City of Austin
WATERSHED PROTECTION

Summary of 303(d)/305(b) Listed Segments from the Draft 2010 Integrated Report in the Austin area, Texas

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Abstract

The Texas Commission on Environmental Quality (TCEQ) is required by the federal Clean Water Act sections 303(d) and 305(b) to biennially report on the quality of water bodies in Texas with available data. A review of water bodies identified as impaired or of concern in Austin was conducted. Twelve segments in Austin were identified as impaired in 2010. All but one of the twelve impairments were previously identified in 2008. The most frequent impairment was elevated bacteria levels. Two impairments previously identified in 2008 were de-listed in 2010. There are 27 assessment units in the Austin area identified as being of concern. Not all City of Austin water quality monitoring is submitted to TCEQ for assessment, and Austin's Environmental Integrity Index is a broader and more consistent comparison of relative water quality citywide. Despite the large number of impaired or of concern water bodies, Austin maintains stream segments with excellent water quality.

Introduction

The Texas Commission on Environmental Quality (TCEQ) is required by Section 303(d) of the federal Clean Water Act to regularly identify water bodies in Texas that are not attaining the established water quality standards. Water quality standards include designations of the use of the water body and specific numeric or narrative criteria, and are published in Title 30 of the Texas Administrative Code, Chapter 307 (http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=4&ti=30&pt=1&ch=307&rl=Y).

Additionally, Section 305(b) of the federal Clean Water Act requires States to regularly generate an inventory of water quality in the state. A water body that does not attain the applicable water quality standards for it's classified or assumed uses is impaired. The list of impaired water bodies is referred to as the "303(d) list." A water body that only partially maintains a designated use or for which data exceed a screening criteria, is "of concern" and is identified in the "305(b) list." TCEQ now generates combined 303(d) and 305(b) lists consistent with US Environmental Protection Agency guidance, in a document known as the Integrated Report. The integrated report is generated biennially, and published in even numbered years. TCEQ identifies a water body as impaired or of concern according to the most recent published assessment procedures, referred to as the "Guidance Manual" (TCEQ 2010b).

Impairments must be addressed by a Total Maximum Daily Load (TMDL). When a segment that was previously identified as impaired is now determined to maintain the designated uses, that segment is removed from the 303(d) list and is said to have been "de-listed."

Stream reaches, or segments, identified in the Texas surface water quality standards are known as "classified segments." All other water bodies are known as "unclassified segments." Some general criteria (which include chloride, sulfate, total dissolved solids, pH, temperature) are only assessed in classified segments and do not apply to unclassified segments. Aquatic life use criteria for unclassified segments are designated based on the presumed normal flow condition (perennial, intermittent with perennial pools, intermittent) of the water body.

Numeric nutrient standards have been developed for some Texas reservoirs, but have not yet been developed for freshwater streams. Only narrative criteria apply for nutrients in freshwater streams. The designated or assumed use of a water body may be reviewed and changed through a process known as a Use Attainability Analysis (UAA). In a UAA, additional short term sampling is conducted to establish if the designated use is realistically attainable and attempts to establish a new site-specific use if the current use is not attainable.

The primary mechanism by which data is submitted to TCEQ for assessing compliance with water quality standards is the Texas Clean Rivers Program (CRP). The City of Austin (COA) is a participant in CRP, as sponsored by the Lower Colorado River Authority (LCRA). A portion but not all of COA routine water quality monitoring is included in CRP and thus assessed by TCEQ. Because of the stringent quality control requirements of CRP, COA cannot afford to submit all monitoring data thru CRP and still maintain high-resolution monitoring on a citywide geographic scale.

Methods

This report is a review of stream segments in the Austin area which are listed on the TCEQ 2010 Integrated Report. Assessments generally cover the last 5-7 years of available water quality data, but may carry forward any previous listings when no new data is available. The report was downloaded from the TCEQ website: http://www.tceq.texas.gov/waterquality/assessment/10twqi/10twqi

Impaired water bodies are separated into categories by TCEQ. Category 5b indicates that a UAA should be conducted before a TMDL is scheduled. Category 5c indicates that more information is needed and will be collected before a TMDL is scheduled.

