

The Texas Commission on Environmental Quality (TCEQ or commission) adopts amendments to §§307.01 - 307.10, concerning the Texas Surface Water Quality Standards.

Sections 307.2 - 307.10 are adopted *with changes* to the proposed text as published in the January 29, 2010, issue of the *Texas Register* (35 TexReg 578). Section 307.1 is adopted *without change* to the proposed text and will not be republished.

The rules are amended to satisfy Texas Water Code (TWC), §26.023, which requires the commission to set water quality standards by rule for water in the state and allows the commission to amend the standards. The rules are also amended to satisfy the Clean Water Act (CWA), §303, which requires states to adopt water quality standards and to review and revise those standards at least once every three years.

BACKGROUND AND SUMMARY OF THE FACTUAL BASIS FOR THE ADOPTED RULES

The Federal Water Pollution Control Act, §303 (commonly referred to as the CWA, 1972, 33 United States Code, §1313(c)), requires all states to adopt water quality standards for surface water. A water quality standard consists of the designated beneficial use or uses of a water body or a segment of a water body and the water quality criteria that are necessary to protect the use or uses of that particular water body. Water quality standards are the basis for establishing discharge limits in wastewater and storm water discharge permits, setting instream water quality goals for total maximum daily loads (TMDLs), and providing water quality targets to assess water quality monitoring data.

The states are required under the CWA to review their water quality standards at least once every three years and revise them, if appropriate. States review standards because new scientific and technical data may be available that have a bearing on the review. Further, environmental changes over time may also warrant the need for a review. Where standards do not meet established uses, the standards must be periodically reviewed to see if uses can be attained. Additionally, water quality standards may have been previously established for the protection and propagation of aquatic life and for recreation in and on the water without sufficient data to determine whether the uses were attainable. Finally, changes in the TWC, CWA, or in the United States Environmental Protection Agency's (EPA) regulations may necessitate reviewing and revising standards to ensure compliance with current statutes and regulations.

Following adoption of revised water quality standards by the commission, the governor or designee must submit the officially adopted standards to the EPA Region 6 Administrator for review. The Regional Administrator reviews the state's standards to determine compliance with the CWA and implementing regulations. Standards are not applicable to regulatory actions under the CWA until approved by EPA.

The Texas statewide surface water quality standards were last amended in July 2000. The EPA approved the majority of the state's revised standards by 2007 and completed its final action on all revisions in October 2009.

Reviews and revisions of the water quality standards address many provisions that apply statewide, such as criteria for toxic pollutants. Other revisions address the water quality uses and/or criteria that are applicable to individual water bodies. An extensive review of water quality

standards for individual water bodies is often initiated when the existing standards appear to be inappropriate for water bodies that are listed as impaired under the CWA, §303(d), or that are potentially affected by permitted wastewater discharges or other permitting actions.

States may modify non-existing designated uses when it can be demonstrated through a use-attainability analysis (UAA) that attaining the current designated uses and/or criteria is not appropriate. Most changes in designated uses are based on a demonstration that natural characteristics of a water body cannot attain the currently designated uses and/or criteria. Natural characteristics include temperature, pH, dissolved oxygen, diversity of aquatic organisms, amount of streamflow, physical conditions such as depth, or natural background pollutant levels. Conversely, a UAA might demonstrate that the currently designated uses and criteria are appropriate or that they should be more stringent.

UAAs can require several years of additional sampling studies, or they may focus on a long-term evaluation of existing historical data. For UAAs on water bodies that are potentially impacted by pollutant loadings above natural background, sampling and evaluation is often conducted on similar but relatively unimpacted water bodies in order to determine reference conditions that can be applied to the water body of concern.

The focus of UAAs depends on the uses and criteria that need to be re-evaluated. The applicable category of aquatic life use is determined by repeatedly sampling fish or invertebrates in relatively unimpacted areas and by applying quantitative indices such as indices of biotic integrity to the sampling data of the biological communities. UAAs to assign aquatic recreational uses include assessing physical and hydrological conditions; observing existing recreation; and collecting information on current and historical recreational activities. Dissolved oxygen criteria are evaluated by monitoring dissolved oxygen over numerous (usually ten) 24-hour periods in relatively unimpacted areas. Site-specific criteria for toxic

pollutants are evaluated by placing selected small aquatic organisms in water samples from the site and exposing them to different doses of the toxic pollutant of concern. Criteria for pH, dissolved minerals, and temperature are often evaluated by analyzing extensive long-term recent and historical data for the water body of concern and similar water bodies in the same area.

The commission adopts changes to the general criteria that are intended to improve statewide qualitative and quantitative criteria; and to ensure that the general criteria are compatible with other revisions. Numerous revisions of toxic criteria are adopted to incorporate new data on toxicity effects, and changes are adopted to provide clarity to the basic requirements for toxicity effluent testing. Other adopted changes provide additional categories of recreational uses and provide more definition on assigning recreational uses. New criteria are adopted to protect numerous reservoirs from excessive growth of aquatic vegetation related to nutrients. The adopted changes provide clarity on how water quality standards apply under different stream flow conditions and on how attainment of water quality standards is assessed using instream monitoring data. Numerous revisions are adopted for the uses and criteria of individual water bodies in order to incorporate new data and the results of recent UAAs.

In conjunction with the adoption of the rules, the commission is completing revisions to the implementation procedures for applying the adopted standards to wastewater discharge permits. These revisions incorporate the adopted changes to the water quality standards contained in the rules. Revisions to the implementation procedures also include numerous updates to incorporate more recent data and information. The implementation procedures are contained in a guidance document entitled *Procedures to Implement the Texas Surface Water Quality Standards* (RG-194).

Revisions include updates to minimum analytical levels for chemicals in wastewater effluent, whole effluent toxicity testing procedures, and

critical low-flows in streams to determine standards applicability. Extensive new procedures are included to evaluate the need for nutrient effluent limits for wastewater discharges to reservoirs, streams, and rivers; and a new process is added to assess recreational uses.

An overview of the standards implementation procedures and a description of the steps to revise the procedures are presented in Series 23 of the commission's Continuing Planning Process for the Water Quality Management Program. The procedures must be approved by the commission and submitted to EPA for approval. Although not part of the regulatory action covered by the adopted revisions to the water quality standards, the revisions to the implementation procedures are being completed at the same time as the revisions to the standards to allow for a more coordinated and consistent review by the commission and the public.

SECTION BY SECTION DISCUSSION

To conform to commission and *Texas Register* formatting requirements, non-substantive revisions were adopted throughout the sections to correct citations, acronym usage, and other minor issues.

The commission adopts editorial revisions as well as substantive changes. Editorial revisions are adopted to improve clarity, to correct grammatical errors, and to renumber or reletter subdivisions, as appropriate.

§307.1, General Policy Statement

The commission adopts the amendment to §307.1 to reflect changes made in 2001 by House Bill 2912, §1.26, which amends TWC, §26.003 by adding the words "taking into consideration" before the words "economic development."

§307.2, Description of Standards

The commission adopts the amendment to §307.2 that includes adopted Appendix B in §307.2(a)(10)(B), relating to sole-source surface drinking water supplies. Adopted Appendix F in §307.2(a)(10)(F) lists numeric chlorophyll *a* criteria for selected reservoirs, and adopted Appendix G in §307.2(a)(10)(G) relates to site-specific recreational uses and criteria for unclassified water bodies. Presumed uses are adopted for inclusion with narrative provisions, designated uses, and numerical criteria as standards that can be changed to account for local conditions. Temporary variances are adopted to include storm water permits as well as discharge permits, and wording is adopted to clarify that temporary variances can only apply to existing discharge permits.

In response to comments, the adoption of amended §307.2 includes a change that deletes all references to supplemental screening levels for nutrients from the proposed language.

§307.3, Definitions and Abbreviations

Adopted changes to §307.3 include revisions to the definitions for "criteria," "designated use," "incidental fishery," "mixing zone," "nonpersistent toxic," "persistent toxic," "presumed use," "segment," "standards," "standards implementation procedures," and "surface water in the state." New definitions are adopted for "aquatic vegetation," "commission," "main pool station," "protection zone," "sole-source surface drinking water

supply," "thalweg," "toxic equivalency," and "toxic equivalency factor." Definitions are also adopted to clarify changes being adopted in the standards. The adopted changes add new abbreviations in §307.3(b) for "aquatic life use (ALU)," "Assessment Tools for the Evaluation of Risk (ASTER)," "bioconcentration factor (BCF)," "cubic feet per second (cfs, ft³/s)," "county road (CR)," "farm to market road (FM)," "Health Effects Assessment Summary Tables (HEAST)," "International Boundary and Water Commission (IBWC)," "Integrated Risk Information System (IRIS)," "kilometer (km)," "minimal aquatic life use (M)," "multiplier (m)," "meters per kilometer (m/km)," "method detection limit (MDL)," "mile (mi)," "primary contact recreation (PCR)," "reference dose (RfD)," "ranch road (RR)," "secondary contact recreation (SCR)," "state highway (SH)," "standard units (SU)," "Texas Commission on Environmental Quality (TCEQ)," "toxic equivalency factor (TEF)," "toxicity reduction evaluation (TRE)," "United States (US)," and "water-effect ratio (WER)."

In response to comments, the commission changed the definitions of several terms in the adoption of the amendments to this section. The revised definitions are for "critical low-flow," "noncontact recreation," "nutrient criteria," "nutrient," "primary contact recreation," "secondary contact recreation 1," "secondary contact recreation 2," "total dissolved solids," and "total suspended solids."

In response to comments, the adoption of amended §307.3 includes renaming the proposed definition for "baseflow conditions" to "dry weather flows" in order to more accurately describe the normal range of conditions over which recreational surveys would be appropriate.

§307.4, General Criteria

Adopted changes to §307.4 include clarifying that general criteria apply to surface water in the state and specifically applies to substances attributed to waste discharges or human activities. "Sheen" is adopted for inclusion with the general criteria for "oil, grease, and related residue." The adopted changes include the location of site-specific numeric criteria for chlorophyll *a*. The revision of the temperature portion is adopted for clarification. The inclusion of "presumed uses" with "existing, designated, and attainable uses" for the aquatic life uses and dissolved oxygen portion of this section are adopted. In addition, language regarding perennial streams is adopted to reference applicable dissolved oxygen criteria in §307.7(b)(3)(A). The revised aquatic life uses and habitat portion is adopted for clarification. The revision to this section is adopted to clarify that intermittent streams not listed in Appendix A or D, which are located in §307.10, are considered to have a minimal aquatic life use.

The aquatic recreation portion was adopted to include four categories of recreational use (primary contact recreation, secondary contact recreation 1, secondary contact recreation 2, and noncontact recreation waters), and a reference to §307.7(b)(1). The adopted revisions to this section also include that classified segments are designated for primary contact recreation unless site-specific information, such as a UAA, demonstrates that different recreational uses and/or criteria may be justified. This section was adopted to explain that primary contact recreation is a presumed use and that secondary contact recreation 1 is a presumed use for certain types of unclassified waters if primary contact recreation does not occur and certain depth characteristics are met. Adopted changes also include descriptions for secondary contact recreation 2 and noncontact recreation, and the new provisions stipulate that no water bodies are presumed to have these two uses. The adopted section includes an explanation of how presumed recreational uses are applied and assigned, and how uses less stringent than presumed uses are assigned to water bodies.

Adopted changes to this section also include clarification that the assessment of unclassified waters pertains to aquatic life uses and that waters that are not in Appendix A or D, which are located in §307.10, are assigned specific uses that are attainable or characteristic of those waters. This section was adopted to include general criteria for pH.

In response to comments, the adoption of amended §307.4(e) and (h)(4) includes the addition of the term "presumed" and the replacement of the term "absolute" with the term "24-hour," respectively. Also, the adopted language includes changes to clarify to what water depths the secondary contact recreation 1 provision applies and replaces the term "base flow conditions" with "dry weather flows" in §307.4(j)(2)(B)(i).

§307.5, Antidegradation

Adopted changes to §307.5 are strictly editorial revisions to improve clarity. In response to comments, the adoption of amended §307.5(b)(2) and (c)(2)(B) includes changing the term "wildlife" to "terrestrial life."

§307.6, Toxic Materials

Adopted changes to §307.6 clarify that chronic aquatic life criteria apply to all water bodies with a designated aquatic life use of limited, intermediate, high, or exceptional; and to allow for the use of other methodologies for deriving data to predict the lethal concentration that has a 50% chance of causing death to aquatic organisms (LC₅₀) in order to calculate aquatic life criteria for substances not listed in Table 1 of §307.6(c)(1). The allowance of the biotic ligand model to develop site-specific aquatic life criteria for copper is also adopted.

In response to comments, the adoption of amended §307.6 includes the addition of language to further clarify under what circumstances toxic criteria would not apply where surface water, as a result of natural phenomena, exhibits characteristics beyond the limits established by this section.

Section 307.6(c)(1), Table 1, which lists numeric criteria for the protection of aquatic life, includes adopted revisions to criteria for arsenic, cadmium, chromium, copper, dieldrin, endrin, hexachlorocyclohexane, mercury, nickel, pentachlorophenol, tributyltin, and zinc. New criteria for nonylphenol and diazinon are also adopted. The conversion factors for both cadmium and lead are revised to include hardness-based equations as opposed to being calculated on a presumed hardness.

In response to comments, the adoption of amended §307.6(c)(2) clarifies that other options are available to recalculate aquatic life numeric criteria. Also, the adopted language in §307.6(c)(7)(C) corrects a typographical error.

Adopted revisions to human health criteria in §307.6(d) include: 1) changing fish consumption rates from ten grams per person per day for freshwater fish and 15 grams per person per day for saltwater fish to 17.5 grams per person per day for all types of fisheries; and 2) revising the consumption rate for incidental fisheries to 1.75 grams per person per day. Human health criteria for all noncarcinogens are adopted to incorporate childhood exposure, with a fish and shellfish consumption rate of 5.6 grams per child per day, drinking water consumption rate of 0.64 liters per child per day, and a child body weight of 15 kilograms (33.1 pounds). Adopted revisions in §307.6(d)(5), in conjunction with related adopted revisions in §307.8(a)(4), clarify the flow conditions when human health criteria are applied.

Table 2 in §307.6(d)(1), which contains human health toxic criteria, is adopted to reflect the latest data provided by the EPA. The adopted criteria for mercury, dichlorodiphenyltrichloroethane (DDT), chlordane, and dioxins/furans/polychlorinated biphenyls (PCBs) are expressed as fish tissue concentrations. Adopted mercury criteria are based on the EPA's 2001 national criteria document and the fish consumption level of concern that was established by the Texas Department of State Health Services. The arsenic criterion for fish and water consumption is adopted to reflect the new drinking water maximum contaminant level. Eight congeners for dioxin were added to the congener list, which now includes dioxin-like PCBs. The dioxin and dioxin-like PCB congener list is adopted to reflect the World Health Organization's latest updates. Human health criteria are adopted for antimony, anthracene, bis(2-chloroethyl)ether, bis(2-ethylhexyl)phthalate, m-dichlorobenzene, o-dichlorobenzene, 3-3'-dichlorobenzidine, dichloromethane, 1,2-dichloropropane, 2,4-dimethylphenol, di-n-butyl phthalate, ethylbenzene, hexachlorocyclopentadiene, nickel, 1,1,2,2-tetrachloroethane, thallium, toluene, and 1,1,2-trichloroethane, and chemical-specific human health criteria are adopted for bromodichloromethane and bromoform. Human health criteria for DDT, dichlorodiphenyldichloroethane (DDD), dichlorodiphenyldichloroethylene (DDE), dioxins/furans, mercury, and PCBs are adopted as tissue-based criteria. In the adopted Table 2, the chemical name "chlorodibromomethane" is substituted for "dibromochloromethane" in order to be consistent with 40 Code of Federal Regulations Part 122.

In response to comments, the adoption of amended Table 2 of §307.6(d)(1) includes a correction to a typographical error for n-nitro-di-n-butylamine. Also in response to comments, the adopted language includes changes from the proposed language in order to correct criteria for benzo(a)anthracene, and to clarify testing methodology in the PCB footnote.

In response to comments, the adoption of amended §307.6(e) includes further clarification that requirements will be added to permits to control toxicity and additional explanation regarding provisions that may be added to a permit if toxicity is not controlled.

§307.7, Site-Specific Uses and Criteria

Adopted changes to §307.7 include editorial changes to the general provisions in §307.7(a). Changes are adopted in §307.7(b) to expand recreational use categories to include primary contact recreation, secondary contact recreation 1, secondary contact recreation 2, and noncontact recreation waters. The adopted revisions to this section also clarify that classified segments are designated for primary contact recreation, unless site-specific information demonstrates that different recreational uses and/or criteria may be justified based on specific reasons provided in this section. Other adopted changes include the option of applying noncontact recreation to classified segments where contact recreation is considered unsafe for reasons unrelated to water quality.

Adopted changes to the freshwater criteria in §307.7(b)(1)(A) include revising the primary contact recreation single sample criterion for *Escherichia coli* (*E. coli*) based on new calculations using updated information, adding criteria for secondary contact recreation 1 and 2, and revising the noncontact recreation geometric-mean criterion for *E. coli* to be based on a higher risk level.

In response to comments, the adoption of amended §307.7(b)(1)(A) includes retaining the primary contact recreation geometric mean criterion for *E. coli* of 126 colonies per 100 milliliter (ml).

Adopted revisions to this section also include a change in the bacteria indicator for certain high saline inland classified segments from *E. coli* to Enterococci. As part of this change, freshwater criteria for Enterococci were added for the four subcategories of recreational uses.

In response to comments, the adoption of amended §307.7(b)(1)(A)(v) includes changes from proposed revisions in order to clarify when *E. coli* can be used as an indicator for unclassified water bodies in certain classified high saline inland segments. Also, in response to comments, the freshwater Enterococci geometric mean criterion for primary contact recreation was changed from 54 per 100 ml to 33 per 100 ml.

Adopted changes to the saltwater criteria in §307.7(b)(1)(B) include revising the primary contact recreation single sample number for Enterococci to the recommended federal criterion. Language is adopted to clarify that a secondary contact recreation 1 category for tidal streams and rivers can be established on a site-specific basis if a use or criteria change is justified by a UAA, and if the water body is not considered to be a coastal recreation water as defined in the Beaches Environmental Assessment and Coastal Health Act of 2000 (commonly referred to as the Beach Act). Also, a secondary contact recreation 1 geometric mean criterion for Enterococci based on a higher risk level is adopted; and the noncontact recreation geometric mean criterion for Enterococci is adopted based on a higher risk level.

Adopted changes in §307.7(b)(1)(C) specify that fecal coliform can be used as an alternative indicator in certain high saline inland water bodies for a transition period of two years after the adoption of the Standards. Adopted changes to this section include adding fecal coliform criteria for

primary contact recreation and secondary contact recreation 1 and 2, rewording the noncontact recreation geometric mean language for clarification purposes, and removing fecal coliform as a surrogate indicator for effluent limits in wastewater discharge permits.

The commission adopts changes in §307.7(b)(2)(A) to add a sole-source surface drinking water supply use, as required by TWC, §26.0286. The adopted section updated the reference to the title of 30 TAC Chapter 290.

Adopted changes to §307.7(b)(3) include rewording of the general provisions that describe aquatic life uses as six categories (minimal, limited, intermediate, high, and exceptional aquatic life and oyster waters). The Aquatic Life Subcategories table was renumbered to Table 3 in §307.7(b)(3)(A)(i) and adopted to include a "minimal" aquatic life use subcategory with corresponding dissolved oxygen criteria. Adopted changes to §307.7(b)(3)(B) clarify the description of criteria for oyster waters and add additional narrative provisions that allow the consideration of other information related to human health protection instead of solely relying on federal recommendations. General provisions are adopted in §307.7(b)(4) to add numerical nutrient criteria for reservoirs.

In response to comments, the adoption of amended Table 3 of §307.7(b)(3)(A)(i) includes the replacement of the term "daily minima" with "24-hour minimum dissolved oxygen concentration." Also in response to comments, the adopted version of §307.7(b)(4)(E) deleted references to screening levels for phosphorus and transparency; and nutrient criteria are expressed as "stand-alone" concentrations of chlorophyll *a* in reservoirs.

§307.8, Application of Standards

Adopted changes to §307.8 replace the phrase "seven-day, two-year low-flows" with the term "critical low-flow," which is defined in §307.3. Adopted revisions clarify what standards do not apply below the critical low-flow, remove the rule provision stating that aquatic recreational criteria for unclassified waters do not apply below the 7Q2, refer to the new location of the low-flow values table, and clarify that the specific low-flow values were calculated from historical daily streamflow records from the United States Geological Survey or International Boundary and Water Commission. Additionally, the adopted revisions specify that these low-flow values apply only to river basin and coastal basin waters; and not to bays, gulf waters, reservoirs, or estuaries. Adopted language is added to explain that the flow values are set to 0.1 cubic foot per second when the calculated critical low-flow or harmonic mean flow is equal to or less than 0.1 cubic foot per second. Adopted revisions include an alternative method to calculate critical low-flows for classified segments that are dominated by springflow. A provision is adopted to clarify that the harmonic mean flow is the applicable upstream flow when calculating wastewater permit limits for criteria that are assessed as long-term means. The adopted revision clarifies that "discharge points" means permitted discharge points.

In response to comments, the adoption of amended §307.8(a)(2)(A) includes changing the term "probability" to "percentile." Also, the adopted language includes the addition of a cross-reference to §307.9 to clarify under what flow conditions criteria can be used for assessment purposes in §307.8(a)(4).

§307.9, Determination of Standards Attainment

Adopted changes to §307.9 clarifies that procedures listed in this section would be solely for the purpose of assessing water quality monitoring data to determine if water quality standards are attained in individual water bodies. A reference to laboratory accreditation requirements is adopted

in this section. Adopted revisions also include an elaboration on what makes a sample representative of a water body, clarification of depth collection for bacteria and temperature, and depth collection for chlorophyll *a* samples. Procedures are adopted to simplify collection of dissolved oxygen samples for non-tidal flowing streams, impoundments, and tidal water. Another adopted revision clarifies that the term "radioactive discharges" refers to radioactive sources; and this revision also stipulates that impacts of radioactive sources are evaluated in accordance with applicable rules in 30 TAC Chapter 290 and Chapter 336.

Revised procedures are adopted to assess standards attainment for recreation criteria; and bacteria samples are now assessed using the geometric mean criteria, rather than both geometric mean and single-sample criteria. A high-flow exemption for bacteria is adopted in this section so that samples taken during extreme hydrologic conditions immediately after heavy rains would not be used for assessment purposes.

Adopted revisions to standards attainment for dissolved oxygen clarify that the minimum criteria are based on the lowest measurement observed during a 24-hour period. New provisions are adopted to describe how new criteria for nutrients for reservoirs would be assessed. A new provision is adopted to clarify that site-specific criteria for certain constituents (aquatic recreation indicators, total dissolved solids (TDS), chloride, and sulfate) do not apply when perennial streams are flowing below 0.1 cubic feet per second, or when intermittent streams have pools that cover less than 20% of the stream bed in a 500 meter reach, or when extremely dry conditions are indicated by comparable observations of flow severity.

Adopted revisions on assessing biological integrity specify that water bodies that are not meeting the applicable index of biotic integrity or dissolved oxygen criteria for a presumed high aquatic life use are not listed as impaired until a site-specific study confirms that the presumed use is

appropriate. The adopted revisions clarify how impairment listings would be deferred, specify the timeframe that water bodies might be deferred from listing as impaired, and describe how site-specific aquatic life use standards will be established.

In response to comments, the adoption of amended §307.9 includes the removal of all proposed references to screening levels for total phosphorus and transparency and the removal of all references to the minimum number of samples and the minimum period of record required for assessment purposes. Also, the adopted language indicates that dissolved minerals criteria and human-health toxic criteria will be based on a "mean," rather than the proposed "median."

In response to comments, the adoption of amended §307.9(e)(3)(B) includes clarification as to how a high-flow exemption applies to freshwater and tidal streams; and the proposed phrase "indicates that swimming is not practical or safe" is replaced with "of flood or an equivalent category."

§307.10, Appendices A - G

Adopted changes to §307.10 include the addition of a new Appendix B, Sole-source Surface Drinking Water Supplies; the addition of Appendix F, Site-specific Nutrient Criteria for Selected Reservoirs; and Appendix G, Site-specific Recreational Uses and Criteria for Unclassified Water Bodies.

Adopted changes to the narrative section in Appendix A of §307.10 clarify that dissolved oxygen absolute minima and seasonal criteria are listed in §307.7, unless different criteria are specified in Appendix A. The language for recreational use is adopted to reflect the revisions in §307.7 and language regarding segments that include reaches that are dominated by springflow are also adopted.

Additional adopted changes to Appendix A of §307.10 include changes to aquatic life uses for Black Bayou (Segment 0406) and James' Bayou (Segment 0407) from intermediate to high and from high to intermediate for the West Fork Trinity River Above Bridgeport Reservoir (Segment 0812), the Clear Fork Trinity River Above Lake Weatherford (Segment 0833), and the North Sulphur River (Segment 0305). A footnote is adopted to clarify that a limited aquatic life use is appropriate for assessment of the benthic community located in the North Sulphur River. In addition, site-specific dissolved oxygen criteria for the following segments are adopted: Little Wichita River (Segment 0211), Black Bayou (Segment 0406), James' Bayou (Segment 0407), Little Cypress Bayou (Creek) (Segment 0409), West Fork Trinity River Above Bridgeport Reservoir (Segment 0812), Clear Fork Trinity River Above Lake Weatherford (Segment 0833), Clear Fork Trinity River Below Lake Weatherford (Segment 0831), Upper Oyster Creek (Segment 1245), Caney Creek Above Tidal (Segment 1305), Oso Bay (Segment 2485), and Laguna Madre (Segment 2491). An adopted footnote includes a site-specific multiple regression equation that must be used for predicting dissolved oxygen in Black Bayou, James' Bayou, Little Cypress Bayou (Creek), and Black Cypress Bayou (Creek). Additional footnotes are adopted to explain that the North Sulphur River, Black Bayou, James' Bayou, West Fork Trinity River above Bridgeport Reservoir, and Clear Fork Trinity River above Lake Weatherford are intermittent streams with perennial pools. Adopted footnotes also provide the site-specific 24-hour dissolved oxygen criteria for Little Wichita River, West Fork Trinity River above Bridgeport Reservoir, Clear Fork Trinity River below Lake Weatherford, Clear Fork Trinity River above Lake Weatherford, Upper Oyster Creek, Caney Creek above Tidal, Oso Bay, and Laguna Madre.

In response to comments regarding the use of the regression equation in the Cypress Creek Basin, the adoption of amended Appendix A of §307.10 includes clarification on the notation for the average 24-hour dissolved oxygen concentrations and modifications in the footnote to the minimum 24-hour dissolved oxygen concentrations, including a watershed size limitation where the regression equation is applied. Also, the adopted language includes modifications to the minimum 24-hour dissolved oxygen concentrations for Oso Bay (Segment 2485) and Laguna Madre (Segment 2491).

Adopted aquatic life use and dissolved oxygen criteria changes to the Angelina River/Sam Rayburn Reservoir (Segment 0615) from intermediate to high are due to the EPA's disapproval of the intermediate aquatic life use and associated dissolved oxygen criteria for the segment in the 2000 Texas Surface Water Quality Standards.

The critical low-flows for 15 spring-fed segments (Segments 0218, 1243, 1415, 1424, 1430, 1808, 1811, 1813, 1814, 1817, 1905, 2109, 2113, 2309, and 2313) and the method for calculating those critical low-flows are adopted.

