

DRAFT - Meeting Summary Notes
Lewis River License Implementation
Engineering Subgroup
September 27, 2007
Fish Passage Meeting Notes

Subgroup Participants Present: (12)

Will Shallenberger, PacifiCorp
Todd Olson, PacifiCorp
Arnold Adams, PacifiCorp
Frank Shrier, PacifiCorp
Bryan Nordlund, NOAA Fisheries (NMFS)
Jim Stow, USFWS
Dana Postlewait, R2 Resource Consultants
Peter Christensen, R2 Resource Consultants
Brian Friesz, Black & Veatch
Ken Bates, Kozmo
Monty Nigus, Black & Veatch (Via phone & Net Meeting)
Dennis Anderson, Black & Veatch (Via phone & Net Meeting – Merwin discussion only)

ADMINISTRATIVE

Welcomed attendees and reviewed agenda. Frank Shrier updated the group on the status of the FERC license. The NMFS Biological Opinion was submitted to FERC on August 27th. PacifiCorp is anticipating a long FERC review period as the FERC staff is extremely busy. At this point, they are anticipating a license issuance around January 2008.

General Meeting Handouts:

Distributed via email on 9/20/2007 by Kim McCune:

- Meeting agenda for 9/27/2007 subgroup meeting
- Copies of the 8/17/2007 subgroup meeting notes with suggested edits by Bryan Nordlund

Distributed at meeting 9/27/2007 (paper copies):

- Meeting Agenda for 9/27/2007 meeting
- Copies of the 8/17/2007 subgroup meeting notes with suggested edits by Bryan Nordlund

FUTURE MEETING DATES

It was confirmed that the November meeting was changed from November 7 to November 2, 2007 at the Merwin Office at 9:00 AM. The following meeting date of December 19 remains unchanged for now, however there was discussion about potentially holding the December meeting at some later date at the hydraulic model lab in Seattle in conjunction with a visit to the Merwin Tailrace physical model, but there was no resolution concerning this suggestion. PacifiCorp will update this meeting date at the next meeting in conjunction with the hydraulic model program schedule.

MERWIN TRAP PROJECT

Handouts

- Merwin Trap Design Tailrace Physical Hydraulic Model Study Plan – for Engineering Subgroup Review - Updated 9/18/07
- Merwin Upstream Trap Draft Study Plan – September 2007

Presentations

- Review of work-in-progress sorting facility flow diagram.
- Review of work-in-progress attraction flow pump station intake rack velocities.

Review of Previous Meetings’ Merwin Action Items: See status summary table below.

No.	SUMMARY OF PENDING MERWIN ACTION ITEMS (remaining from previous Meetings)	STATUS
M37	PacifiCorp (Adams) Revise and distribute a new milestone design schedule by the next subgroup meeting.	This item will be ongoing and will be removed from the action item list as there will be routine updates with significant changes.
M40	PacifiCorp/B&V/R2 (Adams, Nigus, Postlewait) Continue development of trap and water supply options.	Today’s topic. Ongoing.
M45	Black & Veatch/R2 (Nigus/Postlewait) Start work on a construction staging schedule and present findings to the group for discussion at next Subgroup meeting.	Today’s topic. Ongoing
No.	SUMMARY OF NEW MERWIN ACTION ITEMS (from August 17, 2007 Meeting)	STATUS
M49	PacifiCorp (Shrier) will finish preparing fish run timing graphs for the Merwin trap and Lewis River hatchery ladder for presentation at the next ACC and Subgroup Meetings to support the Plan A and Plan B trap construction outage windows.	Complete 8/29/07

