

## **Gilleland Creek Plan**

### ***Ordinance and Planning Management Measure – Key Elements***

#### **Introduction**

This document describes the key elements involved with the implementation of the management measure developed by the Ordinance and Planning Work Group<sup>1</sup> to address bacteria loading in the Gilleland Creek Watershed. The following measure is one of the management measures proposed for the Gilleland Creek Plan:

- **Develop and adopt equivalent water quality ordinances between government jurisdictions.**

These key elements for ordinance and planning will be incorporated into the implementation strategy for the Gilleland Creek Plan and will include all of management measures to address bacteria loading in the watershed. The critical area for the implementation of the Ordinance and Planning Management Measure is the entire 76-square-mile Gilleland Creek Watershed including the main stem of Gilleland and its tributaries: Elm Creek, Decker Creek, and Harris Branch. The watershed originates at Hillside Springs, northwest of Pflugerville and drains to the southeast to its confluence with the Colorado River, upstream of Webberville (Segment 1428).

An adaptive management strategy will be used to adjust the plan as needed since its initial implementation will demonstrate which management measures prove most effective given site-specific watershed conditions. The Texas Commission on Environmental Quality (TCEQ) will assess Gilleland Creek every 2 years as part of updating the Texas Water Quality Inventory and 303(d) List. As potential changes are made to the Texas Surface Water Quality Standards criteria for contact recreation and changes in the creek's water quality are observed, modifications to this plan will be made. This adaptive management strategy allows stakeholders to learn and adapt the plan as progress is made. The ultimate goal is for Gilleland Creek's four assessment units to have sufficiently low E. coli loading that it can be useable for contact recreation.

#### **Key Element #1**

*This element identifies the causes of the impairment, in this case the sources of bacteria that need to be controlled by the TMDL and Plan.*

Because no specific sources of the impairment were isolated during Gilleland Creek TMDL monitoring period, this key element summarizes the results of the study in both dry and wet weather conditions to support the broad ranging approach developed for the Gilleland Creek Plan.

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<sup>1</sup> Work group members include representatives from the Cities of Austin, Pflugerville, and Round Rock, Travis County, Dwyer Realty Companies, LCRA, and TCEQ.

Sampling for the Gilleland Creek TMDL occurred between October 2005 and March 2006 and the results of this sampling during dry weather conditions in this period showed that the geometric mean concentration of *E. coli* exceeded the stream criterion of 126 #/100 ml at six out of the 10 sampling locations. The average of the exceedance (>126) was 38.5. Some dry weather samples exceeded the single sample criterion of 394 #/100ml. During these conditions, effluent from the wastewater treatment facilities makes up the majority (approximately 83 percent) of flow in Gilleland Creek.

In wet weather conditions, *E. coli* concentrations in all samples taken at the ten sampling locations exceeded the geometric mean criterion. Using load duration curve analysis, LCRA staff determined that during high flow conditions (greater than 45 ft<sup>3</sup>/second) and moderate flow conditions (between 16.5 ft<sup>3</sup>/second and 45 ft<sup>3</sup>/second), the water quality in the creek exceeded both the geometric mean and single sample criteria.

This analysis from the load duration curve showed that in order for the creek to meet the maximum allowable load of bacteria in high and moderate flow conditions, that reductions of 93 percent and 82 percent, respectively, are required. The majority of the *E.coli* bacteria loading to the watershed occurred during moderate to high flow (stormflow) conditions, which is indicative of nonpoint sources of bacteria.

This plan targets both point sources and nonpoint sources of bacteria contamination. The Ordinance and Planning Management Measure will reduce the impact of new development and redevelopment on in-stream concentrations.

## **Key Element #2**

*This element describes the management measure that will be implemented to limit future bacteria loads to Gilleland Creek from new development and redevelopment.*

The Ordinance and Planning Work Group was created to address strategies to protect the Gilleland Creek Watershed from future pollutant loading. Work Group members included stakeholders representing the government jurisdictions in the watershed that have development review authority.

At the time of the Gilleland Creek TMDL study, more than 60 percent of the watershed was classified as undeveloped land. However, stakeholders identified that the undeveloped area will be developed because some of the land has approvals from the appropriate government jurisdiction or it will likely be developed because of anticipated growth associated with the new State Highway 130.

