BAKER R. FISH PASSAGE FACILITIES DESIGN
FISH PASSAGE DESIGN TEAM

9:00 a.m. - 3:00 p.m.
January 21, 2004

AGENDA

Objective: Develop performance standards and other issues supporting the settlement agreement.

9:00 - 9:10	Review agenda and handouts (Verretto)
9:10 - 9:15	Review minutes & action items (Verretto)
	Downstream Passage
9:15 - 9:30	Schedule, sequencing (Verretto)
9:30 - 10:35	Settlement agreement article development (Verretto) • Stress-relief ponds • Performance standards/testing • Appendix details • Compensation
10:35 - 10:45	Break
10:45 - 11:45	Settlement agreement article development, cont. (Verretto)
11:45 - 12:15	Lunch (provided)
12:15 - 2:30	Settlement agreement article development, cont. (Verretto)
2:30 - 2:45	Other Issues (Verretto)
2:45 - 2:55	Evaluate meeting & review assignments (Verretto)
2:55 - 3:00	Long-term schedule, agenda, facilitation (Verretto)

PSE PUGET SOUND ENERGY

Baker River Project Relicense

Red Lion SeaTac Hotel 206-246-5535

DRAFT MEETING MINUTES
BAKER RIVER FISH PASSAGE FACIILITIES DESIGN
FISH PASSAGE DESIGN TEAM

Objective: Develop performance standards and other issues supporting the settlement Agreement.

Project: Baker River Project
FERC No. 2150

Written By: Nick Verretto, PSE

Meeting Date: January 21, 2004

Location: Red Lion SeaTac Hotel

Attendees: Arnie Aspelund, PSE
Steve Fransen, NMFS
Nick Verretto, PSE
Stan Walsh, SRSC

Purpose: Develop performance standards and other issues supporting the settlement agreement and continue engineering design development.

Future Meeting Dates:

Mar 8, 2004	*9-3 technical design mtg at Baker Lodge.*
Mar 9, 2004	*9-3 passage design mtg at Baker Lodge.*
Apr. 13, 2004	*9-3 passage technical design mtg at Red Lion SeaTac Hotel.*
Apr. 14, 2004	*9-3 passage design mtg at Red Lion SeaTac Hotel.*
June 01, 2004	*9-3 passage technical design mtg at Red Lion SeaTac Hotel.*
June 02, 2004	*9-3 biological evaluation development mtg at Red Lion SeaTac Hotel.*
July 13, 2004	*9-3 passage technical design mtg at Red Lion SeaTac Hotel.*

See handout for additional meeting dates.

New Action Items

Verretto – Update Settlement Agreement Articles with changes provided during the meeting.
Verretto – Distribute minutes of both January meetings to group.
Verretto – Modify the performance matrix and decision matrix to remove errors and inconsistencies.
Verretto – Add definitions of terms and decisions to the evaluation matrix, and draft a description of the evaluation matrix and send to group.
Eldridge – Update FSC construction schedule based on LB commissioning date of 03/01/09 and distribute old and revised FSC construction schedules to group.
Eldridge – Distill the significant schedule dates for the Aquatic WG and Solution Team on an 8 x 11 sheet – both old and revised versions.
Eldridge – Review pond design at Cowlitz, ODF&W, and Umatilla for methods of forcing fish out of the ponds without inducing jumping, injury or avoidance for incorporation into Baker stress-relief ponds.
Meyer/Verretto – meet to discuss and develop options for achieving performance standards after installation.

Technical Memos/Reports Distributed

The items distributed and reviewed at the meeting were: 01/20/04 and 01/21/04 agendas (PSE), long-term planning schedule (PSE), updated team list (PSE), minutes of 12/03/03 and 12/04/03 meetings (PSE), Baker River Draft Proposed Actions, Section 3.2 (Fish Passage Management Implementation Plan) and Appendix (PSE), decision matrix (PSE), evaluation matrix (PSE), stress-relief pond sizing technical memo (MWH).

Review Agenda, Minutes & Action Items
Verretto – Distributed handouts and reviewed general content of each.
Wiltse – Reviewed agenda with the group.

Schedule, Sequencing
Verretto reviewed the schedule, with the year-by-year phasing of the Upper and Lower Baker FSCs beginning in 2007 and 2009, as discussed at the December 3 meeting. Due to mechanical & logistical difficulties, schedule conflicts and information needs (from the phase one Upper Baker installation), the group had agreed to reschedule Lower Baker phase one commissioning from 03/01/08 to 03/01/09 (group agreed on 11-month push?). The schedule revision was predicated on agreement that the remainder of the schedule remain unchanged.

Settlement Agreement Article Development (Section 3.2)

- **Performance standards/testing – article and appendix**

Verretto led a page-by-page review of the fish passage article and appendices and updated the text as edits were agreed during the course of discussions. Discussions addressed: overall passage settlement schedule, performance standards clarification, decision-making impacts to schedule - FSC modification, evaluation, and compensation. A description of the evaluation matrix is required. Nick will produce and send to group. Nick will add definitions of terms and decisions to the matrix.

The performance matrix describes the performance testing and decision to move from the 500 cfs to the 1000 cfs unit. It describes the incentive that PSE has to making the 500 cfs unit successful within a reasonable period of time in order to avoid having to install the 1000 cfs unit. In other words, unless reasonable progress is made in each successive year, the 1000 cfs FSC will be installed. The matrix recognizes that differences between test results have to be large to be considered significant. The table compares the results of tests and determines direction of the program based on these results. The intent was to have GTE 15% difference between tests to be significant.