Adopted changes in Appendix A of §307.10 include the creation of a new segment (Black Cypress Bayou (Creek)) (Segment 0410) and name changes in three segments (Segments 0307, 1428, and 1429). An acute aquatic life use criterion for zinc is adopted for the Nueces Bay (Segment 2482) for assessment purposes only after the completion and approval of a TMDL and TMDL Implementation Plan. Mission Lake is adopted as an addition to the name for Segment 2462. The maximum temperature criteria are adopted for specified portions of the Comal River (Segment 1811)

and Upper San Marcos River (Segment 1814). Dissolved minerals criteria changes are adopted for the following 20 segments: Cooper Lake (Jim L. Chapman Lake) (Segment 0307), Lake Tawakoni (Segment 0507), Lake Livingston (Segment 0803), West Fork Trinity River above Bridgeport Reservoir (Segment 0812), Lavon Lake (Segment 0821), Brazos River below Possum Kingdom Lake (Segment 1206), Nolan River (Segment 1227), Salt Fork Brazos River (Segment 1238), White River Lake (Segment 1240), Double Mountain Fork Brazos River (Segment 1241), Brazos River Below Whitney Lake (Segment 1257), E.V. Spence Reservoir (Segment 1411), Colorado River below Lake J.B. Thomas (Segment 1412), Lake J.B. Thomas (Segment 1413), Concho River (Segment 1421), Colorado River Below E.V. Spence Reservoir (Segment 1426), O.H. Ivie Reservoir (Segment 1433), Nueces/Lower Frio River (Segment 2106), and Choke Canyon Reservoir (Segment 2116). A footnote for Segment 0507 is also adopted.

In response to comments, the adoption of amended Appendix A of §307.10 includes a change that deletes the revisions to the dissolved minerals criteria for White River (Segment 1239). Also, the adopted language includes a change in the footnote for Nueces/Lower Frio River (Segment 2106) to note that a site-specific conversion factor was used in the dissolved minerals calculation.

The pH range for Upper South Sulphur River (Segment 0306), Cooper Lake (Jim L. Chapman Lake) (Segment 0307), Caddo Lake (Segment 0401), Big Cypress Creek below Lake O' the Pines (Segment 0402), Black Bayou (Segment 0406), James' Bayou (Segment 0407), and Village Creek (Segment 0608) are adopted.

In response to comments, the adoption of amended Appendix A of §307.10 includes retaining the freshwater primary contact recreation geometric mean criterion for *E. coli* of 126 colonies per 100 ml. Also in response to comments, the adoption of amended Appendix A of §307.10 includes the freshwater Enterococci geometric mean of 33 per 100 ml for the following 15 classified high saline inland water bodies: Red River above Lake Texoma (Segment 0204), Red River below Pease River (Segment 0205), Red River above Pease River (Segment 0206), Lower Prairie Dog Town Fork Red River (Segment 0207), Lake Kemp (Segment 0217), Wichita/North Fork Wichita River (Segment 0218), Upper Pease/North Fork Pease River (Segment 0220), South Fork Wichita River (Segment 0226), Pease River (Segment 0230), Brazos River above Possum Kingdom Lake (Segment 1208), Salt Fork Brazos River (Segment 1238), Double Mountain Fork Brazos River (Segment 1241), Colorado River below Lake J.B. Thomas (Segment 1412), Upper Pecos River (Segment 2311), and Red Bluff Reservoir (Segment 2312).

The primary contact recreation use and corresponding Enterococci geometric mean criterion (35 colonies/100 ml) for tidal waters, bays, and estuaries is adopted. A footnote is adopted for bays, estuaries, and Gulf of Mexico to clarify that in oyster waters, Enterococci is the indicator bacteria to measure recreational suitability and fecal coliform is the indicator bacteria for oyster waters purposes only. A footnote is adopted for segments that are high saline inland waters to clarify that Enterococci are the indicator bacteria, but that fecal coliform may still be used as an alternate indicator during a transition period of two years until sufficient data are available for Enterococci for monitoring purposes.

In response to comments, the adoption of amended Appendix B of §307.10 includes language to clarify that the same level of protection that applies to sole-source surface drinking water supplies designated in Appendix B of §307.10 may be applied to a water body that has been

identified as a sole-source surface drinking water supply, but is not yet included in Appendix B. Also, the adopted language includes a modification to one entry in Appendix B replacing "Guadalupe River" with "Terminal Reservoir" and replacing Segment "(1801)" with "(1802)."

Adopted changes to Appendix C of §307.10 include descriptions for new segments, revisions due to name changes, updated normal pool elevations, and revised descriptions for those segments affected by the creation of the new segments in Appendix A of §307.10. Black Cypress Bayou (Creek) is adopted as new Segment 0410 and segment boundary revisions are adopted for Clear Fork Trinity River above Lake Weatherford (Segment 0833), Spring Creek (Segment 1008), Lavaca River above Tidal (Segment 1602), and Salado Creek (Segment 1910). The description of the Neches River above Lake Palestine (Segment 0606), Lake Weatherford (Segment 0832), Lake Waco (Segment 1255), the Neches River Tidal (Segment 0601), the Neches River below B.A. Steinhagen Lake (Segment 0602), Bastrop Bayou Tidal (Segment 1105), Tres Palacios Creek Tidal (Segment 1501), Tres Palacios Creek above Tidal (Segment 1502), Gulf of Mexico (Segment 2501), and South, Middle, and North Bosque rivers (Segments 1246 and 1226) are adopted. The normal pool elevations are adopted for Farmers Creek Reservoir (Segment 0210), Diversion Lake (Segment 0215), Wright Patman Lake (Segment 0302), Sam Rayburn Reservoir (Segment 0610), Lake Worth (Segment 0807), Lake Palo Pinto (Segment 1230), Lake Graham (Segment 1231), Fort Phantom Hill Reservoir (Segment 1236), White River Lake (Segment 1239), Lake Lyndon B. Johnson (Segment 1406), Lake Buchanan (Segment 1408), Lake Brownwood (Segment 1418), and Medina Lake (Segment 1904). The name or description for the Sulphur/South Sulphur River (Segment 0303), Cooper Lake (Segment 0307), Colorado River below Town Lake (Segment 1428), Town Lake (Segment 1429), and Barton Creek (Segment 1430) are adopted.

In response to comments, the adoption of amended Appendix C of §307.10 includes changes to the county name for the upper boundary of Caney Creek above Tidal (Segment 1305).

Adopted changes to Appendix D of §307.10 include updating the title and narrative language to further clarify the purpose of this appendix.

Designated aquatic life uses, dissolved oxygen criteria, and descriptions for where these apply are adopted for numerous water bodies. All water bodies are tributaries within the watershed of the listed segment numbers. Adopted new entries are: Dixon Creek (Segment 0101); Anderson Creek (Segment 0302); White Oak Creek (Segment 0303); Harrison Bayou (Segment 0401); Meddlin Creek (Segment 0403); Black Cypress Bayou/Creek (Segment 0410); Prairie Creek (Segment 0504); Campbells Creek (Segment 0505); Mill Creek and No. 5 Branch (Segment 0506); Sandy and Shawnee Creeks (Segment 0604); Linney Creek and Spring Branch (Segment 0801); Crooked Creek and an unnamed tributary of Crooked Creek (Segment 0802); Bassett Creek, Town Creek, and Walnut Creek (Segment 0804); Walnut Creek and Ash Creek (Segment 0809); Spring Creek (Segment 0840); Woodsons Gully and an unnamed tributary to Woodsons Gully (Segment 1004); Arnold Branch, Mink Branch, and Sulphur Branch (Segment 1008); Mound Creek (Segment 1009); Dry Creek and White Oak Creek (Segment 1010); Mound Creek (Segment 1015); Big Creek, Bessies Creek, and Clear Creek (Segment 1202); North Fork Rocky Creek (Segment 1217); Gonzales Creek (Segment 1232); Deer Creek (Segment 1242); Cluck Creek (Segment 1244); Tonk Creek (Segment 1246); Dry Creek, Harris Branch, and an unnamed tributary of Harris Branch (Segment 1428); Maha Creek (Segment 1434); Wilson Creek (Segment 1501); Lavaca River (Segment 1602); Camp Meeting Creek (Segment 1806); Salado Creek (Segment 1910); and West Prong Atascosa River (Segment 2107).

Site-specific dissolved oxygen criteria for the following water bodies are adopted based on the results of UAAs. The water bodies are: Dixon Creek (Segment 0101); Harrison Bayou (Segment 0401); Black Cypress Bayou/Creek (Segment 0410); North Fork Rocky Creek (Segment 1217); Lavaca River (Segment 1602); Camp Meeting Creek (Segment 1806); and Salado Creek (Segment 1910). Footnotes are adopted that define site-specific dissolved oxygen criteria for these water bodies.

In response to comments regarding the use of the regression equation for Harrison Bayou and Black Cypress Creek/Bayou in the Cypress Creek Basin, the adoption of amended Appendix D of §307.10 includes clarification on the notation for the average 24-hour dissolved oxygen concentrations and modifications in the footnote to the minimum 24-hour dissolved oxygen concentrations; and the watershed size limitation where the regression equation is applied.

Adopted changes to Appendix D of §307.10 also include: segment number updates for water bodies in Segments 0402, 0501, 0503, and 0610; the addition of newly described portions of Gilleland Creek in Segment 1428 and Thompsons Creek in Segment 1242; and a change in aquatic life use from limited to high for Sandy Creek in Segment 0604.

Other adopted changes to Appendix D of §307.10 include boundaries for existing entries. Corrections are adopted for the description of the following water bodies: Rocky Creek (Segment 0505); Turkey Creek (Segment 0803); Pin Oak Creek (Segment 0836); Dry Creek (Segment 1009); South Mayde Creek (Segment 1014); Garners Bayou (Segment 1016); Rabbs Bayou, Brookshire and New Year Creeks (Segment 1202);

Comanche Creek (Segment 1221); Palo Pinto Creek (Segment 1230); and Gilleland Creek (Segment 1428). Lake Fayette is adopted as another name for Cedar Creek Reservoir (Segment 1402).

Channelized streams in Harris County that drain to the San Jacinto Basin (Basin 1000), the San Jacinto-Brazos Coastal Basin (Basin 1100), and Bays and Estuaries (Basin 2400), were described in a UAA sent to the EPA for the 1995 standards. Specific streams were listed in the 1995 standards; however, a generic listing to cover these types of streams in the county was inadvertently excluded. A generic list with uses, criteria, and descriptions is adopted for channelized water bodies in Harris County that drain to these basins.

Adopted changes to Appendix E of §307.10 include revising the title and narrative language to further clarify the purpose of this appendix. The commission adopts the new format of the Appendix E table in §307.10 and the enhanced water body descriptions for 11 entries that better define where the site-specific studies are applied. Footnotes are adopted for the "Parameter" column to clearly state if the site-specific parameter applies to an entire water body or only a portion of the water body. The commission also adopts the column that describes additional site-specific considerations (such as hardness and total suspended solids).

The commission adopts the single copper water-effect ratio entry for five segments that make up the Houston Ship Channel. Twenty new site-specific copper water-effect ratio results are adopted in addition to four site-specific aluminum water-effect ratio results.

In response to comments, the adoption of amended Appendix E in §307.10 includes a change that adjusts the lower boundary for the site description for Buck Creek located in the watershed of Segment 0604. The adopted lower boundary is located at the confluence with Clayton Creek in Angelina County.

In response to comments, the adoption of amended Appendix F of §307.10 includes stand-alone chlorophyll *a* criteria and modifications to the narrative and footnote to reflect the use of stand-alone chlorophyll *a* criteria that were calculated using a 0.01 confidence level. Also, the adopted table includes the default criterion and the chlorophyll *a* calculated values are shown in parentheses.

In response to the comments concerned about trends over time in reservoirs, the commission re-evaluated the data used for criteria calculations. This re-evaluation indicated trends over time that appears to be anomalous and potentially artificial for fifteen reservoirs; and as a result fifteen reservoirs were removed. The adoption of amended Appendix F of §307.10 includes changes that delete the following fifteen reservoirs: Lake Meredith (Segment 0102), Farmers Creek Reservoir (Segment 0210), Diversion Lake (Segment 0215), Lake O' the Pines (Segment 0403), Lake Mackenzie (Segment 0228), Lake Arlington (Segment 0828), Lake Weatherford (Segment 0832), Lake Amon G. Carter (Segment 0834), Lake Houston (Segment 1002), Leon Reservoir (Segment 1224), Lake Palo Pinto (Segment 1230), Fort Phantom Hill Reservoir (Segment 1236), Inks Lake (Segment 1407), E. V. Spence Reservoir (Segment 1411), Lake Brownwood (Segment 1418).

Also, the adoption of amended Appendix F of §307.10 includes changes that delete Buffalo Springs Lake, an unclassified water body in Segment 1241; and two boundary waters, International Falcon Reservoir (Segment 2303) and International Amistad Reservoir (Segment 2305). In response

to the comments that the commission received that setting criteria on these three reservoirs may not be appropriate at this time; the commission removed these water bodies from Appendix F of §307.10.

Appendix G of §307.10 is adopted to track site-specific changes to recreational uses and criteria for unclassified water bodies where recreational UAAs or other sufficient site-specific information exists to provide a recreational use designation. Three unclassified water bodies are incorporated into Appendix G. The commission adopts changing the presumed contact recreation use and corresponding criteria of 126 colonies per 100 ml for these water bodies to a secondary contact recreation use and corresponding criteria of 630 colonies per 100 ml based on results from a Recreational UAA.

FINAL REGULATORY IMPACT ANALYSIS

The commission reviewed the rulemaking in light of the regulatory analysis requirements of Texas Government Code, §2001.0225, and determined that the rule changes are not subject to §2001.0225, because they do not meet the criteria for a "major environmental rule" as defined in that statute.

A "major environmental rule" is defined in Texas Government Code, §2001.0225(a) as applying to rules adopted by a state agency that: 1) exceed a standard set by federal law, unless the rule is specifically required by state law; 2) exceed an express requirement of state law, unless the rule is specifically required by federal law; 3) exceed a requirement of a delegation agreement or contract between the state and an agency or

representative of the federal government to implement a state and federal program; or 4) adopt a rule solely under the general powers of the agency instead of under a specific state law.

The amendments were developed in order to be consistent with the water quality standard rules in the CWA and the TWC. The amendments do not exceed a standard set by federal law, exceed an express requirement of state law, nor exceed a requirement of the National Pollutant Discharge Elimination System (NPDES) delegation agreement between TCEQ and EPA. The amendments were not developed solely under the general powers of the agency, but were specifically developed to meet water quality standards established under federal and state law. In addition, the standards are under authority of the TWC, which authorizes the commission to set water quality standards by rule. The TWC directs TCEQ to consider the existence and effects of nonpoint source pollution, toxic materials, and nutrient loading in developing water quality standards. Therefore, the rulemaking is not subject to the regulatory analysis provisions in Texas Government Code, §2001.0225(b).

TAKINGS IMPACT ASSESSMENT

The commission prepared a takings impact assessment for these rules pursuant to Texas Government Code, §2007.043. The following is a summary of that assessment. The Texas Surface Water Quality Standards (Chapter 307) establishes instream water quality standards for Texas streams, rivers, lakes, estuaries, and other water bodies such as wetlands. The commission is required to establish water quality standards in TWC, §26.023. The CWA, §303 requires states to publicly review and revise their surface water quality standards every three years. The revisions will satisfy the federal requirement for a triennial review.

These revised criteria are more protective of human health and provide a public benefit. The site-specific standards were needed to incorporate new sampling data and to establish the appropriate revisions in the rules so that permit issues related to specific water bodies may be resolved. Site-specific standards more accurately describe the ambient quality of the water body. These site-specific standards also provide more accurate permit requirements that are protective of human health and, in most cases, economically affordable. Additionally, these site-specific standards should enhance water quality.

The specific purpose of the rule changes are to satisfy state statute requirements, TWC, §26.023 and CWA, §303(d) requirements, and to more accurately assess water quality in the state; and revise requirements to protect human health and water quality. The rules would substantially advance this stated purpose by adopting water quality criteria and requirements that are supported by site-specific studies, federal and state research, and statewide monitoring and sampling data. Promulgation and enforcement of these rules will not burden private real property that is the subject of the rules because the amendments revising the state's surface water quality standards do not limit or restrict a person's rights in private real property.

CONSISTENCY WITH THE COASTAL MANAGEMENT PROGRAM

The executive director determined that this rulemaking will affect an action/authorization identified in the Coastal Coordination Act Implementation Rules, 31 TAC §505.11, and considered applicable goals and policies of the Texas Coastal Management Plan (CMP) during the rulemaking process.

The commission prepared a consistency determination for the proposed rules pursuant to 31 TAC §505.22 and found the rulemaking is consistent with the applicable CMP goals and policies. The following is a summary of that determination. The rulemaking is consistent with the CMP goal of protecting, preserving, restoring, and enhancing the diversity, quality, quantity and functions, and values of coastal natural resources by establishing standards and criteria for instream water quality for Texas streams, rivers, lakes, estuaries, and other water bodies such as wetlands. These adopted water quality standards and criteria will provide parameters for permitted discharges that will protect, preserve, restore, and enhance the quality, functions, and value of coastal natural resources. The rulemaking also provides for clearer and more protective conditions for variances that should ensure sound management of all coastal resources by allowing for compatible economic development and multiple human uses of the coastal zone. These variance conditions allow dischargers an opportunity to examine options for upgrades while maintaining water quality that will allow for human uses of coastal waters.

The rulemaking will require wastewater discharge permit applicants to provide information and monitoring data to the commission so that the commission may make an informed decision in authorizing a discharge permit. This will ensure that the authorized activities in a wastewater discharge permit comply with all applicable requirements, thus making the rulemaking consistent with the administrative policies of the CMP. The rulemaking also provides clarity and identifies the circumstances where the commission will consider and grant variances from water quality standards.

The rulemaking considers information gathered through the biennial assessments of water quality in the commission's Water Quality Inventory to prioritize those coastal waters for studies and analysis in reviewing and revising the state's surface water quality standards. The standards are

established to protect designated uses of coastal waters, including protection of uses for recreational purposes and propagation and protection of terrestrial and aquatic life. The rulemaking is consistent with the CMP's policies for discharges of municipal and industrial wastewater to coastal waters and how they relate to specific activities and coastal natural resource areas.

The adopted revisions to §§307.1 - 307.10 as they pertain to designated tidal segments within the CMP boundary, will be submitted to the Coastal Coordination Council for recertification.

The commission invited public comment regarding the consistency with the coastal management program during the public comment period. No comments were received on the coastal management program.

PUBLIC COMMENT

A public hearing was held in Austin, Texas on March 11, 2010 to receive public comments on the proposed revisions to Chapter 307. Commission staff members were available before and after the hearing to address specific questions from those who attended the hearing. The comment period for the proposed revisions ended on March 17, 2010.

The commission received timely public comments from: Albion, Alkylphenols & Ethoxylates Research Council (APERC), Aransas County, City of Austin (Austin), Association of Electric Companies of Texas, Inc. (AECT), Barton Springs/Edwards Aquifer Conservation District (BSEACD), Travis County Judge Samuel T. Biscoe, Blackburn Carter, P.C., Texas State Representative Valinda Bolton, Bosque County Farm

Bureau/Whiskey Canyon Ranch (BCFB), Brazos River Authority (BRA), The Caddo Lake Area Chamber of Commerce (CLACC), Caddo Lake Institute (CLI), The Greater Caddo Lake Association of Texas (GCLAT), The Louisiana Greater Caddo Lake Association (LGCLA), The Friends of the Caddo Lake National Wildlife Refuge (FCLNWR), Clean Water Action (CW Action), City of Cleburne (Cleburne), Children's Environmental Health Institute (CEHI), Honorable Dickie Clary - Precinct 4 Hamilton County Commissioner, Coastal Bend Bays Foundation (CBBF), Dallas County Park Cities Municipal Utility District (DCPC MUD), Edwards Aquifer Authority, Environment Texas, The Environmental Integrity Project (EIP), City of Farmers Branch (Farmers Branch), Fox Dairy LTD, Galveston Bay Foundation (GBF), Gulf Coast Waste Disposal Authority (GCA), City of Hamilton (Hamilton), Harris County, Harris County Flood Control District (HCFCD), Harris County Public Health and Environmental Services (HCPHES), Heifer Ranch at Arroyo Seco, High Plains Dairy Counsel, Highland Lakes Group, Highland Lakes Political Action Committee (Highland Lakes PAC), Independent Cattlemen's Association of Texas (ICA), United States Section: International Boundary and Water Commission (IBWC), International Paper Company; submitted by Integral Consulting, Inc. (IPC), Lake Austin Collective (LAC), Lake Austin Snorkeling Club, City of Lakeway (Lakeway), Legacy Farms, Live Oak County Farm Bureau (LOCFB), Lone Star Chapter of the Sierra Club (Sierra Club), Lower Colorado River Authority (LCRA), Lowerre, Frederick, Perales, Allmon & Rockwell (Lowerre Frederick), City of Lubbock (Lubbock), McGinnes Industrial Maintenance Corporation; submitted by Integral Consulting, Inc. (McGinnes Corp.), Texas State Representative Sid Miller, Harrison County Judge Randy Mills, National Wildlife Federation (NWF), North Texas Municipal Water District (North Texas MWD), Nueces River Authority (NRA), Plains Cotton Growers, Inc. (PCG), Port of Corpus Christi Authority (PCCA), Port of Houston Authority (PHA), Protect Lake Travis Association (PLTA), Parkhill, Smith and Cooper, Inc. (PSC), Public Citizen, Sabine River Authority (SRA), Samsung Austin Semiconductor (Samsung), San Antonio River Authority (SARA), San Antonio Water System (SAWS), San Marcos River Foundation (SMRF), Sanderson Farms, Save Our Springs Alliance (SOSA), Sustainable Energy and Economic Development

Coalition (SEED), Texas Campaign for the Environment (TCE), Texas and Southwestern Cattle Raisers Association (TSCRA), Texas Association of Clean Water Agencies (TACWA), Texas Association of Dairymen (TAD), Texas Black Bass Unlimited (TBBU), Texas Catholic Conference, Texas Cattle Feeders Association (TCFA), Texas Commission on Environmental Quality – Office of Public Interest Counsel (OPIC), Texas Chemical Counsel (TCC), Texas Comptroller of Public Accounts; Susan Combs (TCPA), Texas Conservation Alliance (TCA), Texas Department of Agriculture (TDA), Texas Department of Transportation (TXDOT), Texas Farm Bureau (TFB), Texas Industry Project; submitted by Baker Botts LLP (TIP), Texas Parks & Wildlife Department (TPWD), Texas Poultry Federation, Texas State Soil & Water Conservation Board (TSSWCB), Texas Wade Paddle and Pole (TWPP), Texas Water Conservation Association (TWCA), Texas Water Resources Institute (TWRI), Tischler/Kocurek Environmental Engineers (T/K), City of Uncertain (Uncertain), EPA, Upper Trinity Regional Water District; submitted by Lloyd Gosselink (UTRWD), Village of Volente (Volente), Water Environment Association of Texas (WEAT), Texas State Senator Kirk Watson, White River Municipal Water District, submitted by Lloyd Gosselink (White River MWD), Working Effectively for Clean Air Now (WE CAN), and over one thousand individuals.

Comments were also received from the Association of Texas Soil and Water Conservation Districts and the following Soil and Water Conservation Districts: Andrew Kent #170, Andrews #246, Atascosa County #307, Austin County #347, Bastrop County #340, Bedias Creek #428, Big Bend #227, Calhoun #345, Central Colorado #550, Coke County #219, Concho #201, Dawson County #124, Denton County #547, Fayette #341, Gaines County #166, Gillespie County #220, Gonzales County #338, Gray County #125, Hall-Childress #109, Howard #243, Hutchinson #146, Jack #549, Jackson #336, Jim Wells County #355, Johnson County #541, Karnes County #343, Kendall #216, Lamar #415, Lamb County #130, LaSalle County #354, Limestone-Falls #501, Live Oak #323, Llano County #233, Loma Blanca #328, Lubbock County #108,

Lynn County #119, Marion-Cass #433, Mason County #223, McCulloch #249, McLennan County #512, Menard County #215, Middle Clear Fork #206, Middle Concho #234, Midland #244, Monte Mucho #331, Navasota #440, Nolan County #245, Nueces-Frio-Sabinal #221, Oldham County #153, Palo Pinto #518, Panola #448, Parmer #140, Piney Woods #429, Salt Fork #133, San Saba #250, Sandhills #241, San Patricio #324, Shelby #449, Sherman County #159, Starr County #332, Sulphur-Cypress #419, Tierra Blanca #143, Upper Clear Fork #165, Upper Elm-Red #524, Upper Pease #164, Upper Pecos #213, Upshur-Gregg #417, Victoria #346, Washington #348, Waters-Davis #318, Wharton County #342, Wilson County #301, Wise #548, and Wood #444.

RESPONSE TO COMMENTS

General Comments Related to the Water Quality Standards Changes

Comment: TSSWCB supports the added text throughout the standards that references TCEQ's laboratory accreditation requirements as specified in Chapter 25.

Response: The commission notes the comment in support of the references to the commission's laboratory accreditation requirements.

The commission adopts the revisions as proposed.

Comment: AECT and a number of individuals filed comments supporting the overall proposed revisions to the water quality standards for Texas streams and rivers. Harris County recommends expeditious adoption of the proposed water quality standards.

Response: The commission notes the comment in support of the overall proposed revisions to the water quality standards.

Comment: Farmers Branch comments that further study is needed to determine the ecological benefit in comparison with the financial impacts to wastewater treatment plants. Farmers Branch notes that in some water bodies treated effluent discharges can make up to 90% of its base flow. Therefore, additional studies need to be performed on a case-by-case basis before requiring costly improvements to a wastewater treatment plant.

Response: The commission acknowledges that many wastewater treatment facilities in Texas have very little instream dilution, and a fiscal note analysis in accordance with rulemaking procedures was conducted in the proposal preamble and included some of these requested considerations. The commission is aware that new or more stringent effluent limitations may require expensive treatment plant upgrades and will carefully consider new or more stringent effluent limitations requirements for wastewater treatment plants.

Comment: TAD recommends TCEQ consider how the proposed water quality standards change would impact both urban and rural business, including a business continuity impact analysis. Samsung supports changes to the standards unless they will result in increased costs for dischargers.

Response: The commission appreciates the concern from the regulated community about potential increased costs for all types of business due to changes in the Texas Surface Water Quality Standards. The commission notes that a fiscal note analysis was conducted in accordance with rulemaking procedures and it included a small business analysis of the potential cost impacts of the proposed changes to the water quality standards.

Comment: One individual noted in the Public Benefits and Cost section that during the first five years the proposed rules are in effect, water quality and protection of the public and aquatic life resources would be increased. The individual notes that this statement is illogical given the proposed action to make bacteria standards attainment less stringent. A number of commenters noted that the potential cost savings to the state of approximately \$1 million over a three-year period was not an adequate trade-off for lowering water quality standards. CEHI also objected to a cost-benefit analysis for making environmental decisions.

Response: The commission acknowledges the comment regarding the Public Benefits and Cost section and clarifies that this section of the preamble is in reference to all the changes in the proposed Texas Surface Water Quality Standards. A variety of the proposed revisions increase protective levels for numerous pollutants.

The primary purpose in the changes to the recreational standards is to more appropriately assign recreational uses to water bodies in Texas and to effectively apply those standards to protect the assigned uses. The costs savings identified in the fiscal note addressed a few

of the immediate activities associated with the recreational revisions. However, the primary purpose of these changes were to ensure that all the resources for water quality management available in Texas are more effectively directed to water bodies that need restoration.