With this potential for development in mind, the work group created a “Water Quality Ordinance Framework” that contains provisions for several criteria including Stream Buffers, Water Quality Streambank Erosion Control Requirements, Wastewater Lines, Wetlands, and Variances. The work group reached consensus on the following goal for the ordinance framework:

*Limit future bacteria loads to Gilleland Creek from new development and redevelopment by:*

*(1) providing hydrologic control and treatment of post-development runoff;*

*(2) protecting and preserving natural pollutant control systems [riparian buffers and wetlands];*

*and*

*(3) directing the placement of wastewater infrastructure away from waterways.*

Attachment 1 is a detailed description of the Gilleland Creek Watershed Water Quality Ordinance Framework.<sup>2</sup> The provisions include descriptions of the current regulations for each of the above stated criteria and include descriptions of alternatives to meet this goal.

If adopted by the various jurisdictions, this framework would be implemented through ordinances applied to new development or redevelopment projects in accordance with each jurisdiction's regulations. Each municipality's ordinance will also comply with the Texas Water Code, Title 2, Subtitle D, Chapter 26, Section 26.180 Nonpoint Source Water Pollution Control Programs of Certain Municipalities. Also, as according to State law, this ordinance will not apply to any project that already is approved by the jurisdictions but as of yet is not developed.

### **Key Element #3**

*This element estimates the potential bacteria load reductions that can be reduced with each management measure implemented in the Gilleland Creek Watershed.*

A water-quality ordinance would only impact future development or redevelopment in the Gilleland Creek Watershed. Therefore, the impact of the ordinance will be to reduce future increases in bacterial loads to Gilleland Creek. However, through redevelopment, the impact of the ordinance could reduce existing bacterial loads, but in general its importance is to minimize the impact of future development on the watershed.

### **Estimating Load Reduction**

Estimating the percent reduction in expected bacteria loading due to this ordinance is a complex task; the modeling effort would be extensive. Given that the impact of the ordinance is on minimizing future increases in loading, predicting the impact of this ordinance would require modeling to anticipate future bacterial conditions both with and without the proposed ordinance framework in place. This type of modeling is beyond the scope of this analysis.

New development that mimics a natural system can be expected to reduce the impact of that development on its watershed. However, impacts from the proposed ordinance on future development in Gilleland Creek can not be quantified without a more rigorous modeling analysis. This is because the impact of the ordinance is highly dependant upon the source of the contamination, anticipated development, and other factors.

For example, if the source of bacteria loading is from agricultural nonpoint source runoff, then the impact of the regulation will be different depending on where new development occurs, if the agricultural land uses are changed, and the subsequent nature of the new development. Alternatively, if the majority of the bacteria load in the watershed result from

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<sup>2</sup> The approval and implementation of the provisions of the Gilleland Creek Watershed Water Quality Ordinance Framework is the responsibility of the legislative bodies for each jurisdiction. The framework merely represents the recommendations for provisions for a water quality ordinance by the majority of the work group members.

