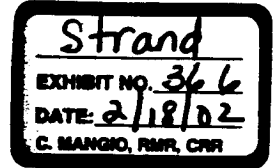


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June 27, 2000

Mr. Peter J. Eglick, Esq.  
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Attorneys for Airport Communities Coalition (ACC)  
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Subj: Review and Evaluation of *Sea-Tac Runway Fill Hydrologic Studies Report*.  
Prepared for the Washington State Department of Ecology by Pacific Groundwater  
Group, Seattle, Washington; Ecology and Environment, Seattle, Washington; and Earth  
Tech, Inc., Bellevue, Washington. June 19, 2000.

Dear Mr. Eglick:

At your request, I reviewed and evaluated Washington Department of Ecology's (WDOE's) independent study to investigate hydrologic impacts of the subject fill project on aquifers, wetlands, and Miller, Walker and Des Moines Creeks. Of particular interest was WDOE's assessment of potential hydrologic impacts on fishery resources and other aquatic life inhabiting area streams. In undertaking this effort, I have relied on my education, specialized training, and professional skills acquired over a 40-year career as a Fisheries Biologist (see attached Curriculum Vitae).

My review and evaluation focused on five areas of the Report:

- Functional assessment of study area wetlands (Sect 3.3.3.2)
- The description of fishery resources in study area streams (Sect 3.4.1.-3.4.5.)
- The assessment of impacts on fish habitat in Miller Creek as a consequence of its relocation in the Vacca Farm area (Sect 1.4.3).
- The methods employed to estimate stormwater flows and sizing flow-control facilities for purposes of mitigating impacts to fish and other aquatic life (Sect 3.6.2.).

- The assessment of impacts of warm water runoff from runways and taxiways entering area streams following summer rains (3.6.10).

My opinions and the detailed evaluations on which they are based are found in the succeeding sections:

#### Opinions

- **The functional importance of area wetlands to support fish, both resident and anadromous, is understated.**

Ecology & Environment (E&E) understates the ecological importance of wetlands to support fish. They say in Sect 3.3.3.2 that "most project wetlands have little direct bearing on resident fish populations and are therefore all equally considered to be of low quality." They offer as the only exceptions to this rule Wetlands 18 and 37. In my opinion they have overlooked the very important wetland at the head of Walker Creek, Wetland 43, which supports both resident and anadromous fish.

E&E makes no attempt to describe the fishes of Wetland 43, nor is there any evidence that they recently conducted fish surveys in this wetland or upper Walker Creek. If they had surveyed the wetlands including upper Walker Creek, they would have found the very abundant cutthroat trout in addition to juvenile coho salmon. They also would have noted that of all the small streams draining this region of King County, i.e., Walker, Miller and Des Moines Creeks, Walker Creek supported the most coho spawning in recent (1998-1999) spawning surveys (Hillman et al. 1998). Even Parametrix (2000b) rated this wetland as moderate in supporting resident and anadromous fish. Based on my own observations, Walker Creek is the most undisturbed of the three drainages (Miller, Walker, Des Moines Creeks), which could account for its greater salmonid production. E&E also does not acknowledge the ecological importance of wetlands as critical habitats supporting other aquatic life, e.g., dragonflies, damselflies, caddisflies, mayflies, and crayfish, many of which are important prey species for trout, salmon, and other fishes.

- **Fishery resources of area streams are not accurately described.**

E&E does not accurately describe the fishes inhabiting the Miller Creek and Des Moines Creek Watersheds (Sect 3.4.1 - 3.4.5), which in my opinion, trivializes the ecological importance of area streams. In addition to coho salmon, chum salmon, and cutthroat trout, E&E reports in this study that three-spined stickleback and pumpkinseed sunfish occur in Miller Creek but not other species. The Airport Communities Coalition (ACC) Pollution Investigation Team found both prickly sculpin and yellow perch during recent (April 2000) water quality studies conducted in area streams. Parametrix (2000) reported finding three-spined stickleback, pumpkinseed sunfish, and black crappie in upper Miller Creek, which suggests that E&E's surveys were neither comprehensive nor quantitative.

E&E also says that "steelhead and pink salmon runs" have been reported in Des Moines Creek, when it is more likely that only "stray" steelhead or pink salmon occur there. Hillman et al., in 1998, document finding only one steelhead in Miller Creek and two in Des Moines Creek.

Furthermore, E&E says "adult coho and chum salmon use of Miller and Walker Creeks was verified up to First Avenue South" yet Hillman et al. (1999) reports finding coho redds above First Avenue South. I question whether or not E&E surveyed above First Avenue South. Similarly, WDOE reports that adult coho and chum exploit Des Moines Creek up to Marine View Drive, while Hillman et al. (1999) reported finding coho spawning up as far as S 212<sup>th</sup> Street, a kilometer above Marine View Drive. If either the Port's consultant or E&E had employed a more systematic and comprehensive survey approach, they also would have found an abundant cutthroat population, not the "small population of resident" fish as stated in this report. The ACC Pollution Investigation Team has captured or observed cutthroat trout at all water quality sampling locations during April 2000 surveys, up to 157<sup>th</sup> Avenue on Miller Creek, and up to S 200 Street on Des Moines Creeks.