M50	PacifiCorp/R2/B&V (Olson/Postlewait/Nigus) Update model study plan to indicate the phased approach, and email to the subgroup for review. Indicate PacifiCorp's desired action for use of the physical hydraulic model assuming the model will support agency approval of the phased trap proposal.	Today's topic, complete with distribution of model study plan.
M51	PacifiCorp/R2 (Shrier/Keefe) Continue development of and publish a draft trap evaluation study plan for ACC and subgroup review.	Today's topic, complete with distribution of draft study plan.
M52	R2/PacifiCorp (Postlewait/Shrier) Confirm number and species of fish identified for the fish return tube, to help the team evaluate trucking fish to the boat ramp instead.	Today's topic, complete. See discussion.
M53	NMFS (Nordlund) Discuss the feasibility of trucking non-target/non-transport fish downstream (instead of returning them to the river by flume) with Michelle Day.	Complete.
M54	PacifiCorp (Olson/Shrier) Discuss trucking non-target fish downstream with the ACC.	Complete.
M55	Black & Veatch (Nigus) Quantify velocities and flows at the pump station intake for various design conditions to help the subgroup discuss barrier rack criteria.	Today's topic, complete. See discussion.

Additional Comments on Last Meeting's Merwin Notes:

- The group discussed Bryan Nordlund's suggested edits to the last meeting notes, under the Phased Trap Proposal heading. The goal was to help define desirable characteristics of the attraction flow relative to the turbine flow. The group agreed that dye tests in the model would be very helpful to observe flow from the trap entrance, and that variables of the testing would include: amount of flow, angle of flow, and potential benefits of a deflector wall. Avoiding back-rollers against the dam or other confusing flow patterns, and having a clear flow path into the entrance that fish could sense is the overriding goal. There will be some judgment involved in determining the best configuration, based on experience with hydraulic design and modeling, and the subgroup members will be able to participate in and witness the flow tests with the model.

It was agreed following this discussion that the sentence: "Nordlund noted that the hydraulic model results must demonstrate the efficacy of any proposed design attraction flow penetrating past the tailrace turbulence for the range of project operations" will be edited to read "Nordlund noted that the hydraulic model results must demonstrate that flow is sufficient to attract fish into the entrance over the range of project operations".

- Other than the edit noted above, the notes are ready to be finalized incorporating the other comments suggested by Bryan.

MERWIN TRAP AGENDA TOPICS

Tailrace Physical Hydraulic Model Study Plan.

Dana Postlewait handed out the final study plan for the model, dated 9/18/07, and briefly discussed the changes since the last meeting. The most notable change is the structuring of the model runs into two phases. Phase 1 is structured as a development phase, with multiple, iterative runs intended to converge into the most desirable layouts for the Corner Trap and Powerhouse Face trap entrances. This phase will also address the attraction flow pump intake configuration, and its potential interaction with the trap. The Phase 1 work will be performed iteratively with the agency representatives, who are welcome to attend testing throughout this phase. Phase 2 will provide for limited documentation runs which the subgroup will agree on following Phase 1 development and witness testing.

The group discussed the Phase 1 tests, and noted that the trap entrance should be made as a modular section, that could be modified or reconfigured quickly during testing. Jim Stow also requested that the lab have materials readily available so the team could evaluate numerous configurations quickly, which Dana noted is part of the current plan.

The schedule was also discussed, noting that much of the Phase 1 model activity is planned from mid-December to later in January, which may overlap with individual's vacation and holiday schedules. Dana noted that there should be sufficient float built into the schedule, but the team agreed to closely monitor model actions, and to communicate schedules in advance to accommodate everyone's planning and travel needs. The model work will be performed in NHC's Seattle lab.

Comments on the study plan were requested from subgroup members within one week if possible, as PacifiCorp is planning on issuing a Notice-to-Proceed to Northwest Hydraulics Consultants (NHC) to begin design and construction of the model.

Water Flow Diagram

Arnold Adams presented a draft water flow diagram that will define supply and drain water for the fish sorting facility. Monty noted that this is a work in progress, which will be updated for the next meeting. The purpose of displaying this diagram at this time is to solicit input from the group. Noted discussion points included:

- The water supply for the sorting facility will be first-pass water, pumped from the tailrace.
- Dana handed out a spreadsheet summary table showing how design flows were calculated for each project feature last year. This table will be updated and provided along with the flow diagram in the future, once the design has progressed to a point it's ready for full subgroup review and approval.

