

Water Quality Standards Implementation

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Water Quality Standards Implementation: Permitting

Changes based on Revision

- Limit Derivation
- Other

Limit Derivation

- Metals and Hardness - Median
 - Actual hardness, or
 - Ecoregion hardness
 - Cd (chronic) and Pb (chronic)
- Total Residual Chlorine
 - 11 $\mu\text{g/L}$ - Chronic
- Cyanide
 - 5.2 $\mu\text{g/L}$ - Chronic

Limit Derivation

- Chlorides and Sulfates
- pH
 - 4-day average
 - Cannot exceed Technology-based Effluent Limits, 10 CSR 20-7.015
- Reasonable Potential Analysis

Other

- Water Quality Standards, 25% - addition
- Anti-backsliding
- ***New*** Numeric Lake Nutrient Criteria



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Water Quality Standards Implementation: Evaluation of Environmental and Economic Impacts

Missouri Revised Statutes 644.058

As part of the implementation of any revised water quality standards modifications of twenty-five percent or more, the department shall conduct an evaluation which shall include the environmental and economic impacts of the revised water quality standards and criteria on a subbasin basis. This evaluation shall be conducted at the eight-digit hydrologic unit code level. The department shall document these evaluations and use them in making individual site-specific permit decisions.



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Water Quality Standards Implementation: Lake Nutrient Criteria Implementation Plan

Part I: Monitoring and Assessment

- Monitoring Efforts
 - Lakes of Missouri Volunteer Program
 - Statewide Lake Assessment Program

Part I: Monitoring and Assessment

Data Requirements for Assessment

- At least four samples collected between May 1 and September 30 under representative conditions;
- Each sample must have been analyzed for at least Chl-a, TN, TP, and Secchi depth;
- At least three years of samples (years do not have to be consecutive). Data older than seven years will not be considered, consistent with the Department's Listing Methodology (see Appendix B);
- Data collected under a Quality Assurance Project Plan (QAPP).

Criteria for Assessment

Lake Ecoregion	Chl-a Response Impairment Thresholds (µg/L)	Nutrient Screening Thresholds (µg/L)		
		TP	TN	Chl-a
Plains	30	49	843	18
Ozark Border	22	40	733	13
Ozark Highland	15	16	401	6

Assessment Methodology

- Lake Numeric Nutrient Criteria
- Lake Response Assessment Endpoints

The five response assessment endpoints are:

1. Occurrence of eutrophication-related mortality or morbidity events for fish and other aquatic organisms
2. Epilimnetic excursions from dissolved oxygen or pH criteria
3. Cyanobacteria counts in excess of 100,000 cells/mL
4. Observed shifts in aquatic diversity attributed to eutrophication
5. Excessive levels of mineral turbidity that consistently limit algal productivity during the period of May 1 – September 30

Part I: Monitoring and Assessment

- Trend Analysis

Part I: Monitoring and Assessment

- Total Maximum Daily Load Development for Nutrient Impaired Waters

Part II: Permit Implementation

Three-Phase Approach:

1. Data Collection and Analysis
2. Voluntary Plant Optimization and Source Controls
3. Final Effluent Limits

Part II: Permit Implementation

Three-Phase Approach – Which Permits?

- Dischargers to lake watersheds
 - Lake is not impaired
 - Lake is greater than 10 acres
 - Lake is not in “Big River Floodplain” ecoregion
- Facility has a design flow $> 100,000$ gpd
- Facility that “typically” discharges nutrients
[10 CSR 20-7.015]

Phase 1: Data Collection and Analysis

- Influent and effluent monitoring for:
 - Total phosphorus
 - Total nitrogen
 - Nitrate plus nitrite
 - Ammonia
- Frequency:

Design flow in GPD	Sampling frequency
100,001-1,000,000	Quarterly
1,000,001 and greater	Monthly

Phase 2: Voluntary Plant Optimization and Source Controls

- Voluntary – If permittee opts out, Phase 3. Phase 1 data will be used to determine reasonable potential.
- Permit will include a special condition to develop and implement a Plant Optimization Plan and a Phosphorus Minimization Plan.
- Resources (training, fact sheets, templates) will be made available to permittees for these efforts.

Phase 3: Final Effluent Limits

- During Phase 1 and 2, Department staff will be setting up models for lake watersheds. This effort will be prioritized based on permit synchronization.
- If watershed modeling shows there is reasonable potential, total phosphorus effluent limits will be established in the permit (unless modeling shows nitrogen is the limiting pollutant).
- If needed, flexibilities such as compliance schedules, integrated planning, variances, etc. may be implemented at this point.

Dischargers to Impaired Lakes

- Watershed modeling
- Not contributing to the impairment:
 - Limits are not needed
 - Possible monitoring
- Contributing to the impairment:
 - Total Phosphorus limits

New and Expanding Sources

Scenario 1: Requests discharge to a watershed with impaired lake:

- Watershed modeling to determine if the new/expanding source will contribute to the impairment
 - ❖ Yes = more advanced treatment is needed or an alternative method of wastewater disposal.
 - ❖ No = total phosphorus effluent limits

New and Expanding Sources

Scenario 2: Requests discharge to a watershed with a lake that is not impaired:

- Tier 2 antidegradation review
- Total phosphorus effluent limits based on technology

Incentives for Early Nutrient Reduction

Water quality may benefit from *early* nutrient reductions through:

- WWTF Optimization
- Pilot Testing
- Stress Testing
- New Technology Trials

Incentives for Early Nutrient Reduction (continued)

- Voluntary participation will be incentivized through regulatory flexibilities such as extended schedules of compliance.
- Permittees may accrue credits for watershed-based trading.
 - If TMDLs are developed, baselines for WWTFs will be established based on data/information in the absence of early actions.



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Water Quality Standards Implementation: Variances

WQS Variances

1. Missouri Multiple Discharger Variance Framework from the Water Quality Standards of Total Ammonia Nitrogen, CWC-MDV-1-17
2. City of Kirksville Variance CWC-V-1-17

Variances will be incorporated into permits once EPA approval is received.

Geospatial Layer

- Owner Name
- Facility ID
- Facility Name
- Permit Number
- Permit Effective Date
- Permitted Feature ID
- Permitted Feature Effective Date
- Receiving Stream Name
- First Classified Water Body ID
- HUC8
- Discharge Location
- Variance ID
- Variance Type
- Variance Factor
- Management Plan Indicator
- Highest Attainable Conditions
- CWC Approval Date
- Variance Evaluation Date
- Variance Expiration Date



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QUESTIONS?

