WQ Standards and Permitting

Jim Davenport TCEQ
512/239-4585 jdavenpo@tceq.state.tx.us
Web: http://www.tceq.state.tx.us/nav/eq/eq_swqs.html

WQ Standards Status

- **2000 Standards still under review by EPA**
- **Standards Workgroup Sessions:**
  - **March 7, 2007**
  - **May 16, 2007**
  - **June 26, 2007**
  - **September 6, 2007**
  - **~ May 2008**
- **Time Frame: Adopt in 2009**

2000 Standards

- Commission approval - 7/26/2000
- Effective - 8/17/2000
- Received by EPA - 10/04/2000
- Mostly approved by EPA
- Pending
  - Aquatic-life toxic criteria - freshwater
  - Tx streams- flow & D.O.
  - Narrative language
  - Site-specific criteria for selenium

2008 Standards

- Site-specific uses and criteria
- Nutrient criteria
- Toxic criteria
- Recreation criteria
- WET testing

Site-Specific Standards

- < Adjust existing standards – 40
- < Aquatic life uses, new streams – 43
- < Toxic criteria for aquatic life – ~ 16

Toxic Criteria

- Revise existing human-health criteria:
  (eat more fish; address child exposure)
- Mercury criterion for fish tissue
- Add criteria: 23 human health, 2 aquatic life
- Revise numerous toxic criteria

Recreation / Bacteria

- Indicators:
  E. *coli* –freshwater; Enterococci –saltwater
- Current uses: Primary contact, noncontact
- More uses?: contact 1, contact 2, secondary
- Establish use-attainability protocols

Nutrient Criteria: Now

Narrative Criterion [307.4(e)]:

"Nutrients … shall not cause excessive growth of aquatic vegetation which impair an existing, attainable, or designated use."

Watershed Rules (§311)

- 8 watershed areas around Texas
- Mainly Highland Lakes reservoirs and Central Colorado River
- Typically require "no discharge" or total phosphorus = 1 mg/L

Nutrient Criteria: EPA Mandate

- July 1998 National strategy
- Dec 2004 States to adopt criteria
- More time for states that submit plan
- Federal criteria for major ecoregions

Nutrient criteria: TCEQ

- Develop plan in 2001; update in 2006
- Work with advisory workgroup, USGS
- Develop first for reservoirs (~ 100)
- Set criteria for chl *a* in main pools
- Secondary "criteria" for TP; TN or nitrate

Nutrient Criteria: TCEQ

- Set criteria using data from each reservoir
- Allow for natural variability by setting criteria at upper confidence interval
- Propose in 2008, 2009 standards revisions
- Get more data on streams for the future

Draft Nutrient Criteria: Examples

Reservoir	Chl *a* µg/L	TP mg/L
Granbury	7.2	0.021
Possum Kingdom	6.4	0.059
Sommerville	30.1	0.061
Stillhouse Hollow	1.9	0.018
Belton	4.3	0.024
Proctor	29.6	0.063

Draft Nutrient Criteria: Examples

Reservoir	Chl *a* µg/L	TP mg/L
Waco	9.6	0.094
Pat Cleburne	12.7	0.149
Hubbard Creek	5.5	0.091
Fort Phantom Hill	8.5	0.066
Lake Limestone	18.5	0.044
Buffalo Springs (Lubbock)	83.8	0.330

Factors in Assessing Nutrients for Wastewater Discharges: Reservoirs

- Size of discharge; new or increasing?
- Distance from reservoir
- Extent of local dilution, mixing
- Cumulative loading
- Limits on TP in similar permits?

Factors in Assessing Nutrients for Wastewater Discharges: Reservoirs

- Reservoir trend: increase in P, chl *a*
- Broad impact: projected TP-main pool
- Local impact: projected TP-locally
- Impaired for nutrients? TMDL in place?
- Watershed rule for TP in place?

Factors in Assessing Nutrients for Wastewater Discharges: Streams

- Size of discharge
- Sensitive?: clear, shallow, rocky
- Evidence of excessive vegetation
- Extent of local dilution at 7Q2
- Limits on TP in similar permits?

