



Texas Surface Water Quality Standards Update



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Water Quality Standards

- The Texas Surface Water Quality Standards (Title 30, Chapter 307 of the Texas Administrative Code) describe the chemical, physical, and biological conditions to be attained in the surface waters of Texas.
- Authority for adopting and revising water quality standards is contained in §26.023 of the Texas Water Code (TWC), and in §303(c) of the Federal Clean Water Act.



Types of Actions by EPA

- **Approved** - available for use in all Clean Water Act (CWA) activities – permitting, assessment, TMDL
 - **Conditional approval** - subject to completion of consultation with USFWS under Endangered Species Act
- **Disapproved** - not available for use in CWA activities
- **No action** - not considered water quality standards under the CWA
- **Under review**



2010 Standards Under Review

- Appendix A
 - Temperature criteria for 3 segments (Guadalupe and Cypress Creek Basins)
 - Dissolved minerals criteria for 19 segments





2014 Revision: EPA Action

- EPA Action Letter
 - September 23, 2014
- Action letters posted on TCEQ Website
- Highlighted 2014 rule indicates status of approval



Approvals

- Human Health Criteria
- Bacteria
 - Removal fecal coliform
- Appendix A (Site-specific Uses and Criteria for Classified Segments)
 - Public Water Supply removal from Segment 1110 – Oyster Creek Above Tidal
 - Uses and criterion for Segment 1258 – Middle Oyster Creek and Segment 1259 – Leon River Above Belton Lake
- Appendix B (Sole source surface drinking water supplies)



Approvals

- Appendix C (Segment descriptions)
 - Boundary changes and clarifications for 8 segments
- Appendix D (Site-specific Uses and Criteria for Unclassified Water Bodies)
 - Corrections and non-substantive changes for 10 water bodies
 - Footnote for unclassified portion of Lavaca River in Segment 1602 – Lavaca River Above Tidal
- Appendix E (Site-specific toxic criteria)



Approvals

- Appendix G (Site-specific Recreational Uses and Criteria for Unclassified Water Bodies)
 - Addition of 8 water bodies
- Temperature
 - Definition of “industrial cooling water area”
 - Designation of industrial cooling water areas in 307.4(f)
 - Allowance for alternate sized mixing zones for separate constituents at a single discharge point



No Action – 2014 WQS

- Removal of standards previously disapproved by EPA
 - Mercury
 - High-flow exemption
 - Deferment of listings
 - Nutrient criteria for 36 reservoirs



2014 Revision: Next Steps

- Remaining portions are still under review
 - PCR 2
 - Oso Bay & Upper Laguna Madre dissolved oxygen
 - Dissolved minerals
 - Recreational use changes on three water bodies
- Provisions must be approved by EPA to be used in Clean Water Act activities like wastewater permitting and assessment



2017 Revision

- Preliminary comment: March 6, 2015
 - 30 day public comment period
- Stakeholder meetings: Winter and spring 2016
- Proposal: Late spring 2017
- 45 day public comment period
- Public hearing: June 2017
- Adoption: Fall 2017



Updates to TCEQ's Aquatic Life Criteria

- Acrolein – new addition
 - Freshwater acute & chronic – 3.0 µg/L
 - No saltwater criteria are recommended at this time
- Carbaryl – update
 - Freshwater chronic criterion – 2 µg/L
 - Saltwater acute criterion – 1.6 µg/L (changed from 613 µg/L)
 - No saltwater chronic criterion is recommended at this time



Bioaccumulation Factors

- TCEQ began using BAFs in the 2010 revision and recommends continuing forward with the BAFs used in the national criteria update
- BAFs: exposure from direct water contact and food ingestion
- BAF use is strongly encouraged in EPA's 2000 human health methodology



Updates to TCEQ's Human Health Criteria

Non-Carcinogen Updates:

- New entries: Ethylene Glycol, 4,4'-Isopropylidenediphenol (bisphenol A)
- Reference dose updates: p-Dichlorobenzene
- BAF/BCF updates: Anthracene, Chlorobenzene, m-Dichlorobenzene, o-Dichlorobenzene, p-Dichlorobenzene, 1,1-Dichloroethylene, 2,4-Dimethylphenol, Di-n-Butyl Phthalate, Endrin, g-Hexachlorocyclohexane, Hexachlorocyclopentadiene, Methoxychlor, Nitrobenzene, Pentachlorobenzene, 1,2,4,5-Tetrachlorobenzene, Toluene, 2,4,5-TP (Silvex), 1,1,1-Trichloroethane, 2,4,5,-Trichlorophenol



Updates to TCEQ's Human Health Criteria

Carcinogen Updates:

- New entries: Epichlorohydrin, Methyl tert-butyl ether (MTBE)
- Cancer potency factor updates: Vinyl Chloride
- Reference dose updates: Tetrachloroethylene, Toxaphene
- BAF/BCF updates: Acrylonitrile, Aldrin, Benzene, Benzidine, Benzo(a)anthracene, Benzo(a)pyrene, Bis(2-chloroethoxy)ether, Bromodichloromethane, Bromoform, Carbon Tetrachloride, Chlordane, Chrysene, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, Di(2-ethylhexyl)phthalate, Dibromochloromethane, 3,3'-Dichlorobenzidine, 1,2-Dichloroethane, Dichloromethane, 1,2-Dichloropropane, 1,3-Dichloropropene#, Dieldrin, Heptachlor, Heptachlor Epoxide, Hexachlorobenzene, Hexachlorobutadiene, α -Hexachlorocyclohexane, β -Hexachlorocyclohexane, Hexachloroethane, Pentachlorophenol, 1,1,2,2-Tetrachloroethane, Tetrachloroethylene, Toxaphene, 1,1,2-Trichloroethane, Trichloroethylene, Vinyl Chloride



Site Specific - Appendix C

- Segment boundary changes
 - Sabine River Tidal
 - Upper, Middle, and Lower Cibolo Creek





Site Specific – Appendix D

- Revised dissolved oxygen criteria on three water bodies
 - Catfish Creek
 - Thompsons Creek - summer criterion
 - Garcitas Creek – summer criterion
- Aquatic Life Use revisions on four water bodies
 - Elm Creek
 - Sandies Creek
 - Slaughter Creek
 - Hurricane Levee Canal



Appendix G

- Recreational use changes based on RUAA studies
- 31 water bodies to retain Primary Contact Recreation
- 46 water bodies recommended to change to Secondary Contact 1
- Six water bodies recommended to change to Secondary Contact 2



RUAAs to Date

- RUAAs initiated or completed on 129 water bodies in the state
- Recommendations made on 103
- 40 recommend retain PCR
- 54 recommend change to SCR 1
- Nine recommend change to SCR 2



2017 Revision

- Incorporate results of water-effect ratio studies for the development of site-specific toxic criteria in Appendix E of §307.10
- Review provisions to consider pending changes in EPA's national regulation on water quality standards, such as anti-degradation review policies, temporary variances, and temporary standards
- Review BEACH Act recommendations and how they apply to the Texas coast



BEACH Act

- Beaches Environmental Assessment and Coastal Health Act.
- Signed into law on October 10, 2000.
- The BEACH Act amended the Clean Water Act by adding the following sections:



§§104(v) & 304(a)(9)

- Requires EPA to conduct studies associated with pathogens and human health and to publish new or revised CWA section 304(a) criteria for pathogens and pathogen indicators based on those studies.



§303(i)(1)(B)

- States, territories, or tribes, that have coastal recreation waters are directed to adopt new or revised water quality standards for all pathogens and pathogen indicators to which EPA's new or revised section 304(a) criteria are applicable by no later than three years after EPA's publication of the new or revised section 304(a) criteria.



§406

- Section 406 authorizes EPA to award grants to states, territories, tribes, or local governments to develop and implement beach monitoring and assessment programs.



Epidemiological Studies

- Conducted on four Great Lakes beaches and five marine beaches
- No statistically significant results with culturable enterococci and GI illness
- Risk of GI illness significantly correlated with Entero and *Bacteroidales* qPCR from one marine study.