Comment: BSEACD reminds TCEQ of the need to honor the special hydrologic relationship between groundwater and certain surface water resources. In particular, BSEACD requests that any surface water body that is now designated by TCEQ for uses that include aquifer protection, be assured of the highest level of water quality as TCEQ applies its new standards and implementation guidance. BSEACD comments that it is appropriate to treat these designated aquifer protection segments as drinking water supplies.

Response: The commission acknowledges this comment and notes that the commission did not propose changes to the designated aquifer protection use.

§307.3 – Definitions and Abbreviations

Comment: Albion comments that a definition for "dissolved trace metals" should be included in either the standards rule or implementation guidance. Without an established or EPA deferred definition of dissolved trace metals, it is unclear what dissolved metals data complies with TCEQ standards, compliance monitoring, or monitoring programs for the purpose of assessment.

Response: While there is no specific definition for "dissolved trace metals" in either the standards rule or implementation guidance, the *Surface Water Quality Monitoring Procedures, Volume 1 (RG-415)* specifically states that a 0.45 microgram filter is to be used when

obtaining dissolved metals data. The commission continues to evaluate these procedures and may determine it is appropriate to add a definition to the standards rule in future revisions. No changes were made in response to this comment.

Comment: TWRI requests that the term "warm-weather" be removed from the definition of "baseflow conditions" because base flows can occur year-round and are not exclusive to warm months. TWRI suggests modifying the definition to read: "The usual, reliable, background level of a river, maintained generally by seepage from groundwater storage and through flow." TPWD comments that the new definition should be consistent with the Texas Instream Flow Program, which is that base flows "represent normal flow conditions (including variability) between precipitation events." TPWD noted that the term "baseflow" also appears as "base flow" in the rules.

Response: The commission is concerned that the use of the Texas Instream Flow definition of "base flow" might be inadvertently restrictive in terms of the normal range of conditions over which recreational surveys would be appropriate. The commission notes that the definition of "base flow conditions" was added for recreational purposes only, and this definition was renamed to "dry weather flows" in order to prevent confusion.

Comment: NWF comments that the definition of "critical low flow" is ambiguous due to the use of the word "include." NWF recommends use of the phrase "consists of" as a better fit in this definition.

Response: The commission agrees with this comment and adopts the definition as modified.

Comment: WEAT suggested modifying the definitions of "E. coli" and "Enterococci" to include the phrase "and other environmental sources" at the end of the first sentence to acknowledge there are sources other than warm-blooded animals and to make the definition consistent with the definition of "fecal coliform." TSSWCB opposes this suggested change, noting that its understanding is that there is little evidence to support it.

Response: The commission acknowledges the comment in support and opposition to adding the term "and other environmental sources." The commission responds that the current definition of *E. coli* and *Enterococci* adequately describes these bacteria indicators. The commission adopts the definitions as proposed.

Comment: TWRI suggests adding a definition of "high saline inland waters" because this term is used throughout the standards, but lacks a clear definition.

Response: For this revision, the commission's purpose is to provide clear designations water-body-by-water-body for the appropriate criteria. More evaluation is needed to develop a numerical definition that could be consistently applied to additional water bodies. The adoption of this provision on a water-body-by-water-body basis prevents confusion as to what is considered a high saline inland water body. No change was made in response to the comment.

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose the proposed changes to the definition of "noncontact recreation" since the proposed criteria for secondary contact recreation 1 would be set at a less protective level than the current noncontact recreation criteria. TSSWCB comments that the definition would be strengthened by clarifying that noncontact recreation is appropriate for either "activities not involving a significant risk of water ingestion" or (not "and") "where primary and secondary are considered unsafe..." Farmers Branch recommends revising the definition to include concrete channels that do not support fish or substantial aquatic life. TPWD comments that to be consistent with other recreation definitions "noncontact recreation" should list types of activities. TPWD suggests rewording to read:

"Activities that do not involve a significant risk of water ingestion, such as those with limited body contact incidental to shoreline activity including birding, hiking, and biking. Noncontact recreation use may also be assigned where primary and secondary contact recreation should not occur because of unsafe conditions, such as ship and barge traffic."

Response: The commission acknowledges the recommended changes and the opposition of the noncontact recreation definition. It is appropriate to expand the current recreational use categories into four categories (primary contact, secondary contact 1 and 2, and noncontact recreation) with corresponding criteria in an effort to better characterize the different levels of water recreation activities that can occur in Texas.

The commission responds that a noncontact recreation designation for concrete channels may be too broad because the extent of concrete channelization can vary on a case-by-case basis. In addition, a water body, including those that are concrete lined, cannot be designated as noncontact recreation without a recreational UAA and without being publically proposed during a rule revision process.

The commission agrees that the noncontact recreation definition should be clarified to be consistent with other recreation definitions by listing the types of activities and modified the language as recommended by these comments. The commission adopts the revisions as modified.

Comment: TPWD comments that the modified definition of "nonpersistent toxic" could be less protective of aquatic life for those toxic substances that move out of the "persistent toxic" category and recommend leaving the definitions at 96 hours. One individual asks why the proposed half-life period is being increased from 96 hours to 60 days in the definitions of "nonpersistent toxic" and "persistent toxic."

Response: The revision to the definitions of "nonpersistent toxic" and "persistent toxic" are based on EPA's Persistent Bioaccumulative Toxic (PBT) Chemicals; Final Rule (64 *Federal Register* 58666; October 29, 1999). Under "Summary of Proposal" (Section IV.B1, Page 58668), EPA states that a half-life criterion of two months for water was used for the purpose of determining whether a toxic chemical is persistent in the environment. EPA further explains (Page 58381) ". . .that application of lower criteria would include so many substances as to be impractical. Further, given the uncertainties that often exist regarding physical properties and environmental behavior of chemicals, caution is especially appropriate for substances with shorter half-lives, since they are (all other things being equal) less likely to

build up in the environment than more persistent substances." Therefore, the commission adopts the definitions of "nonpersistent toxic" and "persistent toxic" as proposed.

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN recommend deletion of the last sentence in the definition of "nutrient criteria" consistent with their position for determining violations of nutrient numeric standards. TPWD notes that the definition includes associated screening levels for total phosphorus and secchi depth. TPWD further notes that the criteria itself in §307.4(e), references only the chlorophyll a standard.

Response: The commission concurs with this comment and adopts the stand alone chlorophyll *a* nutrient criteria for reservoirs. The last sentence in the definition of "nutrient criteria," which relates to screening levels, was deleted. The modified definition is adopted.

Comment: NWF and TIP comment that the proposed definition refers to "aquatic plants that includes phytoplankton, floating algae, floating vascular plants, attached algae, and rooted plants" and recommends using the newly defined term "aquatic vegetation" in order to assure consistency. TIP recommends for consistency with the definition of "nutrient" that the first sentence of the definition of "nutrient criteria" be revised to read: "Numeric and narrative criteria that are established to protect existing, attainable or designated uses of surface water from excessive growth of aquatic vegetation."

Response: The commission concurs with these comments and adopts the language.

Comment: NWF comments that the proposed definition of "nutrient" includes the term "nuisance aquatic vegetation" that is undefined and unclear. NWF suggests replacing with the phrase "can contribute to undesirable growth of aquatic vegetation."

Response: The commission concurs with these comments and adopts the language cited above.

Comment: TWRI asks that in the definition of "primary contact recreation" whether the term "whitewater" applies to kayaking, canoeing, and rafting or just to kayaking. TWRI also noted that the definition does not seem appropriate for intermittent streams and nontidal wetlands, which are more appropriate for secondary contact recreation 1 and 2. Sierra Club, Public Citizen, TBBU, SEED, and WE CAN comment that the definition should also include tubing, kayaking, canoeing, and rafting (the latter three not qualified as whitewater) and that wading should not be limited to "wading by children." TSSWCB comments that canoeing, kayaking, and rafting should be included in the definition of secondary contact recreation rather than in this definition. TSSWCB indicates that this use should only apply to recreational uses that may result in prolonged and direct contact with the water.

TPWD questions the distinction between whitewater kayaking, canoeing and rafting. TPWD indicates that based on current knowledge, it is impossible to draw a meaningful distinction between risks of ingestion based on "whitewater" conditions. TPWD indicates that all canoeing, kayaking and rafting are activities that carry an elevated risk of ingestion and should receive the full protection of the primary contact recreation use category. Therefore, TPWD recommends that the word "whitewater" be removed from the definition of "primary contact recreation."

Response: The commission responds that in the primary contact recreation definition, the term "whitewater" applies to kayaking, canoeing, and rafting. The definition has been modified to clarify this.

In response to comments requesting that primary contact recreation apply to all kayaking, canoeing, and rafting, no changes were made based on this comment in the definition. The distinction of the term "whitewater" recognizes that these activities carry an elevated risk of water ingestion.

There are common types of wading by adults, such as wade fishing, that do not involve a significant risk of ingestion. Therefore, these activities would not be appropriate for primary contact recreation.

The commission responds that intermittent streams and nontidal wetlands have a presumed contact recreation use and this presumption is not changed from the existing rules. Site-specific information for each intermittent stream or nontidal wetland would be required in order to consider a presumed secondary contact recreation 1 use.

Comment: TWRI comments that the definition of "secondary contact recreation 1" should include canoeing, kayaking, and rafting under normal flow conditions. TWRI notes that the risk of ingesting water under normal flow conditions is inherently less than under "whitewater" conditions. Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose adoption of this definition, but if adopted, qualifying the term "boating" by

specifying "motor boating." TPWD also recommends replacing "boating" with "motor boating" or some other language to clarify that all kayaking, canoeing, and rafting activities fall under primary contact recreation.

Response: The commission responds that the term "boating" was intended to include canoeing, rafting, kayaking, and motor boating. In response, the commission changed "boating" to "canoeing, kayaking, rafting, and motor boating" and adopts the language as modified.

Comment: GBF comments that the definition of "secondary recreation 1" allows lowering use as a result of man-made degradation. GBF comments that the physical characteristics may be the result of man-made degradation, such as reduced base/stream flows and limited public access that may be remedied in the future.

Response: The commission will thoroughly evaluate water bodies to determine if recreational activities are occurring and where recreational use may be inappropriate through a Recreational UAA. A Recreational UAA involves coordination with local stakeholders and landowners, data collection, and an evaluation of water recreation activities. In addition, it includes an evaluation of the physical characteristics of the water body and historical uses. Any change to a recreational use less stringent than primary contact recreation will require public notification and the opportunity for public comment. The commission can re-evaluate, as needed, the recreation use of a water body if there are future changes in use as sometimes occurs now with UAAs for other parameters, such aquatic life uses. The commission adopts the definition as proposed.

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose the adoption of the definition of "secondary contact recreation 2," but if adopted, recommend eliminating the term "limited public access" from the definition.

Response: The commission acknowledges the opposition to the adoption of the secondary contact recreation 2 definition. However, there is utility in having a secondary contact recreation 2 category that takes physical characteristics of the water body and limited public access into consideration. The commission adopts the definition as proposed.

Comment: TWRI comments that the phrase "less frequently" in the definition of "secondary contact recreation 2" needs to be better described and clarified.

Response: The commission explored a more specific definition with respect to "less frequently" with the water quality advisory stakeholder group and others, but a clear consensus was not achieved. The commission may continue to work with stakeholders during the process of evaluating recreational UAAs to better apply these definitions.

Comment: TWRI comments that the definitions of "secondary recreation 1 and 2" and "non-contact recreation" should be standardized to the extent possible between freshwater and saltwater. One individual commented that there appeared to be little difference between the two secondary contact recreation standards and that only one was needed.

Response: The commission responds that the secondary contact and noncontact recreation language for freshwater and saltwater in §307.7 were standardized to the extent possible. Detailed information was provided in §307.4(j) regarding how recreational uses would be assigned; therefore, this information was not re-stated in §307.7. The additional language in the saltwater portion in §307.7 was to provide further clarification that these uses cannot apply to a coastal recreation water as defined in the Beach Act.

Comment: TACWA, TIP, TCC, and TWCA comment that the definition of "sustainable fisheries" should be revised so that very small, tidally-influenced ditches are excluded. GCA comments that the definition needs further clarification. GCA and TCC are concerned that proposed definition will be extended to tidally-influenced small ditches that discharge into a tidal water body and these ditches should not be considered sustainable fisheries. T/K, TCC, and TIP recommend the addition of the following sentence to the definition: "Tidal rivers do not include small tributaries of bays and estuaries that do not have the potential for sufficient fish production or fishing activity to create significant long-term human consumption of fish and/or shellfish."

Response: Tidal water bodies are some of the state's most productive fisheries and these water bodies generally have ample public access. For this reason, all tidal water bodies were considered to support sustainable fisheries, regardless of size. The commission notes this comment and recognizes that some tidal ditches may be so small or have such limited public access that this blanket coverage of all tidal water bodies may be unnecessary. However, at this time the commission proposes no change.

Comment: TPWD comments that an apparently arbitrary size limit has been established to define "sustainable fisheries." TPWD notes that there are many water bodies smaller than 50 surface acres that are managed as community fishing lakes. TPWD is concerned that local and subsistence users consuming fish from these waters may not be appropriately protected, since human health criteria are approximately an order of magnitude lower for these water bodies (based on 1.75 grams per day (g/day) consumption for incidental fisheries versus 17.5 g/day consumption for sustainable fisheries). TPWD recommends that the definition be changed to less than 10 acres or 30 acre-feet.

Response: At this time the commission proposes no change regarding the size of a surface water that is presumed to support a sustainable fishery. However, this definition does not prohibit smaller water bodies from being considered a sustainable fishery. Local factors, such as fish stocking practices and local fishing activities, are considered when determining if a water body should be treated as a sustainable fishery. No change to this definition was proposed or is adopted in the rules at this time.

Comment: One individual commented that in the definitions of "total dissolved solids" and "total suspended solids" the use of the phrase "filterable residue" is archaic and misleading and recommends revising this term in both definitions.

Response: The definitions of "total dissolved solids" and "total suspended solids" were modified to clarify that the phrase "filterable residue" is also equivalent to "filterable residue" as the term is used in 40 Code of Federal Regulations (CFR), Part 136.

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN commented that the definition of "wetland water quality functions" should include habitat for "wildlife" and not just habitat for aquatic life.

Response: The commission acknowledges this comment. Since this recommendation could potentially affect regulatory programs, additional coordination with stakeholders is needed. After additional development, changes to these definitions may be publicly considered in the next revision of the standards.

Comment: TPWD requests that the standards include a definition of "wildlife" in §307.3. TPWD notes that common usage of the term "wildlife" conflicts with the statutory definition, in that the statutory definition excludes exotic species, while common use includes species such as feral hogs. TPWD states that this discrepancy has led to confusion and it would appreciate clarification in the standards.

Response: The commission responds that due to potential conflicts with the definition of this term in statutes and regulations, the commission adopted the term "aquatic and terrestrial life" as used in §307.1 rather than the term "wildlife." However, the commission did not change the term "wildlife" in §307.7(b)(1) because bacteria sources could be from any warm-blooded animal. The commission adopts the term as modified.

§307.4 – General Criteria

Comment: Harrison County Judge Randy Mills, Hamilton County Commissioner Dickie Clary, WEAT, SAWS, TSCRA, and one individual filed comments supporting the site-specific UAAs to determine proper water body use. SAWS comments that this approach will more appropriately classify a segments recreational use. SARA comments that not only should a UAA be used to assess current use, but public notice and public meetings should be held within the watershed prior to changing an aquatic recreation classification. Sierra Club, Public Citizen, TBBU, SEED, and WE CAN are concerned that due to difficulties, the result of these studies will result in many streams being characterized as not used for recreation use when they actually are. Sierra Club, Public Citizen, TBBU, SEED, and WE CAN also object to revising the presumed uses for unclassified streams solely through a UAA, without going through a revision of the water quality standards, with public notice and comment requirements. One individual commented that the proposed rules do not mention any sort of periodic review or re-evaluation of UAA results to re-assess changed stream conditions that may justify changes in designated uses. OPIC notes the conducting UAAs on all waterways that would have less stringent bacteria standards is being proposed. GBF expressed concerns that a recreational UAA cannot predict future contact recreation uses.

One individual comments that the language in §307.4(j)(2)(D) and (3)(A), suggests the need for a periodic review of designated uses. TPWD comments that the language in §307.4(j)(3)(A) - (C) appears to allow assignment of secondary contact recreation I use to intermittent and perennial freshwaters based on what, in TCEQ's judgment, is a "reasonable level of inquiry," provided the water body meets conditions specified in §307.4(j)(2)(B). Effectively, this language will allow a standards change in a permit, CWA, §303(d) listing, or TMDL action, without a UAA, statewide notice, or a rulemaking action. TPWD does not think this is appropriate at this time. Perhaps after the scientific adequacy of recreational UAA procedures have been demonstrated it will be justifiable to allow the suggested procedure, but there is no evidence to allow

these changes without thorough review at this time. NWF opposes the proposed standards that would allow perennial stream and river segments to be presumed to support only a secondary contact recreation I level of use.

Response: The commission acknowledges the comments in support of UAAs. The commission notes that EPA has indicated that the recreational UAA procedures, which are not part the proposed rule, are acceptable.

The commission responds that all classified water bodies have a designated primary contact recreation (PCR) use. All unclassified water bodies have a presumed PCR use, except where site-specific information indicates that recreational activities that involve a significant risk of ingestion have little to no likelihood of occurring as described in §307.4(j). The commission will thoroughly evaluate water bodies to determine if recreational activities are occurring and where recreational use may be inappropriate through a recreational UAA. A recreational UAA involves coordination with local stakeholders and landowners, data collection, and an evaluation of water recreation activities. Any change to a recreational use less stringent than PCR will require public notification and the opportunity for public comment. The commission can re-evaluate the recreation use of a water body, as needed, if there are future developments that would justify possible recreational use changes.

Comment: One individual asks for clarification regarding what the numbers in this phrase mean: "...for the proposed site-specific bacteria criteria to protect recreation, one is new, none are more stringent, and 293 are less stringent." The individual notes that this language, by itself, does not lend itself to interpretation that recreation is being protected, since all changes are less stringent.

Response: The commission responds that the phrase referenced the proposed change in *E. coli* criterion for primary contact recreation from 126 colony-forming unit (cfu) per 100 ml to 206 cfu/100 ml. This proposed change was not adopted in the final rulemaking. The commission notes that the EPA has indicated that *E. coli* concentrations of up to 206 cfu per 100 ml can be considered protective of primary contact recreation.

Comment: One individual commented that in §307.4(b)(2) the use of the term "floating debris" suggests that trash may be a pollutant and recommends addressing this issue.

Response: The commission responds that the narrative specifications in §307.4(b) address a broad range of adverse conditions in water that might affect water quality uses. These specifications intentionally include a variety of effects beyond the purview of specifically defined pollutants that is typical of more quantitative standards. No change from the existing language is made at this time.

Comment: One individual commented that the use of the term "aesthetically attractive condition" in §307.4(b)(4) is not defined and notes some perceptions of this term may be environmentally harmful.

Response: The commission acknowledges that this term is open to interpretation, as is generally the case with the narrative criteria in §307.4(b). The wide variety of aquatic environments in Texas creates difficulties in establishing a uniform application of this term. The

general narrative criteria were not a focus of this revision, but changes such as these can be considered for the next triennial revision. No change from the existing language was made in response to the comment.

Comment: TPWD notes that the site-specific criteria section, §307.7(b)(4)(E), includes associated screening levels for total phosphorus and secchi depth and questions whether the criteria in §307.4(e) should include discussion of associated screening levels.

Response: The commission notes that the selected nutrient criteria for reservoirs no longer include associated screening values, so no additional discussion of them in this section is needed.

Comment: NWF comments that the term "presume" should be added to the list of the types of uses that must be protected from excessive growth of aquatic vegetation in §307.4(e).

Response: The commission concurs and adopts the language as modified.

Comment: NWF comments §307.4(f) includes a phrase "discharges of treated domestic (sanitary) effluent" that is too broad. NWF states that it is inappropriate to exempt every discharge of treated domestic effluent from compliance with the temperature standard. NWF comments that to the extent that temperature excursions resulting from discharges of treated domestic effluent are reasonably avoidable, the standards should require that the excursion be avoided.

Response: In general, the temperature exemption in §307.4(f) for domestic wastewater discharges is appropriate. The commission responds that this might be an appropriate consideration for the next revision of the standards pending additional stakeholder review.

Comment: HCFCD notes that the addition of the aquatic life subcategory of "minimal" is appropriate. TPWD notes that a new category of aquatic life use, termed "minimal," is proposed that replaces "no significant aquatic life use" in §307.4(h)(4) and §307.7(b)(3)(A)(i). No attributes are listed in either §307.7(b)(3)(A)(i), Table 3, or Table 1 of the Implementation Procedures, unlike the existing aquatic life use categories (exceptional, high, intermediate and limited). This raises the question of how to distinguish between a limited aquatic life use and a minimal aquatic life use. TPWD recommends that references to minimal aquatic life use be stricken from the standards and implementation procedures until these attributes are developed and that TCEQ continue to use the "no significant aquatic life use" designation until such attributes are developed.

Response: The commission agrees that additional evaluations of biological categories and indices to delineate a "minimal aquatic life use" may be useful, but this change and the requested deletion of references to this use are beyond the proposed scope of these revisions. The commission notes that "minimal aquatic life use" has been historically known as "no significant aquatic life use" and is only used when assigning presumed aquatic life uses to intermittent streams without perennial pools. This use is based on flow characteristics and not aquatic life attributes. The commission currently assigns "no significant aquatic life uses" as the presumed use for intermittent streams without perennial pools in permitting. The term "minimal" is also being added to §307.4(h)(4) and §307.7(b)(3)(A)(i) to be consistent with

the Surface Water Quality Monitoring Program, who use the term "minimal" in their aquatic life use designation for the Integrated Report. Commission staff will continue to coordinate with TPWD staff to improve procedures to assign aquatic life use categories. The commission adopts the revision as proposed

Comment: One individual comments that the phrase "higher uses are protected where they are attainable" in §§307.4(h)(3) and (4) is not defined and can be interpreted in multiple ways.

Response: The commission responds that the intent of this phrase is to facilitate assigning uses that are more protective than presumed, but additional clarification can be reviewed and proposed in the next revision of the standards, if appropriate.

Comment: One individual noted that §307.4(h) states that when water is present in the streambed of intermittent streams, a 24-hour dissolved oxygen mean of at least 2.0 mg/L and an absolute minimum dissolved oxygen of 1.5 mg/L must be maintained. This individual notes that the term "absolute minimum" is not defined and asks whether it means that the dissolved oxygen can never drop below 1.5 mg/L even in a grab sample. If so, it would be helpful if this provision also referenced §307.9(e)(6). This individual also asks whether the 1.5 mg/L is also limited to the eight-hour duration referenced in other tables and finally asks, whether a concentration just over the minimum, e.g. 1.51 mg/L, be acceptable for 16 hours as long as the average of 2.0 mg/L met.

Response: The commission responds that the term "absolute" in §307.4(h) was replaced with "24-hour" and the term "daily minima" was replaced with "24-hour minimum dissolved oxygen concentrations" in §307.7(b)(3)(A)(i), Table 3 (footnote), for consistency purposes. The eight-hour language is only applied when a dissolved oxygen concentration remains right at the 24-hour minimum criterion and this phrase is not intended to allow dissolved oxygen concentrations to go below the daily minimum at any time. The commission adopts this language as modified, but can review these provisions in the next revision of the standards.

Comment: OPIC objects to the process in §307.4(j) governing the assignment of presumed recreational uses to unclassified water bodies. OPIC notes that the process in the rule is very general, but that the specifics are included only in the guidance of the Implementation Procedures and recommends referencing the recreational UAA procedure included in the draft guidance document and require that a recreational UAA be conducted as part of an inquiry into a possible deviation from the presumed use of primary contact recreation.

Response: The procedures for the inquiry are established in the commission's recreational UAA and this document is referenced on the commission's Web site and in multiple Quality Assurance Project Plans. Therefore, the commission respectfully declines to adopt the proposed change.

Comment: TSSWCB comments that it is inappropriate to apply contact recreation use (primary or secondary) where political subdivisions have established enforceable ordinances and rules that forbid contact recreation in water bodies within their jurisdiction. For that reason, TSSWCB encourages the inclusion of a third form of the applicable application of noncontact recreation that would address this issue.

Response: The commission responds that this recommendation is outside the scope of the proposed rulemaking. However, these kinds of ordinances are major factors in assessing recreational uses with a UAA.

Comment: BRA, Fox Dairy, Hamilton County Commissioner Dickie Clary, Heifer Ranch at Arroyo Seco, High Plains Dairy Counsel, Legacy Farms, Texas State Representative Sid Miller, Harrison County Judge Randy Mills, ICA, NRA, Sanderson Farms, 74 Soil and Water Conservation Districts, Hamilton, PCA, SAWS, TCFA, Texas Poultry Federation, TSCRA, T/K, TFB, TSSWCB, TIP, TCC, TDA, TCPA, WEAT, and a number of individuals filed comments supporting the proposed contact recreation standard changes that would allow TCEQ to apply a tiered set of water quality standards to streams depending upon their site-specific characteristics. PHA comments that all four proposed use categories include some type of recreation.

PLTA, Sierra Club, Public Citizen, TBBU, SEED, WE CAN, SOSA, TCA, SMRF, Environment Texas, and NWF oppose the revision to the recreational use categories. OPIC generally supports the new categories, but objects to the indicator bacteria levels associated with the new subcategories because they are less restrictive than current rules. GBF states that great care should be given before lowering a water body's presumed primary contact use and that care has to be taken in the recreational UAA process. GBF is also concerned that a recreational use UAA may not predict future use of a water body.

Response: The commission notes comments in support and opposition to the new recreational use categories. The commission responds that it is appropriate to expand the two current categories for recreational uses (contact and noncontact recreation) into four categories (primary contact, secondary contact 1 and 2, and noncontact recreation) in an effort to better characterize the different levels of water recreation activities that can occur in Texas. In the 1980's and 1990's, a contact recreation use was broadly presumed for all surface waters in Texas, with the exception of eight distinct water bodies, e.g. ship channels. As a result of these broad optimistic presumptions, there may be numerous water bodies with inappropriate recreational uses. The expanded recreational use categories will provide the commission the ability to better assign appropriate recreational use on water bodies. The commission notes that EPA has indicated that recreational use categories and criteria, such as secondary contact recreation with a geometric mean criterion five times the primary contact geometric mean, are acceptable.

Comment: TSSWCB comments that designated swimming areas are more adequately addressed in the recreational UAA protocols and a discussion of parks should not be included in the standards. TPWD comments that all parks with water bodies, whether federal, state, or local, with or without designated swimming areas, are likely to have wading by children. TPWD requests that language be added to §307.4(j)(3)(A) - (C) that specifically designates water bodies in parks as having primary contact recreation use and that requires a rulemaking action to change that use.

Response: The commission responds that designating all water bodies in parks as having a primary contact recreation use is not appropriate and could result in inappropriate water quality standards for numerous water bodies throughout the state. The commission

responds that it will evaluate water bodies on a site-specific basis to establish the appropriate recreation use. The commission notes that it considers all parks in the evaluation of recreational UAAs.

Comment: One individual asks for an explanation of use of the phrase "substantial pools" in §307.4(j)(2)(B)(i). TPWD asks whether the phrase "or greater" should be included as it relates to the depth of one meter in this section.

Response: The commission recognizes that the term "substantial pools" is not quantitatively defined in the rule. The size and extent of pools is considered in the evaluation of recreational UAAs. In response to comments, the commission editorially revised the language to include "or greater." The commission adopts this language as modified.