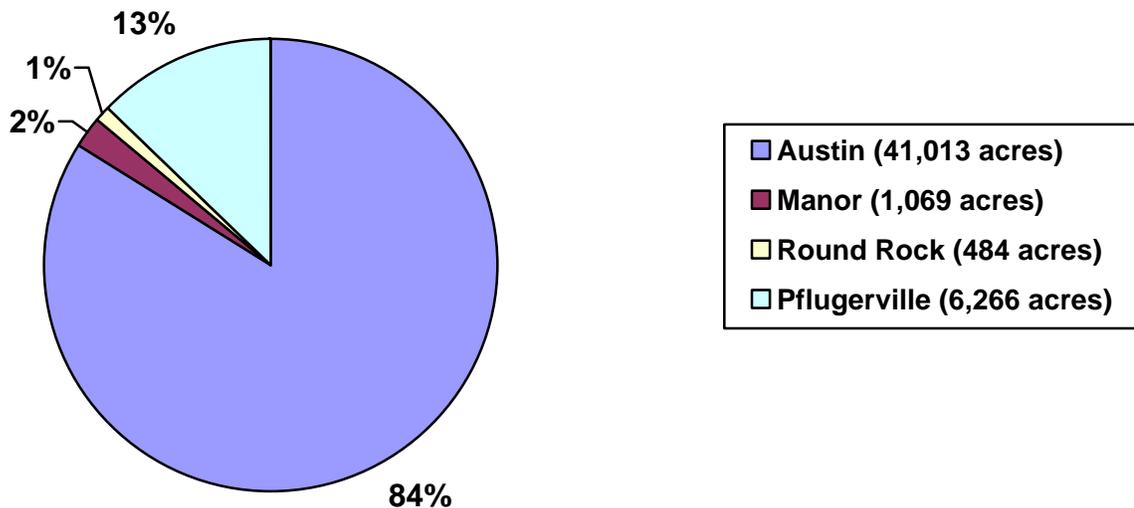
urban nonpoint sources runoff, then the impact of the proposed ordinance would be very different. Although it can not be quantified, it is an essential component of reducing further development impacts. However, it is expected that a load reduction will be achieved from proposed new development and redevelopment complying with the Gilleland Creek Watershed Water Quality Ordinance Framework.

Future development in the Gilleland Creek Watershed will be heavily influenced by the various local governments. Each will explore the feasibility of a water quality ordinance that is consistent with the ordinance framework. Within the extraterritorial jurisdictions (ETJ), the City of Austin and the City of Pflugerville coordinate subdivision development reviews with Travis County.

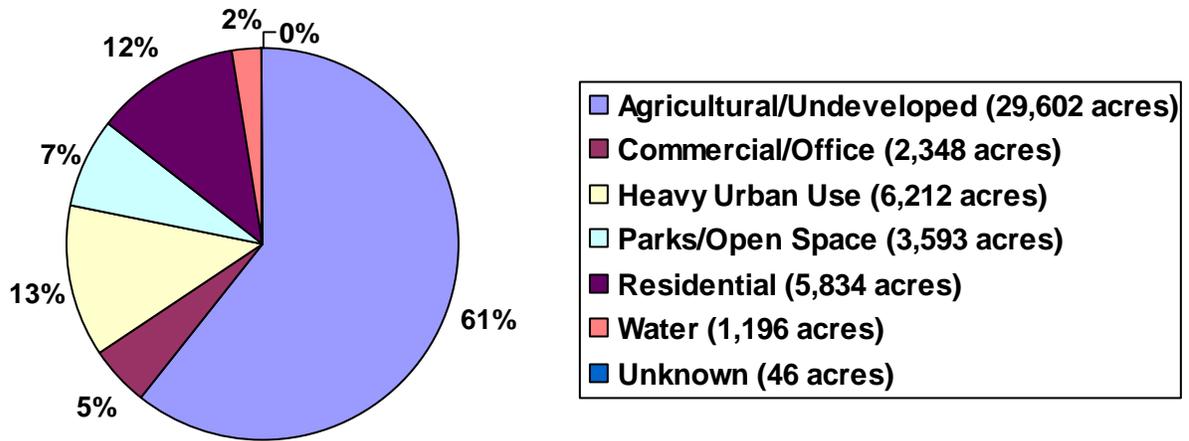
Exhibit 1 contains graphic illustration of the breakdown of various municipal jurisdictions within the watershed. As illustrated, the majority of the land in the watershed is within the jurisdiction of Travis County and the City of Austin 2-or 5-mile ETJ.

Exhibit 2 identifies the current land uses within the watershed. Travis County and the City of Austin have the largest jurisdiction within the Gilleland Creek Watershed with the most land currently classified as agricultural or undeveloped. Thus, as land changes from agricultural to more urban or suburban land uses, the City of Austin and Travis County will play key roles in providing the greatest potential for the proposed ordinance framework.