Water bodies of concern are separated into two categories. Category "CS" indicates that the water body is of concern because of exceedance of screening levels. Category "CN" indicates near non-attainment of water quality standards.

At the time this report was generated, the TCEQ 2010 Integrated Report was still in draft form and had not yet been approved by the US Environmental Protection Agency.

Results

In Texas in 2010, there were 621 segments identified as impaired. Contact recreation impairments constituted the largest type of impairments, with 303 reaches yielding indicator bacteria levels above standards. There were 181 new impairments statewide in 2010, and 76 segments were delisted.

In Austin, six individual water bodies or stream segments were assessed in 2010 and found to be fully supporting uses or of no concern including Onion Creek, Bear Creek, Williamson Creek and two tributaries of Bull Creek. Two previously listed segments in Austin were de-listed in 2010. This includes removal of a macrobenthos impairment from upper Bull Creek (1403A_04) and removal of a bacteria impairment from middle Walnut Creek (1428B_03). Because a TMDL for the bacteria impairment on

lower Gilleland Creek (1428C_01) was completed, the category was changed from 5a (a TMDL is scheduled) to 4a (a TMDL is completed) and the impairment no longer appears on the 303(d) list.

One water body was identified as a new impairment in 2010: upper Bull Creek (1403A_05) was listed for depressed dissolved oxygen. Based on the 2010 Integrated Report, there are 10 impaired segments in Austin in category 5 (Table 1, Figure 1) and two category 4 listings (an impairment for which a TMDL has been adopted): bacteria in lower Gilleland Creek and depressed DO in upper Lake Austin.

Table 1. 2010 Austin water bodies on the 303(d) list of impairments.

Segment Id	Site Name	Reach	Impairment	Category	Year Listed
1403A	Upper Bull Creek	1403A_05	depressed DO	5c	2010
1403J	Spicewood Springs Tributary to Shoal near MoPac	1403J_01	bacteria	5b	2002
1403K	Taylor Slough South at Reed Park	1403K_01	bacteria	5b	2002
1403R	Westlake-Davenport Tributary to Lake Austin	1403R_01	bacteria	5b	2006
1427A	Slaughter Creek	1427A_01	impaired macrobenthos	5b	2002
1428	Colorado River below Town Lake upstream of Walnut Creek	1428_03	bacteria	5c	2006
1428B	Walnut Creek upstream of MoPac	1428B_05	bacteria	5b	2006
1429B	Eanes Creek	1429B_01	bacteria	5b	1999
1429C	Waller Creek	1429C_01-03	bacteria	5b	2004
1429C	Waller Creek downstream of MLK Blvd	1429C_01	impaired macrobenthos	5c	2002