- The drains for the truck during water-to-water transfer (fish loading) are proposed to be tight-lined into a system drain, which would be discharged to the river. This drain would be provided as it would avoid mixing with any oil or debris off the truck in the storm drain system. The group agreed with this approach, which is different than the prototype facility at Cowlitz Salmon Hatchery. It will require an extra step for the truck operator to connect the drain line into the tight-line drain.
- A separate storm water line with an oil-water separator will be provided for collection of surface water flow. There is the potential for a truck to be drained into the surface drains, should an operator forget to attach the tight-line, or need to dump a load of water at the site for some reason. In order to not exceed the design flow capacity of the oil-water separator, it was proposed to provide a large underwater vault with an orifice plate that could accommodate at least one full fish truck full of water. Sizing and details of the vault, oil water separator, and flow release rates will be developed.
- The group discussed whether or not the sorting facility main drain should be discharged into the fish trap as attraction flow. The chart currently illustrates the design team's intent to utilize about 7 cfs of drain flow for the trap entrance flow, by tying into the existing hatchery effluent drain line. Concerns were discussed regarding whether this flow would help to attract either wild or hatchery fish, or if this could be a deterrent due to fish stress which may release chemicals in the water that could repel fish, and odors associated with peoples hand working in the water, etc. Because it is hard to predict this effect prior to construction, the team will proceed with the design to allow use of this flow, or to simply discharge it to the river by use of a diversion valve.
- At a minimum, drain flow associated with the anesthetic tank, and the biological sampling stations should be separated from the overall facility drain that could potentially be used for the attraction flow.
- Waste from the biological sampling station that could contain blood, body fluids, eggs, etc. should be routed to a sanitary septic system or holding tank for transport to a commercial waste treatment facility. Further development on expected flows will be provided as the design progresses.
- Flexibility shall be maintained to allow use of the hatchery effluent via a valve to the attraction flow.
- The need for flexibility means that the pump station supplying the attraction flow to the trap entrance should be designed such that if the hatchery or sorting station effluent is used for the attraction flow, the turbine driven pumps could be throttled down to maintain the desired total attraction flow.

Trap Outage Window and Construction Schedule Estimate

Frank Shrier and Todd Olson briefed the group on their meeting with the ACC, which Bryan Nordlund also attended.

- The ACC has approved an outage window for the purposes of construction of July 1 to December 31st, which will avoid any collection impacts to spring chinook.

- As the design team develops the design details and the construction schedule can be more accurately estimated, we should report back as to whether or not we feel we can work within this schedule. An initial look by Black & Veatch schedulers indicates that double shifting and other such measures will be necessary to meet this window. Arnold Adams indicated that he is concerned about the need to double shift, and would prefer a longer window to avoid extra measures which increase risk of not completing the construction in time.
- There may be some flexibility to extend the outage window, but if it is needed it should only be planned as an extension to the December 31st date. It could not start earlier than July 1, as this is the tail end of the bell curve to collect spring chinook. In no case should the team consider extending the outage window into March, the longest possible extension should end by February 28th.
- In any case, the design team should work to minimize the necessary outage window of the Merwin Trap entrance. The concern being addressed is the need to remove hatchery fish from the wild fish spawning grounds in the river. The ACC is working together to explore the possibility of increasing the daily bag limit for hatchery fish so that fishermen would help to remove these fish from the spawning grounds. Bryan Nordlund asked if there is a pre-season estimate on return sizes, which Frank indicated there is a robust monitoring program. The ACC should be able to monitor runs real time and work together with the design team and contractor during construction to minimize impacts to the collection of spring chinook.
- The design team will continue to update the schedule as design details are finalized and will report back to the group.

Fish Release Pipe to River vs. Transport

Frank Shrier reported that he and Dana had reviewed the fish numbers expected to use the return-to-river tube, and that there was adequate large tank capacity to collect these fish and transport them downstream with the recycle fish. He confirmed this approach with the ACC, and it was agreed that no fish return tube is necessary at the facility. The monitoring program will pay attention to what fish are actually collected needing transport, and how this approach is working, but no additional facilities are needed or anticipated at this time that would affect the design.

