



## King County

### Water and Land Resources Division

Department of Natural Resources and Parks

King Street Center

201 South Jackson Street, Suite 600

Seattle, WA 98104-3855

**206-296-6519** Fax 206-296-0192

TTY Relay: 711

September 1, 2011

TO: Susan Braley, Water Quality Program, Washington State Department of Ecology

FM: David Batts, Senior Engineer, Stormwater Services Section, Water and Land Resources Division, Department of Natural Resources and Parks

RE: WA Ecology WQP Water Quality Assessment Review: WQP Policy 1-11 Chapter 1

We appreciate the opportunity to comment on Ecology's Water Quality Policy 1-11. We recognize that the Water Quality Assessment is required by federal law, and is a critical tool in the effort to return impacted state's waters to beneficial use and back to compliance with state water quality standards. The Assessment includes the criteria for listing and de-listing waterbodies, and it must be recognized as having a significant role in prioritizing of cleanup actions and the associated costs, under increasingly constrained fiscal realities. The Assessment must hew a fine line incorporating legal requirements and environmental protection, and these requirements are not always in complete harmony. We appreciate the opportunity to comment, and hope that our observations will help to improve the Assessment.

The following comments provide our priority concerns and associated observations, some commentary that is applicable throughout the Assessment, and some examples of some of issues identified in the Assessment. We have also edited and commented on details directly in the Assessment itself, and the edited Assessment is included as an attachment with this memorandum. Please note that anywhere the word 'listing' is used below, unless otherwise noted, it is with regard to a listing requiring a TMDL.

1. The Assessment needs to be clear at the onset – in Introduction and Background – that data and information used for 303(d) listings (305(b) Report category 5) must meet the requirements of WQP Policy 1-11, Chapter 2, Ensuring Credible Data for Water Quality Management.
2. While Ecology uses specified excursions exceeding the water quality criteria values as indication that a problem exists, we need to be clear that:
  - a. Excursion of fewer samples than required by a water quality standard (WQS) does not constitute a violation of the WQS. We believe there should be a public process with

respect to sample sets that fall short of actual WQS violations, and whether those may result in category 5 listings, or if they should result in a category 2 ('of concern') listings.

- b. The minimum data requirements for a listing are not sufficient to develop TMDLs. Additional monitoring beyond the minimum required for listing will be required for TMDLs, except where a listing has been developed from a larger credible data set.
3. We note that the procedures for listing and de-listing do not reference any statistically valid methodology with respect to minimizing false positives, which result in unnecessary TMDL cost, and false negatives, which result in continued environmental degradation. Snohomish County has submitted to Ecology, comments that include citations of statistically-based methodology with defined statistical power requirements and risk assessments. We have not had time to review the cited State Assessment Programs and Methods, but on face value they sound reasonable in principle. We urge Ecology to evaluate these and to conduct a survey as to whether methodology with the same intent has been developed by any other states; and having reviewed all, incorporate commensurate methodology into the state of Washington Water Quality Assessment.
4. A case in point regarding comments above. As written in the Assessment, listings seem to be possible in at least some cases with data that cannot be considered credible with respect to representativeness including but not limited to sampling methodology and sample size. A clear example of this is seen under: 6. Assessment Methodology: allowing use of an instantaneous excursion either of the WQ criteria for metals (chronic or acute), i.e.:

"Measurements of instantaneous concentrations will be assumed to represent the averaging periods specified in the state surface water quality standards for both acute and chronic criteria unless additional measurements are available to calculate averages."\*

In the absence of definition of 'instantaneous', one must assume this means a grab sample. In the absence of a body of scientific work indicating the probability and uncertainty around a single grab-sample value representing an average, especially a four-day average (chronic), the stated assumption will lead to listings where there is no prima facie demonstrated exceedance of the WQ standard. This can be said even for a one-hour average (acute), because the full language of the WQS is "not to be exceeded more than once every three years on the average" for both chronic and acute. It can also be said because the quality of a single sample cannot be estimated let alone known unless it happens to be a sample for which a replicate was also obtained, and for which the full suite of laboratory QA/QC has been applied or done in association. And there is no question that the variability around a single sample cannot be known.

We recognize that the water quality criteria for many metals beg the questions:

- a. How many grab samples are needed to constitute a one-hour average? A four-day average?
- b. Can flow-weighted composite sampling be used to achieve the one-hour average? The four-day average?

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\* WA Ecology, 2011. Policy 1-11, DRAFT Public Review 7/6/11-9/1/11, page 20 of 67.

- c. Intent behind EPA's requirement to filter for dissolved metals within 15 minutes of a sample is to minimize post-collection chemical reactions that may affect metals speciation in the sample. How can flow-weighted autosampler compositing be reconciled with that for a one-hour composite? What about a four-day average? If 24-hour compositing is acceptable (and if that is representative from a metals speciation point of view), then a four-day average will require four composites. From a native chemistry point of view, grabs with immediate filtration are probably more representative than autosampler composites; but multiple grabs within the averaging period are expensive to collect and analyze.
- d. Once we have determined how to obtain one-hour and four-day averages, how many of those average values are needed to evaluate the "not to be exceeded more than once every three years on the average" part of the standard?

We recognize that fully meeting these criteria would require no less than some *multiple* of three years of monitoring, multiple times per year, and that for cost reasons this is as unrealistic for de-listing as it would be for listing. However, it is not unreasonable to make a requirement that any single excursion must be followed up by no less than at least one if not more, additional confirming measurements before listing.

Clearly there is a question of reconciling less data than required by WAC 173-201a to demonstrate that a water quality standard has been exceeded or is being met, within the context of the realities of available monitoring resources. Ecology needs to state the legal basis for that discretion.

We recommend that Ecology undertake a study of representativeness, including but not limited to sampling methodology and sample size, for metals with respect to use of data short of that required by water quality criteria as given in WAC 173-201a, and apply that that to the Assessment (see comment 3 with regard to Snohomish County recommendations on assessment methodology). In the interim, we recommend for metals:

- For the acute criteria, confirmation by no fewer than three grab samples spread out over an hour
- For the chronic criteria, confirmation by no less than four grabs collected one each day on four consecutive days.
- In either case, all samples collected during the averaging period must be included in the average.

Ecology should also investigate leading-edge technologies for monitoring metals continuously in-situ, e.g. see [http://www.idronaut.it/cms/view/research\\_projects/vamp/s199](http://www.idronaut.it/cms/view/research_projects/vamp/s199).

5. With regard to all pollutants:
  - a. Ecology needs to state the legal basis for discretion to list as requiring a TMDL, with less data than required to demonstrate a water quality standard exceedance as stated in WAC 173-201a.

Comment 3 with regard to Snohomish County recommendations on assessment methodology applies to the following:

- b. Subject to a finding of legal basis for using less data than required to demonstrate a water quality standard exceedance as stated in WAC 173-201a, Ecology should conduct a study of the risk of false positive and false negative listing determinations for each pollutant.
- c. Ecology should conduct a study of the likelihood of false positive and false negative listing determinations when collecting the minimum number of samples required by WAC 173-201a.
- d. Ecology should conduct a study for all pollutants, to establish statistically-based listing methodology with defined statistical power requirements and risk assessment.
- e. We recommend that Ecology updates WAC 173-201a to include clear definition of sampling methodology, sample size, and sampling period, to be based on defined statistical goals and risk analyses.

DB:bgD04

cc: Curt Crawford, Manager, Stormwater Services Section, Water and Land Resources  
Division (WLRD), Department of Natural Resources and Parks (DNRP)  
Doug Navetski, Supervising Engineer, Water Quality Compliance Unit, WLRD, DNRP