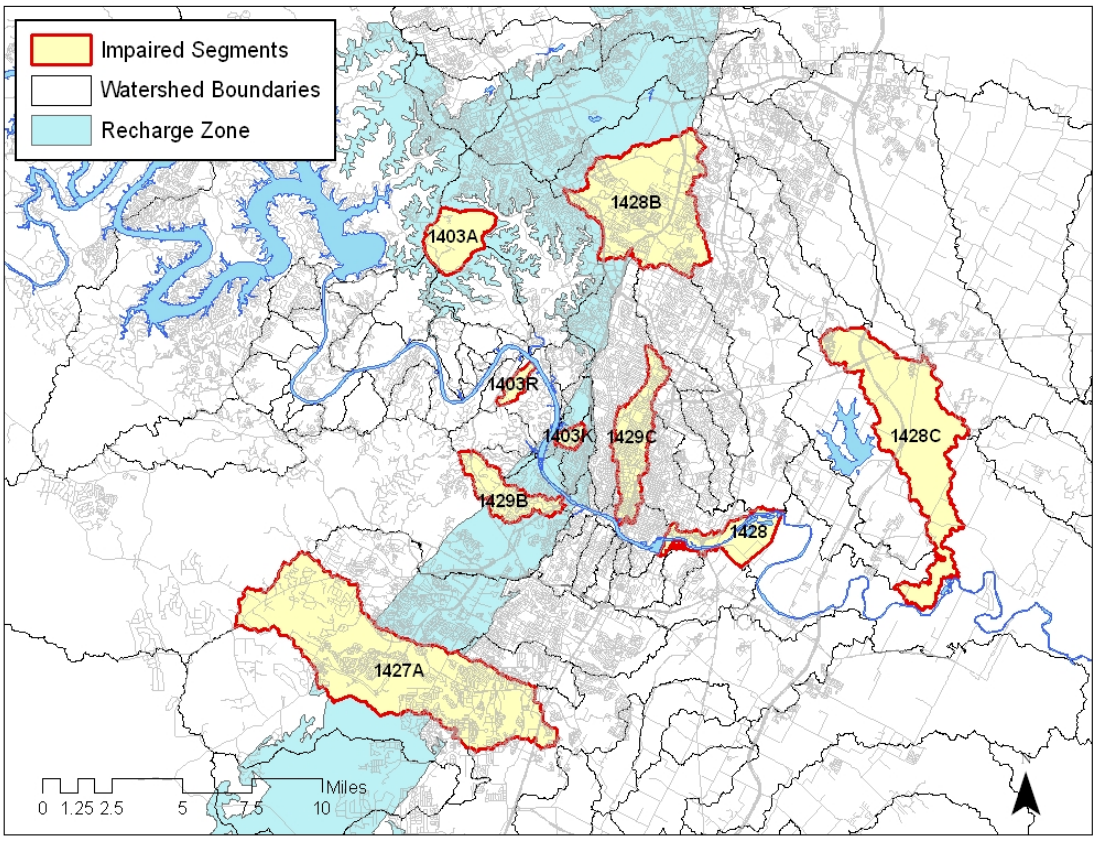

Figure 1. Impaired water bodies on the 2010 Integrated Report in Austin.

Based on the 2010 Integrated Report three reaches were of concern for phosphorus, three reaches were of concern for bacteria, three reaches were of concern for impaired biology, eight reaches were of concern for sediment quality, four reaches were of concern for depressed DO, and ten reaches were of concern for nitrate (Table 2, Figure 2).

Table 2. Water bodies of concern in Austin from the 2010 Integrated Report.

Segment Id	Site Name	Reach	Impairment	Category
1403	Lake Austin from Tom Miller to Loop 360	1403_01	manganese in sediment	CS
1403D	Barrow Preserve Tributary to Bull Creek	1403D_01	Nitrate	CS
1403E	Stillhouse Hollow Tributary to Bull Creek	1403E_01	Nitrate	CS
1403J	Spicewood Tributary to Shoal	1403J_01	Nitrate	CS
1403K	Taylor Slough South at Reed Park	1403K_01	Nitrate	CS
1404	Lake Travis	1404_04, 05, 06, 10	depressed DO	CS
1427A	Slaughter Creek	1427A_01	depressed DO	CN
1427G	Granada Hills Tributary to Slaughter Creek	1427G_01	Nitrate	CS
1428	Colorado River below Town Lake downstream of Gilleland Creek	1428_01	impaired macrobenthos	CN
1428	Colorado River below Town Lake downstream of Walnut Creek	1428_01, 02	Orthophosphorus	CS
1428	Colorado River below Town Lake downstream of Gilleland Creek	1428_01	total phosphorus	CS
1428	Colorado River below Town Lake downstream of Walnut Creek	1428_01, 02	Nitrate	CS
1428	Colorado River below Town Lake downstream of Gilleland Creek	1428_01	impaired fish	CN
1428B	Walnut Creek from FM969 to Old Manor Rd	1428B_02	Bacteria	CN
1428B	Walnut Creek from Dessau to MoPac	1428B_04	impaired macrobenthos	CN
1428C	Gillleland Creek from the mouth to Taylor Ln	1428C_01	Orthophosphorus	CN
1428C	Gillleland Creek from the mouth to Taylor Ln	1428C_01	Nitrate	CS
1428C	Gilleland Creek from Taylor Ln to Old Hwy 20	1428C_02	Nitrate	CS
1428C	Gilleland Creek from Old Hwy 20 to Cameron Rd	1428C_03	Bacteria	CN
1428C	Gilleland Creek upstream of Cameron Rd	1428C_04	Bacteria	CN
1429	Town Lake downstream of Lamar	1429_01	Nitrate	CS
1429C	Waller Creek downstream of MLK Blvd	1429C_01	depressed DO	CS
1429C	Waller Creek from MLK Blvd to 41st	1429C_02	lead in sediment	CS
1429C	Waller Creek from MLK Blvd to 41st	1429C_02	PAH in sediment	CS
1429D	East Bouldin Creek	1429D_01	PAH in sediment	CS
1429D	East Bouldin Creek	1429D_01	cadmium in sediment	CS
1429D	East Bouldin Creek	1429D_01	lead in sediment	CS
1430	Barton Creek downstream of MoPac	1430_02	toxicity in sediment	CN
1430	Barton Creek from SH71 to Hays County Line	1430_04	depressed DO	CS
1430A	Barton Springs	1430A_01	toxicity in sediment	CN
1430B	Barton Creek Tributaries	1430B_01	Nitrate	CS