The group then reviewed Cary's decision matrix (flow chart). It suggests that progress and success in annual performance tests would impel the retention of the 500 cfs unit. For example, the 500 cfs unit would be retained if collection rates of release groups were as follows in subsequent years: year one – 70%, year two – 77%, year three – 83%, year four – 88%, year five – 92%, year six – 95%.

Errors in the performance need correction. Examples of these are: cell D8 has a difference of 20% between the 500 cfs and 1000 cfs tests yet retains the 500 cfs FSC, while cell D17 has a difference of as little as 5.1 % yet recommends construction of the 1000 cfs FSC. Inconsistencies between the performance matrix and decision matrix also require correction prior to submittal as appendices in the settlement document. Nick will modify the documents to remove these errors and inconsistencies.

Three questions need to be addressed by the group: 1) what constitutes "reasonable progress", 2) how do we test reservoir survival, and 3) what is a migrant?

Stan suggested a method of determining reservoir survival by subtracting near-field collection success from overall reservoir collection success. The suggestion was inserted into the text for further discussion with a larger group at the next meeting.

Unresolved note from previous meeting: Ed requested a list of development options, i.e., how far will PSE go if performance standards are unmet by the FSC system? As an example, will the following be pursued or even considered: fully inclined nets, guidance walls, flow deflection, multiple FSCs, plumbed discharge with new unit installation, huge vee net, operating schedule, reservoir control, continued biological studies, secondary systems and alternative technologies? Ed and Nick agreed to meet to develop options for achieving performance standards after installation.

- **Compensation**

This issue was not discussed.

Other Issues
None identified.

Meeting Evaluation
Agreed to forego opportunity.

Long-Term Schedule, Agenda, Facilitation

Mar 8, 2004	*9-3 technical design mtg at Baker Lodge.*
Mar 9, 2004	*9-3 passage design mtg at Baker Lodge.*
Apr. 13, 2004	*9-3 passage technical design mtg at Red Lion SeaTac Hotel.*
Apr. 14, 2004	*9-3 passage design mtg at Red Lion SeaTac Hotel.*
June 01, 2004	*9-3 passage technical design mtg at Red Lion SeaTac Hotel.*
June 02, 2004	*9-3 biological evaluation development mtg at Red Lion SeaTac Hotel.*
July 13, 2004	*9-3 passage technical design mtg at Red Lion SeaTac Hotel.*

See handout for additional meeting dates.

Tuesday, Mar. 09, 2004, 8-2 passage settlement mtg at Baker Lodge.
Review agenda and handouts (Verretto)
Review minutes & action items (Verretto)
Settlement agreement article development (Verretto)

- Stress-relief ponds update
- Schedule, sequencing
- Performance standards/testing
- Appendix details
- Compensation

Other Issues (Verretto)
Evaluate meeting & review assignments (Verretto)
Long-term schedule, agenda, facilitation (Verretto)

Facilitation: Will be provided for future passage meetings (not technical design meetings), unless otherwise noted.

	A	B	C	D	E	F
1	**FSC Performance Evaluation Matrix**					
2						
3	***Year One***					
4				**500 cfs FSC**		
5		**% Capture**	**<70**	**70-80**	**80-90**	**>90**
6		**<70**	discuss	keep 500, modify & test	keep 500, modify & test	keep 500, modify & test
7	**1000 cfs FSC**	**70-80**	keep 500, modify & test	keep 500, modify & test	keep 500, modify & test	keep 500, modify & test
8		**80-90**	build 1,000	keep 500, modify & test	keep 500, modify & test	keep 500, modify & test
9		**>90**	build 1,000	build 1,000	keep 500, modify & test	keep 500, modify & test
10						
11	***Year Two***					
12				**500 cfs FSC**		
13		**% Capture**	**<75**	**75-85**	**85-90**	**>90**
14		**<70**	discuss	keep 500, modify & test	keep 500, modify & test	keep 500, modify & test
15	**1000 cfs FSC**	**75-85**	test 1 more year	keep 500, modify & test	keep 500, modify & test	keep 500, modify & test
16		**85-90**	build 1,000	test 1 more year	keep 500, modify & test	keep 500, modify & test
17		**>90**	build 1,000	build 1,000	test 1 more year	keep 500, modify & test
18						
19	***Year Three***					
20				**500 cfs FSC**		
21		**% Capture**	**<75**	**75-85**	**85-90**	**>90**
22		**<70**	discuss	keep 500	keep 500	keep 500
23	**1000 cfs FSC**	**75-85**	test 1 more year	discuss	keep 500	keep 500
24		**85-90**	build 1,000	test 1 more year	discuss	keep 500
25		**>90**	build 1,000	build 1,000	test 1 more year	discuss

3.2 Fish Passage Management Implementation Plan

3.2.1 Provide Upstream Passage Continuity for Migratory Fish Species (Anadromous, Adfluvial, Fluvial, Resident)

Summary of Action

Upstream passage at the Baker River Project will be provided using trap, sort and haul facilities located on the Baker River in Concrete and other programs and facilities as appropriate for the Upper Baker Development.

Description of Action

PSE will provide and operate passage facilities for upstream migratory fish at the Lower Baker Development. The facility design, construction, testing and operations and maintenance will be approved by the BRCC and satisfy specific Section 18 authorities by US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). Upstream passage will be provided using trapping, sorting, holding and hauling facilities located on the Baker River in Concrete as agreed to by the Fish Passage Technical Working Group and the Aquatics Working Group. The facilities may use the existing site and some or all existing facilities as agreed to by the parties. (see Appendix XXX for the facility conceptual design and rationale).

- Construction: PSE will provide complete plans and specifications for construction of facilities for attraction, capture, and transport of upstream migrating fish at the Lower Baker Development no less than 120 days before initiation of construction and no later than 2 years after license acceptance.