Attraction Pump Station Intake Rack Velocity and Design Details

Arnold Adams and Monty Nigus presented a sketch showing their analysis of pump intake rack velocities at the planned Unit 4 pump station intake. The group discussed options as listed below, and agreed to the following design criteria:

- WDFW has reported that they have observed 2” to 4” (51mm to 102 mm) fish in the existing trap.
- Bryan noted that we should target a maximum 1 fps approach velocity at the bar rack, which has been shown in stamina studies (Smith & Carpenter, 1987) to protect fish in the 78 mm range.

- Frank noted that the ACC doesn't expect large numbers of juvenile fish in this area, and that a 1 fps approach velocity would be no concern to adult fish.
- Because few juvenile fish are expected at this location, the group agreed that a 1-inch clear spacing of the bar rack would be adequate, with a maximum 1 fps velocity across the gross area. A 1-inch spacing would be easier to maintain considering debris than a finer spaced rack.
- Monty indicated a rack location that would meet these conditions, even when allowing a 10% reduction of gross rack area to account for structural members.
- Monty also proposed setting the top of the bar rack just below the low design tailwater flow, and providing a solid plate above the rack that would help prevent floating debris at higher tailwater conditions from collecting on the rack. Because there is sufficient area to accommodate this plate, the group agreed that this would be desirable.
- Bryan Nordlund brought up the concern for handling debris at the face of the rack and potential accumulation of sediment behind the rack. He suggested the team consider design details that would allow access behind the rack to clean out any accumulated sediment, and to consider provisions for mechanical cleaning of the rack. Experience will show the necessary frequency of cleaning.
- Back-flushing via reverse flow will be examined for cleaning, as will other methods as the design progresses. Access to the intake area behind some type of bulkhead will also be examined that would allow sediment removal if this is a problem.
- Use of remote underwater cameras was also discussed for an annual inspection of the rack and intake area.
- Additional detail will be provided at the next meeting.

Tailrace Fish Behavior Study Plan

At the previous meeting Frank Shrier presented a detailed outline of the proposed study plan that will support the phased trap proposal. He also presented this same outline to the ACC, who agreed with the Study approach and will provide further comments at the November 12, 2007 ACC meeting. At this meeting Frank handed out the written Merwin Upstream Trap Draft Study Plan, September 2007, for review.

Frank requested comments on this plan by the next meeting.

No.	SUMMARY OF PENDING MERWIN ACTION ITEMS (remaining from previous Meetings)	STATUS
M40	PacifiCorp/B&V/R2 (Adams, Nigus, Postlewait) Continue development of trap and water supply options.	Pending, Ongoing
M45	Black & Veatch/R2 (Nigus/Postlewait) Continue analysis of a construction staging schedule following further design development. Goal is to define necessary trap outage window.	Pending, Ongoing
No.	SUMMARY OF NEW MERWIN ACTION ITEMS (from September 27, 2007 Meeting)	STATUS
M56	Agency representatives (Stow/Nordlund). Provide any comments to the physical hydraulic model study plan to PacifiCorp by October 5 th .	Pending – due date of Oct. 5 th requested
M57	Black & Veatch/R2 (Nigus/Postlewait) Provide updated flow diagram and water load analysis spreadsheet once this work task is complete.	Pending
M58	Black & Veatch/R2 (Nigus/Postlewait) Provide update design concepts for attraction flow pump station intake and bar rack.	Pending
M59	Agency members of subgroup (Nordlund/Stow/Kinne). Review and provide any comments on the Merwin Upstream Trap Draft Study Plan, dated September 2007, by the next meeting.	Pending

SWIFT DOWNSTREAM PASSAGE PROJECT

Swift Downstream Passage Handouts

- Plan and Profile Drawings of Revised Fish Separation and Distribution Flume System for the Swift FSC Design (Two 11x17 drawings)
- Travel Summary Memorandum detailing the information gathered during a site visit to the Cowlitz Falls fish facilities on April 23, 2007

Presentations

- None.

Additional Comments on Last Meeting's Action Items List

- None. Notes can be made final.