Comment: One individual notes the phrase "existing recreational activities that create a significant risk of ingestion" in §307.4(j)(2)(B)(ii) and asks what the time frame is in this case. Also, the individual asks how an area that previously harbored contact recreation, but now does not, is addressed.

Response: The commission notes that the time frames for evaluating recreational uses are specified in the recreational UAA procedures. In addition, these procedures include an evaluation of historical recreation.

Comment: One individual comments that in §307.4(j)(2)(C), secondary contact recreation 2 is vague and not very different from secondary contact recreation 1.

Response: The commission responds that the differences between secondary contact recreation 1 and 2 is the frequency of occurrence of these activities due to physical characteristics of the water body or limited public access.

Comment: EPA comments that the process for assigning recreational uses to unclassified water bodies in §307.4(j)(3) does not meet the public participation requirements in 40 CFR §131.10(e), which provides the opportunity for a public hearing under 40 CFR §131.20(b). EPA notes that if public notification on a downgraded recreational use occurs through the CWA, §303(d) process there is no opportunity to request a public hearing on the proposed change; and if public notification occurs during the permitting process, only an "affected person" under Texas law may request "a public ('contested case') hearing."

Response: The commission respectfully disagrees that the proposed process for assigning presumed recreational uses does not have adequate public notification requirements. The commission notes that the commission's Integrated Report for the CWA, §303(d) List is noticed in the *Texas Register* for public comment, which accomplishes the same purpose as a public hearing because the public is able to provide comments and submit evidence for consideration by the commission. That process gives the opportunity for the public to comment on and provide evidence regarding any downgraded recreational uses. The commission then responds to the comments received when they propose the final version of the CWA, §303(d) list.

In the permitting process, the general public does have an opportunity to request a "public meeting," which is the Texas equivalent to a federal "public hearing" under 40 CFR §131.20(b). A "public meeting" is held during the permitting process for the same reason as a federal "public hearing," the taking of public comment, (*See* 30 TAC §55.154). The executive director or Office of Public Assistance will hold a public meeting if: (1) the executive director determines that there is a substantial or significant degree of public interest in an application; (2) a member of the legislature who represents the general area where the facility is located or proposed to be located requests that a public meeting be held; or (3) when a public meeting is otherwise required by law. There is no requirement that the requestors be "affected persons" under §55.203 and the executive director is required to respond in writing in the form of a Response to Public Comment "all relevant and material or significant public comments," (*See* 30 TAC §39.551(e)(3)(E)).

The "contested case hearing" process noted by EPA in their comment is not analogous to a "public hearing" under the cited federal rules. A "contested case hearing" is an evidentiary proceeding before an administrative law judge (ALJ), where all parties, e.g. the executive director, the permit applicant, TCEQ's OPIC, "affected persons," and any other party granted party status by the commission or the ALJ may offer evidence in a trial-like proceeding. A contested case hearing is limited to factual issues relating to the particular permit application at issue.

Comment: NWF also comments that TCEQ has failed to show how impacts on downstream waters with higher use would be adequately protected. Volente expressed concerns that tributaries with a higher contact recreation use will contribute to increased bacteria in downstream water bodies with a primary contact recreation use.

Response: The commission's water quality management program has a framework to address protection of downstream water quality standards that are more stringent than upstream. This is a common occurrence with other kinds of criteria, such as those for dissolved oxygen and toxic pollutants. Under this approach, in permits and TMDLs, pollutant sources are evaluated and controlled so that different standards in affected water bodies are attained.

Comment: NWF comments that TCEQ needs to improve narrative criteria for nutrient standards to provide immediate protection to those water bodies that still do not have applicable numerical criteria.

Response: The commission responds that the existing narrative criteria for nutrients provide reasonable latitude to address nutrient problems where they occur. In addition, the commission is proposing a new section in the *Procedures to Implement the Texas Surface Water Quality Standards* to evaluate and control nutrient impacts from wastewater discharges. The commission is also devoting substantial resources to develop numerical nutrient criteria for streams, rivers, and estuaries.

Comment: Lowerre Frederick comment that the proposed rules contain an exemption from its Tier 2 protection for de minimis changes in water quality that is not supported by the CWA. Austin comments that the term de minimis needs a technically accurate, scientifically based, quantitative definition in the rules because the lack of a clear definition has created a loophole that has been exploited by permit applicants for wastewater discharges that would otherwise not be permitted. One individual comments that the phrase "important economic or social development" in §307.5(b)(2) is exceedingly vague and sets a very dangerous precedent.

Response: The commission responds that the antidegradation provisions in §307.5 are in accordance with federal regulation and guidance. The commission acknowledges that some of the considerations of the antidegradation policy have been difficult to define at both the state and federal level. An expanded section, Antidegradation, was put in the *Procedures to Implement the Texas Surface Water Quality Standards* to provide guidelines and examples on how antidegradation is addressed and defined.

§307.6 – Toxic Materials

Comment: Sierra Club, Public Citizen, TBBU, SEED, WE CAN, and EPA support narrowing the language in §307.6(a) regarding instances where the toxic criteria do not apply to instances where surface water, solely as a result of natural phenomena, exhibits characteristics beyond the limits of this section. EPA notes that EPA's policy regarding this does not apply to human health issues.

Response: This provision was intended to be analogous to the similar provision found in §307.7(a). The commission recognizes that EPA's 1997 policy regarding natural background conditions does not apply to human health numeric criteria, unless site-specific justification,

such as a UAA, is provided to support a site-specific change. In response to comments, the commission adopts adding the phrase "with the exception of numeric human health criteria" at the beginning of the second sentence in §307.6(a) to clarify that the provision does not apply to human health criteria.

Comment: TPWD asks for clarification in §307.6(a) of the language when toxic criteria do not apply. For instance, TPWD asks whether toxic criteria apply to inter-basin water transfers of raw water, storm water runoff, surface discharges of groundwater, or to once-through cooling water discharges.

Response: This provision only applies to conditions and sources that are entirely due to natural phenomena.

Comment: NWF comments that "presumed" uses must be added as an additional category of uses to be protected from chronic toxicity in §307.6(b)(2).

Response: The commission notes the comment, but specifies the presumed use to be the designated use, unless a site-specific study has determined otherwise.

Comment: TPWD comments that §307.6(c)(1) and (2) was revised so that the determination of numeric criteria for the protection of aquatic life was limiting the dataset to only native species. TPWD comments that they stock and manage several species of non-native game fish in Texas

water bodies. TPWD asks that these non-native fish also be protected and requests that datasets used to derive numeric criteria for protection of aquatic life include non-native stocked species.

Response: In accordance with the recalculation procedures provided by the EPA in Guidelines for Deriving Numerical Site-Specific Water Quality Criteria (EPA 600/3-84-099) and Appendix B of the draft guidance document entitled Interim Guidance on the Determination and Use of Water-Effect Ratios for Metals (EPA-823-B-94-001), states are allowed to recalculate national criteria based on native species. However, a minimum of eight families must be represented and no taxonomic grouping (including subgroups) may be completely eliminated from the national dataset. These protocols were followed when recalculating the site-specific aquatic life criteria in Table 1 of §307.6.

Comment: TIP is concerned that the language in §307.6(c)(2) may imply that the only valid basis that TCEQ can recalculate EPA nationally recommended criteria is to eliminate the effects of toxicity data for aquatic organisms that are not native to Texas. To avoid confusion regarding the scope of alternatives available to TCEQ, TIP recommends a sentence be added at the end of this section that states: "EPA guidance criteria may be used to establish numerical values as provided in 40 Code of Federal Regulations §131.1(b)."

Response: The purpose of §307.6(c)(2) is not to note all of the EPA approved methods for recalculating national criteria. Instead, §307.6(c)(2) refers to how numerical criteria contained in Table 1 of this section were recalculated. All recalculations were conducted by

removing non-native fish from the dataset used to calculate the national criteria. However, in order to avoid restricting the future development of criteria, the commission adds a statement to this effect at the end of §307.6(c)(2).

Comment: EPA notes a typographical error in the proposed equation for persistent toxic materials in §307.6(c)(7)(C). EPA comments that the factor should be 0.05 instead of 0.5.

Response: The commission notes and corrects this typographic error and adopts the language as modified.

Comment: T/K, TCC, and TIP supported adding the biotic ligand model (BLM) to Table 1 of §307.6 as an alternative method for calculating site-specific criteria for copper in fresh water.

Response: The commission notes this comment in support of adding the biotic ligand model for calculating site-specific criteria for copper in fresh water.

Comment: T/K and TCC recommend that TCEQ consider using the "m" designator in lieu of the "w" multiplier in the equations for all metals in Table 2 of §307.6 in anticipation of EPA's adoption of a BLM approach for one or more of these metals. T/K and TCC recommends that the definition of the multiplier in §307.6(c)(10) be expanded to use the multiplier for all metals where it is applicable.

Response: The commission notes this comment and agrees that the "m" designator will be added to additional metals when EPA approves this approach. However, in order to avoid confusion regarding when this approach may be used in lieu of a water-effect ratio study, the commission will consider adding this designation to individual metals through triennial revisions as they are approved by the EPA.

Comment: APERC and TIP support the TCEQ's proposal to adopt EPA's water quality criteria for nonylphenol. APERC notes that their review of the available studies and data support adoption of the criteria.

Response: The commission notes this comment of support for the addition of nonylphenol numeric criteria.

Comment: EPA comments that the appropriate n-nitroso-di-n-butylamine human health criterion in §307.6(d)(1) for consumption of water and fish should be 0.119 µg/L rather than 0.19 µg/L.

Response: The commission corrected this typographic error and adopts the language as modified.

Comment: AECT, T/K, TCC, and TIP support the proposed fish tissue concentration of 700 mg/L for methyl mercury.

Response: The commission notes this comment of support of the fish tissue criterion for mercury.

Comment: EPA, Sierra Club, Public Citizen, TBBU, SEED, WE CAN, OPIC, NWF, CLI, ,Uncertain, CLACC, EIP, Environment Texas, TCE, CW Action, GCLA, LGCLA, FCLNWR, TCA, TPWD, Environment Texas, and Texas Catholic Conference support adoption of the stricter federal mercury standard of 300 mg/L rather than the TCEQ proposed standard of 700 mg/L in §307.6(d)(1) due to the danger posed by this metal, rather than the standard in the proposed rules.

TPWD supports adopting a water quality criterion of 0.3 mg/kg in §307.6(d)(1) of the standards for implementation in regulatory actions, but using a screening level (e.g., 0.7 mg/kg) to trigger a risk assessment for determining the need for fish consumption advisories and bans.

Response: The Texas Department of State Health Services (TDSHS) uses 0.7 mg/kg for issuing fish consumption advisories to protect public health. The TDSHS has extensive experience with fish tissue contamination as it relates to human health. When developing the fish consumption advisory level, the TDSHS applied an acceptable mercury exposure level developed by the federal Agency for Toxic Substances and Disease Registry. This exposure level is based on human studies that result in safe exposure to mercury in all populations, including sensitive subgroups.

The EPA recommends a slightly lower value of 0.3 mg/kg as the national criterion for the protection of human health. This value is based on similar but different studies of mercury exposure in humans.

The TDSHS issued a fish advisory for largemouth bass and freshwater drum from Caddo Lake in 1995 due to elevated levels of mercury in fish tissue. In 2003, the TDSHS began to receive anecdotal reports that residents, possibly including subsistence fishermen, were continuing to consume these fish species from Caddo Lake. In response to these reports, the TDSHS studied residents of Caddo Lake in May of 2004 to assess low level mercury exposure. Results of this study are captured in the report *Health Consultation: Mercury Exposure Investigation Caddo Lake Area*. The Caddo Lake study showed that while participants were consuming fish with mercury concentrations of 0.7 mg/kg and greater, participants had blood level concentrations of mercury at levels below where any adverse affects would be expected. This study supports the TDSHS approach.

TCEQ toxicologists have evaluated the studies used by the Agency for Toxic Substances and Disease Registry, the EPA, and the Caddo Lake study, and the basis for the TDSHS fish tissue advisory level have been determined scientifically sound. Therefore, the commission supports the criterion of 0.7 mg/kg as being health protective and scientifically defensible. The commission adopts the criterion as proposed.

Comment: TPWD notes that TCEQ in §307.6(d)(1) chose to use an EPA-sanctioned bioconcentration factor (BCF) to convert tissue mercury to water-column mercury concentrations. TPWD concurs that the scientific community does not agree on a bioaccumulation factor (BAF), but notes with concern that use of the proposed BCF will in every instance result in a larger criterion than if any of the BAFs were used. TPWD wonders if the fish-consuming public is adequately protected by the proposed BCF and recommends use of a more conservative interim value.

Response: The numeric standard for the protection of human health is the fish tissue-based criterion of 700µg/kg (0.7 mg/kg), not the translated water-column number, which is used for permitting purposes only.

The commission notes the concern regarding the use of a BCF instead of a BAF, but supports using a translation factor with the widest margin of acceptance among the scientific community. The commission encourages the use of BAFs for the translation between tissue-based and water-column based criteria; and these factors will be updated in future revisions as the science of developing BAFs progresses. The assumed BCF used in this translation is comparable to the BCFs used to derive the mercury criteria in the 2000 Texas Surface Water Quality Standards.

Comment: IPC and McGinnes Corp. comment that the procedures to derive the proposed tissue-based water criterion for polychlorinated dibenzo-p-dioxins and dibenzofurans in §307.6(d)(1) should be reconsidered. A 10^{-4} risk level, similar to what TDSHS uses, or the noncancer minimum risk level should be used to calculate the tissue-based criterion. Another suggestion is to use the fish threshold developed by TDSHS as the water quality standard.

Response: The primary assumptions used to derive the proposed fish tissue concentrations were chosen for specific reasons. The excess cancer risk level of 1×10^{-5} is the risk level used by the commission. It is stated on page 65 of the *Procedures to Implement the Texas Surface Water Quality Standards* (RG-194) that: "Water quality criteria for human health protection are derived as stated in §307.6(d)(8) and (9). For known or suspected carcinogens, a cancer risk of 10^{-5} (1 in 100,000) is applied to the most recent numerical criteria adopted by EPA

and published in the *Federal Register*." This is also in accordance with §1.6 of EPA's guidance document *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)* (EPA-822-B-00-004). Even though EPA uses a risk level of 10^{-6} when calculating national human health criteria, states are allowed to use a less stringent risk level of 10^{-5} when calculating human health criteria as long as states can ensure that the risk to more highly exposed subgroups, such as subsistence fishermen, is no greater than 10^{-4} . A 10^{-5} risk level can also be useful in helping prevent TDSHS fish consumption advisories that use a 10^{-4} risk level. Therefore, the commission recommends using a risk level of 10^{-5} when calculating human health criteria.

The body weight scaling factor of $3/4$ is the appropriate default scaling method for carcinogens; as stated in *Methods for Identifying a Default Cross-Species Scaling Factor*, prepared by L. Rhomberg and T. Lewandowski for a 2004 EPA Risk Assessment Forum: "In the absence of chemical-specific information sufficient to do otherwise, the guidance of the EPA for carcinogen risk assessment is to apply a default animal-to-human oral dose extrapolation based on presumed toxicological equivalence of daily doses scaled by the $3/4$ -power of body weight (i.e., $\text{mg}/\text{kg}^{3/4}$ /day doses are presumed equivalent)." Therefore, the commission uses a body weight scaling factor of $3/4$ for criteria development for carcinogens.

A fish tissue consumption rate of 0.0175 kg/day, as stated in EPA's *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)* (EPA-822-B-00-004), is recommended as a default fish intake rate to adequately protect the general population of fish consumers, based on the 1994 to 1996 data from the USDA's *Continuing Survey of Food Intake by Individuals* (CSFII).

This value is the 90th percentile of the 1994-96 CSFII data and is very similar to the mean intake for all fish, which is 0.018 kg/day.

Therefore, the commission uses 0.0175 kg/day as the default fish tissue consumption rate.

Carcinogens can often cause noncarcinogenic, as well as carcinogenic effects. The commission evaluates both carcinogenic and noncarcinogenic effects of chemicals and sets human health criteria based on the most conservative approach to protect against all potential effects. In the case of dioxins and furans, criteria based on the carcinogenic effects presented the most conservative approach for protection of human health. Therefore, the commission supports deriving the criterion to protect human health based on the carcinogenic potency factor of 156,000 mg/kg/day, which is the same carcinogenic potency factor used by TDSHS and is also found in EPA's *Health Effects Assessment Summary Tables* (EPA 540-R-97-036), as opposed to the noncancer minimum risk level of 1 pg/kg/day. The commission adopts the criterion as proposed.

Comment: IPC and McGinnes Corp. comment that the use of a BCF for establishing water quality criteria for mixtures of polychlorinated dibenzo-p-dioxins and dibenzofurans is inappropriate. IPC and McGinnes Corp. comment that there is currently no reliable way to translate polychlorinated dibenzo-p-dioxins and dibenzofurans from a fish tissue concentration to a water column concentration.

Response: The commission acknowledges there can be high variability in BCFs. However, the use of a fish tissue criterion is one way to improve applicability of a water quality criterion. The commission encourages the development of site-specific BAF. However, even in light of variability, there must be an assumed BCF in order to conduct water quality management programs. The commission proposed

using the BCF found in the EPA's *Ambient Water Quality Criteria for Polychlorinated Biphenyls* (EPA 440/5-80-068); and the commission will continue to update this BCF in future rule revisions as additional BCF/BAF development continues. The commission adopts the language as proposed.

Comment: T/K supports the proposed fish tissue-based human health water quality criteria for various compounds in Table 2 of §307.6 and would like to see that approach be extended to all constituents that have bioconcentration or bioaccumulation factors greater than 1,000. TIP and AECT also support the fish tissue-based human health water quality criteria for specified highly bioaccumulative pollutants. TWCA and TCC support the proposed changes to adopt fish tissue-based criteria for highly bioaccumulative pollutants such as mercury, dioxins, furans, PCBs, and DDT.

Response: The commission notes this comment in support of fish tissue-based criteria and the comment regarding the development of similar criteria for other highly bioaccumulative constituents. This recommendation may be considered for the next triennial revision.

Comment: TCC and TIP comment that the proposed criteria of benzo(a)anthracene in Table 2 of §307.6 of 0.007 mg/L (fish and water) and 0.03 mg/L fish are incorrect. TCC's review of available data shows that the water quality criteria for benzo(a)anthracene should be identical to those of benzo(a)pyrene because the benzo(a)pyrene q_1^ applies to both chemicals. Therefore, TCC, and TIP stated that the proposed limits should be 0.068 mg/L (fish and water) and 0.33 mg/L (fish).*

Response: The commission acknowledges the error in calculation. The necessary correction was made to Table 2 in §307.6 and adopts the criterion as modified.

*Comment: TIP comments that footnote "***" in Table 2 of §307.6 states that PCB criteria apply to the sum of all congeners or all isomers or homologs or Arochlor analysis. TIP contends that this footnote is not yet supported by analytical methods necessary for its application. TIP recommends the footnote be revised to read: "Until Method 1668 or an equivalent method to measure PCB congeners is approved at 40 CFR Part 136, compliance with the PCB criteria shall be determined using Arochlor data." TCC comments that the proposed fish tissue criterion for PCBs in the proposed rules is unworkable and recommends determining compliance with water quality criteria for PCBs with Arochlor data, until EPA promulgates Method 1668.*

Response: The commission edited and adopted the footnote as follows: "Until Method 1668 or equivalent method to measure PCB congeners is approved in 40 CFR Part 136, compliance with PCB criteria is determined using Arochlor data or any alternate method listed in a TCEQ approved Quality Assurance Plan."

Comment: In Table 2 of §307.6, TPWD recommends changing "Polychlorinated Biphenyls PCBs)" to "Polychlorinated Biphenyls (PCBs)."

Response: The commission agrees with this comment and the recommended change was made.

Comment: TIP recommends that TCEQ review the numeric notation format for BCF factors that it uses in its footnotes to Table 2. In some footnotes, TIP notes that TCEQ uses two different forms of scientific notation. For consistency, TIP recommends selecting one format and using it throughout.

Response: The commission agrees with the comment and revised the form of scientific notation for consistency in the adopted rules.

Comment: TPWD comments that in certain instances in §307.6(d)(1), default criteria or calculations are based on United States Food and Drug Administration (USFDA) action levels for contaminants in fish tissue. USFDA action levels are not based only on risk assessment, but also on risk management (i.e., economic impacts) and are set to protect the general public from contaminants in fish shipped in interstate commerce. These action levels are not designed to protect sport or subsistence anglers from eating contaminated fish from local waters. Therefore, TPWD suggests it would be more appropriate to use action levels that are based on local consumer consumption, rather than interstate commerce.

Response: USFDA action levels were used in previous water quality standards revisions for the calculation of human health mercury criteria. However, USFDA action levels were not utilized in this revision to calculate human health criteria listed in Table 2 of this section. Criteria, including fish tissue-based criteria, were calculated in accordance with the procedures described in §307.6(d)(3).

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN support the consideration of childhood exposure in the setting of human health criteria for noncarcinogens in §307.6(d)(2).

Response: The commission notes this comment in support of childhood exposure in the setting of human health criteria for noncarcinogens and adopts the language as proposed.

Comment: TPWD notes that in §307.6(d)(7) and §307.9(e)(4) the reference to an average life span of 70 years was deleted. TPWD supported of this change, since the average longevity of Americans exceeds 70 years. However, TPWD comments that a new value for average lifespan was not included and recommends that a new value be included, along with the appropriate references.

Response: The Center for Disease Control (CDC) currently lists the average life expectancy of 77.7 years. However, the CDC also notes that the average life expectancy varies widely between gender and race. Since the average life expectancy continues to increase as medical technologies and treatments advance, no specific number was included in this revision of the standards.

Comment: TPWD supports requirements in §307.6(e) to address sublethal effects in toxicity testing requirements, particularly in light of recent findings regarding the effects of pharmaceuticals and personal care products on aquatic biota.

Response: The commission notes this comment in support of sublethal effects in toxicity testing requirements.

Comment: NWF notes that the third sentence in §307.6(c)(1) is a confusing circular statement that basically states, "Chronic total toxicity...must be...controlled to preclude chronic toxicity." NWF recommends deleting the term "chronic" the first time it appears in the third sentence.

Response: The word "chronic" is included in the first portion of the sentence because it refers to a specific type (category) of toxicity testing. The purpose of the statement is to clarify that this type of test is used to protect all waters in the state with a designated aquatic life use of limited or greater from chronic toxicity. The commission adopts the language as proposed.

Comment: In regards to §307.6(d)(5), NWF notes that the proposed reference to "stream flow conditions as specified in §§307.8" could be read as making human health concentration criteria inapplicable when any one of those stream flow conditions are not satisfied. NWF recommends a more narrow reference be included.

Response: The commission proposed this change in §307.6(d)(5) in order to indicate that although harmonic mean flows are used as the assumed instream flow when calculating permit limits for human health toxic criteria, the criteria are still applicable, as a long-term average, at flows below the harmonic mean flow. The commission added a sentence to this effect in §307.8(4).

Comment: NWF comments that the proposed revisions to §307.6(e)(2)(D) appear to create an unacceptable situation, such that demonstrated toxic impacts may not be addressed. The proposed language makes the requirement of a toxicity reduction evaluation (TRE) discretionary and

then goes on to state that permit amendments are dependent on the results of a TRE. The section does not appear to have any language describing what happens when acute or chronic toxicity is not precluded, but a toxicity reduction evaluation is not required.

Response: The commission agrees clarification of §307.6(e)(2)(D) is needed and adopts the modified language as follows: "If toxicity biomonitoring results indicate that a discharge is not sufficiently controlled to preclude acute or chronic toxicity as described in this subsection, then the permittee will be required to eliminate sources of toxicity and may be required to conduct a toxicity reduction evaluation (TRE) in accordance with the permitting procedures of the commission. In accordance with the implementation procedures, permits are amended to include appropriate provisions to eliminate toxicity."

Comment: TIP is concerned that language in §307.6(e)(2)(D) that refers only to a chemical-specific limit is confusing and recommends the second to last sentence in the section be revised as follows: "Where sufficient to attain and maintain applicable numeric and narrative state water quality standards, a chemical-specific limit, best management practices, or other actions designed to reduce or eliminate toxicity, rather than a total toxicity limit, may be established in the permit."

Response: The commission agrees with this clarification and changed the language as recommended.

Comment: One individual comments that the variance included in §307.6(e)(2)(E)(i) is not clear whether it refers to natural conditions or human impacts. The individual notes that issuing variances based on the latter is in opposition to the antidegradation policy.

Response: The purpose of this section is intended to describe some of the justifications that might be appropriate in the development of site-specific standards for toxicity and toxic pollutants. This type of site-specific standard requires a revision to the standards rule for it to be fully incorporated into water quality management programs.

§307.7 – Site-Specific Uses and Criteria

Comment: BRA supports changing the indicator bacteria for certain high saline inland waters from E. coli to Enterococci.

Response: The commission acknowledges this comment in support of changing the indicator bacteria for certain high saline inland waters.

Comment: LCRA questions the use of Enterococci as an indicator of pathogenic bacteria in tidally-influenced surface water because their review of the data indicates that Enterococci may not always be the appropriate indicator of pathogenic contamination in tidal streams. LCRA suggests analyzing bacteria samples in tidal streams for both Enterococci and E.coli.

Response: The commission acknowledges that during certain times tidal water bodies may exhibit levels below the thresholds where E. coli could be used. However, for consistency with monitoring and assessment purposes, Enterococcus will continue to be applied as the indicator for recreational suitability in tidal waters.

Comment: Austin, Uncertain, CLACC, EIP, Environment Texas, TCE, CW Action, GCLA, LGCLA, FCLNWR, CLI, DCPC MUD, Highland Lakes Group, Highland Lakes PAC, PLTA, Lakeway, State Senator Kirk Watson, Texas State Representative Valinda Bolton, SMRF, TCA, CEHI, Environment Texas, NWF, and Volente oppose relaxing the bacteria standard from 126 cfu/100 ml to 206 cfu/100 ml. Travis County Judge Samuel T. Biscoe comments that it is inappropriate to make this change statewide and recommends retaining the current standard on each classified and unclassified segment in Travis County. Volente is concerned that the proposed rules will allow for increased bacteria levels in some tributaries to the Highland Lakes. Senator Watson recommended that the rules be written to allow for consideration of potential impact of setting even less stringent requirements for tributaries of the Highland Lakes that risk being classified as secondary contact recreation under the proposed rules. OPIC suggests the current bacteria limits for both fresh and saltwater be maintained. Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose raising the standard to EPA's standard at this time because EPA is working under a consent order to revise their recreational water quality criteria by October, 2012. Sierra Club, Public Citizen, TBBU, SEED, and WE CAN recommend that TCEQ wait until those standards are published prior to making changes at this time to weaken the state's current standards. Sierra Club, Public Citizen, TBBU, SEED, WE CAN, and NWP also oppose the proposed higher allowable bacteria levels in the proposed secondary contact recreation 1 of 630 cfu/100 ml and noncontact recreation of 2,060 cfu/100 ml. HCPHES asks for additional information regarding relaxing the bacteria standards for contact recreation. CLACC, GCLAT, LGCLA, FCLNWR, EIP, CW Action, Uncertain, TCE, and CLI generally do not support any changes to the bacteria criteria. DCPC MUD asked why there is an across the board relaxation of bacteria criteria from 126 cfu/100 ml to 206 cfu/100 ml.

Numerous individuals objected to the redefinition of the contact recreation standards and setting weaker clean water standards by increasing the allowed levels of bacteria in water bodies used for recreation.

