

Recent Changes to UPDES Permitting for Great Salt Lake



Salt Lake County Watershed Symposium
October 24, 2013



Presentation Overview

- ❖ Discharge permitting process for most Utah waters
- ❖ Challenges with Great Salt Lake
- ❖ Recommended approach for Great Salt Lake



Determining Discharge Permit Effluent Limits

Complete Permit Application



Develop technology-based effluent limitations
(TBELs)



Develop water quality-based effluent limitations
(WQBELs)



Determine final effluent limits



Technology-based effluent limits (aka, Secondary Standards and Categorical Limits)

- ❖ Technology-based limits require a minimum level of treatment that is attainable**
 - 1. Publicly-owned treatment works (POTWs) must meet secondary standards**
 - 2. Industry must meet more stringent of secondary or Categorical Limits**



Water-quality based effluent limits

- ❖ **Limits to protect the designated uses**
 - All designated uses considered
 - WQBELs may be higher or lower than TBELs
 - WQBELs usually based on numeric criteria but can use best-professional judgment
 - Arsenic numeric criteria example:
 - 4 day average of 150 $\mu\text{g}/\text{l}$ to protect aquatic life



Water-quality based effluent limits

- ❖ **Waste load allocation model is a dilution model**
 - **Numeric criteria: allowable concentration in water (previous arsenic example)**
 - **Existing pollutant concentration in receiving water**
 - **Volume of receiving water mixing zone (R317-2-5)**
 - **Volume of effluent**



Impairment



Water Quality Standard



Increasing Pollutant Concentration



Antideg.
Review



Assimilative
Capacity

Ambient Condition



No Degradation



Water-quality based effluent limits

- ❖ **Water quality-based effluent limits are required when a discharge causes, or has the reasonable potential to cause, or contributes to the excursion of numeric or narrative water quality criteria. (EPA Technical Support Document for Water Quality-based Toxics Control 1991)**



Water-quality based effluent limits

- ❖ Dilution modeling estimates the assimilative capacity of receiving water for each pollutant
 - Maximum allowable concentration in effluent
- ❖ Compare to maximum allowable to effluent concentration
 - Determine “reasonable potential” for the effluent to cause or contribute to a water quality exceedance



Final Permit Limits

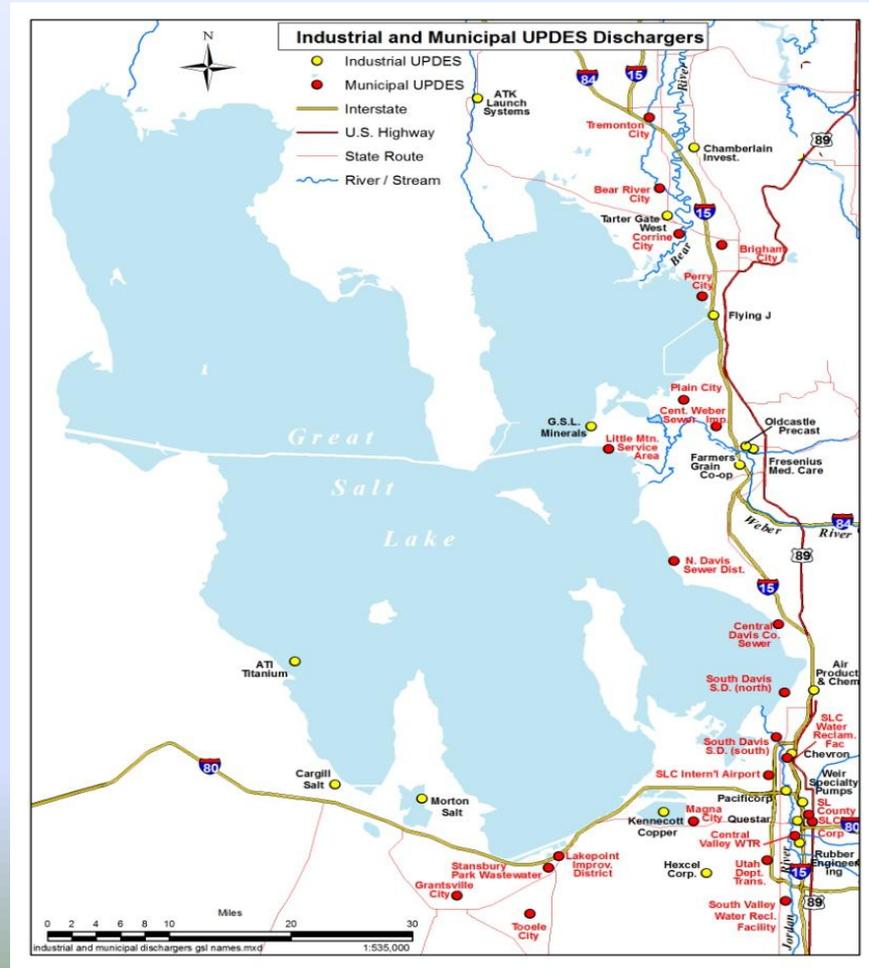
❖ More protective of the technology-based or water-quality based limits become effluent limits