2012 Recreational Water Quality Criteria





EPA 2012 Recreational Water Quality Criteria (RWQC)

- Consists of a geometric mean (GM) and statistical threshold value (STV).
- STV is a single sample criterion based on the 90th percentile with a 10% excursion rate (EPA states this approach encourages more monitoring).
- Includes two sets of criteria values.
- No longer different criteria recommendations for the STV based on use intensities.
- TCEQ removed assessment based on a single sample in the 2010 TSWQS.



2012 RWQC

- Water Quality Standards should consist of a magnitude, duration, and frequency.
- Magnitude – GM and STV.
- Duration – Period of time samples are assessed.
- Frequency – Excursion rate (10% based on 90th percentile STV).



2012 RWQC

CRITERIA ELEMENTS	Recommendation 1 Estimated Illness Rate 36/1,000		Recommendation 2 Estimated Illness Rate 32/1,000	
	GM (cfu/100 mL)	STV (cfu/100 mL)	GM (cfu/100 mL)	STV (cfu/100 mL)
Enterococci (marine & fresh)	35	130	30	110
<i>E. Coli</i> (fresh)	126	410	100	320

cfu/100 mL = colony forming units per 100 mL water



2012 RWQC

- Duration – EPA suggests a 30 day duration to assess samples (could potentially extend to 90 days).
- GM and STV should be assessed regardless of sample size.
- This requires assessment of a GM on a single sample.



Deviation from Draft Criteria

- STV - 75th → 90th percentile
- Different water quality distribution used for marine water.
- STV – 104 cfu → 130 cfu
- BAV included
- Duration changed from 90 to 30 days.
- Alternate set of criteria



Beach Action Value (BAV)

- EPA suggests that states use a BAV as a conservative, precautionary tool for making beach notification decisions.
- The BAV is not a component of EPA's recommended criteria, but a tool states may choose to use, without adopting it into their WQS as a "do not exceed" value for beach notification purposes (such as advisories).



BAV

- BAV was developed on the water quality distribution from EPA epi studies and corresponds to the estimated 75th percentile.
- 70 cfu for illness rate of 36/1000
- 60 cfu for illness rate of 32/1000
- BAV not included in draft 2012 RWQC.



National Beach Guidance and Required Performance Criteria for Grants 2014

- The Texas General Land Office (GLO) uses beach grants to fund monitoring.
- Requires states to adopt 2012 RWQC and BAV to be eligible for grant.
- States and tribes that want to use an alternative threshold must submit a written justification to EPA based in science, local water quality data, or monitoring experience.



- The GLO collects beach samples and TCEQ assesses based on beach advisory days.
- A BAV for the Texas coast would become a de facto standard.
- Would hold Texas to a much more stringent standard than required by the 2012 RWQC.



BAV Justification

Year	Resamples	Resamples \leq 70 cfu	% \leq 70 cfu	Resamples \leq 104 cfu	% \leq 104 cfu
2009	245	188	76.7%	201	82.0%
2010	347	235	67.7%	261	75.2%
2011	242	178	73.6%	202	83.5%
2012	318	189	59.4%	213	67.0%
2013	262	184	70.2%	207	79.0%
5 yr total	1414	974	avg =69%	1084	avg = 77%



	TCEQ Current Assessment of Bacteria Standards for Swimmer Advisories (Beaches)	TCEQ Current Assessment of Bacteria Standards for Coastal Water	EPA 2012 Recreational Water Quality Criteria
Magnitude - GM cfu/100mL	none	35	35
Magnitude - Single Sample (STV) cfu/100mL	104 cfu for swimmer advisories and permitting (% advisories used in assessment)	Single sample not used for assessment of coastal waters	130 cfu
Frequency*	25% excursion rate**	N/A	10% excursion rate
Duration*	7 years**	7 years**	30 day

* These components are currently in TCEQ's Assessment Guidance.

