the final report was provided in-house in December 2002. The report has been reviewed, but had some software bugs that needed to be worked out. The evaluation of the models should be complete by June 30, 2003. When any discrepancies between the Corps' computational methods and the models are resolved, the Corps will proceed with the development of the position paper on whether to go forward with implementing the models as a standby gap measure for emergency operation or not. Cary stated that if all works well, the Corps could preclude the $6.6 million dollars that was budgeted in fiscal year 2002 for a standby pumping plant at Little Goose. Dave Hurson gave a history of the pump performance at Lower Monumental and Little Goose and stated that there was no real justification for the $6.6 million standby pumping plant. There was discussion on the numerical modeling of the EAWS at Lower Monumental and Little Goose. Bill Hevlin asked if there was funding to continue the modeling into 2004. Cary stated that there were limited funds for internal review. If the project goes out to a roundtable forum and the Corps brings in regional concerns, funds could run a little short. See appendix A, handout two, for program summary.

13. Ice Harbor EAWS - Sump and Gearbox Schedule. Cary Rahn stated that the Corps replaced the switchgear on the south shore in 2002. He stated that in December of last year the three fish pumps on the north shore were removed. He stated that two of three fish pumps are installed and operating. He stated that the Corps was in the process of installing the third pump and at approximately one third into the installation they ran into a construction deficiency. The contractor was put on hold for 2 weeks. There is currently a problem with the concrete cure strength. Cary explained where the concrete deficiency is located and the steps being taken to correct it. Cary stated that

even with the concrete problems, the Corps is still running the fish ladder within criteria. He stated that prior to the concrete curing problems the contractor was actually running ahead of schedule. A dry test was to be run on the third pump this week. The contractor had anticipated a 2-week delay and having the third pump on line by May 8. Cary stated that they are not impacting fish passage operation, but are still running without a backup pump. There was discussion on the problem with the third pump.

Cary stated that when the Corps was in the process of construction there were some additional concerns with the model tests that were done at the factory on the pumps. He stated that Larry Swenson went back to Florida with the Corps' hydraulic people, and some anomalies that did not look quite right were noticed. He stated that Northwest Hydraulic Consultants (NHC) provided the Corps with a final report on the sump modeling. Their tests indicated that there was some vortices present in the sump, pre-swirl was prevalent, and the big concern was the spatial distribution of the velocity within the pump column. Cary went over all the tests that NHC and the Corps ran on the sumps. He stated that they talked to some people at the St. Louis District that had worked with a formed suction inlet (FSI) and how the FSI might be utilized on the sumps that exist at Ice Harbor. The NHC went back and modeled the FSI and was able to completely eliminate the vortices, the pre-swirl, and there was only a slight problem with the velocity distribution (at 12-percent instead of 10-percent). He stated that rather than delaying the contract by trying to conduct sump modifications, they decided to proceed with the installation of the three pumps as they were designed. He stated that there have been no problems with the operations of the existing pumps the past 40 years. After reviewing a proposal provided by CH2M Hill, the Corps is proposing a budgetary estimate of $1.5 million to install three FSI at the sumps at Ice Harbor. He stated that he has requested some additional funds to install some vibration instrumentation on the new pumps for monitoring. There was discussion on the sumps. Larry Swenson suggested having a pump expert obtain some vibration measurements. Discussion continued. Bill Hevlin pointed out that there has been vortexing and vibration in the old pumps for the last 30-40 years. Cary explained the aspects of an FSI and discussion continued on the sumps.

Cary Rahn stated that, after the first two pumps had been installed and brought on-line (approximately 8 hours of operation), his team noticed oil running down the shaft. After researching the pumps, it was discovered that the pumps were designed to be used on an emergency-type basis (2 weeks) instead of a constant basis (24 hours/ 7 days a week). He stated that the pumps have an oil bath bearing that sits on a vertical shaft with a lip seal that slowly wears due to the rotating shaft. Cary stated that the project wants the bearings replaced with a seal-less, bath-type journal bearing. He stated that he had received an estimate of $275,000 to replace the bearings (2 bearings per pump). There was discussion on the leaking pumps and the bearing replacement. See appendix A, handout two, for program summary.