Finally, E&E reports in Sect 1.4.4.3 that because no 0-age chum salmon and steelhead were found during juvenile fish surveys conducted March 24 and 25, 2000, that it was unlikely that viable spawning populations of these species exist on Miller, Walker, or Des Moines Creeks. In my opinion, this conclusion is premature and careless, particularly as it applies to chum salmon. Clearly adult chum have been observed in area streams in 1998 by Hillman et al. (1999) and by E&E in 1999 (this study). Hillman et al. (1999) also found that chum entering Miller and Des Moines Creeks in 1998 all voided their eggs indicating that chum, in fact, do spawn in area streams. To suggest that a viable spawning population of chum does not exist in area streams based on only one year's sampling of juveniles is not good science. To only look for juveniles over the very narrow window of March 24-25, 2000, is careless. How sure was E&E that the chum had already hatched and emerged from the gravel? The chum also could have hatched, emerged and outmigrated by March 24<sup>th</sup> or 25<sup>th</sup>. Chum are found in freshwater for only a few days (Wydowski and Whitney 1979) and outmigrate from late February to mid-July in Washington streams and rivers (Wydowski and Whitney 1979; Warner and Fritz 1995). It is likely that E&E missed the chum outmigration.

- **The effects of construction on fish habitat in Miller Creek are substantially understated.**

The impacts on fish habitat of relocating Miller Creek are not even addressed (see Sect. 1.4.3). Clearly, relocation of Miller Creek will result in nearly total elimination of the fish and invertebrate communities presently found in the 980 feet of Miller Creek to be filled accommodating the embankment of the runway. Ecology is remiss for not requiring the Port to address the magnitude of this impact, and appears to have been dazzled by the Port's suggestion that relocated Miller Creek, complete with new riffles, pools, and replacement of woody debris, will provide a net gain in fish habitat. It could

be years before the relocated creek will attain the level of production achieved presently, assuming that the Port or WDOE knows what level of fish production presently occurs. Unfortunately, neither the Port nor WDOE has recently undertaken a quantitative fishery survey in Miller Creek, or for that matter, in Des Moines Creek.

The WDOE also indicates that "an uncontrolled release of stormwater is likely to occur sometime during construction," given the size of the project and human error, however, the size and quality of a release cannot be predicted, nor can its impacts on fish be quantified." I agree, you can't predict impacts if you don't know the kinds and abundances of fish and other aquatic life that inhabit the site.

- **Methods for establishing target flows and sizing flow-control facilities do not work.**

The WDOE and the Port cannot guarantee that stormwater peak flows and durations generated during operation of the third runway will not harm fishery resources in Miller Creek.

As indicated in Sect 3.6.2, the Port proposes to control stormwater runoff from the airport using a combination of local and regional detention facilities to regulate the rate of stormwater released to Miller Creek. Their consultant has employed a Hydrological Simulation Program-FORTRAN (HSPF) computer model to determine the size of detention facilities needed to control stormwater at different flow rates and durations.

As pointed-out by WDOE, the HSPF model as presently configured for Miller Creek predicts higher than observed flow volumes at two reference locations, indicating that the model is not well calibrated. The Port, therefore, could seriously underestimate the size of detention facilities needed to control stormwater releases to Miller Creek. The Port then, can't conclude that flows in Miller Creek will be fish-friendly.

The model requires substantial modification and additional calibration before another evaluation of the proposed stormwater controls can be undertaken. What is missing from WDOE's assessment, however, is what will be the next step. Will, in fact, the model be modified and re-calibrated? Clearly, WDOE must require the Port to develop a reliable method to design flow-control facilities in Miller Creek that will preserve habitat for fish and other aquatic life. The public should be assured that construction will not proceed without this additional step.

- **Warm runoff from runway and taxiways during summer rains could impact area streams (Miller, Walker, and Des Moines Creeks).**

The potential for warm runoff from runway and taxiway paved areas to enter streams and elevate temperatures has been considered but, in my opinion, incompletely. WDOE indicates that this is essentially a non-problem but presents no data to document

the temperature of warm runoff entering area streams or what the volume of warm runoff entering area streams will be under different sized storm events.

The third runway and connecting taxiways will cover about 32 percent of the new embankment surface, and will produce varying volumes of stormwater, dependent on the rate and duration of rainfall events. To be able to calculate flow rates and to limit peak flows and durations, the Port employs the HSPF computer model.

Water running off the paved surfaces is proposed to flow into low areas at the bottom of the filter strips, then into catch basins. Water entering the catch basins would be conveyed through pipes to detention vaults, then ultimately into the streams. Clearly, if the Port has the ability to estimate the volumes of water released to the creeks, they also have the ability to estimate the change in stream temperature from the addition of warm runoff. In Miller Creek, the potential problem is compounded by not having a model that is properly calibrated.

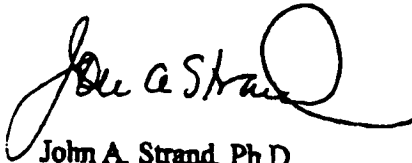
At minimum, WDOE should present data to document their assertion that the volume of warm runoff entering Miller Creek is negligible, or require the Port to generate this data if WDOE's consultants only approached this problem qualitatively.

#### Summary

It is my opinion that WDOE's independent study does not address all possible impacts on area fishery resources from the subject construction project. Notable omissions are the impacts on fish and fish habitat from relocating Miller Creek in the Vacca Farm area. Also, neither WDOE nor the Port provide any data proving that warm runoff from the new runway and taxiways will not impact Miller Creek. Perhaps the greatest weakness is the failure to accurately describe the fish communities at risk. Recent attempts to survey the fish resources of area streams were, unfortunately, neither comprehensive nor quantitative.

Thank you for the opportunity to comment on this Report.

Yours very truly,



John A. Strand, Ph.D.  
Principal Biologist

Cc: Kimberly Lockhard  
Mary Ortega  
Bill Rozeboom

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