- Participation for review: The USFWS and NMFS have Section 18 (FPA) prescriptive authority for fish passage facilities. However, a number of parties have interest in the configuration and performance of the facilities. Therefore, PSE will consult with the BRCC and at least the USFWS, NMFS, Washington Department of Fish and Wildlife, and the Swinomish, Upper Skagit and Sauk-Suiattle Tribes regarding the development and approval of the design. USFWS and NMFS approved designs will be submitted to the FERC for approval at least 60 days before initiation of construction.

- Materials: Prior to construction, PSE will provide a complete list of components to the BRCC.

- Quality Assurance/Quality Control: At least 60 days before initiation of construction, PSE will provide a quality assurance/quality control plan to the BRCC for approval to confirm that approved plans will be constructed as approved.

- Operations & Maintenance: PSE will fund and perform routine operation and maintenance of the facility, with participation in operating the facility by BRCC representatives. At least 120 days before initiation of operation, PSE will provide to the BRCC for approval complete plans and specifications for operation and maintenance of upstream passage facilities. This plan will be updated annually in consultation with the BRCC. O & M Plan Elements will include but not be limited to:

a. Frequency of handling/hauling
b. Frequency and magnitude of attraction flows
c. Species protocol
d. Trap operational flows
e. Fish handling
f. O & M schedule
g. Annual updates
h. Trap counts reported daily

- Emergency Response Plan: At least 120 days prior to the initiation of operation, PSE will provide, for review and approval by the BRCC, a preliminary response plan addressing operational contingencies and emergencies. Following startup testing the plan will be finalized within 120 days and submitted to the BRCC for approval.

- Monitoring, Evaluation and Reporting: PSE will conduct startup testing and evaluation. Operational monitoring and evaluation of the condition of the trapping, holding, sorting and hauling facilities will be conducted in consultation with the BRCC to meet agreed performance standards.

  Each year PSE will provide a report to the FERC and the BRCC describing the operation of the facility for the previous 12 months. The report will include the numbers and species of fish captured in the trap and the associated disposition of those fish. The report will include a description of problems and associated remedies for such problems.

  PSE will develop in consultation with the BRCC, an operational schedule and methods for reporting the daily operation of the upstream fish passage facilities. This reporting method may be through a daily-updated web site or weekly e-mails to BRCC participants. PSE will also provide a mechanism for auditing such compliance and reporting such compliance to the BRCC and the FERC. (The evaluation and monitoring plan is described in Appendix XXX. It includes testing of . . .Nick to provide language on best measures to address difficulty in evaluating standard, e.g., monitor and record observations, recommend modifications)

- Modifications and Improvements: PSE will continue to fund and perform facility modifications until performance standards are met. In addition, after performance standards are met, discretionary improvements to the facility to address changing needs and technologies may be conducted at the direction of the BRCC. PSE will fund the discretionary improvements through an account with an annual installment of $XXX (in 2006 dollars). Funds within this account which are not exhausted within a given year may be accumulated for use in future years. This fund is separate from, and not co-mingled with, the HERC Fund (see Appendix XXX for a description of this fund). Modifications to the facility will be reported to the FERC in the annual report.

Rationale for Action

The Baker River Project interrupts connectivity of migrating fish species to upstream locations. Under the Federal Power Act (sections 18 and 10) various agencies and

organizations will require or recommend conditions for fish passage. The Project, therefore, needs to provide means of access to migrating fish for connectivity.

To address this issue, a Fish Passage Technical Working Group (FPTWG), composed of experts in the field of fish passage from federal and state fisheries agencies and private companies, was convened to evaluate any concept potentially available to pass fish, including volitional and assisted facilities and programs.

After careful, deliberate, and extensive review of a wide range of volitional and assisted passage options, documented by a number of Technical Memoranda, the FPTWG agreed on a proposed facility concept for Lower Baker for upstream migration utilizing a trap and haul concept similar to existing programs but requiring substantial modification to existing facilities including sorting capability. The proposal satisfied the interests of the parties and, while not final in design, is sufficiently detailed to constitute resolution of the issue of access above the Project. (Possibility of having another agency operate the passage facilities?)

3.2.2 Address Connectivity Between Baker Lake and Lake Shannon

Summary of Action

To address connectivity between Baker Lake and Lake Shannon, PSE will study and implement effective connectivity for native aquatic species isolated by the project structures. Connectivity between the Baker/Skagit River and Lake Shannon will be addressed in the upstream passage PME.

Description of Action

- No later than three years after license acceptance PSE will conduct a study in consultation with the BRCC to determine ways to address connectivity between Baker Lake and Lake Shannon. The study may include: tagging, radio-tagging or other study methodologies.

- Results from the study will be used to determine whether facilities or programs are needed to co-mingle isolated groups of fish to provide connectivity. In the event that, in the opinion of the BRCC, the study demonstrates that essential fish passage continuity could be provided through a trap and haul facility, PSE will plan and construct, in consultation with the BRCC, a prototype trap and haul facility for the Upper Baker Development.

  The facility will be designed to capture bull trout and allow their transport above Upper Baker Dam. It will include design accommodations for other aquatic species that do not compromise the primary design focus on bull trout. The facility should be able to operate over the range of flows used at the Project except for spill events and other emergency actions. The facility should also be operable during all seasons of the year if testing shows that bull trout are migrating year around.

  If in the opinion of the BRCC, a facility will not appropriately achieve fish species connectivity, PSE will propose an alternative plan to the BRCC to achieve continuity, which may include seining or other capture and release techniques.

- Develop permanent facility as needed. In the event that the test facility above is demonstrated feasible, PSE will, in consultation with the BRCC, plan, construct, and operate permanent trap and haul facilities. Construction, operations, consultation protocols, and other considerations will follow the formats for the upstream passage facilities. The guiding principle will be a program or facility that is effective but modest in scope.

