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## BAKER RIVER PROJECT RELICENSE

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### Technical Working Group - Downstream Fish Passage

June 13, 2000

9:30 a.m. – 4:00 p.m.  
West Coast Sea-Tac Hotel  
18220 Pacific Hwy S.  
Seattle, WA 98188

### AGENDA (tentative)

1. Review/revise agenda
2. Revisit costs of screened intake conceptual designs utilizing 0.8 fps approach velocity vs. 0.4 fps approach velocity.
3. Temperature Data: <ul style="list-style-type: none"><li>• Team assess adequacy of existing data</li><li>• Nick Verretto (PSE) to review vertical column data</li><li>• Burst speed of fish vs. temperatures recorded at net pens</li></ul>
4. Intake flow test - baffle and pumps: <ul style="list-style-type: none"><li>• Update from test - if any</li><li>• Review test procedure proposal</li><li>• Evaluate whether to go ahead with incremental improvements</li></ul>
5. Hydroacoustic data
6. Spill frequency data
7. Generation record
8. Reservoir drawdown timing
9. Fish species run timing, emergent timing, length-frequency
10. Other issues
11. Meeting evaluation, set agenda and dates for upcoming meetings

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### MEETING NOTES

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

**Attendees:** Ken Bates (WDFW), Gary Sprague (WDFW), Steve Fransen (NMFS), Dennis Dorratcague (MW), Stan Walsh (SSC), Arnie Aspelund (PSE), Wayne Porter (PSE), Nick Verretto (PSE), Ed Meyer (NMFS), Kevin Brink (PSE), Cary Feldmann (PSE), Lyn Wiltse (facilitator)

#### Action Items:

Remaining from 5/16/00 meeting:

- Bob Barnes will e-mail lake elevation charts and data to attendees by May 31.
- Gary Sprague will provide a Corps of Engineers contact to PSE to find reservoir productivity models by May 31.
- Nick Verretto will e-mail team regarding plans to gather temperature data in vertical water column. Stan Walsh will represent agencies in his response to Nick's e-mail
- Nick Verretto will look at Baker River species length-frequency data.
- Fred Seavey will look at Chinook length-frequency data.
- Fred Seavey will come up with a study design by May 23<sup>rd</sup> to conceptualize how we might test gulper efficiency based on attraction flow and e-mail to group for feedback.

New from 6/13/00:

- Nick Verretto to massage temperature data
- Nick Verretto to share data from gulper pump cycle test
- Nick Verretto to get Upper Baker spill frequency data

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- Kevin Brink to see how fluctuation limits affect spill (# events, amounts, seasons, duration, flow-days by month). What drawdown range and why?
  - Stan Walsh and/or Gary Sprague will offer to share a straw man to guide study selection at the next Fish and Aquatic Working group

### **Parking Lot**

- Barrier dam effectiveness -Arnie Aspelund to pass to Fish Working group
- Design strategy/process. As relates to costs.
- Sediment studies

### **Meeting Handouts:**

1. Lower Baker Intake Temperatures graphs: individual charts for 12 years ranging between 1972-2000, a mean chart, and a combined chart.
2. Inventory Record of Lower Baker Intake Temperature data strip charts.
3. Skagit River flows near Concrete, 1925-2000.
4. Montgomery Watson memorandum exploring cost difference between 0.4 fps and 0.8 fps screen criteria for a deep v-screen intake.

(NOTE: PSE stated that these items would be posted to the web page. Due to storage space concerns these will not be posted at this time. However, these documents will be provided by email to whomever is interested in receiving a copy.)

### **Discussion Items:**

1. Revisit costs of screened intake

Dennis Dorratcague reviewed MW's reconnaissance level estimates of construction costs for a single V on-shore fish screen utilizing 0.8 fps vs. 0.4 fps. The design with 0.8 fps would probably result in 15% savings. There was a request for data regarding forebay fluctuation related to spill and to apply that to a design for a V-screen (with controlled forebay) or other alternatives (as presented in initial report).