**EXHIBIT 1**  
Municipal Jurisdictions in the Gilleland Creek Watershed  
*Source: City of Austin GIS Data Sets*



**EXHIBIT 2**  
2006 Land Uses in the Gilleland Creek Watershed  
Source: City of Austin



### Key Element #4

*This element identifies technical and financial assistance and the authorities needed to implement this management measure.*

#### Technical assistance:

In accordance with the agreement on subdivision platting in the ETJ between the City of Austin and Travis County<sup>3</sup>, the City of Austin and Travis County must establish a single set of subdivision regulations in the Austin ETJ. Amendments to existing water quality ordinances will require both the approval of the Austin City Council and the Travis County Commissioners Court. Stakeholders indicate that both entities have adequate resources to amend their water quality ordinances in accordance with the Gilleland Creek Watershed Water Quality Ordinance Framework. The City of Austin's Phase I Municipal Separate Storm Sewer System (MS4) S4 and Travis County Phase II MS4 Storm Water Management Programs (SWMP) include water quality ordinances as best management practices.

In their Phase II MS4 Storm Water Management Program<sup>4</sup>, the City of Pflugerville proposed a Storm Water Pollution Control Ordinance as one of their best management practices. The intent of their ordinance will be to eliminate illicit discharges, require construction site best management practices for erosion and sediment controls, and require zoning and development requirements to regulate discharges from new and redevelopment projects. They will write, adopt, and implement an ordinance in accordance with their MS4 SWMP. The City will also develop a storm water management structure within the City government to support their MS4 SWMP. The City of Pflugerville can explore seeking technical

<sup>3</sup> Austin City Code, Title 30. Austin/Travis County Subdivision Regulations

<sup>4</sup> City of Pflugerville, Texas, Stormwater Management Program, (Phase II) Municipal Separate Storm Sewer System, February 11, 2008.

assistance from the City of Austin and Travis County by participating in the Gilleland Creek TMDL stakeholder process or through personal communications.

The City of Round Rock also proposed the development of a post construction storm water management legal authority to regulate post construction site storm water management resulting from new development and redevelopment construction sites in their Phase II MS4 SWMP.<sup>5</sup> The City's Department of Engineering and Development Services will support this activity.

**Financial assistance:**

The City of Pflugerville will pursue grant funding<sup>6</sup> to assist with the development of their SWMP, including adopting and implementing an ordinance. The City of Pflugerville will also evaluate the appropriateness of Drainage Utility district to provide a source for funding. The Cities of Round Rock and Austin, and Travis County will use existing resources to develop, adopt, and implement their water quality ordinances.

**Key Element #5**

*This element describes the education component to enhance the public understanding of the Gilleland Creek Plan and to encourage their participation.*

For the Ordinance and Planning Management Measure, the Education and Outreach Work Group identified and prioritized education activities and programs that would enhance those impacted most from this management measure – local officials, leaders, and developers. The following is a summary of their recommendations.

**Workshop for local officials:**

The Education and Outreach Work Group identified workshops for local officials as their highest priority education activity for the Gilleland Creek Plan. The purpose of these workshops will be to educate local officials and leaders on overall water quality topics such as the nature and function of watersheds, the current bacteria impairment, potential impairments, and strategies for watershed protection. Emphasis will be on educating leaders on the relationship between land use and natural resource protection, with a focus on water resources. These workshops would be based on the Texas AgriLife Extension Service Texas Watershed Stewards Program and the University of Connecticut Cooperative Extension System Nonpoint Education for Municipal Officials Project, (NEMO). These workshops would highlight the Gilleland Creek Water Quality Ordinance Framework. These workshops will be a collaborative effort of Texas AgriLife Extension, LCRA's Texas Leadership Institute, Envision Central Texas, Austin-Bastrop Corridor Partnership, and the local governments represented in the watershed.

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<sup>5</sup> City of Round Rock, Texas, Stormwater Management Program, TPDES (Phase II) Municipal Separate Storm Sewer System, MS4, February 2008.

<sup>6</sup> "Federal Clean Water Act Section 319 grant opportunities can not be used to fund required permit activities, such as BMPs in Phase II Stormwater Management Programs."

**Educational workshops or materials for developers:**

Similar to the workshop for local officials, the Education and Outreach Work Group identified workshops for developers as a high priority education activity. The purpose of this workshop as well as the educational materials will be to educate developers on the requirements of the Gilleland Creek Watershed Water Quality Ordinance Framework. This workshop will be a collaborative effort between the jurisdictions in the watershed. The City of Round Rock included a similar outreach activity for the development community in Year 3 or 2011 of its SWMP.