14. Lower Granite EAWS Modifications. Cary Rahn stated that construction is complete. The switchgear has been upgraded and is now state of the art equipment. The Falk gear reducer ran for approximately 8 hours and tripped off with an over

temperature indicator. He stated that he had called Falk out to the site and was given a list of things to do to repair the problem. He stated that Falk was told that the reducer was still theirs. It was discovered that the model number on the oil filter for the gear reducer is different than it should be. Cary stated that there are looking to see if the gear reducer might have a flow restriction issue.

Cary stated that the system is back and running with two existing pumps and is a more efficient, reliable system. Fish pump 1 is operating, but has some issues that need to be addressed. See appendix A, handout two, for program summary.

15. Ice Harbor and Lower Granite Adult PIT-tag Status. Cary Rahn stated construction has been completed on all three fish ladders. He stated that last week an issue arose on the upper detector on the Ice Harbor south shore. Pacific States noticed a noise in the transformer located inside the non-overflow section of the powerhouse. He stated that the project looked for loose connections and did some infrared scanning on the transformer (looking for arcing). The project people could not find anything wrong. Cary stated that it would be best to find $2,000 and replace the transformer. There was discussion on the transformer and funding to replace it. Cary showed and explained some pictures of the PIT-tag antenna stations. See appendix A, handout two, for program summary.

16. McNary, Ice Harbor, and Lower Monumental Spill Survival Study Updates. Mark Smith stated that all the equipment at Ice Harbor, McNary, and downstream has been installed for the radio telemetry study. Fish for the study are currently being tagged. The fish will be released on May 29, 2003. It has been coordinated with Ice Harbor to operate 2 days with Biological Opinion (Bi-Op) spill and 2 days with test spill (50-percent for 24 hours a day). The equipment for the hydro-acoustic study has been installed at Ice Harbor, and the study team began collecting data last week. The direct injury of the spillway balloon-tag study is currently beginning. Mark distributed copies of the final study plan from Normandeau Associates, Inc. (see appendix A, handout 3). Mark explained the fundamentals of the balloon-tag study. There was discussion on the results of the parts of the balloon-tag study that had already been done. Mark stated that the study design for Ice Harbor is a good one and is running smoothly. Steve Rainey asked that they keep track of the adult fish count for both study treatments at the north shore antenna.

Mark Smith stated that the radio telemetry equipment at McNary has been delivered and installed, and the study is currently waiting for fish. There was a short discussion on the elements for the radio telemetry study at McNary.

The next FFDRWG meeting was set for July 23 and 24, 2003, at McNary.

APPENDIX A

(1)

FFDRWG Agenda
Walla Walla District COE
April 23-24, 2003

23 April 2003

1130 - Lower Monumental Barge Loading Flume - Done. (Katz)

- Dewatering Concept Design Kickoff.

- **Lower Monumental Deflectors and Stilling Basin Repair -Done. (Katz)**
- **Lower Monumental Tailrace Phase II - on hold. (Katz, Smith)**
- **High Velocity Separator - High fish density test on hold. (Higginbotham)**
- **McNary Spill Pattern - hoist status. (Cain)**
- **Little Goose D-Gas Fast Track (Milligan, Emmert)**
- **McNary Snake Action Plan (Reese, Kalamasz)**
- **Lower Granite BGS Location Shift (Crum, Katz, Wik)**
- **Ice Harbor RSW and BGS Concept Development (Crum, Katz, Wik)**

24 April 2003.

0800 - Ice Harbor Adult PIT - status. (Rahn)

- **Lower Granite Adult PIT - status (Rahn)**
- **Ice Harbor EAWS - sump, gearbox, schedule (Rahn)**
- **Lower Monumental and Little Goose EAWS (Rahn)**
- **Lower Granite EAWS (Rahn)**

STUDY UPDATES

- Lower Granite RSW (WIK)
  - RT 3-D acoustic
  - Fish behavior modeling (Goodwin).
- -Lower Monumental - RT.
- -Ice Harbor - RT, PIT, Hi-Z, HA.
- -McNary - RT. (Smith)
- -Lower Granite - Kelts and Juvenile (Wik)
- -McNary and Lower Granite Transport (Ocker, Kalamasz)

Handout 2 – Cary Rahn's Overhead Presentation

Fish Facility Design Review Work Group
Walla Walla District
April 24, 2003

Lower Monumental /Little Goose Emergency AWS- Numerical Modeling

Issues:

- Proof testing and validation of the numeric hydraulic model. Agency concurrence with the 2 pump operation, along with exceedance curves and acceptable risks.