BRA, Fox Dairy, Hamilton County Commissioner Dickie Clary, Heifer Ranch at Arroyo Seco, HCFCD, High Plains Dairy Counsel, IBWC, ICA, Legacy Farms, Sanderson Farms, Texas State Representative Sid Miller, 74 Soil and Water Conservation Districts, the Texas Poultry Federation, Hamilton, TCFA, PCG, TSCRA, T/K, TFA, TSSWCB, TCC, TCPA, and numerous individuals filed comments in support of changing the bacteria standard from 126 cfu/100 ml to 206 cfu/100 ml. SARA comments that all reservoirs, perennial streams, and intermittent streams with pools should be classified as primary contact recreation with a standard E. coli of 206 cfu/100 ml. Other individuals filed comments supporting the proposed change because it was consistent with EPA guidance for fresh water and would not adversely affect water quality in Texas streams and rivers. HCFCD agrees with the proposed revisions to §307.7(b)(3).

Sierra Club and 9 individuals commented that a major factor in the proposed changes is a reduction in TCEQ workload. TSSWCB does not agree that these changes are being made to address workload, but to determine the appropriate use and criteria.

Response: The intention of the revisions is to better assign appropriate recreational uses and criteria to water bodies in Texas. Currently, recreational waters can have two types of recreational uses – contact and noncontact recreation. In the 1980's and 1990's, a contact recreation use was broadly presumed for all surface waters in Texas, with the exception of eight specific water bodies, e.g. ship channels. As a result of these broad optimistic presumptions, there may be numerous water bodies with inappropriate recreational uses.

The commission will thoroughly evaluate water bodies to determine if recreational activities are occurring and where recreational use may be inappropriate through a recreational UAA. A recreational UAA involves coordination with local stakeholders and landowners, data collection, and an evaluation of water recreation activities.

In response to comments, the commission adopts modified §307.7(b)(1)(A) and Appendix A that retains the freshwater primary contact recreation geometric mean criterion of 126 *E. coli* per 100 ml and modifies the freshwater primary contact recreation geometric mean criterion from 54 to 33 Enterococci per 100 ml for high saline inland water bodies.

The commission notes that the EPA has indicated that states may adopt a secondary contact recreation use and less stringent criterion (such as five times the primary contact criterion).

*Comment: TSSWCB suggests minor alterations in the factors to calculate the limits for inland fresh *E. coli*, inland salt Enterococci, inland salt (alternative) fecal coliform, and coastal salt Enterococci. Based on their calculations, it suggests the following criteria for various uses and parameters. TSSWCB also suggests establishing bacteria criteria for secondary contact recreation 2 for Enterococci in coastal marine waters in §307.7. TSSWCB's recommendations are as follows:*

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	<i>Inland fresh</i>	<i>Inland salt</i>	<i>Inland Salt</i>	<i>Coastal Salt</i>
	<i>E. coli</i>	<i>Enterococci</i>	<i>(Alt) Fecal Coliform</i>	<i>Enterococci</i>
<i>Primary Contact</i>	206	54	200	35
<i>Sec. Contact 1</i>	618	162	600	105
<i>Sec. Contact 2</i>	1,030	270	1,000	175
<i>Noncontact</i>	2,060	540	2,000	350

Response: The commission acknowledges these suggestions. The secondary contact recreation criteria for freshwater is based on EPA's November 2003 draft guidance document entitled *Implementation Guidance for Ambient Water Quality Criteria for Bacteria*, which indicates that states may adopt a secondary contact recreation use and less stringent criterion (such as five times the primary contact criterion). Different fecal coliform criteria for secondary contact recreation 1 and 2 were not proposed because fecal coliform, as an alternative indicator, is only applicable to high saline inland freshwaters for a period of two years after the adoption of the rule. The commission did not propose a secondary contact recreation 2 use for saltwater due to compliance concerns regarding the Beach Act. The commission adopts the language as proposed.

Comment: TSSWCB strongly supports the elimination of fecal coliform as an alternative instream indicator for E. coli in fresh inland waters and for Enterococcus in coastal waters. Additionally, TSSWCB strongly supports the elimination of the use of fecal coliform as an indicator for wastewater effluent discharges.

Response: The commission acknowledges these comments of support.

Comment: TSSWCB comments that certain water bodies in the Panhandle and West Texas have a natural high salt content that makes E. coli detection unreliable. Therefore, TSSWCB supports the use of Enterococcus as the applicable indicator bacteria for high saline waters. TSSWCB supports the use of fecal coliform as a temporary alternative indicator, for a two-year time frame, only until sufficient Enterococcus data are collected.

Response: The commission acknowledges the support for the use of Enterococcus as an applicable indicator bacteria for high saline inland freshwaters.

Comment: GBF comments that the relationship between E. coli and human pathogens has not been established in Houston area bayous and streams and recommends TCEQ immediately undertake research to clarify this relationship. In the future, in order to further refine the standards, WEAT suggests that TCEQ conduct studies to improve the quantitative measures of risk that should inform the criteria for specific uses. For future revisions, Harris County suggests TCEQ could consider adjusting the criteria for bacteria to better correlate with human health risk.

Response: The commission acknowledges these comments and notes that the EPA is in the process of developing new or revising bacteria criteria by October 15, 2012, that are to be based on recent epidemiological studies. The commission will re-evaluate the recreation criteria in subsequent standards revisions when the EPA's new or revised bacteria criteria become available.

Comment: TSSWCB comments that there are conflicting numbers regarding what constitutes high saline inland waters and requests TCEQ explain the disparity between the numbers.

Response: The commission will evaluate provisions in guidance documents where this discrepancy might occur.

Comment: TSSWCB comments that they do not support the unsubstantiated statement that designates Enterococcus as the recreational indicator bacteria for unclassified segments in high saline inland water bodies. TSSWCB suggests adding the following language to §307.7: "...unless specific conductance data indicate that a particular unclassified water body is not high saline."

Response: The commission revised the language as recommended.

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN object to the language in §307.7(b)(1) that would allow a classified segment to be designated for less than contact recreation on the basis that "wildlife sources of bacteria are unavoidably high." TPWD appreciates that in

§307.7(b)(1) TCEQ has made a provision in the contact recreation standards for wildlife management areas, coastal birding trail sites, and similar venues by including language, ". . .unless . . .wildlife sources of bacteria are unavoidably high and there is limited aquatic recreation potential. . ."

Response: The commission acknowledges the comments of support and opposition to the term "wildlife sources of bacteria" in §307.7(b)(1). The commission responds that there is utility in having this language in the standards that takes wildlife sources into account. The commission adopts the language as proposed.

Comment: One individual asks for an explanation of the phrase in §307.7(b)(1) regarding sources of pollution that cannot be controlled by existing regulations.

Response: The commission responds that the language in §307.7(b)(1) is not intended to relax bacteria criteria for regulatory purposes. There may be instances where there are elevated concentrations of indicator bacteria in state or international border waters from sources that are outside the jurisdiction of existing regulations in Texas.

Comment: One individual notes that the reference to the single sample criterion of E. coli in §307.7(b)(1)(A)(i) is inconsistent with the statements on page 16 of the proposal preamble that discusses attainment based on samples taken over a two-year period.

Response: The commission responds that the single sample criterion in §307.7 is provided for non-assessment purposes such as swimmer safety notification and wastewater permit compliance.

Comment: One individual asks what the interpretation of §307.7(b)(1)(A)(v) is where the unclassified segments are not characteristically high saline, but freshwater. The individual also comments that Enterococci levels for high saline inland waters and saltwater in §307.7(b)(1)(B)(i) - (iii) are not consistent and the reason for the discrepancies are not apparent. In addition, the individual asks why there is no secondary contact recreation 2 listing for saltwater.

Response: The commission responds that the intent was for *Enterococcus* to be applied as an indicator uniformly to unclassified water bodies that are within the watershed of certain high saline inland classified segments. This was done to prevent potential confusion from having two indicators within the watershed of a segment, particularly when determining when one indicator is used instead of the other for monitoring and assessment purposes. The proposed language was modified and adopted as changed to allow *E. coli* to be used on certain unclassified water bodies when it is demonstrated that they are not highly saline.

The commission responds that the freshwater and saltwater Enterococci criteria are based on EPA's recommended 1986 bacteria criteria. EPA's criteria were derived using *E. coli* and Enterococci concentrations from epidemiological studies that are roughly correlated to the estimated illness rate associated with EPA's previously recommended fecal coliform criteria. EPA estimated these illness rates to be approximately 1% of swimmers exposed in freshwater and 1.9% of swimmers exposed in marine water. EPA's recommended risk level

and geometric mean for Enterococci to protect for primary contact recreation in saltwater is 1.9% and 35 cfu/100 ml, respectively. Their recommended risk level and geometric mean for enterococci to protect for primary contact recreation in freshwater are 1% and 54 cfu/100 ml, respectively. The commission did not propose a secondary contact recreation 2 use for saltwater due to compliance concerns regarding the Beach Act.

Comment: One individual notes that §307.7(b)(1)(C)(ii) indicates that the fecal coliform criterion for both secondary contact recreation uses is 1,000 cfu/100 ml, but the E. coli criterion between these uses are 630 cfu/100 ml and 1,030 cfu/100 ml and states that this does not follow.

Response: The commission responds that different fecal coliform criteria for secondary contact recreation 1 and 2 were not proposed since fecal coliform, as an alternative indicator, is only applicable to high saline inland freshwaters for a period of two years after the adoption of the rules.

Comment: One individual noted that §307.7(b)(3) refers to "minimum" in the column heading, but "daily minima" in the footnotes, and asks if these terms are synonymous. This individual also asks if "daily minima" is the same as the "absolute minimum" mentioned in other provisions (see §307.4(h)(4)). The individual asks whether it means that the dissolved oxygen can never drop below 1.5 m/L even in a grab sample. If so, it would be helpful if this provision also referenced §307.9(e)(6). This individual also asks whether a concentration just over the minimum (e.g. 1.51 mg/L) would be acceptable for 16 hours, as long as the 24-hour mean dissolved oxygen was met.

Response: The commission responds that the term "absolute" in §307.4(h) was replaced with "24-hour" and the term "daily minima" was replaced with "24-hour minimum dissolved oxygen concentrations" in §307.7, Table 3, (footnote) for consistency purposes. The eight-hour language is only applied when a dissolved oxygen concentration remains right at the 24-hour minimum criterion. This phrase is not intended to allow dissolved oxygen concentrations to go below the daily minimum at any time. The commission adopts this language as modified from the existing rule. The commission may review these provisions at the next revision of the standards.

NOTE: There were comments that directly addressed nutrients in §307.7. However, most of the comments are in reference to §307.10, Appendix F. These comments will be included in that discussion.

Comment: Aransas County, Blackburn Carter, CBBF, NWF, TPWD, TWPP, and a number of individuals commented that the standards do not enhance the protection of seagrasses. Aransas County notes that the county contains all or part of six inland bay systems that are major tourism attractions and that the seagrass habitat must be maintained to protect the environmental integrity of the bays. Blackburn Carter noted that a version of the water quality standards that circulated in January, 2009 included language for the protection of seagrasses. Blackburn Carter notes that these provisions were removed in the proposed standards and recommends reinserting the 2009 language into the standards. Sierra Club, Public Citizen, TBBU, SEED, WE CAN, and NWF also support the previously proposed seagrass standards.

TXDOT and TSSWCB support future setting of seagrass water quality standards, but at this time, all basic uses associated with seagrass propagation have not been clarified. Therefore, TXDOT and TSSWCB support the decision to eliminate any significant revisions at this time. PCCA supports not proposing changes for seagrass at this time, but are strongly committed to addressing issues related to seagrass in the future.

Response: The commission acknowledges the interest in designating individual segments for seagrass use, and because of that interest, draft designations were presented to the Water Quality Standards Advisory Workgroup. The commission was unable to resolve substantial stakeholder concerns about unintended negative regulatory impacts of these designations on navigation in coastal waterways. Provisions that were added in the previous standards revisions, such as the specification of seagrass as a protected use in §307.7(b)(5), remain in place so that an important tier of protection is still provided. The commission will continue to coordinate with stakeholders to better monitor, assess, and protect seagrasses along the Texas coast.

Comment: TWRI recommends providing a definition of the term "natural phenomena" used in §307.7(a) because it is a general term that can be interpreted in many different ways. TWRI recommends providing a definition of the term.

Response: The commission acknowledges that a definition of the term "natural phenomena" might be useful. However, more investigation and expert opinion are needed to develop a definition of that term that is broadly applicable. At this time, the commission does not incorporate this suggestion into the adopted rules.

Comment: TACWA notes that reuse of treated effluent is increasing and that may make the use of historical data, which has worked in the past, problematic. TWCA comments that the procedure for setting chemical parameters is different from all other parameters and is inconsistent with the CWA. TACWA and TWCA recommend inserting the following language at the end of §307.7(b)(4)(a): "It is recognized that criteria developed with the objective of maintaining historical water quality may be different than criteria developed with the objective of maintaining the quality needed to support designated, attainable, and presumed uses. To facilitate that process, the TCEQ encourages the regulated community to develop use-based, site-specific criteria where appropriate."

Response: The commission acknowledges that the use of historical data to establish criteria for parameters such as TDS, chlorides, and sulfates can be problematic at specific sites. For this reason, the commission has actively developed adjustments of these site-specific criteria at individual sites, including in the proposed changes for this standards revision. The language that TWCA and TACWA suggest may be a useful consideration for these adjustments, but it should be more carefully developed over time to evaluate for future changes in the water quality standards or related procedures.

§307.8 – Application of Standards

Comment: One individual asks in §307.8(a)(1)(F) whether the aquatic recreation criteria for unclassified waters apply to classified waters above 7Q2.

Response: The aquatic recreation language was removed from §307.8(a)(1)(F) so that aquatic recreation geometric mean criterion for unclassified and classified water bodies will apply not only above critical low flows, but also below critical low flows.

Comment: T/K and TCC comment that the provision in §307.8(a)(2)(A) relating to critical low flows in spring flow dominated streams with federally listed endangered species is stated to be "0.1% probability value" of a lognormal distribution of flows for the period of record used in the calculation. T/K and TCC comment that this terminology is inconsistent with the typical interpretation of probability, which is normally expressed as a decimal fraction, rather than a percentile. T/K and TCC state that this section should be changed to express probability consistent with §307.8(a)(2)(B), which uses the 5th percentile value of the flow data. TPWD, Sierra Club, Public Citizen, TBBU, SEED, and WE CAN recommend that the critical low-flow for streams or rivers dominated by streamflows should be determined using a 0.1% probability value.

Response: The commission agrees that the terminology in §307.8(a)(2)(A) would be clearer as "0.1% percentile value" rather than "0.1% probability value," and this change is adopted as suggested. In §307.8(a)(2)(B), the commission responds that the use of a 5th percentile provides a significant degree of additional protection to springflow dominated streams and rivers that's supported by currently available information and evaluations. For some springflow dominated streams, the feasibility of establishing critical low flows below 5th percentile flows has not been demonstrated.

Comment: TPWD recommends removing the "new clause" in §307.8(a)(4) that relates to calculation of human health, TDS, chlorides, and sulfates permit limits. TPWD comments that the language appears out of place in the application of standards section, which otherwise focuses on flows below which standards do not apply. The information is already in the Implementation Procedures.

Response: The commission responds that the added language in §307.8(a)(4) is a part of several changes, including §307.6(d)(5), and are being made to clarify the applicability of human health criteria with respect to streamflow. In response to this and other comments, the language in §307.8(a)(4) was adopted as proposed to clarify the applicability of human health criteria at streamflows below the harmonic mean flow. For additional clarity and in response to the comment, the commission adds a sentence to §307.8(a)(4) to indicate that these criteria are still applicable as a long term average at flows below the harmonic mean flow.

Comment: One individual asks whether the reference to periodically recalculating flows in §307.8(a)(8) applies to increased flows due to permitted discharges.

Response: The commission responds that in practice; the flows at gauging sites are recalculated based on measured flows, including those from wastewater discharges. There are no practical means of partitioning permitted discharge flows in a complex watershed.

§307.9 – Determination of Standards Attainment

Comment: TIP supports changes made regarding representative samples in §307.9(b).

Response: The commission notes the comment and the proposed provision that addresses representative samples is adopted.

Comment: TPWD comments that a more appropriate means of chlorophyll a sampling than what is proposed in §307.9(b)(2), would be to take samples from throughout the euphotic zone or solely from the water layer with the highest dissolved oxygen concentration (during daylight hours). However, if the criteria for chlorophyll a developed for lentic water bodies were based upon near-surface water samples, then near-surface samples should be used.

Response: The commission responds that there are some advantages to obtaining a vertical composite sample of chlorophyll a within the euphotic zone. However, using this approach creates complications since varying depths would be used as individual samples and it would be difficult to implement in the field. Routine sampling would need to be conducted on vertical profiles and based on taking discrete interval measurements from top to bottom so that the integration over a prescribed layer can occur "after the fact" during data analysis. However, historical data are based on near-surface single-grab samples. Therefore, criteria based on historical data, and to a large extent assessment of those criteria in the future, are constrained to near-surface samples.

Comment: EPA comments that the use of §307.9(c)(2) confines measurement of dissolved oxygen in all water body types to a single sample taken near the surface. EPA recommends that the rule maintain some measure of specificity on the applicability of measurements taken at depth in deep water systems.

Response: The commission appreciates these comments and concurs that additional specificity may be needed for dissolved oxygen sampling depths, and additional guidance may be developed as appropriate in the *Surface Water Quality Monitoring Procedures*. In terms of data collection, the commission intends to continue measuring vertical profiles of dissolved oxygen in addition to measuring dissolved oxygen over 24-hour periods at a single depth.

*Comment: TSCRA supports the clarification of depth and temperature requirements for collection of bacteria and chlorophyll *a* samples in §307.9(c)(2).*

Response: The commission acknowledges this comment in support of the clarification of depth and temperature requirements for collection of bacteria and chlorophyll *a* samples.

Comment: A number of comments were received concerning proposed revisions in §307.9(e)(1) - (7) to define the minimum sample number minimum time period for applying data to assess standards attainment. T/K, TIP, TCC, and AECT support the proposal in §307.9(e)(1) to determine attainment for chlorides, sulfates, and TDS using sample measurements collected over a period of at least two years. TWRI comments that the inclusion of samples "collected over at least a two-year period" in §307.9(e)(3) directly contradicts TCEQ's Assessment Guidance, which states that assessments should be based on samples collected over a seven-year period. EPA commented that flexibility has to be allowed to consider shorter time frames in certain circumstances, as in the current assessment guidance. TWRI states that the provision should be changed

from a two-year to a seven-year monitoring period. BRA comments that two years of data is not enough, and that due to changing stream conditions over time, a minimum of five years of data should be required for water quality assessments. OPIC asks for additional information regarding the intended purpose and anticipated effects of the two-year time frame. TCA opposes increasing the amount of sampling prior to determining a segment as impaired. One individual notes the revised specification of a minimum sampling period in §307.9(e)(3) - (5), but expresses concern that there is not a discussion on the number of samples in these paragraphs. In §307.9(e)(3), TSSWCB requests that a minimum dataset be codified in the rules regarding how many bacteria samples are necessary to assess use attainment. TSSWCB and TDA both expressed concern that the minimum number of samples for bacteria that are needed to assess for impairment are insufficient. TDA suggests a minimum of 50-75 bacteria samples over five - seven years to evaluate whether a water body is impaired. Numerous individuals also recommended that the number of samples required to classify a water body as impaired not be increased. TCC and T/K also support the proposals in §307.9(e)(3) and (4) to determine attainment for bacteria and toxic materials. Sierra Club, SOSA, Environment Texas, Public Citizen, TBBU, SEED, and WE CAN oppose the proposal in §307.9(e)(3) to require two years of water quality sampling data to demonstrate that the geometric mean for bacteria levels violates the water quality standards. One individual comments that there are no minimum number of samples indicated for §307.9(e)(4), (5), or (7)(A). WEAT, TIP, TCC, and T/K support the proposed use of at least ten samples in determining attainment in §307.9(e)(7)(B) related to nutrient criteria. With respect to nutrient criteria in §307.9(e)(7)(B), GBF asks how the standards will be enforced if determining a violation takes five years and states that there should be a way to have immediate enforcement when obvious violations are present.

Response: The commission responds that the intent of these proposed revisions was to provide a consistent framework for minimum sample numbers and sampling period. The proposal was also intended to be compatible with current assessment procedures. In the

assessment procedures, the overall period of assessment is seven years when data are available for that period, but the minimum time frame that is considered usable for assessment is two years except in prescribed, unusual circumstances. In addition, the assessment procedures specify that a minimum of ten data points is generally required, unless a statistically significant result is clearly available from fewer data. However, because there were a large variety of comments expressing concern with these proposed revisions and additions, and because there were also concerns with clarity, the commission adopts modified proposed and existing language that removes all references to minimum sample numbers and sampling period. The requirements for numbers of samples and sampling period for assessment purposes will be addressed in the Surface Water Quality Monitoring Program's *Guidance for Assessing and Reporting Surface Water Quality in Texas*.

Comment: TPWD questions the decision in §307.9(e)(1) to base standards attainment determinations for chloride, sulfate, and TDS on median values. TCC favors the proposed approach. T/K, TIP, TCC, and AECT support the proposal in §307.9(e)(1) to determine attainment for chlorides, sulfates, and TDS using the median of sample measurements. TPWD notes that §307.10, Appendix A still appropriately refers to TDS, chloride, and sulfate values as "maximum annual averages" for the segments.

Response: The commission acknowledges that the criteria for dissolved solids were derived as the upper prediction interval around the historical mean of sampling data. Therefore, using the mean for assessing compliance is the more statistically rigorous procedure.

However, there are practical advantages for assessing compliance using a median as the measure of a central value of sampling data, in order to minimize the effects of outliers, errors, and non-detect values when the available dataset for assessment is small. In the case of

dissolved solids, the variability over time at a single sampling station is generally not extremely high; and the measured concentrations are well above detection limits and minimum quantification levels. Therefore, the practical advantages for assessing compliance using a median are not as substantial as with some of the other kinds of long-term criteria. The commission concurs that additional review is needed before making this proposed change, and in §307.9(e)(1) the mean will remain as the measure of standards attainment for dissolved solids criteria.

Comment: The Sierra Club, Public Citizen, TBBU, SEED, WE CAN, Environment Texas, and NWF oppose the proposal in §307.9(e)(3) to eliminate the consideration of a single maximum water sample showing high bacteria levels in determining whether the water quality standard for the stream has been violated. TSSWCB comments that the reasoning used by those opposed to eliminate the single sample is flawed. EPA recommends more flexibility to allow for more limited datasets to be used and recommend addressing sampling period requirements or options in the assessment procedures, rather than in the water quality standards.

Response: The commission responds that a geometric mean is more appropriate to determine water quality attainment for assessment purposes rather than single sample numbers. The commission notes that the EPA has indicated that the geometric mean is the more relevant value for ensuring that appropriate actions are taken to protect and improve water quality. Single sample numbers for primary contact recreation in freshwater and saltwater will be retained for the purposes of swimming advisory programs and wastewater permit compliance.

Comment: BRA, Fox Dairy, Hamilton County Commissioner Dickie Clary, Heifer Ranch at Arroyo Seco, High Plains Dairy Counsel, Legacy Farms, Texas State Representative Sid Miller, Hamilton, Harrison County Judge Randy Mills, ICA, Sanderson Farms, 74 Soil and Conservation Water Districts, TCFA, Texas Poultry Federation, PCG, TSCRA, TSSWCB, TFA, WEAT, and a number of individuals filed comments in favor of a high-flow exemption since it was highly unlikely that recreational activities would be occurring during high-flow conditions and that samples taken during these events should not be used for assessment purposes. WEAT suggests that TCEQ develop specific procedures to implement the high flow exclusion in §307.9.

NWF comments that the high-flow exemption, as drafted, is too broad. NWF comments that if this exemption is going to be included, what constitutes a "high-flow" needs to be defined and described in a very clear manner. TPWD recognizes the basis for a high-flow exemption, but thinks it is not well-defined. TPWD recommends that the language be revised to read: ". . . estimated flow severity index of "flood."" TSSWCB suggests that when using the estimated flow severity index, for consistency purposes, TCEQ should define this high-flow exclusion at the severity index of "flood."

CLACC, EIP, Environment Texas, Uncertain, TCE, CW Action, GCLA, LGCLA, FCLNWR, CLI, Sierra Club, Public Citizen, TBBU, SEED, WE CAN, EPA, Environment Texas, SOSA, and TCA oppose the high-flow exemption for samples because high-flow conditions are representative of the variable condition of Texas streams and rivers; and to exclude those samples render the attainment determination unrepresentative of the true conditions. EPA disagrees with the automatic exclusion of sample results. OPIC asks for additional information regarding the intended purpose

and anticipated effects of the high-flow exemption. One individual commented that low-flow situations in segments whose only source is treated wastewater also needs attention.

Response: The commission notes the comments in support and opposition to the high-flow exemption for bacteria. The commission responds that there is utility in having a high-flow exemption for bacteria at times when contact recreation activities are not practical or safe. The commission also notes that while a high-flow exemption is added, the commission also revised language in §307.8 that results in recreation criteria applying below critical low-flows when contact recreational activities are more likely to occur. The commission agrees with the recommendations to better define the estimated flow severity index. In response to the comments, the term "indicates that swimming is not practical or safe" in §307.9(e)(3)(B) was removed and the term "flood or an equivalent category" was substituted for adoption.

The adopted standards establish a reasonable and defined framework for the bacteria high-flow exemption, and further details on recommended procedures for assessing standards attainment will be provided in the Surface Water Quality Monitoring Program's *Guidance for Assessing and Reporting Surface Water Quality in Texas*.

Comment: TSSWCB comments that for consistency, instead of characterizing the high-flow exclusion as "data exclusion" under assessing attainment, it should be addressed like the low-flow exclusion (7Q2) by stating that the use/criteria do not apply under these conditions.

Response: The commission notes that uses apply under all conditions. The proposed high-flow exemption of above the 90th percentile is roughly equivalent to a 7Q2 frequency and it is more straight-forward to apply. The commission adopts the language as proposed.

Comment: TSSWCB asks for clarification in the standards or implementation procedures on how the high flow exclusion would apply to lentic systems and coastal waterbodies.

Response: The commission revised the proposed high-flow exemption language to clarify that §307.9(e)(3)(A) applies to freshwater streams and rivers only and that §307.9(e)(3)(B) applies to tidal and freshwater stream and rivers. The commission adopts the revisions as modified.

Comment: TSSWCB cautions against uniformly applying high flow values across the state. TSSWCB suggests TCEQ establish a public process to examine the statistical validity of a uniform value versus regional values based on an isopluvial map.

Response: The commission is evaluating instream flows in several programs, including water uses, and will continue to coordinate improving evaluations of both high- and low-flow levels that determine standards applicability. The language is adopted as proposed.

Comment: In regards to §307.9(e)(4), EPA recommends the use of the mean or an upper percentile value of a dataset when assessing human health criteria. TPWD questions the decision to base standards attainment determinations for human health criteria in §307.9(e)(4) on median

values. TPWD comments that the proposed new method of determining standards attainment does seem not to be statistically accurate or as protective as the current procedure. TPWD asks for an explanation regarding why this change was made. CLACC, EIP, Environment Texas, TCE, CW Action, GCLA, LGCLA, FCLNWR, CLI, Sierra Club, Uncertain, SOSA, Public Citizen, TBBU, SEED, and WE CAN also oppose the requirement in §307.9(e)(4) that standards attainment for human health criteria for toxics be based on the median rather than the average of samples.

Response: The commission concurs that means rather than medians may be more appropriate for some parameters that are assessed over a long time period. For human health criteria, there is some advantage in using a median in order to dampen the effect of non-detect measurements. However, assessing with a mean ensures that unusually high concentrations of a toxic pollutant are afforded substantial weight in the long-term calculations. For human health criteria, the long-term weighted exposure is important in assessing potential health risk. For this reason, in §307.9(e)(4) the commission deletes the proposed change to median values for assessment of human health criteria, and the assessment will continue to be based on mean values.