**Recognition program to highlight successful developments**

After successful implementation of the ordinance in the watershed, the Education and Outreach Work Group identified the importance of a recognition program to highlight development that complies with or exceeds the requirements of the Gilleland Creek Watershed Water Quality Ordinance Framework. The audience for this program would be developers and the local community. Developments recognized through this program would be a model for other developments. The Education and Outreach Work Group proposed this idea after the Ordinance has been adopted and implemented for 5 or more years.

**Watershed workshop and tour**

The Texas State University Texas Stream Team Stream Team<sup>7</sup> will host a watershed workshop and tour to enhance the public and stakeholder understanding of the watershed, to build support for accomplishing the Gilleland Creek Watershed Plan, and to increase the public's knowledge of pollutant reduction activities. The watershed tour will include stops at flood control ponds retrofitted with automated controls, a wastewater treatment facility, natural features, an agricultural best management practice site, and a water quality monitoring demonstration.

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<sup>7</sup> Texas Stream Team, formerly, the Texas Watch Program, is a statewide water-quality monitoring network of concerned volunteers, partners, and institutions.

## Key Element #6

*This element provides a schedule with milestones for implementing this management measure*

Year	Milestone
2009	<ul style="list-style-type: none"><li>Stakeholders reach consensus on the Gilleland Creek Watershed Ordinance Framework as a part of the Gilleland Creek Plan.</li><li>Responsible entities begin to explore the feasibility of a water quality ordinance based on the provisions of the Gilleland Creek Watershed Water Quality Ordinance Framework.</li></ul>
2010	<ul style="list-style-type: none"><li>Responsible entities begin their processes toward development and adoption, which could include establishing a stakeholder committee to obtain input from affected individuals.</li></ul>
2011	<ul style="list-style-type: none"><li>Responsible entities present their water quality ordinance and seek approval from their appointed officials, such as environmental boards and planning commissions.</li><li>Responsible entities conduct workshop(s) for the development community.</li></ul>
2012	<ul style="list-style-type: none"><li>Responsible entities present their ordinance and seek approval from their elected officials.</li></ul>
2013	<ul style="list-style-type: none"><li>Responsible entities implement their ordinance after it becomes law.</li></ul>

## Key Element #7

*This element highlights the interim, measurable milestones for each measure that will be used to determine its ongoing progress and effectiveness.*

1. City of Austin and Travis County explore the development of water-quality ordinances that will be implemented in the Gilleland Creek Watershed that reflect the provisions of the Gilleland Creek Watershed Water Quality Framework.
2. Cities of Round Rock and Pflugerville explore the development of draft water-quality ordinances that will be implemented in the Gilleland Creek Watershed that reflect the provisions of the Gilleland Creek Watershed Water Quality Framework.
3. The Cities and County initiate their public review process of the ordinances.

## Key Element #8

*This element defines the indicators that will be used to document improvements in water quality due to implementation of this management measure.*

As undeveloped acreage in the watershed converts to developed acreage, bacteria loading concentrations calculated from the samples collected in all four assessment units by the routine water quality monitoring described in Key Element #9 will not show a statistically significant increase.

## **Key Element #9**

*This element describes the monitoring component of the Plan to determine the attainment of the water quality standards throughout the watershed.*

The following summary describes routine water-quality monitoring activities for each of the four assessment units in the Gilleland Creek Watershed. The LCRA currently monitors in Assessment Unit 1 and 2 and proposes to begin monitoring in Assessment Unit 3. The TCEQ currently monitors in Assessment Unit 4. The purpose of this monitoring is to ensure that enough *E.coli* data is collected in each of the four assessment units to determine water quality standards attainment throughout the watershed.

Beginning with the 2010 assessment, TCEQ will require ten sample results over a 7-year period to do a full assessment. If 10 samples are not available, TCEQ will use 10 years to obtain the minimum (10) number of samples. With less than 10 sample results, TCEQ can only identify a water body as a concern and not impaired.

Also included in this element is a summary of the City of Austin's monitoring activities and the Colorado River Watch Network (volunteer water-quality monitoring) program. An attached map illustrates these monitoring programs in the watershed.