Budget Estimate:

- $6.6M for new pumping plant. Possible to reprogram funds to replace aging equipment with some upgrade in pumping capacity.

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Walla Walla District
April 24, 2003

Ice Harbor and Lower Granite Adult PIT Tag

Schedule:

• Start Construction (Demolition IH North)	9 December 2002
• Demolition Lower Granite	2-7 January 2003
• Weir Installation Lower Granite Complete	31 January 2003
• Weir Installation IH North Complete	21 February 2003
• Demolition IH South	27-31 January 2003
• Weir Installation IH South Complete	16 February 2003
• Complete Construction	7 March 2003

Issues:

- Source of RF noise located – Transformer – Investigating cures

Contract Amount:

$ 994,917 (original award)
$1,073,647 (current)

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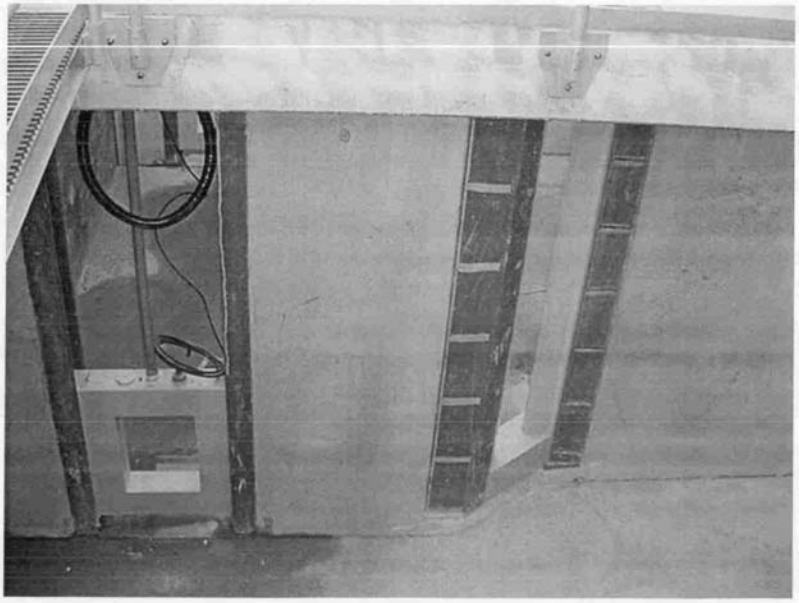

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Lower Monumental /Little Goose Emergency AWS- Numerical Modeling

Status:

- Numerical Models 100% - Reviewed by COE in January-February 2003.
- Models indicated that Fishway hydraulic conditions remain in criteria over a fairly broad range using 2 of the 3 turbine pumps and closing one entrance and one diffuser.
- COE personnel are reviewing Models and Reports in parallel with other adult fishway studies under current development. Will use results from both studies to provide quality assurance checks.
- Scintillation flow meters may need to be utilized for additional data collection to reconcile differences between the two modeling approaches.
- Scintillation flow meters provide precise measurements of hydraulic characteristics in the fishway channel.
- If warranted COE will continue with verification of model this spring with physical measurements of fishway criteria at high flows utilizing the scintillation flow meters.

Handout 2 – Cary Rahn's Overhead Presentation

Fish Facility Design Review Work Group
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April 24, 2003

Ice Harbor Emergency Auxiliary Water Supply

Status:

- Two pumps installed and operating. Pumps brought on line 2 March 2003.
- Third pump installation in process. Concrete strength and curing issue.

Scheduled for completion 1 May. Delay due to concrete strength pushes 3rd pump completion back to 14 May.