- Antidegradation
- Antibacksliding

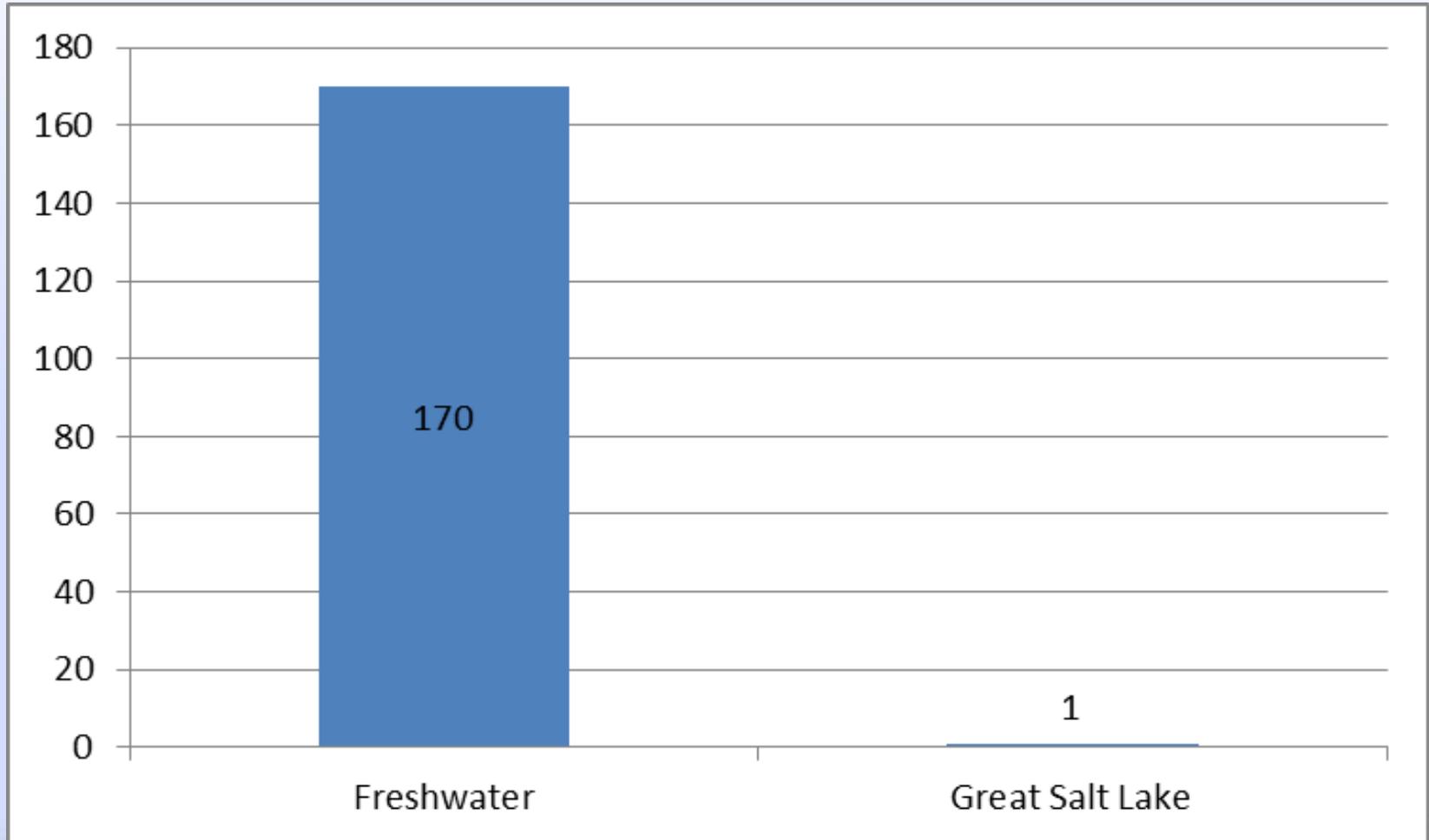


What's different about Great Salt Lake?