### **Assessment Unit 1 (AU 1):** From the Colorado River upstream to Taylor Lane

Site 17257, Gilleland Creek at FM 969 is downstream of Webberville Road/FM 969, east of Austin. It will be monitored on a bimonthly basis (six times per year). This is a current and historical site monitored by LCRA and will provide quality assured data for **AU 1**. This site has already compiled enough data for determination of standards attainment.

### **Assessment Unit 2 (AU 2):** From Taylor Lane upstream to Old Highway 20

Site 12235, Gilleland Creek at FM 973 south of the city of Manor will be monitored on a bimonthly basis (6 times per year). This is a current and historical site monitored by LCRA, and will provide quality assured data for **AU 2**. There should be enough data for standards attainment determination for the 2010 assessment.

### **Assessment Unit 3 (AU 3):** From Old Highway 20 to Cameron Road

Site 12236, Gilleland Creek at US 290 north of Manor has been monitored historically and will potentially be continued by LCRA bimonthly (six times per year) starting in TCEQ's FY 2010. This site should provide quality assured data for **AU 3**. Monitoring at this site should produce enough data to determine standards attainment by the 2014 assessment.

### **Assessment Unit 4 (AU 4):** From Cameron Road to the spring source

Site 20474, Gilleland Creek at Northeast Metropolitan Park, southeast of Pflugerville (at the low water crossing 1.559 kilometers north, 302 meters west to the intersection of Killingsworth Lane and Cameron Road) is a newly established site which TCEQ began monitoring in 2009. It will be monitored quarterly (four times per year). It will provide quality assured data for **AU 4** and should provide enough data to determine standards attainment by the 2014 assessment.

Other sources of data that may or may not be used in the assessment of Gilleland Creek for 305b/303d purposes include: water quality monitoring by City of Austin and monitoring conducted by Colorado River Watch Network volunteers. The City of Austin may submit monitoring results under the quality assurance of the LCRA Clean Rivers Programs Quality Assurance Project Plan. The City of Austin will discuss this possibility with the LCRA at the 2009 Clean Rivers Program Coordinated Monitoring Meeting. At present, Austin's *E.coli* data is analyzed at an in-house, non-NELAC approved lab, and therefore can not be used for assessment purposes but will be used by the City to calculate their Environmental Integrity Index, a tool developed to monitor and assess the ecological integrity of Austin watersheds. Water chemistry data is collected quarterly and biological and habitat surveys are conducted once per year in the summer.

Certified Colorado River Watch Network (CRWN) volunteer water quality monitors will submit to LCRA a minimum of six data points per year from the following sites: Gilleland Creek at Edgemere, Gilleland Creek below Bohl Park (12239), Gilleland Creek at Picadilly Lane (18763), Gilleland Creek at lower end of Gilleland Park at Railroad, and Gilleland Creek at Grand Avenue Parkway. CRWN data is not TCEQ quality assured and will not be used for assessment purposes. Since CRWN volunteer monitoring data provides more frequently collected data from more locations, it might be able to find problem areas that can be addressed by professional monitoring data collection efforts.

## **Key Element #10**

*This element provides the following list of entities responsible for implementing the Ordinance and Planning Management Measure.*

The Cities of Austin, Manor, Pflugerville, and Round Rock have the authority to review and approve development within their full purpose, limited purpose and extraterritorial jurisdictions, (ETJ). Within each city's ETJ boundary (for the City of Austin that includes both the 2 and 5 mile ETJ boundary), the Cities have the authority to review and approve subdivisions and site plans. Travis County also has authority outside of a municipality's corporate limits but within the ETJ to approve developments. It is through these development review processes that the Cities and the County are able to implement a water quality ordinance. Within each City's full purpose jurisdiction, they also have the authority to control land use, via a zoning review process. The City of Austin in its limited purpose jurisdiction also has zoning authority that controls land use.

Both the City of Pflugerville and the City of Round Rock include stormwater pollution control ordinances as a best management practice in their Phase II, MS4 SWMP. The City of Austin will review its existing ordinance and identify opportunities to enhance water quality protection.