Comment: Sierra Club, Public Citizen, TBBU, SEED, WE CAN, PLTA, TPWD, Austin, Volente, SOSA, and NWF oppose the use of the median rather than the mean to determine impairment of nutrient criteria in §307.9(e)(7). They are concerned that the use of a median when the statistic was calculated using the mean, is not statistically valid; and the median will tend to minimize the impact of algal blooms in the assessment process. WEAT, TIP, T/K, TCC, and SRA are in general support of the use of median values to assess nutrient criteria.

Response: The commission concurs that the proposed use of the median is not strictly rigorous in terms of statistical applicability of a mean and a median, since the criteria were initially derived based on the upper prediction interval around the mean. However, assessment of chlorophyll *a* is complicated by: (1) measurements that are below detection limits or quantification levels, (2) the effect of single high value outliers in an assessment dataset, and (3) the relatively small datasets that are often available for assessment purposes. For these reasons, the procedures to assess attainment of chlorophyll *a* criteria will be based on the median of assessment samples, as proposed. The commission will continue to explore ways to improve the development and assessment of nutrient criteria in the future.

Comment: EPA, Sierra Club, Public Citizen, TBBU, SEED, and WE CAN comment that they understand the rationale for using the main pool of a reservoir for sampling, but that TCEQ needs to develop a process for addressing nutrient concerns in the arms and coves of reservoirs. NWF comments that the numerical standards applicable to the main pool must be considered in context with other parts of the reservoir, such as the arms and coves that are likely to experience higher levels of nutrient loading. CLACC, GCLAT, LGCLA, FCLNWR, EIP, CW Action, TCE, Volente, Uncertain, and CLI are also concerned how the criteria will or will not be applied to coves. TWPD comments that reservoir nutrient criteria is applicable only to the main pool stations, which react relatively slower than coves and riverine areas in showing effects of increasing nutrient concentrations. Because of this weakness in the suggested approach, very large increases in the nutrients will occur before a reservoir would be declared impaired. To protect reservoirs from eutrophication, TPWD believes a more sensitive process should be developed.

Response: The commission agrees that nutrient concerns need to be addressed in the arms and coves of reservoirs. At this time the commission has developed nutrient criteria only for main pool stations, these criteria are only applicable at the main pool due to the way in which they were derived. The commission will be addressing nutrient criteria for coves and arms of reservoirs in the future.

Comment: T/K and TCC support the proposal in §307.9(e)(8) that clarifies TCEQ policy with respect to streams that have low or no flow during significant periods of most years. Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose the proposed language that would exempt use of site-specific criteria under certain conditions.

Response: The commission responds that this change, concerning the assessment of criteria that are applied as long term averages (TDS, chlorides, sulfates, indicator bacteria, and human health toxic criteria), is intended to limit the applicability of these criteria when streamflow in perennial streams becomes negligible or when residual pools in intermittent streams shrink during very dry periods. During these periods, water quality tends to become degraded even under natural conditions. The commission notes that these provisions apply only to sampling data to assess standards attainment, and not to regulatory actions such as permitting calculations. Previously, §307.8(a)(1)(A) indicated that site-specific criteria for dissolved solids (TDS, chlorides, sulfates) did not apply at flows less than the seven-day, two-year low-flows; and §307.6(d)(5) exempted human health toxic criteria below harmonic mean stream flows. These exemptions were considered to be inadvertently applicable to streamflows that could be inappropriately high; and the commission adopts the language as proposed. Therefore, the proposed additions in §307.9(e)(8) are needed to provide clear, limited exemptions of long-term criteria during very dry conditions; and these provisions are adopted as proposed.

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose the deferment in §307.9(f) of listing a stream as impaired for a presumed high aquatic life use until a UAA is conducted. EPA comments that the proposed language for deferment of listing for presumed aquatic life use is unacceptable. EPA expects the same standards to apply to both unclassified and classified waters. EPA comments that category 5B of the state's existing Integrated Report provides adequate flexibility to address standards issues prior to development of a TMDL for a given water body.

NWF comments that the failure to assess impairments based on presumed uses is not justified and is not consistent with the CWA. At minimum, NWF states that this must be limited to situations when there is significant evidence to suggest that the presumed use may not be appropriate. NWF comments that this could be accomplished by revising language in the sentence that starts: "Instead, the listing can be deferred. . ." and making the sentence read: "Instead, if there is credible evidence indicating that the presumed use may not be appropriate, the listing can be deferred. . ."

OPIC comments that in order to prevent potential degradation of water quality during UAA preparation, the provision clarify that individual permitting decisions and permit limits will continue to be based on presumed high aquatic life use while the UAA is being conducted. TPWD comments that they do not understand the need to defer CWA, §303(d) listing of water bodies that do not attain a presumed high aquatic life use, but appreciate that this deferral was limited to a maximum of two listing cycles.

Response: The commission acknowledges the concerns that were expressed regarding the proposed temporary deferral of potential listings based on presumed high aquatic life uses (as assessed by indices of biotic integrity) and dissolved oxygen criteria. The purpose of this proposed revision is to preclude inappropriate listings of water bodies as impaired and to avoid associated regulatory actions that may be unnecessary. The intent of the commission is not to change the presumption of high aquatic life use for unclassified perennial streams. The commission will continue to conduct studies and assess site-specific aquatic life uses for unclassified water bodies whenever needed by water quality management programs. The proposed revision explicitly expresses that commitment for purposes of assessing standards attainment, and any deferral under this provision must be evaluated within four years of the initial deferral. This provision in §307.9(f) is adopted as proposed, and the commission will continue to coordinate with stakeholders to explore ways to streamline and improve assessment of aquatic life uses in Texas.

§307.10 – Appendices A – G

General Comments

Comment: OPIC comments that based on the information in the proposal, it is unable to fully evaluate each proposed site-specific change.

Response: The commission responds that detailed documentation on site-specific standards revisions have been provided upon request throughout the rulemaking process.

Appendix A – Site-specific Uses and Criteria for Classified Segments

General Comments

Comment: EPA comments that they have received UAAs or other documentation on the following segments and will initiate review in the near future: Segments 0306, 0307, 0401, 0402, 0406, 0407, 0409, 0410, 0608, 0812, 1245, 1305, 1603, 1811, 1814, and 2308. EPA notes that UAAs for the following segments are still to be submitted to EPA for review: Segments 0305, 2485, and 2491.

Response: The commission acknowledges this comment.

Comment: OPIC recommends TCEQ proceed with full TMDL studies in impaired waters under current limits, rather than relying on UAAs to determine the naturally occurring levels of dissolved oxygen and the water bodies potential to achieve a particular use.

Response: UAAs are essential to establish water quality goals for specific water bodies. In addition, some water bodies are listed based on presumed uses. A UAA indicates that the water body is not actually impaired and can be used to determine whether the actual use is due to natural conditions and not due to human induced factors. In other cases, the presumption is confirmed and the UAA serves a function of establishing an appropriate goal for a TMDL.

Comment: TSSWCB supports designating different aquatic life use categories for fish versus benthic communities on the same water body, as long as data analysis indicates those different designations are appropriate. However, TSSWCB believes that attainment should not be based on only one of these two metrics.

Response: The commission acknowledges the support of the proposed revision.

Comment: TSSWCB comments that if water bodies are included on the CWA, §303(d) list at the sub-segment level, then the water quality standards should allow for establishment of uses and criteria at the sub-segment level. TSSWCB suggests adding text that would allow for designation of site-specific uses and criteria at the assessment unit (AU) level.

Response: The commission responds that the AUs used by the Surface Water Quality Monitoring team are described in the 2008 Surface Water Quality Monitoring Program's *Guidance for Assessing and Reporting Surface Water Quality in Texas* and exist for the purpose of assessing water bodies. AUs are used to describe individual or groups of monitoring stations within a segment. Also, AUs need to be flexible in order to change when monitoring stations are no longer active or new stations are created. Some criteria (TDS, chlorides, and sulfates) are not assessed by AU, but are assessed on a segment wide basis. If water quality standards were set at the AU level, a rule revision would be necessary every time a monitoring station was discontinued or added.

Comment: TPWD notes that TCEQ uses a regionalized index of biotic integrity for the fish community, while a statewide index is used for the benthic macroinvertebrate community. TPWD questions whether the disparity between the observed aquatic life uses arises from the use of a statewide index of biotic integrity for the benthic macroinvertebrate community. TPWD urges TCEQ to prioritize development of regionalized indices of biotic integrity for benthic macroinvertebrates because doing so could help resolve apparent differences between fish and benthic macroinvertebrate community assessments.

Response: The commission responds that a statewide index of biotic integrity continues to be used by the commission for benthic macroinvertebrates because regionalized indices have not been developed to date. The commission acknowledges this comment and notes that the commission has established this as a priority and will continue to work on developing regionalized indices of biotic integrity for benthic macroinvertebrates in coordination with TPWD.

Comment: TPWD comments that the second paragraph of the introduction to Appendix A states that critical low-flows apply at or downstream of the springs providing the flows, but that "critical low-flows upstream of these springs may be considerably smaller." TPWD states that this calls into question why the area upstream would not be defined as a separate segment given a substantial hydrologic change to the system.

Response: In most of these situations, spring flow is usually associated with the upper reach of a stream. Typically the application of the spring flow systems would be overprotective of the upper reaches above the springs. In the future, the commission can consider adjusting low-flow criteria or segment boundaries on a case-by-case basis. The commission adopts the language as proposed.

Comment: PSC asks whether the standard changes would remove Segment 2311 – Upper Pecos River from the CWA, §303(d) list. If so, will the City of Pecos be able to discharge treated effluent into this segment provided they meet the discharge requirements.

Response: The proposed revisions by the commission will not change the CWA, §303(d) listing status of Segment 2311 - Upper Pecos River.

Comment: CLACC, GCLAT, LGCLA, FCLNWR, EIP, CW Action, TCE, Uncertain, and CLI comment that they support the creation of Segment 0410 – Black Cypress Bayou if it is done for the purposes of protecting water quality; and does not cause degradation of Black Cypress or Big Cypress Bayous, but suggest that the new segment be given an exceptional aquatic life use.

Response: The commission acknowledges the support of the creation of Segment 0410 – Black Cypress Bayou. The commission concurs that Segment 0410 is an "Ecologically Unique Stream Segment." However, this designation does not automatically warrant the assumption that the water body can support an exceptional aquatic life use. A UAA was performed on Segment 0410 and the results of this UAA indicate that this segment is a perennial water body that supports a high aquatic life use. In quantitative terms, the fish index of biotic integrity scores for this segment was on the high end of high. However, when considering the benthic index of biotic integrity scores the appropriate overall use was a high.

Bacteria

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose the downgrading of water quality in 293 stream segments proposed as "primary contact recreation" that would set a less stringent bacteria requirement of 206 cfu/100 ml. LCRA supports the proposal that designates all classified segments as primary contact use and recommends retaining the current contact standard for bacteria of 126 cfu/100 in classified reservoirs because reservoirs typically have lower ambient concentrations of bacteria than flowing water. Volente is concerned about the increase in acceptable level of indicator bacteria (126 cfu/100 ml to 206 cfu/100 ml) especially in classified segments, like the Highland Lakes. Lakeway recommends the criterion of 126 cfu/100 ml be maintained for the Highland Lakes. Senator Watson requested that the commission keep the current criterion (126 cfu/100 ml) for primary contact recreation in Lake Austin and Lake Travis.

Response: In response to comments, the commission adopts modified Appendix A that retains the freshwater primary contact recreation geometric mean criterion of 126 *E. coli* per 100 ml and modifies the freshwater primary contact recreation geometric mean criterion from 54 to 33 Enterococci per 100 ml for high saline inland water bodies.

Comment: BRA supports the change in indicator bacteria to Enterococci for Segment 1208 – Brazos River above Possum Kingdom Lake, Segment 1238 – Salt Fork Brazos River, and Segment 1241 – Double Mountain Fork Brazos River.

Response: The commission acknowledges the support of the proposed revisions.

Comment: IBWC agrees with the primary contact recreation designation and the proposed change of the bacteria indicator to 206 cfu/100 ml for Segments 2301-07, 2309-10, and 2313-14; in the Rio Grande Basin, the sole-source drinking water designation for Segments 2302-04, the primary contact recreation designation and the proposed change of the bacteria indicator to Enterococci and alternative indicator to fecal coliform for Segments 2310-11; and the removal of the public water supply designation from Segment 2308.

Response: The commission acknowledges the support of the proposed revisions.

Comment: IBWC comments that Segment 2301 – Rio Grande Tidal should be added to footnote 1.

Response: The commission responds that the appropriate indicator bacteria is identified in both §307.7(b)(1)(B) as well as in footnote 1 in Appendix A. While other water bodies are specifically written into these footnotes, these are water bodies that have been identified as high saline inland water bodies where fecal coliform can be used as an alternative indicator for two years after the adoption of these rules. No other marine or fresh water bodies are listed in these footnotes, because fecal coliform is no longer used as an alternate indicator for recreational purposes. The commission adopts the language as proposed.

Comment: IBWC comments that the indicator bacteria for Segment 2308 – Rio Grande below International Dam should be changed from the proposed 605 cfu/100 ml to 2,060 cfu/100 ml to reflect changes in standards for noncontact recreation proposed in the rules.

Response: The commission acknowledges that the newly adopted geometric mean criterion for noncontact recreation is 2060 cfu/100 ml. However, the definition of noncontact recreation and the way the criteria are applied have changed since the existing use and criteria were evaluated. Therefore, additional UAAs would be needed in order to support a major criterion change for this segment.

Comment: IBWC comments that the alternative indicator bacteria of fecal coliform for Segment 2310 – Lower Pecos River and Segment 2311 – Upper Pecos River should be listed beside the primary indicator bacteria (54/200).

Response: The commission responds that the criterion for the alternate fecal coliform indicator was removed from Appendix A because the commission transitioned to new indicators, *E. coli* and Enterococci, in 2000. Since fecal coliform can only be used in high saline inland water bodies for two years after the adoption of this title in order to allow time to collect sufficient data for Enterococcus, the commission did not include fecal coliform criterion in Appendix A.

Dissolved Oxygen

Comment: One individual notes that Appendix A has a dissolved oxygen criteria of 2.0 mg/L and are allowed a daily variation down to 1.5 mg/L for no more than eight hours per 24-hour period and that a dissolved oxygen criteria of 1.0 mg/L will be considered the minimum value at any time. This individual notes that this minimum appears to be in conflict with the allowable daily variation in a previous sentence in the appendix as

well as the "daily minima" listed in Table 3 in §307.7(b)(3(A)(i). This individual notes the use of the words "down to" seems to be slightly different than used elsewhere. In Appendix A, it appears to mean that a concentration of less than 2.0 mg/L lasting longer than eight hours would be a violation and asks whether that interpretation is correct.

Response: The commission responds that the term "absolute" in §307.4(h) was replaced with "24-hour" and the term "daily minima" was replaced with "24-hour minimum dissolved oxygen concentrations" in §307.7, Table 3, (footnote) for consistency purposes. The eight-hour language is only applied when a dissolved oxygen concentration remains right at the 24-hour minimum criterion and this phrase is not intended to allow dissolved oxygen concentrations to go below the daily minimum at any time. The commission adopts this language as modified from the proposed language.

Comment: NRA, TACWA, and TWCA recommend the use of the current increments for dissolved oxygen, i.e. 5.0 mg/L, 4.0 mg/L, 3.0 mg/L, etc. and do not support the proposed use of fractional increments. TSSWCB support the proposed fractional dissolved oxygen criteria.

Response: The commission agrees that it is generally appropriate to apply dissolved oxygen criteria in 1.0 mg/L increments. However, in cases where there is sufficient information, it can be reasonable to adjust criteria in half mg increments. The commission has utilized this approach in prior Texas Surface Water Quality Standards for dissolved oxygen criteria in Segment 0805 – Upper Trinity River and the Segment 0841 – Lower West Fork Trinity River. The commission adopts the language as proposed.

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose the weakening of the dissolved oxygen criteria from 5.0 mg/L to 3.0 mg/L in Segment 0211 - Little Wichita River and lowering the water quality standards for dissolved oxygen, and lowering the aquatic life designation in Segment 0833 - Clear Fork Trinity River above Lake Weatherford.

Response: The commission responds that UAAs were performed on Segment 0211 – Little Wichita River and Segment 0833 - Clear Fork Trinity River Above Lake Weatherford. The results of these UAAs indicate that Segment 0211 is a perennial water body that supports a high aquatic life use. However, the mean and minimum dissolved oxygen concentrations were extremely low during several sampling events; and did not meet the presumed corresponding dissolved oxygen criteria associated with a high aquatic life use. A recommendation of an average dissolved oxygen criterion of 3.0 mg/L and a minimum dissolved oxygen criterion of 2.0 mg/L are made in the UAA. These criteria best describe the observed data in this segment. Segment 0833 is an intermittent water body with perennial pools that supports an intermediate aquatic life use. However, the UAA demonstrates that during periods of low flow, the presumed corresponding dissolved oxygen concentration of 4.0 mg/L cannot be achieved. A recommendation for a mean dissolved oxygen value of 2.0 mg/L and an minimum of 1.0 mg/L when flow values are below 1 cubic feet per second are made in the UAA. The UAA better describes the current conditions in Segment 0833. EPA has indicated that the findings of both UAAs are appropriate and the commission adopts the changes as proposed.

Comment: NRA recommends a dissolved oxygen standard of 4.0 mg/L in Segment 2485 - Oso Bay and Segment 2491 - Laguna Madre rather than the proposed 4.5 mg/L or current standard of 5.0 mg/L. NRA notes that one of the justifications for proposing a 4.5 mg/L standard for dissolved

oxygen was due to the large data set for Segment 2491. However, NRA notes that this large data set is the result of a large data collection program over a two-year period and that the time frame may not necessarily be representative of a wide range of conditions.

Response: The commission acknowledges that a large dataset was used in the evaluation of Segment 2485 - Oso Bay and Segment 2491 - Laguna Madre; and that the majority of the data used to establish the proposed criteria was collected over a two-year period. The commission notes that data collected over a two-year period is typically used to determine site-specific conditions of waterbodies through the UAA process in accordance to *Surface Water Quality Monitoring Procedures Volume 2* (Appendix E). The minimum requirements for a UAA are five dissolved oxygen samples over a two-year period. However, this UAA uses many more data points than the minimum and an evaluation of historical data was considered as well. This UAA far exceeds the minimum requirements necessary to develop site-specific criteria. The commission adopts the language as proposed.

Comment: Sierra Club, Public Citizen, TBBU, SEED, WE CAN, TPWD, and NWF oppose lowering the current dissolved oxygen in Segment 2485 - Oso Bay and Segment 2491 - Laguna Madre and urges the adoption of a 24-hour minimum dissolved oxygen criterion of 2.0 mg/L instead of 1.5 mg/L. TPWD recommends that no changes to the dissolved oxygen criteria for either Oso Bay or the Laguna Madre until: 1) it is demonstrated that low dissolved oxygen levels are not due to pollutants, 2) it is demonstrated that the change will not have a deleterious impact on aquatic life, and 3) appropriate reference and AUs have been established.

Response: The commission acknowledges the concern that a dissolved oxygen concentration of 1.5 mg/L in Segment 2485 – Oso Bay and Segment 2495 – Laguna Madre may have adverse effects to the aquatic biota. During the course of the studies used in the determination of dissolved oxygen criteria, multiple sampling events occurred when dissolved oxygen levels were low under least impacted conditions. The commission initiated further review of the dissolved oxygen criteria for these segments. The commission concluded that, while no effects were seen in either segment during the course of the studies, the available biological data were limited. Therefore, a 2.0 mg/L minimum dissolved oxygen criteria may be more appropriate at this time.

The commission further responds that although the Laguna Madre is a fairly unique system, it shares chemical and physical parameters with Oso Bay. Both of the water bodies are very shallow, hyper saline, and support communities of seagrasses. The commission also recognizes that portions of Oso Bay are potentially impacted by anthropogenic effects. This is not generally the case for the Laguna Madre. While the Laguna Madre receives fresh water inflows from the Arroyo Colorado, which has point and nonpoint sources of pollution, over 80% of the coastline is sparsely populated, if it is populated at all. It is because of this that the Laguna Madre is one of the least impacted marine water bodies in Texas. The commission asserts that Laguna Madre is sufficiently similar to Oso Bay to be used as a reference site.

The large amount of data provided in these studies demonstrated that 98% of the 24-hour average dissolved oxygen data sets for the Laguna Madre are above 4.5 mg/L and 89% of the Oso Bay data are above 4.5 mg/L. The commission concluded that a 4.5 mg/L average

24-hour dissolved oxygen criterion and a 2.0 mg/L minimum 24-hour dissolved oxygen criterion are appropriate for both Oso Bay and Laguna Madre. The commission adopts the criteria as modified from the proposed language.

TDS, chlorides, sulfate

Comment: TPWD comments that TCEQ has proposed significant changes in the TDS, chlorides and sulfate criteria for Segment 1206, 1238-41, 1411, 1421, 1426, and 2106. TPWD is concerned that the proposed changes are to accommodate increases of TDS, chlorides, and sulfate whether from natural or human activities. If current data indicate increasing TDS, chlorides, and sulfates, TPWD would like TCEQ to identify whether the increases are anthropogenic or natural in origin because their understanding is that the purpose of these criteria is to maintain ambient conditions, and requests that TCEQ provide a rationale for these changes. TPWD does not support changing TDS, chloride, and sulfate criteria in response to anthropogenic influences. Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose lowering the water quality standards for TDS in Segment 0833 - Clear Fork Trinity River above Lake Weatherford.

Response: The commission recognizes the possibility for increased TDS, chloride, and sulfate in waterbodies due to anthropogenic effects as well as a need to maintain ambient conditions. The determination for changes in the above mentioned criteria was based on the full history of data available to the commission at the time of calculation. The secondary constituent levels are: chloride (300 mg/L); sulfate (300 mg/L); and TDS (1000 mg/L). Current federal guidance contained in the EPA document entitled *Ambient Water Quality Criteria for Chloride-1988* recommends 230 mg/L of chloride for chronic protection of freshwater aquatic life. A concentration of 230 mg/L of chloride

is protective of most aquatic invertebrate and vertebrate communities. Of the 19 segments with a proposed change to at least one of the dissolved mineral criteria, 13 are designated as a public water supply. Of these, only four segments (1411, 1421, 1426, and 1433) were proposed with one or more of the dissolved mineral criteria higher than the secondary constituent levels or chloride criteria higher than 230 mg/L. Segments 1411, 1421, and 1426 currently have dissolved minerals criteria higher than the commission's secondary constituent levels. The new dissolved minerals criteria for Segment 1433 exceed secondary drinking water quality standards and the federal chronic chloride criterion. Our evaluation indicates that there are no anthropogenic trends in the dissolved minerals criteria for Segment 1433. This reservoir receives water from Segment 1421 and Segment 1426 that are both high saline inland water bodies with criteria greater than secondary constituent levels and the federal chronic chloride criterion. The current dissolved minerals criteria for Segments 1421 and 1426 are also higher than the proposed criteria for Segment 1433. The recommended criteria changes for Segments 1413 and 1426 are based on data that incorporates a wider range of lake level and stream flow conditions, respectively. The chloride criterion for Segment 1426 currently exceeds the federal chronic chloride criterion. The commission's evaluation indicates there are no anthropogenic induced trends in the data used to calculate the criteria in these two water bodies.

Comment: Sierra Club, Public Citizen, TBBU, SEED, WE CAN, TPWD, and NWF object to the proposed lowering of water quality standards for TDS in Segments 0507, 0812, 0821, and 1227 in order to accommodate a water reuse project. OPIC asks for additional information on the effects on water quality and aquatic life from the proposed change. TPWD specifically asks that TCEQ prepare a UAA prior to approving these standards changes. TPWD asks that TCEQ provide a rationale for why certain entities must meet existing standards and bear the cost of doing so

while others may achieve lower operating costs by meeting a lesser water quality standard. TPWD further requests that TCEQ initiate policy discussions involving water quality and regional water planning stakeholders, prior to approving these standards changes.

Response: The commission recognizes the need to maintain ambient conditions for TDS, chloride, and sulfate in water bodies. However, the commission also recognizes the importance of water reuse as a viable approach for managing the state's water resources. EPA does not require a UAA to be performed when a change in criteria, such as TDS, chloride, sulfate, and pH is requested.

The proposed increases in dissolved minerals criteria for Segment 0507, Segment 0821, and Segment 1227 are due to water reuse projects. The proposed criteria change in Segment 1227 is in response to Cleburne's request that the Segment 1227's dissolved minerals criteria reflect Cleburne's projected future conditions, which includes adding water sources that have higher dissolved minerals concentrations than the current criteria for the Segment 1227. These sources include Segment 1203, which has TDS, chloride, and sulfate criterion of 1500 mg/L, 670 mg/L, and 320 mg/L, respectively. The re-evaluation of dissolved minerals criteria development for Segment 1227 is based on the assumptions that: (1) the effects of increased flow from future projected sources would be additive (rather than proportional or multiplicative); (2) that Cleburne's effluent will be virtually the entire dry-weather flow of the Nolan River at projected future conditions; and (3) a confidence level of 0.99 was used because effluent variability was very low and because the effluent samples were collected over a short time frame and was likely to underestimate the long-term variability. The criteria are the projected instream concentrations using a simple mass balance calculation to determine a prediction interval around the mean. If the calculated criterion was higher than the Segment 1203 criterion downstream, then the criterion for Segment 1203 was substituted as the criterion for that parameter. Data

obtained by the BRA on Segment 1227 was also reviewed to determine if differences in fish communities exist between Segments 1227 and 1203. The data demonstrated that similar communities exist and increases in dissolved solids in Segment 1227 would not cause a negative impact.

The proposed criteria change in Segment 0821 is in response to a request from the North Texas MWD and are to account for the high saline inland water it receives from the Red River Basin as a result of a North Texas MWD permitted inter-basin transfer. The recommended criteria for Segment 0821 were established to be equivalent to dissolved minerals criteria in downstream Segments 0820 and 0819. The proposed criteria are well below the secondary constituent levels of 300 mg/L for chloride and sulfate and 1000 mg/L for TDS.

The proposed criteria changes to Segment 0507 are in response to a request from the SRA that the dissolved minerals criteria be increased in anticipation of a water reuse project in Segment 0507's watershed. The Lake Tawakoni Recycled Water Study, which was initiated by SRA and the City of Dallas, evaluated the feasibility of increasing the overall raw water supply in the Upper Sabine Basin by delivery of highly treated water. The proposed criteria are based on data provided by SRA in a February 22, 2008, Alan Plummer and Associates, Inc. technical memorandum with subject "Request to increase Segment 0507 Texas Surface Water Quality Standards criteria for Total Dissolved Solids, Chloride and Sulfate."

The proposed criteria change in Segment 0812 was not in response to a reuse project. The criteria were based on the full history of data available to the commission at the time of calculation and the evaluation indicates there are no anthropogenic induced trends in the criteria in this water body. These changes were discussed during the January 2009 Standards Workgroup Meeting, but the commission may look into further avenues for public participation in future dissolved minerals changes. No other entities have requested further examination of site-specific dissolved solids criteria, but considerations to those requests would be evaluated on a case-by-case basis.