2. Temperature data

Nick distributed handouts summarizing available temperature data from the cooling water piping gauge. Data from 1972, 73 and records numbers 5-10 of 1974 and 1983 were invalid and therefore not included in the mean. PSE is currently installing temperature recorders/data loggers at the following 8 sites:

- Skagit River near the Dalles gauge
- Spawning beach 4 in chamber D near the outlet
- Lower Baker intake at 340 ft. elevation (~95 feet down from walkway on intake trashrack)
- Lower Baker adult trap in holding pond #1
- Upper Baker domestic water tunnel near UB beach intake
- Sulfur Creek upstream of all significant springs
- Upper Baker beach 4 intake at valve box or upstream of sheet piles
- Upper Baker gulper at 10 meters deep

There was a question whether we should obtain the discharge temperature coming out of Baker into Lake Shannon. There was a question about the purpose of gathering these data. The team decided to add 2 sites for additional temperature recording:

- Skagit River, upstream of the Baker River confluence
- Upper Baker tailrace

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#### 4. Intake flow test baffle and pumps

PSE determined that nothing could be done on the baffle this year due to the run timing and construction considerations. Starting around May 2, PSE began cycling the pumps (every 24 hours) at Upper Baker to reduce the inlet flow by half at the Upper Baker gulper (one of the two primary pumps is shut down for a 24 hour period and both are operated during the following 24 hours). The purpose of conducting this test is to see if decreased flow might affect attraction to the gulper. The team agreed that PSE should continue with this test through the end of July. The team will take these data into consideration for future studies next year. Nick will be overlaying these data against generation information, reservoir levels, solar radiation, and barometric pressure.

#### 5. Spill Frequency data, Generation Record, Reservoir drawdown timing

Nick shared graphs showing Lower Baker discharge/spill vs. pool elevation (means for 1989-98). Nick is working on making sure the data are complete. Kevin will gather spill study analysis data for the team to discuss next month.

#### 6. Other Issues

The team brainstormed a list of desired data, taking into consideration variables that affect fish collection and passage as well as operations (generation). The team will affinitize these data at the next meeting.

##### Collect /Pass fish:

Variables that affect fish collection

Species

Size

Timing

Depth

Behavior

Migration Path (routes through reservoirs)

Flow to migration relationship

Reservoir level

Age of migration

Attraction queues

Inflow/outflow rate

Mortality

Reservoir turnover rate

Predation

Survival through Lake Shannon and Baker Lake

Reservoir level

Harvest of smolts in trout fishery

Debris

Downstream temp effects

temp. profiles (lakes) seasonal and at depth

temp. differential between areas

temp. model

temp. effects on operation of facilities (fish /generation)

Effects on other work groups

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Info on origin of fish  
Impacts of water quality of fish  
Fish loading, density, hauling, handling protocol  
Delay and attractions  
Inflow water temperatures (side flows to Upper Baker, etc.)  
Survival after release (acclimation/release facilities)  
Methodology to trade off risk aversion (Biological uncertainty risk analysis)  
Relationship to upstream passage facilities  
Production potential (how to size any facility we build)  
Physical information about dams intake levels, trashracks, (facilities) including operations  
Geo-technical studies (landslides, etc.)  
Other Basin Studies (research conducted by others)  
Agency and PSE Management initiatives/prerogatives  
Dam removal (NEPA)  
(fish passage during deconstruction)

Operational Needs:

Impacts on fish passage on operations  
How facilities affect project economics  
Additional O&M cost/constraints (that require training, additional staffing, stock piling...)  
Environmental effects associated with construction  
Drawdown flexibility  
Additional Powerhouse capacity  
Minimum Flows-  
    Bypass flow capability  
    Ability to provide minimum flows  
Downstream impacts on flood control  
Construction work windows impacts on operations  
Marketing implications (weekend shutdowns, etc.)

7. Meeting evaluation set date and agenda for next meeting

**Tentative Agenda for next meeting - July 26, 2000**

1. Review Agenda
2. Action Items
3. Affinitize data on data needed
4. Hydroacoustic data - Nick
5. Fish species run timing, emergent timing, length-frequency
6. Kevin's description for model and assumptions,  
    Variables- market, output, stage-volume relationship, inflow flood control  
    constraints, powerhouse capacity  
    What trying to do and how
7. Conceptual study design discussion
8. Strategies for facilities design
9. Other issues?
10. Meeting evaluation set date and agenda for next meeting

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**Meeting Evaluation**

Next time have lunch in room.