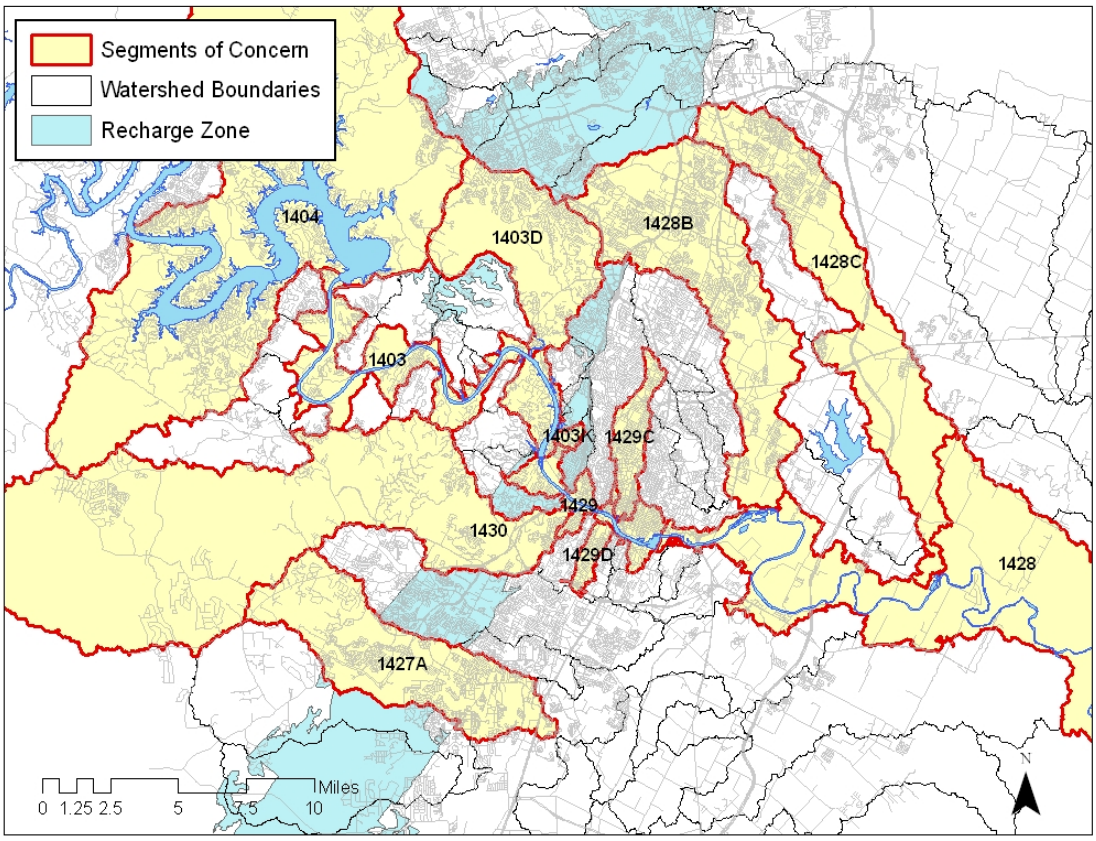

Figure 2. Watersheds with reaches of concern on the 2010 Integrated Report.