Review of Previous Meetings' Swift Action Items: See status summary table below.

No.	SUMMARY OF PENDING ACTION ITEMS FOR SWIFT (remaining from previous meetings)	STATUS
S34	NMFS, WDFW, USFWS (Nordlund, Leigh/Klavas/Kinne/Stow) Provide feedback on the net/curtain arrangements presented today for discussion at the next meeting.	Pending – see Note 1 below
S35	PacifiCorp (Shallenberger) Direct NHC to complete a CFD run using both a north-only discharge from the FSC while factoring in the effects of a constant average wind. This CFD run is not to include the effects of the nets at this time.	Done – PacifiCorp will forward the results of this CFD run – see Note 2
S36	R2 (Postlewait) Contact John Serl and Mike Kohn at Cowlitz Hatchery to get feedback on their experience with the depth of their holding tanks. Do they have problems with fish jumping out, or other concerns for the adult fish in 3' of water?	Done – The adult tank at Cowlitz is 2' deep and John Serl said he felt it would be hard to deal with the fish if the tank was too much deeper.
S37	PacifiCorp/R2 (Shallenberger/Christensen) Compile a matrix of comment responses for comments received on the 30% design.	Done

1. Bryan noted that other than the comments he made during the July 10 meeting (including lengthening the south guide nets and moving its shore anchor upstream to create more of a guiding angle) he did not bring the drawings with him and was not prepared to discuss the nets. Jim noted that he was not at the July 10 meeting and does not believe that he ever saw the net drawings. PacifiCorp agreed to resend that drawings from the July 10 meeting to Bryan and Jim and discuss them again at the next meeting. Jim noted that partial depth nets never worked at Baker and they eventually went to full

depth nets. Frank pointed out that the primary species at Baker are Sockeye and that they may not be representative of the fish behavior at Swift. Will and Ken said that it did not seem like a good idea to commit to the cost of full depth nets before we learn information in the field at Swift with partial depth nets.

2. Jim asked why the nets are not included in the CFD model. Will explained that as discussed at the July meeting the reservoir velocities are so low, and there are already enough questionable aspects associated with the CFD results, that not much concerning the design of the nets would be learned by placing them in the model. Instead it seems better to use the CFD results without the nets to develop the best first iteration at a layout and design enough flexibility into the design that the nets can be reoriented.

SWIFT DOWNSTREAM AGENDA TOPICS

Responses to NMFS comments on 30% Design Report

Bryan said that he felt the PacifiCorp responses covered the NMFS comments and he was satisfied with the responses. Jim Stow also reported that he has no further comments.

Floating Surface Collector (FSC) Update – Revision to Sorting Area Layout

PacifiCorp distributed drawings of the revised separator and flume layout in the sorting area of the FSC. Peter Christensen explained that the revisions from the layout provided in the 30% design report were based on a general rethinking of the efficiency of the flume layout and a site visit to the Cowlitz Falls fish facilities at which the operating conditions were measured. Copies of the site visit summary memorandum were provided to Bryan and Jim. The revisions were described as follows:

- The fry separator length was reduced by just about 2 feet. The original length was based on the Cowlitz design which allowed for rotation of the separator panel so it could be used as a wet or dry separator. Experience showed it worked better as a dry style separator wetted with overhead spray bars, and it is now permanently configured in its steepest downward angle as a dry separator. John Serl (lead biologist at the Cowlitz Falls facility) said it would work better for fish if it were shorter by about 2 feet.
- The smolt separator was reduced by about 3 feet. John Serl said that adults would move more quickly over the smolt separator and into the adult holding tank if the smolt separator were shorter, and he doesn't believe that it would negatively impact the function as a separator.
- Since the fry separator no longer needs to rotate, or at least not as much as the Cowlitz facility was designed for, the space between the two separators was reduced to about 1 foot.
- The length reductions described above allowed for increasing the length of the adult holding tank, which will provide more flexibility in adult fish holding and handling. The

overall volume of the longer tank is now about twice the volume of the tank at Cowlitz Falls.

