**BAKER R. FISH PASSAGE FACILITIES DESIGN**
**FISH PASSAGE TECHNICAL DESIGN TEAM**

9:00 a.m. - 3:00 p.m.
December 03, 2003

## AGENDA

Objective: Continue engineering design development of Upper Baker Guide Net and FSC system.

| | |
|---|---|
| 9:00 - 9:10 | Review agenda and handouts (Verretto) |
| 9:10 - 9:15 | Review minutes & action items (Verretto) |
| | **Downstream Passage** |
| 9:15 - 10:30 | FSC design development (Postlewaite, Eldridge) |
| 10:30 - 10:40 | Break |
| 10:40 - 11:20 | FSC & preliminary forebay hydraulics (Postlewaite, Greg Clark) |
| 11:20 - 11:45 | Stress-relief pond design (Eldridge) |
| 11:45 - 12:15 | Lunch (provided) |
| 12:15 - 1:45 | Guide net design development, schedule (Hijazi, Brink) |
| 1:45 - 2:10 | Log boom design (Dorratcague) |
| 2:10 - 2:45 | Downstream sites trip review (Brink) |
| 2:45 - 2:50 | Other Issues (Verretto) |
| 2:50 - 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 FACIILTIES DESIGN**
**FISH PASSAGE DESIGN TEAM**

*Mission Statement: To develop an efficient fish passage design for the Baker River Project.*

**Project:** Baker River Project
FERC No. 2150

**Written By:** Nick Verretto, PSE

**Meeting Date:** December 03, 2003

**Location:** Red Lion SeaTac Hotel

**Attendees:**

| | |
|---|---|
| Arnie Aspelund, PSE | Ray Eldridge, MWH |
| Ken Bates, FPP&D | Mark Hijazi, MWH |
| Kevin Brink, PSE | Ed Meyer, NMFS |
| Greg Clark, MWH | Frank Postlewaite, MWH |
| Dennis Dorratcague, MWH | Nick Verretto, PSE |

**Purpose:** Continue engineering design development of Upper Baker FSC and guidance net system.

***Future Meeting Dates:***

| | |
|---|---|
| *Dec. 04, 2003* | *9-3 passage design mtg at Red Lion SeaTac Hotel.* |
| *Jan. 20, 2004* | *9-3 passage technical design mtg at Red Lion SeaTac Hotel.* |
| *Jan. 21, 2004* | *9-3 passage design mtg at Red Lion SeaTac Hotel.* |
| *Mar 8, 2004* | *9-3 technical design mtg at Baker Lodge.* |
| *Mar 9, 2004* | *9-3 passage design mtg at Baker Lodge.* |

*See handout for additional meeting dates, through license submittal date.*

**New Action Items**

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.

No other new action items were noted. Design development will continue based on today's discussion.

**Technical Memos/Reports Distributed**

The items distributed and reviewed at the meeting were: 12/03/03 and 12/04/03 agendas (PSE), long-term planning schedule (PSE), updated team list (PSE), minutes of 10/14/03 settlement meeting (PSE), FSC criteria TM (MWH), 12/02/03 guide net and transition structure design memo (MWH).

**Review Agenda, Minutes & Action Items**

Verretto distributed handouts and reviewed general content of each.

**Overall Schedule Review**

Verretto reviewed the long-term schedule, noting only a couple of minor changes.

**FSC Design Development**
Dennis and Frank distributed the floating surface collector design criteria technical memorandum and reviewed it with the group. The full design criteria memo will contain the following sections: introduction (common to all sections), net, net transition, FSC, bypass & trap, transport & stress-relief facility.

The section distributed at the meeting and containing design criteria for the FSC contains the following sections: biological and hydraulics, floatation, structural, mechanical, and electrical. The FSC technical memorandum is scheduled for completion mid-February. Dennis and Frank reviewed and edited the memo based on comments from the team.

'Passage period' was changed to 'Normal migration period' - and was defined as March 1 to August - to better reflect the possibility of testing collection outside of the normal migration windows. It is clear that the facility will have to be designed to operate during all seasons, although year-round operation is not intended. Details such as mechanical and structural handling of snow and ice loads must be factored into the design.

Flow criteria was clarified for the phased installation as 500 cfs for the phase one FSC and 1000 cfs for the phase two installation. These flows include the bypass flow of 25 cfs, so should be considered the total attraction flow. Screened flows – or pumped flows - would therefore be 475 and 975 cfs for the two phases.