Rationale for Action

The Baker River Project interrupts connectivity of aquatic species within the Baker system and isolates streams tributary to Lake Shannon reservoir and the Lower Baker River and the Skagit River. Under the Federal Power Act (sections 18 and 10) various agencies and organizations will require, or recommend conditions for fish passage. The Project, therefore, needs to provide means of access to fish for connectivity. The Fish Passage Technical Working Group (FPTWG), composed of experts in the field of fish passage, extensively reviewed a wide range of volitional and assisted passage options. The trap and haul option selected for upstream migration bypasses Lake Shannon and, therefore, may isolate species desiring to migrate upstream past the Upper Baker Development or into Lake Shannon.

The FPTWG sought to address the need of connectivity associated with populations isolated by Upper Baker Dam between Baker Lake and Lake Shannon. The FPTWG made provision for investigation of facilities and/or programs for other migratory needs at Upper Baker to address species population connectivity, independent of optimized spawning ground access.

There is uncertainty that migratory connectivity behaviors exist between the reservoirs after 50 years of segregation. However the ecosystem need for connectivity between segregated populations may be important. Connectivity to co-mingle these populations can be achieved in a variety of ways apart from passage facilities. Therefore, the proposal for sequential development of programs and or facilities constitutes a reasonable and prudent approach.

Actions proposed that affect bull trout need to be compatible with and support the Recovery Plan for the Puget Sound bull trout DPS.

Ruth and Scott to review and add language regarding PME (study) coverage for native fish.

3.2.3 Provide Downstream Passage Continuity for Migratory Fish Species (Anadromous, Adfluvial, Fluvial, Resident)

Summary of Action

PSE will provide, operate and maintain passage facilities for downstream migratory fish at the Upper Baker and Lower Baker Developments. These facilities will include: a floating surface collector, an entrance module and/or a transition structure, a guide net, a

transportation pipeline, a floating fish trap, transfer facilities, hauling vehicles, and stress-relief ponds.

The downstream passage facilities will be developed and installed using a sequenced or phased approach. Steps and details are:

- Upper Baker Phase I - 500 cfs capacity FSC and ancillary facilities
- Lower Baker Phase I -500 cfs capacity FSC and ancillary facilities
- Upper Baker Phase II -1000 cfs capacity FSC (contingent on failure of Upper Baker Phase I to meet performance criteria)
- Lower Baker Phase II -1000 cfs capacity FSC (contingent on failure of Lower Baker Phase I to meet performance criteria)

(need to review for flexibility to change based on results of performance testing of phase I)

Description of Action

All downstream fish passage facilities and installation schedules will be developed by PSE, in consultation with the BRCC or the FPTWG (whichever is in existence at the time). These facilities are described below.

Floating Surface Collector

- The FSC is a conventional V-screen contained within a floating channel, with flow induced by pumps. The screens will be designed to meet NMFS criteria in effect at the signing of the agreement, except where otherwise agreed by NMFS. The initial installation (phase I) will be sized at 500 cfs capacity and be constructed to meet screening standards of 0.4 ft./sec. approach velocity, but will allow testing of 1,000 cfs capacity at higher approach velocities. The facility will be designed to accept an expansion module to accommodate an increase of flow capacity to a maximum of 1,000 cfs (which equals approximately 20% of Upper Baker generation capacity). The expansion will occur only if the 500 cfs capacity FSC fails to meet the performance criteria. In addition, the initial FSC and the expansion module will be designed to accommodate an entrance module and/or net transition connection at its upstream end. The initial schedule for implementation is included in appendix XXX. The FSC concept may be developed using hydraulic modeling (physical or numerical) to permit resolution of flow continuity, flow orientation and construction/installation issues.

Entrance Module

- The entrance module is a structure attached to the upstream end of the FSC that allows control or modification of various entrance conditions to improve attraction and collection effectiveness.

Transition Structure

- The transition structure is attached to the upstream end of the FSC or entrance module, and downstream of the guide net. Its purpose is to provide a gradual transition from the vertical guide net to the defined channel of the entrance module or FSC, in order to modify initial approach conditions and improve attraction and collection effectiveness.

Guide Net

- The guide net is attached to the upstream end of the transition structure, entrance module or FSC, and extends upstream into the forebay to create a non-hardened vertical V-screen to guide fish to the FSC location. The net will extend from the surface to the bottom of the reservoir and from shore to shore to create a fish barrier.

Transportation Conduit

- The transportation conduit will transport fish from the FSC to the floating fish trap, and may include a kelt/adult separator and holding area.

Floating Fish Trap

- The existing Upper Baker floating fish trap will be modified to adapt to the new FSC and transportation pipeline. It includes four holding areas, with ability to separate fish by timing of entry into the FSC, but not by species. PSE will operate the fish sampling/handling area, with possible participation by the BRCC. A new method of transferring fish from the holding raceways to the sampling area will be designed and installed during phase I of FSC installation. Another trap, holding and sampling facility with similar features will be constructed at Lower Baker, sized appropriately.

Transfer Facilities

- The transfer facilities consist of the fish trap hopper and jib crane at Upper Baker. Similar facilities will be constructed at Lower Baker. In the event that the trap/holding facility cannot be located adjacent to the loading facility, then an appropriate conveyance mechanism will be implemented between the trap/holding and loading facilities.

Hauling Vehicles

- The hauling vehicles will include fish transport tank trucks and trailers, in numbers sufficient to accommodate the anticipated increased run sizes.