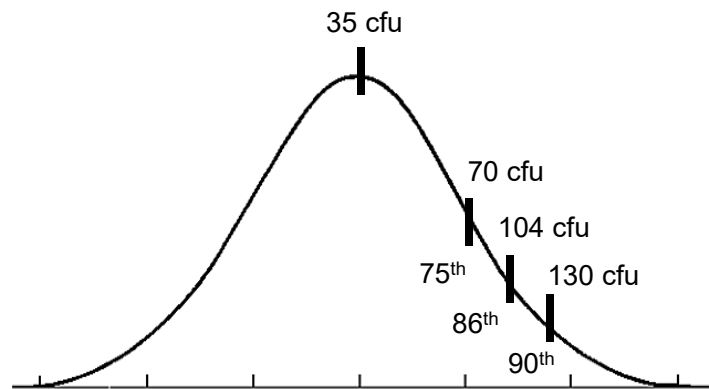
** Located in SWQM Assessment Guidance and 307.9(e)(3) of the TSWQS states that attainment be based on a long term geometric mean.



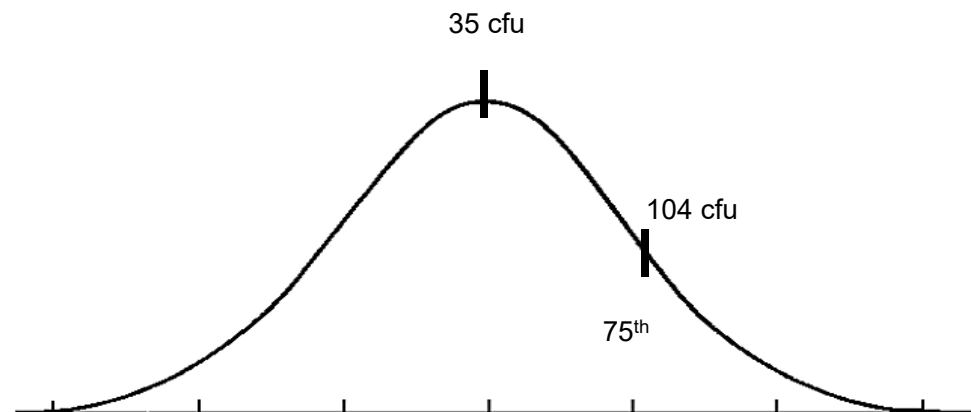
- EPA has suggested the TCEQ could use the 104 cfu value based on their water quality distribution for beaches.
- 104 is approximately the 86th percentile from the distribution derived from EPA epi studies.
- This would allow a 14% excursion rate (frequency).



EPA Water Quality Distribution



Texas Coastal Data Water Quality Distribution





Site Specific Standards?

- Texas' freshwater single sample is based on local water quality data.
- $STV = \text{antilog}_{10} [\log_{10}(GM) + Z_{90} * \log_{10}SD]$
- EPA's log standard deviation (SD) from epi studies was 0.44.



Concerns

- EPA's water quality distribution is not representative of the Texas coast.
- Assessing on 30 or 90 day duration is inconsistent with beach season along the Texas coast.
- Assessing GMs based on small data sets could result in spurious listings.
- Posting a beach advisory on a value that has not exceeded the WQS could be confusing to the public.



Concerns

- Epi studies did not find any statistically significant relationships with culturable entero.
- If no relationships exist, why hold Texas to a 90 day duration.
- No immediate plans to adopt qPCR, possible inhibition issues in Texas coastal waters.



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Options - Magnitude

- Magnitude
 - 104 cfu for beaches only.
 - 104 cfu for beaches, bays and estuaries.
 - 130 cfu for bays and estuaries.



Options - Duration

- Duration
 - Retain current duration.
 - Adopt 90 day duration.
 - Adopt 1 year duration – consistent with GLOs period of recreational use §406(c)(3)(A).



Options - Frequency

- Frequency – dependent on magnitude.
 - 104 cfu with a 25% excursion rate.
 - 104 cfu with a 14% excursion rate.
 - 130 with a 10% excursion rate (bays and estuaries only).



- Proposed Definition of Coastal Recreation Waters for the 2017 TSWQS Revision
 - Coastal recreation waters consist of marine coastal waters including oceans, coastal estuaries, and bays. Waters upstream of an unimpaired natural connection to the open sea or tidal inland waters are not considered coastal recreation waters (e.g. tidal rivers or streams).



Questions



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