The bypass design alternatives, in order of preference, are: 1) open channel flow with 18" minimum width, 2) non-pressurized pipe of 2' minimum diameter, and 3) pressurized pipe of 2' minimum diameter. Head differential should trip pumps, rather than lift or fail screens.

**FSC & Preliminary Forebay Hydraulics**
Greg presented results of some preliminary hydraulics review of both the forebay flow fields and those presented by the existing gulper pumps discharge. Some of the discussion was based on velocity measurements and flow net schematics produced by Pacific International Engineering last spring. Based on Greg's preliminary review, it appears that the gulper pumps discharge exerts a strong influence on the entrance area. This will have to be considered in the future facility, as has been discussed on numerous occasions. Consideration should be given, if possible, to diverting the gulper discharge toward a downstream and submerged direction for the purposes of testing the new net and transition.

**Stress Relief Pond Design**
Eldridge led a discussion of the draft TM for the stress relief ponds that would be located near the confluence of the Baker and Skagit Rivers. The facility is sized for 150,000 fish/day, although calculated numbers per the design team's recommendations produced a maximum of 97,000 sockeye and 20,000 coho per day. At 30 fish/lb., 5,000 lbs. of fish would be loaded into one of three ponds for 48 – 72 hours holding time before being released into the Baker River. Using a loading density of 0.3 lbs./cu. ft., each pond would require a flow of 1.4 cfs and be 3,100 sq. ft., or approximately 16'W x 65'L x 4'D.

The design needs to identify methods of forcing fish out of the ponds without inducing jumping, injury or avoidance. Facilities to consider include Cowlitz, ODF&W, and Umatilla. Pond operation during high river flows must be considered. Release modes to be considered include backing trucks into pond, release hoses and chutes to avoid free-fall truck release into ponds.

**Guide Net Design Development, Schedule**
Mark reviewed the new guide net and transition structure designs. The system is under construction for installation March 2004, and incorporates much of the hydraulic controls discussed during the ongoing FSC design process. Entrance velocity, acceleration and flow continuity will be greatly controlled with the new net transition structure (NTS), which is an aluminum-framed, HDPE-lined inclined channel. The entrance width of

the NTS was reduced from 75' to 50' to prevent deceleration as fish encounter the entrance from either side of the guide net panel. This decision was taken after review by MWH of last spring's forebay velocity data.

The net design incorporates a huge number of innovations developed over several iterations of the system, as well as continuous design development which began last fall. Considerations for a future net may include making the entire panel inclined to guide fish to the surface and increase the distance from the false attraction of the intake.

**Log Boom Design**
Dennis presented the Tuffboom log boom design being considered as a replacement of the existing outer boom. The design consists of polystyrene-filled HDPE 'logs', with 4' wire mesh skirts to prevent debris from bypassing the system. Consideration will be given to solid plate and horizontal bar skirts to prevent debris from becoming lodged in the mesh, and to allow the debris to continue moving with the prevailing winds toward the (likely) south shore removal point.

**Downstream Sites Trip Review**
The trip review and discussion was postponed for a later date due to insufficient time and team members.

**Other Issues**
None identified.

**Evaluate Meeting**
Did not conduct meeting evaluation.

**Long-Term Schedule, Agenda, Facilitation**
*Dec. 04, 2003* *9-3 passage design mtg at Red Lion SeaTac Hotel*
*Jan. 20, 2004* *9-3 technical design mtg at Red Lion SeaTac Hotel.*
*Jan 21, 2004* *9-3 passage design mtg at Red Lion SeaTac Hotel.*
*Mar 8, 2004* *9-3 technical design mtg at Baker Lodge.*
*Mar 9, 2004* *9-3 passage design mtg at Baker Lodge.*
*See handout for additional meeting dates, through license submittal date.*

***Tuesday, Jan. 20, 2004, 9-3 passage technical design mtg at Red Lion SeaTac Hotel.***
Review agenda and handouts (Verretto)
Review minutes & action items (Verretto)
FSC design development (Eldridge)

- Structure
- Hydraulics
- Naval architecture
- Pump station
- Controls
- Electrical

Stress-relief pond design (Eldridge)
Guide net design development, schedule (Verretto)
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.