Stress-Relief Ponds

- Stress-relief ponds will be located near the confluence of the Baker and Skagit Rivers, and allow volitional or forced emigration. Fish transported from the Upper and Lower Baker fish traps and kelt/adult holding areas will be placed into these ponds for approximately two days of stress-reduction prior to release into the Skagit or Baker River. The ponds will be sized for a peak day of approximately 150,000 smolts. The stress-relief ponds may also serve as acclimation ponds if capacity and run timing allows.

Preliminary FSC, guide net and other component design drawings and criteria are contained in a 30% design memorandum developed by the FPTWG (see Appendix XXX, Passage Performance Standards and Evaluation -- Feb. 2004).

The detailed schedule and development scenarios are contained in Appendix XXX, Passage Performance Standards and Evaluation.

Development and Testing: [Add language on evaluation and testing]

- Construction: PSE will provide complete plans and specifications for construction of facilities for attraction, capture, and transport of downstream migrating fish at the Upper Baker and Lower Baker Developments no less than 120 days before initiation of construction and no later than 2 years after license acceptance unless otherwise agreed.

- Participation for Review: PSE will consult with the BRCC or FPTWG (whichever is in existence at the time) during all phases of design development. At a minimum, review periods will be at 30%, 60% and 90% design levels. The USFWS and NMFS have Section 18 (FPA) prescriptive authority for fish passage facilities. However, a number of parties have interest in the configuration and performance of the facilities. Therefore, PSE shall consult with the BRCC and at least the USFWS, NMFS, WDFW, and the Swinomish Tribal Community, Sauk-Suiattle Indian Tribe and Upper Skagit Indian Tribe regarding the development and approval of the final design. USFWS- and NMFS-approved designs will be submitted to the FERC for approval at least 60 days before initiation of construction.

- Materials: Prior to construction, PSE will provide a complete list of components to the BRCC.

- QA/QC: At least 60 days before initiation of construction, PSE will provide a quality assurance/quality control plan to the BRCC for approval to confirm that approved plans will be constructed as approved.

- Operations & Maintenance: PSE will fund and perform routine operation and maintenance of the facilities, with participation by BRCC representatives. At least 120 days before initiation of operation, PSE will provide complete plans and specifications for operation and maintenance of downstream passage facilities to the BRCC for review and approval. This plan will be updated annually. O & M Plan elements will include but not be limited to:
  1. Seasonal period of operation
  2. Special FSC operations (flows, etc.)
  3. Frequency of handling/hauling
  4. Fish sampling/handling protocol
  5. Holding and release protocol
  6. Transport loading rates
  7. Trap counts reported weekly
  8. O & M schedule
  9. Annual updates

- Emergency Response Plan: At least 120 days prior to the initiation of operation, PSE will provide, for review and approval by the BRCC, a preliminary response plan addressing operational contingencies and emergencies. Following startup testing the plan will be finalized within 120 days and submitted to the BRCC for approval. This plan will be reviewed at least annually.

- Monitoring, Evaluation and Reporting: PSE will conduct startup testing and evaluation. Operational monitoring and evaluation of the condition of the trapping, holding, sorting

and hauling facilities will be conducted in consultation with the BRCC to meet agreed performance standards (see appendix XXX, Passage Performance Standards and Evaluation).

Each year PSE will provide a report to the FERC and the BRCC describing the operation of the facility for the previous 12 months. The report will include the numbers and species of fish captured in the trap and the associated disposition of those fish. The report will include a description of problems and associated remedies for such problems.

PSE will develop in consultation with the BRCC, an operational schedule and methods, for periodic reporting of the operation of the downstream fish passage facilities. This reporting method may be through an updated web site or e-mails to BRCC participants.

PSE will also provide a mechanism for auditing and reporting such compliance to the BRCC and the FERC.

- Modifications and Improvements: PSE will continue to fund and perform facility modifications until performance standards are met. In addition, after performance standards are met, discretionary improvements to the facility to address changing needs and technologies may be conducted at the direction of the BRCC. PSE will fund the discretionary improvements through an account with an annual installment of $XXX (in 2006 dollars). Funds within this account which are not exhausted within a given year may be accumulated for use in future years. This fund is separate from, and not co-mingled with, the HERC Fund (see Appendix XXX for a description of this fund). Modifications to the facility will be reported to the FERC in the annual report.

Rationale for Action

The Baker River Project interrupts connectivity of migrating fish species to downstream locations. Under the Federal Power Act (sections 18 and 10) various agencies and organizations will require, or recommend conditions for fish passage. The Project, therefore, needs to provide a safe and efficient means of egress to migrating fish for connectivity. The floating surface collector was selected as the downstream fish passage facility after extensive review of a wide range of volitional and assisted options by the Fish Passage Technical Working Group, composed of experts in the field of fish passage.

Recent migratory investigations indicate that existing attraction barge facilities at Upper Baker are effective at inducing fish to approach a passage facility, and past evaluations indicate that upwards of 50 to 75 percent are routinely caught and transported. However, the existing technology is over 50 years old, and major advances in understanding and technical capability have been developed in the ensuing years.

Moreover, conventional passage technology, well suited for rivers with flowing water, is not readily applicable to fluctuating deepwater reservoirs. And, it is not known whether conventional passage technology will even successfully work in a deep reservoir with fluctuating levels and intermittent operation, much less work better than existing technology. The cost to develop both technologies simultaneously is prohibitive and unnecessary.

Fish stocks in the Baker Basin have been supported by the existing fish passage facilities. Improvements in the technology are clearly available to address many if not most of the dissuasive features of the existing fish passage facilities. It is appropriate, therefore, to build on the solid foundation of existing knowledge and successful technology combined with the potential benefits of prototype facility investigation to develop passage technology appropriate for deep reservoir migration patterns and consistent with other resource uses. Therefore, the proposal for sequential development of programs and/or facilities constitutes a reasonable and prudent approach.

