401 Permit Decision-Making
Sea-Tac International Airport, Third Runway

FINAL MEETING NOTES

LOW FLOW ANALYSIS

July 9, 2001
10:00 – 4:00

These final meeting notes have been prepared by Kate Snider, Floyd & Snider Inc.

ATTENDEES

Ann Kenny, Dept. of Ecology
John Drabeck, Dept. of Ecology
Kelly Whiting, King County
Keith Smith, Port of Seattle
Paul Fendt, Parametrix
Rick Schaefer, EarthTech
Don Weitkamp, Parametrix
Robert Farid, Parametrix
Joe Brascher, Aquaterra
Pony Ellingson, Pacific Groundwater Group

MEETING SCOPE AND AGENDA

In a prior low flow meeting on 6/25/01, expectations for deliverables and agenda associated with this 7/9 meeting were developed. However, the deliverables as defined on 6/25 were not able to be submitted in advance of 7/9. Expectations for the 7/9 meeting were changed accordingly. It was agreed that concurrence on the methodology to be used to determine low-stream flow mitigation requirements would not be expected from this meeting. The agenda of this meeting was defined to discuss the following:

1) Biological effects used in low flow impact determination

2) Des Moines Watershed draft material review and mitigation proposal

3) Miller and Walker watershed briefing on status

4) Expectations for process forward

BIOLOGICAL EFFECTS USED IN LOW FLOW IMPACT DETERMINATION

- Port proposes that in each watershed low stream flow impact will be determined based on the difference between pre-project and post-project 2-year 7-day low flow rates.

- Port concludes that determination of impact and associated mitigation using this method

meets fish habitat goals because of the following:

- Goal relative to fish habitat is to maintain existing conditions through use of mitigation
- Focus of most fisheries review in streams are summer low flows with a duration of 2 weeks or more – effects "carrying capacity" of basic habitat to support fish
- Mitigation as proposed will maintain existing conditions. Use of 2-year 7-day low flow to determine mitigation provides some safety factor for carrying capacity concerns for fish.
- Mitigation flow input unlikely to affect fish behavior problematically – early migration will not be triggered by flow conditions only; and substantial flow changes do occur in the existing record during low flow conditions. Flow changes of the magnitude proposed for mitigation are not large magnitude change for fish.
- Temperature of mitigation flow is likely to be cooler than low stream flow. Cooler temperature flow input is not likely to be detrimental – temperature concern at low flows are increase in temperatures.
- Dissolved Oxygen levels in the stream are likely to be naturally low in low stream flow periods, should not be negatively impacted by mitigation flows. DO > 80% saturation - no effect; DO between 60 – 80% saturation – limited effect; DO < 40% - impairment.

DES MOINES WATERSHED MATERIAL REVIEW AND MITIGATION PROPOSAL

- Proposed mitigation flow for Des Moines watershed is 0.1 cfs = difference between pre-and post-project 2-year 7-day low flows. Pre-project 2-year 7-day low flow = 0.35 cfs. Post-project 2-year 7-day low flow = 0.25 cfs.
- Proposed mitigation duration = July 24 through October 24. Reserve vaults will be sized based on objective of constantly releasing mitigation flow throughout this duration each year. The proposed duration captures all of the low flow events in the existing record. If, at the end of the proposed mitigation period, there is still water available in the reserve vaults, water will continue to be released at the mitigation flow.
- Vault size in Des Moines is calculated at 11 acre-feet of volume. This vault size has been determined based on the ability to fill the vault during the worst year in the record to provide the proposed mitigation flow and duration. Based on the worst year in the record, it could take a maximum of 66 days to fill the vault prior to an August 1 release date. This estimate will be revised based on a July 24 start date for the mitigation period.
- ***For the Des Moines watershed, Ecology and King County requested that as revised information is provided, the following items should be updated:***

- Revised 7-day low flow – frequency information and occurrence distribution for post-project conditions with augmentation.

- Confirmation that augmented numbers have been provided based on re-running statistics.

- Material should be provided comparing calibration data to gauge data for the low flow period in all years.

- Final vault statistics should be provided based on a 7/24 mitigation period start date.

MILLER AND WALKER WATERSHED STATUS BRIEFING

SLICE Model Integration

- Interim deliverables were provided by Pacific Groundwater Group explaining SLICE model integration over the embankment and SLICE model output files to HSPF.

Mitigation Flow and Duration

- Proposed mitigation flow and durations for Miller and Walker creeks will be determined using the same methodology as described for Des Moines watershed. For post-project flows, 7-day low flow events will be reviewed for the 1991 – 1994 water years modeled to include embankment seepage effects.

- In the Miller watershed, all 7-day low flow events in the existing record occur between August 7 and October 25, except for three outlier events that occurred on 11/9, 11/23 and 12/11. The Port will propose a mitigation duration to capture all of the low flow events with the exception of the three outlier dates.

Non-Hydrologic Effects in Acquisition Area

- Within the Miller and Walker watersheds, non-hydrologic effects on low stream flow have been discussed for the property acquisition area – both potential benefit to low stream flow from removal of water rights and the potential impact to low stream flow from removal of septic system inputs.

  The Port proposes that all non-hydrologic effects on low stream flow for the property acquisition area should be removed from consideration for the following reasons:

  - Estimated low stream flow effects from both water rights removal and septic system removal are extremely difficult to compute due to locations of inputs/withdrawls, travel time to the stream and losses to deep groundwater. Documentation regarding both water usage and septic system usage is difficult - much of the water usage estimates have been based on hearsay; active septic system usage is unclear as the area was also supported by a municipal sewer.

  - Policy defensibility is questionable regarding mitigation requirement for septic system [illegible].

The Port questioned Ecology as to whether there is effective regulatory precedent that the Port would be required to mitigate for potential stream flow effects of septic system removal. For example, is stream flow evaluation or mitigation required for sewerage districts when sewers are installed in neighborhoods?

- It was determined that Ecology would look into the Policy question raised above and provide direction to the Port on 401 requirements relative to this issue. Low stream flow work by the Port will continue for now without consideration of non-hydrologic effects in the acquisition area.

Walker Basin "Non-Contiguous" Groundwater Areas

- Material was reviewed related to how groundwater contributions to Walker Creek were determined. For calibration of 1994 data, it was determined theoretically that 630 pervious acres had to be rained on to develop the groundwater contribution to Walker Creek. The location of the groundwater basin was estimated in "non-contiguous" groundwater basin mapping.

- Walker basin modeling will be revised by the Port based on determination of the effective impervious area that will be added in the non-contiguous groundwater basin areas in post-project conditions. This revision will effect the low flow impact determination. Map of groundwater basins should additionally be revised as necessary.

NEXT STEPS

- An additional meeting was scheduled for July 16th to review status of material revisions.

- The Port will submit a comprehensive interim deliverable related to low stream flow impact and mitigation for all three watersheds. This deliverable will include all materials listed in the 6/25 and 7/9 meeting notes. The deliverable will be accompanied by a clear description of the Port's proposal for low stream flow mitigation, and plans for revision of the final low-stream flow report and operations plan. The Port's target date for this submittal is July 23.