Factors in Assessing Nutrients for Wastewater Discharges: Streams

- New or increasing discharge?
- TMDL requirements?
- Watershed rule?
- Stream listed impaired for nutrients?

TP Limits in TPDES Permits

- 0.5 mg/L - ~ 4 permits
- 1.0 mg/L - ~38 permits
- > 1 mg/L - ~ 6 permits
- Proposed: - one with 0.15 mg/L TP
  - one with 8 mg/L TN

Nutrient Regulation: Summary

- Nutrient criteria for reservoirs:
  - To be considered in 2008, 2009
- Studies ongoing for streams, estuaries
- Permitting procedures also under review:
  - More detail for nutrient assessment?
  - More evaluation of technology, costs?

Whole Effluent Toxicity

- In Standards Implementation Procedures
- Failure of lethal testing →TRE
- TRE → (1) chemical limit or (2) WET limit

New EPA Policy for WET

- Include sublethal tox for TREs, WET limits
- "Reasonable potential" → WET limit
- Implement by July 2008
- Require sublethal TRE for "persistent sublethal toxicity" now: in ~ 9 permits

Effluent Bacteria Monitoring

- TCEQ requires effluent limit for chlorine:
  Residual of 1 – 4 mg/L
  After dechlorination, < 0.1 mg/L
- EPA is requiring bacteria monitoring / limits
- 48 other states have bacteria effluent limits
- EPA has objected to ~ 74 permits
- Need interim and long-term resolution

Other Permitting Issues

- Permitting to impaired water bodies
- TDS
- ?

Nutrients: Potential Impacts

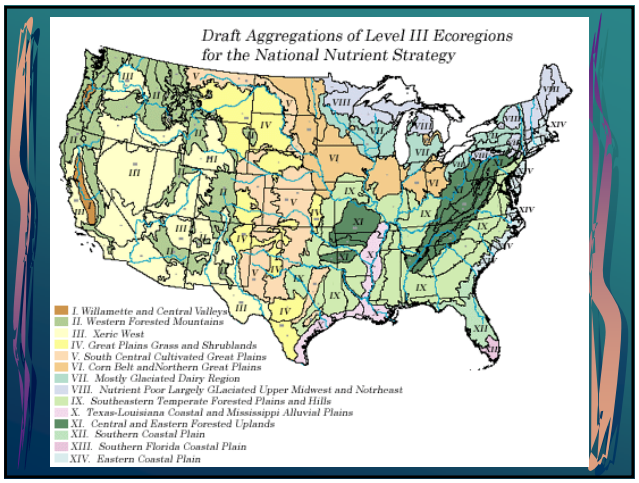
- Phytoplankton algae in open water
- Attached algae; floating algae
- Rooted vegetation
- Aesthetic effects
- Water supplies: THM, taste & odor
- Aquatic-life: >D.O flux; fisheries?

Defining Impaired Waters [303(d)]

- For nutrients, only the Bosque River

Effects of 303(d) list

- No more loading of pollutant of concern
- TMDL, evaluate standard, or get more data
- Note possible secondary effects:
  - Phosphorus was part of TMDL on Lake 'O the Pines because of low D.O.



EPA Criteria for Nutrients

- Streams, lakes/reservoirs, estuaries
- Based on historical monitoring data
- Criteria = 25th percentile for TP, TN, or chlorophyll *a*

To Meet EPA TP Criteria

358 major discharges to Texas streams	TP criterion set at 25th percentile	TP criterion = 0.05 mg/L
TP limit: mg/L	% of discharges	% effluent instream
None - .20	16%	0 - 25%
0.10 - 0.20	9%	26 - 50%
0.07 - 0.10	13%	51 - 75%
0.05 - 0.07	34%	76 - 99%
0.05	28%	100%

Nutrient Criteria: Purposes

- Assessing with monitoring data (impaired?)
- Evaluating large nutrient loads
- Apply only to main pools of reservoirs

Assessing Discharges
Typical reasons for TP Limits

- New discharges to or near reservoirs
- New discharges into clear, shallow, perennial rocky streams; or streams with small impoundments
- Large discharges to above: 0.5 mg/L ?