The City of Manor is not required to comply with the Phase II MS4 general permit and therefore is not required to develop a SWMP. For those areas within the County's jurisdiction, such as the Manor's ETJ, the County's ordinances will apply. Travis County includes structural and nonstructural controls as best management practice in their Phase II, MS4 SWMP and intends to modify their existing water quality ordinance. Travis County will

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 September 4, 2009

permit any site development activities in unincorporated areas within the ETJs in accordance to their SWMP requirements.

As with all TPDES permits in the Gilleland Creek Watershed, the Texas Department of Transportation can not discharge bacteria into the Gilleland Creek Watershed unless their stormwater management program through the general permit for Phase II MS4 is consistent with the approved TMDL and the implementation plan.

As shown in the table below, the majority of the watershed is within the authority of the City of Austin. By agreement, the City of Austin must coordinate the review of new development and redevelopment with Travis County. Exhibit 3 lists the acreage and percentage by each jurisdiction in the watershed.

**EXHIBIT 3**  
 Jurisdictions making up in Gilleland Creek Watershed

<b>Jurisdiction</b>	<b>Acreage</b>	<b>Percent of Watershed</b>
City of Austin – Limited Purpose	2,251 acres	4 percent
City of Austin – 2 Mile ETJ	24,242 acres	50 percent
City of Austin – 5 Mile ETJ	4,841 acres	10 percent
City of Austin – Full Purpose	9,679 acres	20 percent
<b>Subtotal</b>	<b>41,013 acres</b>	<b>84 percent</b>
Manor – ETJ	123 acres	<1 percent
Manor – Full Purpose	946 acres	2 percent
<b>Subtotal</b>	<b>1,069 acres</b>	<b>2 percent</b>
Pflugerville – ETJ	1,783 acres	4 percent
Pflugerville – Full Purpose	4,483 acres	9 percent
<b>Subtotal</b>	<b>6,266 acres</b>	<b>13 percent</b>
Round Rock – ETJ	82 acres	<1 percent
Round Rock – Full Purpose	402 acres	1 percent
<b>Subtotal</b>	<b>484 acres</b>	<b>1 percent</b>
<b>Travis County/Total</b>	<b>48,832 acres</b>	<b>100 percent</b>

## Attachment 1 Gilleland Creek Watershed Water Quality Ordinance Framework

**Goal:** Limit future bacteria loads to Gilleland Creek from new development and redevelopment by: (1) providing hydrologic control and treatment of post-development runoff; (2) protecting and preserving natural pollutant control systems [riparian buffers and wetlands]; and (3) directing the placement of wastewater infrastructure away from waterways.

Criteria	Recommended Provisions
Application	All development activity requiring a site or subdivision permit
Stream Buffers	<ul style="list-style-type: none"><li>• <b>Current regulations:</b> Provide stream buffer setbacks for creek protection<ul style="list-style-type: none"><li>○ Provide buffer zones according to drainage area size, such as 100 feet from the centerline of the waterway for minor drainage areas, 200 feet from the centerline of the waterway for intermediate drainage areas, and 400 feet from the centerline of the waterway for major drainage areas. Current drainage area size thresholds for the City of Austin (COA) and Travis County are as follows:<ul style="list-style-type: none"><li>▪ Minor – 320 acres to 640 acres</li><li>▪ Intermediate – 640 acres to 1,280 acres</li><li>▪ Major – 1,280 acres or greater</li></ul></li></ul></li><li>• <b>Future considerations:</b> Extend headwater protection further upstream in the watershed to better protect the natural drainage areas of waterways and retain/reestablish pollutant removal and channel stabilization functions (both key for bacteria control)<ul style="list-style-type: none"><li>○ Drainage area size thresholds to be evaluated are as follows:<ul style="list-style-type: none"><li>▪ Minor – 32 acres to 320 acres</li><li>▪ Intermediate – 320 acres to 640 acres</li><li>▪ Major – 640 acres or greater</li></ul></li></ul></li></ul> <p style="text-align: center;">Or,</p> <ul style="list-style-type: none"><li>○ Provide buffer zones for the fully developed 100-year floodplain plus 25 feet</li></ul>