Appendix XXX, Passage Performance Standards and Evaluation for Downstream Fish Passage Facilities at the Baker River Project

This protocol addresses the performance standards, evaluation methods, and schedule for downstream fish passage facilities at the Baker River Project.

Performance Standards

1. Reservoir transit and survival – 80% or better.
2. Juvenile collection efficiency – 95% or better of the smolts that migrate to the forebay.
3. Fish passage survival through the collection facilities upstream and downstream, including transport – 98% (minimum achievable, 99.5% target).
4. Fish survival overall, through 1, 2 and 3 above – 75% or better.

Nick/Arnie to add NMFS prescription; Steve to send

Standards Descriptions

1. Percentage of fish that migrate to the dam forebay from the upstream-most extent of the reservoir.
2. Percentage of fish in the dam forebay that enter the floating surface collector to the capture point (point-of-no-return).
3. Percentage of fish that survive from the capture point of the FSC to release from the stress-relief ponds, including trapping, holding, and transportation. This condition excludes handling mortality associated with smolt sampling at the FSC, and associated facilities.
4. The 75% survival is a product of 1, 2 & 3 above, and is an estimate of the survival necessary to result in self-sustaining anadromous fish populations capable of supporting a harvest management component.

~~This protocol addresses the schedule, standards of performance and methods of evaluation for downstream fish passage facilities at the Baker River Project.~~

Evaluation Method

The biological evaluation shall be conducted by the Baker River Coordinating Committee. The Baker River Coordinating Committee (BRCC, Settlement Section 6.2), or their predecessor (the Aquatics Working Group until ratification of the Settlement) will oversee all aspects of standards development, evaluation methodologies, and programmatic implementation of downstream fish passage. The BRCC shall: 1) establish the protocol(s) and methodologies to determine whether or not the ~~Survival~~ Performance Standards are being achieved; 2) determine whether goals can be achieved; 3) approve all studies prior to implementation; and 4) review study results, determine their applicability, and develop a list of common understandings based on the studies.

Testing Element 1 ~~3~~- Reservoir Transit and -Survival – 80%

~~80% Reservoir survival.~~

Reservoir transit and survival testing methods will be developed by the BRCC. An initial method can be interpolated by using the result of the near-field PIT tagged fish collection tests as the baseline by which far-field PIT tagged releases are judged, as measured by crossing the "finish

line" of the outer log boom. For example, 75% of near-field releases are detected crossing the capture point, and 50% of far-field releases are detected crossing the capture point; the reservoir transit and survival is calculated as 50/75 = 66.66%. This method requires installation of a PIT tag detector at the FSC capture point. Test groups will be of the same species and source. Near-field and far-field test release timing will coincide.

Species used will include coho and sockeye. Coho test fish will be from Little Park Creek. Sockeye will be from wild and reared sources. Likely sources are sockeye are the FSC and PSE rearing facilities.

Reservoir survival describes a lifestage that cannot be reliably measured at this time. In the event that during the license period, reservoir survival can be reliably measured, the licensee will conduct a study in consultation with the BRCC to measure survival.

Reservoir survival will be measured using the best available technology and study designs approved by the BRCC. Collection shall be measured at a ninety-five percent (95%) confidence level, with a standard error of the estimate that shall be not more than plus or minus 2.5% (i.e., 5% error). Results from a study meeting this precision level will automatically be included an average of three successful tests, unless the study has violated critical model assumptions or has been determined to be invalid by the BRCC. However, should a study meet all of the testing protocol and model assumptions and provided that the standard error around the point estimate does not exceed plus or minus 3.5%, then the BRCC, following unanimous approval, may utilize this information in the calculation of the three-test average. Point estimates of survival measured from the three valid tests shall be averaged (arithmetic) to compare against the pertinent Reservoir Survival Standard of 80%. The use of survival studies with standard errors between 2.5% and 3.5% shall not be subject to Dispute Resolution.

In the event that the combined passage survival (collection survival 99%, capture efficiency 95% and reservoir survival (80%) multiplied together) does not exceed 75%, . Ccompensation in accord with the propagation plan will be initiated.

Testing Element 2 – Juvenile Collection Efficiency – 95%

Measurement: This standard shall be evaluated through the conduct of two sets of Migration Collection studies, one for coho and one for sockeye. Each test will consist of two replicates at three locations and control groups to define percentage of fish captured after release into forebay (See Table ___ below).

Testing shall commence for purposes of determination of collection efficiency when final operational configuration has been identified.

Definitions:

1. Forebay is defined as the portion of each reservoir contained within a radius of 1,500 feet from the intake of the dam.
2. Migrant- A fish of the test species exhibiting migratory behavior at the time of test as determined by a standard as agreed by the BRCC. Substitution or surrogate indicator test fish may be utilized if the BRCC agrees.

3. Gauge test - The gauge test is the initial test to measure initial performance and guide development of improvements until operational or production performance can be evaluated in formal standards testing.

Conditions for evaluation:

Development Phase: Construct 500 cfs module. Following completion of construction (initial phase) and after system is operating as designed before the first operating season, conduct initial gauge testing. A gauge test will be used to establish the initial status of development toward performance.

Gauge testing Protocol (Less than 70% efficiency?):

A single replicate of PIT tagged migrants from two species (coho and sockeye) will be released from three locations within the forebay and recaptured plus a control group held in the recapture facility for each of the two flow regimes (500 cfs and 1,000 cfs). If the FSC provides less than 70% capture at 500 cfs but greater than 90% at a flow test of 1,000 cfs, then PSE will proceed to construct the 1,000 cfs screening module and conduct a gauge test the following year.