Discussion

Impairments in Austin on the 303(d) list may not be the most severe water quality impairments in Austin as TCEQ does not assess all available water quality information for the area and not all of COA monitoring data is submitted thru CRP. The COA Environmental Integrity Index is the most comprehensive, consistent review of relative water quality for the entire Austin area. Austin may yield a relative high number of impaired or concerned segments, although that is partially a function of the large amount of water quality monitoring done in Austin. On a statewide basis, Austin maintains creeks and lakes with excellent water quality.

Bull Creek Tributary 7

The new listing for depressed DO is from sampling conducted with Balcones Canyon Preserve lands, on Bull Creek Tributary 7 near the Franklin Tract. This site is dominated by groundwater discharge during the index period which may be naturally lower in DO. A use attainability analysis (UAA) to develop a more appropriate site-specific standard should be considered.

Eanes Creek

COA recently completed more than two years of confirmatory monitoring at 7 sites listed for bacteria impairments in cooperation with TCEQ (Jackson and Herrington 2011). This monitoring provides some additional insight into the conditions of these impaired segments. The Eanes Creek (1429B) bacteria listing is based on flow-biased data, as the monitoring site near the confluence with Lady Bird Lake is

completely ephemeral. A UAA should be pursued to change the criteria for this segment to less than primary contact recreation. Based on this recent bacteria data, the Westlake-Davenport Tributary (1403R) will be de-listed in the 2012 assessment. TCEQ is considering recreation use attainability analyses (RUAA) for all water bodies with bacteria impairments, although the RUAA for all urban streams have been postponed indefinitely pending further review of the RUAA methods.

Waller Creek
The planned Waller Creek tunnel will radically alter the hydrology and water quality of Waller Creek, as a portion of the storm runoff will be diverted directly to Lady Bird Lake and Lady Bird Lake water will supplement Waller Creek baseflow during non-storm conditions. The Waller Creek impairments should be re-evaluated on completion of the tunnel project.

Colorado River below Austin
The LCRA has moved the monitoring site from on the Colorado River downstream of Longhorn Dam (1428) to a different location. The new location not only has lower bacteria levels, but also is located in an area more frequently used for human contact recreation. It is anticipated that this segment will be de-listed in the 2014 assessment.

Slaughter Creek
The Slaughter Creek impaired macrobenthos listing appears to be based on an inadequate dataset. TCEQ is considering additional biological sampling to re-evaluate this listing.

Walnut Creek, Taylor Slough South, and Spicewood Tributary
COA is actively pursuing source identification to direct remediation efforts for fecal contamination in Walnut Creek, and making plans to conduct similar efforts on Taylor Slough South (1403K) and the Spicewood Tributary (1403J).

Nutrient Impairments
Impairments cannot yet be determined from quantitative data for nutrients in freshwater streams as numeric nutrient criteria are still in development. The majority of nutrient concerns in western Austin are from nitrate-enriched groundwater which may be influenced by landscaping fertilizer application. In eastern Austin, high nutrients result from wastewater effluent discharged to creeks under TPDES permits.

Sediment Toxicity
Sediment toxicity concerns have been addressed in part by the COA ban on coal-tar based pavement sealers which are high in polycyclic aromatic hydrocarbons (PAH). Sediment screening criteria are driven by the 85^{th} percentile of available data in the TCEQ database and do not necessary reflect specific toxicological assessments.

Conclusions

Based on the TCEQ assessment of the 27 analysis units in the Austin area, water quality problems continue to exist despite the efforts of the City and others to preserve and improve the health of our water resources. However, the statewide assessment has limitations that the City Environmental Integrity Index does not. Using the information from this more comprehensive assessment, the sources of many of the concerns and impairments have been reviewed in detail. Circumstances unique to these water bodies explain much of their placement on the statewide listings. The City will continue to work with TCEQ to provide as much local information as possible to address priority impairments and concerns in Austin surface water bodies.

References

Jackson, T., and C. Herrington. 2011. Supplemental monitoring of selected water bodies with contact recreation impairments. City of Austin Watershed Protection Department, Environmental Resource Management Division. SR-11-04

Texas Commission on Environmental Quality (TCEQ). 2010. 2010 Guidance for Assessing and Reporting Surface Water Quality in Texas. http://www.tceq.texas.gov/assets/public/compliance/monops/water/10twqi/2010_guidance.pdf