Comment: North Texas MWD supports the proposed changes to the criteria for chlorides, sulfates, and TDS for Segment 0821 - Lavon Lake. Cleburne supports the proposed changes to the criteria for chlorides, sulfates, and TDS for Segment 1227 - Nolan River. BRA supports the proposed changes to the criteria for chlorides, sulfates, and TDS for Segment 1238 - Salt Fork Brazos River, Segment 1240 – White River Lake, and Segment 1241 - Double Mountain Fork Brazos River.

Response: The commission acknowledges the support of the proposed revisions.

Comment: White River MWD comments that the proposed TDS standard of 780 mg/L in Segment 1239 - White River does not reflect actual conditions based on the data they have reviewed. White River MWD comments that the natural hydrology of the watershed has changed significantly over the last decade, and as such, the adopted standards need to reflect those changed conditions.

Response: The commission developed this criterion using available data, primarily from the upstream reservoir, which is an approach that is sometimes used to develop TDS criteria and is a reasonable approach. However, this additional information indicates that this approach may be incorrect in this instance. Therefore, the commission withdraws this proposal at this time and the existing language in the current rules will remain in place.

Comment: NRA would like to see consideration of site specific conversion factors for specific conductance of TDS in Segment 2106. NRA notes that analysis has shown that the overall ratio of TDS for Segment 2106 is 0.58, rather than the state-wide conversion factor of 0.65.

Response: The commission clarified in the footnote that a site specific conversion factor for TDS of 0.58 was used in the calculation of the proposed standards change for Segment 2106 - Nueces/Lower Frio River. The commission adopts the footnote as modified.

Uses

Comment: LCRA comments that Segment 1431, Mid Pecan Bayou, is the only classified water body in the state without an aquatic life use. LCRA recommends that TCEQ conduct the appropriate studies to designate the aquatic life use for this segment.

Response: The commission plans to begin a UAA on Segment 1431 - Mid Pecan Bayou the summer of 2010. The results are anticipated to be completed for consideration in the next triennial revision of the Texas Surface Water Quality Standards.

Comment: UTRWD suggests a Limited Aquatic Life Use for Segment 0305 - North Sulphur River is more appropriate than the proposed Intermediate Aquatic Life Use. Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose the reclassification of Segment 0305 - North Sulphur River from "high" aquatic life use to "intermediate" aquatic life use for the fish community and "limited aquatic life use" for the benthic community. TPWD questions the UAA conclusion on this segment that it is not feasible to restore the river's habitat to a point where it will support a high aquatic life use for fish and benthic communities, thus warranting a revision of the aquatic life use. TPWD requests that prior to lowering the aquatic life use, TCEQ conduct an analysis of the feasibility of restoring the river.

Response: The commission responds that the data available supported intermediate and limited aquatic life uses for the fish and benthic communities, respectively. A separate feasibility analysis of restoring the North Sulphur River is outside the requirements of a UAA. The commission considered the following factors from EPA's regulation 40 Code of Federal Regulations §131.10 (g)(4), relevant: "Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use." Specifically, the North Sulphur River was channelized to alleviate flooding in the watershed and the widths and depths of the river before and after channelization became severely enlarged after channelization. The commission adopts the language as proposed.

Comment: TPWD supports the proposed high aquatic life designation for Segment 0406 - James' Bayou, Segment 0407 - Black Bayou, and Segment 0410 - Black Cypress Bayou.

Response: The commission acknowledges the support of the proposed revisions.

Comment: TPWD, Uncertain, CLACC, GCLAT, LGCLA, FCLNWR, EIP, CW Action, TCE, and CLI oppose the use of a regression equation in Segment 0406 - James' Bayou, Segment 0407 - Black Bayou, Segment 0410 - Black Cypress Bayou, and Segment 0409 – Little Cypress Bayou. They specifically oppose the possibility of dissolved oxygen levels set at 1.5 mg/L during certain conditions, as well as several particular comments on the regression equation itself.

TPWD has concerns about implementation of the proposed dissolved oxygen criteria for streams in the Cypress Creek basin. Based on their review of the UAA for the Cypress Creek Basin, TPWD recommends, at a minimum, revising mean dissolved oxygen criteria in Appendices A and D to a value that reflects realistic flow frequencies in the water bodies, rather than providing the impression that 5.0 mg/L is the criterion most of the time. Secondly, TPWD recommends reassessing the minimum dissolved oxygen criterion and consider whether a fixed interval tied to the mean dissolved oxygen equation is appropriate. TPWD is concerned that extremely low minimum dissolved oxygen levels may not be protective of aquatic life and requests that TCEQ provide additional analysis of the frequency of minimum dissolved oxygen patterns. Thirdly, TPWD recommends conducting further statistical analysis to evaluate whether it is appropriate to aggregate data from all the water bodies together for constructing the dissolved oxygen equation, particularly when several are classified segments with somewhat different dissolved oxygen and watershed dynamics. Finally, it recommends explaining the discrepancy between the equations listed in the implementation procedures and Appendix A of the standards. The first term is variously listed as 12.11 or 12.61.

Response: The commission acknowledges that current values listed in Appendices A and D for the Cypress Creek Basin streams that use the Black Cypress Bayou regression equation may be misleading. However, the commission also contends that listing a value that reflects realistic flow frequencies can also be misleading. The commission changed the values in Appendices A and D to read ≤ 5.0 mg/L. This will avoid confusion as well as more accurately depict what the range of values could be, rather than list a single value that may only occur during certain periods of time. Due to the multiple comments received regarding the minimum dissolved oxygen set by this equation, further review of the minimum dissolved oxygen criteria was conducted. As a result of this analysis, the commission determined that a minimum of 1.0 mg/L dissolved oxygen would be more appropriate than the possible 0.5 mg/L dissolved oxygen value that would result during low flow conditions. The commission also incorporates a 0.5 mg/L factor to determine the minimum dissolved oxygen when the average dissolved oxygen criterion is set at or below 2.0 mg/L. The data used to develop the Black Cypress Bayou regression equation utilized only data from the Black Cypress Bayou. Data from the other streams listed in the *Use-Attainability Analysis (UAA) for Selected Streams in the Cypress Creek Basin* were used to validate that the Black Cypress Bayou regression equation could accurately describe the conditions found in these other water bodies. The language is adopted as modified from the proposed language.

The commission notes the discrepancy between the equations listed in *Procedures to Implement the Texas Surface Water Quality Standards* and Appendix A; however, the equation in the *Procedures to Implement the Texas Surface Water Quality Standards* is based on the WQS and is adjusted to provide additional protection when applied in models at steady state flow conditions. The language is adopted as proposed.

The Black Cypress Bayou UAA describes Black Cypress Bayou as a least-impacted watershed within the South Central Plains Ecoregion of Texas. Because of this conclusion, the primary cause of low dissolved oxygen levels was determined to be natural variations. Data were collected in accordance with the Surface Water Quality Monitoring Procedures that specify that data be collected between March and October to capture the low-flow conditions of streams. Although the data were collected over two years of varying flow conditions, this system experiences wide fluctuations and flow regimes. The inclusion of watershed size as a variable in the equation was preferred over bed slope due to the fact that it was less subjective and it helps describe the flow regime of the streams that the equation is being applied to. The equation does not directly take tree canopy into consideration in the equation because it is also a subjective variable. Flow data were collected using United States Geological Survey gauge stations, which is an acceptable practice in UAA studies. Black Cypress Bayou was determined in the UAA to support a high aquatic life use and 5.0 mg/L dissolved oxygen is protective of a high aquatic life use. The inclusion of lower dissolved oxygen levels was also determined to be protective of a high aquatic life use in this study because multiple sampling events occurred when dissolved oxygen levels were low with no observed effects on the fish and benthic communities. The regression equation proposed in the standards was based on an equation that was approved by EPA for use in East Texas. Currently, all dissolved oxygen criteria that are developed by a UAA use 24-hour dissolved oxygen data and can be assessed using grab sample data. These changes were discussed during the January 2009 Standards Workgroup Meeting, but the commission may look into further avenues for public participation in future dissolved oxygen and aquatic life use changes. The commission adopts language as modified from the proposed language.

Comment: PHA requests that Segment 2436 – Barbours Cut Channel be changed to the Navigational/Industrial Water Source category. PHA notes that this segment is part of the Houston Ship Channel and that public access is restricted and is regulated by the Department of Homeland Security and the United States Coast Guard under 33 CFR Part 165. PHA is concerned that listing Segment 2436 as a primary contact recreation water body may inappropriately reflect the allowed uses of these waters.

Response: The commission responds that to remove the contact recreational use of Segment 2436 - Barbours Cut Channel would require a UAA. The commission may evaluate the designated recreational use for Segment 2436 for the next triennial revision.

pH

Comment: CLACC, GCLAT, LGCLA, FCLNWR, EIP, CW Action, TCE, Uncertain, and CLI oppose the pH changes to Segments 0401-02, 0406-07, and 0410. OPIC requests TCEQ provide the scientific basis for its recommended pH changes to these segments.

Response: The commission proposed changes to pH criteria for five segments in the Cypress Creek Basin based on the full history of data available to the commission at the time of calculation. The evaluation indicates there are no obvious trends in the data used in the determination of these criteria. From the available data, the proposed criteria better describe the natural conditions observed in these water bodies. The commission adopts the language as proposed.

Temperature

Comment: The Edwards Aquifer Authority commented that they had collected and analyzed data on temperature in Segment 1811 - Comal River and Segment 1814 - Upper San Marcos River and they support the proposed change of the temperature criteria to 78 degrees Fahrenheit in certain portions of those streams. They concur that the change will provide additional protection to federally listed endangered species within those segments. SAWS is concerned about the focus on temperature criteria in Segment 1811 - Comal River and Segment 1814 - Upper San Marcos River. In SAWS opinion, this focus distracts from other water quality threats in these segments and their aquatic life. SAWS comments that time, effort, and financial resources would be better directed towards addressing these other water quality threats, rather than towards addressing a possible lower temperature standard that is based on a single study in a controlled laboratory setting. SMRF comments that they appreciate the improvement in the temperature standard proposed for the San Marcos River, but note that 72 degrees Fahrenheit is normal water temperature and habitat condition for this segment of the river.

Response: The commission acknowledges SAWS concerns and responds that the proposed maximum temperature criteria in Segments 1811 and 1814 are intended to be protective of federally endangered or threatened aquatic or aquatic dependent species. The temperature changes are based on available literature and data collected on these two water bodies by different entities, including BLOWEST, Inc., TPWD, and TCEQ. The commission notes that the data available indicate that the upper portions of Segments 1811 and 1814, due to direct spring influence, have temperatures lower than the existing maximum temperature criteria of 90 degrees Fahrenheit and 80

degrees Fahrenheit, respectively, and that the proposed revision is appropriate at this time. The commission adopts the maximum temperature criteria as proposed.

Appendix B – Sole-source Surface Drinking Water Supplies

Comment: IBWC concurs with the designations of Segments 2302, 2303, and 2304 and the removal of Segment 2308 in the Rio Grande Basin as sole-source drinking water supplies.

Response: The commission notes this comment in support of the designations of Segments 2302, 2303, and 2304 as sole-source drinking water supplies and the removal of the public water supply use for Segment 2308 in the Rio Grande Basin.

Comment: EPA supports the designation of sole-source drinking water supplies to specific water bodies. However, EPA asks what the process is for making revisions and notes if TCEQ does not plan to conduct interim standards revisions to incorporate changes, it may be appropriate to revise the language in Appendix B to state: "Where a water body has been identified as a sole-source drinking water supply, but is not included in Appendix B yet, the same level of protection may be applied."

Response: The commission notes this comment in support of the designation of sole-source surface drinking water supplies to specific water bodies. The commission edited the first paragraph by removing the sentence: "However, it is subject to amendment at any time."

and replacing it with: "Where a water body has been identified as a sole-source surface drinking water supply, but is not included in this appendix yet, the same level of protection may be applied." The commission adopts the language as modified.

Comment: EPA asks whether the change to Segment 1801 – Guadalupe River Tidal in Appendix B refers to the Guadalupe-Blanco River Authority's diversion near Tivoli for municipal drinking water to the City of Port Lavaca and other cities. If so, EPA asks whether a public water supply use for this segment be designated in Appendix A of this section. EPA also notes that 1801 is in parentheses, indicating only an unclassified segment is being designated. However, EPA states that the segment descriptions in Appendix C of this section do not appear to include any unclassified portions of segments in this area.

Response: The commission responds that the sole-source surface drinking water supply is a terminal reservoir in close proximity to Segments 1801 and 1802. The commission corrected this entry in Appendix B by replacing "Guadalupe River" with "Terminal Reservoir" and replacing Segment "(1801)" with "(1802)," since water is obtained from Segment 1802, which is a designated public water supply use. The commission adopts the language as modified.

Appendix C – Segment Descriptions

Comment: EPA comments that the upper boundary for Segment 1305 – Caney Creek above Tidal is proposed to be changed to the confluence with Water Hole Creek. EPA believes this location is in Matagorda County, rather than Wharton County where the current upper boundary is found.

Response: The commission concurs that the county name for the upper boundary is incorrect and changed it to Matagorda County. The commission adopts the language as modified.

Appendix D – Site-specific Uses and Criteria for Unclassified Water Bodies

Comment: EPA comments that they will provide separate reviews of UAAs for the following water bodies: Dixon Creek (0101), Harrison Bayou (0401), Flag Lake Drainage Canal (1111), North Fork Rocky Creek (1217), Lavaca River (1602), and Camp Meeting Creek (1806).

Response: The commission notes this comment.

Comment: TPWD comments that TCEQ has proposed downgrading the aquatic life use from high to intermediate (dissolved oxygen 4.0 mg/L) in White Oak Creek (0303). Based on their review of the available biological data, TPWD does not support the proposed change. TPWD requests that the aquatic life use remain high with average and minimum dissolved oxygen criteria of 5.0 mg/L and 3.0 mg/L, respectively, until it is demonstrated that low dissolved oxygen levels are not due to pollutants.

Response: A UAA was conducted on White Oak Creek, an unclassified water body within the watershed of Segment 0303, in 2001 and 2002. While the commission recognizes the importance of the use of unimpacted water bodies to establish water quality standards, very

few water bodies in Texas are unimpacted by point and nonpoint sources. Three routine monitoring stations were used in the study in an effort to evaluate variability in the stream as a whole. The data collected at all three stations were uniform in nature, which indicates that while both point and nonpoint sources exist, no significant impacts appear to be adversely affecting one portion of the stream over another. EPA has reviewed the UAA and agreed with the study findings in a letter dated November 2, 2009.

The coefficient of variation (CV) is not applied to index of biotic integrity results in order to set standards. Instead, the CV is utilized during the §305(b) assessment. If the CV were applied while setting the standard and during the assessment process, the index of biotic integrity would be skewed to only the upper range of variation one would expect to see in aquatic biological systems. The CV should only be applied once, and it has been the policy of the commission to apply the CV during the §305(b) assessment.

Comment: Uncertain, CLACC, GCLAT, LGCLA, FCLNWR, EIP, CW Action, TCE, and CLI oppose lowering the water quality standards for Harrison Bayou (0401). TPWD supports the proposed high aquatic life designation for Harrison Bayou.

Response: The commission responds that the due to multiple comments received regarding the minimum dissolved oxygen set by this equation, further review of the minimum dissolved oxygen criteria was conducted. As a result of this analysis, the commission determined that a minimum of 1.0 mg/L dissolved oxygen would be more appropriate than the possible 0.5 mg/L dissolved oxygen value that would result during low-flow conditions; and modified the footnote to use a 0.5 mg/L factor to determine the minimum dissolved oxygen when the average dissolved oxygen criteria is set at or below 2.0 mg/L.

The Black Cypress Bayou UAA describes Black Cypress Bayou as a least-impacted watershed within the South Central Plains Ecoregion of Texas. Because of this conclusion, the primary cause of low dissolved oxygen levels was determined to be natural variations. Data were collected in accordance with the Surface Water Quality Monitoring Procedures, which specifies that data be collected between March and October to capture the low-flow conditions of streams. Although the data were collected over two years of varying flow conditions, this system experiences wide fluctuations and flow regimes. The inclusion of watershed size as a variable in the equation was preferred over bed slope due to the fact that it was less subjective and it helps describe the flow regime of the streams that the equation is being applied to. The equation does not directly take tree canopy into consideration in the equation because it is also a subjective variable. Flow data were collected using United States Geological Survey gauge stations, which is an acceptable practice in UAA studies. Black Cypress Bayou was determined in the UAA to support a high aquatic life use and 5.0 mg/L dissolved oxygen is protective of a high aquatic life use. The inclusion of lower dissolved oxygen levels was also determined to be protective of a high aquatic life use in this study because multiple sampling events occurred when dissolved oxygen levels were low with no observed effects on the fish and benthic communities. The regression equation proposed in the standards was based on an equation that was approved by EPA for use in East Texas. Currently, all dissolved oxygen criteria that are developed by a UAA use 24-hour dissolved oxygen data and can be assessed using grab sample data. These changes to the dissolved oxygen criteria for Segment 0401 were discussed during the January 2009 Standards Workgroup Meeting, but the commission may look into further avenues for public participation in future dissolved minerals changes. The commission adopts language as modified from the proposed language.

Comment: Uncertain, CLACC, GCLAT, LGCLA, FCLNWR, EIP, CW Action, TCE, and CLI oppose lowering the water quality standards for Meddlin Creek (0403).

Response: A receiving water assessment was conducted on Meddlin Creek in 2002 and found the stream to be perennial and supporting a high aquatic life use. Therefore, Meddlin Creek is listed in Appendix D as perennial, supporting a high aquatic life use, and having an average dissolved oxygen concentration of 5.0 mg/L. No criteria for the stream have been lowered from the presumed aquatic life uses for a perennial stream as described in §307.4(h)(3). No additional data was provided to demonstrate that this water body supports an exceptional aquatic life use, but this use can be revisited during a future revision if the commission receives additional information.

Comment: EPA comments that a high aquatic life use is proposed for Spring Branch (0801). EPA notes that a UAA completed in 1999 recommended an intermediate aquatic life use and described it as a shorter stream and suggests TCEQ may want to verify the boundaries.

Response: According to findings during a 2008 receiving water assessment for Spring Branch, the water body is better described as supporting a high aquatic life use with corresponding 5.0 mg/L average dissolved oxygen concentration. The boundaries were verified, and the commission does not recommend any changes to the reach description. The commission adopts the language as proposed.

Comment: Based on their review of data, TPWD is concerned about the current criteria for Pilot Grove Creek (0821) of low aquatic life use and 3.0 mg/L average dissolved oxygen. TPWD recommends that TCEQ conduct a re-evaluation of the aquatic life use and dissolved oxygen criteria.

Response: Revisions to the Appendix D entry for Pilot Grove were needed in order to clarify the description of the reach. The commission agrees that sampling methodology for biological communities has improved over recent years. However, at this time no other evaluation of this stream in the form of a receiving water assessment or UAA has been performed. The comment requesting the stream's re-evaluation is noted and may be considered by the Water Quality Standards Group of the Water Quality Planning Division and the Standards Implementation Team of the Water Quality Division for the next triennial revision.

Comment: HCFCD notes that some of the channelized ditches and streams in Harris County have perennial flow only because of effluent discharges. HCFCD believes the dissolved oxygen criterion in these channels should not be expected to support the same aquatic life use as natural streams. HCFCD comments that the more appropriate aquatic life use category for these manmade segments is "minimal" and not "intermediate" or "limited."

Response: Aquatic life use designations were assigned to HCFCD ditches based on a UAA conducted in 1999. Five streams with existing receiving water assessments were chosen to represent perennial, channelized streams and two concreted bayous were chosen to represent concrete-lined channels. These sites were also compared to least disturbed reference sites in the West Gulf Plain Ecoregion.

Many of the perennial ditches in Harris County are classified as such due to combined effluent flow from multiple upstream dischargers. These streams are presumed to support a high aquatic life use even though they are artificially perennial. Due to alteration of the stream

bed and removal of habitat, these ditches do not support the same type of aquatic life use (intolerant species, diversity, and evenness) as the least disturbed reference sites. A comparison of Harris County ditch sites both upstream and downstream of impacted sites shows that aquatic life uses are similar.

Not all flood control ditches in Harris County can be allowed to re-establish stream-side vegetation due to the increased chance of flooding. However, those that were left unmaintained do attain a higher aquatic life use. The finding of the UAA recommended assigning aquatic life use categories based on the degree of ditch modifications. Channelized and concrete-lined ditches and channelized and maintained (no riparian or instream cover) ditches were determined to support a limited aquatic life use. Ditches that were channelized, but not maintained (riparian vegetation recovered to early successional trees) were determined to support an intermediate aquatic life use. Therefore, the commission adopts the language as proposed.

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN are concerned about whether the designation of limited aquatic life use and corresponding dissolved oxygen criteria of 4.0 mg/L for various concrete lined ditches and streams in Harris County will negatively impact intermediate aquatic life ditches and streams that receive flow from limited aquatic life ditches and streams.

Response: The commission's water quality management program has a framework to address protection of downstream water quality standards that are more stringent than upstream. This is a common occurrence with other kinds of criteria, such as those for toxic

pollutants. Under this approach, in permits and TMDLs, pollutant sources are evaluated and controlled so that different standards in affected water bodies are attained.

Comment: GBF notes that Appendix D has 50 additions of HCFCD concrete-lined ditches and streams for aquatic life uses and dissolved oxygen.

GBF notes that this could cause review of these ditches and streams for nutrients if standard attainment for dissolved oxygen is not met.

Response: The commission acknowledges the concern that the addition of these ditches could cause the review of these water bodies for nutrients if dissolved oxygen is not met. In one recent study, the commission recognized the relationship between dissolved oxygen impairment and nutrient enrichment; and addressed it in a TMDL. The language is adopted as proposed.

Comment: EPA comments that TCEQ may wish to review the previously completed UAA for Dry Creek (1009) in Harris County. The upper boundary for the portion assigned a limited aquatic life use is proposed to change to HCFCD ditch K-145-05-00, 0.29 km upstream of Spring Cypress Road. In the UAA, this ditch appears to be several kilometers upstream from that stream.

Response: The location of Harris County Flood Control District ditch K-145-05-00 was verified by the Standards Implementation Team of the Water Quality Division. The commission adopts language as proposed.

Comment: BRA comments that they have collected information on a number of unclassified segments that are not included in Appendix D. Based on their review of the data, BRA recommends the following unclassified streams be included in Appendix D: Cedar Creek (1209), Middle Yegua Creek upstream and downstream of the confluence of Cross Creek (1212), Trimmier Creek (1216), Reese Creek (1217), South Rocky Creek (1217), and Deadman Creek downstream from the City of Abilene Waste Water Treatment Plant discharge point (1232).

Response: The commission has not had time to evaluate this recent data; and will evaluate it and gather more information, as needed. The commission notes this comment and may consider the inclusion of these streams in future triennial revisions.

Comment: BRA contends that according to data they have collected, Wickson Creek (1209) is an intermittent stream with perennial pools rather than a perennial stream.

Response: The commission is proposing no change to the Appendix D entry for Wickson Creek. At this time, no other evaluation of this stream in the form of a receiving water assessment or UAA has been performed. The commission has not had time to evaluate this recent data; and will evaluate it and gather more information, as needed. The comment requesting the stream's re-evaluation is noted and may be considered by the Water Quality Standards Group of the Water Quality Planning Division and the Standards Implementation Team of the Water Quality Division for the next triennial revision.

Comment: BRA contends that according to available data, Pecan Creek (1221) is an intermittent stream with perennial pools rather than a perennial stream. Because it is proposed as a perennial stream, BRA comments that the aquatic life use and dissolved oxygen criteria assigned are too high and the stream should be assigned a limited aquatic life use with a dissolved oxygen criteria of 3.0 mg/L.

Response: The commission is proposing no change to the Appendix D entry for Pecan Creek. At this time, no other evaluation of this stream in the form of a receiving water assessment or UAA has been performed. The commission has not had time to evaluate this recent data; and will evaluate it and gather more information, as needed. The comment requesting the stream's re-evaluation is noted and may be considered by the Water Quality Standards Group of the Water Quality Planning Division and the Standards Implementation Team of the Water Quality Division for the next triennial revision.

Comment: BRA contends that according to available data, Berry Creek (1248) is an intermittent stream with perennial pools rather than a perennial stream. Because it is proposed as a perennial stream, BRA comments that the aquatic life use and dissolved oxygen criteria assigned are too high and the stream should be assigned a limited aquatic life use with a dissolved oxygen criteria of 3.0 mg/L.

Response: At this time, no other evaluation of this stream in the form of a receiving water assessment or UAA has been performed. The commission has not had time to evaluate this more recent data; and will evaluate it and gather more information, as needed. The comment requesting the stream's re-evaluation is noted and may be considered by the Water Quality Standards Group of the Water Quality Planning Division and the Standards Implementation Team of the Water Quality Division for the next triennial revision.

Comment: Travis County Judge Samuel T. Biscoe files comment in support of the exceptional aquatic life use proposed for tributaries of Colorado River (1428) which include Dry Creek, Gilleland Creek, and Harris Branch.

Response: The commission notes this comment in support of site-specific criteria for unclassified tributaries of Segment 1428.

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN support the designation of exceptional aquatic life use and corresponding dissolved oxygen criteria of 6.0 mg/L for the portion of Dry Creek (1428). Austin comments that the exceptional aquatic life designation should include some form of documentation or technical support.

Response: Flow status is based on field observations and geology. Two receiving water assessment reaches were chosen to characterize this stream because: (1) the stream is braided, (2) it crosses the level 4 Ecoregion, and (3) it crosses several members of Pleistocene era terrace deposits of the Colorado River. The receiving water assessment locations chosen were the Pearce Lane and Wolf Road crossings.

Flow in Dry Creek was observed by staff at several locations on August 5, 2005 after an extended dry hot period. Backpack electrofishing and seine sampling from the Pearce Lane receiving water assessment resulted in 21 different species and 255 individuals despite difficult sampling conditions for both techniques. The region 32 index of biotic integrity score resulting from the data was 49, which correspond to an exceptional aquatic life use for this location.

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose the proposed change for the Lavaca River (1602) in Lavaca County that would decrease the dissolved oxygen criteria from 4.0 mg/L to 2.0 mg/L as a 24-hour average and 1.0 mg/L as a minimum from March 15th through October 15th. TPWD comments that in the Lavaca River, TCEQ took the unusual step of assigning a high aquatic life use, while setting seasonal dissolved oxygen criteria (2.0 mg/L average and 1.0 mg/L minimum) for the period March 15th through October 15th. TPWD concurs that the upper Lavaca River warrants a high aquatic life use and does not object to seasonal dissolved oxygen criteria. However, their review of data in the UAA suggests that the existing dissolved oxygen criteria can be met during the spring and fall. Therefore, the lower dissolved oxygen criteria should only apply for the period July through September, rather than through the entire index period. TPWD recommends that the seasonal dissolved oxygen criteria, 2.0 mg/L average and 1.0 mg/L minimum, be revised to apply from July 1st through September 30th.

Response: Dissolved oxygen concentrations are often influenced by the amount of flow present in the water body. A UAA conducted on the Lavaca River (Segment 1602) in 2005 and 2006 shows a positive relationship between flow and dissolved oxygen concentrations. Table 7 in the final use-attainability report demonstrates that when flows dropped in the early spring the dissolved oxygen also drops, and flows during the study did not begin to increase until early fall. Therefore, the commission adopts the proposed seasonal dissolved oxygen criteria of 2.0 mg/L as a 24-hour average and 1.0 mg/L as a 24-hour minimum apply from March 15th to October 15th.

Comment: SARA comments that the data collected seems to indicate that the dissolved oxygen content with limited aquatic life use for Salado Creek (1910) should be 3.0 mg/L rather than 4.0 mg/L.