500 cfs Test- May 15-30

Release Treatment	1	2	3	Control
Coho	Left bank 100 fish	Middle reservoir 100 fish	Right bank 100 fish	Hold and count for tag loss
Sockeye	Left bank 100 fish	Middle reservoir 100 fish	Right bank 100 fish	Hold and count for tag loss

1,000 cfs Test- June 1-15

Release Treatment	1	2	3	Control
Coho	Left bank 100 fish	Middle reservoir 100 fish	Right bank 100 fish	Hold and count for tag loss
Sockeye	Left bank 100 fish	Middle reservoir 100 fish	Right bank 100 fish	Hold and count for tag loss

Refinement Phase (70% - 90% efficiency):

Following refinement and testing at year two, if the difference between 500 and 1000 cfs is 15 % or more than construct to 1,000 cfs capacity. If the difference remains less than 15 % then the facility will be modified as directed by the BRCC and retested the following year. Sequential improvements will be conducted for up to three more years to reach 90%. Steady progress must be made to reach 90% or greater collection by the end of test year 5.

Testing during the Refinement phase will utilize a single replicate of PIT tagged migrants from two species (coho and sockeye). Test fish will be released from three locations within the

forebay and recaptured plus a control group held in the recapture facility for each of the two flow regimes (500 cfs and 1,000 cfs) as appropriate.

Refinement Test - May 15-30

Release Treatment	1	2	3	Control
Coho	Left bank 100 fish	Middle reservoir 100 fish	Right bank 100 fish	Hold and count for tag loss
Sockeye	Left bank 100 fish	Middle reservoir 100 fish	Right bank 100 fish	Hold and count for tag loss

Production Phase (Greater than 90%):
If the FSC provides 90% or greater collection in any year of gauge testing, the Baker River Project may elect to utilize the that year first year test as the first year of a three-year performance evaluation or continue to modify and retest as a gauge test a second year.

Production Phase Testing protocol - Two replicates of PIT tagged migrants from two species (coho and sockeye) will be released from three locations within the forebay and recaptured plus a control group held in the recapture facility. The Production Phase Testing will be conducted for three consecutive years.

Treatment	1	2	3	Control
Coho	Left bank 100 fish	Middle reservoir 100 fish	Right bank 100 fish	Hold and count for tag loss
Sockeye	Left bank 100 fish	Middle reservoir 100 fish	Right bank 100 fish	Hold and count for tag loss

Testing Analysis:
The performance standards will be measured using the best available technology and study designs approved by the BRCC. Collection shall be measured at a ninety-five percent (95%) confidence level, with a standard error of the estimate that shall be not more than plus or minus 2.5% (i.e., 5% error). Results from a study meeting this precision level will automatically be included an average of three successful tests, unless the study has violated critical model assumptions or has been determined to be invalid by the BRCC. However, should a study meet all of the testing protocol and model assumptions and provided that the standard error around the point estimate does not exceed plus or minus 3.5%, then the BRCC, following unanimous approval, may utilize this information in the calculation of the three-test average. Point estimates of survival measured from the three valid tests shall be averaged (arithmetic) to compare against the pertinent Capture Standard. The use of survival studies with standard errors between 2.5% and 3.5% shall not be subject to Dispute Resolution.

If the BRCC cannot reach agreement, then these decisions shall be resolved through Dispute Resolution as set forth in Section __ (Dispute Resolution).

Testing Element 3 - Fish Passage Survival through Collection Facilities – 98%
The agreed standard for downstream passage survival through collection facilities will be 98% (threshold) 99.5% (goal). What happens if PSE makes 98%? What is the consequence of not making 99.5% if all other goals are met?

Downstream Measurement: Conduct PIT tag recapture study with control groups to define handling mortality not associated with transport. A similar study will be conducted at each facility.
Fish passage survival through the collection facilities upstream and downstream, including transport

48-hour hold for latent mortality.

Treatment	1 Transport Effects	2 Sample Effects	3 Whole-System Effects	4 Control
Test 1 (early season)	Release marked fish at trap hopper transport to pond, hold 48 hours and count (enumerate other groups after test)	Release marked fish into trap raceways, crowd, sample, crowd to trap hopper, transport to pond, hold 48 hours and count (enumerate other groups after test)	Release into FSC point of capture (8 fps) velocity, recapture in trap, crowd, sample, crowd to trap hopper, transport to pond, hold 48 hours and count (enumerate other groups after test)	Transport fish to pond, hold 48 hours and count
Test 2 (mid-season)	Release marked fish at trap hopper transport to pond, hold 48 hours and count (enumerate other groups after test)	Release marked fish into trap raceways, crowd, sample, crowd to trap hopper transport to pond, hold 48 hours and count (enumerate other groups after test)	Release into FSC point of capture (8 fps) velocity, recapture in trap, crowd, sample, crowd to trap hopper transport to pond, hold 48 hours and count (enumerate other groups after test)	Transport fish to pond, hold 48 hours and count
Test 3 (late-season)	Release marked fish at trap hopper transport to pond, hold 48 hours and count (enumerate other groups after test)	Release marked fish into trap raceways, crowd, sample, crowd to trap hopper, transport to pond, hold 48 hours and count (enumerate other groups after test)	Release into FSC point of capture (8 fps) velocity, recapture in trap, crowd, sample, crowd to trap hopper, transport to pond, hold 48 hours and count (enumerate other groups after test)	Transport fish to pond, hold 48 hours and count

Notes	Rationale
Test lots of 50 fish?	Large enough to test effects. Small enough to be manageable without impacting run
Species selection issues: Wild Coho- Wild Sockeye Chinook Bull trout	 Most sensitive- largest % of coho Most sensitive- largest run Small size fish – listed species Small number size – listed species

Analysis:
The performance standards will be measured using the best available technology and study designs approved by the BRCC. Downstream survival shall be measured at a ninety-five percent (95%) confidence level, with a standard error of the estimate that shall be not more than plus or minus 2.5% (i.e., 5% error). Results from a study meeting this precision level will automatically be included an average of three successful tests, unless the study has violated critical model assumptions or has been determined to be invalid by the BRCC. However, should a study meet all of the testing protocol and model assumptions and provided that the standard error around the point estimate does not exceed plus or minus 3.5%, then the BRCC, following unanimous approval, may utilize this information in the calculation of the three-test average. Point estimates of survival measured from the three valid tests shall be averaged (arithmetic) to compare against the pertinent Survival Standard. The analysis of the test shall remove the influence of sampling from the cumulative estimate of mortality.