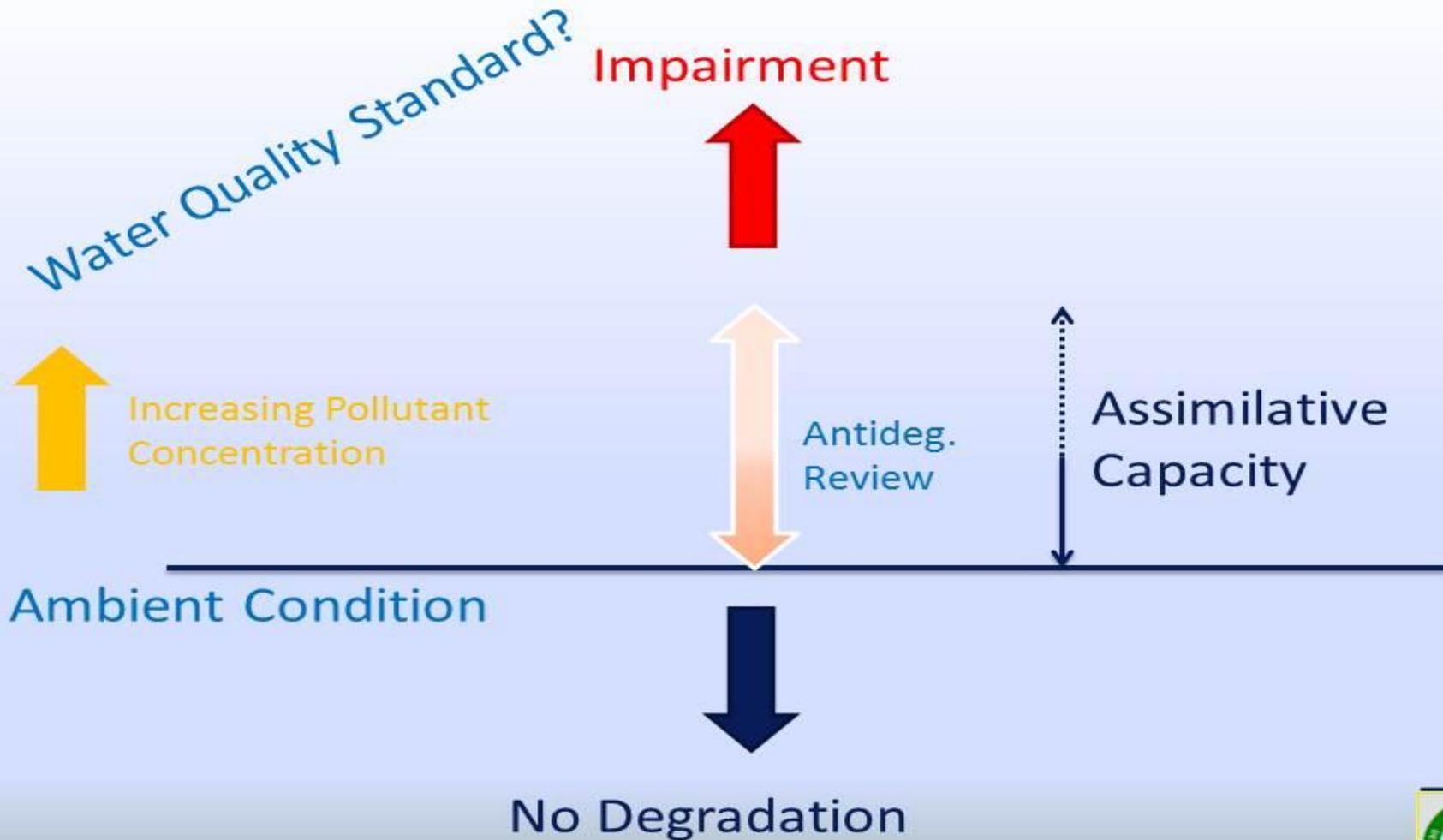
- ❖ Technical-based effluent limits apply
- ❖ Water-quality based effluent limits apply, but...