Handout 2 – Cary Rahn's Overhead Presentation

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Ice Harbor Emergency Auxiliary Water Supply

Sump Issues:

- Final Report on AWS sump modeling received.
- Tests indicate sump is susceptible to sub-surface vortices, pre-swirl angles and spatial and temporal velocity distributions slightly in excess of performance criterion.
- Minor surface vortices observed in field, as predicted in hydraulic model.
- CH2MHill provided Technical Memorandum with proposed modifications to the sump configuration to eliminate/reduce hydraulic anomalies. COE concurs with technical aspects, recommends use of an arched bulkhead for construction access.
- Budgetary estimate stands at $1,550,000. (FY03 dollars)
- Requesting funds for additional new work this FY to provide instrumentation on new pumps to monitor vibration. Data collection will allow for analysis of subsurface conditions and help us determine if sump modifications are necessary.
- Will need to consult with NMFS regarding the scheduling of construction if sump modifications are necessary.

Handout 2 – Cary Rahn's Overhead Presentation

Fish Facility Design Review Work Group
Walla Walla District
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Ice Harbor Emergency Auxiliary Water Supply

Bearing Issues:

- Oil lubricated bearings with lip seals installed per contract.
- Seals began to leak within 8 hours of operation. COE concerned with installation methods.
- Research of installation practices and correspondence with seal manufacturer indicated that lip seals have an expected life of 2.2 years under this application.
- Further research indicated that the specification utilized for this project was intended for pumping plants in a standby mode, not full time service.
- Existing bearing/lip seal combination needs to be replaced with seal-less bearings of the journal or sleeve-type utilizing an oil bath lubrication.
- Budgetary estimate stands at $275,000. (FY03 dollars)
- Requesting funds for new work in FY04 to design and construction contract to replace the existing bearings and seals on the 3 pumps.
- Will need to consult with agencies regarding the scheduling. Prefer to perform construction during summer months.

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Walla Walla District
April 24, 2003

Ice Harbor Emergency Auxiliary Water Supply

Schedule:

• Physical Model Test Results	December 2002
• Technical Memorandum of Sump Modifications	January 2003
• Phase 1 - Install Derrick Crane	Aug-Sept 2002
• Phase 2 - Install Pump #1 and Pump #2	Dec 2002-Feb 2003
• Phase 2 - Install Pump #3	Mar-Apr 2003
• Complete Construction	May 2003

Issues:

- Concrete Strength
- Bearing Replacement
- Future Sump Modifications

Contract Amount:

$5, 601,941 (original award)
$6, 210,793 (current)

Handout 2 – Cary Rahn's Overhead Presentation

Fish Facility Design Review Work Group
Walla Walla District
April 24, 2003

Lower Granite Auxiliary Water Supply Modifications

Status:

- Construction complete
- No problem with delivery of switchgear as issue was raised back in January.
- All new swithgear installed, oil heaters installed and gear reducer for Fishpump No. 1 replaced.
- Fishway System operating on Fishpumps No. 2 and No. 3.
- Fishpump No. 1 experiencing overheating during initial days of operation. Contractor has been notified. Issue may be tied to improperly sized and installed oil filters on the gear reducer.

Handout 2 – Cary Rahn's Overhead Presentation

Fish Facility Design Review Work Group
Walla Walla District
April 24, 2003

Lower Granite Auxiliary Water Supply Modifications

Schedule:

- Start Construction — December 2002
- Complete Construction — March 7, 2003

Contract Amount:

$ 773,800 (original award)
$ 788,800 (current)

Handout 2 – Cary Rahn's Overhead Presentation

Fish Facility Design Review Work Group
Walla Walla District
April 24, 2003

Ice Harbor and Lower Granite Adult PIT Tag

Status:

- Construction complete on all three ladders. Demolition phase complete at Lower Granite and Ice Harbor North Shore.
- Thanks to the agencies for the extended outage on the south ladder (27 January through 16 February 2003) to allow coordination of several contracts.

(3)

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16 April 2003

Mr. Mark Smith
U. S. Army Corps of Engineers
Walla Walla District
201 North Third Avenue
Walla Walla, Washington 99362

Re: Updated testing plan, Ice Harbor spillway (Contract DACW68-02-D-0002, Task Order 0006)

Dear Mark:

Based upon several telephone conversations with you, Mr. Tim Wik, and Mr. Tom Carlson, Normandeau Associates is providing you an updated testing plan in regards to the Ice Harbor spillway investigation to commence the week of 20 April 2003. Outlined below are our reasons for, and corresponding revisions to the Technical and Cost Proposal submitted to Ms. Phyllis Buerstatte on 21 February 2003.

