



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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October 21, 1999

Mr. Tom Hubbard  
Surface Water Program  
Port of Seattle  
P.O. Box 68727  
Seattle, WA 98168-0727

Dear Mr. Hubbard: <sup>Tom</sup>

Re: Port of Seattle, Sea-Tac International Airport  
Dissolved Oxygen De-Icing Study (Final Draft)

Lisa Austin, Tom Luster and I have reviewed the draft final Dissolved Oxygen De-Icing Study submitted by the Port of Seattle on August 16, 1999 in responding to an anticipated 401 Certification monitoring requirement on the impacts of de-icing agents from airport storm water run-off to Miller and Des Moines Creeks. The comments provided below reflect a summary of concerns and criticisms of the study by the three reviewers listed above.

The data clearly show large BOD<sub>5</sub> discharges to both the NW Ponds and Lake Reba. Considering the relatively rapid transit time through and brief residence time in Des Moines and Miller Creeks, one would expect to see any impacts of BOD<sub>5</sub> discharges in Puget Sound and not in the stream systems. To support this conclusion, Streeter-Phelps analyses and modeling on both stream systems should have been conducted.

On page 4-9 of the study, there is a discussion of tributary sampling in the Des Moines Creek East Basin which revealed the highest concentration of BOD<sub>5</sub> (1,176 mg/l) detected in the study and led the Port to conclude that this was an indication that high BOD<sub>5</sub> producing chemicals were being used and discharged into stormwater from elsewhere in the basin. Ecology does not reach the same conclusion. Port of Seattle outfalls SDE4 and SDS1 also discharge into this basin and may be sources for high BOD<sub>5</sub> discharges, as well as any off-site contributions.

The Port should be mindful that glycols are applied to aircraft in some cases on a daily basis at the airport. Small amounts of glycols shear and drip from these aircraft and are introduced into the stormwater drainage system around the runways. This could well be a constant source of BOD<sub>5</sub> discharges to Lake Reba and the NW Ponds that contributes to the low DO levels found in both of these systems between storm events during this study. The Port should consider investigating this hypothesis further.

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The study erroneously describes Des Moines and Miller Creeks as Class A waters and uses the Class A criterion for dissolved oxygen. Both the NPDES permit and last year's 401 describe them as Class AA waterbodies, and the Port's Natural Resource Mitigation Plan describes them as Class AA waters. Also, Lake Reba could be considered Lake Class. All narrative, figures, and tables should be corrected to compare the study's findings to the Class AA (9.5 mg/L) or Lake Class ("no measurable decrease from natural conditions") criterion.

Ecology is concerned that the findings of the study are based on only two de-icing events, which is a less than optimal sample size in developing robust and defensible statistical conclusions. In addition, background levels are based on samples taken on just one day, December 9, 1998. Given the highly variable D.O. levels in the creeks, it would have been helpful to have more background samples from a longer period of time.

This study used samples from Des Moines and Miller Creek tributaries as controls. Ecology believes that a more representative sampling plan would have included samples at points upstream and downstream from the Port's discharge points to more accurately assess Port-related effects in the receiving waters. Using the tributaries as controls does not serve this purpose.

The correction factors applied to the in-stream measurements of dissolved oxygen (D.O.) are puzzling and somewhat troubling to Ecology. The values of the correction factors ranged from -1.43 mg/l to +5.2 mg/l as detailed in the study's Appendix D. The study seemed content to work around this startling variability, rather than to have taken measures to reduce the variability through a more aggressive program of accurate in-stream D.O. measurement through timely maintenance and calibration of in-stream D.O. meters

Among the conclusions that Ecology draws from this draft final study is that some parts of both Des Moines and Miller Creeks do not meet the D.O. criterion for some time period. Samples taken in the upper watersheds did not meet the criterion for a majority of the sampling period.

This is pretty consistent throughout the study. The background sampling shows that D.O. levels in 5 of 18 samples (28%) were below the Class AA criterion (and in fact, that 4 were below Class A (22%), and 3 below Class B (17%)). Control samples taken during the various stages of the deicing events show a range of D.O. levels and a range of compliance with the D.O. criterion. Samples taken during all three stages of the December 11 event (Table 11) shows 2 of 31 samples not meeting the criterion (6%); the February event shows 4 of 14 samples not meeting the criterion (29%).

Figure 4 shows that in Des Moines Creek, the 9.5 mg/L D.O. criterion was generally not met during the 3-month sample time period upstream of the Golf Course Weir. The criterion was met about half the time at the weir, and was usually met downstream from the Des Moines Wastewater Treatment Plant. Figure 5 shows that, in Miller Creek, for the same sample time period, the 9.5 mg/L D.O. criterion was met about half the time at Lake Reba and the Miller

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Creek Detention Facility and almost all the time at the downstream sampling points. These same trends are generally evident in Figures 7, 8, 10, & 11, showing conditions in Des Moines and Miller Creeks for about a two-week period around the December 98 deicing event.

Overall, this indicates that portions of both Miller and Des Moines Creeks were not meeting the applicable water quality criterion, at least in those locations and on those dates. It is difficult to determine, however, what this means as far as its effect on characteristic beneficial uses. Ecology believe this points more to the generally degraded conditions in the watersheds rather than one set of activities in the basins. Ecology believes that this finding is critical to a more complete understanding of Miller and Des Moines Creeks' ecosystems and it is a finding that should be shared with watershed planning authorities working on the restoration of these systems.

Should the Port of Seattle wish to re-submit this study with an addendum addressing the concerns and criticism of Ecology outlined in this letter, Ecology would be happy to re-evaluate the study. Unfortunately, given the deficiencies of the final draft study, Ecology can not make a fully informed decision as to whether or not the Port of Seattle is properly managing de-icing agents in use at Sea-Tac International Airport to prevent water quality impacts to Miller and Des Moines Creeks.

Please contact me at (425) 649-7037 to answer any questions on this letter or for further assistance on Port of Seattle's NPDES permit.

Sincerely,



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NWRO Water Quality

KCF:kcf:gm

cc: Elizabeth Leavitt, Port of Seattle  
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