Number of Pollutants with numeric criteria



How to evaluate protection of the designated uses for Great Salt Lake without standard?



What's different about Great Salt Lake?

- ❖ **No numeric criteria except selenium in Gilbert Bay**
 - **Precludes the Waste Load Allocation (WLA) approach (dilution model)**
 - **DWQ has published a draft strategy for deriving numeric criteria but will take many years**
 - **Narrative Standard must always be met**



Narrative Standard

- ❖ “It shall be unlawful, and a violation of these regulations, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures.”



Great Salt Lake designated uses

❖ Contact recreation

- For instance, swimming, wading, boating

❖ Waterfowl and their food chain

- For instance, ducks, shorebirds, brine shrimp, brine flies, algae



Photo M. McPherson,
2011



How to evaluate protection of the designated uses for Great Salt Lake?

- ❖ Screen pollutant concentrations using ambient concentrations
- ❖ Screen pollutant concentrations using existing Utah freshwater numeric criteria
 - Dilution modeling
- ❖ Screen using site-specific chemistry
 - Copper biotic ligand model



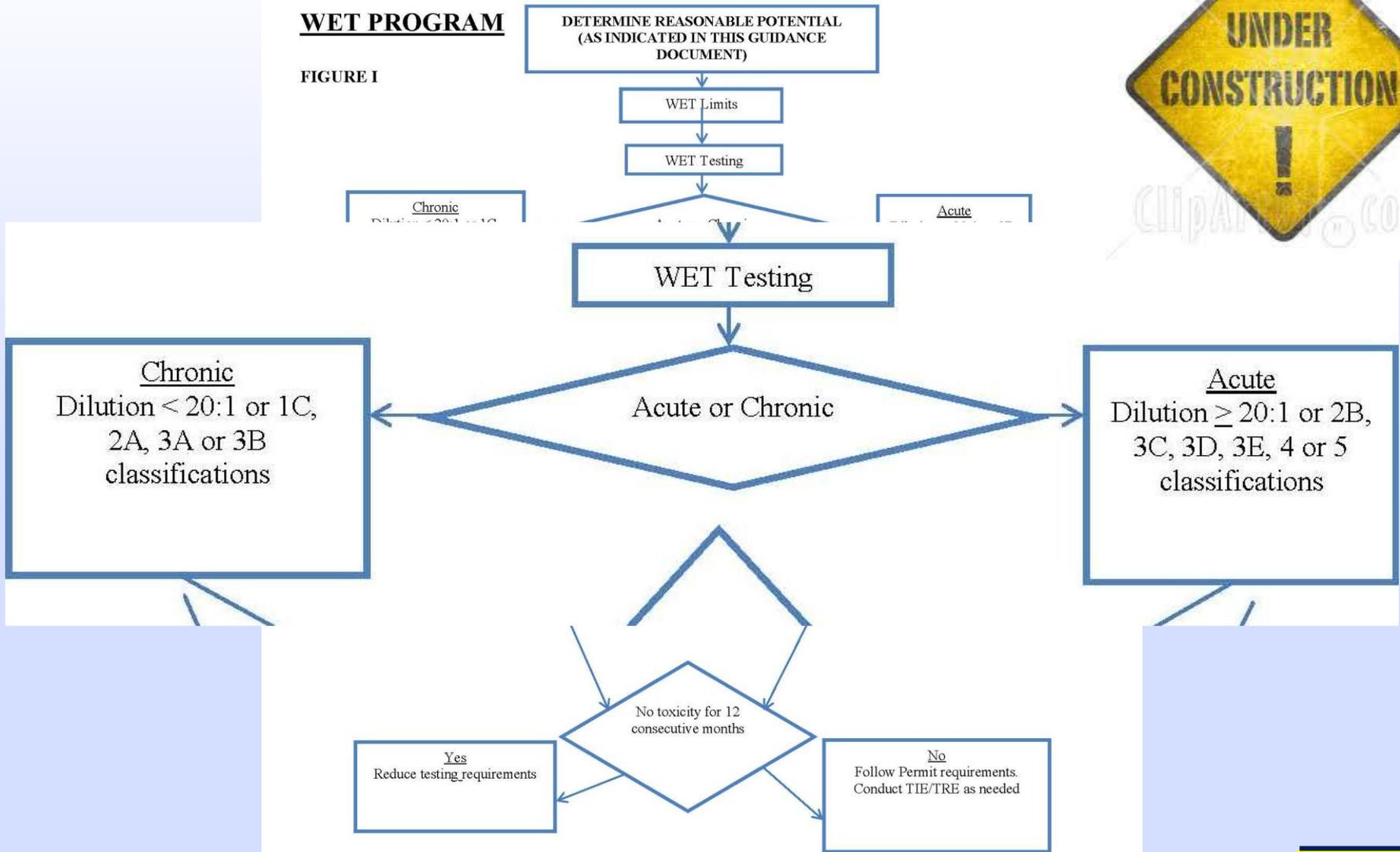
How to evaluate protection of the designated uses for Great Salt Lake?

