BAKER RIVER PROJECT RELICENSE

Flood Control Feasibility Teamlet Meeting

October 8, 2003
11:00 to 3:00
PSE Office
Mt. Vernon, WA

FINAL MEETING NOTES

Teamlet Leader: Lloyd Pernela, 425-462-3507, lloyd.pernela@pse.com

PRESENT
Lloyd Pernela, Gene Galloway, Anna Miles, and Paul Wetherbee (PSE), Jerry Louthain (EES for City of Anacortes, Skagit County PUD, and Town of Concrete), Dave Brookings, Don Dixon, and Lorna Ellestad (Skagit County Public Works), Charles Howard (consultant), Kurt Keilman by phone and Jay Smith (Tetra Tech), Stan Walsh (Swinomish Tribal Community and Sauk Suiattle Indian Tribe), Keith Brooks by phone (FERC), Mark Killgore (Louis Berger Group), Chuck Steele (Department of Ecology), Ken Brettmann and Beth Coffey (Corps), Albert Liou (PIE), Bill Shaffer (Washington Group), Mary Jean Bullock, note-taker, and Lyn Wiltse, facilitator (PDSA Consulting Inc.)

Agenda

Introductions
Review of July 29 Teamlet minutes.
Corps Operations during flood event: Ken Brettmann (Corps)
PSE Operations review 1990 and 1995 flood events: Gene Galloway
Status of our Additional Flood Control Feasibility Study: Tetra Tech and Washington Group.
Review of study results to date
Discuss schedule
Next Steps

INTRODUCTIONS
We welcomed first time attendees Gene Galloway, Anna Miles, Lorna Ellestad and Kurt Keilman, and Beth Coffey. Beth will be assuming Bruce Sexauer's role (Corps) in this process.

NEW ACTION ITEMS

- Mark: Give Lloyd Ken's presentation to post on website.
- Jay: Get new bathymetry information to Paul to share with Skagit County.
- Dave: By October 15, provide additional data to Kurt related to infrastructure, damages, road closures, etc.
- Jay: October 14, Provide hard copy cross section map to Skagit County.

OVERVIEW OF CORPS FLOOD CONTROL FOR UPPER BAKER

Ken reviewed with us the Corps' flood control philosophy and operations for the Baker River Project. He explained that flood control reduces the magnitude and impact of flood events for a given frequency, but doesn't prevent flooding. Flood control is limited to the part of the Basin being regulated.

River Forecast Center weather forecasts are used to provide input to hydrologic models. Watershed characteristics and state are used in hydrologic models to transform precipitation to runoff. Real-time observations are used to update hydrologic forecasts. There is a lot of uncertainty in flood forecasting.

Ken's October 9, 2002 Power Point presentation is posted on the License website. The updated presentation will also be posted.

PSE OPERATIONS FOR FLOOD EVENTS OF 1990 and 1995

Gene explained the philosophy and operations specific to the flood events of 1990 and 1995. The charts he distributed were based on the 1929 vertical datum.

Skagit County distributed some hourly flow data and reservoir level and other background relevant to the '90's and '95 flood events (using the 1988 NAVD datum). They encouraged the group to consider the viability of operating Lower Baker for flood control and the potentially reduced impacts (environmental and others) of maintaining Lower Baker at a lower elevation.

PSE acknowledges that legally the Corps is the entity who "owns" flood control at Upper Baker. Lloyd reported that any modification or operation of Lower Baker for flood control would be at the direction of the Corps.

Ken stated that the Corps is only authorized to manage 74,000 acre-feet of flood control storage at Upper Baker. Changes/expansions to this would require new authorization.

PSE cannot step into the flood control arena and assume any associated liability for flood control. They cannot put PSE shareholders at risk.

PSE recognizes the value of flood control storage and is willing to work with County to secure new authorizations.

Chuck Steele commented that flood control is recognized in the Lewis River through the workings of the private dam operated by Pacific Corps.

While some advances have been made to forecasting, technology, and methodology, the same advances have unfortunately not found their way into implementation.

STATUS: BAKER LICENSE FLOOD FEASIBILITY STUDY and BAKER PMF
Jay reviewed the scope of the Baker flood control feasibility study. Tetra Tech has been executing this since August 2003. The Corps approved the scope (attached to the July 29th flood control teamlet minutes).

He distributed a handout that summarized the tasks completed so far for the Hydrology and Hydraulics and Economic Analysis. Existing Conditions, along with four alternatives were analyzed for long-term economic benefit. The difference between each scenario was the amount of volume (flood control storage) provided prior to the flood control season.

County expressed concern about the credibility of the model used in this study and about inclusion of the economic impacts of flooding on transportation. PSE explained that study uses hydrologic and hydraulic data/methodology provided by/approved by the Corps. Ken explained that the Corps considers uncertainty in its hydrologic and hydraulic data.

Note: Skagit County and the Corps are engaged in discussions of Corps hydrology off line. We will stay tuned and will integrate any changes that come as a result of these discussions into this report.