Response: A UAA was conducted on Salado Creek (Segment 1910) in 2001-2002. All stations used in this study, including Station 12877, were considered to be representative of each flow regime type of Salado Creek. Data collected demonstrated that an intermediate aquatic life use with corresponding 24-hour average dissolved oxygen criteria of 4.0 mg/L is appropriate for this portion of Salado Creek. The commission would need additional biological, physical, and chemical data in order to alter the commission's current recommended aquatic life use and dissolved oxygen criteria as they are currently listed in Appendix D. The commission adopts the language as proposed.

Appendix E – Site-specific Toxic Criteria

Comment: TPWD comments that they have long had concerns about the site-specific standards for selenium under consideration for Dixon Creek (101) in Hutchison County. Therefore, TPWD supports TCEQ's decision to revoke these site-specific standards.

Response: The commission notes this comment related to the removal of the site-specific selenium standard for Dixon Creek.

Comment: EPA comments that the site-specific criteria for lead in Big Cypress Creek (0404) may not represent the dissolved fraction of the metal. EPA believes that these criteria have not been revised since its original adoption in 1995 and additional review may be needed as some of the newer toxicity tests may have measured the dissolved lead portion.

Response: The commission has not proposed changes to this portion of Appendix E. The comment is noted and may be re-evaluated during the next triennial revision.

Comment: EPA comments that the description of Buck Creek (0604) seems to represent a considerably longer reach than would be implemented as a mixing zone. EPA believes the confluence of Buck Creek and Segment 0604 is over ten miles from the point of discharge and recommend revising the site description.

Response: The Angelina and Neches River Authority describes Buck Creek as intermittent with pools above the unnamed tributary that receives the discharge from Lufkin Industries. Therefore, no mixing zone is allowed in Buck Creek, and during normal low-flow conditions the effluent from the discharger makes up all of the flow in Buck Creek downstream of Lufkin Industries' discharge point. In similar situations, the EPA has allowed the water-effect ratio study results to apply from the point of discharge downstream to the first perennial water body. However, the commission recognizes that this leads to an unusually long reach. The commission modified and adopted the language placing the lower boundary of the reach at the confluence of Buck Creek with Clayton Creek in Angelina County.

NOTE: There were comments that directly addressed nutrients in §307.7. However, most of the comments are in reference to §307.10 Appendix F and are addressed in this section.

Comment: Sierra Club, Public Citizen, TBBU, SEED, WE CAN, PLTA, NWF, TPWD, and TCA support the adoption of numerical nutrient standards; however, they are concerned about the methodology used to set the numerical standards. TCA is also concerned about the water bodies in the state that will still have no numerical nutrient standards. Sierra Club, Public Citizen, TBBU, SEED, WE CAN, and PLTA urge the TCEQ to move forward with numeric nutrient criteria for rivers and streams in the next triennial revision. OPIC recommends TCEQ take note of a recent proposal by EPA to regulate nutrients in Florida and consider it a model for Texas.

WEAT and Harris County comment that the proposed revisions mark the completion of an important step. In the future revisions to the standards, Harris County suggests the TCEQ consider establishing more sensitive measures of nutrient impairment in lakes and impoundments. TACWA, TDA, and PHA appreciate the extensive work by TCEQ to develop the proposed revisions.

Sierra Club, Public Citizen, TBBU, SEED, and WE CAN note that adoption of nutrient standards for bodies of water, other than reservoirs, is required by federal law; and urges TCEQ to move expeditiously during the next revision of water quality standards to develop and adopt protective nutrient standards for those other bodies of water. OPIC strongly supports the beginning of the process of establishing numerical nutrient requirements for Texas waterways.

Response: The commission appreciates the support of the public and stakeholders in the efforts toward numeric nutrient criteria development for the State of Texas. Nutrient criteria are complex in such a large and diverse state. The methodologies presented in the rules for reservoir nutrient criteria are the culmination of years of work by the commission staff and stakeholders. The commission and interested parties held many workgroups examining methodologies and concerns. The commission will work toward further development of nutrient criteria for water bodies of the state and further refine the numeric nutrient reservoir criteria presented in the rules. This will include an evaluation of methods to develop nutrient criteria that have been used in other states.

Comment: BRA, SRA, SARA, Fox Dairy, Heifer Ranch at Arroyo Seco, High Plains Dairy Counsel, Legacy Farms, Texas State Representative Sid Miller, HCFCD, T/K, PCG, Hamilton, Farmers Branch, TSSWCB, TSCRA, TFB, TIP, GBF, BCFB, LOCFB, the Association of Texas Soil and Water Conservation Districts, and 74 Soil and Water Conservation Districts filed comments in general support of using chlorophyll a criteria as proposed in §307.9(e)(7) and Appendix F as long as total phosphorus and transparency verify that there is an actual water body impairment. SARA also supports the secondary screening criteria, because there currently is no accreditation program for chlorophyll a and current analytical methods for that constituent are not particularly robust. SRA suggests a better approach would be to utilize both secchi disk transparency and total phosphorus for confirming non-support, and the best approach would be with secchi disk transparency that can be shown to be directly correlated with elevated chlorophyll a values. WEAT and SRA suggest retaining the present structure of Appendix F, but use the chlorophyll a values in the alternative proposal. A second alternative suggested by WEAT is to use chlorophyll a as they are proposed in Appendix F, but require confirmation based on both total phosphorus and transparency.

Sierra Club, Public Citizen, TBBU, SEED, WE CAN, Texas State Representative Valinda Bolton, Uncertain, CLACC, GCLAT, LGCLA, FCLNWR, EIP, CW Action, TCE, Austin, SOSA, PLTA, Volente, and CLI support the development of numerical nutrient criteria, but comment that total phosphorus and transparency should not be used as an additional test to determine water body impairment. TPWD, NWF, and LCRA have general concerns about the current total phosphorous reporting limit of 0.06 mg/L, which they comment is too high to be effective.

TPWD has compared the likelihood of flagging reservoirs with significant changes to the likelihood of identifying reservoirs as impaired using the TCEQ's proposed chlorophyll a criteria and total phosphorus screening levels. TPWD commented that their analysis of the data provided compelling evidence that the TCEQ procedure requiring both total phosphorus and chlorophyll a lack sufficient power to detect obvious change in the reservoirs. TPWD would prefer an approach where high levels of total phosphorus or high levels of chlorophyll a, or low transparency or moderate levels of any two parameters, would flag a reservoir.

TCC notes that the term "supplemental screening levels" is used in §307.7(b)(4)(E) without a description of how they are to be used. TCC recommends adding a definition of this term in §307.3 and cite §307.9(e)(7) to describe how the levels will be used in assessing the nutrient quality of reservoirs and lakes listed in Appendix F. WEAT recommends that the role of the secondary screening parameters in the event of a CWA, §303(d) listing for nutrients be more fully defined. WEAT comments that there should not be a requirement to achieve compliance with secondary screening parameters to fulfill TMDL requirements because they may be due to natural geologic conditions.

*EPA states that "based on the federal regulation at 40 CFR §130.7(b), states must identify water quality limited segments where other pollution control requirements are not stringent enough to implement any water quality standards, inclusive of all numeric criteria; given that chlorophyll *a* criteria are 'applicable' as water quality standards under these regulations." EPA expects that use attainment decisions be based on the assessment of these criteria, irrespective of associated indicator screening levels. EPA comments that the use of supplemental screening may not be as protective as a single criterion, preferably a causal criterion such as total phosphorus or total nitrogen. Harris County also suggests future refinements to the standards should focus on causal variables such as phosphorus.*

Response: The commission appreciates comments on the proposed nutrient criteria and other alternative criteria (stand alone chlorophyll *a* criteria) that were presented. The commission recognizes that some stakeholders prefer stand alone nutrient criteria for chlorophyll *a*, while other stakeholders prefer the use of total phosphorus and transparency as supplemental screening parameters.

The commission recognizes that data to assess eutrophication are highly variable and tend to exhibit cycles over multiple years that complicate the assessment. In addition, key parameters such as chlorophyll *a* and total phosphorus are often at levels that are near or below detection and limits; or minimum quantification levels. These difficulties are potentially lessened by the use of multiple parameters for assessment. However, there were also many comments and substantial concerns in opposition to the use of supplemental screening parameters to confirm nutrient impairment. The commission also recognizes that the statistical level of significance is difficult to determine when using parameters that are likely to be correlated.

In view of these concerns regarding secondary screening parameters, the commission deletes the proposed nutrient criteria based on secondary screening parameters and adopts the "stand alone" chlorophyll *a* nutrient criteria at the confidence level of 0.01 for reservoirs in Appendix F. The use of stand alone chlorophyll *a* criteria is also incorporated into the adopted versions §307.3(a)(40), §307.7(b)(4)(E), and §307.9(e)(7). Other options to incorporate additional parameters for nutrient criteria will be considered by the commission for future nutrient criteria revisions.

*Comment: Austin, Sierra Club, Public Citizen, TBBU, SEED, WE CAN, LCRA, Highland Lakes Group, Highland Lakes PAC, Lakeway, Texas State Representative Valinda Bolton, TPWD, and NWF oppose the language in Appendix F that would apply a 5.0 µg/L criterion for chlorophyll *a* to reservoirs with a calculated criterion of less than 5.0 µg/L. Travis County Judge Samuel T. Biscoe comments that this proposal is unacceptable and recommends that Appendix F reflect the necessity for special laboratory techniques for analysis of chlorophyll *a* and total phosphorus when a criterion is less than the general quantification level.*

*LCRA comments that TCEQ may want to use the model results they developed in evaluating the proposed chlorophyll *a* standard for Segment 1404 – Lake Travis and its watershed to test nutrient criteria. LCRA comments that the calculated criterion for Lake Travis is 3.31 µg/L and assessing it at the proposed 5.0 µg/L significantly decreases the level of protection in the reservoir. Accordingly, LCRA recommends that the high quality, low detection data from the Clean Rivers Program be used to assess the calculated criteria for Lake Travis.*

PLTA comments that the proposed criteria for chlorophyll a are higher than ambient levels in Lake Travis and would result in degradation. PLTA supports LCRA's recommendation. PLTA comments that TCEQ needs to address the nutrient loading of the arms and coves of Lake Travis as well. Highland Lake PAC opposes any lowering of water quality standards in the Highland Lakes, Lake Travis in particular. Several individuals also filed comments opposing any weakening of water quality standards in Lake Travis. State Senator Kirk Watson also opposes raising the chlorophyll a standard in Lake Travis. Volente commented that the proposed numerical standard for chlorophyll a was not adequate to protect water quality in the Highland Lakes. Travis County Judge Samuel T. Biscoe files comments in support of the adoption of the numerical nutrient criteria, but opposed to the proposed nutrient criteria for Lady Bird Lake, Lake Austin, and Lake Travis.

BRA is concerned about the language regarding screening levels in the third paragraph of Appendix F, and suggests the paragraph creates confusion and could lead to misinterpretation. The low total phosphorus level of 0.04 mg/L could result in healthy low nutrient lakes being listed as impaired. BRA requests the screening values should be reflected in the table and removed from the text. Therefore, BRA recommends that Appendix F reflect the actual assessment values.

EPA, Austin, Sierra Club, Public Citizen, TBBU, SEED, WE CAN, TPWD, Texas State Representative Valinda Bolton, and NWF comment that the standard should be set at the calculated value. EPA suggests language on current detection limits could be omitted. Furthermore, they suggest screening level language should be moved to the Surface Water Quality Monitoring Program's Procedures Guidance for Assessing and Reporting Surface Water Quality in Texas, and detection limits for compliance purposes could be addressed in the Implementation Procedures, where there are already provisions for similar parameters.

Response: The commission is aware of the concerns regarding language presented in Appendix F with regard to screening level values for chlorophyll *a* and total phosphorus. The adopted language in Appendix F reflects the stand alone chlorophyll *a* criteria. The note on minimum chlorophyll *a* level has been slightly revised to indicate the minimum default value is based on historical quantification levels. For the table in Appendix F, the commission incorporates a chlorophyll *a* level of 5 µg/L for the minimum default criteria.

Historical data that were used for the calculation often had minimum quantification levels and reporting levels above current chlorophyll *a* reporting values. The default to 5 µg/L is necessary in order to address this higher reporting level in much of the data used in nutrient criteria development. Even with these limitations, the default criteria of 5 µg/L chlorophyll *a* provides a general level of protection for clearer reservoirs. The commission notes that this concentration is lower than the minimum concentration of chlorophyll *a* criteria for those that have been developed for other states, such as for Florida lakes. The commission acknowledges that this approach is of concern to some commenters and the commission will evaluate ways to improve criteria for clear reservoirs, such as non-parametric statistical techniques and additional evaluation of chlorophyll *a* minimum quantification levels. This evaluation will be facilitated where reservoirs, such as the Highland Lakes, have substantial historical data.

To avoid confusion, the default chlorophyll *a* criteria are listed in the table in Appendix F for assessment purposes. For those reservoirs with default criteria, the calculated values are shown in parenthesis.

Comment: IBWC opposes the site-specific nutrient criteria and screening levels for reservoirs in the Rio Grande Basin. Based on review of the available data, IBWC believes that the criteria and screening should be less stringent for Segment 2303 – International Falcon Reservoir, 2305 – International Amistad Reservoir, and 2312 – Red Bluff Reservoir. IBWC requests a thorough review of the chlorophyll a criteria and total phosphorus screening levels for these segments to ensure the appropriateness of the proposed nutrient criteria.

Response: The commission recognizes IBWC's role in water quality management of the Rio Grande. Therefore, in response to their comments, the proposed adoption of nutrient criteria for International Falcon Reservoir (Segment 2303) and International Amistad Reservoir (Segment 2305) were deleted, pending future coordination and consideration. The commission appreciates that these large reservoirs are international boundary waters directly on the Rio Grande River. The commission is adopting a chlorophyll a criteria for Red Bluff Reservoir (Segment 2312) since this reservoir is a long distance (>300 stream miles) from the Rio Grande.

Comment: TPWD supports the TCEQ's efforts in §307.7(b)(4)(E) to establish nutrient criteria for reservoirs. However, TPWD does not support the statistical methodology used for setting the criteria and suggest the TCEQ use the methodology proposed by TPWD. TPWD's methodology is based on non-parametric control charts that evaluate the 90th percentile of chlorophyll a. TPWD suggests that their methodology is less sensitive to non-detect measurements and better reflects the effects of algal blooms. TPWD also notes that unlike TCEQ's proposed methods, their approach does not require the assumption of a normal distribution.

Overall, TPWD states that the TCEQ's approach is too cautious and will fail to identify and address problematic situations before they are extreme. TPWD is concerned that the proposed approach fails to address the antidegradation intent of the CWA, as it is likely to allow the trophic state of reservoirs to change. TPWD suggests that TCEQ look for a new approach that is statistically defensible and has more power to detect changes.

OPIC questions the methodology used to determine the numeric nutrient criteria and recommends using the TPWD methodology. LCRA does not agree with the stand alone approach and supports the TPWD proposed non-parametric method for developing standards for Texas reservoirs. Harris County also supports use of the TPWD method presented above, but suggests these refinements should be addressed after adoption of currently proposed nutrient criteria.

Response: The commission appreciates TPWD's unusual efforts in evaluating nutrient criteria options for Texas reservoirs. There would be some advantages to non-parametric statistical techniques to define criteria from historical data sets, particularly the lack of reliance on a statistical distribution as well as the reduced effect of measurements below quantification levels. Commission staff reviewed TPWD's control chart approaches as well as other non-parametric statistical approaches to derive nutrient criteria from historical data. At this time, the commission's reviews and evaluations indicate that the relatively straight-forward proposed approach that incorporates variability around a mean is an appropriate starting point for initiating nutrient criteria for Texas reservoirs. The use of a 90th percentile for a control chart analysis is less intuitive to those that will be using these criteria, and the commission is unaware of a control chart analysis or similar approach that is being used for criteria development in other states or by EPA. The procedures to evaluate standards

attainment using a control chart are not particularly difficult, but these procedures are relatively specialized and unfamiliar to most stakeholders in the water quality arena. In addition, preliminary analyses and literature reviews suggest that statistical uncertainty can be substantial when estimating the scalar value of the 90th percentile of modest datasets with high variability. This uncertainty would need to be further evaluated and addressed. A criterion based on a 90th percentile can also be more difficult to evaluate when reviewing regulatory actions that affect nutrient loads. The commission will continue to coordinate with TPWD, other stakeholders, and experts in eutrophication analysis in order to develop nutrient criteria for other types of water bodies and to expand and improve nutrient criteria for reservoirs. However, the commission does not adopt the methodology suggested by TPWD as part of this rulemaking.

Comment: If TCEQ chooses to retain the method currently proposed, TPWD recommends TCEQ consider having tiered false positive rates to allow for screening; increase sample sizes used in the assessment; switch from using a two-tailed interval to a one-tailed interval; and/or ascertain if there is structure in the data that can be exploited to reduce the variability.

Response: The commission appreciates TPWD's efforts in evaluating the proposed nutrient criteria. Some of these suggestions are beyond the scope of the current rulemaking. However, commission staff will consider them in future development and re-evaluation of nutrient criteria. The commission also concurs that larger sample sizes are statistically beneficial for assessment purposes and will continue to maximize data collection efforts within the constraints of available resources. At this time, the commission does not incorporate these suggestions into the adopted nutrient criteria. However, the procedures for assessing attainment of nutrient criteria will continue to be reviewed by the commission.

Comment: BRA and SRA have expressed concerns regarding the elimination of values as "outliers" when they may actually be representative data. SRA does not agree with methodology that excludes values by statistical analysis alone.

Response: The commission acknowledges that this is a reasonable concern. However, the approach to identify outliers using Tukey Box Plot is a common statistical practice. Outlier exclusion was needed to avoid excessive outlier effects on smaller datasets, where one error can heavily bias the ultimate result. In general, the effect on the calculated criteria of removing a relative small number of outliers is minimal.

Comment: Overall, TPWD and BRA are supportive of the use of other causative factors, such as nitrate and orthophosphate. BRA recommends that the TCEQ consider using orthophosphate instead of total phosphorus for the phosphorus screening level since orthophosphate phosphorus is the most biologically available phosphorus compound and readily utilized by algal communities. BRA comments that since the goal is to protect lakes showing signs of advance eutrophication from further degradation; and since algal communities may be nutrient limited for phosphorus and nitrogen, they recommend including a screening level for nitrate or total Kjeldahl nitrogen.

Response: The commission agrees that the use of readily available forms of nutrients, such as orthophosphate and nitrate, may have some advantages in assessing eutrophication, such as assessing short-term growth potential at a particular point in time. The available forms can also be important components of some eutrophication models. However, both nitrate and orthophosphate are relatively transitory

and variable in comparison to total forms of nutrients. Sometimes a high proportion of phosphorus can be bound up in phytoplankton algae and rapidly recycled, so that the overall algal density might be substantial even though the orthophosphate remains relatively low. The use of total phosphorus or total nitrogen facilitates assessing long-term trophic status and establishing controls on nutrient loads where needed. In addition, for many reservoirs concentrations of phosphorus are often below quantification levels and this problem is exacerbated when measuring orthophosphates. The commission also agrees that measurements of total nitrogen (including Kjeldahl nitrogen) or nitrate are also potentially useful for screening purposes. At the present time, there are insufficient nitrogen data to historically evaluate screening values for many reservoirs in Texas, and the commission is exploring ways to expand the available nitrogen data for future monitoring efforts. The commission also notes that EPA recommends that nutrient criteria for phosphorus be expressed as total phosphorus, and this has generally been the approach that's been employed for criteria development in other states. As explained in other responses, the initial set of nutrient criteria are adopted for chlorophyll *a*, and supplemental screening of phosphorus values is not included. However, in the future, the commission and stakeholders will have an opportunity to further evaluate appropriate ways to apply phosphorus and nitrogen to nutrient criteria.

Comment: EPA requests that the TCEQ provide further explanation whether all existing uses for the selected reservoirs can be maintained with the proposed numeric criteria. EPA requests an explanation from TCEQ regarding why the available data approach was chosen over the more commonly used approaches to criteria development, such as reference water bodies. EPA questions whether the criteria that would apply to the following reservoirs would be protective of their designated uses: Lake Tanglewood, Lake Tawakoni, Lake Murvaul, Lake Palestine, Lake Livingston, Lake Worth, Eagle Mountain Reservoir, Bardwell Reservoir, Cedar Creek Reservoir, White Rock Lake, Lake Arlington, Benbrook

Lake, Lake Conroe, Lake Granbury, Sommerville Lake, Proctor Lake, Lake Waco, Buffalo Springs Lake, Brady Creek Reservoir, O.C. Fisher Reservoir, and Red Bluff Reservoir.

In general, the EPA does not support chlorophyll a criteria above 20 µg/L, unless there is demonstration that these values are protective of designated uses. EPA comments that reliance on historical data does not necessarily improve water quality in reservoirs. EPA states that if declining water quality trends were captured in a data set, it could be argued that the proposed criteria was not protective, but only reflect water bodies in the process of eutrophication. EPA believes the intent should be protection and improvement in water quality, not maintaining the status of declining water quality. NWF also comments that the numerical standards are not sufficiently protective, particularly for those reservoirs already experiencing relatively high levels of chlorophyll a (over 20 µg/L). Lubbock asks TCEQ to review the proposed chlorophyll a criterion for Segment (1241) - Buffalo Springs Lake. Lubbock comments that the pre-1990 data is not reliable and should not be used to calculate the chlorophyll a criterion.

Response: The commission responds that it is not extraordinary for even the mean chlorophyll a concentrations of Texas reservoirs to exceed 20 µg/L. When statistical variability is accounted for, many of the applicable criteria are above 20 µg/L, as noted by EPA and NWF. The commission's advisory workgroup on nutrient criteria generally recommended that criteria be developed for as many reservoirs as reasonably possible using historical data. The commission also notes that EPA's national guidance criteria for nutrients were not based on concentrations that were known to be related to water quality uses, but rather were selected as arbitrary percentiles of historical data from large aggregate ecoregions. The commission intends to continue exploring improved methods to categorize reservoirs

into groups so that "least impacted" reference reservoirs can be identified and compared to other reservoirs in their group; and identify and address any reservoirs that might demonstrate an increase in eutrophication due to anthropogenic sources of nutrients. In response to this comment and in response to a concern expressed by the City of Lubbock, the commission is deleting the proposed nutrient criteria for Buffalo Springs Lake, since this small, unclassified reservoir exhibits particularly high chlorophyll *a* concentrations. For reservoirs with adopted criteria above 20 µg/L, the commission will coordinate with EPA during the federal review of the revisions to provide additional information and analyses concerning historical data patterns, sources of nutrient loadings, and other relevant information.

Comment: BRA asks the TCEQ to consider more leniencies in nutrient levels for lakes not currently exhibiting signs of eutrophication in setting minimum values to allow for natural lake development.

Response: Texas reservoirs in general show slow rates of natural eutrophication and trends are not generally apparent. There was no clear method to consider the small effects of natural aging. However, to partly address this concern relatively recent historical data were used to calculate nutrient criteria when sufficient data were available.

*Comment: After reviewing available data, TPWD requests that TCEQ explain the methodology that was used in deriving criteria and screening levels; and demonstrate that both methods are protective. TPWD also requests that TCEQ conduct simulations to test the ability of any proposed methodology to discriminate between ambient and altered environments, as TPWD did using the original data set for chlorophyll *a*.*

TPWD comments that examination of the new TCEQ dataset suggests that significant changes in chlorophyll a concentrations have occurred since 2004 at most reservoirs and they are concerned that the TCEQ analysis has not dealt with this appropriately.

BRA, Lubbock, SRA and WEAT are concerned about some of the data used to develop the proposed nutrient standards. BRA states that some of the historical data collected in the 1970's and 1980's is unreliable because they date before the development and implementation of laboratory and program quality control standards. Furthermore, SRA suggest data from 2004-2008 only should be used in developing reservoir criteria for the Sabine Basin. BRA and SRA recommends using only the recent data with verifiable methodologies and quality control in calculating the nutrient standards. WEAT suggests changes to Appendix F to minimize the unintended effects of using data not analyzed with improved current analytical methods.

Response: In response to concerns about using screening parameters, the commission deleted the proposed screening levels as previously discussed in earlier responses. The methodology for deriving criteria is explained in Appendix F.

The commission notes that the nutrient advisory workgroup recommended that criteria be developed and applied to as many reservoirs as reasonably possible. When insufficient data were available for this period for a particular reservoir, the commission added data for the entire period of record. This approach was taken because stakeholders expressed serious concerns about including only historical data, due to changes in chlorophyll a collection and analysis. However, in response to the comments concerned about trends over time in reservoirs, the commission re-evaluated the data used for criteria calculations. This re-evaluation indicated trends over time that appear

to be anomalous and potentially artificial for the following 15 reservoirs: Lake Meredith (Segment 0102), Farmers Creek Reservoir (Segment 0210), Diversion Lake (Segment 0215), Lake Mackenzie (Segment 0228), Lake O' the Pines (Segment 0403), Lake Arlington (Segment 0828), Lake Weatherford (Segment 0832), Lake Amon G. Carter (Segment 0834), Lake Houston (Segment 1002), Leon Reservoir (Segment 1224), Lake Palo Pinto (Segment 1230), Fort Phantom Hill Reservoir (Segment 1236), Inks Lake (Segment 1407), E. V. Spence Reservoir (Segment 1411), and Lake Brownwood (Segment 1418). Therefore, the proposed nutrient criteria for these 15 reservoirs were deleted from the adopted standards. The commission may continue criteria development for these reservoirs in the future.

Comment: One individual noted that EPA's Algal Assay Bottle test might be helpful in resolving the nutrient/chlorophyll/algae dilemma.

Response: The commission notes that data from nutrient enrichment tests are available for some reservoirs. These results can be useful in assessing nutrient sensitivity and defining the limiting nutrients. At this stage, the available enrichment information on Texas reservoirs is insufficient to use in adjusting nutrient criteria.

Comment: CLACC, GCLAT, LGCLA, FCLNWR, EIP, CW Action, TCE, Uncertain, and CLI question why different lakes in the same watershed have different chlorophyll a criteria and why the criteria cannot be applied basin wide.

Response: The commission worked in conjunction with stakeholder workgroups and examined independent studies of reservoirs to develop classification based nutrient criteria. Texas reservoirs are highly variable systems, even within the same watershed or ecoregion,

and this has complicated the development of criteria across groups of reservoirs. The initial set of reservoir nutrient criteria is therefore established for individual reservoirs. The commission will continue to explore approaches to effectively categorize reservoirs into groups.

Appendix G – Site-specific Recreational Uses and Criteria for Unclassified Water Bodies

Comment: Sierra Club, Public Citizen, TBBU, SEED, and WE CAN oppose the designation of Brickhouse Gully/Bayou and the two unnamed tributaries of Whiteoak Bayou as "secondary contact recreation 1" and believes these water bodies should continue to be presumed for contact recreation at this time. Sierra Club, Public Citizen, TBBU, SEED, and WE CAN also question the adequacy of the UAAs conducted to make the proposed changes. EPA also comments that they have received UAAs on these unclassified water bodies and will initiate review in the near future.

Response: Site-specific recreational uses and criteria for these three water bodies are appropriate since the recreational UAA followed the recreational UAA procedures and was submitted to EPA for review and preliminary approval. The commission notes that EPA received the UAA for these three water bodies and will initiate review in the near future. EPA has indicated to the commission that the proposed recreational uses and associated criteria and the recreational UAA procedures are acceptable. The commission notes that designating site-specific recreational uses for certain water bodies is appropriate due to contact recreation being broadly presumed for all Texas surface waters, with the exception of eight water bodies, such as ship channels, in the 1980's and 1990's. The commission adopts Appendix G as proposed.