- **Introduction:** After observing the Ice Harbor model in Vicksburg, Mississippi, the Corps requested that the initial study be modified to ascertain fish survival and conditions passing a spillbay with skimming or plunging flow. The model indicated that during typical spring time river discharges (70 to 100 kcfs), a skimming pattern was evident at a 50% spill rate and plunging pattern with 100% spill.
- **Study Objectives:** The objective of this study is to obtain estimates of direct spillway survival/ injury utilizing the HI-Z recapture technique for juvenile salmon passing Ice Harbor Dam under two conditions/discharge levels, 50 and 100% spill. The direct survival estimates are to be within a precision of ±3%, 90% of the time.
- **Study Design:** There are two primary components, which affect fish using any exit (passage) route: direct and indirect effects. Direct effects are manifested immediately after passage (*e.g.*, instantaneous fish mortality, injury, loss of equilibrium), indirect effects (*e.g.*, predation, disease, physiological stress) may occur over an extended period or distance after passage. The proposed study will estimate direct effects of passage by introducing a known number (predetermined statistically) of HI-Z tagged live fish into Spillbay 5 (treatment), recapturing them immediately after passage, enumerating the alive and dead fish, and then carefully examining the condition of each fish. Normandeau will follow the same HI-Z tag assessment procedures utilized at other Columbia Basin Dams to determine the direct survival/condition of spillway passed fish.

  Treatment fish will be accompanied with the release of control fish downstream of the spillbay discharge likely from Spillbay 1. We are proposing that up to five sensor fish be initially released through the control site to ascertain the hydraulic conditions. Should non-typical (turbulent) conditions exist, the control release site will be adjusted as necessary.

We propose that the study be conducted at water temperatures <14.0°C (≤57°F) to minimize losses of experimental fish to predation by piscivores, particularly northern pikeminnow. Additionally, Normandeau requests that the Corps enlist the U.S. Department of Agriculture to disperse gulls should they pose a threat to study fish.

Juvenile salmonid smolts used in the study will be obtained from a hatchery. Fish will be transported from the hatchery via truck to the study site and held in tanks with 200 or 600 gal capacity. The fish transport tank will be equipped with a recirculation system and supplemental oxygen supply. All fish holding tanks/pools will be supplied continuously with ambient river water and equipped with degassing units (if necessary). Fish will be held a minimum of 24 h prior to tagging to alleviate handling and transport stress, and to acclimate them to ambient river conditions at Ice Harbor. Per the request of Mr. Mark Plummer, Ice Harbor Project Biologist, Normandeau will monitor any test fish held at Ice Harbor 24 h per day.

Because the 100% spill condition is scheduled for evening through night hours (1800 to 0600 h), there will be limited (approximately 2 h) daylight to conduct this test condition. Consequently, we estimate that approximately 60 fish can be released per day for the 100% spill condition; typically we release 120 to 150 fish per day.

- **Sample Size Requirements:** Based on previous studies, we estimate that approximately 300 fish per treatment release should be sufficient. This number assumes study results will be close to 98% control survival, recapture rate of 98%, and expected passage survival of 97%. This should be sufficient to attain a prespecified precision level (ε) of ≤±3%, 90% of the time. We project that approximately 600 treatment (300 at 50% spill and 300 at 100% spill) and 300 control fish will be needed.

  Past experience has suggested that the sample sizes can be adjusted as a study progresses because the results are available daily. If recapture and control survival rates are higher than initially assumed, the sample size can be reduced or reallocated. Conversely, if the values of these parameters are lower than initially assumed, then the sample size must be increased to achieve the prespecified statistical precision.

