

# Proposed Rulemaking: Water Quality Criterion for Chloride

Environmental Quality Board

March 16, 2010

Office of Water Management  
John Hines, Deputy Secretary



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

# The Need to Protect Aquatic Life

- Current criterion is designed to protect Potable Water Supply (PWS) use
- Current criterion is only applicable at the withdrawal point as per § 96.3(d)
- Vulnerability exists between the point of discharge and PWS withdrawal for other uses including aquatic life
- To protect the intervening waters

# The Current Chloride Criterion

§ 93.7. Specific water quality criteria.

**TABLE 3**

<i>Parameter</i>	<i>Symbol</i>	<i>Criteria</i>	<i>Critical Use*</i>
Chloride	Ch	Maximum 250 mg/l	PWS

# Movement of the Compliance Point

- Prior to Dec 2002: the Ch Criterion was applicable statewide
- Currently (after Dec 2002): the Ch Criterion is applicable at the water supply intake
- OP (osmotic pressure) Criterion was expected to protect aquatic life

# Problems with Osmotic Pressure Criterion - OP

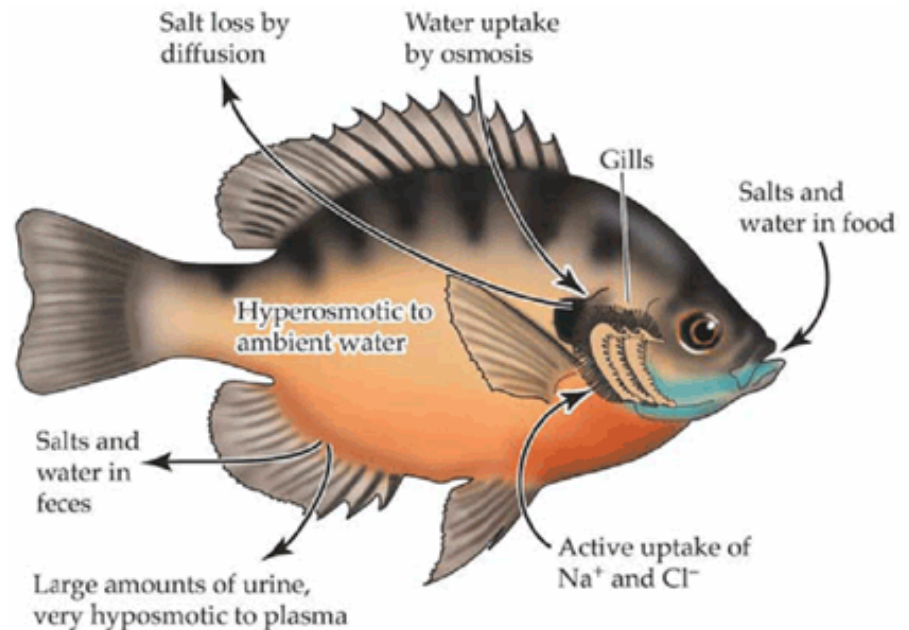
- OP is a measure of pressure – difficult to calculate for WQBELs
- OP is dependent upon the composition of the mixture
- OP can only be evaluated at a single discharge point – difficult to account for cumulative loads from multiple sources
- Limited lab capabilities for analysis of OP

# Chloride Sources

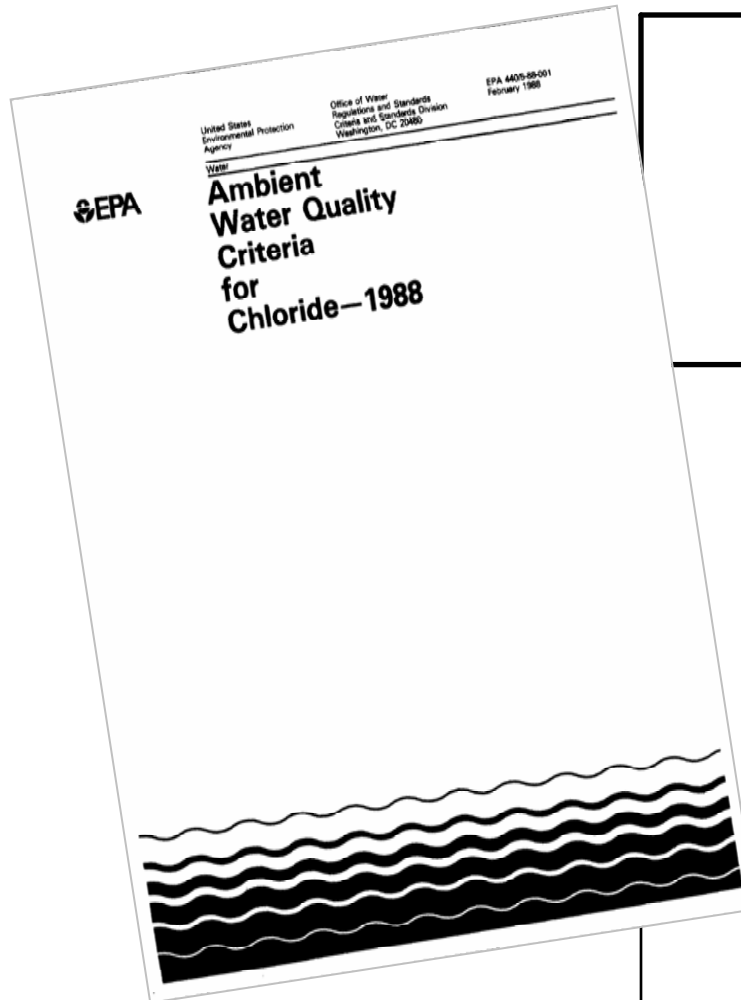
- **NATURAL** – naturally occurring sources of salt & brine in geologic deposits
- **ANTHROPOGENIC** – deicing salt, urban runoff, agricultural runoff, oil & gas well drilling, industrial waste, WWTPs, and septic systems

# OSMOREGULATION – maintaining an internal balance of water and dissolved materials

- Aquatic organisms actively transport ions in and out of their bodies
- Osmoregulation can be disrupted by large increases in certain ions
- High levels of chloride can cause stress or death of aquatic life



# Basis for Proposed WQ Criterion for Chloride



U.S. Environmental Protection Agency's  
**Ambient Water Quality Criteria  
for Chloride – 1988**  
**EPA 440/5-88-001**  
(February 1988)

## National Criteria

... except possibly where a locally important species is very sensitive, freshwater aquatic organisms and their uses should not be affected unacceptably if the four-day average concentration of dissolved chloride, when associated with sodium, does not exceed 230 mg/L more than once every three years on the average and if the one-hour average concentration does not exceed 860 mg/L more than once every three years on the average.



# Recommendations to EQB

- Retain existing criterion for PWS use protection
- Add new criterion for aquatic life protection
- 45 day public comment period

## § 93.7. Specific water quality criteria.

TABLE 3

<u>Parameter</u>	<u>Symbol</u>	<u>Criteria</u>	<u>Critical Use*</u>
Chloride	Ch <sub>1</sub>	Maximum 250 mg/l	PWS
	Ch <sub>2</sub>	Four-day average 230 mg/l; 1-hour average 860 mg/l	CWF, WWF, TSF, MF