

TRIENNIAL REVIEW OF SURFACE WATER QUALITY STANDARDS

Preface

This document is in response to the opportunity provided by the Washington State Department of Ecology for the public to review the water quality standards and provide feedback on the priorities and commitments the DOE makes regarding the standards.

The Current Situation

“More than 1000 freshwater lakes and streams are classified as “impaired” and low oxygen conditions are increasingly frequent in Puget Sound marine waters.” [Page 24 of the Puget Sound Partnership’s Action Agenda]

According to Ecology’s Water Quality Index only 40 % of Washington State waters are considered to be of good quality. 60 % of the State waters are considered to be of fair or poor quality. Yet the primary underlying assumption and context of the State’s Water Quality Standards is that the State’s waters are for the most part in compliance with water quality standards and that they need preservation and protection from degradation by acts of humankind pollution. There is too little emphasis and provision in the current water quality standards on restoring water quality in the 60 % of water bodies characterized as having fair or poor quality water.

Legislative Intent in Regard to Water Quality

The legislative intent of the State’s Surface Water Quality Standards is as follows:

WAC173-201A-010

Purpose.

(1) The purpose of this chapter is to establish water quality standards for surface waters of the state of Washington consistent with public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife, pursuant to the provisions of chapter [90.48](#) RCW. All actions must comply with this chapter.

The *actions* referred to in the above excerpt are referenced below as follows:

RCW 90.48.010

Policy enunciated

It is declared to be the public policy of the state of Washington to maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington.

Consistent with this policy, the state of Washington will exercise its powers, as fully and as effectively as possible, to retain and secure high quality for all waters of the state.

The current Surface Water Quality Standards focus on retaining the good quality water that exists in only 40 % of State waters but largely neglect how the State is going to *secure high quality* water for the 60 % of the waters of the State judged to be of fair or poor quality.

Why are 60 % of the State's Waters of Fair or Poor Quality?

“According to the draft 2004 Water Quality Assessment, the most common water pollution problems in Washington are high temperature, fecal bacteria, pH, low dissolved oxygen, metals, and nutrients.” That this condition exists is primarily attributed to the cumulative impact of nonpoint pollution which *“...is inextricably tied to local land uses and individual actions.”* [Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution]

What is Required to Secure High Quality for all Waters of the State?

To secure high quality water in the 60% of Washington's impaired water bodies requires (1) restoration, in so much as practical, of the natural hydrologic function in their watersheds and (2) removal of metals and nutrients from surface and ground water entering these water bodies. The nature of nonpoint pollution requires effective management of local land uses and enlightened individual action in order to prevent metal and nutrient transport by surface and ground water. Both are difficult, time consuming and expensive to achieve.

Until nonpoint pollution can be prevented at its multiple sources the best hope to *secure high quality for all waters of the state* is (1) restore natural hydrologic function and (2) to apply metal and nutrient inactivation chemicals at the source (e.g., septic system drain fields, stormwater infiltration dry wells), at the points of entry of nutrient laden surface or ground water into a water body, or batch treat the water body to inactivate nutrients already present in the water body.

Restoration of Hydrologic Function

Natural hydrologic function is dependent upon maintaining continuity between surface and ground water. As undeveloped natural areas are developed to accommodate human occupancy and use, stresses are placed upon the available water resource. Too often the consequence of human activity (e.g. impervious surfaces and groundwater withdrawals) is to disconnect surface water from its groundwater source. This results in streams with diminished base flow (or go dry) and lakes with reduced flow through. When stream flows and lake levels (and flow through) decline as a result of lowering the groundwater table level the result is higher water temperatures, lower dissolved oxygen concentration and increased concentration of metals and nutrients (due to the lack of dilution).

Washington's Water Quality Standards fail to recognize and acknowledge the vital linkage between surface and ground water quality. Water quantity is an attribute of and a vital component of water quality. Preservation, protection and restoration of this groundwater surface water linkage (continuity) is vital to the preservation, protection and restoration of water quality in Washington's surface water bodies.

RCW 90.22.010 Establishment of minimum water flows or levels states: *"The department of ecology may establish minimum water flows or levels for streams, lakes or other public waters for the purposes of protecting fish, game, birds or other wildlife resources, or recreational or aesthetic values of said public waters whenever it appears to be in the public interest to establish the same."*

This provision authorizes the Department of Ecology to effectively address the temperature, dissolved oxygen and metal and nutrient effects of nonpoint pollution in the 60 % of the water bodies that Ecology's Water Quality Index indicates have fair or poor water quality.

Restoration of Metal and Nutrient Impaired Water Bodies

It is the Department of Ecology's interpretation and application of the definition of pollution that effectively prevents applications designed to secure high quality water in metal and nutrient impaired water bodies. Whereas the definition of pollution contained in regulations is as follows:

*WAC 173-201A-020
Definition of Pollution*

"Pollution" means such contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the state, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state as will or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish, or other aquatic life.

DOE places heavy emphasis on the first half of this definition as justification for including metal and nutrient inactivation treatments as acts of pollution without regard to the latter half of this definition (underlined). Nutrient inactivation treatments are designed and applied to bring phosphorus impaired (303 (d) listed) lakes back into compliance with State Water Quality Standards. The treatments that inactivate phosphorus also result in adsorbing and co-precipitating toxic forms of dissolved metal.

For the rest of this paper the emphasis will be on phosphorus inactivation since phosphorus is a limiting nutrient for toxic cyanobacteria species. Prevention of toxic cyanobacteria blooms is critical to the preservation of good water quality in

Washington's lakes. The effect of cyanobacteria blooms are elevated water temperatures, high pH conditions, and upon their senescence the release of potent liver and nerve toxins into the water, and their decomposition depletes dissolved oxygen to the extent of causing major fish kills.

In this context it is interesting to note the following language:

WAC 173-201A-300

Description.

(1) The antidegradation policy is guided by chapter [90.48](#) RCW, Water Pollution Control Act, chapter [90.54](#) RCW, Water Resources Act of 1971, and 40 CFR 131.12.

(2) The purpose of the antidegradation policy is to: (a) Restore and maintain the highest possible quality of the surface waters of Washington;

The Big Contradiction

The 60 % of the State waters that are considered as having fair or poor water quality suffer this condition because they are impaired because of external loading by nonpoint pollution conveyed to these waters by surface water runoff and nutrient laden groundwater. The act to restore the natural function of these impaired water bodies is either to prevent their continuing pollution by instituting effective land use practices and metal and nutrient inactivation treatment at the sources of nonpoint pollution or, in the alternative, to apply metal and nutrient inactivation chemicals at the points of entry of nutrient laden surface and ground water into these water bodies or within the water body itself. In so much as it is the Legislature's intent to restore the surface waters of Washington it does not make a lot of sense to consider metal and nutrient inactivation chemicals as pollutants and their application as acts of pollution. The water quality in an impaired water body is already polluted. The application of nutrient inactivation chemicals is design to restore the natural function and value of a nutrient impaired water body and should be encourage, not discourage, by provisions of the State of Washington's Surface Water Quality Standards.

Conclusion

To carry out the Legislature's mandate of preserving, protecting and restoring State waters the current emphasis of the Surface Water Quality Standard on preserving and protecting the 40 % of the State waters that are classified as good from pollution should be counter balanced by equal, or greater, emphasis on restoring the 60 % of the State waters that are classified as fair or poor. In this regard there needs to be an understanding that impaired lakes are already polluted and to *secure high quality* will require restoration of natural hydrologic conditions and application of chemicals and techniques that inactivate the polluting metals and nutrients that result in their impairment.

Don Russell

THIS PAGE IS BLANK