- **Release Conditions:** Two treatment fish release pipes will be utilized in Spillbay 5, along with a pipe to release control fish into the tailrace. This procedure was followed at The Dalles Dam spillway evaluation in the fall of 2002 and is also planned for the spring of 2003. At each release site a 4 in diameter flexible hose will be threaded through a 6 in diameter steel pipe. The terminus of each treatment release hose will be secured within a 6 in sweep elbow oriented downstream. Each treatment steel support pipe will be positioned and secured with guide wires and/or brackets to ensure it remains at the desired depth, does not rotate, or is drawn toward the spill gate. The two treatment release hoses will be in the middle of the spillbay and the terminus of one hose will be near the middle and the other near the top of the opening below the tainter gate. The two pipes will be positioned 3 ft and 7 ft above the ogee.

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- **Survival Estimation and Data Analysis:** Passage survival probabilities for the two discharge conditions, 50% (skimming) and 100% (plunging) spill, will be estimated relative to the control fish survival. The two treatment conditions and one control condition will be simultaneously analyzed and modeled by joint likelihood. A likelihood ratio test will be used to determine whether recapture probabilities are similar for alive (P_A) and dead (P_D) fish.

  The statistic tests the null hypothesis of the simplified model (H_O:P_A=P_D) versus the alternative of the generalized model (H_A:$P_A \neq P_D$). Depending upon the outcome of this analysis for the 1 h survival the parameters and their associated standard errors will be calculated using that model.

  Chi-square analyses will be performed for homogeneity (P=0.05) in each daily treatment release with respect to recapture probabilities of alive, dead, and non-recovered fish. Test of homogeneity (P=0.05) between individual control trials will also be performed using the chi-square test.

  Differences in survival between the two discharge conditions will be tested, *a posteriori*, by log likelihood statistics. The 90% confidence intervals on the estimated survival will be calculated using the profile likelihood method.

- **Sensor Fish Deployment and Retrieval:** Under a separate Task Order, sensor fish will be passed through the treatment and release pipe at the two discharge conditions. Normandeau will provide assistance in the tagging and retrieval of the sensor fish. We anticipate that up to 66 sensor fish will be released (see attached table) using the HI-Z methodology.

- **Schedule:** The proposed revised testing schedule is presented in the attached table.

An initial safety meeting has been scheduled with Mr. Mark Plummer at 0800 h on 22 April. If you need additional information, or have any questions, please do not hesitate to contact me. Thank you for your consideration in this matter. We look forward to conducting this study for the Corps.

Sincerely,

Paul G. Heisey
Sr. Fisheries Scientist

PGH/cll

Attachment (Table)

cc: G. Nardacci, D. Mathur, R. McDonald, J. Fulmer, S. Adams (Normandeau)
T. Wik (Walla Walla District, ACOE)
T. Carlson (Battelle)
Project File 18880.006

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U.S. Army Corps of Engineers, Walla Walla District
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Attachment

Tentative fish (sensor fish) release schedule at Ice Harbor spillbay.

Date[1]	Spill Rate	Spillbay 5[3]		Control[4]	Total
		Pipe 1 (shallow)	Pipe 2 (deep)		
23 April (evening)	100%[2]	20 (2)	20 (2)	20 (1)	60 (5)
24 April (evening)	100%[2]	20 (2)	20 (2)	20 (0)	60 (4)
25 April (evening)	100%[2]	20 (2)	20 (2)	20 (0)	60 (4)
26 April	50%	50 (5)	50 (5)	50 (1)	150 (11)
27 April	50%	50 (5)	50 (5)	50 (1)	150 (11)
28 April (evening)	100%[2]	20 (2)	20 (2)	20 (1)	60 (5)
29 April (evening)	100%[2]	20 (3)	20 (3)	20 (0)	60 (6)
30 April	50%	50 (5)	50 (5)	50 (1)	150 (11)
01 May	50%	--- make up day, if needed ---			
02 May (evening)	100%[2]	25 (2)	25 (2)	25 (1)	75 (5)
03 May (evening)	100%[2]	25 (2)	25 (2)	25 (0)	75 (4)
		300 (30)	300 (30)	300 (6)	900 (66)

1) evening would be approximately 1800 to 2000 h.
2) expected to be 60 to 80 kcfs with a maximum of 100 kcfs.
3) Pipes will be positioned with the terminus 7 ft (shallow) and 3 ft (deep) above the ogee.
4) Controls released downstream of discharge from Spillbay 1; will release sensor fish initially through the control pipe to determine if hydraulic conditions are benign.