- ❖ **Pollutants not passing screening require additional evaluation**
 - Site-specific
 - Pollutant specific
- ❖ **Whole Effluent Toxicity Testing (WET)**
 - Put fish in the effluent and see what happens
 - Useful for detecting toxicity potentially missed by chemical analyses
 - Cumulative effect of all pollutants



WET PROGRAM

FIGURE I



UT 1991 WET Policy



Challenges with WET testing for GSL

- ❖ Representative standard test organisms
- ❖ Salinity challenges
 - Freshwater, brackish, and marine organisms
 - Allowable to add salt
 - Not allowable to dilute
 - No standard test for brine shrimp or brine flies (yet)
- ❖ May be technically impractical for some discharges
 - DWQ reevaluates the need for WET testing



Permit Limits for Great Salt Lake

- ❖ Do reasonable potential to determine need for water-quality based effluent limits (WQBELs)
- ❖ Pick lower of TBELs and WQBELs for effluent limit in permit
- ❖ Document process in permit Fact Sheet and Statement of Basis
 - Public comment
 - Legal challenge



Summary

- ❖ DWQ is deriving numeric criteria for pollutants to Great Salt Lake
- ❖ Until numeric criteria are available, permittees take primary responsibility for providing DWQ information to document that uses will be protected.
- ❖ Implementation of chronic whole-effluent toxicity testing will further ensure the uses are protected.





**Questions,
Comments,
Suggestions,
Concerns**

UAC R317-8-4.2(4)(a)(6)

Where the State has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard the Executive Secretary will establish effluent limits using one or more of the following options:

- a. Establish effluent limits using a calculated numeric water quality criterion for the pollutant which the Executive Secretary determines will attain and maintain applicable narrative water quality criteria and will fully protect the designated use. Such a criterion may be derived using a proposed State criterion, or an explicit State policy or regulation interpreting its narrative water quality criteria supplemented with other relevant information which may include: EPA's Water Quality Standards Handbook, October 1983, risk assessment data, exposure data, information about the pollutant from the Food and Drug Administration, and current EPA criteria documents:
- b. Establish effluent limits on a case-by-case basis, using EPA's water quality criteria, published under section 307(a) of the CWA, supplemented where necessary by other relevant information; or
- c. Establish effluent limitations on an indicator parameter.....