PMF (based on Probable Maximum Flood)
Bill discussed the PMF workup that the Washington Group is conducting. The PMF is the theoretically most severe hydrological and meteorological conditions that could occur in the basin. The analysis would consider rainfall plus snow melt contributions to run-off. This considers impact to the immediate Basin and down stream. What would happen if the Baker Development could not safely pass the PMF? FERC reviews PMF and the project's hydrologic capacity (including spillways.) PMF is a primary driver of FERC ordered upgrades today. Note: Corps PMF standards are more rigid than FERC's PMF standards.

At our next teamlet meeting, we will go through the HEC 1 model for the PMF. We hope the inflow hydrographs for the Baker Project will also be available at that time.

PMF and Calibration Handouts

- Flood Event Flow Charts:
    - High Flow Event 1990 (10.1.90 to 12.15.90) for Sauk, Newhalem, Baker, Dalles
    - Baker Flows 10.1.90 to 12.15.90
    - Shannon Flows10.1.90 to 12.15.90
    - High Flow Event 1990 (10.1.95 to 12.15.95) for Sauk, Newhalem, Baker, Dalles
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- Copies of Hourly Flow Data for 1990 and 1995 flood events, calculated by Skagit County Public Works

- Preliminary Draft Alternative Analysis Results of Skagit River Flood Reduction Feasibility Study, October 8, 2003

Agenda for November 12 Flood Control Teamlet Meeting
(Note: This meeting will immediately follow the conclusion of the Econ/Ops Working Group Meeting.)

12:00 – 12:05 Introductions
12:05 – 12:15 Review of October 8 Teamlet minutes and Agenda for this meeting
12:15 – 12:30 Report on Action Items
12:30 – 12:40 High-Level Update/Status report on PIE Flood Feasibility Study
12:40 – 2:00 Review of Results from Tetra Tech Additional Flood Feasibility Study
2:00 – 2:30 Review of Results from Washington Group's Baker PMF
- HEC 1 Model
- Inflow Hydrographs

2:30 – 2:40 Review of study results to date
2:40 – 2:50 Discuss schedule
2:50 – 3:00 Next Step

ATTACHMENT
The following attached notes are comments by Skagit County received on October 20th. They have not been reviewed/approved by the Flood control teamlet.

SKAGIT COUNTY COMMENTS ON DRAFT NOTES

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Skagit County Comments

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DRAFT MEETING NOTES

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SKAGIT COUNTY COMMENTS ON DRAFT NOTES

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Ken reviewed with us the Corps' flood control philosophy and operations for the Baker River Project. He explained that flood control reduces the magnitude and impact of flood events for a given frequency, but doesn't prevent flooding. Flood control is limited to the part of the Basin being regulated.

River Forecast Center weather forecasts are used to provide input to Corps hydrologic models. Watershed characteristics and state are used in hydrologic models to transform precipitation to runoff. Real-time observations are used to update hydrologic forecasts. There is a lot of uncertainty in flood forecasting.

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Skagit County distributed some hourly flow data and reservoir level and other background relevant to the '90's and '95 flood events (using the 1988 NAVD datum). Lorna said the data indicated that if the Lower Baker had not gone into the floods basically "full" it could have reduced the discharge from Lower Baker into the Skagit by as much as 15,000 to 18,000 cfs. They encouraged the group to consider the viability of operating Lower Baker for flood control and the potentially reduced impacts (environmental and others) of maintaining Lower Baker at a lower elevation and evacuating the Lower Baker reservoir to the maximum extent possible after the notice has come from the Corps that it will assume control of Upper Baker for flood control.

PSE acknowledges that legally the Corps is the entity who "owns" flood control at Upper Baker. Lloyd reported that any modification or operation of Lower Baker for flood control would be at the direction of the Corps.

Ken stated that the Corps is only authorized to manage 74,000 acre-feet of flood control storage at Upper Baker. Changes/expansions to this would require new authorization.

Skagit County acknowledged that the Corps cannot require PSE to operate Lower Baker for flood control but they can request specific voluntary actions by PSE at Lower Baker.

According to Lloyd PSE cannot step into the flood control arena and assume any associated liability for flood control. They cannot put PSE shareholders at risk.

PSE recognizes the value of flood control storage and is willing to work with County to secure new authorizations.

SKAGIT COUNTY COMMENTS ON DRAFT NOTES

Chuck Steele commented that flood control is recognized in the Lewis River through the workings of the private dam operated by Pacific Corps.

While some advances have been made to forecasting, technology, and methodology, the same advances have unfortunately not found their way into implementation. These forecasting advances are being utilized by PSE in their current generation economics and reservoir level operations optimization model in Hydrops.

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County expressed concern about the credibility of the model used in this study~~. and about inclusion of the economic impacts of flooding on transportation.~~ Dixon pointed out that the Tetra Tech model output provided at the meeting indicated 100-year flows from the Baker at Concrete in Table 3. were significantly lower than the observed flow during the three floods in the 1990's. PSE explained that study uses hydrologic and hydraulic data/methodology provided by/approved by the Corps. Ken explained that the Corps considers uncertainty in its hydrologic and hydraulic data.

Note: Skagit County and the Corps are engaged in discussions of Corps hydrology off line. We will stay tuned and will integrate any changes that come as a result of these discussions into this report.

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