- The number of flow supply pipes to the separators was reduced because it was found at Cowlitz that they don't even use many of them based on their preferred operating configuration. The fry separator now has 3 supply pipes instead of 5, and the smolt separator now has 5 supply pipes instead of 7.
- There is now only one discharge flume for the fish coming off each separator, as is the case at Cowlitz Falls. The ability to do this was facilitated by the realization that we could pass a smolt flume under the separator channel so that access for smolt could be provided to all four holding tanks (two on each side) even though they only exit the separator on the starboard side.
- The change described in the previous bullet created more space in the hold which allowed for wider flumes at the beginning and more flume dryers so that the separator discharge flow could be increased from about 1 cfs to about 3 cfs, which more closely matches the Cowlitz Falls flume flow rates. After looking at the Cowlitz Falls facility it was determined that this magnitude of flow is probably beneficial for moving the fish out from under the separator panels more quickly.
- The coded-wire tag (CWT) detector has been removed, however a straight section of flume long enough to allow it to be retrofit into the flume layout has been maintained. It was asked if this decision would have any effect on the study plan. Frank said no, noting that the study plan calls for radio tagging and sonic tags. He explained that the original request for a CWT detector was from the tribes because they plan to tag supplemental fish and wanted to minimize the handling these fish experience. Therefore, the goal was to keep these fish out of the subsample. After discussions with the M&E team, and research into the hydraulic logistics, efficiency, and potential effectiveness of having a CWT detector tied into a switch gate in the flume system it was decided that it will likely be better to allow the tagged fish to go to the sample tank, in the same percentage as the rest of the fish, and that handling of tagged fish can be minimized by identification through hand wanding. Frank brought this up at the last ACC meeting, and they agreed to this approach.

ACC Opinion on CWT Detection and Fish Truck Washing/Disinfection

Issues associated with the CWT detection and the ACC are covered in the last bullet of the previous section. The main issue associated with truck disinfection is the times that it will be required (i.e. between releasing adults and taking on smolt or fry, between releasing smolt or fry and taking on adults, between consecutive trips with smolt, fry or adult, etc.) because this will define where if any there need to be truck disinfection stations. Frank explained that this issue has been raised but has not yet been resolved. The issue associated with truck washing was simply if you are designing a truck disinfection station should you just go ahead and make this a location where the outside of the truck could also be washed. Frank noted that if a truck disinfection station is required at the Swift release site this is not a place that it will be required to also wash the truck.

Upper Baker FSC Site Visit

On Tuesday September 25, members of the design team took part in a tour of the FSC construction occurring at Upper Baker Dam. Agency representatives were also present on the tour, including Jim Stow. Will showed a number of photographs from the visit and discussed some of the information gathered and lessons learned. In many ways, the Upper Baker FSC is similar to the design for the Swift FSC. However, in some key areas the designs are different due to the different species involved, the different settlement agreement requirements, and the physical differences of the to dams and projects. The significant differences include the need to separate fish by size at Swift, the inability at Swift to lift fish vertically at the face of the dam and load them onto trucks, and the greater potential reservoir fluctuation at Swift.

PENDING ACTION ITEMS FOR SWIFT

The following table provides a summary of all pending action items for the Swift Project.

No.	SUMMARY OF PENDING ACTION ITEMS FOR SWIFT (remaining from previous meetings)	STATUS
S34	NMFS, WDFW, USFWS (Nordlund, Leigh/Klavas/Kinne/Stow) Provide feedback on the net/curtain arrangements presented today for discussion at the next meeting.	Pending
No.	SUMMARY OF NEW ACTION ITEMS (from the September 27, 2007 meeting)	STATUS
S38	PacifiCorp (Shallenberger) Send the concept net layout drawings that were first distributed at the July 10 meeting to Jim Stow and Bryan Nordlund via email or a link to the PacifiCorp web site.	Complete – 10/4/07
S39	PacifiCorp (Shallenberger) Distribute the results of the CFD model run with north-only discharge and wind effects to the subgroup members via email or a link to the PacifiCorp web site.	Pending

Adjourned 12:30 PM.