Criteria	Recommended Provisions
<b>Water Quality and Streambank Erosion Control Requirements</b>	<ul style="list-style-type: none"> <li>● <b>Current regulations:</b> <ul style="list-style-type: none"> <li>○ Provide sedimentation-filtration equivalence per City of Austin Environmental Criteria Manual (Section 1.6.0)</li> <li>○ Provide water quality volume per Travis County and City of Austin half-inch-plus standard (Travis County Code § 82.209(g) and City of Austin Land Development Code § 25-8-213B)</li> <li>○ Provide a 48-hour drawdown time where applicable (i.e., not applicable to controls such as vegetated filter strips)</li> <li>○ Provide for nonerosive discharges at all outflow points from developed areas</li> </ul> </li>   <li>● <b>Future considerations:</b> <ul style="list-style-type: none"> <li>○ Provide sedimentation-filtration equivalence per City of Austin Environmental Criteria Manual (Section 1.6.0) or system compliant with LCRA Highland Lakes Watershed Ordinance and Water Quality Management Technical Manual, July 1, 2007</li> <li>○ Provide water quality volume per Travis County and City of Austin half-inch-plus standard (Travis County Code § 82.209(g) and COA Land Development Code § 25-8-213B) or LCRA Technical Manual Equation 2.9 to capture runoff from the 1 year, 3-hour storm</li>   <li>○ Investigate use of biofiltration media (instead of just sand) or other controls for improved control of bacteria; adjust requirements if warranted</li> <li>○ Investigate optimal water quality volume sizing using extended detention systems for channel erosion (and associated turbidity and bacteria) control; adjust requirements if warranted</li> </ul> </li> </ul>
<b>Wastewater Lines</b>	<ul style="list-style-type: none"> <li>● <b>Current regulations:</b> Prohibit wastewater lines in stream buffer zone, except for necessary line crossing</li> <li>● <b>Future consideration:</b> Use Erosion Hazard Zone determination methodology (City of Austin Watershed Protection Development Review Department) to calculate depth of line crossings</li> </ul>
<b>Wetlands</b>	<ul style="list-style-type: none"> <li>● <b>Current regulations:</b> Provide wetlands setback and mitigation protections (e.g., Travis County Code § 82.209(c) or City of Austin Land Development Code § 25-8-282).</li> <li>● <b>Future considerations:</b> Same as existing regulations</li> </ul>

Criteria	Recommended Provisions
<b>Variations</b>	<ul style="list-style-type: none"><li>• <b>Current regulations: City of Austin:</b> General requirements and procedures for variations are defined in Austin City Code, Title 25, Land Development, Chapter 25-1; specific requirements and procedures to water quality ordinances are defined in Chapter 25-8, Subchapter A., [<b>Travis County:</b>] Austin/Travis County Subdivision Regulations, Title 30, General Provisions and Procedures Chapter 30-1, Appeals, Variations, Special Exceptions and Adjustments, Article 9, [<b>City of Pflugerville:</b>] Land Usage: Title 15, Subdivision Code, Chapter 156, Variations, Section 156-018</li><li>• <b>Future considerations:</b> Same as existing regulations</li></ul>

## Definitions

Buffer Zone: Vegetated area free of impervious cover adjacent to a creek or natural drainage way

Creek: A well-defined channel that can convey running water

Development: All land modification activity, including the construction of buildings, roads, paved storage areas, and parking lots for single-family subdivisions, multi-family, retail, medical, educational, and commercial development. Development also includes, any land disturbing construction activities or human made change of land surface including clearing of vegetative cover, excavating, leveling, grading, contouring and the deposit of refuse, waste or fill

Impervious Cover: Impermeable surfaces, such as pavement, sidewalks, or rooftops that prevent the infiltration of water into the soil

Nonerosive discharges: Conveyance from storm sewer outfalls that does not cause channel, bluff, or stream bank erosion

Redevelopment: Any rebuilding, renovation, replat of property, revisions, remodel reconstruction of an existing development or redesign of an existing development which does not cumulatively increase impervious cover by 10,000 square feet or more

Variations: A waiver from any requirements of an adopted water quality ordinance

- Variations will be granted by the governing body in which the requestor's proposed development is seeking approval.

Wetland: A transitional land between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water and conforms to the Army Corps of Engineers definition" (USCOE Wetlands Delineation Manual, Section D, Routine Determinations)