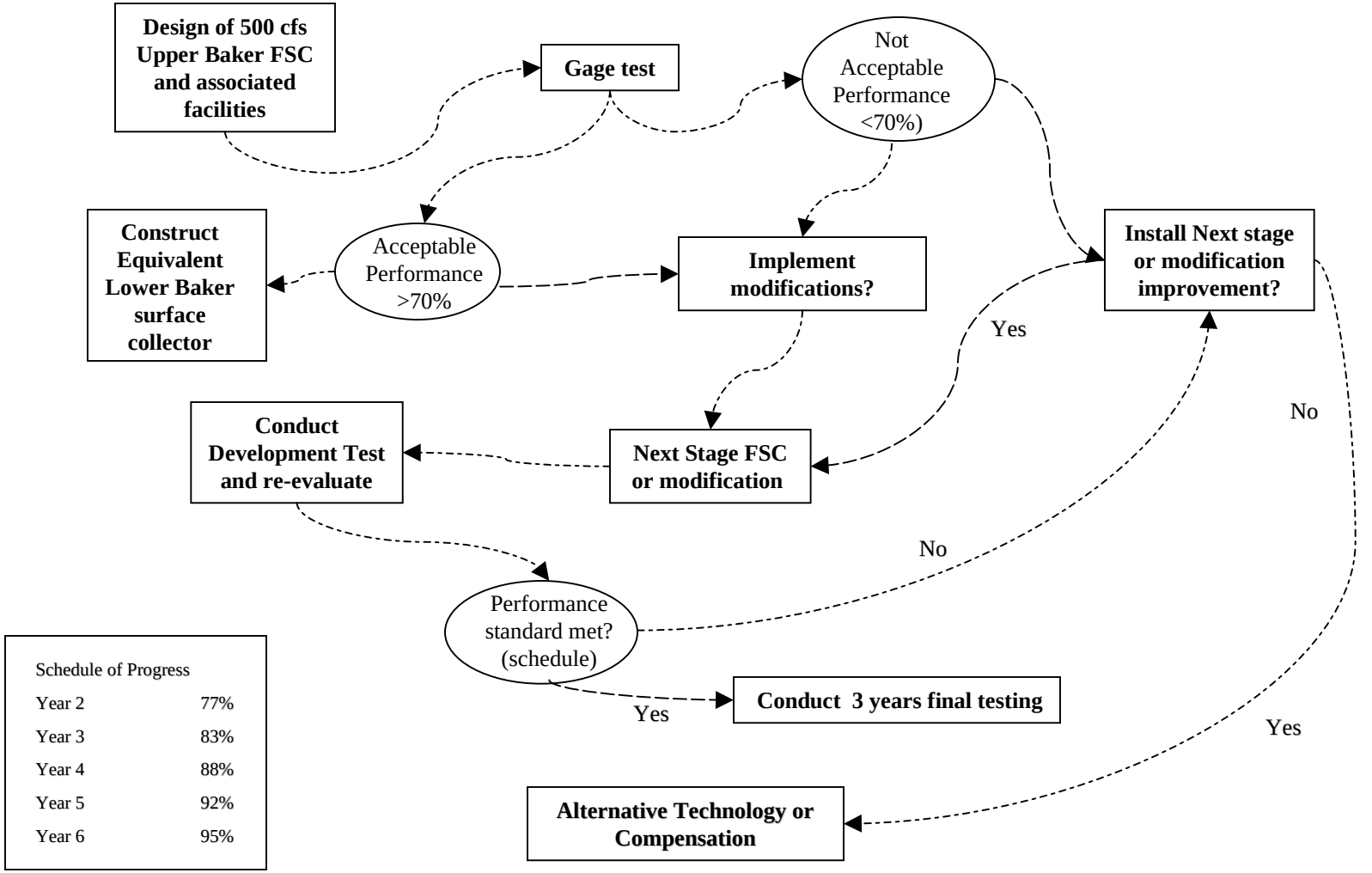
The use of survival studies with standard errors between 2.5% and 3.5% shall not be subject to Dispute Resolution.

The testing shall also consider indirect and delayed mortality as far downstream as possible given the available technology (How might this be done? PSE believes the use of the stress-relief ponds is the best estimate for this.)

If the BRCC cannot reach agreement, then these decisions shall be resolved through Dispute Resolution as set forth in Section __ (Dispute Resolution).

Responses for failing to meet the standard. In the event that the test is valid and the point estimate is lower than the established standard, the BRCC shall recommend actions to improve survival. The actions shall be implemented for the next season. The evaluation of the improvements shall be repeated the next year.

Baker Downstream Passage Decision Matrix



Schedule of Progress	
Year 2	77%
Year 3	83%
Year 4	88%
Year 5	92%
Year 6	95%

Throughout this matrix decision process, the Fish Passage Technical Group of the Baker River Coordinating Committee will determine direction.

Filename: FSC decision chart 012104

Decision-Making Document Only -- Not Mandatory Decision Driver